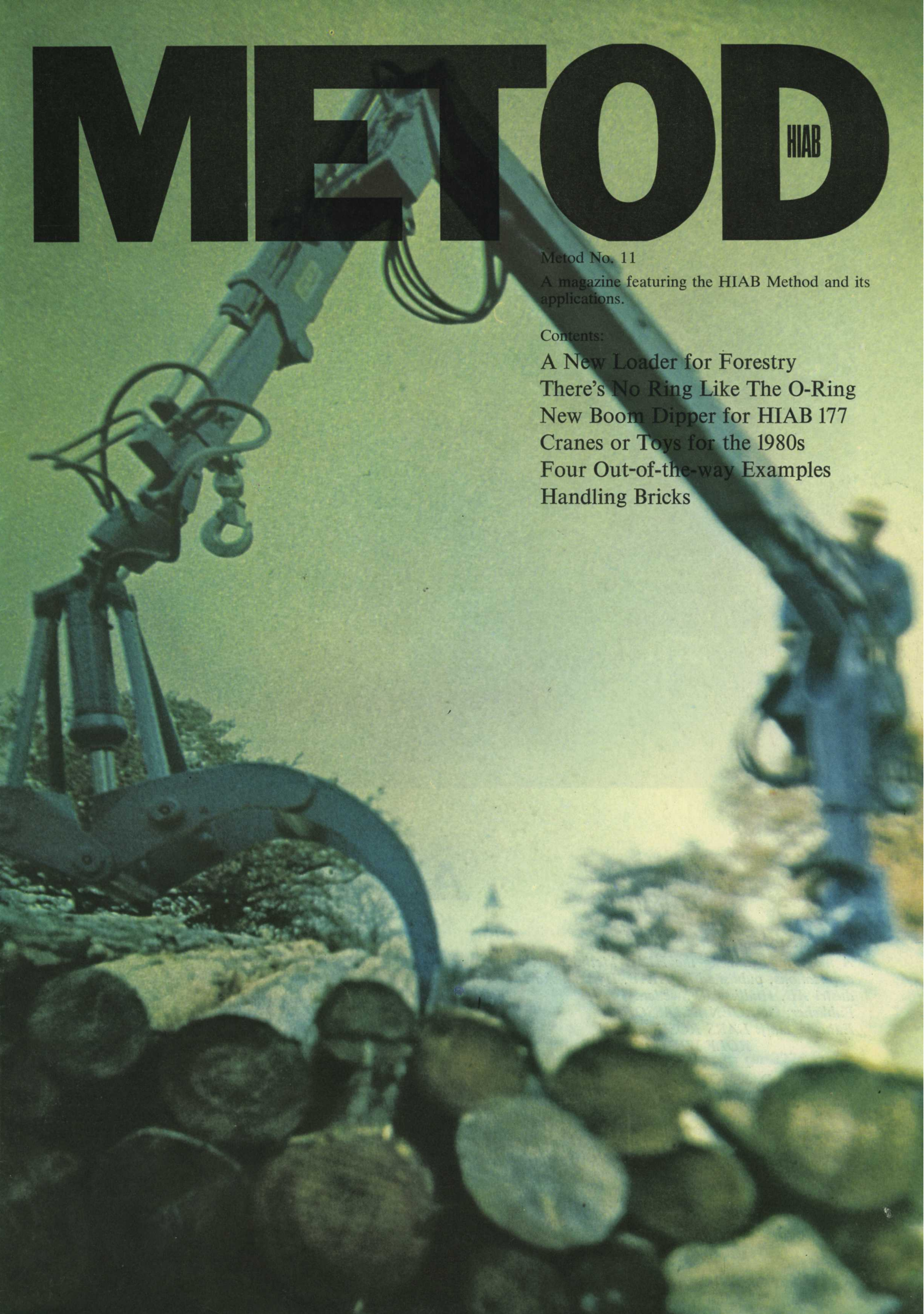
METOD

HIAB

Metod No. 11

A magazine featuring the HIAB Method and its applications.

Contents:



A New Loader

HIAB Metod No. 11

A magazine featuring the HIAB Method and its applications, published by HIAB, Hydrauliska Industri AB, Hudiksvall, Sweden.

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COVER

The colour picture on the cover shows the HIAB 178, featured in the article "A New Loader for Forestry" on pages 2 and 3.

Colour photography: Roland Andersson.

HIAB is bringing out a new loader in the 5-ton-metre class. Known as the HIAB 178, it is chiefly intended for forestry hauls.

In all essentials, the base, kingpost and inner boom of the HIAB 178 are the same as those of its predecessor, the HIAB 177 forestry loader. But the HIAB 178 has an outer boom of cranked design with a hydraulically operated extension. One advantage of the cranked boom is that a longer extension can be used. Another feature is that the extension runs on two rollers, one below and one above. This arrangement gives the extension a smoother action and firmer support, and eliminates jerky movements.

for Forestry

The HIAB 178 has a very big radius of action. The outreach of the standard version is 16 ft. 9 in.—22 ft., while a special version with an extra boom section will reach as much as 22 ft.—27 ft. 3 in. If the crane is used as a separate loader, for example, the increased outreach means that it need not be moved so often. On a forest tractor the great reach offers a double advantage—the tractor doesn't have to move so far and the lumberjack will have less heavy skidding to do.

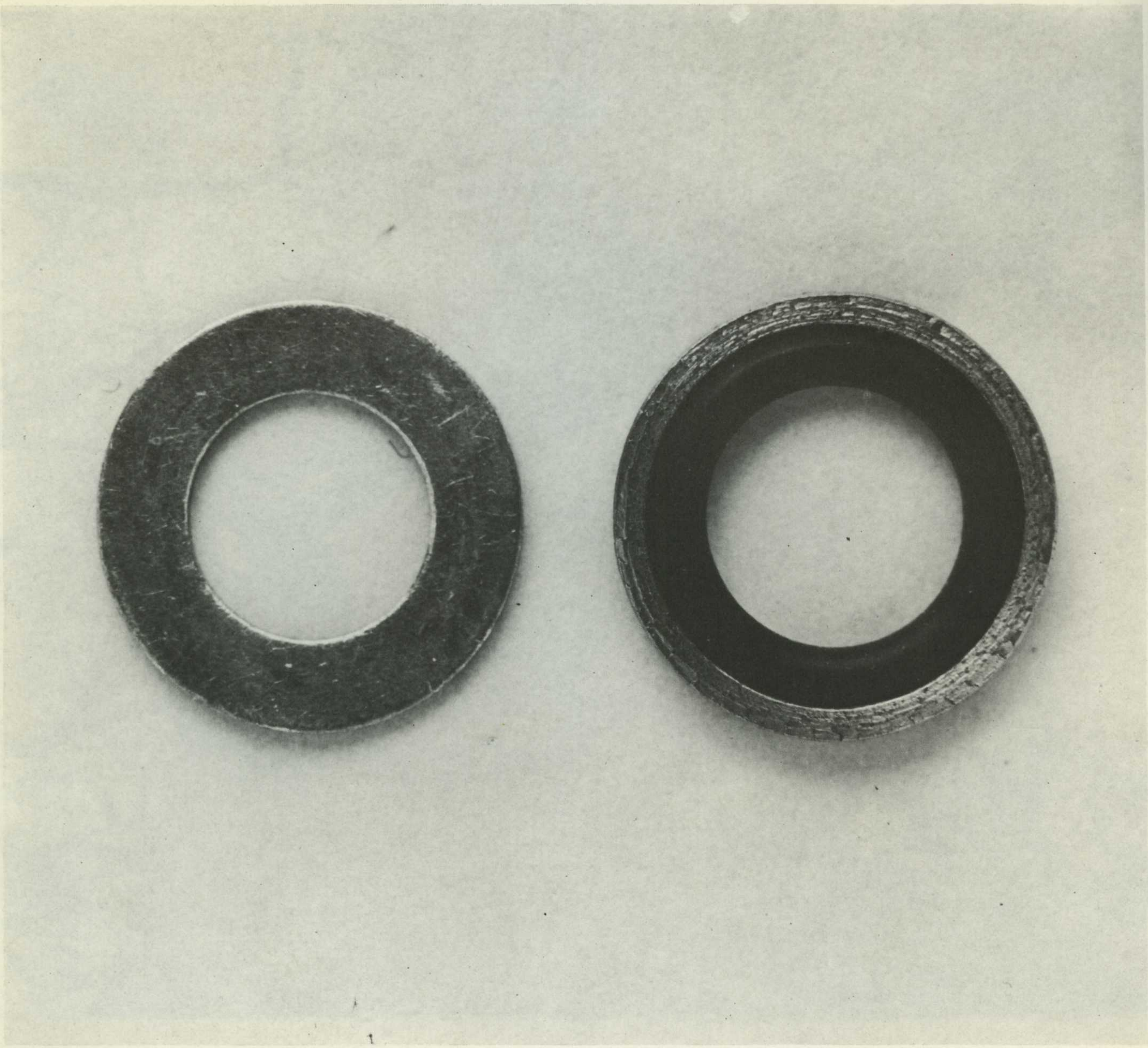
To give the hydraulic lines better protection and safeguard them from damage, the hoses of the HIAB 178 are run inside the extension to the rotator and the grapple. The hoses have also been provided with swivel couplings.

DATA

Type reference	HIAB 178	
Outreach: standard (max.)	6.7 m	22 ft.
special (max.)	8.3 m	27 ft. 3 in.
Slewing angle		410°
Slewing speed		27° per sec.
Working pressure in the hydraulic system	160 kg/cm²	2275 psi

Lifting capacity:

at radius of 16 ft. 9 in.	975 kg	2150 lb.
» » » 22 ft.	700 kg	1545 lb.
» » » 27 ft. 3 in.	500 kg	1100 lb.



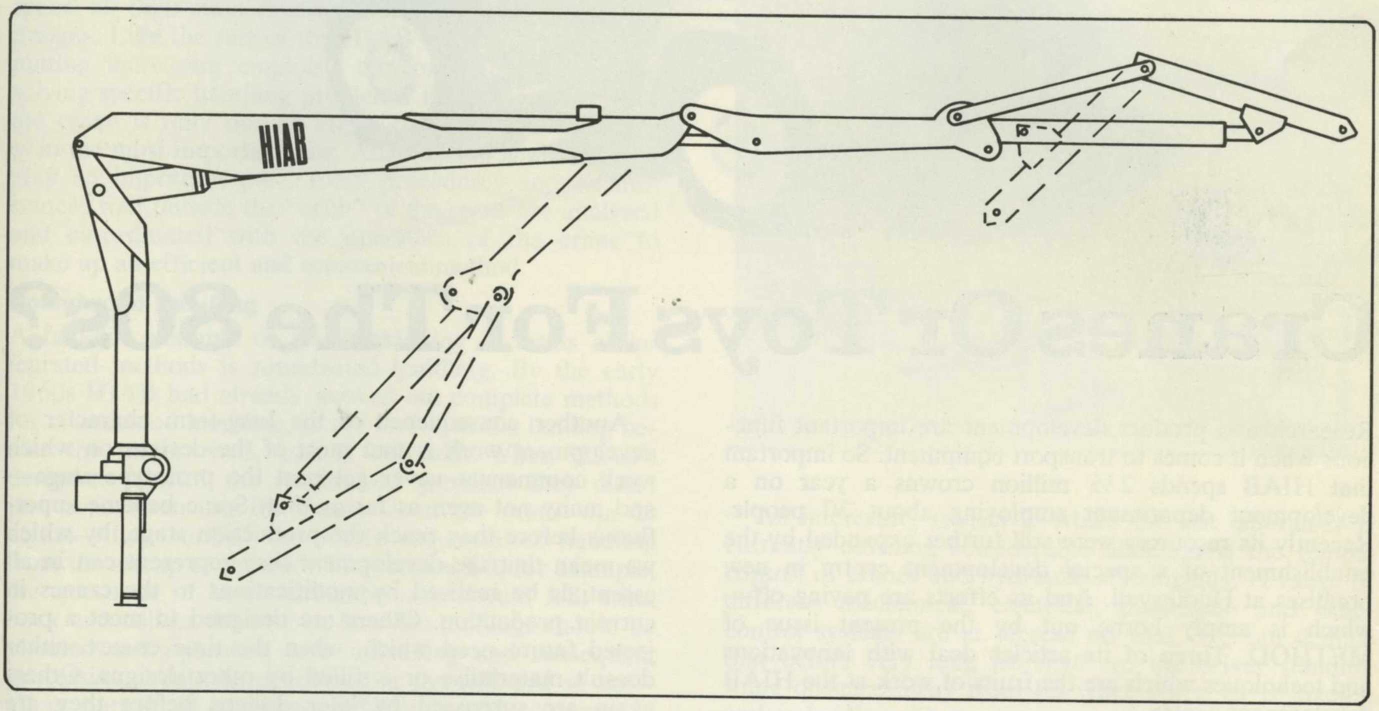
The new sealing ring consists of an outer ring of steel and an inner O-ring of rubber. The diameter of the rubber is greater than the thickness of the steel. So when the coupling is made tight the rubber ring provides the sealing. The function of the steel ring is to hold the rubber one in place and help it to withstand the oil pressure. Thanks to the elasticity of the rubber the new sealing ring provides effective sealing once the coupling is tight.

There's No Ring Like The O-Ring

The hose couplings used to contain a sealing ring made of copper. This ring did a good job, since when the coupling was tightened hard the copper underwent deformation and filled up any small unevennesses in the joint. But one drawback was that if the coupling was taken apart it was generally necessary to discard the old, deformed ring and put in a new one. And if the proper tools were lacking it was often difficult to tighten the coupling hard enough to deform the copper and ensure a perfect seal.

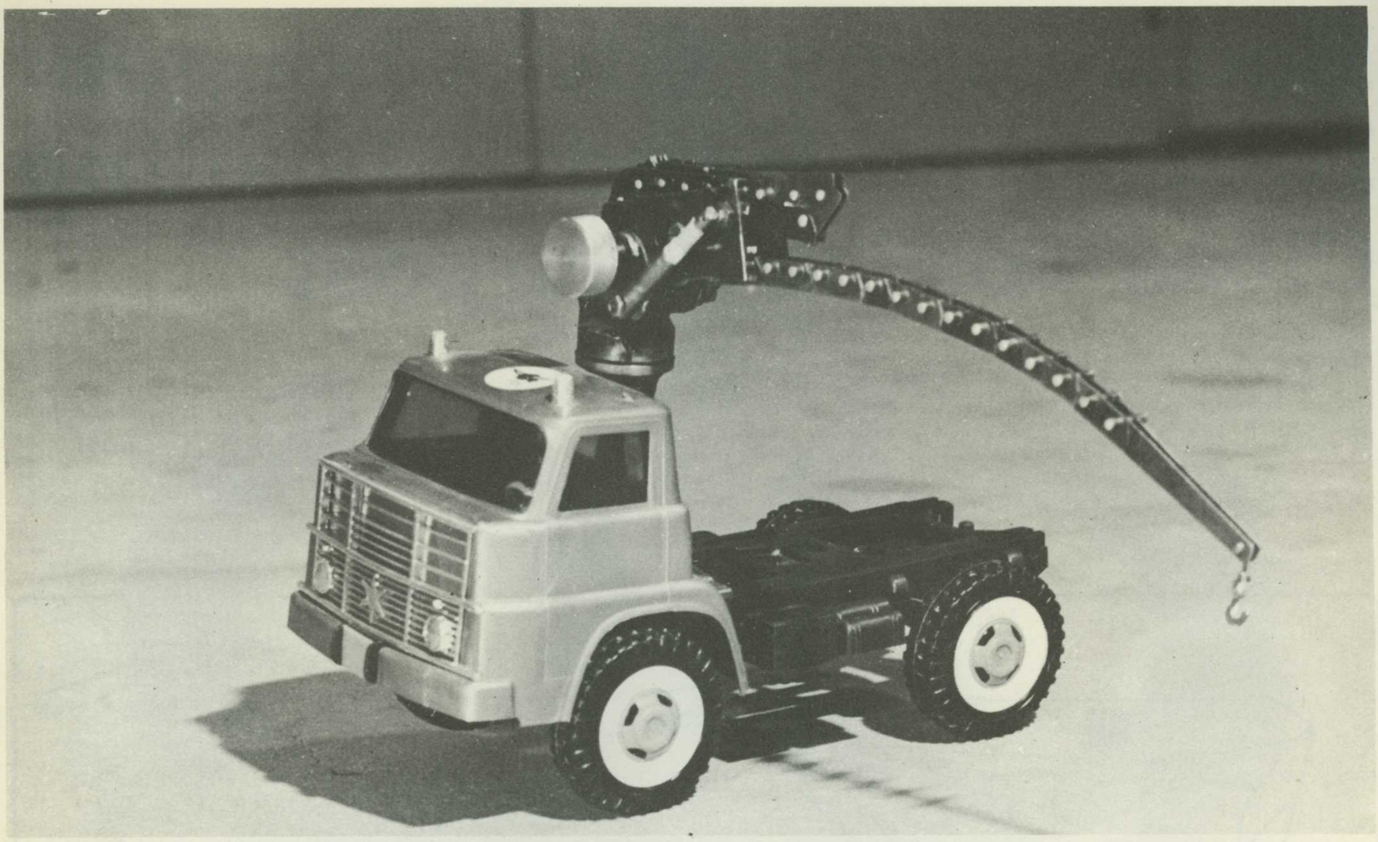
These copper rings have now been replaced by a seal consisting of an outer ring of steel and an inner O-ring of rubber. The diameter of the rubber is larger than the thickness of the steel. So when the coupling is made tight it is the rubber ring that provides the seal, while the function of the steel ring is to hold the rubber ring in place and help it withstand the oil pressure. The O-ring achieves a seal even with the coupling only moderately tight. Since the rubber, unlike copper, is elastic, it reverts to its original shape when the coupling is taken apart. As long as the sealing ring has not been otherwise damaged it can therefore be re-used and will give the same effective seal when the coupling is put together again.

Boom Dipper Gives Longer Reach And Handier Loading Close To The Kingpost



What is a "dipper"? It's a new item which, after a year of practical trials, now forms part of the additional equipment for the HIAB 177. In operation, it automatically increases the effective sweep of the extension. When the extension is run out the dipper swings forward and gives it extra reach. When the extension is retracted the dipper tucks in under it and makes it easier to deposit or grasp a load close to the kingpost. Since the dipper is actuated by the hydraulic extension it needs no control of its own. Dippers are available in two sizes, giving outreach increments of 15 ¾ and 40 inches.

This sketch shows how the dipper enables the crane to work both farther from and closer to the kingpost.



Cranes Or Toys For The 80s?

Research and product development are important functions when it comes to transport equipment. So important that HIAB spends 2½ million crowns a year on a development department employing about 30 people. Recently its resources were still further expanded by the establishment of a special development centre in new premises at Hudiksvall. And its efforts are paying off—which is amply borne out by the present issue of METHOD. Three of its articles deal with innovations and techniques which are the fruits of work at the HIAB development centre.

In 7,500 sq. ft. of workshops and laboratory space and 4,300 sq.ft. of drawing offices and other office accommodation, the staff are constantly at work on the improvement and further development of the existing models.

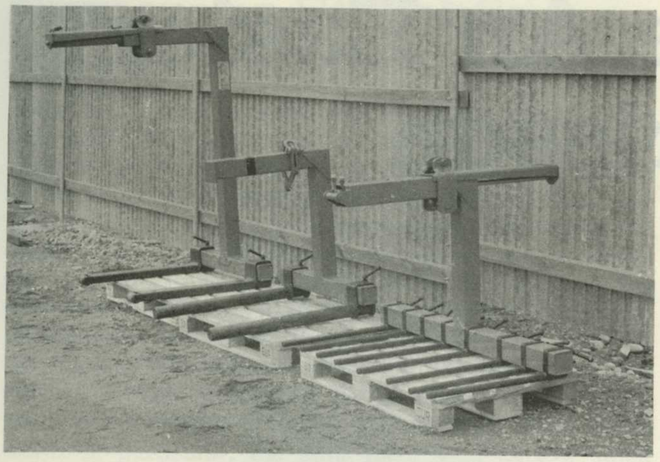
Designs for the Eighties

The HIAB 178, which is presented on pages 2–3, is the outcome of work in another field: the development of an entirely new range of cranes. The aim is that when the development of the haulage business creates the need for a new type of crane there will be a HIAB model with the appropriate capabilities all ready to be put into production. Since it takes about five years to bring out an entirely new type of crane from the first rough sketches to the first production run, work on the types that will be produced around 1974 has to start right now. So the new ideas which the HIAB development centre is now beginning to revolve must be so farsighted that they can measure up to the needs of the transport business a good way into the 1980s.

Another consequence of the long-term character of development work is that most of the designs on which work commences never get past the prototype stage—and many not even as far as that. Some become superfluous before they reach the production stage, by which we mean that the development they represent can in all essentials be realised by modifications to the cranes in current production. Others are designed to meet a projected future need which, when the time comes, either doesn't materialise or is filled by other designs. Others again are surpassed by later designs before they are ready for production. And some simply fail to measure up when they arrive on the laboratory testbenches.

Crane Kits

Another important task receiving attention in the HIAB development centre is the standardisation of crane components. Certain of the hydraulic components have long been identical on most crane models. Now HIAB has gone a step further and developed standardised hydraulic cylinders which are to be used on all cranes. The ultimate aim is a complete system of standard components arranged to fit together—a sort of Meccano set for crane builders. When an engineer wants to turn out a crane satisfying specific requirements in respect of mounting facilities, reach and lifting capacity, he will select from his kit the kingpost most suitable for the mounting he has in mind, and pick out a boom system with the right reach and hydraulic cylinders with the right lifting capacity. And then he will put them all together to make a crane. If he wants a bigger capacity he will have recourse to more powerful cylinders; if he wants to change the reach he will substitute a new boom system, and so on.



HIAB Methods

The research people in the development centre don't spend all their time thinking out new and better crane designs. Like the rest of the HIAB organisation they are putting increasing emphasis on complete methods for solving specific handling problems. From this standpoint the crane is only one of many components—often not even the most important one. Attachments and ancillaries play an important part. Even procedures and circumstances well outside the "orbit" of the crane are analysed and co-ordinated with the operation of the crane to make up an efficient and economical method.

Roundwood Handling

A familiar example of HIAB thinking in terms of integrated methods is roundwood handling. By the early 1960s HIAB had already worked out complete methods for roundwood handling, in the forest, at the landing beside the motor road, and at the mill. When HIAB's designers tackled the roundwood problem they didn't just concentrate on the stages when the crane was in action—they studied the whole sequence of handling from the stump to the mill. They examined, for example, the questions of how the lumberjack should fell, trim, buck and collect the timber, how the landings should be planned and operated, how unloading and subsequent processing should be conducted at the mill and so on—all in pursuit of maximum efficiency and economy in handling and transport. Their findings were an important starting point for the rapid switch from river driving to the highway haulage of roundwood that has since taken place.

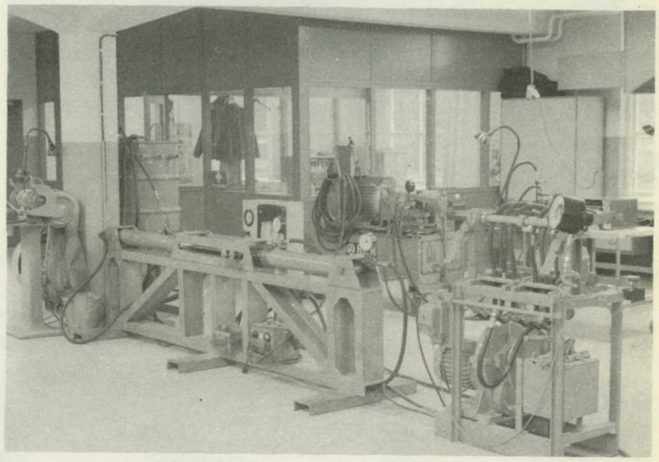
Concrete and Brick

Since then, similar methods have been worked out for a long list of handling problems. The handling of building units made of concrete or lightweight concrete is one field in which the HIAB Method extends to much more than loading alone. In many cases it has led to the design of types of houses and building units specifically tailored for handling and erection by the HIAB Method.

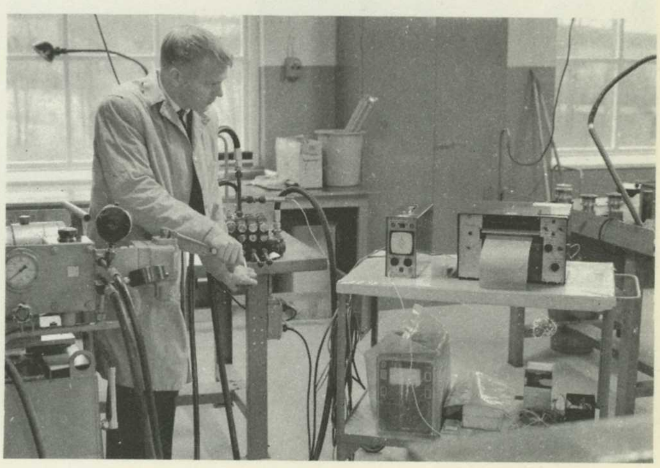
Another field that is currently in the limelight is the handling of bricks. In this context the chief use of the HIAB crane is in unloading the bricks on the building site. Starting from this phase of the operation HIAB's method experts have developed a complete handling technique that begins right inside the kiln when the fired bricks are ready to come out and doesn't end until they have been deposited at the bricklayer's elbow. A preview of this method is given elsewhere in this issue. At the same time, work is in progress on a similar method to ease the very laborious work of handling clayware pipe.

Larger-than-life Lab Trials

The development centre also houses HIAB's test laboratory, which is eminently well equipped to search out defects and weaknesses in both designs and materials. Hoses, valves, cylinders, packings and other items are put through continuous tests which in point of severity and heavy-handedness outdo most things a crane might have to put up with in actual service. On testbenches out in the yard, prototypes of new cranes and random samples from current production are driven hard, day in and day out. Before it has been on the testbench very long, a crane will have done more lifting and slewing at the hands of its automatic "operator" than most cranes will ever have to do.



An interesting subject to which the test laboratory is currently devoting considerable attention is the remote control of cranes and hydraulic attachments. A range of different mechanical, electrical, pneumatic and other control systems are at present on trial. We can deduce that before very long we shall see the driver standing some distance away from his truck when he is loading and unloading. There are many situations in which he would find this a very valuable facility. The reason why remote-controlled hydraulic cranes are rarities as yet is that up to now it has proved difficult to arrive at remote-control systems that can match the standard levers when it comes to smoothness and flexibility of crane operation.

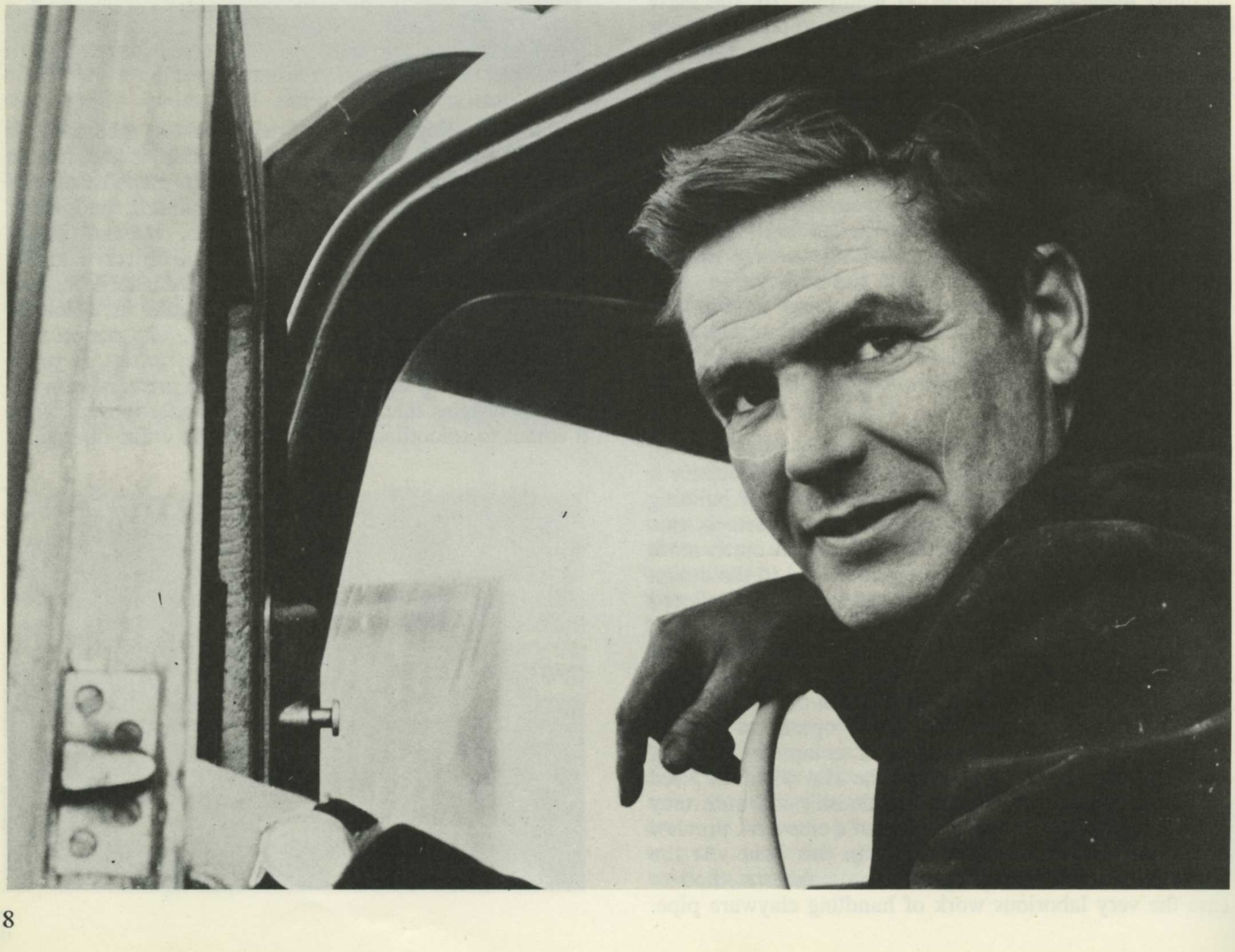


There Must Be An Easier Way, Said Karlsson

Truck driver Kjell Karlsson had an unloading problem. He does delivery runs from a brickworks, and sometimes the load has to be discharged by hand. Two bricks at a time. One in each hand. A single truck-load can take half a day. Sometimes they use a wheelbarrow. Taking a small pallet holding 70–80 bricks at a time. A bit faster than unloading by hand, but still a heavy and hazardous job.

There must be an easier way of doing this, said Kjell Karlsson, and began thinking. In due course he arrived at a solution based on the HIAB Method. He submitted it to HIAB's district manager, who thought it was a sound idea and put HIAB's development department to work on it.

The department's experts weren't unacquainted with Kjell Karlsson's problem. Far from it!—the development of efficient transportation and handling methods for the building trade is one of their major preoccupations. Take bricks alone: four or five hundred million of them are used every year—just in Sweden. So more efficient brick handling is a matter of urgent importance. Another factor is the structural rationalisation now going on in the industry, whereby production is being concentrated to a smaller number of larger firms—about 1,000 in 1964 as against 1,750 in 1954. This involves longer hauls, and steps up the demand for efficient handling.

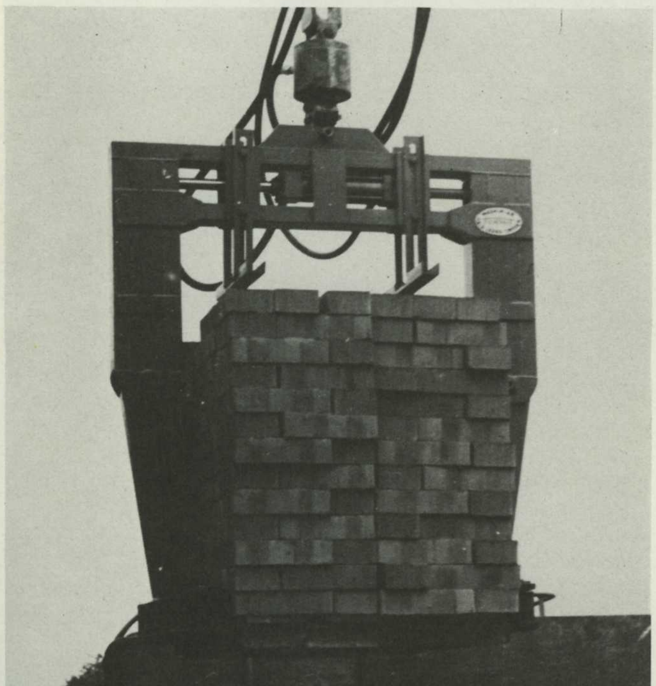


Numerous Stumbling Blocks

There are several reasons why the brick trade had to wait until 1968 for a sensible method of handling to come along. Standardisation of equipment is hampered by the existence of several different standard sizes and an even larger range of local special sizes. The traditional —and often unavoidable—barrowing of bricks within the brickworks and particularly on the building site has prevented the adoption of standard pallets. The bricks are therefore stacked on small pallets holding 200–250 kg. Another obstacle in the way of a switch to larger pallets is that scaffolding is generally limited to a maximum load of 300 kg per sq. metre. At older brickworks in particular, the kilns have such narrow stock outlets that it is difficult to get in with decent-sized handling units. And moreover, the competition from concrete and lightweight concrete has created a climate of uncertainty about the future of brick as a building material and has made people hesitate to invest in modern, efficient handling equipment.

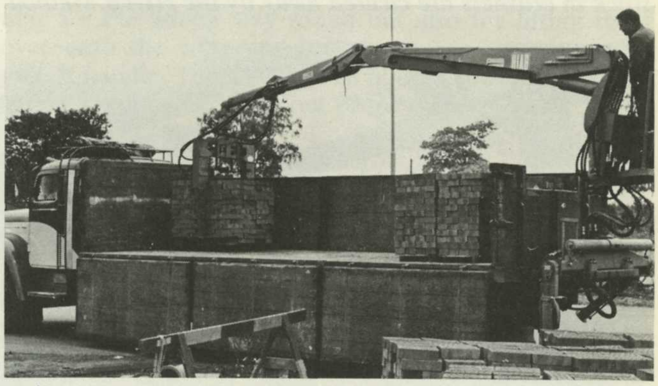
Best of Both Worlds

When HIAB's method experts got to work on the brick problem they found many reasons for retaining the small pallet that is in use at almost all brickworks. Being able to put complete pallet-loads onto scaffolding or to move them by wheelbarrow when necessary were advantages not lightly to be abandoned. Yet this pallet is altogether



too small a unit for mechanical handling by HIAB crane or fork-lift truck.

The final solution was to load and unload the pallets in lots of four. This is about as much as can be got onto a "Europa" pallet. The weight is 800–1,000 kg, which means that full use is made of the crane capacity and a normal truck can be loaded with bricks in ten or twelve lifts. The four pallets are grasped by a concrete-block grapple, augmented with a special device to lift the pallets at the same time, since the small pallets are not sufficiently strong or so designed that the grapple can be applied to them directly with sufficient force to lift the whole parcel. The grapple is therefore applied to the lowermost layer of bricks. Immediately beneath the jaws of the grapple is a skirt—made of metal on the prototype shown here, but of rubber in later production—which is applied to the pallets at lower pressure, sufficient only to hold them together and lift them.



A rear-mounted crane of 5 ton-metres has sufficient reach to load and unload a brick truck of normal length. On longer outfits a Rol-loader is used, or some of the load is barrowed to those parts of the deck which the crane cannot reach. Most brickworks also have a fork lift truck for internal transportation and in some cases it should be possible to use it for loading as well.

The advantages of applying the HIAB Method to brick handling are numerous. Above all it gives substantial time savings, particularly in discharging on building sites. This applies even where there is a crane on site, since the latter is often otherwise engaged, so that the truck is kept hanging about. In any case, the site crane is confined to a fixed area, so that the bricks still have to be shifted about the site by barrows or other means, whereas with the HIAB crane they can always be left at the most convenient spot; in many cases they can be put right onto the scaffolding or floor slab.

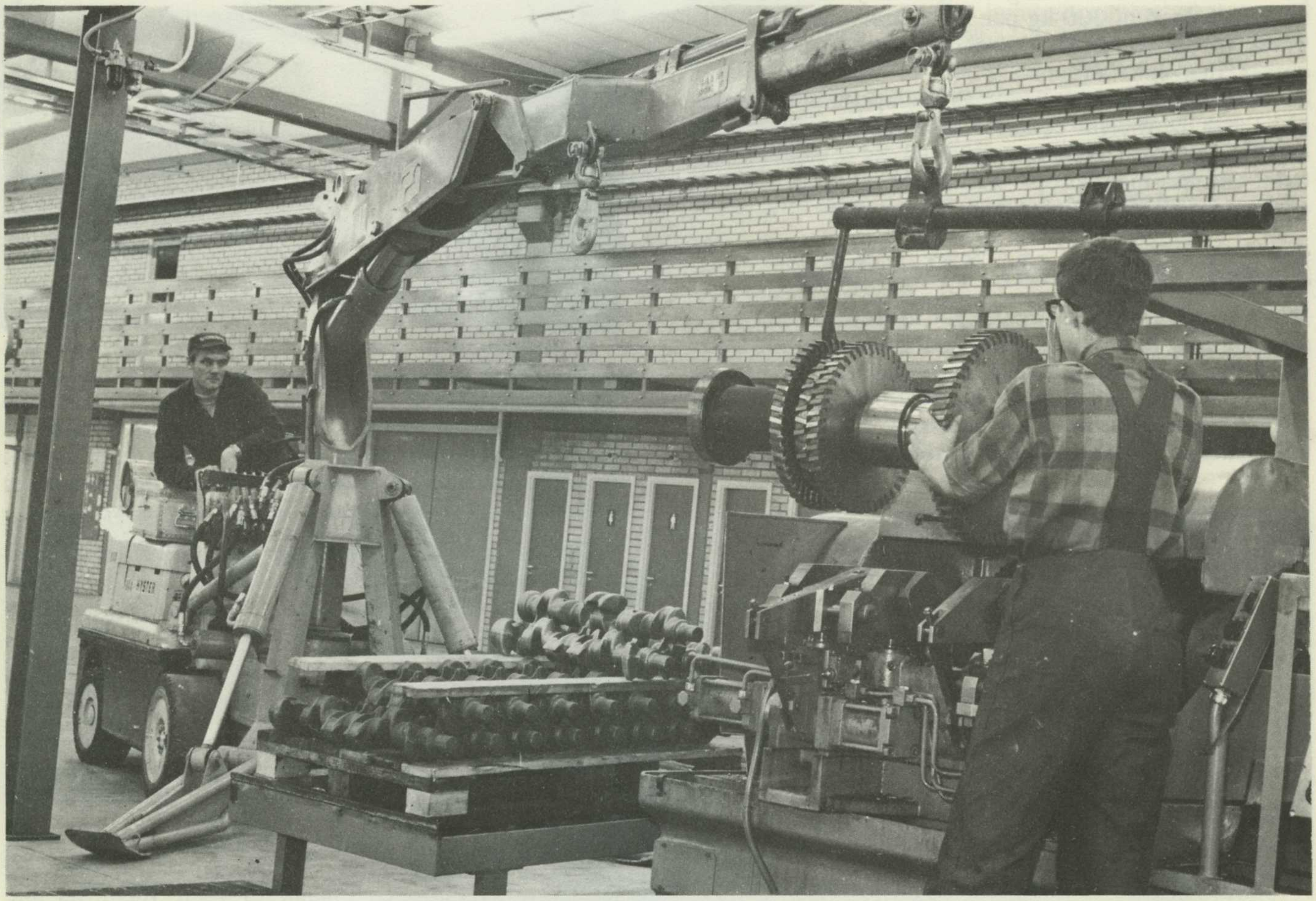
In loading, too, waiting time is eliminated, since the necessary handling equipment is right there on the vehicle. During peak dispatching periods a number of trucks can load up at the same time, each independent of the others.

4 Out-of-the-way Examples

Even though the HIAB Method is still mainly used in connection with vehicular transportation of various kinds its versatility has given it a growing stake in other fields as well. In earlier issues we have frequently shown examples of HIAB cranes on more or less stationary mountings. At electricity plants on the River Rhine, fragile spares and maintenance materials are handled by stationary HIAB cranes. Blocks of stone that have got stuck in crushers are cleared away by the HIAB Method.

The sugar mills in the south of Sweden use a stationary HIAB crane to pick a sackful of beet samples out of each load as it arrives. This is versatility indeed.

In this issue we're presenting some further examples to illustrate the almost unlimited potential for more efficient, cheaper and less laborious handling that the HIAB Method can bring to tasks in the "stationary" category.

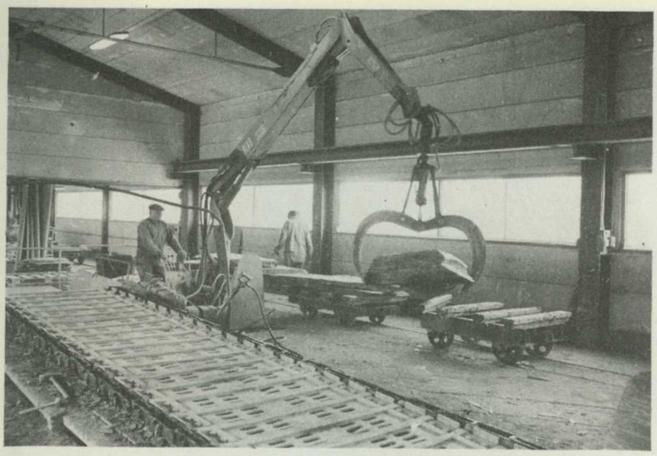


No Underemployed Overheads

The Volvo plants in Skövde have begun to use the HIAB Method for moving machines or changing heavy tools. These jobs are carried out by a HIAB 174 mounted at the front of a truck. Of course this crane isn't stationary in the strict sense, but then it isn't used for transportaion in the strict sense either. The adoption of the HIAB equipment has eliminated the system of overhead travelling cranes that would otherwise have been needed to cover the whole machine shop. Utilisation of such a system would have been on the low side, since all other lifts are performed either with fork lift trucks or by special equipment at certain stations. As these pictures show, the truck also has retractable outrigger legs. To enable it to negotiate narrow passages the slewing cylinder of the crane has been shortened, so that the crane can only be slewed through a limited sector in front of the truck, but this is quite enough for Volvo's purposes.

HIAB Belts It Out

This HIAB 177 is used in a ceramic plant for feeding a conveyor belt. The free-running raw material is stored in a series of bins. So as to command all the bins the crane is arranged to travel along a ramp. The travelling drive is provided by the same electric motor as powers the hydraulic pump. The crane is equipped with a hydraulic 300-litre clamshell bucket with a built-in rotator.



Slated to Remain Unique

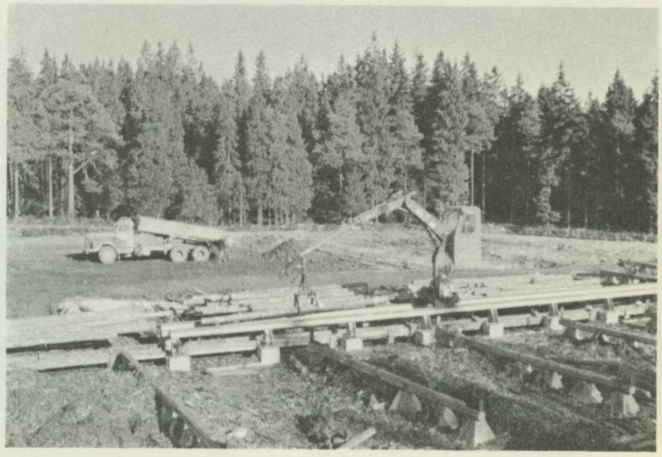
This one-of-a-kind crane is in service at Sweden's only slate quarry—and the experts say there is no likelihood of slate extraction being commenced anywhere else in the country.

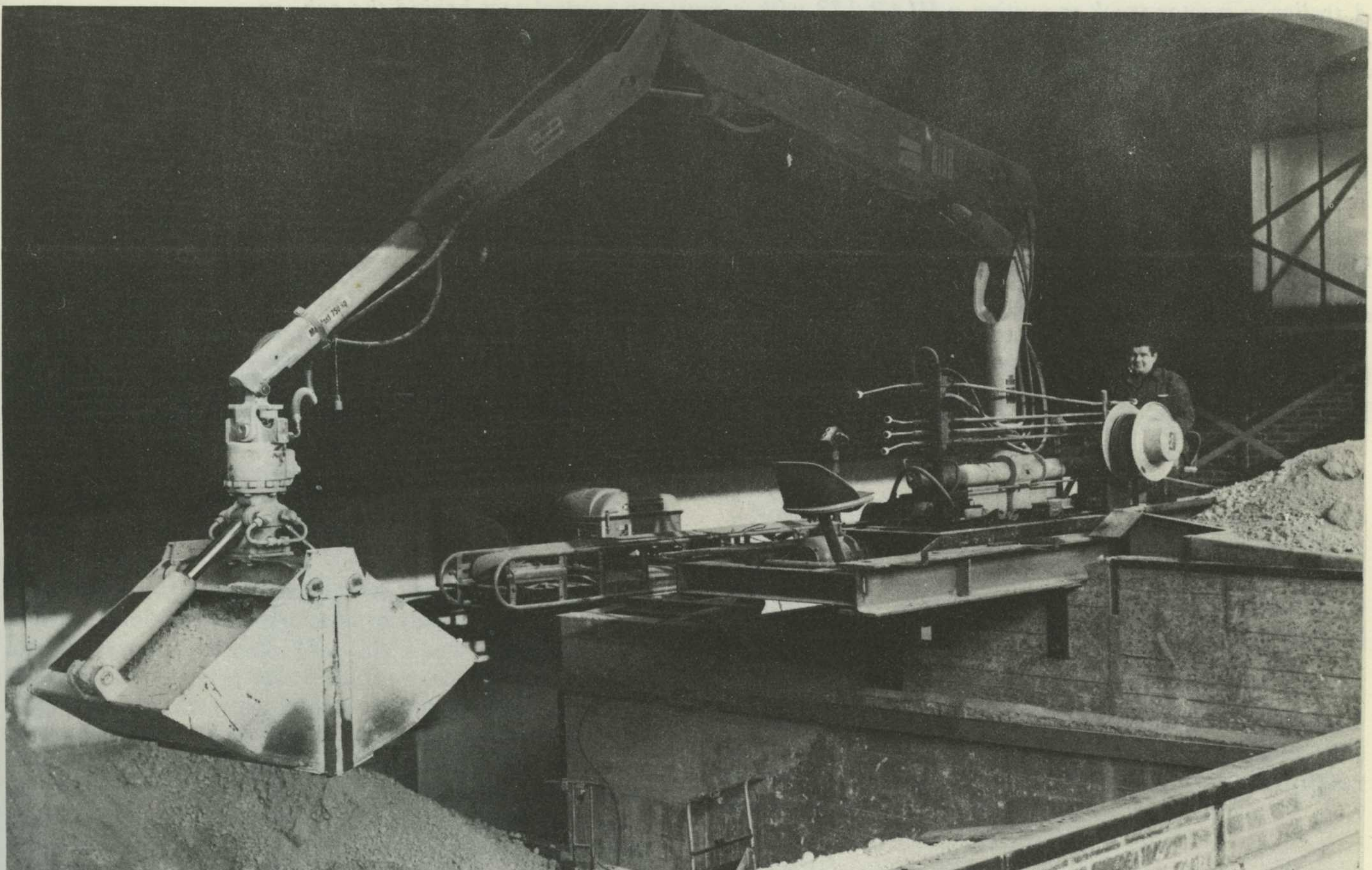
The bulk of the slate is brought up out of the quarry by trucks and is tipped into a bunker, from which a conveyor belt feeds it into the slate works. Large blocks of good-quality slate are transported to the works on railborne wagons and taken charge of by the HIAB crane, which gently lifts them over onto the conveyor belt where they are split into thin slices. The slate yielded by these blocks accounts for by far the greater part of the company's earnings—hence the careful handling. The blocks weigh anything up to 1½ tons, and between 80 and 100 of them are handled every day by a HIAB 177 with a roundwood grapple and a rotator.

HIAB Came — Sawmills Conquered

At the Swedish sawmills we can expect to see stationary HIAB cranes being used on a growing scale. Now that increasing numbers of mills are switching to land-based handling and sorting of timber they need some form of equipment to marshal the sawlogs so that they all enter the plant with the same end first. And for this job the ideal equipment is a HIAB crane—or two HIAB cranes, as at a mill near Hudiksvall.

The Hyltebruk sawmill has a HIAB 174 mounted as a Rol-loader, which it uses not only for turning the logs that are the wrong way round but also for lifting them over onto the conveyor belt that takes them into the mill. It handles 180–200 logs an hour. The crane operator sits in a comfortable cab out of the weather.





A trailer, a tractor truck mounting a HIAB 173 with a mast-top control seat behind the cab, an extra boom section, a log bar and a mechanical grapple—that's all the equipment German trucker Sielemann uses for moving long timber.

HIAB 173 Makes Short Work of Long Timber

The tongs take a grip on the log with the loader boom tucked well in. When the inner boom is raised, the root end of the trunk comes beneath the transvere log bar on the outer boom. And then, when the outer boom is raised, the log rides clear of the ground and can be swung in over the bolsters in a single movement.

The transportation of felled-length timber is a matter that is currently under discussion in German forestry circles. And that automatically raises the question of a suitable method of loading the vehicles assigned to this work. As so often happens when it comes to forestry operations the solution of the problem is to be found in the HIAB Method. The operations of trucker E. Sielemann provide a striking example. For the last three years Herr Sielemann has solved his loading problems with a HIAB 173 Speedloader.

It's an eye-opener to study the simple tackle and the skilful exploitation of the laws of physics on which this loading system is based. The aids which Sielemann uses to get 52-foot tree trunks onto his truck in one working operation are of truly Spartan simplicity—a cross-bar mounted on the outer boom, with an extension that increases the outreach to 15 ft. 9 in., and a pair of mechanical timber tongs. The only "luxury" that Sielemann permits himself is the mast-top mounting of the operator's seat and controls. Up there, the operator is not only comfortable and out of danger—he also has an excellent view of the loading job.

With these ancillaries the HIAB 173 is all set for its task. In practice, the job of lifting a log until it hangs free and can be drawn in onto the load is done in two stages. In the first stage, the tongs take a grip on the log at least ten feet from the root end, after which the inner boom is used to lift the log until its end comes into contact with the log bar mounted on the outer boom.

Now comes the second stage: the outer boom, which up to now has been tucked in, is luffed so that the log is lifted clear of the ground at the top end as well and rises to the horizontal. After that it's a simple matter to swing it in over the stanchions and lay it on the bolsters by reversing the procedure.

The loading time for this 1250-cubic-foot outfit averages 45 minutes. On runs of 30 or 40 kilometres, with his tractor pulling a four-wheel trailer, Herr Sielemann gets in three round trips a day.

Lift with Method

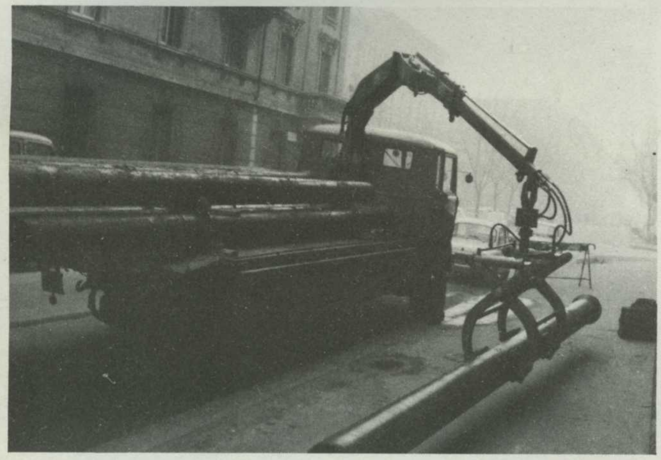
Six HIAB Outfits — soon to be more

The electrical wholesale firm of Pirelli General in England has recently procured six outfits equipped with HIAB 173s. They are stationed at the firm's branches, and the cranes they carry will come in very handy for moving Pirelli's heavy stock-in-trade. Experience with the first six outfits has been so good that Pirelli plans to buy more next year, with the same equipment.

The semitrailer rig in the other picture is also from England and shows an outfit being used to its full potential. The crane is mounted on the tractor truck, which pulls alongside the trailer for loading and unloading. The outfit is used by a firm making telecommunications material, which is both heavy and relatively fragile.

Special Grapple for Line Pipes

The Italians had problems with the handling of line pipes—particularly the heavier sizes. But now one man does the whole job by the HIAB Method—the right crane with a suitably designed grapple.



"Fragile"

Using a HIAB loader and a special pneumatic attachment with six suction cups, two or three men will have this window in place in about an hour. Without that equipment it would take six or eight men and they'd have to work at it for three or four hours—in Spain, as in this picture, or anywhere else.

PR Right Up HIAB's Street

The street being Hiabsvej in Paarup, a small town in Jutland, Denmark. The local factory manager is on the borough council and won its approval for his proposal to name a street after HIAB.

Some Highlights from METOD No. 12

- HIAB 178 at work
- More applications for stationary cranes
- Separate or vehicle-mounted loader? A costing analysis

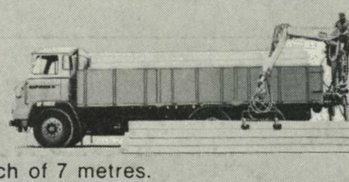
Where the blazes is that fellow with the loader?

Your truck costs you money even when it's standing still. All right: now how often do you hang around waiting for help with loading and unloading?

With a HIAB loader on your truck you'd cut out all that lost time. You'd be driving instead. You'd earn more. (Many customers are willing to pay extra to be relieved of the loading chore.)

HIAB loaders are known all over the world. But we really sell more than just loaders. We sell efficient goods handling by truck. With a suitable combination of crane, grapple and other special equipment.

We call this system the HIAB Method. It doesn't matter what sort of goods you haul. We can rationalize the job for you. For instance, the handling of light-weight slabs at a construction site used to be a slow and awkward business. But the HIAB Method put zip into it. This HIAB 177 Speedloader is equipped with special hydraulic grabs and a hydraulic rotator. The crane has a reach of 7 metres.



Write us or one of our distributors for details of how HIAB has solved your particular handling problem. Is this something you can afford to put off . . .?

HIAB

Hudiksvall, Sweden