

PARALLEL CLAMPS

B1
Rev.1

1	MOUNTING INSTRUCTIONS	P.2
2	USING INSTRUCTIONS	P.5
2.1	Tests and suggestions	P.5
2.2	Operations and maneuvers to avoid	P.5
2.3	Operations and maneuvers prohibited	P.5
3	MAINTENANCE	P.6
3.1	Periodical tests	P.6
3.2	Pad replacing	P.7
3.3	Valve replacing	P.7
3.4	Cylinders replacing	P.7
3.5	Arms or forks replacement	P.8
3.6	Removal of substituted parts	P.8
4	FAILURES AND CORRECTIVE ACTIONS	P.8
4.1	Insuffisant clamping pressure	P.8
4.2	Loss of pressure during the clamping operation	P.9
4.3	Too slow arms travel	P.9
4.4	Irregular shifting of arms	P.9
4.5	Valves and cylinders require too many setting operations	P.9
4.6	Damaged load due to high clamping pressure	P.9
4.7	Low or stopped side shifting	P.10
4.8	Stopped side shifting	P.10
4.9	Blocked side shifting	P.10
5	WARRANTY	P.11

When ordering parts, please, always state:

- a) unit serial number,
- b) date of delivery,
- c) required parts reference and quantity

NOTE: Together with the Instruction we supply the “**EC**” **Conformity Certificate** and all documents, which are in a transparent envelope secured to the attachment.

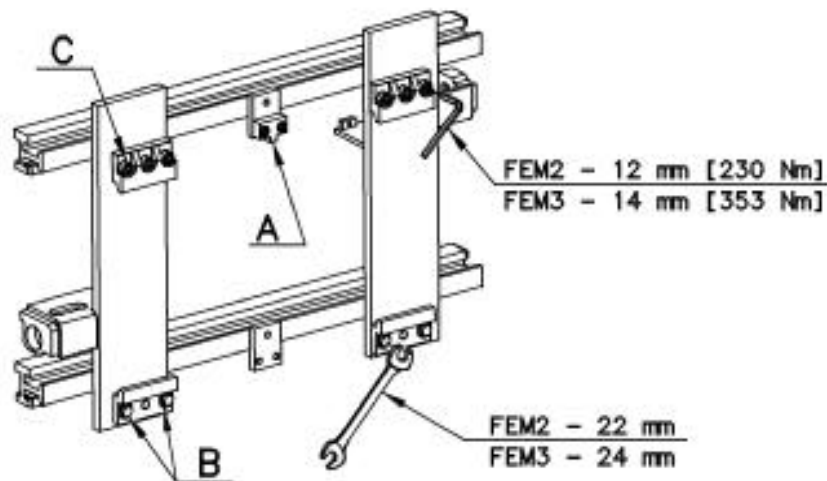
The customer, and therefore the company who owns the attachment shall make sure that the installation instructions are strictly followed, and make sure that the correct working conditions and the maintenance terms are followed as listed.

The inobservance of the above mentioned implies the “improper use” by the end user, lifting from all responsibilities the manufacturer, in accordance with the foreseen safety rules.

The basic rules which have been followed are listed on the “EC Conformity Certificate”, while all derived and reference rules, as the sector quality rules prescribed (ISO 9001) with the risks analysis, are part of the technical leaflet filed by the Technical Department at BOLZONI S.p.A.

1 MOUNTING INSTRUCTIONS

- 1.1 Make sure that the notches on lift truck carriage are undamaged and the truck carriage is plane and smooth.
- 1.2 Place the clamp in vertical position (hooking position) on a pallet side (or other raised surface) in order to enable to move closer to the truck carriage.
- 1.3 Remove the lower hooks (**Pict.01** position **B**) and fix provisionally the flexible hoses feeding the clamp on the front side, in order to avoid any pinching or damage while fixing the clamp on the truck carriage.
- 1.4 Hook the clamp on the truck, positioning the fixing tooth “**A**” in connection with the central notch of the carriage plate (**Pict.01**). Fix the lower hooks tightening the “**B**” screws.



Pict.01

- 1.5 Check the hydraulic line from the clamp to the distributor. The advised internal section of flexible hoses must be:
 - 8 mm (5/16") for the control of clamps up to 3 ton capacity (6,600 lbs),
 - 10 mm (3/8") for the control of clamps from 3 up to 5 ton capacity (from 6,600 lbs up to 11,000 lbs),
 - 13 mm (1/2") for the control of clamps over 5 ton capacity (11,000 lbs).
- 1.6 Max. clamping pressure 180 bar (2,600 PSI) with load completely clamped, at this pressure it is excluded to clamp load with arm edges. Effective working pressure stated on label, considered different type of arms and load.
 - Min. clamping pressure 50 bar (700 PSI) only for arms and forks positioning.
- 1.7 Advised oil flow:
 - 12 l/min. (4 GpM) minimum, 25 l/min. (7 GpM) recommended for KB 10 - 14;
 - 15 l/min. (6 GpM) minimum, 30 l/min. (10 GpM) recommended for KB 18 - 22 - 28;
 - 20 l/min. (8 GpM) minimum, 35 l/min. (12 GpM) recommended for KB 35 - 40;
 more reduced oil flows cause irregular and low movements, higher oil flows do not improve performance, but cause harmful back pressures and oil overheating.

1.8 Before connecting the flexible hoses of the feeding group to the clamp, operate the lever in both directions so that a little oil (approx. 10 cl - 3.5 fl. oz) comes out from both hoses, in order to remove eventual residual parts of rubber coming from the fixing of the fittings to the hoses.

1.9 Connect the flexible hoses of the attachment with the mounting group on the lift truck. As requested by safety rules:

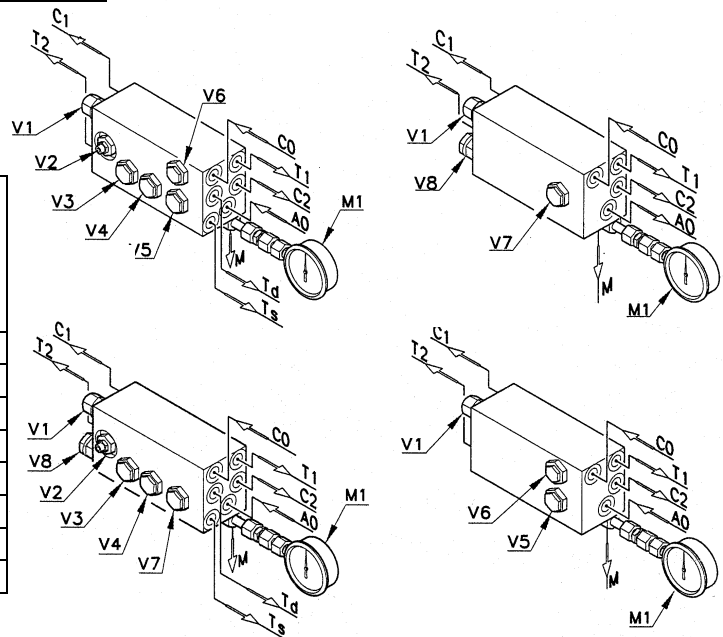
- by pulling the lever arms must close (clamping); connection with inlet “CO” of valve (**Pict.02**).
- by pushing the lever arms must open; connection with inlet “AO” (**Pict.02**).
- by pulling the second lever there must be the side shifting operation to the right (for side shifting version) connection with the inlet “Td” of the valve (**Pict.02**).
- by pushing the lever there must be the side shifting to the left; connection with the inlet “Ts” of the valve (**Pict.02**).

The tightening of the hydraulic circuit fittings with following torque:

- 8 DaN/m (57 Ft/Lbs) for fittings M 14 x 1,5 (or ¼ GAS) on stainless steel body;
- 10 DaN/m (70 Ft/Lbs) for fittings M 16 x 1,5 (or 3/8 GAS) and over, on stainless steel;
- 7 DaN/m (50 Ft/Lbs) for fittings M 14 x 1,5 (or ¼ GAS) on aluminum body;
- 8 DaN/m (57 Ft/Lbs) for fittings M 16 x 1,5 (or 3/8 GAS) and over, on aluminum body.

FILETTATURA THREADINGS	STANDARD	USA
A0-C0-C1-T2	M16 x 1.5 UNI 4535-64	UNF 3/4"-16 2B

POS	SMONTAGGIO DISMANTLING DEMONTAGE DEMONTAJE ABBAUEN	REGOLAZIONE ADJUSTMENT REGLAGE ARREGLAJE EISTELLEN
V1	CH1=24 mm	CH1=22 mm+CH3
V2	CH1=22mm	CH1=13 mm+CH2=4 mm
V3	CH1=27 mm	-----
V4	CH1=27 mm	-----
V5	CH1=27 mm	-----
V6	CH1=27 mm	-----
V7	CH1=27 mm	-----
V8	CH1=24 mm	-----



Pict.02

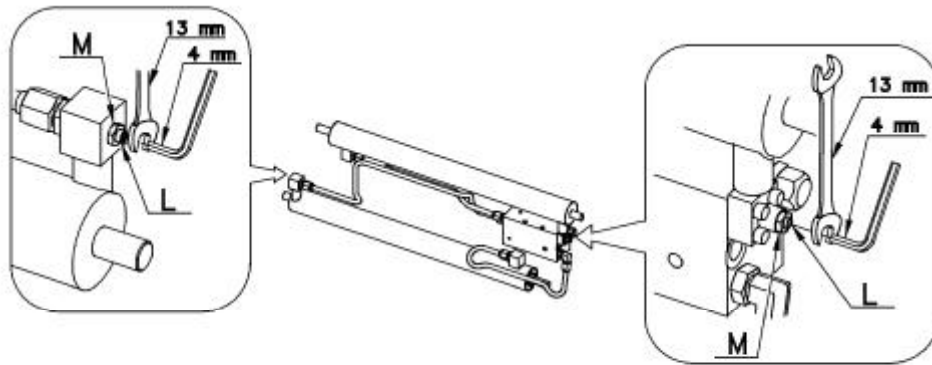
1.10 Check the arm movement both when opening and closing the clamp: it must be synchronised (tolerance approx 20-30 mm).The maneuvers must be done with the distributor lever fully open and, in case of I.C. truck, with the engine at average running. The clamp is pre-adjusted to work with an oil flow determined in accordance with the clamp capacity.

When fitted to the truck, if the oil flow is very different, the clamp may need a further adjustment.

Operate then as follows:

- open the arms completely;
- unloose the lock nut of regulators position “M” (**Pict.03**);
- untighten the two regulators completely “L” (**Pict.03**); open and close the clamp; if there is no

synchronism between the arms, throttle the oil flow entering the quickest cylinder, rotating clockwise the adjusters “L” (**Pict.03**); as the synchronism is reached lock the counter nut “M”.



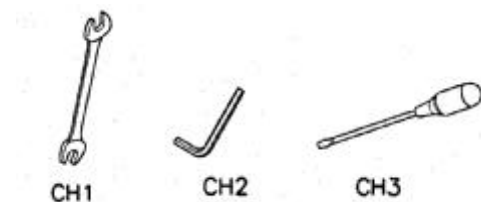
Pict.03

1.11 Operate the clamp a few times, keeping the arms in the extreme positions (completely opened or closed) for 8-10 seconds and then check the perfect tightness of the hydraulic connections between the feeding group and the clamp. In case of leaking, properly tighten the fittings after checking their conditions and cleanliness.

1.12 Check the operating pressure, with the pressure gauge “M1” (**Pict.02**) according to the data shown on the label; an eventual adjustment can be done by removing the cap “V1” with key “CH1” (**Pict.04**) and with screwdriver “CH3” adjust the cursor (by turning clockwise the pressure increases, by turning anticlockwise the pressure is reduced). Refit then the cartridge cap.

A pressure gauge, if not fitted originally, can be fitted on the valve as shown in the picture position “M” **Pict.02** (threaded hole M 14 x 1,5).

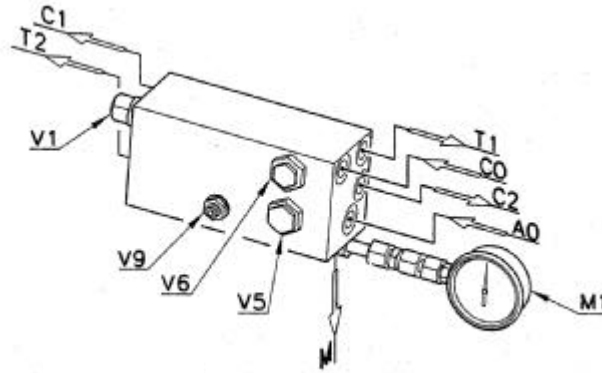
POS	SMONTAGGIO DISMANTLING DEMONTAGE DEMONTAJE ABBAUEN	REGOLAZIONE ADJUSTMENT REGLAGE ARREGLAJE EISTELLEN
V1	CH1=24 mm	CH1=22 mm+CH3
V2	CH1=22mm	CH1=13 mm+CH2=4 mm
V3	CH1=27 mm	-----
V4	CH1=27 mm	-----
V5	CH1=27 mm	-----
V6	CH1=27 mm	-----
V7	CH1=27 mm	-----
V8	CH1=24 mm	-----



Pict.04

1.13 Adjustment of the opening speed for clamps KB35 and KB40 with pression regeneration valve on trucks with oil flow, working on the screw “V9” (**Pict.05**)

- untighten the locking nut;
- slowly unscrew the screw, verifying the opening speed (the excessive unscrewing can cause the opposite effect);
- block the nut once reached the optimum adjustment.



Pict.05

2 USING INSTRUCTIONS

2.1 TESTS AND SUGGESTIONS

- a) Check that the load and the load center of gravity are not higher than the data stated on the label. If the load center is increased (due to its higher dimension) it is necessary to proportionally reduce the load weight, in order not to overcome the tipping momentum.
- b) Make sure that the load unit is steady, even in a breaking or sagging situation.
- c) Clamp the load as centered as possible.
- d) Clamp the load with the adequate pressure in order to avoid useless stress to the structure and possible load damages.
- e) Hold the load in a slightly lifted position (also to have the best visibility), to reach the best truck stability during the maneuvers.
- f) Adjust handling speed according to load nature and stability, considering also difficulties due to overall sizes and available room.
- g) Pay attention to sloping ramps and ground level differences that jeopardize lift truck stability.
- h) Gently action the distributor clamping and side shifting lever, in order to avoid “water hammer” on the hydraulic circuit and not to jeopardize the truck stability at high lifting.

2.2 OPERATIONS AND MANOEUVRES TO AVOID

- to handle loads heavier than the nominal capacity (tolerance of about + 10% only in few occasions and with particular care);
- to lift an unstable load;
- take on an out of center load;
- to lift the load with the arms edge, even if the load is reduced;
- to side shift one load with opening arms;
- to move a nearby load when side shifting with clamped load;
- to side shift while the truck is turning;
- to drive the fork lift truck at high speed, with the load at high elevations;

2.3 OPERATIONS AND MANOEUVRES PROHIBITED

- to use the attachment for purposes different from the original ones;
 - to take on loads heavier than maximum allowed;
 - to drive the lift truck in precarious visibility conditions due to a bulky load;
 - to transport people on the lift truck or on the attachment;
 - to tamper the attachment while opening or clamping;
-
- to stand in the working area of attachment or of lift truck
 - to use the attachment when the unit presents even a slight deformation of its structure or in any way a working defect (excessive clearance, uneven movement, etc.).

NOTE: The risk analysis, made during the planning, has been accurately performed; but, because there are mortise guides and hanging loads, there can be few residual risks. Apart from the instruction here above, notice that adhesive plates have been applied on critical parts for pointing out possible danger

3 MAINTENANCE

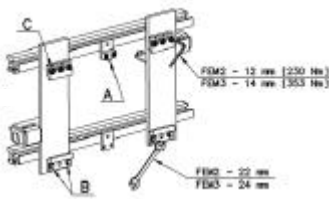
The attachment maintenance has to be executed only by qualified personnel and following to the instructions of this service manual.

The manual maintenance operations on the guides and on all the other sliding parts have to be carried out when the truck is switched off.

3.1 PERIODICAL TESTS

Each 200 hours periodically make the following operations:

- 1) Inspect the hydraulic lines, eventually replacing the damaged parts.
- 2) Check the arms opening-closing synchronism. If arms are slow or not synchronized, act on the adjusters placed on the valve and proceed as explained in point 1.10 of mounting instructions.
- 3) Inspect the cylinders: an eventual leak involves the replacement of the road seals and an accurate checking (if there are any shocks or other damages it is necessary to replace it).
- 4) Check the clamp hooks on the carriage: bolts must be tightened to a torque as on **Pict.01**.



Pict.01

- 5) If the attachment works in dusty atmosphere, it is necessary to frequently clean and grease the sliding parts (arm carriers and bushings) with oil or very fluent grease.
- 6) If the attachment works in humid or corrosive atmosphere, it is important to intensify the cleaning and greasing frequency of the sliding parts, arm carriers and bushings. It is useful to clean the attachment even if it is going to stay still for a long time.
- 7) Carefully check the arms base in the welding points between the profiles; repeat the check after any arms shock.
- 8) Check the clamping arms surface, which has to be smooth or at least able to grant the correct load clamping; replace the worn parts.
- 9) Check the articulation pins, the leading bushings and the arm and oscillating pad clearances; replace the worn leading bushings.
- 10) Check the lower part of the arms: when these slither on the ground in order to clamp a load, the wear pad has to be replaced as soon as its thickness is strongly reduced.

Each 2000 working hours, beside the periodically maintenance operations, fulfill the following operations.

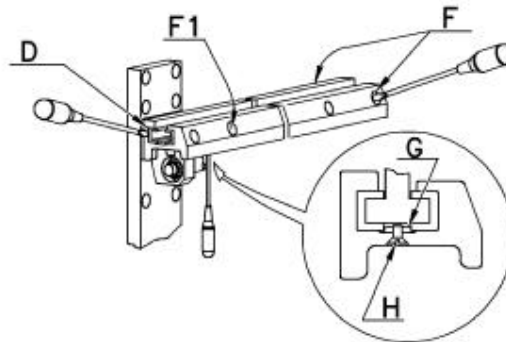
- a) Check the clamp sliding pads wear and replace pieces when the clearances are very high.
- b) Check the tightness of the hydraulic connections and eventually restore the fittings tightness.
- c) Make sure the tightening of the valve and of the cylinders can grant a precise load clamping for at least 10 minutes (test to be carried out with slightly lifted load). If it is necessary, replace the cartridge “V5” and “V6” or “V7” (**Pict.02**) according to the valve fitted on the clamp (or

the complete valve) and/or the cylinder sealing. In order to identify the type of adopted valve, check the code on page 03 _ _ _ of the spare parts catalogue.

3.2 PADS REPLACING

The pads can be taken away as shown on **Pict.06**; for those in position “F” act directly on the pins, for these on “F1” it is necessary to take away the “H” screws and the washer “G”, and act on the pins as for “F”.

The “D” pad can be disassembled prizing with a screwdriver, between the pad and the guide. Reassemble the new pads.



Pict.06

3.3 VALVE REPLACING

Every valve is flanged on the fitting “A” which is directly screwed on the right cylinder back port **Pict.07**. To replace the valve it is necessary to:

- 1) open the clamp nearly at the maximum opening,
- 2) Stop the truck engine and the electro pump and take away the pressure from the feeding circuit, moving in both directions the distributor levers of the clamp.
- 3) Take away the protection “B” fixed by the “C” screws (**Pict.07**).
- 4) Disconnect the distributor feeding hoses to the valve and those from the cylinders to the valve; it would be useful to counter mark the hoses in order to reconnect them in the right sequence afterwards, (this operation causes oil outlet from the valve hoses, therefore prepare one container to pick it up).
- 5) Loosen the “D” screws (**Pict.07**) and take the valve away.

NOTE: Before to assemble the new valve make sure that the surfaces between the valve and the fitting are cleaned, in the flange area, and make sure about the tightening of the O ring; if it is necessary replace it.

3.4 CYLINDERS REPLACING

- a) Position the clamp nearly at the maximum opening.
- b) Untighten the nut connecting the “E” rod with the keys “CH1” and “CH2” (**Pict.07**)
- c) Close the clamp, the cylinder rod will enter without dragging the arms, stop the operation with the rods protruding of about 100 mm from the cylinder body.
- d) Repeat operations number 2, 3, 4, 5 from point 3.3.
- e) Disconnect the hoses and the connecting fittings between valve and cylinder.
- f) Loosen and disassemble the “F” nut on the cylinder anchor (**Pict.07**) and unthread the cylinder from the connecting hole.

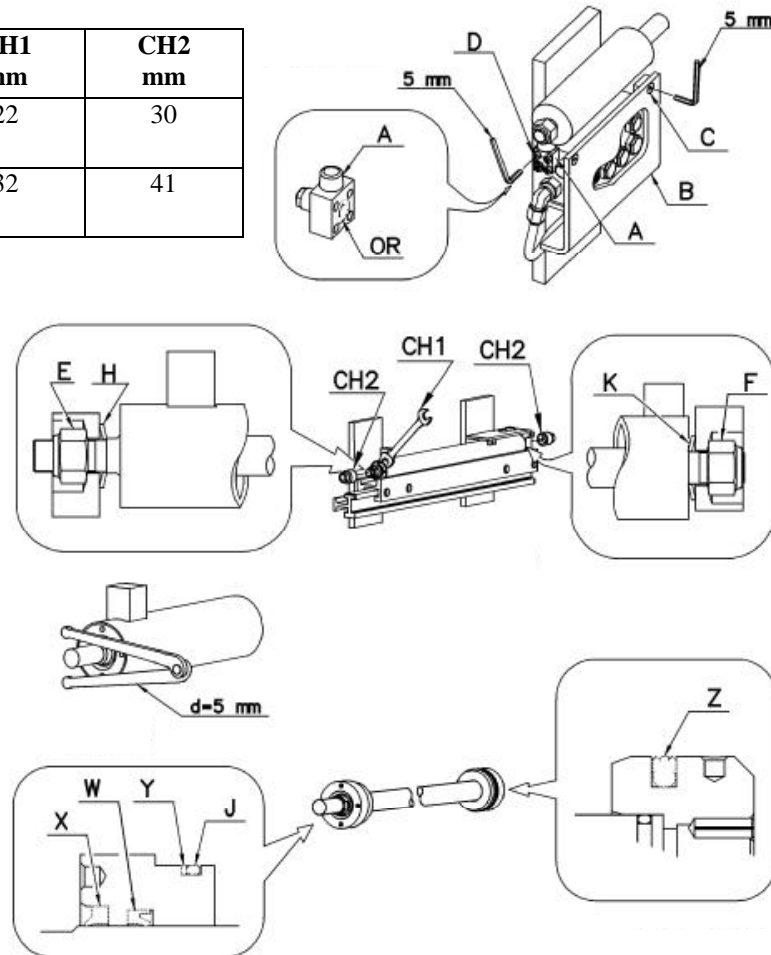
In order to assemble the cylinder position the cup spring “H” and “K” placing them with the hollow part towards the fixing nut, then tighten the nuts till the beginning of the compression of the cup spring and load them with ¼ nut turn.

Reassemble the valve and the connecting hoses.

3.5 ARMS OR FORKS REPLACEMENT

- Position the arms at maximum opening.
- Unscrew the locking nut of the cylinder rod "E" with keys "CH1" and "CH2" (**Pict.07**)
- Operate the clamp closing (the rod will go in and out from its support connected to the arms)
- Sling the arm with the proper bands and high it up slightly with a crane or a lift-truck to make the unthreading of the arms from the guides easier and work safely.

CAPACITY daN	CH1 mm	CH2 mm
1000-28000	22	30
2900-4000	32	41



Pict.07

The replacing of the arms have to be executed beginning from point d), then insert the profiles of the arms in the proper guides, push in center direction until the cylinder rod is inserted in the support with spring "H" as showed in **Pict.08** and tighten the nut until the compression beginning of the spring, plus about ¼ turn for the right pre-load.

3.6 REMOVAL OF SUBSTITUTED PARTS

The substituted parts have to be removed, as for the complete scrapping, considering the material origin and observing the law prescription for the solid industrial refuse removal.

4 FAILURES AND CORRECTIVE ACTIONS

4.1 Failure: *Insufficient clamping pressure*

Causes and remedies

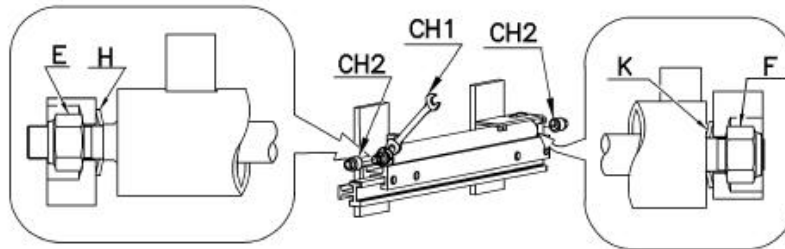
- Oil missing in the tank: restore the oil level
- Obstruction or throttle of the hydraulic circuit: locate and remove the obstruction.
- Air in the circuit: bleed the circuit.
- Worn pump: repair or replace.

5. Insufficient truck pressure: increase pressure (see max. pressure stated on label and eventually adjust according to point 1.11 of the mounting instructions).
6. Oil leak in the cylinders: replace packing or the complete cylinder; fixing it according to the instructions of point 3.4.
7. Oil leak in the valve: disassemble and clean the cartridges position “V5” and “V6 or V7” (**Pict.02**) according to the vale fitted on the clamp. If the failure doesn’t disappear, replace the pieces.

4.2 Failure: *Loss of pressure during the clamping operation*

Causes and remedies

1. Check valve with defective seal: dismount and clean cartridge “V5” and “V6” or “V7” (**Pict.02**) according to the valve type assembled on the clamp and if the problem is still there, replace parts.
2. Oil leak in the cylinders: replace packing or the complete cylinder (**Pict.08**).
3. Oil leak along the hydraulic circuit: locate the leak and replace the defective part.



Pict.08

4.3 Failure: *Too slow arms travel*

Causes and remedies

1. Insufficient oil flow due to worn pump: repair or replace.
2. Insufficient truck pressure: increase pressure (see label and mounting instructions point 1.11).
3. Abnormal friction between arm carriers and frame: replace bushings or eliminate possible deformations of arm carriers (eventually replace them). See point 3.2
4. Restriction in the hydraulic circuit: locate and remove the restriction.
5. Flow adjusters too closed: open them and follow operations shown on point 1.10 of the mounting instructions.
6. Worn cylinder packing : replace them.

4.4 Failure: *Irregular shifting of arms*

Causes and remedies

1. Wrong flow adjusters setting: restore the synchronism (see point 1.10).
2. Air in the circuit: bleed the circuit.
3. Insufficient truck oil pressure: check data and pump wear.

4.5 Failure: *Valves and cylinders require too many setting operations*

Causes and remedies

1. Hydraulic oil with impurity: replace it
2. Scratch on the cylinder tightening surfaces: replace them.

4.6 Failure: *Damaged load due to high clamping pressure*

Causes and remedies

1. Too high adjustment of the pressure relief valve: restore the adjustment (see data on the label and mounting instruction at point 1.11).
2. Broken pressure relief valve: replace it (position V1 **Pict.02**)

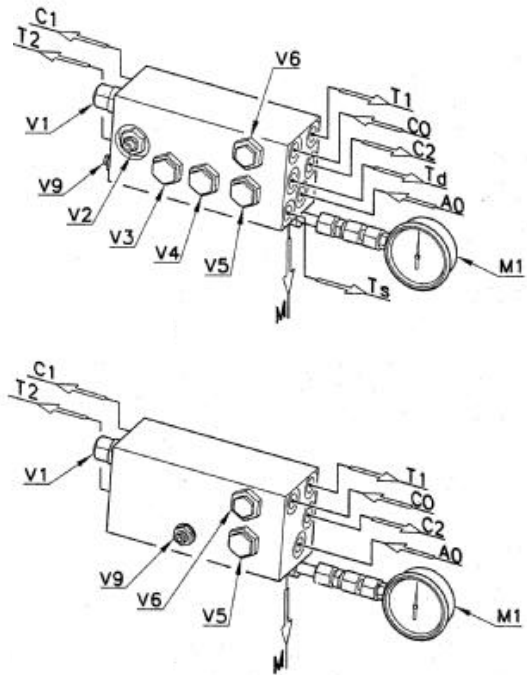
4.7 Failure: *Slow opening speed of the arms (on clamps KB35 and KB40)* also with pressure regeneration valve.

Causes and remedies, apart from what described in spot 4.3

1. High truck oil flow, therefore is necessary to check the V9 cartridge adjustment (**Pict.09**) as per instructions in spot 1.13.

FILETTATURA THREADINGS	STANDARD	USA
A0-C0-C1-T2	M16 x 1.5 UNI 4535-64	UNF 3/4"-16 2B

POS	SMONTAGGIO DISMANTLING DEMONTAGE DEMONTAJE ABBAUEN	REGOLAZIONE ADJUSTMENT REGLAGE ARREGLAJE EISTELLEN
V1	CH1=24 mm	CH1=22 mm+CH3
V2	CH1=22mm	CH1=13 mm+CH2=4 mm
V3	CH1=27 mm	-----
V4	CH1=27 mm	-----
V5	CH1=27 mm	-----
V6	CH1=27 mm	-----
V7	CH1=27 mm	-----
V8	CH1=24 mm	-----
V9	CH1=17 mm	CH1=8 mm+CH2=2.5mm



Pict.09

4.8 Failure: *Slow and blocked side shifting*

Causes and remedies

1. Insufficient oil flow: check data and pump wear.
2. Insufficient truck oil pressure: increase it.
3. Air in the hydraulic circuit: bleed the circuit.
4. Abnormal friction between arm carriers and frame: restore the correct clearance between the guides and/or replace bushings possible deformations of arm carriers (eventually replace them).
5. Dirty or worn cartridge (Position V3-V4 **Pict.02**): dismantle and clean carefully. Replace if necessary.

4.9 Failure: *Blocked side shifting*

Causes and remedies

1. Misadjusted needle (position V2 **Pict.02**): make sure that all parts are perfectly clean and then completely close the oil flow (by tightening the needle). Loosen by ¼ - ½ turn and then lock the counter nut.
2. Dirty or worn cartridge: dismantle and clean carefully. Replace if necessary (position V3 - V4 **Pict.02**).

NOTE: If there are any difficulties during servicing, or the fault is different from those stated above, please contact BOLZONI after sales service.

5 WARRANTY

BOLZONI S.p.A. guarantees all its products for 12 months usable for 8 hours per working day beginning from delivery date. If the products are used more than 8 hours per day, warranty period decreases proportionally. Warranty is limited ex works *BOLZONI S.p.A.* to replacement of those parts that the firm acknowledges are defective because of material or manufacturing failure and does not include labor or traveling expenses for the replacement of such parts.

It is also agreed that warranty acknowledgement is not valid if the attachment failure is due to incorrect use of the product, if mounting instructions have not been followed, or if original parts have not been used on the *BOLZONI S.p.A.* attachment.

BOLZONI S.p.A. does not guarantee its products for uses that are not provided on the labels or in the service manuals.

All the *BOLZONI S.p.A.* attachments are insured for third party injuries due to defective parts or to incorrect functioning of the attachment; all the injuries caused by incorrect or inappropriate use of the attachments are excluded.