MILITARY STANDARD
MARKING OF CONNECTIONS
FOR ELECTRIC ASSEMBLIES

TO ALL ACTIVITIES:

1. THE FOLLOWING PAGES OF THIS STANDARD HAVE BEEN REVISED AND SUPERSEDE THE PAGES LISTED:

NEW PAGE	DATE	SUPERSEDED PAGE	DATE
v	7 February 1958	v	20 October 1955
vi	20 October 1955 (Reprinted without change)		
vii	7 February 1958	vii	20 October 1955
viii	7 February 1958		
ix	7 February 1958		
x	7 February 1958		
7	7 February 1958	7	20 October 1955
7a	7 February 1958	7	20 October 1955
8	7 February 1958	8	20 October 1955
9	7 February 1958	9	20 October 1955
10	20 October 1955 (Reprinted without change)		
85	7 February 1958	85	20 October 1955
86	7 February 1958	86	20 October 1955
71	7 February 1958		
72	7 February 1958		
73	7 February 1958		
74	7 February 1958		
75	7 February 1958		
76	7 February 1958		
77	7 February 1958		
78	7 February 1958		
79	7 February 1958		
80	7 February 1958		
81	7 February 1958		
82	7 February 1958		
83	7 February 1958		
84	7 February 1958		
85	7 February 1958		
86	7 February 1958		
87	7 February 1958		
88	7 February 1958		
89	7 February 1958		
90	7 February 1958		
91	7 February 1958		
92	7 February 1958		
93	7 February 1958		

2. RETAIN THIS COVER PAGE AND INSERT BEFORE THE TABLE OF CONTENTS OF THIS STANDARD.

CONTENTS *(Continued)*

CONTENTS *(Continued)*

Reprinted without change.

CONTENTS *(Continued)*

CONTENTS *(Continued)*

Supersedes page vii of 20 October 1955.

CONTENTS *(Continued)*

CONTENTS *(Continued)*

TABLE

ings shall be marked "ST" followed by the appropriate polarity marking.

5.1.5 *Rotary amplifiers.* The markings shall conform to 5.1. The output load leads shall be marked A_1 (—) and A_2 (+).

5.2 D.c. motors shall be marked in accordance with figures 12 to 30 inclusive.

5.2.1 *Shunt-wound (see figures 12 to 17 inclusive).* Direction of shaft rotation for nonreversing motors shall be standard. Connections shown in these diagrams will give standard shaft rotation. (Commutating field windings are shown on the A_2 side of the armature, but this location, although preferred, is not standardized.) This winding may be connected on one side of the armature or may be divided part on either side.

5.2.2 *Series-wound (see figures 18 to 22).* Direction of shaft rotation for nonreversing motors shall be standard. Connections shown in these diagrams will give standard shaft rotation. (Commutating and series field windings are shown on the A_2 side of the armature but this location, although preferred, is not standardized.) These windings may be connected on one side of the armature or may be divided part on either side.

5.2.3 *Compound-wound and stabilized shunt-wound (see figures 23 to 30 inclusive).* Direction of shaft rotation for nonreversing motors shall be standard. Connections shown in these diagrams will give standard shaft rotation. (Compensating, commutating and series field windings are shown on the A_2 side of the armature but this location, although preferred, is not standardized.) These windings may be connected on one side of the armature or may be divided part on either side. For differential connection of the series fields no change shall be made on the field leads or connection markings on the machine, but the connection of the series field to armature shall be shown reversed.

5.3 A.c. generators and synchronous motors.

5.3.1 *Three-two-and single-phase.* Three-phase a.c. generator and synchronous motor a.c. windings shall have connection markings as described in 5.4.3 for three-phase induction motors.

Two-phase a.c. generator and synchronous motor a.c. windings shall have connection markings as described in 5.4.6 for two-phase induction motors.

Single-phase a.c. generator and synchronous motor a.c. windings shall have connection markings as shown on figure 31.

The connection markings of d.c. field windings shall be F_1 and F_2.

5.3.1.1 *Additional requirements for three-phase generators.* When facing the end opposite the drive end, and when reading from front (the end opposite drive) to back, right to left, or top to bottom, the connection markings shall be arranged in the following order for clockwise rotation: T_1, T_2, T_3, for rotating field generators and M_1. M_2, M_3 for rotating armature generators and in the following order for counterclockwise rotation: T_1, T_3, T_2 for rotating field generators and M_1, M_3, M_2,for rotating armature generators.

5.3.2 *Single-phase motors.* (See figures 32 to 48 inclusive and 124 to 170 inclusive.)

5.3.2.1 *Dual-voltage.* Regardless of type, when a single-phase motor is reconnectible in series or parallel to effect a dual voltage, the terminal marking shall be determined as follows:

(a) Divide the main winding into two halves and assign T_1 and T_2 to one half and T_3 and T_4 to the other half.

(b) Divide the auxiliary winding (if present) into two halves and assign T_5 and T_6 to one half and T_7 and T_8 to the other half.

(c) Polarities are to be established so that standard direction of rotation (counter-clock-wise end opposite drive) is obtained when the main winding terminal T_4 and the auxiliary winding terminal T_5 are joined, or if the equivalent circuitwise connection between main and auxiliary winding is made.

3.2.2 *Single-voltage.* If a single-phase motor is single voltage, or if either winding is provided for only one voltage, the terminal marking shall be determined as follows:

(1) Assign T_1 and T_4 to the main winding and T_5 and T_8 to the auxiliary winding (if present), with the polarity arrangement such that standard direction of rotation is obtained if T_4 and T_5 are joined to one line and T_1 and T_8 to the other.

(2) These terminal marking arrangements are shown diagramatically in figures 124 and 125.

5.3.2.3 *Auxiliary parts within motor.*

Where capacitors, starting switches, thermal protectors, or other auxiliary parts are included within the motor, or are mounted on the motor structure, and are permanently wired in series with the winding without a terminal being provided at the junction, the terminal markings shall be determined from the part of the winding to which the terminals ultimately connect. The presence of an auxiliary part or a plurality of such parts between the terminal and the part of the winding to which it ultimately connects shall not affect the marking.

Where a terminal is provided at the junction mentioned in the preceding paragraph, the terminal marking of this junction shall be determined by the part of the winding to which it is connected. Other terminals shall be identified by letters indicating the auxiliary part within the motor to which the terminal is connected.

5.3.2.4 *Auxiliary parts external to motor.*

Where capacitors, resistors, reactors, transformers or other auxiliary parts are enclosed separately from the motor, the letters for terminal markings shall be as specified in 4.2. The terminal marking letters shall be determined from the part to which they connect directly.

The subscript numbers for the terminal marking letters shall be the same as the subscript numbers of letter T of the motor terminals to which they connect for standard direction of rotation. If the auxiliary part terminal joins to a junction of more than one motor terminal, the lowest motor terminal subscript shall be used for the auxiliary part terminal subscript. For dual voltage motors, subscripts for the auxiliary part terminals shall be determined with the motor connected for the higher voltage value.

If there are several auxiliary parts, in different housings, requiring interconnections between the parts, but with these interconnections not to the motor, a subscript number of 9 or greater that is not used with any motor terminal shall be assigned.

5.3.2.5 *General principles for connection diagrams.* The terminal marking and connection procedure given above and in figures 126 to 170 inclusive are based on the following principles:

(a) *First principle.* The main winding of a single-phase motor is designated by T_1, T_2, T_3 and T_4 and the auxiliary winding T_5, T_6, T_7 and T_8 to distinguish it from a

two-phase motor which uses odd subscript numbers for one phase and even subscript numbers for the other phase.

b) *Second principle.* By following the first principle, it results that odd to odd subscript terminals are joined for lower voltage (parallel) connection and odd to even subscript terminals are joined for higher voltage (series) connection.

(c) *Third principle.* The rotor of a single-phase motor is represented by a circle, even though there are no external connections to it. This indicates definitely whether or not there are any external connections made to it. It also serves to distinguish the single-phase motor schematic diagram from that of the two-phase motor in which the rotor is never represented.

5.3.2.6 *Terminal boards.* When terminal boards are shown, they are viewed from the front. Broken lines indicate permanent connections.

Note. Figures 126 to 170 inclusive represent the normal motor running condition and the contacts of centrifugal switches are shown in the position to correspond with the running condition.

5.4 Marking of a.c. polyphase induction motors shall be in accordance with figures 49 to 75 inclusive.

5.4.1 *Classes of polyphase induction motors.* Induction motors of the collector-ring or squirrel-cage type are divided into the following classes for determining connection markings:

Class 1 — Three-phase motors having one synchronous speed. (See 5.4.3.)

Class 2 — Three-phase motors having two synchronous speeds obtained from a reconnectible winding. (See 5.4.4.)

Class 3 — Three-phase motors having two or more synchronous speeds obtained from two or more independent windings. (See 5.4.5.)

Class 4 — Two-phase motors having one synchronous speed. (See 5.4.6.)

Class 5 — Two-phase motors having two synchronous speeds obtained from a reconnectible winding. (See 5.4.7.)

Class 6 — Two-phase motors having two or more synchronous speeds obtained from two or more independent windings. (See 5.4.8.)

5.4.2 *Purpose of rules applying to induction motors.* Since the windings of a motor are seldom accessible, the markings of the connections are used to show the relations of the windings within the motor. A clockwise rotation in the sequence of connection numbering shall be used as described in subsequent paragraphs. For three-phase motors having two synchronous speeds obtained from a reconnectible winding, it is undesirable to adhere to the clockwise system of numbering for all connections, as this would cause the motor to run with clockwise shaft rotation on one speed and counterclockwise on the other speed if the power lines are connected to each set of connections in the same sequence. For two-phase motors, regardless of the class of motor or the type of winding, the rules are such that odd subscript numbers are in one phase

and even subscript numbers are in the other phase. The markings of all motors except those for two-speed motors using a single reconnectible winding, are based, as are the rules for three-phase windings, on a clockwise spiral system of rotation in the sequence of connection numbering.

5.4.3 *Class I induction motors.* The following rules apply in determining the connection markings of any three-phase induction motor stator having only one synchronous speed regardless of how many circuits per phase there may be or how they are connected and they determine definitely which circuits belong in the same phase and also the polarity of the circuits.

5.4.3.1 Wye-connected windings.

(a) A schematic vector diagram shall be drawn showing an inverted wye connection with the individual circuits in each phase arranged for series connection with correct polarity relation of circuits. The diagram for two circuits per phase, for example, shall be drawn as shown on figure 49.

(b) Starting with T_1 at the outside and top of the diagram, the ends of the circuits shall be numbered consecutively in a clockwise direction proceeding on a spiral towards the center of the diagram. For two circuits per phase, for example, the connections shall be marked as shown on figure 50.

(c) A schematic diagram shall now be drawn showing the particular interconnection of circuits for the motor under consideration and the connection markings, as determined from the preceding paragraphs, shall be arranged to give the correct polarity relation of circuits. If the winding on figure 50 is to be connected with two circuits in parallel per phase, the diagram and markings shall be as shown on figure 51.

(d) The highest numbers shall be dropped and only the lowest number retained where two or more terminals are permanently connected together. If the winding on figure 51 is to have the two circuits in each phase permanently connected together with three line leads and three neutral leads brought out, the connection markings shall be as shown on figure 52. If the winding on figure 50 is to be arranged for either a series or a parallel connection, the diagram and connection markings shall be as shown on figure 53.

(e) Where the ends of three coils are connected together to form a permanent neutral, the connection markings of the three leads so connected shall be dropped. If the neutral point is brought out it shall be marked T_0.

5.4.3.2 *Delta-connected windings.* Where a winding is to be delta-connected, the inverted wye diagram shall be rotated 30 degrees counterclockwise as shown on figure 49. T_1 shall be assigned to the outer end of the top leg and the numbering shall conform to item b under 5.4.3.1 and figure 50. There shall then be constructed, a schematic delta in which the T_1 leg of the rotated wye becomes the right-hand side of the delta, the T_2 leg becomes the bottom (horizontal) side and the T_3 leg becomes the left side of the delta. Items c, d and e under 5.4.3.1 shall be applied as far as they are applicable to a delta connection as shown on figure 54.

5.4.4 *Class 2 induction motors.* Inasmuch as part of the connections follow a clockwise rotation and part a counterclockwise rotation in order to obtain the same direction of rotation for both speeds when the line leads are connected in the same sequence, it is difficult to give a written rule for connection markings. As a consequence, schematic diagrams for connection markings are shown for the few types of reconnectible windings on figures 48, 49, 50, 51, and 52. T_1, T_2 and T_3 are clockwise in all cases and are always the line connections for low speed. If a neutral lead is brought out it shall be marked T_0.

5.4.5 *Class 3 induction motors.*

5.4.5.1 If each independent winding gives only one synchronous speed, the winding giving the lowest speed shall take the same connection markings as determined in 5.4.3 for class 1 motors for the particular winding used. The connection markings for the higher speed windings shall be obtained by adding 10, 20, or 30, to the connection markings as determined in 5.4.3 for class 1 motors for the particular winding used, the sequence being determined by progressing each time to the next higher speed. Figure 61 is an example of the connection markings for a three-speed motor using three windings.

5.4.5.2 If each independent winding is reconnectible to give two synchronous speeds:

(a) Diagrams of the windings to be used shall be drawn and each winding shall be given the connection markings shown in 5.4.4 for class 2 motors.

(b) No further change shall be made in any of the connection markings of the winding giving the lowest speed, irrespective of whether the other speed obtained from this winding is an intermediate or the highest speed.

(c) Ten shall be added to all connection markings of the winding giving the next higher speed, and an additional 10 is added to all the connection markings for each consecutively higher speed winding. Figure 61 is an example of the connections markings for a four-speed motor using two windings.

5.4.5.3 If two or more types of independent windings are used, part of which give only one synchronous speed and the rest give two synchronous speeds by reconnection:

(a) Each winding shall be given the markings as determined in 5.4.3 for class 1, and 5.4.4 for class 2 motors, as the case may be.

(b) No further change shall be made in any of the connection markings of the winding giving the lowest speed, irrespective of whether the other speeds obtained from this winding are an intermediate or the highest speed.

(c) Ten shall be added to all connection markings of the winding giving the next higher speed and an additional 10 shall be added to all the connection markings of each consecutively higher speed winding. Figure 62 is an example of the connection markings for a three-speed motor using two windings.

5.4.5.4 If, under any of the paragraphs of the rule for class 3 motors, the addition of 10, 20, or 30, to the basic connection markings causes a duplication of markings due to more than 9 leads being brought out on any one winding, then 20, 40, or 60, shall be added instead of 10, 20, or 30, to obtain the markings for the higher speeds.

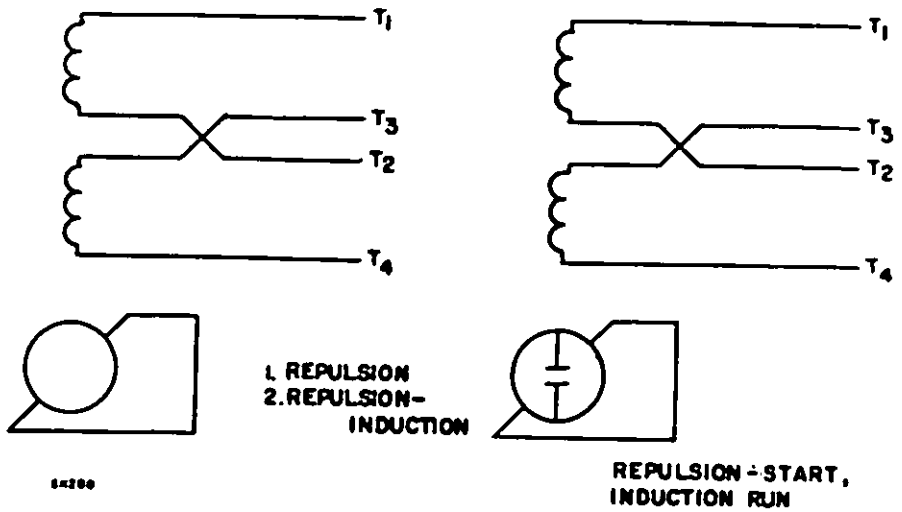
5.4.5.5 The figures shown for class 3 mo-

tors apply when stator connections of all windings are at the same end of the motor. Where one or more of the windings has stator connections at one end of the motor and part on the other end, the sequence of the connection markings for connections at one end may be shown on the diagram as shown on the illustrative figures, and the connection markings for those brought out on the opposite end may be shown reversed in rotation. Where diagrams use this reversed rotation of markings, an explanatory note shall be included for the benefit of the controller of supplies in showing that when L_1, L_2, and L_3 are connected to any winding with the same sequence of subscript numbers (T_1, T_2, T_3 or T_4, T_5, T_6, or T_{11}, T_{12}, or T_{13}), the shaft rotation will be the same.

5.4.6 *Class 4 induction motors.* The following rules may be applied to determine the connection marking of any two-phase induction motor stator having only one synchronous speed regardless of how many circuits per phase there may be or how they are connected and they determine definitely which circuits belong in the same phase, and also the polarity of the circuits. A schematic diagram shall be drawn with the individual circuits in each phase arranged for series connection with correct polarity relation of circuits as shown on figure 63. Starting with T_1 at the outside and top of the diagram, the ends of the circuits shall be numbered consecutively in a clockwise direction proceeding on a spiral towards the center of the diagram. For three circuits per phase, for example, the connections shall be marked as shown on figure 64.

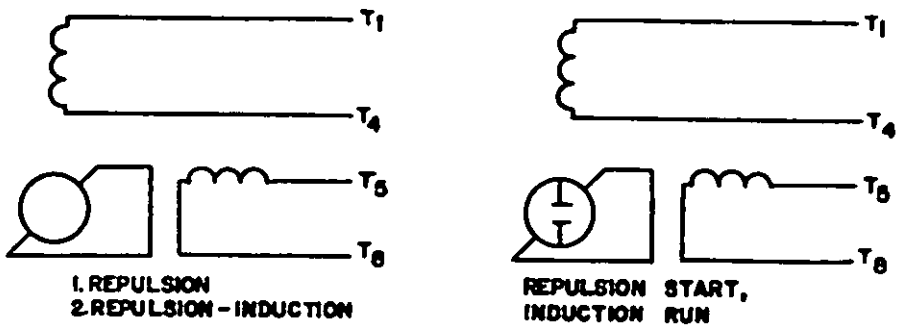
5.4.6.1 A schematic diagram shall now be drawn showing the particular interconnection of circuits for the motor under consideration, and the connection markings as determined in the preceeding paragraphs shall be arranged to give correct polarity relation of circuits. Where the winding on figure 64 is to be connected with three circuits in multiple per phase, the diagram and markings shall be as shown on figure 65.

5.4.6.2 The highest numbers shall be dropped and only the lowest number retained where two or more connections are permanently connected. Where the winding on figure 65 is to have the three circuits in each phase permanently connected together with



	L_1	L_2	Tie together
Low voltage	T_1, T_3	T_2, T_4	....
High voltage	T_1	T_4	T_2, T_3

FIGURE 45. *Repulsion, repulsion-induction and repulsion-start induction run, all dual voltage and without compensating windings.*



	L_1	L_2	Tie together
One direction rotation	T_1	T_4	T_4, T_5
Other direction rotation	T_1	T_5	T_4, T_8

FIGURE 46. *Repulsion, repulsion-induction and repulsion-start induction run, all single-voltage reversible.*

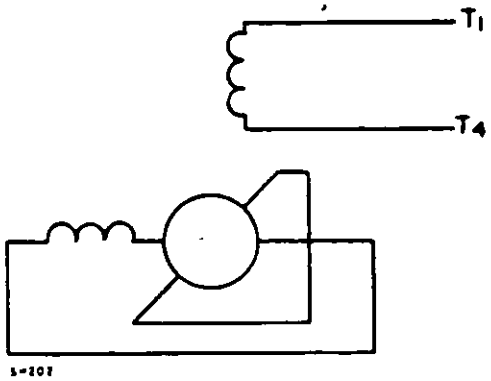
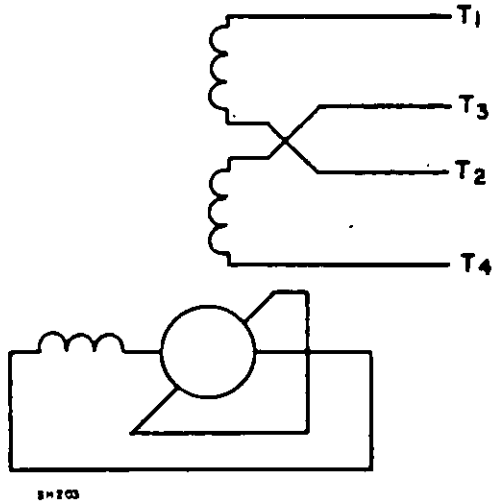


FIGURE 47. *Repulsion motor, single voltage, inductively compensated.*



	L_1	L_2	Tie together
Low voltage	T_1, T_3	T_2, T_4	....
High voltage	T_1	T_4	T_2, T_3

FIGURE 48. *Repulsion motor, dual voltage, inductively compensated.*

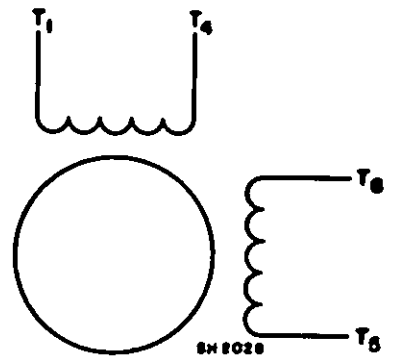


FIGURE 124. *Single-voltage motor.*

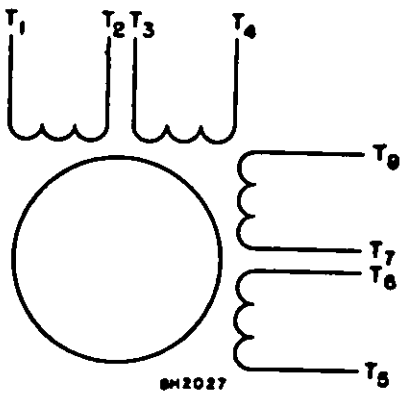
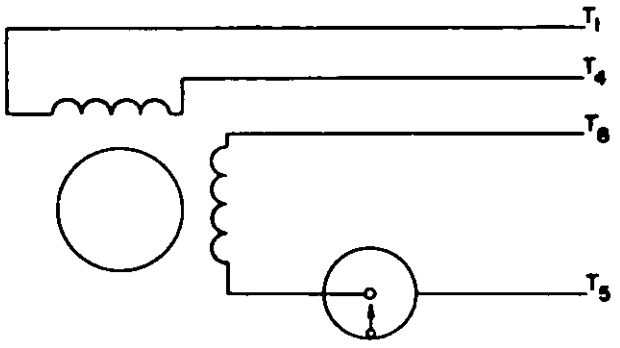


FIGURE 125. *Dual-voltage motor.*



	L1	L2
COUNTER CLOCKWISE ROTATION	T1, T8	T4, T5
CLOCKWISE ROTATION	T1, T5	T4, T8

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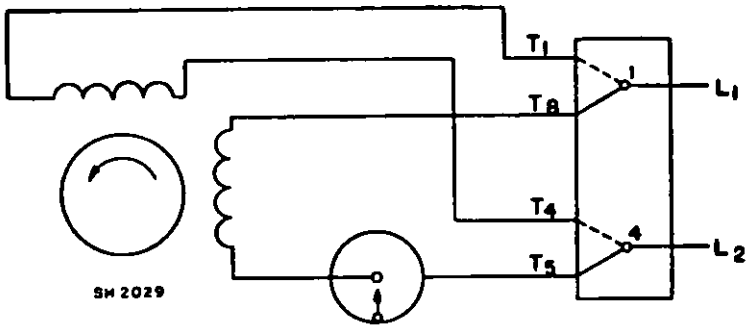
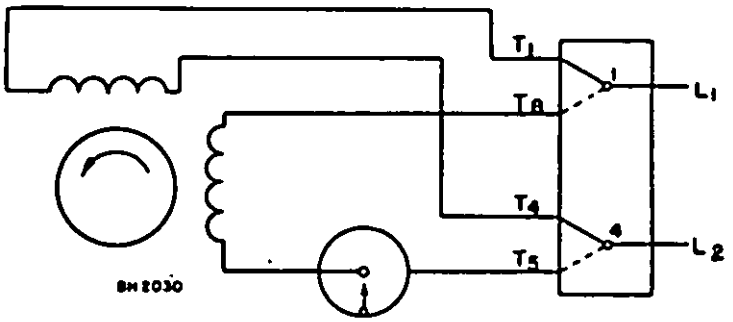
FIGURE 126. *Split-phase, single-voltage, reversible motor without thermal protector.*



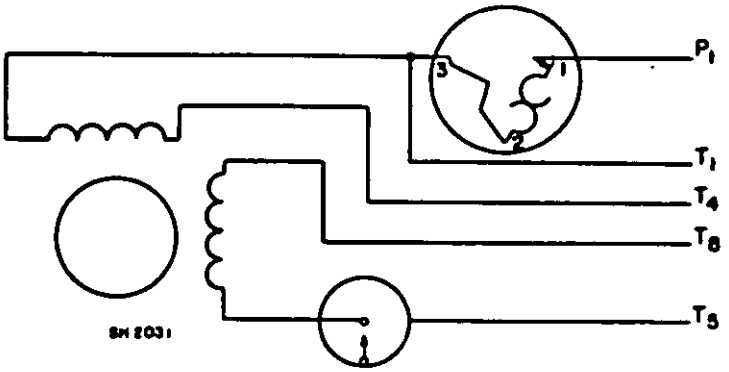
TO OBTAIN CLOCKWISE ROTATION
INTERCHANGE LEADS T5 AND T8.

FIGURE 127. *Split-phase, single-voltage, reversible motor without thermal protector, but with terminal board. Arrangement a.*



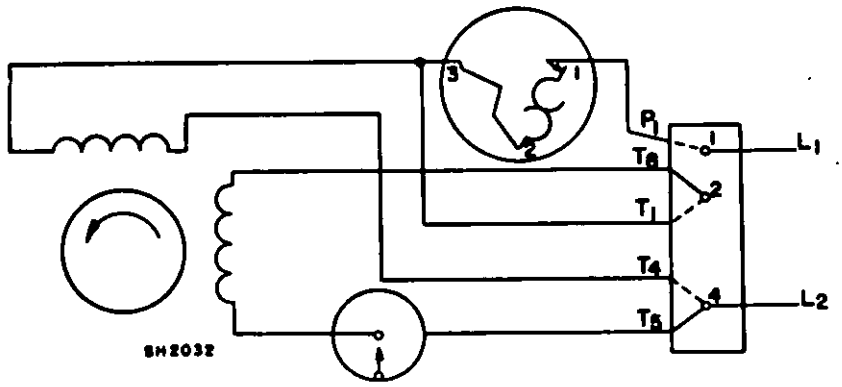
TO OBTAIN CLOCKWISE ROTATION
INTERCHANGE LEADS T1 AND T4.

FIGURE 128. *Split-phase, single-voltage, reversible motor without thermal protector, but with terminal board. Arrangement b.*



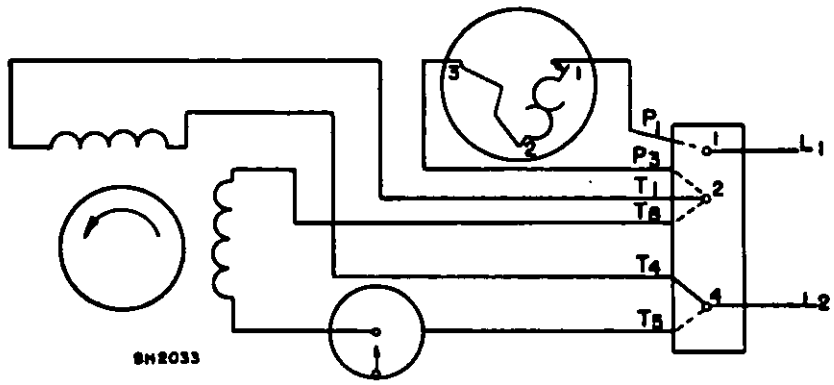
	L1	L2	JOIN
COUNTER CLOCKWISE ROTATION	P1	T4, T5	T1, T8
CLOCKWISE ROTATION	P1	T4, T8	T1, T5

FIGURE 129. *Split-phase, single-voltage, reversible motor with thermal protector.*



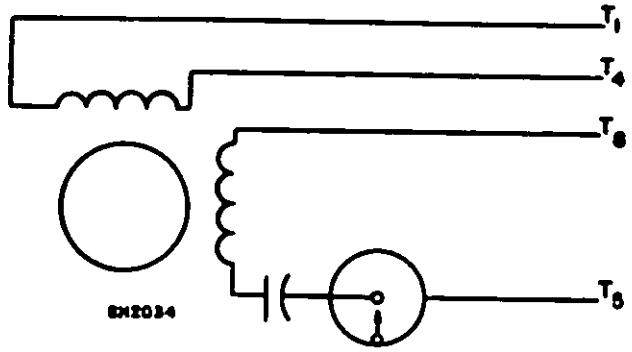
TO OBTAIN CLOCKWISE ROTATION
INTERCHANGE LEADS T5 AND T8.

FIGURE 130. *Split-phase, single-voltage, reversible motor with thermal protector and terminal board. Arrangement a.*



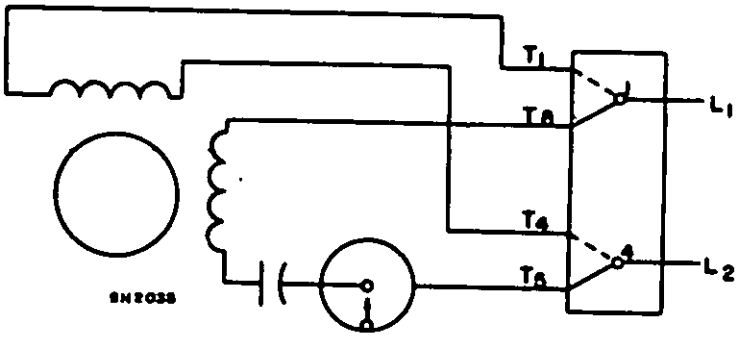
TO OBTAIN CLOCKWISE ROTATION
INTERCHANGE LEADS T1 AND T4.

FIGURE 131. *Split-phase, single-voltage, reversible motor with thermal protector and terminal board, Arrangement b.*



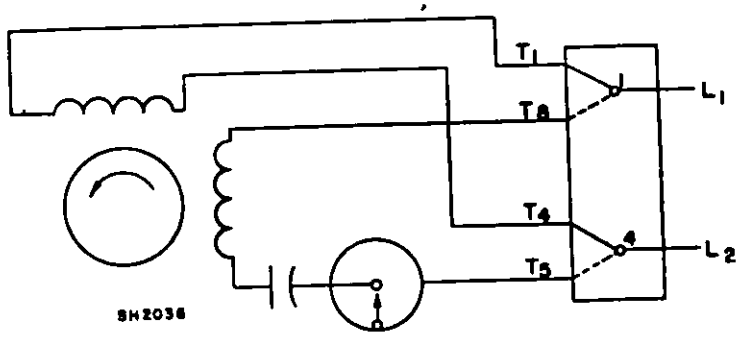
	L1	L2
COUNTER CLOCKWISE ROTATION	T1, T8	T4, T5
CLOCKWISE ROTATION	T1, T5	T4, T8

FIGURE 132. *Capacitor-start, single-voltage, reversible motor without thermal protector.*



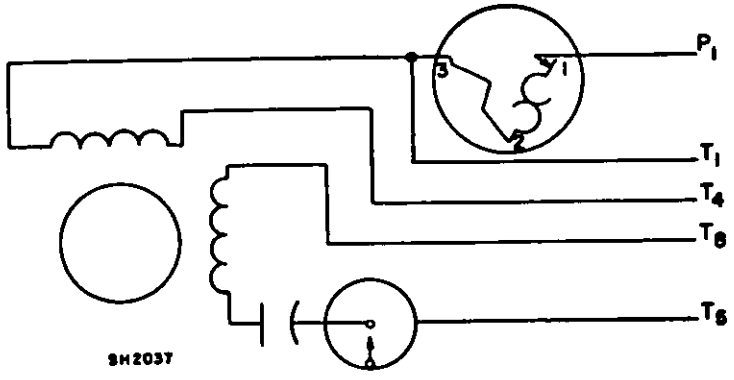
TO OBTAIN CLOCKWISE ROTATION
INTERCHANGE LEADS T5 AND T8.

FIGURE 133. *Capacitor-start, single-voltage, reversible motor without thermal protector but with terminal board. Arrangement a.*



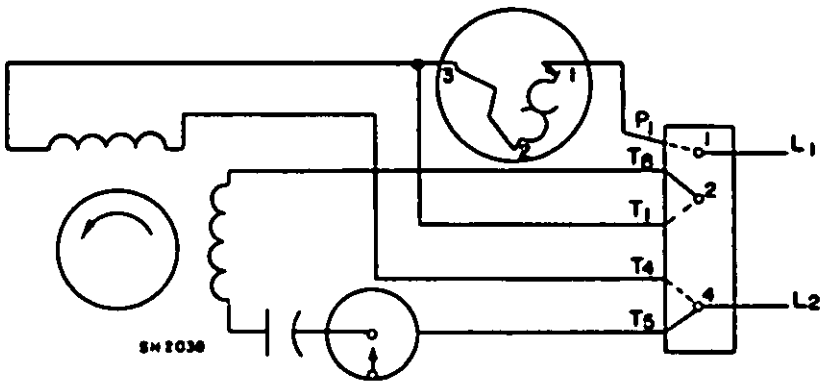
TO OBTAIN CLOCKWISE ROTATION
INTERCHANGE LEADS T1 AND T4.

FIGURE 134. *Capacitor-start, single-voltage, reversible motor without thermal protector but with terminal board. Arrangement b.*



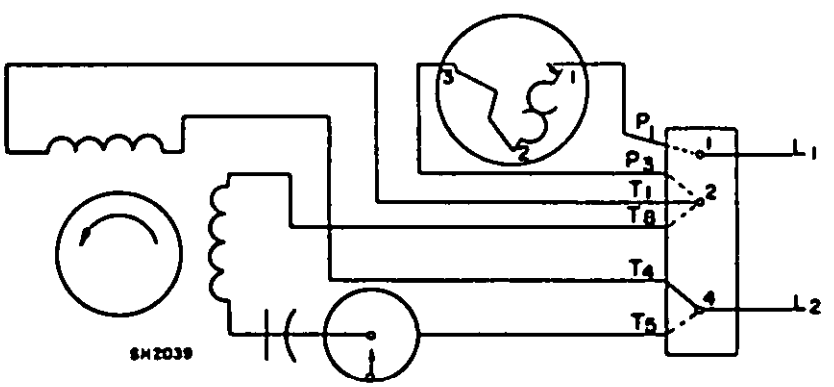
	L1	L2	JOIN
COUNTER CLOCKWISE ROTATION	P1	T4,T5	T1,T8
CLOCKWISE ROTATION	P1	T4,T8	T1,T5

FIGURE 135. *Capacitor-start, single-voltage, reversible motor with thermal protector.*



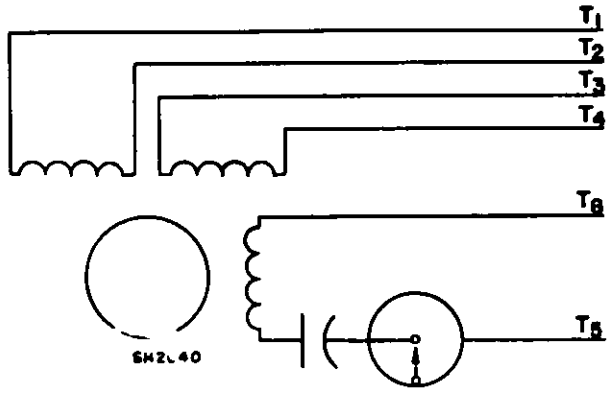
TO OBTAIN CLOCKWISE ROTATION
INTERCHANGE LEADS T5 AND T8.

FIGURE 136. *Capacitor-start, single-voltage, reversible motor with thermal protector and terminal board. Arrangement a.*



TO OBTAIN CLOCKWISE ROTATION
INTERCHANGE LEADS T1 AND T4

FIGURE 137. *Capacitor-start, single-voltage reversible motor with thermal protector and terminal board. Arrangement b.*



		L1	L2	JOIN
HIGHER IDENTIFICATION PLATE VOLTAGE	COUNTER CLOCKWISE ROTATION	T1	T4, T5	T2,T3,T8
	CLOCKWISE ROTATION	T1	T4, T8	T2,T3,T5
LOWER IDENTIFICATION PLATE VOLTAGE	COUNTER CLOCKWISE ROTATION	T1,T3,T8	T2,T4,T5	
	CLOCKWISE ROTATION	T1,T3,T5	T2,T4,T8	

FIGURE 138. *Capacitor-start, dual-voltage, reversible motor without thermal protector.*

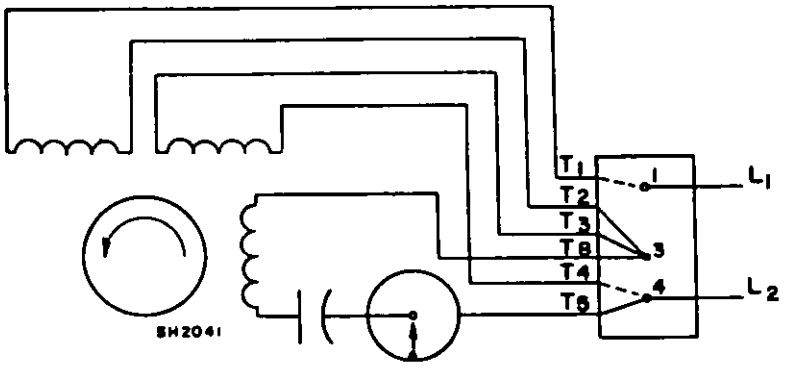
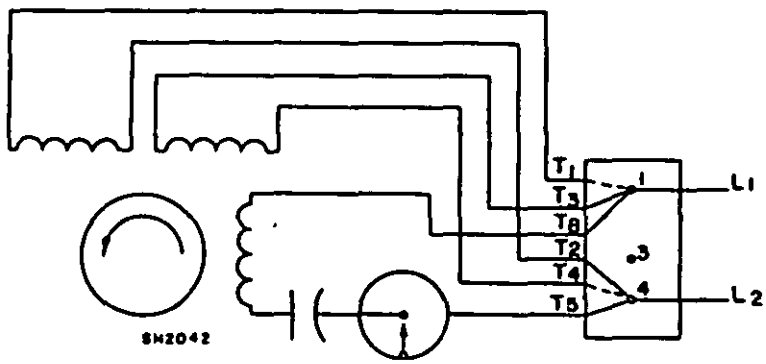
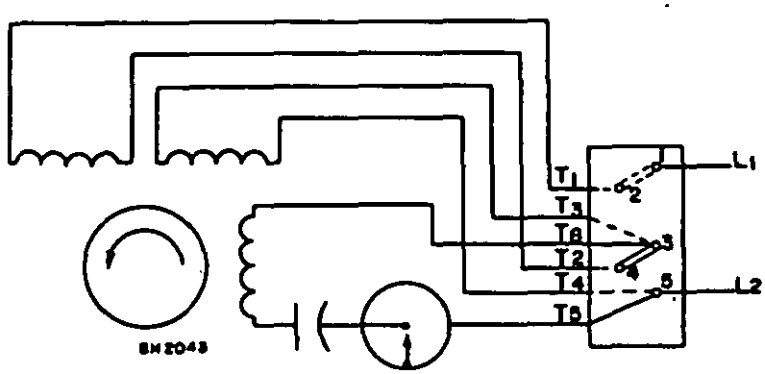


FIGURE 139. *Capacitor start motors, reversible, dual voltage without thermal protector; terminal board line-lead interconnections for operation at plate designated high voltage.*



TO OBTAIN CLOCKWISE ROTATION
INTERCHANGE LEADS T5 AND T8.

FIGURE 140. *Capacitor-start motors, reversible, dual voltage-without thermal protector; terminal board line-lead interconnections for operation at plate designated voltage.*



TO OBTAIN CLOCKWISE ROTATION
INTERCHANGE LEADS T5 AND T8.

FIGURE 141. *Capacitor-start motors-reversible dual voltage without thermal protector; strap jumper equipped terminal board line-lead interconnections for operation at plate designated high voltage.*

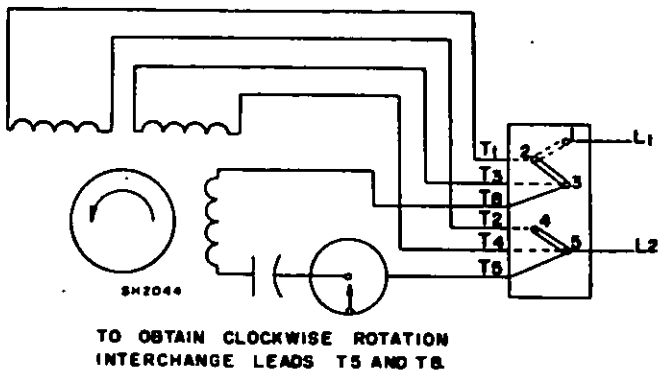
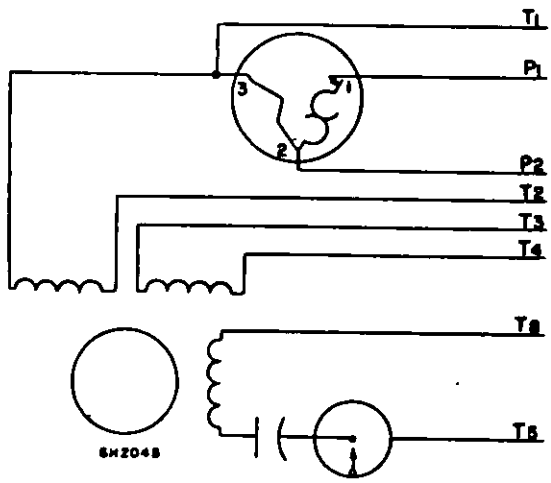
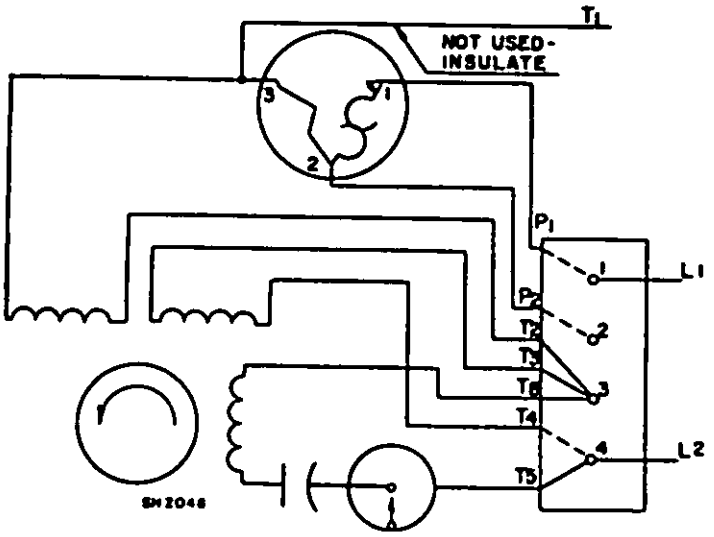


FIGURE 142. *Capacitor-start motors, reversible, dual voltage without thermal protector; strap jumper equipped terminal board line-lead interconnections for operation at plate designated low voltage.*



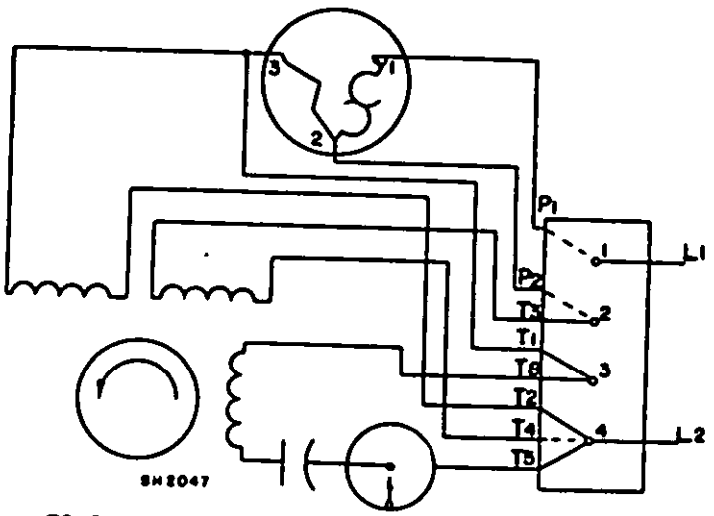
		L1	L2	JOIN	JOIN	INSULATE SEPARATELY
HIGHER IDENTIFICATION PLATE VOLTAGE	COUNTER CLOCKWISE ROTATION	P1	T4,T5	T2,T3, T8	— —	P2, T1
	CLOCKWISE ROTATION	P1	T4,T8	T2,T3, T5	— —	P2,T1
LOWER IDENTIFICATION PLATE VOLTAGE	COUNTER CLOCKWISE ROTATION	P1	T2,T4, T5	P2,T3	T1,T8	— —
	CLOCKWISE ROTATION	P1	T2,T4, T8	P2,T3	T1,T5	— —

FIGURE 143. *Capacitor-start, dual-voltage, reversible motor with thermal protector. Arrangement a.*



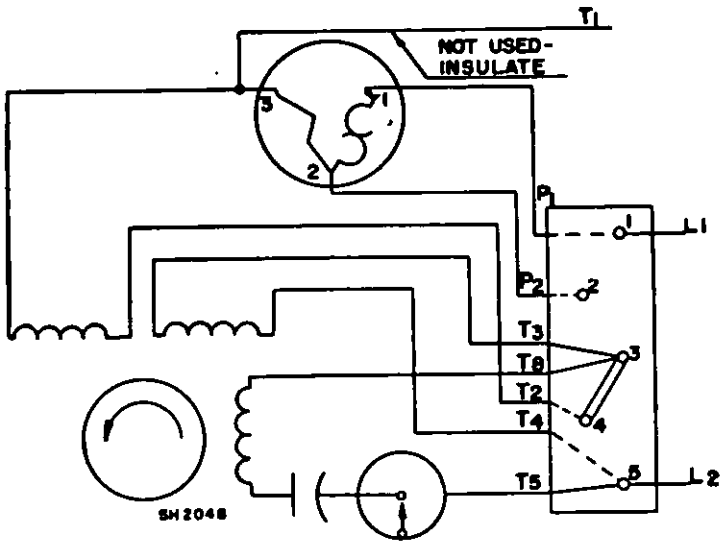
TO OBTAIN CLOCKWISE ROTATION INTERCHANGE
LEADS T5 AND T6.

FIGURE 144. *Capacitor-start motors, reversible, dual voltage, incorporating thermal protector; terminal board line-lead interconnections for operation at plate designated high voltage.*



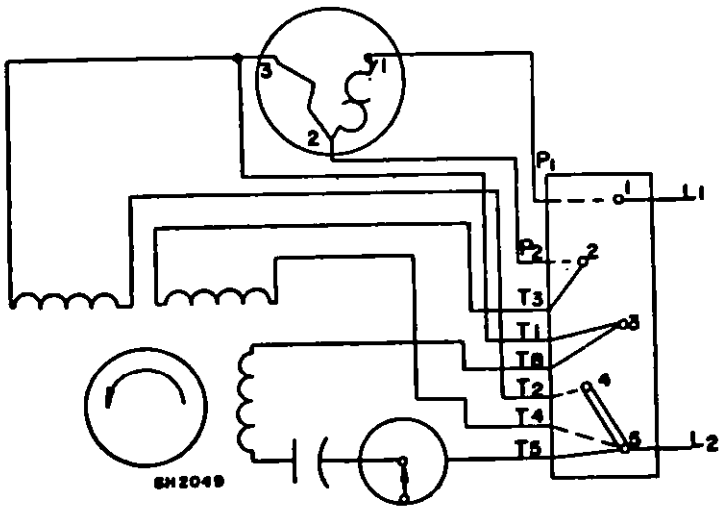
TO OBTAIN CLOCKWISE ROTATION INTERCHANGE
LEADS T5 AND T6.

FIGURE 145. *Capacitor-start motors, reversible, dual voltage, incorporating thermal protector; terminal board line-lead interconnections for operation at plate designated low voltage.*



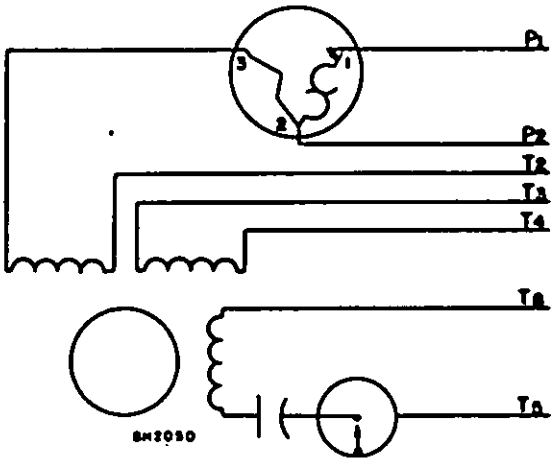
TO OBTAIN CLOCKWISE ROTATION INTERCHANGE LEADS T5 AND T8.

FIGURE 146. *Capacitor-start motors, reversible, dual voltage, incorporating thermal protector; strap jumper equipped terminal board line-lead interconnections for operation at plate designated high voltage.*



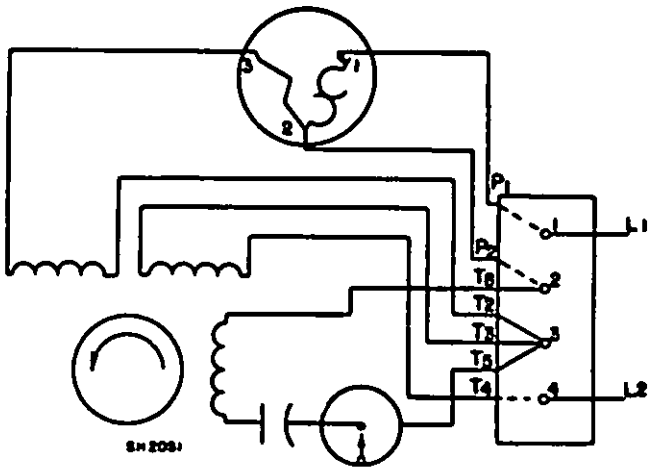
TO OBTAIN CLOCKWISE ROTATION INTERCHANGE LEADS T5 AND T8.

FIGURE 147. *Capacitor-start motors, reversible, dual voltage, incorporating thermal protector; strap jumper equipped terminal board line-lead interconnections for operation at plate designated low voltage.*



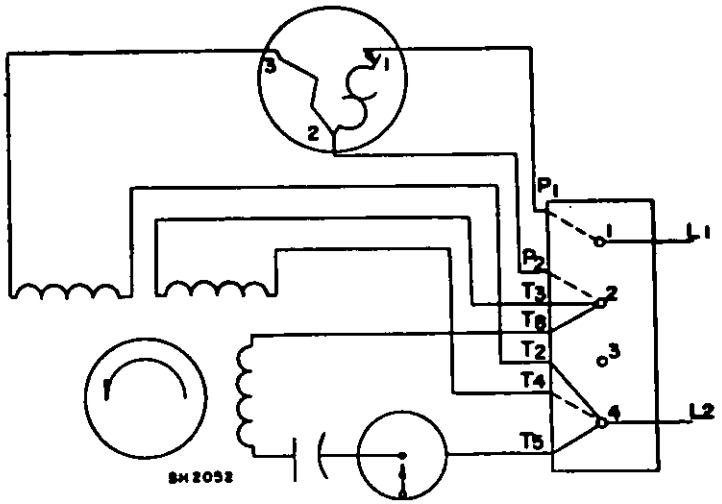
		L1	L2	JOIN	JOIN
HIGHER IDENTIFICATION PLATE VOLTAGE	COUNTER CLOCKWISE ROTATION	P1	T4	P2,T8,	T2,T3, T5
	CLOCKWISE ROTATION	P1	T4	P2,T5	T2,T3 T8
LOWER IDENTIFICATION PLATE VOLTAGE	COUNTER CLOCKWISE ROTATION	P1	T2,T4, T5	P2,T3 T8	- -
	CLOCKWISE ROTATION	P1	T2,T4 T8	P2,T3 T5	- -

FIGURE 148. *Capacitor-start, dual-voltage, reversible motor with thermal protector. Arrangement b.*



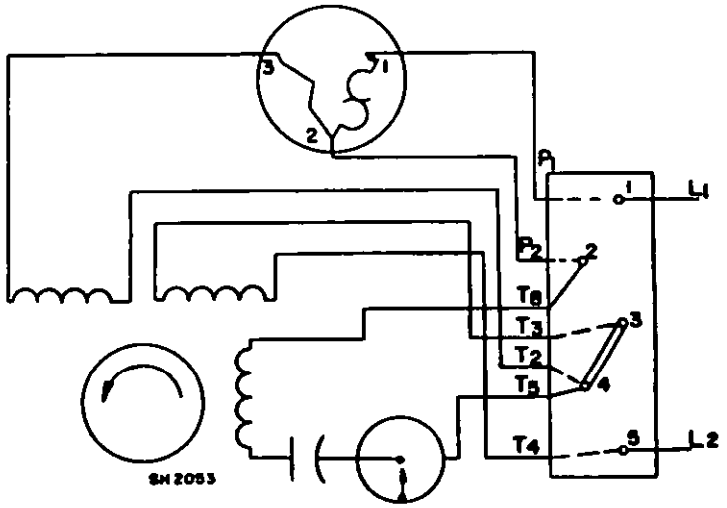
TO OBTAIN CLOCKWISE ROTATION INTERCHANGE LEADS T5 AND T8.

FIGURE 149. *Capacitor-start motors, reversible dual voltage, incorporating thermal protector; terminal board line-lead interconnections for operation at plate designated high voltage.*



TO OBTAIN CLOCKWISE ROTATION INTERCHANGE LEADS T5 AND T8.

FIGURE 150. *Capacitor-start motors, reversible, dual voltage, incorporating thermal protector; terminal board line-lead interconnections for operations at plate designated low voltage.*



TO OBTAIN CLOCKWISE ROTATION INTERCHANGE LEADS T5 AND T8.

FIGURE 151. *Capacitor-start motors, reversible, dual voltage, incorporating thermal protector; strap jumper equipped terminal board line-lead interconnections for operation at plate designated high voltage.*

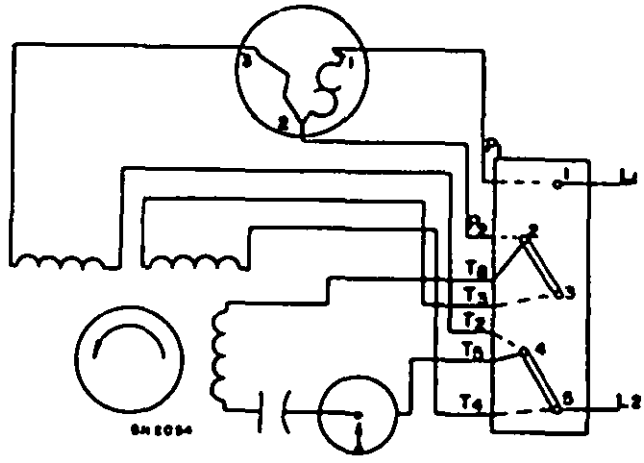
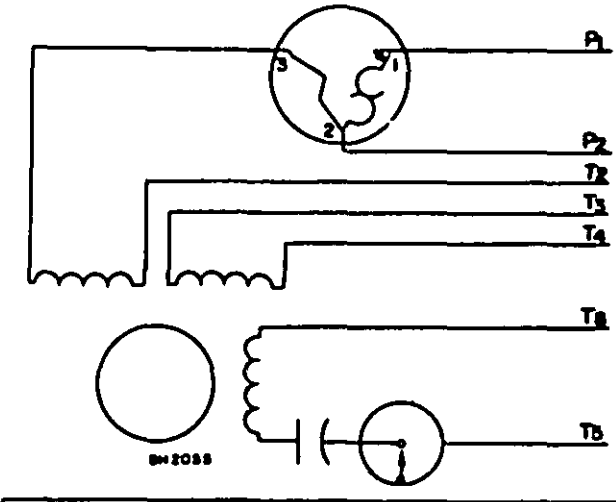
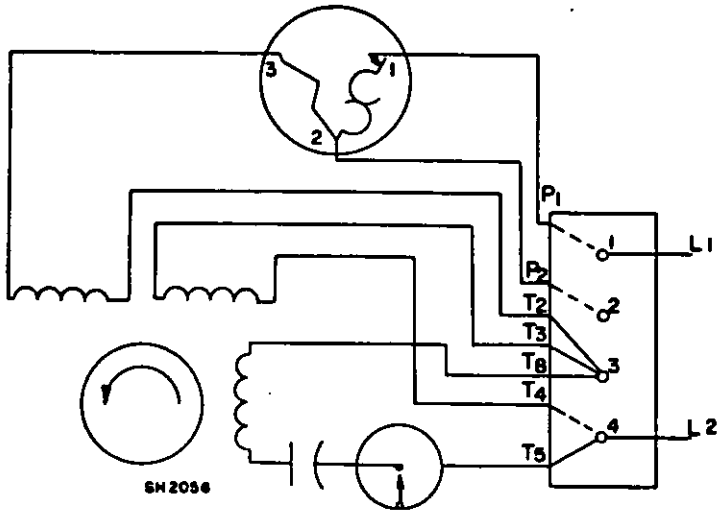


FIGURE 152. *Capacitor-start motors, reversible, dual voltage, incorporating thermal protector; strap jumper equipped terminal board line-lead interconnections for operation at plate designated low voltage.*



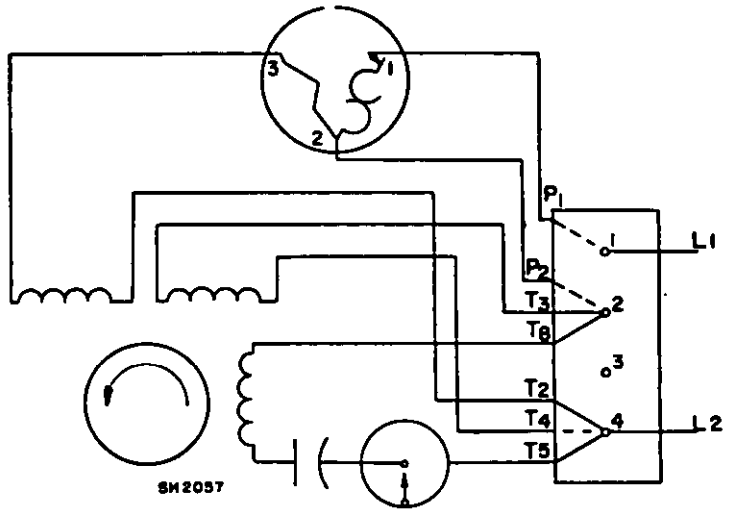
		L1	L2	JOIN	INSULATE SEPARATELY
HIGHER IDENTIFICATION PLATE VOLTAGE	COUNTER CLOCKWISE ROTATION	P1	T4,T6	T2,T3, T8	P2
	CLOCKWISE ROTATION	P1	T4,T8	T2,T3 T5	P2
LOWER IDENTIFICATION PLATE VOLTAGE	COUNTER CLOCKWISE ROTATION	P1	T2,T4, T5	P2,T3 T8	--
	CLOCKWISE ROTATION	P1	T2,T4 T8	P2,T3 T5	--

FIGURE 153. *Capacitor-start, dual-voltage, reversible motor with thermal protector. Arrangement c.*



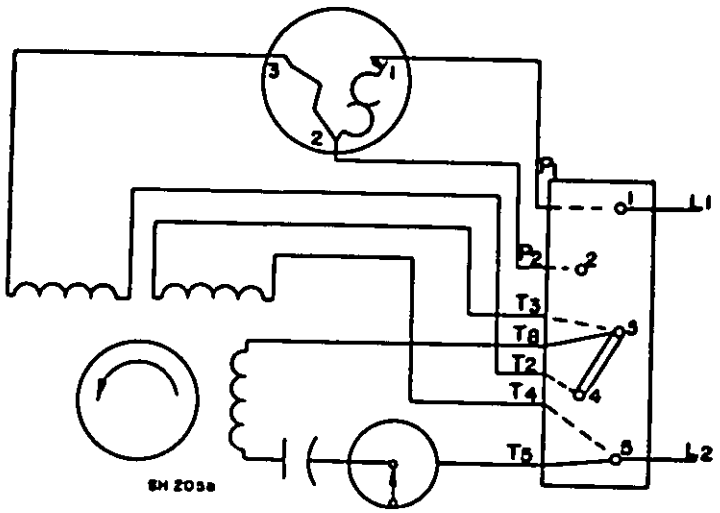
TO OBTAIN CLOCKWISE ROTATION INTERCHANGE LEADS T5 AND T8.

FIGURE 154. *Capacitor-start motors, reversible, dual-voltage, incorporating thermal protector; terminal board line-lead interconnections for operation at plate designated high voltage.*



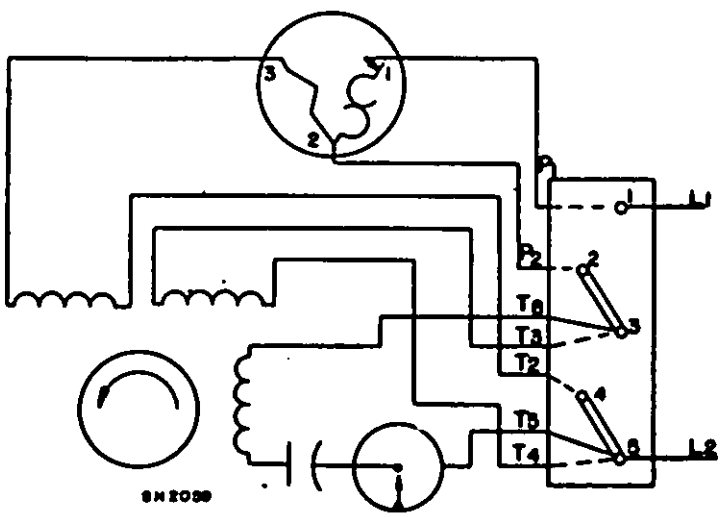
TO OBTAIN CLOCKWISE ROTATION INTERCHANGE LEADS T5 AND T8.

FIGURE 155. *Capacitor-start motors, reversible, dual-voltage, incorporating thermal protector; terminal board interconnections for operation at plate designated low voltage.*



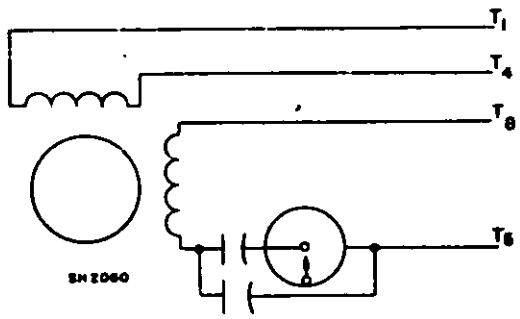
TO OBTAIN CLOCKWISE ROTATION INTERCHANGE
LEADS T5 AND T8.

FIGURE 156. *Capacitor-start motor, reversible, dual-voltage, incorporating thermal protector; strap jumper equipped terminal board interconnections for operation at plate designated high voltage.*



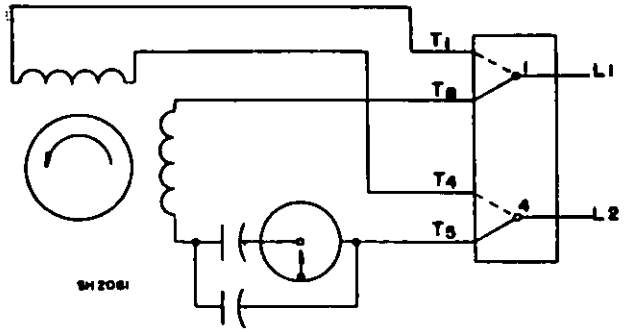
TO OBTAIN CLOCKWISE ROTATION INTERCHANGE
LEADS T5 AND T8.

FIGURE 157. *Capacitor-start motors, reversible, dual-voltage, incorporating thermal protector; strap jumper equipped terminal board interconnections for operation at plate designated low voltage.*



	L1	L2
COUNTER CLOCKWISE ROTATION	T1, T8	T4, T5
CLOCKWISE ROTATION	T1, T5	T4, T8

FIGURE 158. *Two-value capacitor, single-voltage, reversible motor without thermal protector.*



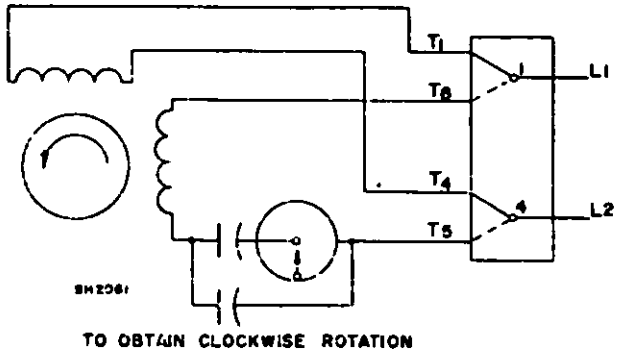
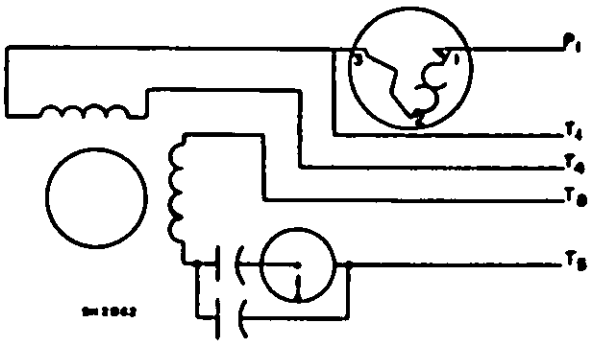


FIGURE 159. *Two-value capacitor, single-voltage, reversible, motor without thermal protector but with terminal board.*



	L1	L2	JOIN
COUNTER CLOCKWISE ROTATION	P1	T4,T5	T1, T8
CLOCKWISE ROTATION	P1	T4,T8	T1, T5

FIGURE 160. *Two-value capacitor, single-voltage, reversible motor with thermal protector.*

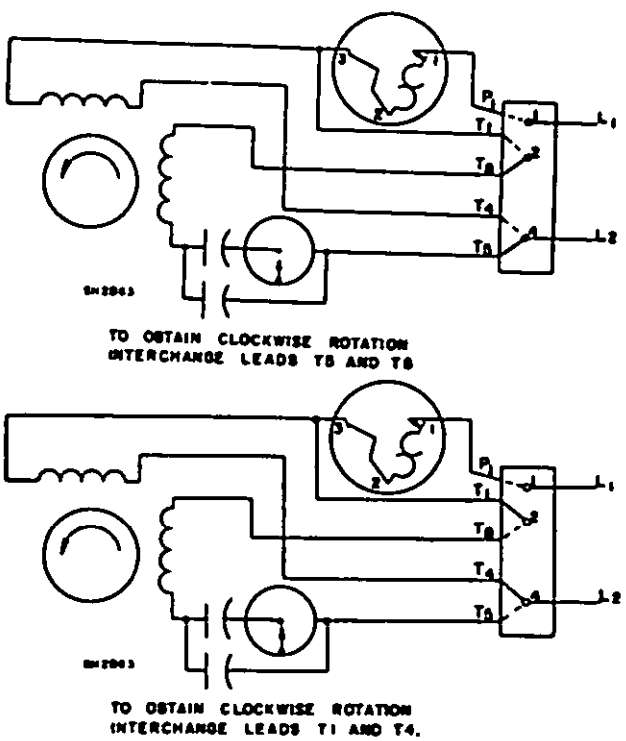
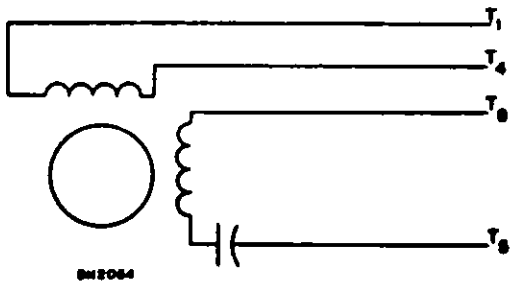
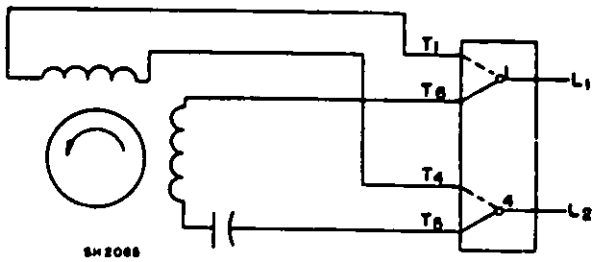


FIGURE 161. *Two-value capacitor, single-voltage, reversible motor with thermal protector and terminal board.*

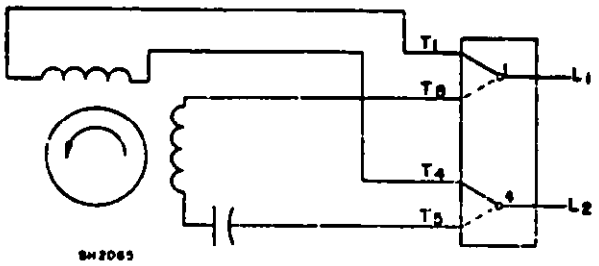


	L1	L2
COUNTER CLOCKWISE ROTATION	T1, T8	T4, T5
CLOCKWISE ROTATION	T1, T5	T4, T8

FIGURE 162. *Permanent-split capacitor, single-voltage, reversible motor.*



TO OBTAIN CLOCKWISE ROTATION
INTERCHANGE LEADS T5 AND T8.



TO OBTAIN CLOCKWISE ROTATION
INTERCHANGE LEADS T1 AND T4.

FIGURE 163. *Permanent-split capacitor, single-voltage, reversible motor with terminal board.*

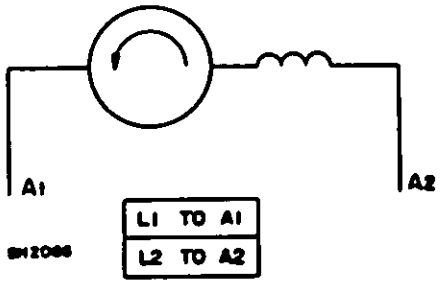
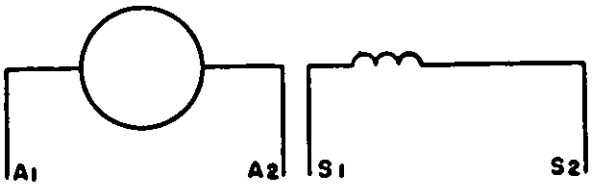


FIGURE 164. *Universal, single-voltage motor.*



SH2067

	L1	L2	JOIN
COUNTER CLOCKWISE ROTATION	A1	S2	A2, S1
CLOCKWISE ROTATION	A1	S1	A2, S2

FIGURE 165. *Universal, single-voltage, reversible motor.*

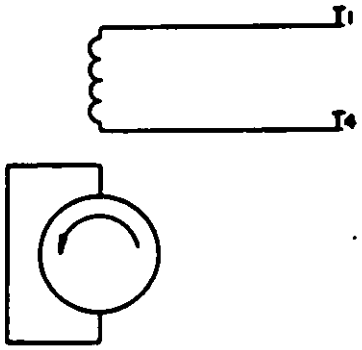
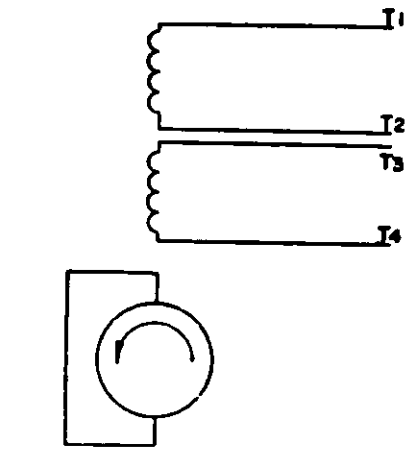
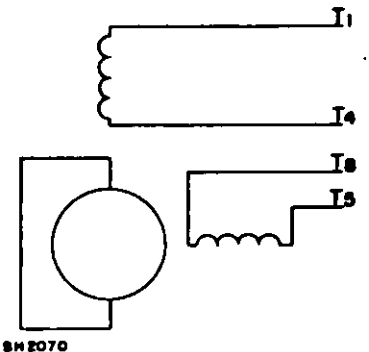


FIGURE 166. *Repulsion, repulsion-start induction and repulsion-induction, single-voltage motor, reversible by shifting brushes.*



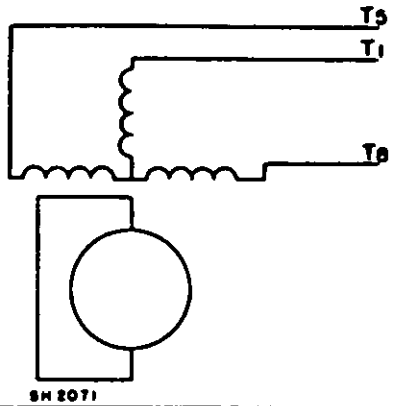
	L1	L2	JOIN
HIGHER IDENTIFICATION PLATE VOLTAGE	T1	T4	T2,T3
LOWER IDENTIFICATION PLATE VOLTAGE	T1,T3	T2,T4	— —

FIGURE 167. *Repulsion, repulsion-start induction and repulsion-induction dual-voltage motor, reversible by shifting brushes.*



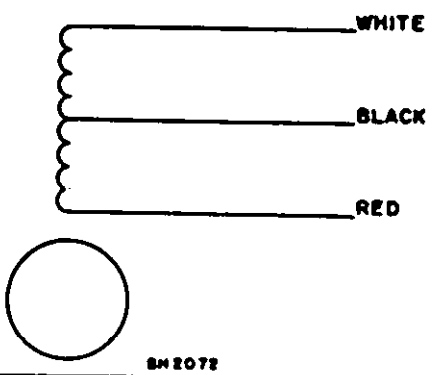
	L1	L2	JOIN
COUNTER CLOCKWISE ROTATION	T1	T5	T4,T8
CLOCKWISE ROTATION	T1	T8	T4,T5

FIGURE 168. *Repulsion, repulsion-start induction and repulsion-induction, single-voltage motor, externally reversible.*



	L1	L2	INSULATE
COUNTER CLOCKWISE ROTATION	T1	T5	T8
CLOCKWISE ROTATION	T1	T8	T5

FIGURE 169. *Repulsion, repulsion-start induction and repulsion-induction, single-voltage motor, externally nonreversible.*



	L1	L2	OPEN
HIGH SPEED	WHITE	BLACK	RED
LOW SPEED	WHITE	RED	BLACK

FIGURE 170. *Shaded-pole, two-speed motor.*