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WITHOUT

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compromise

International Fassi Cranes magazine with the latest news and information

EASY

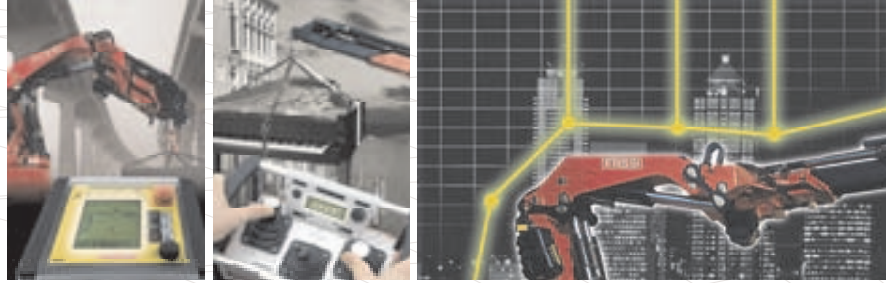
TO

FASSI TECHNOLOGY MAKES EVERYTHING EASIER

USE

FASSI

CRANES WITHOUT COMPROMISE



EASY TO USE

HOW A FASSI CRANE
INTERFACES WITH THE USER

The magazine "Without Compromise" is produced by one of the world's top three manufacturers of truck-mounted cranes. **"EASY TO USE"** in this issue, puts the user of the crane at the centre of attention, by considering his expectations and proposing solutions that can make operations even easier, more convenient and safer. In achieving this result, Fassi has taken an innovative route in the interaction of man and machine. **SEEING, TOUCHING, COMMUNICATING:** on these three interaction levels, a Fassi crane

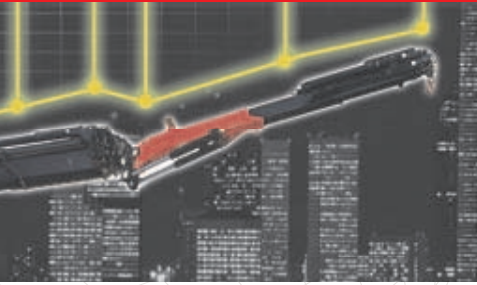
knows where to go, unlike conventional models in this product sector. **A Fassi crane can take in and interpret what is actually happening around it,** and a variety of different working situations, including the most demanding and potentially hazardous ones, whilst activating devices that let you work calmer, faster and more efficiently. This is possible thanks to systems that use the most advanced electronic processes, making the Fassi crane a machine **"WITHOUT COMPROMISE"**.

in this edition

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SEEING

EVERYTHING YOU NEED ON THE DISPLAY

All the functions of the crane that can be selected are easily and immediately available, thanks to the clear and precise graphic interface both on the display of the remote radio control and on the machine's control centre.

TOUCHING

SMOOTHNESS AND PRECISION AT YOUR FINGERTIPS

All of the crane's controls are conveniently located within arm's reach and have an original management system for the operating functions, organised in a new rotating control that can be activated with just one finger positioned directly on the remote radio control console.

COMMUNICATING

A WHOLE HOST OF SENSORS FOR EASE OF OPERATION WITHOUT COMPROMISE

Its very own electronic brain built into a network of sensors provides excellent feedback on a Fassi crane. The machine constantly monitors operations, envisages any problematic situations, and provides all the operating information required for simple and total control of the crane by the operator.

focus

The characteristics that make the EASY TO USE Fassi different are: its operating principles, selections and solutions.

Page 4

dossier

In-depth technical information on what makes Fassi cranes machines without compromise.

Page 10

corner

Open discussion with the Fassi team: people and resources that give added value to technical progress.

Page 22

 **without**
compromise

easy to use



SEEING

EVERYTHING YOU NEED ON THE DISPLAY

The advanced electronics used on Fassi cranes, which are a further development of the proven **FX Fassi system**, allow rationalisation in improving the hydraulic, mechanical and electronic components. Innovative sensors, connected to a centralized operating control unit work in perfect symbiosis, providing obvious progress above all in the control functions and the interface between user and machine. The obvious aspect of this process is in fact **the visualisation of the information on a simple graphic display** that reports what the operator needs to know on the state of use of the crane, thus permitting a quick and effective management of the operation and safety. Top level hardware and software let you display everything you need to control the crane: the quantity and quality of the information and the number of **crane functions that can be directly actuated by the control unit** make selecting the various operating functions and monitoring the state of the crane "at a glance" easy and intuitive.



The visualisation by means of the innovative graphic display simplifies the management of the crane in all conditions of use.

TOUCHING

SMOOTHNESS AND PRECISION AT YOUR FINGERTIPS



The control functions are easily managed thanks to the most advanced control devices and are always within arm's reach.

The technological progress of Fassi cranes has made them "Easy to Use" also from the point of view of using controls that manage the many functions of the machine, laid-out within arm's reach. The heart of the system **is the "Canbus" data transmission**, that is to say the typology and transfer protocols of the information between the operational parts of the crane and the control centre, which is completely digital on crane. The CANbus system, which has the same function as the human nervous system, allows a speed and synchronicity of data transfer that was unheard of on a hydraulic crane until now. The machine responds perfectly and smoothly to the requests from the controls, thanks to the use of this innovative technology. It was also possible to adopt the most modern digital solutions and use graphic displays interfaced with a **rotating functional selector, the Fassi RX system**, similar to the system used on the most innovative and exclusive cars. Thanks to the RX selector, the various control menus of the crane functions (identified on the display by icons) can easily be accessed. You can call up data and access the programming, all with just one finger.

focus

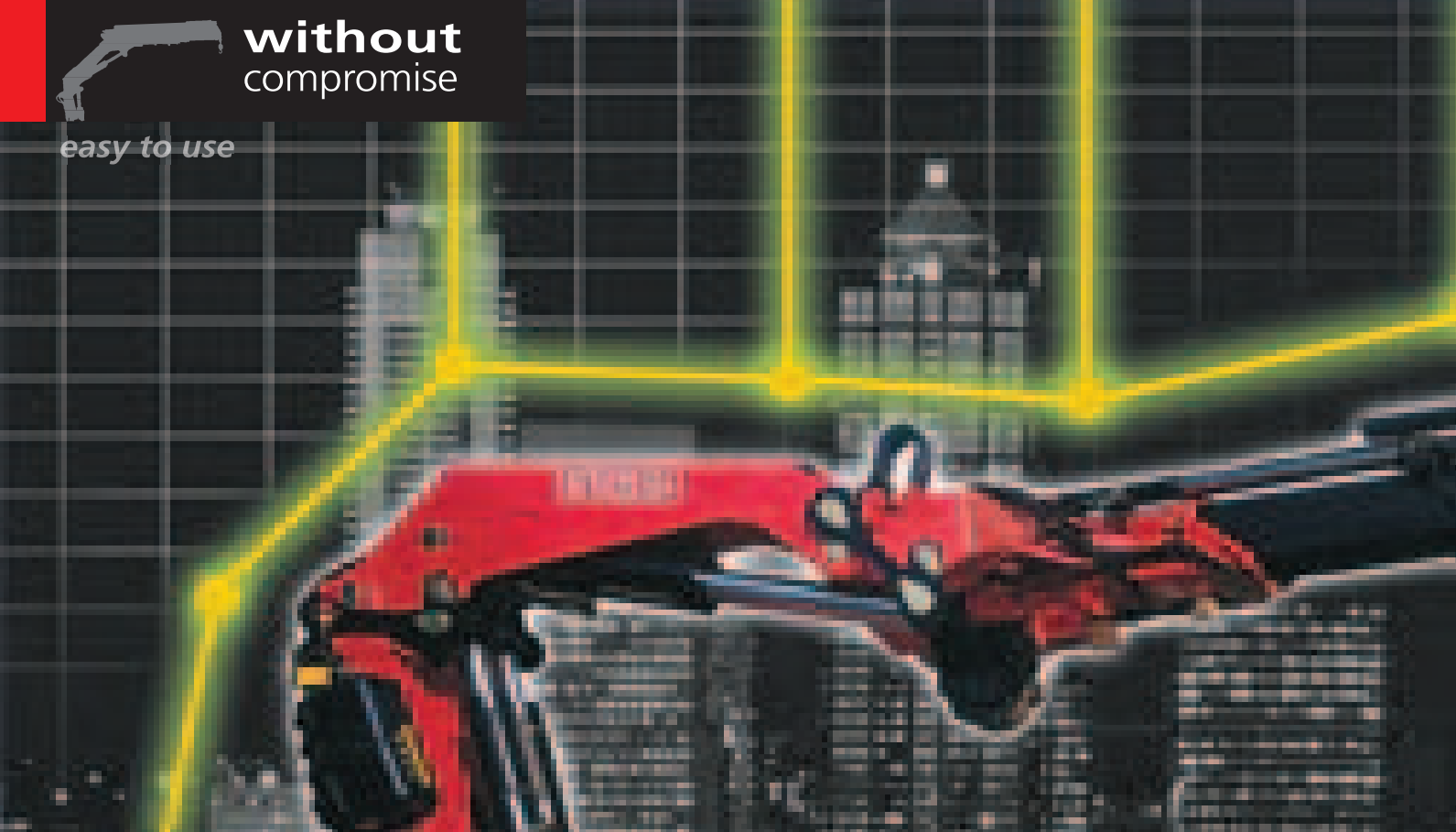
easy to use





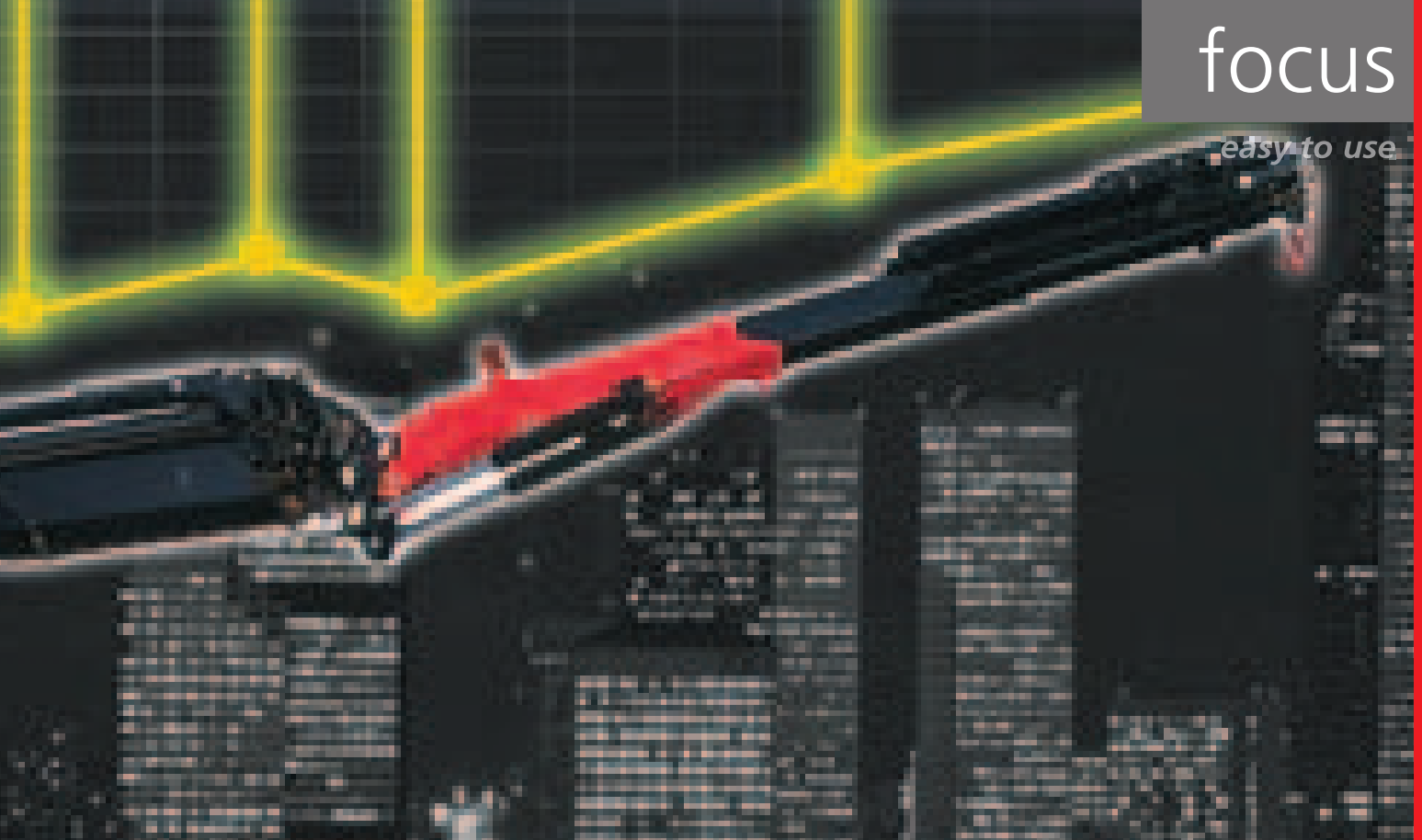
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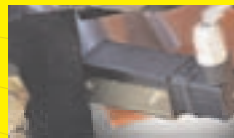


COMMUNICATING

A WHOLE HOST OF
SENSORS FOR EASE
OF OPERATION
WITHOUT COMPROMISE



The synergy between the **Integral Machine Control (IMC)** and the **Automatic Dynamic Control (ADC)** provides the best multi-functional performance in all working conditions. All the data from this combination and integration are transmitted to the innovative board of the processor unit, where the information that comes from the many devices installed on the crane is analysed. The control unit can monitor the operational situation, select the optimal working conditions, locate possible functional problems and automatically check them, thereby ensuring optimal performance based on any specific load and movement. For the operator this means **the highest level of comfort and easy management of all operating conditions**, including those that may be extremely challenging and potentially dangerous, to the extent that the crane automatically anticipates and controls hazardous situations. Furthermore, all the functions and decisions that are about to be implemented by the machine are communicated to the user, either on the radio control display or on the screen of the operator control unit on the crane. The latest generation of electronics guarantees optimal output and an **EASY-TO-USE concept, also in the interface for check-ups**, providing operational data to program periodic maintenance schedules and download detailed reports onto a computer, with information on work done by the machine.



The most up-to-date electronics use integrated systems for data transmission at unprecedented output levels.

Fassi's idea of remote control

Selectors and digital displays: innovation has never been so easy to use

The tangible expression of Fassi's EASY TO USE technology.

The new **RCH radio controls** combine

all the main elements that characterise this progress in the development of the EASY TO USE concept. A commitment aimed at producing reliable,

high-performance devices that are easy to use, rational, and establish a positive and constructive dialogue with the user, from the ergonomics to

The innovative RX system with its rotating control lets you display menus and gain access to the programming of the crane.



the legibility of the functions. Radio controls are even simpler than before and at the same time complete and even more versatile, while being more convenient in operational management, covering all the different functions of the crane.

The new radio controls feature a push-button panel that has a large screen where you can display all the information related to the use of the crane, for improved control in all phases of the operation. The standard configurations envisage 6 or 8 linear control levers or multi-functional joystick controls. In the joystick version, which has 8 functions, there are two functions that are executed with the rotating head of the joystick lever itself.



The various configurations of the new radio controls are available with linear levers or multi-functional commands. The joystick is particularly practical, and you can manage some of the main functions with just one finger on the rotating head. The Fassi radio controls have innovative graphic displays that show all the functions and operating conditions of the crane.



The pushbutton panel has a **rotating function selector, called the RX**, which with a few simple operations gives the operator access to the various menus identified on the display by icons, with information on the utilisation of the crane or the programming. The latter is password-protected. All of the (on/off) push-buttons that can normally be found on traditional radio control push-button panels are therefore eliminated. The aerial and receiver are one-piece, with greatly reduced dimensions.

A compact and easy to use computer.

Inside the radio control unit there is

a microprocessor interfaced via Ethernet with the control centre of the crane and the CANbus digital information transmission system. As standard equipment, the radio controls are fitted with micrometric mechanisms and devices for progressively reducing the crane's manoeuvring speed (with four different programmable levels). It also has specific functions such as starting, acceleration and stopping the engine of the vehicle. The radio controls are protected against electromagnetic fields and radio interference. In fact, to avoid possible frequency clashes, they function within protected wavebands in accordance with the regulations in force in various

countries. Every radio control unit operates with its own unique identification code, and in this way the crane can only be activated with its own specific radio control unit. The receiver on the crane has a dual processor unit that constantly checks and verifies the incoming signal. There is an emergency button that stops all of the movements of the crane, installed where it is easy to reach on the radio control unit. Characterised by the ergonomic and highly functional design (patent pending), the radio control units are made to be impact-proof and weather-resistant. Due to their superior quality-related technical features, Fassi radio control units are homologated in accordance with the strictest international safety standards and can be also used on board PLE for lifting people.



8 LINEAR FUNCTIONS



SWAP OVER JOYSTICKS WITH 8 FUNCTIONS



6 LINEAR FUNCTIONS



Fassi's new radio RCH radio controls stand out from the crowd due to the casing, the lay-out of the control buttons, and the devices for easy management of the functions, offering a wide range to meet the specific needs of users to perfection. The radio controls are protected against electromagnetic fields and radio interference. All the radio controls are in line with the principles of innovation and ease of use that are the characteristic of Fassi's technology.

New hydraulic technology installed on the crane

No compromise distributors in the age of electronics

A new generation of distributors for transmitting electronic energy.

Fassi's "Easy to Use" innovation combines the distribution systems and hydraulic functions of the crane, with technology that has been exclusively adapted by Fassi in collaboration with some of the major companies in this sector on a global scale. A new generation of distributors and electro-hydraulic modules guarantee the maximum multi-functional capabilities, optimum speed and particularly smooth and precise actuation in all operating conditions.

With their operational characteristics and performance, the new hydraulic technologies that have been incorporated into the Fassi cranes bring the "user friendly" philosophy to a new level that positively revolutionises the dialogue between user and machine. The hydraulic systems are in fact the essential element for combining the

extraordinary potential of electronics, characterised from the CANbus digital information transmission system with the dynamic components of the machine, jacks and extensions. The new hydraulic systems are the real "energy package" that lets you take full advantage of the opportunities offered by electronics.

All of this is possible because, with respect to traditional systems, the new compensated distributors let you perform several manoeuvres at the same time, optimizing the speed and precision of the movements. In fact, the flow of oil out of the distributor is kept constant regardless of the manoeuvres that are activated, and the loads that are lifted or traversed.

The best performance combined with the maximum reliability.

The electric controls are also highly innovative, with technology used in the

automotive sector for ABS and Airbag installations, meaning drastic reductions in welding and critical points, and increased resistance to shock and sudden temperature changes. Furthermore, the energy from the oil rather than electrical power is used to move the command cursor, so there is always a ready and safe response without the use of a battery. The use of an electronic supervisory unit for controlling the cursor, apart from guaranteeing extremely fast reaction times, regulates the working speed more progressively and avoids the risk of any inadvertent actuation. The presence of a pressure transducer on the distributor head lets you check the working pressures of the distributor directly on the display, thus avoiding the need for pressure gauges. All of the components of the distributors starting from the electro-hydraulic controls have been studied and tested to be problem-free even in the most

severe operating conditions, including temperatures from -30° to + 60°.

Furthermore, the high degree of protection also makes the distributors

suitable for use in environments with high levels of humidity.



FASSI D 900

The cutting edge of the sector

The most advanced technology in the sector, ideal for interfacing the new generation digital electronics epitomised by the Flow Sharing System, with the hydraulic functions of the crane ensuring high performance.

FASSI D 850

Electronic technology for a multitude of requirements

The host of multi-functional advantages used in an effective and rational manner, optimizing speed and response in all operating conditions, further enhanced by the Flow Sharing system.

FASSI S 800

The ideal distributor for non-digital cranes

It can be used in combination with the new electro-hydraulic modules and adds multi-functional capabilities to cranes without digital control systems.

“XF” and “XP” systems

Two Fassi technological innovations that offer higher speed or more power when needed

The FX system adds speed and greater precision.

The performance and operational versatility of Fassi cranes have been further developed with the new Fassi XF system, bringing standards to a higher level. This technological solution, which is the result of the ongoing activities of Fassi’s research and development division, in addition to a higher actuation speed of the extendible booms, guarantees smooth movements and extremely precise positioning. This innovative device is now part of Fassi’s technological com-

mitment aimed at improving the dialogue between the crane and the user in order to provide not only optimal performance and reliability, but also making operating the machine easy, practical and convenient.

The FX system functions by means of new extension jacks that have a perfect ram thrust area ratio between the cylinder side and the rod side, thus ensuring a better performance of the oil regenerative valve.

This means a significant increase in the overall speed of the machine.

The regenerative valve, using the oil

that comes from the pump and also that which flows out of the rod side of the jack and goes back to the tank, considerably increases the speed of the extendible boom and in addition to this special lockout valves, located on the main and secondary articulation jacks, significantly improve precision in utilisation, while reducing the oil temperature.

This ensures the maximum smoothness and precision of the crane’s movements whenever there is the need to perform several manoeuvres at the same time.

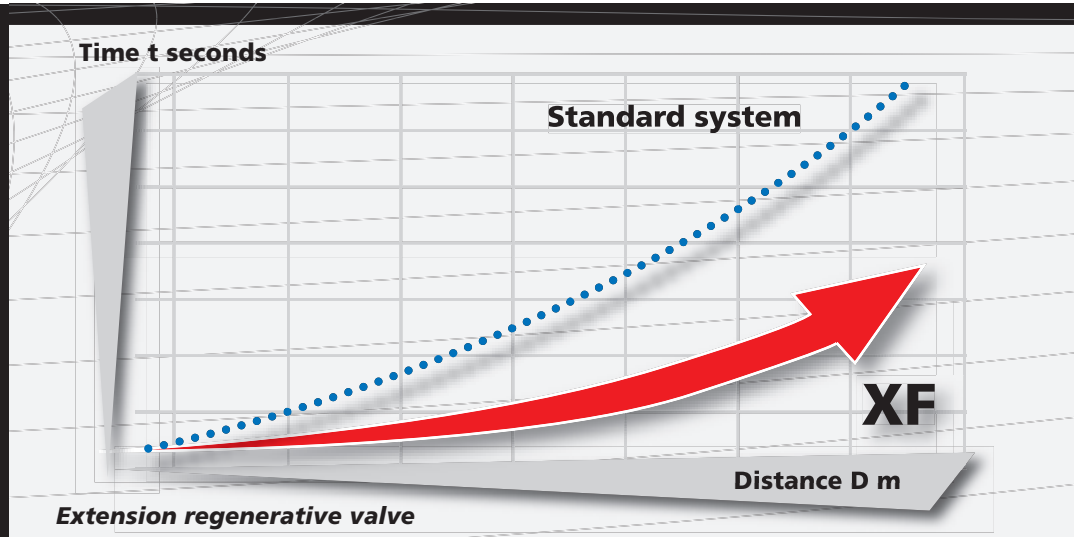


Regenerative valve

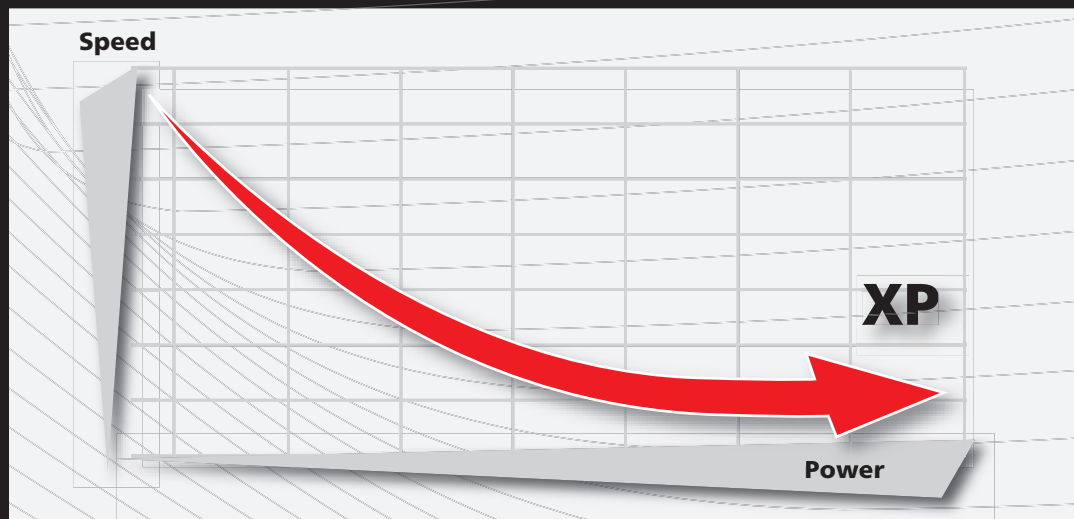
The heart of the innovative hydraulic system on Fassi cranes is the regenerative valve, which as part of the high-level features and performance of the distributors optimises the oil flows between pump and jacks by appreciably increasing the speed of the extendible booms.

XF SYSTEM

The graph shows the functional and operational improvements that have been made thanks to the use of the innovative XF system with the XF regenerative valve. Compared to conventional systems, the operating cycle times are considerably shorter, and a smoother workflow is ensured.

**XP SYSTEM**

The principle of the Fassi XP system is summarised in this graph: when the operating conditions require, the system calls on a reserve of power reducing the speed of the crane's movements while simultaneously increasing the lifting capacity.



Fassi XP, more power just when it's needed

The Fassi Extra Power system is a genuine reserve of power that Fassi cranes make available to users for meeting the most difficult and problematic operating circumstances caused by the size of the load or particularly demanding dynamic conditions. The system can call on a reserve of power precisely when it's needed, reducing

the speed of the crane movements, while at the same time increasing the lifting capacity.

The XP system is a strategic ally when you need to lift very heavy loads, or use a lot of lifting torque, or perform manoeuvres with the maximum precision.

The XP system is great for getting you out of sticky situations, without ever compromising either the perfor-

mance or the operational safety of the crane.

The system can be conveniently started up and disabled with the radio control, making the crane easy to handle in all conditions.

The digital heart of the crane

Safety, performance, and ease of use are the goals of Fassi's research

An intelligent system perceives things, understands them and takes them in.

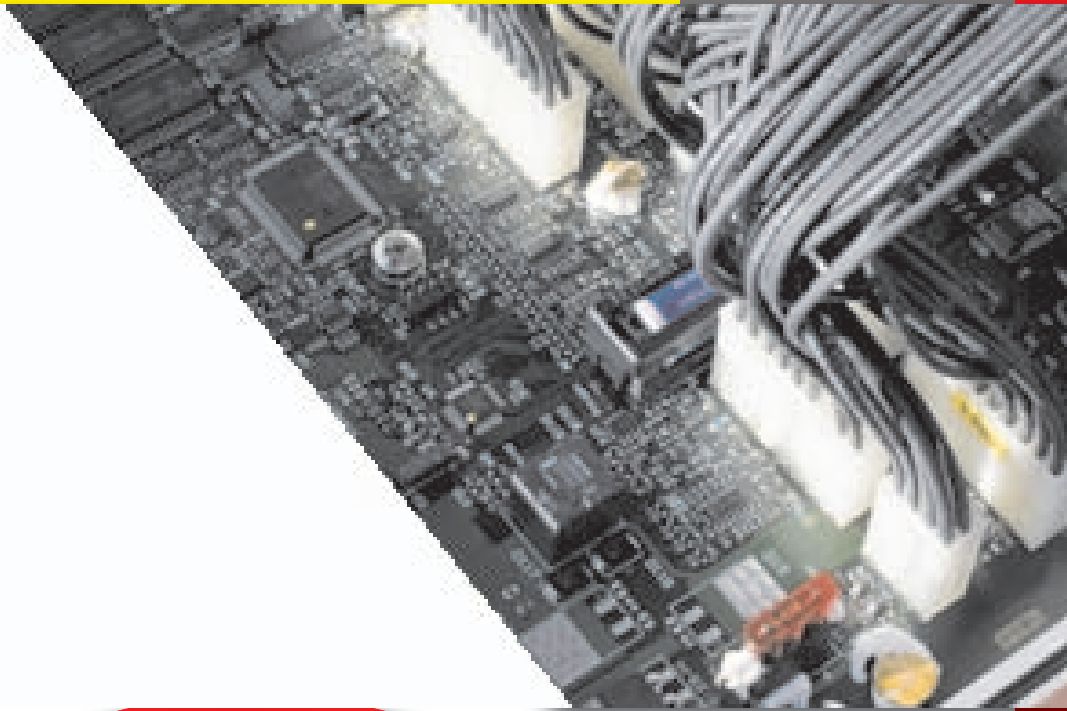
From the software point of view, Fassi's research is revolutionising the approach and the electronic technology that has been used until now in the truck-mounted cranes sector in a significant manner. The innovative integral and "intelligent" **IMC (Integral Machine Control)** control system is a real brain that knows how to coordinate all the extraordinary power that is available thanks to the synergy between the most advanced electronic systems and the latest hydraulic systems. The IMC system works exactly like the nervous system of a living being and has an electronic brain (master unit) at the centre of its own system which can process an enormous amount of information coming from peripheral sensors and from the electro-hydraulic systems of the crane

in real time. This new software is much more powerful, but at the same time more intuitive and easy to manage, as well as being user friendly, and structured with a greater number of operational control parameters of the crane. The IMC coordinates, manages and controls the operating functions of the crane, sending the data from the various equipment and devices to the CANbus. The system is therefore able to select the best conditions in relation to the work to be performed, to detect possible problems and automatically control them, ensuring optimum performance in accordance with any specific load or movement situation. This works hand in hand with the ADC (Automatic Dynamic Control) system that is set up to control the dynamics, and which allows the maximum speeds to be achieved in relation to the load being manoeuvred. Thanks to the ADC system there is a greater

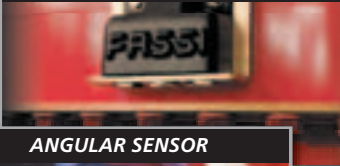
flow of oil through the hydraulic distribution unit and consequently better multi-functional performance and higher working speeds, to the extent that when the induced load on the lift jacks changes, the speed of movement of the crane is automatically managed within the preset parameters.

Everything under control, including stability

The IMC system, integrated into the ADC system, is directly and constantly interfaced with the control devices and radio control of the crane. The entire operative state and functionality of the crane electronics can be checked in real time on the digital display of the radio control and on the operating panel of the machine itself. Thanks to the power of the IMC system, all of the crane functions are constantly shown on the display in exactly the same way as in the cockpit of an aero-



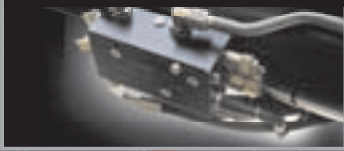
PROXIMITY SENSORS



ANGULAR SENSOR



PRESSURE TRANSDUCER



DIGITAL DISTRIBUTOR



STABILIZER DISTRIBUTOR UNIT



SLAVE UNIT



FX800/ADC BOARD



GRAPHIC VISUALIZER



RECEIVING AERIAL



RCH RADIO CONTROL

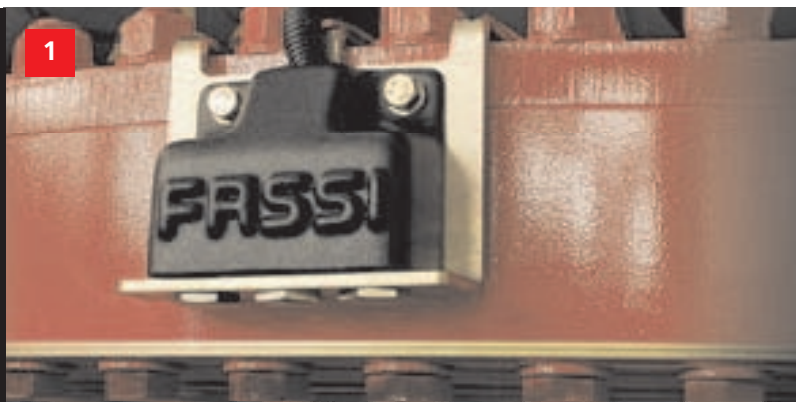


IMC - ADC

1. PROXIMITY SENSORS If required, they limit the rotational arc of the crane, always guaranteeing stability, or they activate a differentiated torque limiter on the unstable working area.

2. PRESSURE TRANSDUCERS. Fitted on all the jacks of the crane, they control the pressure induced by the lifting in the jack.

3. ANGULAR SENSOR. This recognises the position of the load, making the system intelligent: it authorises the manoeuvrable functions and blocks those that would increase overloading.



plane. Also thanks to the IMC system, the activation of the stabilizers can be checked and specific commands given, including any further stabilizing operations, all at the same time.

Inside the Fassi digital system: innovation at all levels.

The innovative electronic components used on Fassi cranes have made it possible to fit multi-functional distribution units with the most advanced hydraulic solutions for performance and reliability. The electro-hydraulic modules of the distributor with Canbus technology, for example, can

communicate with the central control unit and agree on the actuation of the **Electronic Flow Sharing device**. This system distributes the oil that comes from the pump proportionally to all of the manoeuvres that are being actuated at any one time. Using a Fassi unit fitted with the new Flow Sharing system in fact, it is possible to actuate several levers at the same time and then generate different movements redistributing the available oil flow proportionately to all the movements that are being actuated, ensuring the execution in each case.

The digital electronics are again essen-

tial in terms of the synergy between the pressure transducers installed on all of the jacks and the sensors. In particular, the angular sensor is able to recognise the position of the load to make the system genuinely "intelligent". In fact, in overloaded conditions, read by the transducers, the sensor authorises the manoeuvrable functions and blocks those that would increase the overloading. Furthermore, it controls the safety management of the ProLink system. All of this is made possible by the interface between the Slave Unit that transfers the data sent in analog form to the CANbus, and the new

electronic board – the genuine “brain” of the whole system. The board has a new generation dual microprocessor to ensure crosschecking and obtain the maximum safety levels in all operating conditions.

Before any item is put into production it has been subjected to the most severe mechanical, vibration and temperature tests. Even the casing guarantees the highest levels of protection against adverse atmospheric conditions (such as water and dust). Furthermore, the board is protected by an anti-condensate filter: a special unidirectional drain plug that prevents the formation of condensate inside the container. The meticulous attention paid to the quality of the internal electronic components also stands out with respect to the connectors, specially designed for automotive applications and IP 67 certified, equipped with clamps that have spring closures to guarantee a good contact even when subjected to the most severe levels of vibration. This higher reliability stems also from the fact that the connectors must never be opened. In fact, even when the crane is being assembled, they are installed already closed with the appropriate external clips.

Incredible versatility and full self-diagnostic capability

The new electronic systems mentioned above on the Fassi cranes let you

use a multitude of advanced functions, as well as the main ones for the management of the crane or the load control systems. In this respect the possibilities of monitoring the stability conditions of the truck/crane, the transmission of data regarding the working pressure and the lift capacity of each individual jack, the management of the torque limiting device of the winch, and the information that is necessary for managing the crane in a safe manner also when there are mechanical extensions, really stand out. Furthermore the IMC is configured as an “open system” and has memories that can be implemented in time: it knows how to store data on the operation of the machine and lets you run checks, monitoring the state of efficiency of the crane even on a PC or palmtop (PDA), and it is already set up for technological and functional updates resulting from further advances in electronics.

The management and the modification of the operational parameters for updating and customising the operational functions is as a result made much easier because you don't necessarily have to use a PC; you can gain access to the programming function directly from the push-button panel of the radio control unit or from the main control panel. The stored data is still obviously password-protected.



Fassi's technological progress, characterised by the use of a new electronic management system, makes the most convenient and simple interfacing possible also by monitoring operating reports to be aware of the state of efficiency of the crane and schedule maintenance intervals, in real time.

Easy to use online

The results of Fassi's technological progress and the practical application on cranes of these results, creates a scenario that is constantly developing: you can find the latest information on this commitment that encompasses research and engineering on our web site www.fassigroup.com.

This is the best way to learn more about the activities of Fassi and the production of cranes that are more and more efficient, and at the same time simple and convenient to use.



Innovation and development: the Fassi team

Fassi's Research and Development team are essentially involved in the production of prototypes, that is to say equipping the new cranes from the structural and design point of view on the basis of data provided by the engineering office. It subsequently organises, coordinates and controls the fatigue tests and the general testing, that is to say tests that permit cranes "without compromise" to go into production, from every point of view. The team always works in direct contact with all of the other Fassi departments, and valuable feedback is received



regarding expectations and suggestions directly from the market. In fact, every new project the team is faced with starts from meeting the requirements of the user. The principal commitment to innovation means finding the best courses of development for the cranes, evaluating the synergy between the information from the market and that from the results of Fassi's research carried out in the sector. The department is called in to check the feasibility, putting the solutions into practice, and finding just the right balance for these two factors. It also evaluates all the innovations that have resulted from recent developments, particularly in the electronics field. When we think about the extraordinary developments in data transmission systems: today this information represents an essential starting point for putting the project of a new crane into practice. The task is one of organising the available resources in such a way that they are adopted and made available simply and precisely, in a more efficient manner on truck-mounted cranes.

The “language” of Fassi cranes

The innovative Fassi solutions that are an integral part of the “Easy to use” dialogue

GV	Graphic Visualizer	Pages 5 and 19
AV	Alphanumeric Visualizer	Pages 5
BV	Basic Visualizer	
PROLINK	Progressive Positive Link	Pages 20
RCH	Radio Remote Control	Pages 10-13 and 19
RX	Rotary Switch	Pages 6 and 10-11
FL	Full Lift	
S800	Mechanical Distributor Mod. S800	Pages 15
D850	Digital Distributor Mod. D850	Pages 15 and 19
D900	Digital Distributor Mod. D900	Pages 15 and 19
FX	Fassi Electronic Control System	Pages 5 and 19
XF	Extra Fast	Pages 16-17
XP	Extra Power	Pages 16-17
ADC	Automatic Dynamic Control	Pages 9 and 18
IMC	Integrated Machine Control	Pages 9, 18 and 21

FASSI

Fassi magazine collection

- 1- Easy to use*
- 2- Designed to perform*
- 3- Made for you*

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