

## SCREWDRIVERS

### SELECTION, USE AND MAINTENANCE

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#### 1. GENERAL

**1.01** This section covers the use, general handling precautions, care and maintenance of standard Bell System screwdrivers and the screwdriver bit.

**1.02** This section is reissued to cover the plastic-handled Phillips Type B screwdriver and the C, D and E screwdrivers with tougher and longer life blades and plastic handles. Since this reissue covers a general revision, arrows ordinarily used to indicate changes have been omitted.

**1.03** The C, D and E screwdrivers replace the previous standard 3- and 6-inch cabinet, H cabinet, and 4- and 5-inch regular wood-handled screwdrivers. The use and maintenance of the wood-handled screwdrivers still used in the field are the same as covered herein.

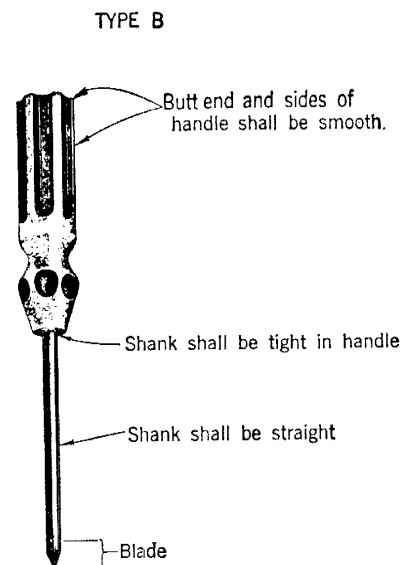
**1.04** Screwdrivers that are designed for special purposes such as offset screwdrivers, cord repair, etc, should be replaced when they become worn or defective.

**1.05** The screwdrivers provided for use in the Bell System are high-grade tools. The blade tips are specially ground to fit the screws ordinarily used in telephone work. The B, C, D and E screwdrivers consist of fluted transparent amber-colored plastic handles pressed on the tangs which are forged in one piece with the heat-treated alloy steel blades. These screwdrivers may be furnished with a 4- or 6-fluted plastic handle.

**1.06** *Screwdrivers are intended for use in turning screws and not for use as drills, chisels or pinch bars.*

#### 2. B SCREWDRIVER

**2.01** Fig. 1 illustrates the B screwdriver and indicates the condition in which screwdrivers of this type shall be maintained for safe and satisfactory service. This screwdriver is furnished in three sizes as shown in the table in Paragraph 2.02. It is for general use with cross-recessed head screws of the Phillips type.



**Fig. 1**

**2.02** The following is a table of the sizes of B screwdrivers, their over-all lengths, and the sizes of screws that are accommodated by each screwdriver. Select the proper size of screwdriver for each type of screw.

SIZE No.	OVER-ALL LENGTH In.	SIZE OF SCREW No.
1	7	4 and smaller
2	8	5 to 9
3	11	10 to 16

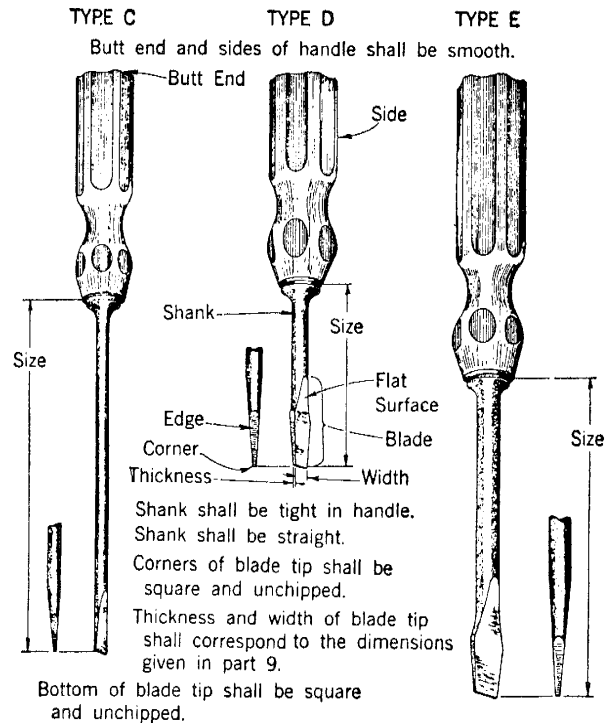
**2.03** It is not feasible to repoint the blade tip of the B screwdriver in the field since it is formed of curved surfaces which cannot be restored readily by filing. Careful storage and use of this screwdriver by squaring the blade tip in the cross-recessed slots of the proper size screws will result in its maximum safe and efficient usage. When the blade tip becomes inefficient or hazardous by wear or defect, it should be marked defective and exchanged for one in good condition.

### 3. C, D AND E SCREWDRIVERS

**3.01** Fig. 2 illustrates the C, D and E screwdrivers and indicates the condition in which screwdrivers of these types should be maintained for safe and satisfactory service. These screwdrivers are furnished in three types designated C, D and E in the sizes as shown in the table in Paragraph 3.02. The two C screwdrivers are for light duty on small screws used principally in apparatus assemblies. The two E screwdrivers are for general use on the larger wood and machine screws used in making plant attachments. The D screwdriver is a combination of features of the C and E types for use on an intermediate range of screw sizes.

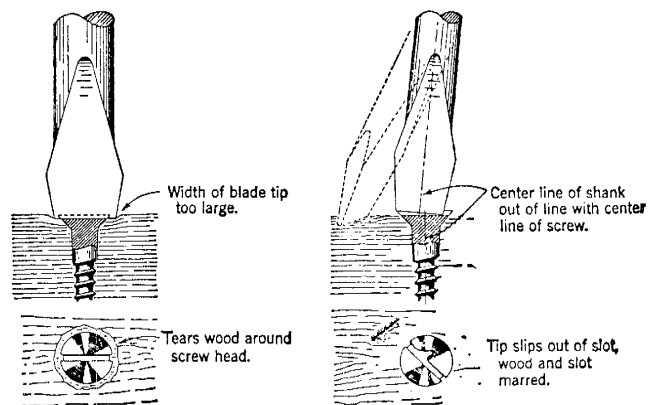
**3.02** The following is a table of the sizes of C, D and E screwdrivers, their over-all lengths, and the range of sizes of screws that are accommodated by each screwdriver. Select the proper size of screwdriver for each size of screw. Wherever practicable, select the D or E type screwdriver for turning in wood screws.

TYPE	SIZE In.	OVER-ALL LENGTHS In.	SIZE OF SCREW No.
C	3	6-7/8	4 to 6
C	6	9-7/8	5 to 8
D	3	6-1/2	5 to 10
E	4	8-5/16	5 to 12
E	5	10-1/2	14 to 18



**Fig. 2**

**3.03** Figs. 3 through 7 illustrate what is likely to occur if a screwdriver is not maintained in good condition, is of the wrong size, or is improperly used. These conditions promote neither safety nor satisfactory workmanship. Also, screws with damaged slots are difficult to remove.



**Fig. 3**

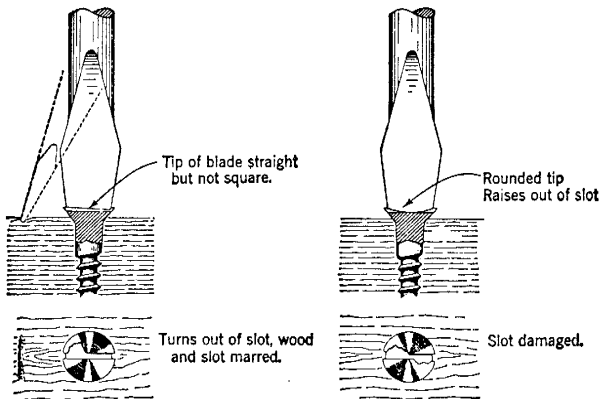


Fig. 4

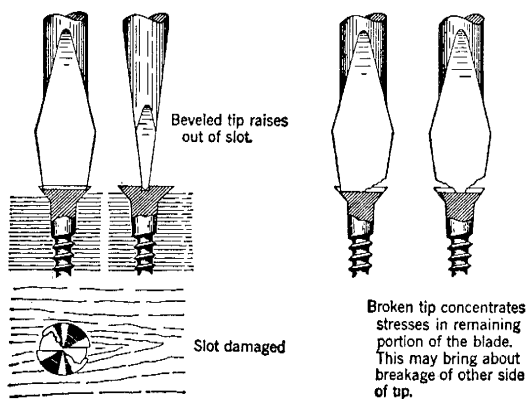


Fig. 5

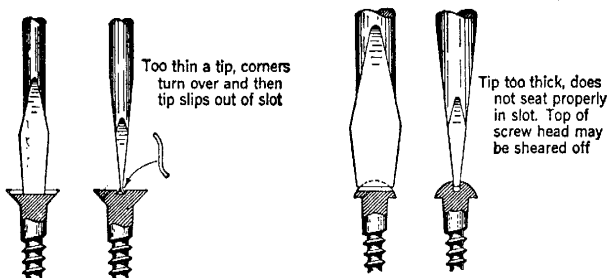


Fig. 6

Bent shank throws screw out of line, causing point to break out of hole.

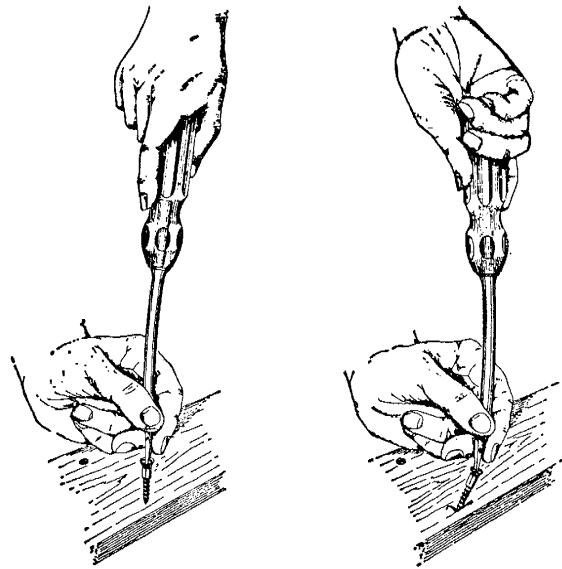


Fig. 7

#### 4. SCREWDRIVER BIT

**4.01** The screwdriver bit, illustrated in Fig. 8, is provided for use where a considerable number of the larger screws are to be placed or removed and a brace is available.

**4.02** The sizes of screws recommended for use with the screwdriver bit range from No. 14 through No. 18.

**4.03** The blade tip of this screwdriver shall be repointed, when required, in accordance with Part 9 of this Section.

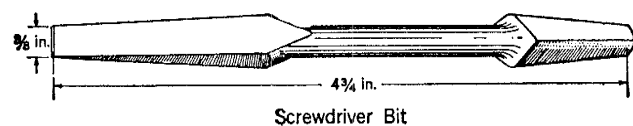


Fig. 8

#### 5. OFFSET SCREWDRIVER

**5.01** The offset screwdriver, illustrated in Fig. 9, has either one or two blades which project at a right angle to the handle or shank. The angles, however, that are listed in the Bell System Practices for the various types of offset

screwdrivers are determined by the angle formed by the face of the blade and the handle (Fig. 9 illustrates a 90° offset screwdriver).

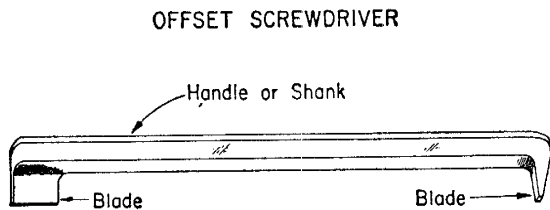


Fig. 9

## 6. USING SCREWDRIVERS

**6.01** In general, a lead hole will not be required for starting the smaller sizes of screws in soft wood. Lead holes of the following sizes shall be made for the larger sizes of screws where such holes are not already available. An automatic drill or a hand drill equipped with twist drills has been found satisfactory for this work.

SIZE OF WOOD SCREW		SIZE OF DRILL POINT
HARD WOOD	*SOFT WOOD	
No. 6	No. 6	1/16 Inch
No. 8 to No. 10	No. 8 to No. 10	3/32 Inch
No. 12 to No. 18	No. 12 to No. 14	1/8 Inch
	No. 18	11/64 Inch

\* Use this table for outside attachments.

**6.02** After lead hole has been drilled insert the screw and start it by holding it and the screwdriver in position as shown in Fig. 10.

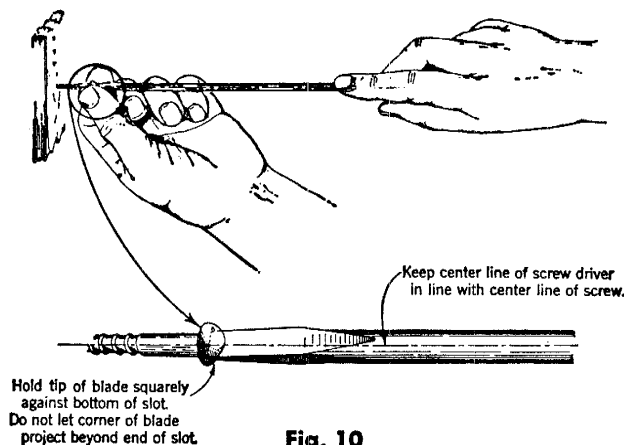


Fig. 10

**6.03** Turn the screw, keeping the center line of the screwdriver in line with the center line of the screw. Hold the tip of the blade squarely against the bottom of the screw slot in order to prevent damaging the screw. Use two hands when starting screws, one on the handle of the screwdriver to do the turning and the other on the blade to steady it on the screw. Avoid injury by keeping the head and arms in such a position that they will not be struck with the tip should the screwdriver slip. Remember that the tip of the blade will have the greatest tendency to slip out of the screw slot just before each turn is completed, especially the last turn.

**6.04** When turning screws in hard wood, lubricate the threads with a small amount of soap or beeswax, taking care, particularly in hot weather, that the lubricant does not enter the slot of the screw or coat the screwdriver tip. It is difficult to keep the tip of the screwdriver engaged with the screw slot if either the blade or the slot is lubricated. Such a condition may be the cause of an accident and, therefore, if lubricant is found at these points it shall be removed before turning the screw.

**6.05** When using an offset screwdriver, the tip of the blade should rest flush with the bottom of the slot in the screw. If room permits, apply pressure on the shank or handle directly above the screw in order to hold the tip of the blade firmly in place while the pressure is applied for the swinging motion. If there is not enough space to apply the pressure directly over the screw it should be applied to the handle as near as possible to the screw head.

**6.06** When the swinging space of the offset screwdriver is limited, it may be necessary to reverse the ends of the screwdriver after each swing. If the screw cannot be turned in this manner, two offset screwdrivers with blades at different angles may be used.

**Caution:** Care should be taken while using offset screwdrivers so as not to injure the fingers or hand or burr the head of the screw by the blade slipping out of the slot of the screw.

## 7. INSPECTION OF SCREWDRIVERS

**7.01** Each employee, on receipt of and at frequent intervals thereafter, shall make an inspection of the screwdriver in accordance with Paragraph 7.04, in order to determine whether any fault has developed.

**7.02** Each employee shall at all times assume the responsibility of determining that the screwdriver is in good condition and that its appearance does not indicate injury or defects sufficient to impair its usefulness.

**7.03** Screwdrivers shall be checked periodically and the employee performing this work shall see that all instructions contained herein are complied with.

**7.04** Screwdrivers should be examined to determine their condition as suggested below. In connection with the inspection of screwdrivers the important conditions to look for are:

- (a) \*Handle broken, split, cracked or rough on sides or butt end.
- (b) Blade loose in handle.
- (c) Blade broken.
- (d) Soft tip (temper destroyed).
- (e) \*\*Blade bent. (See Part 10.)
- (f) \*\*Point of tip chipped, worn or improperly shaped. (See Part 9.)

\*The plastic handles are tough and resistant to breakage, splitting and cracking. However, any roughness on the handle may be made smooth by sanding so as to avoid irritation to the hand.

\*\*When conditions (e) and (f) are found they shall be corrected in accordance with Parts 9 and 10. A screwdriver with an improperly shaped tip that cannot be readily sharpened in the field, or one with the blade excessively bent, shall be exchanged for one in good condition.

**7.05** If any of the conditions under (a), (b), (c) or (d) are found to exist or if the condition of the screwdriver is such that there is any doubt

as to its serviceability, it should be marked defective and exchanged at once for one in good condition in accordance with the established routine.

## 8. STORING SCREWDRIVERS

**8.01** New screwdrivers shall be left in the original package until required. Screwdrivers which have been issued should be placed in a locker or container provided for the purpose when not in use. Never place a screwdriver in such a position on shelves that persons passing by are likely to scratch themselves on the protruding tip or, in such a way that the screwdriver may roll off and create a hazardous condition or strike someone. Screwdrivers shall be kept in tool rolls or other approved carrying cases or suspended from brackets provided in the compartments of a truck for this purpose when not in use. When suspended from brackets, screwdrivers shall be stored with blade downward.

## 9. REPOINTING C, D AND E SCREWDRIVER BLADES

**9.01** The screwdriver blade tip shall be kept properly shaped at all times. The following method has been found satisfactory for repointing the tip:

(a) Select one of the types of files provided for sharpening tools. If the teeth of the file are clogged, clean them before using the file. This can be readily done with the standard carding brush or by pushing the end of a copper strip (a small piece of copper strip of the ground wire clamp is suitable) across the file in line with the cutting edges of the teeth.

(b) Select such a location for performing the work that the elbows will be level with the object to be filed. A flat surface should be sought as this can be used as a guide in determining whether the file is being pushed straight across the object.

(c) For squaring the tip of the blade, hold the screwdriver blade at a right angle to a flat surface (floor of truck, top of box or workbench) using index finger to steady it, as shown in Fig. 11.

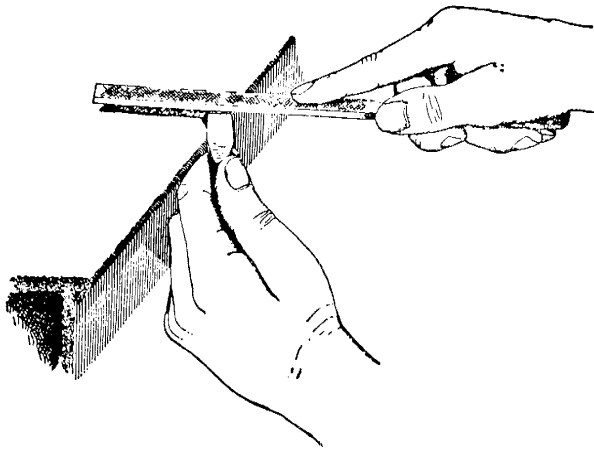


Fig. 11

Place the file parallel with the flat surface and at a slight angle (approximately 20 to 30 degrees) to the center line of the surface to be filed. Grasp the file securely so that it can be easily steadied and its movement controlled at all times. Move the file forward and parallel to the flat surface, applying sufficient pressure for the teeth to grasp the metal. The pressure should be evenly distributed and maintained throughout the forward stroke. On the return stroke, the file should be held slightly above the surface being filed in order not to dull the cutting teeth. Continue filing until broken, chipped or rounded edges have been removed.

(d) With the screwdriver and file held in a position similar to that illustrated in Fig. 12, dress down the edges of the tip, restoring the width of the point to its original size as closely as practicable.

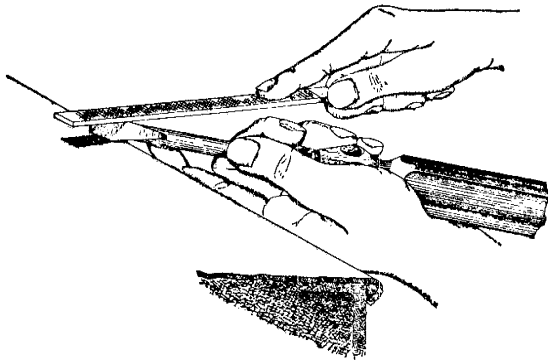


Fig. 12

(e) With the screwdriver and file held as shown in Fig. 13, file the entire broad flat face of the tip until the following dimensions, with regard to thickness of point, are obtained. The slots of the screws listed in the following table may be used as gauges for determining the thickness of the point desired. This method of gauging is only an approximation of the dimensions given, so that when screws having smaller slots than those used for gauging are encountered they shall be adopted as the gauges.

SCREWDRIVER		POINT DIMENSIONS		SIZE OF FLAT HEAD SCREW
TYPE	SIZE	THICKNESS	WIDTH	SLOT TO BE USED AS GAUGE
C	3 in.	.025 in.	3/16 in.	No. 4 Wood Screw
C	6 in.	.028 in.	3/16 in.	No. 5 Machine Screw
D	3 in.	.029 in.	1/4 in.	No. 5 Wood Screw
E	4 in.	.031 in.	1/4 in.	No. 6 Wood Screw
E	5 in.	.043 in.	7/16 in.	No. 14 Galv. Wood Screw
Screwdriver				
Bit		.043 in.	3/8 in.	No. 14 Galv. Wood Screw

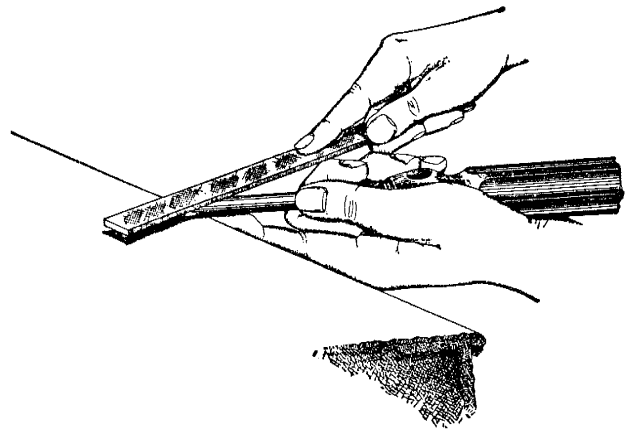


Fig. 13

**9.02** *Never use an emery wheel for repointing a screwdriver blade. Heat generated by its use may destroy the blade temper.*

## 10. STRAIGHTENING SCREWDRIVER SHANK AND BLADE

**10.01** The shank and tip of a screwdriver blade shall be kept straight. If the blade is bent and a vise is not available, straighten it by placing the bent portion on a solid flat surface with the tip and the portion of the shank near the handle resting on the flat surface. With the screwdriver in this position, strike the curved section near the handle lightly with a hammer. Repeat, striking a little ahead of the last blow until the tip is reached. These operations should be followed until the shank is flush with the flat surface. Blades bent excessively shall not be straightened.

**10.02** To straighten a bent shank and blade with a vise available, place the shank of the screwdriver in the vise in a horizontal position. The point where the bend starts should be just outside the jaws of the vise. The shank should be parallel with the top of the workbench on which the vise is mounted. Apply pressure at the handle or shank in a direction that will tend to straighten out the bent portion. If the bent portion is such that one operation does not entirely straighten the shank, reposition the screwdriver in the vise as the portion nearest the vise becomes straight. Continue in this manner until the entire shank is straight.

## 11. PRECAUTIONS

**11.01** Do not use a screwdriver as a drill, chisel or pinch bar.

**11.02** Do not stick a screwdriver in either the flame of a furnace or torch, or a pot of hot solder, as this will destroy the temper of the tool. Never use a screwdriver as a substitute for a soldering copper.

**11.03** Use the size of screwdriver with the sizes of screws for which it is intended.

**11.04** Do not use a screwdriver with broken, chipped or rounded tip.

**11.05** Do not carry screwdrivers in pocket where injury may result through exposure of the tip of the blade.

**11.06** Do not use screws with damaged slots. Burred screw slots often cause the screwdriver to slip, resulting in accidents.

**11.07** Do not work with the screwdriver in such a position that if it slips it will cause injury, particularly in the area of the hands, face or eyes. If it is necessary to hold small objects in which screws are to be placed or from which they are to be removed, the hand should be kept away from the back of the object so that it will not be struck if the screwdriver slips. This can usually be accomplished by placing the object against some supporting surface—*avoid holding small objects in the palm of the hand.*