



FASSI CRANE



F1000A/F1100AXP.28

use and maintenance

FROM SERIAL NUMBER *1119*

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FASSI CRANE

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Use and maintenance ORIGINAL INSTRUCTIONS

THANK YOU FOR SELECTING ONE OF FASSI CRANES.

This crane is the result of **FASSI** philosophy: ongoing research, rigorous testing, data verification, and analysis of performances.

Many years of experience has allowed us to grant you the maximum safety of operation together with the optimization of machine performances.

All this represents the core of **FASSI quality system**.

**FASSI quality system is in conformity with
UNI EN ISO 9001:2000 (ISO 9001:2000)**

FASSI cranes conform with the European Norm EN12999

The fitting of the crane on the vehicle must be carried out in accordance with the instructions given by **FASSI** in the manual for hydraulic crane fitting and the relevant chassis manufacturers directives.

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.

Be sure that the unit has been installed, inspected and tested in accordance with the local legal requirements.

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

The following instructions refer to mobile cranes in general and must be integrated with the manual for use supplied by the centre responsible for the crane fitting on truck, vehicle or other type of structure.

Some of the options described in the use and maintenance manual are available only on request; therefore they may not be on your crane.

READ THIS MANUAL CAREFULLY prior to use or any maintenance. A few minutes spent now could save time and labour later.

Always conform to the safety norms and the instructions for use and maintenance contained in the present manual in order to guarantee a long life to the crane.

NOTE

The original version of the present manual is in italian.

The spare parts catalogue for the crane can be viewed in the Internet site: www.fassicat.com

FASSI



2 CLASSIFICATION OF THE CRANE MODEL

2.1 Generality

The design of this crane has been carried out in respect of fatigue test classification **H1B3 of the EN12999 norm**. 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.

2.2 Hydraulic jibs

Hydraulic jibs									
Extension type Weight=kg		Manual Weight=kg	Manual Weight=kg		Manual Weight=kg		Manual Weight=kg		
L414	850	-----	PL41	31	QL41	21	-----		
L425	1050	QL42 55	RL42	36	SL42	25	-----		
L426	1200	-----	RL42	36	SL42	25	TL42	15	
L516	1400	-----	RL51	36	SL51	25	TL51	15	
L616	1420	-----	RL61	36	SL61	25	TL61	16	

2.3 Technical data

F 1000A/1100AXP.28

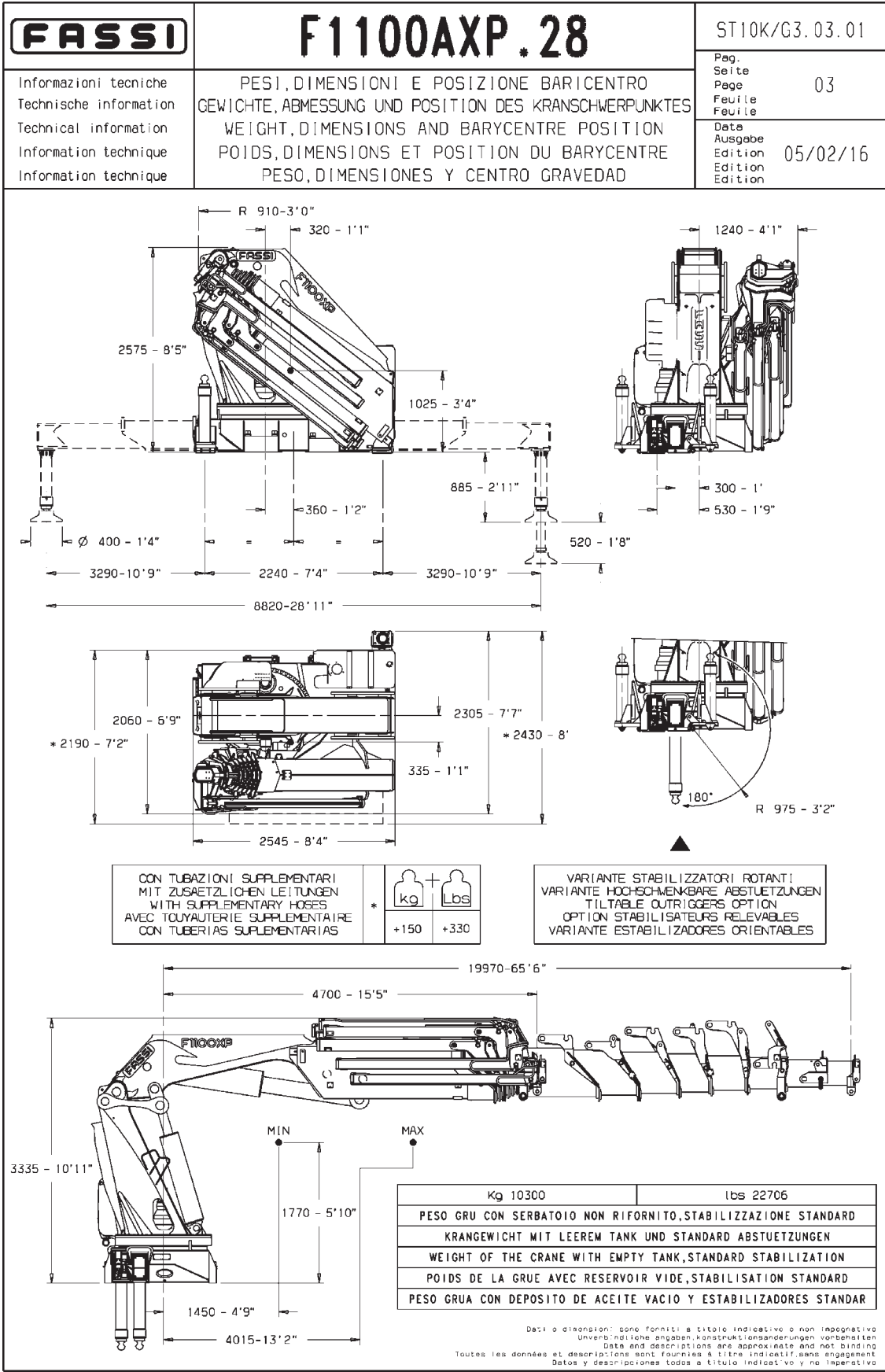
Lifting capacity	Standard reach	Hydraulic extension	Rotation arc	Rotation torque	Working pressure	Pump capacity	Oil tank capacity	Crane weight	Max. working pressure on the outrigger (Φ 400)
78,0 / 85,8 tm 764,92 kNm / 841,41 kNm	20,00 m	15,25 m	360° continuous	10,20 tm 100 kNm	31,0 / 33,5 MPa	90+110 l/min	265 l	9600 kg	21,7 / 23,0 daN/cm ²

FASSI	F1100AXP	ST10K/G3.05.00
Informazioni tecniche Technische Informationen Technical information Informations techniques Información técnica	MASSIMA ALTEZZA SOTTOGANCIO MAXIMALHOEHE BIS KRANHAKEN MAXIMUM HEIGHT UNDER HOOK HAUTEUR MAXIMUM SOUS CROCHET MAXIMA ALTURA BAJO GANCHO	Pagina Seite Page Página Data Ausgabe Edition Fecha 05/02/16

GANCIO	HAKENHÖHE	HOOK	CROCHÉT	GANCHO
630-2'-1"	1030-3'-4"			

	X	Y	X	Y	X	Y	X1	Y1	Y2	Y3	X4	Y4	BGC	BGA
.24		2465 8'1"		2930 9'7"			2005 6'7"	4105 13'5"	5655 18'8"	2960 9'6"	4420 14'5"	1315 4'3"	1150 3'9"	2120 6'11"
.26	1000 3'3"	2340 7'8"	1500 4'11"	2770 9'1"	2000 6'7"	3625 11'10"	2115 6'11"	4145 13'7"	5760 18'11"	2970 9'9"	4530 14'10"	1355 4'5"	1335 4'4"	3145 10'3"
.28		1740 5'8"		2125 6'11"		2795 9'2"	2290 7'6"	3800 12'5"	5760 18'11"	2970 9'9"	4705 15'5"	1010 3'3"	1450 4'9"	4020 13'2"

CALL A RIMBORSO NOME PER IL VOSTRO CONCESSIONARIO PIÙ VICINO
PHOTOGRAPHED BY THE AUTHOR AND REPRODUCED BY THE AUTHOR
Tous les droits de reproduction et de distribution sont réservés à l'auteur





3 CAPACITY PLATES

3.1 Generality

The represented plates refer to the nominal design capacities.

(!) WARNING (!)

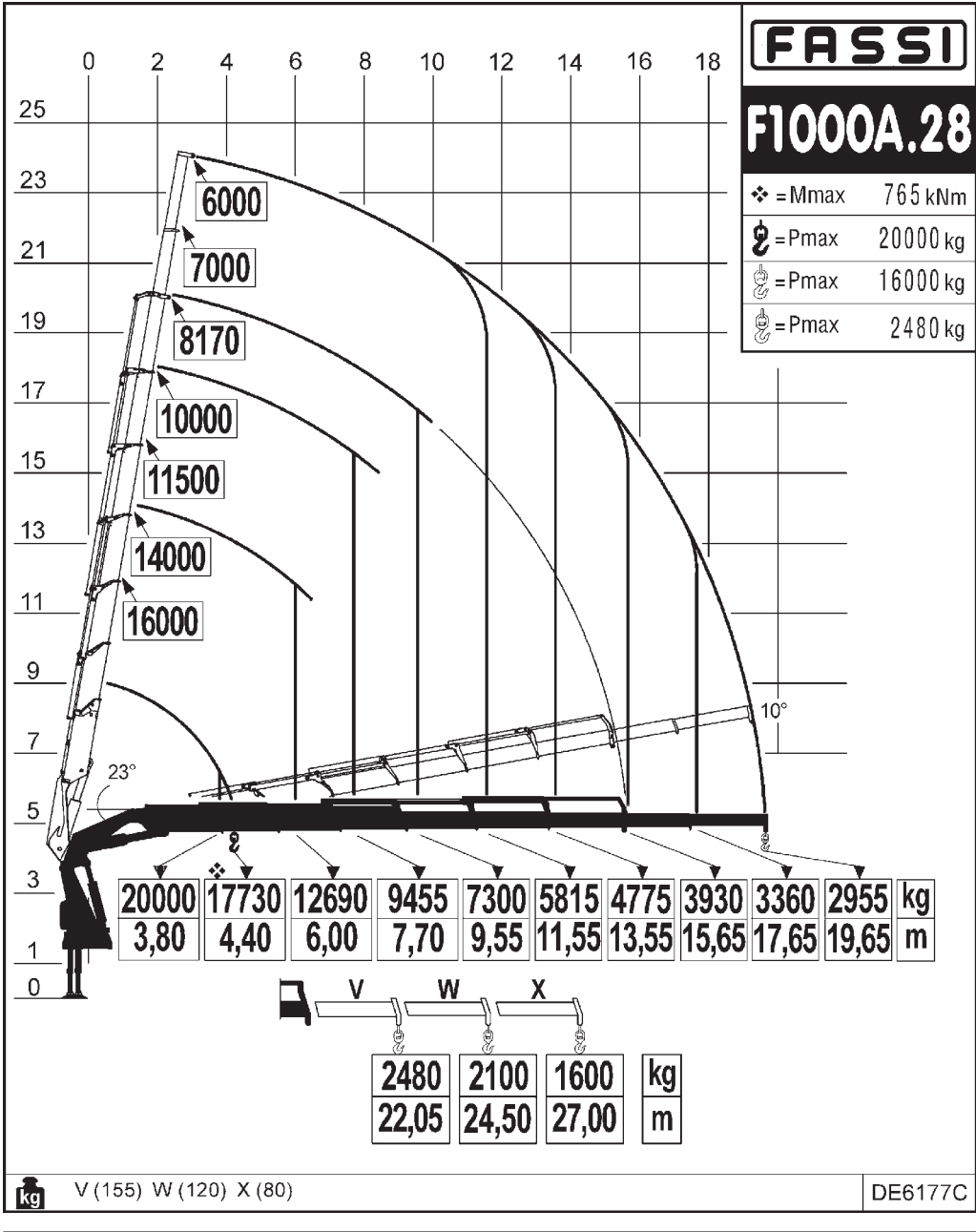
If the capacities are downgraded or partially reduced (e.g. sector in front of vehicle cab) capacity plates must be applied in line with the final test figures.

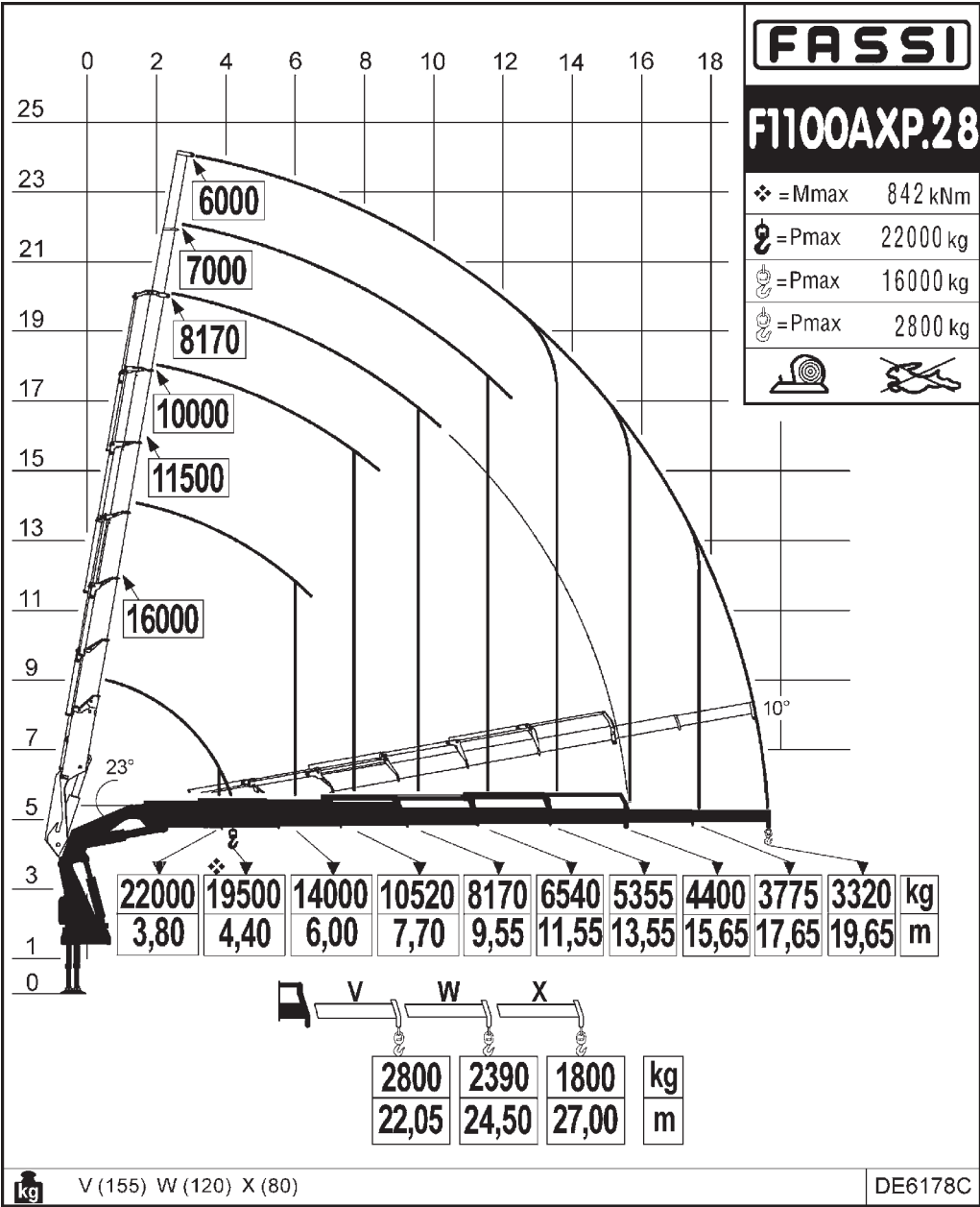
(!) WARNING (!)

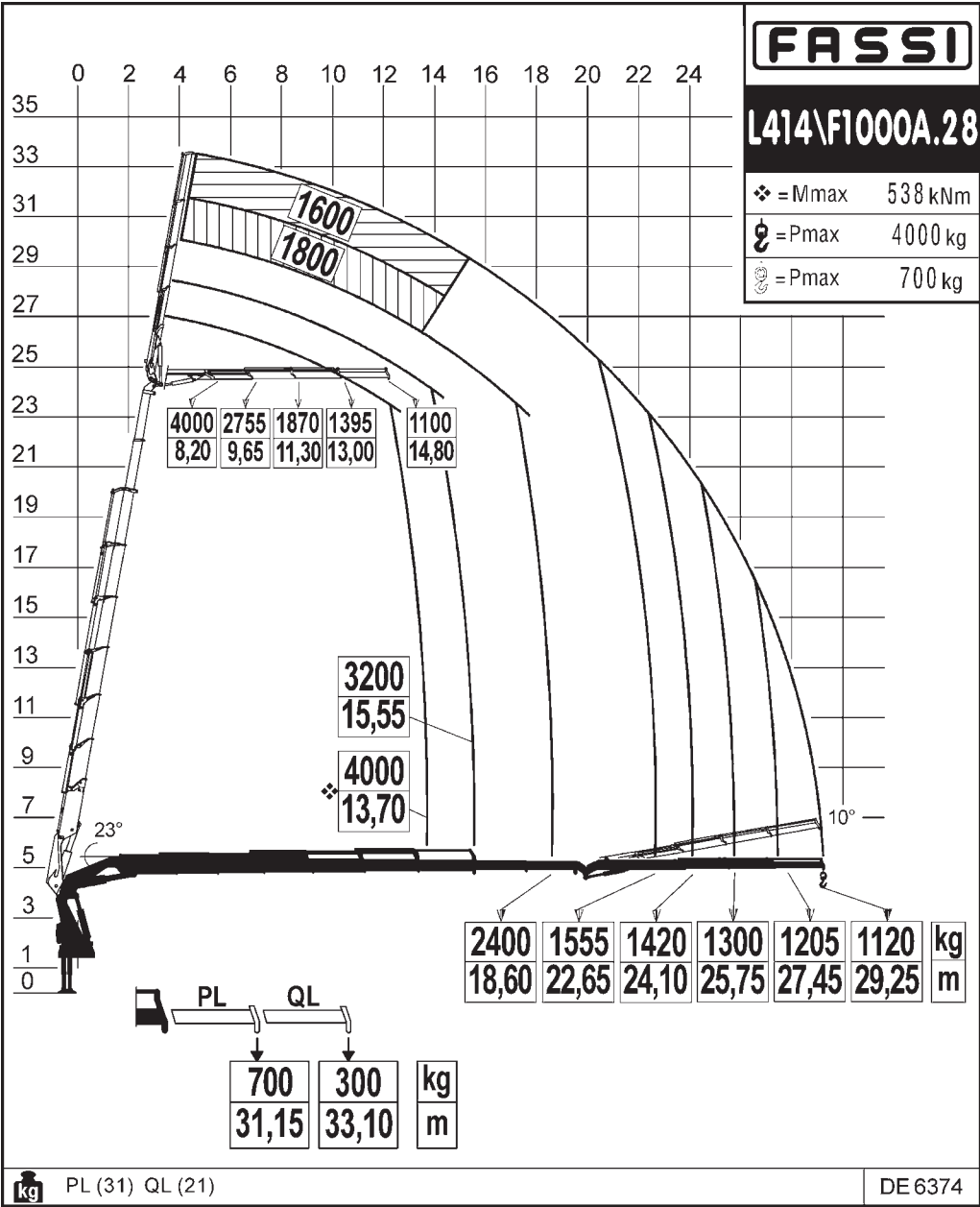
Some cranes with more than 6 extensions have two hooks :

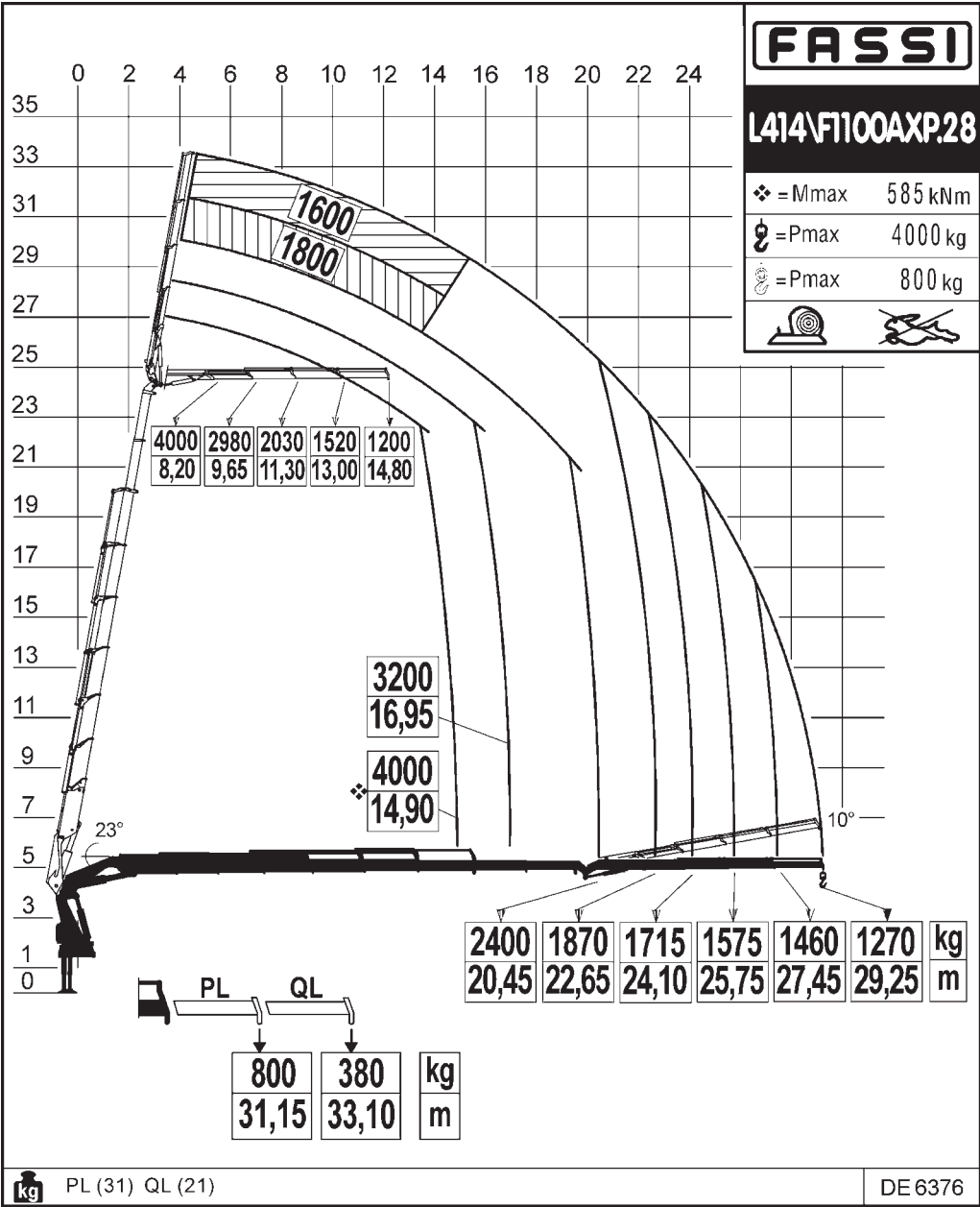
- the first hook () has to be positioned on the hook connection of the sixth hydraulic extension and it has to be used for the greatest loads, represented on the plate with the black hook.
- the second hook () has to be positioned on the hook connection of the last hydraulic extension and it has to be used for the other loads, represented on the plate with the white hook.

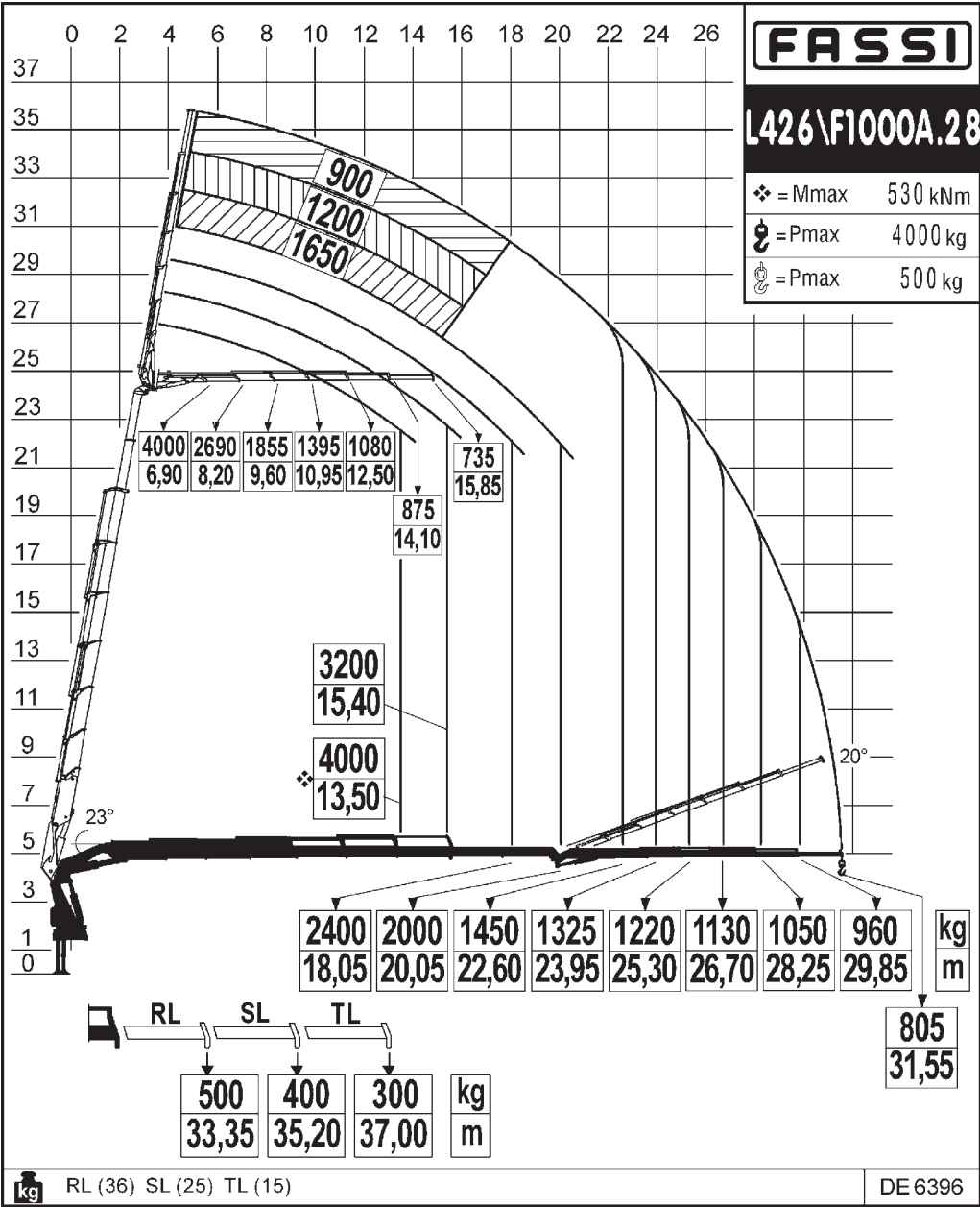
3.2 Capacity plates with lifting moment limiting device

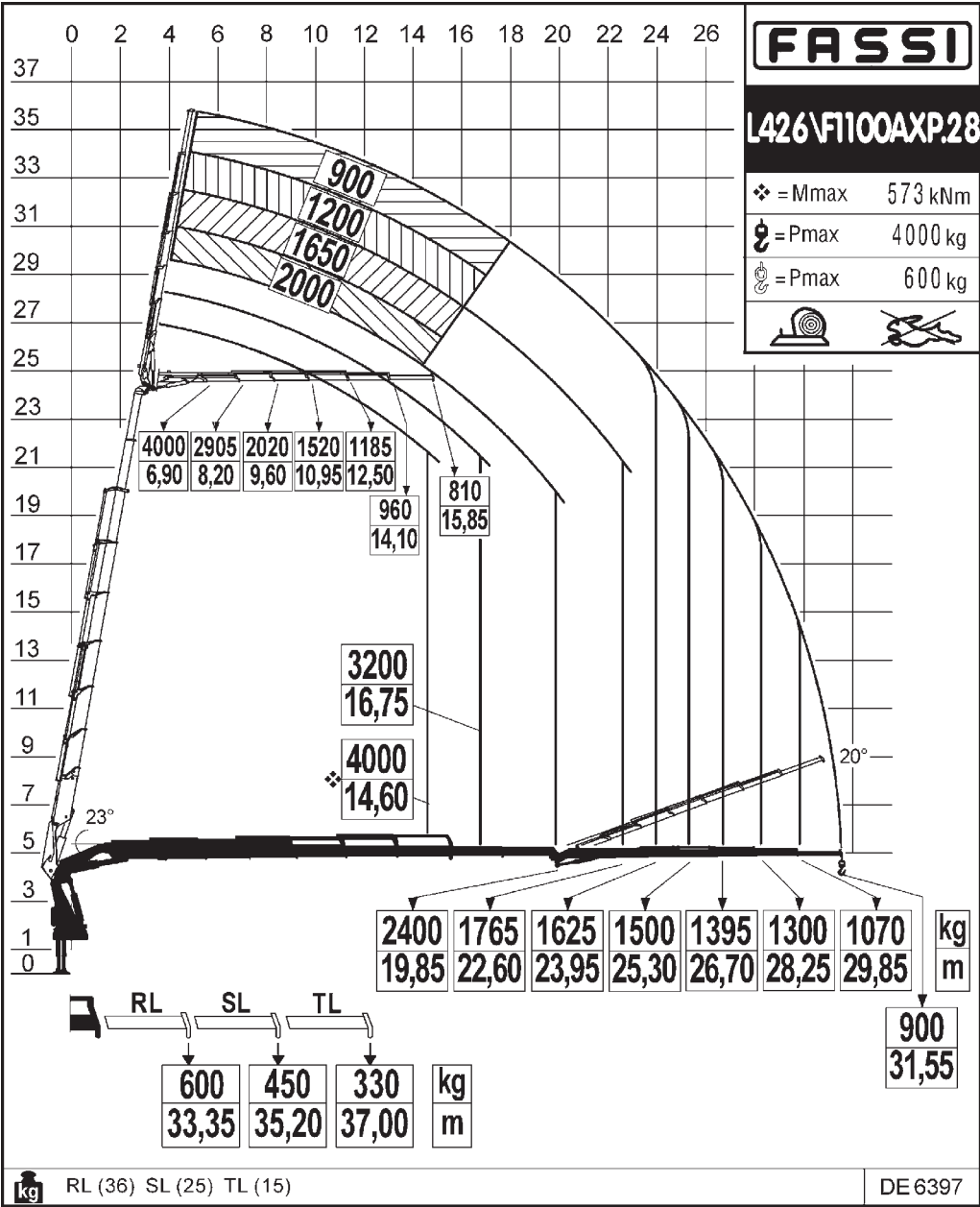


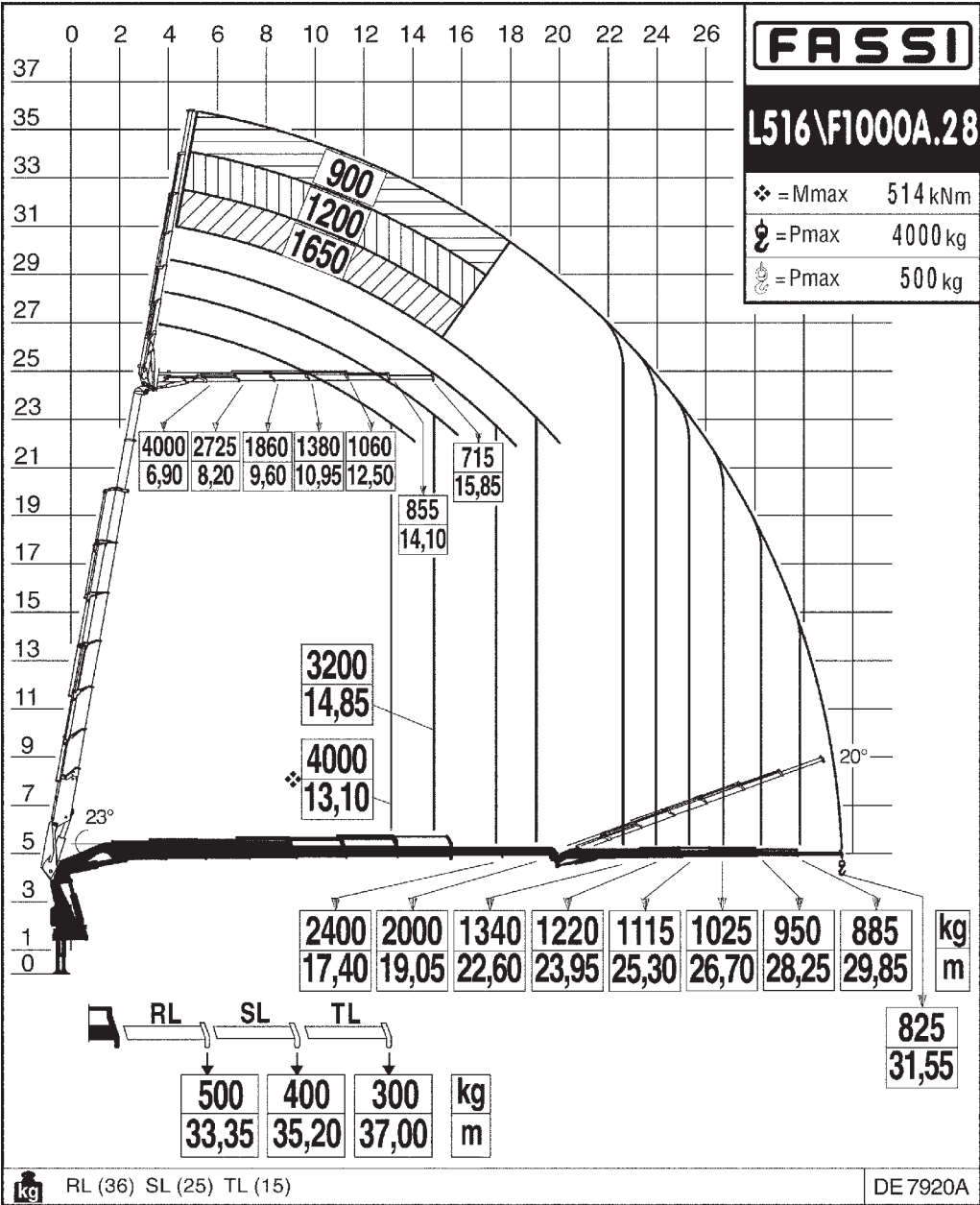


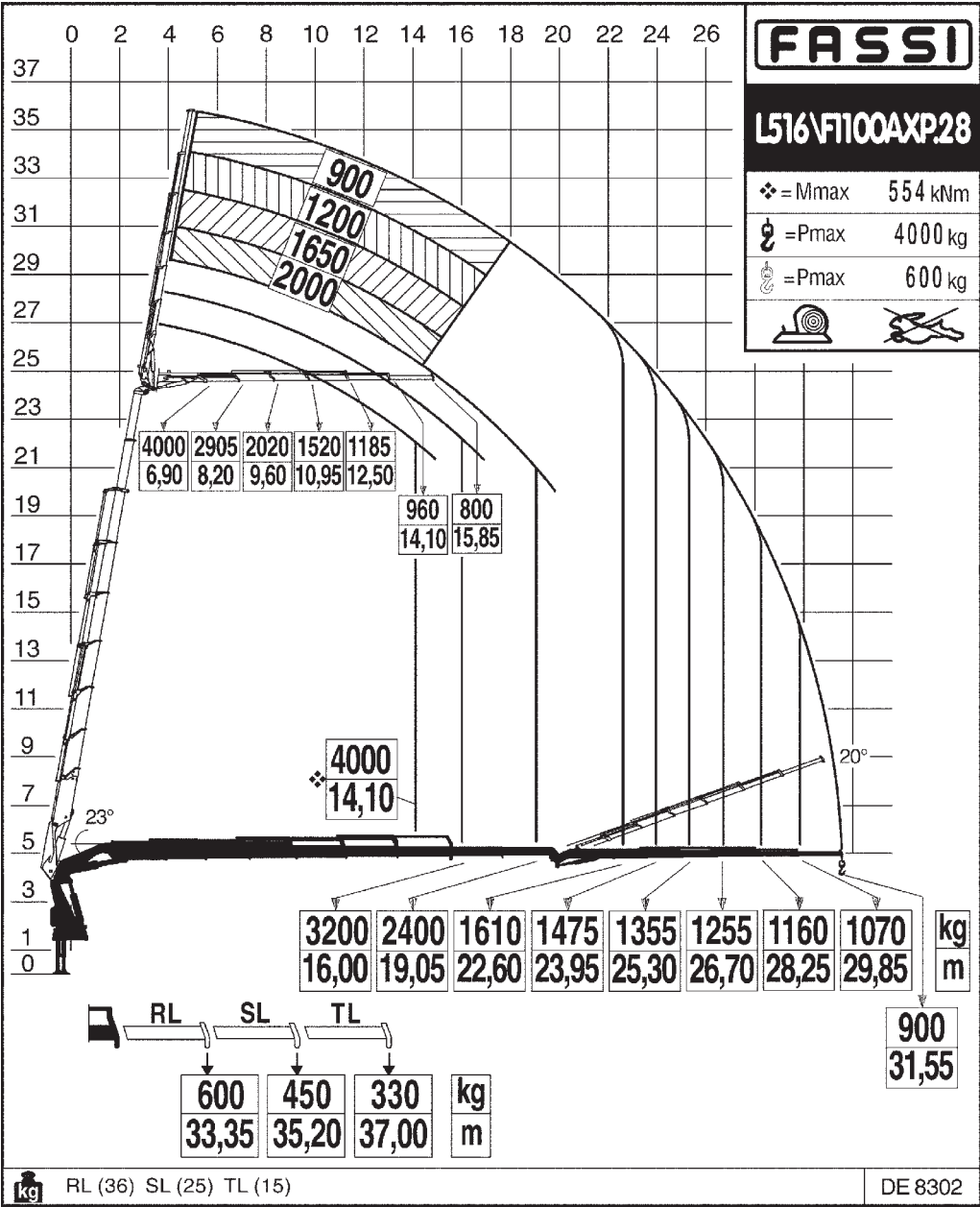


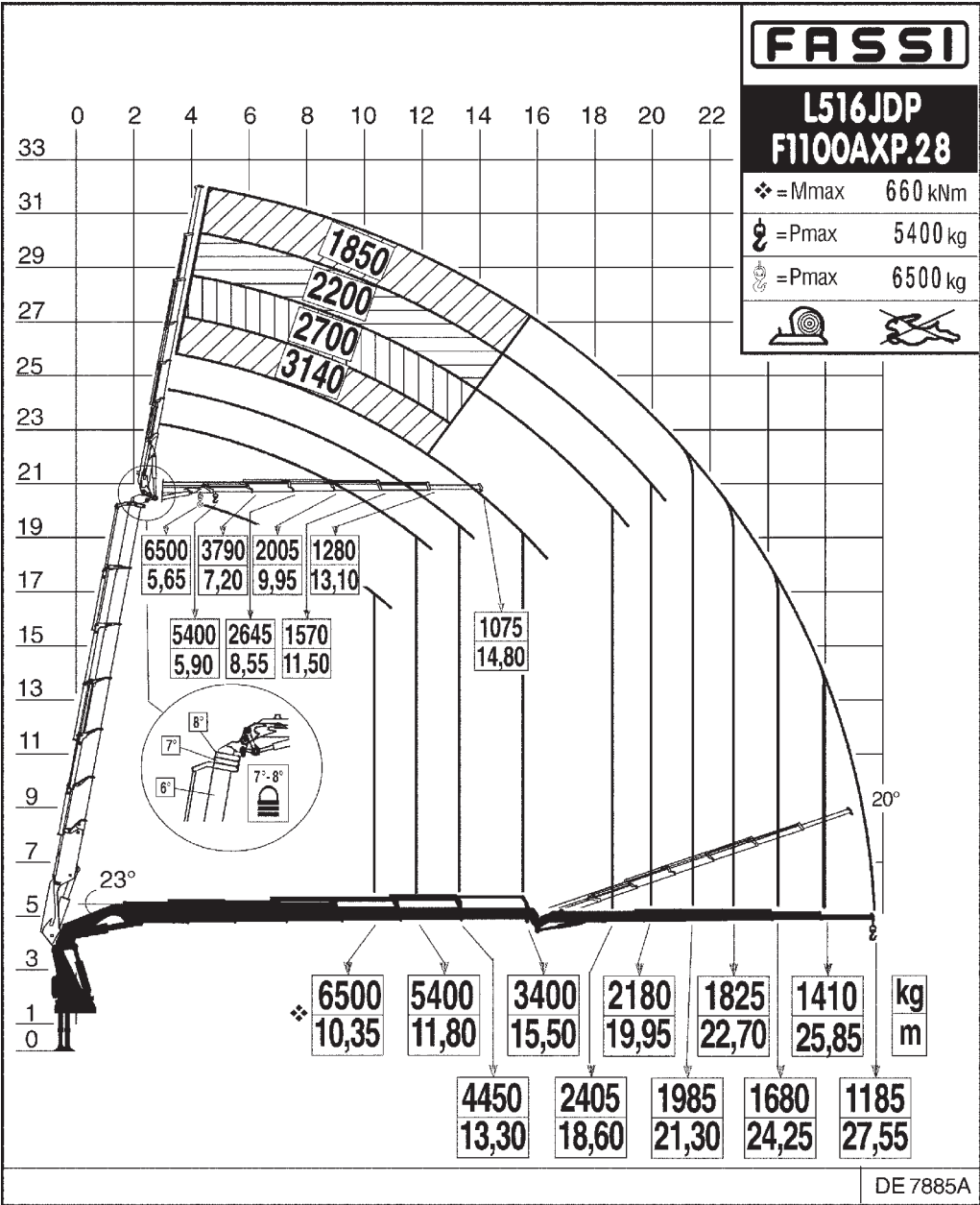


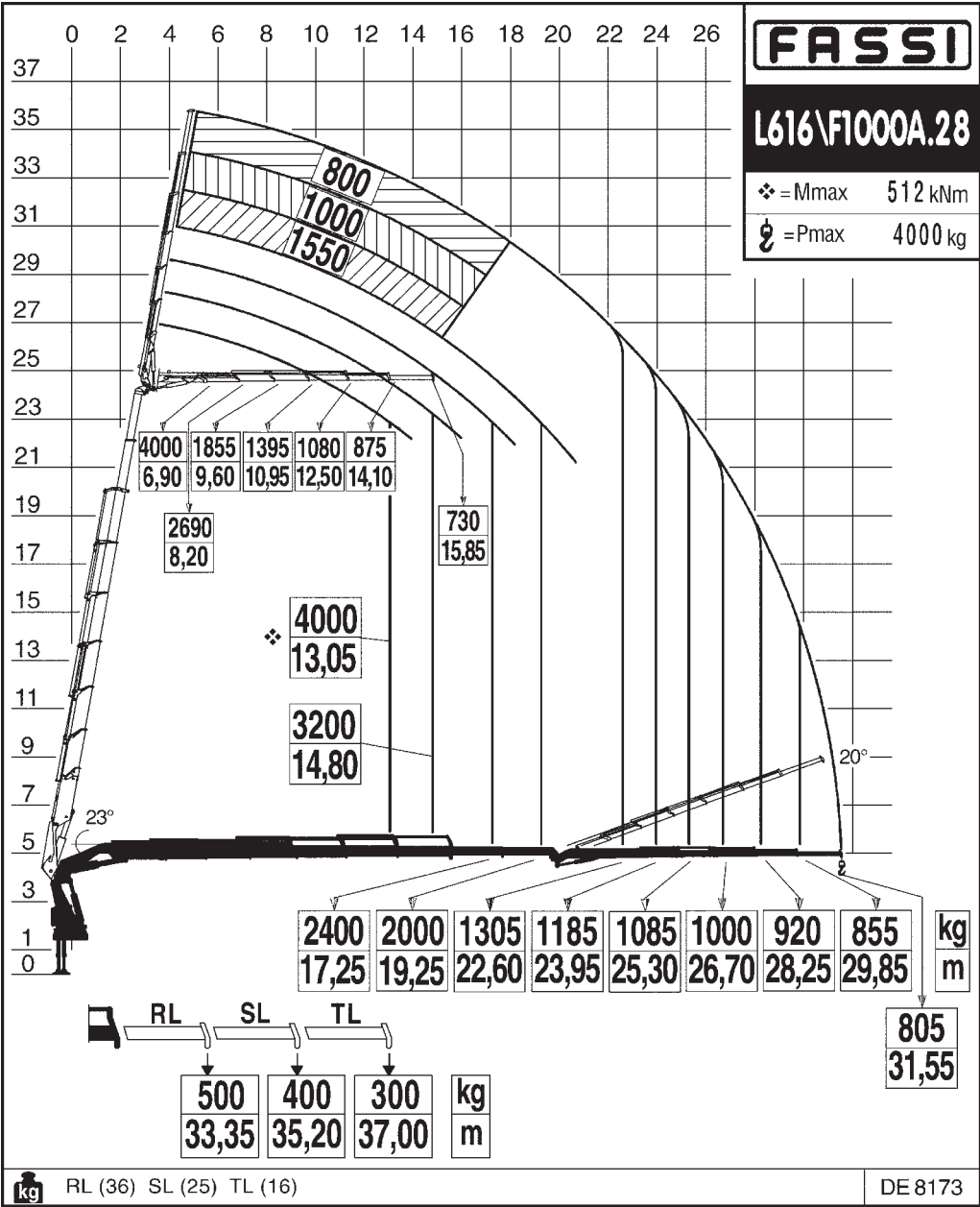


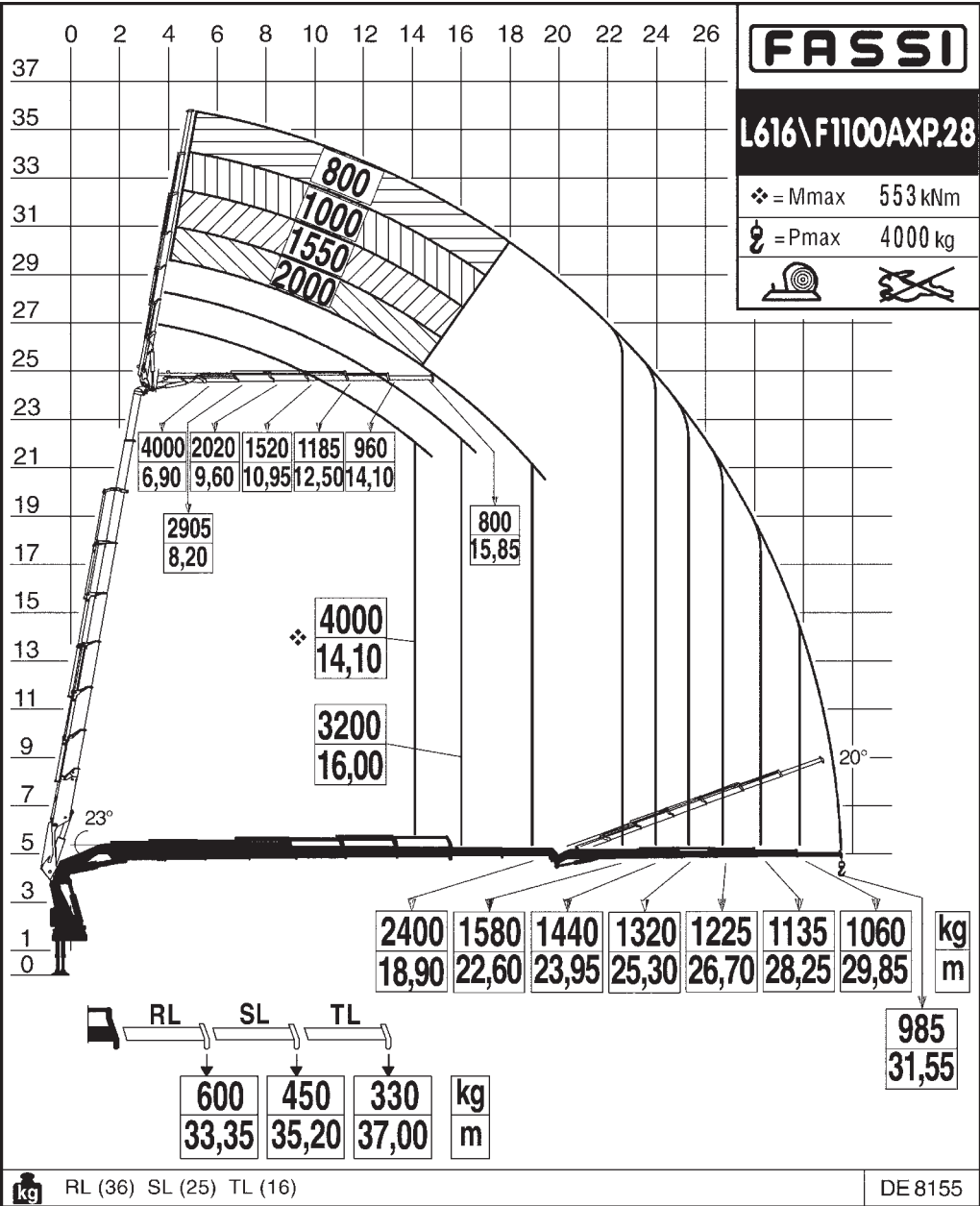


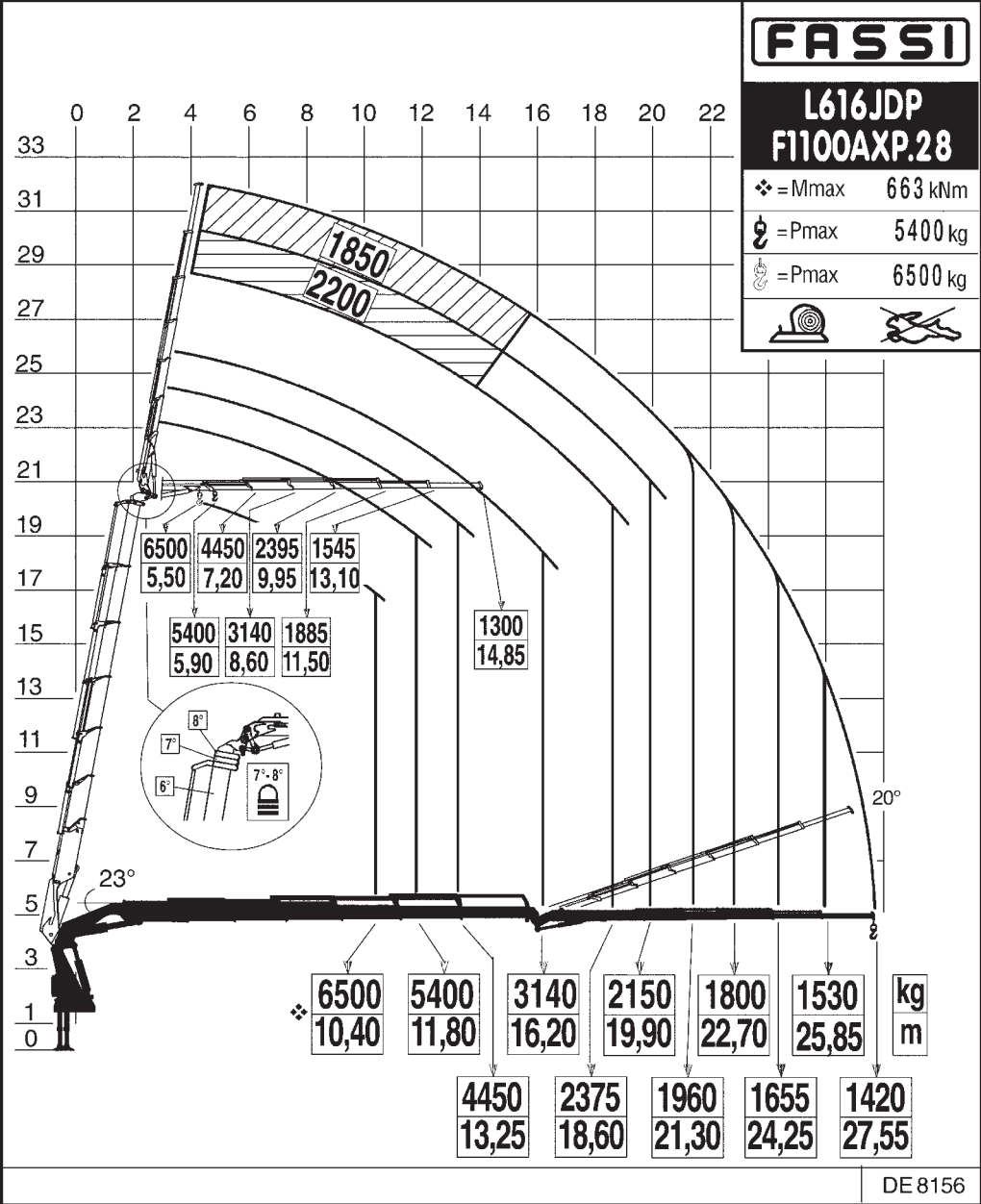


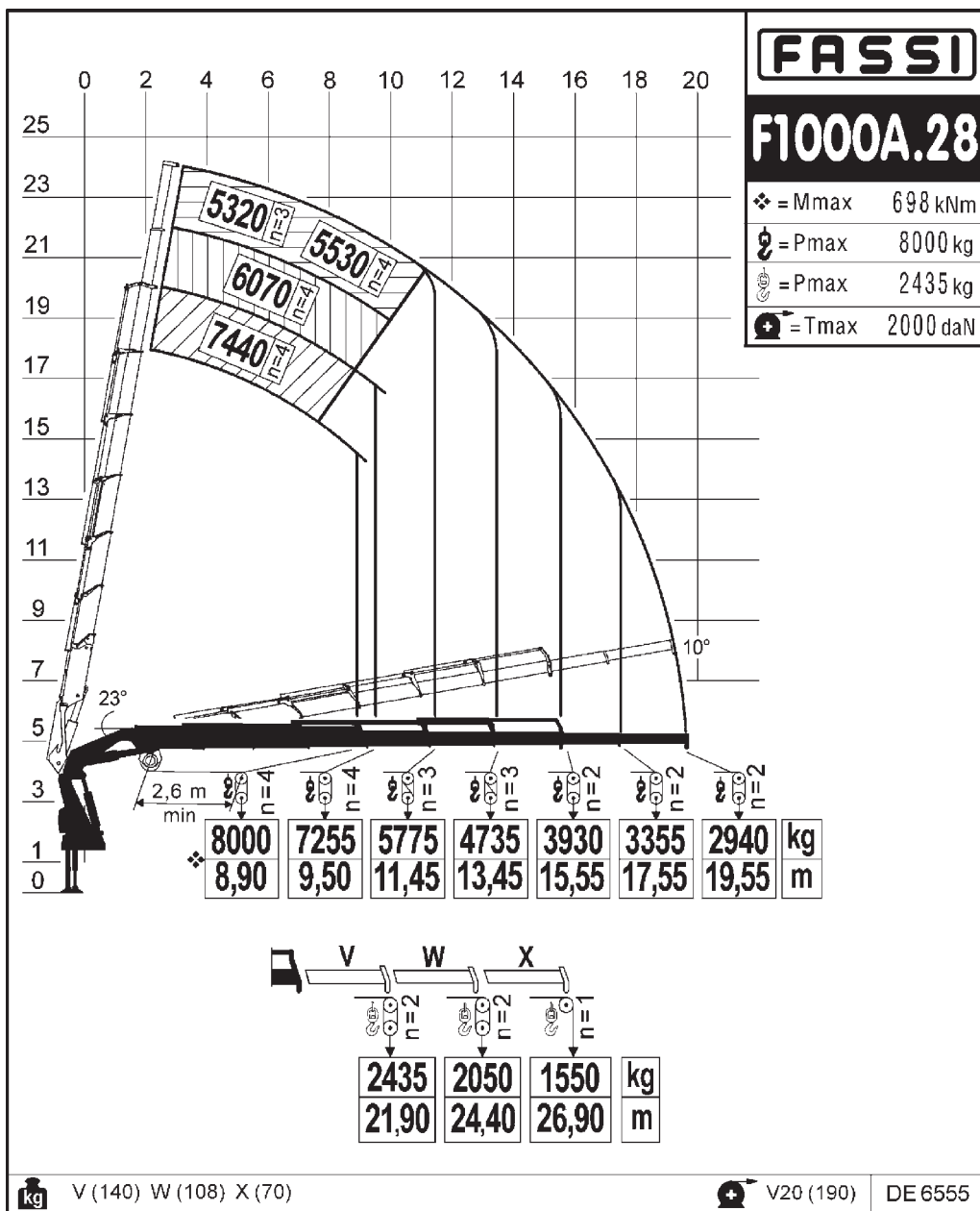


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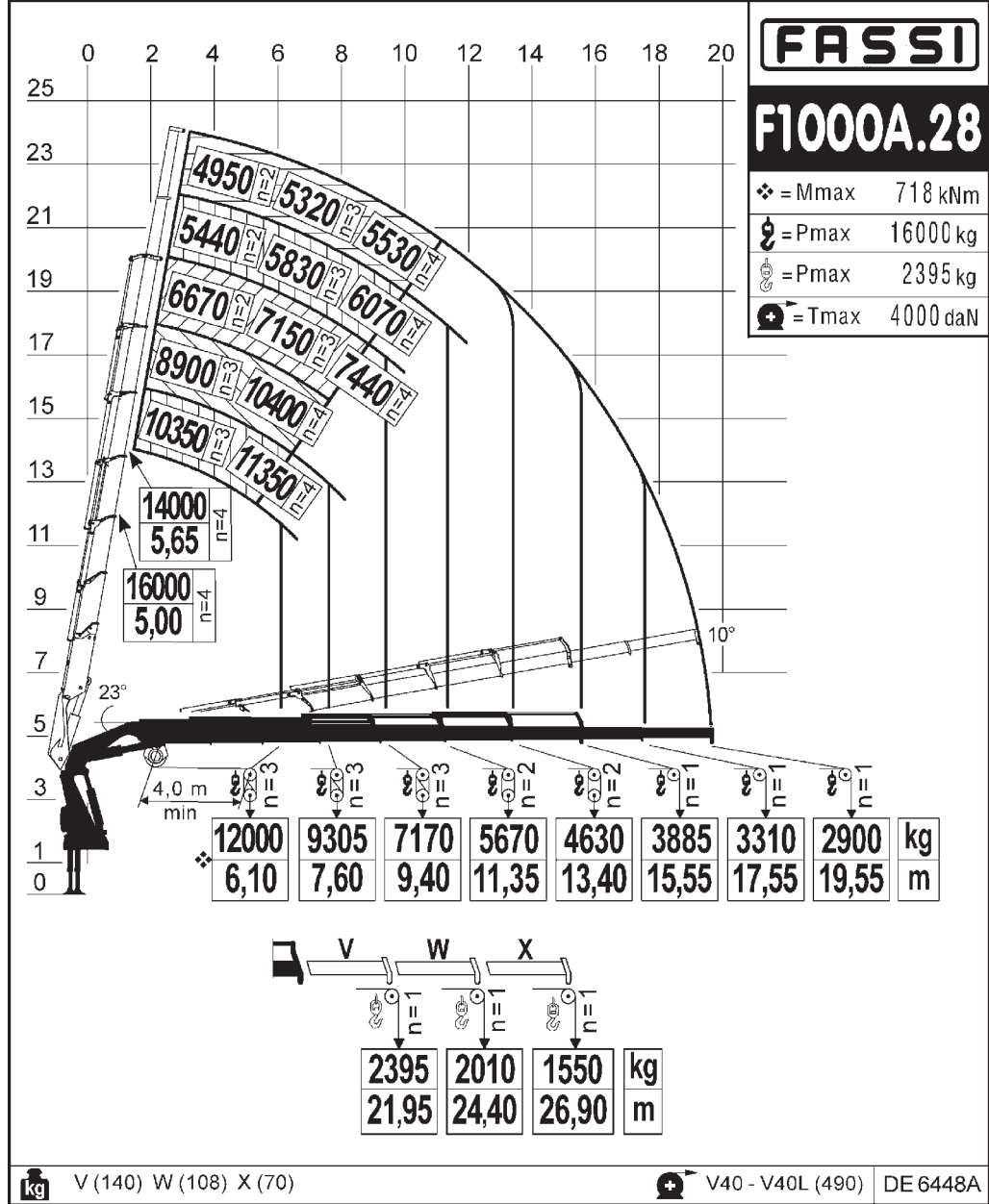


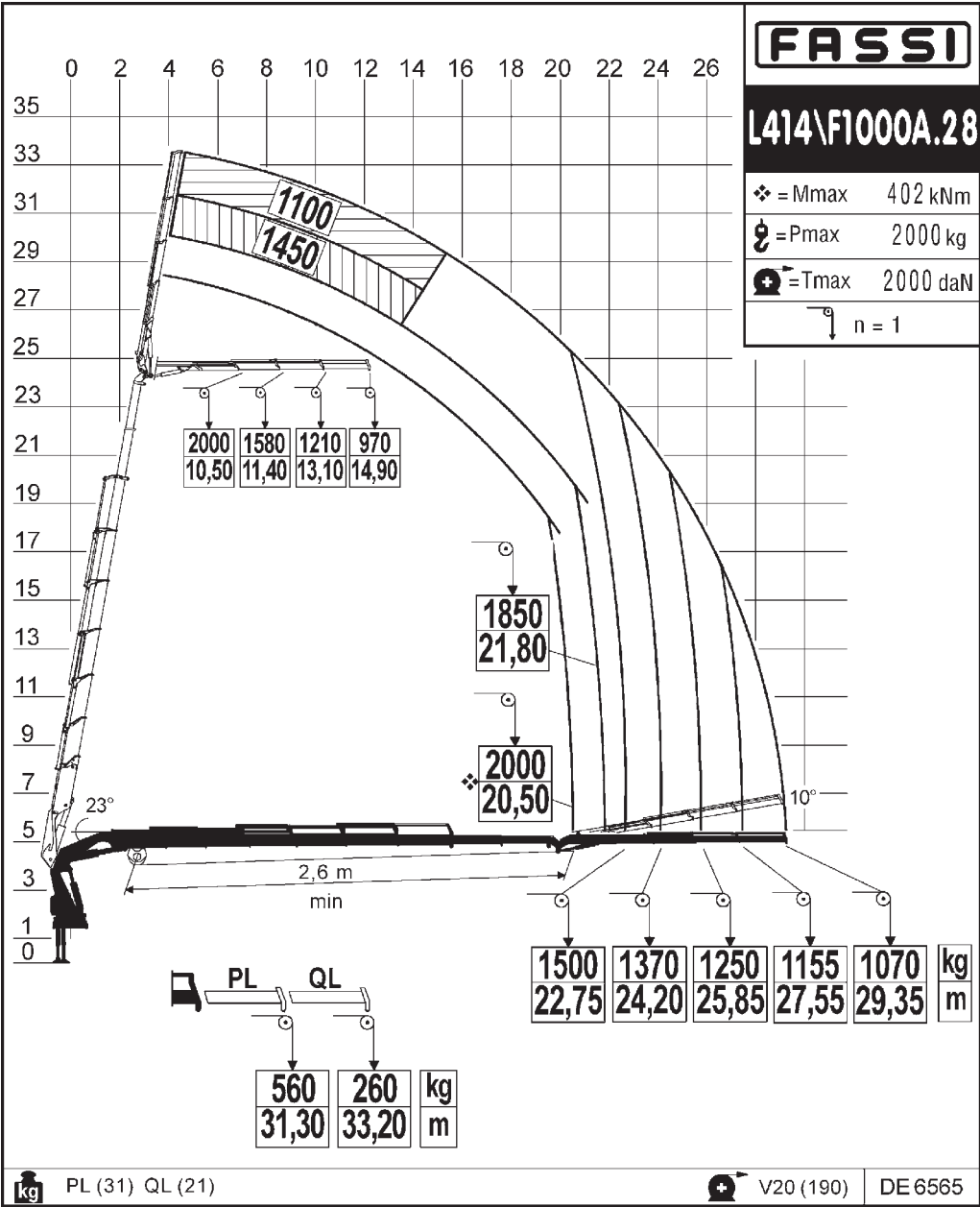


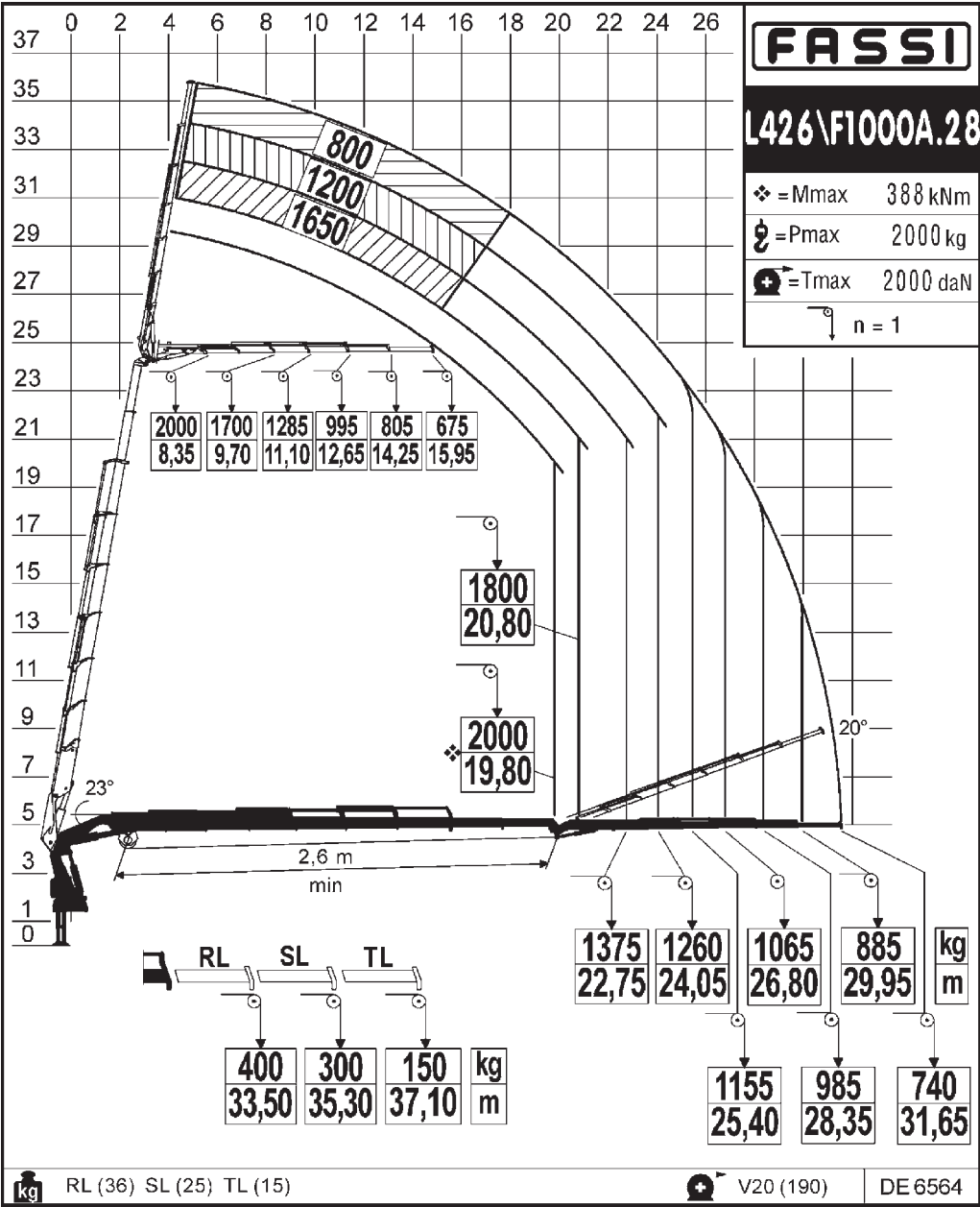


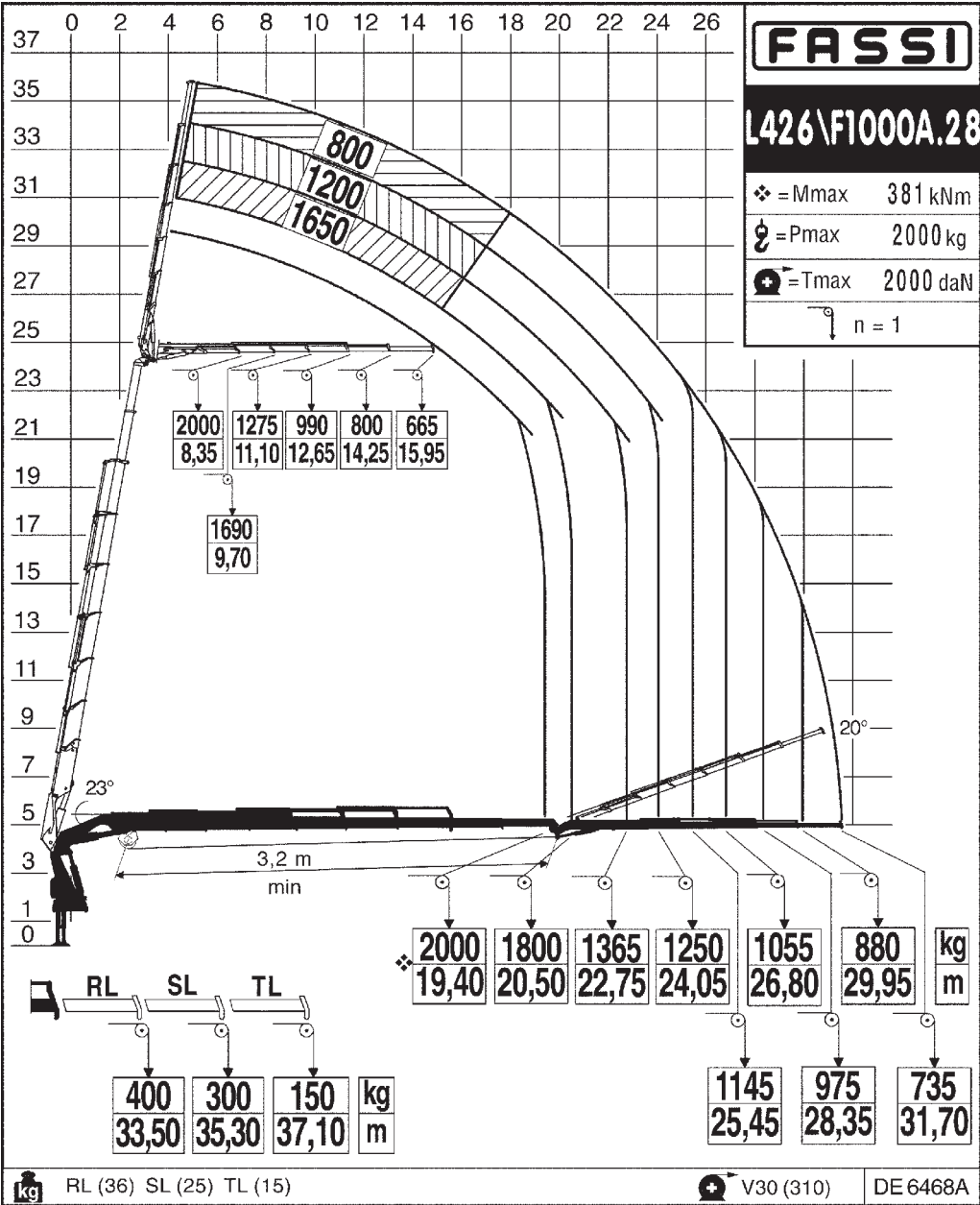


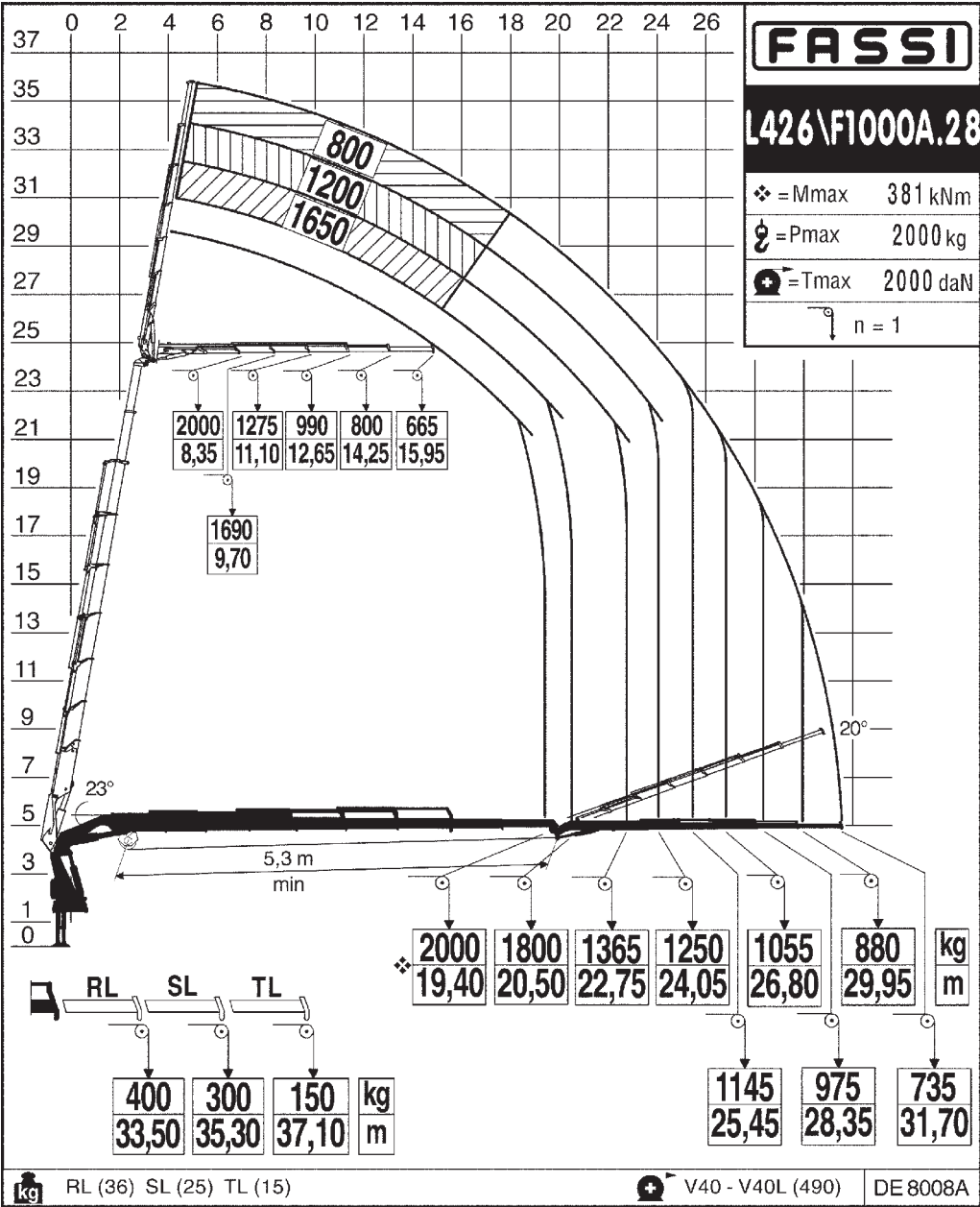


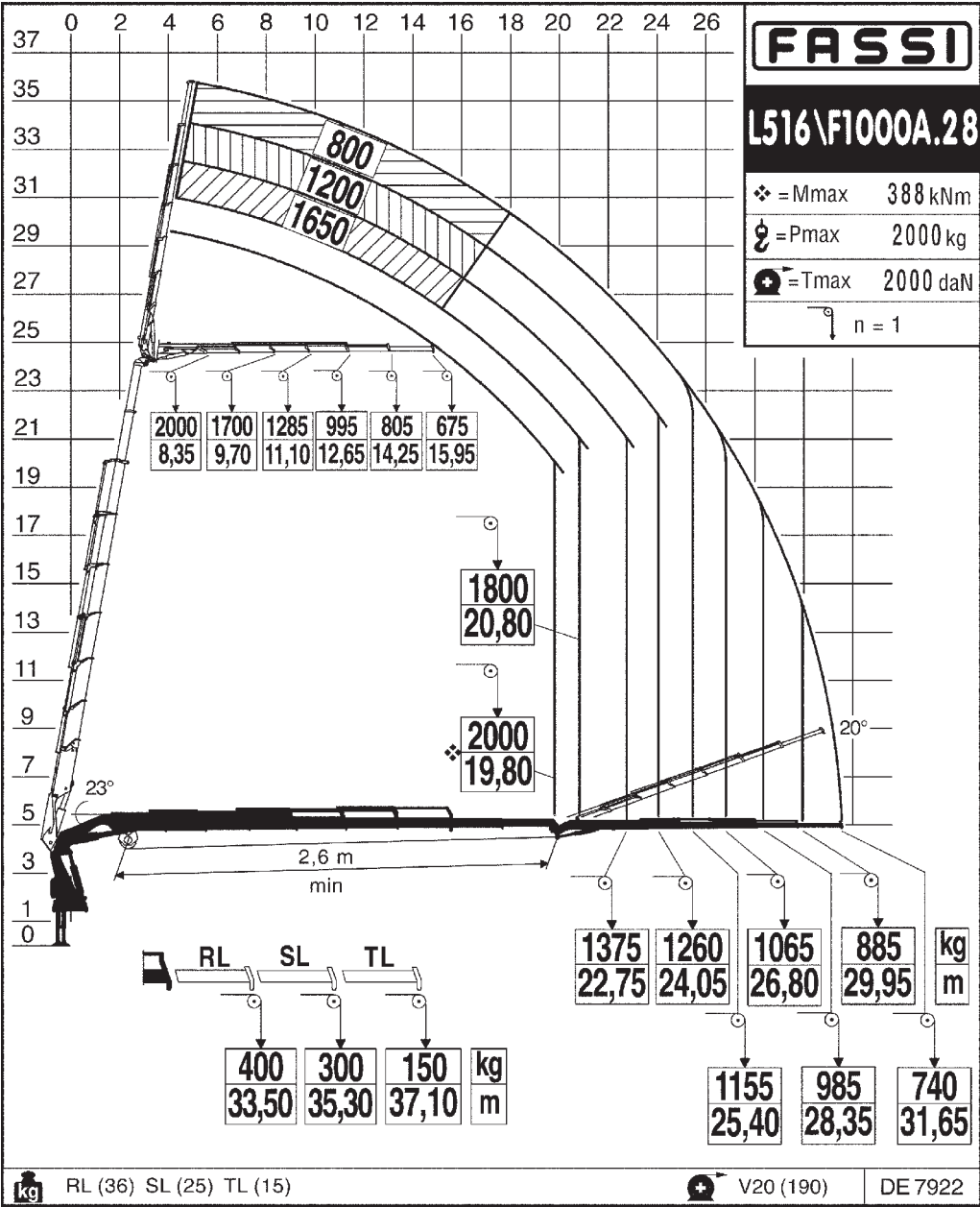


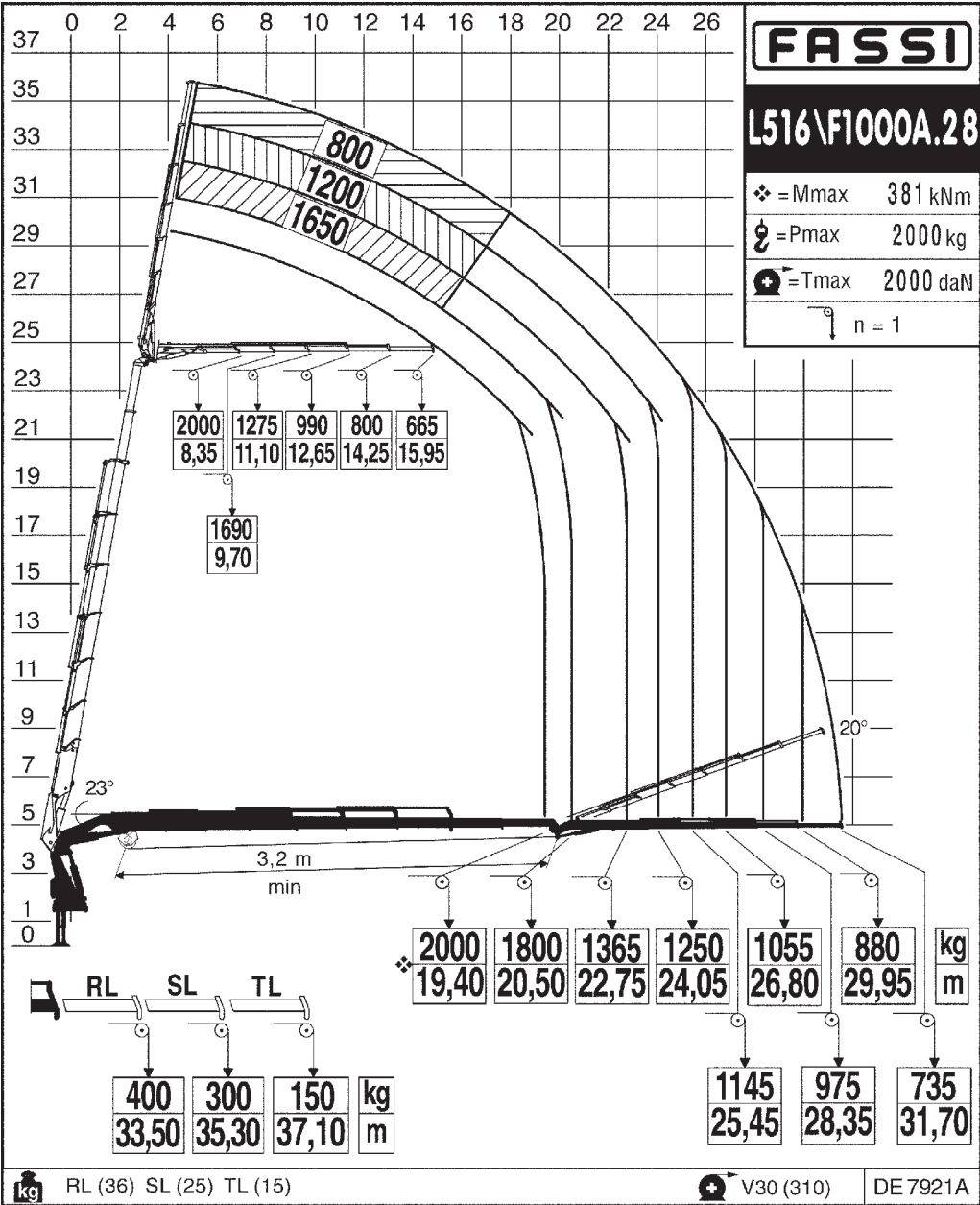


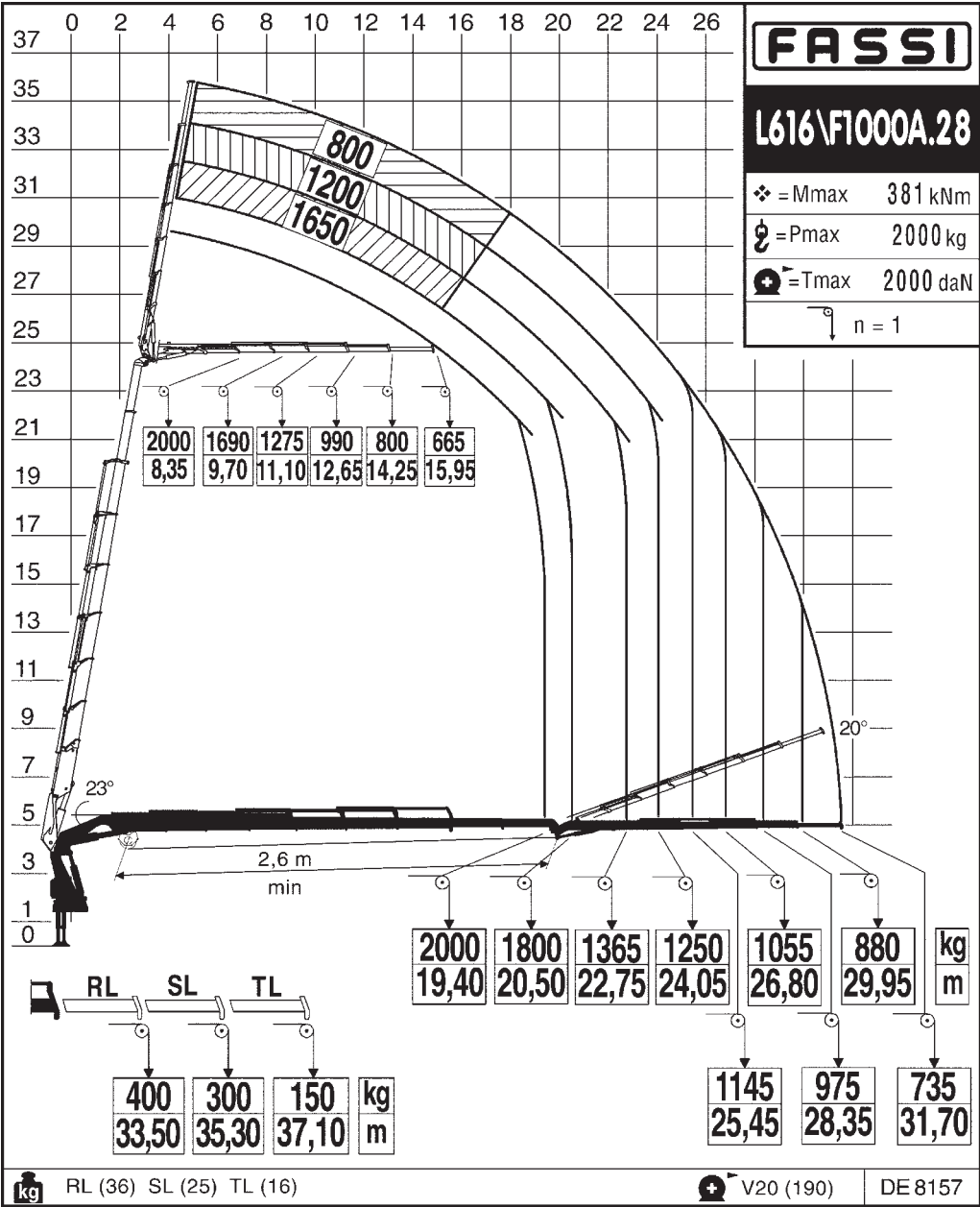


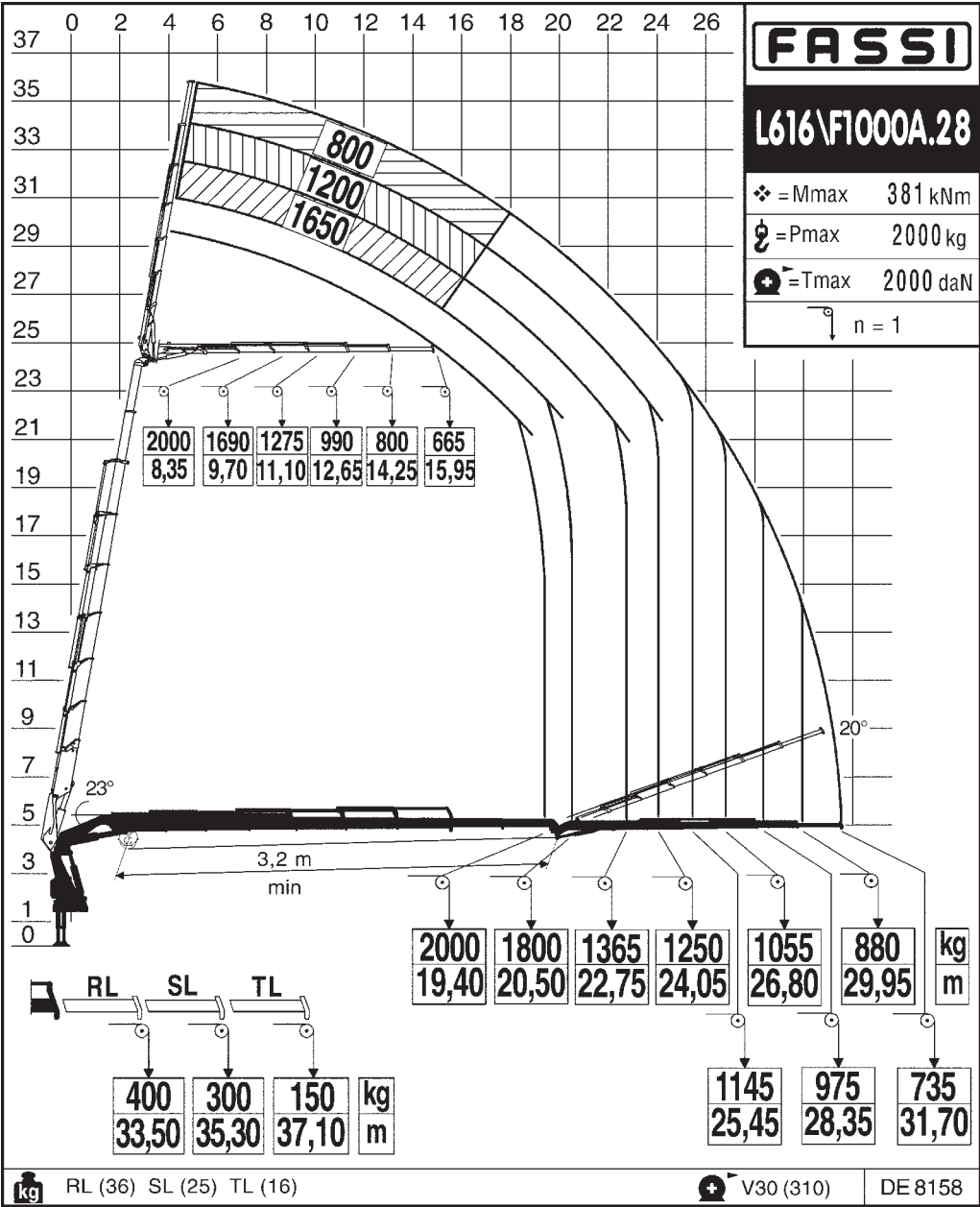
















4

HYDRAULIC SCHEMATICS
(version with lifting moment limiting device)

HYDRAULIC SCHEMATICS
GR5_F1000A/F1100AXP -
EVOLUTION

4

Hydraulic schematic for crane - Danfoss distributor - “electronic” lifting moment limiting device - CE

FASSI

Informazioni tecniche
Technische Informationen
Technical information
Informations techniques
Información técnica

F1100AXP

Schma idraulico distributore Danfoss limitatore di momento elettronico CE
Hydraul. schalt. Danfoss vert. Elektronische überlastabschaltelricht. typ. CE
Hydraulic schematic Danfoss distributor electronic LMLD CE
Schéma hydraulique distributeur Danfoss limiteur de moment électronique CE
Esquema hidráulico distribuidor Danfoss limitador de momento electrónico CE

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07

Data
Ausgabe
Edition
Edition
Fecha
2008/12/03

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Ab serinummer
From serial number
Du n° de serie
Desde matr. n°
1119

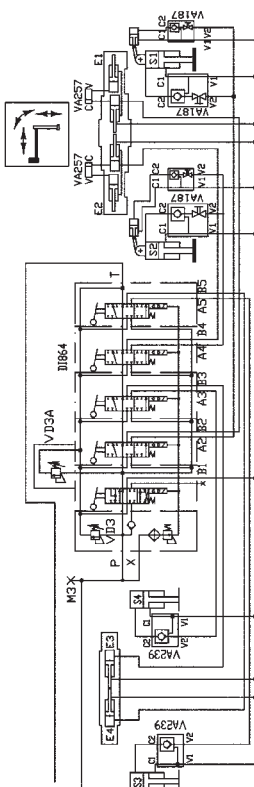
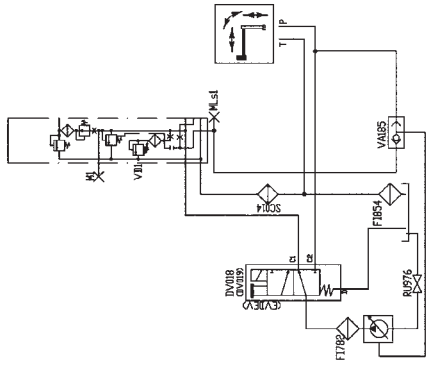
Sciti e dimensioni sono forniti a titolo indicativo e non impegnativo
Unverbindliche angabenskizzen und abmessungen vorbehalten
Sizs and descriptions are approximate and not binding
Toutes les données et descriptions sont fournies à titre indicatif, sans engagement
Datos y descripciones, todos a título indicativo y no representativo

CODE	DESCRIPTION
D1864 26V	DISTRIBUTOR
DV018	DEVIATOR
EV137	ELECTROVALVE
FI782	OIL FILTER (HIGH PRESSURE)
FI854	OIL FILTER (RETURN)
IG503	INTEGRATED ASSEMBLY OF LIMITING DEVICE
M1/M2/M3	GAUGE QUICK CONNECTION
MT 142	MOTOREDUCTOR COMPLETE
RU976	FAUCET
RU982	FAUCET
SC014	OIL COOLER (HEAT EXCHANGER) WITH BY-PASS 26V
SC015	OIL COOLER (HEAT EXCHANGER) WITH BY-PASS 26V
TR003	PRESSURE TRANSDUCER
VA148	ELECTRIC MAIN VALVE WITH ELECTRIC ACTIVATION
VA232	UNIDIRECTIONAL VALVE
VA239	SIMPLE EFFECT BLOCK VALVE
VA256	OIL FLOW REGULATOR VALVE FOR ROTATION CYLINDER
VA257	SEQUENCE VALVE 20 BAR
VA259	REGENERATIVE VALVE WITH ELECTRIC DEACTIVATION
VA262	SIMPLE EFFECT BLOCK VALVE
VA263	DOUBLE EFFECT BLOCK VALVE





HYDRAULIC SCHEMATICS

FASSI	F1100AXP	STK10_G4_11_00_VARIANTI...
Informazioni tecniche Technische Informationen Technical information Informations techniques Informacion tecnica	Varianti 1 Varianten 1 Variants 1 Options 1 Variantes 1	Pagina Seite Page Page Hoja Data Ausgabe Edition Edition Fecha Vale dalla matr. Ab seriennummer From serial number Du n° de serie Desde matr. n° 2 / 3 2008/10/09 1119
(1) Stabilizzatori rotanti a catena Hydraulic drehbare stabilisatoren Hydraulic rotation stabilizer Stabilisateurs relevables hydrauliques Estabilizadores a rotacion hidraulica  (2) Pompa a portata variabile Mit Verstellpumpe Flow variable pump Pompe à débit variable Bomba de flujo variable 		

FASSI

Hydraulic schematic for crane - versions 2

HYDRAULIC SCHEMATICS

GR5_F1000A/F1100AXP - EVOLUTION

4

FASSI Informazioni tecniche Technische Informationen Technical Information Informations techniques Informacion tecnica	F1100AXP Varianti 2 Varianten 2 Variants 2 Options 2 Variantes 2	STK10_G4_12_00_VARIANTI_2 Pagina Seite Page Page Hoja 3 / 3 Data Ausgabe Edition Edition Fecha 2008/10/09 Vale dalla matr. Ab seriennummer From serial number Du n° de serie Desde matr. n° 1119
①	②	Dati e dimensioni sono forniti a titolo indicativo e non impegnativo. Technische Angaben, Dimensionen und sonstigen Angaben vorbehalten. Data and dimensions are approximate and not binding. Toutes les données et descriptions sont fournies à titre indicatif, sans engagement. Datos y descripciones dadas a título indicativo y no obligatorio.

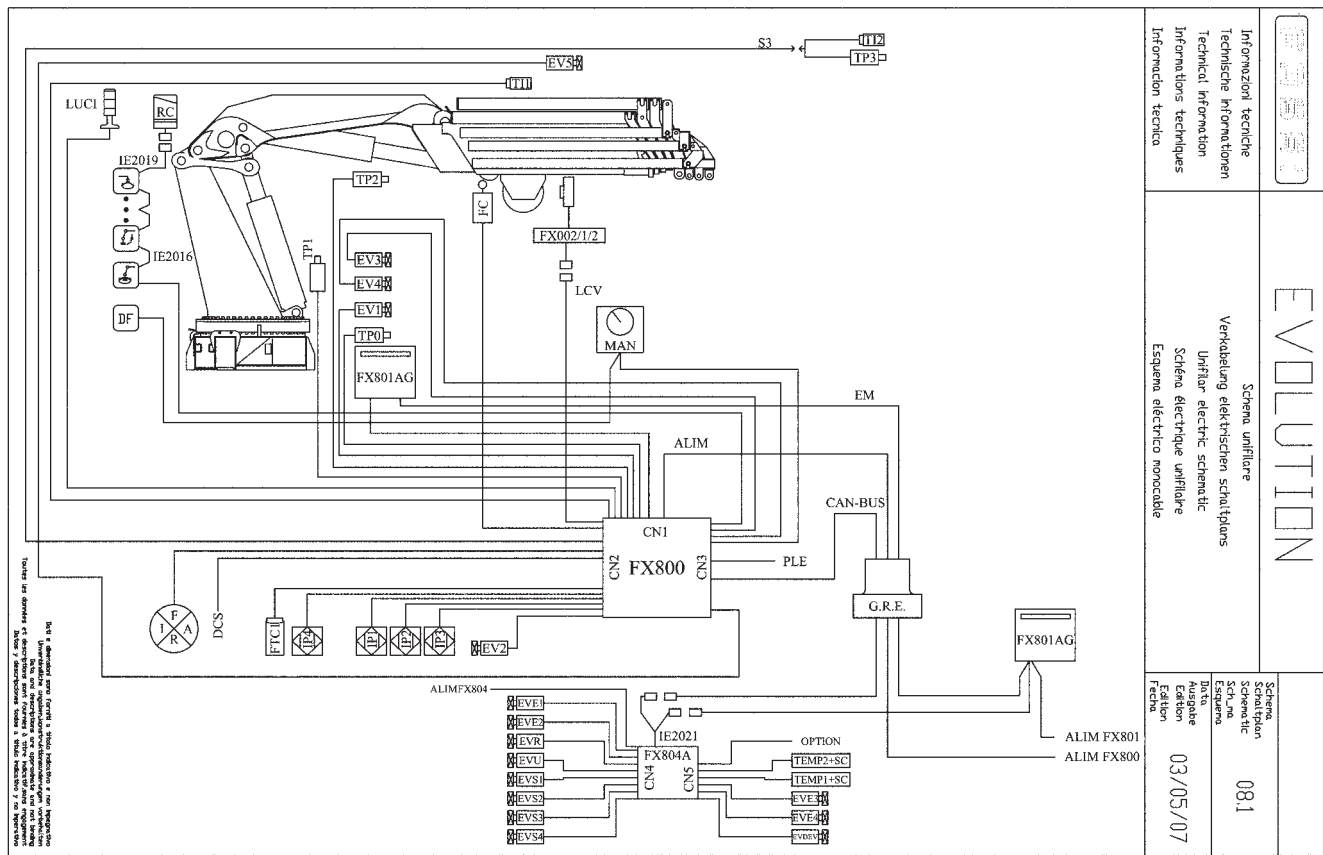
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5 ELECTRIC SCHEMATICS

Electric schematic for crane



SYMBOL DESCRIPTION

ALIM FX800	GENERAL FEEDING
ALIM FX804	FEEDING CONTROL UNIT EXTENSIONS STABILIZERS
ALIM FX801	FEEDING USER PANEL ON BASE
FARI	ACTIVATION WORK LIGHTS
EV1	ELECTROVALVE FOR CRANE BLOCK
EV2	ELECTROVALVE DOUBLE LIMITING DEVICE
EV3	XP ELECTROVALVE
EV4	ELECTROVALVE FOR PRESSURE REDUCTION OF REGENERATIVE EXTENSION EXIT
EV5	REGENERATIVE ELECTROVALVE
FX800	CENTRAL PROCESSING UNIT
FX801A/G	USER PANEL
IP1/2/3	PROXIMITY MICROSWITCH FOR ROTATION CONTROL
LCV	WINCH LOAD LIMITING DEVICE
FC	RUN END WINCH
OPTION	OPTIONS
PLE	CONTACT FOR PLATFORM
RC	RECEIVER OF THE RADIO
MAN	SELECTOR REMOTE/MANUAL FOR CRANE USE WITH RADIO OR MANUAL
FX002/1/2	WINCH LOAD LIMITING DEVICE
S3	CONNECTION SENSOR JIB CONNECTING DEVICE
TEMP1+SC	SENSOR ACTIVATION WARMTH EXCHANGING DEVICE 1
TEMP2+SC	SENSOR ACTIVATION WARMTH EXCHANGING DEVICE 2
TI1	SENSOR OF CORNER ON SECONDARY ARM
TI2	SENSOR OF CORNER ON HYDRAULIC JIBS
TP0	PRESSURE TRANSDUCER FOR DISTRIBUTOR
TP1	PRESSURE TRANSDUCER FOR INNER RAM

TP2	PRESSURE TRANSDUCER FOR SECONDARY RAM
TP3	PRESSURE TRANSDUCER FOR THE JIB RAM
DF	FLOW DEVIATOR (FOR VERSIONS FROM GROUND AND FROM SEAT)
FX804	CONTROL UNIT EXTENSIONS/STABILIZERS
EVE1...EVE4	ELECTROVALVE CONTROL EXTENSION 1... EXTENSION 4
EVS1...EVS4	ELECTROVALVE CONTROL STABILIZER 1... STABILIZER 4
EVR / EVU	ELECTROVALVE FOR CONTROL EXIT/RETURN EXTENSIONS/STABILIZERS
EVDEV	ELECTROVALVE FOR CONTROL ELECTRICAL DEVIATING DEVICE CRANE/STABILIZERS
G.R.E.	JOINED ELECTRICAL ROTATING
DCS	DECLASSEMENT
IE2016	CABLE FOR CONNECTION FORM CANBUS
IE2017	CABLE FOR CONNECTION FORM CANBUS
IE2019	CABLE FOR FORM CANBUS TO RADIO
IE2021	CONNECTOR IN "Y"
EM	URGENCE
LUCI	LUMINOUS TOWER
CN1	CONNECTOR 1 ON FX800
CN2	CONNECTOR 2 ON FX800
CN3	CONNECTOR 3 ON FX800
CN4	CONNECTOR 4 ON FX804
CN5	CONNECTOR 5 ON FX804





6 SAFETY NORMS

SAFETY NORMS

GR2_3_4_5 6

Strictly conform to the norms reported by the plates **DE2499A** (fig. 1) or **DE1771A** (fig. 1a) placed next to the controls, in order to avoid possible accidents while operating the crane.

Only authorized persons are allowed to operate the crane.

The crane must be used on firm, level ground.

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

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.

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.

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.

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

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

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.

VERTICAL VERSION

fig. 1

FASSI

FASSI GRU S.p.A.
Via Roma, 110 24021 ALBINO (BG) - ITALIA
Tel. 035 / 77.64.00 - fax 035 / 75.52.13

DE2499A

INSTRUCTIONS FOR SAFE USE OF THE CRANE

- 1 Only authorized persons are permitted 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 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 with the outriggers, 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, if present, are closed;
- 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 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 ensure that the outriggers are fully retracted and re-entered, the safety taps closed and the crane is in the folded position.

HORIZONTAL VERSION

fig. 1a

FASSI

FASSI GRU S.p.A.
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Tel. +39 35 77.64.00 - Fax +39 35 75.50.20

DE1771A

INSTRUCTIONS FOR SAFE USE OF THE CRANE

- 1 Only authorized persons are permitted 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 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 with the outriggers, 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, if present, are closed;
- 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 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 ensure that the outriggers are fully retracted and re-entered, the safety taps closed and the crane is in the folded position.





7 WARNING AND INSTRUCTIONS

7.1 Generality

The use of the crane is reserved to authorized personnel, instructed in advance, who has to conform to the safety norms and instructions contained in the Use and maintenance manual supplied with the crane. (See norms ISO 9926-1).

It is prohibited to walk or stop under a suspended load.

It is prohibited for unauthorized persons to be within the working area.

Under no circumstances interfere with the safety and protection devices.

Warning plates, as well as instruction and operation plates, must be replaced when no longer readable or missing. See Paragraph "25 Instruction and warning plates".

Do not use the outriggers to raise the vehicle.

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.

Do not run the engine in a indoor area without first making sure there is adequate ventilation. Take the vehicle fumes away from the working area by fitting an extension tube of a suitable diameter and a right length to the exhaust system.

When using the ladder to reach the control station on the top seat, avoid knocking into the controls while going up or down the ladder.

The control station on the top seat is provided with side safety guards; stay within these guards.

The crane must be activated only in the stability conditions. Park the vehicle correctly and insert the parking brake.

7.2 Before operating

(!) ATTENTION (!)

Make sure that the protections are in their place and that all the safety devices are fitted and active (See norms ISO 9927-1).

Keep the ladder and the control station on the top seat clean (if present). Normally, the seat can be tilt forward.

Make sure that control stations, the instruction plates and the loading charts are properly lit and visible, so as to ensure safety while operating.

Pay attention to not crash against the control station on the top seat (if fitted) during manoeuvres.

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.

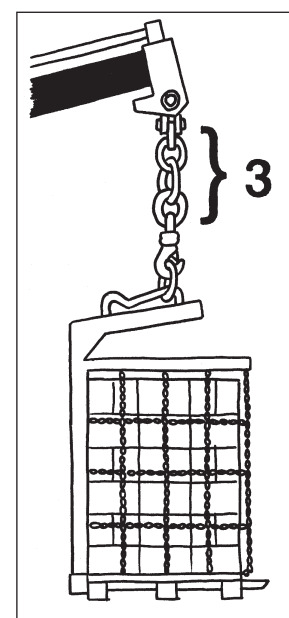
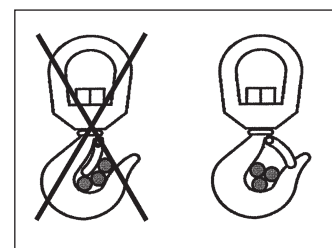
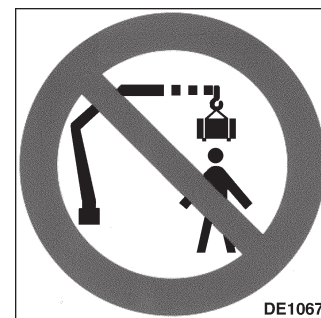
Check the efficiency of the hook safety catch.

Carefully inspect the condition of ropes or chains (if present).

Make sure that the pallet fork (if present) is connected to the crane hook by means of a chain having at least **three (3)** rings.

WARNING AND
INSTRUCTIONS
GRU FASSI

7



FASSI



7.3 During operation

WARNING AND
INSTRUCTIONS
GRU FASSI

7.3

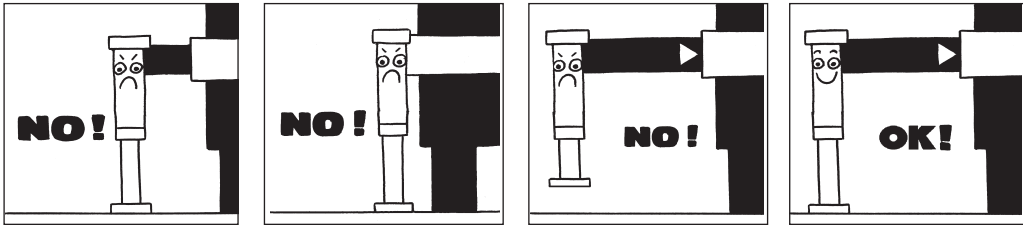
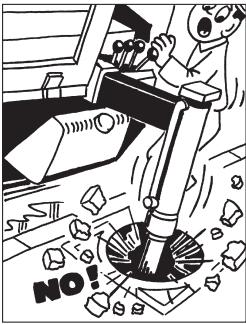
Locate and delimit the working area.

Make sure that no one is within the working area of the crane. Do not stop and do not pass in the delimited area.

Choose the correct control position, making sure to have the complete visibility of the working area.

Stabilize the vehicle on a horizontal plane with a maximum tolerance of 1,5 degrees. Check the vehicle inclination on the levelness indicator. The bubble must be contained in the internal circle, and in any case it doesn't must to come out from the external circle.

Make sure that the outrigger rams 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.



(!) ATTENTION (!)

The stability of the unit (crane-vehicle) is only guaranteed by the complete lateral extension of the outriggers and by the observance of the capacity plates.

The values of the support force F are indicated in the table at paragraph "2.3 Technical Data". Just as an indication it's enclosed the below table.

ADMITTED PRESSURE ON THE GROUND (Load capacity of the ground) - Rif. DIN 1054		
A	Made ground, not compacted artificially	0 - 10 daN/cm ²
B	Asphalt	20 daN/cm ²
C	Compact ground, not removed	
1.	Mud, peat, marshy ground	0 daN/cm ²
2.	Not compacted ground, adequately solid	
	From fine to middle sand	15 daN/cm ²
	From thick sand to gravel	20 daN/cm ²
	Shattered and compacted stones	25 daN/cm ²
3.	Compact ground	
	Wet	0 daN/cm ²
	Soft	4 daN/cm ²
	Compact	10 daN/cm ²
	Half - solid	20 daN/cm ²
	Hard (solid)	30 daN/cm ²
4.	Rock	
	Eroded	100 daN/cm ²



(!) ATTENTION (!)

Carefully inspect the load rigging.

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

(!) ATTENTION (!)

Avoid swinging the load above working and transit areas. Any hidden danger situation must be audibly alarmed. 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 or with the radio-remote control (if fitted).

During the loading and unloading operations it is prohibited to leave the control station or the control at a distance.

Activate the controls with slow and progressive movements. Move the load with the greatest caution, and avoid swingings and collisions. Avoid the rapid displacements and the temporary stops, since they can cause the load swinging.

Do not rotate the crane before the load is lifted. 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.

(!) ATTENTION (!)

Handle the wet or frozen load with the maximum attention: it exists the skidding danger. It's obligatory to clean the load from the ice or the snow before lifting.

When operating through a winch, lift the load vertically using the cable and not the booms in order to avoid swinging the load.

The crane must be used exclusively to lift loads.

It is prohibited to unblock, hit, pull or drag the loads.

It is prohibited the lateral traction or the vehicles drawing.

(!) ATTENTION (!)

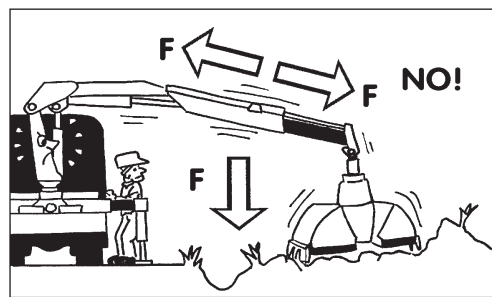
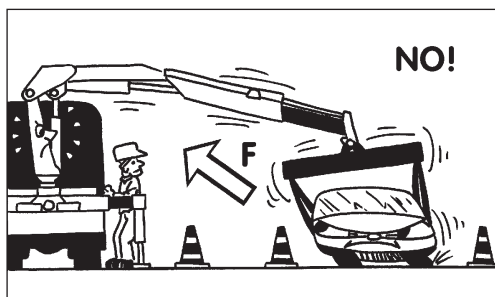
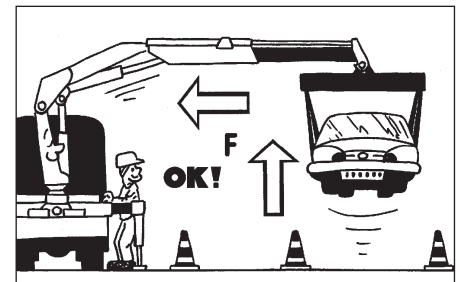
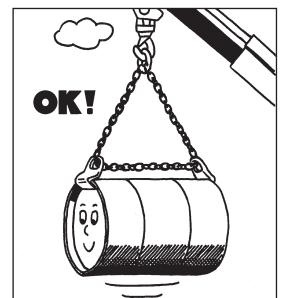
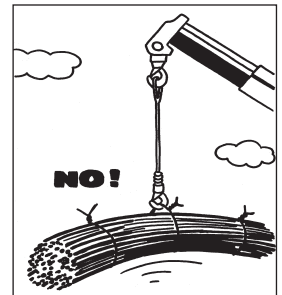
Do not utilize the crane for pushpull (F), lateral (F) or sideways (F) operations.

Crushing (F) or push (F) manoeuvres are not permitted.

Never operate the outriggers when the crane is loaded.

WARNING AND
INSTRUCTIONS
GRU FASSI

7.3



(!) ATTENTION (!)

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

Do not move the vehicle when the crane is not in transport position.

Do not move the vehicle with a load suspended on the crane.

(!) ATTENTION (!)

Avoid working conditions which present danger for the operator and the persons present in the action area of the crane, the outriggers or the load.

FASSI



- CRUSHING DANGER / SHEARING DANGER

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

The table indicates the minimum safety working distances concerning the various parts of the body. The figures illustrate circumstances which may turn out to be dangerous if you fail to respect the minimum safe distances and if it is impossible to introduce larger parts of the body.

(In conformity with EN 349 standard the minimum safe working distances to avoid crushing parts of the body)

Parts of the Body	Minimum safe working distance mm	Figure	Parts of the Body	Minimum safe working distance mm	Figure
Body	500		Head	300	
Leg	180		Foot	120	
Toes	50		Arm	120	
Hand Wrist Fist	100		Finger	25	

(!) ATTENTION (!)

Failure to respect the minimum safe distances may result in a safety hazard and a deadly risk.

(!) ATTENTION (!)

For designated areas as: outrigger running towards rest position, leaning and folding points of the booms in rest position, control platform and swiveling column, top seat and running inner boom, where no carter is possible to be placed, please observe the shear and trapping hazard stickers nearly placed.

- ELECTROCUTION DANGER

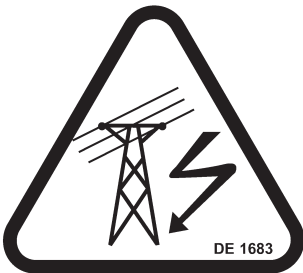
General safety precautions for the operator and potential co-workers.

(!) ATTENTION (!)

Respect the safety distances from electric lines; the minimum distance is, according to CEN norms, five (5) meters, except for otherwise prescribed by national norms. Failure to respect the minimum safe distances may result in electrical hazards for the operator and his assistants.

If the crane comes into contact with an electric line, it's necessary to follow the next procedure:

- If the crane hits an overhead power line, do not touch the crane, the truck or the load.
- Carefully evaluate the danger before moving. If you are closer than 10 meters from the crane, the truck, the load or the electric line, move at least 10 meters away, by shuffling away with small steps, in order to minimize the chance of getting a too high voltage difference between the feet.
- Warn others to stay away.
- Call for help and contact the power company to de-energize the line. Do not attempt to assist someone in direct or indirect contact with the power line before the power has been disabled: you run the risk of being electricuted yourself.





- If you are in the truck cabin, stay inside without touching the vehicle body because it's extremely hazardous to go out before the line is de-energised.
- Help the electricuted person if you know the first-aid procedures, otherwise wait for the paramedics to arrive.

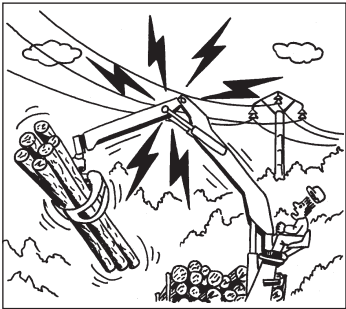
WARNING AND
INSTRUCTIONS
GRU FASSI

7.3

(!) ATTENTION (!)

**A wind gust can cause the swinging of an electric line.
Do not utilize the crane during thunderstorms and when wind speed exceeding 13,8 m/s (50 km/h), maximum value of the Beaufort scale degree 6.**

Force of the wind Beaufort scale	Wind speed m/s	Classification	Characteristics
0	0,0 - 0,2	Calm	Calm wind, smoke goes up quite vertically
1 2	0,3 - 1,5 1,6 - 3,3	Light breeze	Smoke reveals the direction of the wind, one can feel the wind blowing, leaves start fluttering.
3 4	3,4 - 5,4 5,5 - 7,9	Moderate breeze	Leaves and branches are in constant motion, small branches start fluttering. Dust and papers dance on the ground.
5 6	8,0 - 10,7 10,8 - 13,8	Fresh breeze Near gale	Small green branches bend, the surface of waterways and lakes are wavy. Big branches bend, wind whistles through high-tension cables, it's difficult to walk keeping the umbrella open.
7	13,9 - 17,1	Moderate gale	Trees sway, it's hard to walk
8	17,2 - 20,7	Storm wind	Branches get broken, it's hard to walk.
9	20,8 - 24,4	Storm	It damages houses (antennas and roof tiles fall down)



- BURN DANGER

During the oil flow in the hydraulic circuit, the oil and all the components of the circuit reach high temperatures.
It's necessary to verify the temperature of every hydraulic component before to touch it, for to avoid burns.



- USE TEMPERATURE AND CRANE STORING

The crane is designed for the utilization at ambient temperature included in the below table. If the ambient temperature of utilization is not included in the indicated limits, the crane functionality can be compromised.
Temperatures too high or too low can damage the components of the oleodynamic and electric circuit, and compromise the crane functioning.
If the crane is used in the presence of ice or snow, it's necessary to start the hydraulic system at the minimum speed of the motor. It's necessary to do circulate the oil for some minutes, until to its heating.

(!) ATTENTION (!)

It's obligatory to clean the load from the ice or the snow before lifting.

USE TEMPERATURE AND CRANE STORING	
Temperature of the working ambient of the crane	-30°C to +50°C
Temperature of the storage ambient of the crane	-40°C to +70°C

(!) ATTENTION (!)

If you work at ambient temperature different from that prescribed in the table, it's obligatory to request the specific authorization to the FASSI GRU.



7.4 At the end of the operation (Prior to driving the vehicle)

WARNING AND
INSTRUCTIONS
GRU FASSI

7.4

Unhook the load, and make re-enter the crane booms.

Fold the crane.

Make the re-enter of the outrigger cylinders one at a time, checking every single organ in motion. The operator must have a full visibility during every operation of re-entry of the stabilization organs.

Make sure that the outrigger supports and rams are re-entered within the overall width of the truck and locked by the safety devices.

If the booms of the crane (or of the hydraulic jib) are to be laid on the body or on the load, they must be suitably blocked to prevent possible sideways movements.

Make sure that the indications about the overall dimensions are respected.

Implements can be left mounted on the booms of the crane (or of the hydraulic jib) only if the overall dimensions are respected. They must be suitably blocked to prevent possible sideways movements.

If an accessory (fork, ...) is mounted, it must be tied down at all times during transport.

Disengage the power take off.

Fix the load adequately, to avoid the fall of the load from the vehicle during march.

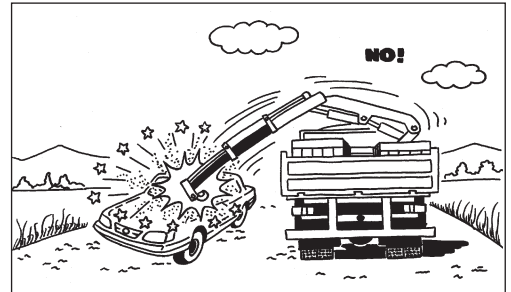
(!) ATTENTION (!)

After having closed the crane, and having do the re-enter of the outriggers, it's necessary to fix all the crane organs, to avoid the booms or outriggers exit during the vehicle march.

Hook all the fixing devices correctly.

(!) ATTENTION (!)

Annotate the maximum dimensions of the vehicle, included the possible transported load. Respect the greatest height of volume for the transit below the tunnels, bridges, subways, tension lines and the maximum axial loads consented from the vehicle.





7.5 Residual risks

Utilize the crane only for the provided aims by the Use and Maintenance manual. It is prohibited the crane utilization for differents aims to those indicated in the Use and Maintenance manual.

(!) ATTENTION (!)

It is prohibited the crane utilization not by qualified staff.

The operator is responsible for the machinery, its movements, the load movement and all the working area of the crane.

Therefore it's necessary the maximun attention in all the phases of the crane opening and closing, of stabilization and of the load handling, it exist a series of residual risks, not predictable completely, which can create danger for the employed in the crane handling

In the below list are indicated some residual risks, that have as danger a relieved and in movement load, which request particular attention during the working period.

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 is safe from hazards (i.e. stand clear of the load, make sure that 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, must 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. 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.

If the load sticks out of the maximum volumes of the vehicle, the operator must make sure of the new maximum dimensions of volume, to avoid collisions with the tunnels, the subways, the bridges and the electric lines.

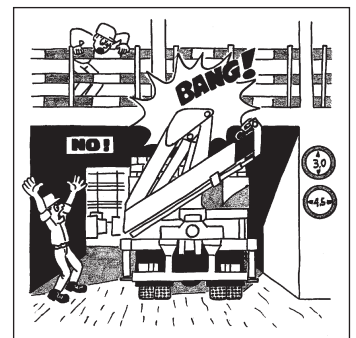
JOBSITE CONDITIONS

Enclose the working zone. Prior to use, make sure 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.

WARNING AND
INSTRUCTIONS
GRU FASSI

7.5





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

Utilize the crane only for the provided aims by the Use and Maintenance manual. It is prohibited the crane utilization for different aims to those indicated in the Use and Maintenance manual.

WRONG MANOEUVRING

The directives in force impose a suitable training of the personnel before using these types of machines, and require an adequate psychophysical condition to operate safely a lifting device that always implies the intrinsic danger of a lifted load.

The crane can fall break or overturn if the operator performs a wrong manoeuvre, due to the lack of familiarity with the operation procedures or due to inadequate psychophysical conditions.

WEATHER CONDITIONS

Too high or too low temperatures may damage the components of the oleodynamic and electric circuits. It is forbidden to operate the crane during a storm with lightning hazards, so we recommend to fold it and put it to rest. Furthermore when the wind is too strong the crane can overturn or break down.

In the chapter "7.3 During operation" are indicated the utilization limits for the temperature, the wind loads and the annexed danger (electrocution, collisions, etc.).

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.

In the chapter "7.3 During operation" are indicated the utilization limits for the ground consistency and the load capacity of the ground.

SHEARING, ENTRAPMENT

The crane has a lot of parts in movement that it is impossible to cover.

The operator shall always be aware of this residual risk and keep clear from the parts in movement, particularly from the load. The operator is held responsible for himself and also for those working people in proximity of the crane, and for those who may draw closer even if not authorized.



ELECTRICUTION

The crane is not insulated from electric contacts and therefore it is not equipped to work under tension, even if the contact is accidental. Therefore be compliant with the min clearance prescribed by the national directives in force. Generally speaking the clearance from electric lines with a max tension of 38.000 volts should be at least 5 meters, higher tensions require higher clearance to be verified case by case together with competent technicians.

The operator must consider the ambiental conditions: a wind gust can cause the crane swinging, and so a contact with the electric lines.

The minimum distance of safety can differ according to typ of the electric line. It's obligatory to respect the regulation in force in the country of use for to can operate in safety.

MANUAL EXTENSION OVERLOAD

Manual extensions are controlled by the moment limiting device only under the conditions described in the relative chapter. The control system of the manual extension overload must be activated by the operator as described.

It's prohibited to overload the extensions over the indicated limits in the capacity plates.

In the chapter "3 Capacity plates" are indicated the maximum capacity of the manual extensions.

ACCESSORIES

Be careful when assembling and disassembling the accessories (extensions, buckets, baskets,...): verify the weight, the securing systems and the instructions for assembly and dismantlement, then appraise their barycentre and provide for adequate provisional blocking systems in order to avoid sudden movements.

BREAKDOWN OF SOME SENSORS

The system "**moment limiting device - intelligent type**" is always monitored during ignition: the system, after having activated the various circuits, checks the presence of all the inputs for around 4 seconds, and then continuously monitors the operation and the efficiency of the limiting device (approx. every 25 milliseconds).

For most of the components the system checks also the congruence of the incoming signal with the one the system expects.

It's obligatory to replace the damaged or spoilt components for to work with safety, and for to obtain the best performances of the crane.

MAINTENANCE

Maintenance is particularly important: the lack of it may damage things or hurt people.

In the chapter "22 Maintenance instructions" are described all the operations for to maintain efficient your crane, and to avoid serious damages to things and persons caused by the crane malfunction for the scarce or null maintenance.

(!) ATTENTION (!)

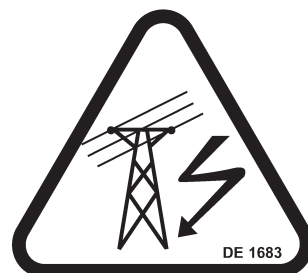
The FASSI GRU declines every responsibility for the spoils, the breakings or the damages caused by the maintenance failing.

PARTICULAR OPERATIONS

If you are required to operate under particular conditions not illustrated in the manual of use and maintenance, analyse carefully the situation and always refer to an authorised Fassi shop or to the Fassi technical support service or to experienced operators before starting working.

WARNING AND
INSTRUCTIONS
GRU FASSI

7.5







8 IDENTIFICATION OF THE CRANE MODEL

IDENTIFICATION OF
THE CRANE MODEL
GRU FASSI

8

8.1 Generality

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

8.2 Crane mark

The **CE** indicates that the crane complies with the Machines Directive (D.M.) 98/37; it can be considered effective only with a written declaration of conformity enclosed.

The cranes with the CE mark and the capacity superior to 1000 kg and/or the lifting moment superior to 40KMm is supplied with a lifting moment limiting device, that preserves the structure from possible overloads.

Identification data are marked on the plate **DE5891** used for the **CE** mark (fig. 2) and rivetted on the base with personalized rivets **FASSI**.

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

fig. 2

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

The crane must not be put into service within the European Community unless the machine on which it is mounted also conforms with the prescribed Directive. Ever change of use, modification or addition of accessories, not specified by this manual must be affixed with a new **CE** mark in accordance with the Machinery Directive.



A further metallic plate (fig. 3) 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

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. 3

(!) ATTENTION (!)
It is forbidden to alter the data marked on the plates.





9 CRANE NOMENCLATURE

CRANE
NOMENCLATURE
GR5_700B»1400A-
EVOLUTION

9

9.1 Controls for crane and outriggers through push-button panel of the radio remote control (fig. 1)

Pos	Description
1.	Outrigger rams
2.	Outrigger supports
3.	Base
4.	Slew ring
5.	Rotation motoreducer
6.	Deviator crane - outriggers
7.	Dual control for deviator crane - outriggers
8.	Integrated group for outrigger controls
9.	Electric hydraulic distributor for crane
10.	Column
11.	Inner ram
12.	Inner boom
13.	Outer ram
14.	Outer boom
15.	Booms extension rams
16.	Extension boom sections
17.	Lifting hook
18.	Oil tank
19.	Manual extensions (optional)
20.	Heat exchanger
21.	Receive radio remote control
22.	Push-button panel (transmitting-console of the radio remote control)

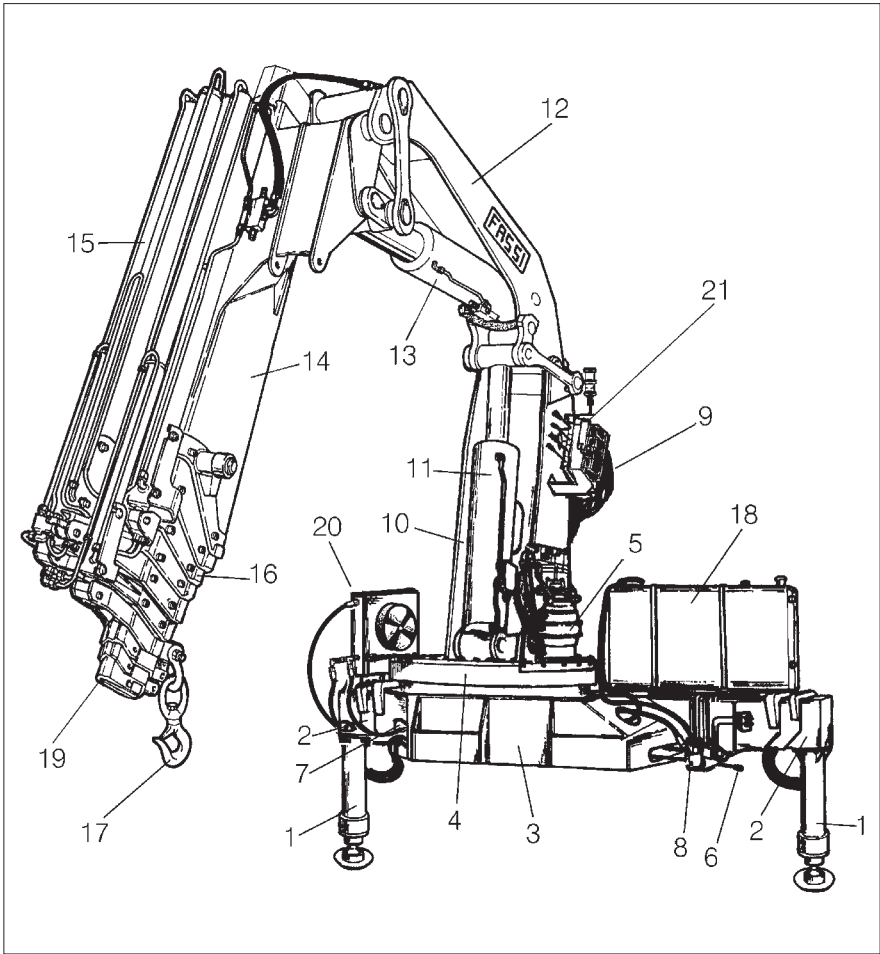
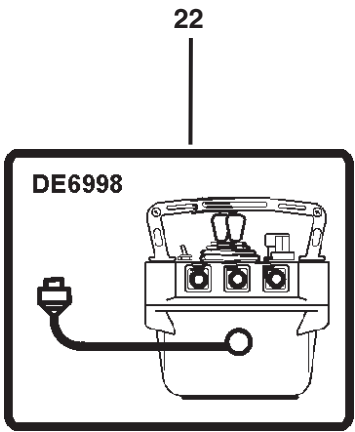


fig. 1





10. NOMENCLATURE OF THE SAFETY AND PROTECTION DEVICES

NOMENCLATURE OF
THE SAFETY AND
PROTECTION DEVICES
GR5_700B»1400A-
EVOLUTION

10.1 Controls for crane and outriggers through push-button panel of the radio remote control (fig. 1)

Pos	Description
1.	Check valves for outrigger rams
2.	Check valves for rotation control (flow regulators)
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.	Control panel
8.	Rotation limiting device
9.	Main pressure valve (outriggers)
10.	Main pressure valve (crane)
11.	Auxiliary valves (crane)
12.	Safety device for outrigger supports
13.	Hook safety device
14.	Exclusion tap lever
15.	Visual indicator yellow/red light

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 seal remove the Manufacturer and invalidate the warranty.

Use the ladder for the access to the top seat.

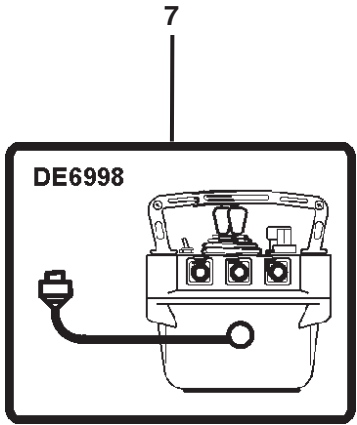
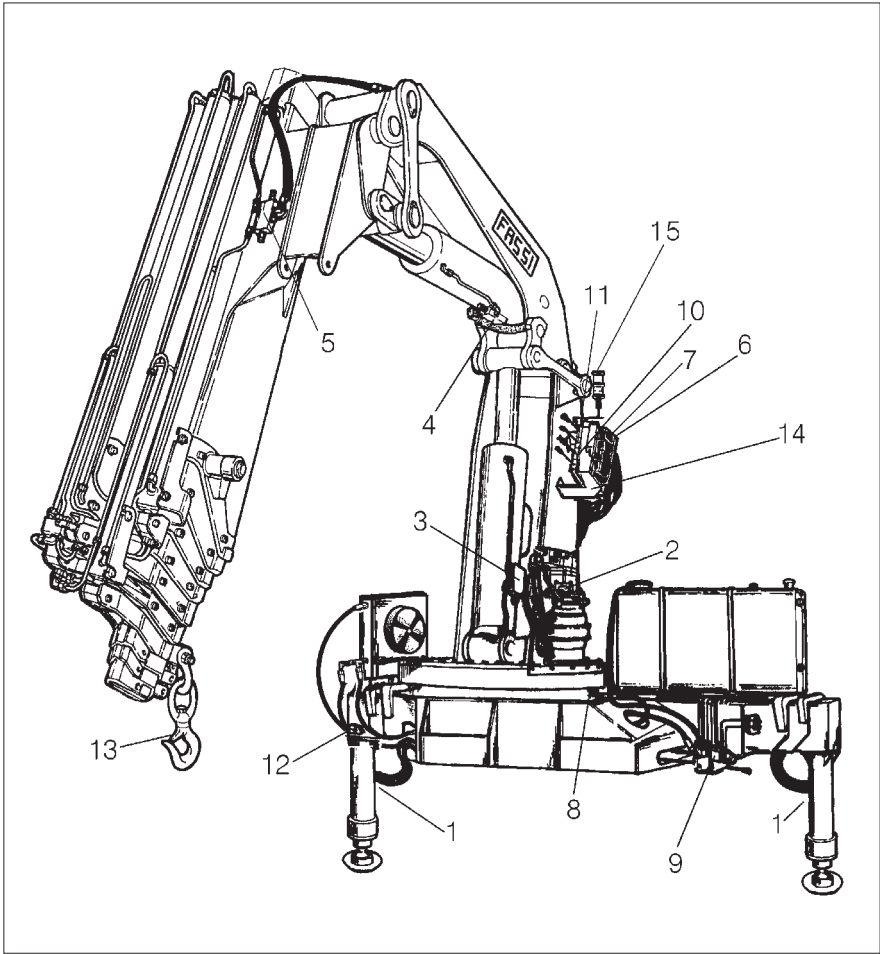


fig. 1

11 SUPPLEMENTARY BEAMS

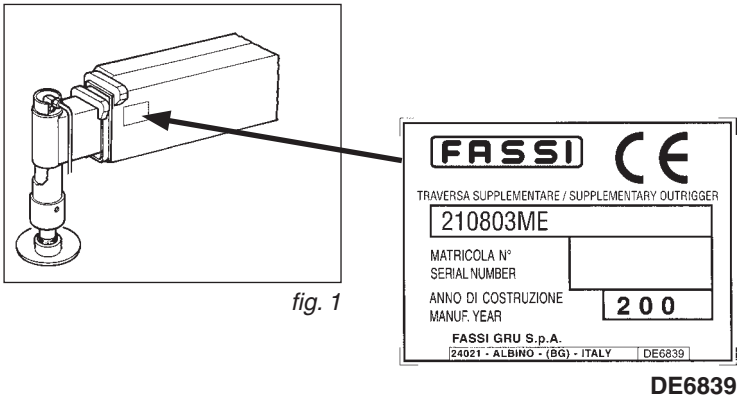
11.1 Generality

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

Code	outrigger ram stroke mm	outrigger interaxis mm	extension type	Weight kg
1400801HE	410	8500	Hydraulic-“H” variable	1600
1400802HE	353	10000	Hydraulic-“H” variable	2400

11.2 Identification of the supplementary beams

Identification data of the supplementary beam is punched on the plate DE6839 (fig. 1).







13 MANOEUVRES AND CONTROLS TO STABILIZE THE VEHICLE

SUPPLEMENTARY
BEAMS
GRU FASSI

13

13.1 Generality

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

(!) ATTENTION (!)

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

(!) ATTENTION (!)

The crane stability is maintained by the maximum extension of the outrigger supports, by the solidity of the base underneath the plates of the outrigger rams and by the observance of the capacity plates. To check the maximum working pressure see Paragraph 2.3 Technical data

Check that the outrigger rams are applied on a solid base; if necessary use larger outrigger base plates (available on request) to avoid sinking.

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.

While loading, it may be necessary to vertically adjust the outrigger rams to prevent an overload on the outriggers, then stabilize again.

While unloading, the outrigger rams may not be perfectly in contact with the ground because of a rise in the suspension; it is therefore recommended to stabilize the vehicle during operation to avoid an overturn.



DE 6409A





13.2.2 Functions of control levers for stabilization with radio-remote control

SUPPLEMENTARY BEAMS
GR3_4_5 - EVOLUTION

13.2.2

The controls to stabilize the vehicle with radio-remote control are activated only from the push-button panel of the transmitting-console.

(!) ATTENTION (!)

Before starting manoeuvring of the stabilisers with the radio remote control, the operator shall make sure that their movements are fully visible.

(!) ATTENTION (!)
SINCE THE RADIO REMOTE CONTROL IS MOBILE,
BEFORE STARTING MANOEUVRING OF THE
STABILISERS WITH THE RADIO REMOTE CONTROL,
THE OPERATOR SHALL MAKE SURE THAT
THEIR MOVEMENTS ARE FULLY VISIBLE.
(!) ATTENTION (!)
DE5842

- RCH PUSH-BUTTON PANEL

You can select whether to control the outrigger functions using the buttons placed on the remote control as follows:

- Position the rotating selector on the icon . "?outriggers?" appears on the display.
- Confirm the operation pressing contemporarily the left buttons "CLACSON" and "INDEX". "outriggers" appears on the display.

You can select whether to control the crane functions using the buttons placed on the remote control as follows:

- Position the rotating selector on the icon . "?crane?" appears on the display.
- Confirm the operation pressing contemporarily the left buttons "CLACSON" and "INDEX". The indications of the crane load appear on the display.

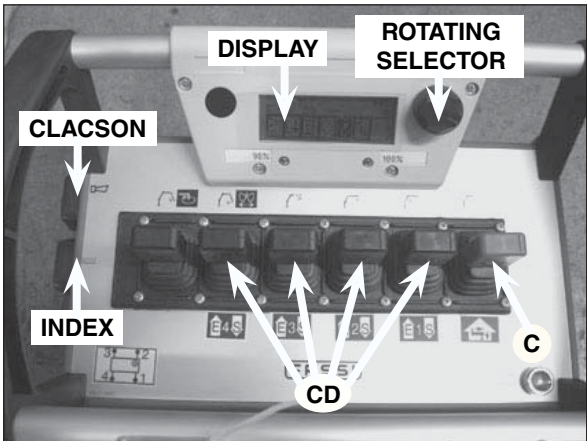
LINEAR PUSH-BUTTON PANEL (fig.2)

The first 5 control levers on the push-button panel (beginning on the right) have two plates because they can control 5 functions of the crane or the functions for stabilization.

Hereunder are reported the plates indicating the stabilization functions for every lever.



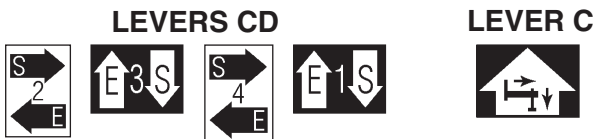
LINEAR PUSH-BUTTON PANEL *fig. 2*



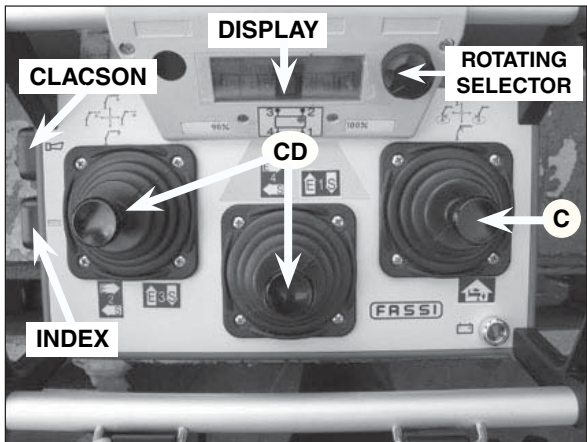
PUSH-BUTTON PANEL WITH JOYSTICK (fig.2a)

The three control joy-sticks on the push-button panel have two plates because they can control the functions of the crane or the functions for stabilization.

Hereunder are reported the plates indicating the stabilization functions for the joystick.



PUSH-BUTTON PANEL WITH JOY-STICK *fig. 2a*



Rotating selector
Leve **CD**

Selector of the icons on the display.
Controls for the selection of the outrigger supports and
of the outrigger rams.

Leva **C**

Control of the selected outrigger support or ram.



- **SCANRECO PUSH-BUTTON PANEL**

You can select whether to control the outrigger functions using the buttons placed on the remote control as follows:

- Position the rotating selector on the icon . "?outriggers?" appears on the display.
- Confirm the operation pressing contemporarily the buttons "INDEX" and "IGNITION". "?outriggers?" appears on the display.

(!) ATTENTION (!)
SINCE THE RADIO REMOTE CONTROL IS MOBILE,
BEFORE STARTING MANOEUVRING OF THE
STABILISERS WITH THE RADIO REMOTE CONTROL,
THE OPERATOR SHALL MAKE SURE THAT
THEIR MOVEMENTS ARE FULLY VISIBLE.
(!) ATTENTION (!)

DE5842

You can select whether to control the crane functions using the buttons placed on the remote control as follows:

- Position the rotating selector on the icon . "?crane?" appears on the display.
- Confirm the operation pressing contemporarily the buttons "INDEX" and "IGNITION". The indications of the crane load appear on the display.

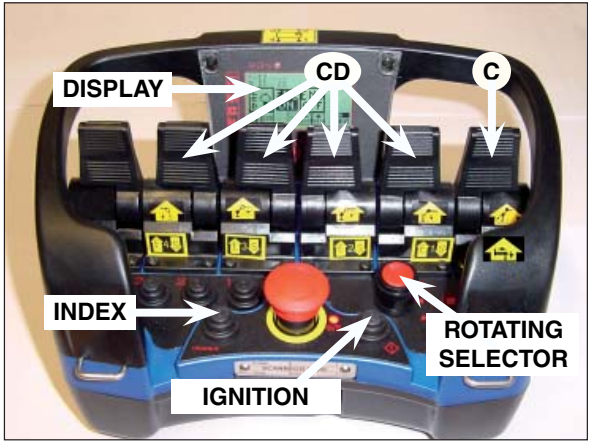
LINEAR PUSH-BUTTON PANEL (fig.3)

The first 5 control levers on the push-button panel (beginning on the right) have two plates because they can control 5 functions of the crane or the functions for stabilization.

Hereunder are reported the plates indicating the stabilization functions for every lever.



LINEAR PUSH-BUTTON PANEL *fig. 3*



Rotating selector	Selector of the icons on the display.
Leve CD	Controls for the selection of the outrigger supports and of the outrigger rams.
Leva C	Control of the selected outrigger support or ram.



MANOEUVRES OF THE OUTRIGGER RAMS IN CASE OF AN ELECTRICAL FAILURE

In case of an electrical failure, electrical malfunctions, you cannot use the selectors on the push-button panel and so it is necessary to operate directly the outrigger distributor bank (fig. 4). In such an emergency condition, the operator shall make sure that no one is within or passing in close proximity to the working area of the outriggers, neither from the operator side nor from the opposite side. The operator shall be able to visually see the whole working area at all times. If it is not possible he shall team up with a co-worker (i.e. located on the opposite side of the crane) in a way not to harm each other while manoeuvring the outriggers (i.e. disengage of the locking devices of the outrigger supports, see fig. 5-5a). To operate with the distributor bank use the two levers without thread in equipment.

PICTURE LIST (fig. 4):

- Levers **CD** Controls to select the outrigger supports and rams.
- Levers **C** Control of the selected outrigger support or ram.
- T** Electric deviator of the crane-outriggers (fig. 4a)

Example: re-entry of the outrigger ram **S1**

- tighten the **T** screw (fig. 4a)
- activate the corresponding lever **CD** towards "**S1**" and keep it in position.
- activate the lever **C** to control the descent of the ram.
- to reactivate the crane functions loosen the **T** screw, to the previous position (see fig. 4a)

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

(!) ATTENTION (!)

Interferences with the valves or removal of the lead seal release the FASSI GRU from any responsibility and invalidate the warranty.

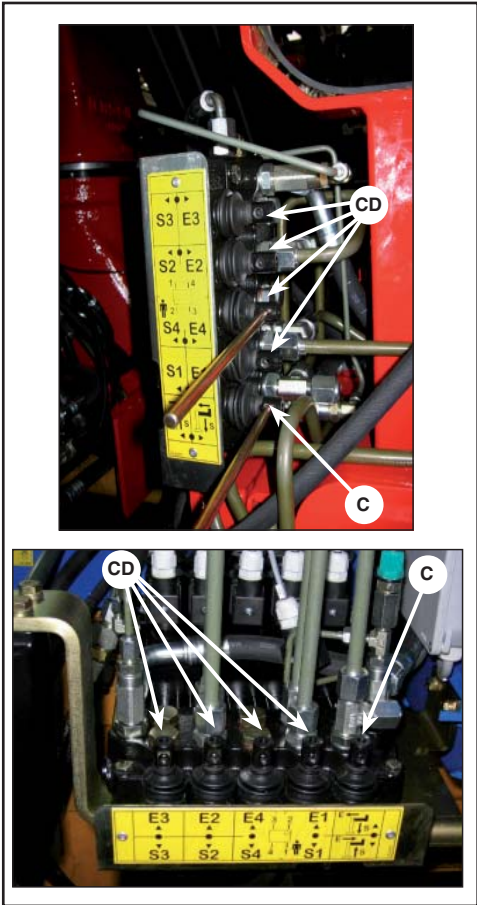


fig. 4

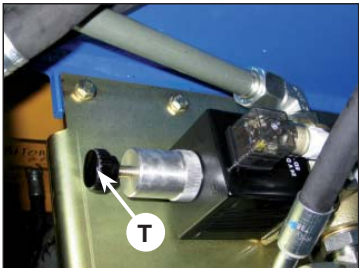


fig. 4a

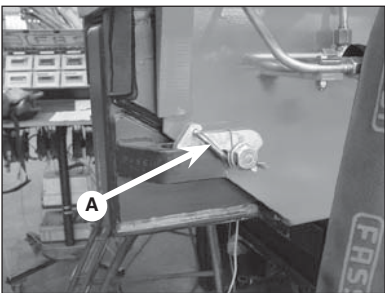


fig. 5



fig. 5a





13.3 Controls to stabilize the vehicle

13.3.1 Crane with fixed or manually tiltable supports for outrigger rams

Operate the locking devices of the outrigger supports (lever A fig. 6-6a) with extreme care, in order to prevent the fingers being pinched between the outriggers and the supports. Make sure that **NOBODY IS OPERATING NOR ON THE POINT OF OPERATING the controls of the locking devices of the outrigger supports.**

- Disengage the locking devices of the outrigger supports by putting the levers **A** from the position of the fig. 6 to the one of the fig. 6a.
- Position lever **D** of oil diverter ( - **E/S**) on **E/S**.
- Position selector ( - **E/S**) of the push-button panel on **E/S**. (you read "outriggers" on the display)

- By using the levers **CD** and the lever **C** extend the outrigger supports and lower the outrigger rams till the complete stabilisation of the vehicle.

Example of using the levers **CD** and the lever **C**:

- extension of the outrigger support n°1
 - activate the lever **CD** n°1 in the direction of **E**.
 - by keeping activated the lever **CD** n°1, activate the lever **C** in the opposite direction.
- descent of the outrigger ram n°1
 - activate the lever **CD** n°1 in the direction of **S**.
 - by keeping activated the lever **CD** n°1, activate the lever **C** in the opposite direction.

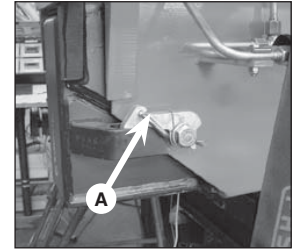


fig. 6



fig. 6a



fig. 6b

(!) 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 of the support if it's supplied with extra double extension beams) (Fig. 6b).

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

To operate the crane controls, after having completed the stabilisation manoeuvres,

- Position lever **D** of oil diverter ( - **E/S**) on .
- Position selector ( - **E/S**) of the push-button panel on .

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

- Repeat by reversing the sequence of the operations effected for the stabilisation of the vehicle.

(!) ATTENTION (!)

Keep hands clear of automatic stop device of the outrigger supports (Fig. 6).

(!) ATTENTION (!)

Always check that the outrigger supports, once in their rest position, are locked in their seat by the safety devices, so as to assure the impossibility of accidental movement (Fig. 6).



13.3.2 Crane with hydraulic tiltable supports (WITH CHAIN) for outrigger rams:

SUPPLEMENTARY
BEAMS
GR5
13.3.2

(!) ATTENTION (!)

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.

- Disengage the locking devices of the outrigger supports by putting the levers **A** from the position of the fig. 6 to the one of the fig. 6a.
- Position lever **D** of oil diverter ( -E/S) on **E/S**.
- Position selector ( -E/S) of the push-button panel on **E/S**.
- By using the levers **CD**, the lever **C** and the valve taps, extend the outrigger supports, rotate the outrigger rams putting in a working condition and lower them till the complete stabilisation of the vehicle.

Example of using the levers **CD**, the lever **C** and the valve tap on the outrigger and the valve tap on the control ram for the tiltable support:

- **extension of the outrigger support n°1**
 - activate the lever **CD** n°1 in the direction of **E**;
 - by keeping activated the lever **CD** n°1, activate the lever **C** in the opposite direction.
- **rotation of the outrigger ram n°1 from the rest position (fig. 7) to the working condition (fig. 9)**
 - make sure that the tap **R1** of the valve of the outrigger ram **S1** is closed (for the closed or opened position see fig. 8);
 - open the tap **R2** of the valve of the control ram for the tiltable support;
 - to remove the pin **2** proceed as follows:
 - activate the lever **CD** n°1 in the direction of **S**;
 - by keeping activated the lever **CD** n°1, activate the lever **C** in the opposite direction to control the rotation and take the ram **S1** to its rest position so that the pin **2** is extractable;
 - lift the parking pin **1** (safety) until it is released and remove from its seat the pin **2**;
 - to rotate the outrigger ram **S1** proceed as follows:
 - activate the lever **CD** n°1 in the direction of **S**;
 - by keeping activated the lever **CD** n°1, activate the lever **C** in the opposite direction till the requested extension of the outrigger ram **S1**.

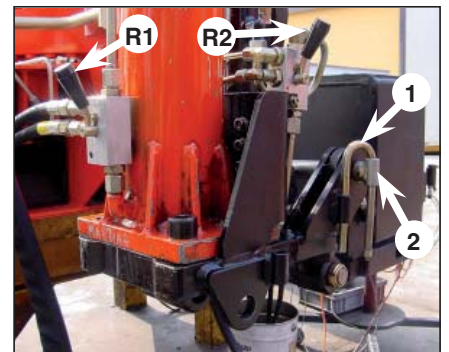


fig. 7

(!) ATTENTION (!)

Make sure that no one is or transits in close proximity of the working area of the outriggers.

- manually complete the rotation by positioning the ram vertically, insert the pin **2** in its new seat and lock it with the parking pin **1** (safety);
- close the tap **R2** of the valve of the control ram for the tiltable support

(!) ATTENTION (!)

The locking pin **2** is constructed from special material. Do not replace it with a non original part: your security depends on it

- **descent of the outrigger ram n°1**
 - open the tap **R1** of the valve of the outrigger ram **S1**;
 - activate the lever **CD** n°1 in the direction of **S**;
 - by keeping activated the lever **CD** n°1 activate the lever **C** in the opposite direction till the requested extension of the outrigger ram **S1**;
 - close the tap **R1** of the valve of the outrigger ram **S1**.

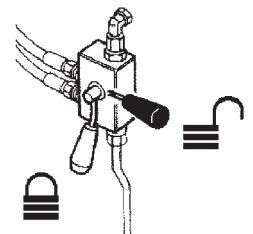


fig. 8



(!) 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 of the support if it's supplied with extra double extension beams) (Fig. 6b).

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

To operate the crane controls, after having completed the stabilisation manoeuvres,

- Position lever **D** of oil diverter ( -**E/S**) on  .
- Position selector ( -**E/S**) of the push-button panel on  .

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

- Repeat by inverting the sequence of the operations effected for the stabilization of the vehicle.

(!) ATTENTION (!)

Keep hands clear of automatic stop device of the outrigger supports (Fig. 6).

(!) ATTENTION (!)

Always check that the outrigger supports, once in their rest position, are locked in their seat by the safety devices, so as to assure the impossibility of accidental movement (Fig. 6).

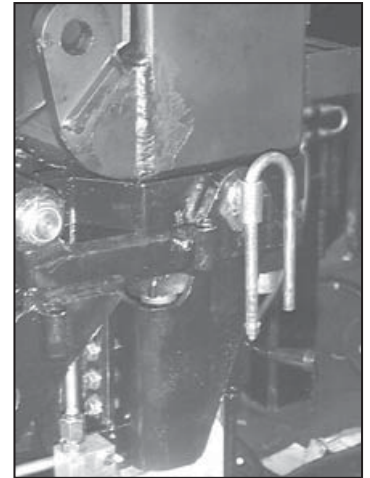


fig. 9





14 CONTROLS TO OPERATE THE CRANE

14.1 Generality

(!) ATTENTION (!)

Before operating the crane it is compulsory to set the outriggers (Plate DE6723 fig. 1).

The crane and hydraulic implements can be manually operated with:

- with the radio-remote control
- with controls from the emergency station from the column (if accessible)
- ground controls on both sides.

The plates reported over each lever define their function in relation to their movement.

FASSI

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 DER INBETRIEBNAHME DES KRANS MÜSSEN DIE ABSTÜTZUNGEN AUSGEFAHREN WERDEN

ATENCIÓN: ANTES DE ACCIONAR LA GRÚA ES OBLIGATORIO ESTABILIZAR EL VEHÍCULO.

ATENÇÃO: ANTES DE UTILIZAR A GRUA É OBRIGATÓRIO COLOCAR EM FUNCIONAMENTO OS ESTABILIZADORES.

DE6723

fig. 1



14.2 Radio-remote control

14.2.1 Use of the radio-remote control

(!) ATTENTION (!)

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

The plates shown on the side of each push-button panel lever of the radio remote control determine the operation of the levers in relation to the movement of the crane.

(!) ATTENTION (!)

The sequence of the plates placed on the crane controls may be different. Make sure that the lever you are going to operate corresponds to the control you selected.

(!) ATTENTION (!)

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.

- TELE-RADIO REMOTE CONTROL

The radio remote control, in the case of a discharged battery or in the presence of interference in the radio transmission, or use of the crane in situations where the transmission by radio is forbidden, can be easily transformed into tele-radio remote control.

Connect the push-button panel and the socket, indicated by the DE6998 plate (fig. 2), placed on the base with the serial cable (supplied with the radio remote control). The battery of the push-button panel may be left (even if it will not be charged). Turn push-button panel on, using the ignition key (fig 5).

If the remote radio control does not work, you can use the emergency distributor to put down the load on the ground. Read attentively paragraph 16.8.1, before using it.

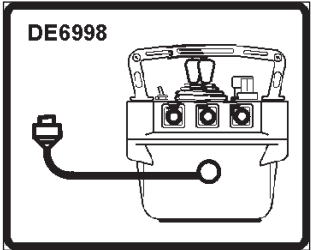


fig. 2



14.2.2 Push-button panel of the radio-remote control "RCH"

The push-button panel of the radio remote control "RCH" in its standard configuration, features 6 linear levers (but it can allocate up to 8) and a display where it is possible to visualize information about the use of the crane.

Optionally, the push-button panel can be supplied with joystick controls with 6 or 8 functions. The 8-function version features two side joysticks with 3 functions; the third function is available through the rotation of the joystick head.

- LINEAR PUSH-BUTTON PANEL

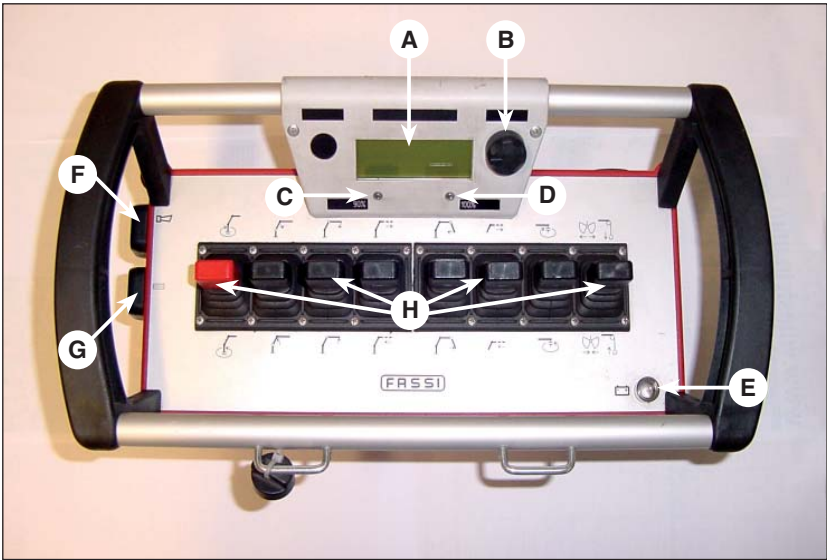


fig. 3

- PUSH-BUTTON PANEL WITH JOYSTICK

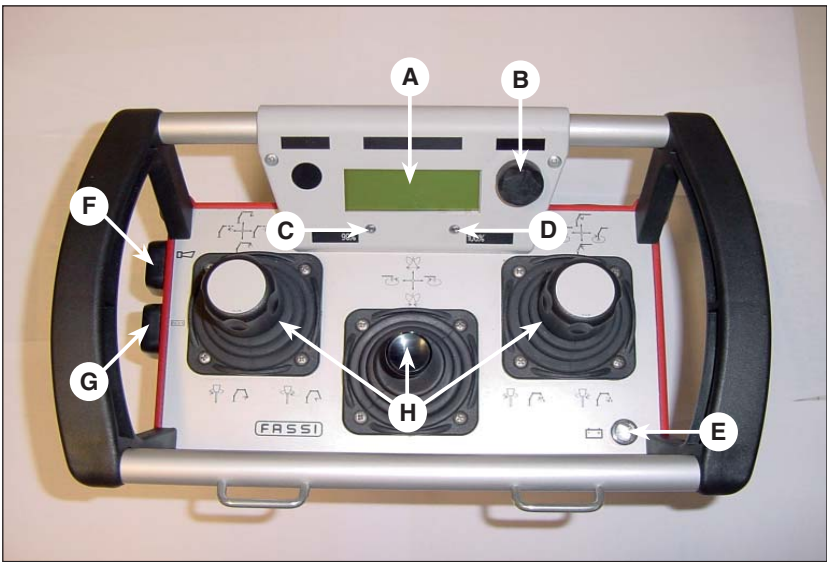


fig. 4

Each push-button panel element is identified with letters of the alphabet as shown in figures 3,4,5,6,7: check the list down below to get the meaning of each element.

- A) Graphic Display visualizing the pressure on the lifting rams, alarms, various information and icons for the selection of the different menus (For translations see graphic panel).
- B) Function selector with rotary movement "RX" to select the icons of the program menus (see the icon legend, par. 14.2.4). Press on the selector to confirm the choice.
- C) Yellow light indicating that the crane exceeds 90% of its capacity.
- D) Red light indicating that the crane exceeds 100% of its capacity, and the activation of the lifting moment limiting device. It can signal too alarms, warnings or particular conditions of the crane.



- E) Battery condition visual indicator. Correct functioning (charged battery) is indicated by a green flashing. Red flashing with audible bleep indicates that the battery is almost discharged and needs to be replaced.
- F) Activation push-button for acoustic alarm.
- G) Button "INDEX" used:
 - a) To start again to "Initial Menu", getting out from the under menus.
 - b) To do the scroll of the alarms. At every pressure, it will be visualized the following alarm, if fitted.
 - c) To move with the cursor towards right, if you are inserting a PIN.
 - d) To activate the retrolighting on the display (the retrolighting will switch off automatically. The extinction time is planed out in the SW FX800).
- H) Levers/joystick for crane control.
- I) Socket for radio remote control serial cable. Standard radio remote control is supplied with 10mt-long serial cable connecting the push-button panel with the socket on the base.
- L) Push-button panel ignition key. When the key is in "0" position, the push-button panel is off, when in "1" position, the push-button panel is on (the emergency button must be released).
- M) Mushroom-shaped emergency button.
- N) Battery.

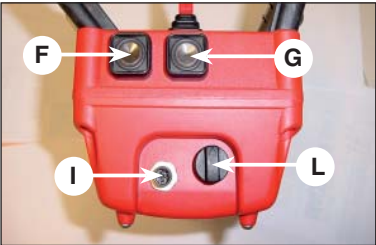


fig. 5

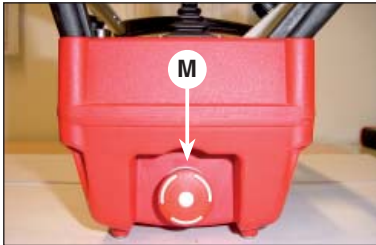


fig. 6



fig. 7

Check the list down below to get the meaning of the elements identified with letters of the alphabet as they are displayed when turning on the push-button panel, as shown in figure 8.

- 1 a. Load on the crane lifting rams, expressed in percentage.
- 1 b. Pressure in the crane lifting rams, expressed in bars.
- 1 c. Pressure in the crane lifting rams, expressed in daPsi*.
- 2. Crane angle monitored by the angle sensor placed on the outer boom.
- 3. Hydraulic extension angle monitored by the angle sensor placed on extension arm (the extension is not present in this case).
- 4. Space for messages.
- 5. Load on the winch (if fitted), expressed in percentage.
- 6. Oil temperature monitored by the temperature sensor.
- 7. Pressure in the hydraulic distributor .
- 8. Icons.
- 9. Flags.

The second line of the display can indicate too particular conditions of the crane through messages like WARNING, ALARM, STOP ROTATION, etc. In this case, all the data on the second line disappear at the moment and will reappear automatically when the crane control is taken again.

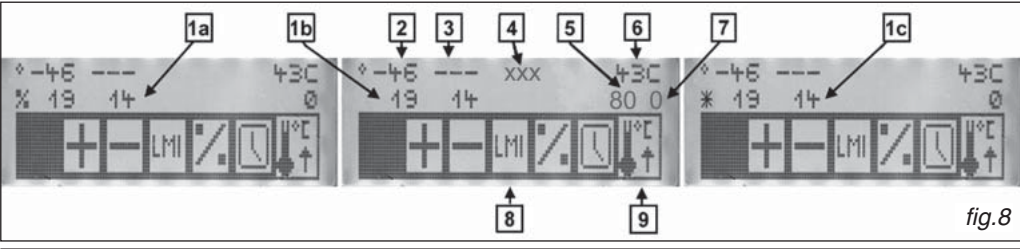


fig.8



14.2.3 Push-button panel of the radio-remote control "SCANRECO"

The push-button panel of the radio remote control "SCANRECO" in its standard configuration, features 6 linear levers (but it can allocate up to 8) and a display where it is possible to visualize information about the use of the crane.

- LINEAR PUSH-BUTTON PANEL

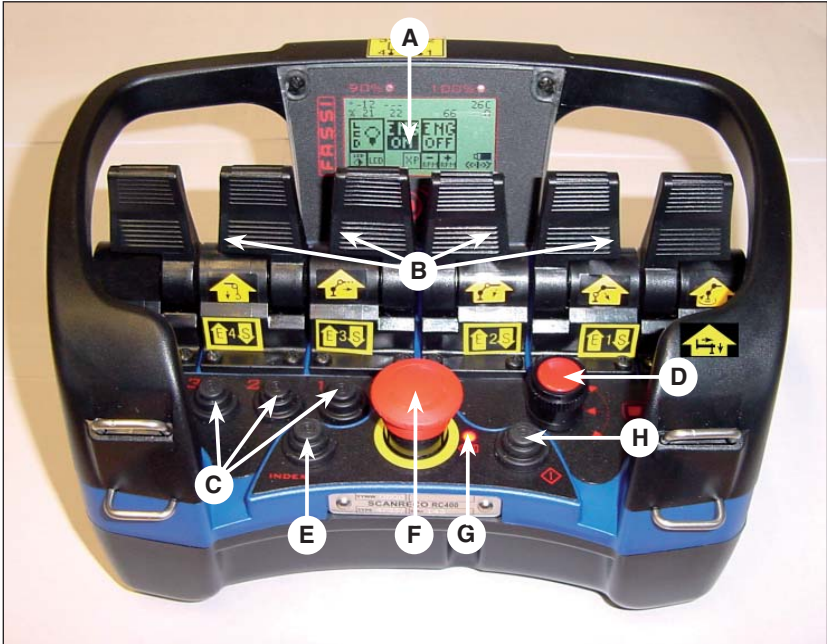


fig. 9

Each push-button panel element is identified with letters of the alphabet as shown in figures 9 - 10 - 11 - 12 - 13 : check the list down below to get the meaning of each element.

- A) Display.
- B) Linear levers to control the crane functions.
- C) Short cut buttons 1, 2 and 3. These can be paired with any of the virtual buttons (VB).
- D) Rotary selector. Using this selector, icons in the program menu can be selected. Clockwise rotation selects icons to the right, anti clockwise rotation selects icons to the left.
- E) Button "INDEX" used:
 - a) To start again to "Initial Menu", getting out from the under menus.
 - b) To do the scroll of the alarms. At every pressure, it will be visualized the following alarm, if fitted.
 - c) To move with the cursor towards right, if you are inserting a PIN.
 - d) To activate the retrolighting on the display (the retrolighting will switch off automatically. The extinction time is planed out in the SW FX800).
- F) Emergency push-button.
- G) Light showing the battery status. Green permanent light means that the battery is working correctly (charged). Red flashing light means that the battery is discharged and needs to be replaced.
- H) Activation button. Press once to start up the radio remote control.
- I) Yellow light indicating that the crane exceeds 90% of its capacity.
- J) Red light indicating that the crane exceeds 100% of its capacity, and the activation of the lifting moment limiting device. It can signal too alarms, warnings or particular conditions of the crane.
- K) Battery.



fig. 10



fig. 11



- L) Connection point to the cable that serves to connect the radio remote control to the electronic unit installed on the crane. The radio remote control is supplied with a 10 m. length serial cable to connect the radio remote control to the electronics present on the crane.

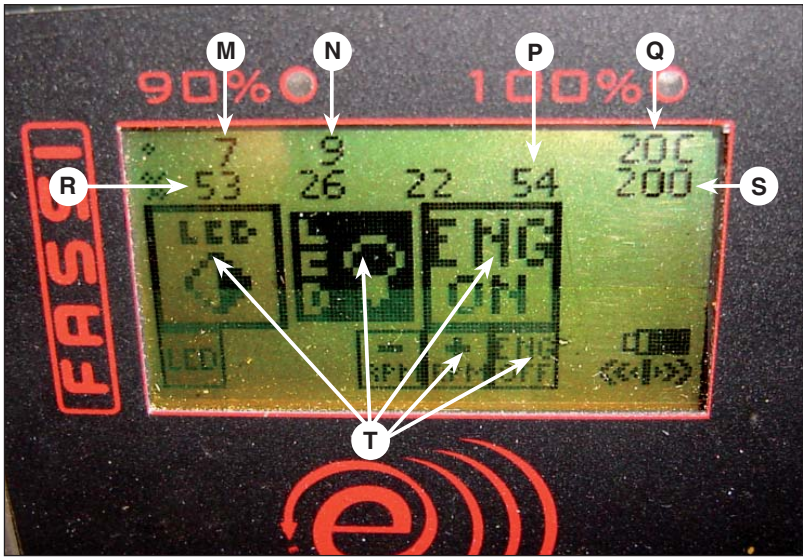


fig. 13

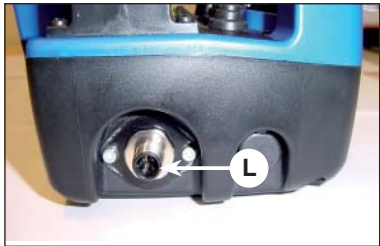


fig. 12

- M) Angular position of the crane, read by the angular sensor applied on the outer boom.
- N) Angular position of the hydraulic extension. If the hydraulic extension isn't present, no value will be visualized. If the hydraulic jib is present but not attached, it will be visualized "----".
- P) Load percentage on the winch.
- Q) The oil temperature, read by the temperature sensor applied on the heat exchanger.
- R) Load indication on: the inner ram, the outer ram, the hydraulic extension (if fitted).
- S) Working pressure in the distributor bank.
- T) Virtual Button VB.

- FIRST ACTIVATION OF THE RADIO REMOTE CONTROL AND PROCEDURE OF AUTOLEARNING

When the radio remote control is installed, and in case it is required to be replaced, the following procedure is required before it is operated:

1. Insert the battery in the radio remote control.
2. Connect the radio remote control to the crane through the serial cable.
3. Switch on electrically the crane, and after approx. 15 seconds (when the electronics is activated completely) push and keep pushed the button "ON" on the radio remote control until the display shows the inscription "Learnmode OK. Please power off". Switch off the radio remote control. Switch off the crane.
4. Remove the serial cable and switch the radio remote control on again.
5. Wait for approx. ten (10) seconds.
6. Electrically feed the crane to put the electronic card under tension (FX800); the radio remote control display will show "updating Gui version".
7. Wait approx. three (3) minutes to allow loading of all the icons on the display. When the display shows "Icons updated please power off", switch off and restart the radio remote control panel.
8. The crane can now be operated



- CONFIGURATION OF SUPPLEMENTARY BUTTONS AND COMBINATION OF THE ICONS (VIRTUAL BUTTONS)

CONTROLS TO
OPERATE THE CRANE
GR4_5-EVOLUTION **14.2.3**

1. Insert the battery in the radio remote control and switch on electrically the crane.
2. Push and keep pushed two of the three buttons of supplementary activation and switch on the radio remote control with the button "ON". Appears the inscription "FAVORITE CONFIGURATION" that confirms the entry in the menu of buttons combination.
3. Move with the rotary selector on the icon requested and push the physical button 1, 2 or 3 according to the button that you want to combine to that icon.
4. Repeat the operation to assign the functions of the other two buttons.
5. To confirm the assignment of the buttons functions, it's necessary to switch off and relight the radio remote control.

The combination physical button/virtual button can be modified at any time simply repeating all the procedure previously indicated.

- RE-START OF THE RADIO REMOTE CONTROL

If, when switching on the radio remote control after its first activation, problems concerning icon representation on the display appear, proceed in the following way:

1. Switch on the radio remote control panel.
2. Push at the same time the "E" and "H" buttons (fig.9).
3. The radio remote control display will show "updating".
4. Wait approx. three (3) minutes to allow loading of all the icons on the display. When the display shows "Icons updated please power off", switch off and restart the radio remote control panel.
5. The crane can now be operated.



14.2.4 Icon legend

- RADIO REMOTE CONTROL DISPLAY AND GRAPHIC PANEL

-  **ENTER**
-  + (to increase values when modifying the parameters or to navigate the menus in progression).
-  - (to decrease values when modifying the parameters or to navigate the menus in regression).
-  Activation of the procedure for the temporary exclusion of the lifting moment limiting device, and for the reset of the messages "**alarm**" and "**warning**".
-  Modification of the values displayed: pressure in Bar, load in %, pressure in dapsi, **crane angle** in degrees, (**jib angle**) in degrees, oil **temperature**.
-  Clock activation and access to the timer menu.
-  Activation/disactivation "**XP**" device.
-  Activation of the load check procedure on manual extensions (only on the graphic display).
-  To increase truck's engine r.p.m.
-  To decrease truck's engine r.p.m.
-  Starting the truck engine.
-  Turning off the truck engine.
-  Decrease in crane general speed (each selection reduces speed by the percentage set in the parameter visualised on "**Lnn**").
-  Selection of the 9°/10° function on the radio remote control.
-  Visualization of active "flag" icons in addition to the one selected.
-  Lighting working lights.
-  Activation of the supplementary exit 0.
-  Activation of the supplementary exit 1.
-  Activation of the supplementary exit 2.
-  Activation of the supplementary exit 3.
-  Activation of the supplementary exit 4.
-  Activation of the supplementary exit 5.
-  Activation of the supplementary exit 6.
-  Activation of the supplementary exit 7.
-  Activation of the supplementary exit 8.
-  Activation of the supplementary exit 9.
-  Activation of electric regeneration.
-  Activation of the electric deviator of flow.
-  Activation of JDP (Jib Dual Power).
-  De-energizing of the EV1 electrovalve without hindering the levers move-ment to unload the pipes pressure.
-  Passage from crane control to stabilizers and vice versa.

- ICONS VALID ONLY FOR MENU OF THE PANEL GRAPHIC REGULATION

-  Upon activation the setting menu of the graphic panel is displayed (lightness, contrast, etc.).
-  Access to the setting menu.
-  Keyboard blockage.
-  Contrast regulation.
-  Lighting retrolighting.
-  Visualisation of the software release.
-  Modification of load values from % to Bar on crane layout.
-  Visualization state of the lever, the control and the position of the electric modules



- **ICONS VALID ONLY FOR MENU OF THE RADIO REMOTE CONTROL REGULATION**

-  LCD
- Entry of the diagnostics levers, buttons and radio remote control menu.
-  Lighting
- retrolighting.
-  Contrast
- regulation.

- **"FLAG": WARNING ICONS NOT SELECTABLE WITH SELECTOR "RX"**

-  L%
- Warning icon indicating the activation condition of the general speed reduction.
-  90%
- Icon signalling 90% load capacity.
-  100%
- Icon signalling that load capacity exceeds 100% (activation of the moment limiting device).
-  DCS L1
- Downgrade to level 1.
-  DCS L2
- Downgrade to level 2.
-  LMI
- Icon signalling the activation of the procedure for the temporary exclusion of the lifting moment limiting device.
-  FC
- Icon signalling the activation of the photocell located on the control station on the top seat (operator is present) or the regenerative activation on crane with slew ring.
-  °C
- Icon signalling oil temperature in the tank (only on graphic panel and on cranes fitted with heat exchanger).
-  !
- Icon indicating the activation of the manoeuvre with EV1 forced at rest (open) or the regenerative activation on F240B.
-  9° and 10°
- Icon indicating the activation of the 9° and 10° function.
-  ME
- Icon signalling the activation of the procedure of the manual jibs.

- **INFORMATION MESSAGES**

- STOP ROTATION
- The "ROTATION STOP" is activated
- MAX ANGLE CRANE
- The "LIFTING STOP" is activated by the crane angle sensor
- MAX ANGLE JIB
- The "LIFTING STOP" is activated by the hydraulic jib angle sensor
- STOP BOOM OUT
- The "WINCH STOP" is activated by the boom out stop
- NOT ALLOWED
- The manoeuvre is not allowed
- WARNING ANGLE
- Warning upon reaching the "lifting block" activation angle (only on graphic display)
- CRANE FOLDED
- The crane is folded
- STOP
- The emergency stop button is pressed
- JIB OFF!
- The hydraulic jib is not electrically connected; it's not possible to manœuvre it
- BATTERY LOW!
- The FX800 battery is getting low
- WINCH CAL. ERROR
- The winch limiting device is not correctly calibrated, repeat the calibration as soon as possible.
- WINCH OFF!
- Intervention of the "WINCH OFF" caused by the rope being completely unwound
- START ENGINE
- Starting the truck engine
- STOP ENGINE
- Turning off the truck engine
- WARNING ROTATION
- IP4 cuts out without the operator presence on third control station
- NEW PVED
- Noticed an exchange module to plan on the Can Bus line
- DANGEROUS
- Noticed a pressure on TP0 with manoeuvre blocked and EV1 de-energized
- UPDATING
- Updating GUI version in progress
- WARNING VB
- Buttons state on the radio remote control not corresponding to the one of Fx800
- STOP INNER BOOM
- Intervention of "main descent block" for the interference with truck cab

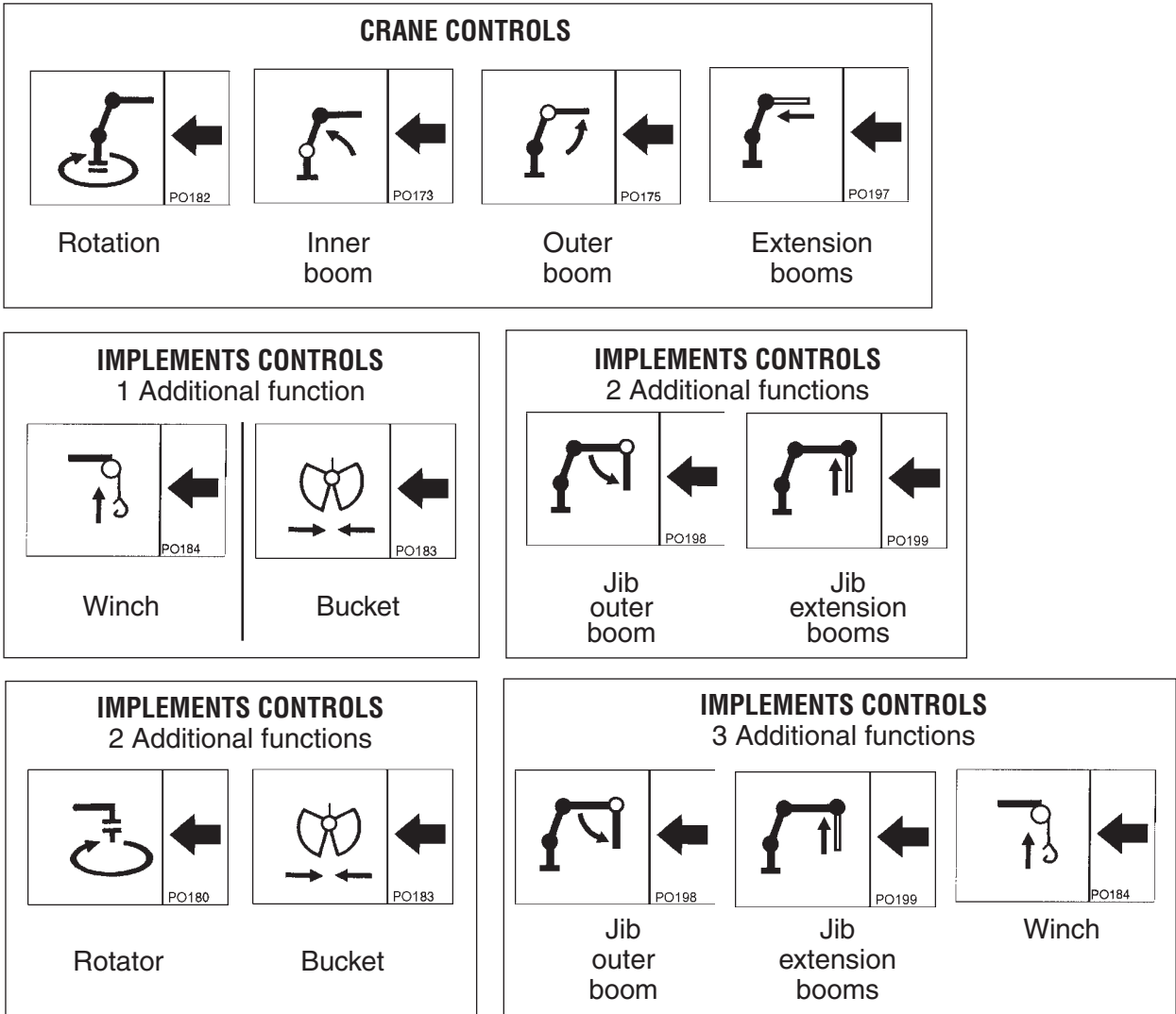




14.3 Emergency station from the column (if accessible) or
Control station (version with load limiting device) (not available)

(!) ATTENTION (!)

The sequence of the plates placed on the crane controls may be different. Make sure that the lever you are going to operate correspond to the control you selected.



(!) ATTENTION (!)

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.

(!) ATTENTION (!)

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. (DE6400 fig. 14)

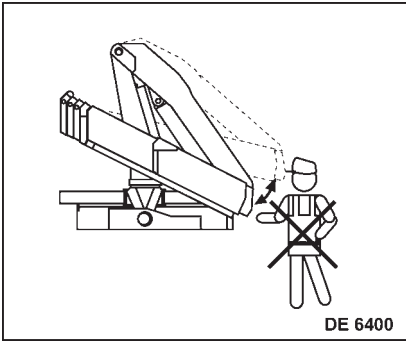


fig. 14



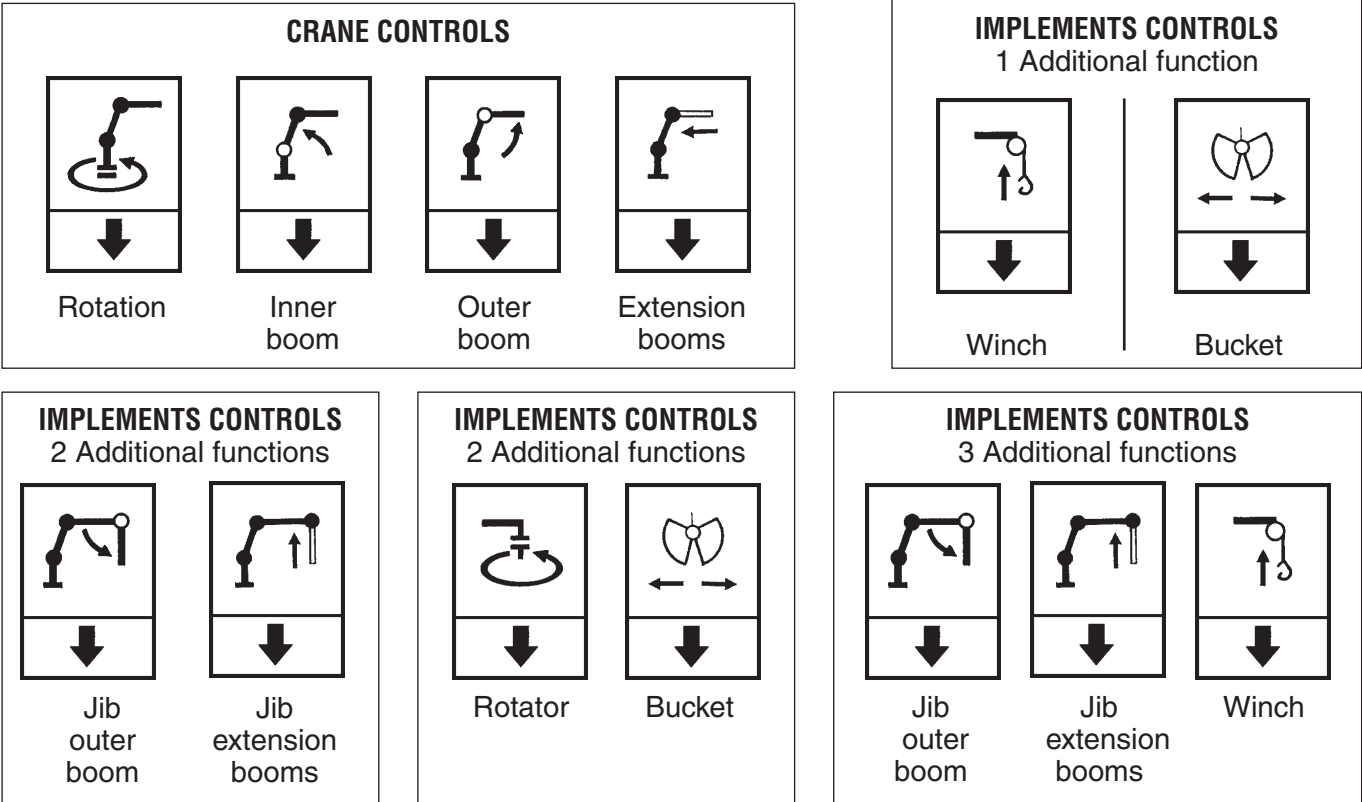
DE 6409A



VERSION WITH HORIZONTAL CONTROLS (top seat controls)

(!) ATTENTION (!)

The sequence of the plates placed on the crane controls may be different. Make sure that the lever you are going to operate correspond to the control you selected.



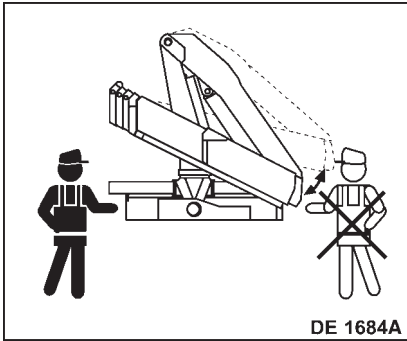
(!) ATTENTION (!)

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.

(!) ATTENTION (!)

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. 15)



DE 1684A

fig. 15

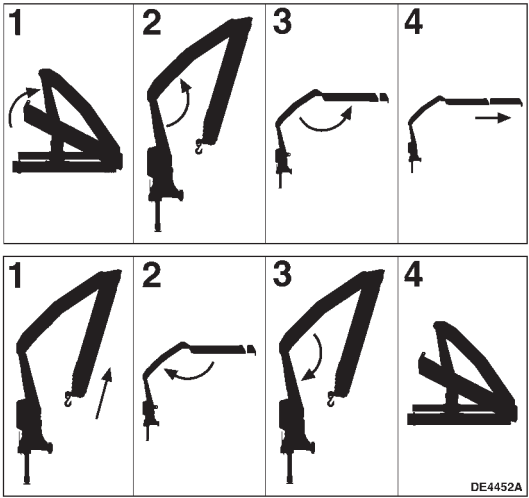


14.4 Manoeuvres to unfold the crane into a working condition

CONTROLS TO
OPERATE THE CRANE
GR4_5 - EVOLUTION **14.4**

The plate DE4452A indicates the sequence of the manoeuvres to be carried out to unfold and to fold the crane.

- Engage the power take off.
- Stabilize the vehicle (see details on Paragraph 13 "Manoeuvres and controls to stabilize the vehicle").



(!) ATTENTION (!)

**It is forbidden to operate near the booms in movement.
Operate from ground control distributor side.**

By operating the corresponding levers:

- make sure that the extension booms and the outer ram are closed;
- lift the inner boom over the horizontal line;
- open the outer boom to the "horizontal" position;
- position the hook on the vertical line above the load.

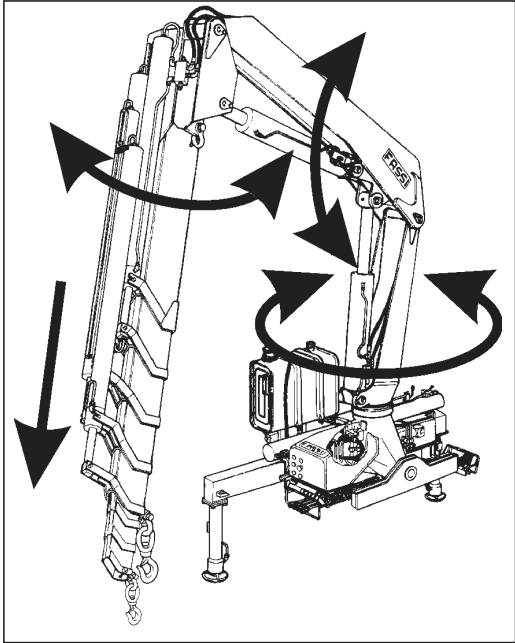
14.5 Manoeuvres to fold the crane into the rest condition (see Plate DE4452A)

(!) ATTENTION (!)

It is forbidden to operate near the booms in movement. Operate from ground control distributor side.

By operating the corresponding levers:

- fold the extension booms to their stroke end;
- lift the inner boom to its stroke end;
- fold the outer boom to its stroke end;
- rotate the crane until the reference arrows coincide (on the column and on the base);
- fold the inner boom to its stroke end; the rest locating pin locates into its seat;
- re-position the outriggers to within the overall vehicle width as described on Paragraph 13.



(!) ATTENTION (!)

If the hook goes out of size with the crane folded it must be taken of before starting the truck.



(!) ATTENTION (!)

A safety device is installed on the outer boom of the crane version "C" preventing the exit of the extension boom sections when the crane is in rest position.

14.6 Manoeuvres to unfold the crane "C" into a working condition (only for the crane version C")

(!) ATTENTION (!)

It is forbidden to operate near the booms in mouvement.
Operate from ground control distributor side.



By operating the corresponding levers:

- Lift the inner boom over the horizontal line.
- Open the outer boom to the "horizontal" position.
- Extend the extension boom sections; the hook of the safety device is free.
- Position the hook on the vertical line above the load.

14.7 Manoeuvres to fold the crane "C" into the rest condition (only for the crane version "C")

(!) ATTENTION (!)

It is forbidden to operate near the booms in mouvement.
Operate from ground control distributor side.



By operating the corresponding levers:

- completely reenter the extension boom sections;
- lift the inner boom close to its stroke end;
- fold the outer boom to its stroke end;
- lower the inner boom until the hook of the safety device rests on the extension boom sections;
- reenter the extension boom sections and suitions and suitably lock them in place by means of the hook;
- do not insist on the control!
- rotate the crane until the reference arrows coincide (on the column and on the base);
- fold the inner boom to its stroke end; the rest locating pin locates into its seat;
- re-position the outriggers to within the overall vehicle width as described on Paragraph 13.

(!) ATTENTION (!)

If the hook goes out of size with the crane folded it must be taken of before starting the truck.

14.8 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.



16 MANOEUVRES OF THE CRANE LOADS

16.1 Generality

(!) ATTENTION (!)

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

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 weight of the load to be lifted (**kg**) by its distance (**meters**) from the centreline 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.

(!) 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.

16.2 Lifting moment limiting device "EVOLUTION" (LMEV) and automatic dynamic control (ADC)

This device utilises an electro-hydraulic system managed by an electronic logic that prevents any operation tending to cause an increase in the pressure induced by the load in the lifting rams (inner, outer rams of the crane and of the hydraulic extension, if fitted), up to the critical values. These values, which are not exceedable, determine the intervention levels and provide the data for setting the device.

The pressure values detected in the lifting rams are turned into electric signals by the transducers, and sent to the electronic logic of the device which determines the locking or unlocking of the controls concerned, according to the horizontal position of the crane outer boom; only the controls allowing a reduction of the overload are enabled, while those increasing it are disabled.

The device features an electro-hydraulic control that does not allow the set value to be exceeded, by deactivating the controls commanded by the limiting device. When the controls are released (levers in neutral position) it's this electronic logic that handles which manoeuvres are disabled, according to the position of the crane outer boom and in overload condition, by sending electric signals to special micro-switches placed on the elements of the distributor.

The ADC device (if fitted) can be activated only through the radio remote control. It controls the dynamics of the movements by limiting the distributor control levers run according to the pressure of the hinged rams in movement, thus providing the maximum speed available subject to the applied load. When using manual controls (therefore the ADC system is not enabled), the oil capacity is automatically reduced in order to avoid excessive dynamic solicitations.

(!) ATTENTION (!)

The ADC device is not active on winch controls and on accessories other than the hydraulic jibs.

Practically the speed of the load movement decreases as the intervention limit of the lifting moment limiting device approaches.



Any movement (ram) (including the rotation) acts on all the movements, exclusive of the re-entry/exit of the boom sections (provided that this speed is too low).

(!) ATTENTION (!)

This control of the dynamics and therefore of speed engenders a variation of the movement speed of the crane also without varying the position of the control levers. (For instance when putting down on the ground the load hanged on the winch, the crane movement gradually accelerates even if the control lever of the radio remote control is kept unchanged).

16.3 Control panels of the lifting moment limiting device (if fitted)

There are three types of control panels: Graphic, Alphanumeric or Basic.

GRAPHIC PANEL

Refer to fig. 1 to identify the various components of the panel:

- 1 Green, yellow and red led band signalling the load percentage as compared to the capacity plate. Green light load between **0** and **90%**. Yellow light load between **90** and **100%**. Red light load higher than **100%** (activation of the lifting moment limiting device).
- 2 Graphic Display visualizing the pressure on the lifting rams, alarms, various information and icons for the selection of the different menus.
- 3 Mushroom-shaped emergency button (always active).
- 4 **"INDEX"** push-button to program or select menus.
- 5 Audible alarm push button (see instructions and warnings).
- 6 Control button for the temporary exclusion of the lifting moment limiting device, and for the reset of the messages **"alarm"** and **"warning"**.
- 7 Function selector with rotary movement **"RX"** to select the icons of the program menus (see the icon legend, par. 14.2.3). Press on the selector to confirm the choice.
- 8 Red led light-flashing for **"warning"** or fixed for **"alarm"**.
Led lights 4-6. If led lights 4 and 6 are flashing the panel is not enabled (emergency excluded); contemporarily press on push-buttons 4 and 6 to activate it.

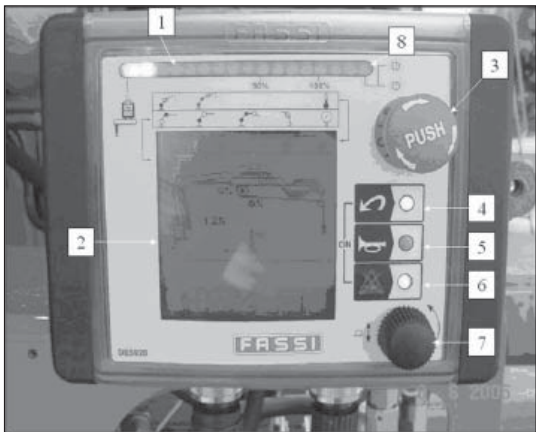


fig. 1



ALPHANUMERIC PANEL

CONTROLS TO OPERATE
THE CRANE
GR4_5 - EVOLUTION

16.3

Refer to fig. 2 to identify the various components of the panel:

1. Green, yellow and red led band signalling the load percentage as compared to the capacity plate. Green light load between 0 and **90%**. Yellow light load between **90** and **100%**. Red light load higher than **100%** (activation of the lifting moment limiting device).
2. Alphanumeric Display visualizing the pressure on the lifting rams, alarms, various information and icons for the selection of the different menus.
3. Mushroom-shaped emergency button (always active).
4. Push-button to select the use of buttons 5, 6, 7, 8, 9 in configuration "A" or "B". If the light is on, the "A" mode is enabled, if the light is off, the "B" mode is enabled.
- 5A. Control button for the temporary exclusion of the lifting moment limiting device, and for the reset of the messages "**alarm**" and "**warning**".
- 6A. "XP" device push-button.
- 7A. Audible alarm push button (see instructions and warnings).
- 8A. Push-button to modify the values displayed: pressure in Bar, load in %, pressure in dapsi, crane angle in degrees, jib angle in degrees, oil temperature.
- 9A. Button for the clock activation and to access the timer menu (see timer 16.7).
- 5B. + button (to increase values when modifying the parameters or to navigate the menus in progression).
- 6B. - button (to decrease values when modifying the parameters or to navigate the menus in regression).
- 7B. "INDEX" push-button to program or to select menus.
- 8B. "ENTER" button used to program or to select menus.
- 9B. F2 button (actually not in use).
10. Red light-flashing for "**warning**" or fixed for "**alarm**".
Led lights 4-6. If led lights 4 and 6 are flashing the panel is not enabled (emergency excluded); contemporarily press on push-buttons 4 and 6 to activate it.

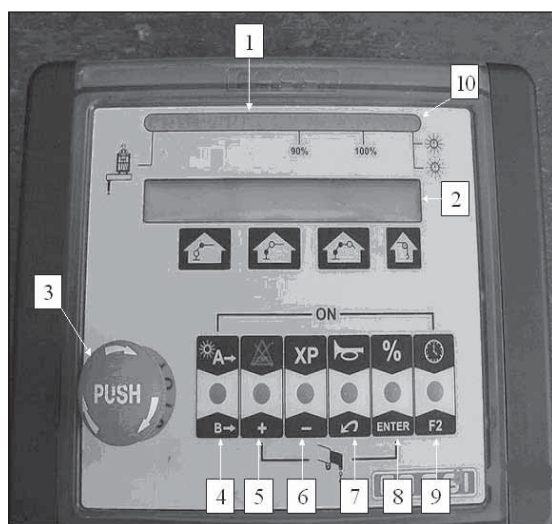


fig. 2



BASIC PANEL

Refer to fig. 3 to identify the various components of the panel:

- 1 Green, yellow and red led band signalling the load percentage as compared to the capacity plate. Green light load between **0** and **90%**. Yellow light load between **90** and **100%**. Red light load higher than **100%** (activation of the lifting moment limiting device). The red light can also signal **"warning"** if flashing, or **"alarm"** if fixed.
- 2 Orange light signalling that the **XP** device is enabled.
- 3 Mushroom-shaped emergency button (always active).
- 4 Green light signalling tension in he panel; if flashing, it indicates the presence of the operator in the third control station.
- 5 Control button for the temporary exclusion of the lifting moment limiting device, and for the reset of the messages **"alarm"** and **"warning"**.
- 6 **"XP"** device push-button.
- 7 Audible alarm push button (see instructions and warnings).
- 2-4 Lights 2-4 are flashing during the exclusion procedure of the lifting moment limiting device.

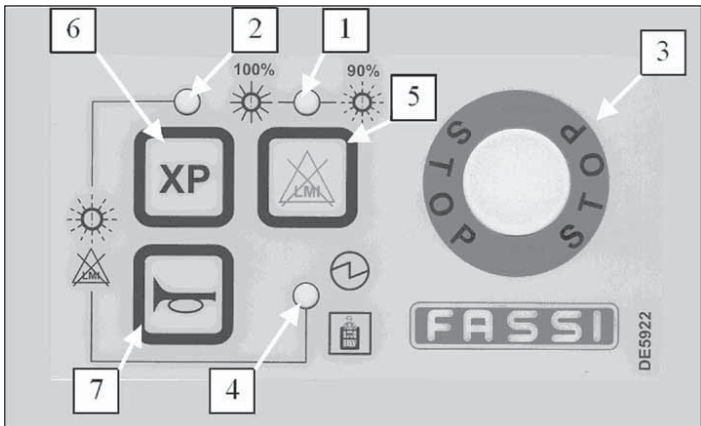


fig. 3



16.4 Load handling

Any block condition requiring the distributor unloading does not allow the use of hydraulic accessories (bucket, rotator, ...); these could however be activated when coupled with permitted manoeuvres.

16.4.1 "Block due to overload condition"

According to the type of block and to the crane configuration, the only manoeuvres permitted are the ones allowing a reduction of the overload, as follows:

Crane in overload condition with outer boom and hydraulic jib under the horizontal line

Manoeuvres not allowed
- Inner boom lift - Outer boom lift - Exit of the crane extension boom sections (if the overload is created by the hydraulic jib, it can still operate) - Hydraulic jib lift (if crane is equipped with) - Exit of the jib extension boom sections (if crane is equipped with) - Winch lift (if crane is equipped with)

Crane in overload condition with outer boom under the horizontal line and hydraulic jib horizontal

Manoeuvres not allowed
- Inner boom lift - Outer boom lift - Exit of the crane extension boom sections (if the overload is created by the hydraulic jib, it can still operate) - Exit of the jib extension boom sections (if crane is equipped with) - Winch lift (if crane is equipped with)

Crane in overload condition with outer boom under the horizontal line and hydraulic jib over the horizontal line

Manoeuvres not allowed
- Inner boom lift - Outer boom lift - Exit of the crane extension boom sections (if the overload is created by the hydraulic jib, it can still operate) - Hydraulic jib descent (if crane is equipped with) - Exit of the jib extension boom sections (if crane is equipped with) - Winch lift (if crane is equipped with)

Crane in overload condition with outer boom horizontal and hydraulic jib under the horizontal line

Manoeuvres not allowed
- Inner boom lift (only if the overload is created by the hydraulic jib) - Outer boom lift (only if the overload is created by the hydraulic jib) - Exit of the crane extension boom sections (if the overload is created by the jib ram, it can still operate) - Hydraulic jib lift (if crane is equipped with) - Exit of the jib extension boom sections (if crane is equipped with) - Winch lift (if crane is equipped with)



Crane in overload condition with outer boom and hydraulic jib horizontal

Manoeuvres not allowed
- Exit of the crane extension boom sections (if the overload is created by the hydraulic jib, it can still operate) - Exit of the jib extension boom sections (if crane is equipped with) - Winch lift (if crane is equipped with)

Crane in overload condition with outer boom horizontal and hydraulic jib over the horizontal line

Manoeuvres not allowed
- Exit of the crane extension boom sections (if the overload is created by the hydraulic jib, it can still operate) - Hydraulic jib descent - Exit of the jib extension boom sections (if crane is equipped with) - Winch lift (if crane is equipped with)

Crane in overload condition with outer boom over the horizontal line and hydraulic jib under the horizontal line

Manoeuvres not allowed
- Inner boom lift (only if the overload is created by the hydraulic jib) - Inner boom descent - Outer boom lift (only if the overload is created by the hydraulic jib) - Outer boom descent - Exit of the crane extension boom sections (if the overload is created by the hydraulic jib, it can still operate) - Hydraulic jib lift (if crane is equipped with) - Exit of the jib extension boom sections (if crane is equipped with) - Winch lift (if crane is equipped with)

Crane in overload condition with outer boom over the horizontal line and hydraulic jib horizontal

Manoeuvres not allowed
- Inner boom descent - Outer boom descent - Exit of the crane extension boom sections (if the overload is created by the hydraulic jib, it can still operate) - Exit of the jib extension boom sections (if crane is equipped with) - Winch lift (if crane is equipped with)

Crane in overload condition with outer boom and hydraulic jib over the horizontal line

Manoeuvres not allowed
- Inner boom descent - Outer boom descent - Exit of the crane extension boom sections (if the overload is created by the hydraulic jib, it can still operate) - Hydraulic jib descent (if crane is equipped with) - Exit of the jib extension boom sections (if crane is equipped with) - Winch lift (if crane is equipped with)

Note: In case of alarm to be reset on sensors TI1 and TI2 (inclinometers on outer boom and extension boom), not knowing the crane configuration, the block is activated on manoeuvres both above and under the horizontal line.

(!) **ATTENTION (!)**

During load handling with the crane and with the crane and hydraulic jib, in vertical configuration or close, the operator must strictly refer to the loads indicated on the capacity plates since the limiting device shows to be not particularly sensitive with vertical lifts.



16.4.2 "Winch off" (when fitted)

Crane in overload condition by the intervention of the load limiter of the winch

Manoeuvres not allowed	
-	Clockwise/anticlockwise rotation
-	Inner boom lift/descent
-	Outer boom lift/descent
-	Exit of the crane extension boom sections
-	Hydraulic jib lift/descent (if crane is equipped with)
-	Exit of the jib extension boom sections (if crane is equipped with)
-	Winch rope lift

Crane in overload condition for winch rope totally unwound

Manoeuvres not allowed	
-	Winch rope descent

16.4.3 "Lifting block" (Prolink)

Function of the safety device controlling the articulation "Prolink"

When the first angle limit **alfa1** is reached, the safety device temporarily stops all movements and activates the flashing red light; "**Warning angle**" is displayed on the screen. In order to reactivate all the crane functions (except for the lifting of the inner boom that in this case is definitely disabled) just put the all the levers in neutral position. Press the **LMI** button to remove the message "**Warning angle**" (it will disappear when the temporary block angle **alfa1** is no longer exceeded).

When the second angle limit **alfa2** is reached, the safety device definitively stops all lifting movements and activates the fixed red light; "**Max angle crane**" or "**Max Angle jib**" are displayed according to which boom has reached the limit.

The outer booms of the crane and of the hydraulic jib can reach both the **alfa1** (temporary block) and **alfa2** (definitive block) limits, independently from the position of the other booms.

But if one of these two booms reaches the second limit **alfa2**, this condition evidently stops any other lifting.

Only if neither the crane outer boom nor the hydraulic jib reach the first angle limit **alfa1**, the inner boom can attain its max limit **alfa2**, that is its mechanic stroke end.

Lift stop by the activation of crane angle sensor

Manoeuvres not allowed	
-	inner boom lift
-	outer boom lift

Lift stop by the activation of hydraulic jib angle sensor

Manoeuvres not allowed	
-	inner boom lift
-	outer boom lift
-	hydraulic jib lift
-	winch lift



16.4.4 Other functional characteristics

Crane block by the attainment of the mechanical stroke end of the lifting ram.

The limiting device may intervene also during loadless crane operation following a pressure peak provoked by the attainment of the stroke end of the lifting ram at high speed. In this condition, the permitted manoeuvres can be activated, but to reset the block it is necessary to perform the opposite manoeuvre to the one that caused the block. Then the limiting device checks if the pressure goes down and therefore decides whether to remove the block, or to maintain it. Such type of reset works only one time.

Activation of the temporised exclusion device of the lifting moment limiting device

Such device has been added in order to solve the problem of the lifting of heavy and bulky loads with the extension boom sections almost completely re-entered. Once above the horizontal line (with pressure reaching the activation level of the lifting moment limiting device), during the load descent, due to the dynamic overload caused by the descent, the lifting moment limiting device is activated and therefore it becomes impossible to put down the load on the ground.

The temporised exclusion device sets remedy to what described above as follows:

With the crane in block condition, maintain the command for the extensions boom re-entry until stroke end until "**LMI**" is displayed at the top right corner of the radio remote and contemporarily the icon (flag) is displayed at the right end corner.

Release the lever commanding the extensions booms and then press the exclusion device button of the lifting moment limiting device (if the procedure has been correctly executed, "**ELMI**" will be displayed at the top right corner of the radio remote controller). From this moment on you have at your disposal **five (5)** seconds to carry out the descent of the outer boom in order to bring the load under the horizontal line and therefore put it down on the ground. As soon as the crane exits the block, "**ELMI**" is no more displayed.

After the execution of such manoeuvre (5 seconds) wait at least **one (1)** minute in order to be allowed to carry out the manoeuvre once again.

(!) ATTENTION (!)

**Activation of the exclusion device of the lifting moment limiting device.
Only the outer boom descent is allowed.**

When the operator uses this device, it means that he wishes to override the lifting moment lifting 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 over load to the minimum.**



Crane folded into the rest position

We introduced the handling of the crane in the rest condition. When you fold the crane to its rest position, the angle sensor detects a value around 90°, thus disabling the lifting manoeuvres. In order to obviate to this condition, when turning on the crane, if it exceeds the limit values, the message **"CRANE FOLDED"** will be displayed on the main unit. At this point the only manoeuvre allowed is the folding of the outer ram (according to the manual for Use and Maintenance, this is the first manoeuvre to be executed when unfolding the crane). If during this manoeuvre the pressure in the outer ram goes down for at least two seconds, then the crane is considered in rest condition, the messages **"CRANE FOLDED"** disappears and all the manoeuvres are allowed.

NOTE: the message **"CRANE FOLDED"** is displayed also when the crane is turned off with the booms in **"LIFTING BLOCK"** condition and then the crane is turned back on; descend the outer boom below the horizontal line in order to remove the message.

16.4.5 Visual indicator yellow/red light

The crane is fitted with visual indicator of the following signals: yellow light upon reaching 90% and red light upon activation of the lifting moment limiting device. The visual indicator (fig. 4) is in full view on the structure of the crane or of the vehicle.

NOTE: If the radio-remote control is off or however one cannot communicate with the crane (receiver) the yellow and red warning lights alternately flash.

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.

If a reduction of capacity is necessary because of insufficient stability of the complete unit, new capacity plates must be fixed giving the derated capacity in accordance with the final stability test.

(!) ATTENTION (!)

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



fig. 4



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.

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

- the opposite rotation
- the manoeuvres allowed by the limiting device.

16.7 Setting menu

How to visualise the data

- Press the clock button to have the current date visualized on display

How to activate the timer:

<< Partial timer >>:

- Start from the main screen showing pressures in the lifting rams, and select the **"CLOCK"**  icon until **"TIME"** is displayed
- select the icon  : **"Partial Time"** is displayed,
- select the icon  **"ENTER"** to read the value on the timer.
- To reset the partial time, do as follows:
- keep the icon  pressed until you read **"TIME"** on the display,
- select the icon  to read **"Partial Time"** on the display,
- select again the icon  : **"Total Time"** is displayed,
- select again the icon  : **"Work Time"** is displayed,
- select again the icon  : **"Reset Partial"** is displayed,
- select the icon  to read **"Enter to Confirm"** on the display,
- select again  : the timer is reset and it will start recording again.

<< Total Time (total activation time of the electric panel)>>:

- Start from the main screen and select the **"CLOCK"**  : icon until **"TIME"** is displayed,
- select the icon  : **"Partial Time"** is displayed,
- select again the icon  : **"Total Time"** is displayed,
- select the icon  **"ENTER"** to visualize, for about 5 seconds, the total time expressed in hours and minutes.

<< Work Time (total crane work time linked to the activation of the levers)>>:

- Start from the main screen and select the **"CLOCK"**  icon until **"TIME"** is displayed,
- select the icon  : **"Partial Time"** is displayed,
- select again the icon  : **"Total Time"** is displayed,
- select again the icon  **"Work Time"** is displayed,
- select the icon  **"ENTER"** to visualize, for about 5 seconds, the total work time expressed in hours and minutes.



VERSION: how to control the software release.

- Select the icon **"ENTER"** (FX800 will be displayed), select, again, press the icon repeatedly and then select icon.
- Select the menu **"VERSION"** by using the icon then select the icon
- The software release (i.e. 02.00 09/06/05) will be displayed; by selecting the icon you'll read the graphic version (GUI).

v		n	n	.	n	n		g	g	/	m	m	/	a	a

HOW TO CONTROL THE LOAD HOOKED ON MANUAL EXTENSIONS.

When to use the procedure:

The procedure allows to calculate if a load can be moved when using manual extensions on crane and/or hydraulic jibs.

This procedure give us back the following information:

- **YES/NO** response about lifting a load (**YES** if the load weight is smaller or equal to the maximum applicable load; **NO** in the opposite case).
- Approximate calculation of the load weight

The procedure can be activated only if:

- The procedure for the use of the manual extensions has been activated through password.
- The password has been typed in and accepted.

Procedure:

- Start from the main menu and press contemporarily the **ENTER** and % buttons.

%		1	2			2	1			3	3				

- At this point, if the crane can install manual extensions both on crane and on hydraulic jibs, the following message will be displayed.
(Note: the bold characters represent non-flashing characters).

		C	R	A	N	E	?			J	I	B	?		

- Select **JIB** if the manual extensions are mounted on hydraulic jib or **CRANE** if they are mounted on crane, by using the "+" button. To confirm the selection press the **ENTER** key. The following screen will be displayed.

		M	1				M	2				M	3		



- Select the correct number of manual extensions installed by using the "+" button. If the crane version doesn't allow the installation of all the three manual extensions, select only the manual extensions allowed though the "+" button. The selection is valid both for extensions installed on crane (**CRANE**) and on hydraulic jib (**JIB**). Press **ENTER** to confirm and pass to the following screen.

					F	C			P	2					

- If no load is applied to the hook, bring the outer ram to its stroke end while lifting. If the ram is already in this condition, perform anyway the procedure of lifting the ram to be able to pass to the following screen.

	E	N	T	E	R		T	O		S	T	A	R	T	

- If the manual extensions are mounted on the hydraulic jib, by pressing the **ENTER** button you can get the following screen.

	K	1			K	2			K	3			K	4	

- Select the outer boom configuration, by using the "+" button:
 - K1** Outer booms of the crane totally re-entered
 - K2** Outer booms of the crane totally re-entered and jib extensions totally extended
 - K3** Outer booms of the crane totally extended and jib extensions totally re-entered
 - K4** Outer booms of the crane and jib extensions totally extended
- Press **ENTER** to confirm the selected configuration. The following screen will be displayed.

					F	C			P	3					

- Bring the hydraulic jib to its stroke end. If it is already in this position, lift the ram to be able to pass to the following screen.

	E	N	T	E	R		T	O		S	T	A	R	T	



- Press **ENTER** to continue. The following screen will be displayed.

					U	P			P	1					

- Activate the lifting of the inner ram to eliminate possible overpressures (the manoeuvre does not determine the crane movement). When the lever is in the neutral position, the system calculates the pressure in the inner ram. Errors in the pressure will display the following message.

	P	R	E	S	S	U	R	E		E	R	R	O	R	

- In this case repeat the procedure (press **ENTER** to go back to the main screen). If the system does not found errors in the pressure of the inner ram, the procedure will continue with the request to lift the load.

	S	T	A	R	T			L	O	A	D		P	1	

- Lift the load from the ground. If the load is accepted the following message is displayed.

				L	O	A	D			O	K				

- By pressing the "%" button you can read an estimation of the load.

L	O	A	D			O	K					6	0	8	

- If the load exceeds the limit of the selected manual extension, the following message will be displayed.

				N	O			S	P	E	E	D			



- If during the load calculation the lifting has been too quick, the system will display the following error message.

				N	O			S	P	E	E	D			

- Finally if the load exceeds the crane limit (i.e. inner ram overload), the following message will be displayed.

	N	O		L	O	A	D		C	R	A	N	E		

- When one of the above mentioned messages is displayed, the procedure is over. Press **ENTER** to go back to the main menu (ram pressures).

16.8 Diagnostic: alarms and warnings

It is possible to install on the machine some operation improvements of the limiting device. The crane software has a reference code that can be read on the display when switching on or by following the **VERSION** procedure (see par. 16.7). For further explanations refer to Fassi service network.

All eventual problems of the electronic system are detected and shown as codes on the display of the push-button panel of the radio remote control (or displayed on the operator panels) and determine the interruption of **EV** outputs (towards the electrovalves) and the immediate halt of the machine.

The alarms can be divided in two groups:

Alarm:

non-resettable alarm; this means that the alarm can be reset by pressing on the **LMI** button only if the problem has been solved. The alarm is signalled not only on the display, but also by the fixed red light on the push-button panel, by the red tower light and by the acoustic alarm.

Warning:

resettable alarm; this means that the alarm can be reset by pressing on the **LMI** button which brings the display back to its main menu and restores the crane operation, even if the problem has not been solved. The malfunctioning is signalled not only on the display, but also by the red flashing light on the push-button panel, the red tower light and by the intermittent audible alarm.

Notes:

- In case of crane block due to overload conditions, the resettable alarms (warning) become non-resettable and determine the appearance of the signal "**Alarm**".
- On the alphanumeric panel the red light corresponds to the last led on the led band signalling the load percentage, while on the graphical panel and the push-button panel of the remote control the warning condition is signalled by the flashing of the 100% icon.



16.8.1 Emergency control station on the column and exclusion tap lever

CONTROLS TO OPERATE
THE CRANE
GR4_5_240B»1500AXP
- EVOLUTION

16.8.1

(!) ATTENTION (!)

The distributor placed on the column (fig. 5) is to be used exclusively as emergency control and only if its accessibility has been explicitly contemplated by the crane configuration. In such condition in fact the only admitted manoeuvre is the descent of the load on the ground; it is not allowed to rotate the column in order to avoid all those situations which may result in crushing or shearing against obstructions around the column (tank, edge of the truck chassis, heat exchanger...).

When operating the emergency control using this distributor, consider with extreme care the several elements in movement such as the crane arms and rams in order to avoid the shearing of the operator.

If during the emergency, the distributor is not accessible due to the above mentioned obstructions around the column, or it is not possible to operate the emergency controls because the hydraulic circuit is faulty (breakdown of one ram feeding pipe) or the oil is lacking in the distributor circuit (truck motor is off, the pump is faulty,...), call the assistance.

Operate the manual/radio switch with automatic release (fig. 5 pos.1) that electrically restores the oil flow from the pump to the distributor (if accessible) in the event of a failure of the remote control, as a temporary emergency measure, instead of removing the seals from the exclusion tap lever for the lifting moment limiting device (drastic measure to be used only as the final option). As compared to the exclusion device, such selector allows to keep the limiting device active and therefore when the emergency is over, it is not necessary to go to a Fassi authorized centre to reseal the exclusion tap lever.

This switch with automatic release enables also the reduction of the max pressure in the feeding circuit at 200 bar and therefore it allows to stop the oil feeding to the distributor in case of immediate danger, by simply releasing the rotation switch.

In order to use the distributor in manual mode, remove the carter indicated in fig. 5 pos. 2 and mount the appropriate levers.

In the event of a black-out or failure of the electronic limiting device, it has been installed an emergency exclusion tap lever **R** (fig. 6) that, if activated, overrides all crane emergency devices. Only in the event the crane cannot be manoeuvred otherwise, remove the original lead seal placed on the tap lever in order to lower down the load on the ground, using the levers of the emergency distributor mounted on the column.

When operating the tap lever, the working pressure of the crane is reduced.

For the access to the tap lever remove the yellow aluminium plate (fig. 7) placed under the protection guard of the distributor by unscrewing the fixing screws (10 mm hexagonal spanner).



fig. 5

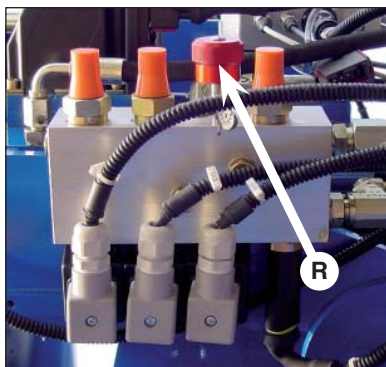


fig. 6



fig. 7



(!) ATTENTION (!)

When the electric power is reestablished, remember to put the lever in the opened position.

CONTROLS TO OPERATE
THE CRANE
GR4_5_240B»1500AXP
- EVOLUTION

16.8.1

(!) ATTENTION (!)

Activation of the emergency lever.

This activation prevents the operation of the lifting moment limiting device, consequently, the operation under such conditions can involve an overload condition. In such an emergency condition (where the lifting moment limiting device has been disabled), the operator, who is 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.

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

(!) ATTENTION (!)

Interferences with the valves or removal of the lead seal release the FASSI GRU 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.

(!) CAUTION DANGER (!)

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



DE1680



DE1679

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.

(!) ATTENTION (!)

Do not walk on... DE1679

Do not use water to extinguish fire! DE1680



16.8.2 Exclusion tap lever 7°/8° extension (if fitted)

The exclusion tap lever (fig.8), inserted between the sixth and the seventh extension ram, activates or deactivates the exit of the seventh and the eighth extendable boom.
Therefore it's obligatory to close the exclusion tap lever (fig.9), when it's used the hook connection on the tip of the sixth extension.

(!) ATTENTION (!)

Before closing the tap lever make sure that the 7° and the 8° extension are re-entered completely.

For restoring the seventh and the eighth extendable boom it's sufficient to bring again the tap lever in the initial position (fig. 8).



fig. 8



fig. 9





16.9 XP DEVICE

XP DEVICE
GR4_5 - EVOLUTION

16.9

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 certain movements.

Furthermore the **XP** device can be used, not just to increase the capacity crane:

- but to exploit the reduction in the speed when moving a load that must be positioned with precision.
- and to exploit the variation in the lifting moment limiting device adjustment parameters to exit from a critical situation when moving the load (overcoming of the **90%** or intervention of the lifting moment limiting device).

(!) ATTENTION (!)

When the **XP** device is enabled, respect what is indicated on capacity plates marked with **FXP**

16.9.1 Activation and instructions for use of the **XP/CR** device

The **XP/CR** device can be activated only through the push-button panel of the radio remote control by using the appropriate rotary selector shown in fig. 10.

The activation of the **XP/CR** device is indicated with the mark **XP** displayed on the radio remote control and on the graphic panel (if fitted); furthermore the warning light over the **XP** button of the alphanumeric panel (if fitted fig. 11) and of the panel (if fitted, fig. 12) comes on.

NOTE: the **XP** buttons on the control panels are ineffective.

NOTE: when the **XP** is activated, the distributor can be enabled only through radio-remote control; therefore do not operate manually on the distributor levers (lever stop)

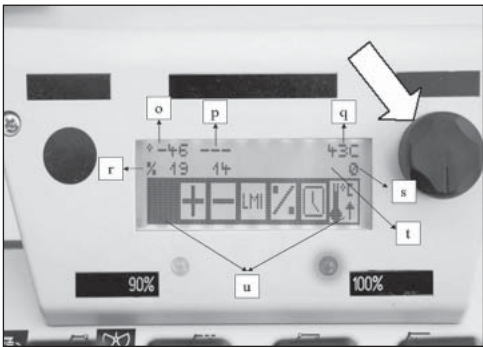


fig. 10

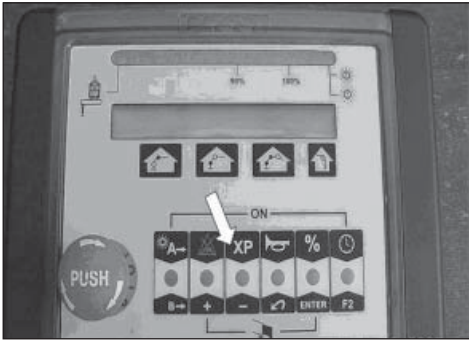


fig. 11

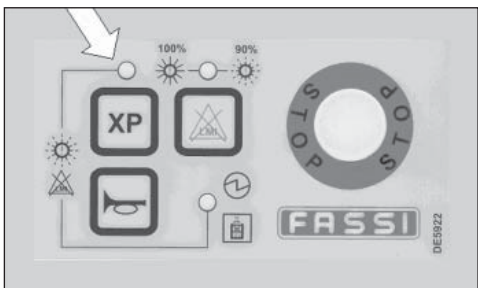


fig. 12



(!) ATTENTION (!)

It is recommend to release the crane controls (levers of the control console in neutral position) before activating or deactivating the XP/CR device, since the variation of speed is considerable and immediate; carefully operate the controls.

XP DEVICE
GR4_5 - EVOLUTION **16.9.1**

Refer to paragraph 14 of the Use and Maintenance manual for details on "Controls to operate the crane" .

Refer to paragraph 16 of the Use and Maintenance manual for details on "Lifting moment limiting device".

Activation of the XP/CR device on cranes with free rotation or with rotation limiting device will produce the following:

- an increase in the crane loading capacity
- a reduction in the rotation speed without increasing the torque
- a reduction in the lifting and lowering speed of the inner boom, of the outer arm and of the jib boom (if fitted)
- allows normal speed of boom sections, bucket and rotator.
- allows normal speed and lifting capacity of the winch.

Activation of the device on cranes with lifting moment limiting device for two working sectors will produce the following:

- in the "**stable**" zone working area, the same effects as with crane with free rotation
- in the "**unstable**" zone working area, a reduction in the speed without increase in the loading capacity.

Activation of the XP/CR device when 90% of the rated capacity has been reached, will produce the following:

- the yellow light on the "**led**" band signalling that **90%** of the rated capacity has been reached, goes off.
- allowing the manoeuvres that increase the lifting moment, you then have the repeat of the yellow "**led**" band and red "**led**" band of the warning lights

Activation of the XP/CR device after the lifting moment limiting device block, will produce the following:

- A)** The block continues
 - the crane must be reset
- B)** The red "**led**" band of the warning light switches off and the yellow "**led**" band of the warning light usually comes on.
 - the crane controls are enabled. Allowing the manoeuvres that increase the lifting moment you get the yellow and red warning lights again.



16.10 "JDP" FUNCTION (if fitted)

The JDP function has the object of to activate the blockage electrovalve of the exit of the extension boom sections and of to increase the blockage pressure of the hydraulic jib.

To activate the blockage electrovalve of the exit of the extension boom sections it's sufficient simply to press the icon.

To increase the blockage pressure of the hydraulic jib the following conditions are necessary:

- icon pressed
- XP activated
- crane in stable zone
- extension boom sections re-entered

When the conditions are verified and the icon appears pressed (Fig.13), the JDP function is activated automatically.

The definitive disconnection of JDP function happens pressing again the icon (Fig.14).



fig.13



fig.14

The happened increase of the blockage pressure of the jib is indicated by the JDP inscription on display. The only case where the JDP inscription occurs without the pressure increase happens in the unstable zone. In the unstable zone in fact it's impossible to increase the pressure of the jib.

Possible cases visualized on display:

- exit of the extension boom blocked and JDP not activated as XP not activated (Fig.15)
- exit of the extension boom blocked and JDP not activated as extension boom micro open (Fig.16)
- exit of the extension boom blocked and JDP activated (except for the unstable zone) (Fig.17)
- JDP not activated (Fig.18)



Fig.15

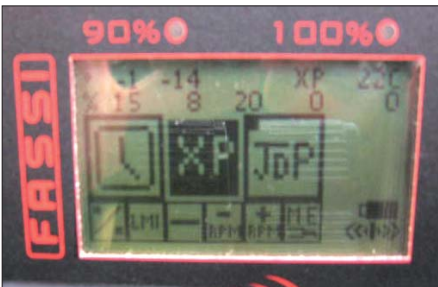


Fig.16

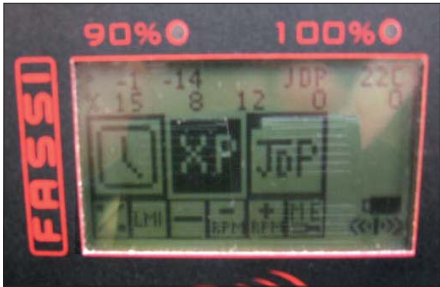


Fig.17

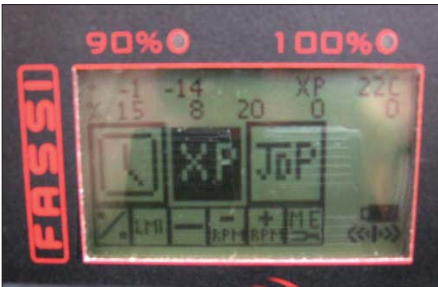


Fig.18





17 USE OF IMPLEMENTS

USE OF IMPLEMENTS

GRU FASSI

17

17.1 Generality

The crane in function of model, in load condition H1B3, can be provided with implements such as:

- Manual extensions
- Winches
- Hydraulic extensions
- Personnel baskets
- Clam 'shell buckets
- Augers

(!) ATTENTION (!)

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

For further information please refer to FASSI GRU.

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, EN280 in Europe, and prior to use of the crane it has to be tested and inspected in accordance with the local legal requirements.

(!) ATTENTION (!)

When the crane is fitted with implements or laid on the truck body it is necessary to check they are locked to assure the impossibility of accidental movements and that the led signalling maximum obstruction in height (if fitted) confirms the correct positioning of the crane.

(!) ATTENTION (!)

The crane can operate, intermittently and not continuously, with lifting devices other than the hook, only on loose and light materials (not on scrap iron).

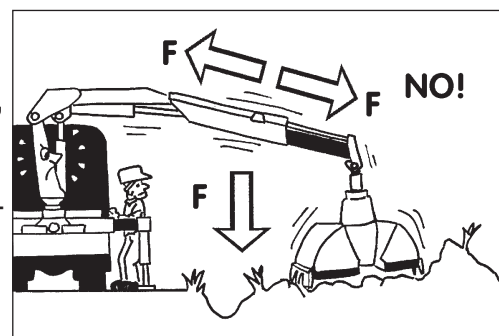
(!) ATTENTION (!)

In case of using the crane with lifting devices other than the hook, the access to the working area at the persons must be prevented.

The dimensions and the capacity of the implements must be proportioned with crane performances.

(!) ATTENTION (!)

Crushing (F) or push (F) manoeuvres are not permitted.





17.2 Hydraulic connections for implements - supplementary hoses.

(!) ATTENTION (!)

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 or unusual overload with implement itself could occur.

NOTE

When using 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 or ram seals.

17.3 Oil cooler (heat exchanger) (if fitted)

The crane is 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.

(!) ATTENTION (!)

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



18 MANUAL EXTENSIONS

18.1 Generality

These are additional extensions, which are placed in the hydraulic extensions of the crane and of the hydraulic jib and secured by locking pins.

Manual extensions have a maximum capacity independent from the crane configuration as shown on the capacity plates.

(!) ATTENTION (!)

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.

(!) ATTENTION (!)

- Do not stand in front of stabilisers during operation!
Operate from a lateral position in respect of the extension movement of the manual extensions; operation from the frontal position is dangerous.
- 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.
- When manual extensions are in place, fit the locking pins and secure them with the check pins to prevent accidental escape.

(!) ATTENTION (!)

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

18.2 Lifting moment limiting device “ELECTRONIC” for the manual extensions (see Chapter 16.7)

This procedure aims to calculate the weight applied on the manual extensions. It is necessary to apply the same procedure **EVERY TIME** you use the manual extensions.

For its correct execution, follow meticulously the instructions reported **HERE**.

The extension limiting device **IS NOT ALWAYS ACTIVE**; on the contrary of the crane limiting device, it responds about lifting a load only if **QUESTIONED**, therefore only if you enable the procedure. Remember that the procedure is manual. In any case always refer to the capacity plates of the crane.

The limiting device for manual extensions, when interrogated, compares the real weight applied on the lifting hook (inclusive of all the accessories attached) with the value reported on the capacity plates. Such evaluation is effective only during the execution of the procedure, therefore it is prohibited to add weight or replace loads after the procedure is completed; in such case the procedure shall be executed again from the start.

In the case one or more manual extensions are added or removed with respect to the initial installation, it is **COMPULSORY** to have the crane initial configuration file modified accordingly (See Authorised Shops).

Before activating the procedure, extend and lock by a pin not only the manual extension you intend to use but also the preceding ones.

The instructions for the correct execution of the procedure of manual extensions weight control are in the paragraph “**Setting Menù**”.





19 **CONTROLS TO OPERATE THE HYDRAULIC
IMPLEMENTS OF THE CRANE**

IMPLEMENTS CONTROLS
1 Additional function

PO184

Winch

PO183

Bucket

IMPLEMENTS CONTROLS
2 Additional functions

PO198

Jib
outer
boom

PO199

Jib
extension
booms

IMPLEMENTS CONTROLS
2 Additional functions

PO180

Rotator

PO183

Bucket

IMPLEMENTS CONTROLS
3 Additional functions

PO198

Jib
outer
boom

PO199

Jib
extension
booms

PO184

Winch

The plates placed over each lever define their function in relation to their movement.

(!) ATTENTION (!)
The sequence of the plates placed on the crane controls may be different.

Make sure that the lever you are going to operate correspond to the control you selected.





20 HYDRAULIC JIBS

20.1 Generality

The hydraulic jibs, foldable behind the cab, are additional booms, with articulation and with one or more extension booms to be fitted to the last extension boom of the crane; on request the manual extensions can be installed on the extension booms of the jib.

NOTE

The weights reported in the table are indicative and can vary in relation to the fittings.

The jibs are fitted by means of the insertion of the extension connecting boom into the crane extension boom; the fixing to the crane is obtained through locking pins. The hydraulic connection to the supplementary functions of the crane, is through quick couplings.

(!) ATTENTION (!)

Warnings and norms for crane utilisation apply also for hydraulic jibs use.

(!) ATTENTION (!)

The loads shown on the capacity plates which concern the configuration of the crane with hydraulic jib, refer to the hydraulic jib and consequently they are the same whether the crane has its extension booms retracted or extended.

(!) ATTENTION (!)

Warnings and norms for manual extensions are indicated at Paragraph 18.

(!) ATTENTION (!)

It is recommended to employ lifting means adequate to the weight of the load and radius of the extensions; during this operation the operator is responsible for the machine safety. The slings or the cables used for handling the load should have the adequate capacity and length; try to avoid the load overturning by having one length passed through itself and the other one through the hook.

20.2 Identification of the hydraulic jib

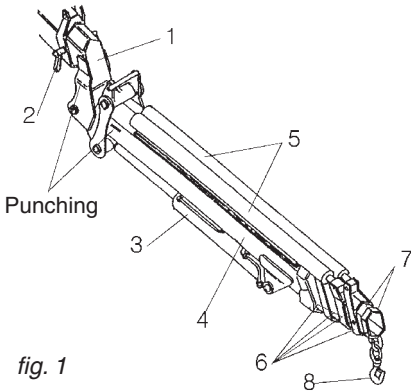
The model, the version of the crane, the year of construction and the serial number are stamped on the hydraulic jib (fig. 1) in the following sequence:

L102*03*001
A B C

A = model
B = year of construction
C = serial number

20.3 Nomenclature of the hydraulic jib

Pos.	Description
1.	Connecting boom
2.	Locking pins
3.	Jib outer ram
4.	Jib outer boom
5.	Boom extension rams
6.	Extension booms
7.	Manual extension (on request)
8.	Lifting hook





20.4 Manoeuvres to unfold the jib in working condition

- Operate as described to put the crane in working condition (paragraph 14.2).

By operating the corresponding levers:

- open the outer boom of the jib;
- extend the jib outer boom sliding sections;
- position the hook on the centerline of the load.

20.5 Manoeuvres to fold the jib in rest condition

By operating the corresponding levers:

- re-enter the hydraulic sections of the jib and of the crane;
- lift the inner boom to its stroke end;
- re-enter the outer boom of the jib and of the crane to its stroke end;
- operate, as described, to fold the crane in rest position.

(!) ATTENTION (!)

Always check and record the overall height of the crane in the folded position or in laid position in the body or on the load.

Always respect and pay proper attention that the load and dimension limits are in conformity with the road regulations.

20.6 Operations to remove the hydraulic jib from the crane

By operating the corresponding levers:

- re-enter the jib outer booms sliding sections to their stroke end;
- extend the crane outer ram to its stroke end;
- extend (of at least 1 - 1,5 m) the crane outer booms sliding sections;
- re-enter the outer ram of the jib and the inner ram of the crane to obtain the two rest brackets of the jib, either lay on the ground, or on the truck body or, if possible, on a specific rest trestle;
- remove screwing the locking pins;
- re-enter the outer booms sliding sections of the crane to free the first boom of the crane jib;
- disconnect the jib from the hydraulic circuit of the crane operating on the quick couplings.
- disconnect the electric cable of the pressure transducer and put on the specific cap.

(!) ATTENTION (!)

Assure that the hydraulic jib is adequately stripped to avoid side turnover.

20.7 Operations to mount the hydraulic jib on the crane

By operating the corresponding levers:

- place the extension on the vehicle or on the ground in the direction of the movement of the extension booms;
- extend the crane outer ram to its stroke end and position the extension booms of the crane not too close to the first boom of the jib in order to allow the lining-up manoeuvres and the connection of the hoses;
- connect the jib hoses to the hydraulic plant through coupling unions, following indications of Paragraph 17.2, Hydraulic connections for implements - supplementary hoses;
- disconnect the cap and connect the electric cable for the pressure transducer;
- reset the FX system which now shows Alarm # 6 by pressing the LMI button. If the correct connection has been made then the normal screen should appear with no Alarm.
- operate the outer ram of the jib and the inner ram of the crane in order to align the extension booms of the crane and the first boom of the jib thus allowing their connection;
- eventually repeat the previous operation until the fixing holes are aligned, working on the extension booms of the crane;
- insert the lock pin into the fixing holes and secure it with the check pin.



20.8 Crane with lifting moment limiting device and "Prolink" (if fitted)

USE OF IMPLEMENTS
GR3_4_5
EVOLUTION

20.8

The cranes fitted with “**Prolink**” can operate the outer boom and/or the hydraulic jib with an increased angle towards the top. The value of the inclination angle of the outer boom and jib is indicate on the capacity plates.

In order to prevent the booms from exceeding the maximum angle over the horizontal line, the crane is fitted with a suitable safety device.

If during the utilization, the verticalising limit value of the hydraulic jib has been reached, the safety device intervenes preventing every further verticalising.

Manoeuvres not allowed with the intervention of the safety device
- Lift of the inner boom - Lift of the outer boom - Lift of the jib mouvement boom

Manoeuvres allowed
- All other movements

Safety device for “Prolink”.

The device is continously monitored, therefore an eventual fault causes an alarm signal on the control panels and stop the three prevented movements (see above) leaving all other movements free.

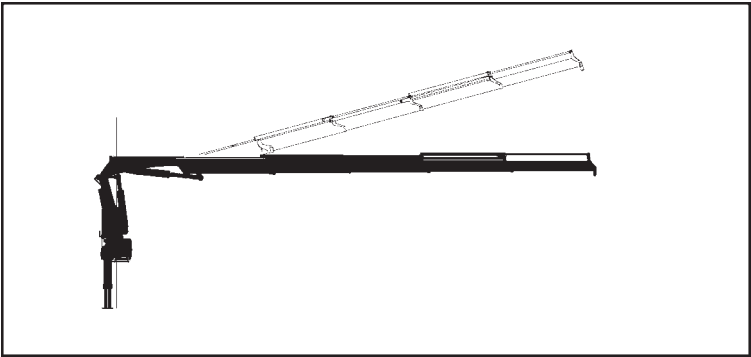
At this point it is necessary to read the alarm message and the paragraph which concerns the alarms in the use and maintenance manual and follow the written instructions (please see paragraph 16.4.3 for the working of the safety system).

The safety device receives the signals about the inclination of the outer boom of the crane and of the hydraulic jib and transmits them to the limiting system that controls the manoeuvres. The significant values are the first and the second angle limit (**alfa1** and **alfa2** respectively about 70 and 80 degrees from the horizontal line).

Function of the safety device controlling the articulation “Prolink”

When the first angle limit **alfa1** is reached, the safety device temporarily stops all movements and activates the flashing red light; “**Warning angle**” is displayed on the screen. In order to reactivate all the crane functions (**except for the lifting of the inner boom that in this case is definitely disabled**) just put the all the levers in neutral position. Press the LMI button to remove the message “**Warning angle**” (it will disappear when the temporary block angle **alfa1** is no longer exceeded).

When the second angle limit **alfa2** is reached, the safety device definitively stops all lifting movements and activates the fixed red light; “**Max angle crane**” or “**Max Angle jib**” are displayed according to which boom has reached the limit.





The outer booms of the crane and of the hydraulic jib can reach both the **alfa1** (temporary block) and **alfa2** (definitive block) limits, independently from the position of the other booms.

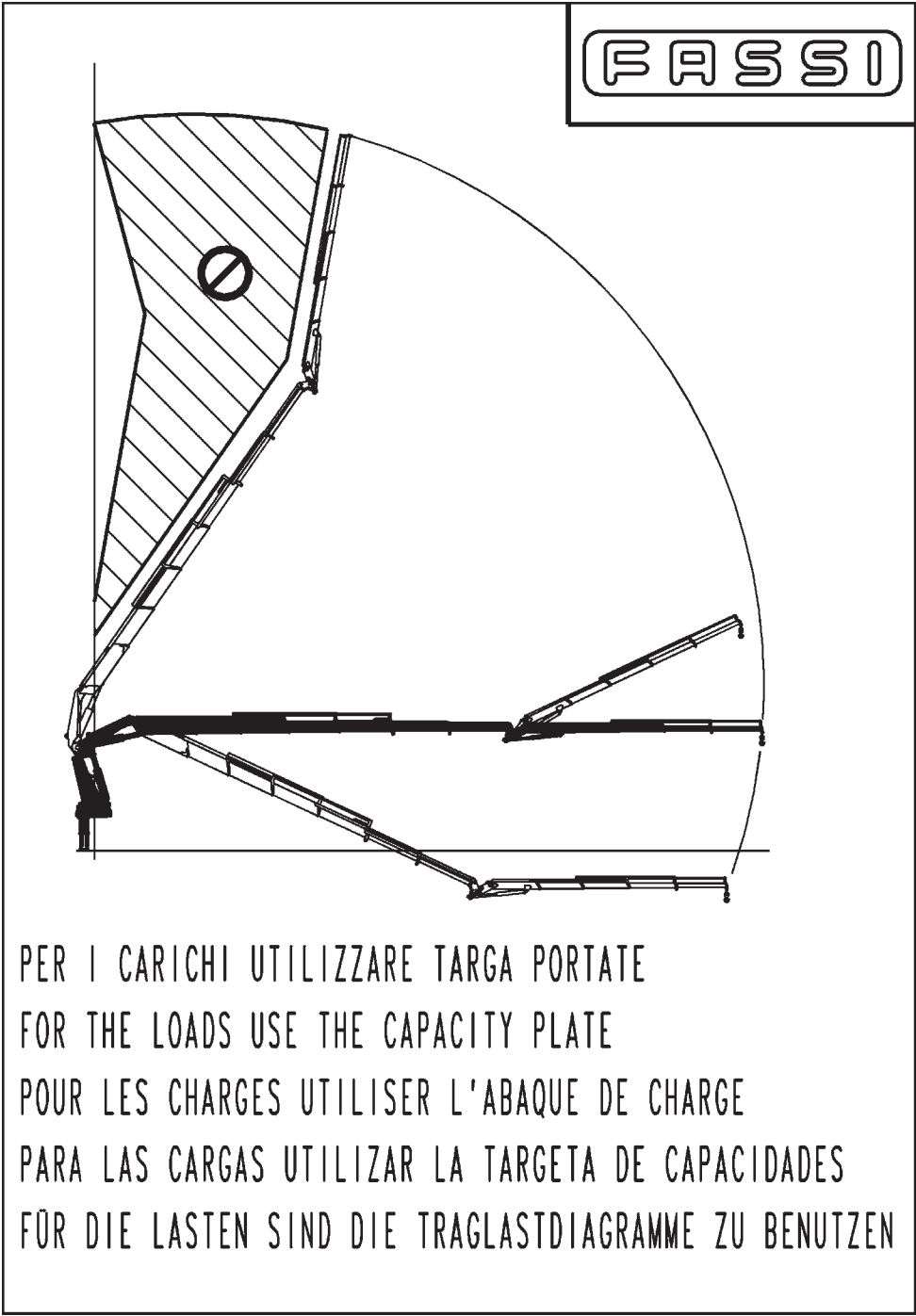
But if one of these two booms reaches the second limit **alfa2**, this condition evidently stops any other lifting.

Only if neither the crane outer boom nor the hydraulic jib reach the first angle limit **alfa1**, the inner boom can attain its max limit **alfa2**, that is its mechanic stroke end.

Folding the crane

When you fold the crane, the outer boom is positioned with an angle that generally exceeds the second limit **alfa2**; this is because the safety device “**Pro link**” **never disables the descent of the inner and outer booms.**

At this point the inner boom lifting is not permitted. To unfold the crane just turn off the system; when you turn it on the message “**Crane Folded**” is displayed. At this point the only manoeuvre allowed is the folding of the outer boom (we recommend to perform this manoeuvre on all the cranes in order to ensure a correct and safe crane unfolding); if you activate it for some seconds, the message “**Crane Folded**” will disappear and **all the manoeuvres will be reactivated.**





21 WINCH (if fitted)

21.1 Generality

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. 1)

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

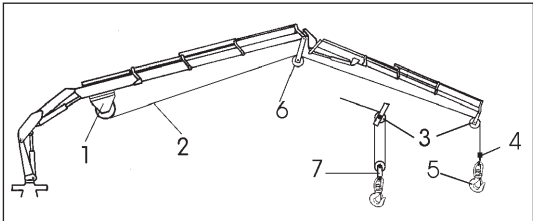


fig. 1

(!) 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.

21.2 Winch for crane

The identification data and the essential characteristics are marked on a plate fixed by the manufacturer and used for the CE mark which testifies its conformity to the Machine Directive (D.M.)

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

(!) ATTENTION (!)

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 crane capacity plate.

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 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.

(!) ATTENTION (!)

Under no circumstances interfere with the limiter device adjustment.



21.2.1 Winches equipped with a mechanical stroke end device

(!) ATTENTION (!)

The end stroke condition takes place when the block takes contact with the pulley structure. The operator must stop the manoeuvre before the block rotates the pulley completely with consequent activation of the load cell on the winch. Such end stroke device shall be used only under emergency conditions and not as a simple end stroke interrupter.

The mechanical stroke end device combined with the winch limiter prevents the hook bracket (or pulley/snatch block) from hitting the fixed pulley when lifting or when extending the extension booms, and thus from damaging the cable.

When the winch limiter is activated, all the crane functions are disabled.

Manoeuvres allowed:

- Rotation in both directions
- Re-entry of the crane extension boom sections
- Re-entry of the extension booms sections of the jib
- Winch rope descent

Manoeuvres not allowed:

- all other movements

When unwinding, an electric device maintains at least **three (3)** turns of the lifting cable wound around the winch drum on activation the following controls are deactivated.

Manoeuvres not allowed:

- Winch rope descent

Manoeuvres allowed:

- all other movements

(!) ATTENTION (!)

Limit the exit speed of the extension rams when, during the lifting, the hook bracket (or pulley/snatch block) is next to the fixed pulley, in order to avoid unnecessary stress to the cable.

(!) ATTENTION (!)

When the hook bracket (or pulley/snatch block, in case of double or triple line) and the fixed pulley are very close, and the operator needs to manoeuvre in their proximity (i.e. operations like load hook-up, arms folding, etc), we recommend to always stand side on with respect to the pulley plan (never in front or at the back) and to operate the crane at a low speed, since the contact (especially without load) can result in rapid and violent rotations of the hook group (from the fig. 2 to the fig. 3).

(!) ATTENTION (!)

The end stroke condition takes place when the block takes contact with the pulley structure. The operator must stop the manoeuvre before the block rotates the pulley completely with consequent activation of the load cell on the winch. Such end stroke device shall be used only under emergency conditions and not as a simple end stroke interrupter.



fig. 2

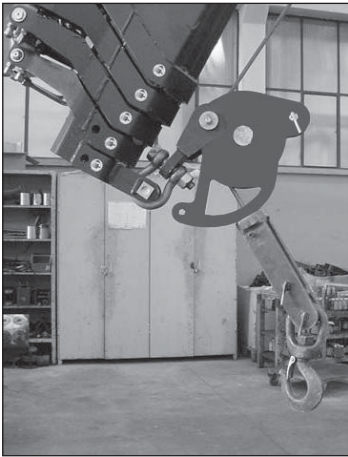
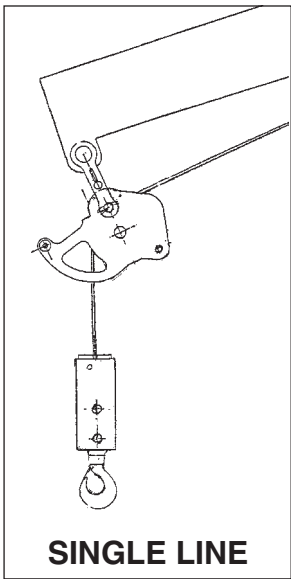
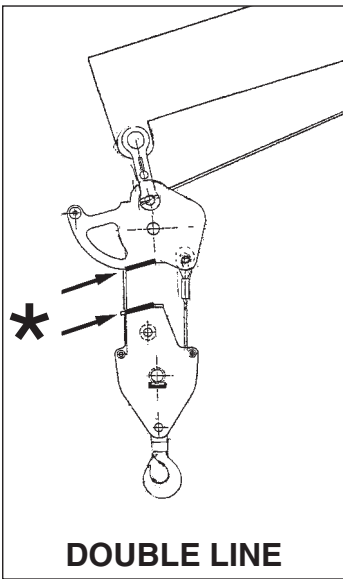


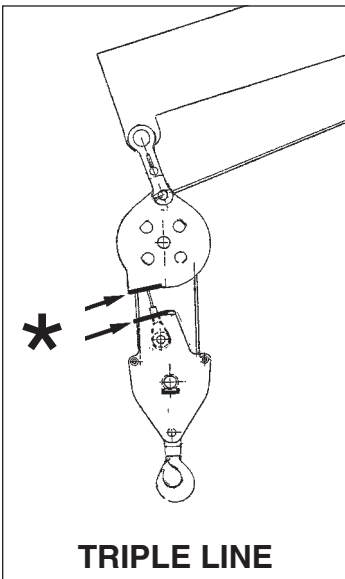
fig. 3



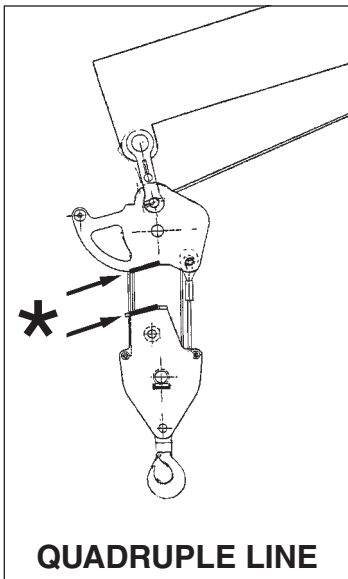
SINGLE LINE



DOUBLE LINE



TRIPLE LINE



QUADRUPLE LINE

* CORRECT POSITION
FOR THE PULLEY AND
THE PULLEY BLOCK



22 MAINTENANCE INSTRUCTIONS

22.1 Generality

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

(!) ATTENTION (!)

SYSTEM IN PRESSURE AND TEMPERATURE

Before disconnecting/connecting any hydraulic pipe follow the next prescriptions:

- Disconnect the pump.
- Discharge the pressure from the lines operating the control levers in both directions of working.
- Only after having checked that there isn't pressure in the system will be possible to disconnect / connect the pipes.
- Countermark always the removed pipes and their comparisons on the crane:

(!) ATTENTION (!)

THE OIL IN THE PIPES COULD BURN!! (DE4945)



(!) ATTENTION (!)

An error in connecting / disconnecting the pipes can cause damage to the rams and the hydraulic system. A bad screwing of the couplings may cause blow-by of oil and thus a contamination of the environment. Moreover, the loss of pressure, that could derive, can compromise the good functioning of the machine.



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. 1)

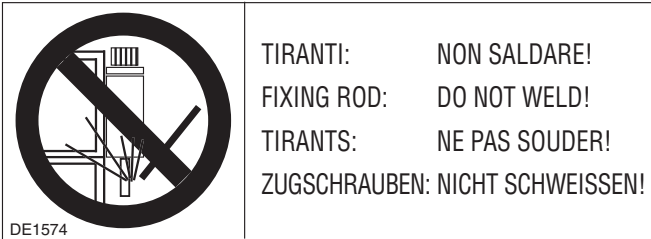


fig. 1

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 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.



22.2 Timer (if fitted)

The control panel of the “**electronic**” lifting moment limiting device (fig. 2), placed next to the distributor of the crane, features an alphanumeric readout for displaying the date, the activation time expressed in hours-minutes of the electric control panel (“**Partial Time**” and “**Total time**”) or the working time of the crane whilst being operated via the control levers (“**Work Time**”).

How to view the date

Press button **C2** (clock/-) to have the current date visualized on display **B**. Fig. 2.

Partial time

How to view the partial time of the electric panel; which can be reset.

- Keep button **C2** (-) pressed until you read “**Time**” on display **B**.
- Press button **C1** (+) until you see “**Partial time**”.
- Press button **C3** (enter) to view the time.

How to reset the “Partial time”.

To start a new count perform the following:

- Keep button **C2** (-) pressed until you read “**Time**” on display **B**.
- Press button **C1** (+) to read “**Partial time**” on the display.
- Press button **C1** (+) again to read “**Total time**” on the display. Fig. 29a
- Press button **C1** (+) again to read “**Work time**” on the display.
- Press button **C1** (+) again to read “**Reset partial**” on the display.
- Press button **C3** (enter) to read “**Enter to confirm**” on the display.
- Press button **C3** (enter) again; the timer is reset and it will start recording again.



fig. 2

Total time

How to view the total activation time of the electric panel; this cannot be reset.

- Keep button **C2** (-) pressed until you read “**Time**” on display **B**.
- Press button **C1** (+) to read “**Partial time**” on the display.
- Press button **C1** (+) again to read “**Total time**” on the display.
- Press button **C3** (enter) to visualize, for about 5 seconds, the total time expressed in hours and minutes.

Work time

How to view the work time which is the actual time recorded whilst a crane operating lever/function is being activated.

- Keep button **C2** (-) pressed until you read “**Time**” on display **B**.
- Press button **C1** (+) to read “**Partial time**” on the display.
- Press button **C1** (+) again to read “**Total time**” on the display.
- Press button **C1** (+) again to read “**Work time**” on the display.
- Press button **C3** (enter) to view, for about 5 seconds the work time of the crane expressed in hours and minutes.



22.3 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 all the components of the hydraulic circuit for possible leaks.
- Check that the control and the oil diverter levers can easily be positioned; they must show no signs of forcing.
- Check the condition of shackles, hooks, wire ropes and any other lifting equipment.

22.4 After every 40 working hours or after every working week

Check the tightening torque of the fixing rods of the crane (fig. 3).

See table at paragraph 22.6

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. 4.

- 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.

Replacement of the filter on the delivery line (before the distributor) fig. 5.

- 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 holder (1).
- Insert a new cartridge and re-assemble the filter body into the head checking the seal (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. 6).

Top up using hydraulic oil with the same characteristics as those indicated in the table at paragraph 23.

The following lubricators have been centralized and gathered in a case (fig. 6a) 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.

(!) ATTENTION (!)

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.

(!) ATTENTION (!)

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

All the lubricators mounted on the crane are protected by a plastic cap so to avoid the oil contamination.

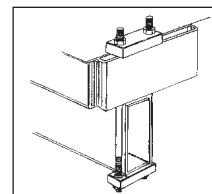


fig. 3

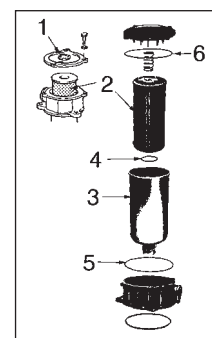


fig. 4

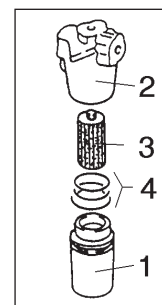


fig. 5



fig. 6

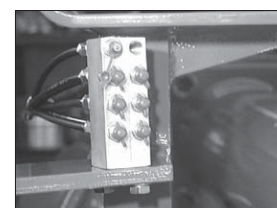


fig. 6a



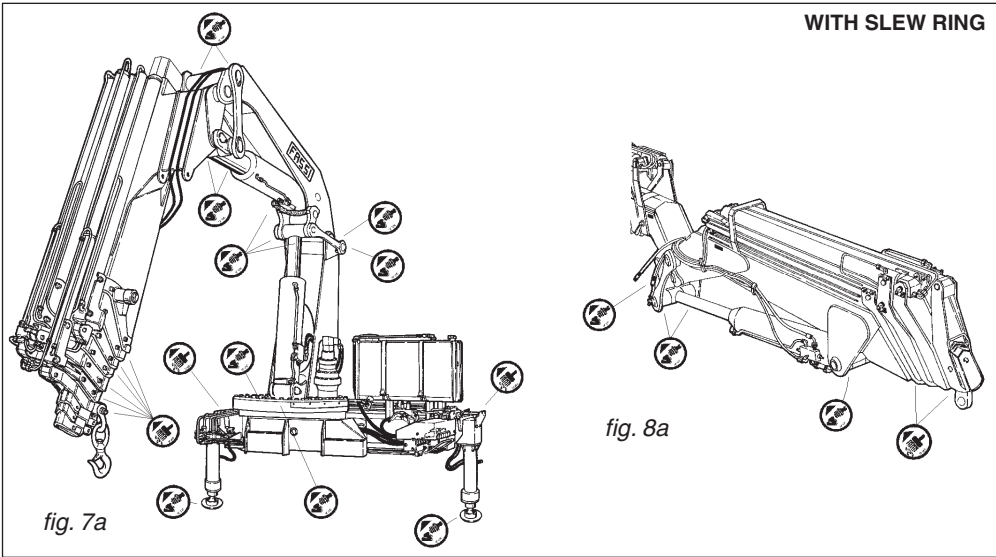
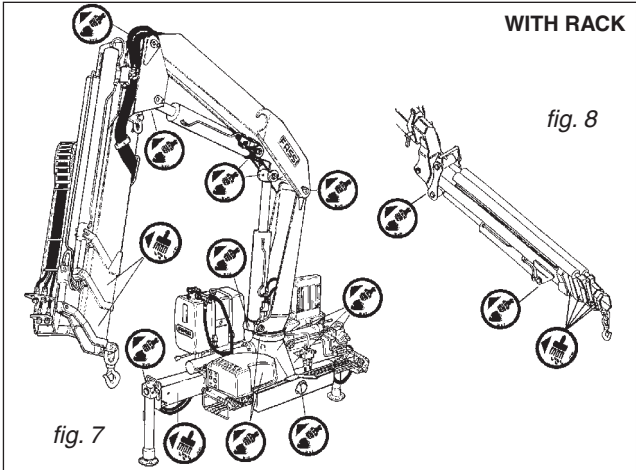
22.5 After every 100 working hours or more frequently in case of more intensive utilisation

WITH RACK

Periodically grease the points indicated on the crane (fig. 7) (and on the hydraulic jib, when fitted, fig. 8) paying particular attention to the points not easily detected. 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 extension booms are free from impurities such as sand etc. Top up using hydraulic oil with the same characteristics as those indicated in the table at paragraph 23.

WITH SLEW RING

Grease the slew gear to prevent friction during rotation and to ensure that it is stable by preventing water (corrosion protection) and contaminants from entering the bearings. For a better internal distribution of the grease it is advisable to rotate the crane and grease it in such a way as to see grease at the seals. Top up using hydraulic oil with the same characteristics as those indicated in the table at paragraph 23. 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. Top up using hydraulic oil with the same characteristics as those indicated in the table at paragraph 23.



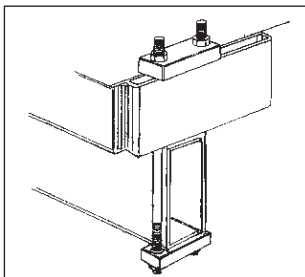
22.6 After every 500 working hours or after every 6 working months

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 = Nm
M22x1,5	300
M24x2,0	400
M27x2,0	600
M30x2,0	471
M33x2,0	1200
M39x3,0	1800





WITH SLEW RING

- of the slew gear screws (bolts M20 Class 12.9: Tightening torque = 620 Nm)

WITH RACK

- 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, in general, with average friction value (0,15) and average-good tightening accuracy (C).

From... "ELEMENTS DE FIXATION - ASSEMBLAGES VISES" (AFNOR E 25-030 1984)

Diameter Bolt = 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
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

WITH SLEW RING

Check the rotation control motoreducer oil level. Fig. 9

- 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 in the table at Paragraph 23 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.

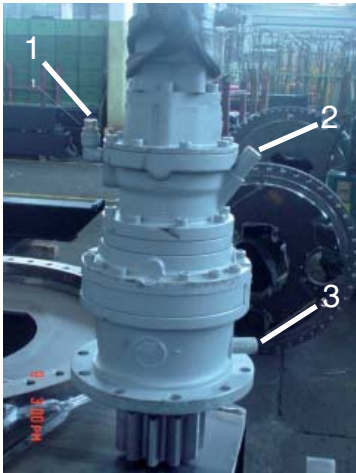


fig. 9

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 and the filter cartridges.

(!) ATTENTION (!)

The waste oil and the filter cartridges **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.

Contiene mercurio: smaltire secondo le leggi in vigore

Hg



Es hat quecksilber: bitte beseitigen so wie gesetzlich

Mercury inside: scrap following laws in force

Contient du mercure: recycler selon les lois en vigueur



22.7 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

Element	Checks to be carried out:
Subframe Structure and fixing rods	Tightening torque of the fixing rods, wear and any deformation, actions
<i>For crane with rack:</i> Base Rack group, compensator	Lubrication, tightening torque of the rods, wear and any deformation, actions
<i>For crane with slew ring:</i> Base Slew ring group, compensator	Lubrication, tightening torque of the screws 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

22.8 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 an authorised service centre.

22.9 Instructions for the dismantlement and the demolition of a FASSI crane

INSTRUCTIONS FOR THE DISMANTLEMENT AND THE DEMOLITION OF A FASSI CRANE

In case of demolition it is necessary to dismantle the whole machine and separate the different types of materials according to the respective waste disposals requirements.

The materials involved are the following:

- Ferrous materials: fabrications and mechanical components.
- Plastic materials: gaskets, belts, covers.
- Electric materials: windings, controls, electrovalves and similar.
- Oils and lubricants: hydraulic oil, lubricants for reducers, lubricating greases.
- For the truck follow the indications of the manufacturer
- Different material: Mercury (level sensor)

Take extreme care when slinging the components to be disassembled especially with respect to their weight.

Completely release the residual pressure in the hydraulic circuits and then fully drain the oil present in the circuits before starting the dismantlement of the relevant components. Be careful not to let the oil drop on the ground, therefore collect it in special containers, since exhausted oil must be eliminated in compliance with the waste disposal rules in force.

Disable all the electric power supplies (batteries etc.) before dismantling the components of the electric circuits.



23 **TABLE OF HYDRAULIC OIL AND LUBRICANTS CHARACTERISTICS**

TABLE OF HYDRAULIC
OIL AND LUBRICANTS
CHARACTERISTICS
GRU FASSI

HYDRAULIC OIL WITH HIGH VISCOSITY: ISO-L-HV		
Minimal external temperature: -35°C -20°C	maximal oil temperature: +45°C +75°C	Gradation ISO VG 32 ISO VG 46

HYDRAULIC OIL WEAR RESISTANT: ISO-L-HM		
Minimal external temperature: -10°C + 0°C + 5°C +10°C	maximal oil temperature: +60°C +75°C +85°C +90°C	Gradation ISO VG 32 ISO VG 46 ISO VG 68 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)

(!) ATTENTION (!)
Don't use greases with solid particles as "Bisulphide of Molybdenum"
(not compatible with eventual teflon bushes).



24 POSSIBLE FAULTS

24.1 Generality

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.

(!) ATTENTION (!)

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

(!) ATTENTION (!)

In the event that the crane ceases to operate and the code "alarm" with a number appears on the Display B. Call your FASSI authorised service centre reporting the Alarm number with the crane model and serial numbers. If the fault cannot be cleared follow the procedure in the chapter "Controls to operate the crane" and override the dump valve EVI.

THIS IS ONLY A TEMPORARY ACTION FOR EMERGENCIES, the crane should be taken to a FASSI service centre for repair as soon as possible.

TO OPERATE THE CRANE FOR TOO LONGER PERIOD WITH THE OVERRIDE ACTIVATED MAY INVALIDATE THE CRANE WARRANTY.

24.2 Only operations which can be carried out by the user

Note: Any operation, other than those indicated hereunder, must be performed only and exclusively by specialized personnel from an authorized support centre, considering the potential residual risks.

FAULTS	CAUSE	REMEDIES
The crane does not rotate properly	Vehicle non in level position Lack of lubrication	Stabilize the vehicle - <i>WITH RACK:</i> Grease the bushes and the rotation guide shoe - <i>WITH SLEW RING:</i> Grease the slew ring and the pinion gear-slew ring group
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 stroke end active (if fitted)	See 21.2
	The rotation limiting device is activated	See 16.6
Vibrations in crane operations	Shortage of oil	Check the level and top up if necessary
	Obstructed filters	Clean or replace the filter cartridge
Noteable decrease in movement speed	Obstructed filters	Clean or replace the filter cartridge



24.3 Operations to be carried out only by an authorized service center

FAULTS	CAUSE	REMEDIES
The crane does not lift the loads indicated on the capacity plate	Non efficiency of the pump (main pressure or auxiliary) valves not properly adjusted, or worn Ram seals are not properly fitted	Replace the pump Check the pressure, adjust the valves or replace them! Replace the seals
A boom of the crane does not hold up the load and visually lowers	The safety check valve the ram is open Oil leaks inside the ram	Replace the valve Defective seals, replace them!
The crane does not rotate properly - <u>WITH RACK</u> : - <u>WITH SLEW RING</u> :	Valves controlling the rotation not adjusted Wear of rotation guide shoe Wear of the seals of the rotation cylinder Wear of the slew ring Wear of the motoreducer group	Adjust the valves Replace the guide shoe Replace the seals Check the slew ring wear, replace if necessary Check the motoreducer group wear, replace if necessary
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





25 INSTRUCTION AND WARNING PLATES

INSTRUCTION AND
WARNING PLATES
GR5

25

FASSI

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Tel. +39 35 77.64.00 - Fax +39 35 75.50.20

INSTRUCTIONS FOR SAFE USE OF THE CRANE

1 Only authorized persons are permitted 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 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 with the outriggers, 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, if present, are closed;

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 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 ensure that the outriggers are fully retracted and re-entered, the safety taps closed and the crane is in the folded position.

DE1771A

DE 1771A
Instruction plate and safety norms

FASSI

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 DER INBETRIEBNAHME DES KRANS MÜSSEN DIE ABSTÜTZUNGEN AUSGEFAHREN WERDEN

ATENCIÓN: ANTES DE ACCIONAR LA GRÚA ES OBLIGATORIO ESTABILIZAR EL VEHÍCULO.

ATENÇÃO: ANTES DE UTILIZAR A GRUA É OBRIGATÓRIO COLOCAR EM FUNCIONAMENTO OS ESTABILIZADORES.

DE6723

DE 6723
Warning plate to stabilize the vehicle before using the crane

1

2

3

4

1

2

3

4

DE4452A

DE 4452A
Instruction plate to fold the crane into the rest condition



DE 4491
Do not operate from the frontal position, to extend the outrigger supports



DE 2100
Danger plate for crushing of lower limbs



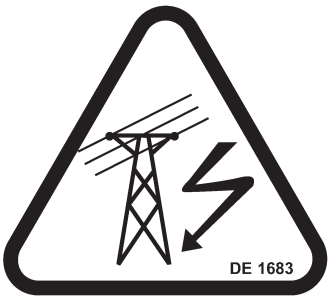
DE 1681
Greasing points with brush



DE 1682
Greasing points at pressure



DE 1686
Do not walk or stop under a suspended load



DE 1683 / DE 2361
Do not operate in proximity of electric high-tension lines



DE 1067
Do not walk or stay under a suspended load and for unauthorized persons to be within the working area..



DE 1679
Do not walk on...



DE 1680
Do not use water to extinguish fire



DE1574

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

DE 1574
Do not weld the fixing rods

