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WITHOUT compromise

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Fassi Gru international magazine with information and updates

DESIGNED TO PERFORM

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FASSI

CRANES WITHOUT COMPROMISE

DESIGNED TO PERFORM

INNOVATIVE DESIGN OPERATIONS MEAN SAFE, HIGH-PERFORMANCE CRANES

Design is a crucial factor in a company's ability to offer products at the top market levels, from performance through to safety. In fact, all those solutions that increase performance and reduce risk margins come from the design. Design is not just an abstract theoretical concept, but an essential phase in really producing machines that do not have to compromise. This is the reason why "DESIGNED TO PERFORM" is the watchword that features in Fassi's work. Each of the solutions used in Fassi cranes is part of an engineering technology focused on the synergy between potential and reliability. Design as the beating heart of innovation.

It is no coincidence that Fassi is constantly in the vanguard in terms of the technology used on its cranes. This continually being "ahead" of the competition is the logical consequence of the considerable investments incessantly made by Fassi to design research, which is seen and interpreted as a guiding factor for its market position. However, Fassi's main feature is its ability to apply the results of technological evolution to its entire range of cranes, rather than just to a single top-of-the-range model. Those who choose Fassi are certain they will be getting all the innovations that make Fassi cranes unique and inimitable, regardless of crane type and version.

FASSI CRANES WITHOUT COMPROMISE

SAFETY

FOR FASSI SAFETY STARTS WITH THE DESIGN

There is no real power without suitable control: based on this concept, the Fassi engineering design team has worked out a coordinate series of technological solutions which develop the active and passive safety of the crane in all working conditions, however complicated and demanding they may be. Peace of mind for the operator, but also for the machine itself, which is less stressed even though it provides bigger and better operating performance.

PERFORMANCE

A FASSI CRANE IS DESIGNED TO EXCEED THE TRADITIONAL LIFTING LIMITS

The working capacity of a modern hydraulic crane is the direct expression of choices and advanced technological solutions which allow the power to be used and managed exactly when and where it is needed, according to the type of operation and the working situation. With this in mind, the Fassi engineering team has developed innovative devices which revolutionise the very idea of "power", which can now be controlled with greater precision and is better able to co-ordinate the various lifting, load handling and turning operations.

In this number

SAFETY

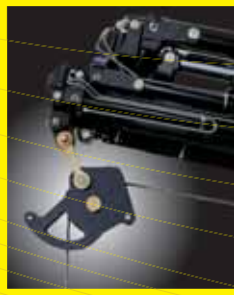
SERVING THE OPERATOR AND HIS CRANE

FASSI

Hydraulic cranes are being used in an ever wider and more articulated scenario, covering lifting and load handling needs that can be very delicate and complex. Needs and responsibilities are increasing, along with standards, which are being modified with the aim of guaranteeing even greater safety. Fassi responds to all these requests and expectations with a prestigious engineering activity, characterised by exclusive and patented technological results. The innovative electronic lifting moment limiting device, which works in synergy with the other original devices likewise developed by Fassi research, is also part of this evolutionary logic. The same applies to the innovative winch lifting couple limiter, a technology that renders the mechanical devices based on Belleville washers or strain gauges obsolete, introducing the concept of electronic and intelligent controls even on the winch.

Fassi engineering research has faced up to and brilliantly solved all the critical factors in the crane that are subjected to the most demanding work, introducing decisive innovations such as the rotation arc limiter and the lifting moment limiting device applied on mechanical extensions: with these two technologies, today the operator can count on unprecedented reliability from his machine, leaving him to concentrate on the operating phase, optimising times, methods and results.

The new third control station, equipped with a completely automatic system to detect the presence of the operator and with activation of the related safety devices, also gives an active contribution towards improving safety levels.



The innovations introduced by Fassi significantly improve active and passive safety levels.

PERFORMANCE

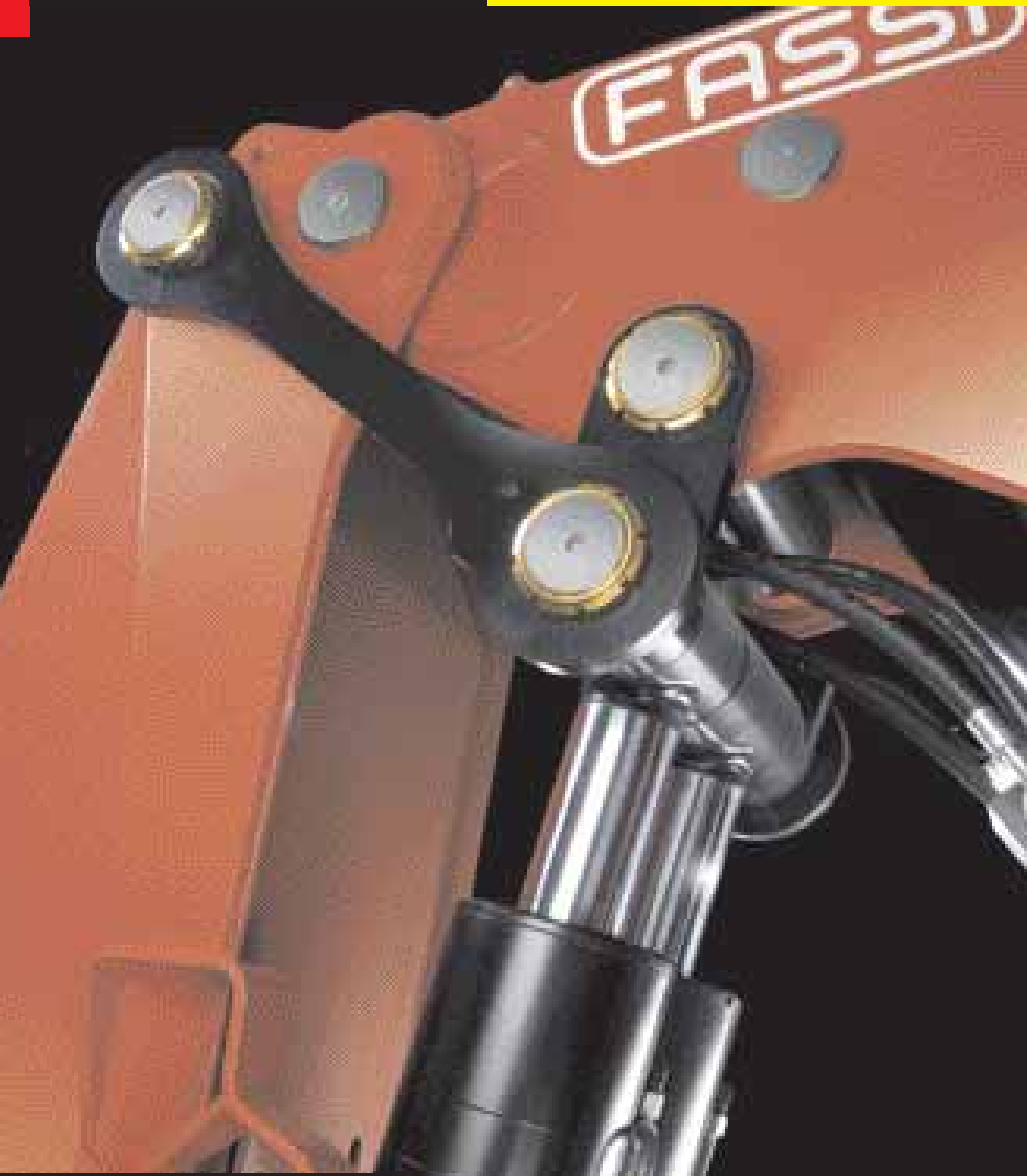
USING POWER TO THE BEST ADVANTAGE

Double linkage and ProLink are of strategic importance for optimum handling of crane operating potential.

Fassi technological research proves itself once again a reference point in the hydraulic crane sector, with innovations capable of handling power like nobody else can. A supremacy that immediately becomes a concrete expression of work and optimisation of the different lifting phases with the innovative Fassi double linkage system, with new materials and kinematics.

A new technology of double linkage on articulations, which assures perfectly constant lifting at all times, as the lever boom always maintains the same distance between the centre of the articulation pin and the ram pin throughout the movement.

Another significant example of work-focused design is the original ProLink System, based on the principle of a longer outer ram combined with a particular double linkage system, which allows the working angle to be increased above the horizontal line by up to 20 degrees. A device applied both on cranes and hydraulic jibs. Both systems ensure improved performance, as shown by load curves which would be impossible to suggest on machines not equipped with these Fassi exclusive new features.



The double linkage system technology developed and improved by Fassi ensures perfect kinematics and really helps the lifting dynamics. The configuration of the boom lever is kept constant throughout all movements of the ram and of the boom. This specific configuration guarantees more safety even when used at maximum reach.

From double linkage to the ProLink system

With this advanced technology, Fassi increases working options to beyond the limits considered achievable in full safety until now

THE FASSI DOUBLE LINKAGE SYSTEM

The kinematics in the coupling between articulations and rams represent one of the "most sensitive points" in the crane, both at structural, performance and safety level.

For this reason, Fassi engineering has given maximum attention to the dynamics directly related to the boom lever, producing a completely new technology which ensures optimum operation even in the most demanding working conditions. The D.L. technology ("Double Link Technology"), based on the use of double linkage made of special steel, provides considerable advantages in terms of lifting dynamics: configuration of the boom lever, that is to say the distance between the centre of the articulation pin and the centre of the ram head pin, is kept constant at all times, remaining at the same distance during all movements of the ram and consequently of the boom.

In this way, it is possible to obtain perfect kinematics, which allow lifting capacity charts with a horizontal load configuration at 0° to benefit of the maximum geometric reach and reduced working envelop under low-ceiling areas in lieu articulating inner boom.

In strict co-operation with the lifting moment limiting device electronic control, which requires monitoring and checking of the pressures induced on all the lifting rams, the D.L. system ("Double Link Technology") technology allows maximum constancy during all the lifting. Even in the presence of the Fassi ProLink system, that is to say the ability to increase the working angle of the outer boom above the horizontal line by 10 to 20 degrees (see presentation on pages 12/13 of this number of "without compromise"), the highest load performances for cranes with load configuration at 0° are guaranteed. The cranes equipped with D.L. technology ("Double Link Technology") provide more high performance load curves, and the advantages are tangible in all possible load configurations.

The particular Fassi double linkage technology allows fluid and constant movement throughout lifting operations, even when the outer boom is above the horizontal line (application of the ProLink system).

The angle values of the ProLink system are variable according to the model and reach a maximum of 15° on the outer boom and 20° on the jib.

THE FASSI PROLINK SYSTEM

The ProLink system is another significant result, which shows how Fassi research offers unprecedented levels of crane performance. Thanks to a longer outer ram and to a particular double linkage system, combined with the Fassi ProLink technology, the outer boom actually increases the working angle above the horizontal line for a number of degrees variable from 10 to 15, depending on the crane type, and from 10 to 20 according to the model of hydraulic jib; this allows recovery of the bend in hydraulic extension booms caused by the load, thus facilitating positioning of the loads themselves.

The Fassi ProLink system ensures an increase in the crane working options, simplifying positioning of the loads in complicated situations and where the inner boom, due to its vertical encombrement, cannot be lifted sufficiently.

For example, it is strategic inside openings at ground level, during transfer of loads through doors and windows, or to allow easy handling in low structures such as porticoes and factories.

The perfect geometry of the double linkage system allows the horizontal standard lifting configuration to start from 0 degrees: moreover, when the Fassi ProLink system is activated, the outer ram lifting power does not decrease. The standard nominal capacities can be dynamically lifted and handled even in the ProLink working area. The ProLink system is normally used with the booms in a horizontal

In many situations, such as storage in low warehouses (1) or handling in narrow places like porticoes (2), the Fassi ProLink system ensures an increase in crane working options, facilitating the positioning of loads.

position but, thanks to its automatic devices, it can also be activated in a vertical position.

But take note: activation of ProLink in a vertical position may create some problems.

This is why Fassi has foreseen some electronic and automatic control functions to prevent the crane from ending up with the boom in negative when reaching the maximum vertical value, and to keep it within operating safety limits.

This safety system, exclusively applied to Fassi cranes, is electronically handled from the "on-board computer" which automatically reduces the verticality of the first boom when the ProLink system is active, warning the crane operator that the crane is reaching its maximum authorised angle.

During this phase, if lifting continues, the electronic system reduces the ram speed to ensure that, at end of stroke, the load inertia does not determine a state of instability on the extension booms.

On reaching of the maximum vertical limit, a suitable message is shown on the display, and all lifting operations are blocked.

FASSI SAFETY WITHOUT COMPROMISE

Fassi cranes are equipped with an automatic safety system to prevent the boom from being in a negative position when reaching the maximum vertical value.

LIMITS AMONG THE COMPETITION

Fassi doesn't limit itself to a warning in the crane use and maintenance manual about the possible risks of use, as the most of the competition normally do, making the operator fully responsible for high-risk situations.

Automatic safety devices

When designing and using applied technology in its cranes, Fassi makes "no compromises" in terms of safety

Each innovation developed by Fassi research directly or indirectly deals with safety, as this is an integral part of the company DNA.

Fassi carefully designs and tests each system or device, putting safety at the centre of the engineering and working interest.

Each new technology or system adopted by Fassi on its cranes is always part of an overall logic aimed at maximising the safety of both the operator and the machine. The evolution of electronics applied to hydraulic cranes has offered an essential contribution to this work, allowing the creation of technologies that control themselves automatically, recognise working limits, inform the user in real time and prevent static and dynamic problems how, where and when required.

Fassi cranes are in the vanguard world-wide as regards active and passive safety. A record that is consolidated by further innovations, which underline how safety for Fassi is truly something that cannot be compromised.

Yes to safety, but without limiting the performance and the versatility of the machine, which is guaranteed by innovative and particularly effective systems, as seen in the preceding pages of this edition of the magazine. Let us now take a look at the main aspects that make Fassi safety "without compromise".

FX LIFTING MOMENT LIMITING DEVICE

One of the determining factors guaranteeing maximum safety in every working condition is the FX system (Fassi Electronic Control System), part of the electronics developed and improved by Fassi for its cranes. The constant interface between electronics and hydraulics allows the pressure induced by the load on all the articulations (inner, outer and eventual jib) to be kept under constant control, with constantly vigilant and full handling of crane operations from the point of view of safety as well.

The FX system (Fassi Electronic Control System) detects the load and movement conditions, extensions included, activating when reaching the nominal loads, the block of all the crane functions that, if activated, would determine an overload.

On the contrary, it keeps active all the functions which reduce the distance of the load from the column and consequently brings the crane back to within the foreseen working conditions.

When compared to normal "lifting moment limiting devices", the FX system (Fassi Electronic Control System) ensures greater working versatility and precision by means of centralised coverage of all the operations related to lifting.

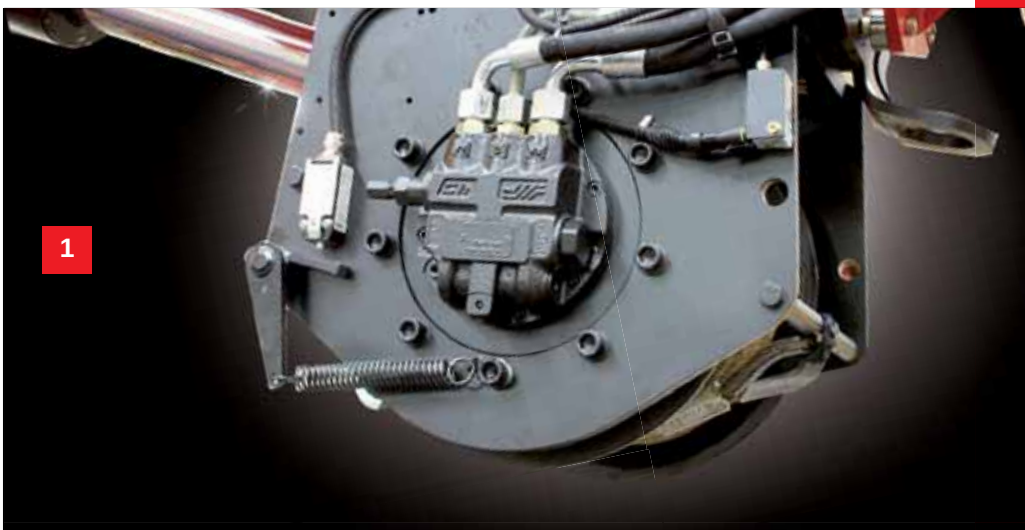
WINCH TORQUE LIMITER DEVICE

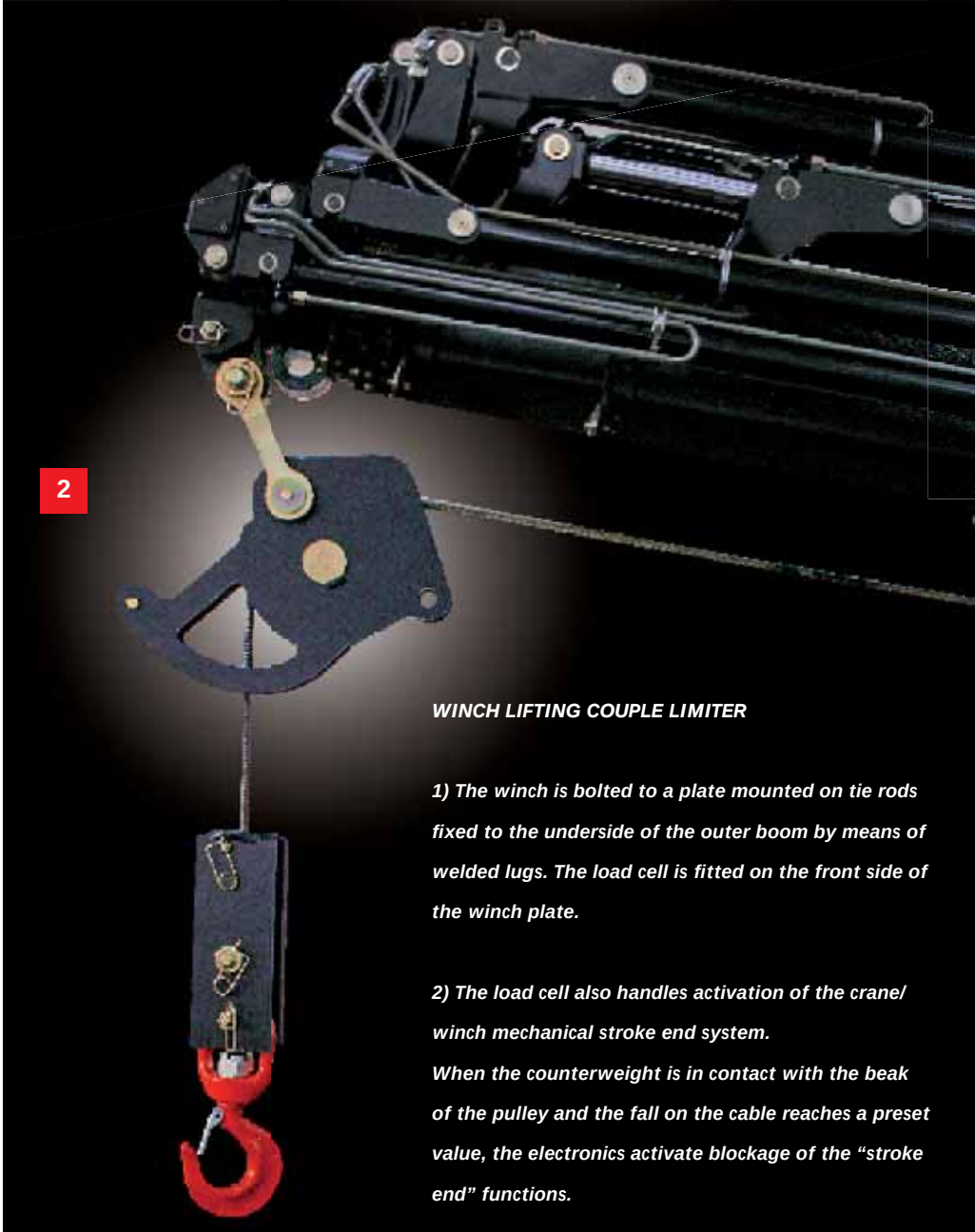
With enforcement of the Machinery Directive and the new European safety standards (EN12999), the adoption of a safety device against risks deriving from direct or indirect overload applied to the winch has become compulsory.

Most of the methods used are based on devices such as Belleville washers or strain gauges, which read the deformation of the winch fixing plate and consequently of the cable fall. However, these systems have shown considerable shortfalls in terms of reliability, precision, correct reading of stresses and maintenance of the original settings, often obliging the users to deactivate them in order to work.

In line with its own qualified work for safety, Fassi has studied and created an innovative device which overcomes all the limits shown by traditional systems: an exclusive and patented winch torque limiter device which uses a load cell. Based on the load lifted by the winch cable, the plate moves slightly forward and acts on the load cell, which, on reaching the guide value, sends a message to the electronic main unit, which intervenes to deactivate the crane/winch lifting functions. The load cell also checks activation of the mechanical cable stroke and safety function.

The system also allows automatic handling of any de-rating of the winch capacities for its use on the jib.





WINCH LIFTING COUPLE LIMITER

1) The winch is bolted to a plate mounted on tie rods fixed to the underside of the outer boom by means of welded lugs. The load cell is fitted on the front side of the winch plate.

2) The load cell also handles activation of the crane/winch mechanical stroke end system.
When the counterweight is in contact with the beak of the pulley and the fall on the cable reaches a preset value, the electronics activate blockage of the "stroke end" functions.

ROTATION ARC LIMITER

In conformity with safety standards, Fassi cranes adopt a system which automatically limits the crane working arc if truck stability is not guaranteed for the whole rotation arc.

The advanced Fassi system works with 3 co-ordinated sensors handling the rotation stroke end.

FX ROTATION ARC LIMITER

European standards also require a stability check on the installation with an increased load of 25%. If truck stability is not guaranteed throughout the whole rotation arc (360°), the adoption of a system limiting the crane working arc exclusively to the sector in which stability is guaranteed is compulsory.

Bearing in mind this safety requirement, Fassi has designed and created an innovative electro-hydraulic rotation arc limiter system integrated in the electronic safety device management system. Handling of the rotation stroke end takes place by means of three proximity sensors mounted on the column, in order to check the position of the crane booms with respect to the rotation arc limiter, coupled with metallic bands determining the variation in authorised degrees. The two lateral proximity sensors have the job of recording the direction of rotation (clockwise or anticlockwise) and the central one stops rotation in an unauthorised direction when the metallic band passes beyond it. The electronic card will then, through the signal from the proximity sensors and the micro-switches installed on the control element, handle the direction of authorised rotation.

LIFTING MOMENT LIMITING DEVICE WITH TWO WORKING ZONES

On Fassi cranes, besides the rotation arc limiter, the installation of a lifting moment limiting device with two working zones is extremely easy and interesting.

This device allows operation, with reduced loads, in the unstable area as well, thanks to the electronic connection which handles all the safety devices.

LIFTING MOMENT LIMITING DEVICE ON MANUAL EXTENSIONS

In conformity with EN 12999 standards, Fassi has designed a manual activation system, combined with the electronic lifting moment limiting device, which uses a dedicated software to decide whether, according to the foreseen loads, the load applied to the manual extension can be lifted or not. The system also supplies a sufficiently reliable indication of the value in Kg of the applied load. Should the operator be required to lift a load whose weight is not known with the manual extensions, he can ask the system if the load is within the capacity of the manual extension and then decide,

according to the known weight, whether or not to continue with the lifting procedure.

CRANE AND SUPPLEMENTARY OUTRIGGERS

Among Fassi safety equipment, special attention has also been paid to the elements forming part of the crane/truck relationship. A special system of mechanical locking devices to prevent any accidental extension of the outriggers lateral extension supports during truck movement stands out in this sense. Fassi cranes allow the operator to concentrate on his work, preventing problems and helping him at all time in his work with crane and truck.

CRANE HEIGHT WARNING SYSTEM

Fassi cranes can be equipped with an optional system to warn about crane height in the transport position; in the most Countries, this height must not exceed 4 meters (as foreseen by the highway code) in order to avoid problems and accidents during movement of the truck. The system made up of proximity sensors, can be connected to acoustic and visual devices outside the truck or in the cab. The system avoids risky situations, even the most stressful activities when the operator's attention could fail.

CARTER FOR OIL PRESSURE HOSES

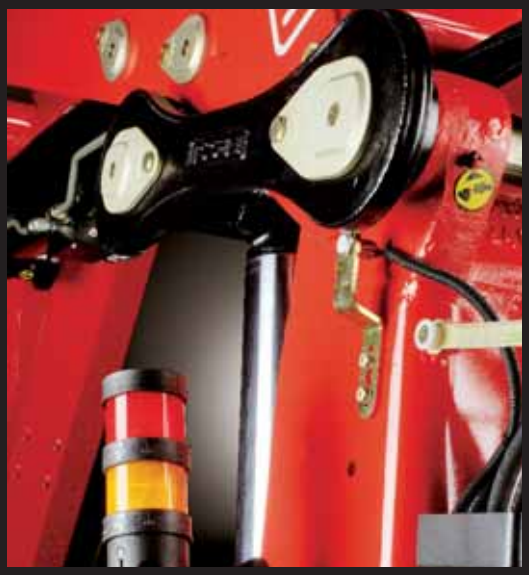
The meticulous safety work carried out by Fassi engineers also involves all the mechanical components destined to protect the operator in the event of problems to the hydraulic pressure systems. A special, extra-large carter covers the hydraulic hoses at exactly their most sensitive point, protecting them from accidental shocks and preventing any risk that leakage of oil under pressure might reach the operator. As you can see, Fassi's attention to aesthetics and the characteristic beauty of Fassi cranes is the result of operations in which design has concrete functional values.

THIRD STAND UP CONTROL STATION

The attention to safety is an integral part of the Fassi manufacturing culture, and goes beyond ordinary commercial models or dynamics.

Significant proof of this comes from the third stand up control station, required by selected users and in specific markets, but not for this reason underestimated by the Fassi designers from a reliability point of view.

In fact, the third stand up control station is equipped with a completely automatic system to check the operator's presence. By means of a photocell on the control station itself, a special additional proximity sensor, designed to avoid contact between the crane boom and the third stand up control station, is activated. A safety system that gives the operator maximum peace of mind.



1) the crane height warning system prevents risky situations during the movement of the truck.
2) the presence of a carter on the pressure hoses is an integral part of Fassi's work to ensure safety.

IMPORTANT: to know which of the devices presented in this article are actually operating on your crane, kindly contact the Fassi commercial department.

Our test was carried out using a Fassi F310AXP.24L323 crane mounted on a Mercedes Actros truck. This Fassi crane model is part of the Evolution family, and we chose it so that we could test the many safety devices featured by this new technological generation, which is also equipped with ProLink.

New safety technology put to the test

We have tested some of the most significant innovations concerning safety for hydraulic cranes in the field

Safety technology is a very important concept when dealing with the new generation of hydraulic cranes. But how does this technical progress, the result of modern engineering research, work in practice? The best way to check working applications and advantages is to test them in the normal working scenarios.

For the test in the field we used a Fassi F310AXP.24L323 "Evolution" crane, as this model is equipped with all the safety systems mostly under discussion at this time, both on the market and in the specialised press.

GUARANTEEING SAFETY WITHOUT EVER BLOCKING THE CRANE COMPLETELY

In the test, we start by looking at the new FX800 lifting moment limiter installed on all the "Evolution" generation of Fassi cranes. One of the main features of the FX800 system is the ability to provide the operator with all the most useful information on its interventions, both in terms of the percentage use and the pressure values.

But let us go on to talk about the test: the crane was taken to a particularly demanding condition, to the limits of its load capacities. Before the lifting moment limiting device came into function, at approximately 90% of the crane capacities, we noted that a special orange warning light came on and simultaneously an intermittent acoustic signal was heard.

When maximum capacity was reached, the lifting moment limiting device intervened to stop all the functions that could determine a dangerous overload. However, we were happy to note that it was still possible to operate the crane quite normally for all the other functions that did not determine any overload. With activation of the lifting

The ProLink takes an active part in crane safety. A typical risky situation occurs when the boom reaches the maximum vertical position: the electronic devices intervene to prevent the crane/truck stability limits being exceeded.

moment limiting device, the alarm light turned red and the acoustic signal became continuous. Thanks to the FX800 lifting moment, the crane is automatically self-controlled without in any way preventing operation. We also tested this situation with the hydraulic jib and the manual extensions.

We would like to point out that Fassi is one of the few companies that handles the manual extensions using its own software.

In this test "on the road" we did not have a crane with winch at our disposal, but it is important to remember that the Fassi winch, which we tested directly in the company's test department, also stands out for its safety. In fact, it is equipped with a particular load cell system which, combined with the FX800 system, intervenes to safeguard from overloads. Fassi has also patented an exclusive, particularly functional and safe mechanical stroke end, which no longer uses the now obsolete micro-switches that the operator often had to disable because of their poor reliability. Let us now take a look at how the crane and its technology behave in the working area. In fact, we are well aware that the weak point of cranes mounted on the back of the cab is the area 180 degrees in front of the cab itself, as the outriggers cannot intervene in this area.

The F310AXP.24L323 Evolution crane used in the test is equipped with a lifting moment limiting device with two working zones, which should completely solve the problem. We tested it by lifting 1.500 kg; when reaching the outriggers, at 180 degrees, the crane stopped. We brought the jib extension ram back in to decrease the "moment", and then tried the manoeuvre again. We noticed that the crane is able to turn easily even in the front part, guaranteeing truck stability.

During this test we were also able to test the safety system related to the use of ProLink (device which allows operation above the horizontal). With the crane unloaded we lifted the inner boom and the outer boom all the way up and did the same with the jib, but the machine stopped before exceeding the maximum verticality allowed by the safety device (80°). Also to be noted is the fact that the FX800 provides information on working times, so as to allow planned maintenance for safety as well. Information on use, detailed reports giving the crane working cycles, can be downloaded from the special black box, which is the brain of the system.

PREVENTION OF UNCONTROLLED DYNAMIC STRESS

Another very important safety system is the ADC (Automatic Dynamic Control), which is standard on Fassi Evolution cranes. Let us take a look at how it works: the system protects the crane from uncontrolled dynamic stress. This risky situation might occur, for example, if a less experienced operator mistakenly moves the radio control lever suddenly, instead of moving it proportionally.

On a machine not equipped with this safety device, uncontrolled and sudden lowering would occur, with a consequent shock to the booms that might also cause the truck to tilt.

Let us now look at how the ADC sys-

We tested the Fassi crane in one of the most critical situations: the lifting within 180° in front of the cab. The test was passed with flying colours thanks to a lifting moment limiting device for two working zones.

tem works. The crane was once again loaded with a weight of 1500 kg and brought up to maximum height. When the incorrect manoeuvre indicated above was performed, we noted that the boom descended normally and without jerking; we also noted that the speed of descent automatically drops proportionally to the increase in the reach. All this happens smoothly and progressively.

GETTING OUT OF UNEXPECTED BLOCKAGES

Unexpected blocking of the crane is a condition that sometimes occurs for various reasons and types of use. Normally the operator deactivates the safety systems to get out of the situation, but this creates potentially hazardous situations. High quality technological research must be aimed at helping the operator even in the most complicated and difficult situations.

Fassi's engineers have been working on this problem and have found an innovative solution. In fact, Fassi Evolution cranes are now equipped with a system, foreseen by the "Machinery Directive", using which it is possible to deactivate the lifting moment for 7 seconds at one minute intervals.

This means that it is possible to get out of a state of blockage without deactivating the safety systems.

Let us look at how it works in practice. With an overhead bridge crane a weight exceeding the crane capacity was loaded onto the crane. The extensions were completely retracted. An attempt was made to lift: the crane did not move. We then pressed the button that releases the block and we managed to exit the critical situation, using the outer boom to set the load down on the ground.

In short, the field test produced positive results for all the parameters tested. Use of the new devices and of the original solutions created by Fassi has anticipated the requests of an increasingly demanding market which rightly expects its machines to give even better performance in total safety.

Service edited by Massimiliano Barberis
from the specialised magazine "Vado e Torno"

The special ADC system allows the operator to keep the situation under control at all times. The lowering speed reduces automatically according to the load conditions and the lifting dynamics.

How to read and interpret the lifting capacity charts

The graphics and values expressed in Fassi crane lifting capacity charts are a further reason for coherence, because on the market some charts are better than others....

HOW TO READ A LIFTING CHART

The lifting capacity chart expresses the potential of a crane: the load size that it can lift according to the distance. Being able to read a lifting capacity chart properly means that, when evaluating purchase, you will have a proper knowledge of how much this crane can actually do.
In the diagram published below we have summarised the meanings of the different elements present in a Fassi lifting capacity chart, outlining the main points for a correct reading. As you will see, the indications aim to provide the most precise and truthful information on the real dynamic load performance, that is to say the direct ratio between liftable load and the distance from the crane column.

ATTENTION! ALWAYS EXPECT MAXIMUM CLARITY IN THE INFORMATION PROVIDED

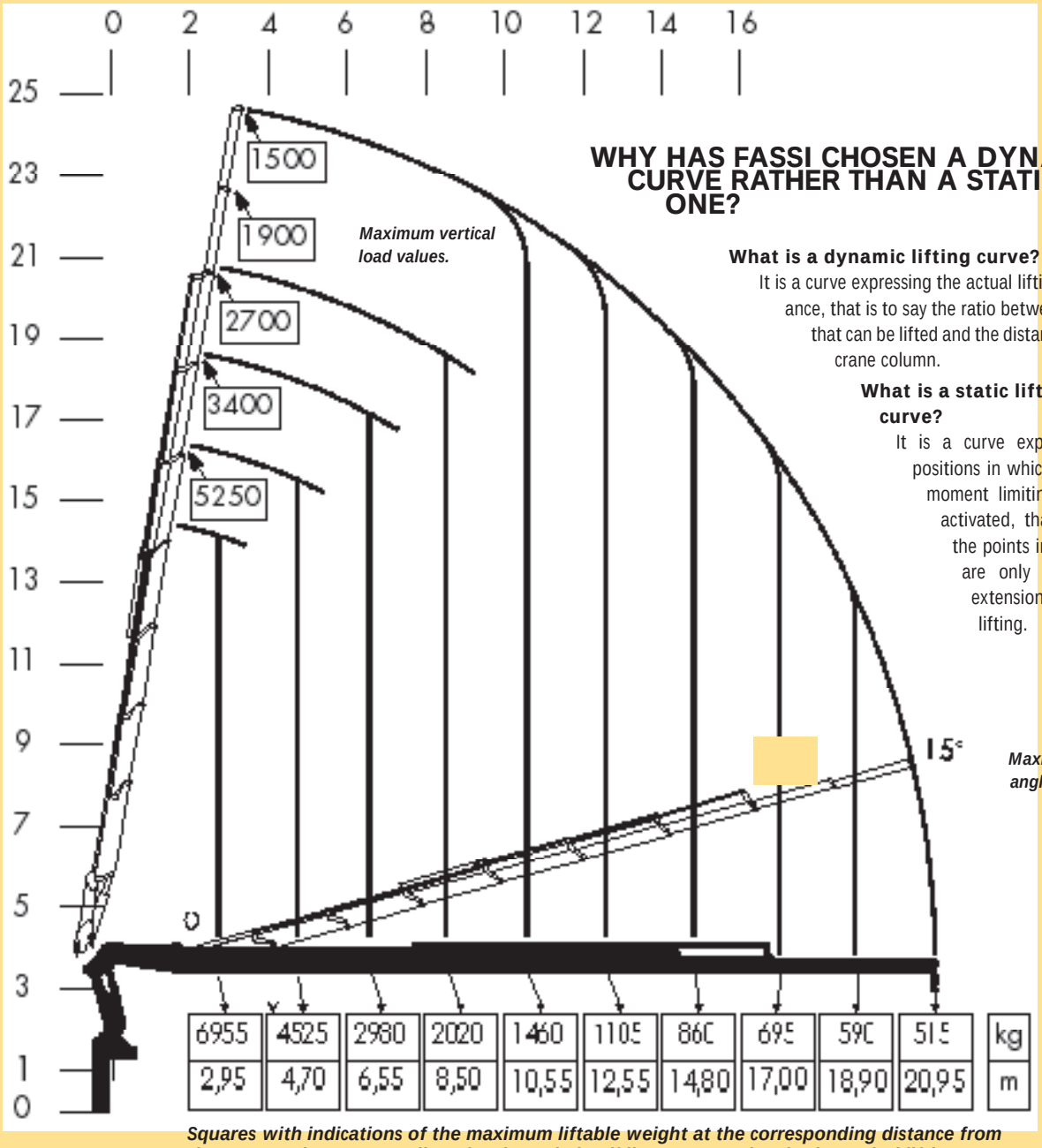
Fassi lifting capacity charts indicate dynamic values: the nominal loads are liftable at any point of the diagram and the reaches take into consideration deformation of the crane structure. However, the fact that on the market there are other graphic and numeric models used to represent capacity data may generate misunderstandings and confusion. These documents, instead of referring to dynamic load performance, express static load performance, that is to say not related to actual lifting capacity.
Static curves express the positions at which the lifting moment limiting device is triggered, so that the points in the curves are only reached by load extension (translation) and not by lifting! Indicating a static curve it's possible to show values 10% higher than what the same crane model can actually lift in dynamic conditions. What appears to be an advantage is however in reality a limit, although this is only indicated in the use and maintenance manuals. It is therefore very important to evaluate information regarding crane performance at the time of purchase, asking the seller to declare, ideally in writing, the capacity conditions. This topic is so important for the customer who is selecting his crane that we will be going into it in greater detail in forthcoming numbers of "Without Compromise" magazine.

USEFUL INFORMATION

WHAT TO DO WHEN EVALUATING PURCHASE OF A CRANE

1) Ask to the dealer if the lifting capacity chart is static or dynamic. In any case ask for a practical lifting test, checking that the crane actually meets the indications on the lifting capacity chart.

2) During the test, make sure that the crane is prepared for normal working conditions with all the due and necessary safety devices turned on.



Height scale expressed in meters or inches.

Maximum vertical load values.

Maximum working angle with ProLink.

Squares with indications of the maximum liftable weight at the corresponding distance from the centre column. Recordings for the ratio load/distance are taken in the typical lifting conditions (retracted and extended extensions).

WHY HAS FASSI CHOSEN A DYNAMIC CURVE RATHER THAN A STATIC ONE?

What is a dynamic lifting curve?

It is a curve expressing the actual lifting performance, that is to say the ratio between the load that can be lifted and the distance from the crane column.

What is a static lifting curve?

It is a curve expressing the positions in which the lifting moment limiting device is activated, that is to say the points in the curves are only reached by extension and not by lifting.

FASSI TECHNOLOGY MAKES THE MOST OF REACH DURING LIFTING

What is the advantage of a 0° inner boom angle?

It means you are making the most of the hydraulic reach in lifting curves, instead of having to angle the inner boom, causing a reduction in the maximum hydraulic reach.

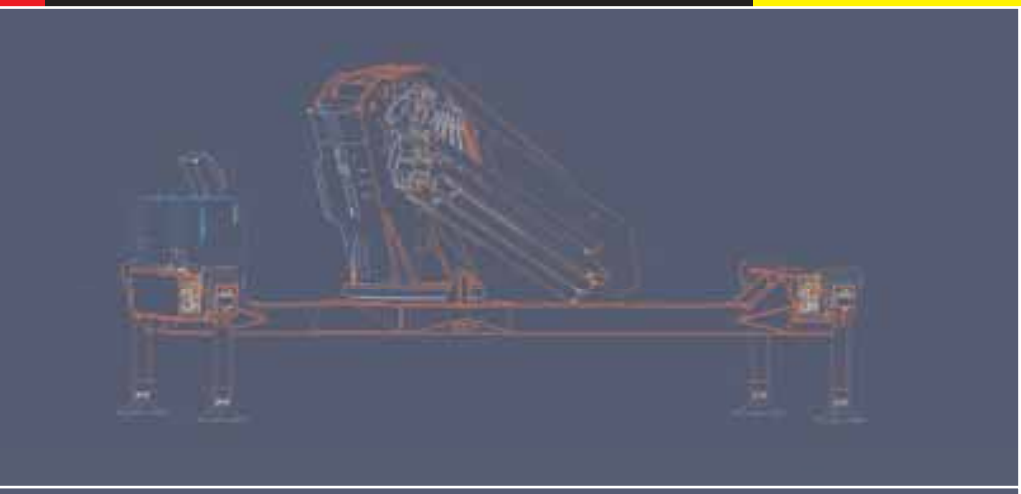
FASSI LIFTING CHARTS SHOW EXACTLY WHAT IT'S POSSIBLE TO DO

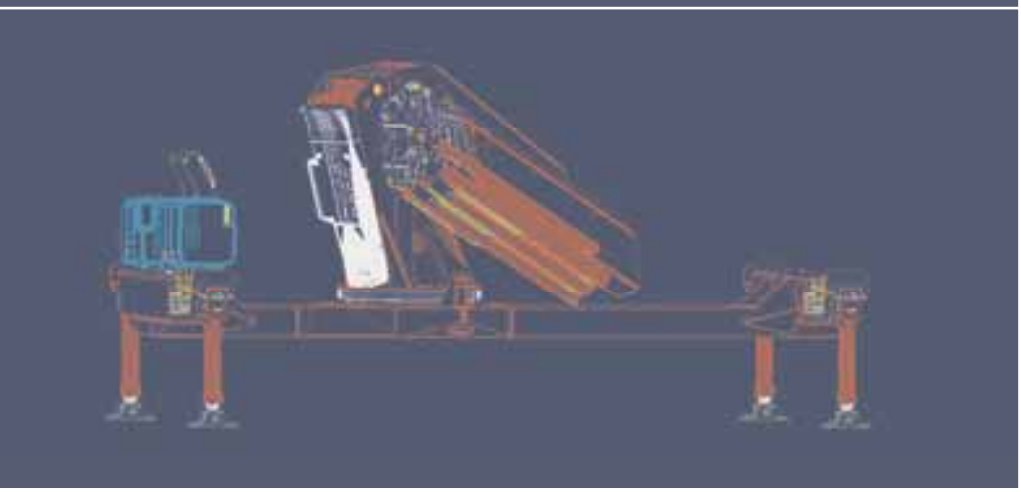
What is the advantage of a clear lifting capacity chart?

A chart that clearly and truthfulness indicates the dynamic lifting data allows an understanding of the real lifting potentialities of the crane.

What does publication of certain information actually mean?

It means pursuit of a company politics of reliability and good practice towards purchasers and users.





Interview with Rossano Ceresoli

Design and safety manager – Fassi team

What is the relationship between design and safety?

For Fassi safety has always been the starting point when creating a new machine. The technical/operating reference on which to develop a multidisciplinary operation that ranges from electronics, to mechanics, to hydraulics, to components. At Fassi this philosophy starts way back: we have actually been applying the concept of combining high performance and maximum safety for over twenty-five years now. We apply this principle on each model. The design is the essential condition to confirm one of the positive features that best defines us on the market: the fact that we build cranes that have all the advantages of production in series, but at the same are able to adapt themselves to the customers expectations and needs.

What are your targets when designing a Fassi crane?

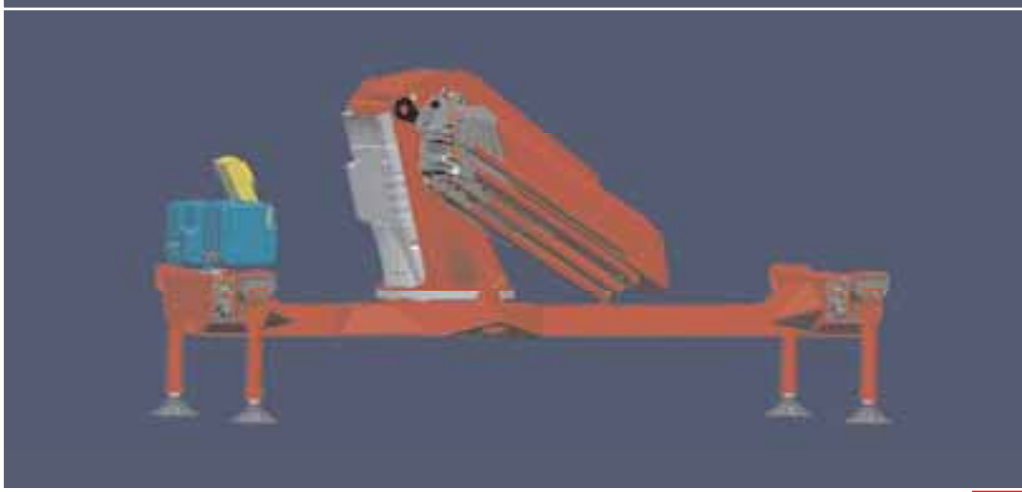
A Fassi crane must be innovative, unique, versatile and ready to welcome further progress, above all in electronics. It must be ready to evolve in harmony with developments in our research.

But above all it must be safe. This condition is the result of an obligation that marks us and makes us stand out on the market: the result of a reliability that ranges from the choice of materials to the clarity of the information accompanying our machines.

The results we are achieving worldwide, which are a strong feature, confirm the validity of a working model that is now part of our company DNA, our own philosophy here at Fassi.

How is the design work carried out?

We work as a team, first developing the design in the technical office and then carrying out strict tests in the workshop and on the field. Over the years the way we work has evolved significantly. Initially we only relied on classic calculations and on fatigue tests; now, for about the last 10 years, we work using the most advanced information technology. Software and computers provide virtual simulation of what will actually happen when the crane is in use. This means we can decide in advance how to proceed from a production point of view. Today the tests in the field are confirmation of what we have processed using the computer. However, we haven't stopped doing the fatigue tests! The proto-



types that are subjected to extreme tests and come up to expectations are the best proof of the effectiveness of our work. I would also like to stress that design is never aseptic and outside the concrete market reality and the expectations of users. Our first task is to acknowledge the input from our technical and sales organisation, which in turn is in direct contact with the users. Our first obligation is therefore to listen. In this sense, I consider it important to invite anyone who works with Fassi to give us indications, suggestions and advice about possible crane evolution. We will consider these ideas and develop them into feasibility projects. Some of the systems and devices presented in this number of "Without Compromise" came into being or were improved in this way.

Mario Ferrari's opinion

Marketing Manager – Fassi team

Design and marketing at the service of the market

Over the years our research and development investments have been progressive and constant, with the aim of creating within our company both versatility and a capacity for diversification that, in my opinion, can be offered by no other organisation in this sector. We design with the user in mind, rather than just the company manufacturing cycle. Our design is never self-centred, but is born of and develops from investigations into market requirements. Providing the right response is an integral part of design, so that technological innovation, state-of-the-art research technology, can be applied easily and in a competitive way on all our cranes and for all user needs. This is why our cranes are born to work and why every Fassi crane is "without compromise".

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