

F 22A.21

use and maintenance

FROM SERIAL NUMBER *2001*

INDEX

- 1 INDEX
- 2 CLASSIFICATION OF THE CRANE MODEL
 - 2.1 Generality
 - 2.2 Hydraulic jibs (not available)
 - 2.3 Technical data
- 3 CAPACITY PLATES
 - 3.1 Generality
 - 3.2 Capacity plates with load limiting device
 - 3.3 Capacity plates with lifting moment limiting device (optional)
- 4 HYDRAULIC SCHEMATICS (version with load limiting device)
- 5 ELECTRIC SCHEMATICS
- 6 SAFETY NORMS
- 7 WARNING AND INSTRUCTIONS
 - 7.1 Generality
 - 7.2 Before operating
 - 7.3 During operation
 - 7.4 At the end of the operation (Prior to driving the vehicle)
 - 7.5 Residual risks
- 8 IDENTIFICATION OF THE CRANE MODEL
 - 8.1 Generality
 - 8.2 Crane mark
- 9 CRANE NOMENCLATURE
 - 9.1 Version with ground controls for crane and outriggers
- 10 NOMENCLATURE OF THE SAFETY AND PROTECTION DEVICES
 - 10.1 Version with ground controls for crane and outriggers
- 11 SUPPLEMENTARY BEAMS
 - 11.1 Generality
 - 11.2 Identification of the supplementary beams
- 12 TILTABLE OUTRIGGER RAMS
 - 12.1 Manually tiltable outrigger rams
- 13 MANOEUVRES AND CONTROLS TO STABILIZE THE VEHICLE
 - 13.1 Generality
 - 13.2 Standard extendable outrigger supports or, on request extra-extendable outrigger supports
 - 13.3 Super extra-extendable outrigger supports (if fitted)

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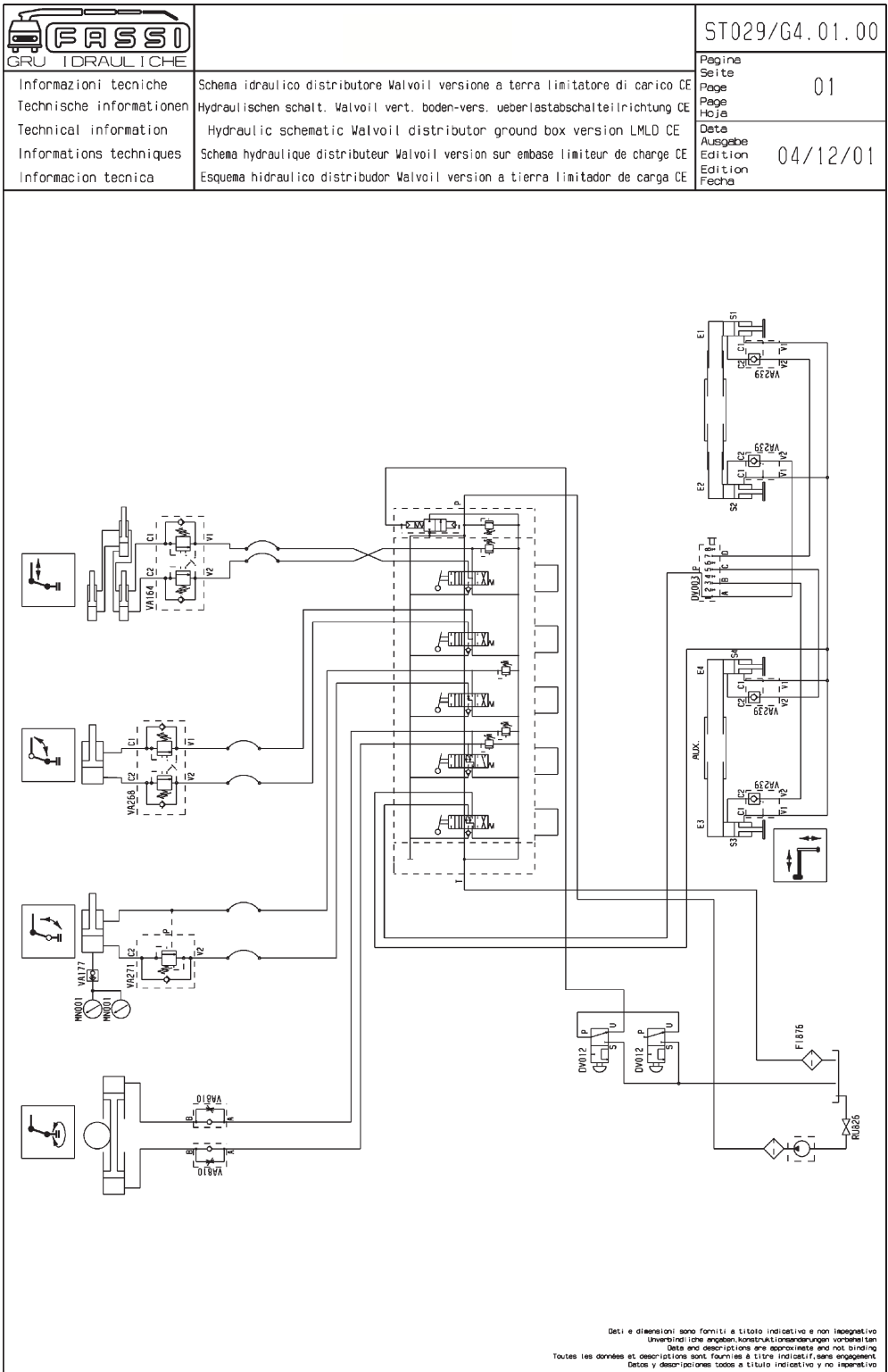


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4 HYDRAULIC SCHEMATICS

Hydraulic schematic for crane - Walvoil distributor - load limiting device - ground controls



CODE	DESCRIPTION
DV003	DEVIATOR
DV012	HYDRAULIC EMERGENCY PUSH BUTTON
FI876	FILTER (RETURN)
MN001	GAUGE QUICK CONNECTION
RU826	FAUCET
VA164	DOUBLE EFFECT BLOCK VALVE
VA177	PARACHUTE VALVE
VA239	SIMPLE EFFECT BLOCK VALVE
VA268	DOUBLE EFFECT BLOCK VALVE
VA271	SIMPLE EFFECT BLOCK VALVE
VA810	OIL FLOW CHECK VALVE

7.5 Residual risks

NOTE: This reasoned list does not carry the complete list of the residual risks, which are examined more in detail paragraph by paragraph in the manual under "**(!) ATTENTION (!)**"; it is instead a way to exemplify to the operator the types of hazards linked to the use of the crane, which basically involves a lifted load in movement. Therefore we confirm you the following

It is absolutely forbidden to use the crane without having read and understood the manual for use and maintenance and without having been previously instructed by experienced personnel on all aspects of safe crane operation.

Risk evaluation shall be followed by adequate provisions in order to avoid risks and damages to people and things.

The crane operator shall be held directly responsible for the correct operation of the crane also according to the jobsite conditions.

Overturn: the crane can overturn, thus hurting people and damaging things specially in following conditions:

- if it is not correctly stabilized
- if the moment limiting device is disabled
- if the ground conditions at the jobsite are not stable enough with respect to the dimensions of the outrigger base and/or of the additional base plate
- if you increase the design dynamic increasing the pump oil flow.

Moment limiting device: never try to bypass nor tamper with the moment limiting device and the various safety systems installed on the crane. In such case the operator shall be held responsible for the subsequent crane performance. It is also important to understand the alarm messages generated by the "moment limiting device" and act consequently.

Control seat: before operating from the control seat the operator shall make sure that he's safe from hazards (i.e. he stands clear of the load, there is a way of escape,..). Otherwise he shall manoeuvre from a different control seat; if there is none available, the crane should be equipped with a radio control or remote control in order to allow the operator to operate the crane in absolute safety.

From the control seat the operator shall be able to visually inspect the whole working area at all times. If it is not possible he shall team up with a co-worker able to control the whole area; otherwise the crane shall be equipped with a radio control in order to ensure the operator with the perfect position to see all potential hazards clearly at all times. Naturally the operator shall also teach this eventually co-worker with the scope of not harm each other with control commands.

Load rigging: carefully inspect the load rigging; the operator shall make sure that the load is properly attached and balanced and that all unexpected movements are not allowed. Be careful not to hit any potential impediments during the crane movements.

Jobsite conditions: prior to use always ascertain that the working area is free and clear of potential obstacles to crane operations (people, building walls, balconies, eaves, scaffoldings, tree branches, other lifting means or machines, electric lines,...). This may hurt people, damage both the impediments and the crane, and provoke also the crane overturn.

Make sure that there is no risk of elements falling on the operator or on the crane and take the right precautions to prevent it.

Overload and/or fatigue: the crane can break down due to fatigue or overload:

- If it is misused (with cycles, loads or pump oil flow not pertinent to the crane class)
- If it is used for improper tasks (side, oblique or reversal pull)
- If it is used in poor jobsites (corrosive environment, too high or too low temperature, foundry,... [see conditions of use])
- If the load exceeds the rated capacity indicated on the relevant plates

13.2 Standard extendable outrigger supports or, on request extra-extendable outrigger supports

Manoeuvres for the manual extension of the outrigger supports

(!) ATTENTION (!)

To manoeuvre the supports hands must only grab the handles placed on the outrigger rams.

(Note: the pictures are related to the distributor side)

- Position the lever **B** of the locking device (fig. 8), placed on the base, upwards (fig. 8a); the spring loaded security pin of the device will be released from its position.

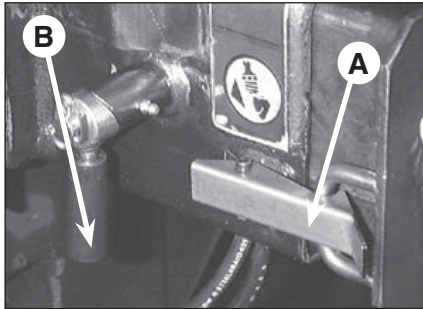


fig. 8

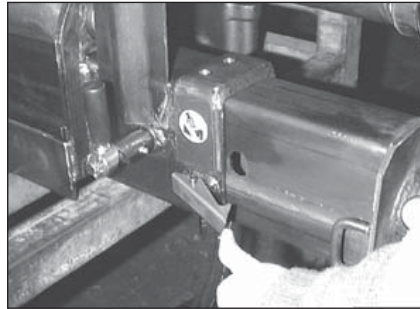


fig. 8a

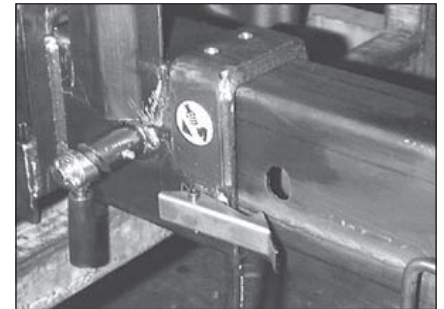


fig. 8b

- Release the locking device (fig. 8a) bringing it to the outside of the hook spring **A** and simultaneously pull, extending from the base the outrigger support.
- Position the lever **B** (fig. 8b) downwards; the locking loaded security device remains released.
- Pull, extending the outrigger support till the coupling of the pin.
- By the same sequence, repeat the operations described to extend the other support.

(!) ATTENTION (!)

The complete extension of the outrigger support is visually indicated by the yellow triangle which is found at the end of the beam. (fig. 8c)

Always check that the outriggers supports, once in their rest position, are locked in their seat by the locking devices (spring loaded security pin); this will ensure complete extension of the outrigger support (essential for the stability of the complete crane vehicle unit) and the impossibility of accidental movement.

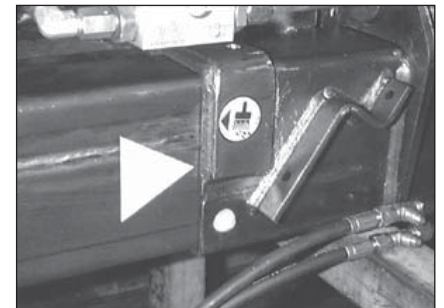


fig. 8c

Manoeuvres for the re-entry of the outrigger supports

NOTE Crane with extra-extension outriggers, first you must re-enter the support placed on the distributor side.

- Position the lever **B** (fig. 9) upwards; the spring loaded security pin of the device will be released from its position.
- Re-enter the second outrigger support halfway.
- Position the lever **B** downwards; the spring loaded security pin remains released. (Fig. 9b)
- Push, by re-entering, the outrigger support till the coupling of the locking devices and stops.
- By the same sequence, repeat the operations described to re-enter the other support.

(!) WARNING (!)

Keep hands clear of automatic stop device (hook-spring-A).

Always check that the outriggers supports, once in their rest position, are locked in their seat by the locking devices, so as to assure the impossibility of accidental movement.

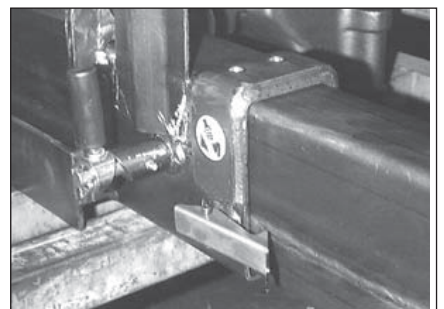


fig. 9

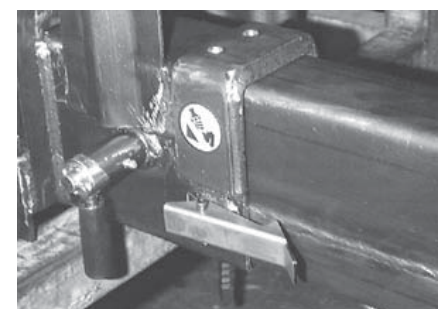


fig. 9b

14.6 Indicator of inner boom horizontal position (on request)

The column is fitted with a device that informs the driver through a sound/light signal in the cab, that the inner boom max position allowed during transport on road has been exceeded.

14.7 Stand-up control station

This special fitting allows the operator to use the crane controls whilst standing in a higher position, in order to have good vision of the working area.

The stand-up control station is constructed with a platform fixed on to the base of the crane and with a control panel. The control point allows the manual operation of the crane controls through remote control cables or rigid rods.

On the control panel, further to the control levers and to the plates, we can find the supplementary electric control panel (fig. 15 pos. 1).

Controls to operate the crane.

See paragraph 14 of the USE AND MAINTENANCE MANUAL for details of "Controls to operate the crane"

See paragraphs 16 of the USE AND MAINTENANCE MANUAL for details of "Lifting moment limiting device"

The operator's presence in the stand-up control station activates photocell L (fig. 15) that automatically prevents the crane from rotating above the station and activates the flashing of the green light in the different control panels near the plate DE5775 (fig. 16b).

(!) ATENTION (!)

Before accessing the stand-up control station make sure that the photocell L pilot-light (fig. 15) is turned on and green; then check its correct functioning: if put your hand in front of the photocell the pilot-light shall turn yellow (thus enabling the limitation of the rotation path). Besides, when entering the stand-up control station, before starting the crane operation, check that the limitation of the rotation path is active, see the flashing of the green light.

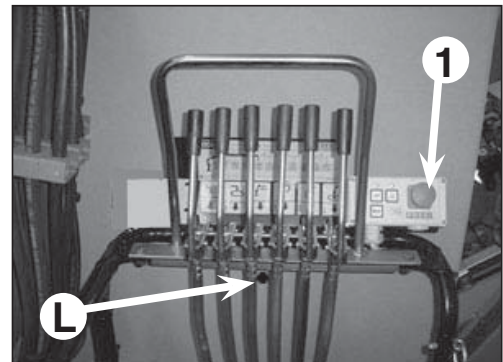


fig. 15

Always use the ladder fitted by the installer to gain access to the control station; the side of the access to the platform is protected by chain link, always replace the chain onto the structure of the platform after climbing up.

(!) ATTENTION (!)**Activation of the exclusion device of the lifting moment limiting device.**

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, who is the main responsible for the machine safety, must:

- carefully consider the manoeuvres required to return to normal working conditions: it is however compulsory to effect the re-entry of the extension booms at first,
- 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.

16.5 Lifting moment limiting device for two working sectors

In case of one sector of the working area with reduced stability of the vehicle (e.g. sector in front of vehicle cab) the limiting device can be provided with a special function which allows to operate with a reduction 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.

(!) ATTENTION (!)

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:

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

The following manoeuvres are allowed:

- the opposite rotation
- the manoeuvres allowed by the limiting device in relation to the position of the outer boom (positioned over or under the horizontal line).

16.6 Rotation limiting device

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 only allows operation within the safe area. (Warning: persist in the operation!)

When exceeding the "safe area" the rotation limiting device only allowing:

- the opposite rotation
- the manoeuvres allowed by the limiting device in relation to the position of the outer boom (positioned over or under the horizontal line).

3. Message "M1 - M2 - M3" (fig. 3)

After having pressed the above mentioned keys, the message illustrated in GR2_45»65_3_4_5_SE Fig. 3 will be displayed.



fig. 3



fig. 3

At this point, through the "+" button, select the correct number of the manual extension at the moment in use (M stands for manual and 1, 2 and 3 indicate the number of the manual extensions). Select the number of the manual extension you want; that number starts blinking. You can select only the manual extensions that have been installed: i.e. if only one manual extension is installed, by pressing the "+" key, only the M1 extension will start flashing. To confirm your choice, press once the "F1" key (control panel) or "ENTER" (radio-remote control); you'll access the section dedicated to the system configuration.

4. Message "K1 - K2 - K3 - K4" (fig. 4)

[paragraph to read only in case of manual extensions installed on Jib and not on Crane]



fig. 4



fig. 4

If you press the "ENTER" key with the manual extensions mounted on the jib, the screen of Fig. 4 will be displayed.

Therefore we can choose the most convenient configuration among the following:

- K1 Outer booms of the crane totally re-entered and jib extensions as you like
- K2 Outer booms of the crane as you like and jib extensions totally re-entered
- K3 Outer booms of the crane totally extended and jib extensions as you like
- K4 Outer booms of the crane as you like and jib extensions totally extended

Select the desired configuration using the * button to move among the various options. Confirm your selection by pressing the "F1" (control panel) or "ENTER" (radio-remote control) key. If the hydraulic jib boom is not at its stroke end, the message at point 3 will be displayed; otherwise the message "F1 TO START" is visualised.

5. Message "FC P2" (fig. 5)

Note: do not hang any load on the hook.

This means that the outer ram must be positioned at its stroke end (if it is already in that position this message won't appear), using the lever until the next screen is displayed.



fig. 5



fig. 5

21.3 Generality (version with load limiting device)

The winch is made of a drum that can rotate by means of a hydraulic motor, on a structure fixed on the crane. The rotation of the drum on which the cable winds is achieved by a hydraulic motor controlled by a safety check valve connected to the crane circuit. A parking brake integrated to the motoreducer group hold the load in position when the winch control lever is in neutral position.

Nomenclature of winch unit (Fig. 23)

Pos.	Description
1.	Winch
2.	Cable
3.	Fixed pulley
4.	Balance weight
5.	Hook
6.	Transmission pulley
7.	Block (double-triple.... line)

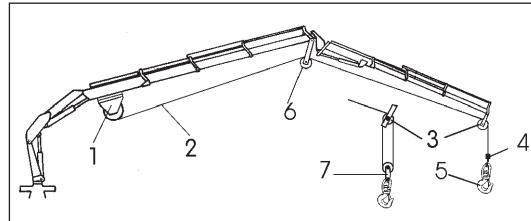


Fig. 23

(!) ATTENTION (!)

Check the condition of wire rope.

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

Do not rotate the crane before the load is lifted. Lift the load vertically using the cable and not the boom in order to avoid swinging the load. With the suspended load rotate slowly and with care checking the stability of the vehicle.

21.4 Winch for crane

The identification data and the essential characteristics are marked on a plate fixed by the manufacturer.

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

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

The winch has a maximum capacity (which cannot be exceeded), 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 capacity plate of the crane with the winch.

Note: We do not recommend using the winch with load moving (winch in or out) at the same time as the extension booms or the crane and hydraulic jib (if fitted), since it accelerates the wear of the extension guide pads reducing their life to one third compared to a standard application.

The cranes with winch feature a sensor that deactivates the exit of the extension boom sections when the load on the winch exceeds the nominal load by 20%. There is no other control on the maximum load lifting which is therefore limited only by the lifting limit of the winch itself. In order not to overload the winch, it is therefore forbidden to lift a load attached to the winch cable using the crane rams when the load exceeds the values indicated on the capacity plate of the crane with winch.

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