



Michigan Wheel Loaders

L50, L70, L90, L120, L160



MICHIGAN

WE HAVE THE RESOURCES AND THE EXPERIENCE IT TAKES TO BUILD THE LOADERS OF THE FUTURE

FOR MORE THAN 30 YEARS

Michigan has been building loaders for more than 30 years. This experience has taught us a great deal about different market demands. We are continuously gathering experience from many work areas and are applying that experience in meeting the needs of the ever changing market requirements. Our goal is to build powerful, efficient and reliable production machines. We also make them versatile enough to perform many different tasks for good overall economy. Our present-day loader range therefore includes everything from small, utility machines up to effective production loaders. The basic de-

signs are the same for all loaders in the range. It is these fundamental design principles that make the machines such high performers. These loaders have been proven in tests and in practical work applications all around the world. Another advantage we have, thanks to our large development and production resources, is that the most important components in the machines are of our own manufacture. This means the machines have well-balanced construction to give you a product of consistently high quality.



L50 1.5–1.75 yd³ (1,15–1,35 m³)

The loader designed to provide good solid performance for the small contractor and municipality. Offered with the standard quick attachment bracket it provides the capability of changing from bucket to forks, to lifting arm in a matter of seconds.



L70 2.0–2.25 yd³ (1,5–1,7 m³)

A step larger in size and performance, this loader will meet the needs of the contractors and government entities that require more production capacity. The L70 is also equipped with the standard quick attachment bracket for the versatility needed in the many varied jobs encountered.



L90 2.75–3.25 yd³ (2,1–2,5 m³)

This size machine is available for contractors who have the need for a dedicated loader for material handling, truck loading in sand and gravel pits, general contracting requirements, with the added versatility of the optional quick attachment bracket for forks, grapples, lift-arms, and other needed attachments.



L120 3.5–4.0 yd³ (2,7–3,0 m³)

Larger prime production capability, in sand and gravel, crushed stone operations, feeding hoppers, loading trucks, and other typical applications. The option of a quick attachment bracket, combined with high tilt and rollback forces provide exceptional log grapple performance in loading and unloading of log trucks, picking and sorting, decking, and loading feed tables at the mill. Also permits quick conversion to a high volume wood chip bucket or to forks for handling sawn lumber.



L160 4.5–5.0 yd³ (3,5–3,8 m³)

The L160 is an exceptional, prime production loader ready to perform against any competitive machine of comparable size. Adding the optional quick attachment bracket, offers a variety of bucket capacities, for handling materials of varying types and weights, forks, and log grapples.

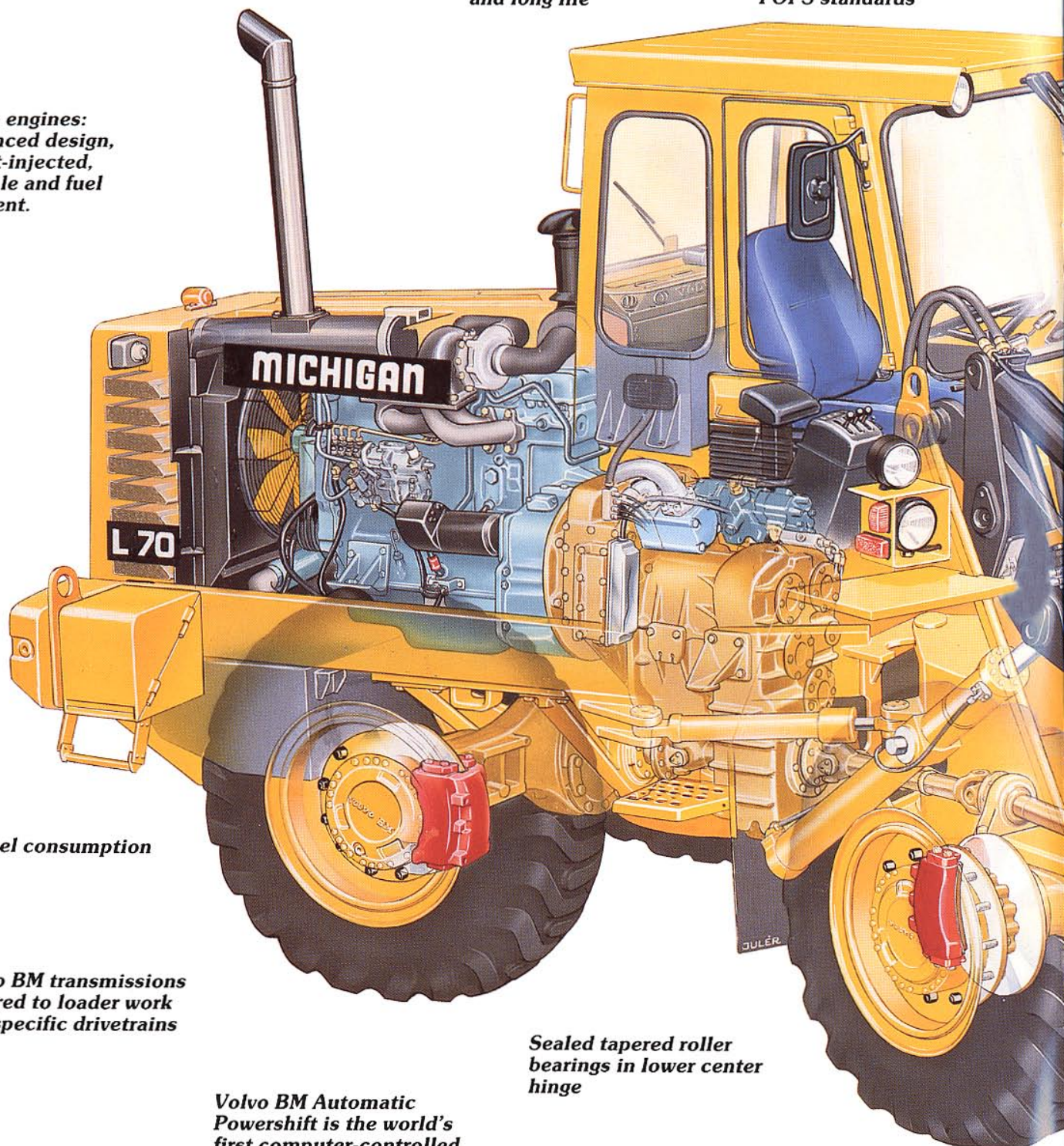


Turbocharged for better combustion, lower fuel consumption and cleaner exhaust emissions

Air cleaning in three stages ensures reliable engine performance and long life

Comfortable and safe cab tested and approved according to ROPS and FOPS standards

Volvo engines:
Advanced design,
direct-injected,
reliable and fuel
efficient.



Low fuel consumption

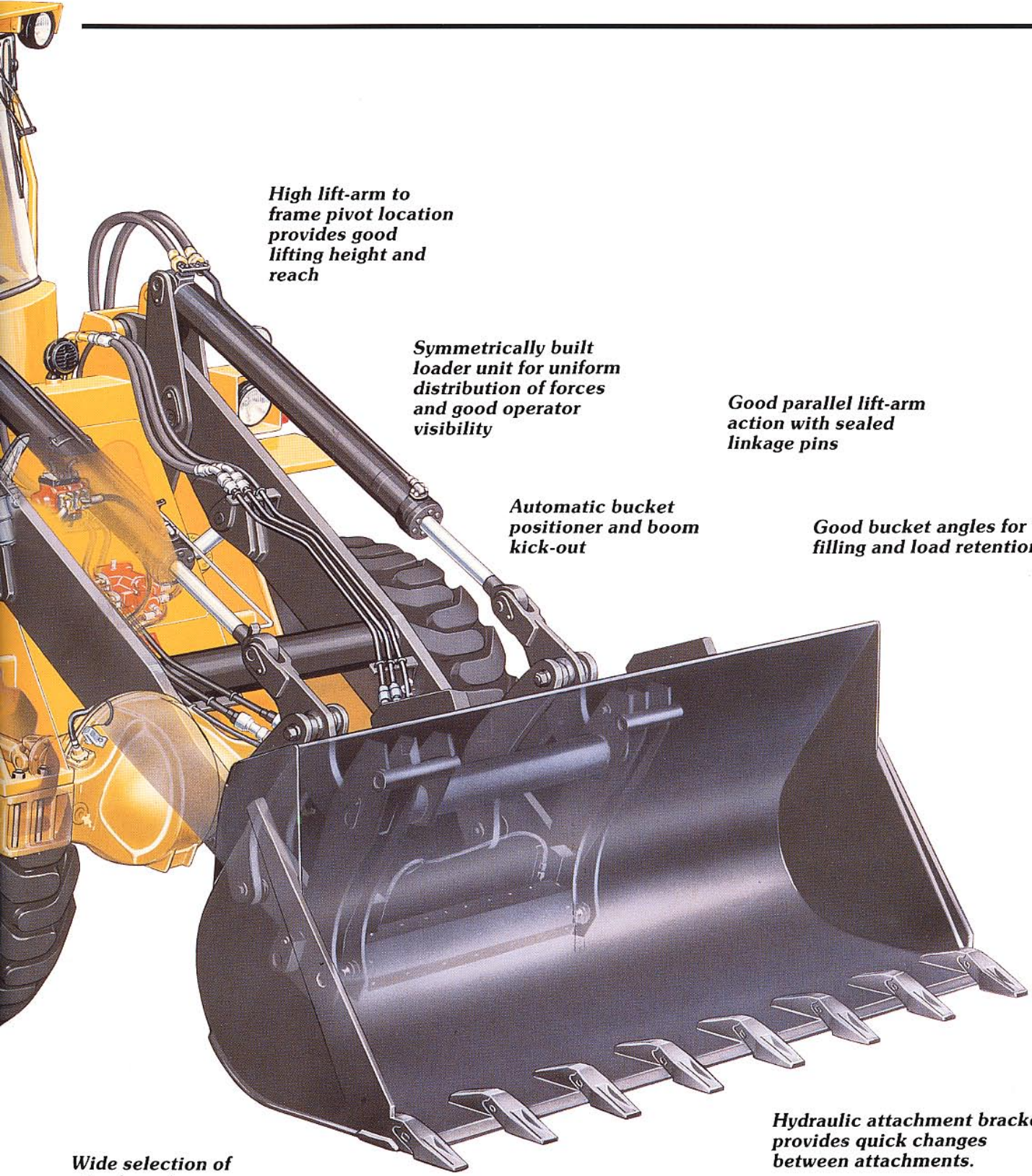
Volvo BM transmissions
tailored to loader work
and specific drivetrains

Volvo BM Automatic Powershift is the world's first computer-controlled automatic loader transmission. The machine always works in the optimum gear

Sealed tapered roller bearings in lower center hinge

Volvo BM planetary axles of standard designs for long life

PRODUCTION-BOOSTING FEATURES "ALL AROUND" MAKE THE MICHIGAN LOADER THE RIGHT CHOICE ECONOMICALLY



*High lift-arm to
frame pivot location
provides good
lifting height and
reach*

*Symmetrically built
loader unit for uniform
distribution of forces
and good operator
visibility*

*Good parallel lift-arm
action with sealed
linkage pins*

*Automatic bucket
positioner and boom
kick-out*

*Good bucket angles for
filling and load retention*

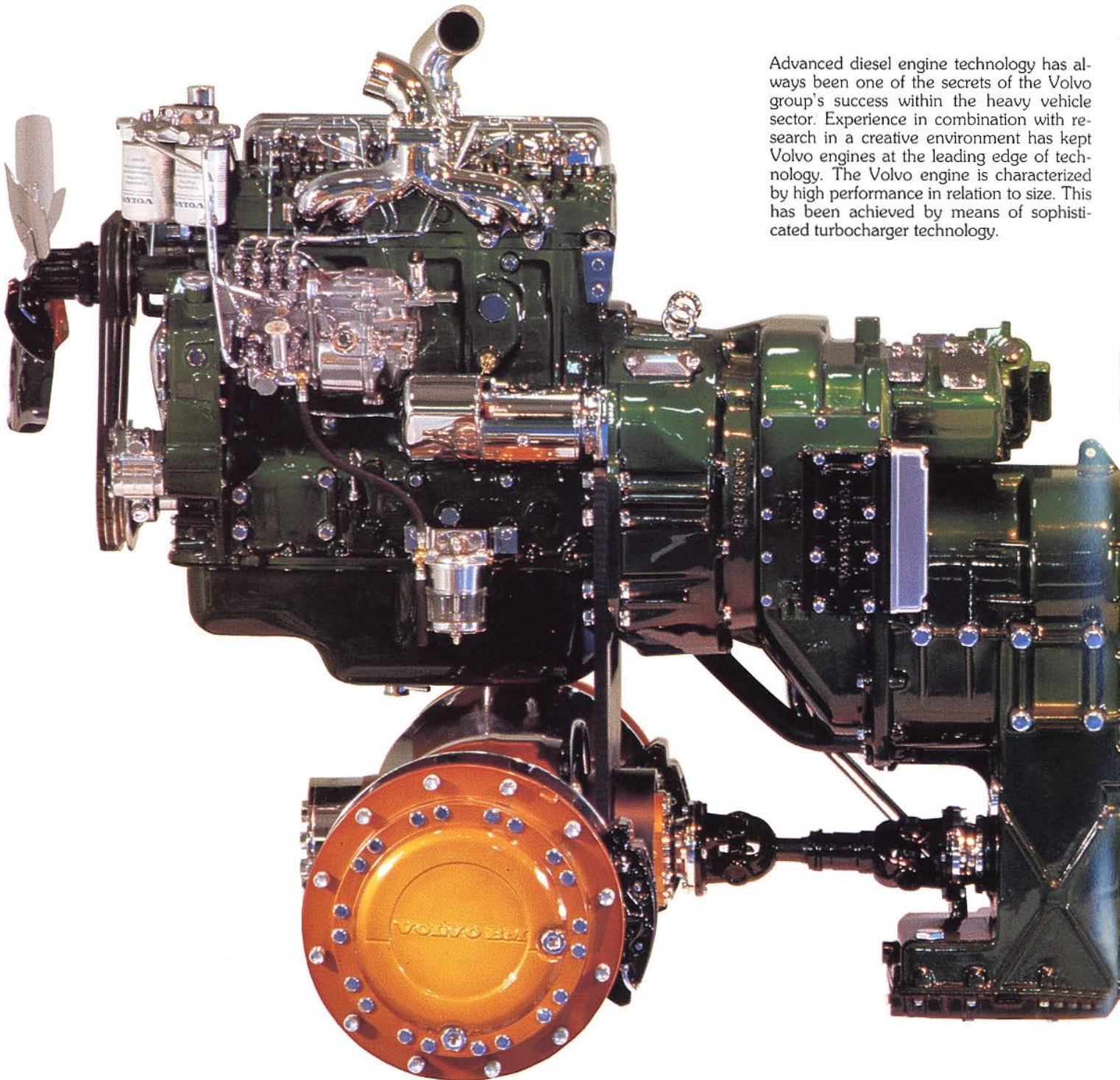
*Wide selection of
attachments*

*Hydraulic attachment bracket
provides quick changes
between attachments.*

WE ALWAYS HAVE ACCESS TO STATE-OF-THE-ART ENGINE TECHNOLOGY

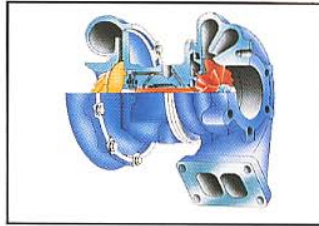
VOLVO OCCUPIES A LEADING POSITION IN THE DEVELOP

Advanced diesel engine technology has always been one of the secrets of the Volvo group's success within the heavy vehicle sector. Experience in combination with research in a creative environment has kept Volvo engines at the leading edge of technology. The Volvo engine is characterized by high performance in relation to size. This has been achieved by means of sophisticated turbocharger technology.



MENT OF HEAVY DUTY "STATE-OF-THE-ART" POWERTRAINS

Fuel economy is also very good, since the engines feature very efficient combustion with low heat and friction losses. Volvo engines are renowned all over the world for their reliability. And this is no accident—a great deal of effort has been devoted to making designs as simple as possible, and in this endeavour the in-line, direct-injected engine has proven to be the right alternative.



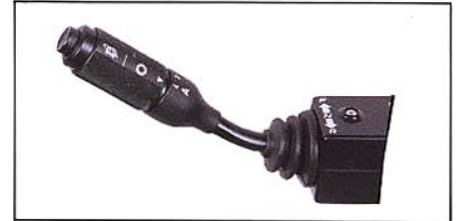
Turbocharging makes combustion more efficient. Higher power is achieved with a lower specific fuel consumption. Standard on models L 70, L 90, L 120 and L 160.

THE MICHIGAN'S VOLVO BM TRANSMISSION—EASY TO OPERATE, UNCOMPLICATED AND RELIABLE

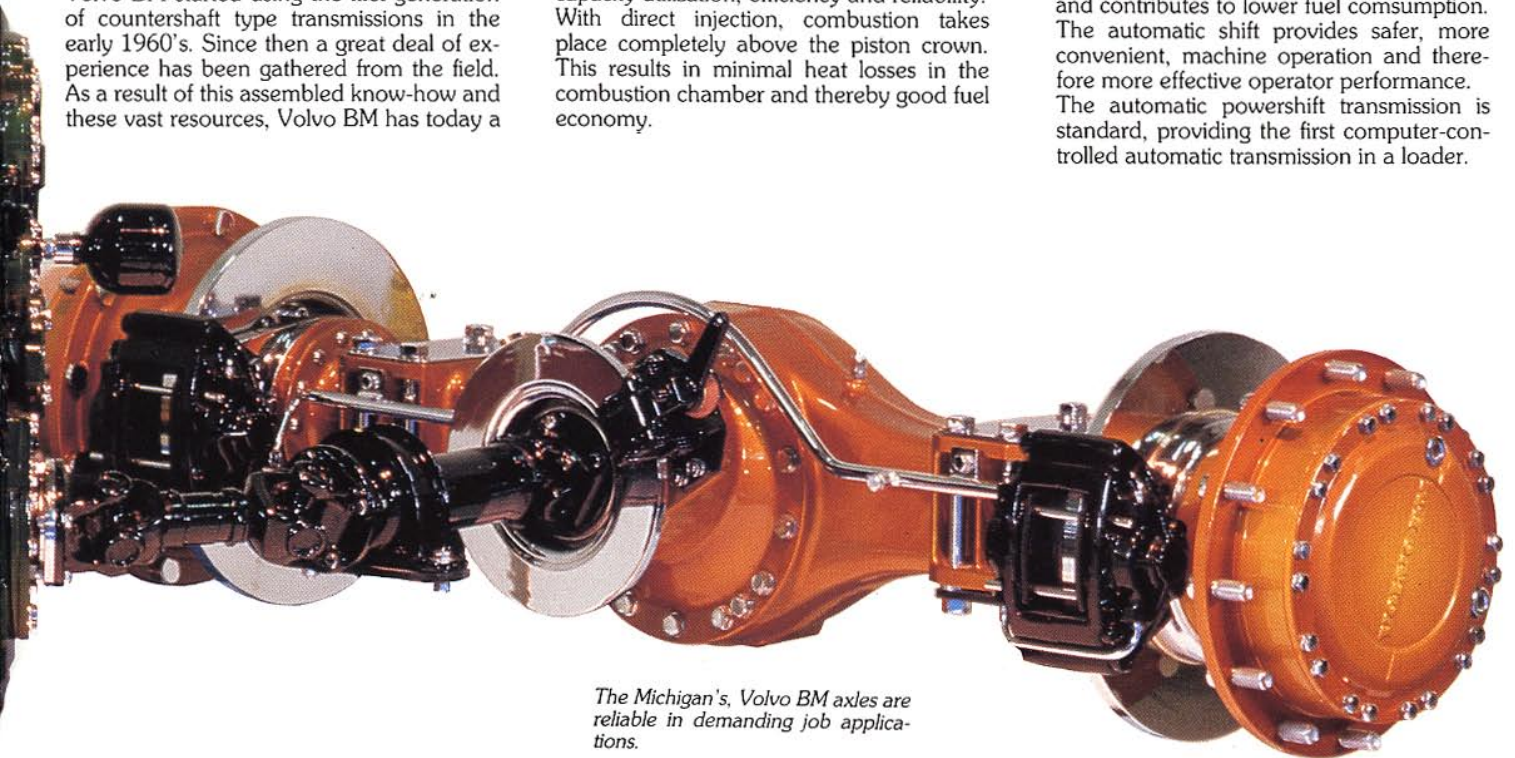
Volvo BM's new generation of transmissions is based on long experience and sophisticated engineering. Volvo BM started using the first generation of countershaft type transmissions in the early 1960's. Since then a great deal of experience has been gathered from the field. As a result of this assembled know-how and these vast resources, Volvo BM has today a

new generation of transmissions with outstanding characteristics. They are ideally matched to give Michigan loaders high capacity utilization, efficiency and reliability. With direct injection, combustion takes place completely above the piston crown. This results in minimal heat losses in the combustion chamber and thereby good fuel economy.

The Michigan's Volvo BM Automatic Powershift Transmission is the leader in technology



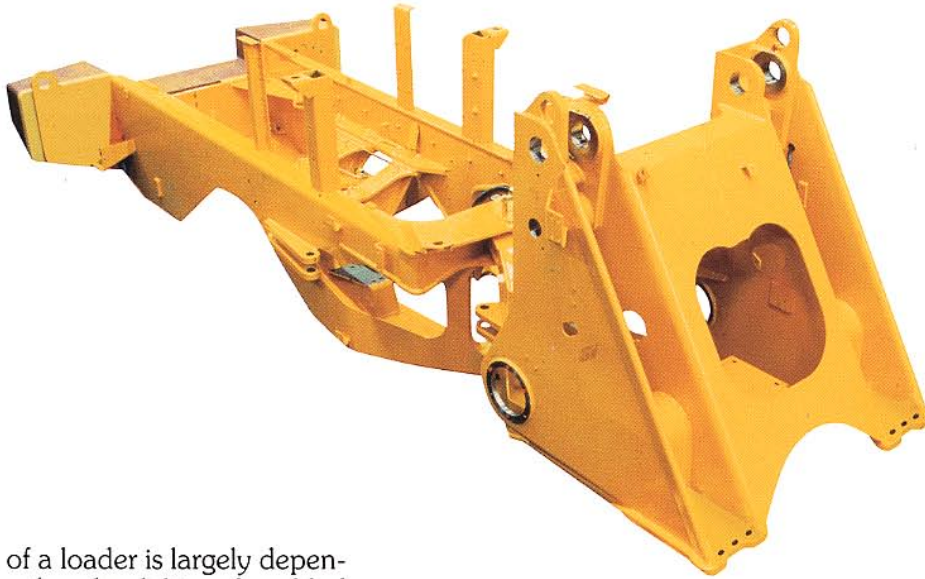
Volvo BM transmissions with electromagnetic actuation have made possible the development of microcomputer-controlled automatic gear changing. Automatic shifting makes sure that the loader always works in the right gear. This results in optimum efficiency and economy. In addition, the system reduces wear and tear on components and contributes to lower fuel consumption. The automatic shift provides safer, more convenient, machine operation and therefore more effective operator performance. The automatic powershift transmission is standard, providing the first computer-controlled automatic transmission in a loader.



The Michigan's, Volvo BM axles are reliable in demanding job applications.

STRONG AND WELL-BUILT

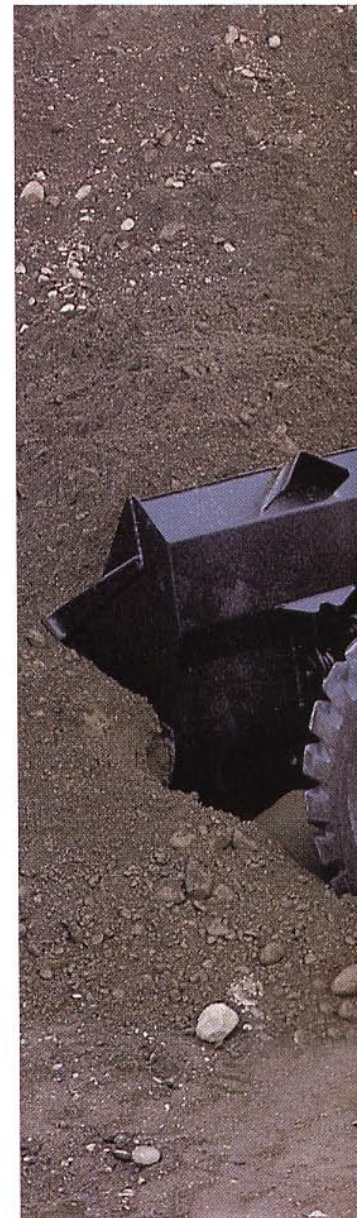
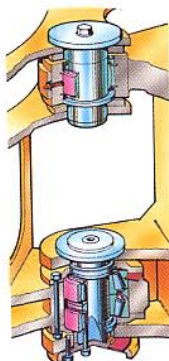
ADVANCED MANUFACTURING IN MODERN PLANTS EN



The life of a loader is largely dependent on the durability of welded joints, bearings and frame elements to withstand severe, continuous service. Michigan loader frames are of very rugged construction. The strong, rigid rear frame is made of box sections, all welded and thoroughly quality tested. The front frame is made up of four vertical steel plates between which the lift cylinders are mounted. The cylinders are thereby well protected.



The frame center hinge joint is designed to withstand high loads. The bearings are widely spaced. The lower bearing consists of two tapered roller bearings, which provide for both long life and extended lubrication intervals.



SURES QUALITY



The frame and components have machined surfaces at all points where components are attached; axle shown here.

The precision fit at the point of attachment increases the strength of the joint, while exactly fixing the position of the components. This is a quality detail that results in both better function and higher reliability.



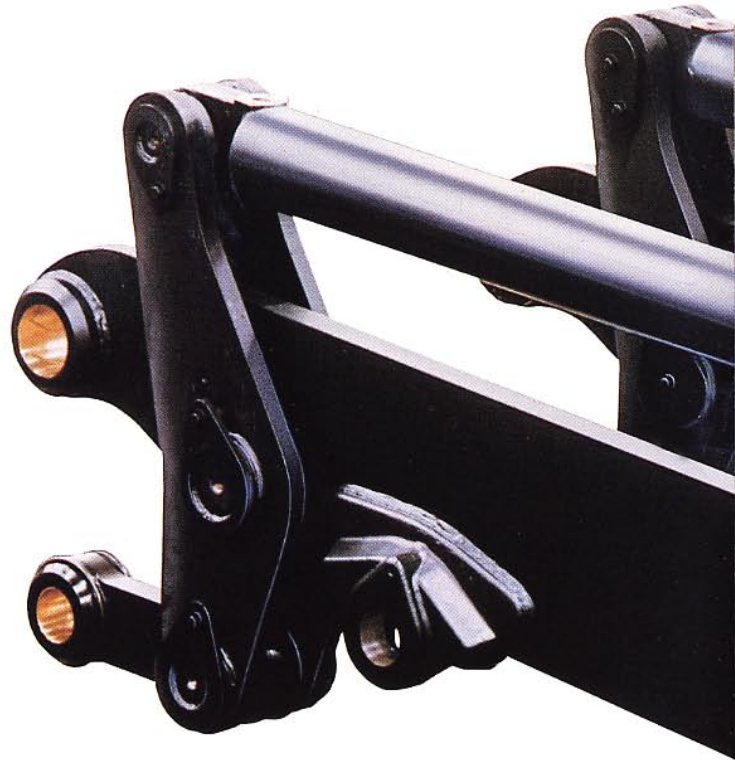
WE HAVE BUILT A LOADER UNIT THAT GIVES YOU CAPACITY IN ALL SITUATION

GOOD BREAKOUT, GOOD BUCKET ANGLES AND GOOD

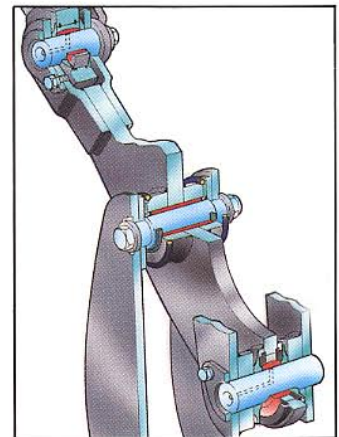
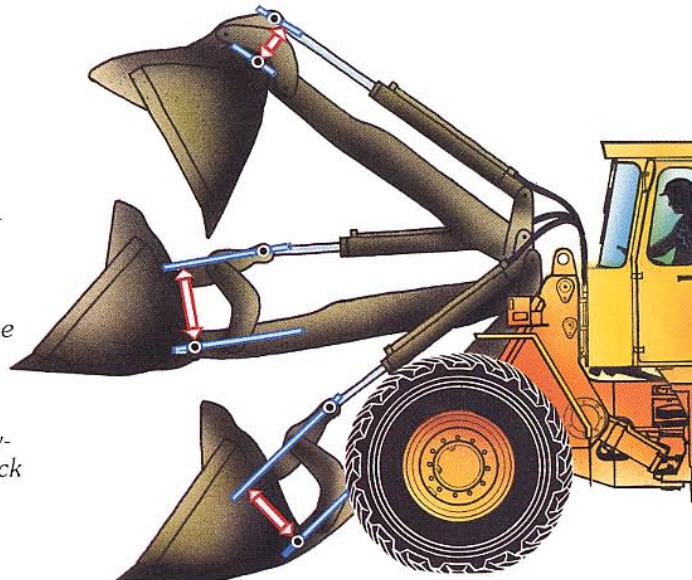
The most distinguishing characteristic of our lift-arm system is the combination of high tilt & rollback forces, good bucket angles and parallel lift-arm action throughout the lift-arm movement.

The lift-arm system is a simple effective design with high quality manufacturing throughout. The bearings have through pins, supported on both sides, and all bearing journals have replaceable bushings. Naturally, all bearings also have effective seals that protect against dirt and retain the lubricant. Wherever there is a risk of edge stresses, self-aligning link bearings are used: In both of the tilt cylinder mounts, in the tilt links' lower bearings and in the upper bucket hinge pin. Other bearings in the lift-arm system have pins and bushings with large bearing surfaces and low specific surface pressure.

Our loader unit possesses the combination of characteristics necessary for effectiveness and capacity in every situation.



The loader unit is characterized by a high lift arm to frame pivot location that provides a combination of good lifting height and reach. Furthermore, the lift arm system is designed so that the lever that carries out the tilt movement is always long. (Distance between the arrows in the schematic drawing). This means good rollback & tilt forces.



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PARALLEL LIFT-ARM ACTION ARE COMBINED.



The bearings are well-sealed from dirt. This contributes to long life and extended lubrication intervals.

Self-aligning bearings are provided at high-stress points.

Symmetrical lift-arm system:

The lift cylinders are located directly below the lift-arms and the tilt cylinders directly above the lift-arms. The symmetrical attachment of the cylinders minimizes the risk of skewed forces, which gives the loader unit very good reliability. The symmetrical design also allows the operator excellent visibility.

High lift arm to frame pivot location:

The machines have high lifting height in combination with good reach. You can load high-sided vehicles and work at high loading bins on sloping surfaces. For example: in the case of some feeding and sorting plants. Wide vehicles can be loaded and unloaded from one side, resulting in short work cycles.

Features that combine to give you good bucket loads:

Good bucket angles result in good bucket load retention & load factors. When the bucket hits the mechanical stop, the material is thrown back against the rear of the bucket. This means that the center of gravity of the material is shifted to the most favorable position in the bucket.

Mechanical dump stop:

A mechanical stop at the maximum dump angle enables you to shake the material from the bucket effectively.

Good parallel lift-arm action:

The Michigan loader unit has a geometry that provides excellent parallel lift-arm action. This enables you to utilize the machine for the most diverse jobs, such as handling of piece goods and palletized goods.

High tilt & rollback forces:

Very good tilt & rollback forces throughout the lift-arm movement permit effective, controlled unloading of timber from trucks. This is due to the design of the link arms.

As a result, the lever that carries out the tilt movement is always long. Good control at the top position means that you have precise control of load placement either in haulage vehicles, in hoppers or on feed tables.

Attachment bracket with quick coupling:

As manufacturers of wheel loaders, we realized from the start the importance of flexibility and adaptability of the machines to different jobs. The attachment bracket with quick coupling has led to the development of a wide range of attachments and a loader unit with effective characteristics for various tasks. This development has proceeded to today's hydraulically operated attachment bracket that permits virtually instantaneous, trouble-free attachment changes.

Automatic bucket positioner and boom kickout:

Automatic bucket positioner and boom kickout are controlled by reliable inductive transmitters. The impulse is transmitted electrically all the way up to the lever mechanism. By means of switches on the instrument panel, the operator can switch on automatic stop for the bucket and lift-arms.

There are three automatic stop functions that can be switched in as needed:

*Rollback (Bucket Positioner),
Raising (Boom Kickout) and
Lowering (Ground Positioner).*

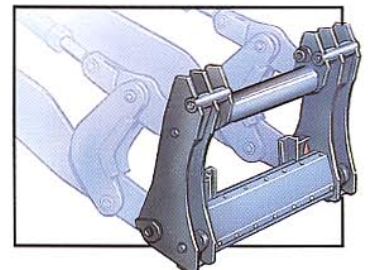
The equipment varies between different models. Information is provided in special data brochures.



The symmetrical attachment of the cylinders gives very good reliability and extra good visibility through the loading unit.



High tilt and rollback forces throughout the lift-arm movement permit effective, controlled unloading of timber from trucks.



Changing attachments is simple. With the hydraulic attachment bracket, you never hesitate to switch to the right attachment.



THE HYDRAULIC SYSTEM IS EASY TO OPERATE AND IDEALLY MATCHED TO THE MACHINE'S PERFORMANCE

THE EFFICIENT HYDRAULIC SYSTEM IS BUILT FOR HIGH RELI

The hydraulic system is easy to operate and works with sure precision. Pressure equalization to the tank takes place through an air filtered breather. The oil is cleaned by a magnetic core filter. This thorough cleaning makes the hydraulic system highly reliable. Another reliability detail is that we have installed the vane pumps directly beneath the tank. A short suction line eliminates the occurrence of cavitation.

The L50, L70, L90, L120 and L160 loaders are all equipped with a three spool valve. The smaller models are provided with piping on the lift-arms for the quick coupler attachment bracket. The hydraulic system is easy to supplement with a 4th function control.

Steering System

Our steering system features precision response and is easy to operate. The hydraulic oil is delivered by a piston pump with variable flow. Flow and pressure are regulated automatically according to need.

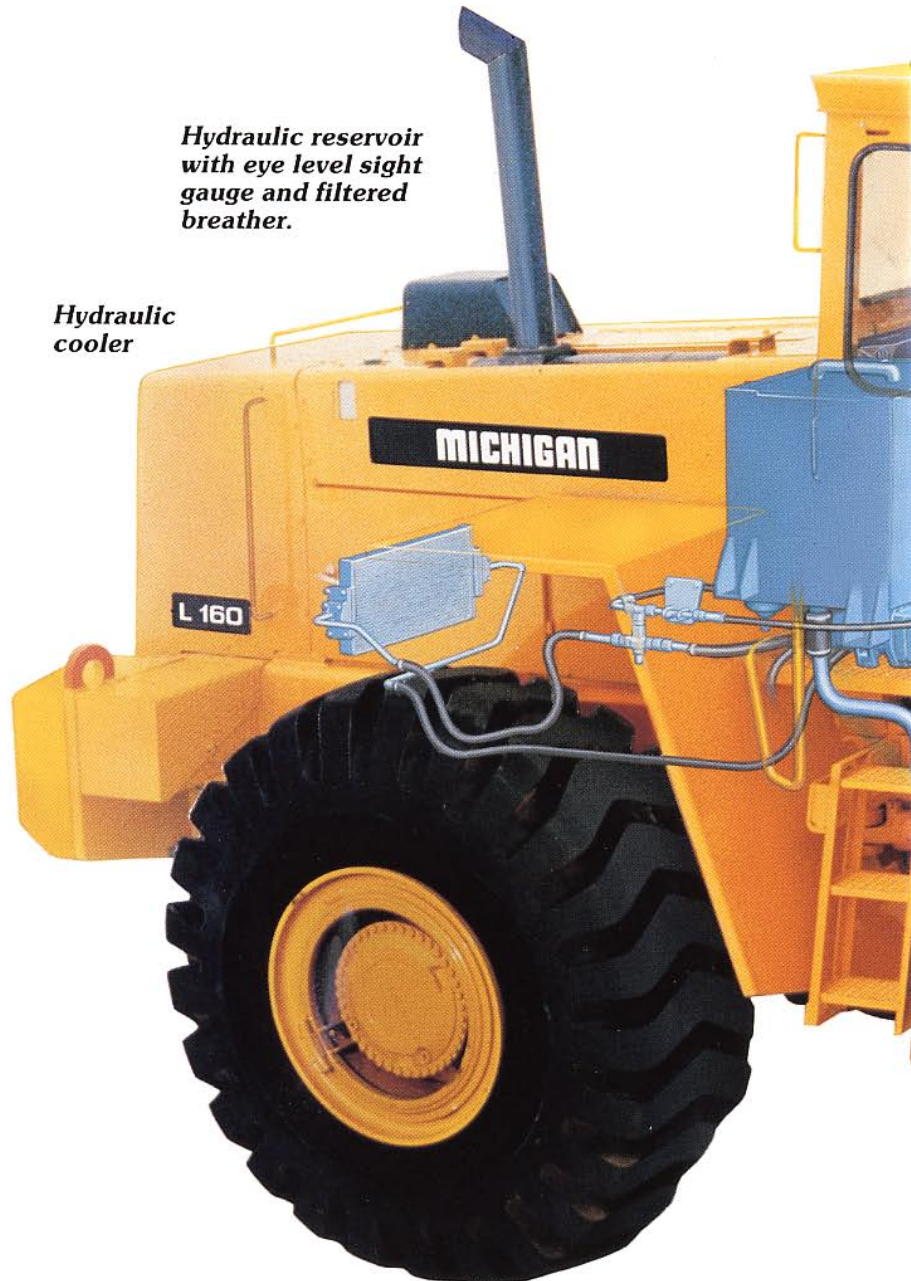
Our control system has the following advantages:

- *Quick and easy steering in uneven terrain.*
- *Lower fuel consumption due to the fact that the pump only draws power as needed.*
- *The system works quietly.*

The L160 loader works with a hydrostatic system flow amplifier powered by a vane pump.

Hydraulic reservoir with eye level sight gauge and filtered breather.

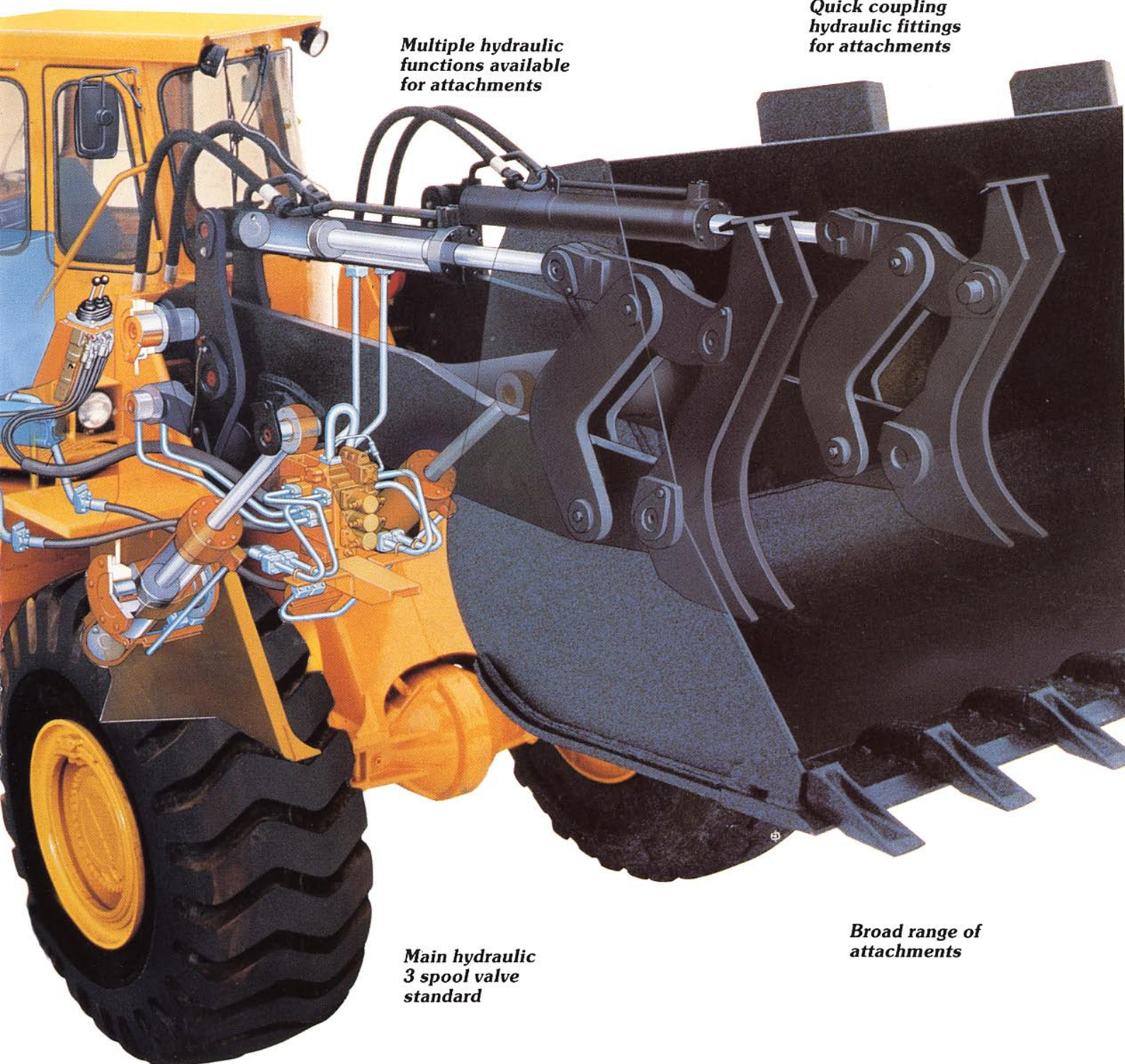
Hydraulic cooler



Quiet, efficient main hydraulics with vane pump

L90, L120, L160 pilot valve operated main hydraulics (3 functions standard)

ABILITY



Multiple hydraulic functions available for attachments

Quick coupling hydraulic fittings for attachments

Main hydraulic 3 spool valve standard

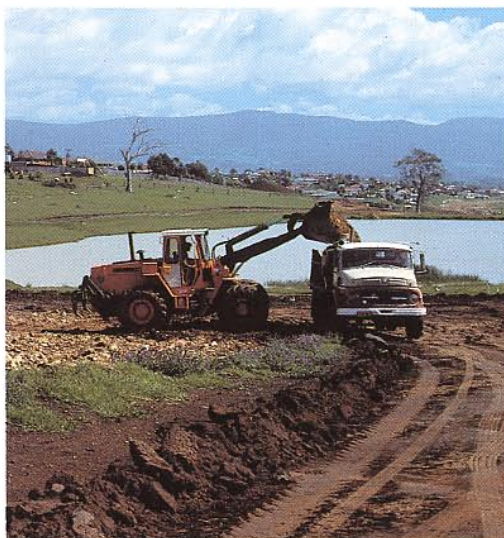
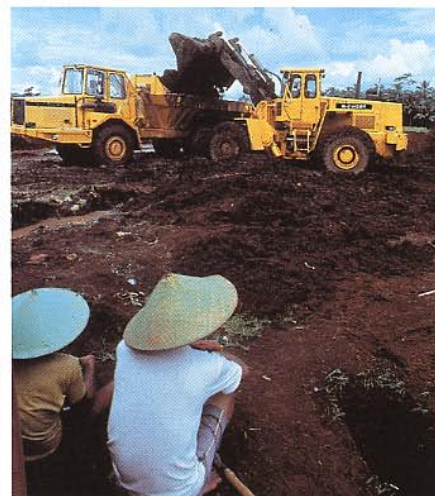
Broad range of attachments

YOU WILL FIND MICHIGAN LOADERS WHEREVER TOTAL ECONOMY IS THE PRIME CONSIDERATION

MICHIGAN LOADERS ARE POWERFUL, PRODUCTIVE, VERSATILE

You can find Michigan loaders almost anywhere in the world. The machines' economy and versatility have made them highly sought-after.

All Michigan loaders have the same exclusive features; the choice of machine is determined by capacity requirement. A Michigan loader also gives you access to the resources offered by one of the world's leading loader manufacturers: Service, technical development and security of invested capital.



RSATILE AND RELIABLE



COMFORT – TRADITIONALLY A STRONG POINT WITH MICHIGAN

THE IMPORTANT WORK DONE BY THE OPERATOR DES

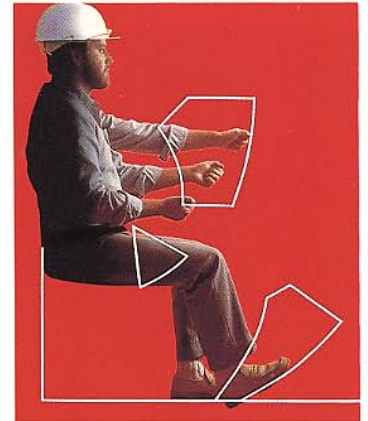
The highly qualified and important work that is performed with a loader requires a special working environment. In the Michigan loader, the operator operates his machine from a very safe cab. The cab is exceptionally comfortable, well insulated and equipped with an effective heating and ventilation system.

This keeps the operator fresh and alert for long hours. We have ergonomics experts who have studied and prepared guidelines for the design and location of controls and instruments. The final design is then fine-tuned by means of practical trials using professional operators.

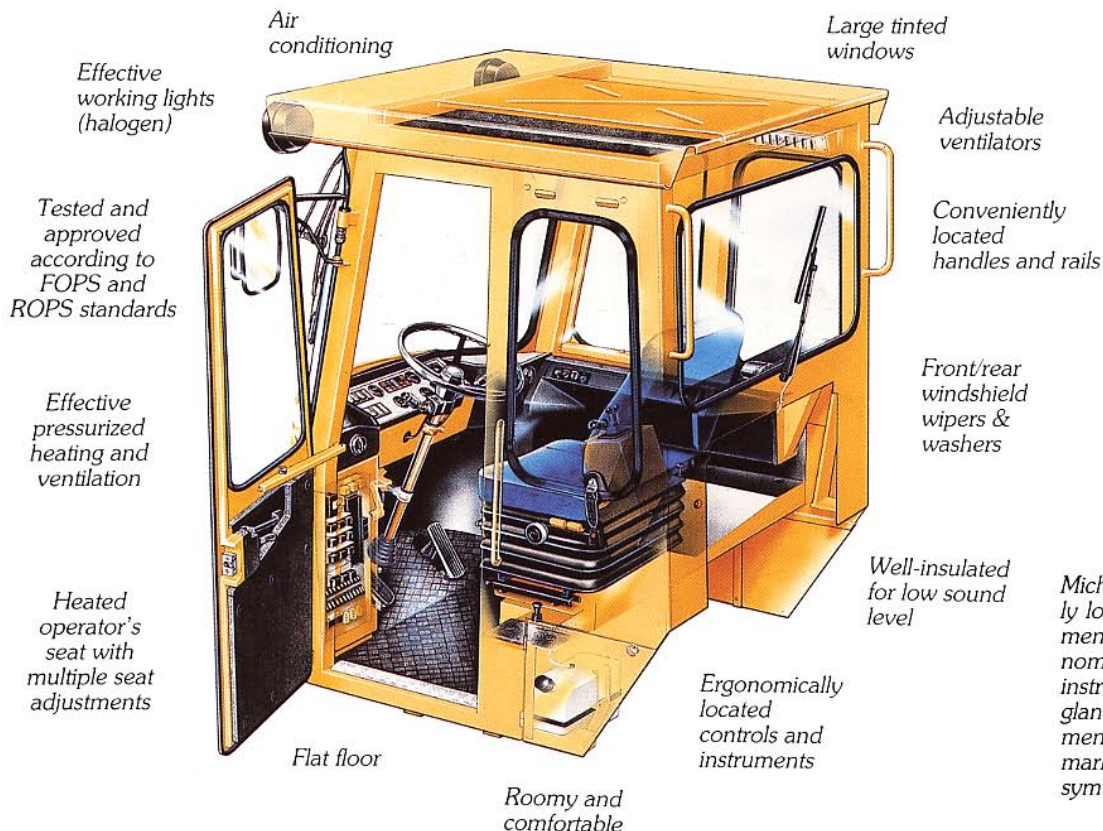
Right Climate

A pleasant "indoor climate" can be maintained in the Michigan loaders regardless of the weather outside. The fresh air is cleaned in replaceable filters before being drawn into the cab. 15 nozzles distribute large volumes of air evenly without creating a draft.

The heating system will keep the operator warm in the coldest of winters and the air conditioning (optional) will cool the operator in the warmest operating conditions.



The cab is ergonomically designed to enable the operator to give his best.



Michigan loaders feature ideally located controls and instruments. The controls are ergonomically positioned and the instrumentation is visible at a glance. Pilot lamps, instruments and controls are marked with easily identifiable symbols.

ERVES A GOOD WORKING ENVIRONMENT



MICHIGAN QUALITY GIVES HIGH AVAILABILITY AND ECONOMY

MODERN MANUFACTURING TECHNOLOGY COMBINED

Michigan quality means that every loader will give you a whole package of positive features that enable you to perform demanding jobs with few interruptions and good economy over a long period of time. The basis of this quality is that we manufacture our own basic components such as engines, transmissions and axles.

This gives us complete control over technical design, size compatibility and the manufacturing process so that we can build the loaders with optimum performance and long life. Service and maintenance aspects are also included in the quality design right from the drawing board, along with the design requirement of top performance. Practical experience from around the world is gathered at the Technical Center, together with know-how and ultramodern equipment for design work and laboratory testing.

All of this adds up to give you a product that is easy to maintain, has high capacity and a long life and is economical to operate. Modern manufacturing technology and meticulous quality control are prerequisites for high, consistent quality. We at Michigan make use of state-of-the-art technology in our development work. Computer technology is also employed in order to simulate reality as closely as possible in loader tests.

Stresses on different parts are registered electronically on loaders at work and recorded on magnetic tapes. Realistic

conditions are then simulated in the laboratory and the computer processes the results. Combined with hard tests in the field, this ensures that Michigan owners will get the desired economic yield.

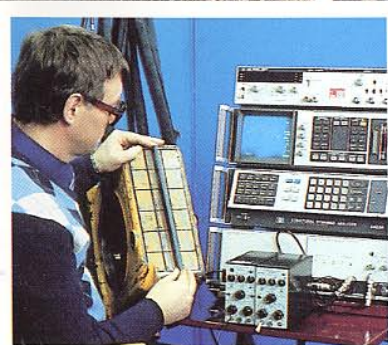
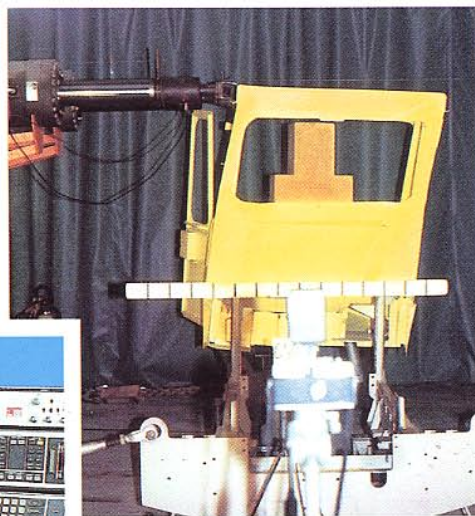
There is only one way to make a machine easy to service: The product must be designed with serviceability in mind right from the start. We have Service specialists involved throughout the development phase. Their job is to see that the design leads to simplified service and maintenance.



WITH METICULOUS QUALITY CONTROL



Michigan loaders roll over and over again down a rocky slope—and pass the test successfully.



Sophisticated laboratory tests are combined with sustained field testing. In one test, machines have been forced to roll down slopes, with only superficial damage resulting. These tests complement the approved ROPS and FOPS tests.



DESIGNED FOR PRACTICAL, CONVENIENT SERVICE ACCESSIBILITY

OUR LOADERS ARE USEFUL AND EASY TO MAINTAIN IN

Michigan has many years of experience from work in different countries and under diverse conditions. Our service technicians and development engineers keep in constant touch with the demands of the market as well as the feedback from the field. This results in new improvements for added efficiency in service, maintenance and operator satisfaction.

The photos to the right show...

- Service panels, generously sized for inspection and fluid filling.
- Engine and transmission oil level checks from ground level.

- Protected location of lights and direction indicators.
- Safe and convenient access steps.
- Ground level fueling, filler tube under lock.

Visual level checks provided for brake fluid and hydraulic fluid



Hinged grille and side panels

Lockable battery boxes

Battery disconnect switch

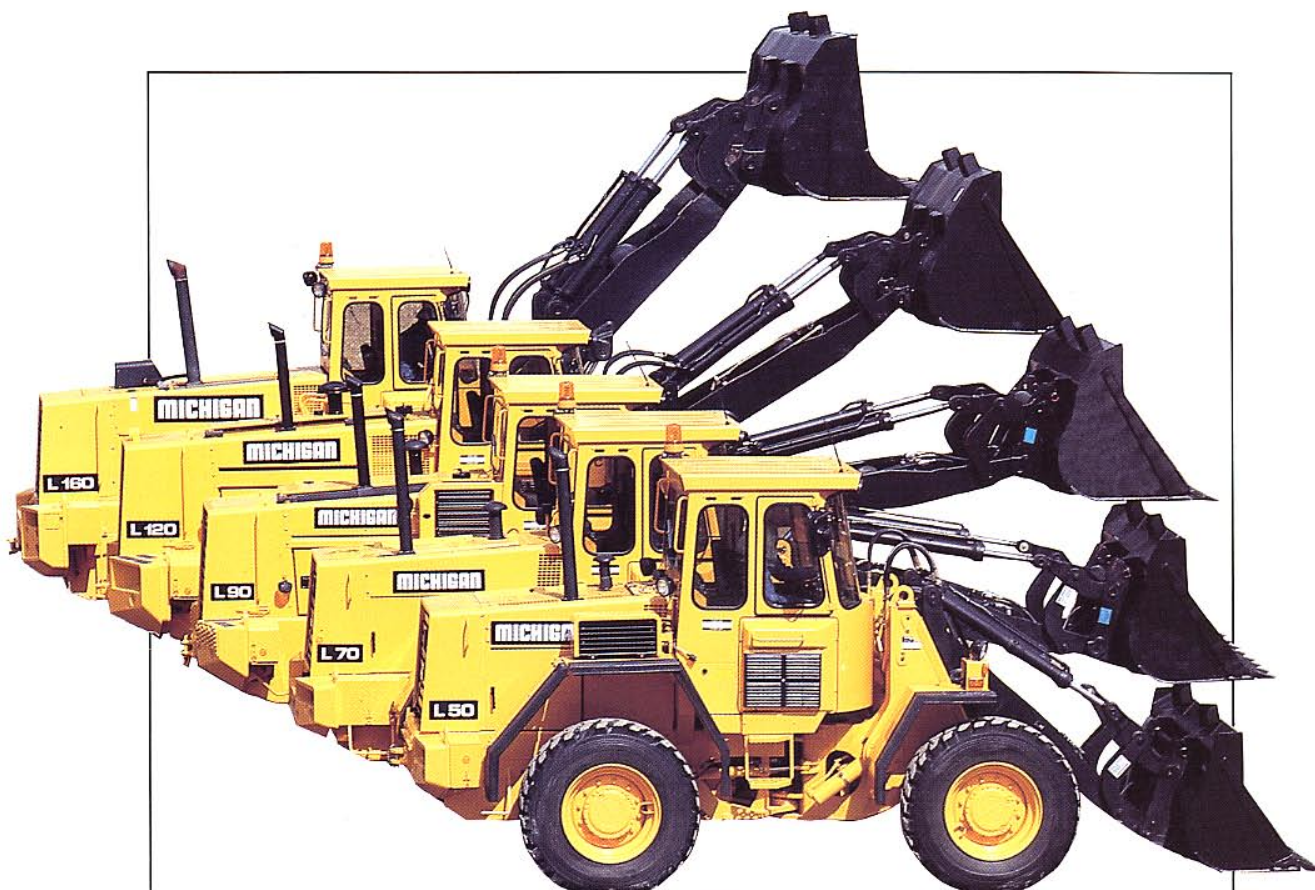
Transmission dipstick, level check

Access steps with grab handles

EVERY DETAIL



***Replaceable brake pads
without wheel-removal***



The Michigan L50–L160 loaders have been designed and developed to meet your needs for versatility and capacity. With the choice of five machines and over 100 different attachments, you can always choose the right combination for maximum productivity.

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