STUD DRIVERS
RAMSET MODEL 4160 AND STAR MODEL P651
DESCRIPTION, OPERATION AND MAINTENANCE

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1. GENERAL

1.01 This section describes the Ramset Model 4160 and the Star Model P-651 stud drivers (Figure 1). These tools replace the Bell System AT-8435 B Stud Driver, which was rated "manufacture discontinued".

1.02 It is issued to provide information and operating instructions which comply with California Administrative Code, Title 8, Construction Safety Orders and with Federal Standards in force in the State of Nevada.

1.03 Stud drivers utilize an explosive power load to drive fasteners into concrete and steel.

1.04 Unlike the B Stud Driver, the Star and Ramset tools are commercial models and will accept all power loads.

Note: Gray, brown and green loads in brass cases are the only cartridge loads approved for use by telephone personnel. No other loads shall be purchased.

1.05 This section parallels information contained in the manufacturer's manuals and the Basic Training Manual issued by the Powder Actuated Tool Manufacturers Institute Inc. Where differences occur, information contained in this practice shall take precedence.

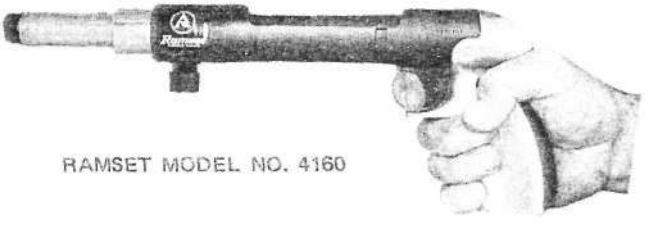
1.06 Telephone personnel operating stud drivers must be not less than 21 years of age, able to read and understand the English language and shall have completed the following:

(a) Personal instruction, by the manufacturer, in the correct use of the particular tool to be used. After satisfactory completion of training, a Qualified Operator's Card will be issued.

Note: This card is valid for three years for the make and model shown thereon only.

(b) A thorough review of this section.

(c) A thorough review of the manufacturer's manual and the Basic Training Manual referred to in 1.05.


RAMSET MODEL NO. 4160

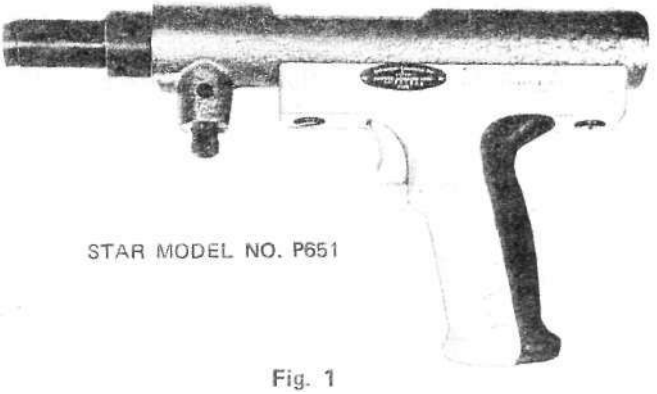

STAR MODEL NO. P651

Fig. 1

2. DESCRIPTION

2.01 The Star Model P651 and Ramset Model 4160 stud drivers are low-velocity powder-actuated piston-type tools. Fasteners are installed in concrete or steel when the power load is fired, driving the piston, which acts as a hammer to set the fastener.

2.02 Stud drivers are supplied with metal carrying cases. When the tool is not in use, it shall be stored in the case and the case shall be kept locked to prevent unauthorized use.

2.03 Carrying cases also contain wrenches, brushes and lubricants necessary for daily maintenance. A copy of the manufacturer's manual and the Basic Training Manual (see 1.05) shall be kept in each carrying case for ready reference.

2.04 Power loads for the Star and Ramset stud drivers are crimped .22 caliber loads. Loads are identified by the color on one end and the case color.

2.05 Telephone employees shall use brass case loads with color codes gray, brown and green only.

WARNING: Do not exceed power level 3, the green load.

3. PRECAUTIONS

3.01 Only trained personnel, as defined in Part 1 of this section, shall operate stud drivers. The qualified operator is responsible for the tool from the time it leaves the work center until it is returned to the foreman or tool crib.

3.02 A caution sign 8-1/2 inches by 11-inches or larger with panels and lettering of equivalent proportion, shall be posted prominently in all areas where powder actuated tools are being used. Signs shall be yellow and black with lettering and panel measurements as detailed in Figure 2. Signs are available from the manufacturers. When not in use they should be stored in the tool carrying ease.

3.03 Do not allow unqualified persons to operate or handle the stud driver. When it is not in use, it shall be stored in the metal carrying case and the case shall be locked.

3.04 Should the stud driver develop a defect, it shall be removed from service immediately. Contact the manufacturer's representative or send it to the appropriate service center listed in 5.08.

3.05 Do not alter a stud driver in any manner or use any attachment not specifically designed for use with the particular make and model.

3.06 Stud drivers shall not be loaded until ready for use. Should use of the driver be interrupted, unload immediately. Do not carry a loaded driver from job to job or store a loaded driver in the carrying case.

3.07 Persons operating stud drivers, or in the vicinity of work operations involving stud drivers, shall wear B Plastic or No. 710-B Goggles.

CAUTION: Safety glasses are not to be used in lieu of goggles.

3.08 Where working conditions dictate, for example, heavy spalling and overhead work, safety headgear and the Kit, Shield, Face, Safety shall be worn in addition to the goggles to provide maximum protection for the face and eyes.

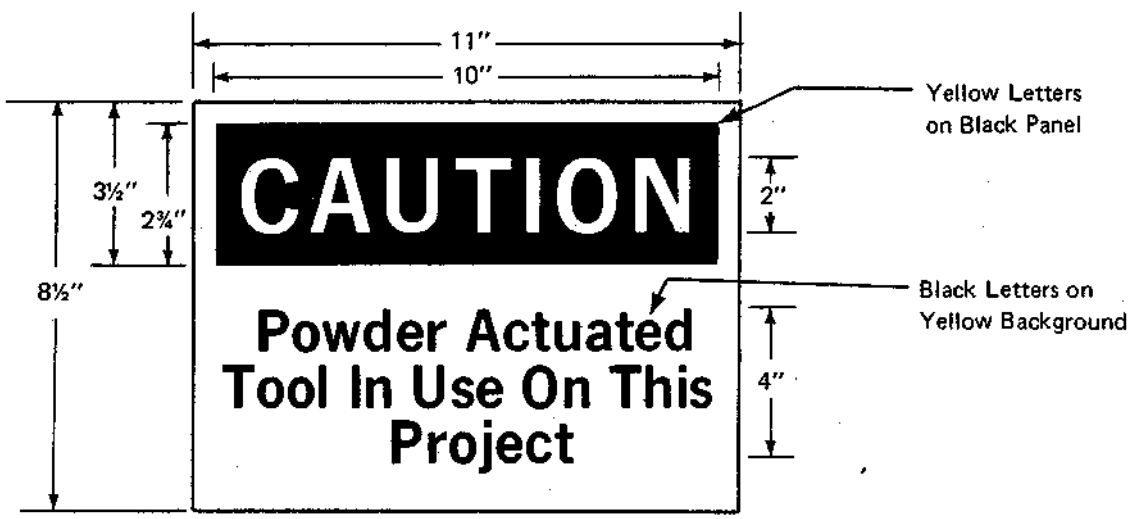


Fig. 2

3.09 Ear protection is required when the stud driver is operated in a confined area. Section 010-100-903PT provides requirements for and descriptions of ear protection devices.

3.10 Neither loaded nor empty tools are to be pointed at one's self or another person. Hands shall be kept clear of the barrel end. Handle the stud driver as you would conventional fire arms.

3.11 Always operate the tools at a right angle to the work surface to obtain maximum protection from the spall shield. Keep face and hands away from the sides of the muzzle when firing.

3.12 Stud drivers must not be used in manholes, cable vaults, central offices, or any other location where a torch or open flame is not permitted.

3.13 Use powder actuated stud drivers to place fasteners in poured concrete, pre-cast concrete, pre-stressed concrete, concrete block, horizontal mortar joints and structural steel only. Common structural steel shapes are:

(a) Structural beam

(b) Angle iron

(c) Channel

(d) Tee

(e) Plate

(f) Strip

3.14 Do hot attempt to drive fasteners if base material is wood, fiberboard, plaster, or similar materials which- might permit the fastener to go into "free flight".

3.15 Never attempt to drive a fastener into aluminum, steel alloy, tile or stone.

3.16 Fasteners shall not be driven in existing holes, spalled areas, cracks or a location where a previous attempt to drive a fastener has failed.

3.17 If a misfire occurs continue to hold the stud driver barrel against the work surface for at least .30 seconds, then open the tool and remove the cartridge. Exercise care when removing the cartridge that the muzzle is not aimed at the operator or another person.

3.18 It is permissible to attempt to fire a misfired cartridge. However, the precautions in 3.17 must be observed after each attempt.

3.19 Misfires and other defective cartridges shall not be discarded in trash or refuse containers. They shall be disposed of as follows:

(a) Render inactive immediately by soaking in a metal container filled with water for at least one hour, then return to your supervisor for disposal.

(b) The supervisor shall return misfired cartridges to the respective supplier.

WARNING: **Power loads, either active or those rendered inactive, shall not be shipped by mail or parcel post.**

3.20 **If** more than five misfires occur before a box of 50 cartridges is used, the misfires and the remaining cartridges should be returned to the supplier for credit.

3.21 To release loaded powder-actuated stud drivers that have jammed in the firing position, hold the tool firmly against the work surface and follow the manufacturer's prescribed procedure. Remove the load, then the fastener and return the tool for repair.

3.22 Do not carry power loads in pockets or containers with fasteners or other metal objects. Loads shall be kept in the original container until used. They shall be stored in the carrying case and the case shall be locked when the driver and loads are not in use. Keep loads of different force (color code) segregated from each other and from the other contents of the carrying case.

4. OPERATION

4.01 Before operating a powder-actuated stud driver, all requirements of 1.06 must be met.

4.02 Loading of the stud driver shall be in accordance with the manufacturer's manual which accompanies each tool. Tools shall be loaded just prior to firing (see 3.06). A shield is supplied with each stud driver and shall be used whenever possible. Shields confine flying particles and with the protective equipment required by 3.07, help prevent eye injuries.

4.03 Concrete: Before driving fasteners into concrete, determine that it is not less than three times the thickness of the intended fastener penetration.

4.04 Steel: Base material thickness must be no less than the diameter of the fastener shank. The point of fasteners driven into steel must penetrate the opposite side to prevent the compressive force in the art a of the point from forcing it back out.

4.05 Unsuitable base material will be either too hard, too brittle or too soft. Test, in a hidden location, for suitability with a hammer, using a fastener as a center punch. Unsatisfactory base material will be indicated by the following:

(a) Fastener point blunted — Base material too hard.

(b) Base material cracks or shatters — Material too brittle.

(c) Fastener sinks into base material with an average hammer blow — Material too soft.

4.06 Base materials are considered satisfactory when the test produces a clear fastener point impression and the fastener point is not blunted.

Note: Blunted fasteners must be discarded. A blunted point will limit both penetration and holding power.

4.07 After determining that the base material is satisfactory, drive a test fastener with the stud driver, using the gray, lightest, load. If it does not set the fastener, use a brown load and a new fastener for a second test. If a third test is required, use a green load and a new fastener.

CA UTION: Do not exceed the green load for any reason. (See 1.04).

Fastening In Concrete

4.08 To assure maximum holding power, fasteners should penetrate the concrete to a minimum depth of 1 inch. Very dense concrete may require the use of 3/4-inch fasteners to obtain proper set.

4.09 If an occasional gray or brown fastener does not set on the first attempt, place a gray load in the driver, position the muzzle over the fastener and complete the setting.

4.10 The need for two loads to set a fastener should happen infrequently. If it becomes a common occurrence, use the next heavier load.

Note: Remember — do not exceed the green load for any reason.

4.11 When a base material, either concrete or steel, is encountered which does not allow the fastener to set with a single green load, use a different method to make the attachments. Do not attempt to set the fastener with a second firing.

4.12 Concrete requires at least 28 days to cure and reach acceptable compression strength. Do not drive fasteners into uncured concrete. They will not develop their potential holding power.

4.13 Fasteners driven into concrete or cinder blocks must not penetrate into voids. Make certain that fasteners are installed in solid sections only.

4.14 When it is necessary to drive fasteners into brick wall construction, fasteners must be placed in horizontal mortar joints only.

4.15 The following rules must be remembered when driving fasteners into concrete base materials:

(a) Do not fire into base material of unknown hardness; test first. (See 4.06).

(b) Fasteners shall not be placed in base material when the thickness is less than 3 times the intended fastener penetration. In very dense concrete, where a 3/4-inch shank fastener is required, the thickness shall be not less than 2-1/4 inches.

(c) Do not attempt to set fasteners within 3 inches of concrete edges.

(d) Before driving a fastener through floor covering, determine that the covering will not shatter and that the floor is an acceptable concrete base material of the correct thickness. If either the covering or the floor is questionable, do not fire.

(e) Never attempt to set a fastener in glass, tile; brick, or rock.

Fastening In Steel

4.16 Fasteners driven into steel must protrude through the opposite side of the steel base

material. Select a fastener with a shank 1/2 inch " longer than the base material thickness to assure proper penetration.

4.17 Remember the following rules when driving fasteners into structural steel base material:

(a) Fire into structural steel only (See 3.12). Never fire into steel of unknown hardness; test first. (See 4.06).

(b) Fasteners shall not be driven unless the steel base material thickness is greater than the fastener diameter. Select a fastener that will penetrate 1/2 inch through the steel.

(c) Do not drive fasteners within 1/2 inch of the steel base material edge.

(d) Fasteners may be driven through wood into steel base material when thickness and hardness are known to be suitable. If there is any doubt, do not attempt to make the fastening.

(e) Do not drive fasteners in spring steel, tool steel, cast steel, cast iron, aluminum or other metals.

Selecting Fasteners

4.18 Obtain drive pins, threaded studs and wire loop fasteners from the respective manufacturer.

CA UTION: Do not use B or C Masonry Fasteners in Ramset Model 4160 or Star Model P651 tools.

5. MAINTENANCE

Daily Tool Checks

5.01 Before being used for the first time each day, the qualified operator who will use the stud driver shall determine that:

(a) The tool is clean and that excess lubricants are removed from the piston, piston cylinder, and barrel.

(b) All moving parts operate freely.

(c) Barrel and muzzle bushings are free of obstructions.

(d) The piston is not burred or badly worn. Do not file or grind burred or worn pistons. Replace them, following the procedures outlined in the manufacturer's manual.

(e) Safety devices which prevent firing of the tool, until a force of not less than 5 pounds more than the total tool weight is applied, are tested in accordance with the manufacturer's recommended procedure.

(f) Required cleaning equipment, lubricants and a spare piston are available in the carrying case.

Note: Return the tool for repair if there are any signs of damage or malfunction. (See 5.08).

5.02 If the tool is to be stored, apply a light coating of lubricant to the piston, piston cylinder and barrel.

Weekly Tool Checks

5.03 At least once a week, or more often if visual inspection or sluggish operation indicate, the tool shall be given a thorough cleaning.

5.04 Disassemble the stud driver, clean all muzzle bushings, remove dirt and carbon buildup and apply a thin film of lubricant to each part, in accordance with the manufacturer's manual.

5.05 If any parts other than the piston, which the operator can replace, are damaged or worn, return the tool to the appropriate service center for repair. (See 5.08).

Annual Service and Inspection

5.06 All powder-actuated stud drivers shall be returned to the manufacturer or his authorized service representative for inspection and service at intervals not to exceed 1 year.

5.07 A record shall be kept of each inspection and service, showing the inspection date, extent of service, part replacements and the serial number of the tool.

Note: THE SERVICE RECORD MUST BE KEPT IN THE CARRYING CASE AND BE AVAILABLE FOR REVIEW BY CALIFORNIA AND NEVADA STATE SAFETY INSPECTORS.

Authorized Service and Repair Locations

5.08 All services and inspections shall be completed by one of the following authorized locations:

(a) Star Expansion Industries

(1) 970 East 11th Street
LOS Angeles, California 90021
(213) 627-4848

(2) 1103 Airport Blvd.
South San Francisco, California 94083
(4I5)) 871-7078

(b) Ramset Fastening Systems

(1) 5348 Jillson Street
Los Angeles, California 90022
(213) 269-0589

(2) 393 Mathew Street
Santa Clara, California 95050
(408) 244-0676