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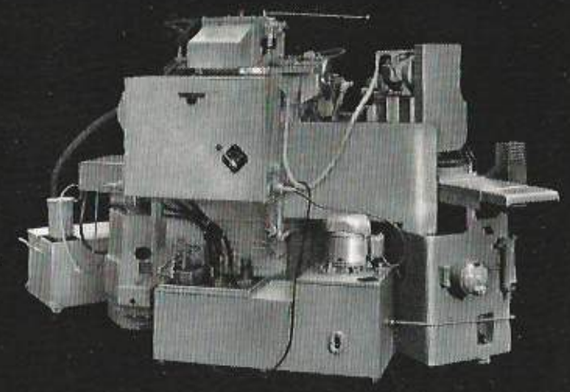
NEWALL-KEIGHLEY

L12-AA



Rear view showing the accessibility of the hydraulic pump and relief valve and the electrical control panel.

angle approach cylindrical grinding machine

Many years of experience in the design and manufacture of the ' L' type Plain Cylindrical Grinder and the L12-AH Angle Head Grinder has ensured that the progressive development towards the Angle Approach type of machine has been well proven in all stages.

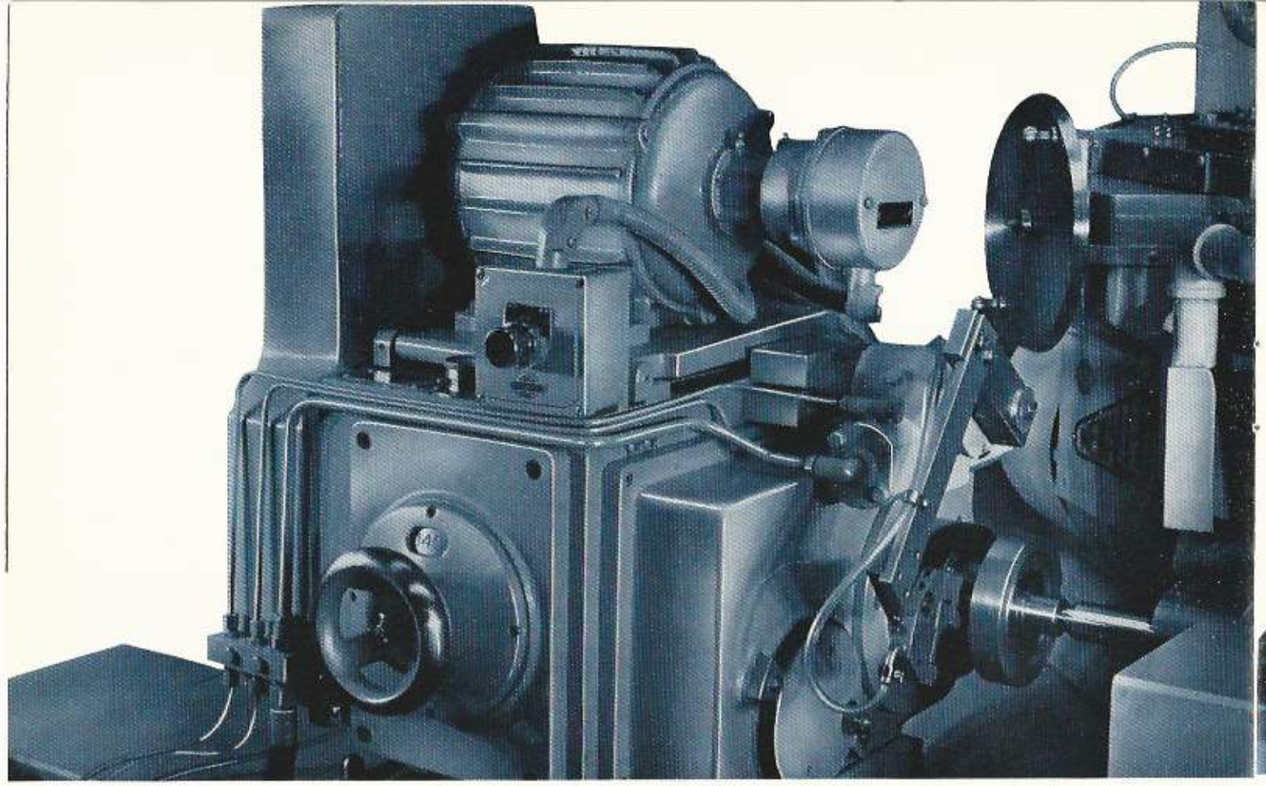
The L12-AA Angle Approach Grinder has been especially designed for rapid, accurate production and simplicity of control. An important feature of the machine is the sturdily designed base casting of modern fish-tail construction giving extreme rigidity and positive support to the slideways. Furthermore, the design of the base permits the machine to be built with a choice of approach angles, according to customer requirements, and a maximum quick withdrawal of 4" (102 mm.) can be provided to ensure that the grinding wheel is well clear of the work-piece to facilitate loading and unloading.

Anti-creep control and compensation for temperature change are built-in and combined with the extremely stable wheel spindle assembly the resultant repetitive accuracy may be favourably compared with any Plain Cylindrical Grinder.

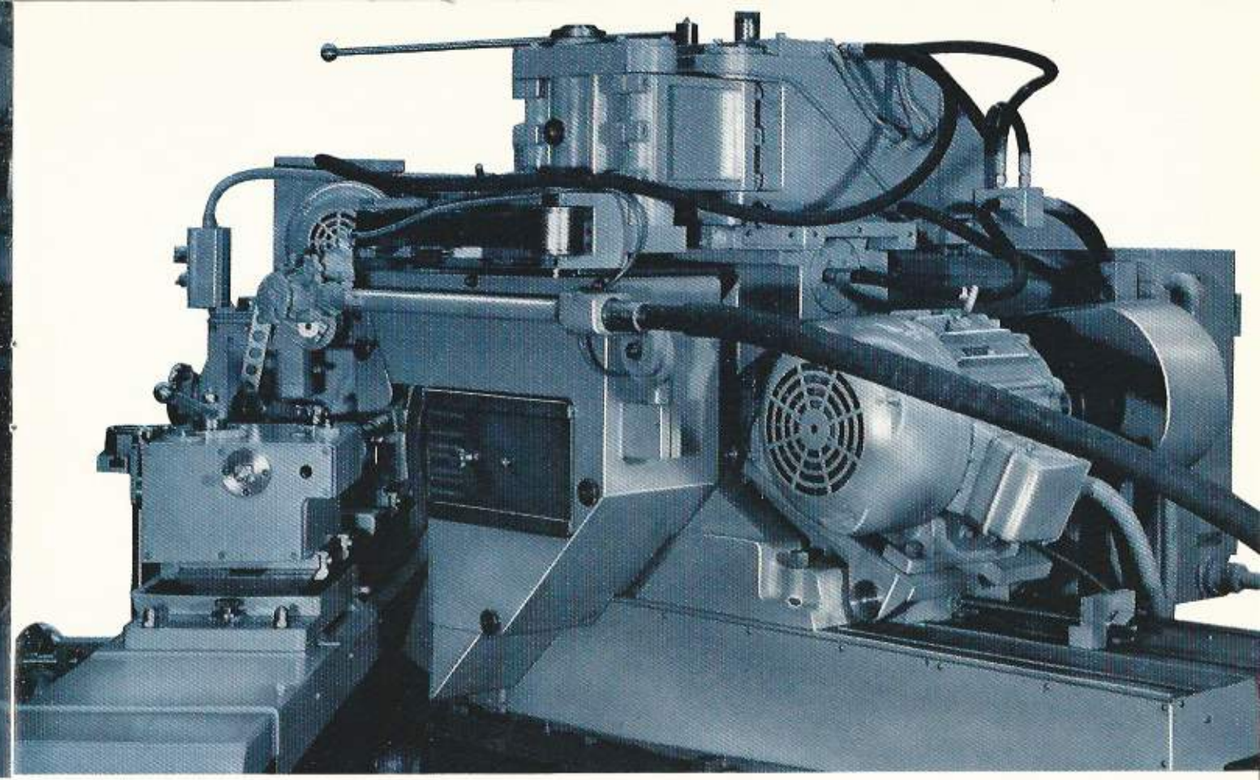
The Newall-Keighley type L12-AA Angle Approach Grinder incorporates all of the features which have been found, from experience, to be necessary in a machine for producing accurate work at a high production rate.

FEATURES OF THE NEWALL-KEIGHLEY L12-AA ANGLE APPROACH CYLINDRICAL GRINDER

- **accessibility for service**
  hydraulic control box, electric panel, separate hydraulic oil supply tank and pump unit are all easily accessible. All valves can be removed individually without necessitating the removal of the control box.
- **angle of approach**
  30°, 45° or 60° according to requirements.
- **automatic feed mechanism**
  steplessly variable hydraulic feed for plunge cut grinding.
- **automatic lubrication**
  to slideways from independent oil supply.
- **centralised controls**
  for the hydraulic system are conveniently grouped on the front of the machine and are easily accessible to the operator.
- **coolant supply**
  by electric pump from a large capacity tank situated at the rear of the machine.
- **dead stop**
  fitted, on standard machines, to automatic feed mechanism for repetition work.
- **hand table traverse**
  arranged through reduction gearing, essential when locating components from a right hand datum face. A hydraulic table motion can be supplied to order.
- **hydraulically operated wheelhead slide**
  giving rapid approach and withdrawal of wheel from work and incorporating anti-backlash device. Quick run-back of wheelhead of either 2", 3", or 4" (51, 76 or 102 mm.) is available.
- **six workhead speeds**
  obtainable through gear box on standard dead centre workhead.
- **spring loaded tailstock**
  lever operated, with adjustable spring tension, equipped with clamp for locking spindle when required.
- **vee belt drive**
  to wheel spindle permitting the choice of two speeds by change pulleys.



The standard dead centre workhead



Rear side view of sturdily designed wheelhead arrangement

CONTROLS

All controls are conveniently situated at the front of the machine and have been reduced to a minimum for ease of operation and to ensure a completely efficient hydraulic control system. The wheelhead infeed lever is interlocked with the workhead motor to permit the component to revolve as the wheelhead approaches. By depressing a knob adjacent to this lever the wheelhead retracts and the workhead stops. By the turning of a knurled knob the rate of plunge feed can be accurately controlled. A wheelhead infeed accelerator lever is placed immediately above the main wheelhead infeed knob and this is employed when there is a variation in the rough size in the components being ground. Alternatively, this lever may be supplied as a feed arrester to permit the wheel to clear itself when grinding larger faces. All motors are controlled by a master push button switch with a supplementary switch for inching the workhead. The hydraulic oil supply tank is placed at the rear of the machine to ensure that any temperature rise of the oil, after continued use, is not transmitted to the machine castings.

DEAD CENTRE WORKHEAD

Drive to the workhead is through a 6-speed gearbox with ground gears mounted on hardened and ground spline shafts. Six speeds are available through the gearbox by using a single handwheel and the actual speed obtained at the workhead spindle is shown in a window behind the control wheel. The standard workhead is suitable for dead centre grinding only but for live centre or chuck work a heavy duty live centre workhead, incorporating a spindle mounted in high precision taper roller bearings, is available. Alternatively, a live and dead centre workhead, having a swivel base, can be supplied if ordered with the machine. The dead centre workhead can be supplied with an automatically retractable, spring loaded centre, in conjunction with special bearings, to the driver plate permitting its use for positive length location.

TABLE

The table is fitted with manual traverse and slides on accurately scraped vee and flat surfaces, automatic lubrication being effected by an oscillating pump from a lubricating oil reservoir. The top table, which can swivel for taper work, is fitted to the upper surface of the bottom table and carries both workhead and tailstock.

Hand traverse of the table is provided through reduction gearing to rack and pinion and is extremely light in operation. A separate fine screw adjustment is provided for final table location.

Hydraulic traverse of the table may be supplied and is operated by a lever situated at the left-hand side of the control panel. The rate of hydraulic traverse is regulated by a control on the front of the machine and has a range of from 3" (76 mm.) to 204" (5182 mm.) per minute. Oil for the hydraulic system is circulated by a constant-delivery gear pump coupled direct to a 2½ h.p. motor.

WHEELHEAD

The exceptionally sturdy design of the wheelhead ensures vibrationless operation. A cartridge sleeve houses the well proportioned nitralloy spindle which runs in precision, taper roller bearings, grease packed to eliminate maintenance problems: the self-contained assembly is especially designed to avoid spindle growth during normal running conditions. The wheelhead slide is hydraulically operated for rapid approach and withdrawal of the wheel from the workpiece. Oil cushions are located at each end of the wheelhead stroke and the cushioning effect is regulated by means of needle valves. A lever at the right of the control panel, on the front of the machine, controls both workhead and rapid approach of the wheelhead slide. Movement of this lever to the right starts the workhead motor and brings the wheelhead forward to the grinding position. A quick-release button stops the workhead motor and withdraws the wheel from the component.

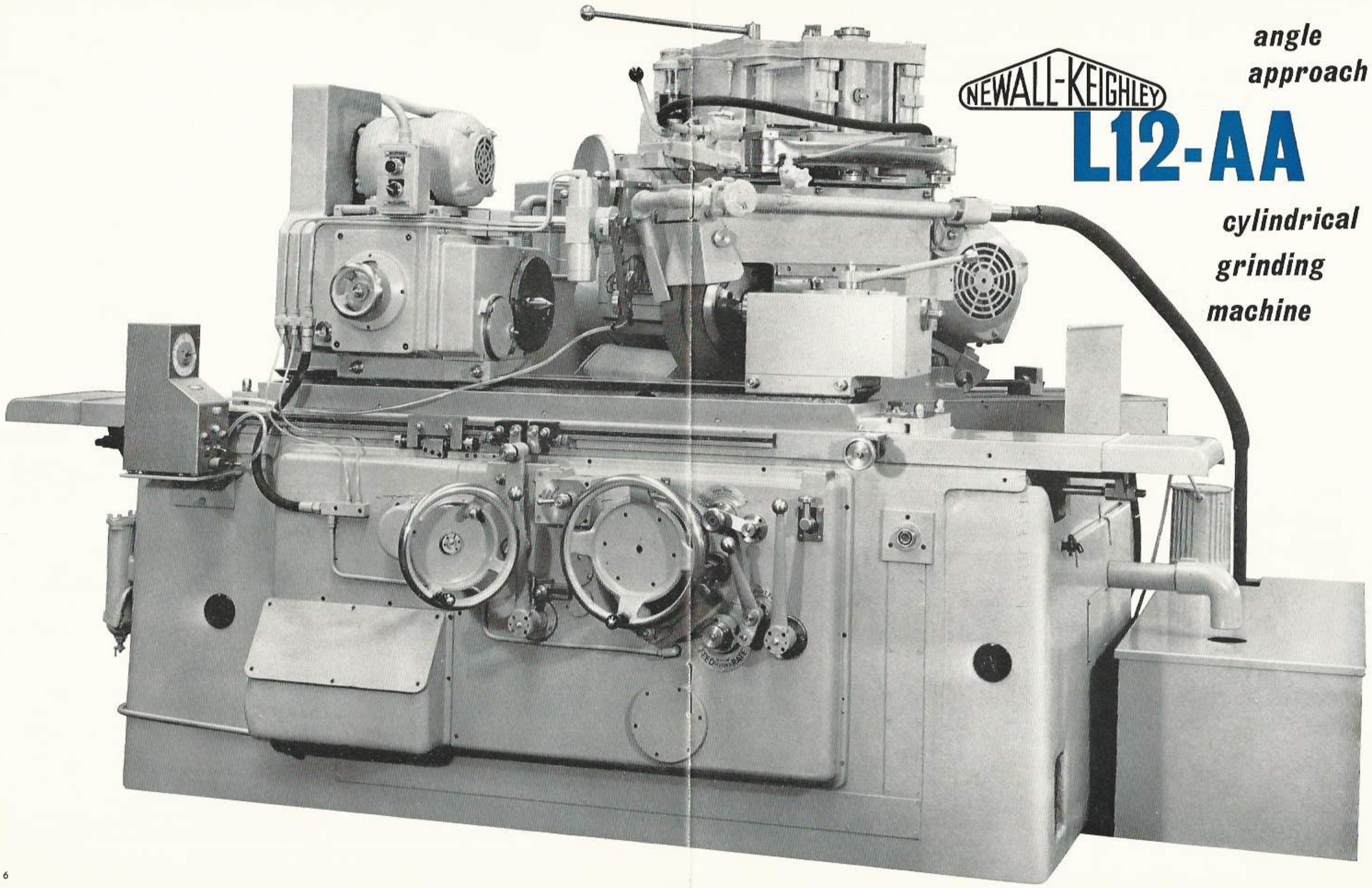
The wheelhead slides on long, accurately scraped, automatically lubricated vee and flat surfaces and is driven through a multiple vee belt drive by a 10 h.p. motor mounted at the rear of the wheelhead. Belt tension is easily adjustable and the correct speed of the grinding wheel is maintained by change pulleys on the wheel spindle.

NEWALL-KEIGHLEY

L12-AA

angle approach

cylindrical grinding machine



TAILSTOCK

The spring-loaded tailstock is of a simple and sturdy design. It has a hardened and ground spindle mounted in a lapped cast-iron bearing. The movement of the barrel is operated externally through a spring-loaded lever. At the top of the tailstock is a locking wheel and the spring tension may be adjusted by means of a regulator on the rear face of the unit. The complete tailstock unit can be clamped securely in any position on the top table. By the cam action of the withdrawal mechanism, the spindle will remain in the withdrawn position, thereby leaving the hands free for the loading of comparatively heavy components. A hydraulically operated tailstock, with pedal control, can be supplied to order.

PLUNGE FEED

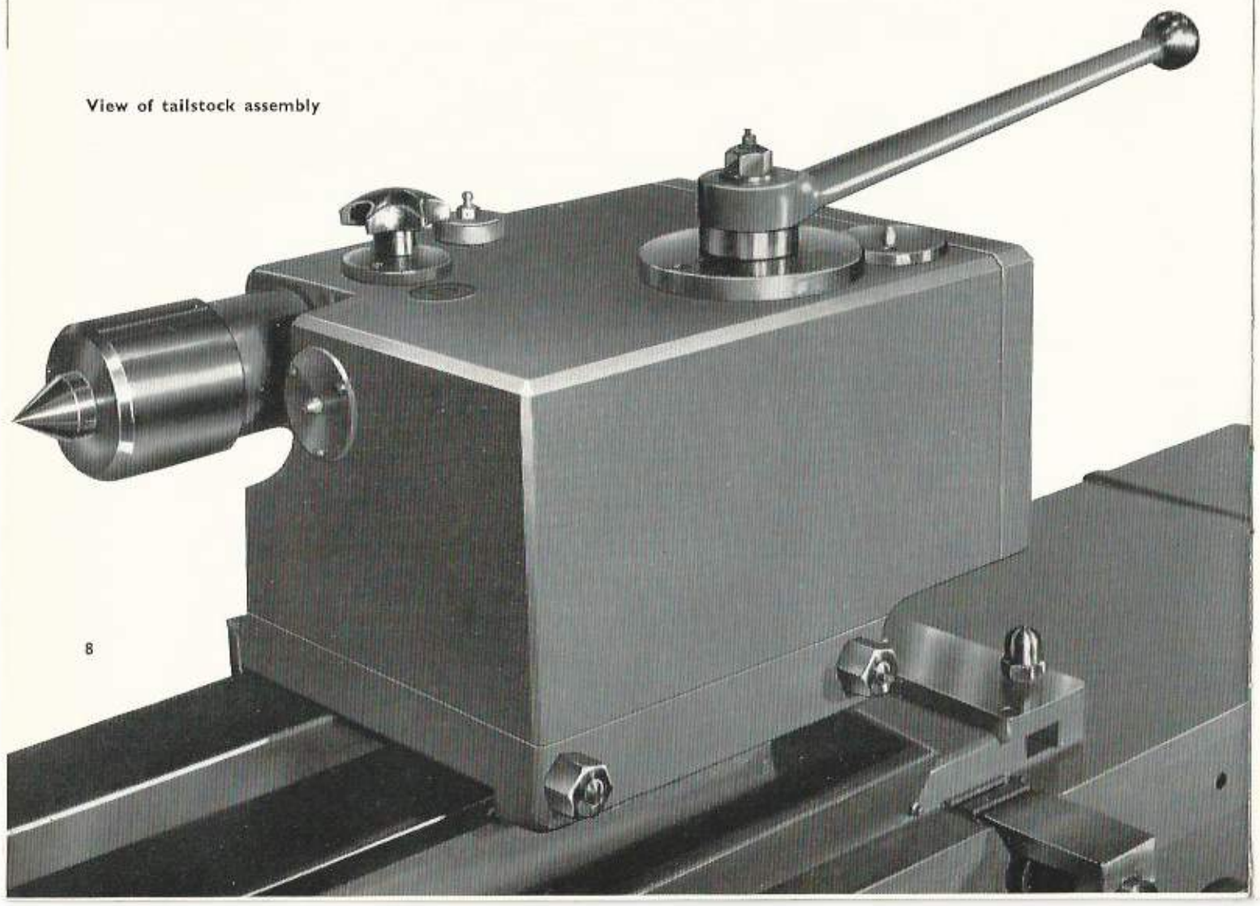
A continuous hydraulic feed for plunge cut grinding is steplessly variable between predetermined limits. The feed dial automatically returns to its initial position when the wheelhead withdraws from the component.

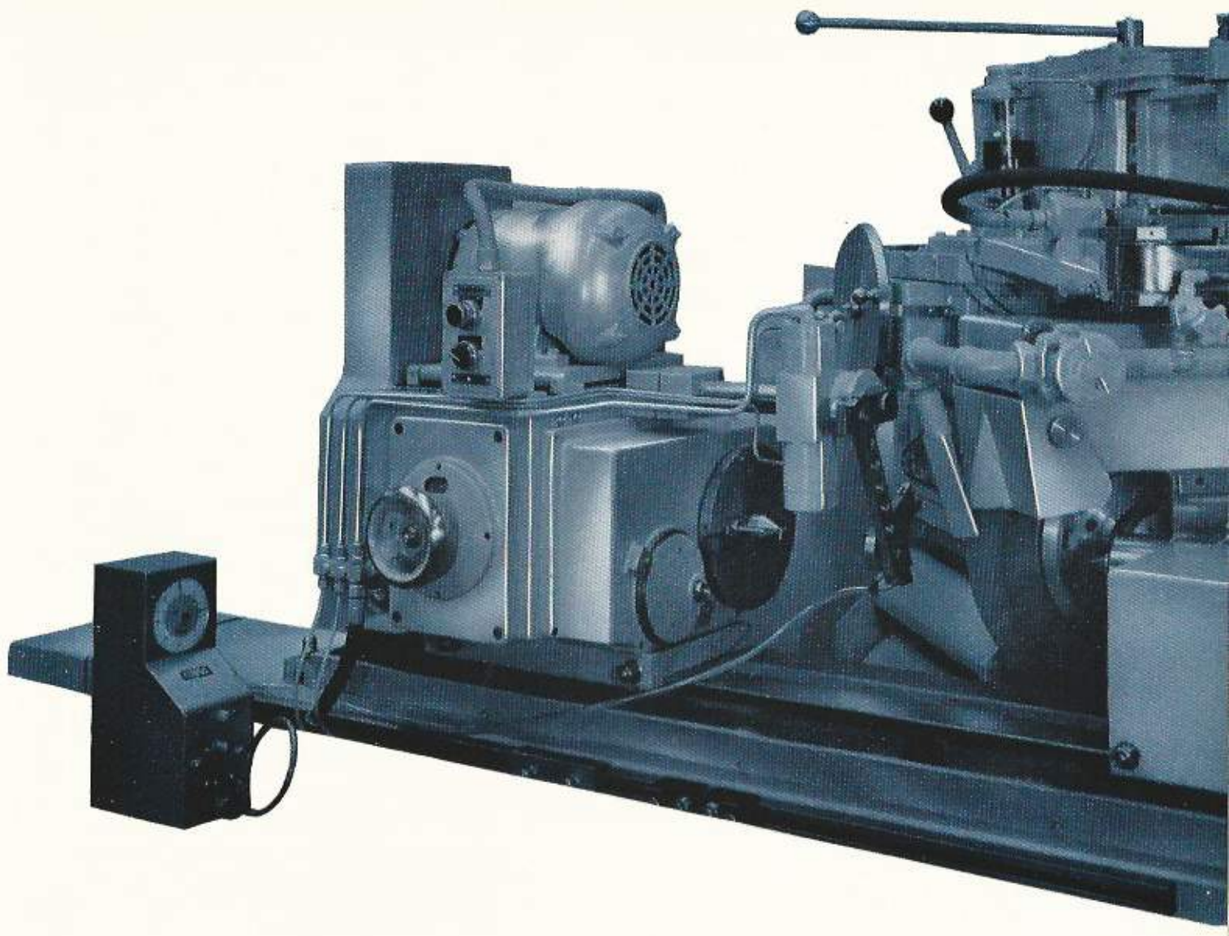
A dead stop is provided to limit the total amount of feed and to ensure accurate control of the final diameter of the workpiece.

COOLANT

Coolant is supplied to the component by means of an electric pump with a delivery rate of 10 galls. (45 litres) per minute. The supply is from a large capacity moveable tank located at the rear of the machine.

View of tailstock assembly

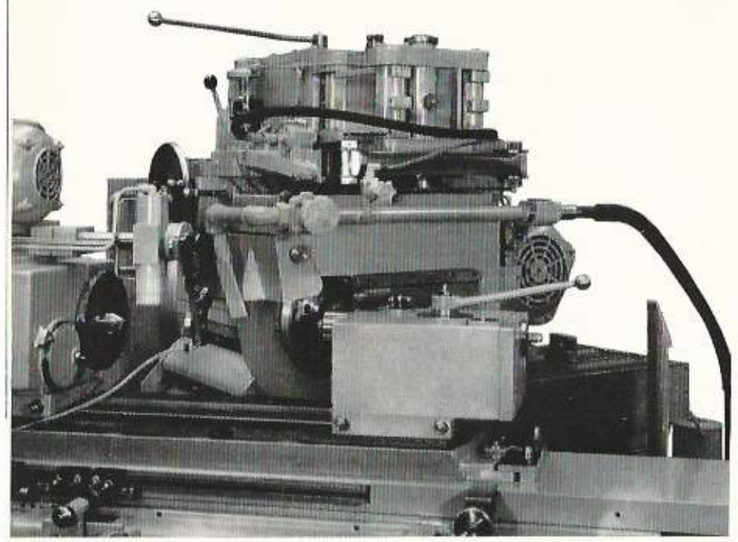




AUTOMATIC COMPONENT SIZE AND MACHINE CYCLE CONTROL SYSTEM

To cater for the requirement of users who specify the addition of such systems to grinding machines, OMT-Etamic pneumatically operated equipment is recommended for installation with the L12-AA Grinder. Of a compact nature and proven reliability, a comprehensive range of units is offered to cover all applications within the scope of the machine and to promote improved accuracy, uniformity of component size and increased output of finish ground components.

In the illustration above, the OMT-Etamic equipment consists of an indicator head, situated lower left, the component sizing caliper combining component size control with automatic approach and retraction from the workpiece.

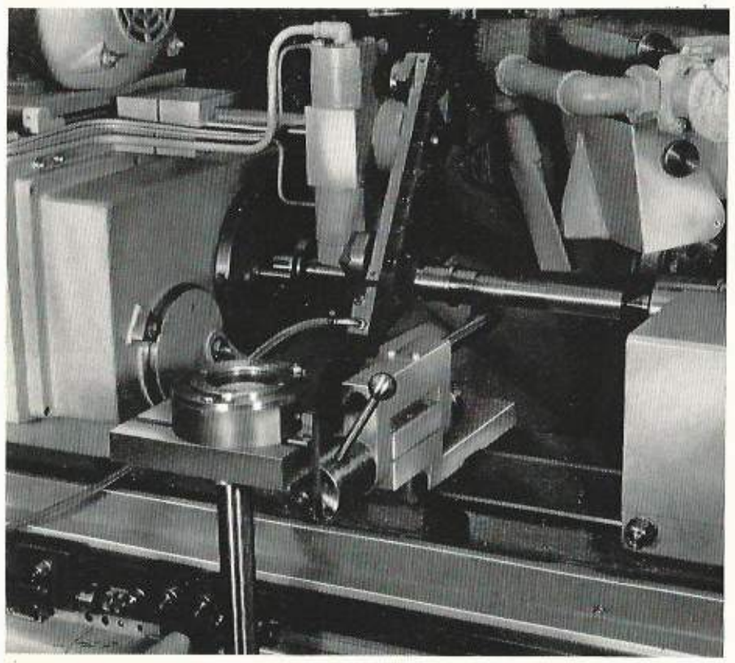


WHEELHEAD-MOUNTED DRESSERS

In addition to the table-mounted wheel truing and forming device a variety of hydraulically operated, wheelhead-mounted dressers is offered.

The range includes straight dressers for truing a single plain peripheral face and universal former-dressers for generating forms on the face and diameter of the grinding wheel.

Illustration depicting sturdy construction of universal former-dresser



Length positioning unit

This attachment is used to indicate the length position of a component in relation to the wheel. Generally for use when a right-hand face is used as a datum.

ABRIDGED SPECIFICATION

Angle of approach	30°, 45°, 60°
Height of centres	$6\frac{1}{16}$" (154 mm.)
Dimensions of standard wheel	20"×2"×8" (508×51×203 mm.)
Maximum width capacity of standard guard	4" (102 mm.)
No. and range of wheel speeds (2)	955 and 1414 r.p.m.
No. and range of work speeds (6)	16 to 235 r.p.m.
Capacity between centres	24" (610 mm.)
Maximum swivel of top table	12° included angle
Rate of hydraulic plunge feed	Infinitely variable
Quick run-back of wheelhead	2", 3" or 4" maximum (51, 76, or 102 mm.)
Wheelhead motor	10 h.p.
Workhead motor	$1\frac{1}{2}$ h.p.
Floor space required	176"×79" (4·4×2·0 metres)
Nett weight (approx.)	10528 lbs. (4785 kgs.)

STANDARD EQUIPMENT

- Balancing mandrel
- Change pulleys for wheelhead
- Diamond holder (without diamond)
- Set of foundation bolts
- Set of keys
- Set of spanners
- Set of splash guards
- Set of standard wheel flanges
- Two No. 4 Morse taper centres (Full)

EXTRA EQUIPMENT

- Auto dressing cycle
- Balancing stand
- Centre grinding attachment
- Heavy duty live centre workhead
- Hydraulically operated tailstock
- Live and dead centre workhead with swivel base
- OMT-Etamic sizing control systems
- Time sizing device
- Wheelhead-mounted hydraulic former dresser
- Wheelwear compensating arrangements