

**TIMERS**  
**2-TYPE, 4A, 4B (MFR DISC.), 4E AND D-171689**  
**PIECE-PART DATA AND REPLACEMENT PROCEDURES**

CONTENTS	PAGE
1. GENERAL . . . . .	1
2. PIECE-PART DATA . . . . .	1
3. REPLACEMENT PROCEDURES . . . . .	4

**1. GENERAL**

**1.01** This section covers the information necessary for ordering parts to be used in the maintenance of 2-type, 4A, 4B (Mfr Disc.), 4E, and D-171689 timers. It also covers approved procedures for replacing these parts.

**1.02** The reasons for reissuing this section are listed below. Revision arrows are used to emphasize the more significant changes. The Equipment Test List is not affected.

- (1) To add the 4E timer
- (2) To add paragraphs 1.05 and 3.15
- (3) To rate the 4B timer manufacture discontinued (Mfr Disc.).

**1.03** Part 2 of this section covers the piece-part numbers and the corresponding names of the parts which it is practicable to replace in the field in the maintenance of these timers. No attempt should be made to replace parts not

designated. Part 2 also contains explanatory figures showing the different parts.

**1.04** Part 3 of this section covers the approved procedures for the replacement of the parts covered in Part 2.

**1.05** The 4E timer is an electronic replacement for the 4B timer (Mfr Disc.), and is an exact wire-for-wire replacement of the electromechanical 4B (Mfr Disc.). The 4E timer provides the 0.25-second pulse each second and the 2.8-second pulse each 6 seconds as required by the Master Timing Frame SD-25633-01 for the timing of long distance calls.

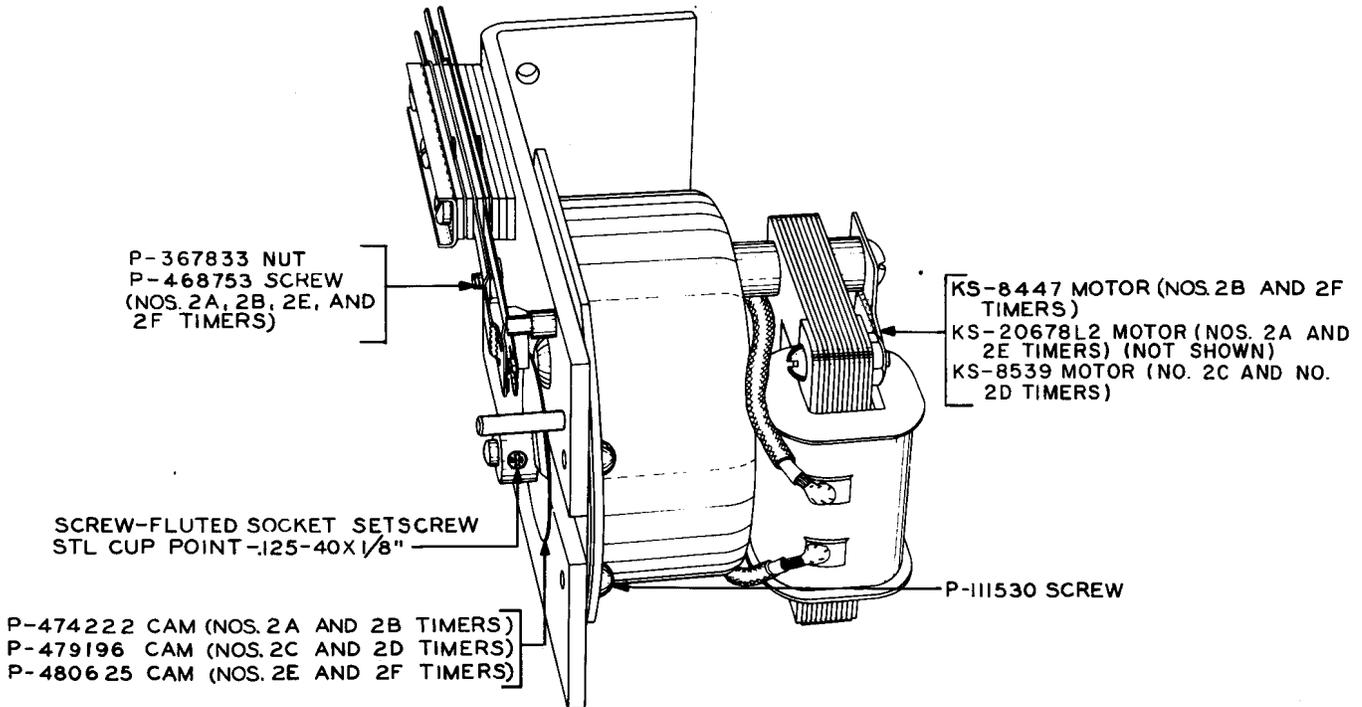
**2. PIECE-PART DATA**

**2.01** The figures included in this part show the various piece parts in their proper relation to other parts of the timer. The piece-part numbers of the various parts are given together with the names of the parts as listed by the Western Electric Company Merchandise Department. Where these names differ from those in general use in the field, the latter names, in some cases, are shown in parentheses.

**2.02** When ordering piece parts for replacement purposes, give both the number and name of the piece part; for example, P-474222 Cam. Do not refer to the BSP number or any information shown in parentheses following the piece-part number.

**NOTICE**

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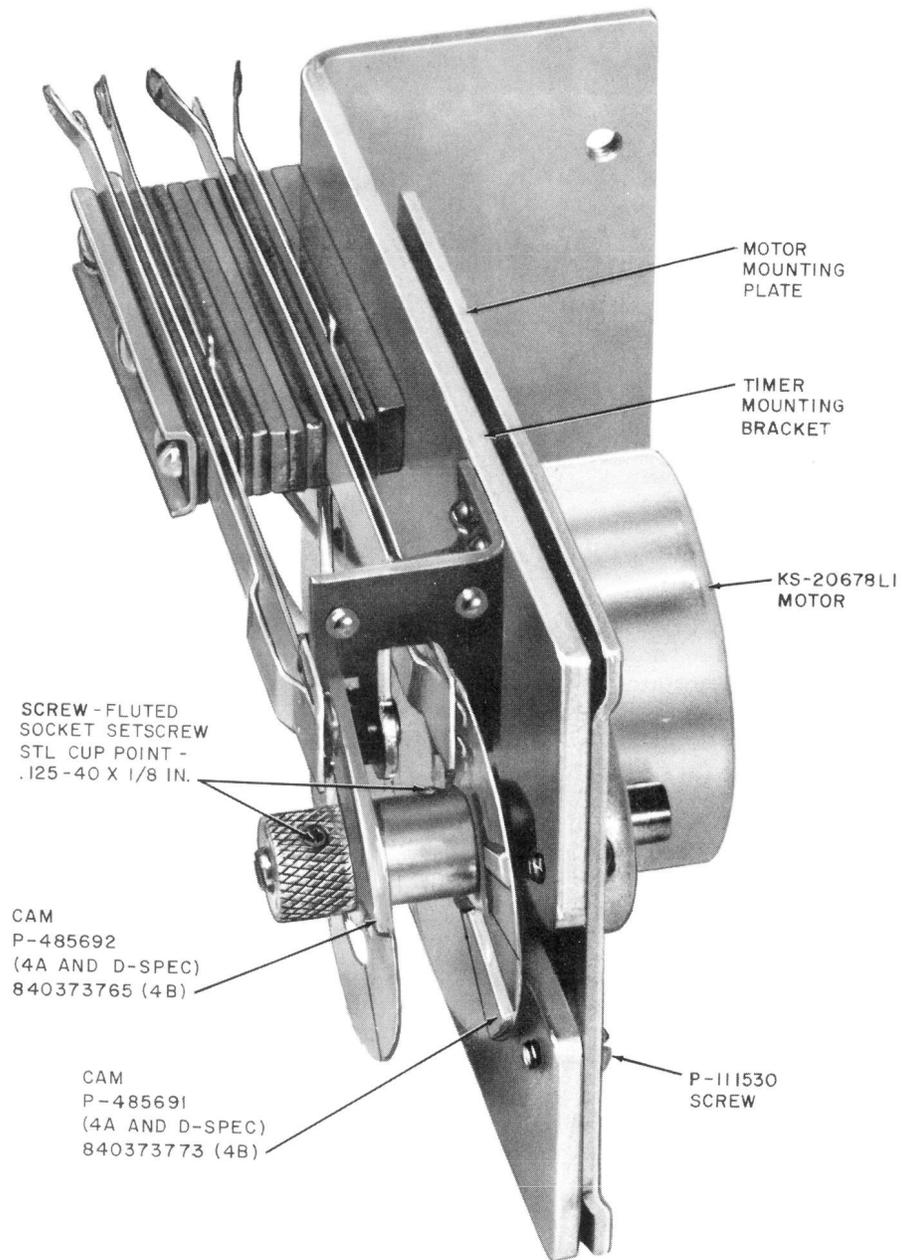


PARTS NOT ILLUSTRATED

MOTOR MOUNTING SCREW, SPACER, AND CLAMPING PLATE (NOS. 2C AND 2D TIMERS)  
P-210800 SCREW (2 REQUIRED)  
P-479195 SPACER  
P-459935 CLAMPING PLATE  
P-458047 COVER

TIMER MOUNTING SCREW AND WASHER  
P-217497 SCREW (2 REQUIRED)  
P-284148 WASHER (2 REQUIRED)

Fig. 1—2-Type Timer With Telechron Motor



PARTS NOT ILLUSTRATED

TIMER MOUNTING SCREWS AND WASHERS  
 P-217497 SCREW (2 REQUIRED)  
 P-284148 WASHER (2 REQUIRED)

P-15A955 COVER

REAR MOUNTING SCREW AND NUT  
 P-126153 NUT  
 P-468753 SCREW

Fig. 2—4A, 4B (Mfr Disc.) and D-171689 Timers (4B Illustrated)

**3. REPLACEMENT PROCEDURES****3.01 List of Tools**

CODE OR SPEC NO.	DESCRIPTION
<b>TOOLS</b>	
417A	1/4- and 3/8-inch open double-end flat wrench
R-2653	No. 5 Bristo wrench
R-2959	1/16-inch Allen wrench
-	3-inch C screwdriver
-	4-inch E screwdriver

**3.02** Before making any replacements of parts of the timer, take the associated circuit out of service in accordance with the approved procedures.

**3.03** Remove the timer from the mounting plate to make any replacements. Unsolder the leads from the terminals, and tag them. Remove the timer mounting screws with the 4-inch E screwdriver. After making the necessary replacement of parts, remount the timer securely on the mounting plate and connect and resolder the leads that were removed to the proper terminals.

**WARNING:** *When replacing cover on timers without a cover guide, care should be taken to replace the cover by inserting cover lips between the motor mounting plate and the timer mounting bracket. Incorrect installation may cause the rotating cam shaft to grind against the metal cover. Also there is a chance the cover might short out the contact springs.*

**3.04** No replacement procedures are specified for screws or other parts where the procedure consists of a simple operation.

**3.05** After making any replacement of parts of a timer, the part or parts replaced shall meet the readjust requirements involved as specified in Section 030-141-701. Other parts whose adjustments may have been directly disturbed by the replacing operations shall be checked to the readjust

requirements, and an overall operation check shall be made of the timer before restoring the circuit to service.

**Motor**

**3.06** To replace the motor, unsolder the motor leads from the pileup. Loosen the nut which fastens the rear motor mounting screw for motors so mounted with the 417A wrench.

**WARNING:** *When it is necessary to manually rotate the motor shaft to check requirements or make adjustments, rotate it in the normal direction only to avoid possible damage to the motor bearings or gearing.*

**3.07** Remove the front motor mounting screws with the 3-inch C screwdriver. Draw the motor forward, exercising care not to strike the cam disc against the cover guide.

**3.08** On 2-type timers, remove the cam as covered in 3.11 or 3.12. On the 4A, 4B (Mfr Disc.), and D-171689 timers, loosen the setscrews on the inner cam and remove the motor.

**3.09** Mount the motor, and position the cam or cams as covered in Section 030-141-701. Then tighten the motor mounting screws and nut and cam setscrews securely. Reconnect and solder the leads to the terminals on the pileup.

**Cams**

**3.10 General:** After replacing a cam or cams, lubricate the parts as covered in Section 030-141-701.

**2A and 2B Timers**

**3.11** To replace a cam, remove the motor as covered in 3.06 and 3.07. Loosen the cam setscrews using the R-2653 wrench or 1/16-inch Allen wrench. Remove the cam and position the new cam. Remount the motor as covered in 3.09, taking care that the cam is between the operating finger and the button. Tighten the cam setscrews securely.

**2C, 2D, 2E, and 2F Timers**

**3.12** To replace a cam, loosen the cam setscrews using the R-2653 wrench or 1/16-inch Allen wrench. Then turn the cam disc until it clears the operating finger. Remove the cam and position the new cam. Tighten the cam setscrews securely.

**4A, 4B (Manufacture Discontinued), and D-171689 Timers**

**3.13 Outer Cam:** To replace the outer cam, remove the motor as covered in 3.06 and 3.07. Loosen the setscrews on the outer cam using either the R-2653 wrench or 1/16-inch Allen wrench and slide the cam off the hub of the inner cam and substitute a new cam. In mounting the new cam on the 4A and D-171689 timers, position the high portion of the outer cam over the low portion of the inner cam; and on the 4B timer (Mfr Disc.), align the cams according to requirement 2.04(c) of Section 030-141-701. Remount the motor as covered in 3.09, taking care that the cams are between

the operating fingers and the buttons. Check the cam timing requirements per Section 030-141-701. Then tighten the cam setscrews securely.

**3.14 Inner Cam:** To replace the inner cam, remove the motor as covered in 3.06 and 3.07. Loosen the setscrews on the outer cam, then the inner cam, using either an R-2653 wrench or a 1/16-inch Allen wrench and remove the outer cam, then the inner cam. Mount a new inner cam on the motor shaft, and position the outer cam on the hub of the inner cam as covered in 3.13. Remount the motor as covered in 3.09, taking care that the cams are between the operating fingers and the buttons. Check the cam timing requirements per Section 030-141-701. Then tighten the cam set screws securely.

**4E Timer**

**3.15** The 4E timer requires no additional frame wiring or frame modification and eliminates the need for periodic lubrication and cam adjustment.