

# F 360SE.24

## use and maintenance

### INDEX

Chapter	I	INTRODUCTION	page	2
	II	SAFETY NORMS	page	3
	III	INSTRUCTIONS FOR CRANE USE	page	7
	IV	IDENTIFICATION OF THE CRANE MODEL	page	8
	V	TECHNICAL DATA	page	9
	VI	CRANE NOMENCLATURE	page	12
	VII	SAFETY AND PROTECTION DEVICES	page	14
	VIII	LIFTING MOMENT LIMITING DEVICE	page	16
	IX	CONTROLS TO STABILIZE THE VEHICLE	page	18
	X	CONTROLS TO OPERATE THE CRANE	page	20
	XI	USE OF IMPLEMENTS	page	23
	XII	MAINTENANCE INSTRUCTIONS	page	24
	XIII	POSSIBLE FAULTS	page	28
	XIV	HYDRAULIC AND ELECTRIC SCHEMATICS	page	29
	XV	OIL AND LUBRICANT CHARACTERISTICS	page	35
	A	INSTRUCTION AND WARNING PLATES	page	36
	B	CAPACITY PLATES	page	40

# FASSI CRANE

## F 360SE.24

use and maintenance

This instruction manual describes the FASSI CRANE F360SE.24.

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.

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

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

**THANK YOU FOR SELECTING ONE OF OUR CRANES.**

## SAFETY NORMS

SAFETY NORMS

F 360SE

c II

( ! ) 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.

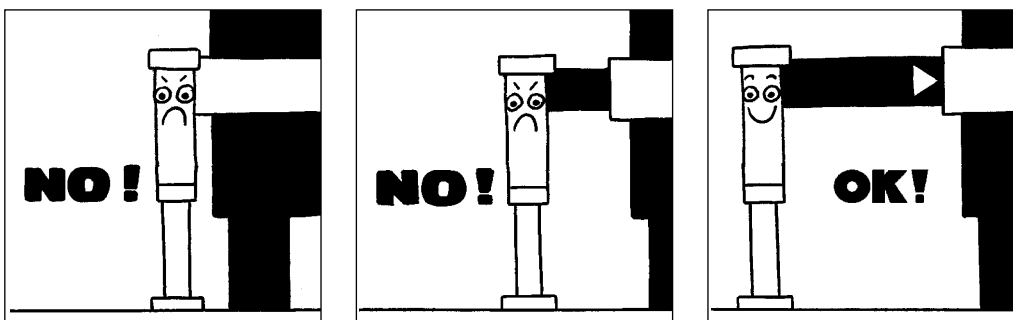
To operate the crane it is necessary to fully understand its working, safety and warranty norms.

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

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

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 checking that they rest on a solid base; if necessary use larger outrigger base plates (available on request) to avoid sinking. If you adopt other means, make sure that they are suitably sized for the load they must bear.



Stabilize the vehicle on a horizontal plane with a maximum tolerance of 1,5 degrees.

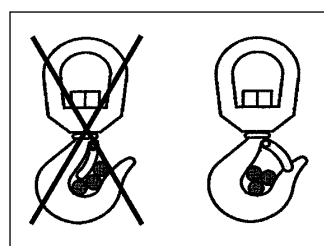
Never operate the outriggers when the crane is loaded.

Remember that the stability of the unit (crane-vehicle) is only guaranteed by the fully 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 manoeuvring a load check that the working area is adequate and properly lighted for your crane.

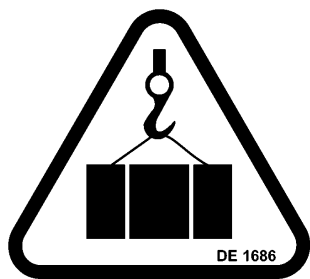
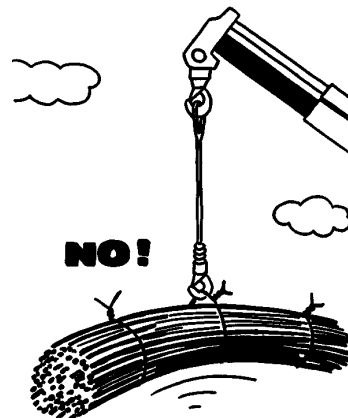
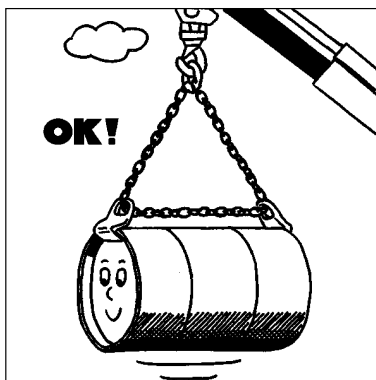
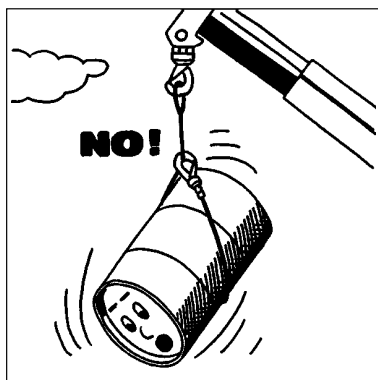
Make sure that the hook is always free to rotate on its pin and that nothing obstructs its vertical positioning.



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.

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

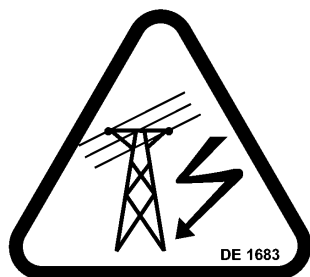


It is absolutely prohibited to walk or stop under a suspended load and for unauthorized persons to be within the working area.

Avoid swinging the load above the control station; any hidden danger situation must be audibly alarmed.

Avoid all those situations which may result in crushing during crane stabilization, movement and load handling.

The table reports the minimum safe working distances to avoid crushing parts of the body.

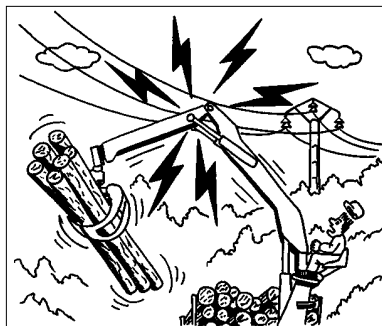


Parts of the Body	Minimum safe working distance inch	Figure	Parts of the Body	Minimum safe working distance inch	Figure
Body	19,68		Head	11,81	
Leg	7,09		Foot	4,72	
Toes	1,97		Arm	4,72	
Hand Wrist Fist	3,94		Finger	0,98	

In conformity with "EN 349" Standard the minimum safe working distances to avoid crushing parts of the body.

**NOTE:** Failure to respect the minimum safe distances may result in a deadly risk for the operator and his assistants.

Maintain safe clearances from electrical lines and apparatus. You must allow for boom sway, rock or sag and electrical line and loadline swaying. This lifting device does not provide protection from contact with or proximity to an electrically charged conductor. You must maintain a clearance of at least 10 feet between any part of the crane, loadline or load and any electrical line or apparatus carrying up to 50.000 volts. One foot additional clearance is required for every additional 30.000 volts or less.



**NOTE: Failure to respect the minimum safe distances may result in electrical hazards for the operator and his assistants.**

**(!) ATTENTION (!)**

**Do not utilize the crane with wind speed exceeding 12,5 m/s (value 6 of the Beaufort scale).**

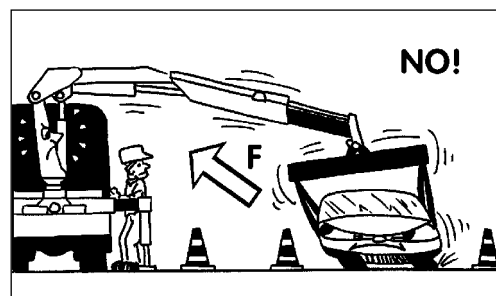
**Indications about wind speed**

Force of the wind Beaufort scale	Wind speed foot/s	Classification	Characteristics
0	0,0 - 0,66	Calm	Calm wind, smoke goes up quite vertically
1 2	0,98 - 4,92 5,25 - 10,83	Light breeze	Smoke reveals the direction of the wind, one can feel the wind blowing, leaves start fluttering.
3 4	11,15 - 17,72 18,04 - 25,92	Moderate breeze	Leaves and branches are in constant motion, small branches start fluttering. Dust and papers dance on the ground.
5	26,25 - 35,11	Fresh breeze	Small green branches bend, the surface of waterways and lakes are wavy.
6	35,43 - 45,28	Near gale	<b>Big branches bend, wind whistles through high-tension cables, it's difficult to walk keeping the umbrella open.</b>
7	45,61 - 56,10	Moderate gale	Trees sway, it's hard to walk.
8	56,43 - 67,91	Storm wind	Branches get broken, it's hard to walk.
9	68,24 - 80,05	Storm	It damages houses (antennas and roof tiles fall down)

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

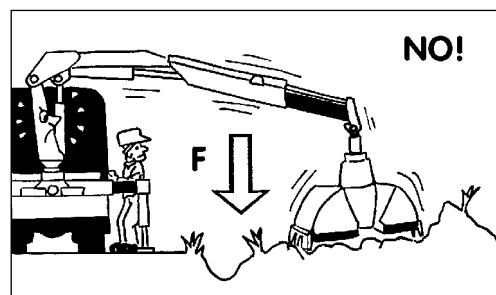
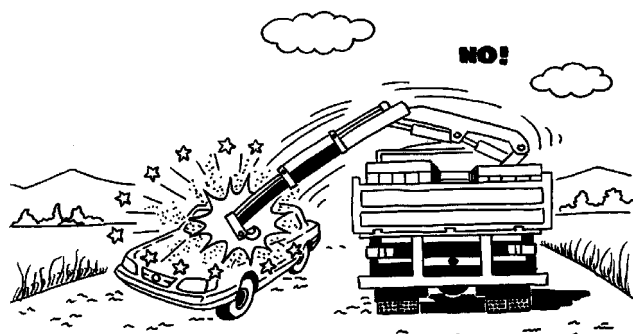
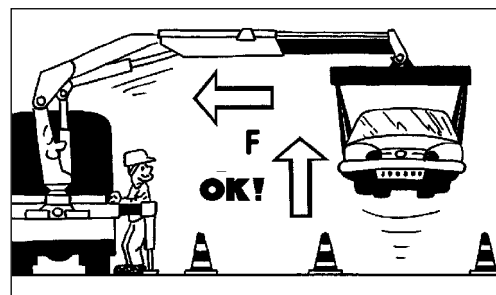
When operating from the top seat, stay within its side safety guards.

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 utilize the crane for pushpull, lateral or sideways operations.

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

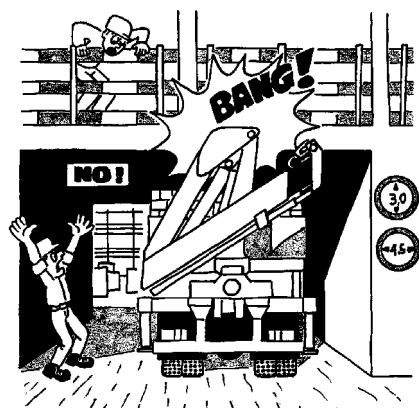


Under no circumstances interfere with the safety and protection devices.

The vehicle/crane must not be left unless the load is on the ground, the booms of the crane are folded and laid on a solid base and the power take-off is disengaged.

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.

**NOTE** Implements can be left mounted on the booms of the crane only if the overall dimensions are respected.

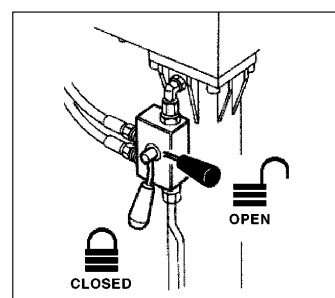


### THE FORK MUST BE TIED DOWN AT ALL TIMES DURING TRANSPORT

Make sure that the outrigger rams are lifted and the supports re-entered within the overall width of the truck.

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


INSTRUCTIONS  
FOR CRANE USE  
F 360SE

c III

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.
- 6 — Use the crane in accordance with the use and maintenance manual, making sure that:
  - the load and radius 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, and the crane is in folded position.

fig. 1

	<b>FASSI GRU IDRAULICHE SpA</b> 24021 ALBINO (BG) ITALY - Via dei Carmelitani, 2 Tel. + 39 35 77.64.00 - Fax + 39 35 75.50.20	<b>INSTRUCTIONS FOR SAFE USE OF THE CRANE</b>	DE2676
<div><div><div>1 Only authorized persons are permitted to operate the crane.</div><div>2 The crane must be used on firm, level ground.</div><div>3 Check that the vehicle hand brake is on and that the wheels are chocked.</div><div>4 Before operation make sure that:<ul style="list-style-type: none"><li>- no-one is within the working area of the crane;</li><li>- the safety devices are in place and operative;</li><li>- the minimum safe working distances from power lines are observed;</li><li>- the load is correctly slung and hooked.</li></ul></div><div>5 Stabilize the vehicle with the outriggers, making sure that:<ul style="list-style-type: none"><li>- the lateral supports are fully extended;</li><li>- the wheels are in contact with the ground and the suspension is not completely unloaded;</li></ul></div></div><div><div>6 Use the crane in accordance with the use and maintenance manual, making sure that:<ul style="list-style-type: none"><li>- the load and radius are within the maximum limits shown on the crane capacity plate;</li><li>- the crane is used progressively avoiding sudden load movements;</li><li>- swinging or dragging of the load is avoided;</li><li>- the load is lifted before rotating.</li></ul></div><div>7 When using implements protect the working area with a barrier.</div><div>8 The vehicle/crane are not left unless the power take off is disengaged and the load is on the ground.</div><div>9 Before driving the vehicle ensure that the outriggers are fully retracted and re-entered and the crane is in the folded position.</div></div></div>			

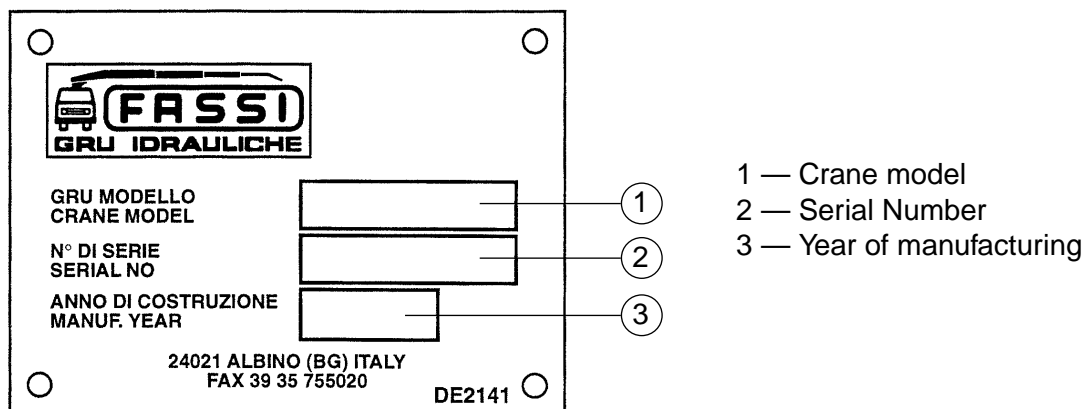
THESE INSTRUCTIONS FOR THE USE OF THE CRANE COINCIDE WITH THOSE OF THE PLATE DE2676 (FIG. 1) PLACED NEXT TO THE CRANE.



## IDENTIFICATION OF THE CRANE MODEL

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

Identification data of the crane are marked on the plate DE2141 and fixed on the base.



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



## TECHNICAL DATA

TECHNICAL DATA

F 360SE

c V

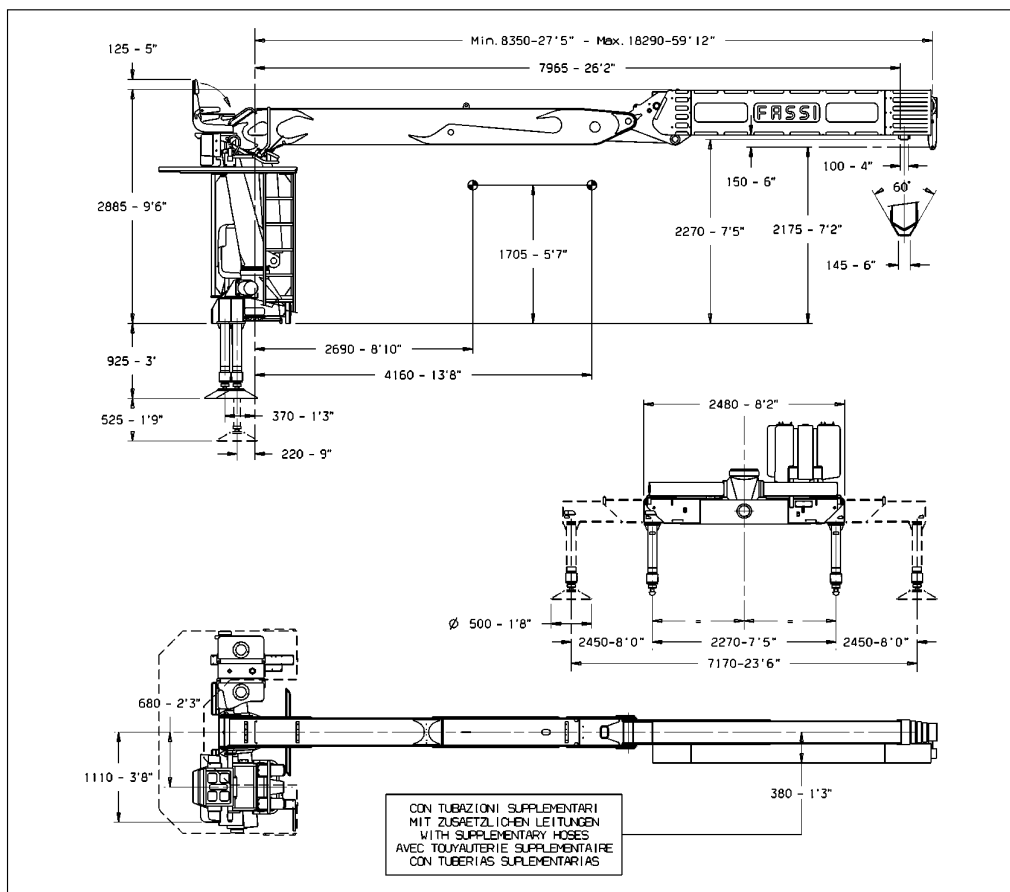
The design of this crane has been carried out in respect of **DIN 15018** norms, fatigue test classification **H1B3**.

( ! ) **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 360SE.24

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 500) (Φ 1'7")
26,6 tm 260,86 kNm 192398 lbf.ft	18,30 m 60'0"	9,94 m 32'7"	420° 420°	4,69 tm 45,99 kNm 33923 lbf.ft	30,0 MPa 4351 psi	60+60 l/min 15,85+15,85 gal/min	250 l 66,04 gals	4680 kg 10318 lbs	120 psi 8,3 daN/cm²



PESO GRU CON SERBATOIO NON RIFORNITO, STABILIZZATORI STANDARD	kg	4.800
WEIGHT OF THE CRANE WITH EMPTY TANK, STANDARD STABILIZATION		
POIDS DE LA GRUE AVEC RESERVOIR VIDE, STABILISATION STANDARD	lbs	10.582
KRANGEWICHT MIT LEEREM TANK UND STANDARDABSTUETZUNG		

### F 360SE.24

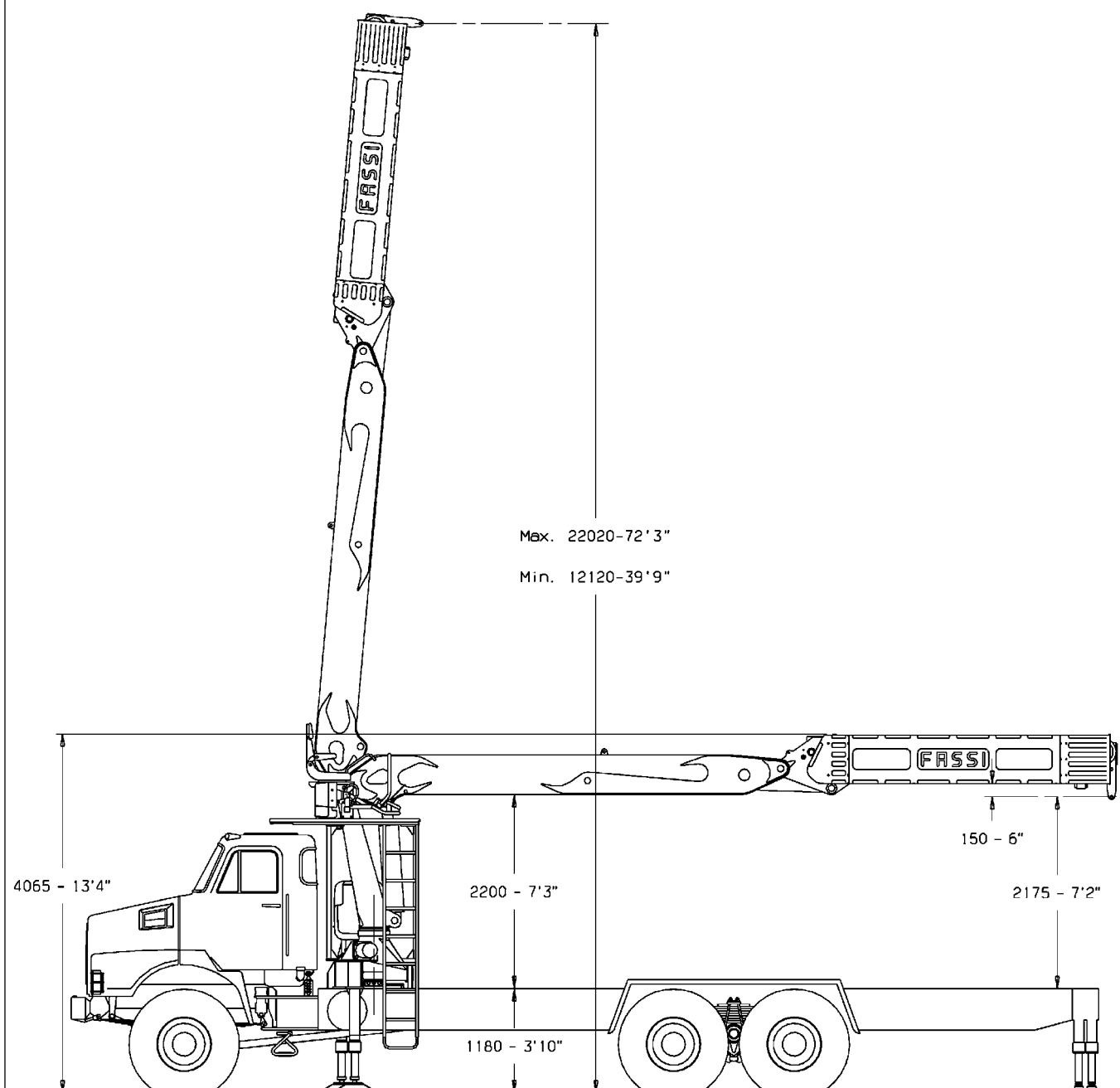


ST 331

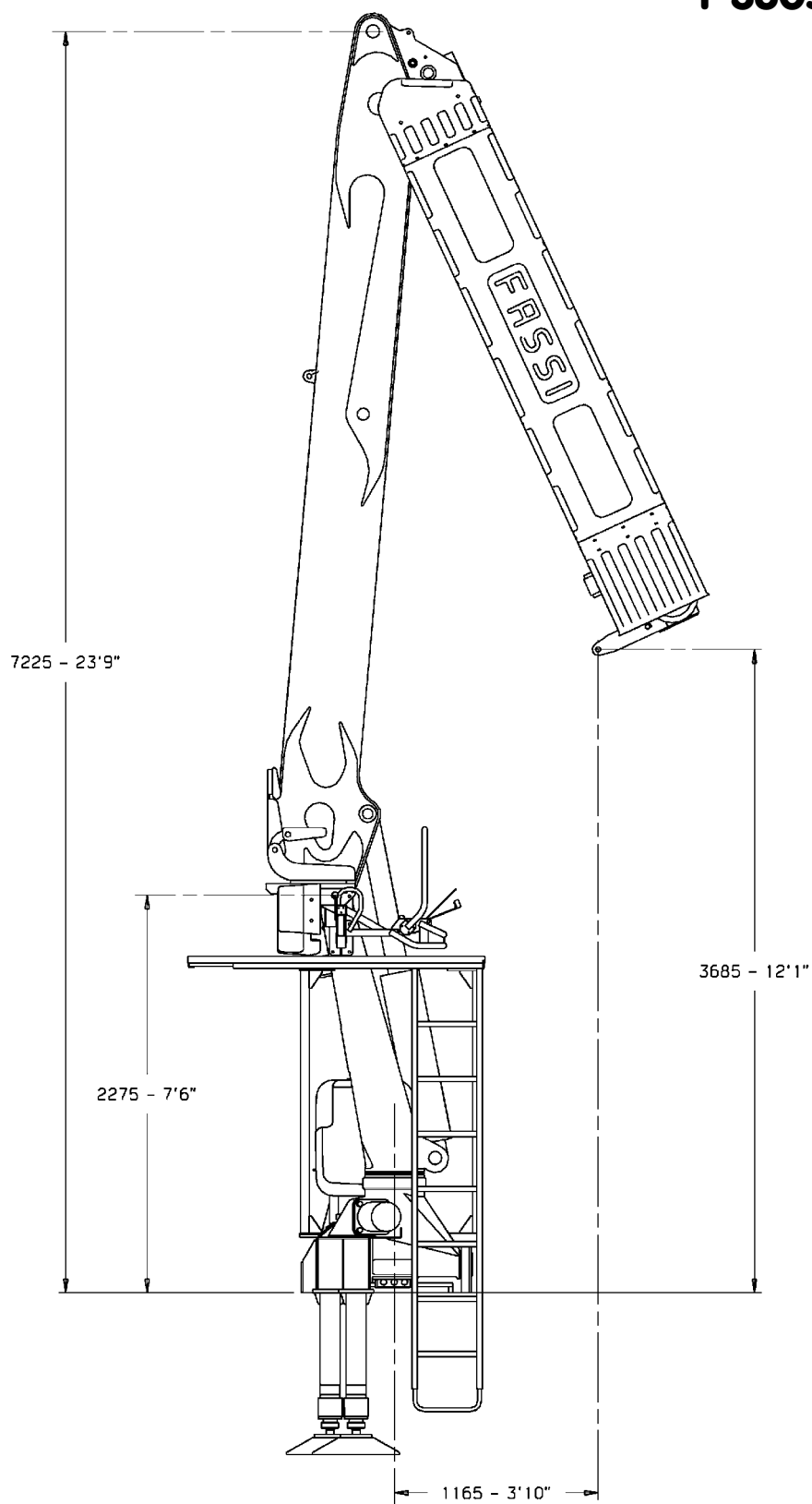


F 360SE

ST 331



# F 360SE



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



**ST 331**



## CRANE NOMENCLATURE (fig. 2)

Pos.		Description
1	-	Outrigger rams
2	-	Outrigger supports
3	-	Base
4	-	Rotation cylinders
5	-	Column
6	-	Inner ram
7	-	Inner boom
8	-	Outer ram
9	-	Outer boom
10	-	Booms extension rams
11	-	Extension boom sections
12	-	Deviator crane - outriggers
13	-	Outrigger distributors
14	-	Outrigger transmission
15	-	Ladder and cat walk
16	-	Seat and control station
17	-	Manual and foot controls (crane distributors)
18	-	Supplementary hoses (hydraulic implements)
19	-	Oil tank
20	-	Heat exchanger (available on request)

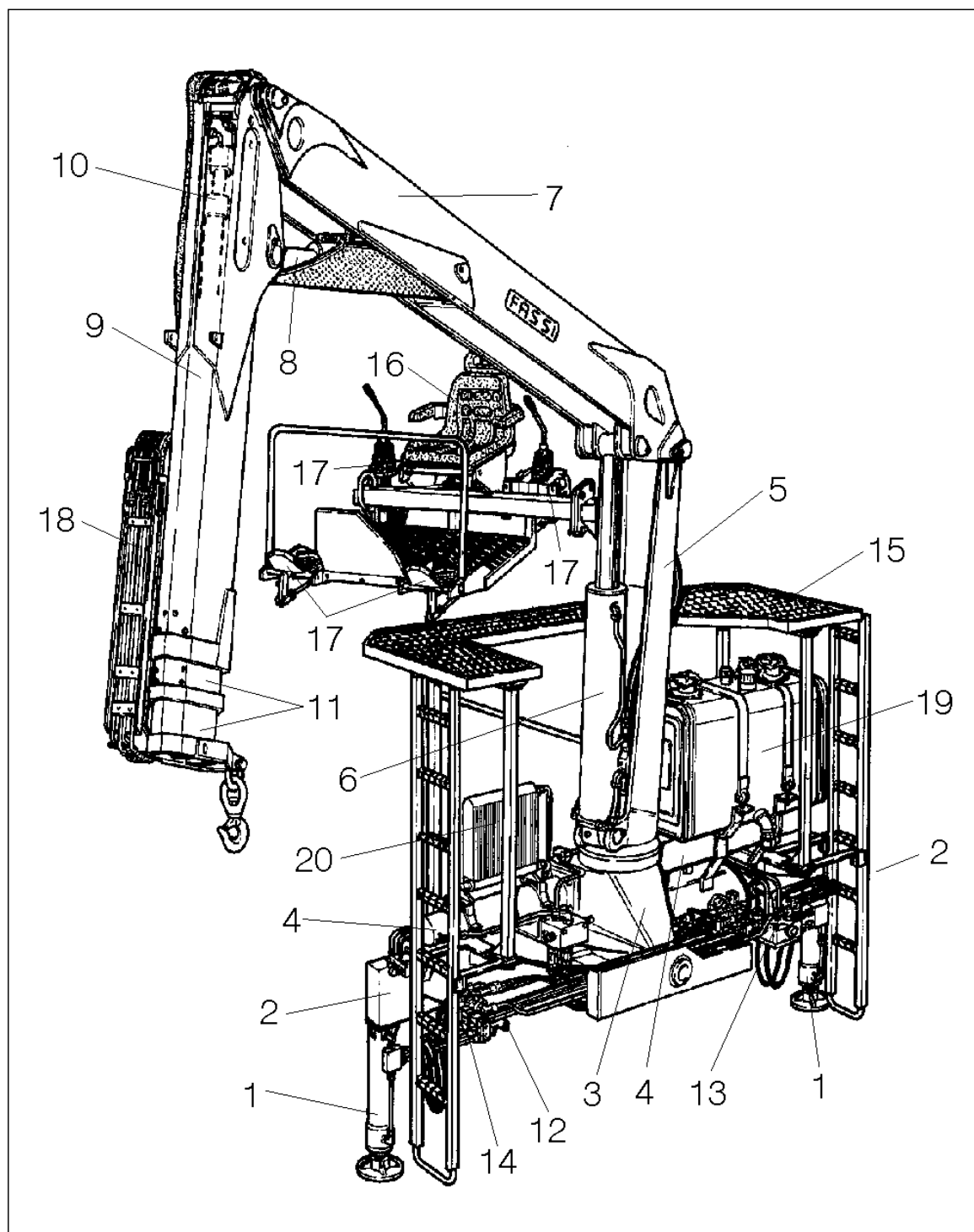


fig. 2

**SAFETY AND PROTECTION DEVICES** (fig. 3)

Pos.		Description
1	-	Check valves for outrigger rams
2	-	Check valve for rotation control
3	-	Check valve for inner ram
4	-	Check valve for outer ram
5	-	Check valve for booms extension rams
6	-	Lifting moment limiting device assembly
7	-	Parachute valves (lifting moment limiting device)
8	-	Main pressure valves (outrigger distributor)
9	-	Main pressure and auxiliary valves (crane distributors)
10	-	Carter for outer ram
11	-	Carter for hose protection devices
12	-	Carter for booms extensions ram check valve
13	-	Handle
14	-	Emergency tap (lifting moment limiting device)
15	-	Seat with device indicating the operator presence
16	-	Heat exchanger (available on request)

- (!) 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.**
- (!) For the access to the top seat use a ladder and a cat walk.**

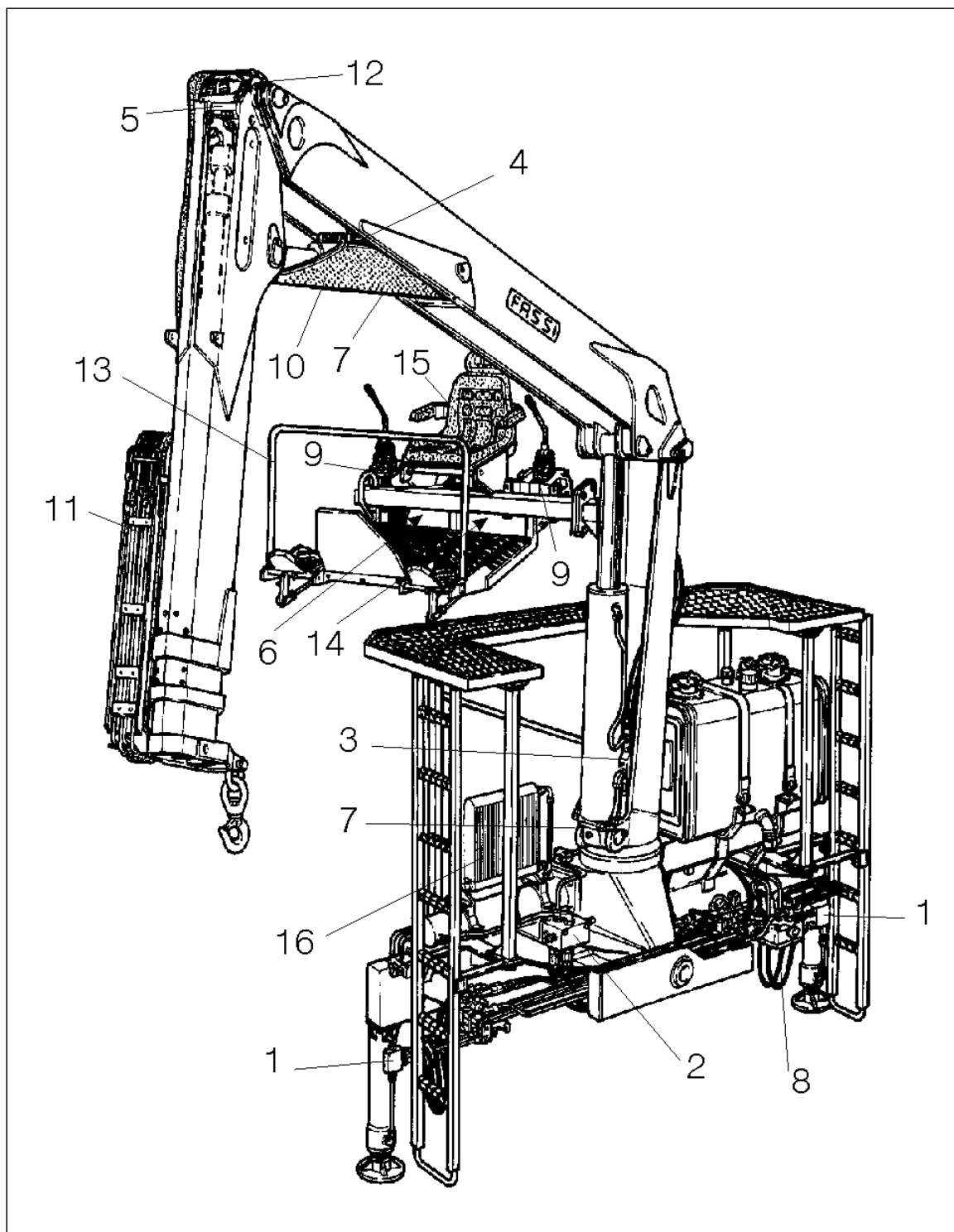


fig. 3

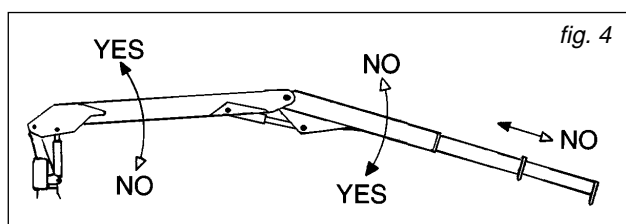
## LIFTING MOMENT LIMITING DEVICE

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 lbs) by its distance (in ft) 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.

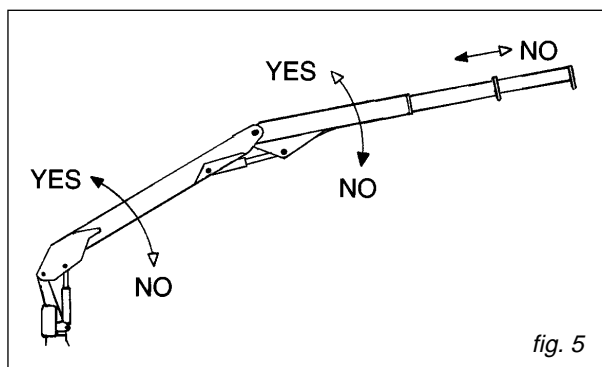
### Lifting moment limiting device "INTELLIGENT TYPE"

This device 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, up to the "critical values". These values, which are non-exceedable, determine the intervention levels and provide the data for setting the device.



The lifting moment limiting device concerns 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.



### Crane with standard distributor

The device is based on hydraulic controls which are activated when the intervention value is reached and block the movements of the relevant distributor levers in one or both directions. Please remember that the device will return the lever of the element being used to neutral position. 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.

### Crane with Danfoss distributor (available on request)

This system uses the specific functions of the distributor by utilising an electro-hydraulic technology, it does not allow you exceed the set value, by disactivating the controls (levers in neutral position) commanded by the limiting device. The condition of intervention is operated by the position of the outer boom (or, if hydraulic extension is fitted, the position of the extension outer boom), on which the electronic signal position (mercury level switch) is read by a special electrovalve. This determines controls which are locking or unlocking (resetting) of the controls concerned.

When the moment is reduced, it resets automatically (the manoeuvres blocked by the device are released). **N.B.:** There is a delay of **four (4)** seconds after the moment reduction before the reset can occur in order to safeguard the stability of the device.

The crane configurations (fig. 4-5) 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).

### (!) 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.**

Contiene mercurio: smaltire secondo le leggi in vigore

Es hat quecksilber: bitte beseitigen so wie gesetzlich

Mercury inside: scrap following laws in force

Contient du mercure: recycler selon les lois en vigueur

Hg





## Crane with standard distributor

### Reactivation device of crane functions in the absence of the electric power

Each device is fitted with an exclusion tap lever (fig. 6) which allows to reactivate all the crane functions in case of absence of the electric power. Only in these situations it is permitted to remove the lead seal placed on the tap lever and place it in the closed position.

### EMERGENCY exclusion screw

The electro-valve is installed with an exclusion screw which must only be used in case of emergency, testing or other abnormal situations when it is not possible to carry out any of the movements allowed by the limiting device (This may occur when the extension booms are fully folded and the load is particularly heavy and bulky).

Only in these situations it is permitted to remove the lead seal; slacken the lock nut of the screw, fig. 7 (14 mm hexagonal spanner), tighten the screw (without forcing) (5 mm allen key) and re-tighten the lock nut.

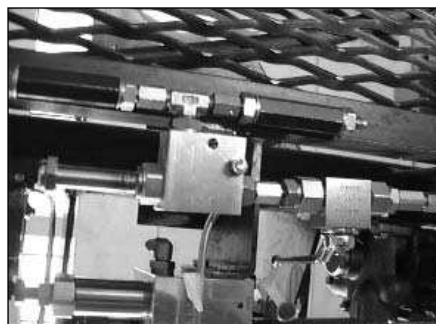


fig. 6

## Crane with Danfoss distributor (optional)

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

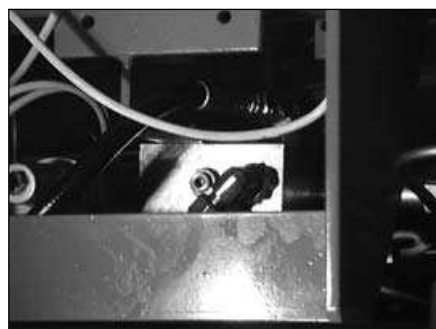


fig. 7

### (!) ATTENTION (!)

#### Activation of the exclusion device or of the emergency tap lever.

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 level, but involve an overload condition. In such an emergency condition (where the lifting moment limiting device has been disabled), the operator must be:

- 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.

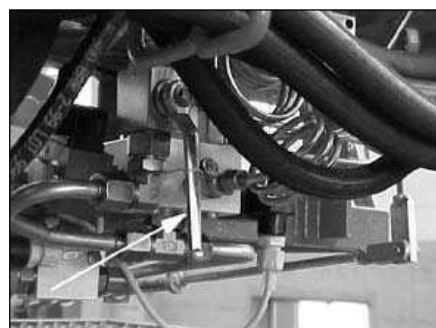


fig. 8

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 seal release the FASSI GRU IDRAULICHE from any responsibility and invalidate the warranty.**

### (!) 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.

### (!) ATTENTION (!)

**Do not walk on the electric control panels. (Plate DE1679)**

**Do not use water to extinguish fire! (Plate DE1680)**



DE1679



DE1680

## 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.

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.

### (!) ATTENTION (!)

The crane stability is only guaranteed by the maximum lateral extension of the outrigger supports and by the solidity of the base underneath the plates of the outrigger rams. To check the maximum working pressure see Paragraph D0.1 Technical data

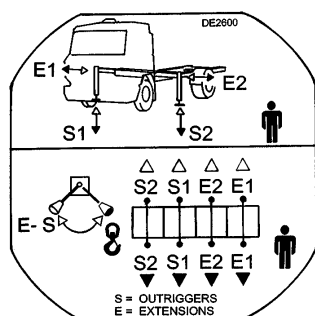
When stabilization is complete the wheels of the vehicle must still be in contact with the ground and the suspensions must not be fully unloaded.

Stabilize the crane so as to operate on a horizontal plane with a maximum tolerance of 1,5 degrees.

### Description of the controls to stabilize the vehicle

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

fig. 9



The extension and re-entering of the support and outrigger rams indicated on the fig. 9-10 coincide with what indicated on the plates **DE2600** and **DE2601** placed next to the control stations.

The symbols and the graphics of the plates define the vehicle side from which you operate and indicate the operating levers in relation to their movement.

On the plate **DE2600** is also reported the oil diverter (placed on the side of the base beam, on the left side of the vehicle) with the position of the lever for **E/S** control (E=extensions, S=outiggers).

### Lever function fig. 9-10

- **E1** Control for outrigger support extension **E1** crane
- **E2** Control for outrigger support extension **E2** crane
- **S1** Outrigger ram control **S1** crane
- **S2** Outrigger ram control **S2** crane

### Controls for positioning the outriggers of the crane

### (!) ATTENTION (!)

When controlling from the opposite side of the vehicle (it is not possible visually check the operation) it is compulsory make sure that no one is or transits in close proximity of the outriggers. (Fig. 11 plate **DE2497** and fig. 12 plate **DE2498**).

fig. 10

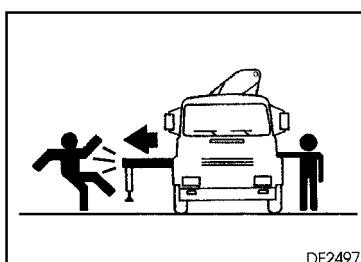
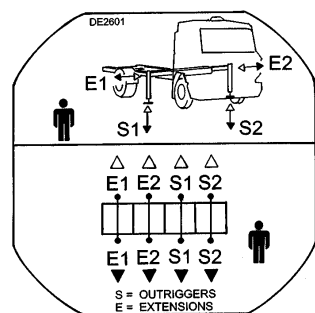


fig. 11

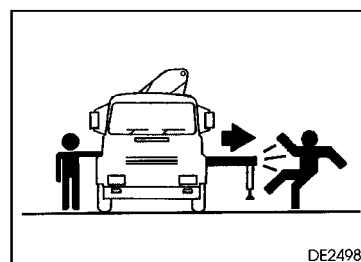


fig. 12

- Position lever **D** of oil diverter (☞ - **E/S**), (placed on the beam of the crane base, on the left side of the vehicle), on **E/S** (extensions - outriggers).

Extension of the outrigger support **E1**

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

Extension of the outrigger support **E2**

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

Descent of the outrigger ram **S1**

- Operate the lever **S1** to lower the ram.

Descent of the outrigger ram **S2**

- Operate the lever **S2** to lower the ram.

### **(!) ATTENTION (!)**

The complete extension of the outrigger supports is visually indicated by the yellow triangles which are found at the end of the beam. (Fig. 13)

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.



### **(!) ATTENTION (!)**

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

Unfold the crane into a working condition, positioning lever **D** of oil diverter crane-outriggers (☞ - **E/S**) on ☞. fig. 9.

### **Manoeuvres for re-entry of the crane outriggers after crane use.**

- Position lever **D** of oil-diverter (☞ - **E/S**) on **E/S** (extensions-outriggers). fig. 9.

Re-entry of the outrigger ram **S1**

- Operate the lever **S1** to control the re-entry (at stroke end) of the ram.

Re-entry of the outrigger ram **S2**

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

Re-entry of the outrigger support **E1**

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

Re-entry of the outrigger support **E2**

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

### **(!) WARNING (!)**

**Due to the particular characteristic of the hydraulic circuit (double circuit with two pumps), the distributor placed on the right of the top seat (outer boom, pallet-fork and extension booms) is alimented by one pump also with the oil-diverter ☞ - E/S on E/S; the distributor controls are disactivated by a device indicating the operator presence which prevents the control activation before the operator sits down at the control station.**

- (!) Under no circumstances interfere with the device indicating the operator presence which is fitted on the seat of the control station.**

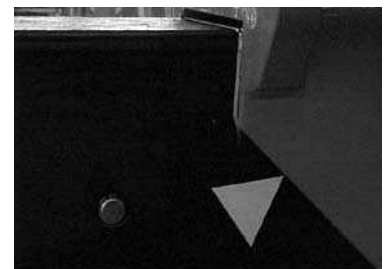


fig. 13

## CONTROLS TO OPERATE THE CRANE

**(!) WARNING (!)**

Before operating the crane it is compulsory to set the outriggers

This coincides with that indicated on the plate **DE2327** placed on the outriggers. (Fig. 14)

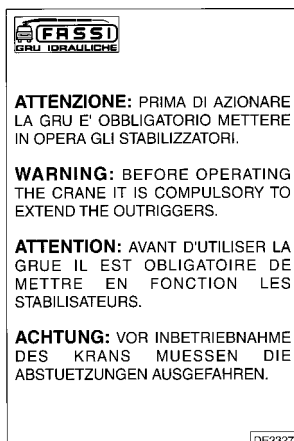


fig. 14

- (!) 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.**

The control station is on the top seat, the crane and the hydraulic implements are controlled from the distributors placed on the left and on the right side of the operator and are manually activated by means joystick or levers (in relation to the distributor type) and foot controls.

- (!) The device indicating the operator presence which is fitted on the seat of the control station prevents the activation of the hydraulic working of the two distributors before the operator sits down at the control station.**

## Controls to operate the crane, standard distributor

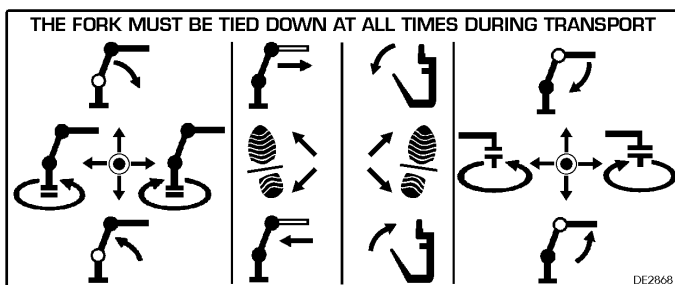


fig. 15

Respect to the operator

The left distributor controls three functions:

- Inner boom
- Rotation of the crane
- Exit of the extension boom sections

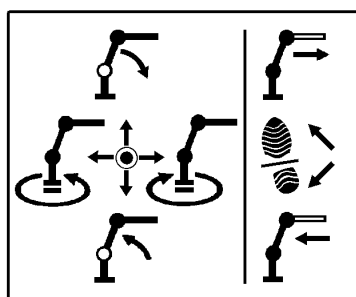
The right distributor controls three functions:

- Pallett-fork
- Outer boom
- Pallett-fork rotator

The symbols on the plate **DE2868**, placed on the support handle in front of the operator, identify the left and right side of the control station, define the lever function and foot controls in relation to the movement to be effected. Fig. 15.

## Left side of the control station

Respect to the operator (left to right) we activate, by means of joystick, the **inner boom** and the **rotation** of the crane, and by means of foot controls the exit of the extension boom sections.



The joystick controls the **inner boom** and the **rotation** of the crane:

**forwards**, controlling the **descent** of the inner boom;  
**towards**, controlling the **ascent**.

on the **right**, controlling the **clockwise rotation** of the crane;  
on the **left**, controlling the **counterclockwise rotation**.

- (!) Properly changing the angle of the operating direction of the joy-stick, it is possible to simultaneously control both functions.**

The foot control activates the **exit** of the **extension boom sections**:

**pushing** with the foot tip, we control the **exit** of the extension boom sections;  
**pushing** with the heel, we control the **re-entry** of the booms.

## Right side of the control station

Respect to the operator (left to right) we activate, by means of foot controls, the **pallet-fork** and by means of joystick, the **outer boom** and the **pallet-fork rotator**.

The foot control activates the **pallet-fork**:

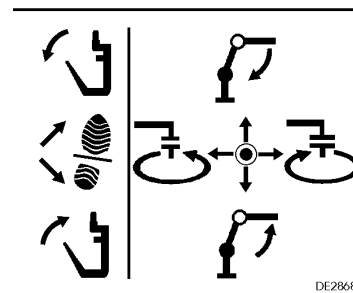
**pushing** with the foot tip, we control the **opening** of the pallet-fork.  
**pushing** with the heel, we control the **closure**.

The joystick controls the **outer boom** and the **pallet-fork**:

**forwards**, controlling the **descent** of the outer boom;  
**towards**, controlling the **ascent**.

on the **right**, controlling the **clockwise rotation**;  
on the **left**, controlling the **counterclockwise rotation**.

(!) Properly changing the angle of the operating direction of the joy-stick, it is possible to simultaneously control both functions.



## Controls to operate the crane, Danfoss distributor

Respect to the operator

The left distributor controls three functions:

- Inner boom
- Rotation of the crane
- Exit of the extension boom sections

The right distributor controls three functions:

- Pallet-fork
- Outer boom
- Pallet-fork rotator

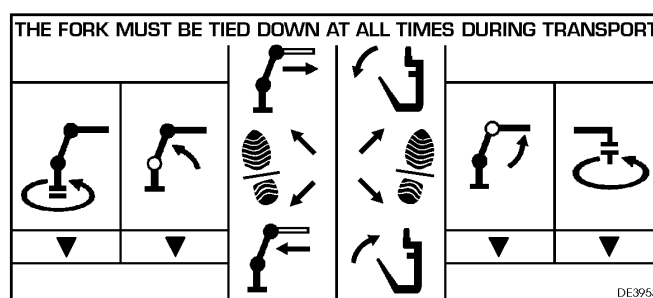


fig. 16

The symbols on the plate **DE3953**, placed on the support handle in front of the operator, identify the left and right side of the control station, define the lever function and foot controls in relation to the movement to be effected. Fig. 16.

## Left side of the control station

Respect to the operator (left to right) we activate, by means of levers, the **rotation of the crane** and the **inner boom**, and by means of foot controls the exit of the extension boom sections.

The lever controls the **rotation** of the crane:

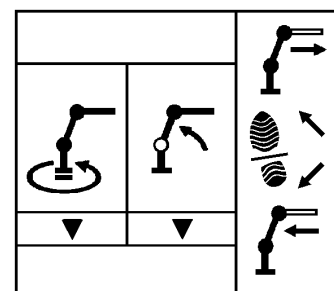
**forwards**, controlling the **clockwise rotation**;  
**towards**, controlling the **counterclockwise rotation**.

The lever controls the movement of the **inner boom**:

**forwards**, controlling the **descent**;  
**towards**, controlling the **ascent**.

The right foot control activates the **exit** of the extension boom sections:

**pushing** with the foot tip, we control the **exit** of the extension boom sections;  
**pushing** with the heel, we control the **re-entry** of the booms.



## Right side of the control station

Respect to the operator (left to right) we activate, by means of foot controls, the **pallet-fork** and by means of joystick, the **outer boom** and the **pallet-fork rotator**.

The foot control activates the **pallet-fork**:

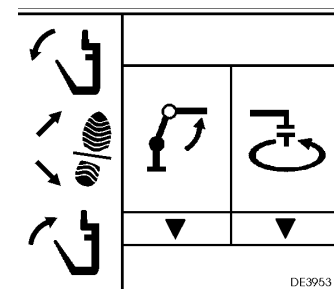
**pushing** with the foot tip, we control the **opening** of the pallet-fork.  
**pushing** with the heel, we control the **closure**.

The lever controls the movement of the **outer boom**:

**forwards**, controlling the **descent**;  
**towards**, controlling the **ascent**.

The lever controls the movement of the **pallet-fork rotator**:

**forwards**, controlling the **clockwise rotation**;  
**towards**, controlling the **counterclockwise rotation**.



## Manoeuvres to unfold the crane into a working condition

- Engage the power take off.
- Stabilize the vehicle as described on page 16.
- Before lifting the inner boom, be sure that the outer ram is open.
- Lift the inner boom over the horizontal line, close the outer boom and eventually extend the booms of the crane.
- Operate on the crane rotation to position the fork on the vertical line above the load, operate on the pallet-fork rotation control for the correct orientation of the fork.

## Manoeuvres to fold the crane into the rest condition

- Open the outer boom to its stroke end.
- Re-enter the extension boom sections.
- Operate the rotation control of the crane and fold the inner boom, paying attention to the crane boom position on the body. It is necessary during this operation to orientate the pallet-fork position to avoid obstacles on the body or the load.
- Lift and re-enter the outriggers as previously described.
- Disengage the power take off.

### (!) ATTENTION (!)

## THE FORK MUST BE TIED DOWN AT ALL TIMES DURING TRANSPORT

### Load manoeuvres

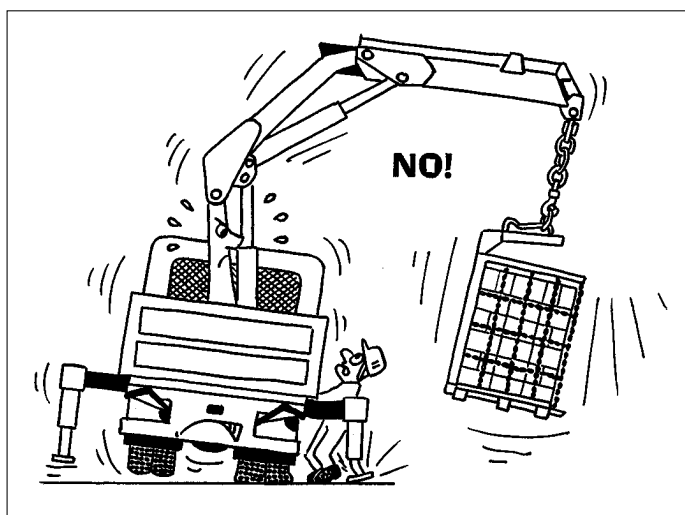
- (!) **Before manoeuvring the load, verify that the working area is suitable for your crane.**

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

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

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 lifting moment 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 chart.**



### OIL COOLER (HEAT EXCHANGER)

The crane (available on request) can be equipped with an oil cooler (air-oil heat exchanger) to prevent damage caused by an excessive increase of the oil temperature.

#### NOTE

**When working in a low temperature climate, we recommend to bring the hydraulic oil up to working temperature prior to starting work, This is best done by operating the crane thru all its functions ram stroke end.**

#### **(!) WARNING (!)**

The heat exchanger openings must be kept clear and clean. At no time should it be covered.

### HYDRAULIC ACCESSORIES

The crane can be provided with implements such as:

- Fork rotator
- Pallet-fork

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

#### **Hydraulic connections between implements and hoses fitted on the extension boom section of the crane.**

- (!) In case of hoses connection to implements through coupling unions it is necessary to verify that there is no trace of soil, dirt 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.

## 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.

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

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

(!) 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.

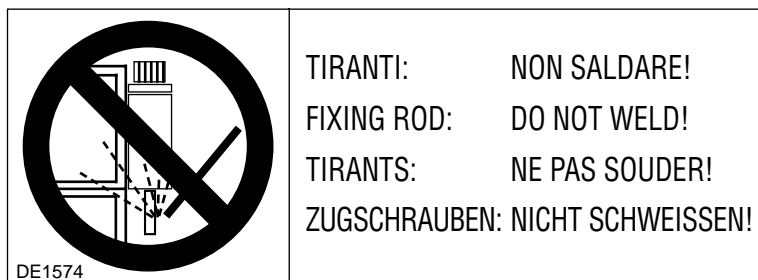
Respect the information supplied for maintenance and technical assistance.

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.

fig. 17



Do not weld the fixing rods of the crane (DE1574 fig. 17)

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, distributors, double controls, hand cable controls), on the electronic components (boxes, control panels), on the heat exchanger (if fitted), on the tank.

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

When cleaning the exchanger (if fitted) direct the jet of water or air parallelly to the fins in order not to damage them; protect the electric motor adequately. Where needed use a cleaning product which does not eat into the alluminium of the radiant group.

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



## After every 8 working hours or 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** lever can be moved easily.

Check that the crane controls (levers and foot) and the outrigger controls (levers) can be moved easily and return freely to neutral position.

Check the condition of shackles, hooks, wire ropes and every eventually used equipment.

## After every 40 working hours or after every working week

Check the tightening torque of the fixing rods of the crane.  
(fig. 18)

Tightening torque for the rods M33x2 = 10620 inch-pound force

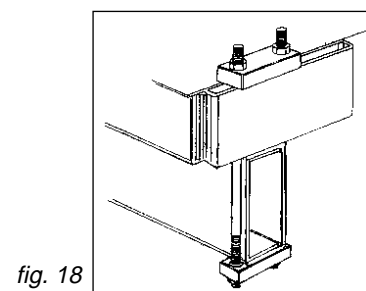


fig. 18

Clean the oil filter placed in the oil tank of the crane and if any, on the pump section and pressure hoses.

**NOTE** The filters of fibre or paper can not be cleaned, they must be replaced.

Cleaning of the wire mesh filter on the tank (oil return to the oil-tank) fig. 19.

- Unscrew the security bolts of the filter cover 1 and remove it.
- Extract the cartridge, clean by flushing with a non flammable, non corrosive and non toxic solvent (gas oil or other). Thoroughly dry the filter inside and out (do not use compressed air).
- Check if the cartridge has collapsed; if so, replace it!
- Remove the filter body 3 and clean it
- Re-assemble the filter body and the cartridge: check the sealing of the 'O' ring 4-5-6; in case, replace it!

### NOTE

Take care that no contaminated material passes into the tank.

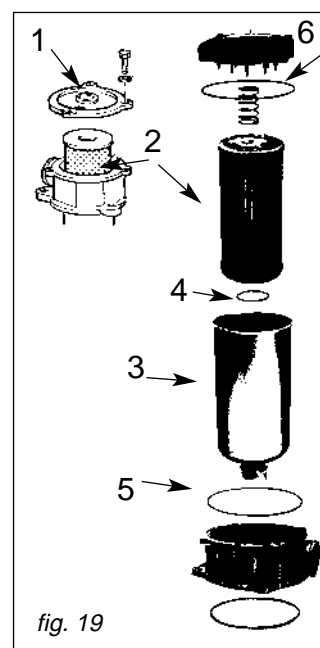


fig. 19

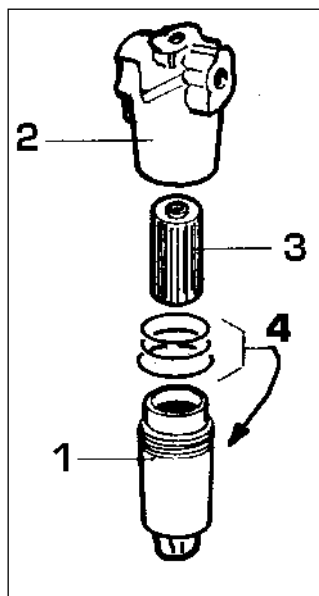


fig. 20

**Replacement of the filter on the delivery line (before the distributor) fig. 20**

- When the visual indicator becomes red, replace the cartridge.
- Unscrew with a suitable spanner the filter body (1) from the head (2).
- Remove the cartridge (3) and clean inside the filter body (1).
- Insert a new cartridge and re-assemble the filter body into the head (check the sealing (4)).

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 not exceed the maximum or be lower than the minimum (fig. 21).

Top up using hydraulic oil with the same characteristics as those indicated in the table at paragraph N0.

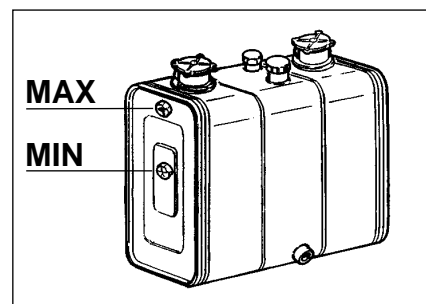


fig. 21

**Note!**

The following lubricators have been centralized and gathered in a case positioned on the base (crane distributor side):

- rack guide shoe - rotation,
- upper and lower bush of the column - column support,
- rack group - column gear,
- column support group - pendulum beam.

**(!) WARNING (!)**

**At low temperatures, the grease shall not crystallize or, to be more precise, shall not change its characteristics.**

At the effective operative temperature, the grease we recommend shall have a fluidity at least equal to rating **NLGI 0** or max. 1.

**(!) WARNING (!)**

**Centralized lubrication shall not be used when room temperature is below -10°C / -20°C.**

For the sliding sections of the outrigger supports and of the extension booms guide shoes made from a special material have been fitted: to ease their movement it is recommended to smear a light film of grease on them, taking care that the surfaces of the outrigger supports and inner and extension booms are free from impurities such as sand etc.

For the sliding sections of the carter of the outer ram and ease their movement it is recommended to smear a light film of grease on the guide-shoes.

Use a grease with the same characteristics indicated in the table at paragraph N0.

## After every 500 working hours

Check the tightening torque:

- of the fixing rods of the crane; consult the following table in order to find it's value according to the bolt diameter.

*Table of the tightening torques of the fixing rods of the crane on the vehicle.  
From "C0404 Kit for crane fixing".*

D. Fixing rods	Tightening torque = inch-pound force
M22x1,5	2655
M24x2,0	3540
M27x2,0	5310
M30x2,0	4169
M33x2,0	10620
M39x3,0	15931

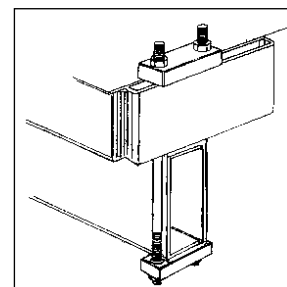


fig. 22

- 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 (C).*

Bolt inch Diameter = D	Class 8.8 Torque = inch-pound force	Class 10.9 Torque = inch-pound force	Class 12.9 Torque = inch-pound force
0,118	9,4	13,8	16,2
0,157	21,6	31,7	37,1
0,197	42,7	62,8	73,5
0,236	73,5	109	126
0,315	177	257	310
0,394	354	522	611
0,472	611	903	1053
0,551	982	1443	1690
0,630	1531	2257	2637
0,709	2115	3115	3646

Bolt inch Diameter = D	Class 8.8 Torque = inch-pound force	Class 10.9 Torque = inch-pound force	Class 12.9 Torque = inch-pound force
0,787	3000	4416	5169
0,866	4124	6063	7098
0,945	5169	7594	8886
1,063	7656	11249	13161
1,181	10382	15250	17843
1,299	14108	20728	24251
1,417	18108	26605	31128
1,535	23525	34562	40448

From "ELEMENTS DE FIXATION - ASSEMBLAGES VISSÉS"  
(AFNOR E 25-030 AGOSTO 1984)

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.

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.**



**After every 1000 working hours or after every working year**

Perform: Washing, Function Testing, Testing according to the capacity plates

Check: Identification plates, Capacity plates

Checklist in accordance with ISO 9927-1

<b>Element</b>	<b>Checks to be carried out:</b>
Subframe Structure and fixing rods	Tightening torque of the fixing rods, wear and any deformation, actions
Base Rack group, compensator	Lubrication, tightening torque of the rods, wear and any deformation, actions
Outriggers Supports, rams, base plates safety catches, hoses	Greasing of extension supports, oil-leaks, wear, actions, inspection of hoses
Rotation cylinders Cylinders, pistons, seals,	Oil-leaks, chromium plating, any deformation, inspection of hoses
Column Inner boom connection, outrigger connection, pins, bushes	Lubrication, wear and any deformation, actions
Inner boom Pins, outrigger connections	Lubrication, wear and any deformation, actions
Inner ram Cylinder, rod, piston, seals, hoses	Oil-leaks, chromium plating, any deformation, inspection of hoses
Outer boom Pins, outrigger connections	Lubrication, wear and any deformation, actions
Outer ram Cylinder, rod, piston, seals, hoses	Oil-leaks, chromium plating, strains, inspection of hoses
Extension booms Guide shoes, pins, outrigger connections	Lubrication, wear and any deformation, actions
Extension rams Cylinder, rod, piston, seals, hoses	Oil-leaks, chromium plating, any deformation, inspection of hoses
Hydraulic jib Booms, pins, outrigger connections	Lubrication, wear and any deformation, actions
Rams (hydraulic jib): Cylinder, rod, piston, seals, hoses	Oil-leaks, chromium plating, any deformation, inspection of hoses
Winch Torque limiter, brake, rope slide guide, cable, stroke end, pulleys	Lubrication, wear and any deformation, actions

Distributors, deviators, valves Control levers, forks, joints, fixing screws, lead seals	Checking of the pressure, oil-leaks, wear and any deformation, actions,
Lifting moment limiting device Valves, pressure switches, electrovalves	Checking of the pressure, oil-leaks
Power take-off, pump, oil-tank Filters, hoses	Pump capacity, checking of the pressure, oil change, replacement of filters, inspection of hoses
Oil-pressure system Hoses, hose protection devices	Checking of the pressure, oil-leaks, inspection of hoses
Implements for lifting Hooks, chains, cables, slings	Safety check, wear and any deformation, actions,
Implements Wallboard forks, buckets, rotators	Oil-leaks, wear and any deformation, actions, inspection of hoses
Seat, third control station Frame, fixing screws	Access inspection, wear and any deformation, strains
Tele(radio)remote control	Test

**Complete overhaul of the crane is required when 10.000 working hours or 10 years' life are reached - i.e.:**

When one of the limits indicated hereunder is reached:

**10.000 working hours**, (i.e.: 10 years, 50 weeks a year, 20 hours a week, or 5 years, 50 weeks a year, 40 hours a week)

or

**10 years' life of the crane,**

a complete overhaul with in-depth structural inspection of the crane must be carried out by the Manufacturer or by an authorised service centre.

## 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.

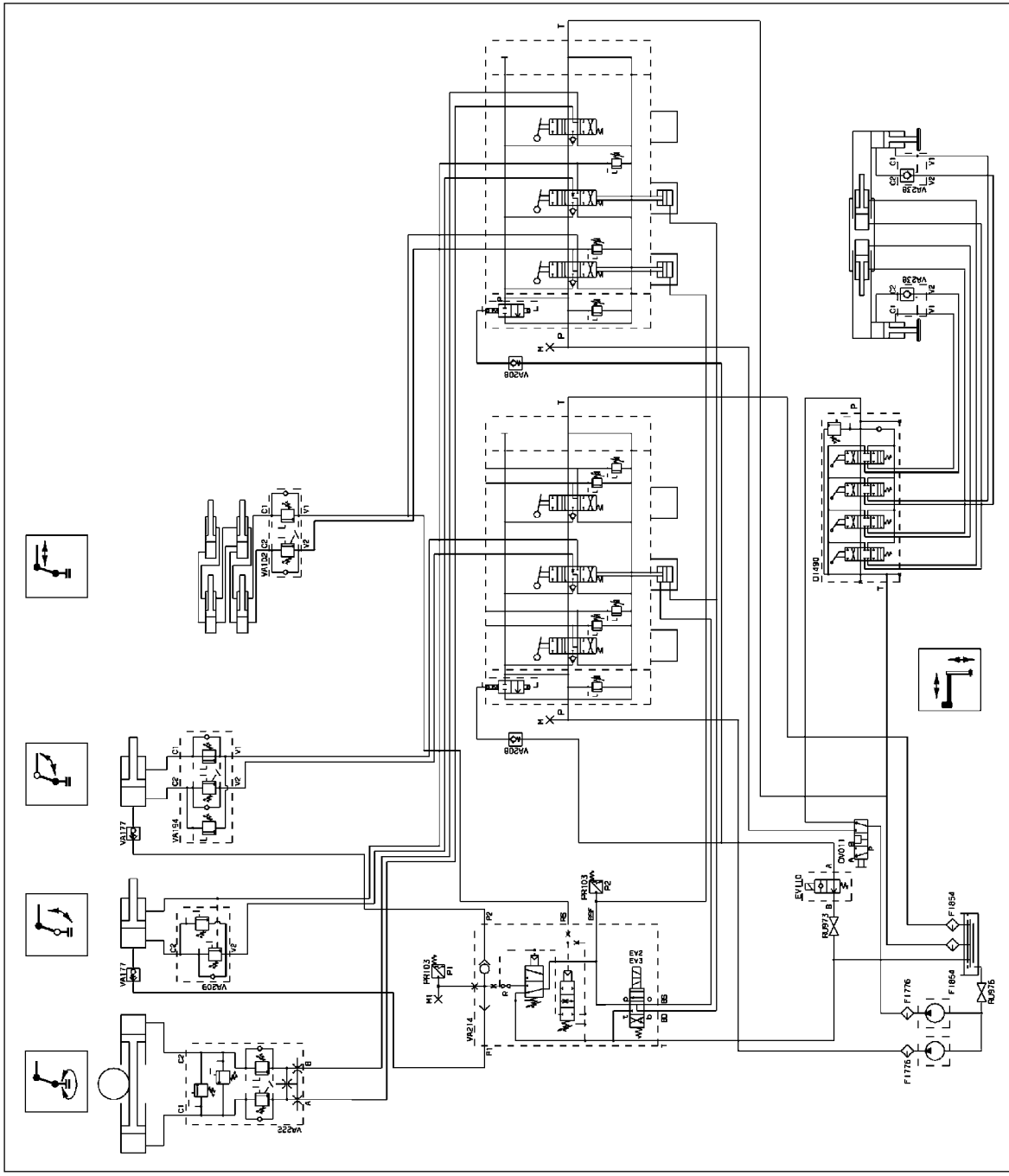
Faults	Cause	Remedies
The crane does not rotate properly	<i>Vehicle non in level position</i> <i>Lack of lubrication</i>	Stabilize the vehicle Grease the bushes
The extension booms do not completely extend or work jerkily	<i>Lack of lubrication of the guide shoes</i>	Grease the guide shoes
Crane controls are not active with the operator at the control station	<i>Lack of electric energy</i> <i>The device indicating the operator presence on the top seat is activated</i>	Check the fuse, the battery and electric circuit Check the circuit of the device indicating the operator presence on the top seat
Vibrations in crane operations	<i>Shortage of oil</i> <i>Obstructed filters</i>	Check the level and top up if necessary Clean or replace the filter cartridge
Noteable decrease in movement speed	<i>Obstructed filters</i>	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	<i>Non efficiency of the pump</i> <i>(main pressure or auxiliary) valves not properly adjusted, or worn</i> <i>Ram seals are not properly fitted</i>	Replace the pump Check the pressure, adjust the valves Replace the seals
A boom of the crane does not hold up the load and visually lowers	<i>The safety check valve of the ram is open</i> <i>Oil leaks inside the ram</i>	Replace the valve Defective seals, replace them
The crane does not rotate properly	<i>Valves controlling the rotation not adjusted</i> <i>Wear of the seals of the rotation cylinder</i>	Adjust the valves Replace the seals
The extension booms do not completely extend or work jerkily	<i>Wear of guide shoes</i>	Check the guide shoes wear, replace if necessary
Vibrations in crane operations	<i>Non efficient pump</i>	Check the pump
Noteable decrease in movement speed	<i>Non efficient pump</i>	Check the pump

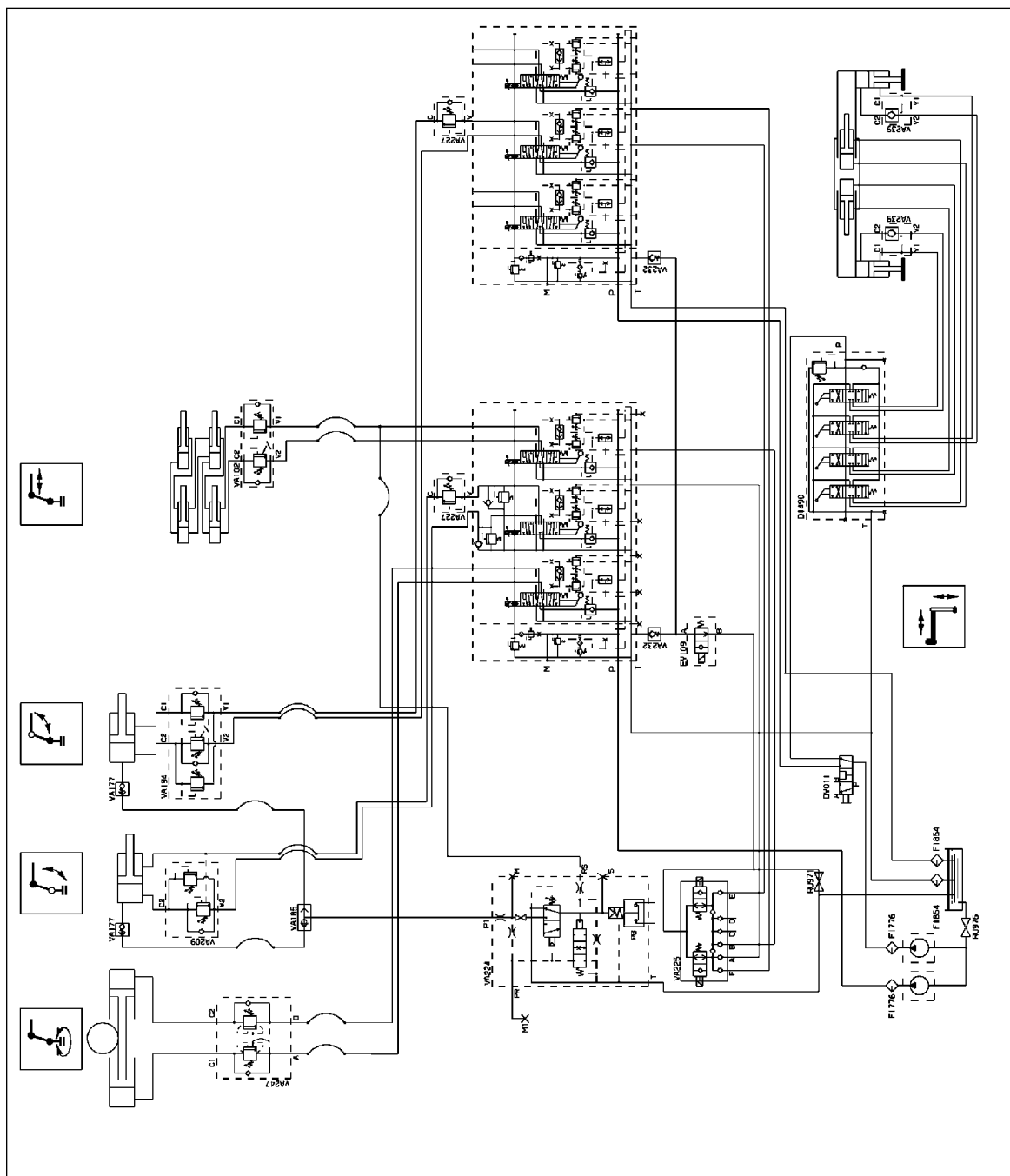
# HYDRAULIC AND ELECTRIC SCHEMATICS

Hydraulic schematic for crane - two standard distributors - lifting moment limiting device "intelligent" type



CODE	DESCRIPTION		
DI490	DISTRIBUTOR	VA102	DOUBLE EFFECT BLOCK VALVE
DV011	DEVIATOR	VA177	ANTIBURST VALVE FOR LIFTING RAMS
EV110	ELECTROVALVE	VA194	DOUBLE EFFECT BLOCK VALVE
FI776	FILTER	VA208	UNIDIRECTIONAL VALVE
FI854	FILTER	VA209	SIMPLE EFFECT BLOCK VALVE
M1/M	GAUGE QUICK CONNECTION	VA214	LIFTING MOMENT LIMITING DEVICE VALVE
PR103	PRESSURE SWITCH	VA222	OIL FLOW REGULATOR VALVE FOR ROTATION
RU973	FAUCET		CYLINDER
RU976	FAUCET	VA238	SIMPLE EFFECT BLOCK VALVE



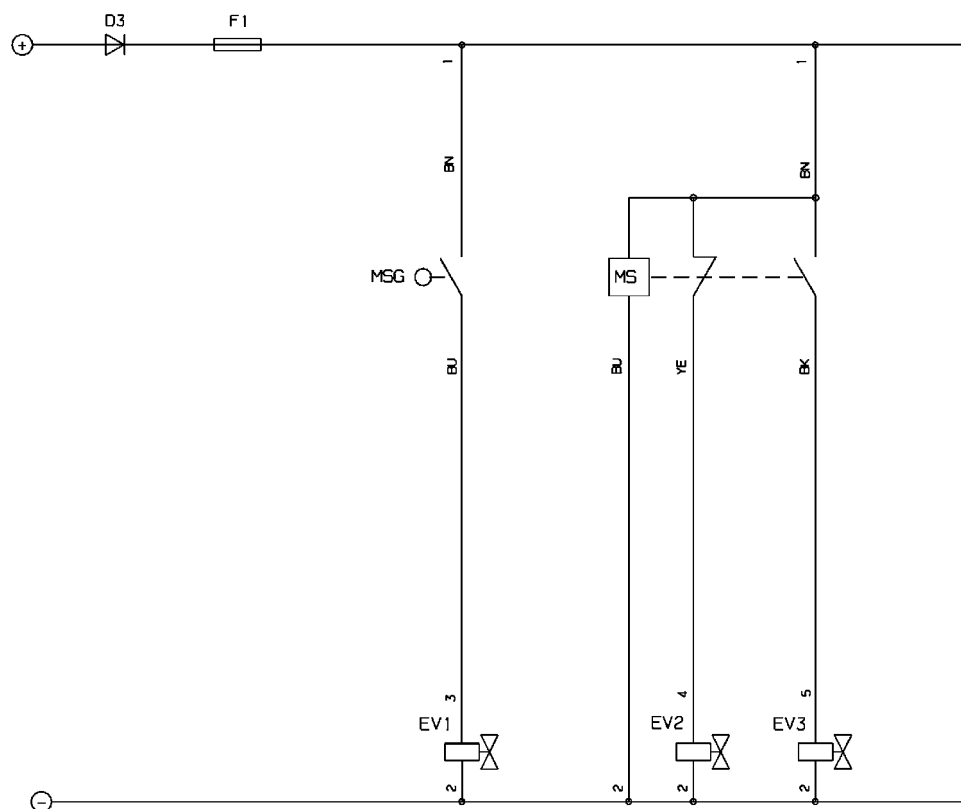


## SYMBOL DESCRIPTION

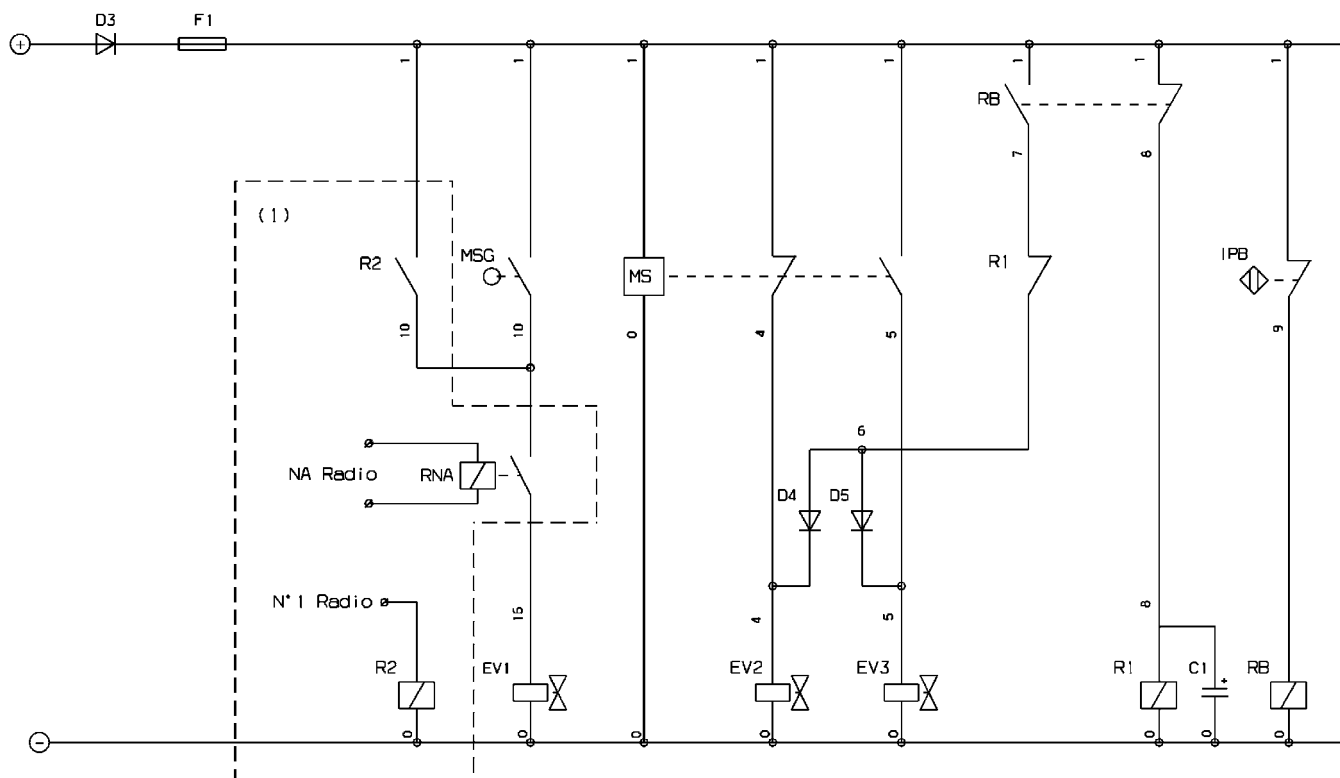
DI490	DISTRIBUTOR	VA185	SELECTOR VALVE
DV011	DEVIATOR	VA194	DOUBLE EFFECT BLOCK VALVE
EV109	ELECTROVALVE	VA209	SIMPLE EFFECT BLOCK VALVE
F1776	FILTER	VA224	LIFTING MOMENT LIMITING DEVICE VALVE
F1854	FILTER	VA225	LEVEL SENSOR VALVE
M1/M	GAUGE QUICK CONNECTION	VA227	SEQUENCE VALVE
RU971	FAUCET	VA232	UNIDIRECTIONAL VALVE
RU976	FAUCET	VA239	SIMPLE EFFECT BLOCK VALVE
VA102	DOUBLE EFFECT BLOCK VALVE	VA247	DOUBLE EFFECT BLOCK VALVE
VA177	ANTIBURST VALVE FOR LIFTING RAMS		



# Electric schematic for crane - two standard distributors - free rotation

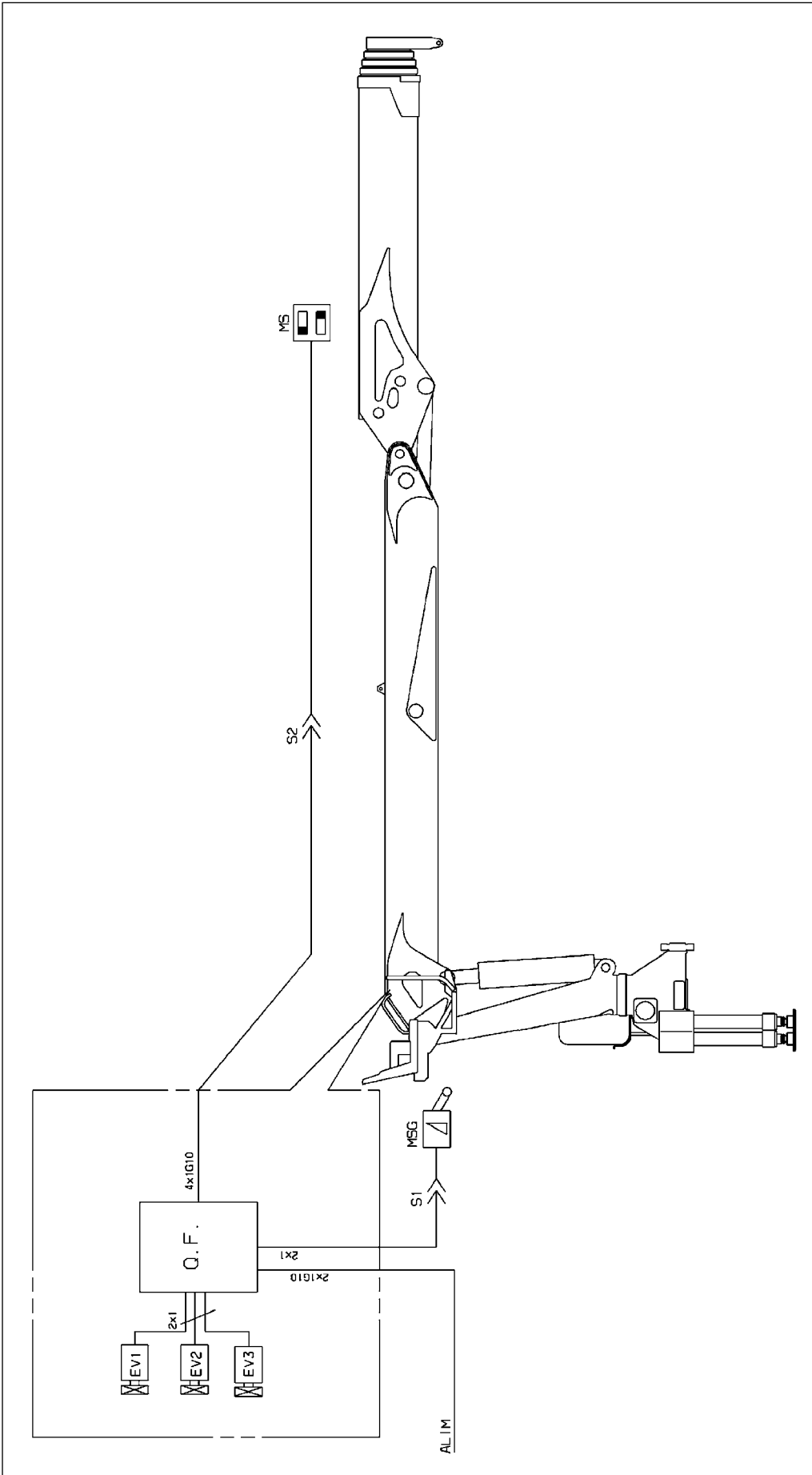


CODE	DESCRIPTION
ALIM	FEED MAIN CONTROL PANEL
D3	POLARITY PROTECTION DIODE
EV1	EMERGENCY ELECTROVALVE
EV2	ELECTROVALVE FOR CRANE LIFTING BLOCK
EV3	ELECTROVALVE FOR CRANE DESCENT BLOCK
F1	PROTECTION FUSE 5A
MS	MERCURY SLOPE SENSOR ON OUTER BOOM
MSG	SIGNAL MICROSWITCH FOR PRESENCE OPERATOR ON TOP-SEAT

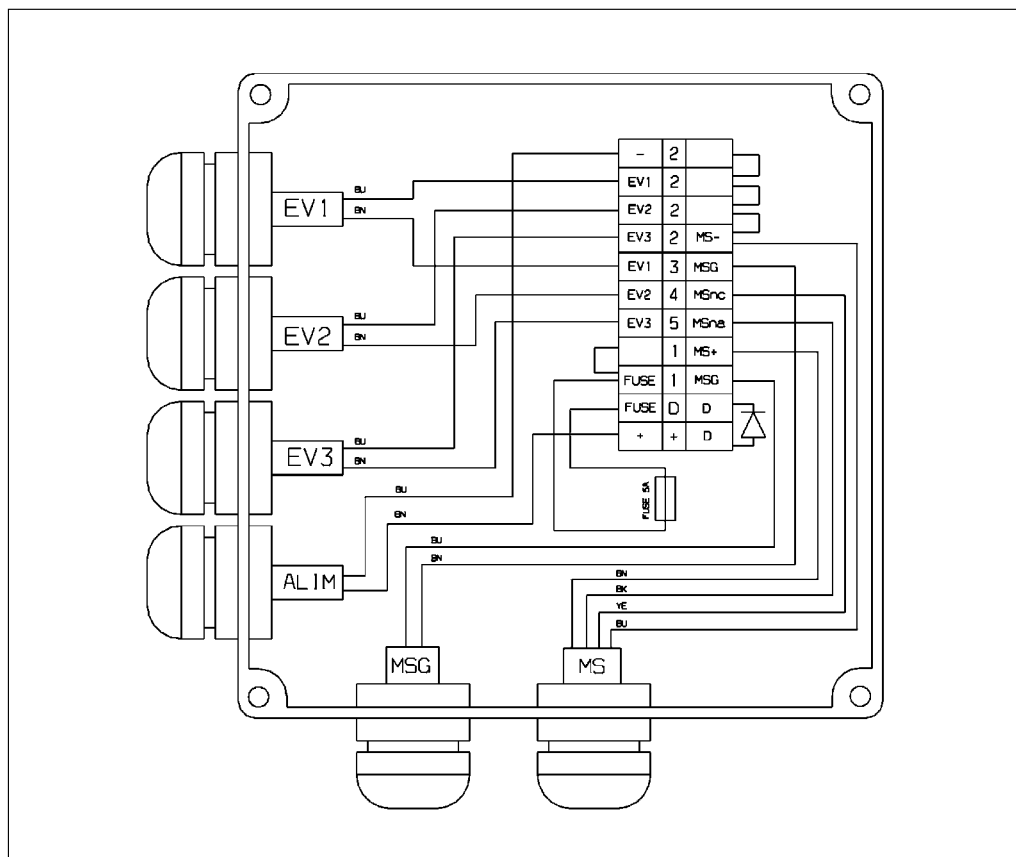


(1) WITH RADIO REMOTE CONTROL ONLY

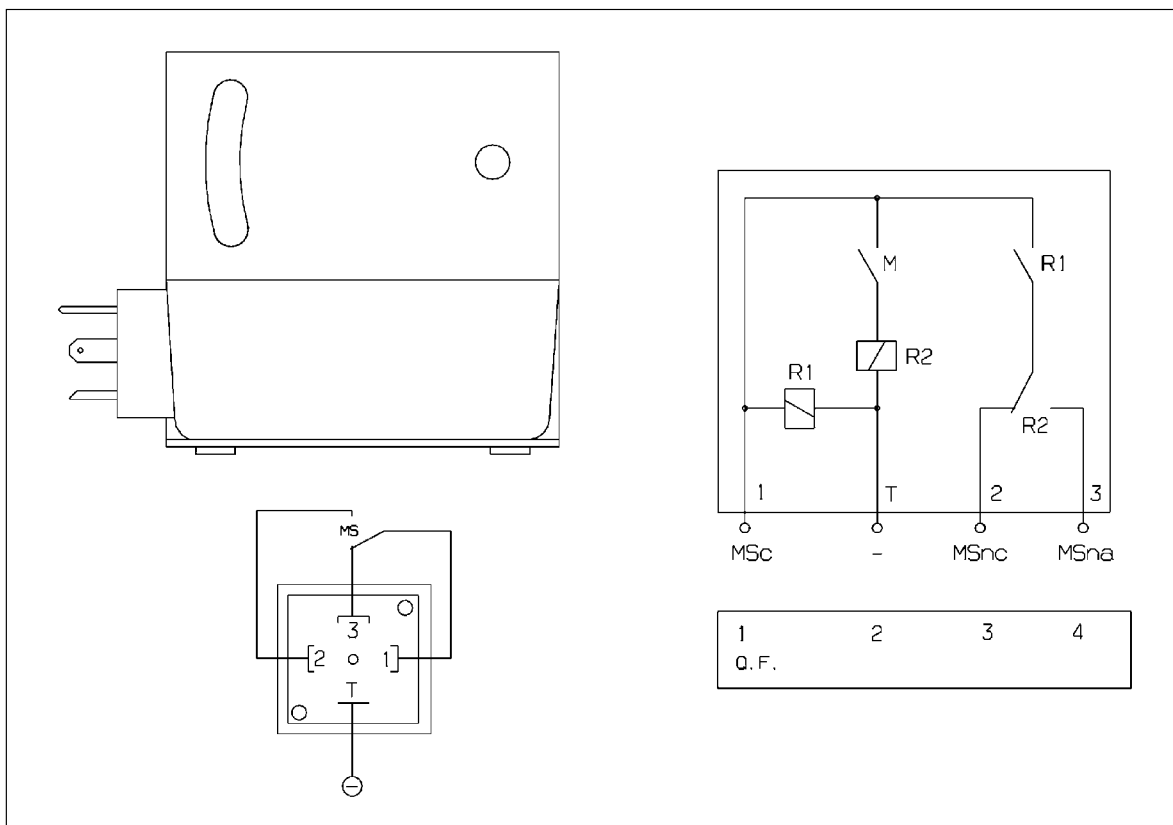
CODE	DESCRIPTION		
ALIM	FEED MAIN CONTROL PANEL	IPB	PROXIMITY SENSOR VALVE
C1	CONDENSATOR FOR BLOCK DELAY	MS	MERCURY SLOPE SENSOR ON OUTER BOOM
D3	POLARITY PROTECTION DIODE	MSG	SIGNAL MICROSWITCH FOR PRESENCE OPERATOR ON TOP SEAT
D4	DIODE FOR LIFTING MOMENT DEVICE	R1	BLOCK LATE RELAY
D5	DIODE FOR LIFTING MOMENT DEVICE	R2	RELAY FOR OPERATOR PRESENCE ON THE TOP SEAT MICRO SWITCH EXCLUSION
EV1	ELECTROVALVE FOR EMERGENCY	RB	LMLD BLOCK SIGNAL RELAY
EV2	ELECTROVALVE FOR CRANE LIFTING BLOCK	RNA	EMERGENCY RADIO REMOTE CONTROL RELAY
EV3	ELECTROVALVE FOR CRANE DESCENT BLOCK		
F1	PROTECTION FUSE 5A		



Electric schematic for crane - terminal strip - seat box



Electric schematic for crane - mercury slope sensor - seat box



## TABLE OF HYDRAULIC OIL AND LUBRICANTS CHARACTERISTICS

TABLE OF HYDRAULIC  
OIL AND LUBRICANTS  
CHARACTERISTICS  
**F 360SE**

**c XV**

### HYDRAULIC OIL WITH HIGH VISCOSITY: ISO-L-HV

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

### HYDRAULIC OIL WEAR RESISTANT: ISO-L-HM

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

### GREASE (for centralized system)

Use only GREASE NILEX EP1 of the firm NILS.  
NOTE: Do not ABSOLUTELY mix different types of grease.

### GREASE (for slew ring, extension booms, outrigger supports...)

-30°C up to +130°C    EP1 Gradation (cold climate)  
   EP2 Gradation (warm climate)

All grease used must be free from acid and resin, not hygroscopic and long-life such as

BP GREASE LTX-EP1\EP2 or ELF EPEXA 1\2  
ESSO BEACON EP1\EP2 or TEXACO EP1\EP2  
MOBIL EP1\EP2 or SIMILAR.

### HYDRAULIC OIL FOR MOTOREDUCER

Classification ISO-L-CC

Gradation EP ISO-VG 150

### 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" (not compatible with eventual teflon bushes).**

# INSTRUCTION AND WARNING PLATES

	<b>FASSI GRU IDRAULICHE SpA</b> 24021 ALBINO (BG) ITALY - Via dei Carmelitani, 2 Tel. + 39 35 77.64.00 - Fax + 39 35 75.50.20	<b>INSTRUCTIONS FOR SAFE USE OF THE CRANE</b>	DE2676
<div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <p><b>1</b> Only authorized persons are permitted to operate the crane.</p> <p><b>2</b> The crane must be used on firm, level ground.</p> <p><b>3</b> Check that the vehicle hand brake is on and that the wheels are checked.</p> <p><b>4</b> Before operation make sure that:</p> <ul style="list-style-type: none"> <li>- no-one is within the working area of the crane;</li> <li>- the safety devices are in place and operative;</li> <li>- the minimum safe working distances from power lines are observed;</li> <li>- the load is correctly slung and hooked.</li> </ul> <p><b>5</b> Stabilize the vehicle with the outriggers, making sure that:</p> <ul style="list-style-type: none"> <li>- the lateral supports are fully extended;</li> <li>- the wheels are in contact with the ground and the suspension is not completely unloaded;</li> </ul> </div> <div style="width: 48%;"> <p><b>6</b> Use the crane in accordance with the use and maintenance manual, making sure that:</p> <ul style="list-style-type: none"> <li>- the load and radius are within the maximum limits shown on the crane capacity plate;</li> <li>- the crane is used progressively avoiding sudden load movements;</li> <li>- swinging or dragging of the load is avoided;</li> <li>- the load is lifted before rotating.</li> </ul> <p><b>7</b> When using implements protect the working area with a barrier.</p> <p><b>8</b> The vehicle/crane are not left unless the power take off is disengaged and the load is on the ground.</p> <p><b>9</b> Before driving the vehicle ensure that the outriggers are fully retracted and re-entered and the crane is in the folded position.</p> </div> </div>			

## DE 2676 Instruction plate and safety norms



**ATTENZIONE:** PRIMA DI AZIONARE LA GRU E' OBBLIGATORIO METTERE IN OPERA GLI STABILIZZATORI.

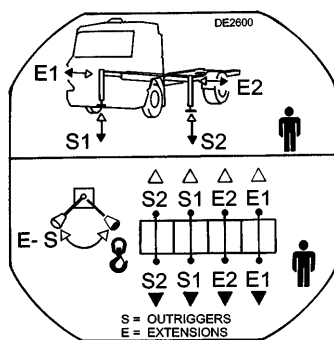
**WARNING:** BEFORE OPERATING THE CRANE IT IS COMPULSORY TO EXTEND THE OUTRIGGERS.

**ATTENTION:** AVANT D'UTILISER LA GRUE IL EST OBLIGATOIRE DE METTRE EN FONCTION LES STABILISATEURS.

**ACHTUNG:** VOR INBETRIEBNAHME DES KRANS MUESSEN DIE ABSTUETZUNGEN AUSGEFAHREN.

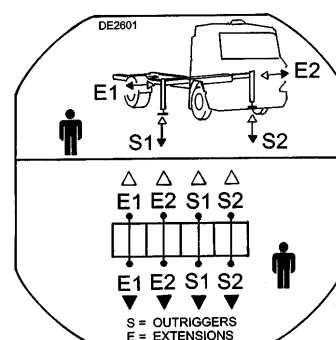
DE2327

## DE 2327 Warning plate to stabilize the vehicle before using the crane

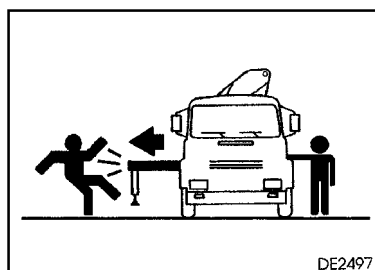


**DE 2600**

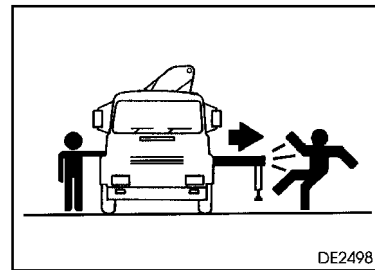
Instruction plates  
to stabilize the vehicle



**DE 2601**

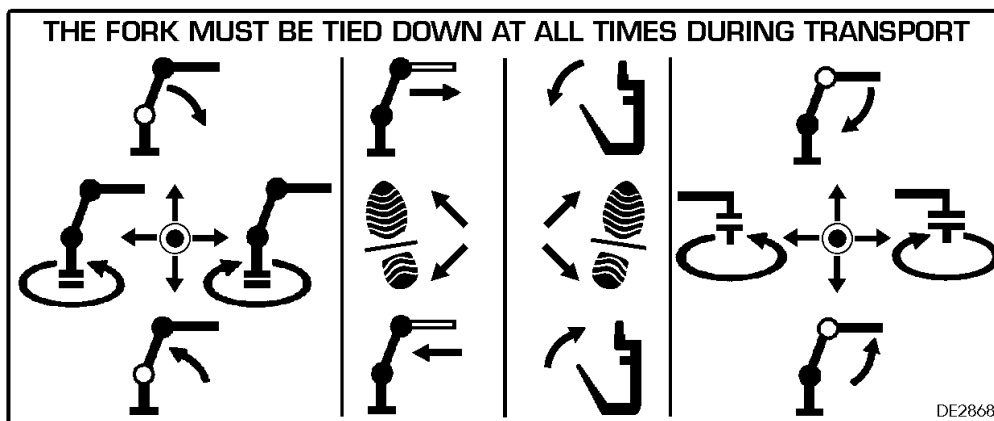


**DE 2497**



**DE 2498**

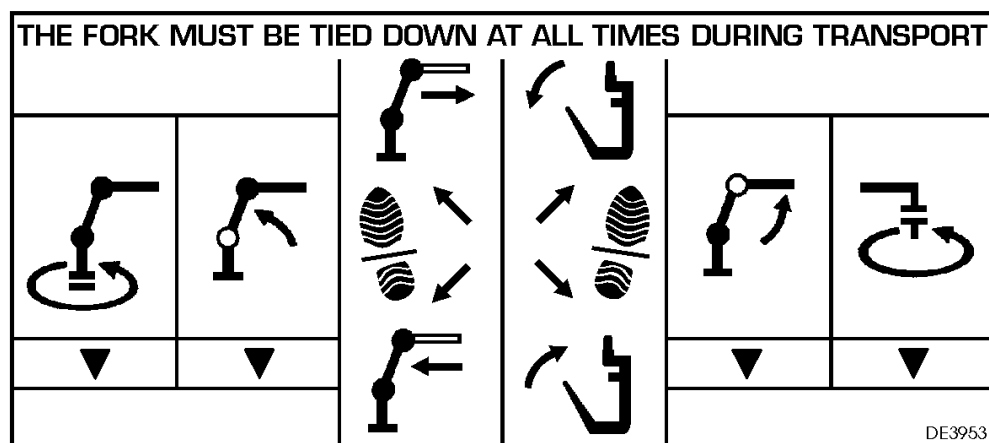
Warning plates to make sure that no one  
is or transits in close proximity of the outriggers



DE 2868

Crane controls plate

DE 3953



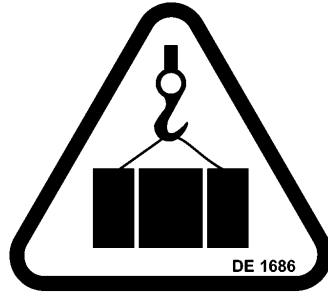
**DE 1067**

Do not walk or stay under a suspended load and for unauthorized persons to be within the working area.



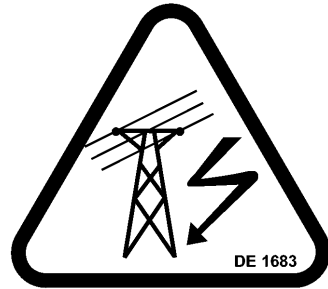
**DE 2100**

Danger plate for crushing of lower limbs



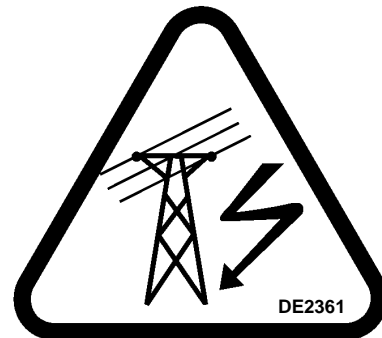
**DE 1686**

Do not walk or stop under a suspended load



**DE 1683**

Do not operate in proximity of electric high-tension lines



**DE 2361**

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





**DE 1681**  
Greasing points with brush



**DE 1682**  
Greasing points at pressure



DE1574

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

**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.

