

ASEA MANIPULATOR

12-13-78 - RBH

All of the manipulator hardware ordered, has been received, and the unit is completely functional.

Jaws were made to fit the standard gripper to clamp on the end of centerfire Barrel blanks. The manipulator was programmed to simulate the machine loading of an Ajax upsetter, to demonstrate the unit's capabilities. The very successful test consisted of picking up a 1.031 - 1.036"  $\phi$  blank about 20" long, from "V" blocks, and after some demonstration maneuvering, the bar was inserted through a 1.063" hole, a distance of 12". The machine capability in both strength and accuracy appears much better than advertised.

A dial test stand has been built to check the O. D. position accuracy on a series of M/742 Receivers, as they are picked up and clamped internally with the A SEA designed gripper. From the test data we can determine what, if any, surface position feedback into the manipulator computer, might be necessary for individual Receivers, to assure relatively constant material removal during polishing. This test work has been started.

The polishing development area has now been moved to building 72-1 & a floor layout is being circulated. A protection wall or barrier will be necessary to insure the safety of curious people as this work progresses. The (2) surplus Devine polishing jacks that were part of the semi-automatic Shotgun Receiver radius polishers will be used for part of this work. Transfer arrangements are under way.

Two additional machines plus a dust collector remain to be procured. Acme has quoted, however their equipment appears more cumbersome and not as versatile as the Devine equipment observed during a recent visit. Devine's quote will be in shortly. Both prices are comparable.

**CENTERFIRE RIVETLESS EXTRACTORS**

12-13-78 - RBH

Tooling to coin an Extractor anti-rotation surface into M/7400-7600 Breech Bolts has been designed and is being built by the Model Shop.

A Purchase Order has been given to H & P to provide 1000 Regular size rivetless Extractors to be made on temporary tooling. These will have the preferred .033" thick section under the claw. Delivery is expected in late February 1979.

20 rivetless Extractors of all three sizes - Magnum, Small & Regular have been completed and are awaiting heat treatment. These have the current .024" thinner section under the claw. Comparable Bolts are being produced for adverse condition testing. All Centerfire Rifles except the M/742-760 will be tested.

The first Small rivetless Extractor has been functioned tested to 100 rounds in an XP-100 with no extraction or ejection problems occurring.

P. E. & C. has been furnished with all pertinent rivetless Extractor and Bolt Head modification information so that they can provide an estimate of tooling cost requirements along with new process sheets to I. E. for an economic evaluation.

AUTO-DRILL LINE

H/AS BEEN SIGNED &amp; SENT TO THE VENDOR

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The order for a turnkey chip system to collect chips, recover their retained oil, and do all preliminary oil filtration ~~is being sent to Bridgeport today~~. It was accompanied by a 5-page dissertation on the research involved in choosing the vendor. It is anticipated that the fabrications to be cast into the floor concrete, will be available for installation in April 1979, to the vendor's drawings.

Sandvik was visited on 12/5 when they were starting life tests on .906"  $\phi$  Ejector drills on 11.9" blanks of  $1\frac{1}{2}$ "  $\phi$  C-1140 Mod. steel. These will become useable 870-12-30 GFM blanks after turning. The test heads were fabricated from Sandvik's choice of carbides, which differ from our specs. In a surprise to them, they were able to drill over 300% further, than they had predicted. These results may make Ejector Drilling with its throw-away heads, an attractive alternative, to replace the proposed twin-jet two-flute spade type drills which require regrinding.

The Wagner Saw people were also contacted on this trip, to review the inclusion of of their controls into the overall automation. Considerable thought must be given to the handling of emergency stops for any reason, plus the subsequent start-up sequencing, to avoid cutter breakage or handling jam-ups.

All the operating units, no matter what source, will be tied together electrically from one main operating console for automatic operation. Complete system emergency stop buttons will be placed in several convient locations, within the area. In addition, each will be functional in a manual mode from its own panel.

*Updated 12/21/78  
by [signature]*

M/1100 INTEGRAL FORMED EJECTORS

12-13-78 - RBH

Ejectors with a 30° rearward inclined surface were formed into several 12 Ga. - 2-3/4" Barrels at various positions along the extensions. During field testing, those from the current Ejector position to .100" rearward produced malfunction free ejection.

A few 12 Ga. Magnum Barrels with contoured ports have been produced with the formed Ejectors, but, as is the case with the current pin type Ejector, testing, so far has not produced satisfactory ejection.

It appears that considerable testing will still be needed to determine an optimum formed Ejector, both in position & surface angle to satisfy all gages, and all shell lengths, in both standard & contoured ports, using all brands of shells.

It is evident, however, from the limited testing done, that with the right combination of position and surface, that satisfactory ejection can be accomplished. The formed Ejector appears to withstand wear as good and perhaps better than the pin type. Ejector marking on the shell bases is negligible even on 12 Ga. - 3" Magnum fired cases.

Temporary tooling is now being made to test other inclined & compounded angle ejection surfaces to investigate an optimum combination. Permanent type tooling for the M/1100 Lt.-20 Barrels is being designed, which could be used for regular production, once the optimum has been established.