PORTABLE-TYPE STEP, ROLLING, AND PULPIT LADDERS

PIECE-PART DATA, REPLACEMENT PROCEDURES, AND MINOR REPAIRS

CONTENTS PAGE

1. GENERAL

1.01 This section covers piece-part data, replacement procedures, and minor repairs for portable-type step, rolling, and pulpit ladders.

1.02 Whenever this section is reissued, the reason for reissue will be listed in this paragraph.

1.03 Track-type rolling ladders and ladder seats are covered in Section 065-105-802. The KS-21415 L1 and L2 rolling platform ladders are covered in Section 065-105-301. The material in Sections 065-105-301, 065-105-802, and 065-105-803 replaces the material formerly contained in Section 065-105-801 which is canceled.

1.04 Part 2 of this section covers the two methods by which the KS-5239-03 ladder may be modified in the field; it also lists the materials and tools for each method.

1.05 Part 3 covers the piece-part data which includes part numbers with corresponding part names which it is practicable to replace in the field. No attempt shall be made to replace parts not designated. Part 3 also contains explanatory figures illustrating the different parts.

1.06 Part 4 covers the approved procedures for the replacement of parts designated in Part 3.

1.07 Part 5 covers the approved procedures for making minor repairs on the ladders.

1.08 When parts which are not designated require replacement, the ladder should either be replaced or returned to the service center.

2. MODIFICATION OF KS-5239-03 PORTABLE ROLLING LADDERS

2.01 The KS-5239-03 ladder may be modified in the field by the addition of S hooks and cords as shown in Fig. 1.

2.02 This modification may be accomplished in either of two ways. The first method consists of riveting straps to the existing spreaders and adding straps to the top-step support. The second method is similar to the first with the exception that new spreader assemblies are used rather than riveting the straps to the existing spreaders.

2.03 ***Method 1***

(a) ***List of Tools and Materials***

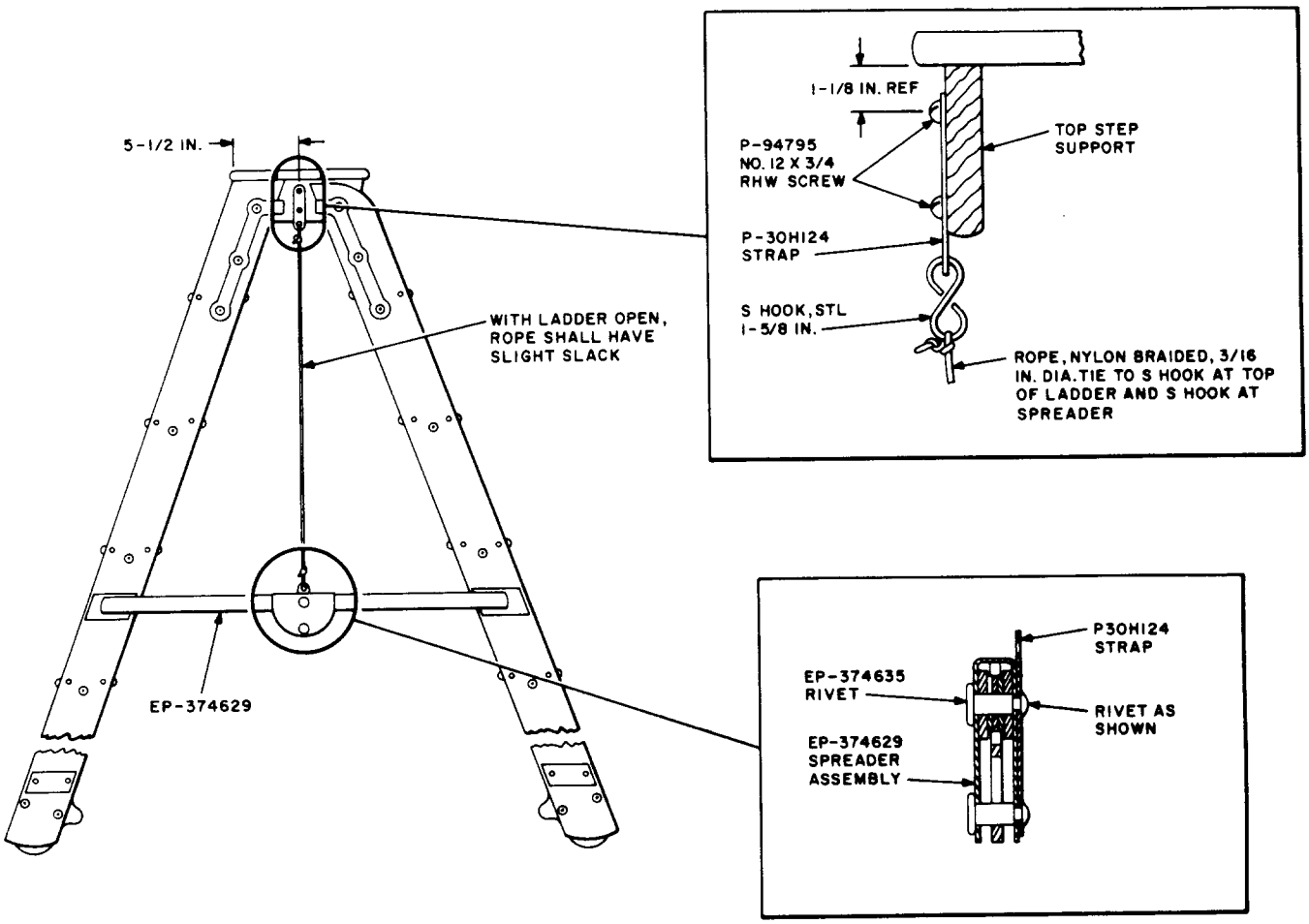


Fig. 1—Modification of KS-5239-03 Ladder

CODE OR SPEC NO.	DESCRIPTION
TOOLS	
R-1640	Punch, center, 4-inch
—	Punch, pin drive, 1/8-inch point (No. 565 or equivalent)
—	1/2-inch cold chisel
—	1-pound ball-peen hammer
—	4-inch E screwdriver (or the replaced 4-inch regular screwdriver)
MATERIALS	
—	P-30H124 straps (4 required)
—	EP-374635 rivets (4 required)
—	S hooks (1 5/8 inch) (4 required)
—	P-94795 No. 12 by 3/4 inch RHW screws (4 required)
—	Pieces of 3/16-inch diameter braided nylon rope approximately 3 feet long (2 required)

(b) ***Procedure***

(1) Remove the rivets from the spreader cover on one side using the cold chisel, ball-peen hammer, and punch. Position the P-30H124 strap as shown in Fig. 1.

(2) Rerivet using EP-374635 rivets and ball-peen hammer.

(3) Repeat operation on second side.

(4) Using the P-94795 wood screws and 4-inch E screwdriver, attach a P-30H124 strap to the outer side of the top-step support as shown in Fig. 1.

(5) Repeat operation on second side.

(6) Insert an S hook in each strap and, with ladder in open position, tie nylon rope to the S hooks leaving a slight slack in the rope (Fig. 1).

2.04 ***Method 2***

(a) ***List of Tools and Materials***

CODE OR SPEC NO.	DESCRIPTION
TOOLS	
—	4-inch E screwdriver (or the replaced 4-inch regular screwdriver)
—	Small sharp knife
MATERIALS	
—	EP-374629 spreader assemblies (2 required)
—	P-304124 straps (2 required)
—	S hooks (1 5/8 inch) (4 required)
—	P-94795 No. 12 by 3/4-inch RHW screws (4 required)
—	Pieces of 3/16-inch diameter braided nylon rope approximately 3 feet long (2 required)

(b) ***Procedure***

(1) Install new spreader assemblies that have the straps already added.

(2) Perform 2.03(b)(4), (5), and (6).

3. PIECE-PART DATA

3.01 The figures (Fig. 2 through 7) included in this part show the various piece-parts, their numbers, and their associated assemblies. Names of parts are also included to the extent practicable to facilitate in identification.

3.02 The ladders covered in this section have been supplied by the Western Electric Company or by an outside supplier. Parts which the Western Electric Company supply are listed by P numbers, while the parts furnished by outside suppliers are listed by EP or B numbers. A few parts, peculiar to the older outside suppliers' ladders are listed by their KS detail numbers.

3.03 All ladders manufactured by the Western Electric Company are steel stamped with the characters Western Electric Company, Made in U.S.A., and the ED drawing number. This stamping is located either on the central portion of a side rail or on the bottom of a centrally located step. Old KS ladders usually have the outside suppliers' nameplate with a stamped KS number located on an inner side rail on the upper portion of the ladder. The newer outside suppliers' ladders have the KS number and list number on the outside, the same as the Western Electric Company ladders. If no identifying mark can be found on an older-type ladder, it can be assumed that the ladder is a KS ladder.

3.04 When ordering parts, the P number, EP number, B number, or KS detail number should be given with the name of the part; for example, Fig. 2 Hinge Assembly EP-30A111. Do not refer to BSP numbers or to any information shown in parentheses following the piece-part numbers.

3.05 In the ordering of replacement parts, determine if such items as tab lockwashers, locknuts, mounting screws, tie rods, or bolts are likely to be damaged during the removal of the old part. If there is a possibility of damage, order the required quantity of those items together with the replacement part.

Note: In cases where a locknut is reused and after having been released by a wrench, if the locknut can be backed off by finger pressure, it must be replaced by a new locknut.

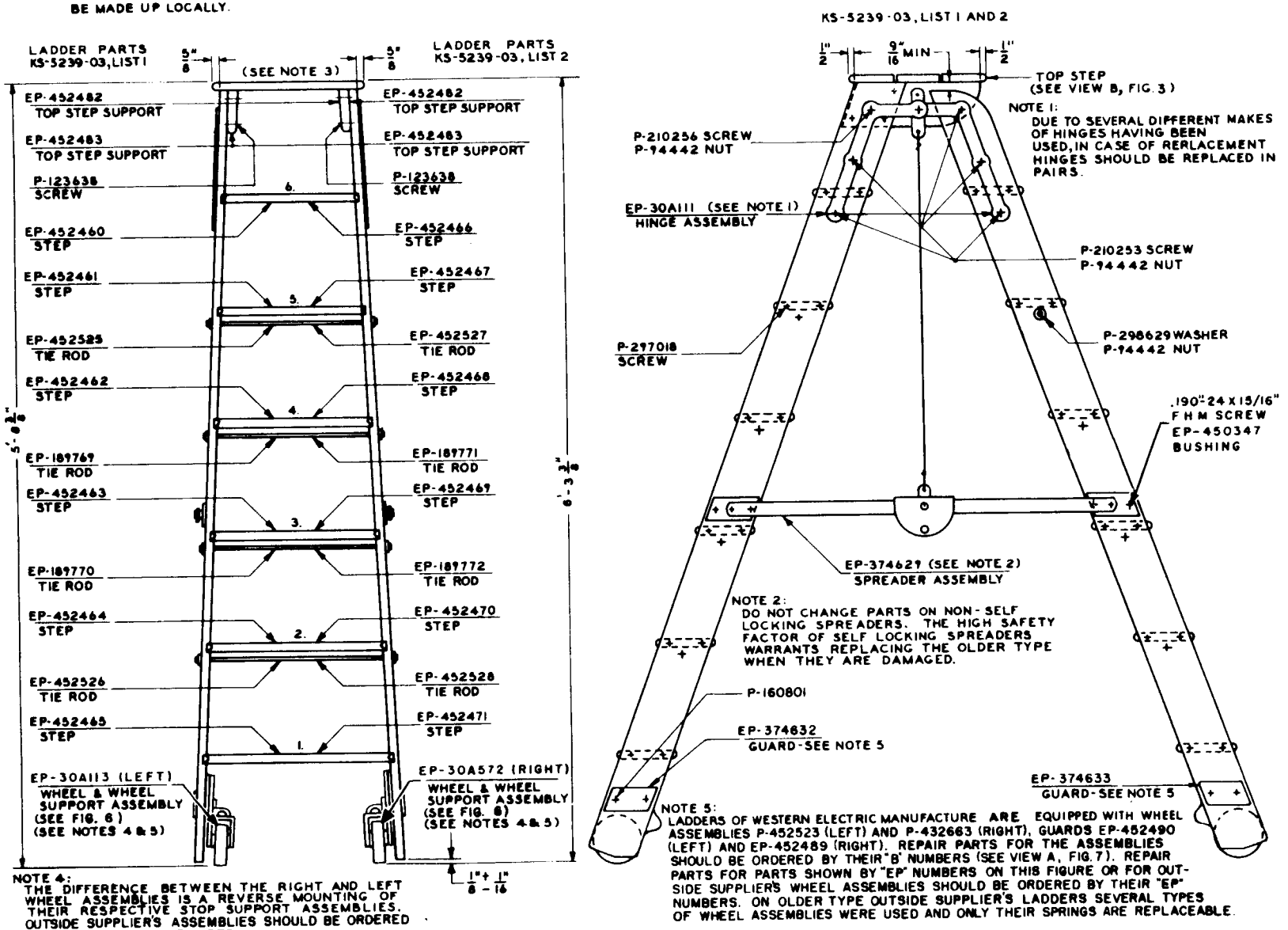
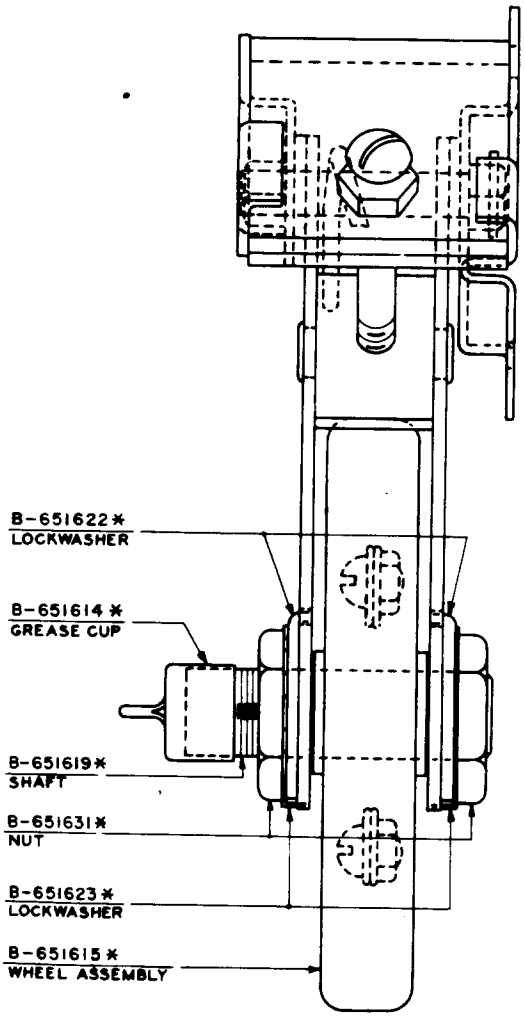
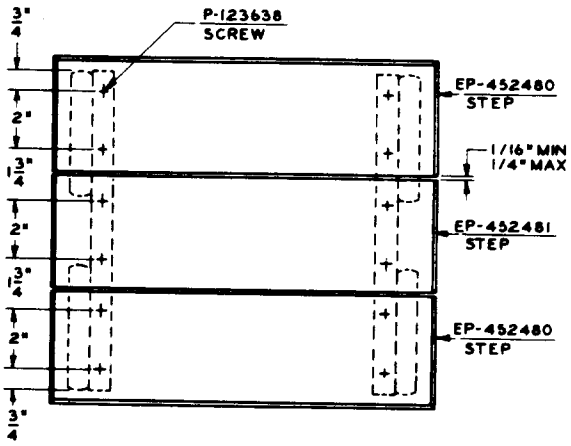


Fig. 2—Portable-Type Rolling Ladder



WHEEL & WHEEL SUPPORT ASSEMBLY
P-452523(LEFT)-P-432663(RIGHT)
VIEW A



VIEW B

NOTE:

PARTS ORDINARILY NEEDED FOR MAINTENANCE ARE INTERCHANGEABLE BETWEEN THOSE MANUFACTURED BY WESTERN ELECTRIC AND THOSE COVERED BY KS-5049-02. THESE PARTS ARE MARKED WITH AN ASTERISK (*).

Fig. 3—Views of Portable-Type Rolling Ladder

LADDER	DIMENSION					ACCESSORIES	
LIST NO.	A	B	C	D	E	QUANT	DETAIL
KS-21054, L1	5'-0"	4'-6"	1'-10"	10"	4'-5-1/4"		
KS-21054, L2	6'-0"	4'-11"	1'-11"	10-9/32"	5'-5-1/4"		
KS-21054, L3						25	L-148819
KS-21054, L4						2	L-148815
						2	L-148817
						4	L-148818
						4	1/4-20 X 2-1/8 RHMS
						4	1/4 STL WASHER
						4	1/4-20 HEX NUT
						4	1/4-SPRG LOCK WASHER

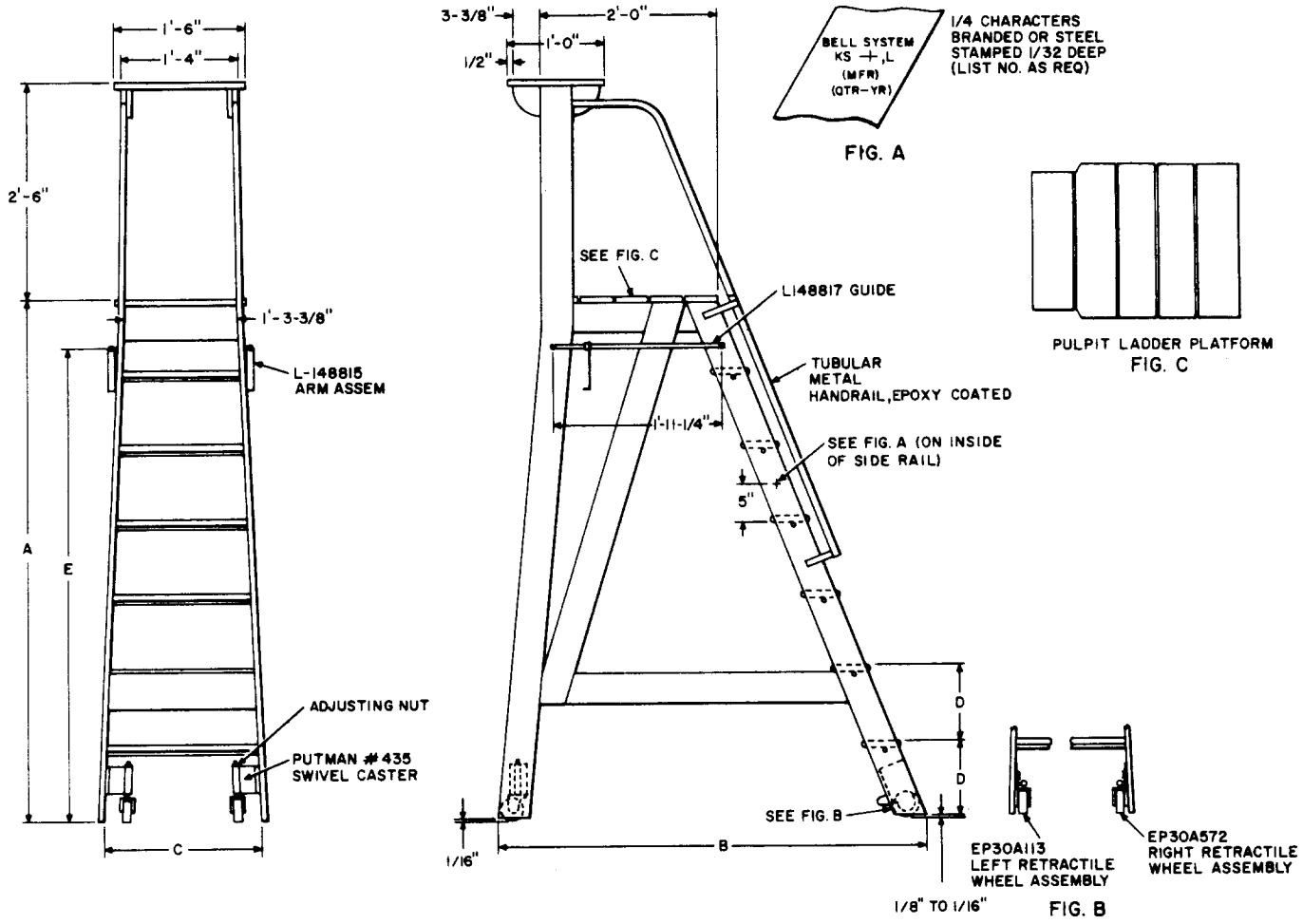


Fig. 4—KS-21054 Pulpit Ladder

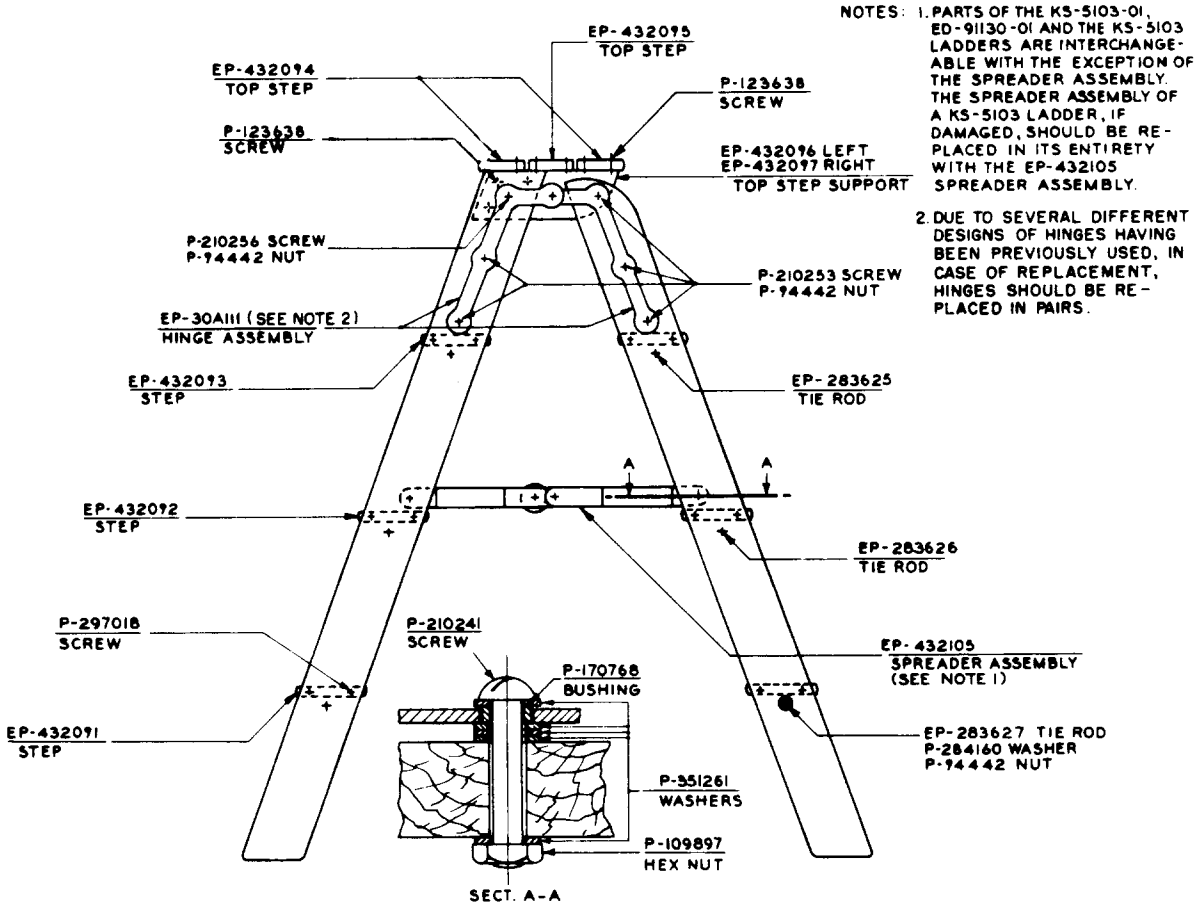


Fig. 5—4-Foot Portable Stepladder (See Note 1)

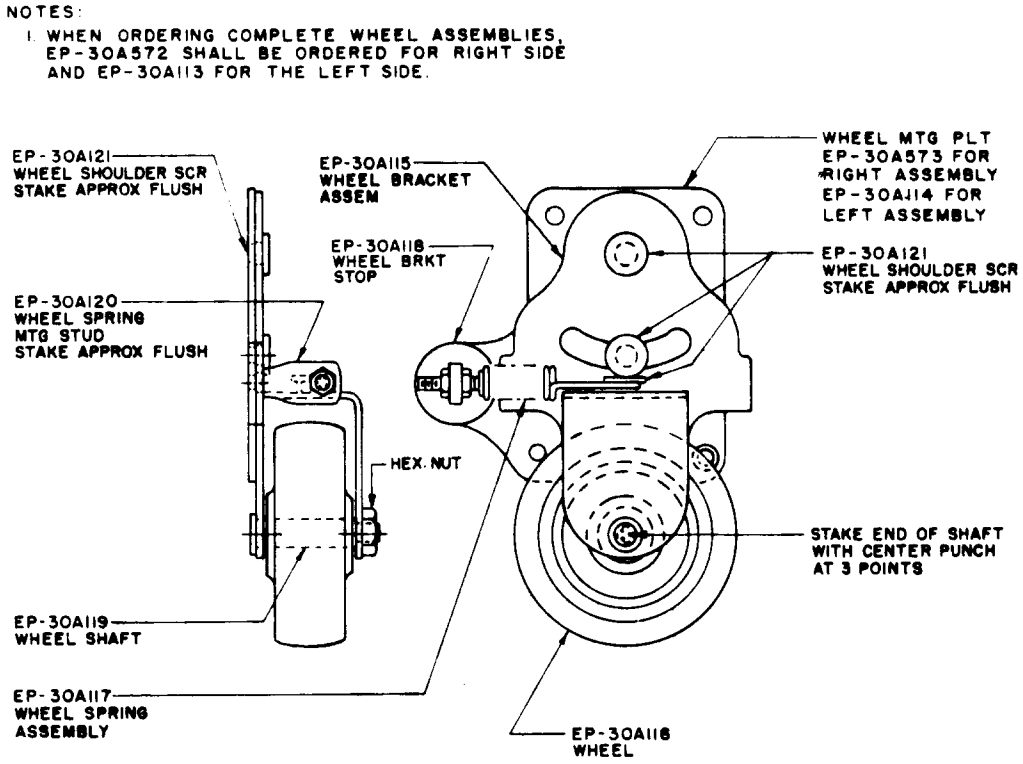


Fig. 6—Platform and Portable-Type Rolling Ladder Wheel Assemblies

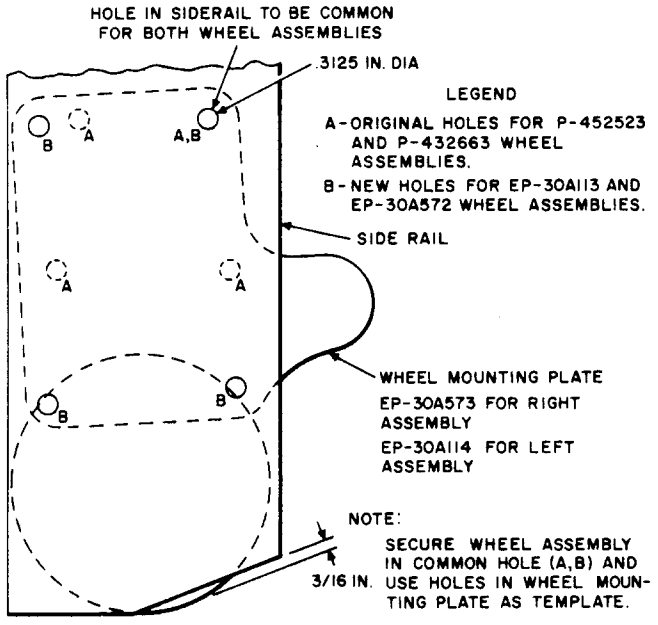


Fig. 7—Modification of Side Rails of Portable-Type Rolling Ladder for Wheel Assembly Replacement

4. REPLACEMENT PROCEDURES

4.01 *List of Tools, Gauges, Materials, and Apparatus*

CODE OR SPEC NO.	DESCRIPTION
TOOLS	
247	1-1/4 inch flat open single-end wrench
624	Hand drill
AT-8176	Hacksaw blade, B (18 teeth per inch), C (24 teeth per inch)
AT-8420	B combination pliers
AT-8551	Hacksaw frame B
KS-2993	Brush
R-1051	File

CODE OR SPEC NO.	DESCRIPTION
TOOLS	
R-1060	Putty knife
R-1298	Oilcan
R-2512	8-inch adjustable open-end wrench
R-2919	3/16-inch round brush
R-4428	Threaded rod inserting (modified vise-grip lever wrench)
—	No. 3 twist drill
—	No. 19 twist drill
—	No. 28 twist drill
—	7/32-inch twist drill
—	15/32-inch twist drill
—	5/16-inch twist drill
—	3/8-inch twist drill
—	4-inch wood sanding block
—	Small cellulose sponge
—	1/2-inch cold chisel
—	1-pound ball-peen hammer
—	Small sharp knife
—	3-inch C screwdriver (or the replaced 3-inch cabinet screwdriver)
—	4-inch E screwdriver (or the replaced 4-inch regular screwdriver)
—	5-inch E screwdriver (or the replaced 5-inch regular screwdriver)
—	Goggles, B Plastic or Bausch & Lomb W90 BAL-GUARD Fog Ban
GAUGES	
91C	0.060-inch thickness gauge
173A	0.191-inch thickness gauge

CODE OR SPEC NO.	DESCRIPTION
MATERIALS	
KS-7471	Grease
KS-7860	Petroleum spirits
KS-8662	Gray enamel
KS-16326 L1	Oil
KS-16832 L2	Lubricant
R-2998	Tan chromate enamel
—	3/4-inch gray friction tape
—	Assorted grits of abrasve paper
—	Plastic wood
—	Clean rags
—	Finish, wood clear, penetrating, Du Pont VC-5357 or Pittsburgh Plate Glass Company VD-4971 in quart cans for touching up ladders having the 118BB finish
—	Clear spar varnish
—	White shellac
—	Household scouring power
APPARATUS	
P-432514	Wire washers

4.02 Care should be exercised when using petroleum spirits in power rooms where there are dc machines, since commutation may be adversely affected by the softening of the commutator film by the fumes. To avoid the need for burnishing the commutators of the dc machines after completing cleaning operations, take the following precautions.

(1) Use the absolute minimum required amount of petroleum spirits for the cleaning operation.

(2) Provide adequate ventilation during the operation.

(3) Keep the petroleum spirits container closed when not in use.

4.03 Replacement procedures for parts listed in this section are given in the following order:

PORTABLE-TYPE ROLLING LADDERS (4.06 Through 4.12)

KS-21054 PULPIT LADDERS (4.15)

PORTABLE STEPLADDERS (4.16)

4.04 All wood parts furnished for replacement purposes shall be finished with clear, penetrating wood coating.

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

PORTABLE-TYPE ROLLING LADDERS

4.06 ***Spreader Assembly:*** To replace the older-type spreader with the self-locking type, proceed as follows.

(1) Open the ladder with the older spreader in place.

(2) Position the new mounting plates as shown in Fig. 2.

(3) Mark the drill holes, and drill with the 5/16-inch twist drill.

(4) Remove the old spreader and mount the new, filling the old screw holes with plastic wood if so desired.

4.07 ***Top Step and Top-Step Support:*** The mounting screw holes of the top-step supports should match on all ladders. However, there may be some variation in locations of the top-step screw holes. Fill the holes that cannot be reused with plastic wood, and allow to dry thoroughly before the new holes are drilled. Then proceed as follows.

(1) Position the top step in accordance with Fig. 2 and View B of Fig. 3.

(2) Mark the new hole positions on the support, and drill 11/16 inch deep with a No. 28 twist drill.

(3) Place all screws firmly, taking care not to force them to the extent of damaging the screw.

4.08 ***Steps:*** To replace a step, proceed as follows.

(1) Remove the two screws from each side rail, and loosen the adjacent tie rod sufficiently to release the step.

(2) Using a hammer, tap alternately at the end and center of the step until it is driven free.

(3) Insert the new step evenly and, with the hammer, drive it into place.

4.09 If the new step should prove to be too thick for the side-rail grooves, the ends of the step may be tapered slightly with the sanding block. Taper the step primarily on the top edge of the ends so the load-bearing side remains squared. Exercise care that the edges are not rounded in the sanding process.

4.10 Should the screw lead holes of the new step fail to center with those in the side rail, fill the lead holes with plastic wood and allow to dry thoroughly before new holes are drilled. Then proceed as follows.

(1) Insert new step, and drill new holes 1 3/4 inches deep with the 7/32-inch twist drill.

(2) Insert the four screws and tighten firmly.

(3) Remove burrs and sharp edges with R-1051 file.

4.11 ***Tie Rods:*** All tie rods shall be retightened that may have been loosened during step repair. Tie rods tightened with nuts will be riveted so the ends will be free from burrs. Tie rods using Teenuts are self-locking and should not be riveted or staked. After the Teenut is in place, insert the new tie rod in the ladder making certain there is a washer under the head. Then turn the tie rod in the Teenut to a firm tightness.

4.12 ***Wheel and Wheel Support Assemblies:*** When a P-452523 or a P-432663 type wheel assembly has to be replaced, all four wheel assemblies shall be replaced by EP-30A113 and EP-30A572 type wheel assemblies (Fig. 6). In order for the newer-type wheel assemblies to be

mounted, the side rails must be modified as illustrated in Fig. 7. After replacing the wheel support assemblies, stake the screws flush with the nuts (Fig. 6 and 7).

4.13 With the new wheel support assemblies in place and the floor wheel brackets lubricated so there is no undue friction between the two parts of the floor wheel brackets, the ladder shall meet the following tests. (Test first on one side of the ladder, and repeat the test on the opposite side.)

(a) Place a load of 10 pounds in the center of the bottom step.

(1) Press down with your hand on the bottom step until the two side-rail feet contact the floor.

(2) Remove your hand and pressure from the bottom step. The springs which cause the retractile wheel brackets to operate shall be tensioned sufficiently to lift the two side-rail feet off the floor when the hand pressure is removed. This adjustment in the retractile wheel brackets should make it possible for a sheet of letter paper to be passed freely back and forth under both of the side rails.

(b) Place a load of 30 pounds in the center of the bottom step.

(1) The two side-rail feet should rest on the floor.

(2) With your hands raise the two side rails off the floor.

(3) Lower and release the side rails. The 30-pound weight on the bottom step shall cause the two side rails to rest on the floor so it is impossible to pass a sheet of letter paper under the feet of either side rail.

(c) Place 200 pounds on the third step of the ladder, and then repeat on opposite side of the ladder.

(1) With the weight on either side of the ladder, all four side-rail feet will contact the floor so it is impossible to pass a sheet of letter paper under any of the four side rails.

(d) With no load on the ladder, the springs shall hold the movable parts of all four floor wheel brackets against the stops. The stops will be so adjusted to pass a 91C gauge under all four side rails but impossible to pass the 0.191-inch end of the 173A gauge under any of the four side rails.

4.14 ***Wheel and Wheel Support Assembly Adjustment***

(a) To adjust the height of the ladder side rails, proceed as follows.

(1) Loosen the backstop screw locknuts.

(2) Turn screw in to lower the rails or turn the screw out to raise them.

(3) When proper position has been attained, retighten the locknuts.

(b) To adjust spring tension on the wheel support, proceed as follows.

(1) Loosen the locknut on the spring adjusting screw.

(2) To increase spring tension, turn the screw in.

(3) To release spring tension, turn the screw out.

(4) When load requirements have been met, retighten the locknut.

(c) On outside suppliers' assemblies with adjusting details, the same procedure can be followed for the spring adjustment. The side-rail height adjustment can only be changed by shifting the mounting of the whole wheel support assembly.

KS-21054 PULPIT LADDERS

4.15 There are no replacement procedures for the wood parts or the handrails on the pulpit ladders (Fig. 4). The retractable Putnam No. 435 swivel casters and the retractile wheel assemblies EP-30A113 (left) and EP-30A572 (right) may be replaced. Both the wheel assemblies and the swivel casters are available from the supplier. The retractile wheel assemblies are illustrated in Fig. 6 and 7. Replacement of the swivel casters requires

a simple operation and needs no explanation. Each ladder is equipped with locking devices, by which they are locked to the frame. Each ladder is provided with 25 shoulder bushings for the locking arrangement. Additional lots of 25 bushings are provided by the KS-21054 L3. Latching devices for use on ladders which may be in use without latches are available as KS-21054 L4.

PORTABLE STEPLADDERS

4.16 The replacement procedures for the portable step ladders (Fig. 5) are the same as those given in 4.06 through 4.12 covering the portable-type rolling ladder.

5. MINOR REPAIRS

5.01 This part of the section covers the minor repairs that may be made to ladders. It includes cleaning, reconditioning, restoration of wood and finished metal parts, and cleaning and lubricating of moving parts and repair.

CLEANING WOOD PARTS

5.02 Remove wax and dirt from wood parts by using a cloth moistened with KS-7860 petroleum spirits.

Caution: Use only in well-ventilated area away from flame or heat.

This method is applicable to both the varnished and the penetrating finish ladders. If trouble should be encountered in the cleaning of excessively dirty penetrating finish ladders, take household scouring powder to some area outside the switchroom and mix with water to form a thick paste. Dip the cellulose sponge lightly in the paste, and rub the soiled part briskly until it becomes clean. Rinse the sponge well in clear water, and wipe the cleaned area thoroughly. This method has a bleaching effect on the finish, and it will be necessary, after the part is thoroughly dried, to wipe a thin coat of new penetrating finish over the cleaned portion with a soft cloth.

RECONDITIONING WOOD PARTS

5.03 Wood parts that are damaged to the extent that they may not be refinished should be replaced. If finishing of the part will not impair its strength, cut out the damaged portion with the sharp knife and sand the area smooth with fine sandpaper. Remove all dust with a soft cloth moistened with petroleum spirits, allow to dry, and, with the KS-2993 brush, apply a thin coat of penetrating finish to the sanded area. Allow the finish to penetrate for approximately 15 minutes; then with a clean cloth, wipe off the excess finish before it becomes tacky. When the finish is thoroughly dry after approximately 1 hour, sand the area lightly again; and after wiping with the moistened cloth and allowing the area to dry, apply a second coat of finish. Wipe off the excess finish, and allow the area to dry for several hours before using.

5.04 Varnished ladder parts may be refinished as covered in 5.03. However, if for appearance reasons it is not desirable to mix the two finishes, use two coats of clear spar varnish in place of the penetrating finish. Allow the varnish to dry overnight between coats and before using.

5.05 Steps that have become badly worn or damaged should be replaced with new steps rather than turning them over or reversing the front to the rear.

CLEANING METAL PARTS

5.06 Finished metal surfaces shall be cleaned by wiping lightly with a cloth moistened with petroleum spirits or with household scouring powder if the dirt is stubbornly ingrained.

RECONDITIONING METAL PARTS

5.07 Burrs and sharp edges should be removed with the R-1051 file or by peening with the ball-peen hammer.

5.08 When a nut is tightened on an end-staked bolt or a riveted tie rod, saw one or two threads off the end beyond the nut, if necessary, before restaking or reriveting. Peen staked bolts free of sharp edges, and rivet tie rods free from burrs.

5.09 Details having a No. 395 or 525 standard, gray, enamel finish and which have been marred by the use of a file shall be retouched with the KS-8662 gray, enamel finish using the R-2919, 3/16-inch round brush. The consistency of KS-8662 enamel differs markedly from that of trade sales enamels in that it was designed primarily as a

retouching enamel for small areas. Use a small amount of paint on the brush for touching up small spots. Use care not to rush the job. Apply paint, flowing on with strokes in one direction and finish with strokes in the opposite direction.

LUBRICATION OF FLOOR WHEELS

5.10 If floor wheels do not revolve freely, remove any foreign material that may be twisted around the axle. Check metal wheels for lubrication. If grease cups are provided as on the P-452523 and P-432663 wheel assemblies (Fig. 3) and a bearing appears dry, turn up its grease cup until a small amount of grease is forced through as indicated by grease appearing at the far end of the bearing. If the grease cup is screwed up to the limit of its travel, refill it with KS-7471 grease. If grease cannot be forced through the bearing, remove the axle and thoroughly clean all passages. Where grease cups are not provided on ladders equipped with ***metal*** wheels, apply a few drops of KS-16326 Ll oil, exercising care to avoid an excess which might later reach the rubber tires or the floor.

Note: Bearings of rubber composition wheels should not be lubricated unless bronze bushed.