

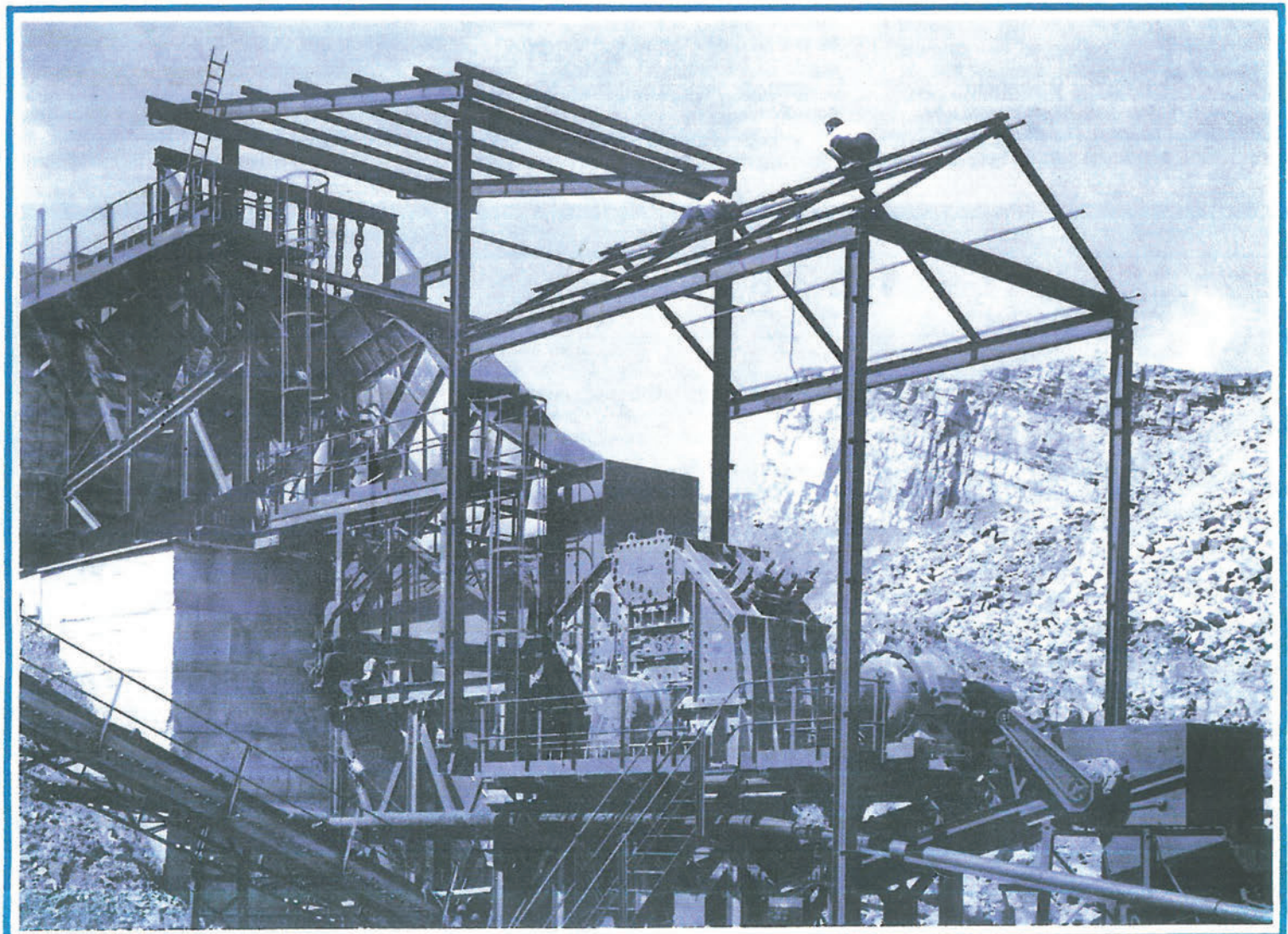
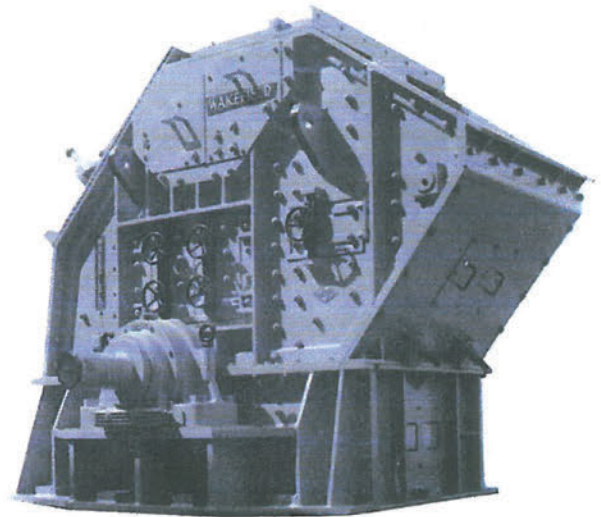
Waketield

Impact Breakers

and Plant

for the Quarry Industry

- High reduction ratio
- Ideal shape of product
- Large capacity
- Easy variation of product size
- Takes large feeds
- Constant speed rotor
- Low power requirements
- Easy maintenance
- Low operating costs
- For primary, secondary or tertiary duties



Impact Breaking is now accepted as the modern method of stone reduction, giving a well-shaped product, free from flakiness or elongation.

The Wakefield is the most highly developed impact breaker made. It produces an outstandingly good cubical product and gives a high reduction ratio with single-stage crushing; e.g., Model 55 will reduce a 36" feed to a nominal 3" product. Without alteration of rotor speed, a wide range of product sizes can be obtained, by a simple external adjustment, which only takes minutes.

The weight and strength of Wakefield Impact Breakers—the heaviest machines of this type on the market—enable them to withstand very rigorous quarry conditions. The solid rotor gives maximum impact force, with very smooth operation.

Wakefield design is very flexible. According to each machine's intended duty, the type and placing of impact elements can be varied to provide maximum efficiency.

Product

By simple adjustment of the breakerplate (controlled externally), a product range with top sizes between 8" and 1½" can, for example, be obtained by single-stage crushing of limestone.

The predetermined, constant rotor speed does away with the necessity for a variable speed drive. Further, the slow speed of the rotor keeps down the proportion of 'fines'.

It is, however, possible to regulate the analysis of the product range. Thus, if a greater proportion of mid-range sizes or fines is desirable, this can be achieved within wide limits.

Product shape is maintained throughout the life of the impeller bars. Again, product shape is not affected, even if the shearpins are broken; there is, in this case, a small percentage of oversize passing through the machine.

Where stage crushing facilities are already installed, the Wakefield Impact Breaker can be successfully introduced to increase plant capacity as a primary, secondary or tertiary crusher.

Rotor

Forged 'blanks' of 8"—10" thick steel are welded together to form a solid rotor body, which is keyed onto an alloy steel shaft. After each stage of manufacture prior to final mounting, individual blanks are stress-relieved.

The rotor assembly is mounted on double-row self-aligning spherical roller bearings, normally arranged for grease lubrication. Oil lubrication is employed on the larger machines.

Heavy-duty cast steel bearing housings are mounted outside the working area of the machine, protected against ingress of dust and dirt by accurately-machined grease labyrinth seals.

To ensure vibration-free operation, the complete rotor assembly is dynamically balanced.

Although rotor peripheral speed is constant on each individual machine, various speeds are selected according to the size of machine and type of stone to be reduced. This can be accurately determined from tests on samples.

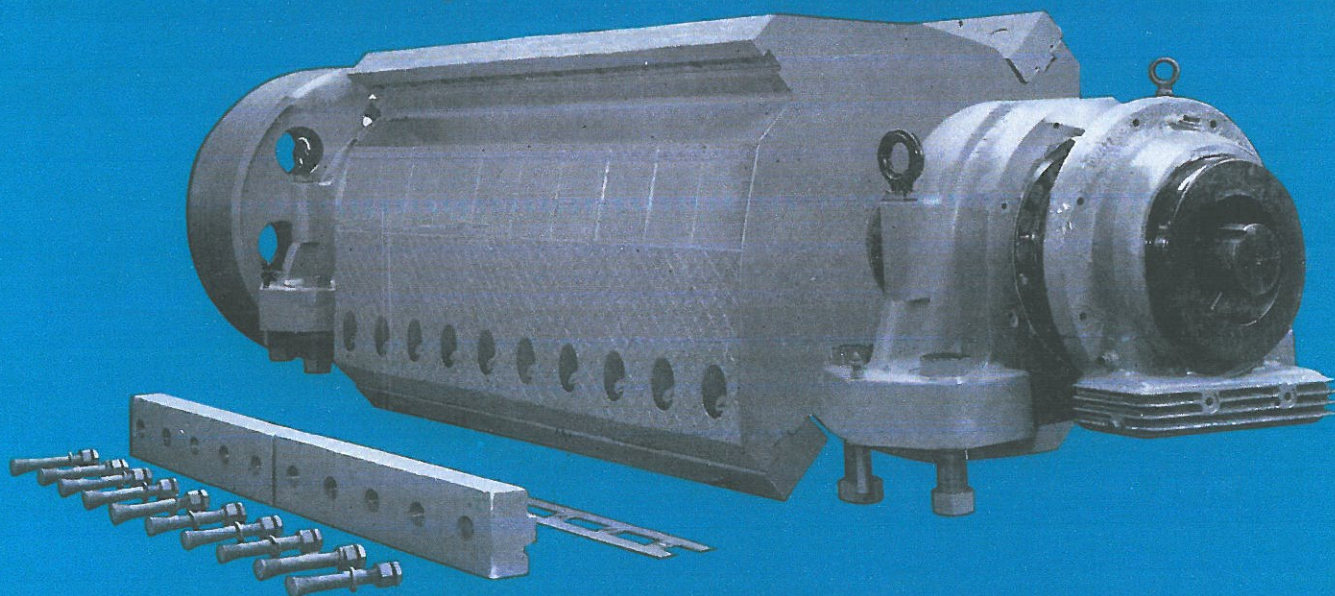
Impeller bars

The impeller bars, which are either of the wedge or bolt-fixing type, according to rotor diameter, are cast either in manganese or chrome alloy steel, to suit the duty. Each bar is reversible, to present alternative working faces; when replacements are required, only the bars themselves (and not fixing assemblies) need be ordered.

The number of bars used is dependent on the machine's duty. In some cases only two are needed; in others as many as six.

Breaker plate

Heavy fabricated sections, protected by manganese wear-resisting steel liners, are hinged and suspended freely on heavy-duty stabiliser screws, which are spring-loaded and easily adjusted from outside the machine. Protection is by shearpin. Even though the shearpins should fail, due to ingress of tramp metal, etc. the machine will continue to produce a



Wakefield 'Package Plant' provides standard crushing plant that can readily be installed, with little site preparation. According to the throughput desired, the appropriate size of Wakefield Impact Breaker, feed hopper, apron feeder, grizzly (if required), feed hood, power unit and walkways can be accommodated on standard structure.

All the units are matched to work well together and are built-up by BJD experts.

Power can be either by electricity or diesel engine with generator for driving units other than the impact breaker. With a Wakefield Impact Breaker at the heart of the plant, high outputs of excellently-shaped products are assured.

cubical product with only a small additional percentage of oversize. When the machine is intended to give top size products of the order of $\frac{3}{4}$ "—1", or for use as a secondary or tertiary crusher, a **second breaker plate** may be introduced, in place of impact bars.

Impact bars

The Impact Bars consist of heavy-duty rolled manganese steel sections and are situated in the breaking chamber immediately over the entry impact point so that a reaction blow is imparted almost instantaneously with the initial impact.

The final position of the impact bars was decided upon only after extensive full-scale experiment.

Bulk sample testing

The full-scale test installation at Thornes Works is probably the largest and best equipped in the country. A production machine is installed in the Test House, which is fully equipped with measuring instruments to enable power

requirements to be accurately determined. A 26 inch feeder conveyor carries customer's material into the impact breaker and the resulting product is taken on a discharge conveyor to a delivery point, where it is weighed and analysed.

The fact that product analyses under quarry conditions very closely follow those of sample test analyses amply justifies the BJD procedure.

Feed ramp

A fabricated steel ramp plate, or chute, over which feed material passes into the machine. The ramp is pivoted, and adjustable at the lower end by means of an external screw, to enable the angle of entry to be altered.

Frame

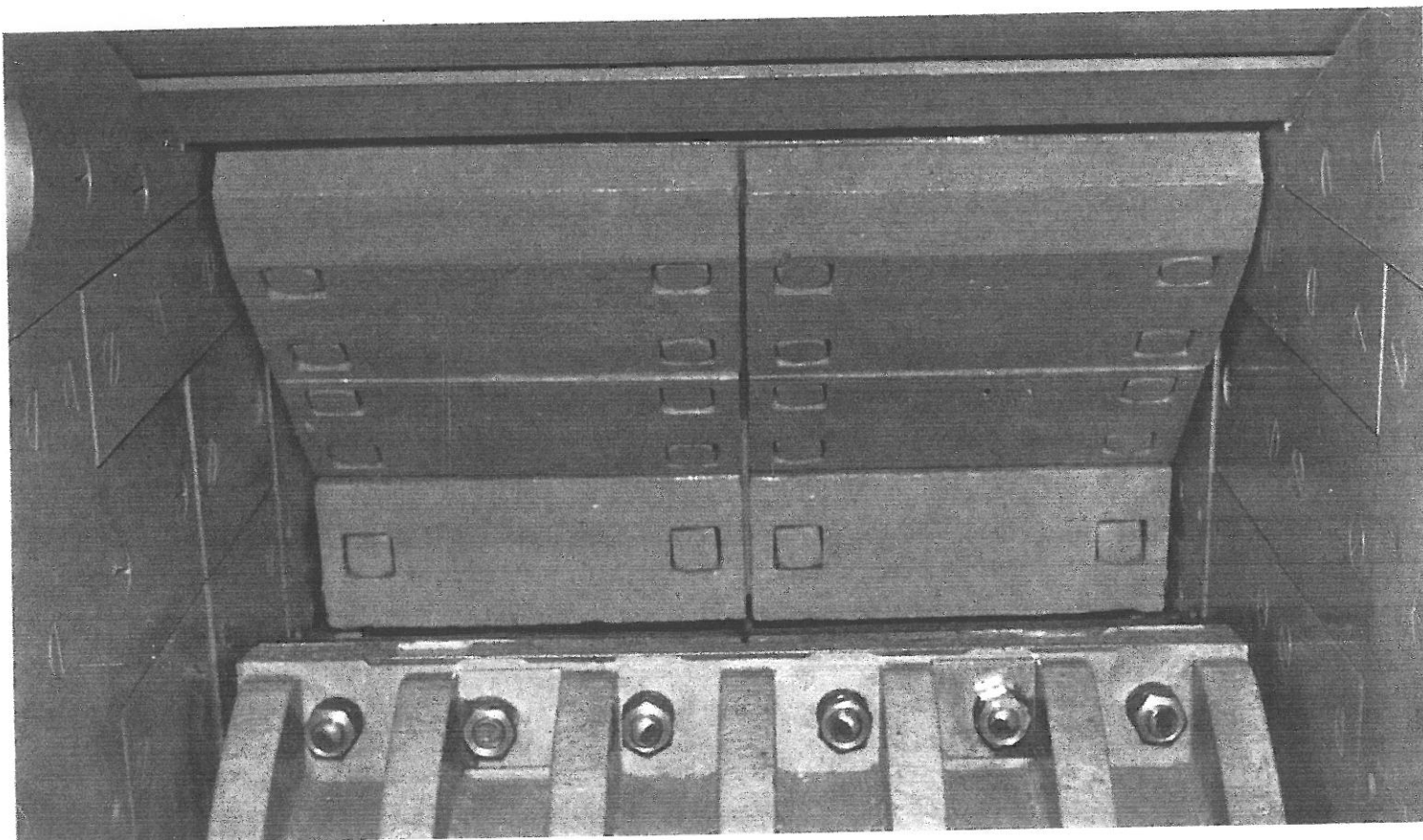
The frame is built in two parts—the upper and the lower frame, each consisting of welded and bolted assemblies of very heavy steel sections, protected by abrasion-resisting steel wearing liners. The liners are secured by plough bolts and are arranged for utmost interchangeability and reversibility. Great care has been taken to provide

maximum access by means of quick-release doors and bolted inspection plates on each side of the machine to facilitate maintenance of impeller bars, feed ramp and impact bars. A feed hood is available for use between the feeder and the machine. Within the lined hood is a curtain of heavy freely-suspended chain, which acts as a protection against flyback. To cater for wear-and-tear due to high velocity discharge, a 'gravel-box' is incorporated in the lower frame. This 'box' quickly fills with stone, forming a cushion on which the outgoing product falls and has its velocity reduced before discharge on to the conveyor belt.

Drives

Normally, power is supplied by electric motor, the horse-power of which can be accurately determined by tests on material.

Alternatively, diesel power can be used where electrical supplies are inadequate. Power to the impact breaker is transmitted by pulley and V-rope drive. Having regard to the high reduction ratio and output, power requirements are low. Normal requirements are of the order of 1 h.p. per ton per hour of material reduced.



MODEL	33	44	45	55	56	66	69
Feed Opening inches	30" x 24"	40" x 32"	50" x 36"	50" x 40"	60" x 40"	60" x 50"	90" x 50"
Feed Size (edge length) inches	18"	24"	27"	36"	36"	40"	40"
Capacity (Average limestone) Nominal 3" product TONS per hour	50—75	70—150	100—200	175—300	200—400	300—500	350—650

The above capacities are approximate and dependent upon the crushing characteristics of the material. If an adequate sample is sent to Wakefield for test, accurate capacity assessment can be made on the material in question.

DIMENSIONS, HORSEPOWERS, etc (approx).

MODEL	33	44	45	55	56	66	69
Length	9' 3"	11' 1"	11' 8"	12' 9"	12' 9"	13' 11"	13' 11"
Width (over shaft)	6' 9"	8' 7½"	11' 0"	10' 11"	11' 9"	12' 7"	15' 1"
Height	6' 9"	7' 2½"	9' 3"	12' 0"	12' 0"	11' 7"	11' 7"
MOTOR (HP)	60/150	100/250	100/300	150/350	150/450	150/500	150/700
ROTOR SPEED (r.p.m.)	700/1000	500/850	450/750	400/650	400/650	325/400	325/400
ROTOR WEIGHT	2.75T	5.5T.	8T.	10T.	12T.	18T.	26T.

SHIPPING SPECIFICATION (approx.)

MODEL	33	44	45	55	56	66	69
Net Weight (Tons, cwt.)	9T.5	18T.15	26T.0	34T.10	37T.10	54T.0	65T.0
Gross Weight (Tons, cwt.)	10T.13	20T.0	27T.0	36T.0	39T.10	54T.10	65T.10
Overall dimensions	115" x 87" x 92" high	124" x 120" x 100" high	124" x 130" x 100" high	124" x 155" x 135" high	134" x 155" x 135" high	180" x 150" x 144" high	180" x 180" x 144" high

No case—local protection only.



British Jeffrey Diamond

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