F 800/900XP.22

use and maintenance

Edition CE 15.01.98

Valid from serial no. *0162*

INDEX

FASSI CRANE

F 800/900XP.22
use and maintenance

This instruction manual describes the FASSI CRANE F800/900XP.22.

The crane, which conforms to the Machines Directive (D.M.) 89/392 and successive amendments, 91/368 and 93/44 must not be put into service within the European Community unless the machine on which it is mounted also conforms with the prescribed Directive.

The fitment must be carried out in accordance with the instructions given by the Manufacturer in the manual for hydraulic crane fitting.

The Manufacturer declines all responsibility and guarantee if the fitting is entrusted to workshops without sufficient technical capability to carry out the work in conformity.

Every change of use, modification or addition of accessories, must be affixed with a new CE mark in accordance with the Machinery Directive.

As well as the principal safety norms, this manual contains a description of the crane and the instructions for use and maintenance.

Equipment other than Fassi must be supplied with its own use manual.

The crane must only be operated by responsible persons, previously instructed and authorized.

THANK YOU FOR SELECTING ONE OF OUR CRANES.

SAFETY NORMS

(**!**) This symbol draws your attention on the points concerning safety.
It means: **WARNING! BE CAREFUL!**
IT CONCERNS YOUR SAFETY!

!ATTENTION!

READ THIS MANUAL CAREFULLY *prior to use of the crane or any maintenance.*
A few minutes spent now could save time and labour later.
Be sure that the unit has been installed, inspected and tested in accordance with the local legal requirements.

To operate the crane it is necessary to fully understand its working, safety and warranty norms.

Warning plates, as well as instruction and operation plates must be replaced when no longer readable or missing. (See chapters A - B)

Check that protections are in their place and that all safety devices are fitted and active.

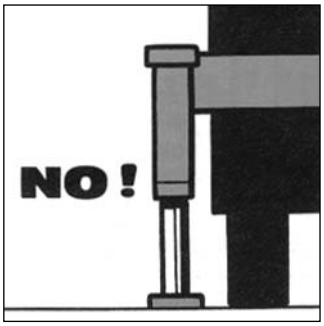
Do not run the engine in a indoor area without first making sure there is adequate ventilation. Fit a suitable extension tube to the vehicle exhaust pipe to take the fumes away from the working area.

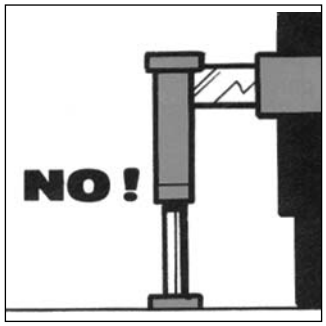
Stabilize the vehicle by means of the outrigger rams, checking that they rest on a solid base; if in doubt use special larger outrigger base plates (available on request). (See chapter IX)

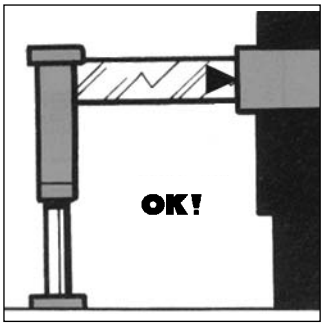
Level the crane so as it is always operated on a horizontal plane.

Check that the taps of the outrigger rams safety check valves are closed. Never operate the outriggers when the crane is loaded.

Remember that the stability of the unit (crane-vehicle) is only guaranteed by the maximum lateral extension of the outriggers.

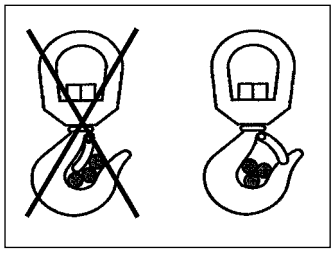






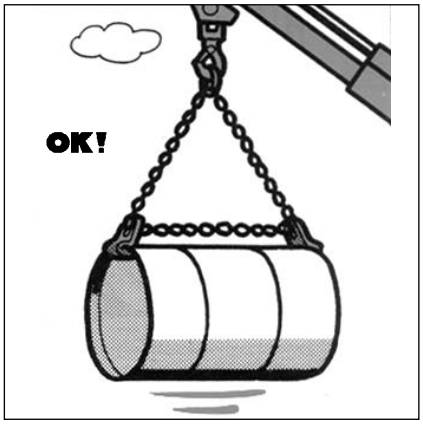
Should visibility be insufficient, make sure that control stations are properly lighted so as to ensure safety while operating control functions and allow reading of the plates.

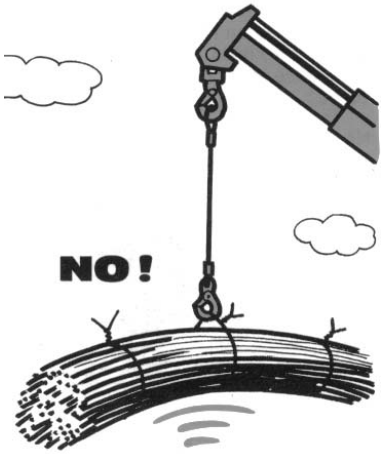
Before manoeuvering a load check that the working area is adequate and properly lighted for your crane.

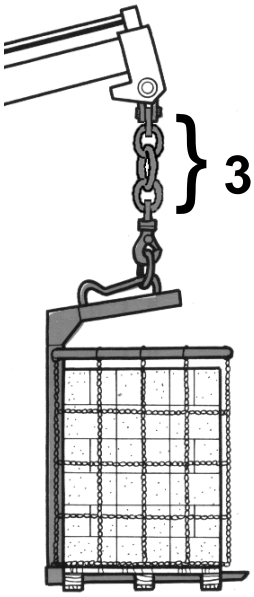


Make sure that the hook is always free to rotate on its pin and that nothing obstructs its vertical positioning.
Check the efficiency of the hook safety catch.

Carefully inspect the load rigging and the condition of ropes or chains.
Make sure that the lifted load is balanced.

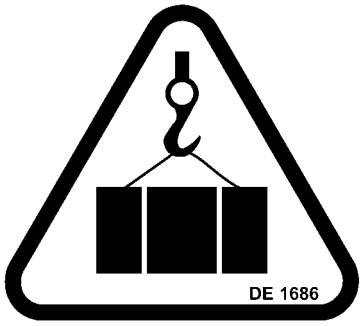






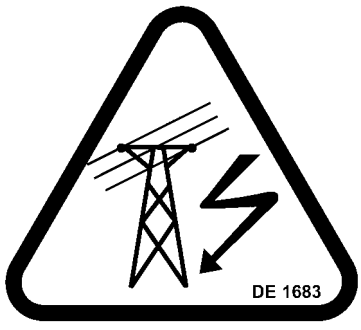
The pallet fork must be connected to the crane hook by means of a chain having at least 3 rings.

Hook up the load, checking that it does not exceed the capacity indicated on the lifting diagram specific to each load configuration.



It is absolutely prohibited to walk or stop under a suspended load and for unauthorized persons to be within the working area.

Avoid swinging the load above the control station; in cases where the load is too close, the crane must be operated from the opposite side.

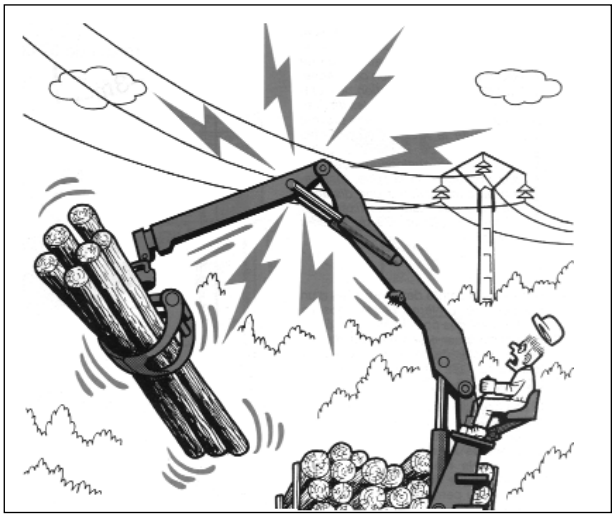


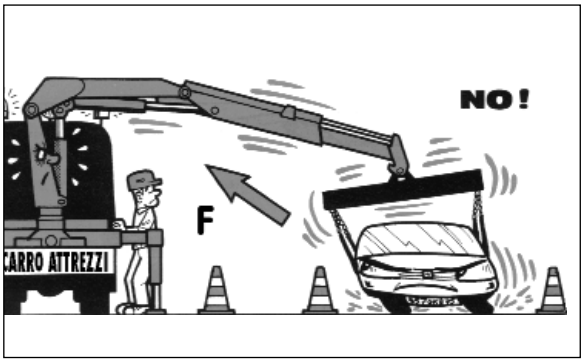
It is absolutely prohibited to load or unload under or in proximity of electric lines.

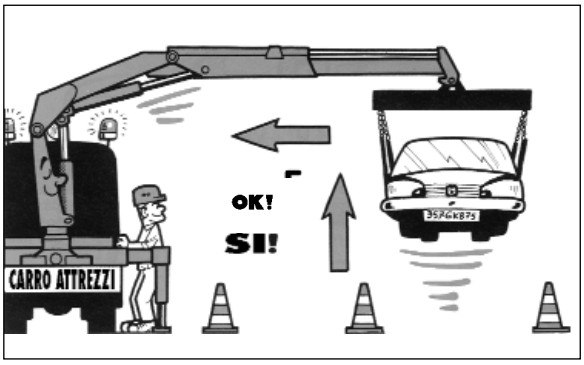
(!) The minimum distance from electric lines is, according to CEN norms, **5 meters**, except for otherwise prescribed by national norms.

For cranes with top seat controls, it is necessary to use a ladder to reach the control station.

When operating from the top seat, stay within its side safety guards.







Do not rotate the crane before the load is lifted,do not operate with sudden movements, activate the controls with slow and progressive movements.
Rotate slowly and with care paying attention to the stability of the vehicle.
With vertical lift, on hydraulic and mechanical extension, rotate slowly in order to avoid side-skidding.

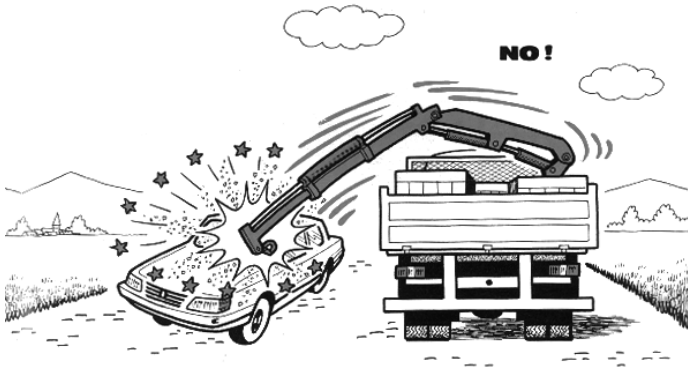
Do not move the vehicle if a load is suspended on the crane.

Do not utilize the crane for pushpull, lateral or sideways operations.

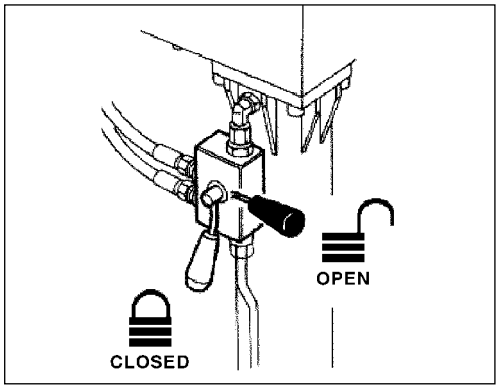
Under no circumstances interfere with the safety and protection devices.

The vehicle/crane are not left unless the power take off is disengaged and the load is on the ground.

At the end of the job and prior to driving the vehicle the crane must be folded.
If the booms are to be laid on the body or on the load, they must be blocked to prevent possible sideways movements.
Outrigger rams must be lifted and re-entered within the overall width of the truck and safety devices locked.

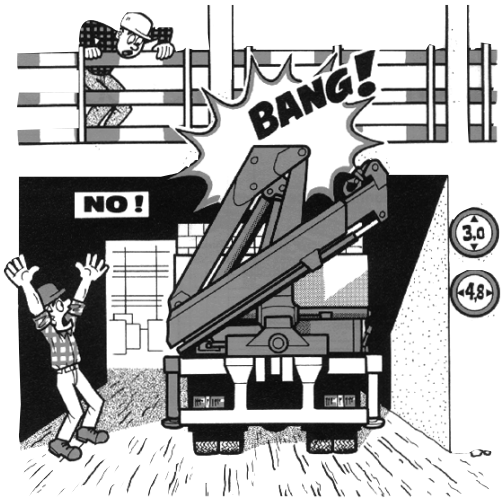


Check that the taps of the outrigger rams safety check valves are closed.



Disengage the power take off.

To avoid hitting bridges or tunnels check and record the overall height of your crane in the folded position or in laid position in the body or on the load. Always respect and pay proper attention to road signs placed in proximity of such obstacles.



INSTRUCTIONS FOR CRANE USE

The use of the crane is reserved to authorized personnel, instructed in advance, who has to strictly conform to the safety norms and instructions contained in the instruction manual supplied with the crane.

1 — Only authorized persons are allowed to operate the crane.

2 — The crane must be used on firm, level ground.

3 — Check that the vehicle hand brake is on and that the wheels are chocked.

4 — Before every operation make sure that:
— no-one is within the working area of the crane
— the safety devices are in place and operative
— the minimum safe working distances from power lines are observed.
— the load is correctly slung and hooked.

5 — Stabilize the vehicle by the outrigger rams, making sure that:
— the lateral supports are fully extended
— the wheels are in contact with the ground and the suspension is not completely unloaded
— the outriggers safety taps are closed.

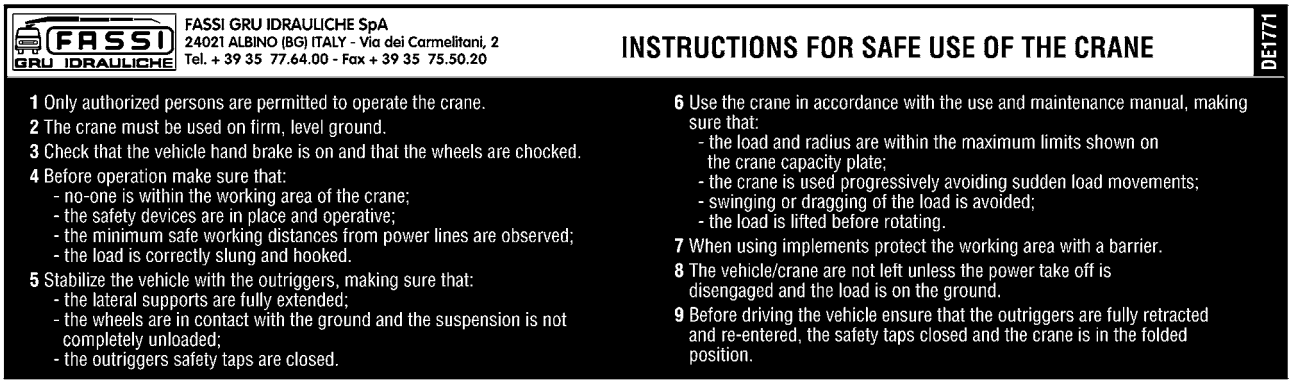
6 — Use the crane in accordance with the use and maintenance manual, making sure that:
— the load and radii are within the maximum limits shown on the crane capacity plate
— the crane is used progressively avoiding sudden load movements
— swinging or dragging of the load is avoided
— the load is lifted before rotating.

7 — When using implements protect the crane working area with a barrier.

8 — The vehicle/crane are not left unless the power take off is disengaged and the load is on the ground.

9 — Before driving the vehicle make sure that the outriggers are fully retracted and re-entered, the safety taps closed and the crane is in folded position.

fig. 1



THESE INSTRUCTIONS FOR THE USE OF THE CRANE COINCIDE WITH THOSE OF THE PLATE DE1771 (FIG. 1) PLACED NEXT TO THE CRANE.

IDENTIFICATION OF THE CRANE MODEL

Essential data for the identification of the crane are given on the plate DE1661 used for the CE mark and fixed to the base. (Fig. 2)

1—Crane model
2—Serial Number
3—Year of manufacturing

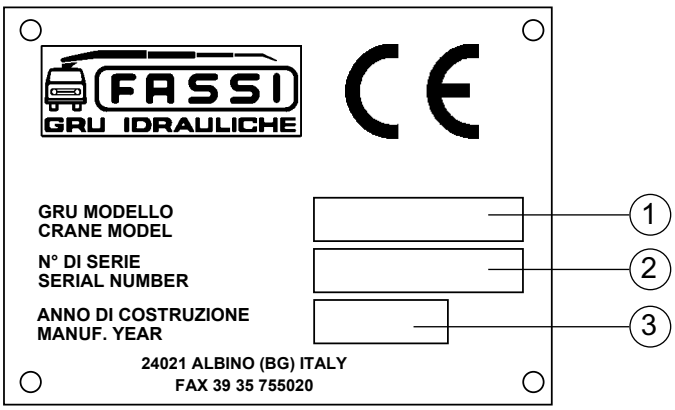


fig. 2

The model, the version of the crane, the year of manufacturing and the serial number are stamped on the base (fig. 3) in the following sequence:

F800/900XP.22*07*0170

- serial no.
- year of manufacturing
- version /.23/.24/.25/.26/.27
- model

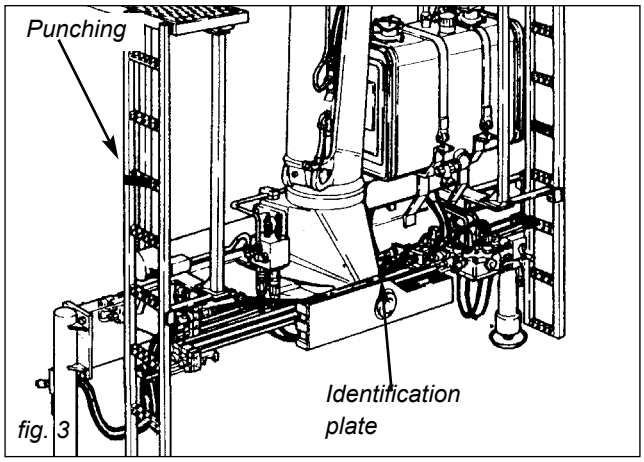


fig. 3

(**!**) **UNDER NO CIRCUMSTANCES SHOULD THE DATA MARKED ON THE PLATE AND PUNCHED ON THE BASE BE ALTERED.**

It is essential to give the correct **crane model** and **serial number,** when you contact the Service and Parts Department.

The exact **crane model, serial number** and description of **implements** will enable FASSI Service Department to give a rapid and efficient response.

A further metallic plate (fig. 4) fixed to the crane by the installer, quotes the identifying data of the equipment and the final CE mark.

1 Name of the installer who applied the final CE mark
2 Crane mark, model and serial number
3 Vehicle mark, model and chassis number
4 Year of mounting

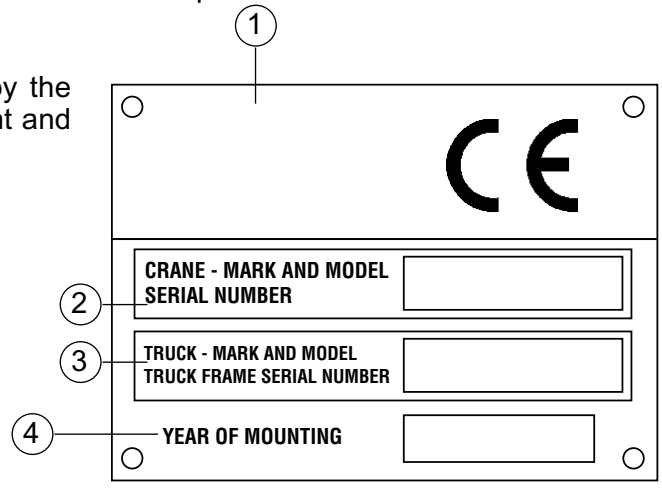


fig. 4

FASSI

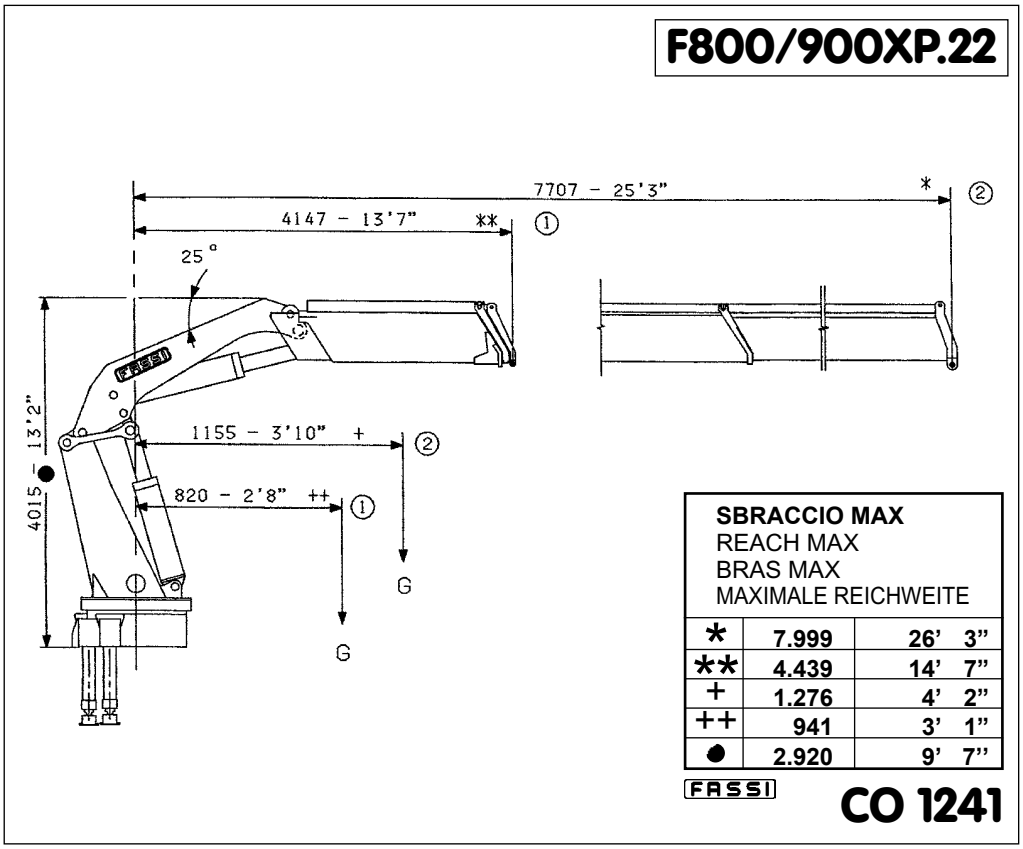
TECHNICAL DATA

The design of this crane has been carried out in respect of DIN 15018 norms, fatigue test classification **H1B3** .

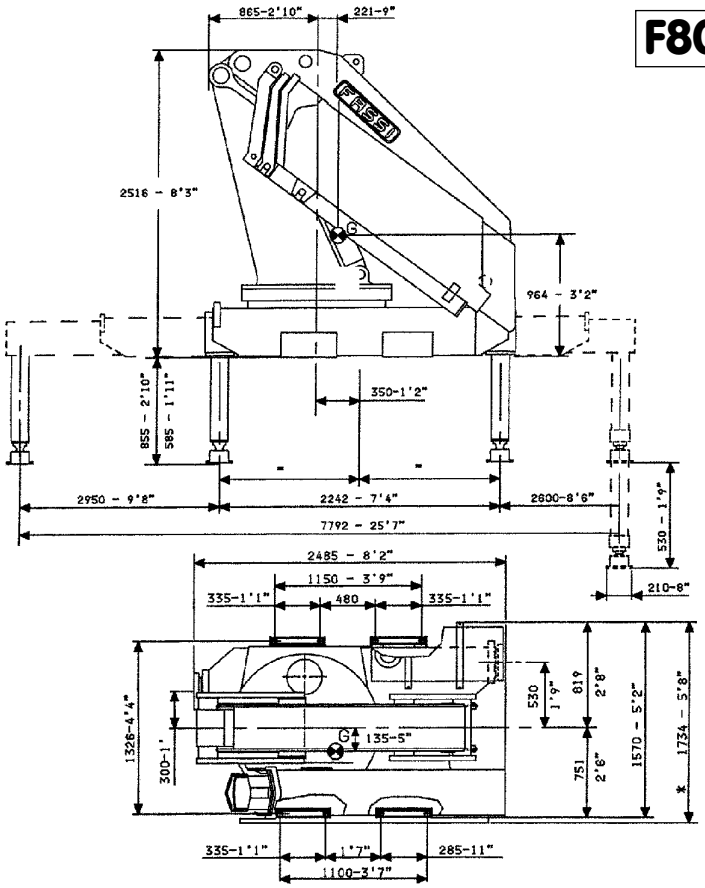
The crane can operate, intermittently, with lifting devices other than the hook. The dimensions and the capacity of the implements must be proportioned with crane performances.

F 800/900XP.22

Lifting capacity	Standard reach	Hydraulic extension	Rotation arc	Rotation torque	Working pressure	Pump capacity	Oil tank capacity	Crane weight	Max. working pressure on the outrigger (Φ 210)
82,2 tm 806,4 kNm	**8,00 m**	**3,55 m**	**360°**	**6,74 tm 66,14 kNm**	**32,0 MPa**	**80 l/min**	**250 l**	**6350 kg**	**70 daN\cm²**



F800/900XP.22



— MEZZERIA TIRANTI
— FIXING ROD CENTER DISTANCE
— LIGNE MEDIANE TIRANTS
— ABMESSUNG DER BEFESTIGUNGSBRIDEN
M39 x 3

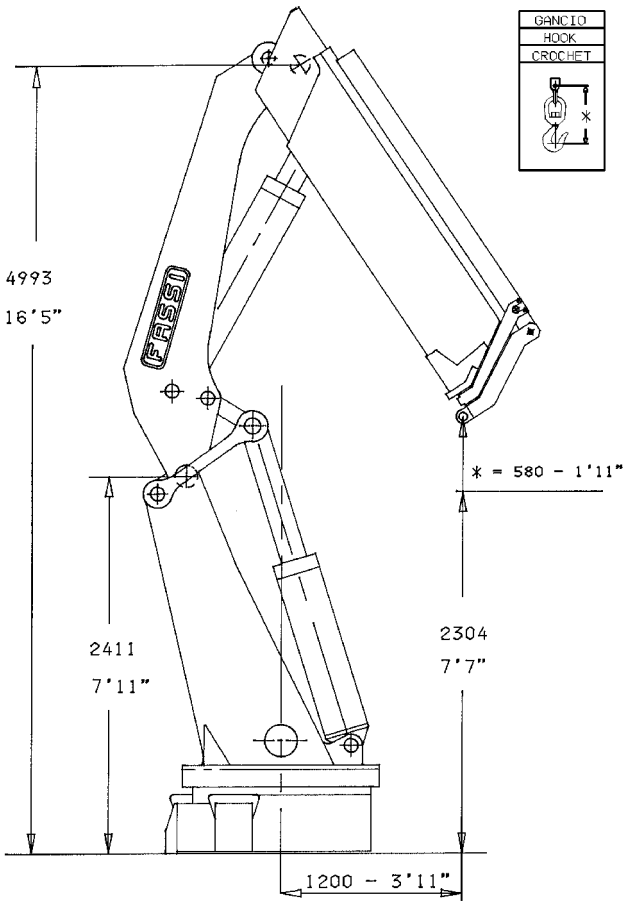
PESO GRU CON SERBATOIO NON RIFORNITO, STABILIZZATORI STANDARD WEIGHT OF THE CRANE WITH EMPTY TANK, STANDARD STABILIZATION POIDS DE LA GRUE AVEC RESERVOIR VIDE, STABILISATION STANDARD KRANGEWICHT MIT LEEREM TANK UND STANDARDABSTUTZUNG	kg 6.350 lbs 13.995

✶ CON TUBAZIONI SUPPLEMENTARI
✶ WITH SUPPLEMENTARY HOSES
✶ AVEC TUYAUTERIE SUPPLEMENTAIRE
✶ MIT ZUSAETZLICHEN SCHLAEUCHEN

PESI, DIMENSIONI E POSIZIONE BARICENTRO.
POIDS, DIMENSIONS ET POSITION DU BARYCENTRE.
WEIGHT, DIMENSIONS AND BARYCENTRE POSITION
GEWICHTE, ABMESSUNG UND POSITION DES KRANSCHWERPUNKTS.

CO 1253 FASSI

F800/900XP.22



MASSIMA ALTEZZA SOTTOGANCIO.
HAUTEUR MAXIMUM SOUS CROCHET.
MAXIMUM HOOKING POSITION.
MAXIMALHOEHE BIS KRANHAKEN.

FASSI **CO 1247**

FASSI

CRANE NOMENCLATURE

— Version with ground controls for outriggers and controlers of the crane radio remote control proportional Hetronic. (Fig. 5)

Pos. Description

1 — Outrigger rams
2 — Outrigger supports with lateral hydraulic extension
3 — Base
4 — Slew ring
5 — Rotation motoreducer
6 — Oil diverter crane-outriggers
7 — Double control for oil-diverter crane-outriggers
8 — Multi-purpose outriggers oil-diverter
9 — Double control for multi-purpose outriggers oil-diverter
10 — Column
11 — Distributore electric hyadraulic crane
12 — Inner rams
13 — Inner boom
14 — Outer ram
15 — Outer boom
16 — Booms extension rams
17 — Extension boom sections
18 — Manual extensions (optional)
19 — Lifting hook
20 — Oil tank
21 — Receive (switchboard) radio remote control
22 — Radio remote control transmitting-console

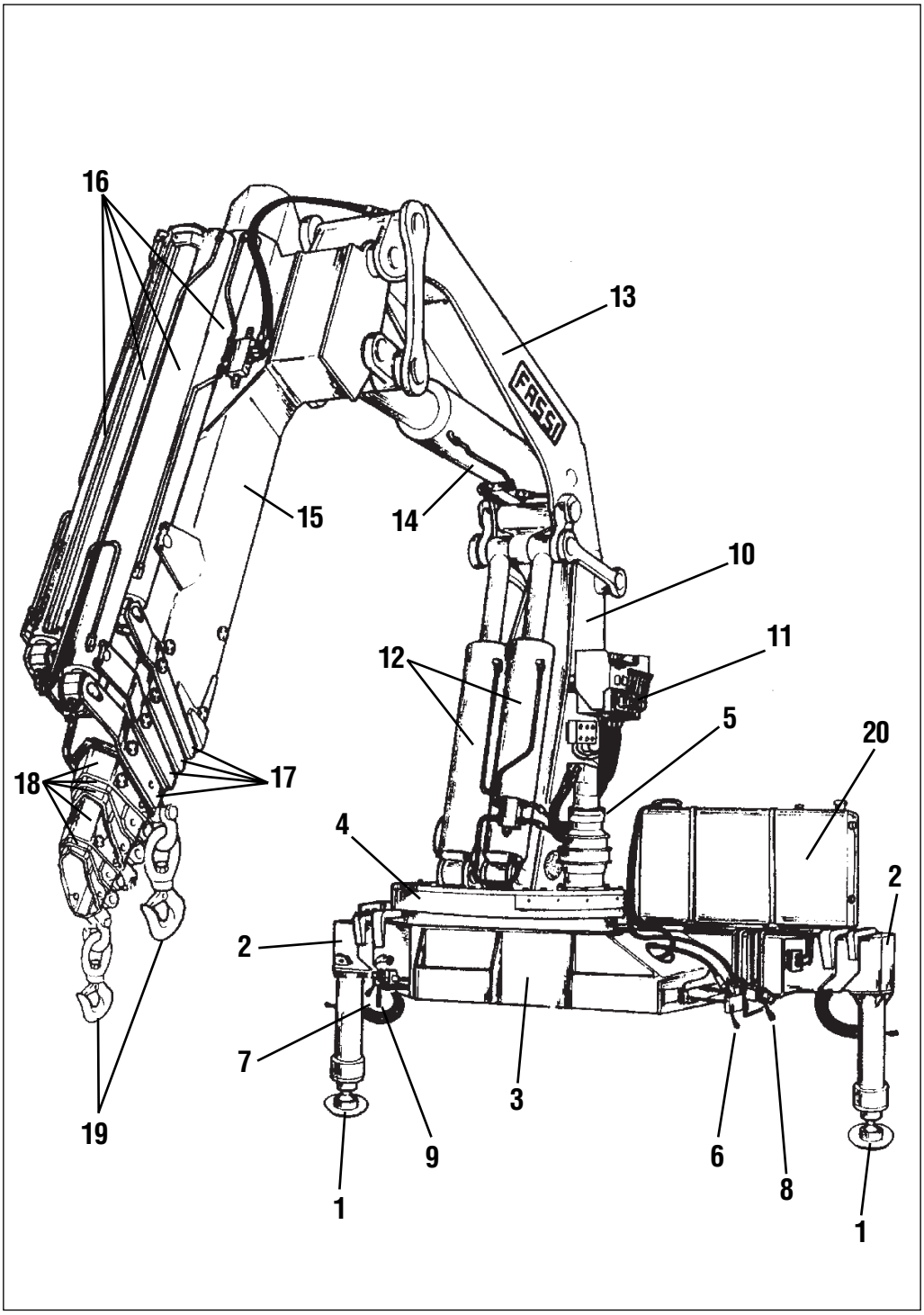
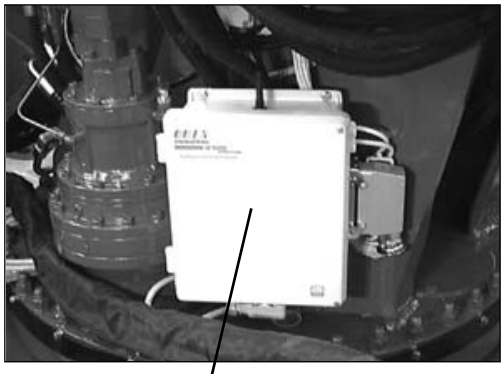


fig. 5



SAFETY AND PROTECTION DEVICES

— Version with ground controls for outriggers and controlers of the crane radio remote control proportional Hetronic. (Fig. 6)

Pos. Description

1 — Tap and check valve for outrigger rams
2 — Check valves for rotation control
3 — Check valve for inner rams
4 — Check valve for outer ram
5 — Check valve for booms extension rams
6 — Lifting moment limiting device assembly
7 — Parachute valves
8 — Board of control limiter on column
9 — Rotation limiting device
10 — Main pressure valve (crane - outriggers)
11 — Main pressure valve (crane)
12 — Auxiliary valves (crane)
13 — Safety device for outriggers supports
14 — Hook safety device
15 — Remote control - audible alarm - emergency stop button (STOP)
16 — Visual gauge yellow-red light (activation of the limiting device)

(!) WARNING (!)

First read the instructions given in the User's Manual supplied by the Manufacturer before using the remote control to avoid improper use.

(!) Before crane use check that safety and protection devices are fitted and active.

(!) Under no circumstances interfere with the safety and protection devices.

(!) Interference with the check valves and removal of the lead seals remove the Manufacturer and invalidate the warranty.

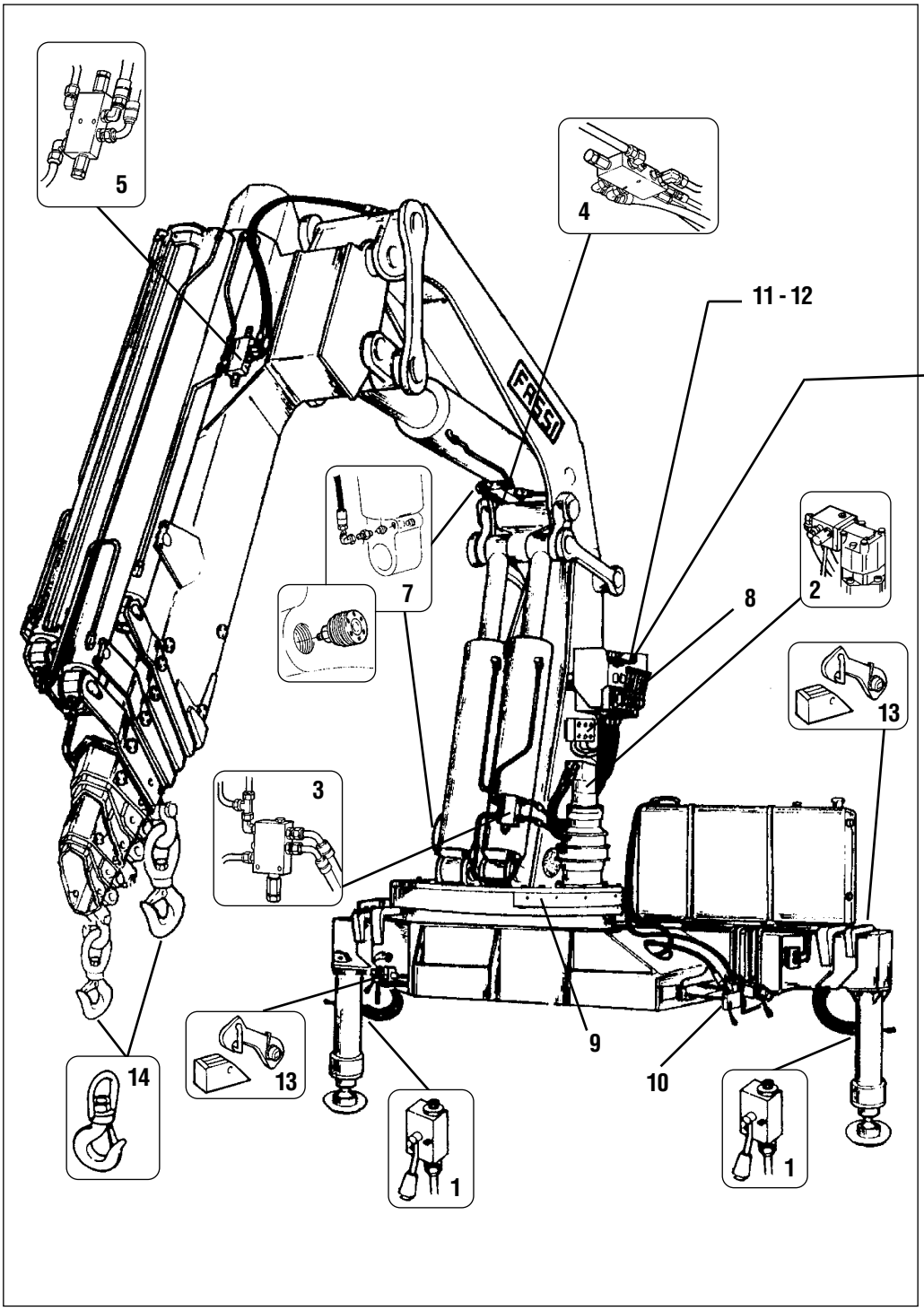
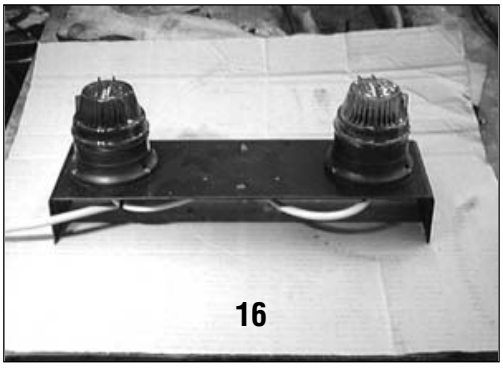
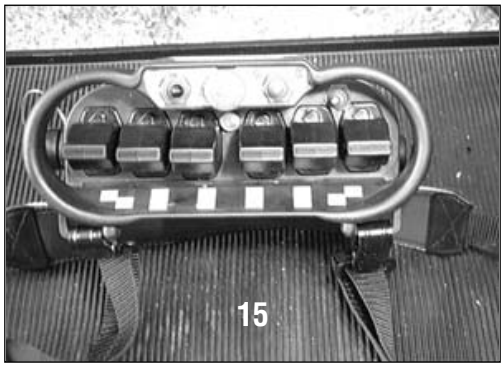


fig. 6





LIFTING MOMENT LIMITING DEVICE AND CONTROL PANELS

A characteristic which permits the classification of cranes is their lifting capacity or maximum lifting moment. The moment is defined by the value obtained from the product of the load to be lifted (in kg) by its distance (in meters) from the centerline of the crane rotation.

The device called “lifting moment limiting device” preserves the crane structure from overloads, as it prevents any movement which increases the value of the moment up to the maximum established value.

This device is fitted close to the distributor, whose specific functions it uses. It utilises an electrohydraulic technology, preventing any movement which causes an increase in the pressure induced by the load in the inner and outer rams of the crane (and in the outer ram for the hydraulic extension if fitted), up to the “critical values” which have been established in the structural test. These values, which are non-exceedable, determine the intervention levels and provide the data for setting the device. The condition of intervention is operated by the position, in connection with the horizontal position, of the crane outer boom, on which the electronic signal position (mercury level switch) is read by a special electrovalve. This determines the controls of the locking or unlocking (resetting) of the controls concerned.

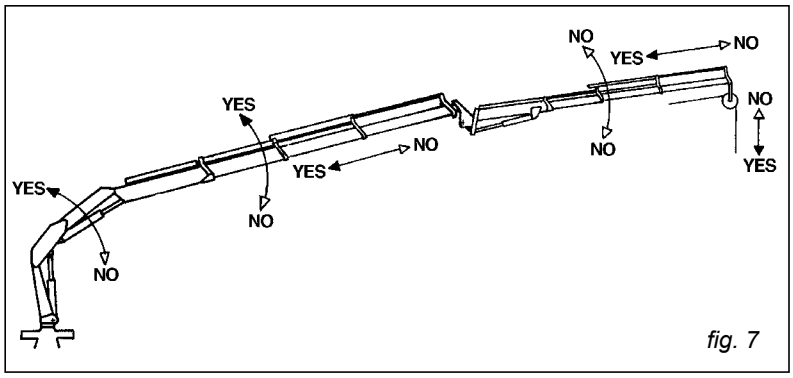


fig. 7

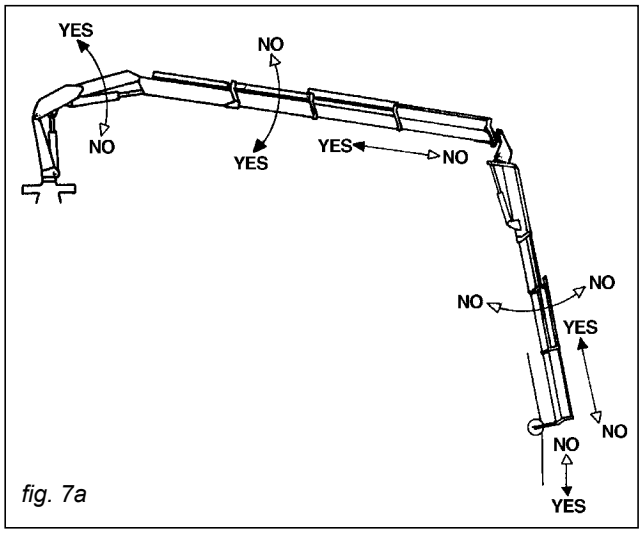


fig. 7a

The lifting moment limiting device concernes the following manoeuvres:

— Inner boom descent; the inner boom lift is controlled by the general main pressure valve of the distributor.
— Outer boom lift.
— Outer boom descent.
— Extension of extension boom sections.
— Winch rope lift (if fitted).
— If hydraulic extension is fitted: extension outer boom lift.
— Extension outer boom descent.
— Extension of the jib extension booms section.

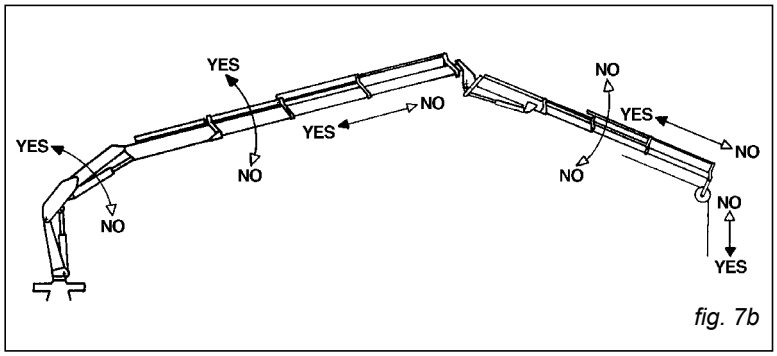


fig. 7b

The crane configurations (fig. 7-7a-7b) (and the eventual hydraulic extension) indicate the manoeuvres which are allowed and not allowed by the device, in connection with the horizontal position of the crane and extension outer booms.
When the moment is reduced, it resets automatically (the manoeuvres blocked by the device are released).

N.B.: There is a delay of 4 seconds after the moment reduction before the reset can occur in order to safeguard the stability of the device.

Lifting moment limiting device for two working areas

When a sector of the working area exists in which the stability is insufficient (for example in the area in front of the cab) the permitted arc of rotation is limited by means of an adjustable electro-hydraulic device which allows operation with a reduced value of the intervention level.
The reduction of the intervention level reduces the crane capacity values and this reduction value is defined in the vehicle stability calculation.

Consequently the working area is divided in one sector (e.g. body side) where the crane works according to the capacity plate values and another sector (e.g. cab side) where it works with reduced capacity values.

The device has consequently two intervention levels which are activated in relation to the sector of the crane working area always securing the vehicle stability.

(!) WARNING (!)

If the rotation stops by going through the working zone where the crane can operate according to the capacity plate values to the one where it can operate according to the reduced values, it means that one of the following conditions is reached:

- manoeuvre of a load bigger than the one admitted in the reduced sector defined in the vehicle stability calculation
- manoeuvre without load with (at least) one of the inner, outer rams of the crane or the jib (if fitted) extended till the stroke end.

The only one allowed manoeuvre is the crane rotation in the reversed sense, and consequently, an action which respectively allows to reduce the moment or to re-enter the inner ram(s), the crane outer ram, the jib outer ram.

EMERGENCY tap lever fig. 8

Each device is fitted with an emergency tap lever to be used in the event of a black-out, electrical or hydraulic malfunctions or whenever the lifting moment limiting device makes it impossible to use any controls when handling a load (this may occur when the extension booms are fully folded and the load is particularly heavy and bulky).

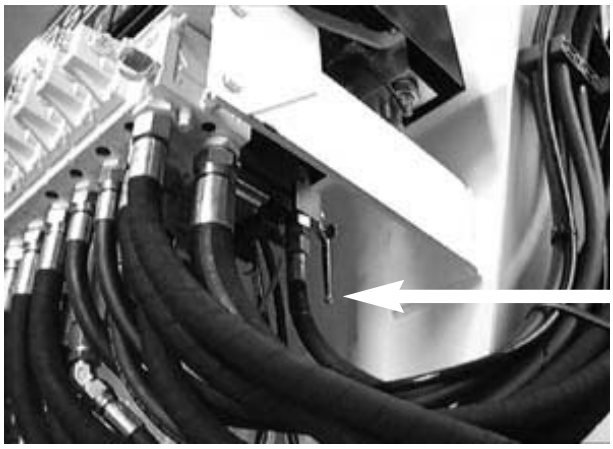


fig. 8

(!) WARNING (!)

When the operator uses this device, it means that he wishes to override the lifting moment limiting device in order to make some manoeuvres (which would be impossible with the device active) that bring the moment to within the maximum level, but involve an overload condition. In such an emergency condition (where the lifting moment limiting device has been disabled), the operator must:

— carefully consider the manoeuvres required to return to normal working conditions;
— calmly and carefully assess the type and scale of the hazards arising from these manoeuvres and the possible reaction of the crane (tipping over, frame overload, uncontrolled fall of the load due to a hydraulic system overload etc.);
— make all movements as slowly as possible to reduce the dynamic overload to the minimum.

Only In these situations it is permitted to remove the lead seals placed on the tap lever and place it in the closed position.

After such emergency operations and prior to re-use of the crane, you must immediately go to FASSI authorised Center for testing the structure and re-sealing of the device.

(!) Interferences with the valves or removal of the lead seals release the Manufacturer from any responsibility and invalidate the warranty.

Control panel of the limiting device

Layout of the control panel (fig. 9), positioned on the column, next to the distributor

pos. 1 - Emergency stop button (STOP)
2 - Audible alarm push button (danger)
3 - Orange warning light (90% of the capacity has been reached)
4 - Red warning light (activation of the limiting device)
5 - White warning light (power on)
6 - Fuse

If the white warning light **5** comes on, it confirms that the electric circuit is active and the push-button panel functions are enabled.

!NOTE! In the absence of electric power all crane functions will be desactivated.

If the orange warning light **3** comes on during load handling, 90% of the capacity (lifting moment) has been reached.

If during operation the red warning light **4** comes on, the activation value of the lifting moment limiting device has been reached.

Any hidden danger situation for persons must be audibly alarmed by pressing the push button **2**.

DE 1679

When there are serious, imminent and dangerous conditions for persons and things during load handling, operate on the emergency stop button **1**, which isolates all crane functions.

(!) ATTENTION (!)

Do not walk on the electric control panels or on the lever guards of the lifting moment limiting device positioned on the distributors. (Plate DE1679)

DE 1680

Do not use water to estinguish fire! (Plate DE1680)

VISUAL INDICATOR YELLOW / RED LIGHT Fig. 9a

On the radio remote control it is not possible to have the visual signals of intervention of the load limiting device.

The crane is furnished of visual indicator signals, which has to be located in a visible position, on the crane structure or on the truck, indicates with:
- yellow light, 90% of the capacity (lifting moment) has been reached
- red light, the activation value of the lifting moment limiting device has been reached.

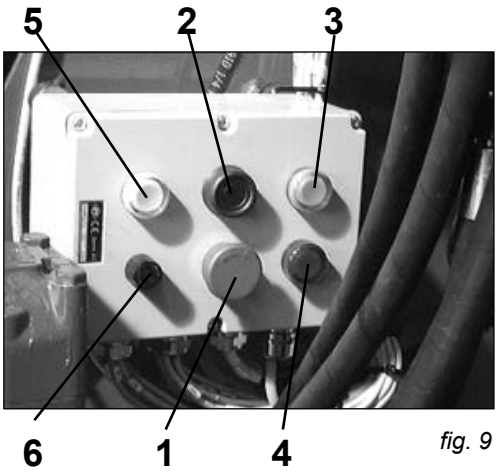


fig. 9

fig. 9a

(!) WARNING (!)
First read the instructions given in the User's Manual supplied by the Manufacturer before using the remote control to avoid improper use.

Any hidden danger situation for persons must be audibly alarmed.

When there are serious, imminent and dangerous conditions for persons and things during load handling, operate on the emergency stop button 1, which isolates all crane functions.

(!) ATTENTION (!)
The presence of the lifting moment limiting device does not release the user from the obligation to respect what is indicated on capacity plates and lifting curves.

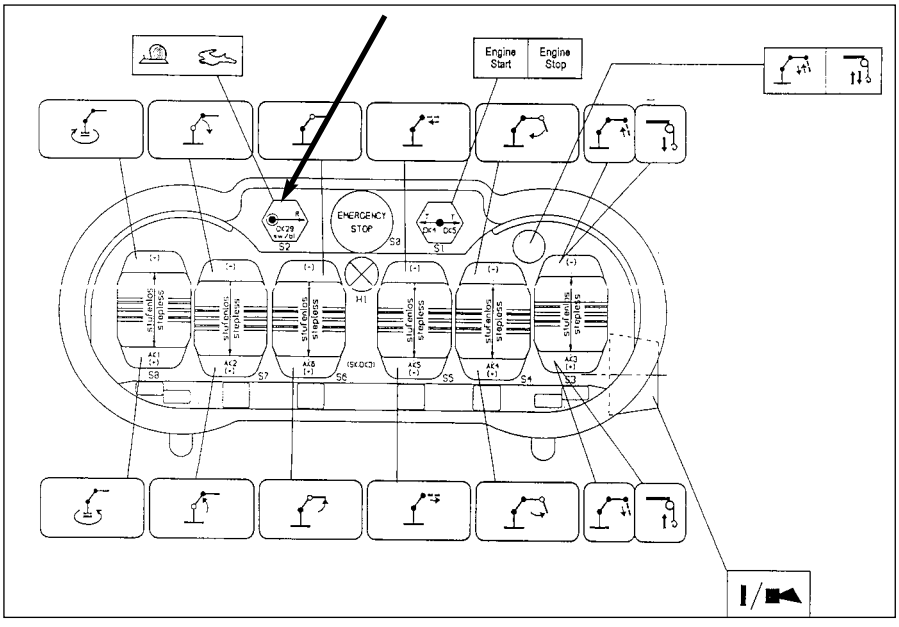
XP/CR/CE DEVICE

The XP device works on the principle of an increase in the lifting capacity of the crane with a reduction in the dynamic effect achieved with a reduction in the speed of the movements.

ACTIVATION OF THE XP DEVICE

You operate on the SLOW/FAST selector (-) fig. 10 placed on the radio remote on the SLOW position ( ). With the selector set on this position you have the electric signals of the strokes of the radio remote control keys, they come modified and interpreted from the electric controlers of the crane distributor segment which limits the strokes obtaining the reduction of the speed movements of the crane.

fig. 10



(!) WARNING (!)
The capacity plates relevant to the XP device are marked F900XP.

(!) WARNING (!)

When the XP device is active, remember that:

- The crane rotates with a decreased speed, without increasing the rotation capacity (the maximum load that the crane can rotate remains unchanged).
- The Extension and Retraction of the extension rams and, if fitted,
- the Up/Down stroke of the winch and
- The Extension and Retraction of the hydraulic jib are all possible without any reduction in speed (they produce negligible dynamic effect).
- On cranes with a lifting moment limiting device for double working zones, manoeuvres within the “unstable” area are slower without any increase in the lifting capacity.

How to use the XP device

The XP device can be activated by the crane operator before or during manoeuvres to handle the load.
For example, it can be used:

- to exploit the reduction in the speed when moving a load that must be positioned with precision.
- to exploit the variation in the lifting moment limiting device adjustment parameters to exit from a critical situation when moving the load (yellow light or activation of the lifting moment limiting with the red light and block).

Switching on the XP device after the yellow light has come on

- the light goes off
- insisting with the manoeuvres that increase the lifting moment, you get the yellow and red lights again.

Switching on the XP device after the red light has come on (lifting moment limiting device block)

A) The block continues:
- the crane must be reset by retracting the extension rams (with hydraulic jib, act on the retraction of the jib extension rams).

B) The red light switches off and the yellow lights usually comes on.
- the crane controls are enabled. Insisting with the manoeuvres that increase the lifting moment, you get the yellow and red lights again.

CONTROLS TO STABILIZE THE VEHICLE

The outriggers rams prevent harmful stresses both to the frame and to the vehicle suspensions on which the crane is mounted and assure the stability of the unit during load handling.

Supplementary beams

Supplementary beams (supplementary outriggers) are used in conjunction with the crane outriggers to ensure the vehicle stability during load handling.

Supplementary beam code	outrigger ram stroke	extension max. integrals
750B055	520 mm	5770 mm hydraulic extension
750B054	340 mm	5770 mm hydraulic extension
750B053	520 mm	6870 mm double hydraulic extension
750B043	340 mm	6870 mm double hydraulic extension

Identification data of the supplementary beam are punched on the beam (fig. 11) in the following sequence:

Example ***750B055*0001***

serial no.

identification code

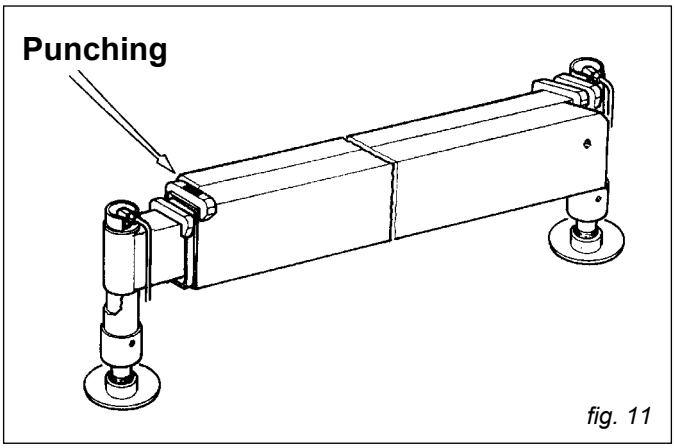


fig. 11

! ATTENTION !

(!) The crane stability is only guaranteed by the maximum lateral extension of the outrigger supports of the crane and supplementary outriggers (if fitted).

Be very careful during vehicle stabilization operation; make sure that no one is or transits in close proximity of the working area of the outriggers.

Check that they are applied on a solid base; the plate pressure of the rams is:

70 daN/cm^2 on a plate which diameter is 210 mm

If needed use the special base plates (on request).

When stabilization is complete the wheels of the vehicle must still be in contact with the ground and the suspensions must not be fully unloaded.

Level the crane so as to operate on a horizontal plane.

The controls to stabilize the vehicle are activated only on ground level and on both sides of the crane base.

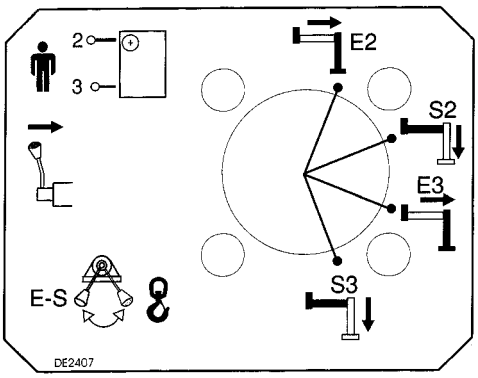


fig. 12

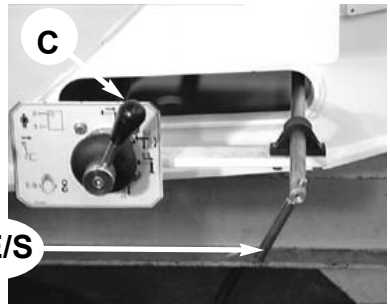


fig. 13

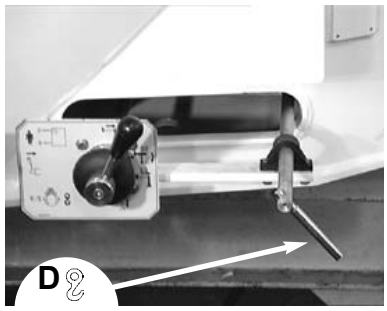


fig. 13a

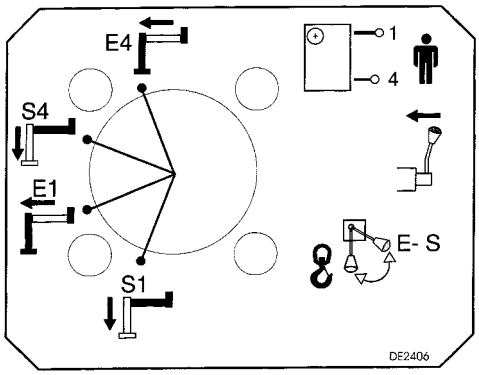


fig. 14

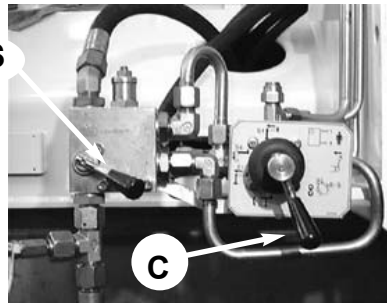


fig. 15

(!) The controls to stabilize the vehicle are in conformity with the safety directives and enable the operator to activate the lateral extension of the outriggers (outrigger supports and rams) only from the side where he can visually check the operation.

The special construction concept of the outrigger control group which combines the functions of an 8 positions deviator with those of a distributor segment, allows to use the control lever for selecting and operating the supports and the outrigger rams.

— The selection (support or ram) is effected, like on a deviator, by positioning the lever on the corresponding position indicated by the function schematic (plates DE2406 and DE2407 (or DE2589 and DE2590 for cranes with a adjustable hydraulic outriggers, available on request) placed on the controls.

— The control is effected by operating the lever like on a distributor; the stability of the selected position is guaranteed by an internal device.

The extension and re-entering of the support and outrigger rams indicated on the fig. 12-14 coincide with what indicated on the plates DE2407 and DE2406 placed in dual side position on the base.

The symbols reported at side of each lever indicate the operating levers in relation to their movement.

Lever function **D** - **C**

– Lever **D** Deviator crane - outriggers (**- E/S**). Fig. 13-15

– Lever **C** Multifunction deviator for selecting and operating the supports and the outrigger rams of the crane as well as the supplementary outriggers. Fig. 13-15

– Position lever **D** of oil diverter crane-outriggers (**- E/S**) on **E/S**. Fig. 13-15

– Open all the taps of the valves placed on the outrigger rams fig. 17.

– Disengage the locking devices of the outrigger supports by putting the levers **A** from the position of the fig. 16 to the one of the fig. 16a.

Double oil-diverter control side fig. 12-13 **DE2407**

– Select the outrigger support **E2** positioning the lever **C** of the multifunction deviator on **E2**.

– Operate the lever to extend the support **E2**.

– Select the outrigger ram **S2** positioning the lever **C** on **S2**.

– Operate the lever to control the ram descent **S2**.

– Select the support **E3** positioning the lever **C** on **E3**.

– Operate the lever to extend the support **E3**.

– Select the ram **S3** positioning the lever **C** on **S3**.

– Operate the lever to control the ram descent **S3**.

N.B. The lever, if in other positions, does not allow any operations as a security device keeps it in free position.

Oil-diverter side fig. 14-15 **DE2406**

– Select the support **E1** positioning the lever **C** on **E1**.

– Operate the lever to extend the support **E1**.

– Select the ram **S1** positioning the lever **C** on **S1**.

– Operate the lever to control the ram descent **S1**.

– Select the support **E4** positioning the lever **C** on **E4**.

– Operate the lever to extend the support **E4**.

– Select the ram **S4** positioning the lever **C** on **S4**.

– Operate the lever to control the ram descent **S4**.

N.B. The lever, if in other positions, does not allow any operations as a security device keeps it in free position.

(!) ATTENTION (!)

During the stabilisation operations, for each outrigger ram, it is recommended to DESCENT the outrigger as last manoeuvre.

(!) ATTENTION (!)

— The complete extension of the outrigger supports is visually indicated by the yellow triangles which are found at the end of the beam and the first outrigger support. (Fig. 16b-16-c)

— The stabilization has to be carried out with care and gradually keeping the vehicle in horizontal levelled condition to prevent springs overloads and chassis torsions.

— After having completed the descent and stabilisation manoeuvres, close the taps of the valves placed on the outrigger rams.

Enable the crane by taking lever **D** controlling the crane/outriggers oil-diverter (- **E/S**) to position fig. 13a-15a.

Manoeuvres for re-entry of the crane outriggers and supplementary outriggers within the overall vehicle width after crane use.

– Position lever **D** of oil diverter crane-outriggers (**- E/S**) on **E/S**. Fig. 13-15

– Open all the taps of the valves placed on the outrigger rams (fig. 17).

(!) WARNING (!)

Under no circumstances put the hands on the locking devices of the outrigger supports; The device re-hook (lever **A** from position of fig. 16b to fig. 16) is automatic.

Oil-diverter double control side fig. 12-13 **DE2407**

– Select the outrigger ram **S2** positioning the lever **C** on **S2**.

– Operate the lever to control the re-entry of the ram **S2**.

– Select the outrigger support **E2** positioning the lever **C** on **E2**.

– Operate the lever to control the re-entry of the support **E2**.

– Select the ram **S3** positioning the lever **C** on **S3**.

– Operate the lever to control the re-entry of the ram **S3**.

– Select the support **E3** positioning the lever **C** on **E3**.

– Operate the lever to control the re-entry of the support **E3**.

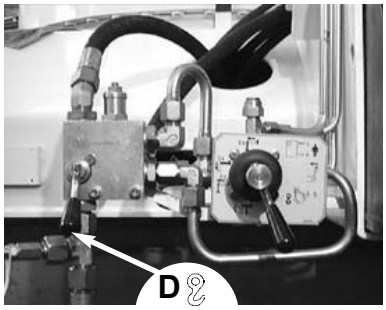


fig. 15a

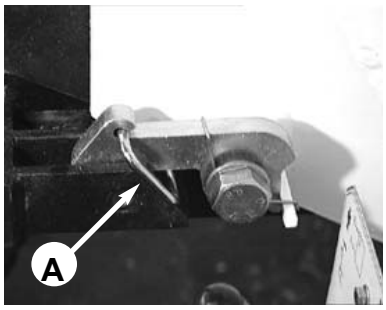


fig. 16


fig. 16a

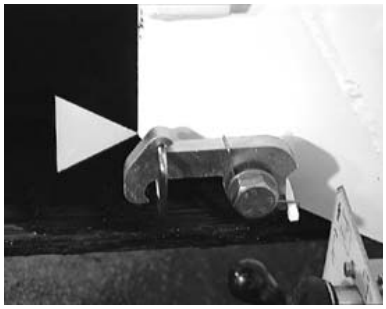


fig. 16b

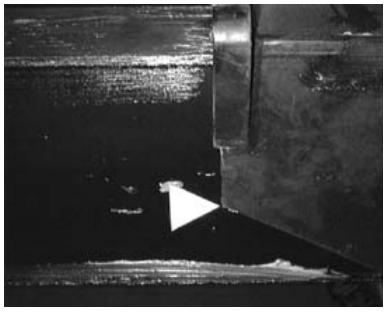


fig. 16c

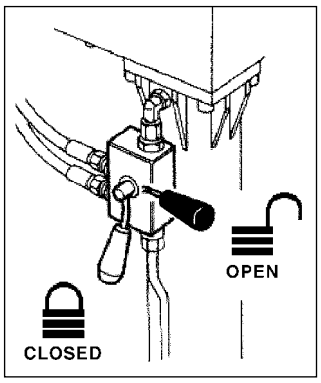


fig. 17

fig. 18

fig. 18a

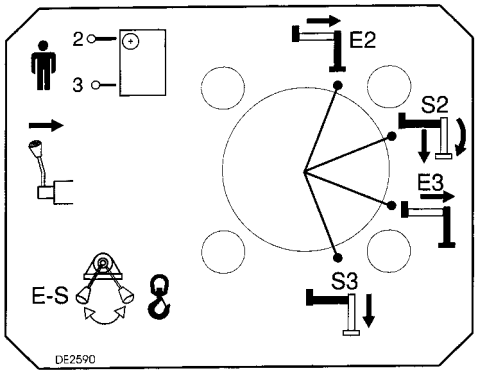


fig. 19

N.B. **The lever, if in other positions, does not allow any operations as a security device keeps it in free position.**

Oil-diverter side fig. 14-15 **DE2406**

– Select the ram **S1** positioning the lever **C** on **S1**.

– Operate the lever to control the re-entry of the ram **S1**.

– Select the support **E1** positioning the lever **C** on **E1**.

– Operate the lever to control the re-entry of the support **E1**.

– Select the ram **S4** positioning the lever **C** on **S4**.

– Operate the lever to control the re-entry of the ram **S4**.

– Select the support **E4** positioning the lever **C** on **E4**.

– Operate the lever to control the re-entry of the support **E4**.

N.B. **The lever, if in other positions, does not allow any operations as a security device keeps it in free position.**

(!) **Always check that the outriggers supports, once in their rest position, are locked in their seat by the safety devices, so as to assure the impossibility of accidental movements. (Fig. 16)**

(!) **It is compulsory to close the outriggers rams valves taps before moving the truck. (Fig. 17)**

Adjustable supports (manual) **for the outrigger rams** (on request and only for cranes without integrated sub-frame)

Outrigger rams which allow to be rested in an inclined position, when obstructions on the vehicle chassis prevent their vertical stowability. They are supports with articulation to be put between the outrigger supports and rams; the fixed part is screwed to the outrigger supports and the mobile one to the outrigger rams.

After the extension of the lateral outrigger supports, place the outrigger ram in a working condition as follows:

— Remove the check pin and the locking pin from their position (fig. 18), hand carrying the ram.

— Carefully position the ram, insert the locking pin in its new seat and secure it with the check pin (fig. 18a).

To re-position the rams in folded condition:

— Remove the check pin and the locking pin from their position.

— Carefully rotate the ram in a upward direction, insert the locking pin in its new seat and secure it with the check pin.

(!) **The locking pin is constructed from special material**
- do not replace it with a non original part
- your security depends on it

Adjustable supports (hydraulic control) **for the outrigger rams** (on request and only for cranes without integrated sub-frame)

These are hinged supports with a mechanical-hydraulic device for resting the outrigger rams at 180 (upwards) if there are

obstructions on the vehicle chassis.
These should be placed between the outrigger supports and the rams: the fixed part if screwed to the outrigger supports and the moving part to the outrigger rams.

Controls for positioning the hydraulic (adjustable) **outriggers and the supplementary beam.**

The extension and re-entering of the support and outrigger rams indicated on the fig. 19-21 coincide with what indicated on the plates DE2590 and DE2589 placed on the base in proximity of the control stations.

The symbols reported at side of each lever indicate the operating levers in relation to their movement.

Lever function **D** - **C**

– Lever **D** Deviator crane - outriggers (**- E/S**). Fig. 20-22

– Lever **C** Multifunction deviator for selecting and operating the supports and the outrigger rams of the crane as well as the supplementary outriggers. Fig. 20-22

(!) WARNING (!)

Be very careful during vehicle stabilization operation; make sure that there are no obstacles preventing the rotation of the rams and that no one is or transits in close proximity of the working area of the outriggers.

– Position lever **D** of oil diverter crane-outriggers (**- E/S**) on **E/S**. Fig. 20-22
– Disengage the locking devices of the outrigger supports by putting the levers **A** from the position of the fig. 16 to the one of the fig. 16a.
– Open all the taps of the valves placed on the outrigger rams fig. 17.

Double oil-diverter control side fig. 19-20 **DE2590**

– Select the outrigger support **E2** positioning the lever **C** of the multifunction deviator on **E2**.
– Operate the lever to extend the support **E2**.
– Select the outrigger ram **S2** positioning the lever **C** on **S2**.
– Make sure that the ram valve tap **S2** is closed (fig. 23).
– Open the valve tap on the rack ram belonging to the outrigger rotation device (fig. 24).
– Remove the check pin and release the pin (fig. 25).
– Use lever **C** to control the rotation and take the ram **S2** to its working position.
– Insert the pin in its new seat and secure with the check pin (fig. 26).
– Close the tap on the rack ram valve and open the tap of the outrigger ram valve **S2** (fig. 27).
– Again use lever **C** to lower the ram **S2**.
– Select the support **E3** positioning the lever **C** on **E3**.

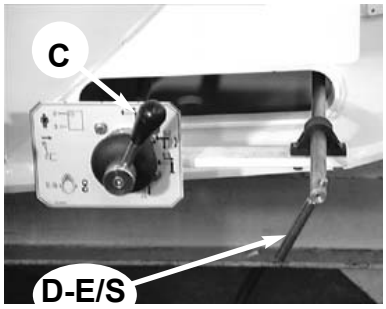


fig. 20

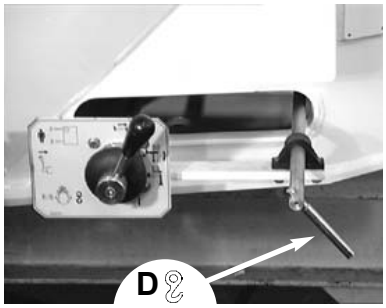


fig. 20a

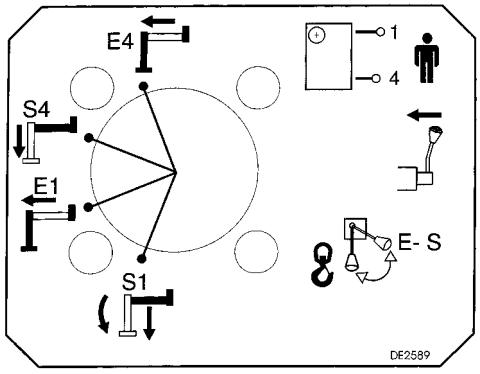


fig. 21

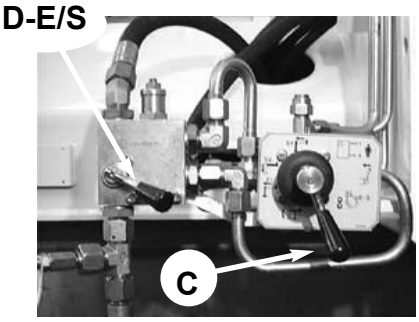


fig. 22

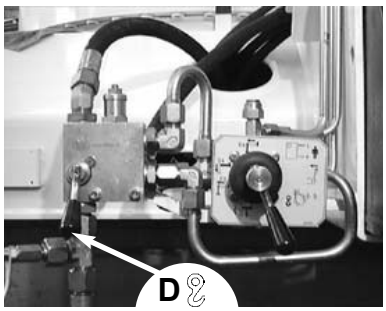


fig. 22a

FASSI

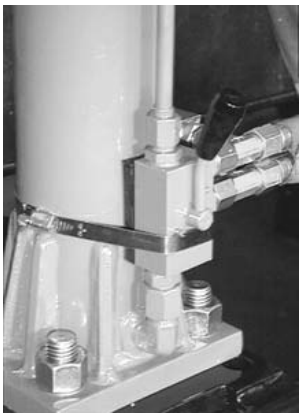


fig. 23

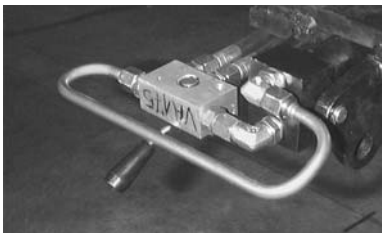


fig. 24

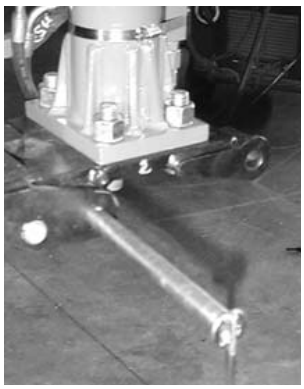


fig. 25

fig. 26

fig. 27

– Operate the lever to extend the support **E3**.
– Select the ram **S3** positioning the lever **C** on **S3**.
– Operate the lever to control the ram descent **S3**.

N.B. **The lever, if in other positions, does not allow any operations as a security device keeps it in free position.**

Oil-diverter side fig. 21-22 **DE2589**

– Select the support **E1** positioning the lever **C** on **E1**.
– Operate the lever to extend the support **E1**.
– Select the ram **S1** positioning the lever **C** on **S1**.
– Make sure that the ram valve tap **S1** is closed (fig. 28).
– Open the valve tap on the rack ram (fig. 29).
– Remove the check pin and release the pin (fig. 30).
– Use lever **C** to control the rotation and take the ram **S1** to its working position.
– Insert the pin in its new seat and secure with the check pin (fig. 31).
– Close the tap on the rack ram valve (fig. 32).
– Open the tap of the outrigger ram valve **S1** (fig. 33).
– Again use lever **C** to lower the ram **S1**.
– Select the support **E4** positioning the lever **C** on **E4**.
– Operate the lever to extend the support **E4**.
– Select the ram **S4** positioning the lever **C** on **S4**.
– Operate the lever to control the ram descent **S4**.

N.B. **The lever, if in other positions, does not allow any operations as a security device keeps it in free position.**

(!) ATTENTION (!)

During the stabilisation operations, for each outrigger ram, it is recommended to DESCENT the outrigger as last manoeuvre.

(!) ATTENTION (!)

— The complete extension of the outrigger supports is visually indicated by the yellow triangles which are found at the end of the beam and the first outrigger support. (Fig. 16b-16-c)
— The stabilization has to be carried out with care and gradually keeping the vehicle in horizontal levelled condition to prevent springs overloads and chassis torsions.
— After having completed the descent and the stabilisation manoeuvres, close the taps of the valves placed on the outrigger rams.

Enable the crane by taking lever **D** controlling the crane/outriggers oil-diverter (ℰ - **E/S**) to position ℰ fig. 20a-22a.

Manoeuvres for re-entry of the crane outriggers and supplementary outriggers within the overall vehicle width after crane use.

– Position lever **D** of oil diverter crane-outriggers (& **- E/S**) on **E/S**. Fig. 20-22

– Open all the taps of the valves placed on the outrigger rams of the supplementary beam (fig. 17).

(!) WARNING (!)

Under no circumstances put the hands on the locking devices of the outrigger supports; the device re-hook (lever **A** from position of fig. 16b to fig. 16) is automatic.

fig. 28

Oil-diverter double control side fig. 19-20 **DE2590**

– Select the outrigger ram **S2** positioning the lever **C** on **S2**.

– Open the valve tap on the ram **S2**.

– Make sure that the valve tap belonging to the rack ram is closed.

– Operate the lever **C** to control the re-entry of the ram **S2**.

– Remove the check pin and release the pin.

– Close the tap on the ram valve **S2**.

– Open the tap of the rack ram valve.

– Use lever **C** to control the rotation and take the ram **S2** to its rest position.

– Insert the pin in its new seat and secure with the check pin.

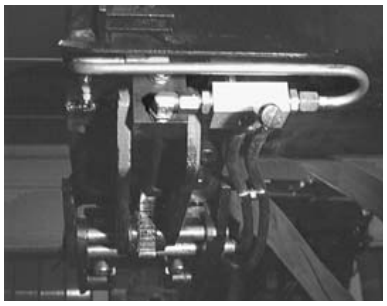


fig. 29

– Select the support **E2** positioning the lever **C** on **E2**.

– Operate the lever to control the re-entry of the support **E2**.

– Select the ram **S3** positioning the lever **C** on **S3**.

– Operate the lever to control the re-entry of the ram **S3**.

– Select the support **E3** positioning the lever **C** on **E3**.

– Operate the lever to control the re-entry of the support **E3**.

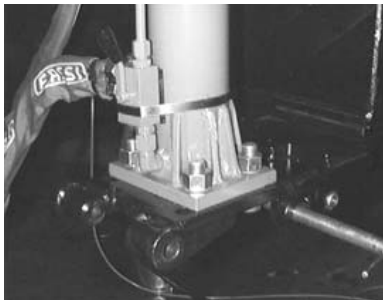


fig. 30

N.B. **The lever, if in other positions, does not allow any operations as a security device keeps it in free position.**

Oil-diverter side fig. 21-22 **DE2589**

– Select the ram **S1** positioning the lever **C** on **S1**.

– Operate the lever to control the re-entry of the ram **S1**.

– Open the valve tap on the ram **S1**.

– Make sure that the valve tap belonging to the rack ram is closed.

– Operate the lever **C** to control the re-entry of the ram **S1**.

– Remove the check pin and release the pin.

– Close the tap on the outrigger ram valve.

– Open the tap of the rack ram valve.

– Use lever **C** to control the rotation and take the ram **S1** to its rest position.

– Insert the pin in its new seat and secure with the check pin.

fig. 31

– Select the support **E1** positioning the lever **C** on **E1**.

– Operate the lever to control the re-entry of the support **E1**.

fig. 32

fig. 33

– Select the ram **S4** positioning the lever **C** on **S4**.
– Operate the lever to control the re-entry of the ram **S4**.
– Select the support **E4** positioning the lever **C** on **E4**.
– Operate the lever to control the re-entry of the outrigger support **E4**.

N.B. **The lever, if in other positions, does not allow any operations as a security device keeps it in free position.**

(!) **Always check that the outriggers supports, once in their rest position, are locked in their seat by the safety devices, so as to assure the impossibility of accidental movements. (Fig. 16).**

(!) **It is compulsory to close the outriggers rams valves taps before moving the truck. Fig 17**

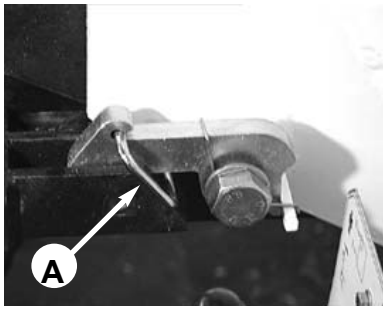


fig. 16

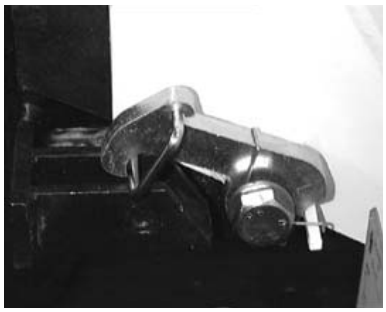


fig. 16a

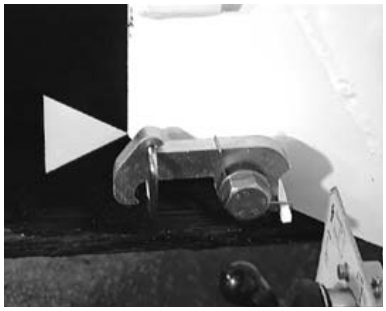


fig. 16b

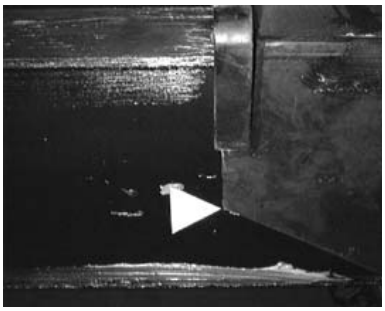


fig. 16c

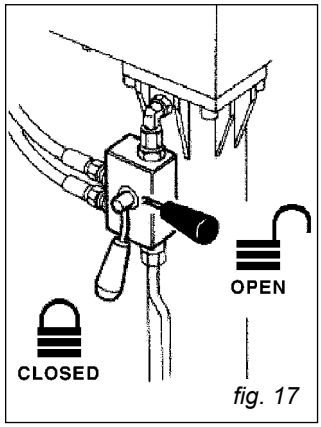


fig. 17

CONTROLS TO OPERATE THE CRANE

(!) WARNING (!)

Before operating the crane it is compulsory to set the outriggers and to shut the safety check valve taps.

This coincides with that indicated on the plate DE319 placed on the outriggers. (Fig. 34)

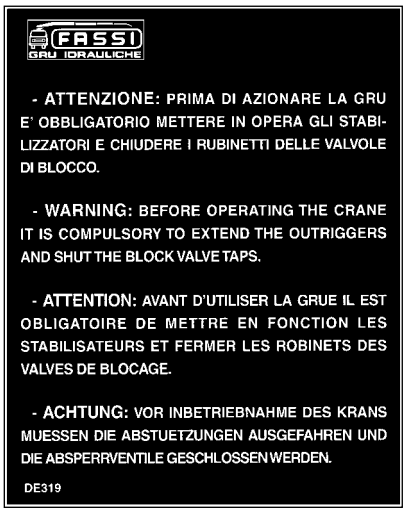


fig. 34

(!) Operate the levers smoothly and gradually.
When carrying out simultaneous movements of two or more functions, also related to pump flow and lever travel, it is possible that on reaching the stroke end of a particular function, an increase in speed of the other functions will occur.

(!) WARNING (!)

While exiting and folding the crane, you must operate from the distributor side; it is forbidden to operate from the double control side because of the overall dimensions of the booms. (DE1684A fig. 34a)

The crane and the possible hydraulic accessories are operated through proportional radio remote control subjugate to a distributore which the manual order is to be used only in case of emergency.

HETRONIC RADIO REMOTE CONTROL

Complete of key linears (joystick) proportional for the crane and the functions of starting/turning off the motor, the emergency stop system, the start, the warning horn and starting spy system.

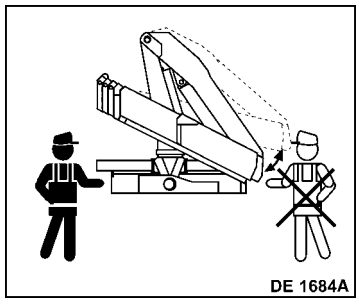


fig. 34a

(!) WARNING (!)

First read the instructions given in the User's Manual supplied by the Manufacturer before using the remote control to avoid improper use.

Activation of the radio remote control

- Turn the selector swicth (fig. 35) on the **Manual - Radio** panel to **Radio**.

The particular configuration of the radio remote control allows to control 6 functions (distributor segment of the crane) through 6 keys. To control a higher number of functions (7 or 8) it is necessary to operate on proper selectors which allows at some keys the order of a double function.

The ideogramms placed on the side of each radio remote control key and on each lever on the emergency control, determine the working of the levers in relation to the movement to effect.

EMERGENCY CONTROLS

- Turn the selector swicth (fig. 35) on the **Manual - Radio** panel to **Manual**.

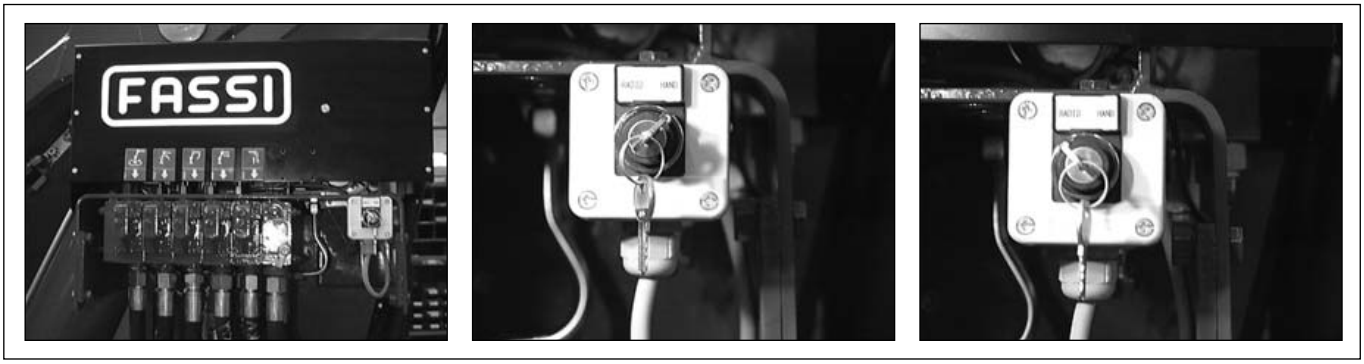


fig. 35

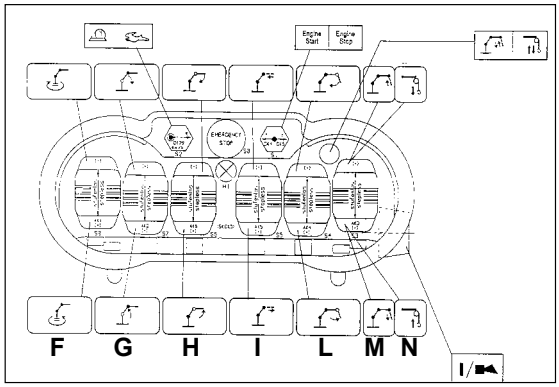
(!) WARNING (!)

The control lever NOT assembled on the distributor must only be used to manoeuvre the crane if the electricity supply is cut off.
The column controls must only be used in an emergency and only to bring the crane to its rest position.
During emergency manoeuvres, the operator should be assisted by a second trained person who can intervene if necessary.

(!) WARNING (!)

The operator must pay particular attention to his working position and safety when using the crane. Particular care is needed when turning the crane, due to obstacles around the column (driver's cabin, back of the truck....).

fig. 36a



The operation of the distributor segment (functions) for the control of the crane and of the possible hydraulic accessories are obtained by operating properly the radio remote control key. As said before certain keys allowes to the control, after selection, two different functions.
Observe the disposition of controls which appears on the radio remote control; the fig. 36a represents the possible combinations of the controls and the numbering of the levers is given as reference

The fig. 36b represents the manual control of the crane and eventual accessories in emergency conditions.

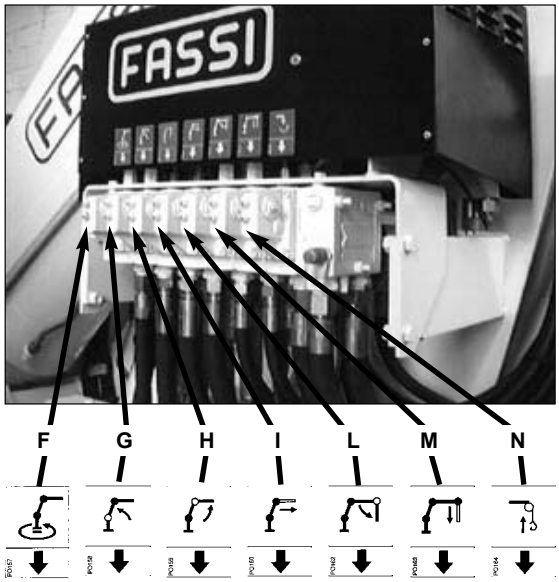


fig. 36b

Lever function F-G-H-I
Crane controls

F - Rotation motoreducer control
G - Inner ram control
H - Outer ram control
I - Outer booms section rams control

Lever function L - M - N
Hydraulic implements controls

L - First hydraulic implement control
M - Second hydraulic implement control
N - Third hydraulic implement control

Always remember that the number of levers for hydraulic implements controls changes upon the type of fittings, as follows:

1 lever	winch control
2 levers	jib outer ram - jib extension rams control
3 levers	jib outer ram - jib extension rams and winch control

Manoeuvres to unfold the crane into a working condition (fig. 36)

(!) IT IS FORBIDDEN TO OPERATE FROM THE DOUBLE CONTROL SIDE (!)

(!) Operate from ground control distributor side (!)

- Engage the power take off.
- Stabilize the vehicle as described in the chapter IX and position lever **D** of the deviator crane-outriggers (- **S E**) on ( ).
- Turn the selector swicth (fig. 35) on the **Manual - Radio** panel to **Radio**.
- Operate lever **I** (re-entry) to ensure that the outer boom sections are completely re-entered.
- Before lifting the inner boom, be sure that the outer ram is closed (operate the lever **H** re-entry function).
- Lift the inner boom over the horizontal line, by operating lever **G** (fig. 34a).
- Open the outer boom to the "horizontal" position by operating lever **H**.
- (Eventually) extend the booms of the crane by operating lever **I**.
- Position the hook on the vertical line above the load, operating lever **F** (rotation).

Manoeuvres to fold the crane into the rest condition

(!) IT IS FORBIDDEN TO OPERATE FROM (!) THE DOUBLE CONTROL SIDE

(!) Operate from ground (!) control distributor side

- Fold the extension boom sections to their stroke end (lever **I**).
- Lift the inner boom to its stroke end (lever **G**).
- Fold the outer boom to its stroke end (lever **H**).
- Operate the rotation control (lever **F**) until the arrows placed on the base and on the slew ring coincide.
- Fold the inner boom to its stroke end (lever **G**); the rest locating pin lines up with its seat (fig. 34a).
- Lift and re-enter the outriggers to within the overall vehicle width as described in the chapter IX.
- When all manoeuvres are complete, check that the taps of the outrigger ram valves are closed. Fig. 17

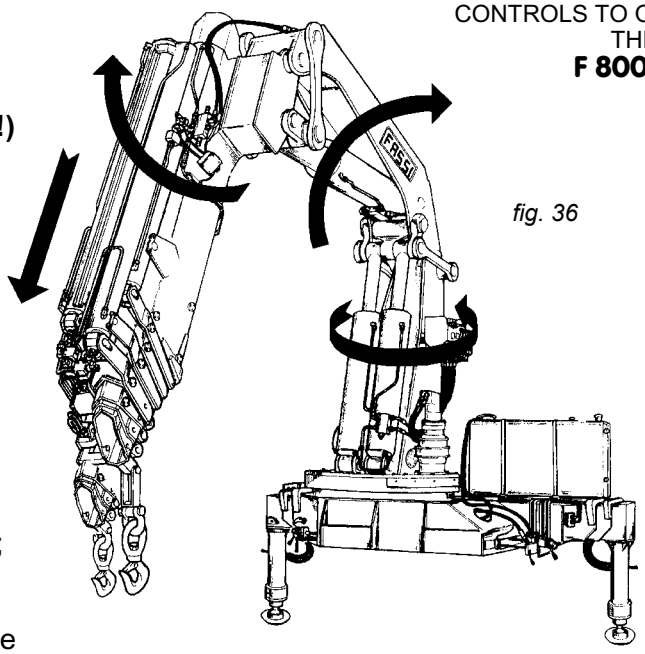


fig. 36

(!) If there are accessories placed on the load or the back of the truck, make sure that these are secured to avoid any sideways movement.

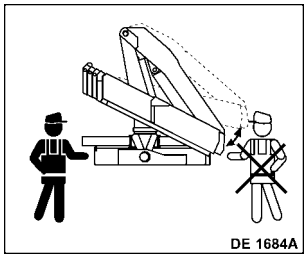


fig. 34a

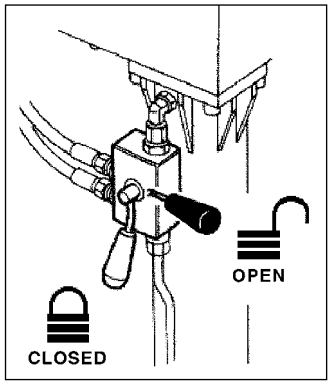


fig. 17

Tele-radio remote control (by request)

The HETRONIC radio remote control, in the cases of unloaded battery or presence of interference on the transmission by radio or use of the crane in determine applications where the transmission by radio is forbidden, it is easily transformable in tele-radio remote control using a connection cable (supplied by request):

Activation of the tele-radio remote control

- Connect by cable the radio remote control to the connector fixed on the plinth of the crane (fig. 37)
- Connect the flying connector of the delay cable to the switchboard (fig. 37a)

The use of the cable of prolongs it is necessary to operate with the same procedure of connection.

Turn the selector swicth (fig. 35) on the **Manual - Radio** panel to **Radio**.

(!) ATTENTION (!)

To restore the radio remote control it is necessary to disconnect the cable from the console and the switchboard.

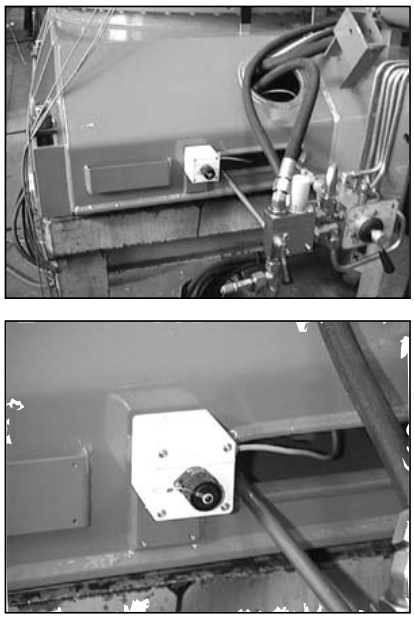


fig. 37

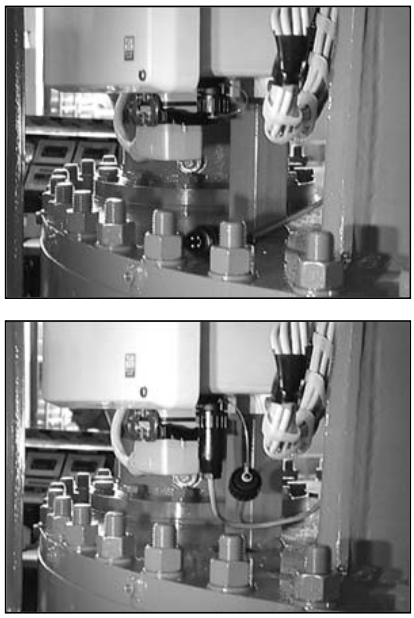


fig. 37a

Load manoeuvres

(!) Before manoeuvering the load, verify that the working area is suitable for your crane.

The lifting curves of the capacity plate indicate the maximum load that the crane can lift at a certain radius and at a certain height.

To utilize the maximum capacity of the crane, it is necessary to position the inner boom as indicated on the capacity plate

During load handling, do not exceed the reach limits given, or the load indicated on the above mentioned charts.

If the limits are exceeded, the load limiting device, allowing all manoeuvres, which reduce the lifted load within the permitted reach limits and forbid all other manoeuvres, will be immediately activated.

The presence of the lifting moment limiting device does not release the user from the observance of the capacity plates and lifting curves.

(!) WARNING (!)

Always check carefully that the vehicle is perfectly stable, paying special attention to the area immediately in front of the driver's cabin which is usually less stable.

USE OF IMPLEMENTS

The crane can be provided with implements such as:

— Manual extensions
— Winches
— Hydraulic extensions
— Personnel baskets.

(!) When using an implement it is always necessary to check that its weight, dimension and capacity is matched to the crane performances.

Warning and norms for crane use also apply for hydraulic implement use.

(!) Before using a personnel basket it is necessary to provide the crane with the safety devices requested by the local norms in force. Prior to use of the crane it has to be tested and inspected in accordance with the local legal requirements.

Manual extensions

Manual extensions are additional boom sections, which are placed in the crane outer booms and secured by pins and check pins; they have a maximum capacity, indicated on the plate, independent from the crane configuration.

(!) WARNING (!)

Manual extensions are not protected by the lifting moment limiting device. Before lifting the load make sure that its weight does not exceed the capacity indicated on the plate.

Manual extensions can be extracted from the rest position and be operative, once the security pins have been removed, with the outer boom in sliding position.

(!) Verify that the area is suitable for this operation and there are no unauthorized persons in the working area.

Do not permit the extension to slide out at speed as this will damage the stroke end stops.

Do not try to align the holes (slots) for the locking pins with your fingers; always use a suitable tool.

Always remember that when operating with implements, their tare weight must be deducted from the capacity of the crane.

When manual extensions are in place, fit the locking pins and secure them with the check pins to prevent accidental escape.

Winch (fig. 38)

The winch is made of a drum (pos.**1**) that can rotate by means of a hydraulic engine (pos. **2**), on a structure (pos.**3**) fixed on the crane (i.e. under the outer boom). The rotation of the drum on which the cable winds is achieved by a hydraulic motor (pos. **2**) connected to the circuit by means of hoses; in case of fittings or hoses brake the stop of the rotation is guaranteed by a safety check valve (pos. **4**). A parking brake integrated to the motoreducer group prevents the rotation on the drum (held of the winch load in position), when the control function is not activated (lever **N** in neutral position) .

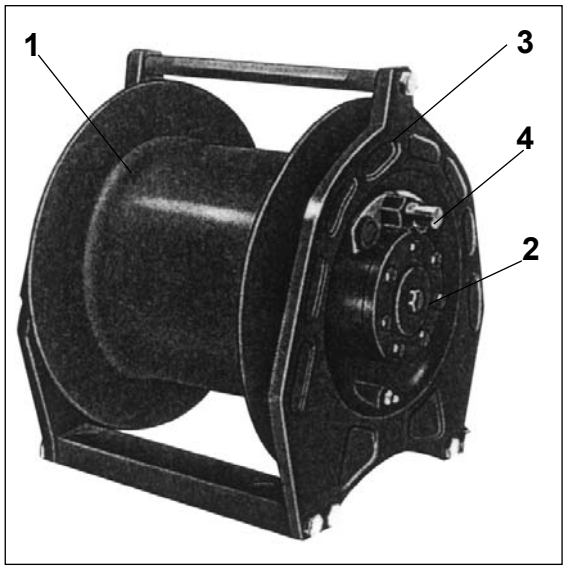


fig. 38

The winch is identified by a plate (fig. 38a) indicating the essential data and fixed by the manufacturer:

Manufacturer mark ...
Winch type ...
Serial number ...
Maximum line in N at the 4th layer...
Maximum speed in m/min ...

(!) See operator winch manual supplied by the winches' manufacturer.

The winch has a maximum capacity, indicated by a plate, not related to the crane capacities which can also be lower.

Consequently avoid to lift, with the winch, heavier loads than those allowed by the crane capacity plate.

The couple limiter, installed on the winch structure, prevents that on the cable, can be created a load major to the value of maximum line at the 4th layer, quiescing all the crane controls.

(!) Under no circumstances interfere with the limiter device adjustment.

Do not rotate the crane before the load is lifted, rotate slowly and with care the suspended load checking the stability of the vehicle.

fig. 38a

The presser-cable always keeps the cable in tension easing the regular rewinding and without overlappings on the drum.

(!) On winches not equipped with presser-cable, check the rewinding of the cable on winch drum proceeds regularly and without overlapping: it is suggested not to rewind the cable if it is not sufficiently taut.

According to the actual norms the winches must be provided with safety device. That adopted one uses an electrohydraulic technology, where a signal, given by a microswitch, controls the quiescing and the reactivation of crane controls through an electrovalve.
The adopted device prevents that:

- in the lifting with the winch or in the booms extension rams exit (crane or hydraulic extension) the cable hook (or the block) takes contact with the pulley structure;
- in the unwinding the cable is completely wound from the winch drum(three turns must be wound at least), causing the controls quiescing.

To reactivate the controls the lever (fig. 26-27-28), winch control must be activated controlling:
- the descent of the cable if the device operation is happened in the lifting with the winch or in exit with the booms extension rams;
- the lifting of the cable if the operation is happened in the unwinding of the same one.

In the phase of lifting or exit of booms extension rams, the control of the position about the cable hook (or about the block), as regards the pulley structure, is obtained through a microswitch, which lever is kept in position by a chain balance weight, assembled free on the cable.
In the quiescing of the crane the keeping in position of the microswitch lever becomes impossible with the consequent quiescing of controls.

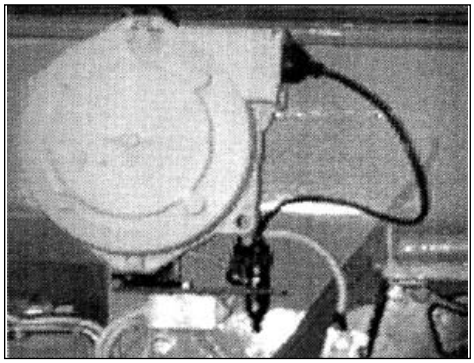


fig. 39

To put the crane in rest position it is necessary to operate in this way:
- withdraw the flying drive (it is assembled on the cable of the cable winder) from the pin placed near the microswitch, placed on the pulley, assembled on the booms extension rams.
- In case it is a crane with hydraulic extension it is necessary to detach the cable of the cable winder, placed on the crane from the pin of the second cable winder, assembled on the extension.
- Release the cable from all support rings placed on the booms letting that it winds free in the cable winder.
- Insert the flying drive in the pin placed in the cable winder. (Fig. 39).

This operation gets active all crane controls to complete the rest position operations.

(!) Please remember that after stabilizing the vehicle and placing the crane in working position it is compulsory to reset the functionality of end stroke device, otherwise the cable could be damaged.

Hydraulic connections between implements and hoses fitted on extension boom section. (Fig. 40)

(!) In case of hoses connection to implements through coupling unions it is necessary to verify that there is no trace of soil, curt etc. on the unions and inside the seats so as to avoid the oil contamination and consequently wear the tightening " surface of unions.

(!) WARNING (!)

To ensure that the control corresponds to the implement movement, hydraulic connections are symmetrically fitted with coupling unions. Never invert such positions: movements inversion as well as operating difficulties could occur.

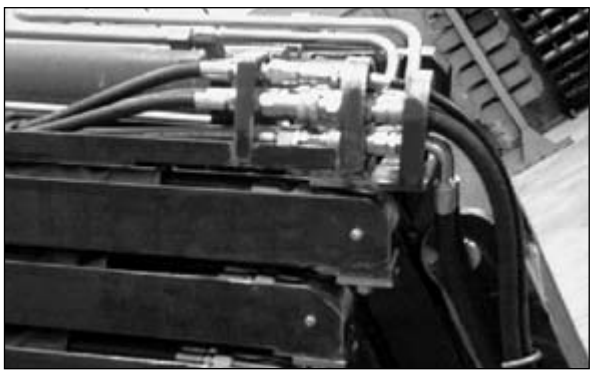


fig. 40

MAINTENANCE INSTRUCTIONS

To assure a long life to the crane, it is necessary to meticulously follow the instructions.

General lubrication and small repairs can be carried out by the user; repairs of a more complicated nature must be carried out by authorized service personnel.

Spare parts must be original.

Good maintenance and proper use are imperative to maintain efficient use and guarantee the safety of the crane.

At least once a year you must take the crane to a Fassi Service Center for a check.

(!) Before disconnecting any hydraulic hoses, ensure that there is no pressure in the hydraulic circuit. After removing hoses always mark them and their respective ports on the crane. Faulty replacement can cause damage to the rams and to the hydraulic circuit.

Respect the information supplied for maintenance and technical assistance.

Any maintenance operation must be carried out with the crane power source turned off. (in case of fixed mounting with hydraulic power pack, the electric motor has to be turned off).

Do not place limbs, fingers or any other parts of anatomy into areas of the crane, which present possibilities of shearing, without having blocked such parts of the crane.

Do not weld, drill or grind any part of the crane without the Manufacturer's authorisation.

Do not weld the fixing rods of the crane (see plate DE1574 fig. 41).

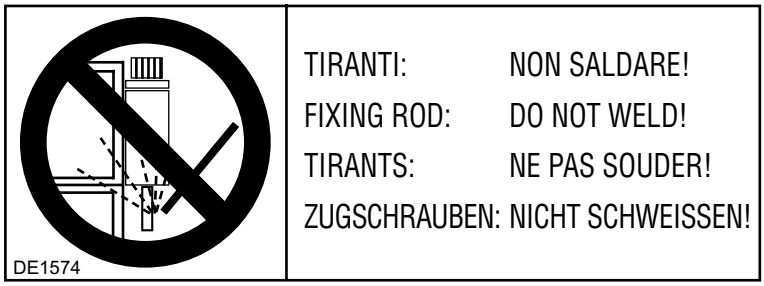


fig. 41

When repairs to, or checks of, the hydraulic circuit and of the rams are carried out, it is very important not to use, or be in the proximity of, materials which can damage the circuit or contaminate the hydraulic oil eg. metal shavings, sand or dust.

Do not use the high pressure washing on the controls (deviators and double controls, distributor), on the slewing ring, on the electronic components (boxes, control panels...), on the tanks.

Never use detergents, petrolsol or inflammable liquids, always use non flammable or non toxic liquids.

To avoid down time, it is recommended to periodically carry out the following checks.

At the end of every working day

Check that all safety devices are efficient.

Check the level of the hydraulic oil in the tank.

Check the hoses fittings and all the components of the hydraulic circuit for possible leaks.

Check that the oil-diverter - **E/S** and the double controls levers can be moved easily.

Check that the multi-purpose oil-diverter and double control levers can be moved easily and return freely to neutral position.

Check the condition of shackles, hooks, wire ropes and any other lifting equipment.

After the first 40 hours use

Check the tightening torque of the fixing rods of the crane (Fig. 42)

Tightening torque for the rods M 39x3 = 1800 Nm

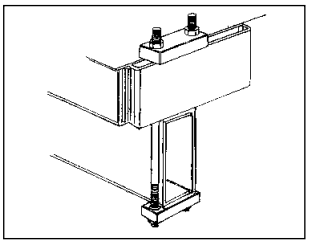


fig. 42

After every working week

Clean the oil filters in the crane tank (at the intake before the pump) and immediately after the pump. If the hydraulic circuit of the crane is connected to a tipper a remote oil tank may be fitted, in this case the filter will be found in this tank.

Cleaning of the filter on the tank (oil return from the distributor) fig. 43

— Remove the filter cover, pos. **1**, by unscrewing the three security bolts.
Remove the spring and extract the filter cartridge pos. **2**: during this operation take care that no contaminated material passes into the tank.
— Clean the cartridge by flushing with a non flammable and non toxic solvent. Thoroughly dry the filter inside and out with compressed air.
— Remove the filter holder from the filter body pos. **3** (a hose is attached to its base); clean and reassemble checking the sealing 'O' rings pos. **4** (internal seal between cartridge and pos. **5** holder and external seal between holder and body).
— Re-assemble the filter cartridge into its holder, re-assemble the spring and the filter cover pos. **6** (check the sealing of the 'O' ring under the filter cover).
— Re-fit the three security bolts.
— Check for leaks when the pump is activated.

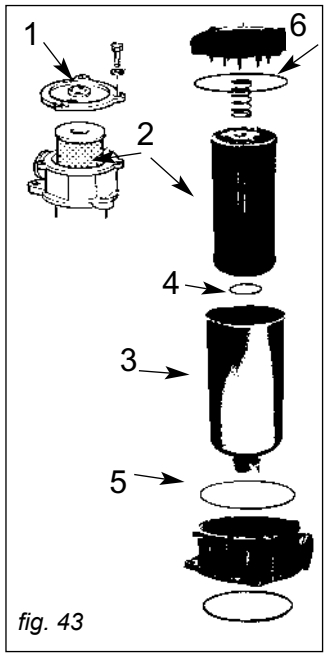


fig. 43

FASSI

Cleaning of the filter on the delivery line (before the distributor) fig. 44.

— Unscrew with an hexagonal spanner (30 mm) the body filter pos. **1** from the head pos. **2**

— Remove the cartridge pos. **3** and clean it as previously indicated.

— Check if the cartridge has crumbled up; in case, replace it!

— Re-assemble checking the seal pos. **4** on the filter body.

— Screw the filter body into the head.

— Check for leaks when the pump is activated.

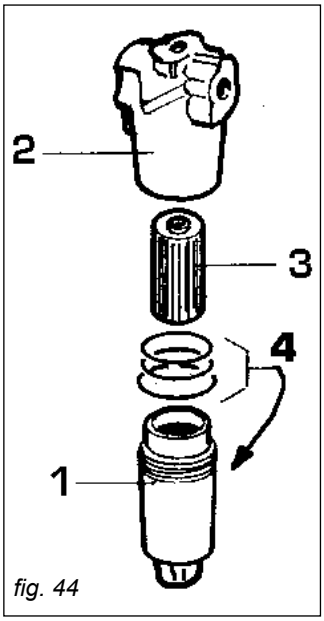


fig. 44

Check the oil level in the tank with the crane in the folded position and with the outriggers (crane and supplementary) fully re-entered. The oil level must be within the maximum and minimum markings (fig. 45).
Top up using hydraulic oil with the same characteristics as those indicated in the table on page 47.

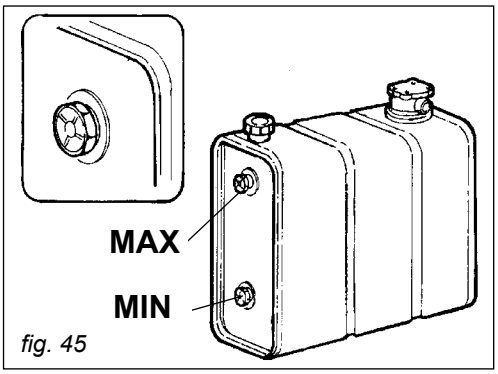


fig. 45

After every 100 working hours or more frequently in case of more intensive utilisation

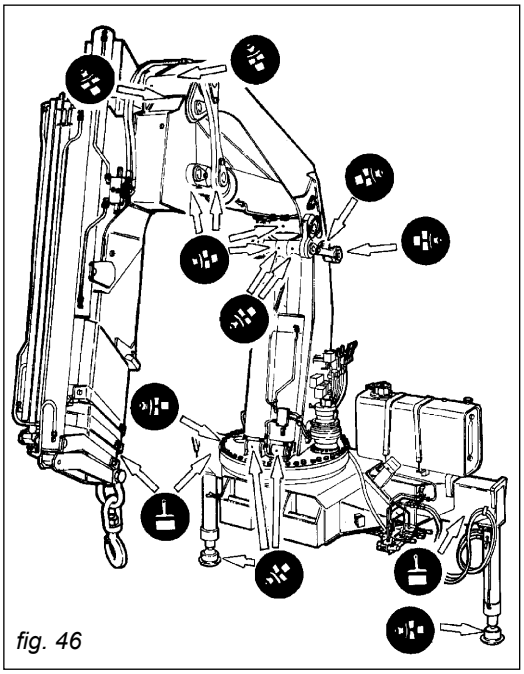


fig. 46

Periodically grease the points indicated on the crane paying particular attention to the points not easily detected.

Guide shoes made from a special material have been fitted to allow the crane extension boom sections, the hydraulic booms and the outrigger supports to slide freely. To ease their movement it is recommended to smear a light film of grease on them, taking care that the surfaces of the extension boom sections are free from impurities such as sand etc.

Use a grease with the same characteristics indicated in the table on page 47.

Grease the fifth wheel to prevent friction during rotation and to ensure that it is stable by preventing water (corrosion protection) and contaminants from entering the bearings.
We recommend greasing this with the crane rotating and making sure that the grease overflows from the fifth wheel seals.

Use a grease with the same characteristics indicated in the table on page 47.

Grease the winch cable (if fitted) after having first cleaned the cable of any encrustation (grease mixed with sand, dust, dirt etc.) The lubricant used must guarantee a good level of penetration in order to lubricate both the inside and the outside of the cable. Use a grease with the same characteristics indicated in the table on page 47.

After every 500 working hours

Check the tightening torque

- of the fixing rods of the crane
  Tightening torque for fixing rods M39x3 = 1800 Nm

- of the slew gear screws
  Tightening torque for bolts M20 Class 12.9 = 620 Nm

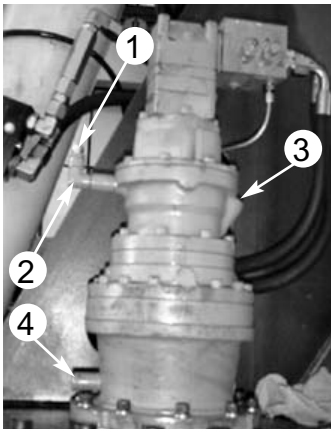
- of the securing bolts for the ram pins and of all the other bolts and screws, where the tightening torque is not expressly indicated, consult the following table in order to find it's value according to the bolt diameter and class.

Table of the bolts tightening torque with average friction value (0,15) and average-good tightening accuracy (type C).

Bolt Diameter = D	Class 8.8 Torque = Nm	Class 10.9 Torque = Nm	Class 12.9 Torque = Nm
3	1,06	1,56	1,83
4	2,44	3,58	4,19
5	4,83	7,10	8,30
6	8,30	12,30	14,30
8	20	29	35
10	40	59	69
12	69	102	119
14	111	163	191
16	173	255	298
18	239	352	412

Bolt Diameter = D	Class 8.8 Torque = Nm	Class 10.9 Torque = Nm	Class 12.9 Torque = Nm
20	339	499	584
22	466	685	802
24	584	858	1004
27	865	1271	1487
30	1173	1723	2016
33	1594	2342	2740
36	2046	3006	3517
39	2658	3905	4570
From "ELEMENTS DE FIXATION ASSEMBLAGES VISSES" AFNOR E 25-030 AGOSTO 1984			

Check the rotation control motoreducer oil level



- Remove the bleed plug (**1**) using a 22 mm Allen wrench
- Remove the plug (**2**) using an 8 mm Allen wrench and the O-ring.
- Top up, if necessary, with the same type of oil as indicated on page 47 via the mouth (bleed plug).
- The correct level is reached when oil starts to escape from the threaded hole in plug (**2**).
- Check the state of wear of the O-rings (replace if necessary) and then return the plugs.
  The lubrication oil can be drained completely by removing plug (**3**) using an 8 mm Allen wrench.

Check the guide shoe wear as it affects the sliding section tolerances; if the clearances are considerable, damage to the rams and the structure may occur.

Replace the oil filter cartridges.

Clean the air filter placed in the top of the oil tank filter cap.

Completely replace the hydraulic oil.

(!) The waste oil must be disposed of by authorized persons.

(!) CAUTION DANGER (!)

On the outer boom there is a mercury capsule (mercury level switch) duly protected and provided with the following warning stickers.

MERCURY IS EXTREMELY TOXIC. IN CASE OF REPLACEMENT AND/OR SCRAPPING, DISPOSE OF OR RECYCLE THE CAPSULE CONTAINING MERCURY WITH MAXIMUM CARE AND IN ACCORDANCE WITH THE NATIONAL REGULATIONS IN FORCE.

POSSIBLE FAULTS

Many years experience of our product has allowed us to identify and classify the most common faults which occur. In most cases it requires accurate hydraulic and electric troubleshooting and simple rectification. In the following table we report the most frequent inconveniences and our suggested remedies.

(!) Checking and adjustment of oil pressures of valve settings must be carried out by an authorized service agent, under penalty of warranty forfeiture.

Operations which can be carried out by the user.

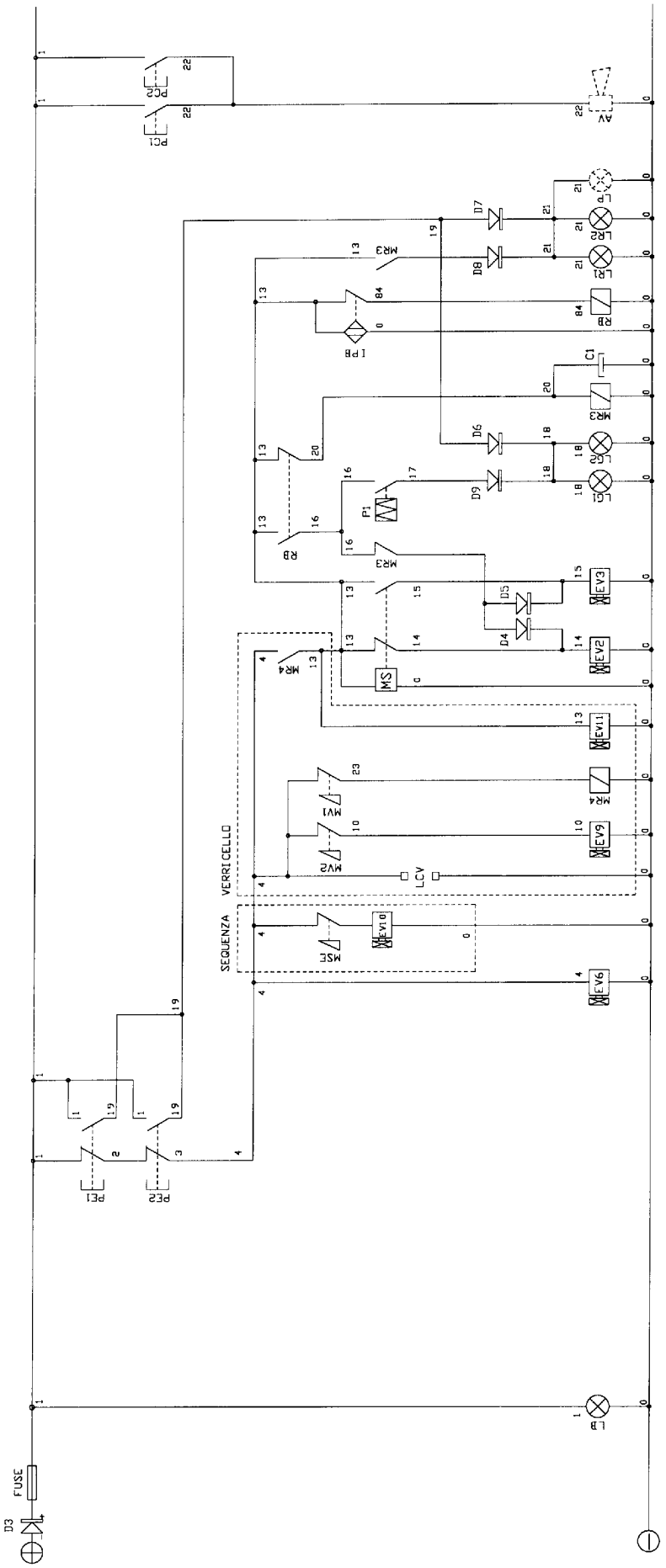
Faults	***Cause***	**Remedies**
The crane does not rotate properly	*Vehicle non in level position*	Stabilize the vehicle
	Lack of lubrication	Grease the slew ring
The extension booms do not completely extend or work jerkily	*Lack of lubrication of the guide shoes*	Grease the guide shoes
Crane controls are not active	*Lack of electric energy*	Check the fuse, the battery and electric circuit
	Winch end stroke active	See Chapter XI
	The rotation limiting device is activated	See Chapter VIII
Vibrations in crane up operations	*Shortage of oil*	Check the level and top if necessary
	Obstructed filters	Clean or replace the filter cartridge
Noteable decrease in movement speed	*Obstructed filters*	Clean or replace the filter cartridge

Operations to be carried out by a service center.

Faults	***Cause***	**Remedies**
The crane does not lift the loads indicated on the capacity plate	*Non efficiency of the pump*	Replace the pump
	Main pressure valve not properly adjusted, blocked or out of service	Check the pressure, adjust the valve
	Ram seals are not properly fitted	Replace the seals
A boom of the crane does not hold up the load and visually lowers	*The safety check valve of the ram is open*	Replace the valve
	Oil leaks inside the ram	Defective seals, replace them
The crane does not rotate properly	*Valve controlling the rotation not adjusted*	Adjust the valve
The extension booms do not completely extend or work jerkily	*Wear of guide shoes*	Check the guide shoes wear, replace if necessary
Vibrations in crane operations	*Non efficient pump*	Check the pump
Noteable decrease in movement speed	*Non efficient pump*	Check the pump

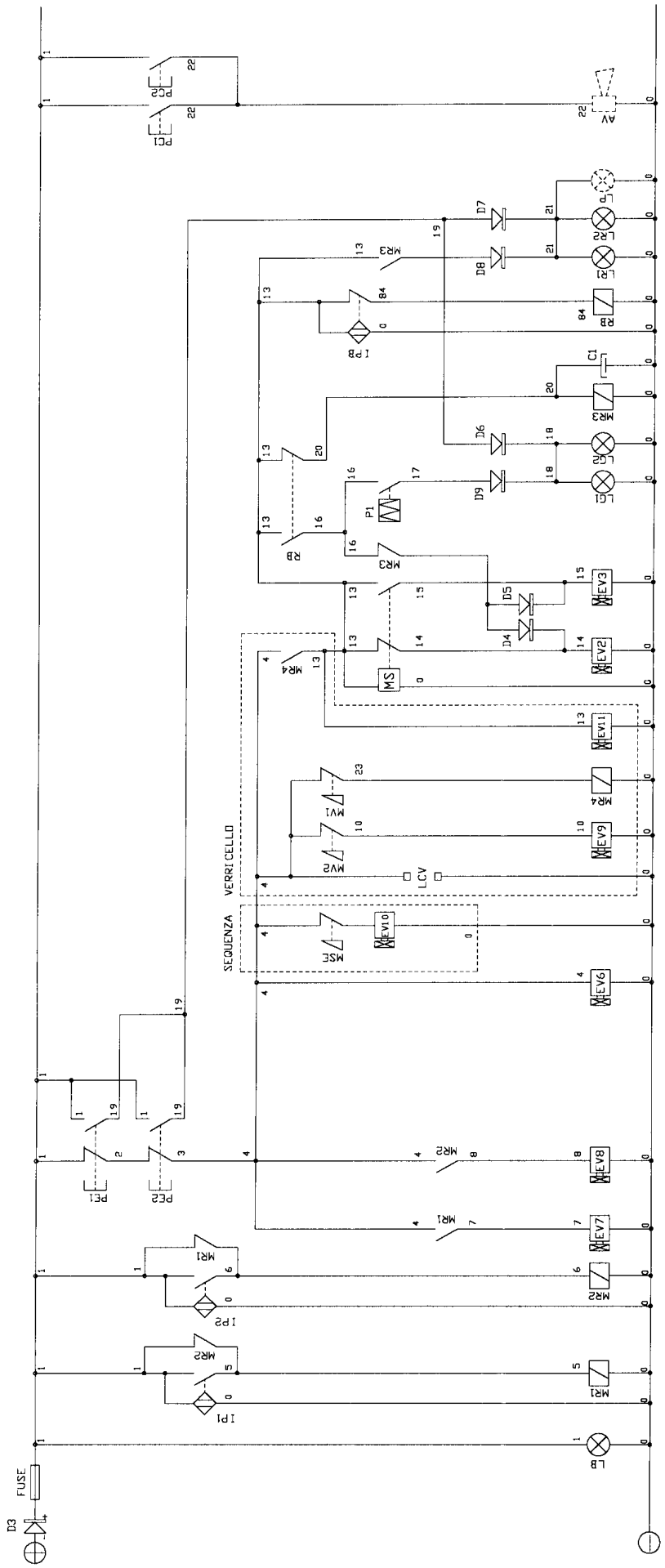
HYDRAULIC AND ELECTRIC SCHEMATICS

Electric schematic for crane - arc of free rotation



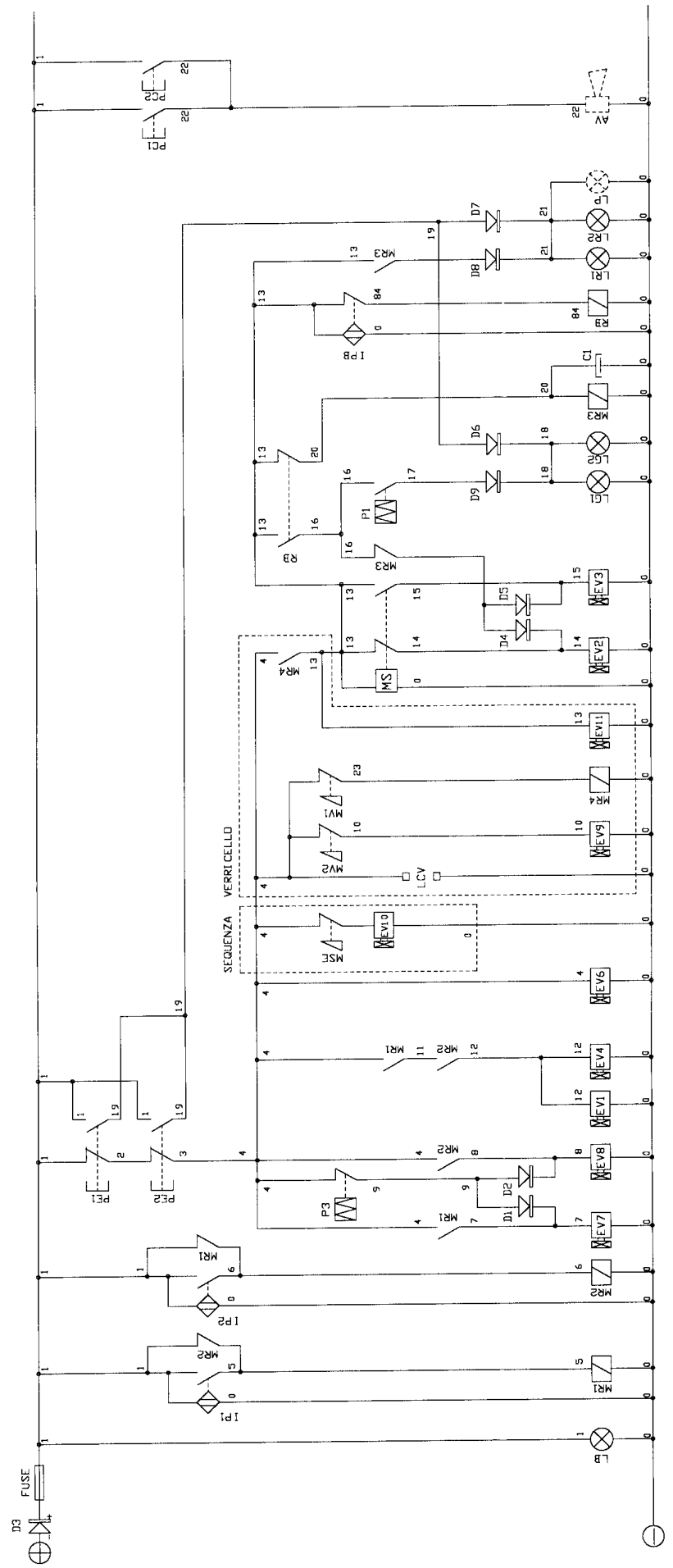
CODE	*DESCRIPTION*
ALIM	FEED MAIN CONTROL PANEL
FUSE	PROTECTION FUSE 10A
DR	ELECTRIC ROTATIONING DISTRIBUTOR
AV	ACOUSTIC ALARM
D3	POLARITY PROTECTION DIODE
D4/D5	LIFTING MOMENT LIMITING DEVICE DIODES
D6/D7	LAMPS TEST DIODES
D8/D9	NOT BACK DIODES
EV2	ELECTROVALVE FOR CRANE LIFTING BLOCK
EV3	ELECTROVALVE FOR CRANE DESCENTS BLOCK
EV6	EMERGENCY ELECTROVALVE
MS	MERCURY SLOPE SENSOR ON OUTER BOOM
IPB	PROMISSITY SENSOR VALVE
RB	RELE' STOP SIGNAL
C1	BLOCK LATE CAPACITOR
MR3	BLOCK LATE RELAY
P1	90% LOAD PRESSURE DETECTOR
LB	WHITE WARNING LIGHT
LG1	YELLOW WARNING LIGHT FOR MAIN CONTROL PANEL 90% LOAD REACHING
LG2	YELLOW WARNING LIGHT FOR DOUBLE CONTROL SATELLITE 90% LOAD REACHING
LR1	RED WARNING LIGHT FOR MAIN CONTROL PANEL BLOCK
LR2	RED WARNING LIGHT FOR DOUBLE CONTROL SATELLITE BLOCK
LP	ADDITIONAL FLASHING
PE1	MAIN CONTROL PANEL EMERGENCY BUTTON
PE2	DOUBLE CONTROL SATELLITE EMERGENCY BUTTON
PC1	ACOUSTIC WARNING BUTTON FOR MAIN CONTROL PANEL
PC2	ACOUSTIC WARNING BUTTON FOR DOUBLE CONTROL SATELLITE
SAT2	DOUBLE CONTROL SIDE SATELLITE
SE	SEQUENCE SHUNT BOX
MSE	SEQUENCE MICRO
EV10	SEQUENCE ELECTROVALVE
AR1	CRANE WINDING
AR2	EXTENSION WINDING
LCV	WINCH LOAD LIMITING DEVICE
MV1	PULLEY MICRO WINCH
MV2	DRUM MICRO WINCH
MR4	WINCH RELAY
EV9	WINCH DESCENT BLOCK ELECTROVALVE
EV11	MAIN LIFTING BLOCK ELECTROVALVE
SAT. EC	ELECTRICONTROLLER SATELLITE CABLE
SAT. RADIO	RADIO REMOTE CONTROL SATELLITE CABLE

Electric schematic for crane - limited arc rotation



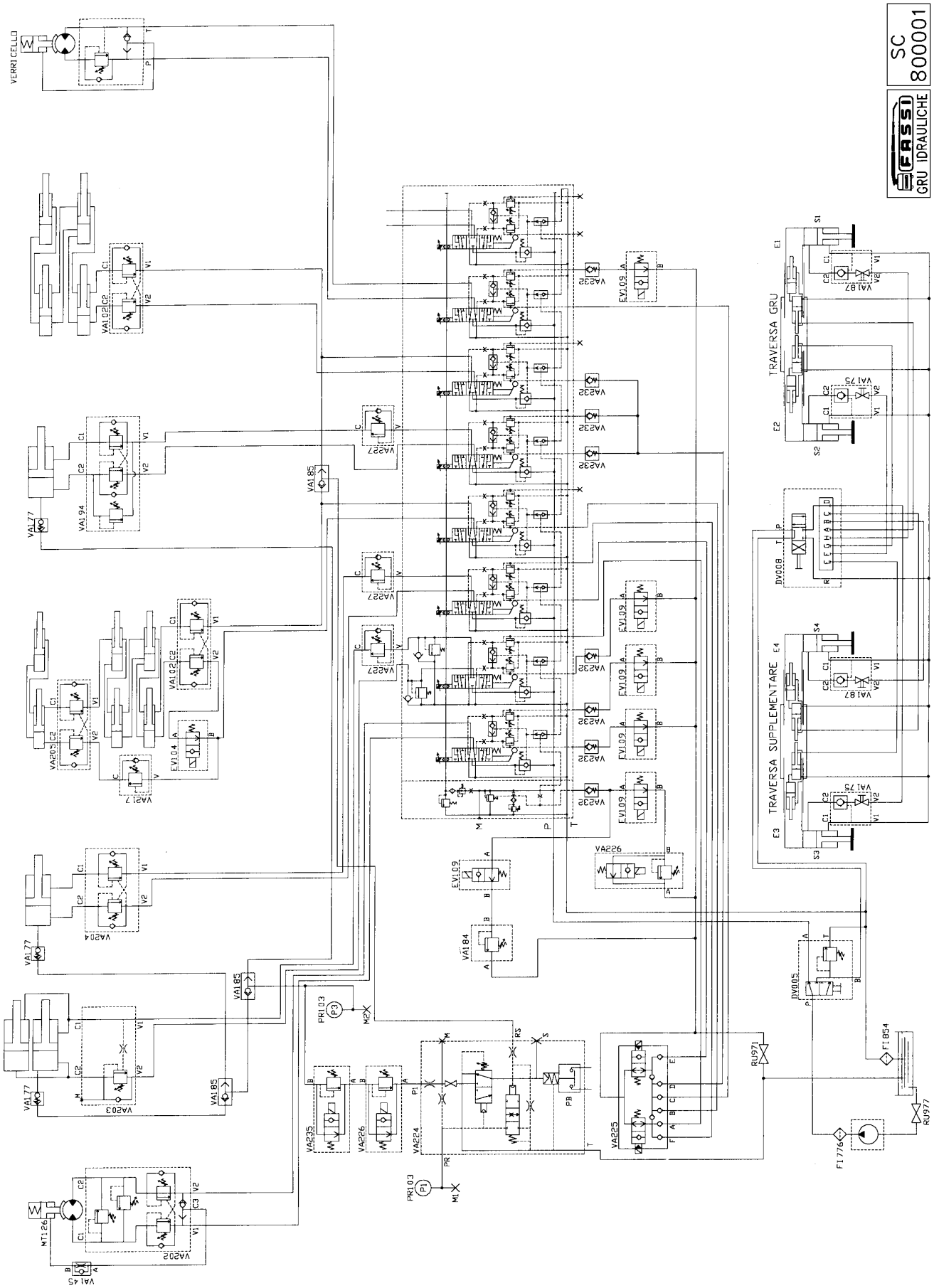
CODE	*DESCRIPTION*
ALIM	FEED MAIN CONTROL PANEL
FUSE	PROTECTION FUSE 10A
DR	ELECTRIC ROTATIONING DISTRIBUTOR
AV	ACOUSTIC ALARM
D1/D2	ROTATION CONSENT DIODES
D3	POLARITY PROTECTION DIODE
D4/D5	LIFTING MOMENT LIMITING DEVICE DIODES
D6/D7	LAMPS TEST DIODES
D8/D9	NOT BACK DIODES
EV2	ELECTROVALVE FOR CRANE LIFTING BLOCK
EV3	ELECTROVALVE FOR CRANE DESCENTS BLOCK
EV6	EMERGENCY ELECTROVALVE
EV7	CLOCKWISE ROTATION BLOCK ELECTROVALVE
EV8	ANTICLOCKWISE ROTATION BLOCK ELECTROVALVE
IP1	CLOCKWISE ROTATION PROXIMITY
IP2	ANTICLOCKWISE ROTATION PROXIMITY
SDP	SEAT PROXIMITY SHUNT BOX
MR1	CLOCKWISE ROTATION RELAY
MR2	ANTICLOCKWISE ROTATION RELAY
MS	MERCURY SLOPE SENSOR ON OUTER BOOM
IPB	PROMISSITY SENSOR VALVE
RB	RELE' STOP SIGNAL
C1	BLOCK LATE CAPACITOR
MR3	BLOCK LATE RELAY
P1	90% LOAD PRESSURE DETECTOR
LB	WHITE WARNING LIGHT
LG1	YELLOW WARNING LIGHT FOR MAIN CONTROL PANEL 90% LOAD REACHING
LG2	YELLOW WARNING LIGHT FOR DOUBLE CONTROL SATELLITE 90% LOAD REACHING
LR1	RED WARNING LIGHT FOR MAIN CONTROL PANEL BLOCK
LR2	RED WARNING LIGHT FOR DOUBLE CONTROL SATELLITE BLOCK
LP	ADDITIONAL FLASHING
PE1	MAIN CONTROL PANEL EMERGENCY BUTTON
PE2	DOUBLE CONTROL SATELLITE EMERGENCY BUTTON
PC1	ACOUSTIC WARNING BUTTON FOR MAIN CONTROL PANEL
PC2	ACOUSTIC WARNING BUTTON FOR DOUBLE CONTROL SATELLITE
SAT2	DOUBLE CONTROL SIDE SATELLITE
SE	SEQUENCE SHUNT BOX
MSE	SEQUENCE MICRO
EV10	SEQUENCE ELECTROVALVE
AR1	CRANE WINDING
AR2	EXTENSION WINDING
LCV	WINCH LOAD LIMITING DEVICE
MV1	PULLEY MICRO WINCH
MV2	DRUM MICRO WINCH
MR4	WINCH RELAY
EV9	WINCH DESCENT BLOCK ELECTROVALVE
EV11	MAIN LIFTING BLOCK ELECTROVALVE
SAT. EC	ELECTRICONTROLLER SATELLITE CABLE
SAT. RADIO	RADIO REMOTE CONTROL SATELLITE CABLE

Electric schematic for crane - diversfied arc rotation

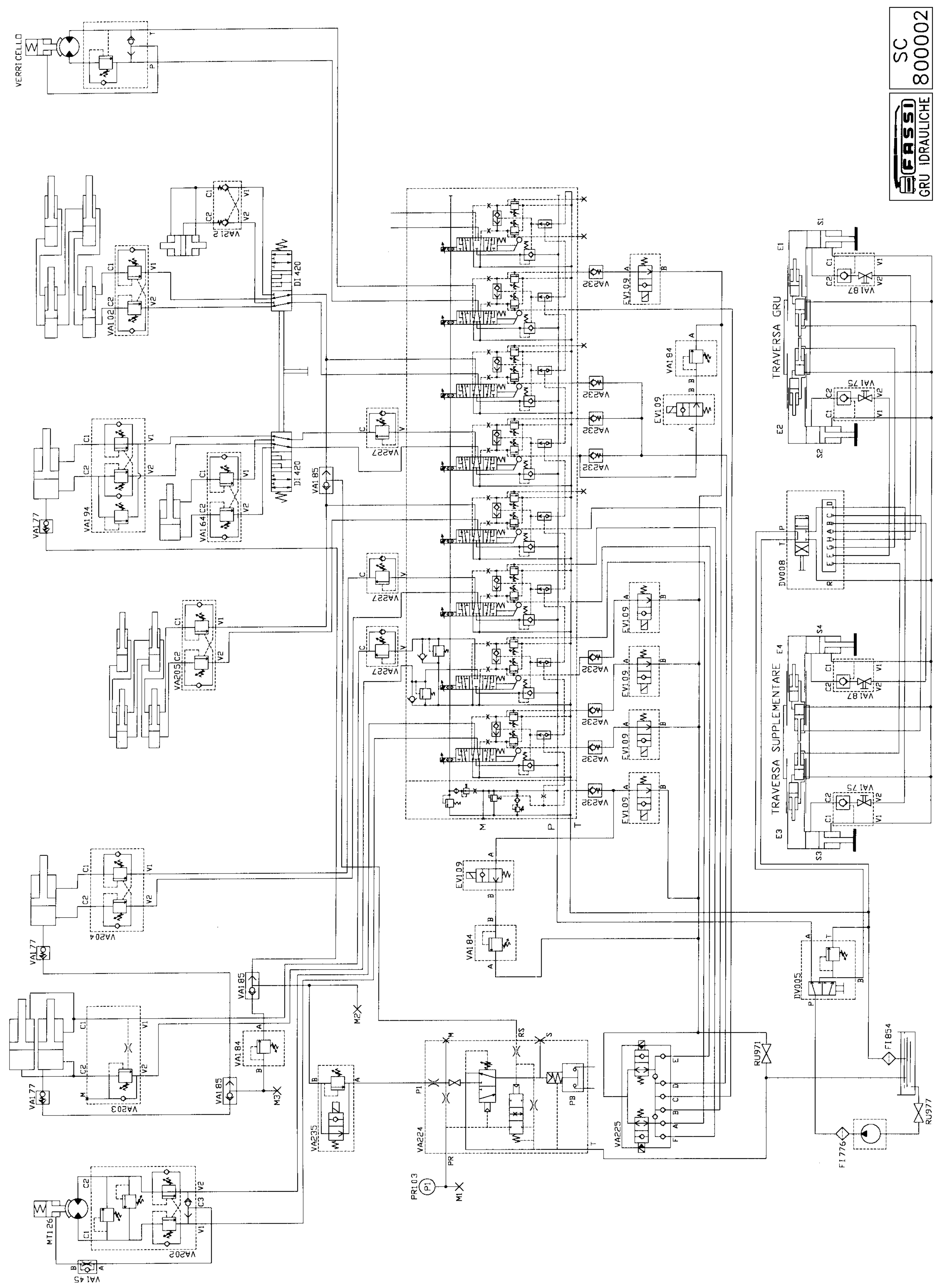


CODE	*DESCRIPTION*
ALIM	FEED MAIN CONTROL PANEL
FUSE	PROTECTION FUSE 10A
DR	ELECTRIC ROTATIONING DISTRIBUTOR
AV	ACOUSTIC ALARM
D1-D2	ROTATION CONSENT DIODES
D3	POLARITY PROTECTION DIODE
D4/D5	LIFTING MOMENT LIMITING DEVICE DIODES
D6/D7	LAMPS TEST DIODES
D8/D9	NOT BACK DIODES
EV1	ELECTROVALVE FOR LIMITING GENERAL PRESSION
EV2	ELECTROVALVE FOR CRANE LIFTING BLOCK
EV3	ELECTROVALVE FOR CRANE DESCENTS BLOCK
EV4	ELECTROVALVE FOR LIFTING MOMENT LIMITING DEVICE FOR TWO WORKING ZONES
EV6	EMERGENCY ELECTROVALVE
EV7	CLOCKWISE ROTATION BLOCK ELECTROVALVE
EV8	ANTICLOCKWISE ROTATION BLOCK ELECTROVALVE
IP1	CLOCKWISE ROTATION PROXIMITY
IP2	ANTICLOCKWISE ROTATION PROXIMITY
SDP	SEAT PROXIMITY SHUNT BOX
MR1	CLOCKWISE ROTATION RELAY
MR2	ANTICLOCKWISE ROTATION RELAY
MS	MERCURY SLOPE SENSOR ON OUTER BOOM
IPB	PROMISSITY SENSOR VALVE
RB	RELE' STOP SIGNAL
C1	BLOCK LATE CAPACITOR
MR3	BLOCK LATE RELAY
P1	90% LOAD PRESSURE DETECTOR
P3	THRUST METER CONSENT ROTATION
LB	WHITE WARNING LIGHT
LG1	YELLOW WARNING LIGHT FOR MAIN CONTROL PANEL 90% LOAD REACHING
LG2	YELLOW WARNING LIGHT FOR DOUBLE CONTROL SATELLITE 90% LOAD REACHING
LR1	RED WARNING LIGHT FOR MAIN CONTROL PANEL BLOCK
LR2	RED WARNING LIGHT FOR DOUBLE CONTROL SATELLITE BLOCK
LP	ADDITIONAL FLASHING
PE1	MAIN CONTROL PANEL EMERGENCY BUTTON
PE2	DOUBLE CONTROL SATELLITE EMERGENCY BUTTON
PC1	ACOUSTIC WARNING BUTTON FOR MAIN CONTROL PANEL
PC2	ACOUSTIC WARNING BUTTON FOR DOUBLE CONTROL SATELLITE
SAT2	DOUBLE CONTROL SIDE SATELLITE
SE	SEQUENCE SHUNT BOX
MSE	SEQUENCE MICRO
EV10	SEQUENCE ELECTROVALVE
AR1	CRANE WINDING
AR2	EXTENSION WINDING
LCV	WINCH LOAD LIMITING DEVICE
MV1	PULLEY MICRO WINCH
MV2	DRUM MICRO WINCH
MR4	WINCH RELAY
EV9	WINCH DESCENT BLOCK ELECTROVALVE
EV11	MAIN LIFTING BLOCK ELECTROVALVE
SAT. EC	ELECTRICONTROLLER SATELLITE CABLE
SAT. RADIO	RADIO REMOTE CONTROL SATELLITE CABLE

Hydraulic schematic for crane - Danfoss distributor - L604 - lifting moment limiting device "intelligent type"



Hydraulic schematic for crane - Danfoss distributor - L804 - lifting moment limiting device "intelligent type"



Hydraulic schematic for crane - versions: 1) double motor riducer
2) F800/900XP.27
3) hydraulic rotating stabilizers

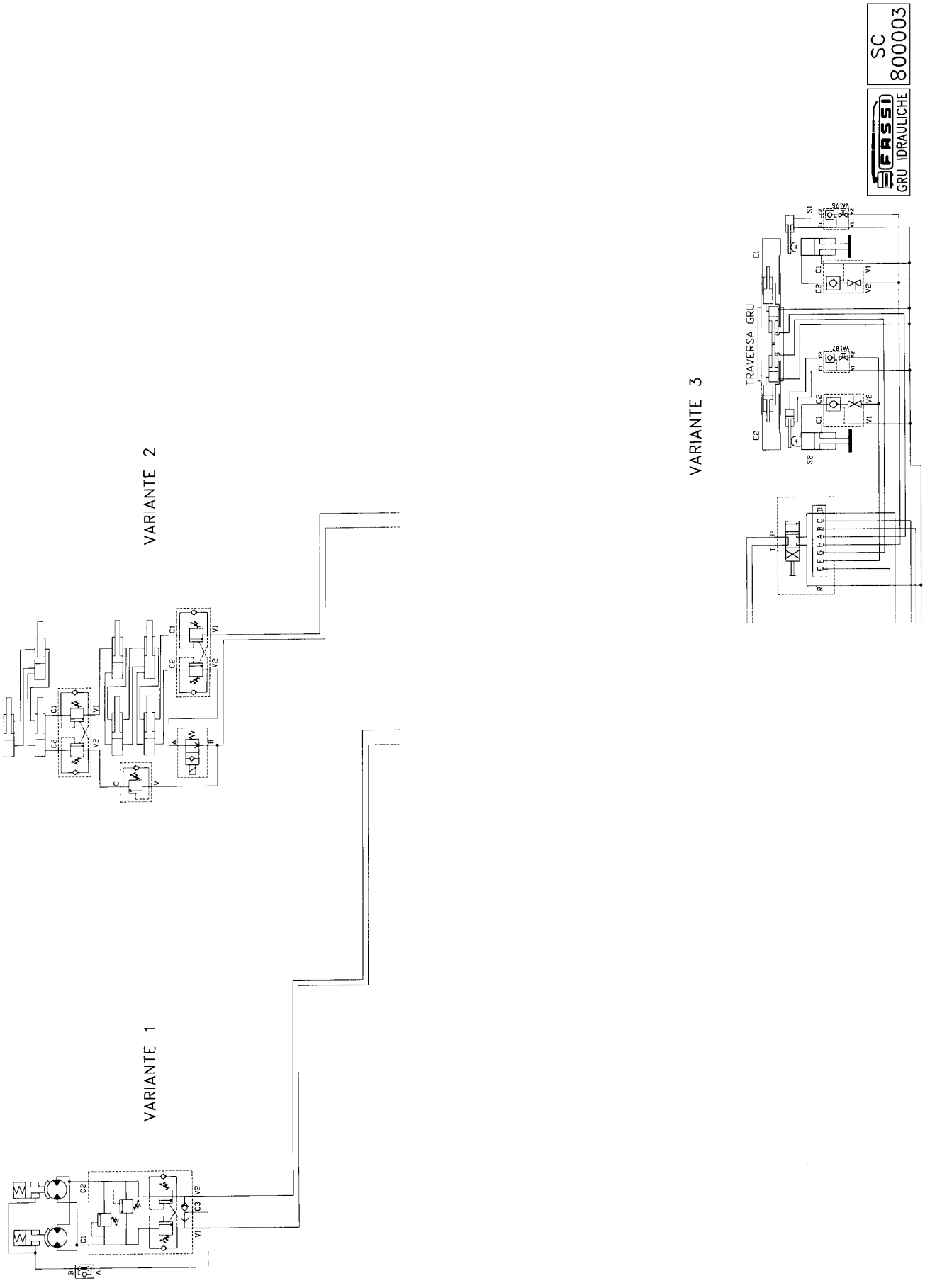


TABLE OF HYDRAULIC OIL AND LUBRICANTS CHARACTERISTICS

HYDRAULIC OIL WITH HIGH VISCOSITY: ISO-L-HV

Minimal external temperature :	maximal oil temperature:		
– 35 C	+45 C	Gradation	ISO VG 32
– 20 C	+75 C	Gradation	ISO VG 46

HYDRAULIC OIL WEAR RESISTANT: ISO-L-HM

Minimal external temperature:	maximal oil temperature:		
-10 C	+ 60 C	Gradation	ISO VG 32
+ 0 C	+ 75 C	Gradation	ISO VG 46
+ 5 C	+ 85 C	Gradation	ISO VG 68
+10 C	+ 90 C	Gradation	ISO VG 100

GREASE

Consistency: NLGI BEACON EP 2 - BEACON 3

HYDRAULIC OIL FOR MOTOREDUCER

Classification ISO-L-CC
Gradation EP ISO-VG 150

GREASE (for slew ring)

– 30 C up to +130 C EP2 Gradation

All grease used must be free from acid and resin, not hydroscopic and long-life such as BP GREASE LTX-EP2, ELF EPEXA 2, ESSO BEACON EP2 or SIMILAR.

LUBRICATING OIL (for winch cable)

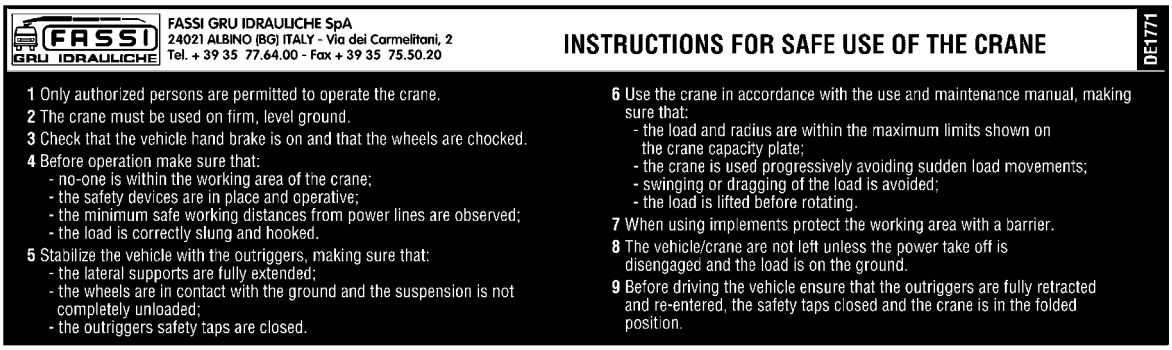
The most suitable here is a general-purpose lubricating oil with about SAE 30 viscosity. A lubricating oil containing non-stick additives is recommended if the cables are expected to move quickly through the pulleys.

BRILUBE 50 (BRITISH ROPES - BRINDON)

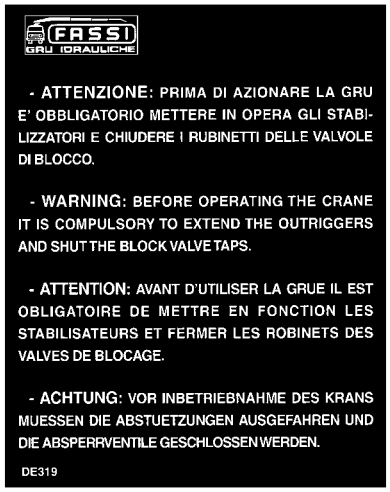
(!) WARNING (!)

Don’t use greases with solid particles as “Bisulphide of Molybdenum”.

INSTRUCTION AND WARNING PLATES

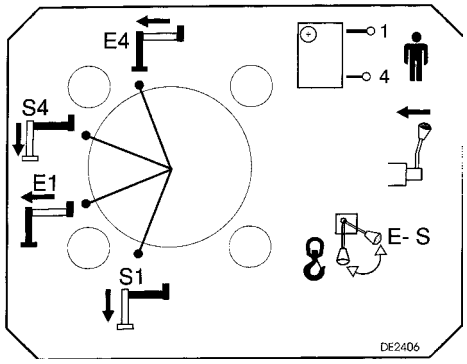


DE 1771
Instruction plate and safety norms

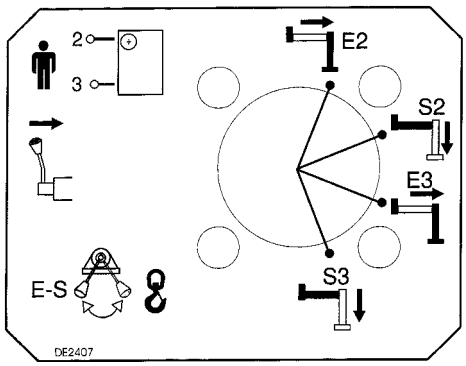


DE 319
Warning plate to stabilize the vehicle before using the crane

DE 2406

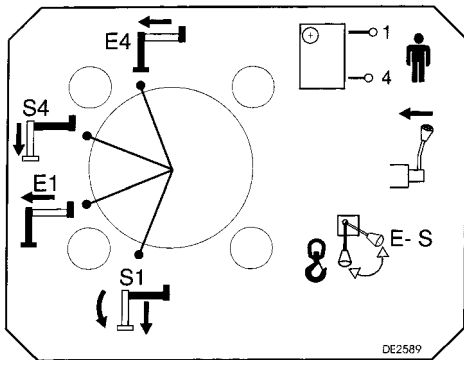


Instruction plates to stabilize the vehicle

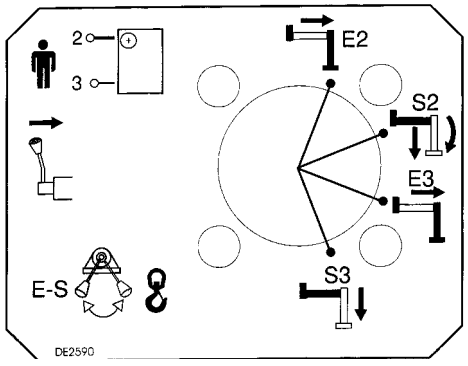


DE 2407

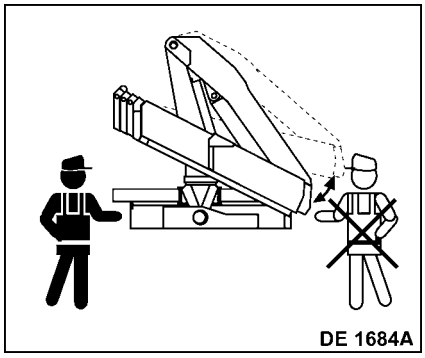
DE 2589



Instruction plates to stabilize and adjust hydraulically the vehicle



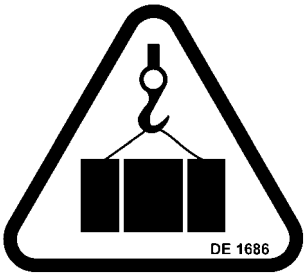
DE 2590



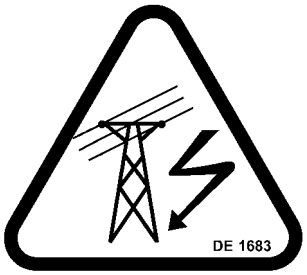
DE 1684A
Do not operate from the double control side, to unfold or fold the crane

DE 1681
Greasing points with brush

DE 1682
Greasing points at pressure



DE 1686
Do not walk or stop under a suspended load



DE 1683
Do not operate in proximity of electric high-tension lines

DE 1679
Do not walk on...

DE 1680
Do not use water to extinguish fire

TIRANTI:	NON SALDARE!
FIXING ROD:	DO NOT WELD!
TIRANTS:	NE PAS SOUDER!
ZUGSCHRAUBEN:	NICHT SCHWEISSEN!

DE 1574

Do not weld the fixing rods

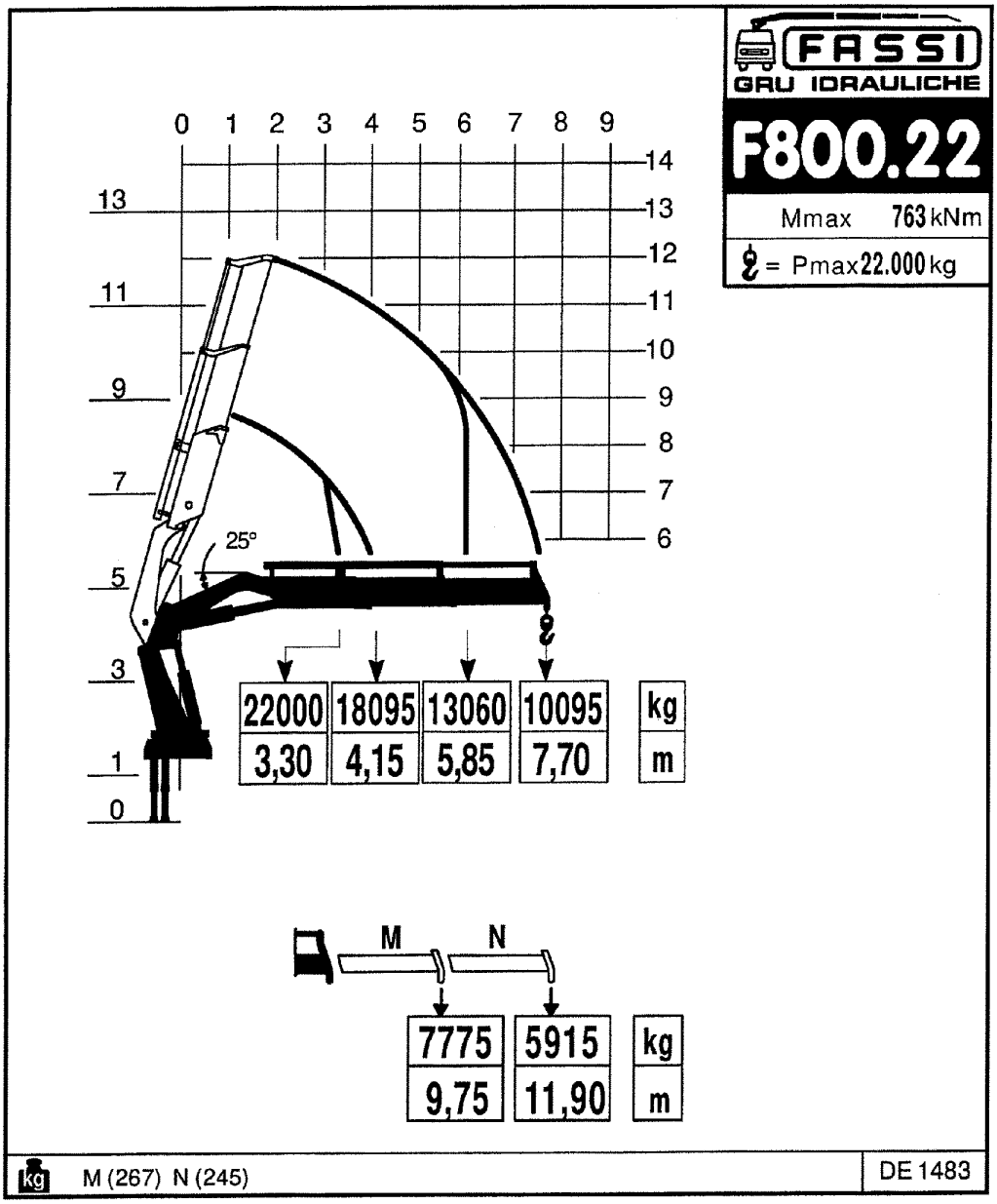
CAPACITY PLATES

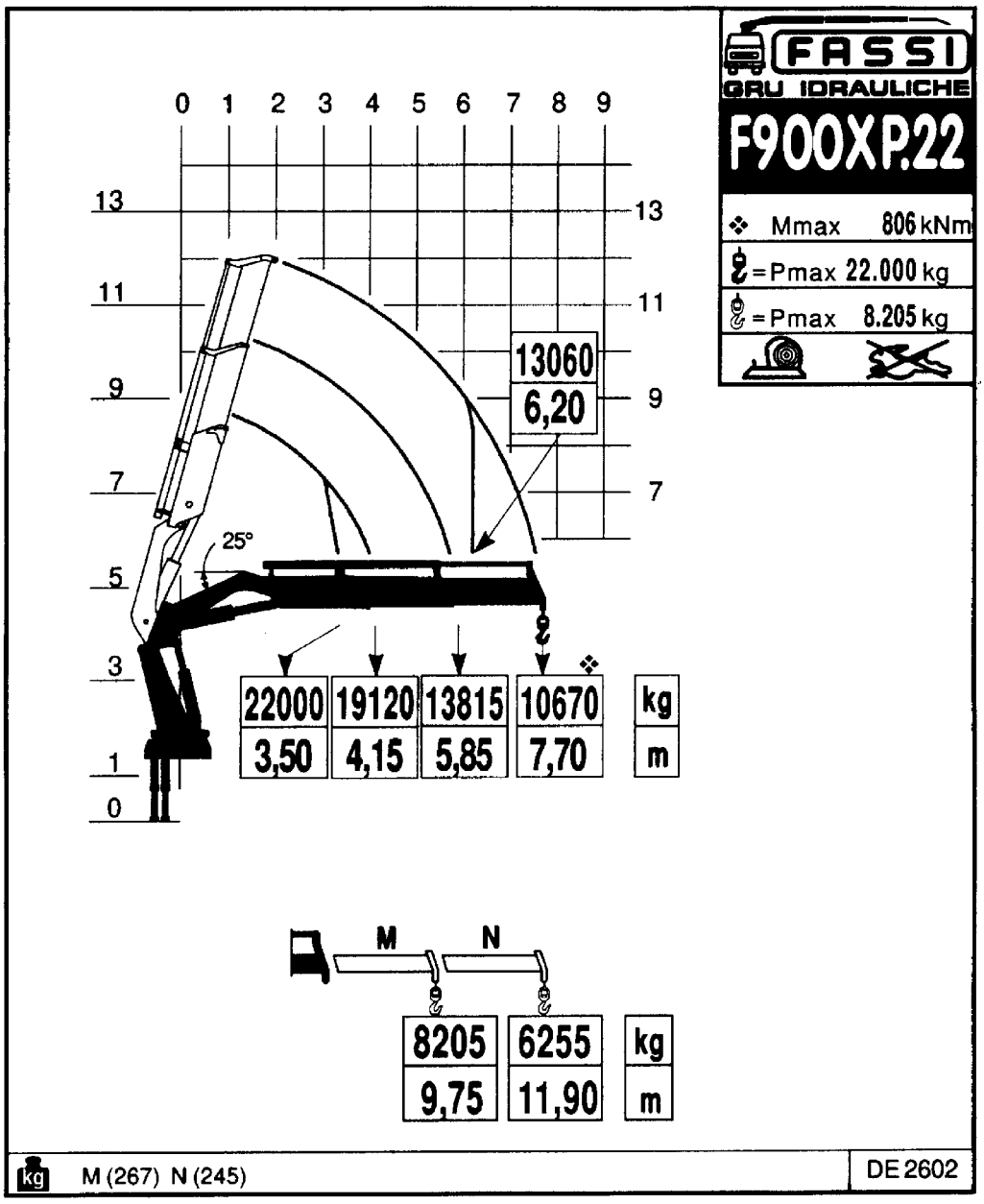
For cranes and manual extensions.

The represented plates refer to the nominal design capacities.

! WARNING !

If the capacities are downgraded or partially reduced (e.g. sector in front of vehicle cab) capacity plates must be applied in line with the final test figures.




FASSI
GRU IDRAULICHE
F900XP.22
Mmax 806 kNm
=Pmax 22.000 kg
=Pmax 8.205 kg
0 1 2 3 4 5 6 7 8 9
13
11
9
7
5
3
1
0
25°
13060
6,20
22000 19120 13815 10670 kg
3,50 4,15 5,85 7,70 m
M N
8205 6255 kg
9,75 11,90 m
M (267) N (245)
DE 2602