J.H. FLETCHER & CO.

PRODUCT NEWSLETTER

2016 ISSUE 1

MESH HANDLING AND BOLTING SIMULTANEOUSLY – MODEL N3016–AD/E AT ELKO

Fletcher® machine designs are largely dictated by mine conditions and individual customer needs. Developing numerous designs over the years, Fletcher now carries a full range of bolters, capable of working in headings as low as 6.5′ and as high as 40′.

Due to Fletcher's background in custom machine designs, Small Mine Development (SMD) tasked the engineering department of J.H. Fletcher & Co. with the design and manufacture of a mechanized roof bolting machine with the ability to simultaneously perform mesh handling and bolting. Through this process, SMD was supported by a Fletcher representative, a team of engineers, a crew of build technicians, and a fully-staffed service department.

The Fletcher model N3016–AD/E was built for mine use in the western United States. This machine was Fletcher's first to enter the Nevada market. The new machine is designed for headings as small as 10′ × 10′ (3.05 × 3.05 m).

The objective was to produce a machine capable of drilling and installing mesh simultaneously, with a single operator. The goal of the mine was to decrease the time to install mesh and bolt a cut, improving the safety level of their current roof bolting method, improve efficiency and to improve the bottom line cost.

To address safety concerns, the N3016–AD/E was designed to allow the operator to remain under a protective canopy for additional protection from rock falling while bolting, and while installing mesh. Once the bolt carousel is loaded, drilling and bolting are both performed from the operator's deck. The machine can also be equipped to handle resin insertion from the operator's deck. The option of an enclosed, filtered cab is also available, providing a cleaner and quieter working environment. Unlike most commercially available air conditioning/heating systems, the Fletcher air conditioning/heating system filters both recirculated air and the make-up air with a high efficiency filter, working to provide the operator added protection from high noise levels, diesel particulate matter, and ambient mine dust.

To improve efficiency, the boom has the ability to lift, swing, and extend, allowing multiple installations from one chassis position. The machine is equipped with a KRM module, with single-pass, chain-driven drill and bolt feeds, featuring independent crowd on both drill and bolt feeds, allowing versatility in narrow headings. The compact design is made possible by utilizing the low profile HV–32 Rock Drill. The HV–32 is a low profile, rotary percussive drill head designed specifically for roof bolting applications. The drill has already found success in coal, limestone and salt mines. The low frequency, high impact nature of the percussion cycle, allows drilling in hard-to-penetrate rock.

The release of the N3016–AD/E into Nevada, was recently featured in the Elko Daily Press. SMD General Manger, Keith Jones was quoted calling Fletchers a "good, very responsive group."

CONTACT

J.H. Fletcher & Co.
Box 2187
Huntington, WV 25722–2187
www.jhfletcher.com

IN THIS ISSUE

FIRST SIX HEAD ROOF AND RIB BOLTERS UNDERGROUND IN ILLINOIS BASIN

In underground mining, it is necessary to support the roof to prevent areas that have already been mined from collapsing. Since the 1950's the primary method for supporting the roof has been the installation of roof bolts. Roof bolting is one of the most basic and necessary functions in an underground mining operation. Founded in 1937, J.H. Fletcher & Co.'s product line has long reflected a great interest in the growth and expansion of roof control equipment since its introduction. Fletcher was a major player in the development of current methods used today.

Today, Fletcher machine designs are predominantly dictated by mine conditions and individual customer desires. This explains why when a Midwestern U.S. operation needed a custom piece of equipment, they consulted Fletcher. They tasked the engineering department of J.H. Fletcher & Co. to design and manufacture a new roof bolting machine with six independent drilling apparatus on board capable of drilling and bolting the mine roof and side walls (rib) simultaneously. The machine was also to be equipped with material handling.

This would be the first Fletcher six head machine to be designed and built for mine use in the United States, intended to work in the Illinois Basin. The mining method used at this particular mine is room and pillar with coal being extracted by way of a continuous miner, followed by a dual boom CHDDR style bolter which would install mesh and rib bolts. The entry width of their operation is 18′–20′ (5.49–6.1 m), with a mining height of 8′–14′ (2.44–4.27 m).

The objective was to produce a machine capable of drilling and installing six bolts simultaneously, with a limited number of operators. The goal of the mine was to decrease the time to bolt a cut, which in turn would improve the safety level of their current roof bolting method. They also hoped to improve efficiency and the bottom line cost of entry development. The customer wanted the

capability to install rib bolts, thus meeting the customer's request: a machine with four drillheads at the front of the machine for installing roof bolts and two separate drillheads dedicated to rib bolts.

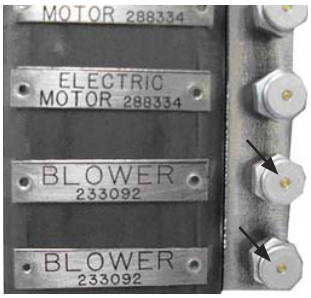
This design allows fewer operators to drill and install roof and rib bolts, which in turn lowers the miners' exposure per cut. The machine was designed to reduce the operator's exposure to inherent pinch points and rotary hazards once the operator has engaged the latched drilling. Therefore, the machine will help to decrease the time to bolt a cut, improving productivity while enhancing the ability to operate the machine safely.

The final result is a machine with a single platform and six independent masts and drillheads; four masts strictly for drilling and installing roof bolts on the front of the platform and two masts on the back of the platform for rib bolts. The feed and rotation controls at each operator's station include a latch control for drilling. The rear of the machine is equipped with material handling. There are two material pods with winch controls as well as a mesh rack that includes mesh lift, mesh tilt and mesh sump.

GREASING OF ELECTRIC MOTORS AND BLOWERS ON FLETCHER ROOF BOLTERS

The bearings in electric motors and also the bearings used in the blowers in the dust collection system operate at a relatively high temperature and therefore require the use of specialty high temperature greases. Fletcher uses ***Shell Gadus S5 V100 #2*** grease for both of these applications. In addition to requiring a specialty grease, both of these applications require a specific greasing routine. Because of this, Fletcher installs special button-head grease fittings on the lube points for electric motors and blowers to prevent inadvertent use of improper grease. The proper end fitting for a grease gun to use with the button head grease fitting is JHF# 123486.

Electric motors do not typically have shaft seals on the motor shaft. Therefore, when grease is pumped into the bearing cavity, if there is no place for the old grease to easily escape; then the grease will flow into the rotor area and could damage the motor.



The shaft end bearings of the blower are grease lubricated, above left. Location of blower grease fittings, above right.

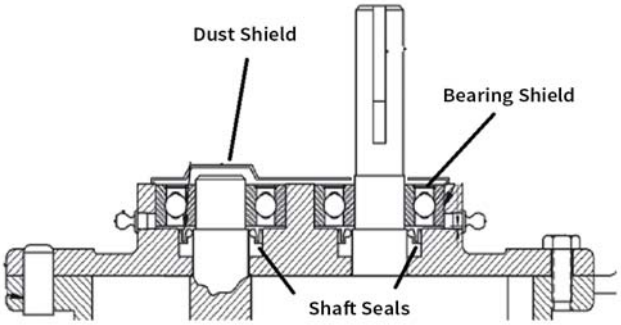
For this reason, the electric motor is equipped with a second grease drain port located 180 degrees from the grease port. When greasing an electric motor, the plug should first be removed from the drain port to provide a low resistance bleed port for the old grease before pumping any new grease into the grease port. On Fletcher equipment, it is often difficult to access the grease drain port on the motors, so we install a grease relief in-line so that it is not necessary to remove and reinstall the drain plug.

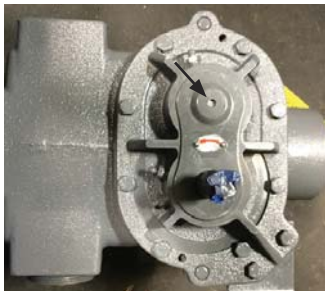
The bearings only require a few pumps of grease. Just pump grease into the bearing until grease begins to flow out of the bleed port. Never use an automatic grease gun on motor bearings. The high rate of flow from an automatic gun can over pressurize the grease cavity and cause grease to enter the motor rotor area.

BLOWER BEARING GREASING

The bearing cavities on the 2504 DVJ Blowers used on the dust collection system are not equipped with a standard grease bleed port. Both bearings are equipped with synthetic shields on one side to help prevent dirt ingress from the outside; however, they will allow grease to flow out of the bearing from the inside. A thin, kidney shaped dust cover with a grease bleed port is held in place over the bearings with 2 rivets. Shaft seals are used to prevent grease from being pumped from the bearing cavities into the blower lobe chambers.

The driven shaft bearing has two grease ports which are common. Currently Fletcher leaves a standard zerk grease fitting in one port and connects the other port to a remote button head grease fitting. The non-driven shaft bearing has only one grease fitting, which also connects to a remote button head grease fitting. When grease is pumped into any of the grease fittings, excess grease pumped into the bearing chamber escapes via the grease bleed port, the bore around the shaft, or by lifting the kidney-shaped thin metal dust shield covering the bearings, allowing the grease to escape around the dust shield. Although the dust shield does have one grease relief hole, the grease will typically lift the shield if it is pumped in quickly, before it can flow out of the hole.




Grease bleed hole in dust shield, above.

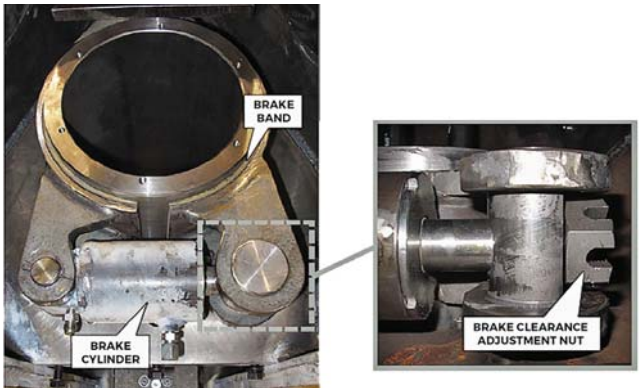
When adding grease to a blower, you are only trying to replace any grease that might have been lost from the chamber during use. When adding grease to a blower, you should only need to add 2–3 pumps of grease. As soon as grease is seen escaping from around the edges of the dust shield, no more grease should be added. Never use an automatic grease gun on blower bearings.

PROPER TENSIONING OF BLOWER V-BELTS IS CRITICAL. TO PREVENT BROKEN SHAFTS, USE JHF# 43611 GAUGE TO APPLY 10–12 lb (3.7–4.3 kg) OF FORCE TO THE BLOWER DRIVE BELTS.

MODEL 4250 SCALER – PROPER ADJUSTMENT OF THE TOOL ROLL BRAKE CYLINDER

There are two holding systems in the tool roll circuit on the Model 4250 Scalers: a motion control valve and a brake cylinder. The motion control valve has two counterbalance valves that are pre-set by the valve manufacturer and should not be readjusted. The brake cylinder is a spring-set / hydraulic-release type of cylinder. This cylinder is used to operate the tool roll brake band. When the tool roll is actuated in either direction, pressure is applied to the brake cylinder (releasing the brake), allowing the tool to roll.

A mechanical adjustment of the brake cylinder involves setting the clearance between the brake band and drum while having the tool roll actuated. It is essential that the brake cylinder be properly adjusted (an adjustment procedure is located in the service manual). Clearance should be rechecked after every 250 hours of machine operation. If the adjustment is too tight, the brake band will not fully open when the tool roll is actuated. This will result in excessive wear and reduced operating life of the brake band.



J.H. FLETCHER & CO. AT MINEXPO 2016

We encourage you to visit J.H. Fletcher & Co. this year at MINExpo 2016 — the world's largest mining show. The show will take place this September at the Las Vegas Convention Center. Fletcher will be showcasing some of the latest designs in narrow vein equipment. Stop by and see us in booth #2615 to discuss your next custom project.

CUSTOMER SATISFACTION SURVEY

In keeping with the philosophy of continuous improvement and Fletcher's commitment to meeting the voice of the customer, we have established an online Customer Satisfaction Survey located on our website at: **www.jhfletcher.com/customerservice.html**.

We will use your feedback to improve the quality of our products and services. In return for your time and opinion, we will provide you with a Fletcher hat and Quality Assurance Sticker.

JOB OPPORTUNITIES

Information on job opportunities and how to apply can be found on our website at **www.jhfletcher.com**.
(AA/EEO Employer)

FLETCHER ON THE WEB

For the most up-to-date news, visit our website at **www.jhfletcher.com**!
There you can access our Literature, Newsletters, Bulletins, and Published Papers. Also, be sure to check out our newly added section featuring Technical Information Documents. Our site is constantly being updated, so check back often for the latest news and information.

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J.H. FLETCHER & CO.
BOX 2187
HUNTINGTON, WV 25722–2187