SERVICE MANUAL

Outdoor Warning SIRENS

MODELS

2

5

SD10

STH10

STL 10

SIGNAL DIVISION
Federal Signal Corporation

255A154F
182
Printed in U.S. A.

Warranty

Federal Signal Corporation (Federal) warrants outdoor warning sirens of its manufacture to be free from defective material and workmanship at the time of delivery to the user. Federal will repair or replace, without charge to user other than transportation, removal and reinstallation costs, any of its outdoor warning sirens and controls, or part thereof which Federal shall determine, in its sole discretion, to be defective in material or workmanship provided written notice of such defect shall have been given to Federal within one year from the date of delivery as to such defects in electrical components, such as motors and controls, and within three years from date of delivery as to all other such defects, such as mechanical components. Additionally, Federal's obligations hereunder shall be conditioned upon the user, at its cost, making the outdoor warning siren available to Federal for its inspection at such location as Federal may designate. This warranty shall not extend to any outdoor warning siren which has been improperly installed or inadequately maintained according to instructions supplied by Federal or which has been subjected to misuse, negligence, accident, tampering or alteration. The sole remedy for breach of the foregoing warranty shall be repair or replacement as aforesaid, or in Federal's sole judgment, refund of the purchase price paid for such outdoor warning siren, and every other form of liability for direct or consequential damages, cost or loss is expressly excluded or denied. THE FOREGOING WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES OF MERCHANTABILITY, FITNESS FOR PURPOSE AND OF ANY OTHER TYPE, WHETHER EXPRESS OR IMPLIED.

FEDERAL SIGNAL CORPORATION

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GENERAL DESCRIPTION

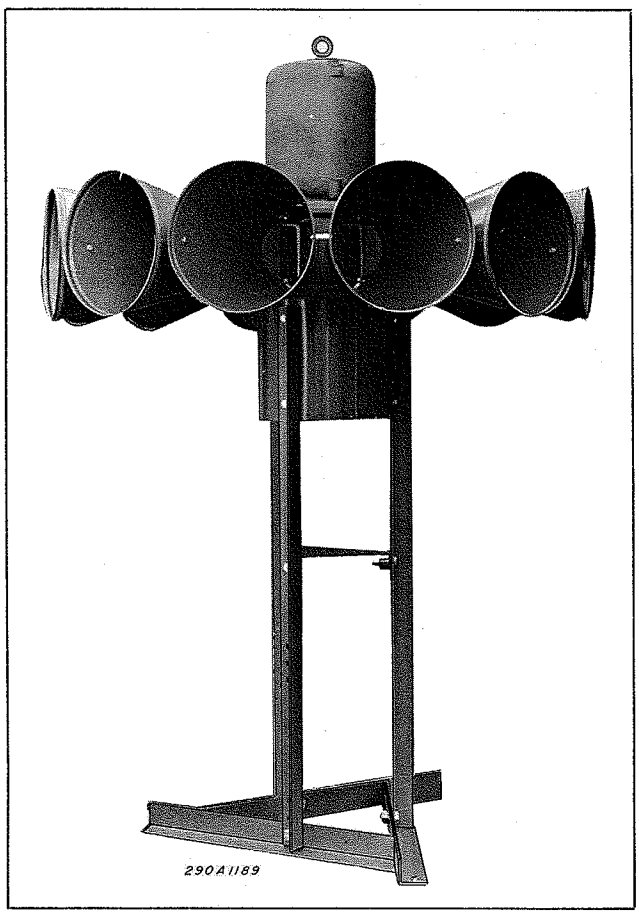


Figure 1-1. Federal Model STH10 Siren.

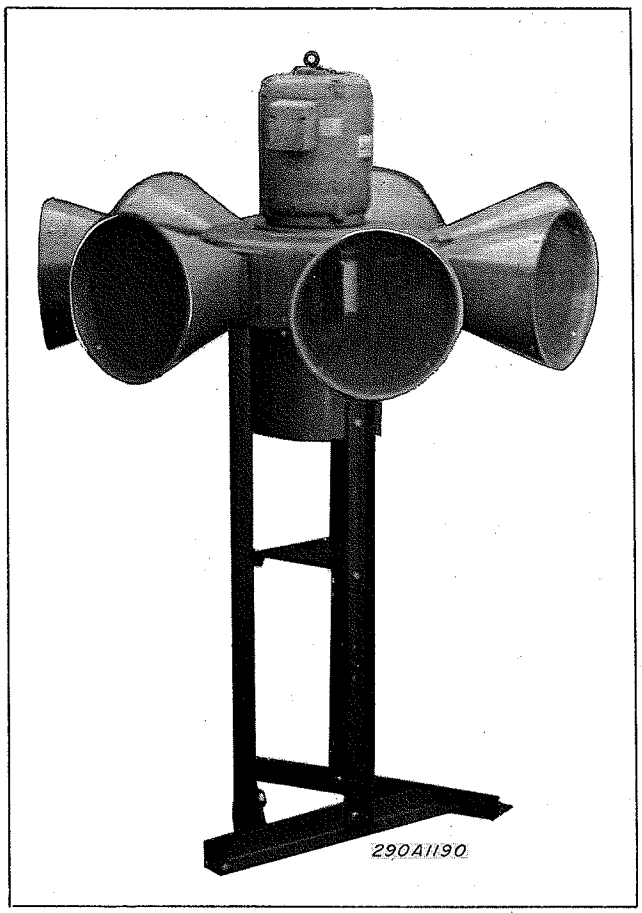


Figure 1-2. Federal Model STL10 Siren.

1-1. SCOPE OF THIS MANUAL

This service manual describes the characteristics, specifications, installation, controls, theory of operation, and servicing of the Federal Models STH10, STL10, SD10, 5, and 2 Outdoor Warning Sirens. In addition, this manual describes the similarities and differences of the various siren models. Some of the sirens described are dual tone sirens that are intended primarily for use as Civil Defense warning sirens. However, any of the sirens can be used as a general outdoor warning siren.

1-2. GENERAL.

The Federal Models STH10,STL10, SD10, 5, and 2 Outdoor Warning Sirens are omnidirectional sirens that are capable of producing high intensity warning signals over a large area. Federal provides mounting hardware that enables the user to install a siren on a utility pole or on the roof of a building. As a result, the siren can be installed in almost any situation. The high efficiency of these siren models enables them to produce a high sound level while making moderate demands on the power source.

1-3. MECHANICAL DESCRIPTION.

The mechanism of all siren models covered in this manual consists of a vertically installed motor with a stator attached to the motor housing, and a rotor mounted on the driveshaft concentric to the stator. The rotor and stator each contain at least one row of ports. As the motor rotates the rotor, air is drawn through an intake tube, and passes through the rotor and stator ports in pulses. These pulses are produced because the rotor alternately opens and closes the stator ports. The pulses of air produce sound at a frequency (pitch) that is dependent on the instantaneous rotational speed of the motor, and the number of ports in the rotor-stator combination.

Some siren models have two rows of ports in the rotor-stator combination. Each row has a different number of ports.Consequently, these sirens produce two-tone signals that are even more distinctive than the signals from the single tone models. These two-tone sirens are intended for use as Civil Defense sirens.However, they can also be used as general warning sirens.

1-4. SIREN DESCRIPTION.

A. Model STH10 and Model STL10

The Models STH10 and STL10 (see figures 1-1 and 1-2) are single tone sirens capable of producing a 115dB and 114dB sound level, respectively, at 100 feet. The STH10 has twelve megaphonic sound projectors evenly spaced around the stator. Screws are installed in the air intake and the throat of each sound projector to prevent obstructions from entering the siren mechanism. An eyebolt is attached to the top of the motor to provide a convenient lifting point when it is necessary to lift the siren. The Model STH10 produces a top sound frequency of approximately 694Hz.

The Model STL10 is similar to the Model STH10 except that it has seven sound projectors spaced around the stator. The STL10 produces top sound frequency of approximately 405Hz.

A Model RC5 Motor Starter is required to operate the Models STH10 and STL10.

Both the STH10 and STL10 are available in single phase and three phase models.

B. Model SD10

The Model SD10 Siren is a 109dB Civil Defense dual-tone only outdoor warning siren. As shown in figure 1-3, the housing of the Model SD10 consists of two truncated conical projectors mounted in opposition to each other and separated by spacers. The vertical space between the truncated conical projectors is partially enclosed by a circular band of sheet metal. The siren is fitted with a screen across the air intake at the bottom of the unit and around the circumference of the stator to prevent obstructions from entering the mechanism.

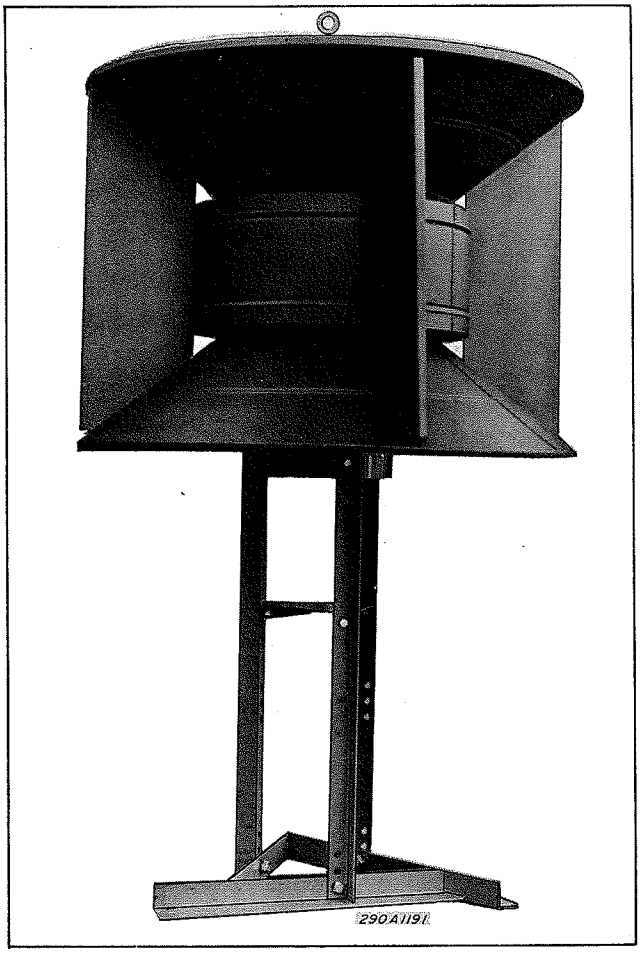


Figure 1-3. Federal Model SD10 Siren.

The two top frequencies produced by the SD10 are approximately 694Hz and 521Hz. Both of these tones are produced simultaneously whenever the siren motor is operating at top speed.

A Model RC5 Motor Starter is required to operate the Model SD10.

C. Model 5.

The Model 5 Siren (figure 1-4) is available in both single tone and dualtone models. The dual tone model (Model 5T) is usually used for Civil Defense. Model 5 produces a sound level of 113dB; Model 5T produces 108dB.

The siren mechanism is housed in a weatherproof cylindrical sheet metal housing with a conical dome on top and a truncated conical cowling approximately one-third of the distance between the top and the bottom of the housing. An eyebolt is attached to the support bracket to provide a convenient lifting point. Air

Figure 1-4. Federal Model 5 Siren.

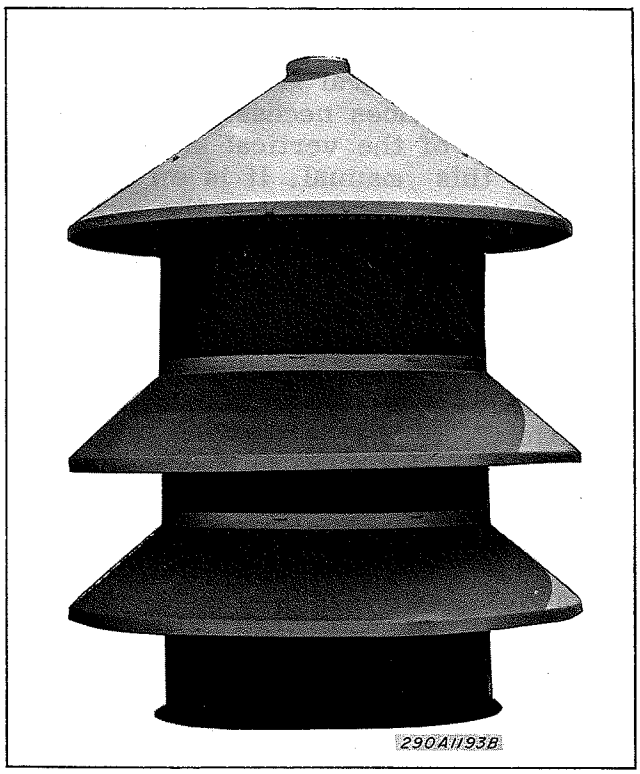


Figure 1-5. Federal Model 2 Siren.

is drawn through a screened air intake in the side of the housing. All other openings in the housing are also screened to prevent obstructions from entering the siren.

Single-tone models produce a top frequency of 533Hz. Dual-tone models produce top frequencies of 533Hz and 427Hz. A Model RC5 Motor Starter is required to operate the Model 5.

D. Model 2

The Model 2 Siren (Figure 1-5) is a 104dB siren that is available in single tone and dual tone (Model 2T) Civil Defense Models. Model 2T produces 100dB. The Model 2 siren mechanism is enclosed in a sheet metal housing. A conical dome is mounted on the top of the housing and two truncated conical cowls are attached to the housing, approximately one-third and two-thirds along the height of the housing. Screens are installed across openings in the housing to prevent obstructions from entering the unit.

A Model RC2 Motor Starter is required to operate the siren. The Model 2 uses a 120 or 240 volt universal motor that can operate from either dc or 25-60Hz single phase ac.

1-5. CONTROL DESCRIPTION

A. Model RC5 and RC5W

The Model RC5 Motor Starter is basically a heavy duty relay that is capable of controlling the starting and operating current of all siren models except the Model 2. The RC5 is enclosed in a metal enclosure for installation inside of a building. The RC5 is also available housed in a weatherproof enclosure (Model RC5W) for outdoor installations. The motor starter must be installed on a vertical surface.

The RC5 is available in three phase (A) and single phase (B) models. One RC5 is required for each siren in a system.

B. Model RC2 and RC2W

The Model RC2 Motor Starter is required to operate a Model 2 or Model 2T Siren. The RC2 is similar to the Model RC5. However, the RC2 is intended specifically for use with the Model 2. The RC2W is housed in a weatherproof enclosure for outdoor installations. The unit must be installed on a vertical surface.

C. Model AR Timer.

The Federal Model AR Timer contains the devices necessary for the control of all of the vertical sirens described in this manual. It is an electromechanical timer that causes the associated siren motor starter to activate the siren. The AR Timer is capable of controlling a three-minute "Attack" signal and a three-minute "Alert" signal. The timer has a priority circuit that provides "Attack" with priority over "Alert". If the "Attack" signal is initiated while the siren is producing the "Alert" signal, the "Attack" siren signal automatically overrides the "Alert" signal for the remainder of the three-minute timer cycle.

The AR Timer has a Test and a Cancel function. Depressing the TEST button causes the siren to produce a sustained signal that is identical to the "Alert" signal except that the signal is produced only for the time that the pushbutton is depressed.

The CANCEL pushbutton causes the siren signal in progress to cease immediately. This function can be used in the event that an error was made in the selection of a signal. Another signal can be initiated after the CANCEL pushbutton is pressed. However, the second signal sounds only for the remainder of the three-minute timer cycle. The Cancel function can also be used if it is necessary for "Alert" to override "Attack". To override "Attack" with "Alert" press the CANCEL pushbutton while "Attack" is sounding, and then press ALERT.

D. Model PGA Timer

The Model PGA Timer is similar to the Model AR Timer except that it is capable of controlling a two-minute "Attack" signal only. The PGA does not have a "Cancel" capability. Depressing the TEST button causes the siren to produce the "Alert" signal for the time that the pushbutton is depressed. The PGA Timer can control any siren described in this manual.

1-6. SIGNAL DESCRIPTION.

All of the vertical sirens are capable of providing a sustained signal, and a wailing signal. The steady signal is frequently used as a Civil Defense "Alert" signal. The wailing signal is often used as a Civil Defense "Attack". However, the signal can be used for any desired indication. These signals are shown graphically in figure 1-6 for both single tone and dual tone vertical siren models.

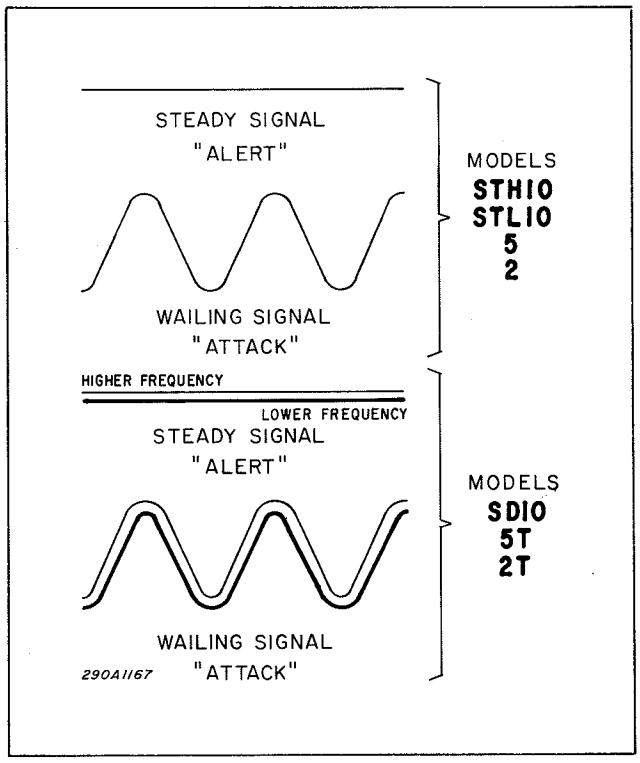


Figure 1-6. Signal Characteristics.

SECTION II
SPECIFICATIONS

2-1. MODEL STH10.

Power Requirements	
STH10A	208-240/480 Vac, 3 phase, 34/17A., 50/60Hz
STH10B	240V, single phase, 56A., 60Hz only
Physical	
Diameter	54" (137 cm)
Height	74" (199 cm)
Shipping Weight	
STH10A (pole)	363 lb. (165 kg.)
STH10A (roof)	391 lb. (178 kg.)
STH10B (pole)	375 lb. (170 kg.)
STH10B (roof)	403 lb. (183 kg.)
Miscellaneous	
Sound Output	115dBC at 100 ft. (30.5m)
Motor Type	
Model STH10A	3 phase ball bearing induction dual voltage 208-240/480Vac
Model STH10B	Single phase repulsion-induction 240Vac
Power	7.5 HP
Top Frequency (approx.)	694Hz (60 Hz) 578Hz (50 Hz)

2-2. MODEL STL10.

Power Requirements	
STL10A	208-240/480 Vac,3 phase, 38/19A., 50/60Hz
STL10B	240VAC,single phase, 56A.,60Hz only
Physical	
Diameter	54" (137 cm)
Height	80" (188 cm)
Shipping Weight	
STL10A (pole)	353 lb (160.5 kg.)
STL10A (roof)	381 lb. (173 kg.)
STL10B (pole)	365 lb. (166 kg.)
STL10B (roof)	413 lb. (188 kg.)

Miscellaneous

Sound Output	114dBC at 100 ft. (30.5m)

Motor Type

Model STL10A	3 phase ball bearing induction dual voltage, 208-240/480Vac
Model STL10B	Single phase repulsion-induction 240Vac
Power	7.5 HP
Top Frequency (approx.)	405Hz (60Hz) 338Hz (50Hz)

2-3. MODEL SD10.

Power Requirements

SD10A	208-240/480Vac 3 phase 28/14A., 50/60Hz
SD10B	240Vac, single phase, 56A.,60Hz only

Physical

Diameter	46" (117 cm)
Height	80" (203 cm)

Shipping Weight

SD10A (pole)	510 lb (232 kg.)
SD10A (roof)	538 lb. (244.5 kg.)
SD10B (pole)	522 lb. (237 kg.)
SD10B (roof)	550 lb. (250 kg.)

Miscellaneous

Sound Output	109dBC at 100 ft. (30.5m)

Motor Type

Model SD10A	3 phase ball bearing induction, dual voltage 208-240/480Vac
Model SD10B	Single phase, repulsion-induction, 240Vac
Power	7.5 Hp

Top Frequency (approx.)

High	694Hz (60Hz) or 578Hz (50Hz)
Low	521Hz (60Hz) or 434Hz (50Hz)

2-4. MODEL 5.

Power Requirements

5A	208-240/480Vac, 28/14A. (5A) or 30/15A.(5AT)
5AT (dual tone)	3 phase, 50/60Hz
5B	240Vac single phase, 56A. 60Hz
5BT (dual tone)	only

Diameter	41" (104 cm)
Height	52" (132 cm)
Shipping Weight	
5A	395 lb. (179.5 kg)
5AT	405 lb. (184 kg.)
5B	430 lb. (195 kg.)
5BT	410 lb. (186 kg.)
Miscellaneous	
Sound Output	113dBC at 100 ft. (30.5m - Model 5) 108dBC at 100 ft. (30.5m - Model 5T)
Motor Type	
Models 5A and 5AT	3 phase ball bearing induction, dual voltage 208-240/480 Vac
Models 5B and 5BT	Single phase repulsion-induction 240Vac
Power	7.5 HP
Top Frequency	
Single Tone (approx.)	694Hz (60Hz) or 578Hz (50Hz)
Dual Tone (Approx.)	
High	694Hz (60Hz) or 578Hz (50Hz)
Low	521Hz (60Hz) or 434Hz (50Hz)

2-5. MODEL 2, 2T.

Power Requirements	120Vac/dc, single phase 24A. or 240Vac/dc, single phase 12A.
Physical	
Diameter	18" (46 cm)
Height	25.5" (65 cm)
Shipping Weight	68 lb. (31 kg.)
Miscellaneous	
Sound Output	104dBC at 100 ft. (30.5m. - Model 2) 100dBC at 100 ft. (30.5m. - Model 2T)
Motor Type	Single phase ball bearing, universal series 120Vac/dc, or single phase ball bearing universal series 240V ac/dc
Power	2 HP
Top Frequency	
Single Tone	533Hz(60Hz) or 444Hz (50Hz)
Dual Tone	
High (approx.)	533Hz(60Hz) or 444Hz (50Hz)
Low (approx.)	427Hz (60Hz) or 356Hz (50Hz)

SECTION III
INSTALLATION

3-1. SIREN LOCATION.

The information in this paragraph provides guidelines to aid the user in the selection of an installation site that makes the best possible use of the siren.

If the siren is being installed as part of a Civil Defense Warning system. ALWAYS follow Federal Emergency Management Agency (FEMA) recommendations.

Careful consideration of the factors affecting the propagation of sound from the siren and the response of the human ear to the sound will optimize the ability of the siren to effectively warn the community.

The reduction of signal intensity, as the distance from the siren increases and the minimum desired signal level at the fringe of the area to be covered are important considerations when choosing a siren installation site. As the distance from the siren increases, sound level losses accumulate. These losses are a result of weather conditions, the terrain, obstructions in the sound path, the pitch of the sound and the height of the siren. Optimum sound propagation conditions exist when there are no obstructions in the sound path, the terrain is flat, and the air is calm. Under these conditions, each time the distance from the siren is doubled, the sound level decreases by approximately 8dB. For example, the sound level 100 feet (30.5m) from a Model STH10 is 115dB. At 200 feet (61m), the sound level drops to 107dB; at 400 feet (122m) the sound level drops to 99dB; etc. This is referred to as the "loss per distance doubled".

A loss per distance doubled of 8dB is seldom experienced. This is because buildings and other obstructions are frequently present in the sound path. In addition, the atmosphere is rarely calm, and the terrain may not be flat. As a result, a typical loss per distance doubled in residential areas may be 10dB, and as high as 12dB in areas having tall buildings.

Experience indicates that an individual with normal hearing will probably hear a warning signal whose intensity is at least as high as the ambient noise level. Experience has also shown that the ambient noise level in industrial districts is typically 90dB. Therefore, for a person to hear a warning signal in an industrial area, the sound level intensity of that signal must also be approximately 90dB. In this situation, any point receiving a signal having less than 90dB intensity is considered to be outside the effective range of the siren.

In business districts an ambient noise level of 80dB is common and in residential areas, 70dB of ambient noise is typical. Assuming a 10dB loss per distance doubled and a 70dB minimum sound level, the effective range of a Model STH10 is approximately 2250 feet (686m).

Wind speed and direction often affect the propagation of sound from the siren. Consequently, the direction of the prevailing wind may also be a factor to consider when selecting the installation site(s) of a small, one or two-siren system. For example, if the prevailing wind is from the west, it may be desirable to install the siren toward the western edge of the area to be covered.

Other factors to consider before selecting the installation site include the availability of electrical power, the ease of installation and maintenance, and the height of surrounding obstructions.

3-2. SIREN ASSEMBLY.

The Models STH10 and STL10 require some assembly before installation. The Models SD10, 5 and 2 are fully assembled and ready for installation on the mounting hardware.

A. Model STH10

Install all screens and sound projectors on the siren stator as indicated in figure 3-1. Use two $\frac{1}{4}$"-20 hex bolts,nuts, and shakeproof lockwashers (all provided) to attach each projector and screen to the stator. Install one projector at each stator port. When installing the projectors, make sure that the seam in each faces down. This reduces the chance of water entering the seam and causing corrosion of the horn. As each projector is mounted on the siren stator, install a $\frac{1}{4}$"-20 bolt,nut,lockwasher,and spacer (all provided) between the projectors,as shown in figure 3-1. There are 12 identical screens and projectors.

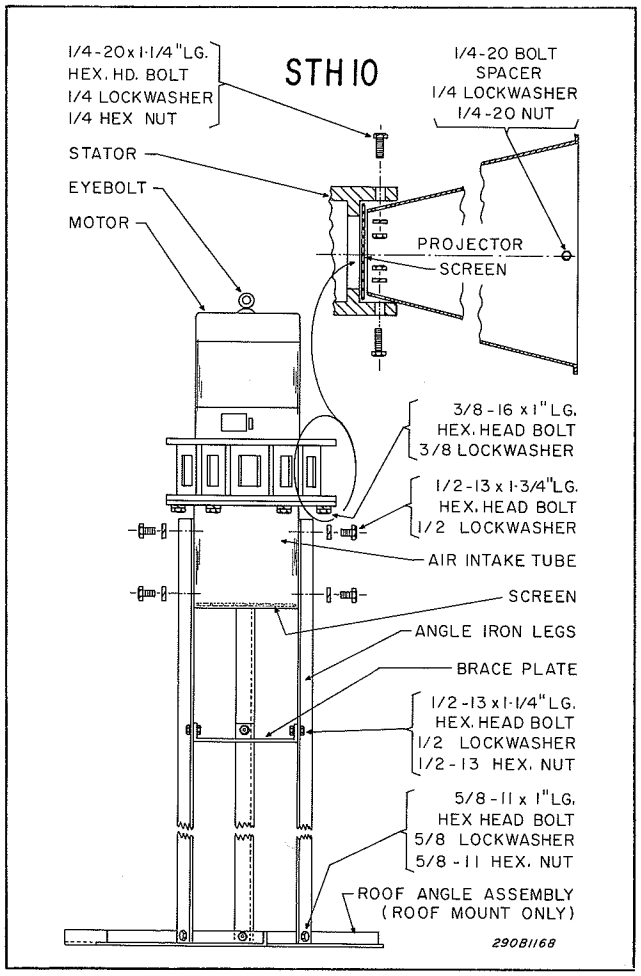


Figure 3-1. STH10 Assembly.

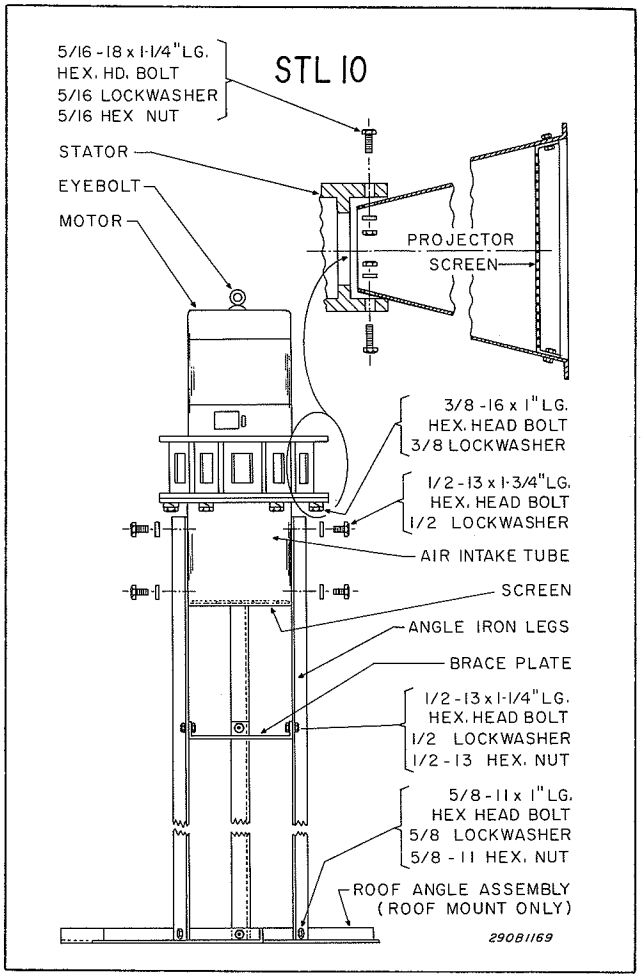


Figure 3-2. STL10 Assembly.

Attach the Air Intake Tube to the bottom of the siren stator using the six 3/8-16 x 1" hex head bolts and split lockwashers provided. The holes in the bottom of the stator are tapped to accommodate the bolts.

B. Model STL10

Install all sound projectors on the siren stator, as shown in figure 3-2. Use two 5/16-18 hex nuts and bolts and shakeproof lockwashers (all provided) to mount each projector on the stator. Attach one projector to each stator port. Install a projector screen as indicated in figure 3-2, using three 10-32 nuts and bolts. When installing the projectors, make sure that the seam in each faces downward. This reduces the chance of water entering the seam, and causing corrosion of the horn. There are seven identical screens and projectors.

Attach the Air Intake Tube to the bottom of the siren stator using the six 3/8 - 16 x 1" hex head bolts and split lockwashers provided,as shown in figure 3-2. The holes in the bottom of the stator are tapped to accept the bolts.

3-3. PHYSICAL INSTALLATION.

A. General.

Most siren installations are one of two types; Pole Mount or Flat Surface Mount. These two configurations make it possible to install a siren in almost any situation. If neither of the installations in this paragraph is suitable, modification of one of the configurations described may be practical.

A siren is typically installed 35 to 40 feet above the ground. If the installation is less than 35 feet above the ground, the sound intensity at close range may increase, but the effective range of the siren may be reduced. Conversely, if the siren is located more than 40 feet above ground, the effective range of the siren may increase, but the sound may skip over areas closer to the siren. These variables may

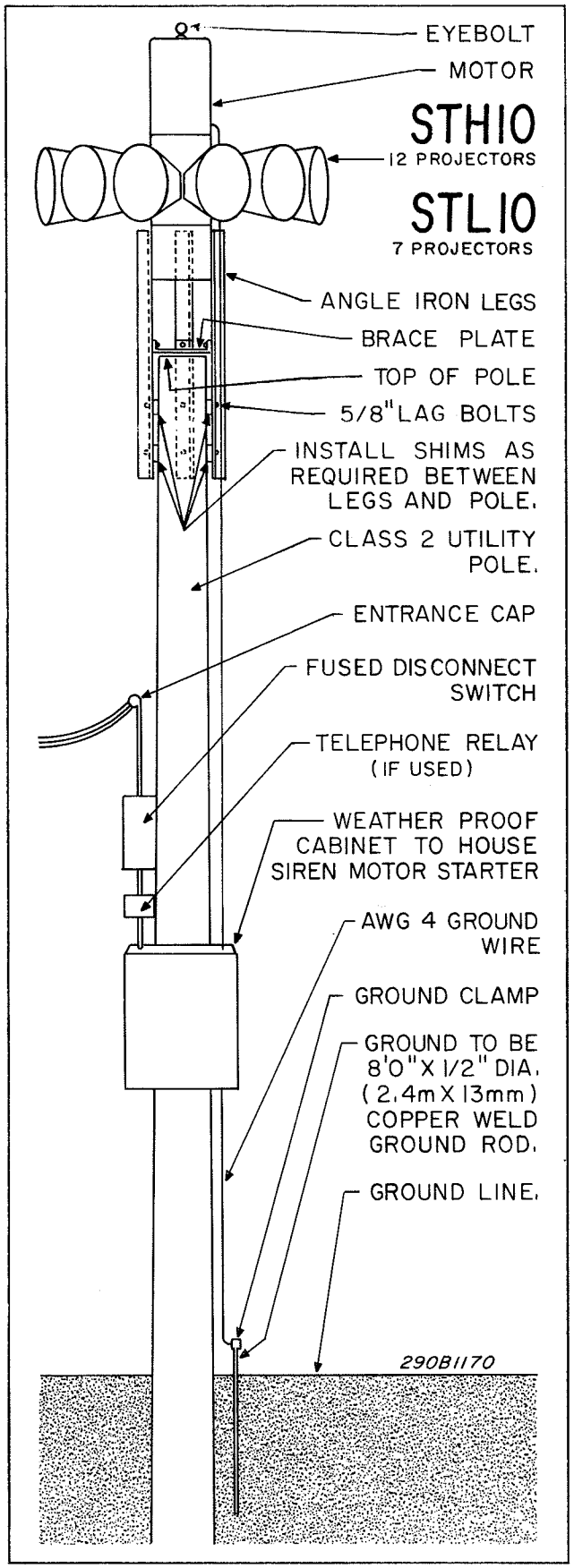


Figure 3-3. Typical STH10 or STL10 Pole-Mounted Installation.

make it desirable to test the sound coverage of the siren at various heights and locations whenever possible. ALWAYS insure that the air intakes are clear when the siren is being tested and when it is installed at its final location.

B. Pole Mounting.

A typical siren pole-mounted installation is shown in figure 3-3. The siren is mounted on a Class 2 utility pole 35 - 40 feet above the ground. The siren is attached to the pole by means of a stand that is provided by Federal. The stand consists of three legs and a brace plate. The brace plate is attached to the legs approximately half-way along the height of the legs. The braceplate insures that there is sufficient clearance between the top of the pole and the siren air intake while adding stability to the assembly. The clearance between the top of the pole and siren is necessary to allow sufficient air to enter the rotor and stator. If the space between the air intake tube and the top of pole is not present or is too small, the output sound level of the siren will be significantly impaired.

1. Model STH10, Model STL10, Model SD10

The Models STH10, STL10 and Model SD10 are mounted on a class 2 utility pole by means of three angle iron legs, approximately 3-1/2 feet long. To attach the siren to the pole, proceed as follows (see figure 3-1, 3-2, or 3-4):

(a) Uncrate the siren and remove the bolts that hold the siren on the shipping base. Use a crane or hoist to lift the siren approximately 3-1/2 feet by the eyebolt.

(b) Install the three legs on the intake tube. Use two 1/2" - 13 x 1-3/4" hex. head bolts and 1/2" lockwashers (provided) for each leg. Do not tighten the bolts completely.

(c) Install the braceplate on the legs. Use a 1/2" - 13 x 1-1/4" hex head bolt, a 1/2" lockwasher, and a 1/2" 13 hex. nut to attach the braceplate to each leg. Tighten all bolts including those that were installed in step (b).

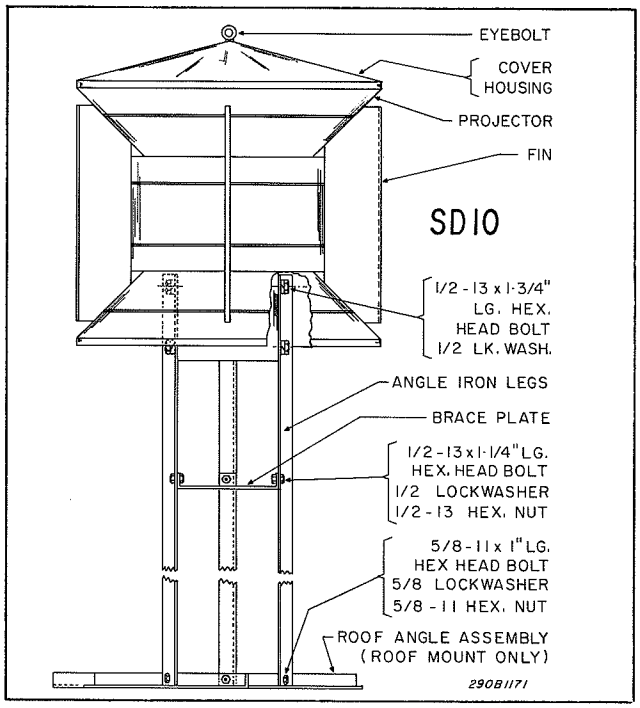


Figure 3-4. SD10 Flat Surface Mount.

CAUTION

The eyebolt does NOT have sufficient strength to support the combined weight of the siren and a utility pole. Therefore, do NOT attempt to erect the pole and siren together using the eyebolt as a lifting point.

(d). Erect the Class 2 utility pole in accordance with accepted practice. Be sure that the pole extends about 33 feet above the ground (refer to CAUTION between steps (c) and (d) in this paragraph).

(e) Raise the siren to the necessary height, and lower it over the pole so that the braceplate rests on the top of the pole (refer to CAUTION between steps (c) and (d) in this paragraph.)

(f) If necessary, insert shims between the siren legs and the pole. Bolt the siren legs to the pole using two 5/8" lag bolts, at least four inches long for each leg, as shown in figure 3-3.

(g) Install the control cabinet or motor starter and disconnect switch in a location that is readily accessible to service personnel, but discourages vandalism. The control cabinet or motor starter must be installed in a vertical position for proper operation. A Model RC5 or RC5W Motor Starter is required to control a Model STH10, STL10, or SD10. Install the motor starter in accordance with NEC recommendations and local electrical codes.

2. Model 5

A Model PMS Pole Mounting Stand is required when mounting the Model 5 and utility pole. The PMS consists of a mounting plate, three angle iron legs, six 1/2" - 13 x 2" hex head cap screws, six 1/2" - 13 nuts and six 1/2" lockwashers.

(a) Erect the Class 2 utility pole in accordance with accepted practice. Be sure that the pole extends approximately 33 feet above the ground (refer to CAUTION in paragraph 3-3. B.1).

Perform steps (b) through (h) on a rigid work surface.

(b) Uncrate the siren and remove the bolts that hold the siren to the shipping base.

(c) Remove the eyebolt from the top of the Model 5, and lift off the siren housing.

(d) Thread the eyebolt back into the mounting bracket on the top of the siren.

(e) Mount the siren motor-rotor-stator assembly on the mounting plate using 1/2" - 13 nuts,bolts, and lockwashers. Attach the assembly to the plate through the appropriate set of holes in the mounting plate, as indicated in figure 3-5. A three phase (A) motor has four mounting holes, and a single phase (B) motor has three mounting holes.

(f) Using the eyebolt as a lifting point, lift the siren approximately 3-1/2 feet with a crane or hoist.

(g) Attach the three angle iron legs to the mounting plate using six 1/2" -13 x 2" nuts and bolts and the three 2-1/2 x 1/4" slotted angle clips provided. Attach the legs through the holes indicated in figure 3-5.

(h) Do NOT replace the housing on the siren. It will be reinstalled later. Raise the siren to the necessary height, and lower it over the pole so that the

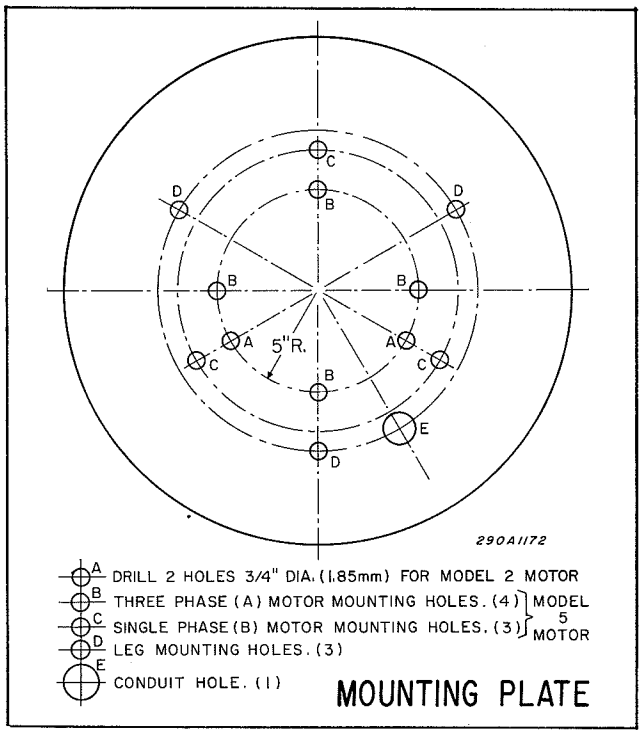


Figure 3-5. Mounting Plate Drilling Detail.

mounting plate rests on the top of the pole (refer to CAUTION in paragraph 3-3.B.1.).

(i) If necessary, insert shims between the siren legs and the pole. Bolt the siren legs to the pole using two 5/8" lag bolts, at least four inches long for each leg, as shown in figure 3-1.

(j) Install the control cabinet or motor starter and disconnect switch in a location that is readily accessible to service personnel, but discourages vandalism. The control cabinet or motor starter must be installed in a vertical position for proper operation. A Model RC5 or RC5W Motor Starter is required to operate a Model 5.

3. Model 2.

A Model PMS Pole Mounting Stand is required when mounting the Model 2 on a utility pole. The PMS consists of a mounting plate, three angle iron legs six 1/2" - 13 x 2" hex head cap screws, six 1/2" - 13 nuts, and six 1/2" lockwashers.

(a) Uncrate the siren and remove the siren from the shipping base. Retain the screws, wing nuts, and clips that hold the siren housing on the shipping base.

(b) See figure 3-5. Attach one of the angle iron legs of the siren mechanism to the mounting plate using a 3/8" nut and bolt through one of the 3 phase motor holes in the mounting plate.

(c) Center the siren mechanism on the mounting plate, and using the mounting holes in the legs of the mechanism as a template, drill two 9/16" holes in the mounting plate, as indicated in figure 3-5.

(d) Attach the remaining two legs of the siren mechanism to the mounting plate using two 3/8" nuts and bolts and the holes that were drilled in step (c).

(e) Temporarily set the siren housing over the siren mechanism on the mounting plate. Center the housing over the mechanism.

(f) Using the housing and the clips that held the housing on the shipping base as a template drill three 1/4" holes through the mounting plate approximately equidistant around the circumference of the housing. Lift the housing off the siren. It will be reinstalled later.

(g) Lay the siren mechanism on its side and attach the three legs to the mounting plate using three angle iron clips and six 1/2" -13 nuts and bolts. Attach the legs through the holes indicated in figure 3-5.

(h) Dig the hole for the Class 2 utility pole and lay the pole on the ground as close as practical to the installation site.

(i) With the siren laying on its side, and the pole laying on the work surface attach the siren to the utility pole using at least two 5/8" lag bolts at least four inches long (not supplied) for each leg. If necessary, install shims between the siren legs and the pole.

(j) Wrap a cable or chain capable of bearing at least one ton around the pole-siren combination at least three times. Wrap the chain or cable around the legs of the siren. Use the chain or cable in conjunction with a crane or hoist capable of lifting at least one ton to erect the pole in accordance with accepted practice.

(k) Install the Model RC2 or RC2W Motor Starter and a fused disconnect switch in a location on the pole that is readily accessible to service personnel, but discourages vandalism. The RC2 must be installed in a vertical position for proper operation. Install the electrical devices following NEC recommendations and local electrical codes. A suggested installation configuration is shown in figure 3-6.

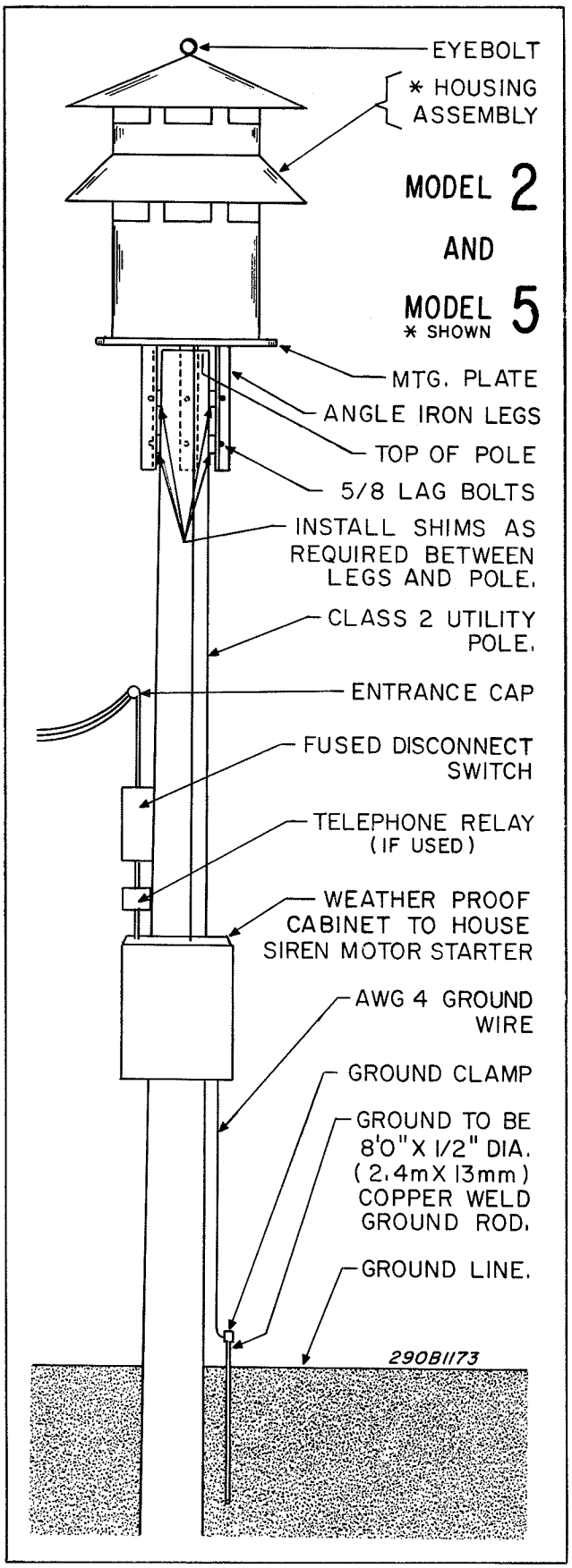


Figure 3-6. Typical Model 5 or Model 2 Pole-Mounted Installation.

C. Flat Surface Mount.

1. Model STH10, Model STL10, Model SD10

This installation configuration is practical when the installation site is on a flat roofed building. The siren can be anchored directly to the roof, on a platform as shown in figure 3-7, or on a weight distribution mat like the one shown in figure 3-8. When installing the siren on a flat roof, always be sure that the horns clear parapets or other obstructions by at least ten feet.

The siren is attached to the mounting surface by means of a stand that is provided by Federal. The stand consists of three angle iron legs, a braceplate, and a Roof Angle Assembly fabricated from angle iron. The roof angle assembly can be anchored directly to the mounting surface.

When the siren is installed on a flat roof, a weight distribution mat, like the one shown in figure 3-8, may be necessary. This mat is required when the siren mounting surface is unable to support weight in excess of 212 pounds per square foot (960 kg. per square meter). Therefore, if the mounting surface cannot support more than 212 pounds per square foot (960 kg. per square meter), construct the weight distribution shown in figure 3-8. This mat distributes the siren weight to approximately 10 pounds per square foot (45 kg. per sq. m.).

To install a Model STH10, STL10 or SD10 on a flat roof or other flat surface, proceed as follows:

(a) If desired, construct a platform for mounting the siren. The platform must be capable of supporting at least 450 pounds (202.5 kg.) and withstanding a siren wind load of 100 mph. The platform must also be capable of distributing its own weight plus that of the siren to a value that is safe for the mounting surface. Platform design and construction details are left to the installer. Locate the platform on the mounting surface. Install waterproof joints where mounting bolts pass through the roof to prevent water from entering the building.

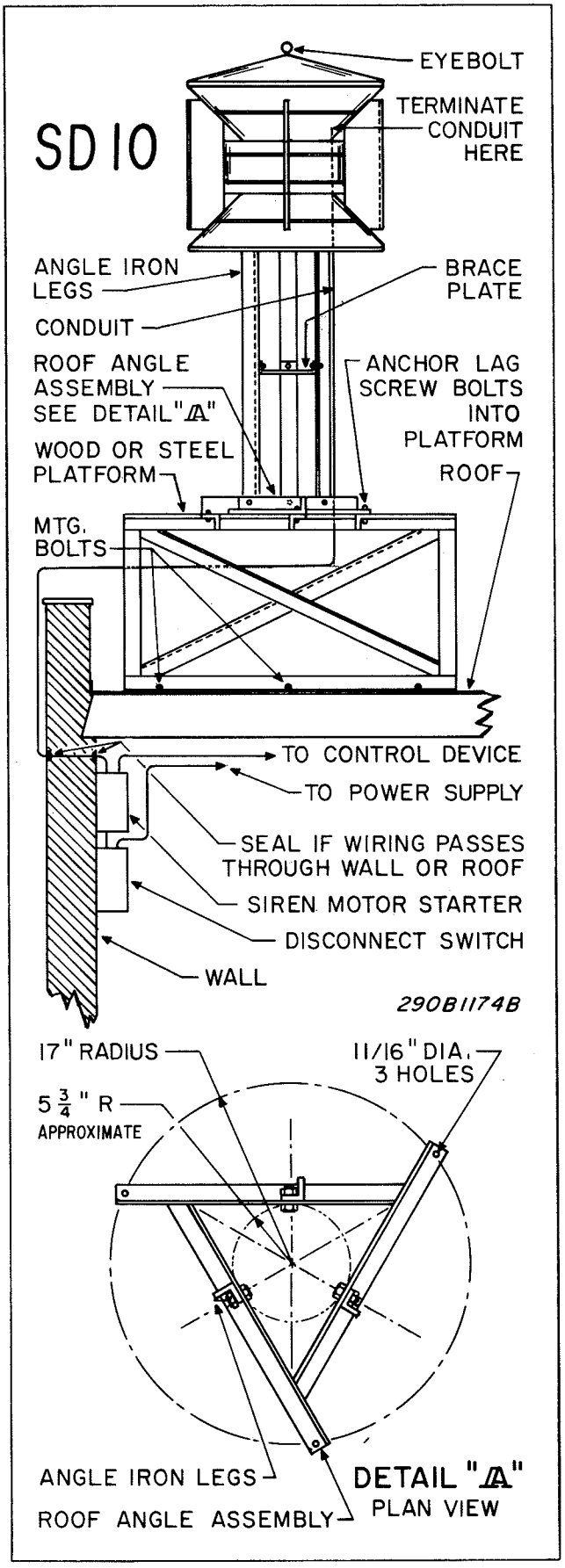


Figure 3-7. Typical SD10 Platform-Mounted Installation.

CAUTION

The eyebolt and hoisting bracket do not have sufficient strength to support the combined weight of the siren and a platform. Therefore, do NOT lift the siren and platform together using the eyebolt as a lifting point.

(b) Remove the siren from the shipping base. Use a crane or hoist to lift the siren approximately 3-1/2 feet.

(c) Install the three legs on the air intake tube. Use two ½" - 13 x 1-3/4" hex., head bolts and ½" lockwashers (provided) for each leg. Do not tighten the bolts completely.

(d) Attach the braceplate to the legs using 1/2" - 13 x 2" bolts, nuts, and lockwashers. Do NOT tighten the bolts completely.

(e) Install the roof angle assembly on the legs. Use one 5/8" - 11 x 1" hex head bolt, 5/8" lockwasher and 5/8" - 11 hex nut (provided) to attach each leg to the roof angle assembly. Tighten all bolts.

(f) Hoist the siren to the installation site using the eyebolt as a lifting point (refer to CAUTION between steps (a) and (b) of this paragraph).

(g) Anchor the siren to the mounting surface using 5/8" lag bolts or nuts and bolts, as appropriate through the 11/16" holes in the roof angle assembly (see figure 3-7, detail A). If the siren is mounted directly on a roof, (without a platform or weight distribution mat) be sure to install waterproof joints where the mounting bolts pass through the roof so that water does not enter the building.

(h) Install the RC5 Motor Starter, a fused disconnect switch and other control devices as close as practical to the siren, following local codes and NEC recommendations. If the siren is installed on the roof of a building, it may be desirable to install the RC5 and other control devices inside of the building. Install the RC5 on a vertical surface because the motor starter cannot operate properly unless it is installed vertically.

2. Model 5

The flat surface mount configuration is practical when the installation site is on a flat roofed building. The siren can be anchored directly to the roof, on a platform as shown in figure 3-9, or on a weight distribution mat like the one shown in figure 3-8. When installing the siren on a flat roof, always be sure that the siren clears parapets or other obstructions by at least ten feet.

When the siren is installed on a flat roof, a weight distribution mat, like the one shown in figure 3-8, may be necessary. This mat is required when the siren mounting surface is unable to support weight in excess of 410 pounds per square foot (1980 kg. per square meter).

To install a Model 5 on a flat roof or other flat surface, proceed as follows:

(a) If desired, construct a platform for mounting the siren. The platform must be capable of supporting at least 450 pounds (203 kg) and withstanding a wind load of 100 mph (160 kmph). Platform construction details are left to the builder. Locate the platform at the siren installation site, and anchor the platform to the mounting surface. Install waterproof joints where mounting bolts pass through the roof so that water does not enter the building.

CAUTION

The eyebolt and hoisting bracket do not have sufficient strength to support the combined weight of the siren and a platform. Therefore, do NOT lift the siren and platform together using the eyebolt as a lifting point.

(b) Remove the bolts that hold the siren on the shipping base.

(c) Remove the eyebolt from the top of the Model 5, and lift off the siren housing.

(d) Thread the eyebolt back into the mounting bracket.

(e) Drill holes, as necessary, in the mounting surface to accommodate the mounting screws or bolts.

(f) Mount the siren motor-rotor-stator assembly on the mounting surface, using 1/2"-13 nuts and bolts (provided). Do NOT replace the housing on the siren. It will be replaced later.

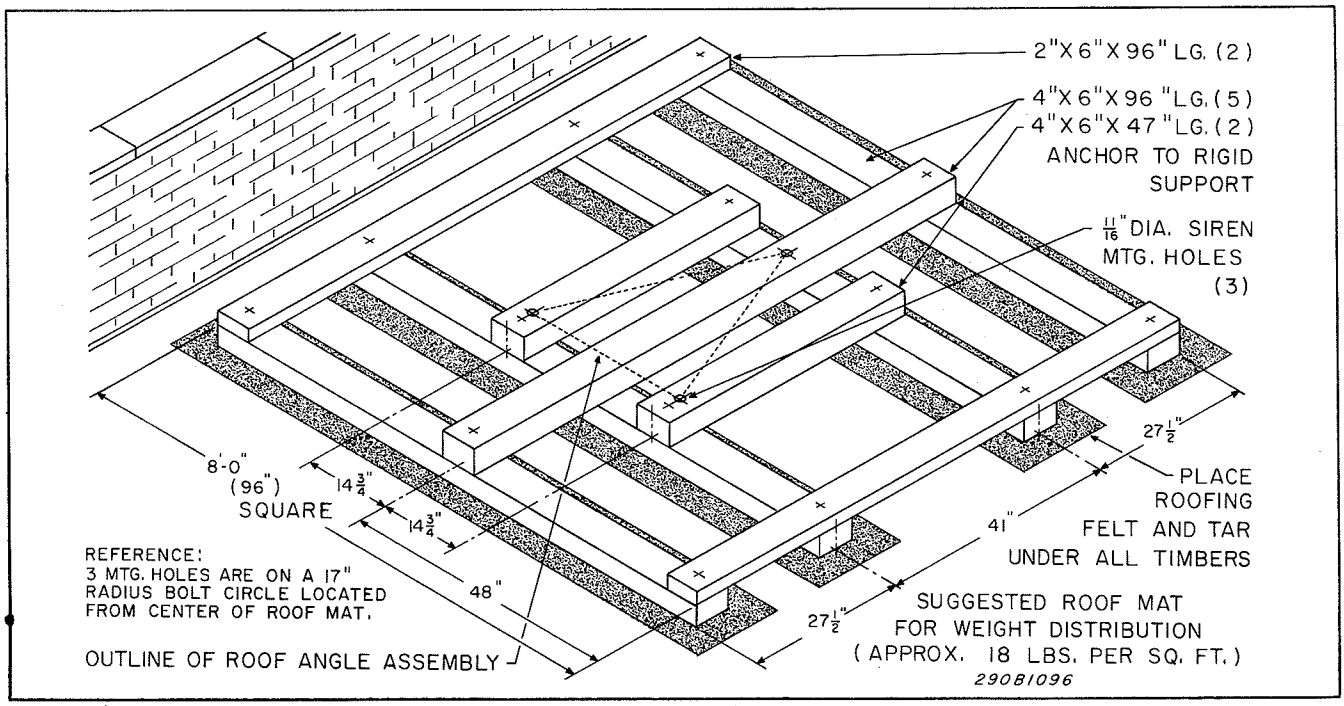
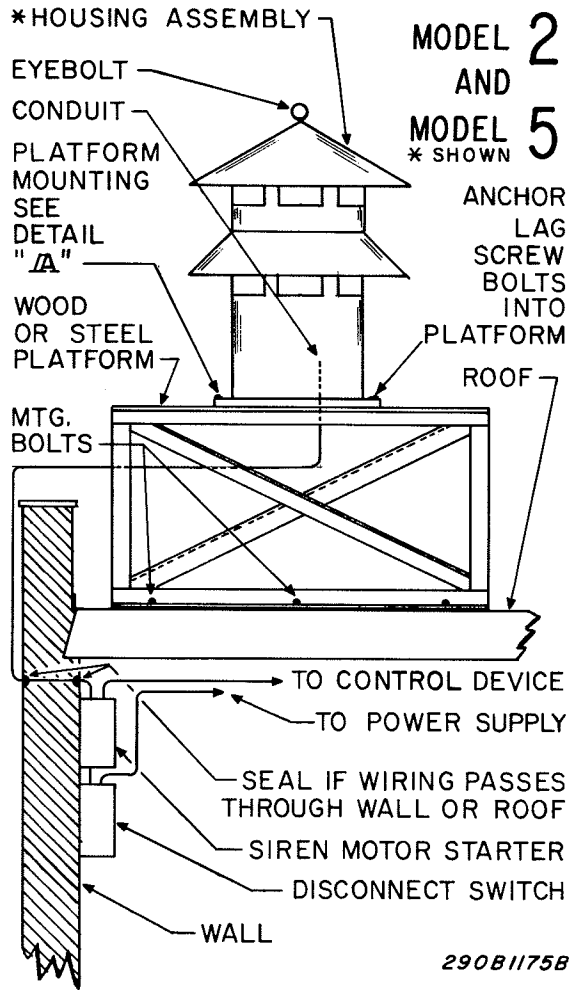
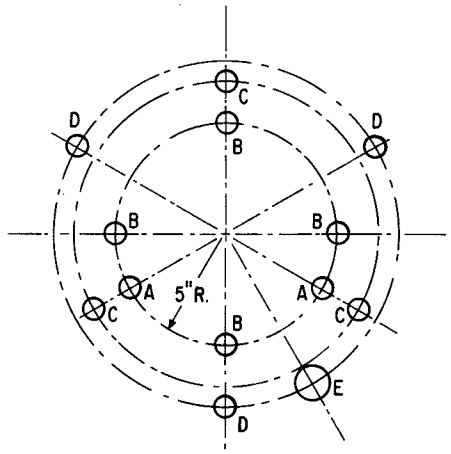


Figure 3-8. Weight Distribution Mat Construction.





DETAIL "A" PLAN VIEW

A DRILL 2 HOLES 3/4" DIA.(1.85mm) FOR MODEL 2 MOTOR.
B THREE PHASE (A) MOTOR MOUNTING HOLES. (4) *
C SINGLE PHASE (B) MOTOR MOUNTING HOLES. (3) *
D LEG MOUNTING HOLES. (3)
E CONDUIT HOLE. (1) (*) FOR MODEL 5 MOTOR

Figure 3-9. Typical Model 5 or Model 2 Platform Mounted Installation.

(g) If the siren is mounted directly on a roof (without a platform or weight distribution mat), be sure to install waterproof joints where the mounting bolts pass through the roof so that water does not enter the building.

3. Model 2

(a) Uncrate the siren and remove the siren from the shipping base. Retain the screws, wing nuts, and clips that hold the siren housing on the shipping base.

(b) Center the siren mechanism on the mounting surface, and using the mounting holes in the legs of the mechanism as a template, drill three 7/16" holes in the mounting surface.

(c) Temporarily set the siren housing over the siren mechanism on the mounting plate. Center the housing over the mechanism.

(d) Using the housing and the clips that held the housing on the shipping base as a template, drill three $\frac{1}{4}$" holes approximately equidistant around the circumference of the housing. Lift the housing off of the siren. It will be reinstalled later.

(e) Mount the siren-base plate assembly on the mounting surface using lag bolts or nuts and bolts, as appropriate. Do NOT replace the housing on the siren. It will be replaced later. If the siren is mounted directly on a roof (without a platform or weight distribution mat) be sure to install waterproof joints where the mounting bolts pass through the roof so that water does not enter the building.

(f) Install the RC2 or RC2W Motor Starter, fused disconnect switch, and other control devices as close as practical to the siren following local electrical codes and NEC recommendations. If the siren is installed on the roof of a building, it may be desirable to install the RC2 and other control devices inside of the building. Install the RC2 on a vertical surface because the motor starter cannot operate properly unless it is installed vertically.

3-4. ELECTRICAL CONNECTIONS.

A. Models STH10, STL10, SD10 and Model 5.

The power and control circuitry of a typical siren installation is shown in figure 3-10. The wiring diagram of the Model RC5 Motor Starter is also shown in the figure. The Model RC5 or RC5W can be used to control all sirens except the Model 2.

The RC5 Motor Starter is provided with various size knockout holes. Some of the knockouts can accept 1/2" conduit fittings, others can accept 3/4" conduit fittings, and still others can accommodate 1" conduit fittings. These various sized knockout holes are provided because electrical wiring requirements are frequently unpredictable. The diameter of the conduit required for the installation depends on the number of wires that must pass through the conduit (at least 5 wires for 3 phase, two wires for single phase) the AWG size of the wiring used (see Table 3-1), the type of insulation on the wiring and local electrical codes. Therefore, be sure that the size of the conduit selected meets the requirements of the installation. The RC5W has a weatherproof housing that is not provided with knockout holes. Therefore the installer must drill or punch holes of the appropriate size to accommodate conduit fittings.

To connect the motor starter and siren to the power source and control circuitry, proceed as follows (see figure 3-10):

1. Install conduit between the RC5 and the electrical junction box on the side of the siren motor.

2. Install conduit between the RC5 and the disconnect switch.

3. Install conduit between the disconnect switch and the electrical power source. If the siren is installed on a utility pole, add an entrance cap to the end of the conduit, as shown in figure 3-3.

4. Route three wires (2 wires for single phase - B-Models) of the proper size from T1, T2, and T3 (3 phase-A-models only) to the motor leads in the junction box on the siren motor. See Table 3-1 for the proper wire size.

5. Three phase (A) models only. Route two AWG 12 insulated wires from terminals V and 3 on the motor starter to P1 and P2 in the siren motor junction box. Disconnect the jumper wire between terminals V and 3.

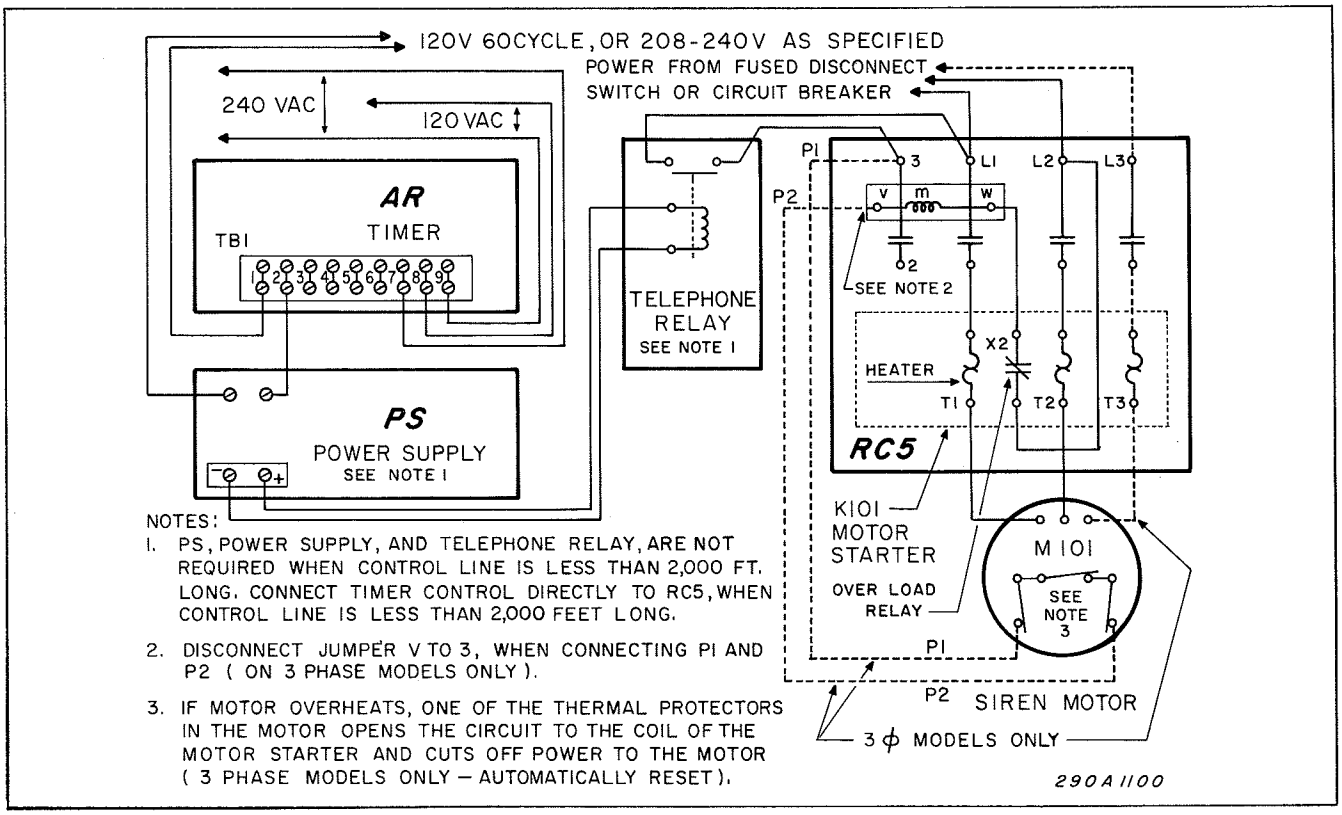


Figure 3-10. RC5 Electrical Connections.

208-240 Volts - 3 Phase Wire Length feet (Meters)			
	Less than 100 (30.5)	100-200 (30.5-61)	Over 200 (61)
Control Cabinet to Motor	AWG 6	AWG 4	Use AWG wire size that drops less than 5% of line voltage between power source and the siren when the siren is drawing rated current.
Control Cabinet to Power Source	AWG 6	AWG 4	
Telephone (Control) Relay to Control Cabinet	AWG 14	AWG 14	

240 Volts - 1 Phase Wire Length - feet (meters)			
	Less than 100 (30.5)	100 - 200 (30.5-61)	Over 200 (61)
Control Cabinet to Motor	AWG 4	AWG 2	Use AWG wire size that drops less than 5% of line voltage between power source and the siren when the siren is drawing rated current.
Control Cabinet to Power Source	AWG 4	AWG 2	
Telephone (Control) Relay to Control Cabinet	AWG 14	AWG 14	

480 Volts - 3 phase Wire Length - feet (meters)			
	Less than 100 (30.5)	100-200 (30.5-61)	Over 200 (61)
Control Cabinet to Motor	AWG 10	AWG 8	Use AWG wire size that drops less than 5% of line voltage between power source and the siren when the siren is drawing rated current.
Power Source to Control Cabinet	AWG 10	AWG 8	
Telephone (Control) Relay to Control Cabinet	AWG 14	AWG 14	

Table 3-1. Wire Sizes.

6. Route three wires (two wires for single phase-B-models) of the proper size from L1, L2 and L3 (3 phase-A-models only) through the conduit to the power disconnect switch. Refer to Table 3-1 for the proper wire size.

7. Route three wires (two wires for single phase-B-models) of the proper size from the disconnect switch to the power source. Refer to Table 3-1 for the proper wire size.

8. Connect terminals 1 and 2 of the AR Timer to terminals L1 and 3 in the motor starter.If it is desired to operate the timer from remote control pushbuttons, install them at this time also. If the length of the wiring between the pushbutton and the timer exceeds 1500 feet (457 m), or the timer and the motor starter exceeds 2,000 feet (610 m), install an SPST telephone relay, such as a Federal Model TRC*1020, between the pushbuttons and timer or timer and motor starter. If it is necessary to install one or more telephone relays, a 48 Vdc power supply, such as the Federal Model PS Power Supply, must be installed. This is necessary because the timer does not supply the 48Vdc required for the operation of the telephone relay(s). The telephone relay(s) and power supply are NOT necessary when the length of the control lines is less than that already mentioned. It is recommended that all control wiring be routed through conduit whenever practical.

9. Replace the housing on the siren.

B. Model 2

The power and control circuitry of a typical Model 2 installation is shown in figure 3-11.The schematic diagram of the Model RC2 Motor Starter is also shown in the figure.

The RC2 Motor Starter is provided with various size knockout holes. Some of the knockouts can accommodate 1/2" conduit fittings, others can accept 3/4" conduit fittings, and still others can accommodate 1" conduit fittings. These various sized knockout holes are provided because electrical wiring requirements are frequently unpredictable. The diameter of the conduit required for the installation depends on the AWG size of the wiring used (see Table 3-1) the type of insulation on the wiring, and local electrical codes. Therefore, be sure that the size of the conduit selected meets the requirements of the installation. The RC2W has a weatherproof housing that is not provided with knockout holes. Therefore, the installer must drill or punch holes of the appropriate size to accommodate conduit fittings.

To connect the motor starter and siren to the power source and control circuitry, proceed as follows (see figure 3-11):

1. Install conduit between the RC2 and the electrical leads on the side of the siren motor.

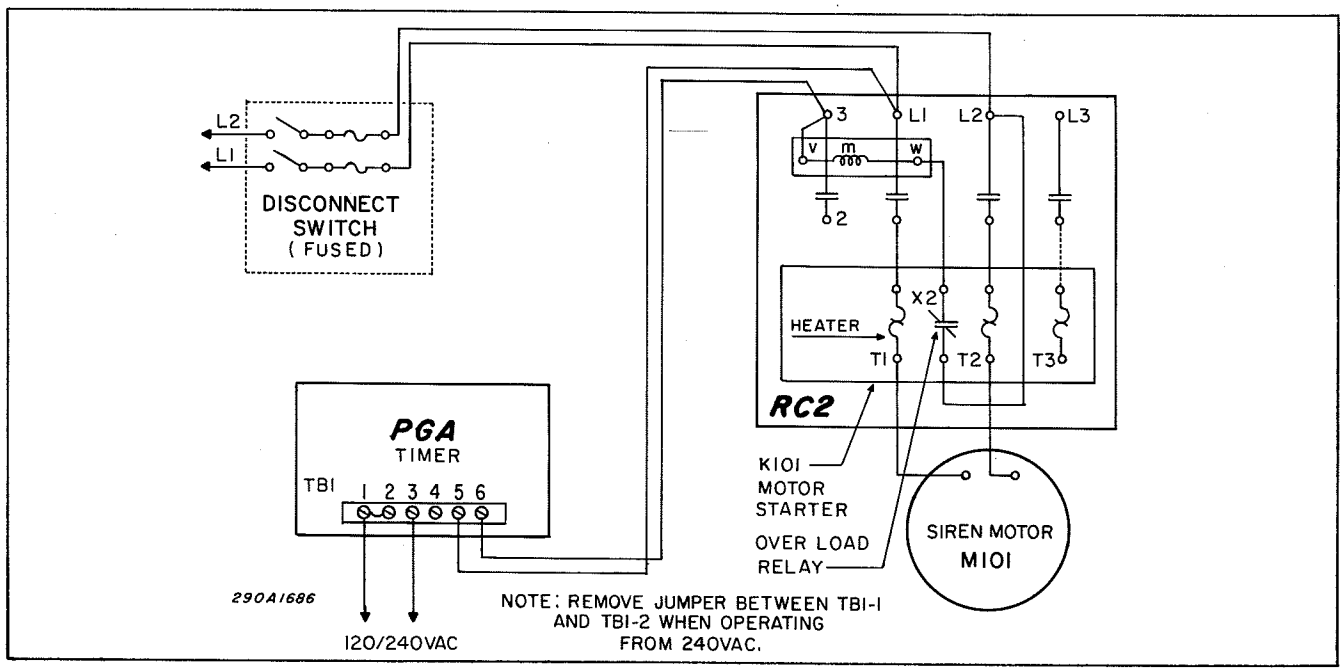


Figure 3-11. RC2 Electrical Connections.

2. Install conduit between the RC2 and the disconnect switch.

3. Install conduit between the disconnect switch and the electrical power source. If the siren is installed on a utility pole, add an entrance cap to the end of the conduit, as shown in figure 3-6.

4. Route two wires of the proper size from T1 and T2 in the RC2, through the conduit to the siren motor leads. See Table 3-1 for the proper wire size. NOTE: The motor leads are located in a junction box on some sirens.

5. Route two wires of the proper size from L1 and L2 through the conduit to the power disconnect switch. See Table 3-1 for the proper wire size.

6. Route two wires, of the proper size, from the disconnect switch to the power source. Refer to Table 3-1 for the proper wire size.

7. Connect the AR or PGA Timer to terminals L1 and 3 in the motor starter. See figure 3-12 or figure 3-13, as appropriate, for the location of the control voltage terminals in the AR or PGA Timer. If it is desired to operate the timer from remote control pushbuttons, install them at this time also. If the length of the wiring between the pushbutton and the timer exceeds 1500 feet or the timer and the motor starter exceeds 2000 feet (610m.), install an SPST telephone relay, such as a Federal Model TRC*1020, between the pushbuttons and timer or timer and motor starter. If it is required to cancel a signal from a remote location, remove the jumper between TB2-15 and TB2-16 in the AR Timer and connect the normally closed contacts of the switch or relay to TB2-15 and 16 (see figure 5-6). If it is necessary to install one or more telephone relays, a 48Vdc power supply, such as the Federal Model PS Power Supply, must be installed. This is necessary because the timer does not supply the 48Vdc required for the operation of the telephone relay(s). The telephone relay(s) and power supply are NOT necessary when the length of the control lines is less than that already mentioned. It is recommended that all control wiring be routed through conduit whenever practical.

8. Replace the housing on the siren.

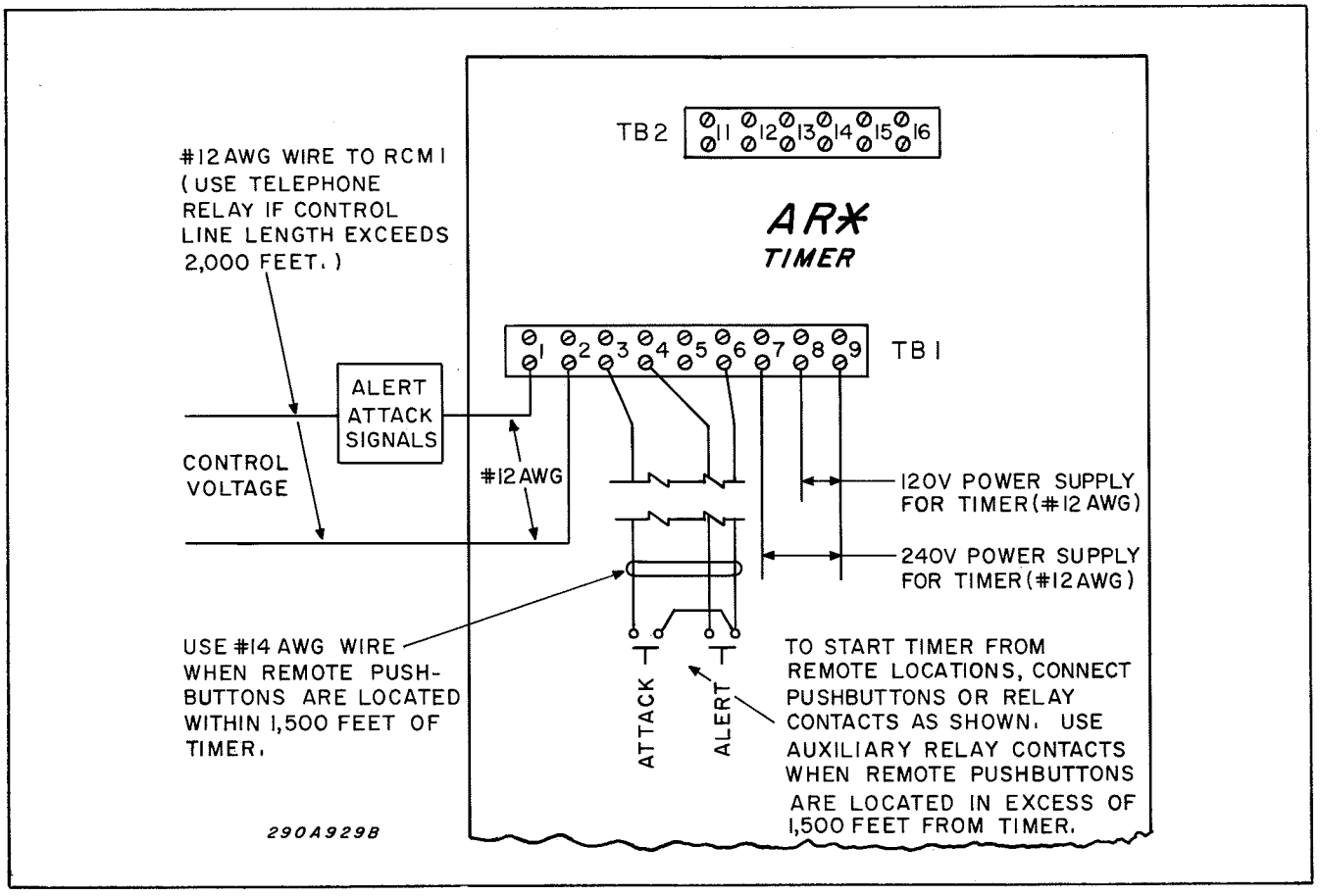


Figure 3-12. AR Timer Electrical Connections.

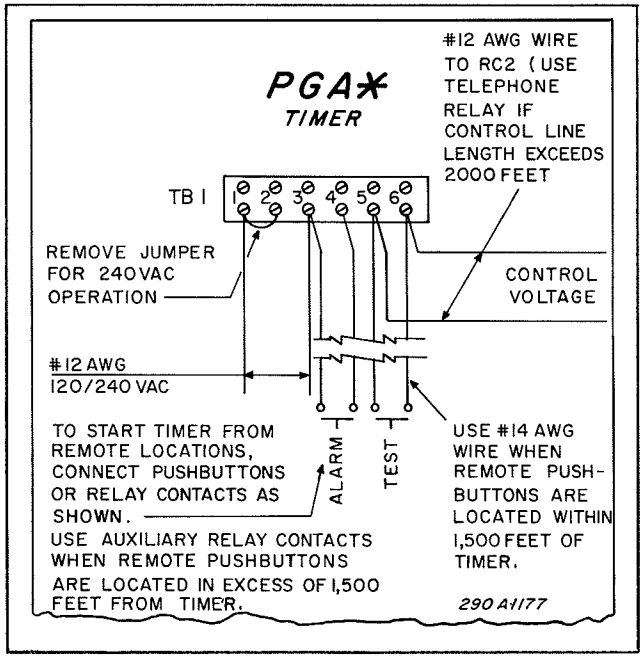


Figure 3-13. PGA Timer Electrical Connections.

9. As a safety precaution to protect both personnel and equipment, it is highly recommended that the siren and all control devices be solidly connected to an earth ground. If the siren is installed on a building, ground the system to a metallic object known to be grounded. For pole mounted installations, drive a metal rod or bar, at least two feet (61 mm) into the ground, or close as practical to the base of the pole. For maximum protection, use a separate, continuous 10AWG or larger, wire from the siren frame to ground and the cabinet of each control device to ground.

3-5. THREE PHASE MOTOR CONNECTIONS.

A three phase motor can be operated from either 208-240 Vac or a 480 Vac source when the appropriate arrangment of electrical connections is used. The siren is shipped with the motor wired to operate at the voltage specified by the user. This voltage is stamped on the nameplate of the motor. However, if it is ever necessary to change the motor operating voltage, connect the wires in the appropriate arrangement as shown in figure 3-14. NOTE: If it is ever necessary to change the siren operating voltage, the controls must also be modified or exchanged.

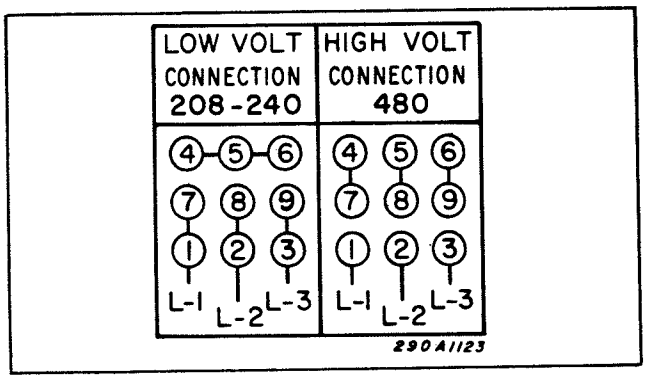


Figure 3-14. Three Phase Motor Power Connections.

3-6. PREOPERATION CHECKS.

After the siren has been completely installed, perform the following checks before putting the siren into service.

WARNING

The output sound level of a siren is capable of causing severe hearing discomfort or permanent hearing damage. Therefore, ALWAYS wear hearing protection when performing tests or maintenance on the siren.

A. Make sure that all air intakes and sound outlets are not obstructed.

B. Press the TEST pushbutton on the AR or PGA Timer. The siren should produce a continuous signal until the pushbutton is released.

C. Check the operation of the control circuitry by initiating one or more signals from the AR or PGA Timer.

After the installation is complete and it has been established that the siren is operating properly, Federal recommends that all control devices be padlocked to discourage tampering and vandalism.

SECTION IV
CIRCUIT DESCRIPTION

4-1. GENERAL.

Most siren installations include a Model AR Timer. The Model AR may be installed with any siren described in this manual. However, if desired, the Model PGA Predetermined General Alarm Timer can be used. The operation of the Model PGA is similar to that of the Model AR. The operation of the Models AR and PGA will be described separately.

4-2. MODEL AR TIMER.

The Model AR Timer (see figure 5-5) causes the vertical siren to produce a steady three-minute "Alert" signal, and a three minute, undulating up and down scale "Attack" signal.

The timer controls the siren "Attack" signal by applying a three-minute series of eight-second control contract closures separated by four-second opens to the control winding (coil) of the motor starter.

The AR Timer includes a TEST pushbutton switch, S4. The TEST pushbutton operates the control devices only for the time that it is pressed. The timer is not activated because the TEST pushbutton is in the timer output circuit.

The CANCEL button, S3, enables the operator to stop the siren signal in progress in the event that an error was made in the selection of a signal. If a signal is cancelled, the timer motor continues through the three-minute cycle. If another signal is selected during the cycle it will be produced only for the remainder of the signal cycle selected.

The AR Timer may be operated from either a 120 volt or 240 volt, single phase, 50-60Hz source. When properly connected to the power source, transformer T1 provides 120 volts to the 120 volt components.

The Model AR Timer contains the devices necessary for the control of all sirens covered by this manual. However, the timer does not include a power supply for the control circuits. Therefore the user must provide an external power supply, such as the Federal Model PS Power Supply, in the siren control circuitry when landline control is used (see figure 3-10).

The output circuitry is electrically independent of the timing circuitry. Consequently, the output circuit can utilize up to 480V. The capacity of the microswitch contacts in the signal circuits is 15 amperes AC, or 1/4 ampere DC.

The timer is activated by pressing the appropriate local or remote pushbutton for at least two seconds.

The red pilot light, DS2, on the front panel of the timer, indicates that the timer is cycling. The yellow pilot light, DS1, indicates that power is available to the timer.

When the ALERT or ATTACK pushbutton is pressed, the respective relay energizes, establishing a holding circuit through the relay holding contacts. Simultaneously, the motor feed contacts apply operating voltage to the timer motor M, and the motor begins to rotate the cams. After the cams rotate slightly, the motor feed cam contacts close to provide a parallel circuit to the timer motor.

The control closures required for the production of the "Attack" signal are generated by cam-operated contacts in the Timer. These control closures are applied to the siren motor starter coil or control panel terminals (TB102) through the signal contacts of the selected relay in the timer. There are no cam-operated contacts for the "Alert" signal. As a result, when the "Alert" signal is selected a sustained closure is applied to the siren motor starter coil or control panel, and the siren produces a signal having constant level and pitch for three minutes.

Several seconds before the end of the three-minute timer cycle, the cam-operated hold contacts open momentarily, releasing the relay holding circuit. The timer control circuit closure to the motor starter coil or control cabinet opens, stopping the siren motor.

The "Attack" signal has priority over all other signals. If "Attack" is initiated while "Alert" is sounding, "Attack" automatically overrides the signal being sounded until the end of the timer cycle, or the CANCEL pushbutton is pressed.

The CANCEL pushbutton can be used to override a higher priority signal. For example, to override "Attack" with "Alert" press the CANCEL pushbutton and then press ALERT pushbutton.

4-3. MODEL PGA TIMER.

The Model PGA Timer (see figure 5-6 ALARM button causes the siren to produce a two-minute undulating, up and down scale "Attack" signal only.

The timer controls the siren "Attack" signal by applying a two-minute series of eight-second control contact closures separated by four-second opens to the control winding (coil) of the motor starter.

The PGA Timer includes a TEST pushbutton switch, PB-2. The TEST pushbutton operates the control devices only for the time that it is pressed.The timer is not activated because the TEST pushbutton is in the timer output circuit.

The timer can be operated from either a 120 volt or a 240 volt, single phase, 50-60Hz source. The jumper between terminals 1 and 2 on the terminal strip must be removed when the unit is operated from a 240 vac source.

The PGA timer contains the devices required for the control of any siren described in this manual.

The Timer does not include a power supply for the control circuit. Therefore, the user must provide an external power supply, such as the Federal Model PS Power Supply, in the control circuitry when landline control is used (see figure 3-11).

The output circuitry is electrically independent of the timing circuitry. Consequently, the output circuit can utilize up to 480V. The capacity of the microswitch contacts in the signal circuits is 15 amperes AC, or 1/4 ampere DC.

The timer is activated by pressing the ALARM pushbutton or its remote counterpart, for at least two seconds, energizing DPST relay R. When relay R energizes, one set of contacts applies power to the timer motor M, and the motor begins to rotate the cams. After the cams rotate slightly, the motor feed contacts close to provide a parallel circuit to the timer motor. This allows the timer motor to continue running through its two-minute cycle after the ALARM pushbutton is released.

The control closures required for the production of the "Attack" signal are generated by the cam-operated contacts in the timer. These closures are applied to the siren motor starter coil. As a result, the motor starter energizes and deenergizes, causing the siren motor to increase and decrease speed producing the wailing "Attack" signal.

Several seconds before the end of the two-minute timer cycle, the cam operated holding relay contacts open momentarily, releasing the motor feed circuit. The timer control circuit closure to the motor starter coil opens, stopping the siren motor.

The TEST pushbutton is connected in parallel with the timer output circuit. Therefore, when the TEST pushbutton is depressed, a closure is applied to the siren motor starter coil until the pushbutton is released. Consequently, the Model 2 produces a signal having a constant level and pitch until the pushbutton is released.

4-4. SIREN CONTROL DESCRIPTION.

The operation of the Models RC2 and RC5 Motor Starters is identical.The Model RC5 can be used to operate any of the sirens described in this manual including a Model 2. However, an RC2 can only be used with a Model 2 Siren.

Application of a control signal to an RC2 or RC5 energizes the motor starter and applies power to the siren motor. The sirens produce the undulating "Attack" signal because the timer closes the control circuit for eight seconds and opens the circuit for four seconds. When the control circuit opens the motor starter deenergizes, deenergizing the siren motor. As the siren motor coasts toward a stop, the pitch of the sound and the sound level decrease. After approximately

four seconds the timer energizes the motor starter and the motor starter reapplies power to the motor; the pitch and sound level of the signal increase, and the cycle repeats.

The AR timer causes the siren produce the continuous "Alert" signal by energizing the motor starter continuously for three minutes. As a result, the siren is energized continuously for three minutes causing the siren to produce a continuous tone signal.

As shown in figures 3-10 and 3-11, the motor starter includes an overload relay. The relay protects the motor starter and the motor in the event that excess current is drawn. The overload relay is activated when there is sufficient current through one or more of its heaters to cause the heater(s) to expand enough to open the relay contacts. The opening of the relay contacts opens the motor starter control circuit. As a result the motor starter deenergizes, protecting the circuit against damage. After the motor starter deenergizes, the relay contacts reset automatically when the heater(s) cools sufficiently. The overload relay can also be reset manually after approximately one minute.

4-5. THERMAL PROTECTION CIRCUIT.
(3 phase models only)

Three phase (A) motors are designed to operate for a maximum of 15 minutes with at least 45 minutes between 15 minute operations. If the siren is operated for more than 15 minutes, or the 45 minute off-time is not observed, the motor may overheat and be damaged. As a result, three thermal protectors are included in the motor; one for each field winding. As shown in figure 3-10, these three thermal protectors are electrically in series with the control winding (coil) of the motor starter in the RC5. If one or more of the field windings overheat, the associated thermal protector opens the circuit, deenergizing the motor starter coil and turning off power to the motor. After the motor cools off sufficiently, the protector(s) closes and the siren can be reenergized.

The thermal protection circuit is a secondary protection circuit that is not absolutely necessary for the operation of the siren. In addition, the three thermal protectors are an integral part of the motor. A faulty thermal protector CANNOT be replaced without replacing the entire motor. Therefore, if a thermal protector malfunctions (opens), connect a jumper wire between terminals V and 3 on the motor starter.

SECTION V
SERVICE AND MAINTENANCE

5-1. GENERAL.

All sirens are designed to require a minimum of maintenance. In addition, experience has shown that all Federal sirens are highly reliable devices. However, if a siren failure does occur, Federal will provide technical assistance with problems that cannot be handled locally. If assistance is desired, contact:

Service Department
Federal Signal Corporation
136th & Western Avenue
Blue Island, Illinois 60406

It is recommended that the siren be tested for proper operation at least once a month.However, a daily test of the siren at noon, curfew, or other selected time, provides a more reliable test of system readiness. In addition, the daily test enhances the usefulness of the siren and instills public confidence in the reliability of the warning system.

5-2. ANNUAL INSPECTION.

In order to minimize the possibility of siren failure, inspection and maintenance at regular intervals is desirable. Therefore, it is recommended that the procedure in this paragraph be performed at least once a year. However, it may be necessary to increase the frequency of this procedure if the siren is used frequently or if it is used in an extreme climate. ALWAYS turn off the power to the siren at the disconnect switch before inspecting the siren.

Perform steps 1 through 3 on single phase (B) models only.

1. Remove the inspection cover and inspect the motor brushes. Replace the brushes if they are 7/8 inch long or less. Refer to paragraph 5-3B for brush replacement instructions.

2. Examine the motor commutator for burned spots, pitting and signs of excessive wear. If necessary, remove the motor brushes and use a fine grade of sandpaper to clean the commutator.DO NOT use aluminum oxide paper or emery cloth to clean the commutator.

3. After cleaning the commutator, use a small screwdriver or similar tool to clean the slots between the commutator segments. Use caution to avoid damaging the commutator surface.

4. Inspect all screens on the siren. There is one screen in each intake and one screen at the throat of each projector (Models STH10 and STL10 only). Replace all damaged screens.

5. Inspect all electrical and mechanical connections. Make sure that all fasteners are properly tightened.

6. Inspect the siren installation to be sure that it is vertically oriented. Take corrective action if a pole mounted installation is more than 5° from vertical or a roof or flat surface mount is more than 10° from vertical to prevent lubrication losses and excessive motor bearing wear.

7. Examine all painted surfaces. Repaint as necessary.

5-3. CORRECTIVE MAINTENANCE.

A. Troubleshooting.

The Troubleshooting Chart (Chart 5-1) is provided to assist repair personnel when troubleshooting a siren malfunction. This section also includes diagrams that may be helpful if the siren or control devices need repair.

WARNING

Always turn off the power at the disconnect switch before performing any maintenance on the siren.

B. Motor Brush Replacement (All Single Phase (B) models except Model 2).

1. Turn off the power to the siren at the disconnect switch.

2. Remove the inspection cover from the motor.

3. See figure 5-1 while performing steps 3 through 10 of this procedure. Remove the pigtail screw from the brush holder, and lift the pigtail leads away from the holder.

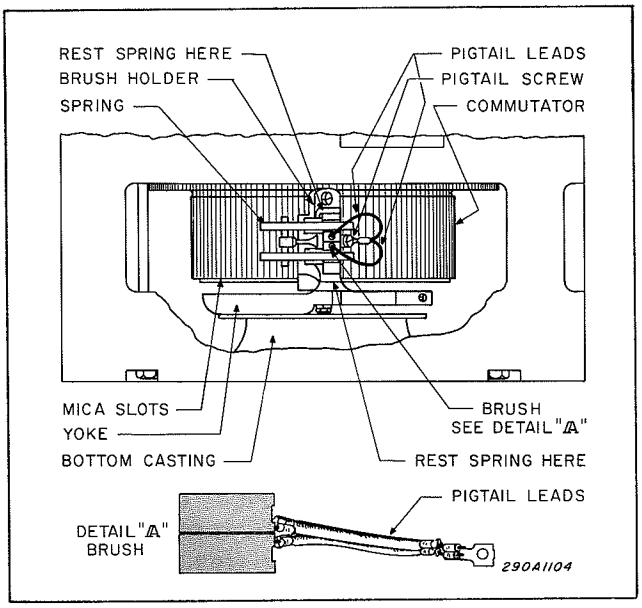


Figure 5-1. Single Phase Motor Brush Replacement.

4. Carefully lift the springs away from the two-segment brush and allow each spring to rest on the brush holder next to the brushes, as indicated in figure 5-1.

5. Lift the worn brushes out of the brush holder. When replacing brushes, they must be contoured to the commutator. If the brushes are not contoured, the commutator may be damaged and the brushes may wear excessively. To contour the replacement brushes, proceed as follows:

6. Cut a strip of 000 sandpaper 1-1/2" wide by 13-1/4" long. Do NOT use aluminum oxide paper or emery cloth.

7. Insert one end of the sandpaper in one of the slots between the commutator segments and wrap the paper around the commutator.

8. Install the replacement brushes in the brush holder making sure that the pigtail leads are next to each other as shown in detail "A" of figure 5-1.

WARNING

The rotor lends a significant amount of inertia to the siren motor armature. As a result, the rotor ports could cause severe injury when the rotors are rotating at any speed. Therefore, DO NOT rotate the commutator by sticking your fingers in the stator ports and pushing on any part of the rotor.

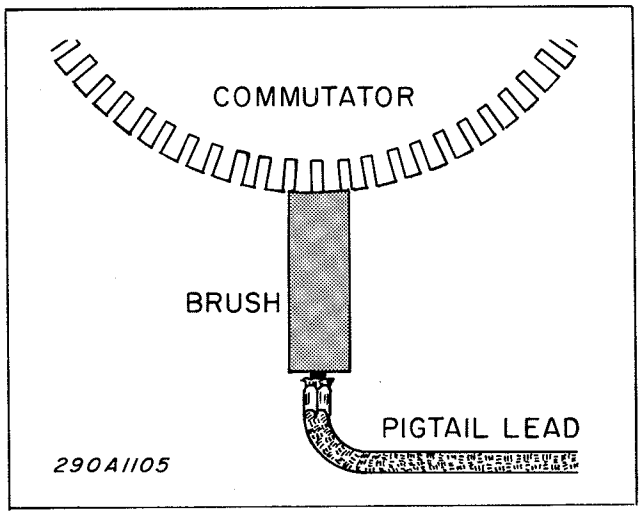


Figure 5-2. Replacement Brush Contouring.

10. Connect the pigtail leads to the brush holder, using the pigtail screw.

11. Manually rotate the motor armature approximately ten turns in the direction of the sandpaper is wrapped.

12. Lift the brushes slightly and remove the sandpaper from the motor. Clean all carbon dust out of the commutator. The brush should seat on the commutator as shown in figure 5-2. If the brush does not fully contact the commutator, as shown in figure 5-2, repeat steps 7 through 12 until the brushes seat on the commutator as shown in the figure.

13. Manually rotate the siren motor by pushing on the commutator through inspection port in the motor housing (see WARNING). Observe the operation of the brushes on the surface of the commutator. The brushes should slide smoothly on the commutator surface and should not shift position vertically or laterally. If the brushes do not slide smoothly or if they shift position, repeat steps 7 through 12.

C. Model 2 Motor Brush Replacement.

1. Loosen the clips that hold the siren housing to the mounting surface. Lift off the housing.

2. Remove the insulated cap from the Armature Brush Holder and slide out the worn armature brush. Do not loosen or remove the brush holder.

3. Install the replacement brush and replace the cap. Ensure that the brush is properly seated as indicated in figure 5-2, before tightening the cap. Make sure that the cap seats properly. However, do not tighten the cap excessively, or it may break.

TROUBLE	POSSIBLE CAUSE	REMEDY
Siren motor inoperative.	Motor starter overload relay tripped.	Reset relay
	Open circuit between motor starter and Motor.	Check wiring for continuity.
	Rotor jammed	Check rotor for free rotation. Remove material causing jamming.
	Siren motor defective.	Check motor, and repair or replace, if necessary.
	Faulty Overload Heater(s)	Replace
	Open thermal protector in in motor.	Connect a jumper wire between TB104-P1 and P2.
Motor starter inoperative.	Faulty motor starter control winding	Replace coil
	Motor starter overload relay tripped	Reset relay
	Faulty overload heater(s)	Replace heater(s)
	Open circuit between disconnect switch and motor	Check wiring for continuity. Repair or replace wiring as necessary.
	Open circuit between control equipment and motor	Check wiring for continuity. Repair or replace wiring, as necessary.
	Faulty control device(s)	Repair or replace, as necessary.

Chart 5-1. Troubleshooting Chart.

D. Model 2 Armature and Field Replacement.

1. Armature.

(a) Turn off the power to the siren at the disconnect switch.

(b) Remove the siren housing from the mechanism.

(c) Disconnect the electrical power wiring from the siren motor.

(d) Remove the mechanism from the mounting surface. If desired, the legs can also be removed from the mechanism.

(e) Remove the four bolts holding the chopper rotor and armature to the stator. Lift out the rotor and armature.

(f) Remove the lock nut and lockwasher from the armature.

(g) Use a bearing puller to pull both roller bearings from the armature shaft.

(h) Use a hydraulic press to separate the armature from the chopper rotor.

(i) When installing a new armature it may be necessary to change the electrical connections of the field. Therefore, refer to the instructions included with the replacement armature for the correct field connections.

(j) Install the replacement armature and reinstall the siren following steps (a) through (h) in reverse.

2. Field

(a) Turn off the power to the siren at the disconnect switch.

(b) Remove the siren housing from the mechanism.

(c) Disconnect the electrical power wiring from the siren motor.

(d) Remove the siren mechanism from the mounting surface. If desired, the legs can also be removed from the mechanism.

(e) Remove the field retaining ring from the motor housing.

(f) Arrange two spacers consisting of 4" x 4" (102mm x 102mm) lumber or similar material, approximately 5" (127mm) apart on a solid work surface as shown in figure 5-3.

(g) Sharply rap the motor housing against the spacers several times until the field drops out of the motor housing. The motor housing is an aluminum die casting. As a result, it can be broken or damaged. Therefore, use caution to ensure that the motor housing strikes the spacers squarely as indicated in figure 5-3.

NOTE

It is not necessary to follow the procedure described in steps (h) through (k) if a hydraulic press is available to press the replacement field into the motor housing.

(h) Fabricate two 8" (203mm) guide pins from 3/16" (5mm.) metal rod. Taper these pins as indicated in figure 5-4.

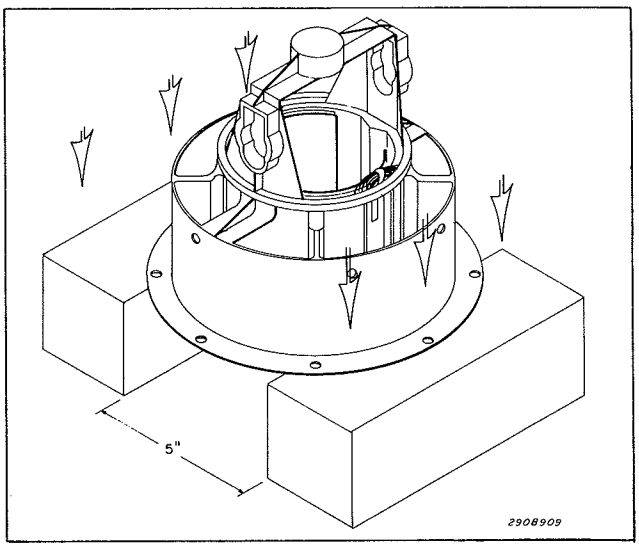


Figure 5-3. Model 2 Field Removal.

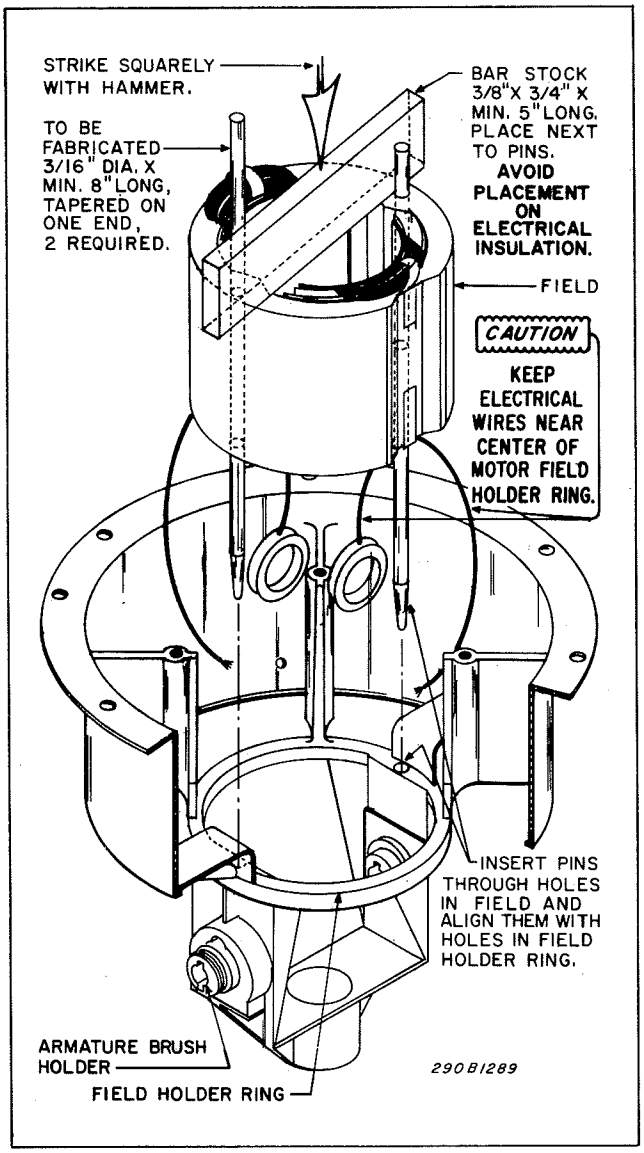


Figure 5-4. Model 2 Field Replacement.

(i) Insert the tapered end of the pins into the threaded holes in the field holder ring as indicated in figure 5-4.

(j) Set the new field on the motor housing with the guide pins passing through the two mounting holes in the body of the field as shown in figure 5-4. Be sure that the four wires are in the position shown in figure 5-4.

(k) Set a length of 3/8" (9.5mm) steel bar stock approximately 5" (127mm) long, or similar object, on the field as illustrated in figure 5-4. Drive the field into the motor housing by firmly and squarely tapping the bar with a hammer. See figure 5-4. Use caution to avoid cutting or otherwise damaging the wires that are connected to the field.

(l) Connect the two wires having rings to the motor brush holders, one wire to each brush holder.

(m) Reinstall the field retaining ring.

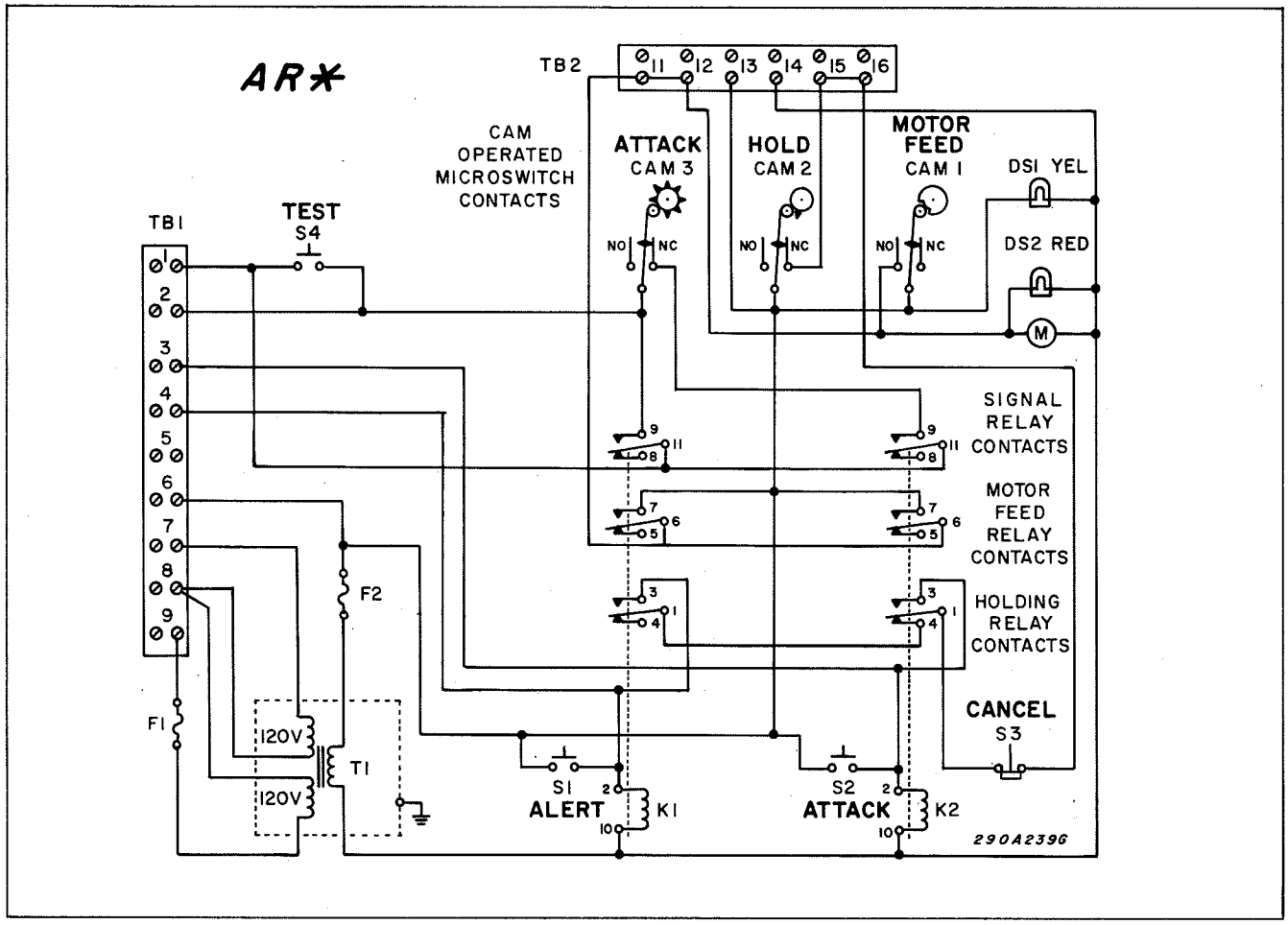


Figure 5-5. Model AR Timer Wiring Diagram.

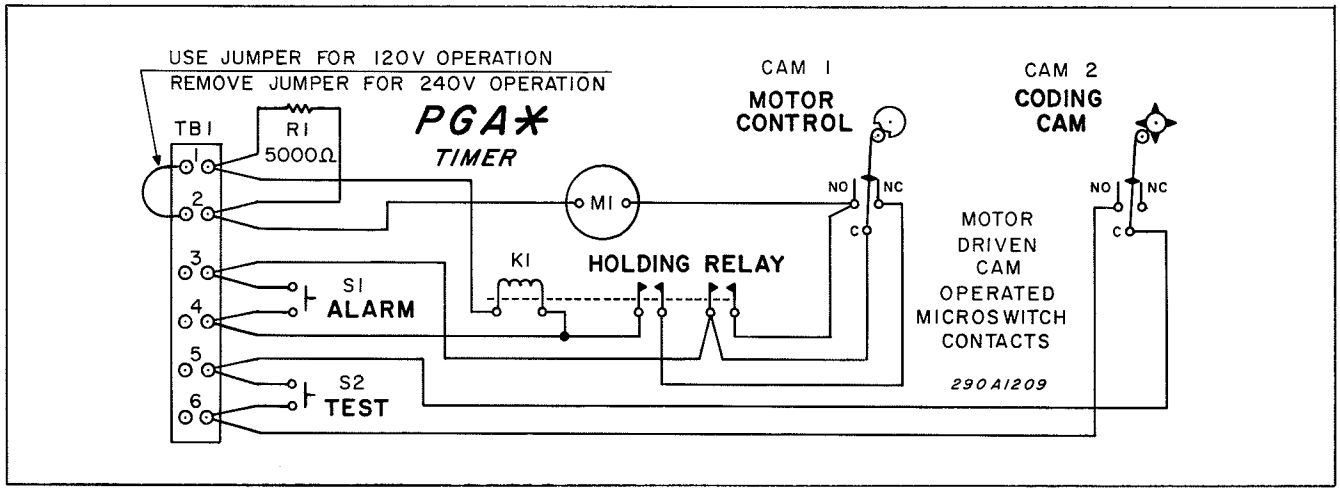


Figure 5-6. Model PGA Timer Wiring Diagram.

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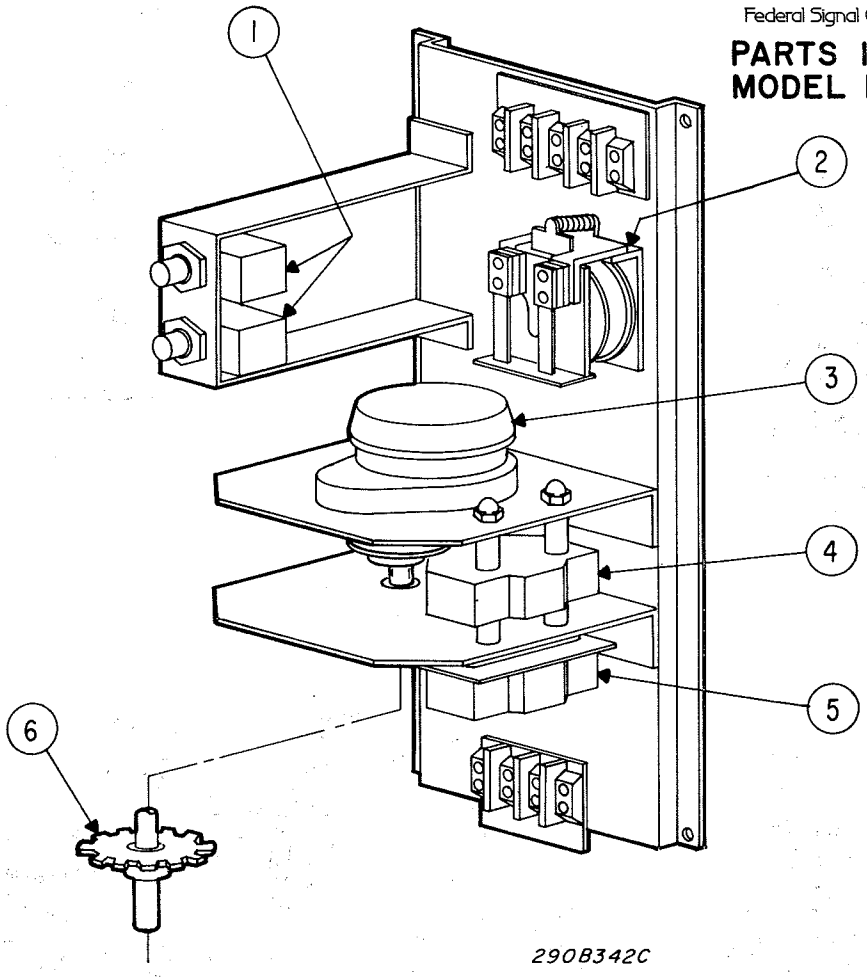
PARTS INDEX
MODEL PGA



PPL 0061 MODEL P G A TIMER JUNE 1979
PARTS LIST

Index No.	Description	Part No.	Qty.
1	Switch (Test and Alarm)	8283A955	2
2	Relay, Holding (120V)	8283A897	1 AR
	Relay, Holding (240V)	8283A896	
3	Motor, 120Volt	8283A849	1 AR
	Motor, 240Volt	8283A848	
4	Microswitch, Motor Circuit	8283A932	1
5	Microswitch, Code Circuit	8283A933	1
6	Code Wheel (Standard) (8 on, 4 off, 10 times)	8287A213	1
Not Shown	Code Wheel, Blank (uncut)	8283A906	1
	Code Wheel, (cut for special code)	8217A200-XX	1

DO NOT ORDER PARTS BY INDEX NUMBER.
Give model, voltage, description and part number.

Refer to PARTS PRICE LIST (Part No. 1001) for prices of parts.

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Figure 5-7. PGA Timer Parts Index.

SIGNAL DIVISION
Federal Signal Corporation

PARTS INDEX
MODELS AF & AR
SERIES AI

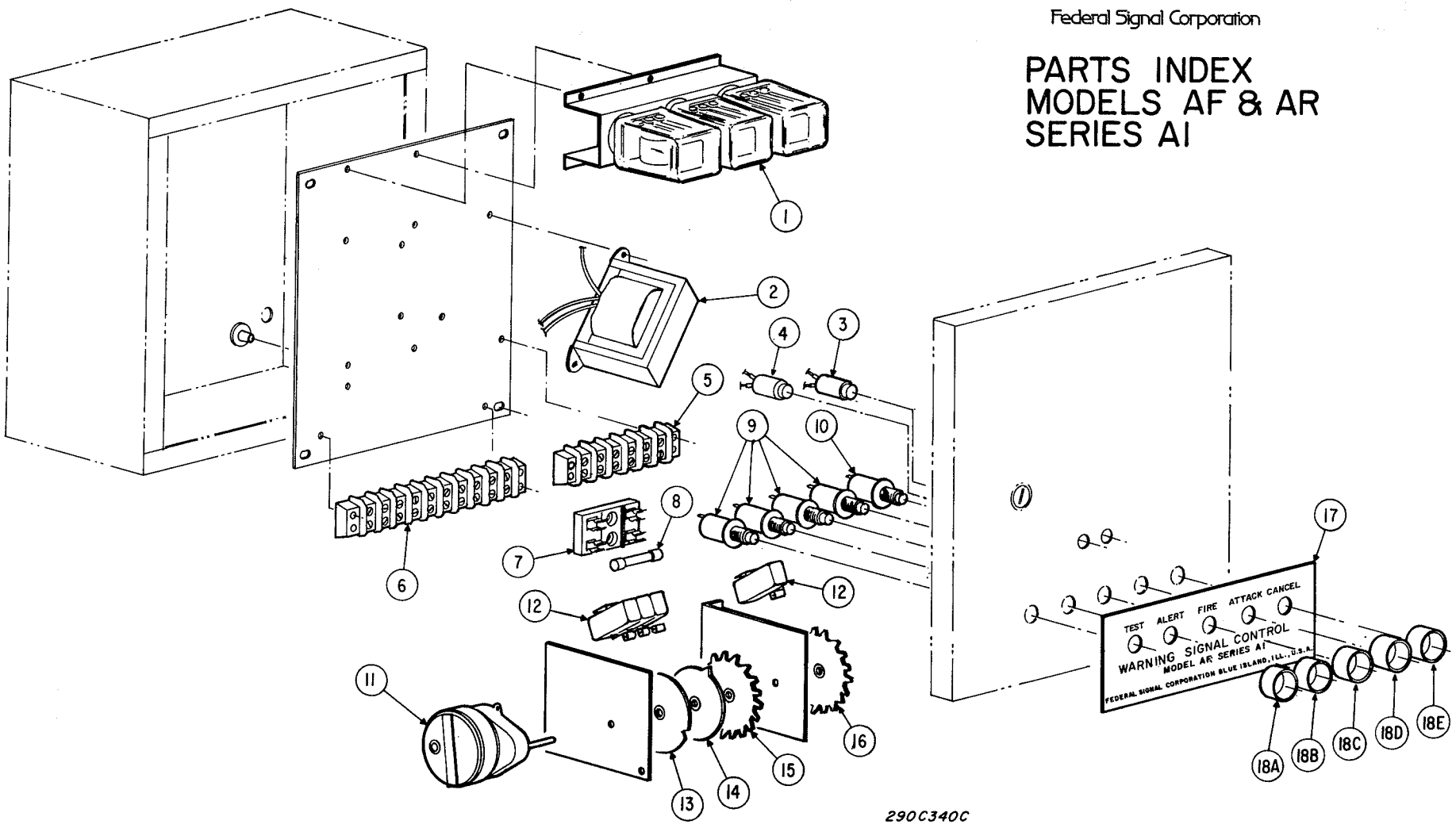

Figure 5-8. Models AF and AR Parts Index.

Index No.	Description	Part No.	Qty.
1	Relay (2 used on AR, 3 used on AF)	8217A082	AR
2	Transformer	8217A083	1
3	Motor Pilot Light Assembly	8217A087	1
4	Power Pilot Light Assembly	8217A213	1
5	Terminal Block, 6 terminal	8217A086	1
6	Terminal Block, 9 terminal (Model AR)	8217A173	1 AR
	Terminal Block, 10 terminal (Model AF)	8217A085	
7	Fuseholder	8217A091	1
8	Fuse, one ampere	8217A090	2
9	Switch, Red Push-button (3 used on AR, 4 used on AF)	8217A089	AR
10	Switch, Black Push-button	8217A088	1
11	Motor	8217A084	1
12	Microswitch (3 used on AR, 4 used on AF)	8217A081	AR
13	Cam Number 1	8217A092	1
14	Cam Number 2	8217A093	1
15	Cam Number 3	8217A094	1
16	Cam Number 4 (Model AF only)	8217A095	1 AR
17	Nameplate , Model AR	8146A331	1 AR
	Nameplate, Model AF	8146A330	
18A	Switch Guard, Silver	8217A097-05	1
18B	Switch Guard, Blue	8217A097-03	1
18C	Switch Guard, Red (Model AF only)	8217A097-01	1 AR
18D	Switch Guard, Yellow	8217A097-02	1
18E	Switch Guard, Black	8217A097-04	1

DO NOT ORDER PARTS BY INDEX NUMBER.
Give model, voltage, description and part number.

Refer to PARTS PRICE LIST (Part No. 1001) for prices of parts.

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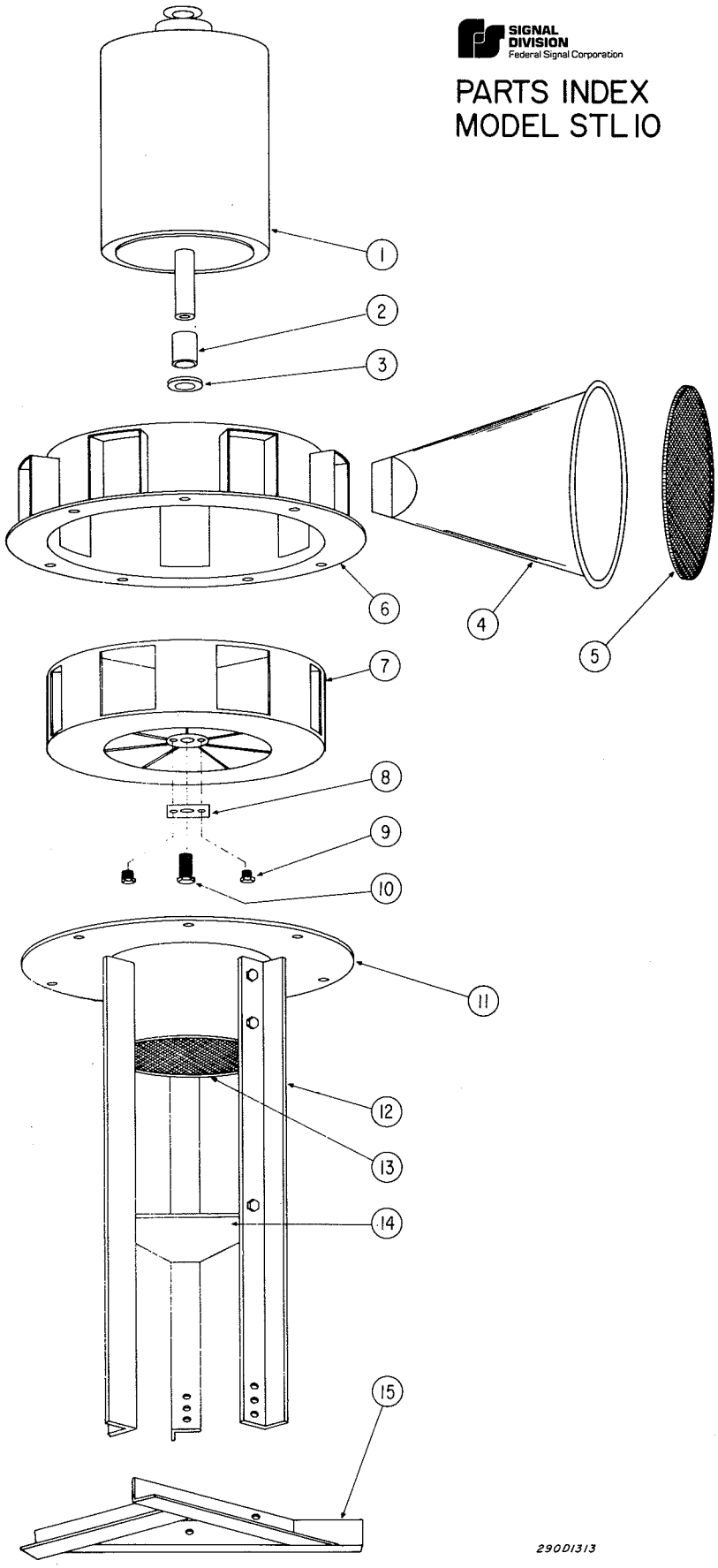

Figure 5-9. Model STL10 Parts Index.

MODEL STL10 SIREN

PPL 0149
PARTS LIST

JUNE 1979

Item No.	Description	Part No.	Qty.
1	Motor, 7½ HP , 3 Phase	8283B789	1 AR
	Motor, 7½ HP , 1 Phase	8287B179	
2	Spacer (for 3 phase motor only)	8149A038	1
3	Washer	7072A145A	1
4	Projector	8450D007	7
5	Screen, Projector	8450B008	7
6	Stator	8450D002	1
7	Rotor	8450D001	1
8	Plate, Locking	8279A026	1
9	Bolt, Locking	8279A033	2
10	Bolt, Locking	8279A034	1
11	Flange and Tube Assembly	8450B033A	1
12	Bracket, Angle	8450B015	3
13	Screen, Intake Tube	8451B010	1
14	Plate, Brace	8451C037	1
15	Angle, Roof	8450C017A	1
Not Shown	Kit, Pole Mounting	8450D035A	1 AR
	Kit, Roof Mounting	8450C017A-01	
	Hoisting Bracket (1 Phase)	8287B183	1
	Brush, Motor (1 Phase)	8283A342	1 set
	Spring, Motor (1 Phase)	8283A343	4
	Projector Kit	8454A032	1
	Eyebolt	7003A003A	1

DO NOT ORDER PARTS BY INDEX NUMBER.
Give model, voltage, description and part number.

Refer to PARTS PRICE LIST (Part No. 1001) for prices of parts.

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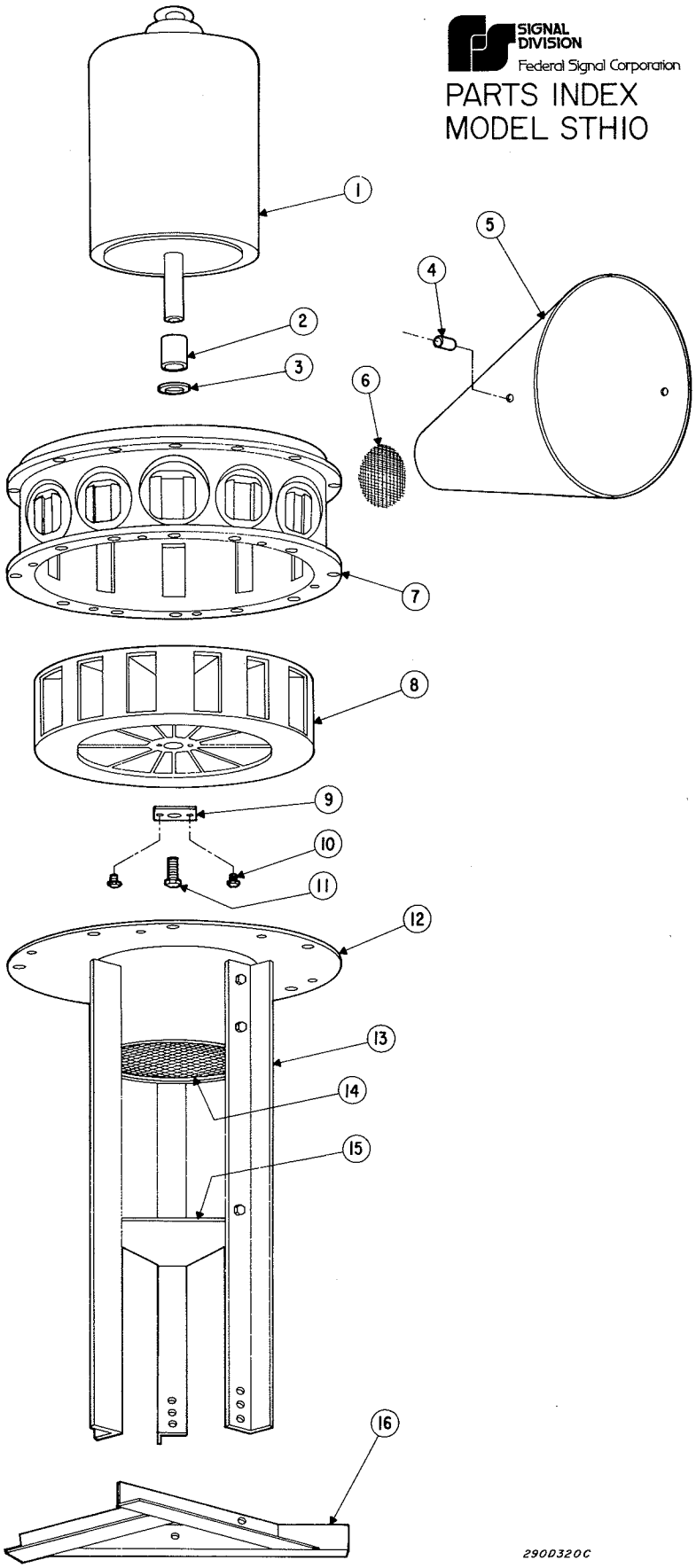

Figure 5-10. Model STH10 Parts Index.

PPL 0059
PARTS LIST

MODEL STH10 SIREN

JUNE 1979

Item No.	Description	Part No.	Qty.
1	Motor, 7½ HP , 3 Phase	8283B789	1 AR
	Motor, 7½ HP , 1 Phase	8287B179	
2	Spacer (for 3 phase motor only)	8149A038	1
3	Washer	7072A145A	1
4	Spacer	8454A007	12
5	Projector (Gray)	8454D002	12 AR
	Projector (CD Yellow)	8454D002-01	
6	Screen, Projector (Gray)	8454A011	12 AR
	Screen, Projector (CD Yellow)	8454A011-0Y	
7	Stator	8454D001	1
8	Rotor	8454D004	1
9	Plate, Locking	8279A026	1
10	Bolt, Locking	8279A033	2
11	Bolt, Locking	8279A034	1
12	Flange and Tube Assembly (Gray)	8450B011A	1 AR
	Flange and Tube Assembly (CD Yellow)	8450B011A-0Y	
13	Bracket, Angle (Gray)	8450B015	3 AR
	Bracket, Angle (CD Yellow)	8450B015-0Y	
14	Screen, Intake Tube (Gray)	8451B010	1 AR
	Screen, Intake Tube (CD Yellow)	8451B010-0Y	
15	Plate, Brace (Gray)	8451C037	1 AR
	Plate, Brace (CD Yellow)	8451C037-0Y	
16	Angle, Roof (Gray)	8450C017A	1 AR
	Angle, Roof (CD Yellow)	8450C017A-0Y	
Not Shown	Kit, Pole Mounting (Gray)	8450D010	1 AR
	Kit, Pole Mounting (CD Yellow)	8450D010-01	
	Kit, Roof Mounting (Gray)	8450C017A-01	1 AR
	Kit, Roof Mounting (CD Yellow)	8450C017A-01-0Y	
	Hoisting Bracket (1 Phase)	8287B183	1
	Brush, Motor (1 Phase)	8283A342	1 set
	Spring, Motor (1 Phase)	8283A343	4
	Projector Kit	8450A025	1
	Eyebolt	7003A003A	1

DO NOT ORDER PARTS BY INDEX NUMBER.
Give model, voltage, description and part number.

Refer to PARTS PRICE LIST (Part No. 1001) for prices of parts.

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PARTS INDEX
MODELS SD10A
SD10B

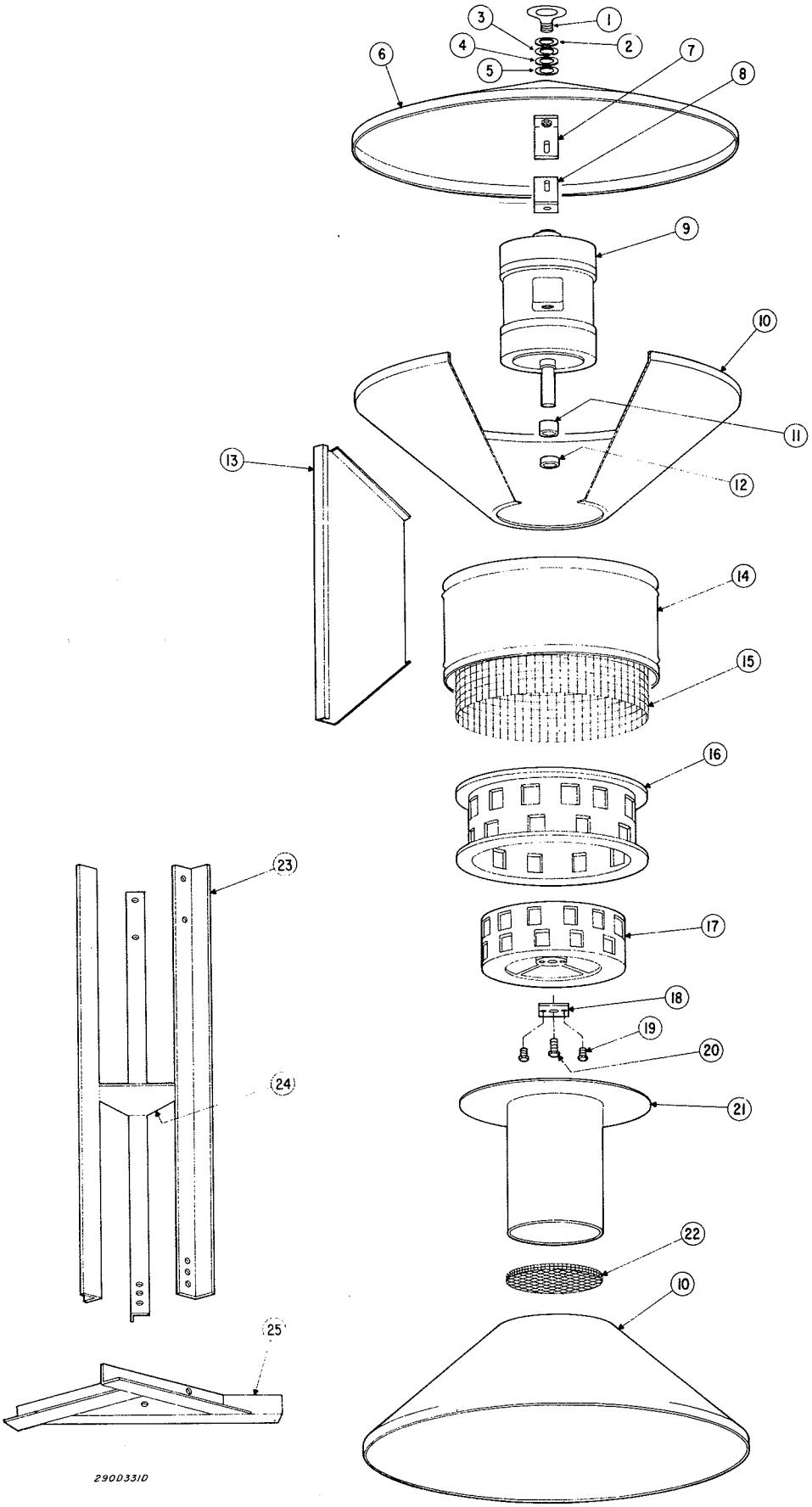

Figure 5-11. Model SD10 Parts Index.

Index No.	Description	Part No.	Qty.
1	1/2-13 Eyebolt	7003A003	1
2	1/2" Split Lockwasher	7074A025	1
3	1/2" Flat Steel Washer	7072A095	1
4	1/2 x 1-3/8 O.D. Steel Washer	7072A115	1
5	Rubber Washer	7072A038	1
6	Cover, Housing	8451C003	1
7	Hoisting Bracket, Top (Model SD10A ONLY)	8451A038	1
8	Hoisting Bracket, Bottom (Model SD10A ONLY)	8451A039	1
9	Motor (Model SD10A) *	8283B789	1 AR
	Motor (Model SD10B)	8287B179	
10	Projector	8451D004	2
11	Spacer (used with part no. 8283B789) *	8149A038	1 AR
12	Spacer, Motor (model SD10A ONLY)	8179A029	3
13	Fin, Vertical	8451C006	4
14	Shield	8451C005	1
15	Screen, Stator	8451B011	1
16	Stator	8279D036	1
17	Rotor	8279D018	1
18	Plate, Locking	8279A026	1
19	Bolt, Locking	8279A033	2
20	Bolt, Locking	8279A034	1
21	Flange and Tube Assembly	8451B002A	1
22	Screen, Intake Tube	8451B010	1
23	Bracket, Angle	8450B015	3
24	Plate, Brace	8451C037	1
25	Angle, Roof	8450C017A	1
Not Shown	Roof Mounting Kit (includes item 22 and misc. hardware)	8540C017A-01	AR
	Pole Mounting Kit (includes items 18, 20, 21, and misc. hardware)	8450C014-01	AR
	Bracket, Hoisting (Model SD10B)	8287B183	1
	Brush (for single phase motors)	8283A342	1 set
	Spring, Brush (for single phase motors)	8283A343	4

DO NOT ORDER PARTS BY INDEX NUMBER.
Give model, voltage, description and part number.

Refer to PARTS PRICE LIST (Part No. 1001) for prices of parts.

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PARTS INDEX
MODELS
5A
5AT
5B
5BT

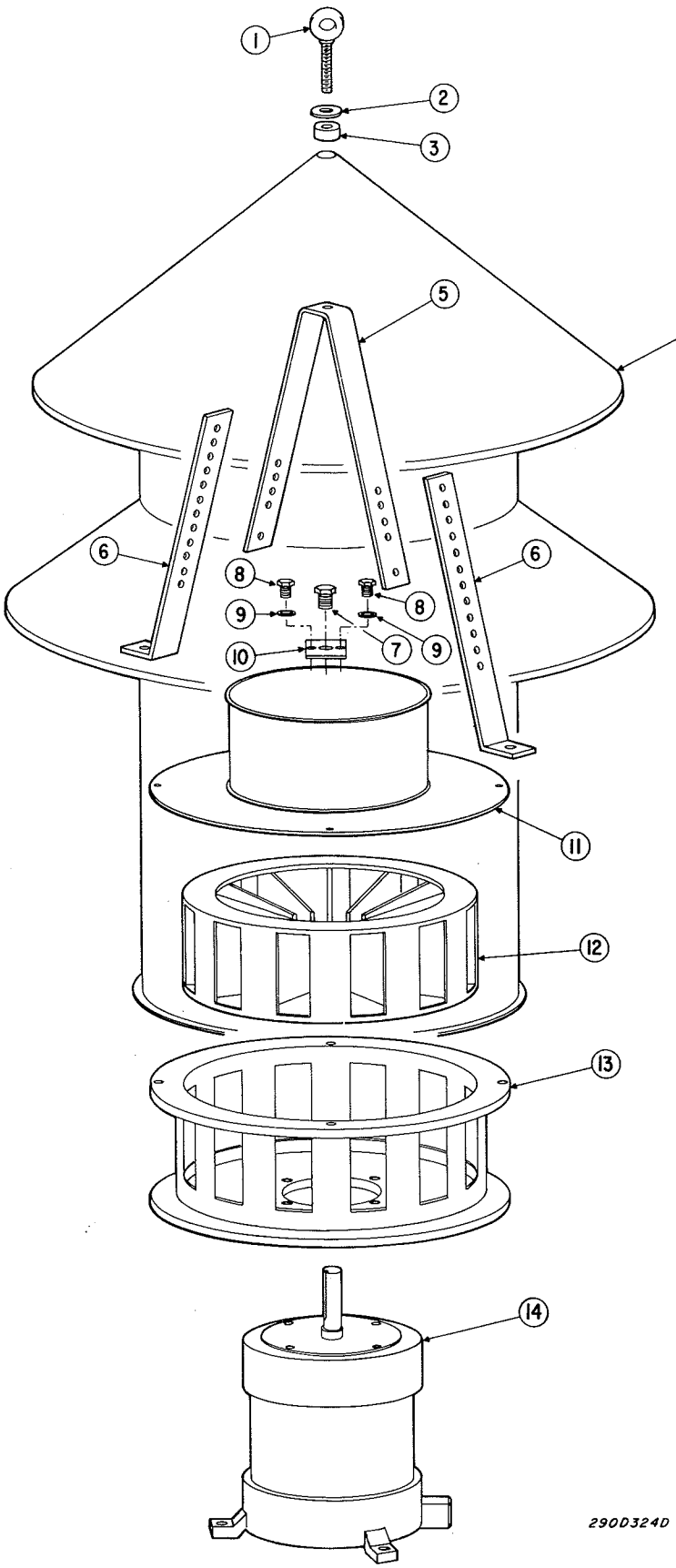

Figure 5-12. Model 5 Parts Index.

Index No.	Description	Part No.	Qty.
1	Eyebolt	7003A003A	1
2	Flat Washer, 5/8 Steel	7072A041	1
3	Washer, Rubber Mount	8287A161	1
4	Housing Assembly	8155B087	1
5	Bracket Top, Hoisting	8155C077	1
6	Bracket Sides, Hoisting	8155B078	2
7	Bolt, Locking, 1/2-13	8279A034	1
8	Bolt, Locking, 5/16-18	8279A033	2
9	Lockwasher, Split	7074A021	2
10	Plate, Locking	8279A026	1
11	Projector, Intake		
	(Model 5A and 5B single tone units only)	8147C009	1 AR
12	Rotor		
	(Model 5A and 5B single tone units only)	L 127-01	1 AR
	Rotor		
	(Model 5AT and 5BT two tone units only)	8279D018	
13	Stator		
	(Model 5A and 5B single tone units only)	8283D180	1 AR
	Stator		
	(Model 5AT and 5BT two tone units only)	8279D036	
14	Motor, 3 Phase		
	(Model 5A and 5AT)	8283B791	1 AR
	Motor, 3 Phase		
	(Model 5A, 550/600 Volts)	8283B791-01	
	Motor, 1 Phase		
	(Model 5B and 5BT)	8287B177	
Not Shown	Brush (for single phase motors)	8283A342	1 set
	Spring (for single phase motors)	8283A343	4
	Stainless Steel Wire	RC 15-02-01	AR

DO NOT ORDER PARTS BY INDEX NUMBER.
Give model, voltage, description, and part number.

Refer to PARTS PRICE LIST (Part No. 1001) for prices of parts.

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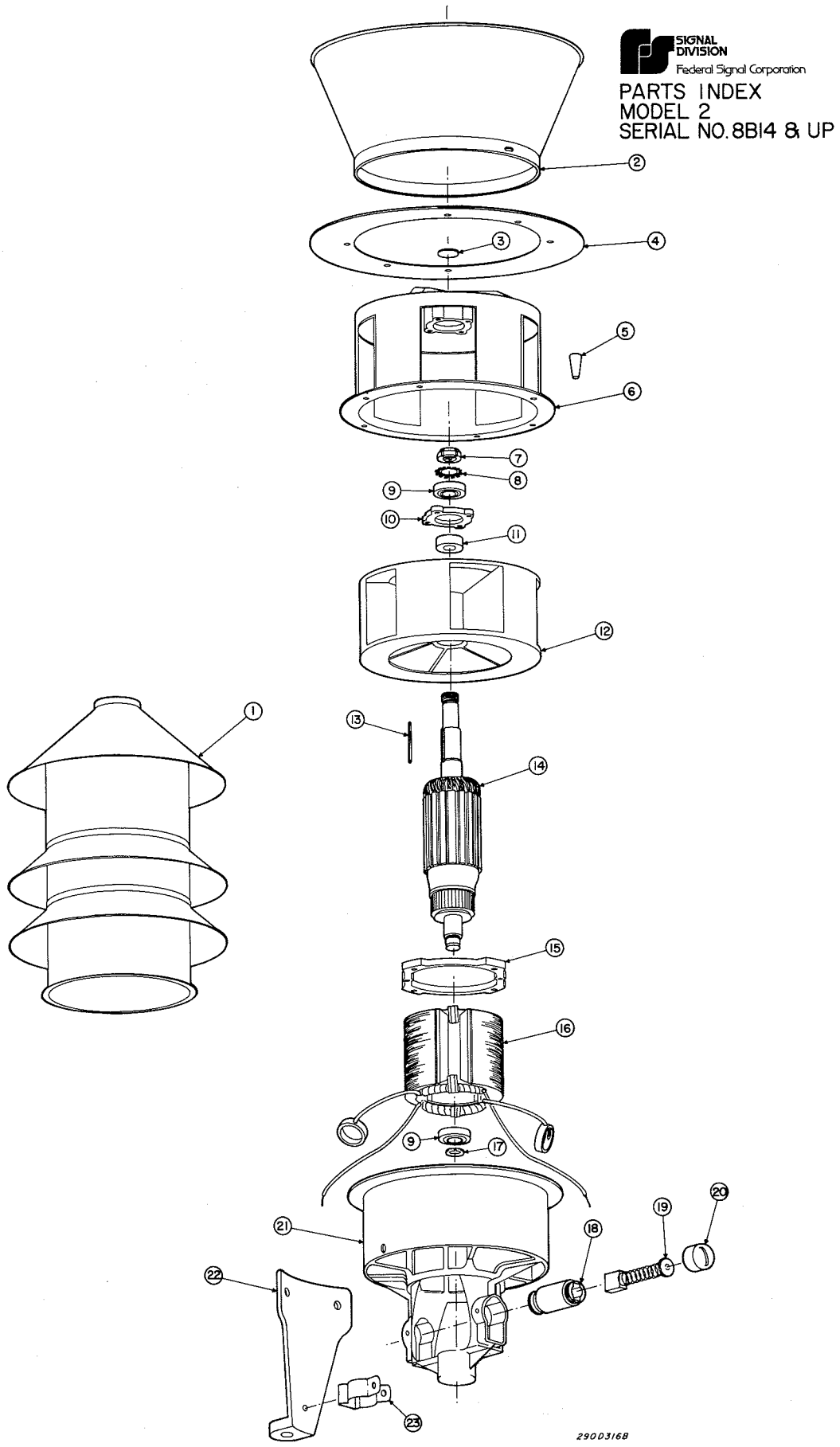

Figure 5-13. Model 2 Parts Index

Index No.	Description	Part No.	Qty.
1	Housing Assembly, Galv. steel	8155B086	1AR
	Housing Assembly, Aluminum	8155B086-01	
2	Projector	8247C006	1
3	Plug	8283A120	1
4	Plate, Baffle	8247C007	1
5	Taper Pin, #5 x 1	8400A229	2
6	End Bell, Stator	LO1-02	1
7	Locknut	LO1-15	1
8	Lockwasher	LO1-16	1
9	Bearing	8239A045	2
10	Locking Ring, Top Bearing	LO1-07	1
11	Rotor Spacer and Bearing Stop	LO1-08	1
12	Rotor	LO1-21	1
13	Key	8247A057	1
14	Armature, 120-volt	8247B041G	1AR
	Armature, 240-volt	8247B039G	
15	Locking Ring, Field	LO1-20	1
16	Field, 120-volt	8247B042G	1AR
	Field, 240-volt	8247B040G	
17	Spring Lockwasher, Lower Bearing	LO1-11	1
18	Holder, Brush	8247A021	2
19	Brush and Spring	8247A020	2
20	Cap, Brush Holder	8247A022	2
21	Housing, Motor	LO1-03	1
22	Legs	LO1-4A	3
23	Hanger, Cable	8400A211	1
Not Shown	End Bell, Stator (replaces item 6 on two-tone units)	8247D023	
	Rotor (replaces item 12 on two-tone units)	8247D024	

DO NOT ORDER PARTS BY INDEX NUMBER.
Give model, voltage, description and part number.

Refer to PARTS PRICE LIST (Part No. 1001) for prices of parts.

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PARTS INDEX
CANADIAN
MODEL 2

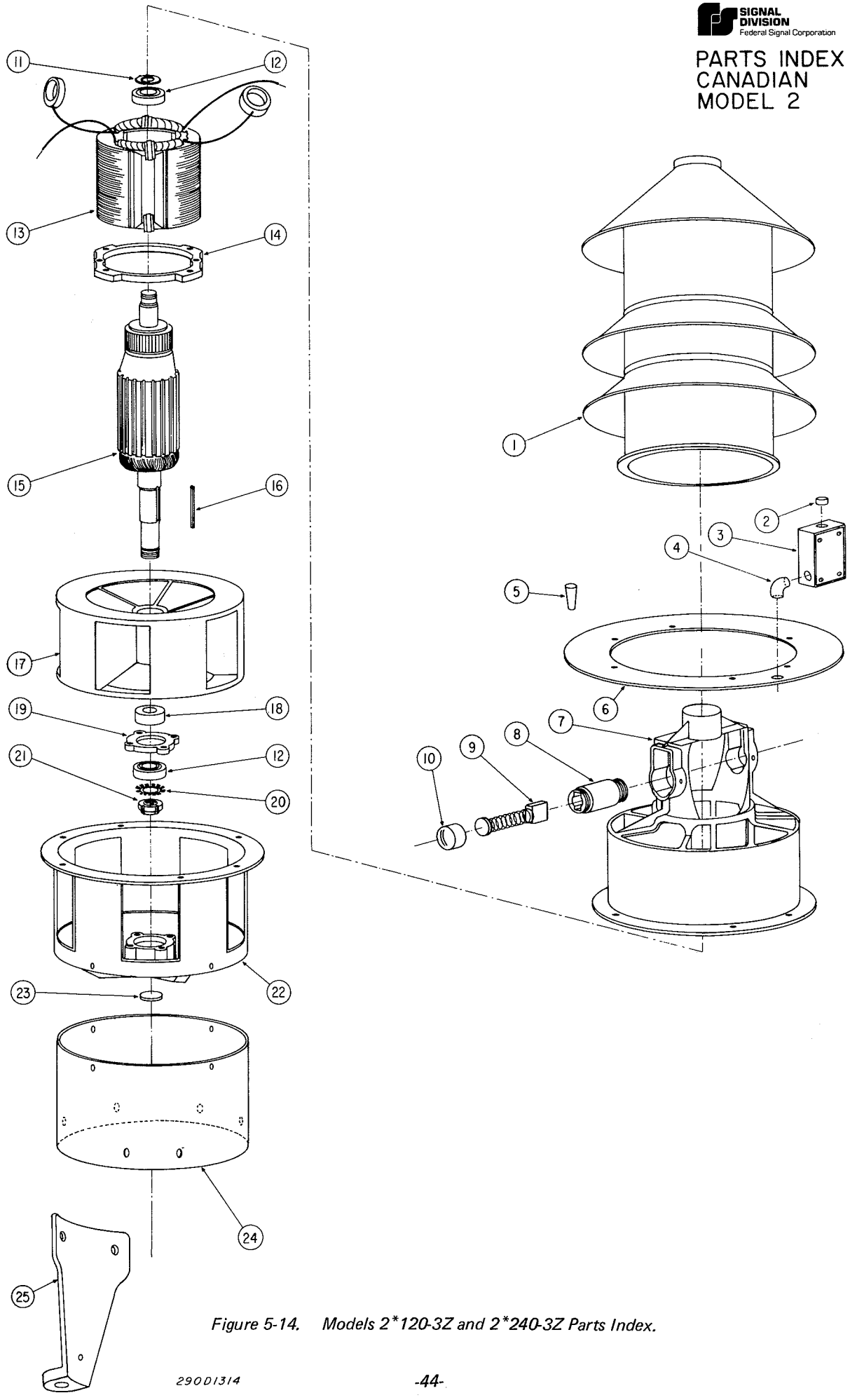

*Figure 5-14. Models 2*120-3Z and 2*240-3Z Parts Index.*

CANADIAN MODEL 2 SIREN

PPL 0150
PARTS LIST

JUNE 1979

Item No.	Description	Part No.	Qty.
1	Housing Assembly	8155B092	1
2	Bushing	8129A001	1
3	Junction Box, with Cover	8287B202	1
4	Elbow, 90°	8287A145	1
5	Taper Pin, # 5 x 1	8400A229	2
6	Plate, Baffle	8247C007-01	1
7	Housing, Motor	LO 1-03	1
8	Holder, Brush	8247A021	2
9	Brush and Spring	8247A020	2
10	Cap, Brush Holder	8247A022	2
11	Lockwasher, Spring	LO 1-11	1
12	Bearing	8239A045	2
13	Field (120V)	8247B042G	1 AR
	Field (240V)	8247B040G	
14	Ring, Locking Field	LO 1-20	1
15	Armature (120V)	8247B041G	1 AR
	Armature (240V)	8247B039G	
16	Key	8247A057	1
17	Rotor	LO 1-21	1
18	Rotor Spacer, and Bearing Stop	LO 1-08	1
19	Ring, Locking	LO 1-07	1
20	Lockwasher	LO 1-16	1
21	Locknut	LO 1-15	1
22	End Bell, Stator	LO 1-02	1
23	Plug	8283A120	1
24	Adapter, Mounting	8155C059	1
25	Legs	LO 1-4A	3

DO NOT ORDER PARTS BY INDEX NUMBER.
Give model, voltage, description and part number.

Refer to PARTS PRICE LIST (Part No. 1001) for prices of parts.

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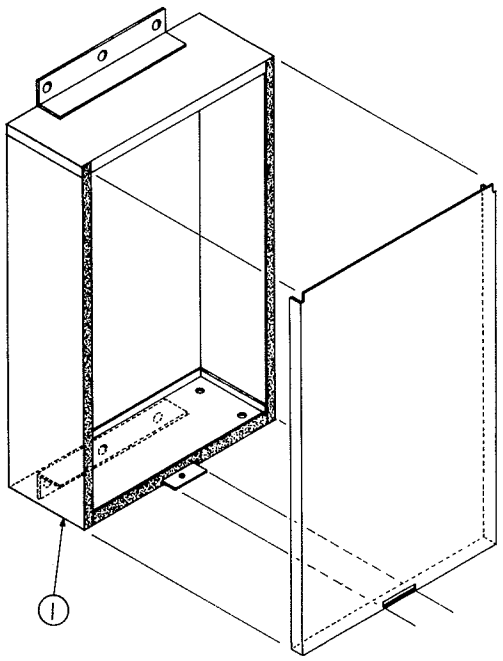

SIGNAL DIVISION
Federal Signal Corporation

PARTS INDEX
REMOTE CONTROL
MODELS
RC5A, RC5WA
RC5B, RC5WB
SERIES AI

290C336C

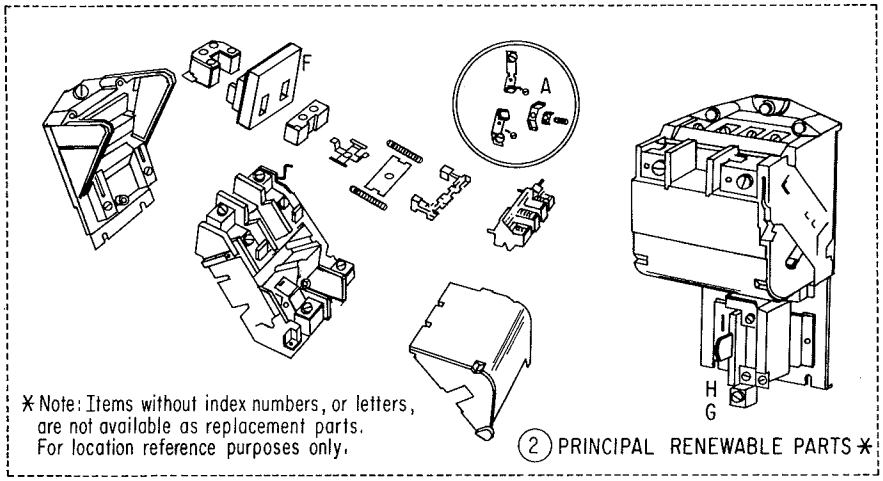

Figure 5-15. RC5 Parts Index.

PPL 0064 MODELS : RC5A, RC5WA, RC5B, and RC5WB JUNE 1979
PARTS LIST SIREN REMOTE CONTROL

Index No.	Description	Part No.	Models RC5 A	WA	B	WB
1	Cabinet, Weatherproof	8247D002		1		1
	Cover (seperately)	8247D002-02		1		1
	Cabinet, Control	**	1		1	
2A	Contacts & Springs, One Complete					
	Power Pole, 240V, 480V, 3 Phase	* 8217C180-11	3	3		
	Interlock Pole, All Voltages, All Models	* 8217C180-12	1	1	1	1
	Power Pole, 240V, 1 Phase	8217C211-11			2	2
2F	Coil 120 240V,50/60 Hz, 240V, 3 Phase	8217C180-16	1	1	1	1
	Coil 240/480V,50/60 Hz, 480V, 3 Phase	8217C180-17	1	1		
2G	Overload Relay Heaters, 480V,					
	Std. Bi-Metal, 1 Pole	8217C211-17			1	1
2H	Overload Relay Heaters					
	240V, 1 Phase, K72	* 8217C211-18			1	1
	240V, 3 Phase, K75	* 8217C180-20	3	3		
	480V, 3 Phase, K64	* 8217C180-21	3	3		
	550V, 3 Phase, K63	* 8217C204-20	1	1		
Not Shown	Model RC5A 9 (Complete)	8217C180	1			

NOTE : ** Models RC5A, and RC5B, are housed in a NEMA General Purpose Enclosure.
* Contact Customer Service Department for special pricing.

DO NOT ORDER PARTS BY INDEX NUMBER.
Give model, voltage, description, and part number.

Refer to PARTS PRICE LIST (Part No. 1001) for prices of parts.

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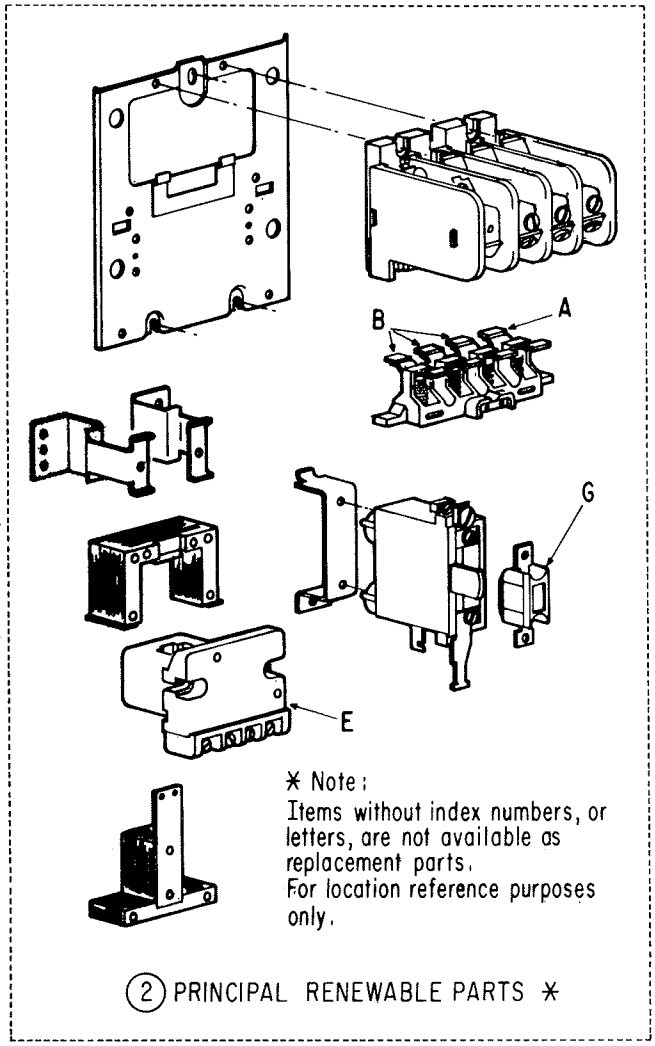
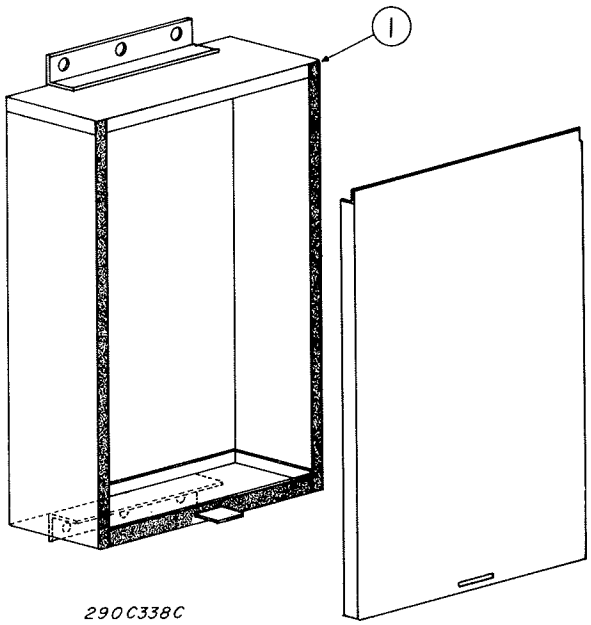


SIGNAL DIVISION
Federal Signal Corporation

PARTS INDEX
RC2*120
RC2*240
RC2W*120
RC2W*240
SERIES A1



MODELS : RC2*120, RC2*240, RC2W*120, RC2W*240

PPL 0062 SIREN REMOTE CONTROL JUNE 1979
PARTS LIST

Item No.	Description		Part No.	Qty.
1	Cabinet, Weatherproof (RC2W*)		8247D002	1 AR
	Cover (seperately)		8247D002-02	
	Cabinet, Control (RC2*)	**		
2A	Contacts and Springs (Power Pole)	*	8217C182-11	3 sets
2B	Contacts and Springs (Interlock)	*	8217C180-12	1 set
2E	Coil, 60Hz, 120/240 Volt	*	8217C180-16	1
2G	Overload Heaters (K -58) 120V	*	8217C182-20	1
	Overload Heaters (K -42) 240 V	*	8217C183-20	1

NOTE : ** Models RC2*120, and RC2*240 are housed in a NEMA General Purpose Enclosure.
* Contact Service Department for special pricing.

DO NOT ORDER PARTS BY INDEX NUMBER.
Give model, voltage, description, and part number.

Refer to PARTS PRICE LIST (Part No. 1001) for price of Item No. 1 .

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Figure 5-16. RC2 Parts Index.