BUCYRUS-ERIE

walking draglines

a size for every mining need... since 1892

BUCYRUS-ERIE® walking draglines are direct descendants of the first ones ever made. Back in 1913, this one-ton machine introduced the revolutionary new walking concept. It was a first, and it swept the field by walking "where others feared to tread."

This constant commitment — to seek out the best in new technology and bring it to the mining industry — has kept B-E walking draglines "first" from the start.

In 1919, when Ward-Leonard control made workable electric power available, it went on BUCYRUS® machines first;

In 1923, while the rest of the industry debated, Bucyrus put the new diesel engines on all its fuel-powered models;

In 1944, the "unthinkable" size barrier was crossed — by a 25-yard B-E 1150-B dragline;

In 1961, a B-E dragline was the first to use instant-reacting, stepless static controls;

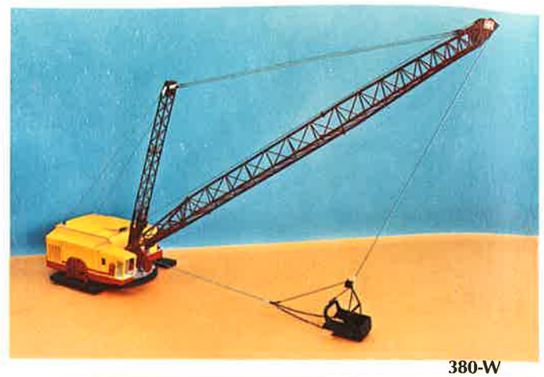
In 1963, B-E's cam-and-slide walker doubled workable machine size, a breakthrough that made deep-lying coal reserves readily available;

In 1970, B-E took the lead in applying modern computer techniques like dynamic simulation and finite element analysis to dragline design.

In fact, just about every major advance in walking draglines has been brought to the mining industry first by Bucyrus-Erie Company.

In the years since 1913, B-E and its predecessors have put over 1,000 walking draglines to work in the field — more than any other manufacturer. And on today's B-E draglines, you will find more than a dozen "exclusives," important firsts that no one else can match.

BUCYRUS-ERIE — the most experienced name in walking draglines.



380-W

480-W

800-W

1260-W

1300-W

1350-W

1360-W

1370-W

Walking Draglines

Model	Bucket Size* Cubic Yards	Boom Length Feet	Bucket Size M³	Boom Length Meters
380-W	16 — 9	140 — 200	12.2 — 6.9	42.7 — 61.0
480-W	18 — 12	175 — 215	13.8 — 9.2	53.3 — 65.5
800-W	27 — 18	195 — 265	20.6 — 13.8	59.4 — 80.8
1260-W	40 — 24	225 — 302	30.6 — 18.4	68.6 — 92.1
1300-W	45 — 29	235 — 325	34.4 — 22.2	71.6 — 99.1
1350-W	48 — 37	285 — 325	36.7 — 28.3	86.9 — 99.1
1360-W	53 — 46	285 — 325	40.5 — 35.2	86.9 — 99.1
1370-W	62 — 51	270 — 320	47.4 — 39.0	82.3 — 97.5
1570-W	80 — 57	285 — 345	61.2 — 43.6	86.9 — 105.2
2570-W	115 — 93	335 — 360	87.9 — 71.1	102.1 — 109.7
3270-W	175 — 125	330 — 400	133.8 — 95.6	100.6 — 121.9

*Bucket size based on 5,000 lbs./cu. yd. for bucket and material.

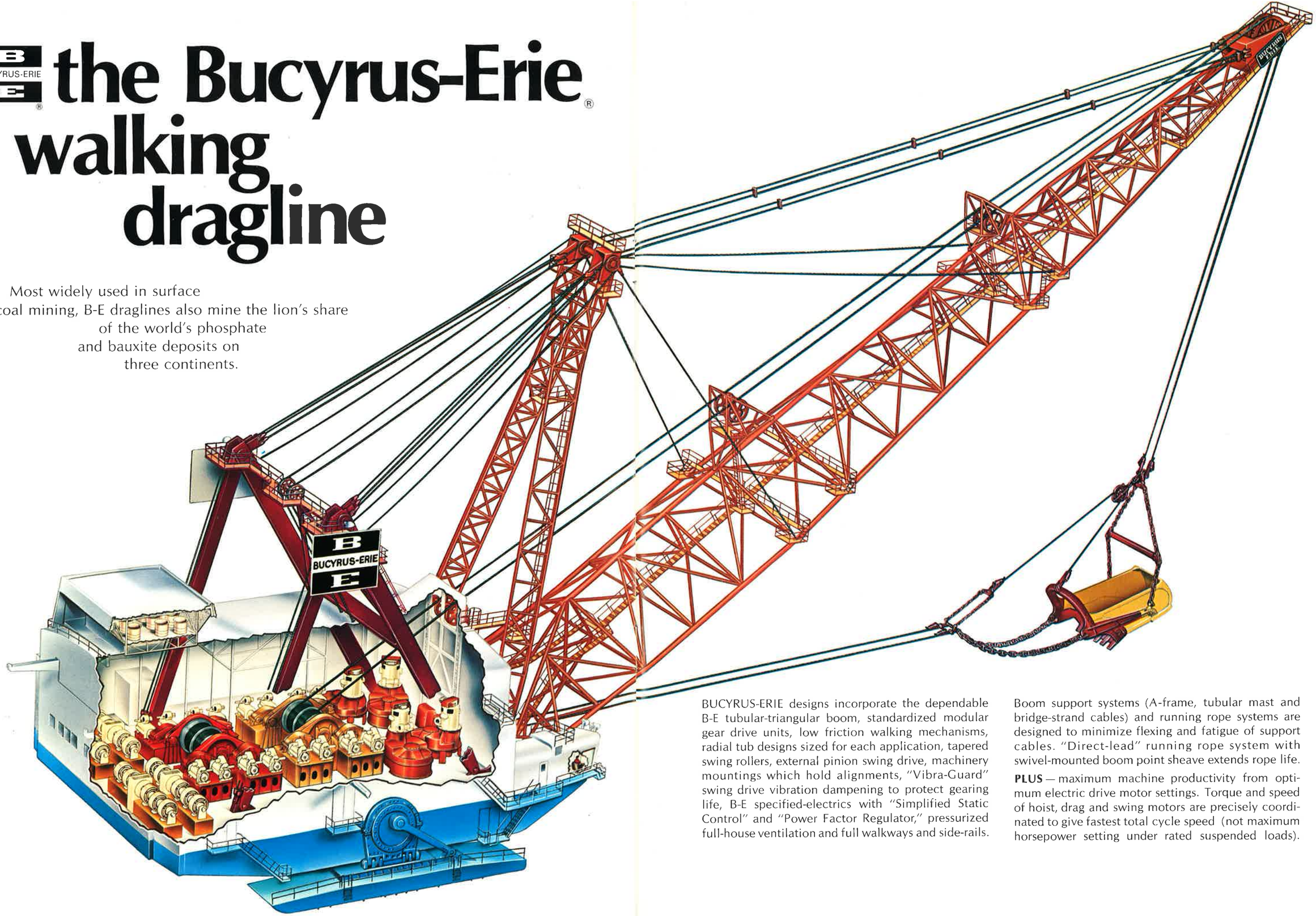
1570-W

2570-W

3270-W

the Bucyrus-Erie® walking dragline

Most widely used in surface coal mining, B-E draglines also mine the lion's share of the world's phosphate and bauxite deposits on three continents.



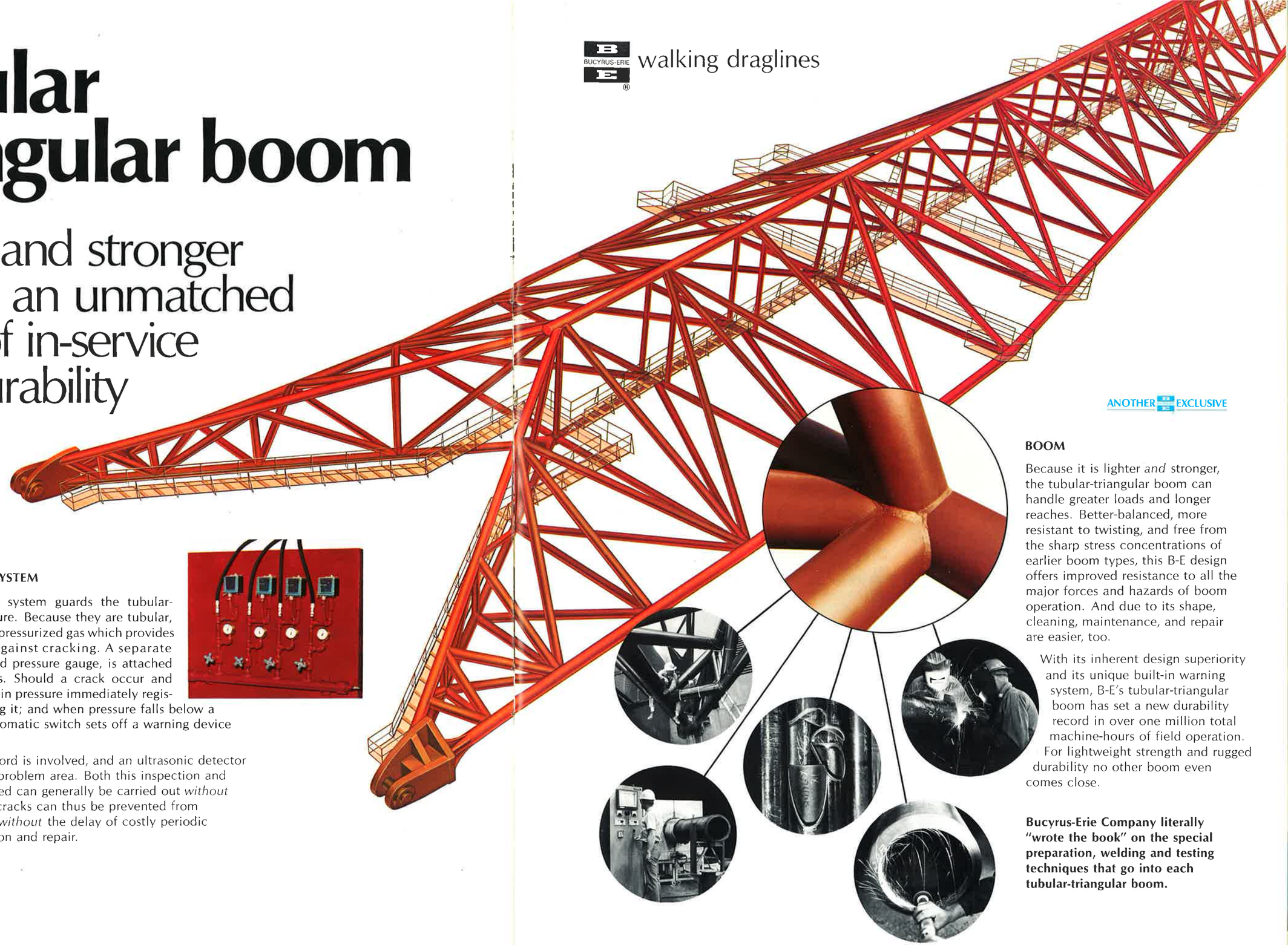
BUCYRUS-ERIE designs incorporate the dependable B-E tubular-triangular boom, standardized modular gear drive units, low friction walking mechanisms, radial tub designs sized for each application, tapered swing rollers, external pinion swing drive, machinery mountings which hold alignments, "Vibra-Guard" swing drive vibration dampening to protect gearing life, B-E specified-electrics with "Simplified Static Control" and "Power Factor Regulator," pressurized full-house ventilation and full walkways and side-rails.

Boom support systems (A-frame, tubular mast and bridge-strand cables) and running rope systems are designed to minimize flexing and fatigue of support cables. "Direct-lead" running rope system with swivel-mounted boom point sheave extends rope life.

PLUS — maximum machine productivity from optimum electric drive motor settings. Torque and speed of hoist, drag and swing motors are precisely coordinated to give fastest total cycle speed (not maximum horsepower setting under rated suspended loads).

tubular triangular boom

lighter and stronger with an unmatched record of in-service durability



ANOTHER B-E EXCLUSIVE

PRESSURIZED WARNING SYSTEM

A unique, built-in warning system guards the tubular-triangular boom against failure. Because they are tubular, the chords can be filled with pressurized gas which provides an early-warning system against cracking. A separate supply system, with tank and pressure gauge, is attached to each of the main chords. Should a crack occur and penetrate any chord, a drop in pressure immediately registers on the gauge monitoring it; and when pressure falls below a predetermined level, an automatic switch sets off a warning device in the operator's cab.

The gauge reveals which chord is involved, and an ultrasonic detector readily locates the specific problem area. Both this inspection and the actual repair work needed can generally be carried out *without* lowering the boom. Minor cracks can thus be prevented from causing serious problems—*without* the delay of costly periodic downtime for visual detection and repair.

ANOTHER B-E EXCLUSIVE

BOOM

Because it is lighter *and* stronger, the tubular-triangular boom can handle greater loads and longer reaches. Better-balanced, more resistant to twisting, and free from the sharp stress concentrations of earlier boom types, this B-E design offers improved resistance to all the major forces and hazards of boom operation. And due to its shape, cleaning, maintenance, and repair are easier, too.

With its inherent design superiority and its unique built-in warning system, B-E's tubular-triangular boom has set a new durability record in over one million total machine-hours of field operation. For lightweight strength and rugged durability no other boom even comes close.

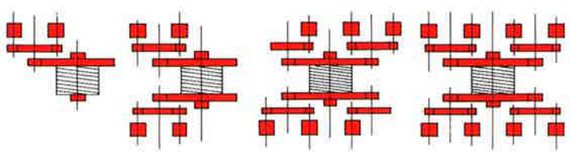
Bucyrus-Erie Company literally "wrote the book" on the special preparation, welding and testing techniques that go into each tubular-triangular boom.

BUCYRUS-ERIE walking draglines

drive systems

modular drives...

ANOTHER B-E EXCLUSIVE



Typical gearing patterns for several dragline sizes.

BUCYRUS-ERIE walking draglines use standardized gear modules for hoist, drag and swing drives. As horsepower requirements increase from the smaller to the larger dragline models, appropriately powered drive systems for each function are provided by using multiple combinations of the identical gears and motors used in the simplest drive.

The use of standardized gear packages in multiples offers a number of owner advantages, as compared to the conventional approach of designing a different size gear drive for each machine size. The most obvious advantage is the reliability of field-proven gear designs, so that even newly designed machines incorporate basic componentry which is thoroughly tested and developed. Service parts back-up for the various drives is also simplified by having common components across a broad range of machine sizes.

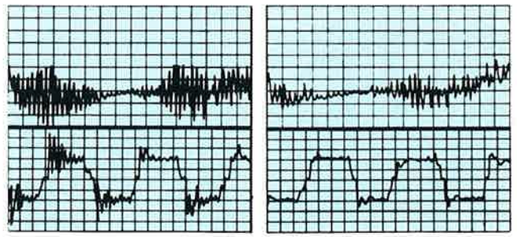
"VIBRA-GUARD"

ANOTHER B-E EXCLUSIVE

"Vibra-Guard" dampens or eliminates characteristic vibrations which have been a primary cause of wear in swing gears, shafts, bearings and motors. "Vibra-Guard" dramatically extends the service life of these components.

Discovery of this primary machine wear cause — and the means to handle it — was made possible by the use of B-E's "whole system simulation" computer programs.

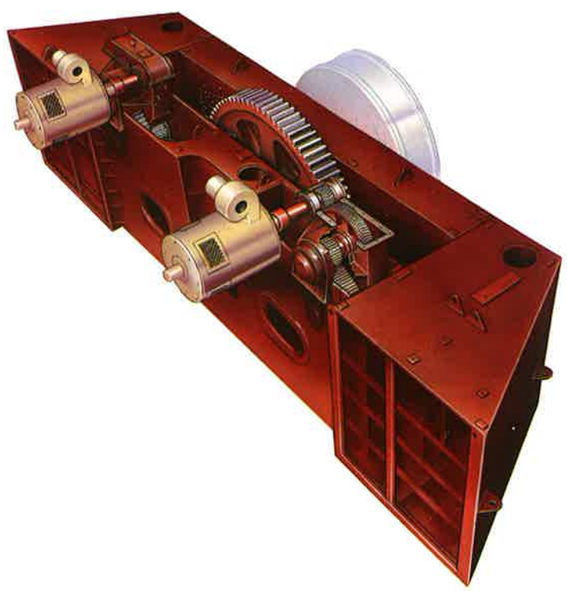
Field tests have shown that "Vibra-Guard" can slash low-torque vibrations by 80% or more, and eliminate high-torque vibrations completely.

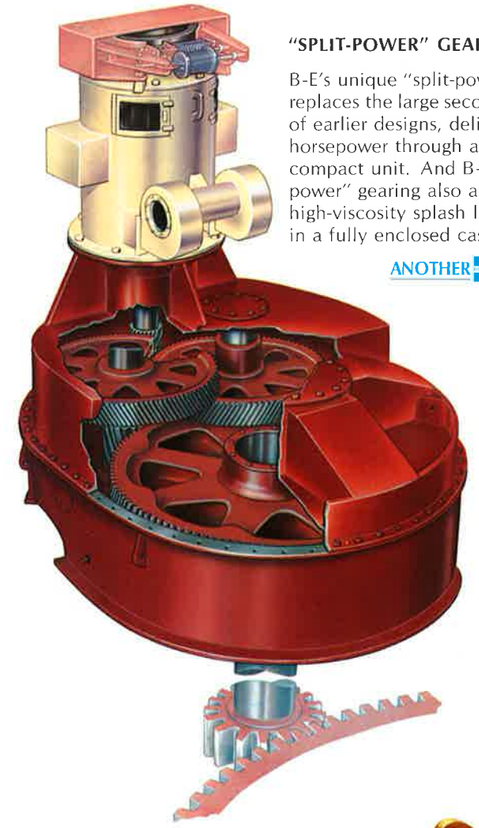


REGULAR WITH "VIBRA-GUARD"

For easy access, the propel motors and first gear reductions on medium and large-sized draglines are mounted above the deck, and all the gearing is housed in a special propel girder set off from the main revolving frame. On all machines 50 cubic yards and larger, electric timing of the walking shoes is standard, too.

Shafting is mounted either in anti-friction bearings or in sleeve bushings as required.





"SPLIT-POWER" GEARING

B-E's unique "split-power" drive replaces the large second reduction of earlier designs, delivering full horsepower through a more compact unit. And B-E "split-power" gearing also allows for high-viscosity splash lubrication in a fully enclosed case.

ANOTHER B-E EXCLUSIVE

...optimized cycle times

Electric motors are properly sized for each machine function.

But, in addition, each motor can be set up — not just for maximum horsepower rating — but for adjusted torque and speed characteristics which will provide the best combination for each function, to achieve maximum production through faster cycling *in the conditions for which each particular machine is to be used.* Design of the drive systems for optimum torque and speed protects the motors against periodic overloads in the dig and swing cycle, as well — and provides the required acceleration, power and speed needed for the particular job characteristics — taking into consideration planned arcs of swing, depth of cut, height of spoil, characteristics of material dug, etc.

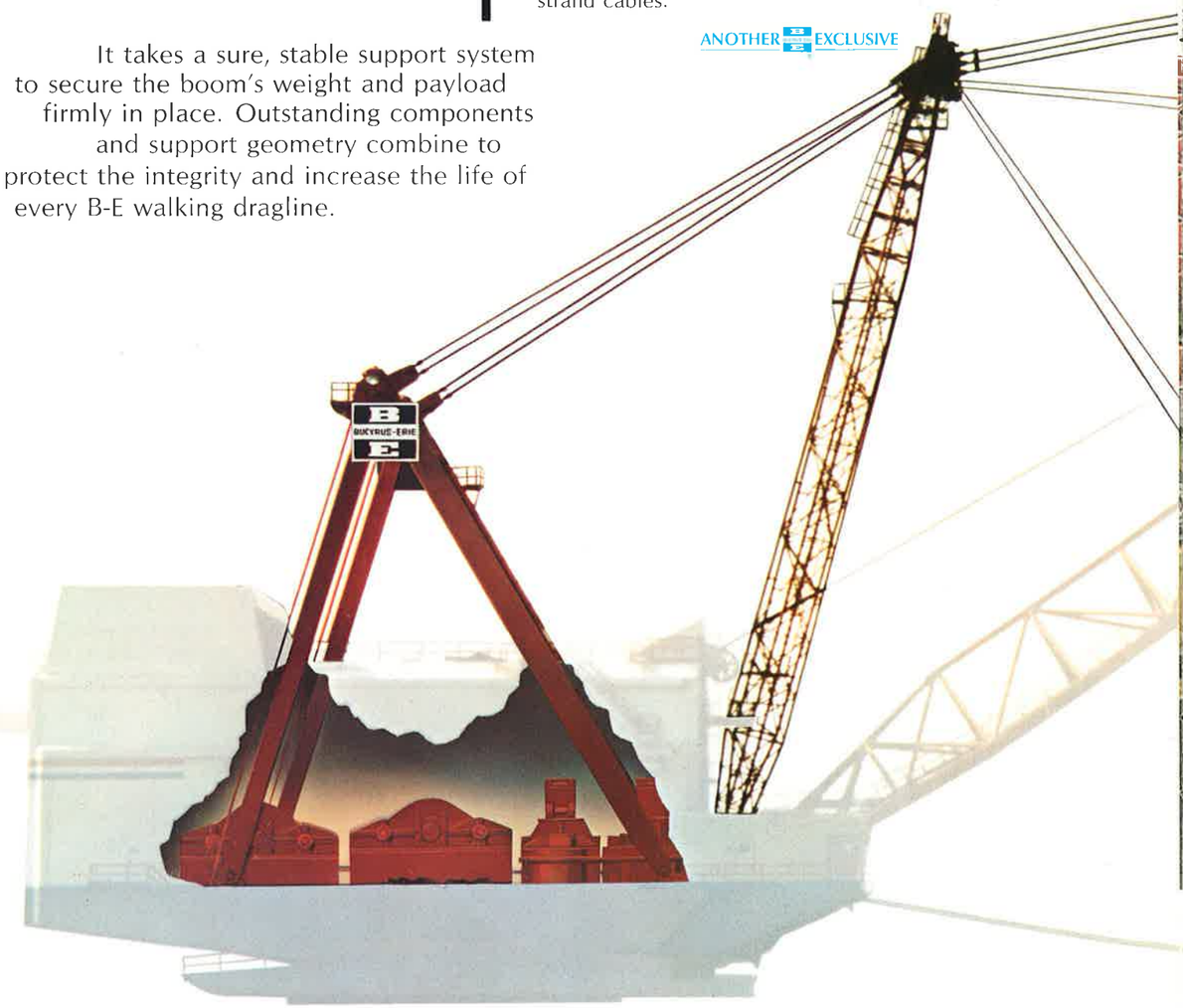
Through use of B-E's "whole system simulation" computer programs, the precise needs of each machine function are determined for each machine application. This capability, applied to each new machine sale, is an added plus of incalculable extra value throughout the life of the machine. Added value from greater production and increased motor life.

support system

It takes a sure, stable support system to secure the boom's weight and payload firmly in place. Outstanding components and support geometry combine to protect the integrity and increase the life of every B-E walking dragline.

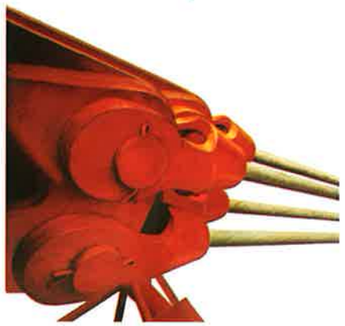
TUBULAR MAST
The mast, fashioned from light and strong tubular chords like the boom, is tailored to fit the angle and length of the boom. Use of the mast (pioneered by Bucyrus-Erie Company) greatly improves support geometry, producing wide angles of support for the boom-point cable and the intermediate boom support cables. This provides maximum efficiency in load distribution, and increased life for the bridge-strand cables.

ANOTHER B-E EXCLUSIVE



A-FRAME
The A-frame is a sturdy, box-welded structure anchored by dual-bolting on both backlegs. Bridge-strand emergency support cables, parallelling each backleg, add a further measure of protection — and a pressurized warning system is standard on larger machines.

ANOTHER B-E EXCLUSIVE



Galvanized bridge-strands — used throughout the B-E support system — provide visual wear detection and longer life.

INDEPENDENT LOADING

A dragline's two rope systems deal with two different kinds of tasks: *the support system* secures the load of the suspended boom, while *the running rope system* handles the constantly shifting loads of filling and hoisting the bucket.

The B-E design keeps them separate. The variable running loads are all transmitted into the boom or the revolving frame, where they belong. And the supporting members, free from running system loads, deliver the maximum in steady, secure support. Independent loading — another result of Bucyrus-Erie Company's unmatched experience building mining machines.

running system

direct-lead design...

ANOTHER B-E EXCLUSIVE

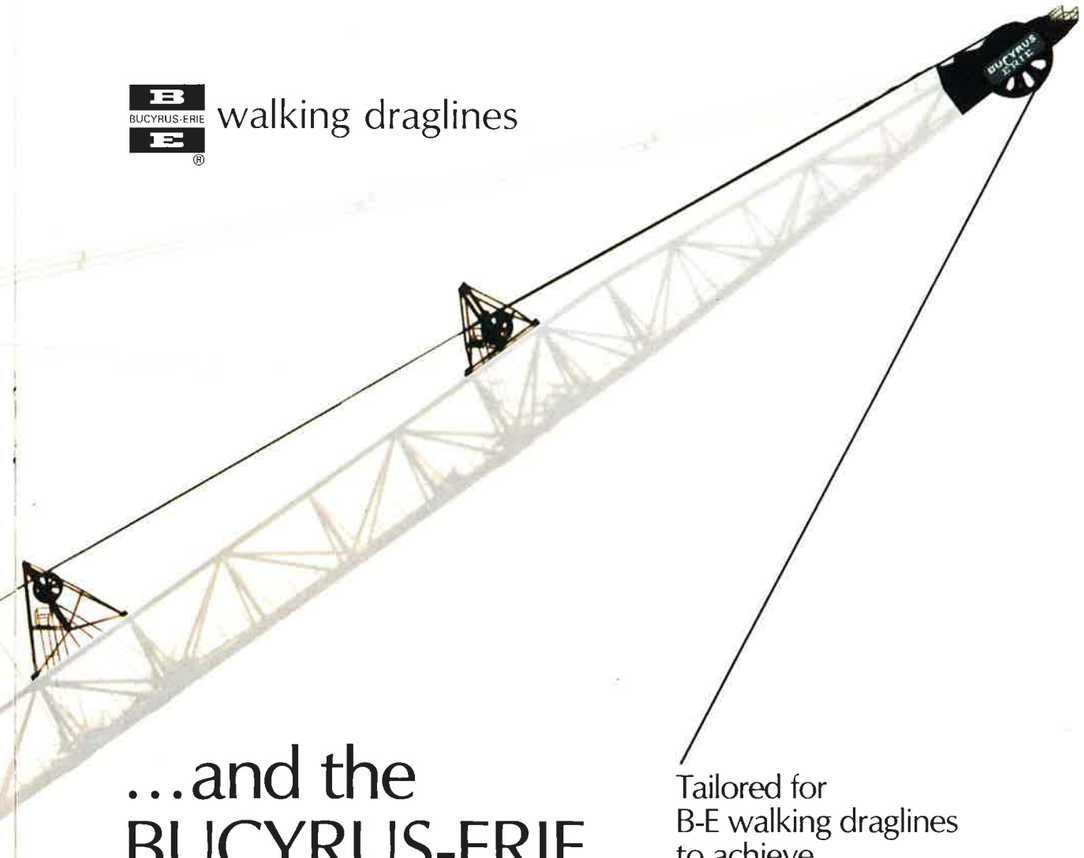
B-E takes extra care to assure maximum life and efficiency for the constantly-working running ropes.

Every surface they move across is carefully prepared — the grooves in the hoist and drag drums, and in every sheave, are machined to fit the selected rope size and then flame-hardened. This allows smooth, free running and reeving, and keeps wear from slip, concussion or abrasion to an absolute minimum.

"Direct-Lead Design" is the other major safeguard against unnecessary rope wear.

The hoist rope runs directly from drum to boom point, with support sheaves to keep it straight. In a similar fashion, the drag drum is mounted to the rear for the smallest possible fleet angle. B-E also swivel-mounts the sheaves, so the rope does not scuff in the sheave when the bucket moves behind or ahead of the boom point while swinging.

For direct, efficient force application and the maximum in rope life, B-E's "Direct-Lead Design" is without equal.



...and the BUCYRUS-ERIE® bucket

Tailored for B-E walking draglines to achieve maximum performance.

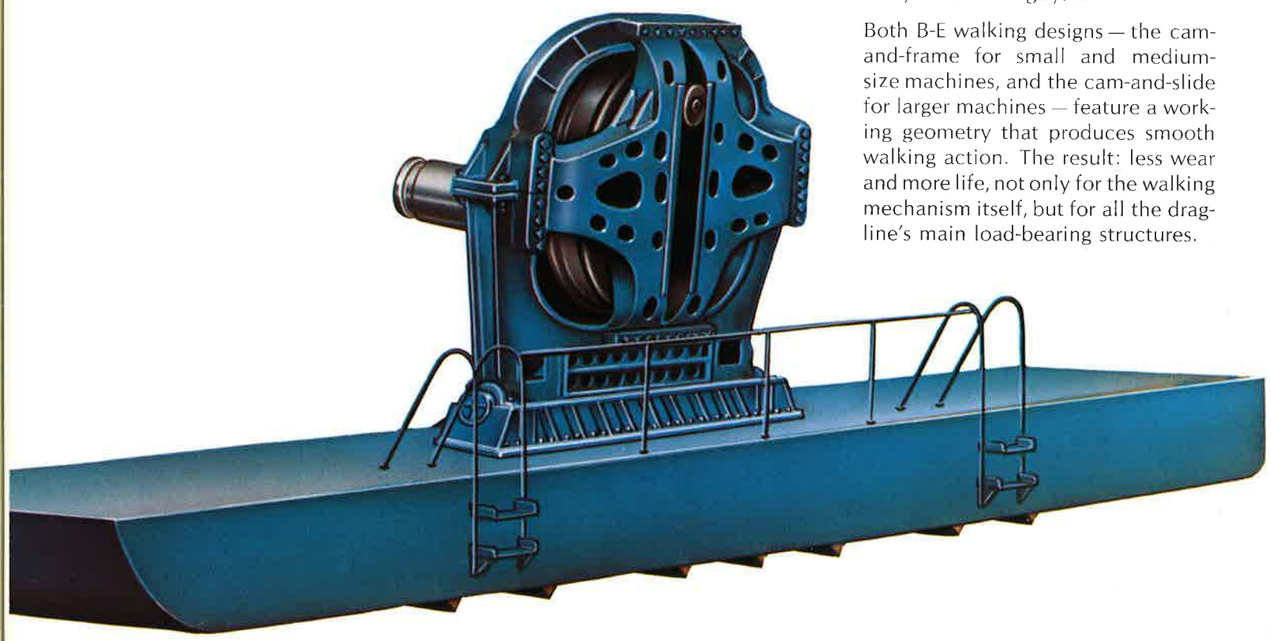
walking mechanisms

walking draglines

the standards of the industry

The key to a walking dragline's mobility is its walking system.

Both B-E walking designs — the cam-and-frame for small and medium-size machines, and the cam-and-slide for larger machines — feature a working geometry that produces smooth walking action. The result: less wear and more life, not only for the walking mechanism itself, but for all the dragline's main load-bearing structures.



cam and frame

Today's versatile cam-and-frame mechanism, working on hundreds of B-E draglines around the world, has set an unmatched performance standard for small and medium-sized machines. And its simplicity of design means quicker erection and easier maintenance.

This descendant of the device that first brought walking draglines to mining has been thoroughly modernized, with improved alloys, heat treating and other modern manufacturing techniques, and an improved design.

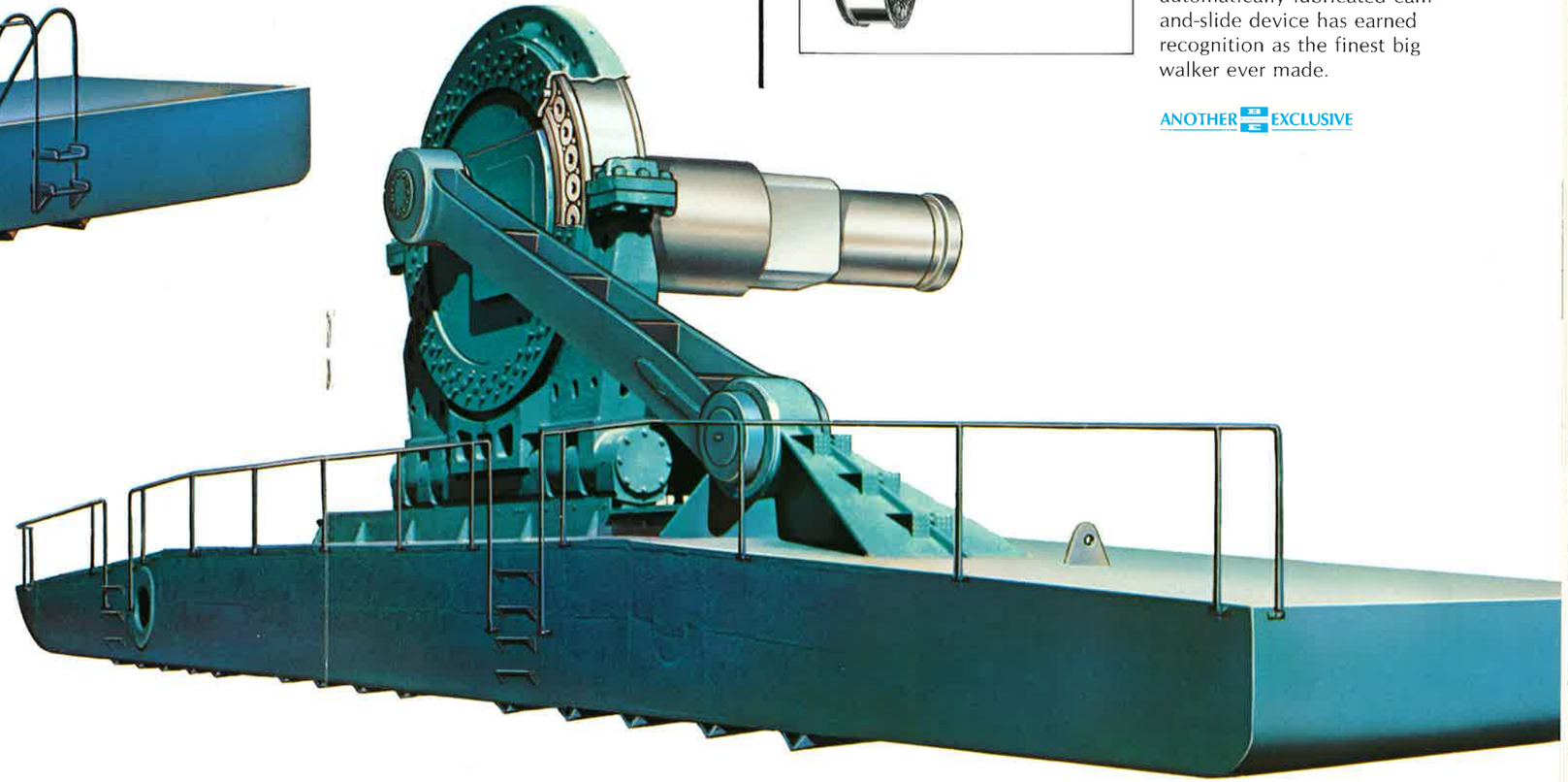
ANOTHER B-E EXCLUSIVE

B-E walking know-how yields other important benefits: special lifting hooks on the revolving frame lift the tub when the machine walks, relieving the center pintle of undue strain; and the cam assemblies on both designs are mounted *outside* the main revolving frame, for quicker installation, ready access and easier maintenance.

cam and slide

This walking mechanism opened a whole new world in dragline size. A special anti-friction roller bearing (designed and produced by Bucyrus-Erie Company) handles machine weights above 4,000 tons more effectively than any other cam design. In 10 years of field performance the automatically lubricated cam-and-slide device has earned recognition as the finest big walker ever made.

ANOTHER B-E EXCLUSIVE



revolving frame

modular sections... proven designs...

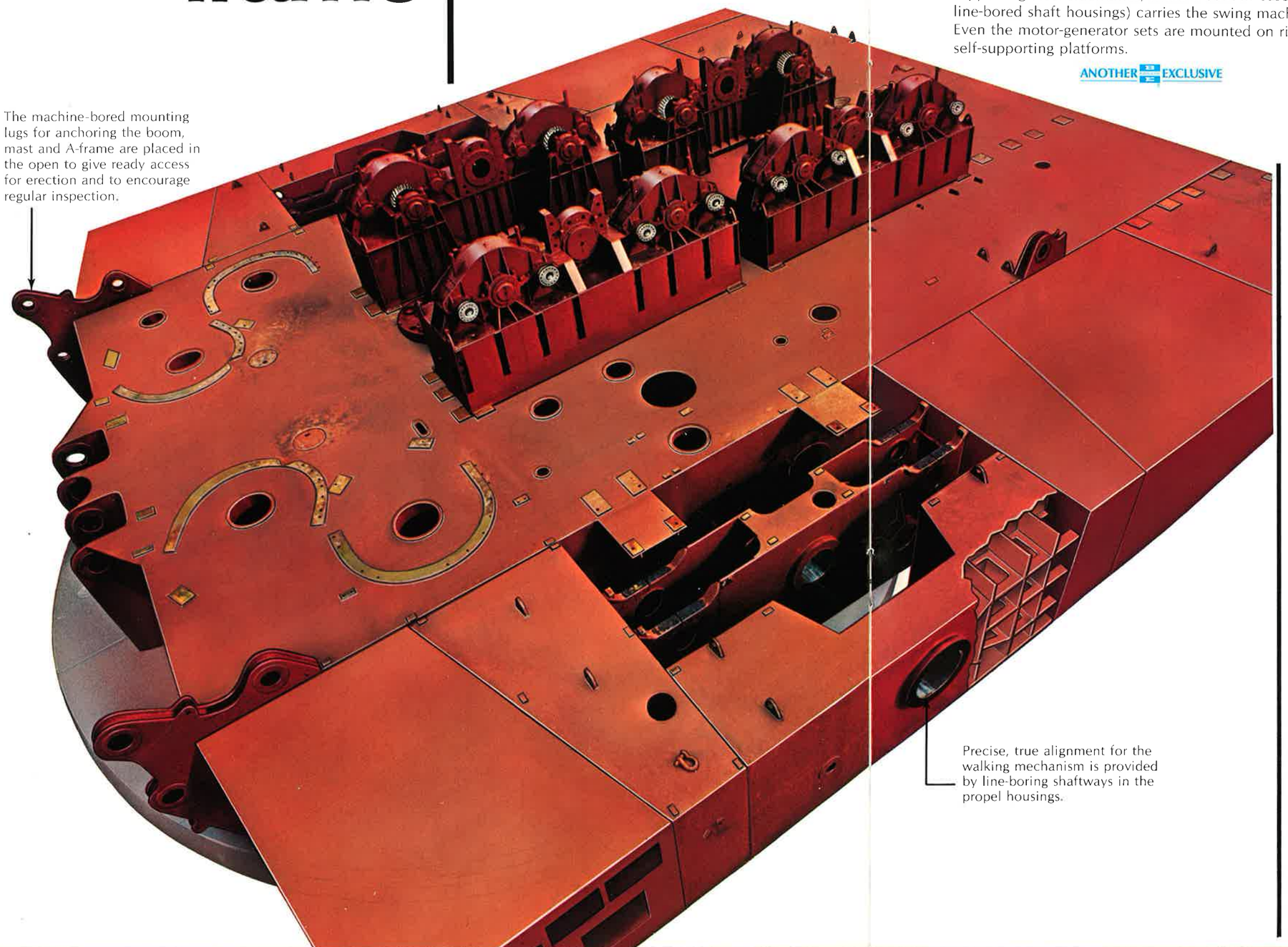
MAIN MACHINERY PLATFORMS
B-E's unique machinery mounting system gives an extra measure of protection to critical machinery alignment, and provides easier access for inspection and maintenance.

First, all drive system units are set on factory-machined pads to provide a level mounting surface.

Then, hoist and drag units are mounted on sturdy, self-supporting steel sideframes, while a built-in base (with line-bored shaft housings) carries the swing machinery. Even the motor-generator sets are mounted on rigid self-supporting platforms.

ANOTHER B-E EXCLUSIVE

The machine-bored mounting lugs for anchoring the boom, mast and A-frame are placed in the open to give ready access for erection and to encourage regular inspection.

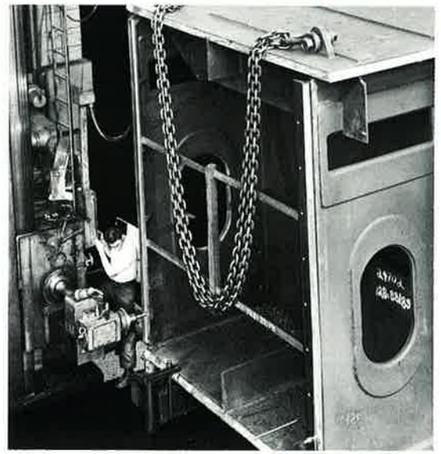


Precise, true alignment for the walking mechanism is provided by line-boring shaftways in the propel housings.

shop-machined for fit and strength

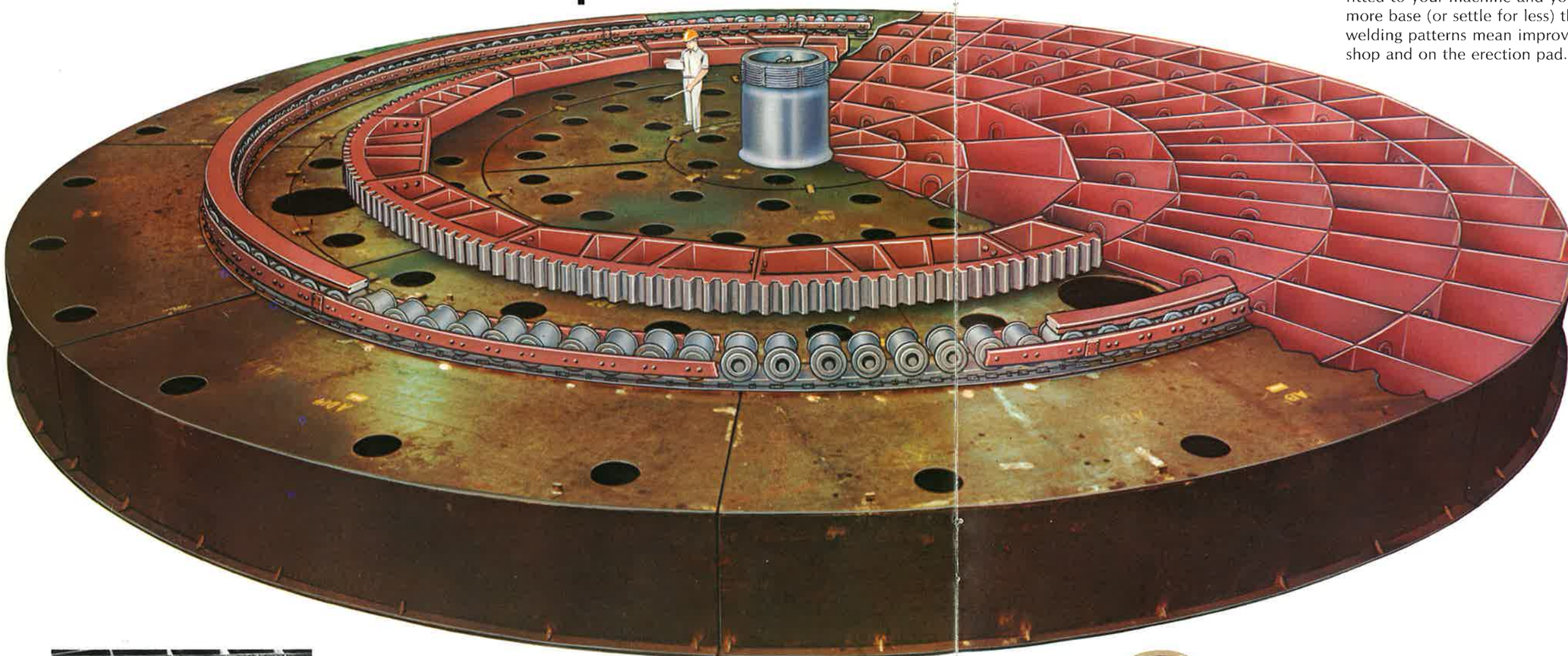
The revolving frame must absorb the stresses and vibrations produced during operation, while preserving true machinery alignment and providing a solid base for the A-frame, mast and boom foot, and the upper swing rail. Painstaking design and production give the B-E revolving frame its remarkable strength and stability.

Its sections are designed to time-tested configurations, for maximum strength with minimum weight. And wherever machinery alignment is involved, facing surfaces on the sections are machined in the plant, then drilled and fitted with aligning bolts. This means a quicker, tighter fit-up in the field — and a stronger, longer-lived dragline. ANOTHER B-E EXCLUSIVE



radial base

a B-E design makes custom innovation... sizing a reality



A thick steel wear-plate protects the base's trailing surface against friction during the walking movement.

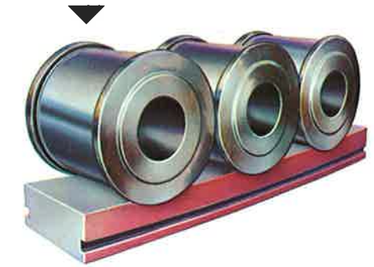
The proven standard for smaller walking draglines, B-E's strong and solid box-section design benefits from continuous improvement. Computer analysis has been used here, to provide optimum internal design in each base size for machines in the 6 to 45 yard range.

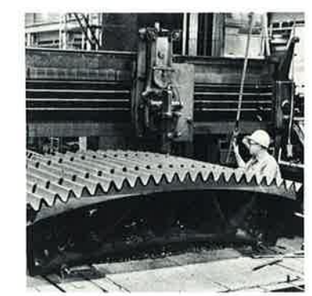
BUCYRUS-ERIE walking draglines

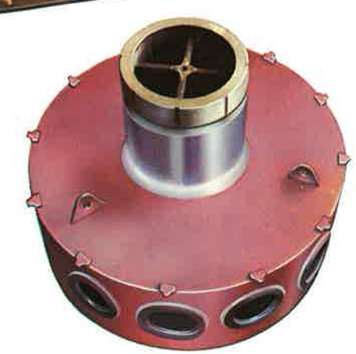
B-E pioneered the radial base design to give more efficient load distribution for today's larger, heavier machines. With more than 10 years of field experience, strain-gage testing, and computer stress analysis, B-E has refined this radial design to an advanced stage.

The radial base's uniform geometry also allows for custom sizing — using a special computer program, B-E engineers have developed a complete range of diameters, with variable internal patterns to suit loading and terrain requirements. You get a proven design fitted to your machine and your mine. You don't have to buy more base (or settle for less) than you need. And the simpler welding patterns mean improved quality in less time, both in the shop and on the erection pad.

Rollers and rails are made from vacuum-degassed, forged steel. Both are shop-machined and tapered for precise, continuous contact and uniform loading.







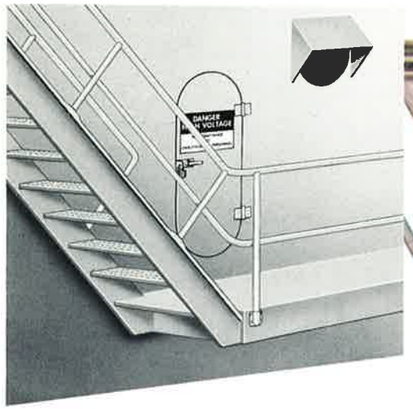
The cast center pintle is anchored deep in the base. Integral radial plates inside the pintle give maximum strength against distortion, keeping the machine's rotating alignment true.

Swing rack segments are made from large, heat-treated alloy steel castings. Teeth are machine-finished during manufacture, then segments are aligned and bolted in the field for concentricity. B-E's external-pinion drive maintains optimum alignment and contact, giving you more efficient power transmission and longer life.

electrical systems

"total responsibility" for major electrical dragline systems

As the oldest and best-respected name in mining machinery, Bucyrus-Erie Company is proud to take "Total Responsibility" for delivering the very best electrical systems to the needs of mining operators.



For personnel protection and ease of maintenance, all high-voltage AC switching equipment is isolated in a separate, specially-shielded room below the machinery deck.

From start to finish, BUCYRUS-ERIE electrical systems are made for mining. B-E engineers are involved at every step, from the first design concepts through the actual operating life of the dragline.

Developed by B-E mining machinery experts. B-E works as a design partner with major electrical manufacturers to develop and test each major component specifically for the demands of heavy-duty, high-production excavating. B-E selects all high and low voltage auxiliary equipment for reliability, long life, and ease of maintenance. Not tied to any one source, B-E can also control design changes, so you don't sacrifice interchangeability for electrical devices you don't need.

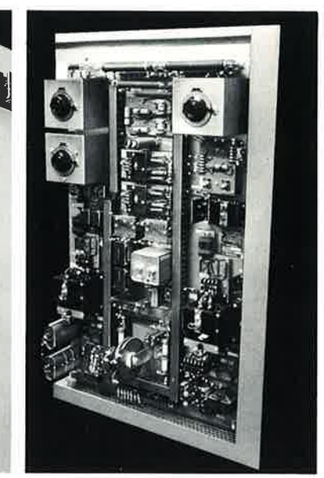
Custom-fit to the individual machine. For each new model, B-E runs a complete computer simulation test on all electrical components—showing how they will interact with mechanical systems under actual digging conditions. In addition to providing the optimum electro-mechanical design for each machine, this test doublechecks the electrical manufacturer's ratings on every component.

Backed by B-E service. Field adjustments and servicing for B-E electrics are done by B-E mining machinery experts. Your machine is serviced by the men who designed it.

The "brains" of the B-E walking dragline are housed in a single centralized control room located directly behind the operator's cab for prompt access from either the cab or the machinery deck.

From this central control room, any machine function or accessory can be readily monitored. And behind-the-cab location means adjustments can be visually coordinated with the operator's motions.

In a B-E designed system, filtered pressurized air keeps the circuitry panels clean. Walk-in control rooms provide ease of inspection and unobstructed access for maintenance. ANOTHER B-E EXCLUSIVE



SIMPLIFIED STATIC CONTROL

ANOTHER B-E EXCLUSIVE

This B-E innovation puts the most advanced, reliable electronic controls to work - and cuts trouble-shooting to a matter of minutes.

Using a concept first developed in high-reliability military systems, B-E engineers worked with major electrical manufacturers to condense the elaborate "static" control circuits. The result: simplified, compact panels for all dragline drive systems.

There are no endless circuit diagrams or costly test procedures for the electrician to master; a three-point check and dial-type adjustments complete the trouble-shooting process.

B-E "Simplified Static Control:" the finest controls available with quick and easy maintenance.

POWER-FACTOR REGULATOR

An electronic Power Factor Regulator works with the synchronous motors to even out the effects of the widely fluctuating power demands made by a working dragline. This contributes importantly to economic performance of the entire mine electrical system.

The Power Factor Regulator keeps "power factor" (the ratio between actual working power and total power demand) at a high level. This greatly reduces the danger of unintentionally shutting down the motor-generator sets, and smooths out voltage fluctuations in the mine distribution system. In addition, power companies charge mine customers extra for low "power factor" usage, and the Power Factor Regulator on a B-E dragline can help cut those charges.

B-E also includes the most complete range of protection devices for its synchronous motors, giving you longer, more reliable service.

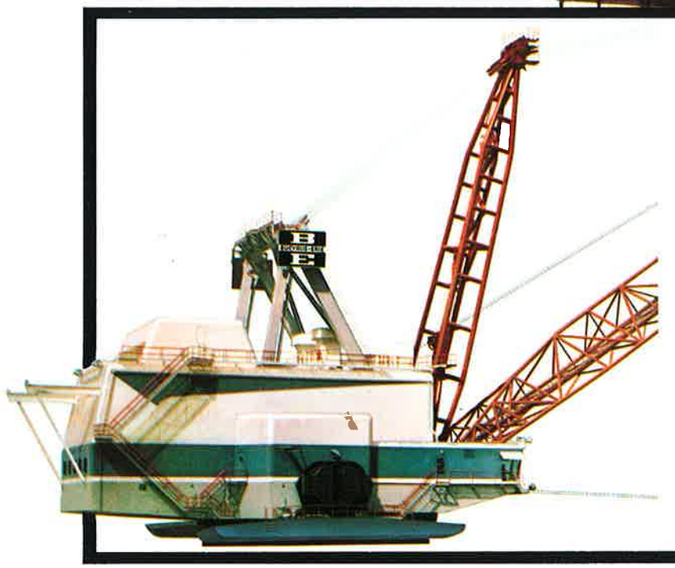
maintenance and operator extras

PRESSURIZED MACHINERY HOUSE
A constant flow of pressurized fresh air is directed throughout the machinery house of every B-E dragline, maintaining a cooler, more uniform internal temperature.

Air intake fans in the ventilation pagoda pump hundreds of thousands of cubic feet per minute into the house, where front and rear exhaust fans draw airstreams over all machinery and work areas.

The flow design eliminates "dead spots" for dust accumulation or heat build-up, and the continuous fresh-air "bath" cools the machinery, improving operating effectiveness and personnel comfort.

An optional filtering system is also available, to remove dust and particles from incoming ambient air. Dust is filtered inertially and bled off through waste ducts (circled).



WALKWAYS & RAILINGS
B-E draglines feature a complete network of walkways for ready access to the entire machine, and railings throughout for personnel protection.

Literally thousands of feet of serrated steel "non-skid" stairways and platforms provide outside maintenance access to every machine area, from the boom point to the locked high-voltage room. All this in addition to the main ladders and walkways leading up onto the walking shoes and up to the machinery house and operator's cab.

Inside the house, stairways and platforms of the same durable, protective materials put all machinery and maintenance areas within easy reach. Every foot of walkway and every platform, inside and out, is protected by sturdy side-rails.

FLOODLIGHTING
B-E's unique, custom-designed floodlighting system is indispensable for top production during night shifts.

Weathersealed mercury vapor lamps provide the main illumination aided by sodium vapor lamps for long reaches and fast restrike characteristics. Many times brighter than ordinary lamps, they carry special lenses, tempered for shock resistance and chemically treated for "softer" light diffusion and color correction. The floodlights are equipped with voltage equalizers to compensate for variations in line voltage during the working cycle, and mounted on special B-E neoprene shock-absorbing mountings.

Production figures show that night crew efficiency is directly proportional to the quality and quantity of floodlighting. BUCYRUS-ERIE floodlighting systems put sharp, clear light where it's needed.

OPERATOR'S CAB
Designed for comfort and efficiency, the B-E operator's cab sets the industry standard for quality.

The insulated double-walled shell, with all-electric heating and air conditioning, maintains a comfortable working temperature in all seasons. Extra-large safety glass windows with an outsized electric wiper and electric defrosters provide a clear, uninterrupted overview of the front end and work area. The front window can be raised automatically and tucked away into the ceiling for unobstructed view.

Seating, and hand and foot controls are arranged in accord with the best human engineering principles. The instant-response, stepless controls give the operator smooth, accurate control of the bucket.

CENTRALIZED AUTOMATIC LUBRICATION

Time-released, pre-measured lubrication reaches four major service areas automatically from this central station. With minimum personnel time, this station services the propel and walking machinery; the center pintle, swing shaft, and house-front running system components; and all anti-friction bearings. Automatic lubrication has also been installed for the cam-and-frame walking device.

Similar pneumatically-operating pumping systems are available for the boom running system components; the mast and A-frame; the hoist and drag ropes; the swing rollers and rails; and the gearing for all drive systems.

For special lube protection against severe cold weather, burnel heaters with infra-red heated pumping stations and lube line heat trace are available for each point affected by ambient temperatures.

For heavy-duty service anywhere on the machinery deck, and for convenient intake and storage of supplies, the B-E dragline features a full-electric overhead crane.

- Travelling over the complete deck, and even out the access doors, the crane is equipped with deck-level controls and an auxiliary hoist.
- Additional monorail-and-hoist combinations are provided for servicing the propel machinery. Twin two-speed B-E winches are mounted near the hoist and drag drums for rope reeving.

where capability counts

- **In design,** where B-E engineers apply the computer techniques of the space age (used by NASA for Saturn rockets, and for the SST and 747 super-jets) to pre-test components *before* they're built.

B-E combines one of the most sophisticated computer networks in the heavy equipment industry with more than 90 years of firsthand experience building machines for mining.

- **Foundry facilities.** Bucyrus-Erie has poured a large share of walking dragline castings for years at its foundry in South Milwaukee. This facility utilizes two electric furnaces with capacities of 10 and 25 tons.

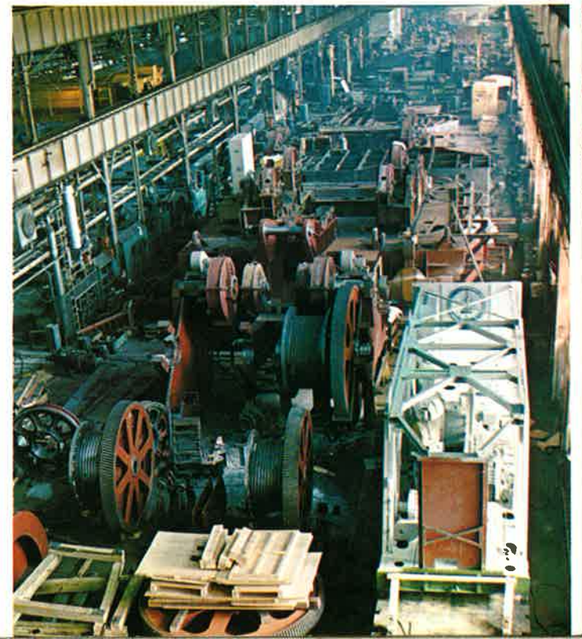
In 1974 Bucyrus-Erie acquired a second foundry in Glassport, Pennsylvania to meet its own growing demand for mining machinery castings. Glassport has a 50-ton open hearth furnace and two electric furnaces with capacities of 20 and 35 tons. Casting pours as large as 210,000 pounds can be made at the Glassport foundry.

- **Manufacturing facilities.** Walking dragline components are manufactured and assembled in plant facilities at South Milwaukee, Wisconsin and Pocatello, Idaho.

The South Milwaukee works has 1,200,000 square feet of manufacturing space and the Pocatello plant has 1,400,000 square feet.

Between the two giant manufacturing complexes Bucyrus-Erie Company has assembled an unprecedented arsenal of the largest and finest heavy machine tools in the world.

Machine tools such as Schiess Froriep gear hobers, Grey horizontal boring bars, LeBlond automatic NC control lathes, and a great percentage of the large MAAG gear cutters in the U.S. produce B-E's walking dragline components.



- **In the laboratory,** where stringent quality control has helped make B-E reliability a hallmark. B-E is recognized as a leader in the use of non-destructive testing to insure quality.

- **Specialized training programs.** Bucyrus-Erie's Service Department offers a wide selection of mining machinery training programs that will help the surface miner achieve maximum production with his high capital cost mining machine.

B-E's experienced field instructors and headquarters supervisors are available on a paid basis to present the programs to your people, or if you prefer, train your own teachers so you can use the B-E material (or some of your own material) and conduct your own classes.

The Surface Mining Supervisory Training Program, one of more than thirty training programs available, was specially created for surface mining operations using walking draglines. Subjects covered in the program include mine planning and layout, bank preparation, mineral recovery, machine selection, power distribution, multiple seam operations, equipment operation, time studies and reclamation.

- **International parts network.** Bucyrus-Erie has established a vast international network of 18 parts depots strategically located to serve walking dragline customers efficiently and quickly.

Parts Central in Racine, Wisconsin is the command center of the multi-million dollar parts network. Over 190,000 square feet of office and indoor warehouse facilities house thousands of mining machinery spare parts that are ready to be shipped by air, rail, or road when needed.

An integrated communication system links Parts Central with all domestic and international depots for immediate response to our customers' needs 24 hours a day.

The things that make a dragline more valuable...

These special features provide extra service life, easier maintenance, higher availability and production, and a lower over-all cost for the working life of a dragline.

1. Tubular-triangular boom, with automatic warning system
   for greater boom dependability.
2. Mast-type suspension system
   for stronger support and longer cable life.
3. Direct-lead design for hoist and drag ropes
   for maximum running rope life.
4. Simplified static control panels on all drive systems
   for high reliability and easy troubleshooting.
5. Field-proven walking mechanisms
   for dependable low-friction movement.
6. Tapered rails and rollers, of vacuum-degassed alloy steel
   for "true-circle" swing movement.
7. Deep-section main machinery frames
   for machinery alignment protection.
8. Modular drive components
   for reliability and interchangeability.
9. Optimized cycle times
   for maximum productivity under actual mine conditions.
10. Deluxe heated, insulated and air-conditioned cab
    for operator comfort and efficiency.
11. Flame-hardened grooving on all sheaves and drums
    for free running and minimum wear.
12. Anti-friction bearings throughout hoist, drag and swing
    for power savings and extended life.
13. Self-aligning anti-friction bearing with field-machined seat, for lower swing shaft
    for longer life and simplified service.
14. Overhead electric cranes, auxiliary hoists and winches
    for fast service and maintenance.
15. Pressurized machinery house (with optional intake air filtering)
    for dust control and lower temperatures.
16. "Vibra-Guard" on swing machinery circuits
    for longer gear, shaft and bearing life.
17. Swivel-mounted boom point sheave
    for hoist rope protection while swinging.
18. "Split-power" swing drive with splash lubrication
    for a more compact, easier-to-maintain unit.
19. Walkways, stairways and platforms
    for access to required machine areas.
20. Emergency support cables on A-frame backlegs, with pressurized warning system on machines 50 yards and larger
    for extra support system security.
21. Machined surfaces and aligning bolts on revolving frame sections
    for more precise fit-up in erection.
22. Pullout protection, phase reversal relay, field loss guard, under/over voltage protection, frequency detector and overspeed guard
    for synchronous motor protection.
23. Limit switches on hoist and drag
    for automatic protection against overwinding, or pulling bucket into boom or fairlead.
24. Thermal detectors and annunciators on main machinery motors
    for protection against overheating.
25. Power Factor Regulator
    for more economical mine power costs.
26. Lockable electrical cabinets and rooms
    for personnel and security.
27. Custom-designed front end floodlighting
    for top night-shift efficiency.
28. Electrically-timed propel in machines 50 yards and larger
    for smooth, synchronized walking.
29. Speed and attitude indicators for propel, hoist and drag
    for accurate positioning and control.
30. Bucyrus-Erie Parts Depots stocked to meet regional needs
    for off-the-shelf manufacturer parts service.

ALL THESE IMPORTANT FEATURES ARE STANDARD ON BUCYRUS-ERIE® WALKING DRAGLINES.

outstanding machines for

surface mining

BUCYRUS-ERIE

for more than 90 years

Bucyrus-Erie Company, South Milwaukee, WI 53172

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