

## B STUD DRIVER

### DESCRIPTION, OPERATION, AND MAINTENANCE

CONTENTS	PAGE
1. GENERAL . . . . .	1
2. DESCRIPTION . . . . .	1
3. PRECAUTIONS . . . . .	1
4. OPERATION . . . . .	4
DETERMINING SUITABILITY OF BASE MATERIAL . . . . .	5
FASTENING IN CONCRETE . . . . .	5
FASTENING IN STEEL . . . . .	6
SELECTING PROPER FASTENER . . . . .	6
5. MAINTENANCE . . . . .	6

#### 1. GENERAL

**1.01** This section describes the B Stud Driver and the B and C Power Loads and specifies safe methods of using them. The B Stud Driver is intended for use in outside plant applications only and is not intended for use by central office personnel.

**1.02** The B Stud Driver is a tool that utilizes an explosive power load for use in driving masonry fasteners into steel or concrete. The tool has been designed so the chamber will accept only the B and C Power Loads.

**1.03** Stud drivers authorized for use will have BELL SYSTEM B with the manufacturer's name or trademark printed on the tool, will be listed by Underwriters' Laboratories, Inc. with their label affixed to the tool, and will have BELL SYSTEM, AT-8435, B STUD DRIVER and the manufacturer's name or trademark printed on the carrying case. Stud drivers that do not bear these markings are not authorized for use.

**1.04** The information in this section parallels in part information in the manual furnished with the stud driver by the manufacturer. The information contained in this section shall take precedence over the manufacturer's manual wherever differences occur.

*Warning: Do not attempt to operate the B Stud Driver until this section and the manufacturer's manual have been thoroughly studied and personal instruction has been received from an authorized instructor.*

#### 2. DESCRIPTION

**2.01** The B Stud Driver is a powder-actuated, *low-velocity* tool that utilizes the energy from a special cartridge (the B or C Power Load) to drive a piston that acts as a hammer which sets a masonry fastener into steel or concrete. A typical stud driver is illustrated in Fig. 1.

**2.02** The stud driver is supplied in a metal carrying case that shall be locked when the tool is not in use to prevent unauthorized use of the tool. Included in the case are cleaning equipment, accessory items, an instruction manual, and a copy of Bell System Practice 075-130-301. A typical tool and items supplied are illustrated in Fig. 2.

**2.03** The B and C Power Loads are for use only in the B Stud Driver. They consist of an explosive charge in a rim-fire, crimped, cartridge case that is encased in a plastic jacket. The plastic jacket is color-coded for identification. The B Power Load is a level 2 light power load with a brown jacket. The C Power Load is a level 3 medium power load with a green jacket. Power Loads are illustrated in Fig. 3.

#### 3. PRECAUTIONS

**3.01** Only craftsmen properly trained, as defined in this section, shall be authorized to operate the stud driver. Any authorized person with a stud driver in his possession shall neither allow

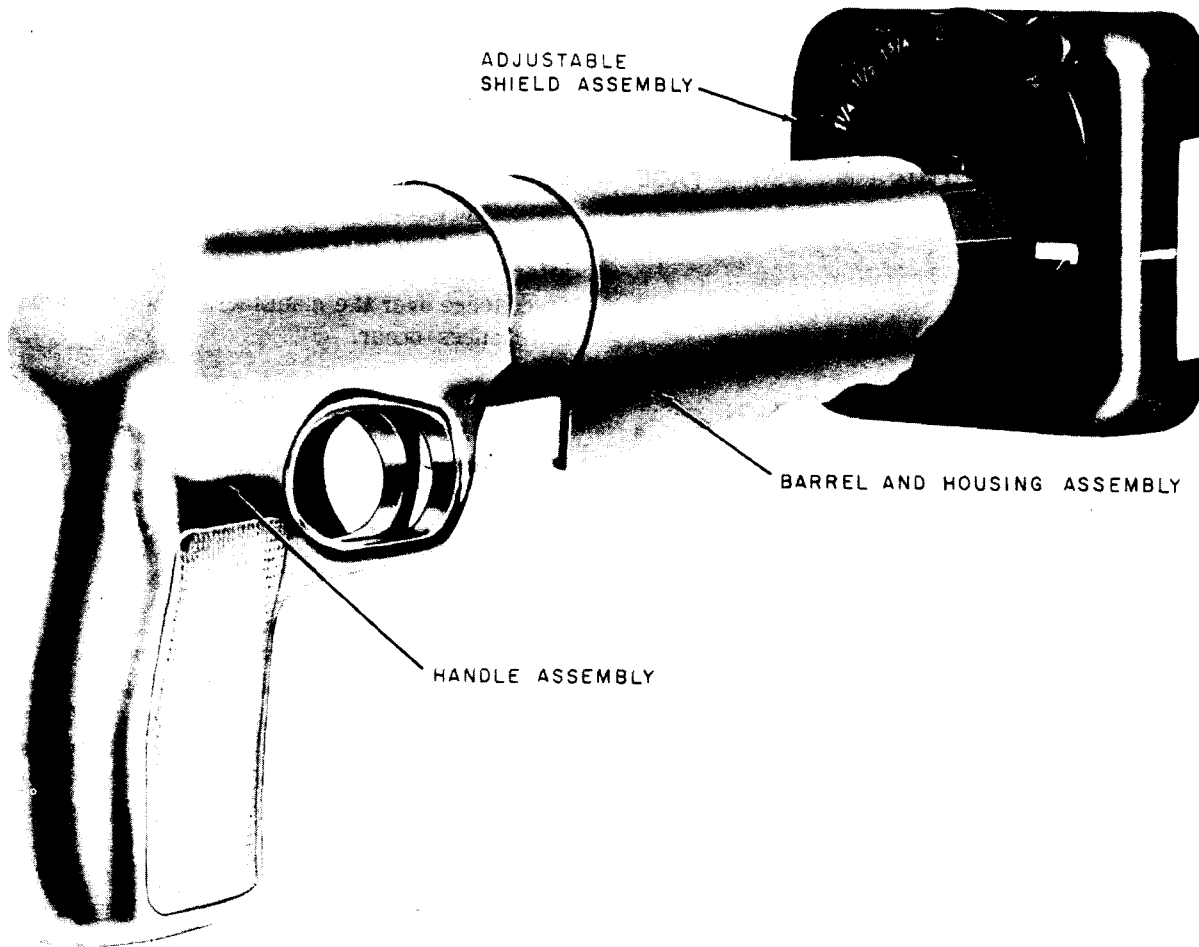


Fig. 1—Typical Stud Driver

unqualified persons to operate or handle the driver nor leave the driver where it will be accessible to unauthorized persons.

**3.02** If the stud driver develops any defect during use, the craftsmen shall *immediately* cease to use it and shall return it for repair in accordance with local instruction.

**3.03** Do not attempt to alter the driver in any way or to operate it with any attachments other than those specifically designed for use with the tool and furnished as a part of the tool.

**3.04** Do not load the stud driver until ready to use it. If work is interrupted after loading,

unload the stud driver immediately. The stud driver shall never be moved from job to job or carried from one location to another while it is loaded.

**3.05** Any person either operating the stud driver or in the proximity of the tool while it is being operated shall wear special eye protection (B Plastic Goggles or equivalent).

**3.06** Never point the tool at yourself or any other person. Handle the stud driver as if it were a loaded gun.

**3.07** Keep face and hands away from the sides of the shield when firing the tool.

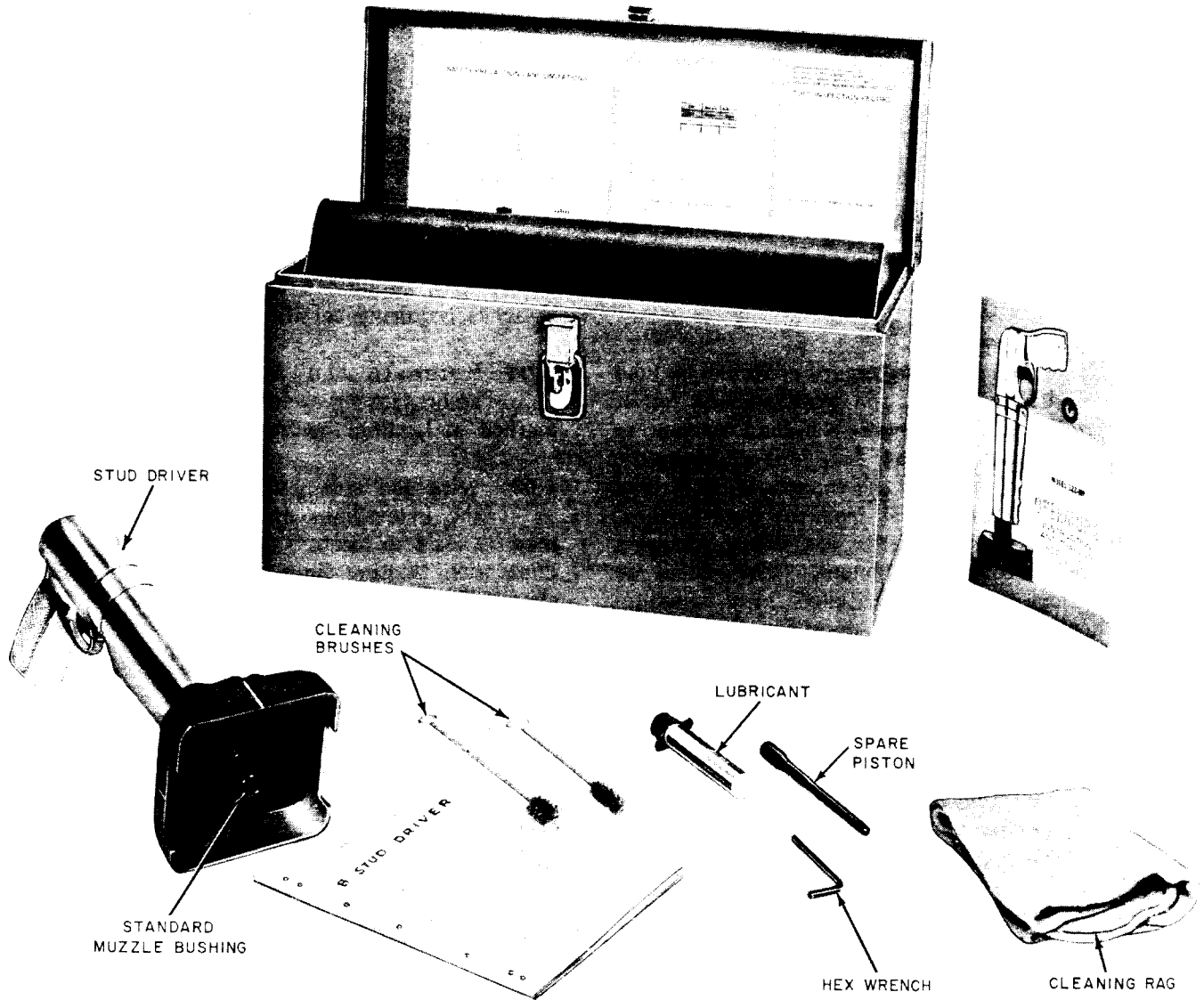
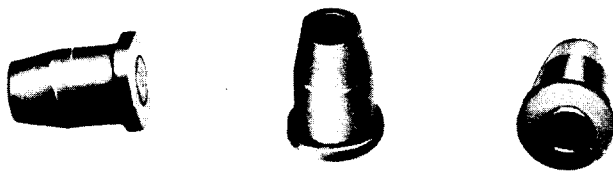


Fig. 2—B Stud Driver—Typical



NOTE:  
 BROWN LOAD IS A LIGHT CHARGE.  
 GREEN LOAD IS A MEDIUM CHARGE.

Fig. 3—B and C Power Loads

3.08 Do not use the stud driver in manholes or in any area where an open flame or torch would not be permitted.

3.09 Do not attempt to drive a fastener through an existing hole or too close to the edge of any work surface. *Drive at least 2 inches from the unsupported edge of concrete and 1/2 inch from the unsupported edge of steel.*

3.10 Be sure the tool is perpendicular to the work surface when it is fired. This will

## SECTION 075-130-301

keep spall, dust, dirt, and other fragments from escaping.

**3.11** Do not attempt to drive a fastener into a spalled area in concrete where a previous fastener has failed. Select a new location at least 2 inches from the spalled area.

**3.12** Fasteners shall be driven into concrete, concrete blocks, or structural steel only. Never drive a fastener into wood, fiberboard, or plaster walls or into any similar material. Do not drive fasteners into aluminum. Do not drive fasteners into stone.

**3.13** If a misfire should occur, continue to hold the driver against the work surface for at least 30 seconds. Then make a second attempt to fire. If this attempt should fail, wait an additional 30 seconds, open the tool, and remove the cartridge before moving the tool away from the work surface. Defective cartridges or misfires shall not be discarded into trash or refuse containers. They shall be rendered inactive by being soaked for a minimum of one hour in a light oil (SAE #10 or lighter) and then returned to the storeroom for transshipment to Western Electric Company. If as many as five loads from any one box of fifty should misfire, render the misfired loads inactive, and return them and the remainder of the loads in the box to the storeroom for transshipment to Western Electric Co. Any container used for transshipment of power loads must be marked:

### EXPLOSIVES

(*Quan.*) Misfired Power Loads Rendered Inactive

(*Quan.*) Power Loads Unfired ACTIVE

### FOR DISPOSAL

**Caution:** *Power loads, either active or inactive, must not be shipped by mail or parcel post.*

**3.14** To release a loaded tool that has jammed in the firing position, hold the shield firmly against the work surface and pull back on the handle assembly. Remove the load, then the fastener, and return the tool for repair.

**3.14** Do not carry the B and C Power Loads in a pocket or container with fasteners or

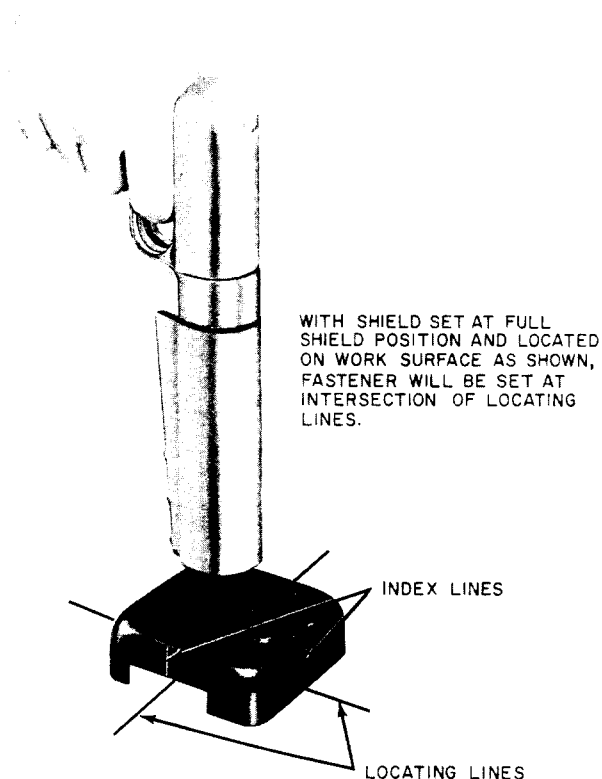
other metal objects. Keep the loads in their original container until they are used.

## 4. OPERATION

**4.01** Before using the B Stud Driver on the job, an individual shall be trained by a qualified instructor and, when the training has been satisfactorily completed, issued an operator's card. Instructors shall be trained and issued certificates by qualified manufacturer's personnel or by Bell System training personnel and/or by state or local government authorities or their designated agents in areas requiring certification.

**4.02** Refer to the manufacturer's manual accompanying each stud driver for the proper method of loading the tool.

**4.03** With the shield at the full shield setting, the index lines on the sides of the shield may be used to locate studs by aligning the index lines with locating lines on the work surface as shown in Fig. 4.



**Fig. 4—Positioning Stud Driver on the Work Surface**

**4.04** The shield shall be used in the full shield setting for maximum protection against flying particles of spall, dust, etc. If it is necessary to adjust the shield to set fasteners close to a wall, the shield shall be tight against the wall and held squarely against the work surface to give proper protection against flying particles.

**4.05** The stud driver may be used with any one of several muzzle bushings. The muzzle bushings supplied with the tool are:

- (a) A standard bushing or bushings for use with B, C, or D Masonry Fasteners
- (b) A bushing for use in attaching wire loops.

**Note:** When using the bushing for attaching wire loops, place the fastener in the bushing first. Then place the wire loop securely in the bushing. Fig. 5 illustrates a B Wire Loop in the muzzle bushing.

#### DETERMINING SUITABILITY OF BASE MATERIAL

**4.06** Before using the stud driver, it must be determined that the base material will be of sufficient thickness and density to prevent the fastener from passing through and going into free flight. Concrete must be twice as thick as the fastener shank is long with a minimum thickness of 2 inches, and steel must be thicker than the diameter of the fastener shank. Also, the base material must not be so hard that the fastener will not penetrate properly.

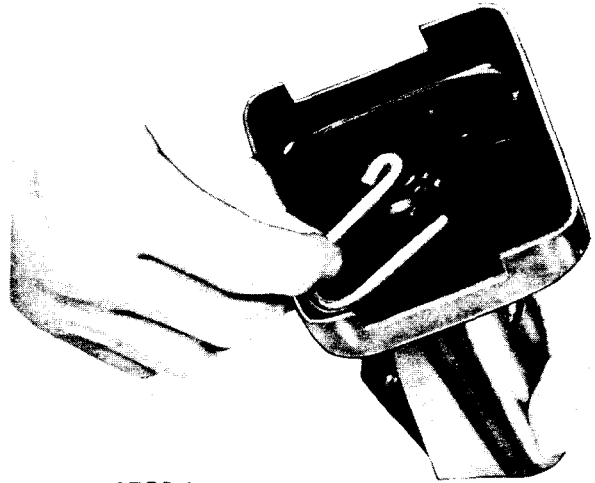
**4.07** To determine whether a base material is suitable, make a test using a light hammer and a fastener as a center punch. If the material is not marked but the fastener point is blunted, the material is too hard; if the fastener penetrates too easily, the material is too soft; and if the material shatters, it is too brittle. Do not use the stud driver on these materials.

**Note:** Discard fasteners that have been blunted. The blunted point will affect the penetration characteristics and could reduce the holding power of the fastener.

**4.08** After determining that the base material is suitable, it is advisable to make a test shot using the brown (light) load to be sure the selected



STEP 1  
PLACE MASONRY FASTENER  
IN BUSHING FIRST.



STEP 2  
BE SURE WIRE LOOP IS HELD  
BY SPRING LOADED CATCH.

**Fig. 5—Placing Fastener and Wire Loop in Muzzle Bushing**

fastener will penetrate properly and give maximum holding power.

#### FASTENING IN CONCRETE

**4.09** Fasteners should penetrate into concrete to a minimum depth of 1 inch to assure maximum holding power. In very dense concrete, the 3/4-inch

fastener may be used but only if the 1-inch fastener will not set properly. If, on occasion, a fastener is not completely set on the first attempt, it is permissible to place a brown power load in the chamber, position the muzzle directly over the partly set fastener, and fire the second time.

**4.10** New concrete requires approximately 28 days to reach its full compression strength. Therefore, fasteners set in concrete that has not cured will develop less than their potential holding power. Do not set fasteners in concrete that is less than 4 days old.

**4.11** Fasteners set in cement or cinder blocks must not penetrate into the hollow space in the block. Fasten in solid sections only. On brick construction, fasten in horizontal mortar joints only. Do not fasten directly into the brick.

**4.12** When fastening in concrete, *remember the following rules:*

- (a) Never fire into an unknown material. Test first, as described in 4.07.
- (b) The thickness of any concrete material into which a fastener will be driven shall be not less than twice the length of the fastener shank with the minimum thickness being 2 inches.
- (c) It is permissible to set fasteners through floor covering into a floor if the covering is of the type that will not shatter and if the floor is *known* to be concrete. If there is any doubt, do not fire.
- (d) Do not fasten in glass, glazed tile, earthen or clay tile, bricks, stone, or rock.

#### FASTENING IN STEEL

**4.13** The point of a fastener driven into steel must *completely* penetrate and protrude through the opposite side of the steel. If not, the spring action of the steel on the point will tend to force the fastener out. With the point all the way through, the holding power in steel depends on the thickness of the steel and the diameter of the fastener shank. When fastening in steel, select a fastener with a shank length 1/2 inch longer than the steel is thick to assure proper penetration.

**4.14** When fastening in steel, *remember the following rules:*

- (a) Never fire into steel of unknown hardness. Test first, as described in 4.07.
- (b) The thickness of steel into which a fastener will be driven must be greater than the diameter of the fastener.
- (c) It is permissible to set fasteners through wood into steel if the *thickness* and *hardness* of the steel are *known* to be suitable. If there is any doubt, do not fire.
- (d) Do not fasten in spring steel, tool steel, cast steel, or cast iron.
- (e) If the brown (level 2) load will not set the selected fastener on the first shot, use the green (level 3) load.

#### SELECTING PROPER FASTENER

**4.15** As a guide for selecting the proper fasteners and wire loops, refer to the appropriate sections in Division 080 of the Bell System Practices. Remember the holding power of fasteners set in concrete varies as to the length of fastener and density of the concrete, and the holding power of fasteners set in steel varies as to the diameter of fastener shank and thickness of the steel. For maximum holding power in steel the fastener should protrude through the steel at least 1/2 inch.

#### 5. MAINTENANCE

**5.01** When a fastener is driven into a portion of a mortar joint or cinder block that is not solid, the fastener may penetrate to a depth that will cause the piston to overdrive. When the piston overdrives, it seats against a buffer that limits piston travel. If the piston becomes wedged in the buffer, free the piston by tapping it with a hammer. If the buffer device needs to be replaced after an overdrive, return the tool for repair.

#### DAILY CHECKS

**5.02** Each day before using the tool, the operator shall determine that the tool is clean; that all moving parts operate freely; and that the barrel

and muzzle bushing are free of obstructions. Check the tool by using the following procedure:

- (1) Examine the barrel, muzzle bushing, and piston for obstructions or defects. Replace the piston if the end is burred or badly worn. Do not file or grind the piston rod end. The end of the piston must not be worn past the chamfer. Refer to the manufacturer's manual for piston replacement procedures.
- (2) With the tool unloaded fully depress the tool against a work surface and pull the trigger. Complete trigger pull should release the firing pin. Release the tool and, with the shield in the full-shield position, place a 3/8-inch rod under one edge of the shield so the edge of the shield cannot contact the work surface. Fully depress the tool. The trigger, when pulled, should not release or contact the firing pin.
- (3) Thoroughly examine the tool for wear, rust, dirt, carbon buildup, and any signs of damage. If the tool functions properly as covered in (1) and (2) and appears to be in good condition, it is ready to use. If there are any signs of damage or if the tool does not function properly, return the tool for repair.
- (4) Check the contents of the tool box. Cleaning equipment and a spare piston should be available.

**5.03** After each day's firing, apply a light film of lubricant (lubricant is furnished with the tool) to the piston and piston cylinder.

**5.04** A record of the number of rounds fired and the date the piston rod is replaced is to be kept on the chart in the tool box.

#### WEEKLY CHECKS

**5.05** Once each week, or sooner if sluggish operation or visible dirt dictate, the tool shall be given a thorough cleaning. To clean the tool:

- (1) Disassemble the tool in accordance with instructions in the manual supplied by the manufacturer.
- (2) Clean all parts (including extra muzzle bushings) with an oily KS-14666 Cloth and the brushes provided with the tool. Remove all dirt and carbon buildup. After the tool is clean remove excess oil leaving only a thin film on each part.
- (3) Reassemble the tool. If any of the parts, other than the piston, do not fit correctly or if wear or damage is visible, return the tool for repair. Replace the piston as required.

#### PERIODIC OVERHAUL

**5.06** The tool should be returned to Western Electric Company for overhaul at the date indicated on the tool or after firing 5000 rounds, whichever comes first.