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1. DESCRIPTION AND FUNCTIONING

1.1 With dragging devices (FIG. 001)

Device for the synchronized positioning of the loading forks.

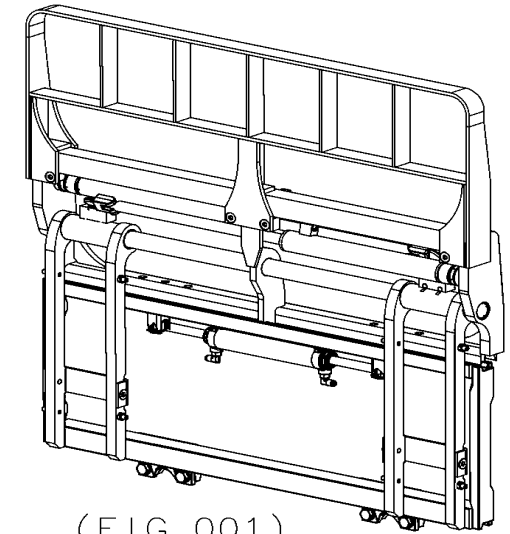
Based on a frame in which the lower side is intended for the assembly of the shifting cylinder and of the corresponding sliding pads, while for the dragging devices that are moved by opposite double-acting cylinders, a bar is fixed on the top side of the frame and is used as a guiding device (the load is carried by the FEM profile of the frame).

The loading forks are inserted into the FEM profile and positioned in the middle of the dragging devices by means of side screws or, on request, of spacers that are fastened on the dragging devices.

A protection grid can be mounted on the top side of the frame.

The “STANDARD” hydraulic system is equipped with inlets that are positioned in the rear central side above the cylinders; the pipe fittings have a metrical thread as well as airtight squeeze bushing with 10 mm diameter according to DIN 3861.

Adapters with different threads and airtight joints as well as side inlets in the top left side of the frame are available on request.



(FIG. 001)

1.2 With customized forks (FIG.002)

Device for the synchronized positioning of the loading forks.

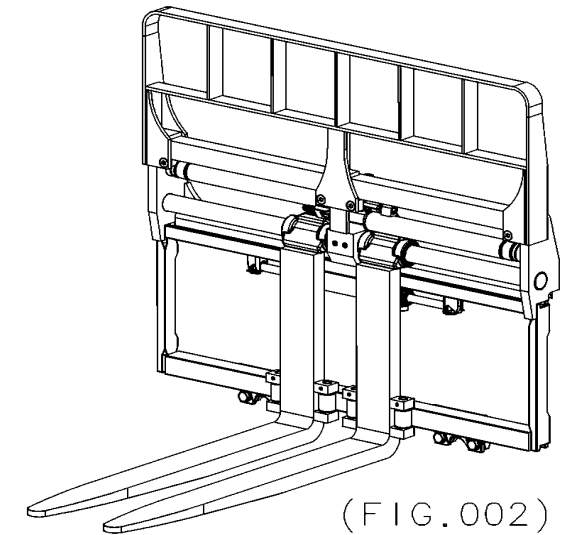
Based on a frame in which the lower side is intended for the assembly of the shifting cylinder and of the corresponding sliding pads, while a bar is fixed in the top side and is used as a guiding as well as a carrying device for the load handled by the forks.

Our loading forks are equipped with sliding bushes and scraper seal ring, in the top side, with or without bottom sliding rollers, and are moved by opposite double-acting cylinders.

A protection grid can be mounted on the top side of the frame.

The “STANDARD” hydraulic system is equipped with inlets that are positioned in the rear central side above the cylinders; the pipe fittings have a metrical thread as well as airtight squeeze bushing with 10 mm diameter according to DIN 3861

Adapters with different threads and airtight joints as wells as side inlets in the top left side of the frame are available on request.



(FIG.002)

1.3 With carriers for FEM forks (FIG.003)

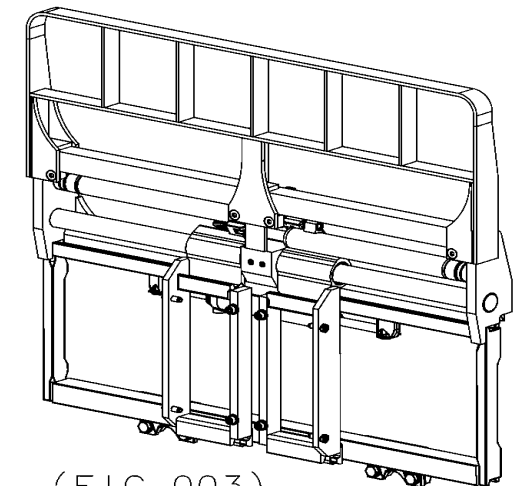
This attachment differs from the previous one described at point 1.2 in that the loading forks are substituted with carriers for FEM profiles that are equipped with sliding bushes and scraper seal ring in the top side, with or without bottom sliding rollers, to which the loading forks of the lift truck can be connected.

The forks are locked in position by means of side screws.

2. ASSEMBLY INSTRUCTIONS

2.1 Version with side-shifter

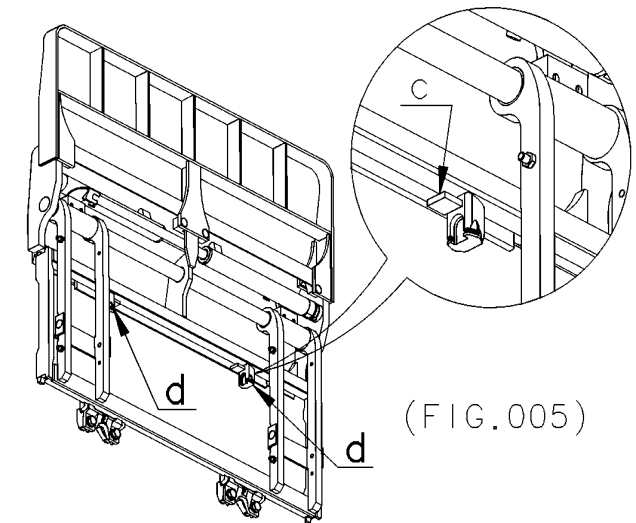
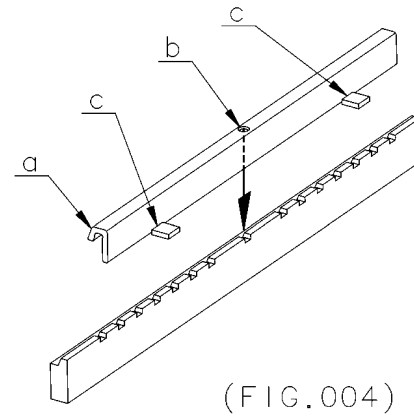
For the assembly of the fork positioner with side-shifter, it is necessary to follow the instructions specified at point “1. INSTALLATION” of the side-shifter manual; the only difference consists in the connecting and lifting (fig. 03 side-shifter manual) that can be carried out by means of belts or tie rods that are positioned at the end of the frame (adhesive indication label on the attachment) and also point “1.3.5 fork assembly” described below.



(FIG.003)

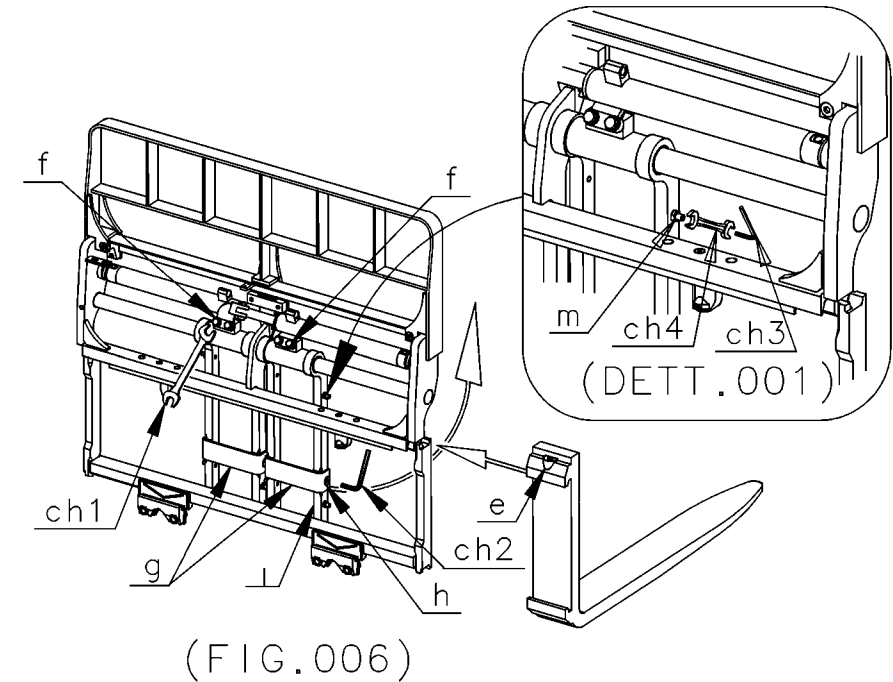
2.2 Version without side-shifter

For the assembly of the fork positioner without side-shifter, it is necessary to follow the instructions specified at point “1. INSTALLATION” of the side-shifter manual. The only difference concerns point 1.3.2 (fig. 03 side-shifter manual) that must be replaced by the following procedure:
position the carrier “a” so that the tooth “b” matches into the central notch of the fork plate holder of the lift truck (see Fig. 004). Couple the attachment to the carrier “a” by lifting it as shown at point 2.1.1; make sure that the pin stops are inside the plug “d”. (see Fig. 005)



2.3 Fork assembly with dragging device (Fig.006)

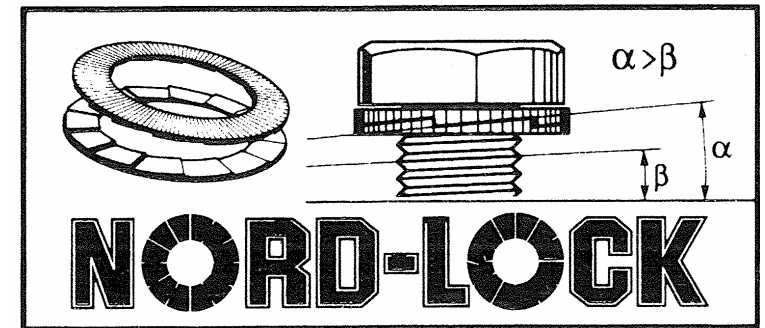
- 2.3.1 Raise the stop pin of the forks in position “e”
- 2.3.2 Remove the 4 screws “h” (ch2=10mm for FEM2 and FEM3 3.5 ton; ch2=12mm for FEM3 4,9 ton) and the fork pin stop “g”.
- 2.3.3 Remove the 4 screws “f” (ch1=19mm for FEM2 e FEM3 3.5 ton; ch1=24mm for FEM4 4,9 ton).
- 2.3.4 Rotate forward the dragging devices “l”.
- 2.3.5 Put the forks into the frame with FEM profile and position them in the middle of the dragging devices, lower them and remount the pin stops “g”.
- 2.3.6 Tighten the 4 screws “h” to a tightening torque of 85 N/m (60 Ft/Lbs)
- 2.3.7 Re-tighten the 4 screws “f” with their washers (check the fitting direction of the washers specified in the NORD-LOCK adhesive applied to the dragging device; Re-fit the washers coupled as before dismounting; to the right, example of the adhesive) with tightening torque 84 N/m (60 Ft/Lbs) ch1=19mm for FEM2 and FEM3 35 quintals; in the case of model FEM3 49 quintals, re-tighten the 4 screws “f” to a tightening torque of 204 N/m (145 Ft/Lbs) ch1=24mm.



NB: tighten the screws “m” (detail 001) on the side of the dragging device (ch4=16mm, ch3=5mm) to get the positioning of the forks inside the dragging devices.

IMPORTANT: The regulation of the “m” screws must be performed so that the fork is not forced to rub on the FEM profile in an anomalous way; the fork hook must be able to slide in parallel to the FEM coupling profile.

If necessary, tighten the upper screws to a lesser or greater extent than the lower ones, so that the fork can run correctly on the profile. In any case, the “m” screws must be all tightened against the fork so as to prevent the same from impacting the said screws. At this point, tighten the counter-nuts on the “m” screws to a torque of 50 N/m (35 Ft/Lbs).

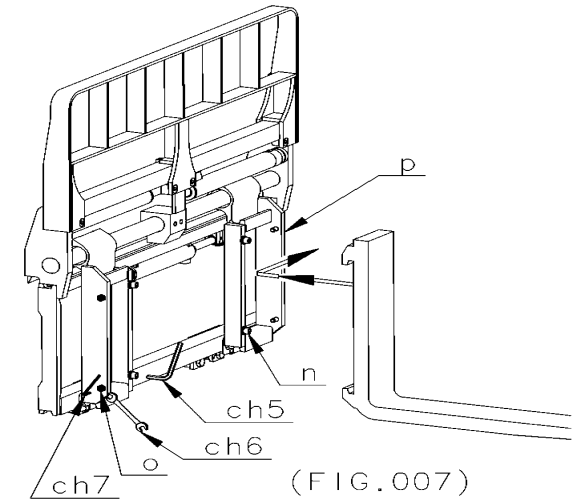


2.4 Fork assembly with carriers (Fig.007)

2.4.1 Remove the 4 screws “n” and the knurled washers (ch5=18mm), and put the forks into the FEM profile of the carrier “n” (tightening torque 85 N/m, 60 Ft/lbs) and tighten the screws “n.” and the knurled washers in the appropriate assembly direction.

2.4.2 Tighten the “o” screws (ch6=18mm, ch7=6mm) against the fork securing it against the “n” screws.

2.4.3 Tighten the counter-nuts onto the “o” screws to a torque of 50 N/m (35 Ft/Lbs).

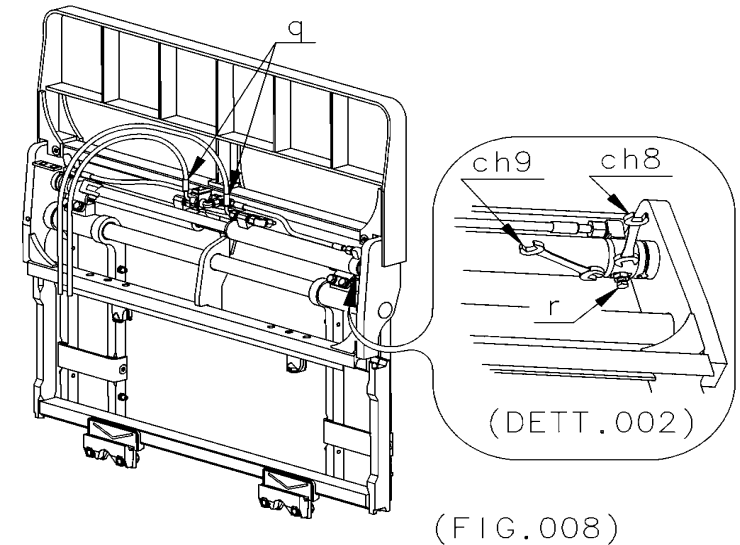


2.5 Connection of the hydraulic system with central inlet (recommended when the power supply system of the lift truck ends to the right or to the left outside the standards)

2.5.1 Using hose pipes equipped with terminal fittings, connect the system on the truck standard to the fittings “q” (Fig. 008) of the attachment, by tightening to a torque of 60 N/m (43Ft/Lbs).

IMPORTANT: the connecting hose pipes should be arched in order to allow the side shifting of the whole unit.

2.5.2 Carry out some trial movements so as to check the perfect hydraulic seal of the fittings as well as the speed and synchronism of the fork shifting. In case of oil leakage from a fitting, it is necessary to remove and clean it carefully. The speed and synchronism of the forks can be adjusted by means of flow regulators “r”(detail 002) placed on the cylinders lower side; unscrew (ch8=12) to increase the speed and screw in to reduce the speed. After any adjustment, lock the screws “r” by means of the hex nut (ch9=16).



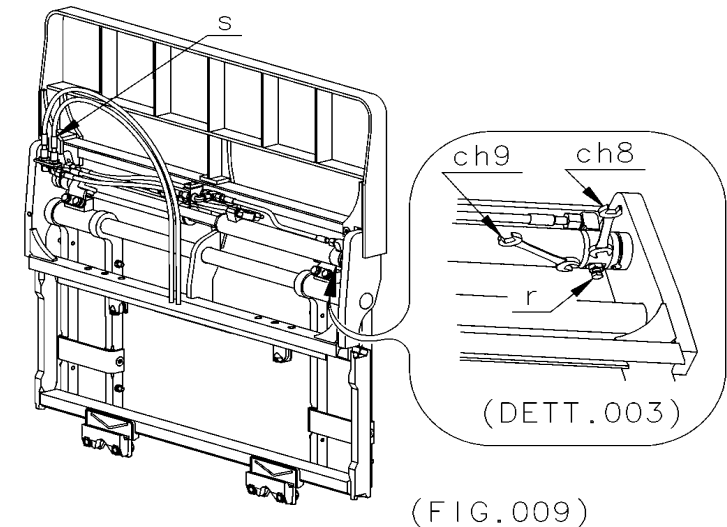
FORK POSITIONERS mod. 04

2.6 Connection of the hydraulic system with side inlet (recommended when the power supply system of the lift truck ends in the middle of the standards)

2.6.1 Using hose pipes equipped with terminal fittings, connect the system on the truck standard to the fittings “q” (Fig. 009) of the attachment, by tightening to a torque of 60 N/m (43Ft/Lbs).

IMPORTANT: the connecting hose pipes should be arched in order to allow the side shifting of the whole unit.

2.6.2 Carry out some trial movements so as to check the perfect hydraulic seal of the fittings as well as the speed and synchronism of the fork shifting. In case of oil leakage from a fitting, it is necessary to remove and clean it carefully. The speed and synchronism of the forks can be adjusted by means of flow regulators “r”(detail 003) placed on the cylinders lower side; unscrew (ch8=12) to increase the speed and screw in to reduce the speed. After any adjustment, lock the screws “r” by means of the hex nut (ch9=16).

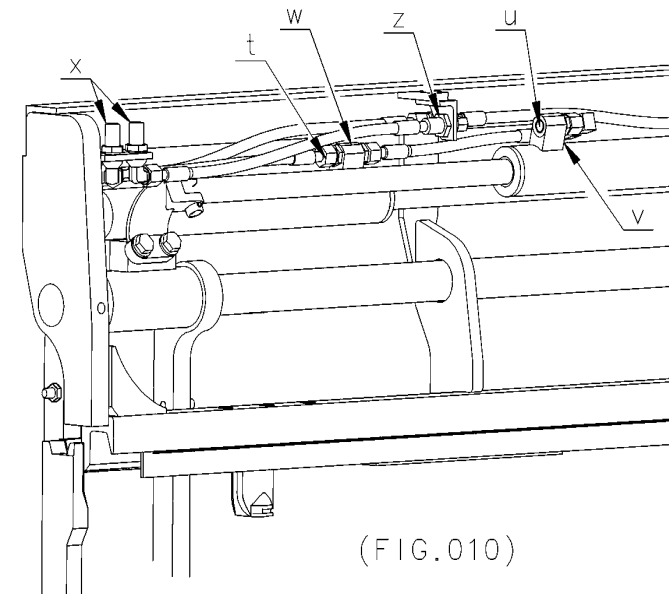


2.7 Conversion of the system from central inlet to side inlet (Fig. 010)

2.7.1 Reverse the positions between fitting “t” and cap “u”. After this operation the boss “v” of the right cylinder will be plugged, while the boss “w” of the left cylinder will have the fitting.

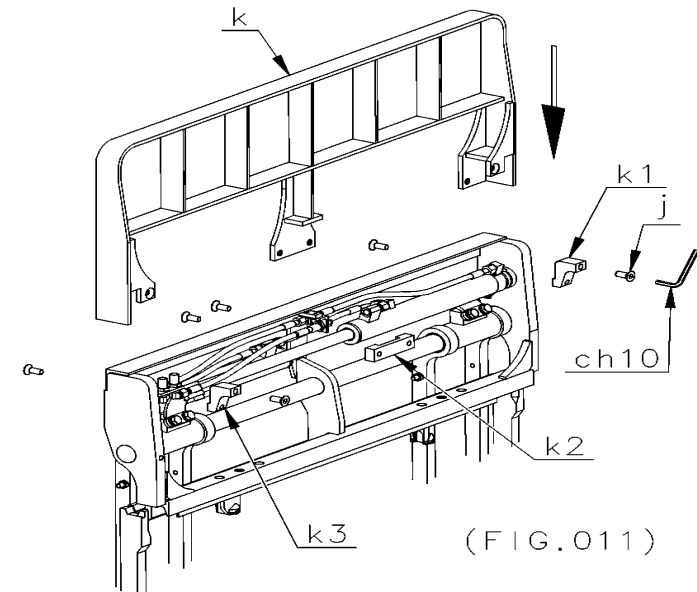
2.7.2 Fasten the fittings “x” to their welded support on the top left side of the frame.

2.7.3 Connect the fittings “x”, “t” and “z” by means of the hose pipes provided.



2.8 Mounting of the protection grid (Fig. 011)

- 2.8.1 Position the grid and insert it from above by placing it on the top side of the frame.
- 2.8.2 Put the brackets “k1” and “k3” inside the top crosspiece at the ends of the frame and tighten the screws “j” (ch10=5mm); fasten the grid in the middle by means of the bracket “k2” and of the remaining screws “j” (ch10=5mm).



3 USE INSTRUCTIONS

3.1 Checks and recommendations

- Take on the load as centred as possible
- Hold the load only slightly lifted in order to reach optimum truck stability during manoeuvres.
- Keep the load completely tilted (fork ends up) during truck movements
- Action the control levers gently in order to avoid sudden pressure changes in the hydraulic circuit and not to jeopardise the load stability
- Adjust the truck speed according to load nature and stability, considering also the difficulties due to available room and bulk
- Pay attention to sloping floors and ground level differences that jeopardise the lift truck stability
- Adjust the fork position before forking the pallet so as

3.2 Manoeuvres to be avoided

- Handling loads bigger than the nominal values
- Lifting an unstable load
- Lifting a load on a single fork even if its weight is reduced
- Moving a side load when there is a load on the forks
- Carrying out fast truck manoeuvres or shifting operations with a load on the forks and raised high
- Shifting or positioning of the forks when the load has already been taken on and

3.3 Prohibited manoeuvres

- Use of the attachment for different purposes than those for which it has been designed
- Operating the movements control level when the attachment is in maintenance
- Running the truck in uncertain visibility conditions due to oversized load
- Tampering with the attachment
- Staying within the attachment and truck working area
- Use of the attachment when it shows even a minimal structure deformation, or a malfunctioning
- It is not a pincer (do not use the forks for blocking the load either on opening or

not to force the forks against the pallet feet

the lift truck is moving

closing)bloccare il carico sia in apertura che in chiusura)

4 MAINTENANCE

4.1 Preliminary remarks

The attachment is supplied with guides, rollers and pads lubricated with quality grease in order to guarantee the normal settling and polishing of the sliding surfaces during the first working period.

The recommended lubricant for most applications is ISO X M2 grease (SHELL ALVANIA GREASE R2 or similar). For the use of the attachment outdoors or in very dusty environments, the application of ISO CB 32 (ESSO NUTO 32 or similar) oil is recommended).

The maintenance mentioned below refers to correct use of the attachment in a clean indoor environment.

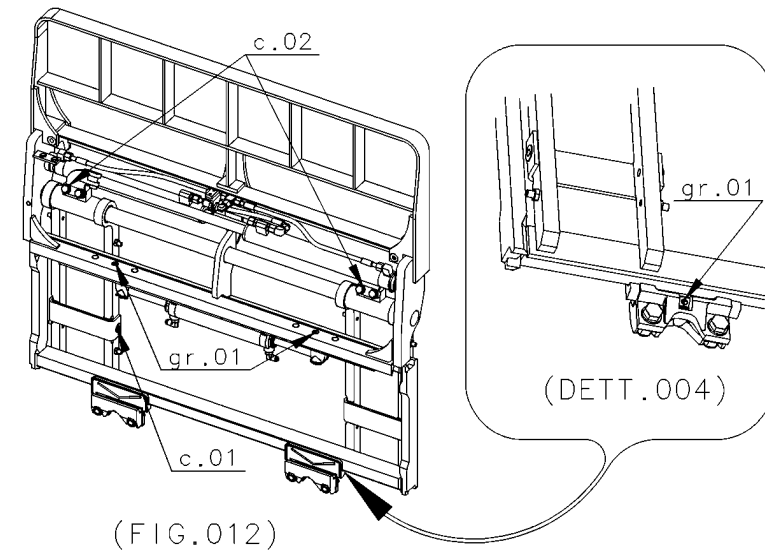
4.2 Ordinary maintenance

(In addition to point “2 ORDINARY MAINTENANCE” of the manual for coupled side-shifter mod. HN)

WITH CARRIERS FOR FEM FORKS

4.2.1 Every 500 working hours:

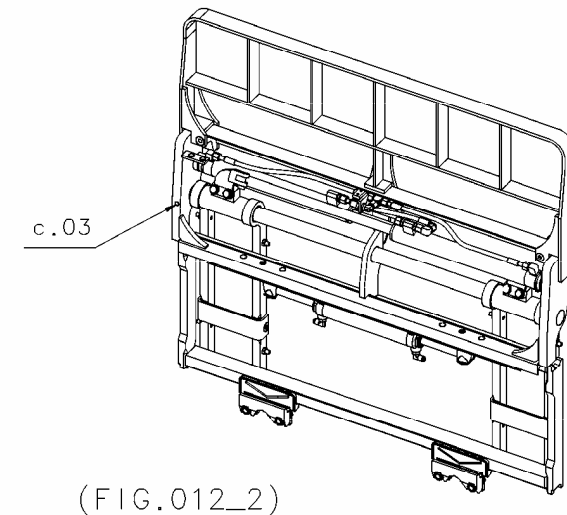
- Grease the points “gr.01”.
- Check the tightness of the screws in the points “c.01” and “c.02” (see point 2.3 for restoring tightness).
- Check the tightness of the chrome bar stop screws, point “c.03” (if slack screws are found, clean the screw and tighten it again using thread-lock - type “Loctite 243”. Check the correct screw fitting and the tightness of the chromed bar.
- Check the hydraulic seal of the fittings.



4.2.4 Every 1000 working hours.

In addition to the operations shown at point 4.2.1, the following operations should be carried out:

- Clean the sliding guides, pads and bushing
- Check the general state of the attachment
- Check specifically the state of the hose pipes



FORK POSITIONERS mod. 04

WITH CUSTOMIZED FORKS

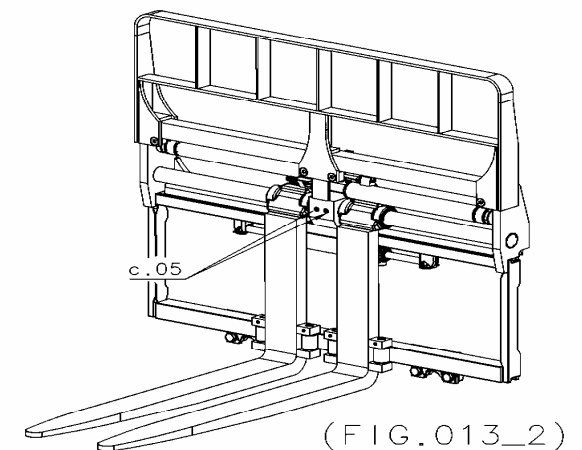
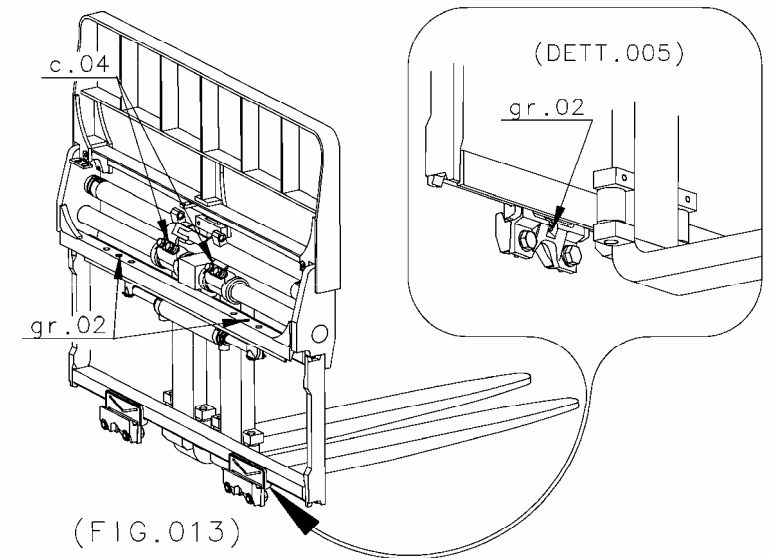
4.2.2 Every 500 working hours:

- Grease the points “gr.02”.
- *Check the tightness of the screws in the points “c. .04” (if slack screws are found, clean the and tighten them again to a torque of 84 Nm (60 Ft/Lbs) for the Fem2 and fem3 35 quintal models and a torque 204 Nm (145 Ft/Lbs) for the fem3 49 quintals model; in both cases, use thread-lock - type “Loctite 243”.*
- check the tightness of the chromed bar stop screws, point “c.05” (if slack screws are found, clean the and tighten them again using thread-lock - type “Loctite 243”.*
- Check the hydraulic seal of the fittings.

4.2.5 Every 1000 working hours.

In addition to the operations shown at point 4.2.2, the following operations should be carried out:

- Clean the sliding guides, pads and bushing
- Check the general state of the attachment
- Check specifically the state of the hose pipes



WITH CARRIERS FOR FEM FORKS

4.2.3 Every 500 working hours:

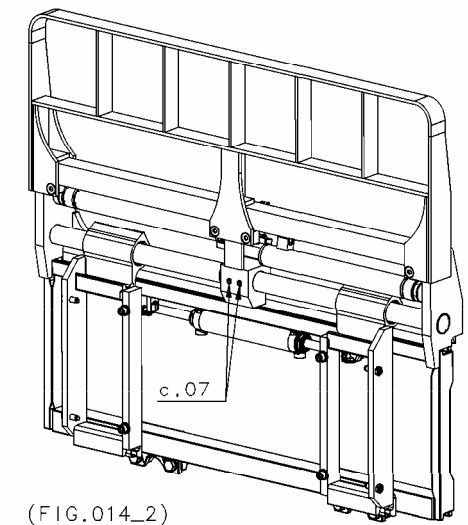
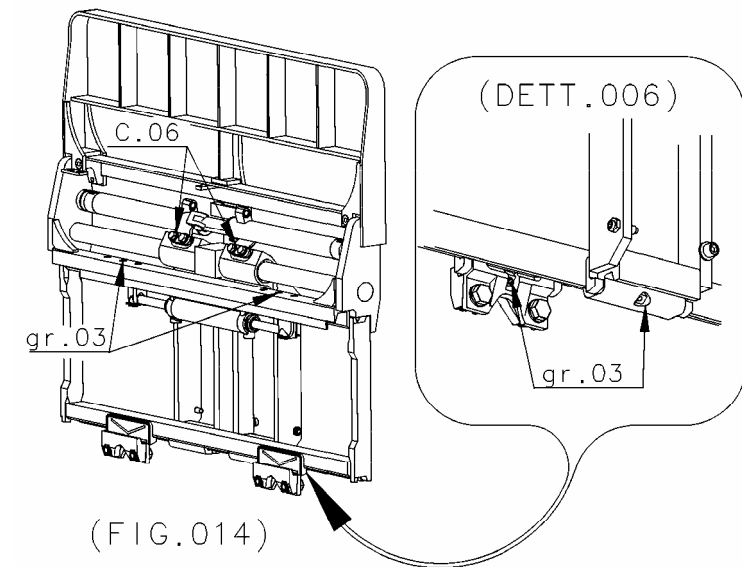
- Grease the points “gr.03”.
- Check the tightness of the screws in the points “c.01.06” ((if slack screws are found, clean the and tighten them again to a torque of 84 Nm (60 Ft/Lbs) for the Fem2 and fem3 35 quintal models and a torque 204 Nm (145 Ft/Lbs) for the fem3 49 quintals model; in both cases, use thread-lock - type “Loctite 243”).
- check the tightness of the chromed bar stop screws, point “c.07” (if slack screws are found, clean the and tighten them again using thread-lock - type “Loctite 243”).
- Check the hydraulic seal of the fittings.

4.2.5 Every 1000 working hours.

In addition to the operations shown at point 4.2.2, the following operations should be carried out:

- Clean the sliding guides, pads and bushing
- Check the general state of the attachment
- Check specifically the state of the hose pipes

4.3 EXTRAORDINARY MAINTENANCE

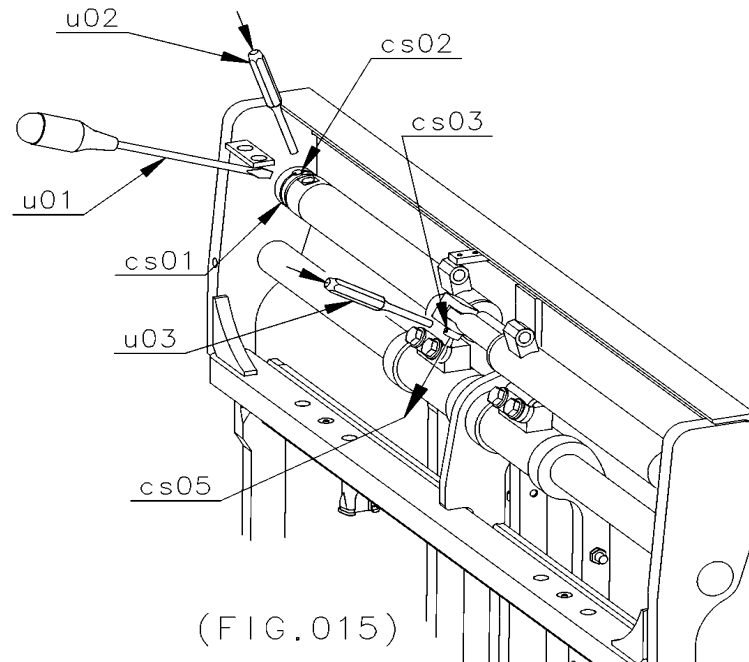


Preliminary operations

- Before any extraordinary maintenance operation, switch off the carriage and remove pressure from the supply circuit.
- Make certain that the pump is not switched on or the distributor lever is moved during the entire maintenance time.

4.3.1 Dismantling of the fork shifting cylinder

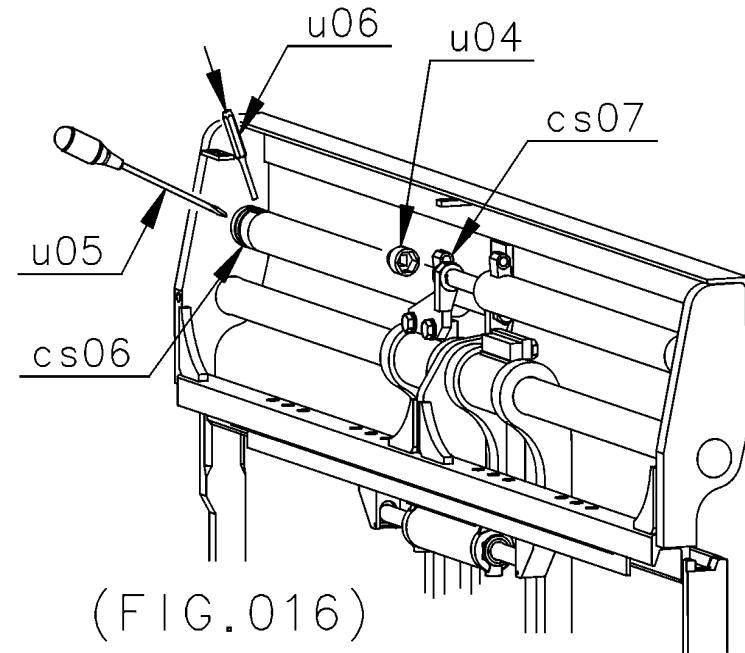
(for attachments with load capacity 2.5 and 3.5 t)



- Remove the spring ring "cs01" using a screw driver
- Take out the pin "cs02" using a punch diam. 8 mm
- Take out the stop pin "cs03" using a punch diam. 4 mm

4.3.2 Dismantling of the fork shifting cylinder

(or attachments with load capacity 4.9 t)



- Remove the spring ring "cs06" using a screw driver
- Take out the pin "cs07" using a punch "u05" diam. 8 mm
- Loosen the nut "u04" using a socket wrench "u04" 30 mm.

NOTE FOR REASSEMBLY: screw the nut "u04" until it is well tightened,

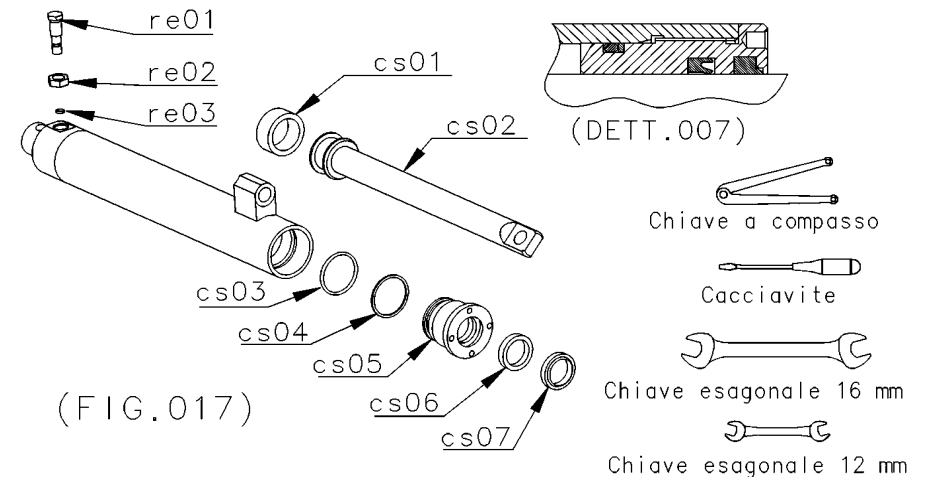
- Take out the pin “cs05” using a screw T.E. M6 and ejector

then loosen it by about ¼ rotation so as to restore the ideal deflection condition for the Belleville springs.

4.3.3 Replacement of the cylinder seals and of the flow regulator

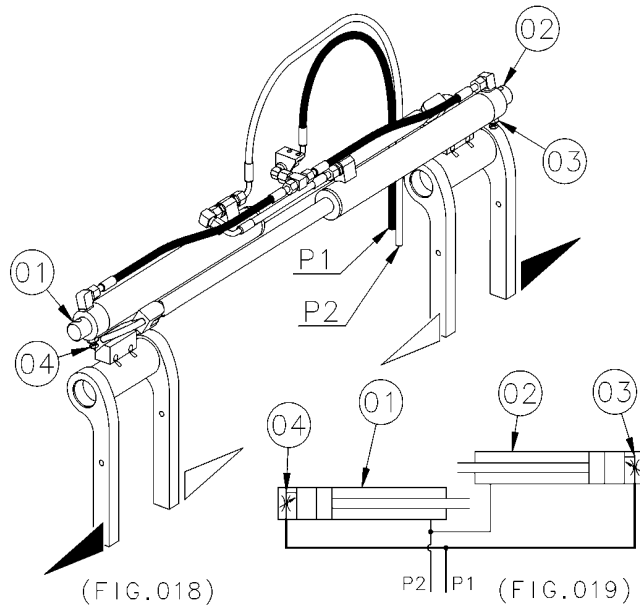
- Loosen the cylinder cap “cs05” using a C wrench and pull it out from the rod
- Pull out the rod “cs02” from the cylinder body
- Loosen the lock nut “re02” (hexagonal wrench 16 mm) and pull out the flow regulator “re01” (hexagonal wrench 13 mm).
- Proceed with the replacement of the seals “cs01”, “cs03”, “cs04”, “cs06”, “cs07” and “re03” (if necessary, use a screw driver)

The reassembly of the cylinder must be carried out according to the reverse sequence with respect to the above-mentioned dismantling steps, paying particular attention to the cleaning and checking the correct orientation of the seal “cs06” and “cs07” (detail cp)



4.4 HYDRAULIC SYSTEM DIAGRAM

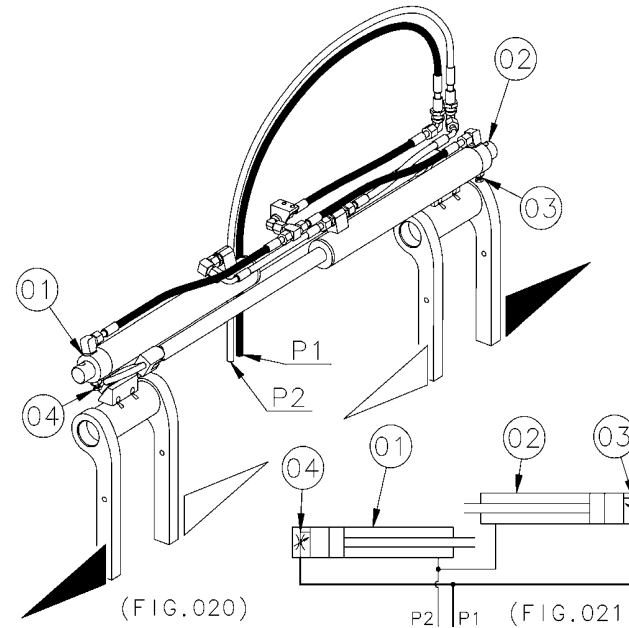
4.4.1 Central inlet 2,5-3,5 TON



- To move the forks away, introduce pressure into P1
- To approach the forks introduce pressure into P2

NB: The manufacturer of the lift truck will supply the instructions about the distributor that must be used.

4.4.2 Side inlet 2,5-3,5 TON



- To move the forks away, introduce pressure into P1
- To approach the forks introduce pressure into P2

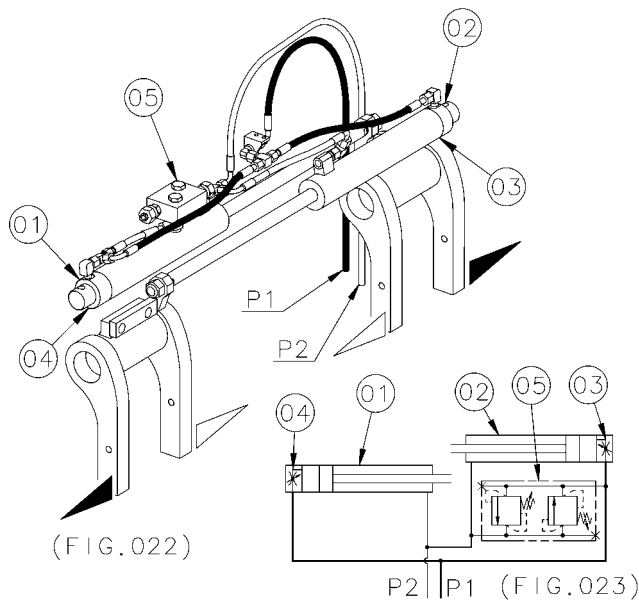
NB: The manufacturer of the lift truck will supply the instructions about the distributor that must be used.

4.4.3 Hydraulic system 4,9 TON

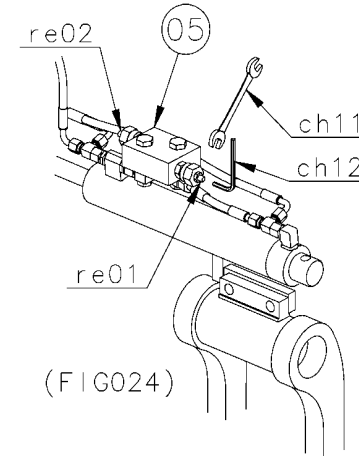
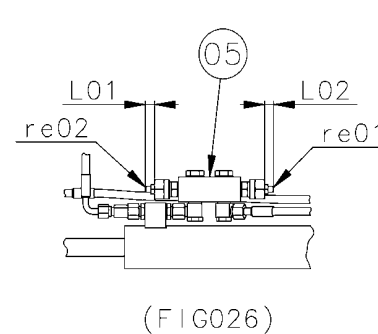
- To move the forks away, introduce pressure into P1

- To approach the forks introduce pressure into P2

NB: The manufacturer of the lift truck will supply the instructions about the distributor that must be used.



4.4.4 Regolazione delle valvole controllo pressione impianto per 4,9 TON



Opening: re01

L02 = 6 mm (max. 6.5 mm)

Closing: re02

L01 = 9 mm (max. 9.5 mm)

PROCEDURE:

- Loosen the nut using the hexagonal wrench ch11=13 mm.
- Carry out the adjustment using a wrench for hexagonal nuts

5 FAULTS AND REMEDIES

NB: In case of faults concerning the side-shifter, see at point “6 FAULTS AND REMEDIES” of the manual “COUPLED SIDE-SHIFTER MOD.HN”

FAULTS	CAUSES	REMEDIES
5.1 Forks shifting movement is not carried out	<p>Obstructions or dirty accumulation on the sliding guides</p> <p>Insufficient hydraulic pressure</p> <p>Obstruction or failures in the hydraulic circuit</p> <p>Internal leakage in the cylinder (worn seals)</p> <p>High pressure valves are not correctly adjusted (version 4.9 TON only)</p>	<p>Remove the obstructions, clean and grease the sliding guides</p> <p>Check and adjust the pressure delivered by the pump of the lift truck</p> <p>Remove the obstruction or replace the damaged hose pipe</p> <p>Check and, if necessary, replace the seals see at point “4.3.3”</p> <p>Carry out the adjustment of the valves as indicated at point “4.3.4”</p>
5.2 The forks shifting is carried out slowly	<p>Insufficient oil flow</p>	<p>Check and adjust the pressure delivered by the pump of the lift truck.</p>

FAULTS	CAUSES	REMEDIES
5.3 The forks shifting is carried out too fast	Pressure reducing valves on the cylinder bottom are not correctly adjusted. Obstructions in the hydraulic system Internal leakage in the cylinder (worn seals)	Carry out the adjustments as indicated at point “2.5.2” Remove the obstruction or replace the damaged hose pipe Check and, if necessary, replace the seals see at point “4.3.3”
5.4 The forks shifting is not synchronized	Pressure reducing valves on the cylinder bottom are not correctly adjusted. Obstructions or dirty accumulation on the sliding guides Pressure reducing valves on the cylinder bottom are not correctly adjusted.	Carry out the adjustments as indicated at point “2.5.2” Remove the obstructions, clean and grease the sliding guides Carry out the adjustments as indicated at point “2.5.2”

NOTE: If difficulty is experienced in intervening correctly, or the defect is different to or missing from those listed, please contact the BOLZONI Technical Assistance Service

6. WARRANTY

For a period of 12 months or 2.000 work hours (whichever comes first), from the date of delivery to customer, Bolzoni [S.p.A](#) guarantees all its products. If the products are used for more than 8 hours per day, the warranty period decreases proportionally.

This warranty is limited to the replacement (ex factory Bolzoni [S.p.A.](#)) of the parts that Bolzoni S.p.A. acknowledges as defective because of material or manufacturing flaw and it does not include any labour or travelling expense for the replacement of said parts.

It is also understood that the warranty is not recognized if the failure is due to an illegitimate use of the product, if the installation has not been carried out according to the instructions of Bolzoni [S.p.A.](#) or if non-original parts have been assembled onto the product of Bolzoni [S.p.A.](#)

Bolzoni [S.p.A.](#) products are not guaranteed for uses exceeding the performance values indicated by plates and specifications.

All products of the Bolzoni [S.p.A.](#) are covered by an insurance for any injury suffered by a third party because of defective parts or wrong working of the equipments; all damages due to an improper or illegitimate use of the equipments are excluded.

7. MATERIAL DISPOSAL

Mobile frames	steel
Lower hooks	cast iron
Pads	nylon
Paint	epoxy polyester
Cylinder	steel
Hydraulic oil	to be disposed according to the local regulations