# TB ORD 444-22

DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

# SHOP SET, FIELD MAINTENANCE, AUTOMOTIVE FUEL AND ELECTRICAL SYSTEM, BASIC (4910-754-0714) AND NO. 1 SUPPLEMENT (4910-390-7774): INSTALLATION IN ONE 6-TON 2-WHEEL SHOP-VAN SEMITRAILER M-146 (2330-569-9372) AND ONE 2½-TON 2-WHEEL GENERATOR TRAILER CHASSIS M200A1 (2330-331-2307)

Headquarters Department of the Army, Washington, D.C.
3 October 1963



**1. General** *a.* The instructions in this bulletin are to be used as a guide for Army field maintenance personnel responsible for the installation of Automotive Fuel and Electrical System Field Maintenance Shop Set 4910-754-0714 and supplement No. 1 4910-390-7774.

*b.* These instructions can be followed as prescribed in most instances. However, installation of the shop set in vehicles and equipment of different manufacturers may require minor changes. Equipment may be installed in location other than specified herein when justified by work requirements.

*c.* A complete list of items contained in this shop set is included in SM 9-4-4910-A02, Shop Set, Field Maintenance, Automotive Fuel and Electrical System 4910-754-0714 and SM 9-4-4910-A75, No. 1 Supplement 4910-390-7774.

*d.* Items not mentioned in this bulletin that are components of the aforementioned shop set may be stowed on table shelves and in table drawers, or other convenient places, in such a manner as to avoid damage in transit.

*e.* Personnel performing this installation should have a knowledge of practical electricity.

Special care should be exercised to avoid damaging between-wall wiring when installing the power circuit.

*f.* Precautions should be taken when drilling holes through the body of the shop-van semitrailer to insure that the waterproof characteristics of the body are retained. All hardware extending through the floor and all steel channels added under the floor of the vehicle should have the outer parts covered with paint or undercoating compound similar to that used on the underside of vehicles.

*g.* Since minor variations exist in the construction of equipment and vehicles of different manufacturers, measurements in this bulletin should be taken as a guide only.

**2. Shop Set.** *a.* Hardware required to mount this shop set is listed in table I. Electrical and hardware supplies required to rewire the shop-van semitrailer for 220 volts circuit are listed in table II. Items to be mounted in vehicles are listed in table III.

*b.* Each shop set will be mounted in one 6-ton 2-wheel shop-van semitrailer M146 (2330-569-9372) and one 2½-ton 2-wheel generator trailer chassis M200A1 (2330-331-2307).

***Caution:*** **Do not drill holes through cross members or into frames of vehicles or work tables. If necessary move the item to be mounted slightly so that drilled holes will avoid these structures.**

*c.* Unused space in the shop-van semitrailer and generator trailer chassis may be used for storing and transporting cable assemblies, test sets, generator set, compressor, tools, etc.

*d.* Ground all electrical powered equipment mounted in the shop-van semitrailer to the chassis of the vehicle as a safety precaution against electrical shock to the operator.

*e.* One ground rod with cable assembly is included in the shop set. Drive the ground rod into the ground and secure the cable assembly to the chassis of the shop-van semitrailer each time the shop set is placed in operation.

**3. Rewiring Shop-Van Semitrailer for 220 Volts Power Circuit.** *a. Installation of the 100 Ampere Circuit Breaker 5925-242-2266* (figs. *2* and 3).

(1) Remove the center knockout from the bottom of the main switch box. Install a 1¼ NPT electrical conduit locknut 5975-295-9986 on each end of the 1¼ NPT x 1 5/8 pipe nipple 4730-196-1470. Install one end of the pipe nipple in the bottom knockout hole of the switch box and secure with a 1¼-inch electrical conduit bushing 5975-152-1098.

***Caution:*** **Avoid interference with and/or damage to mechanism mounted in main switch box.**

(2) Remove the circuit breaker from its box and remove the rear center knockout from the top of the box. Remove the rear bottom knockout from the left side of the box and install one 1¼-inch electrical box connector 5075-280-7196. Drill a 9/32-inch hole in the right side of the box, 1½ inches from the top and 1½ inches from the front edge of the box. Insert the ¼-20 x 1-inch hexagon head cap screw 5305-531-1783 in the hole and install the 5/16-inch internal-external teeth lock washer 5310-017-8532 and the ¼-20 hexagon plain nut 5310-012-0375 on the cap screw. Do not tighten.

*Note.* This screw is installed for grounding purposes.

(3) Remove the upper 1½-inch knockout from the back of the circuit breaker box. Position the circuit breaker box under the main switch box so that the 1½-inch pipe nipple enters the 1½-inch knockout hole in the top of the circuit breaker box. Secure the box to the nipple with the remaining 1¼-inch electrical conduit bushing 5975-152-1098. Mark the location of the four mounting holes and the 1½-inch knockout hole in the circuit braker box on the wall of the trailer. Unscrew the electrical conduit bushing from the pipe nipple and remove the box.

Drill four 7/32-inch holes and one 1½-inch hole in the trailer wall.

*Note.* Drill the four 7/32-inch holes and the 1½-inch hole through the inside trailer wall (fig. 3) only.

Place the box in position again and secure to the wall with four No. 14-10 x ¾-inch thread forming tapping screws 5305-014-4824. Install and tighten the electrical conduit bushing on the pipe nipple. Tighten the two electrical conduit locknuts. Install the circuit breaker back in the box.

*b. Installation of the 4-Wire 100 Ampere Electrical Receptacle Connector* 5935-642-1694 (figs. 2 and 3).

(1) Disconnect the two wires of the 2-wire 110 volt electrical receptacle connector (located on the outside wall of the trailer) from the top terminals in the main switch box. Remove and discard the wires and the 2-wire 110 volt electrical receptacle connector.

(2) Cut three pieces of No. 4 AWG electrical wire 6145-635-0047 and one piece of No. 6 AWG electrical wire 6145-299-4398 each 80 inches long. Strip ½-inch of insulation from both ends of each wire. Solder one end of the No. 6 AWG electrical wire to the pole of the 4-wire 100 ampere electrical receptacle connector 5935-642-1694 marked "ground". Solder one end of each No. 4 AWG electrical wire to each one of the three remaining poles.

(3) Install the 4-wire 100 ampere electrical receptacle connector in the place previously occupied by the 2-wire 110 volt electrical receptacle connector, (1) above. Work the four wires of the receptacle connector up between the inside and outside walls of the trailer and through the 1½-inch hole drilled in the inside wall, *a(3)* above, and into the box of the 100 ampere circuit breaker.

(4) Connect the three No. 4 AWG electrical wires to the top terminals of the circuit breaker. Position the No. 6 AWG electrical wire over the grounding screw located in the top right side of the circuit breaker box, *a(2)* above. Strip off 1 inch of insulation at this point and secure the wire under the grounding screw (do not cut wire). Thread the remainder of the wire up into the main switch box and connect the end to the top right terminal.

*(5)* Cut one 24-inch length of No. 6 AWG electrical wire 6145–299–4398. Strip ½-inch of insulation from each end. Connect one end to the bottom center terminal of the circuit breaker. Thread the other end up into the main switch box and connect it to the top left terminal.

**4. Installation of Equipment in Shop-Van Semitrailer.** *a. Generator Test Stand 4910-316-5251.*

(1) *Mounting* (figs. 1 and 2).

*(a)* Place the test stand 9½ inches from left side and 30 inches from front wall of trailer. Using the mounting holes in the base of the test stand as a template, mark and drill four 9/16-inch holes in the trailer floor. Cut two 18-inch long pieces and one 94-inch long piece of 1½ x 3-inch steel channel 9520-287–9417. Place the 94-inch length of steel channel under the trailer floor, overlapping the top flange of the side rail on each side of the trailer, and centered over the two rear mounting holes as shown in figure 4. Support the steel channel against the floor and mark the location of the two mounting holes on the channel from inside the trailer. Place an 18-inch length of steel channel under the trailer floor, overlapping the top flange of the two front cross members of the trailer frame, and centered over the front mounting hole as shown in figure 4. Support the steel channel

against the floor and mark the location of the mounting hole on the channel from inside the trailer. Locate and mark the other 18-inch length of steel channel under the remaining front mounting hole. Drill four 9/16-inch holes as marked on the steel channels.

***Caution:*** **Use care when marking and installing the 94-inch length of steel channel to avoid damage to the two copper brake tubes and electrical power cable running the length of the trailer.**

*(b)* Secure the test stand to the floor of the trailer by installing from underneath the trailer the four ½-20 x 3½-inch hexagon head cap screw 5305–206–0021, eight 17/32-inch inside diameter flat washers (4 under bolt head) 5310–012–0396, four ½-inch split lock washers 5310–012–0384, four ½-20 hexagon plain nuts 5310–021–4267, and the three pieces of steel channel. Be sure the channels overlap the trailer side rails and front cross members with their open side up against the trailer floor.

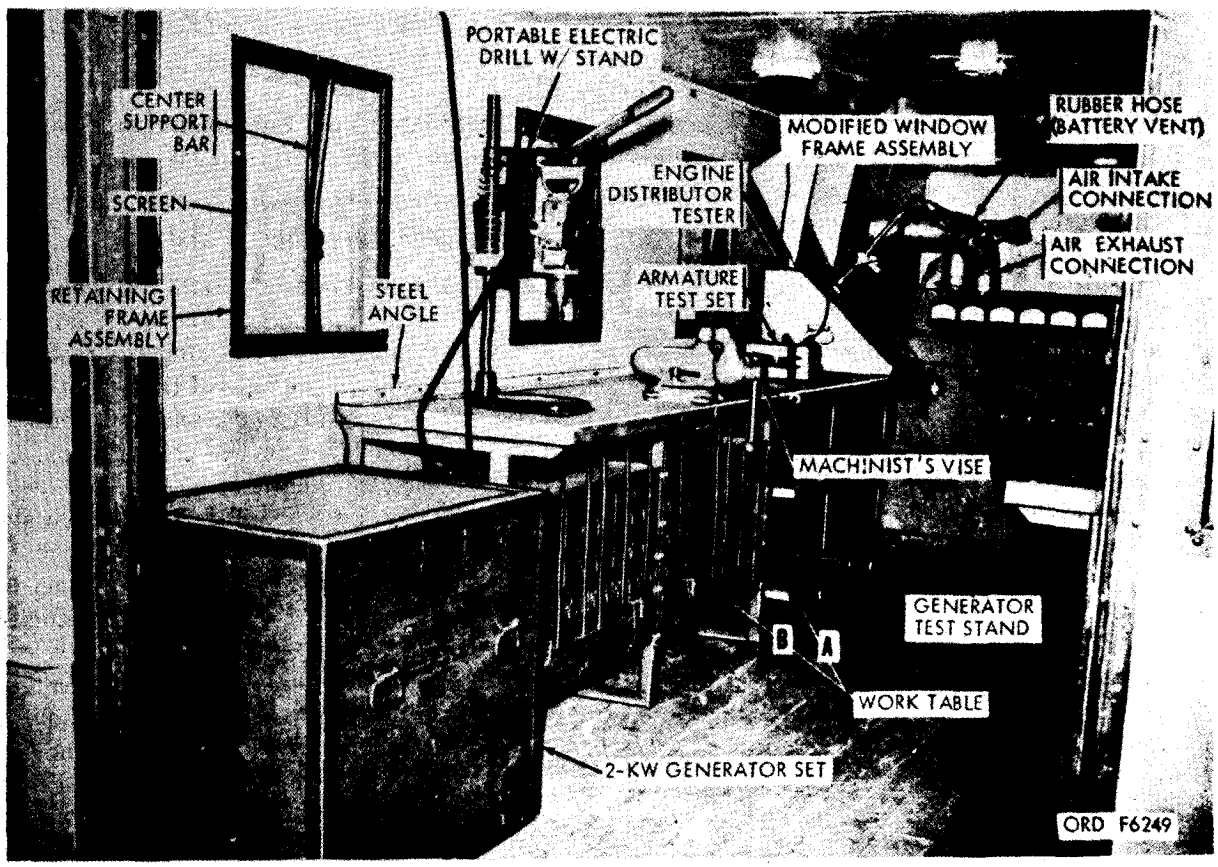



*Figure 1. Equipment installed in shop-van semitrailer - front and left side view.*

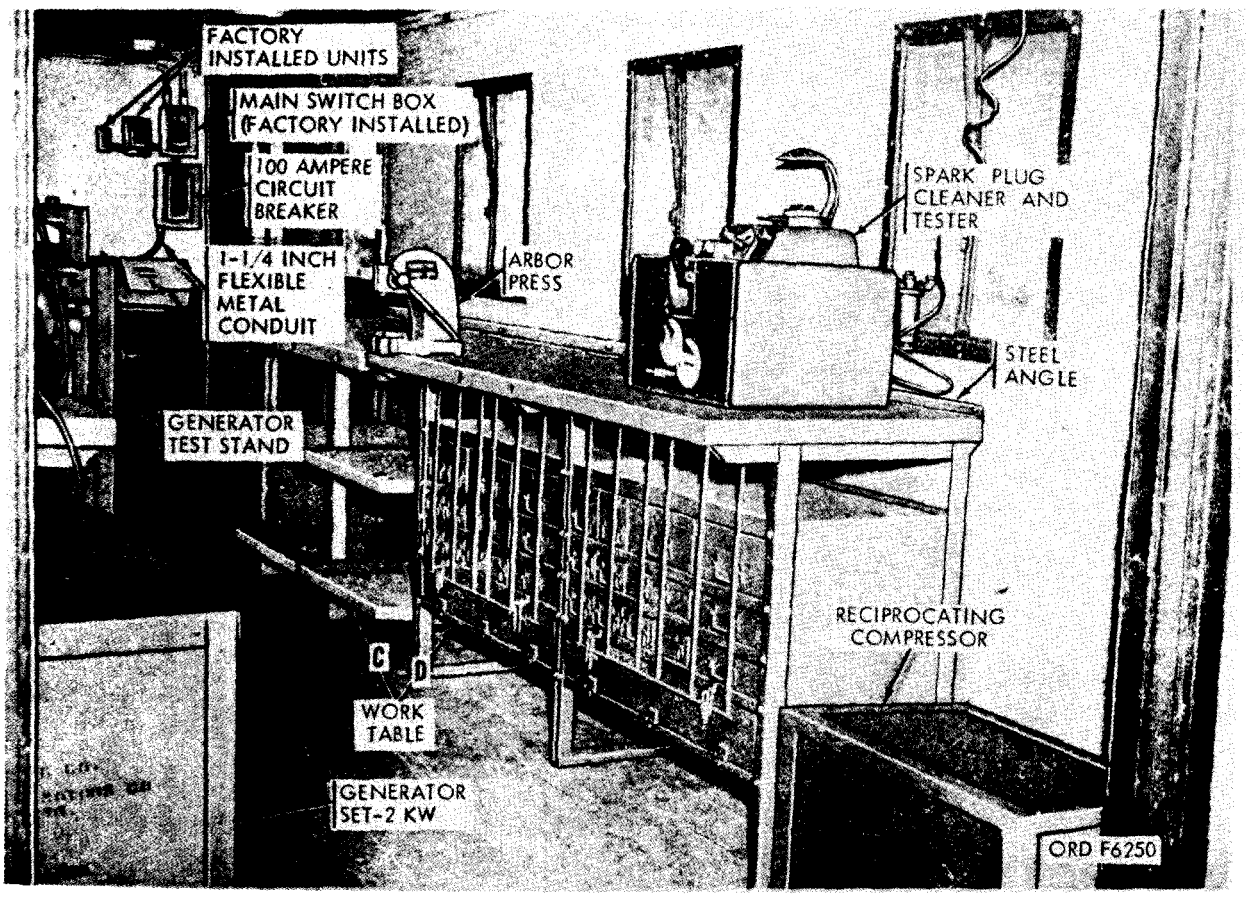



*Figure 2. Equipment installed in shop-ran semitrailer - front and right side view.*

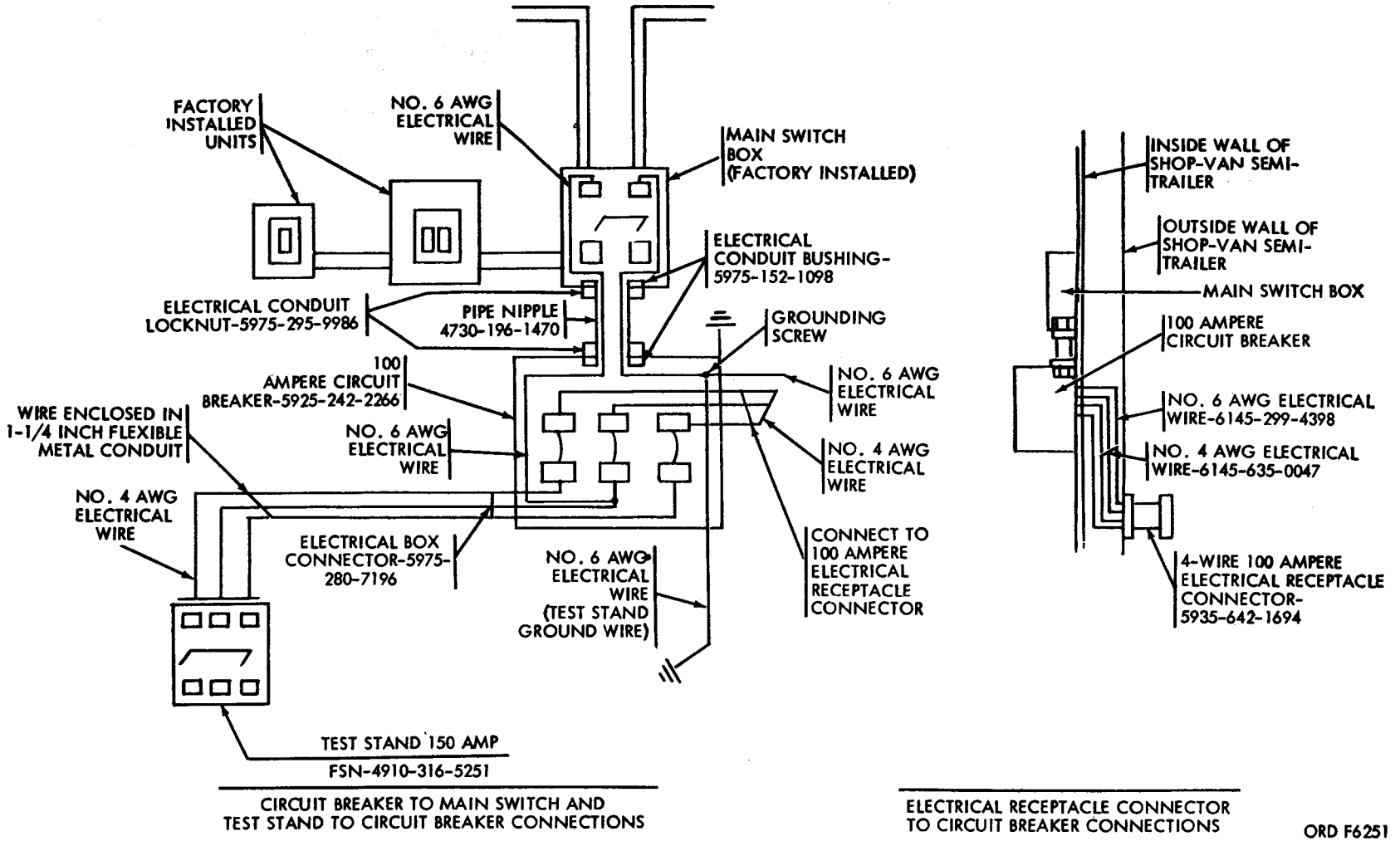



*Figure 3. Wiring diagram.*

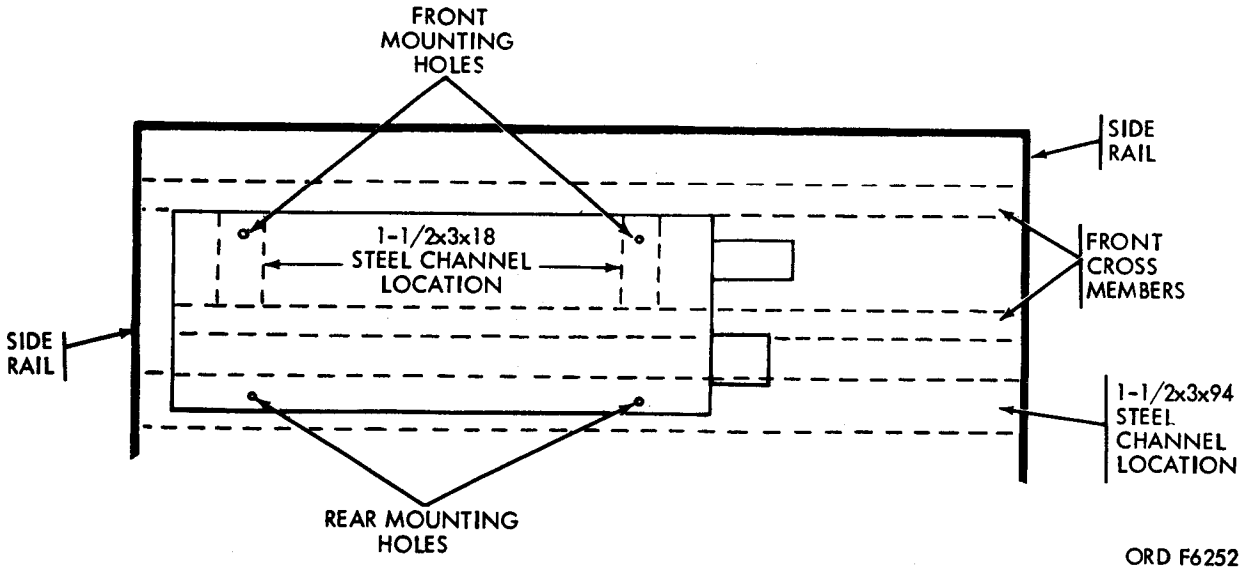



*Figure 4. Location of steel channels mounted under trailer floor.*

*(2) Modification of trailer window and installation of air intake and exhaust connection.*

*(a)* Unscrew the 18 screws from the retaining frame assembly and remove the retaining frame assembly and screen (fig. 1) from the front left hand trailer window (next to the test stand). Save the screen and discard the retaining frame assembly and screws.

*(b)* Slide the blackout shielf (fig. 6) of the front left hand trailer window all the way down. Loosen the screw in the center of the window hinge channel (not illustrated) which retains the window frame assembly in the trailer body (same as modified window frame assembly shown in figure 6, except for having window glass instead of adapter plate). From outside the trailer, grasp the window frame assembly at the bottom and pull outward and upward lifting the window frame assembly until the rolled top edge clears the trailer body and then slide it out of the window hinge channel.

*(c)* Lay the window frame assembly down flat on a bench or table and unscrew the 23 screws from the inside frame and remove the inside frame from the outside frame (fig. 5). Remove the two rivets from the center support bar (fig. 1) and remove it from the outside frame. Discard the center support bar and rivets.

*(d)* Remove the two glass windows and rubber mounting strip (not illustrated) from the outside frame (fig. 5). Discard the glass and rubber mounting strip.

(e) Drill a 9/32-inch hole at each bottom outside corner of the outside frame (fig. 5) as shown in figure 6. Install the outside frame on the trailer and mark the location of the holes on the trailer body. Remove the outside frame from the trailer and drill and tap two ¼–20 x ½-inch deep holes in the trailer body at points marked above.

*Note.* Before marking hole location on trailer body, raise the blackout shield (fig. 6) to assure alinement of sliding channels

on trailer body with those on window frame assembly.

*(f)* Fabricate a window adapter plate (fig. 6) from aluminum plate 9535-231-8327. Install the ¾-14 NPT pipe lock nut 4730-278-8584 on the ¾-14 NPT x 2-inch pipe nipple 4730-196-1505 (fig. 5), screwing the nut down on the nipple the full length of the threads. Thread the pipe nipple in the window adapter plate (fig. 5) until it is flush with the outside surface of the plate. Tighten the pipe locknut against the window adapter plate.

*(g)* Fabricate two ½ x 5/8 x 19¾ and two ½ x 5/8 x 21¾ wood strips (fig. 5). Cut the salvaged screen, *(a)* above, to 12 x 20¼ inches. Place the screen against the top outside surface of the window adapter plate and form a ¼-inch of the top and sides of the screen over the edge of the adapter plate as shown in figure 5.

*(h)* Place the outside frame (fig. 5) face down and lay a strip of talking compound 8030-530-6608 on the inside ½-inch ridge of the frame. Install the screen, window adapter plate, and the four wood strips (fig. 5) in the outside frame.

*(i)* Lay a strip of calking compound on the face of the wood strips. Install the inside frame in the outside frame (fig. 5) and secure with 23 screws removed during disassembly, *(c)* above. Remove excess calking compound from both sides of the modified window frame assembly (fig. 6).

*(j)* Install the modified window frame assembly on the trailer. Raise the blackout shield (fig. 6) a few inches into the channels on the frame assembly to insure alinement of channels, and secure the modified window frame assembly at each bottom corner with two ¼-20 x 7/8 fillister head machine screws 5305-515-8288 and two ¼-inch split lock washers 5310-010-3319. Tighten the screw in the center of the window hinge channel, *(b)* above. Touch-up paint to match on inside and outside of trailer. Close the blackout shield.

*Note.* Blackout shield must be open whenever test stand is in operation.

*(k)* Use two 6-inch elbows 4520-272-8661 on the exhaust connection (fig. 1) and one 6-inch elbow on the air intake connection (fig. 1). Cut the two 24-inch lengths of heating pipe 4520–273-1243 as required to effect a properly alined connection from the test stand to the modified window frame assembly (fig. 1). Fabricate the smooth end of each pipe by cutting the end in segments and bending every other segment over forming ears as shown in figure 6. Assemble the heating pipes and elbows on the test stand and in the window frame assembly. Drill a 5/64-hole in four ears of the pipe to match with the holes in the window adapter plate (fig. 6). Secure each pipe to the window adapter plate with four No. 2-32 x ¼-inch pan head thread forming tapping screws 5305-012-7847.

*(l)* Drill three 1/16-inch holes in each pipe and elbow connection, and in each elbow, pipe, and test stand stack connection. Space the holes evenly around the circumference of the pipe, elbow, and stack. Install a No. 2-32 x ¼-inch thread forming tapping screw 5305-012-7847 in each hole.

*(m)* Cut a 4 foot piece of 1-inch inside diameter rubber hose 4720-235-4125 and install a hose clamp 4730-542-3295 on each end of the hose.

Install one end of the rubber hose (fig. 1) on the battery vent outlet in the top of the test stand and the other end on the pipe nipple in the window adapter plate (fig. 5). Slide each hose clamp in place and tighten securely.

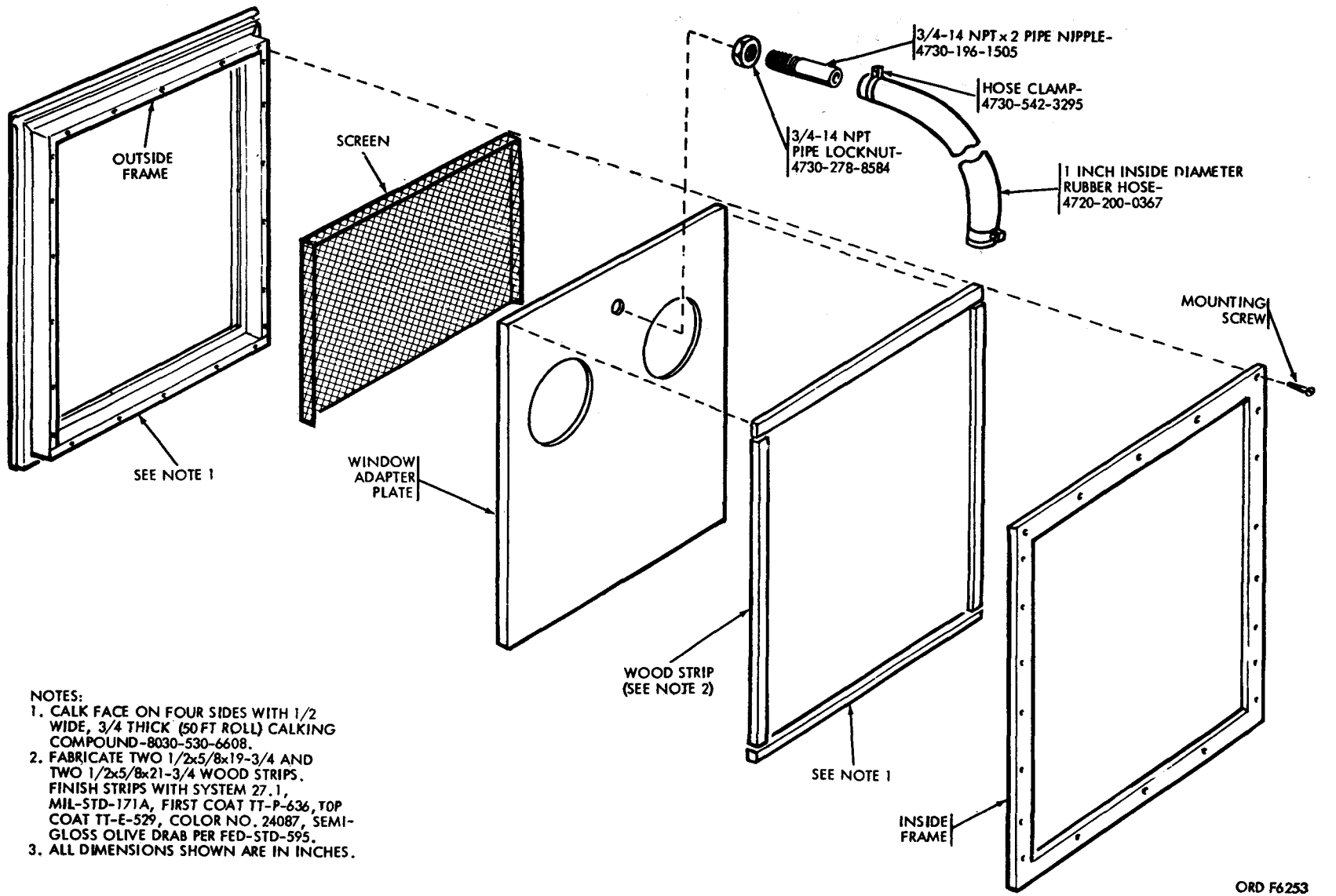
(3) *Connecting the test stand to the 100 ampere circuit breaker.*

*(a)* Connect a 10 foot length of 1¼-inch flexible metal conduit 5975-178-1225 (figs. 2 and 3) to the box of the 100 ampere circuit breaker (figs. 2 and 3) using the 1¼-inch electrical box connector 5975-280-7196 previously installed (par. 3a(2)).

*(b)* Cut three 11 foot lengths of No. 4 AWG electrical wire 6145-635–0047 and one 12 foot length of No. 6 AWG electrical wire 6145-299-4398. Strip ½ inch of insulation from both ends of each wire. Thread the wires through the flexible metal conduit, *(a)* above. Solder a terminal lug 5940-500-7667 on the end of the No. 6 AWG electrical wire and connect the terminal lug under the grounding screw (fig. 3) (par. 3a(2)) in the box of the circuit breaker. Connect the three No. 4 AWG electrical wires to the bottom terminals of the 100 ampere circuit breaker (fig. 3). Connect the other end of the flexible metal conduit to the test stand using conduit elbow supplied on test stand. Connect the other ends of the No. 4 AWG and No. 6 AWG wires to the four conductor electrical power cable installed in test stand.

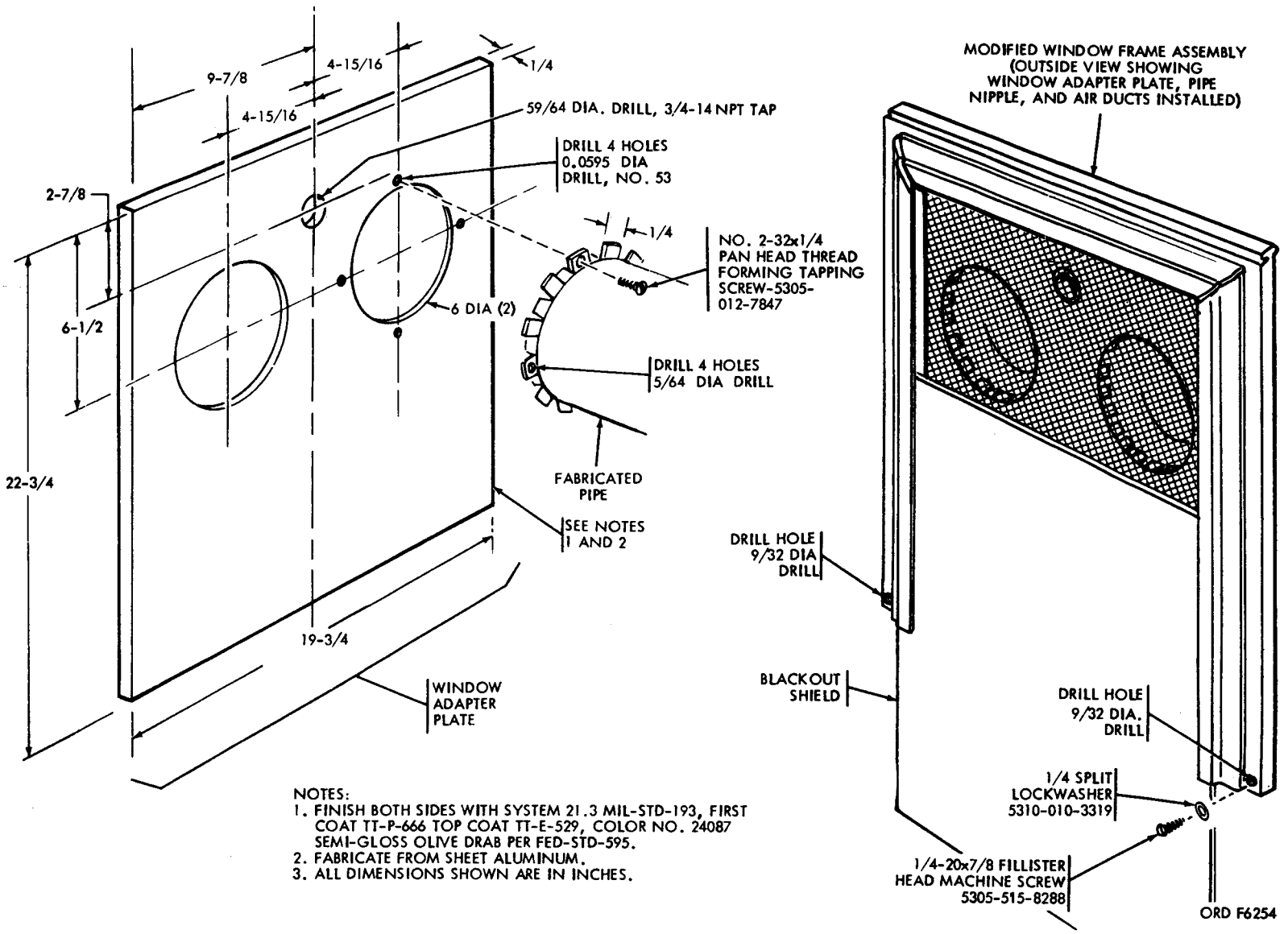
*Note.* Refer to TM 9-4910-380-12 for instructions for installing the four conductor electrical power cable, *(b)* above.

Mark and drill five evenly spaced 7/32-inch holes in the trailer wall and secure the flexible metal conduit to the wall with five retaining straps 5340-050-4659. Secure the straps with five No. 14-10 x ¾ thread forming tapping screws 5305-014-4824.




NOTES:
1. CALK FACE ON FOUR SIDES WITH 1/2 WIDE, 3/4 THICK (50 FT ROLL) CALKING COMPOUND-8030-530-6608.
2. FABRICATE TWO 1/2x5/8x19-3/4 AND TWO 1/2x5/8x21-3/4 WOOD STRIPS. FINISH STRIPS WITH SYSTEM 27.1, MIL-STD-171A, FIRST COAT TT-P-636, TOP COAT TT-E-529, COLOR NO. 24087, SEMI-GLOSS OLIVE DRAB PER FED-STD-595.
3. ALL DIMENSIONS SHOWN ARE IN INCHES.

*Figure 5. Modified window frame assembly — exploded view.*




NOTES:
1. FINISH BOTH SIDES WITH SYSTEM 21.3 MIL-STD-193, FIRST COAT TT-P-666 TOP COAT TT-E-529, COLOR NO. 24087 SEMI-GLOSS OLIVE DRAB PER FED-STD-595.
2. FABRICATE FROM SHEET ALUMINUM.
3. ALL DIMENSIONS SHOWN ARE IN INCHES.

*Figure 6. Modified window frame assembly and fabricated details for window adapter plate and pipe.*

*b. Work Tables 4910-543-7771 and 4910-543-7772* (figs. 1 and 2).

(1) There are four work tables to be installed in the shop-van semitrailer. Two work tables 4910–543–7772 are designated as A and C, and two work tables 4910–543–7771 are designated as B and D to clarify locating and subsequent mounting of equipment.

(2) Place work table (B) against the left wall and 38 inches from rear of trailer. Place work table (D) against the right wall and 31 inches from the rear of the trailer. Place work table (A) against the left wall and flush against the right end of work table (B). Place work table (C) against the right wall and flush against the left end of work table (D). Using the mounting holes in the table legs as template, mark and drill six 3/8-inch holes through the trailer floor for each table. Secure each table to the floor with six 5/16–18 x 2-inch hexagon head machine bolts 5306–208-1559, six 7/16-inch inside diameter rectangular flat washers 5310-209–0061 (use on unders de of trailer floor), six 1/32-inch inside diameter flat washers 5310–050–2246, six 5/16-inch split lock washers 5310-012-0214, and six 5/16–18 hexagon plain nuts 5310–012-4824.

(3) Cut two pieces of 2-inch steel angle 9520-277-4913, 131 inches long. Place a 131-inch length of steel angle on top of tables (A) and (B) (fig. 1) and a 131-inch length on top of tables (C) and (D) (fig. 2). Push the steel angle back against the wall of the trailer and flush against the table tops. Mark and drill four 1/16-inch holes through each 131-inch length to match the two 5/8–11 nuts that are factory installed in each table top Secure each 131-inch length to the table tops with four 5/8–11 x 3¼-inch hexagon head cap screws 5305-022-3518, four 5/8-inch split lock washers 5310-010-3331, and four 21/32-inch inside diameter flat washers 5310–753-8683. Locate s x ribs of the trailer body behind each length of steel angle, and drill a ½-inch hole through the steel angle, each rib, and trailer body. Secure each length of steel angle to the trailer body with six 7/16–20 x 3½-inch hexagon head cap screws 5305–753-4443, six 15/32-inch inside diameter flat washers 5310-619-4779, six 7/16-inch split lock washers 5310-194-0743, and six 7/16–20 hexagon plain nuts 5310-012-0370.

*c. Portable Electric Drill w/Stand 5130-204–271 8* (fig. 1). Place the portable electric drill and stand on work table (B). Position the base of the stand 5 inches from the front edge and 10 inches from the left end of the table top. Using the mounting holes in the base of the stand as a template, mark and drill four 1/32 -inch holes through the table top. Secure the stand to the table top with four 5/16–18 x 2½-inch square neck bolts 5306-012–6652 (a 5/16 x 4½-inch square neck bolt 5306-013-1300 is required for some stands), four 11/32-inch inside diameter flat washers 5310-050-2246, four 5/16-inch split lock washers 5310-012-0214, and four 5/16–18 hexagon plain nuts 5310-012-4824.

*Note.* When securing equipment to work tables, insert the bolts in the drilled holes from the underside of the table top.

*d. Machinist's Vise 5120-293-1439* (fig. 1). Place the machinist's vise on work table (B). Position the base of the vise 32¼ inches from the left end and 2¼ inches from the front edge of the table top. Using the mounting holes in the base of the vise as a template, mark and drill four 17/32-inch holes (some vise require 3 holes) through the table top. Secure the vise to the table top with four ½-13 x 3½ inch square neck bolts 5306-010-9141, four 17/32-inch inside diameter flat washers 5310-012-0396, four ½-inch split lock washers 5310-012-0384, and four ½-13 hexagon plain nuts 5310–012-0378.

e. *Armature Test Set 6625-238-1459* (fig. 1). Place the engine distributor tester on work table (A). Position the tester 14 inches from the left end and 8 inches from the front edge

of the table top. Place one strap fastener loop 5340-339-3770 on each side of the test set and secure the loops to the table top with four No. 6 x 1-inch wood screws 5305-015-1878. Secure the test set to the table top by threading the 25-inch webbing strap 5340-505-6393 through the two loops and over the test set.

*f. Engine Distributor Tester 4910-392-2939* (fig. 1). Place the engine distributor tester on work table (A). Position the tester 4 inches from the right end and flush with the front edge of the table top. Using the mounting holes in the base of the tester as a template, mark and drill four **⅜-inch** holes through the table top. Secure the tester to the table top with four **⅜–16** x 2½-inch square neck bolts 5306-010-9117, four **13/32-inch** inside diameter flat washers 5310-012-0394, four **⅜-inch** split lock washers 5310-012-0381, and four **⅜–16** hexagon plain nuts 5310-655-9372.

*g. Spark Plug Cleaner and Tester 4910-261-5868* (fig. *2*). Place the spark plug cleaner and tester on work table (D). Position the base of the cleaner 6 inches from the front edge and 4 inches from right end of the table top. Using the mounting holes in the base of the tester as a template, mark and drill four **9/32-inch** holes through the table top. Secure the tester to the table top with four ¼-20 x 2½-inch square neck bolts 5306-010-9095, four **9/32-inch** inside diameter flat washers 5310-059-4261, four ¼-inch split lock washers 5310-010-3319, and four ¼-20 hexagon plain nuts 5310-012-4818.

*h. Arbor Press 3444-248-2654* (fig. *2*). Place the arbor press on work table (D). Position the base of the press 4 inches from the left end with the base extending 2 inches beyond the front edge of the table top. Using the mounting holes in the base of the press as a template, mark and drill two **11/32-inch** holes through the table top. Secure the press to the table top with two **5/16–18** x 3½-inch square neck bolts 5306-010-9108, two **11/32-inch** inside diameter flat washers 5310-050-2246, two **5/16-inch** split lock washers 5310-012-0214, and two **5/16–18** hexagon plain nuts 5310-012-4824.

*i. Power Driven Reciprocating Compressor 4310-265-7917 and 2KW Generator Set 6115-240-0393* (figs. 1 and 2). Stow the compressor and the generator set in space of semitrailer as instructed in paragraph **2c** and in such a manner as to avoid damage in transit.

5. Installation of Equipment on Trailer Chassis.

***Caution:* Before mounting the generator set be sure that the landing leg and step jacks (fig. 9) are extended and securely locked in position.**

*a. Changing Position of Mounting Supports* (fig. 7).

(1) Remove the eight **⅝–11** hexagon self-locking nuts and eight **⅝–11** hexagon head cap screws from the two mounting supports and remove the supports from the factory installed position along each side of the trailer chassis. Discard the cap screws and salvage the nuts. Remove the two **⅜–16** hexagon self-locking nuts and the two **⅜–16** x 2¼-inch hexagon head cap screws securing the support pins in the bosses of the mounting supports. Remove the support pin from each boss (use nuts, screws, and pins to mount generator set, *b* below).

(2) Place a mounting support on each side of the trailer chassis, with open side up, boss facing inward, and across the two cross members. Position the mounting supports so the middle hole on each end of the support is centered over the sixth hole of the cross member inward from the side rail of the trailer chassis. Secure the mounting supports to the cross members with four **⅝–11** x 1¾-inch hexagon head cap screws 5305-042-8685 and four **⅝–11** hexagon self-locking nuts 5310-050-3289 (salvaged, (1) above).

*Note.* The mounting supports are replaced on the trailer chassis so that they will be available in the future if a smaller generator set is to be mounted on the trailer chassis.

*b. Installation of Generator Set 6115-635-9954* (figs. 8 and 9).

(1) Install a support pin (removed, a(1) above) through the boss in the side rail on each side of the trailer chassis. Place the holes in the support pin toward the tire and push the pins through the bosses until each pin touches the tire.

(2) Using an appropriate type hoist, lower the generator set over and on the trailer chassis, with the control panel facing the rear of the chassis. Secure the generator set to the trailer chassis by installing a ⅝–11 x 1¾-inch hexagon head cap screw 5305-042-8685 through each of the three holes in the bottom of each skid of the generator set. Install a ⅝–11 hexagon self-locking nut 5310–050–3289 (salvaged, a above) on each cap screw. Slide the support pins, (1) above, in through the holes in the skids of the generator set. Aline holes in the boss and pin and install a ⅜–16 x 2¼ hexagon head cap screw (removed, a(1) above) in the holes and secure with a $4-16 hexagon self-locking nut (removed, a(1) above).

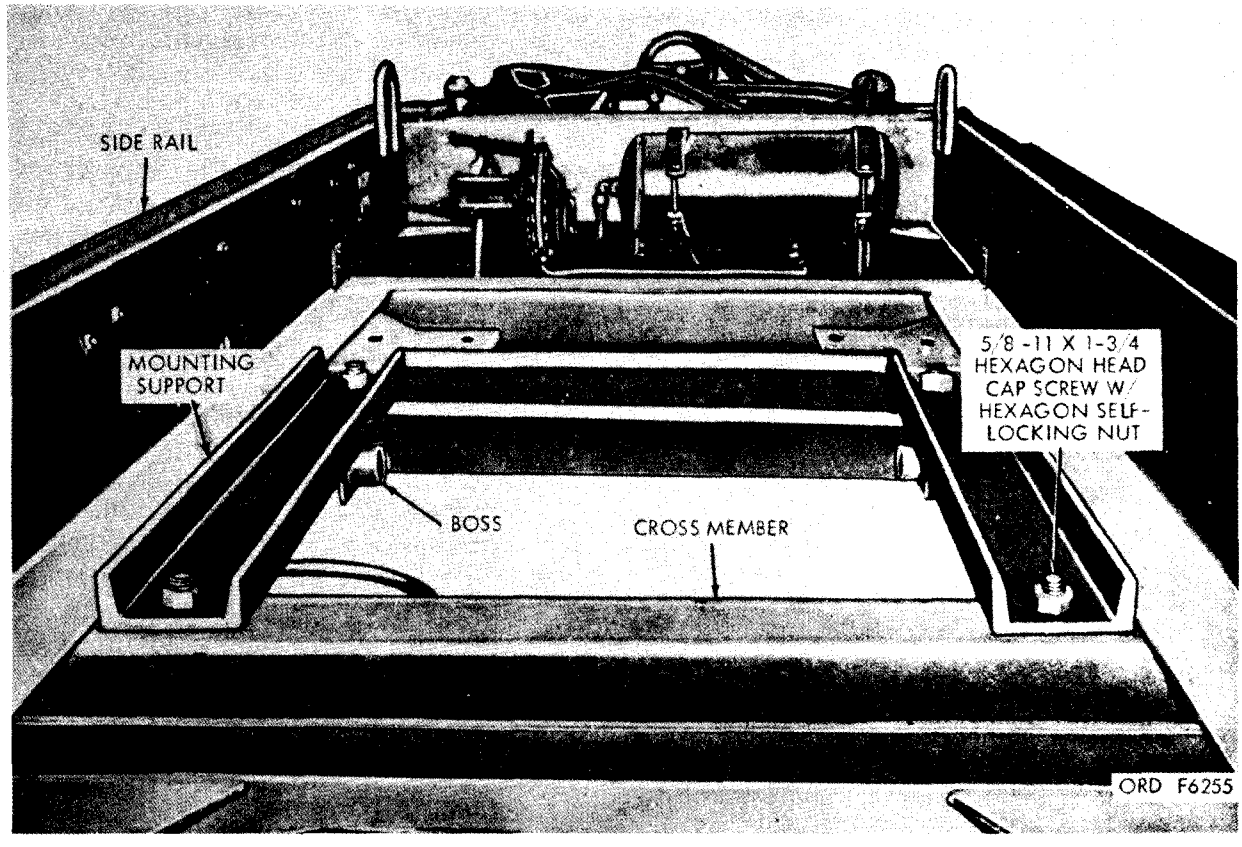



*Figure 7. Position of mounting supports on trailer chassis.*

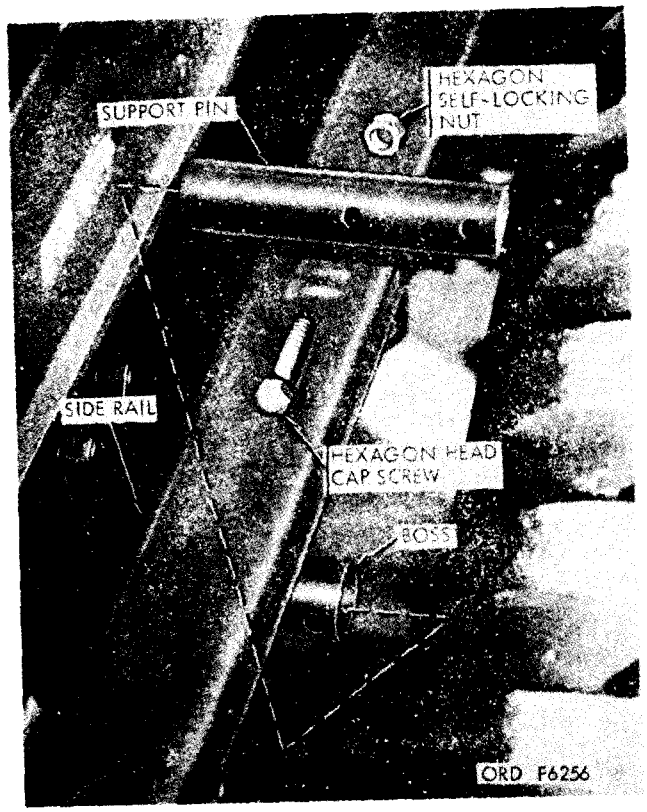



*Figure 8. Support pin and boss in side rail.*

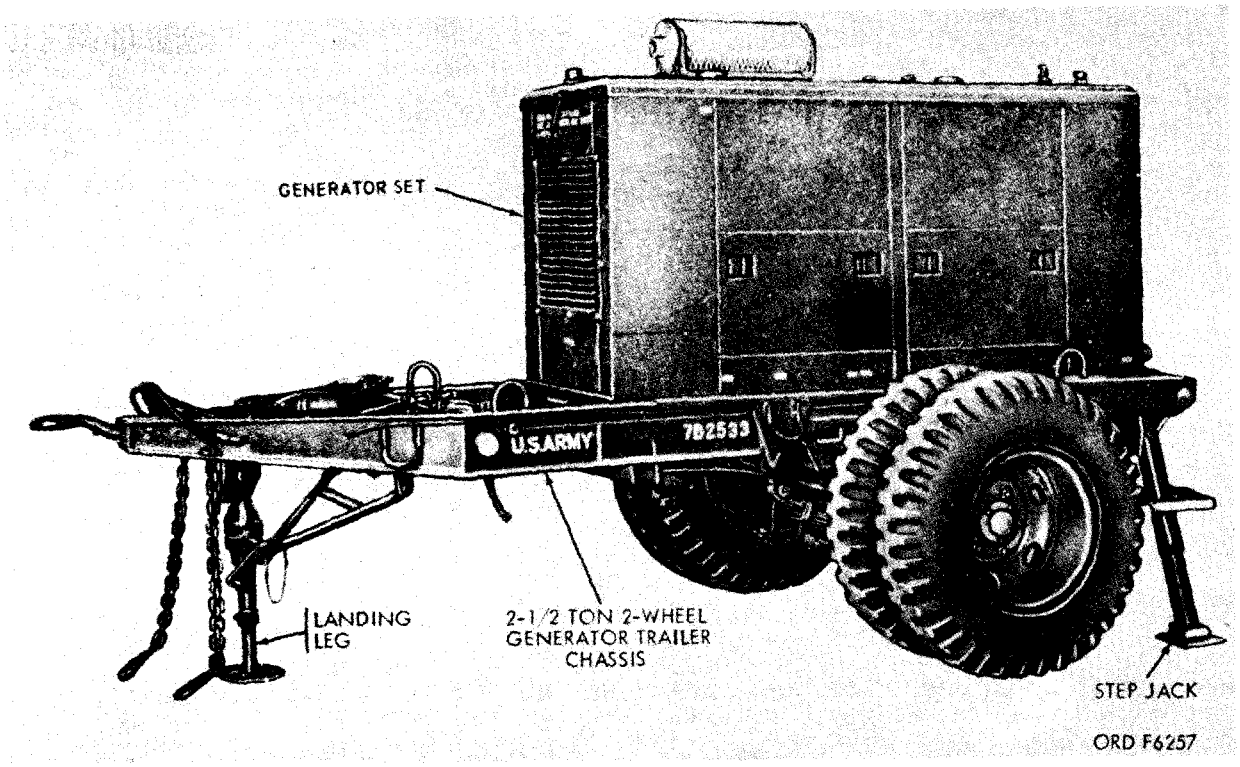



*Figure 9. Generator set mounted on trailer chassis.*

TABLE I. *Hardware for Shop Set Installation: Field Maintenance, Automotive Fuel and Electrical System, Shop Set, and Supplement No. 1*

| Federal stock No. | | Quantity | Use |
|---|---|---|---|
| 9535–231–8327 | ALUMINUM ALLOY PLATE: 0.250 in. thk, 48 in. w, 144 in. lg, alloy 2014–T6, alloy 6003 matl of cladding ( QQ–A–255), 1 pc 19¾ in. x 22¾ in. | ..... | Modification of semitrailer window (par. 4*a* (2) (*f*)). |
| 5306–208–1559 | BOLT, MACHINE: hex-hd, alloy-S, cd- or zn-chromate fin., 5/16–18 UNC–2A x 2. | 24 | Work tables (par. 4*b* (2) ). |
| 5306–010–9095 | BOLT, SQUARE NECK: (carriage bolt) b-hd, S, ¼–20 UNC–2A x 2½. | 4 | Spark plug cleaner and tester par. 4*g*). |
| 5306–012–6652 | BOLT, SQUARE NECK: (carriage bolt) b-hd, S, cd- or zn-pltd, 5/16–18UNC–2A x 2½. | 4 | Portable electric drill w/stand par. 4*c*). |
| 5306–010–9108 | BOLT, SQUARE NECK: (carriage bolt) b-hd, S, 5/16–18UNC–2A x 3½ . | 2 | Arbor press (par. 4*h*). |
| 5306–013–1300 | BOLT, SQUARE NECK: (carriage bolt) b-hd, S, cd- or zn-pltd, 5/16–18UNC–2A x 4½. | 1 | Portable electric drill w/stand (some models) (par. 4*c*). |
| 5306–010–9117 | BOLT, SQUARE NECK: (carriage bolt) b-hd, S, ⅜–16 UNC–2A x 2½. | 4 | Engine distributor tester (par. 4*f* ). |
| 5306–010–9141 | BOLT, SQUARE NECK: (carriage bolt) b-hd, S, ½–13 UNC–2A x 3½. | 4 | Machinist's vise (par. 4*d*). |
| 8030–530–6608 | CAULKING COMPOUND: rope type ..... | 15 ft | Modification of semitrailer window (par. 4*a*(2) (*h*) ). |
| 4730–542–3295 | CLAMP HOSE: adj, band type, corros-res-S, ⅞ to 1⅝. | 2 | Generator test stand battery vent (par. 4*a*(2) (*m*) ). |
| 4520–272–8661 | ELBOW, AIR CONDITIONING-HEATING: S, sgle construction, adj, 90 deg angle, 24 ga, 6 in. dia. | 3 | Generator test stand air intake and exhaust connections (par. 4*a*(2) (*k*) ). |
| 4720–235–4125 | HOSE, RUBBER: coolant lines stght, moderate duty, hv wall, low temp (40° F.), 1 in. di. | 4 ft | Generator test stand battery vent (par. 4*a*(2) (*m*) ). |
| 4730–278–8584 | LOCKNUT PIPE: galvd, ¾–14NPT ..... | 1 | Semitrailer window battery vent (par. 4*a*(2) (*f*) ). |
| 5340–339–3770 | LOOP, STRAP FASTENER: S, 3 1/16 in. lg overall, 1 ⅝ in. inside length, ⅜ in. outside width, ¼ in. inside height. | 2 | Armature test set (par. 4*e*). |
| 4730–196–1505 | NIPPLE, PIPE : S, glvd, std wt, ¾–14 NPT x 2. | 1 | Semitrailer window battery vent (par. 4*a*(2) (*f*) ). |
| 5310–012–4818 | NUT, PLAIN, HEXAGON: S, cd- or zn-pltd, ¼–20 UNC–2B, 7/16 in. w, 5/32 in. thk. | 4 | Spark plug cleaner and tester (par. 4*g*). |
| 5310–012–4824 | NUT, PLAIN, HEXAGON: S, cd- or zn-pltd, 5/16–18UNC–2B, ½ in. w, 3/16 in. thk. | 30 | Work tables (par. 4*b* (2) ). Arbor press (par. 4*h*). Portable electric drill w/stand (par. 4*c*). |
| 5310–655–9372 | NUT, PLAIN, HEXAGON: S, cd- or zn-pltd, ⅜–16UNC–2B, 9/16 in. w, 7/32 in. thk. | 4 | Engine distributor tester (par. 4*f*). |
| 5310–012–0370 | NUT, PLAIN, HEXAGON: S, cd- or zn-pltd, 7/16–20UNC–2B, ⅝ in. w, ⅜ in. thk. | 12 | Steel angle to wall of semitrailer (par. 4*b*(3) ). |
| 5310–012–0378 | NUT, PLAIN, HEXAGON: S, cd- or zn-pltd, ½–1 3UNC–2B, ¾ in. w, 7/16 in. thk. | 4 | Machinist's vise (par. 4*d*). |
| 5310–021–4267 | NUT, PLAIN, HEXAGON: S, cd- or zn-pltd, ½–20UNC–2A, 13/16 in. w, 27/64 in. thk. | 4 | Generator test stand (par. 4*a*(1) (*b*) ). |
| 5310–050–3289 | NUT, SELF-LOCKING, HEXAGON: S, cd- or zn-pltd, ⅝–11UNC–3B, 1 1/16 in. w, ⅞ in. thk (10 required–8 salvaged (par. 5*a*(1) ). | 2 | Generator set to generator trailer chassis (pars. 5*a*(2) and 5*b* (2) ). |
| 4520–273–1243 | PIPE, AIR CONDITIONING-HEATING : S, sgle construction, rd, 6 in. dia, 24 in. lg, 24 ga. | 2 | Generator test stand air intake and exhaust connections (par. 4*a*(2) (*k*) ). |

TABLE I. *Hardware for Shop Set Installation: Field Maintenance, Automotive Fuel and Electrical System, Shop Set, awd Supplement No. 1 - Continued*

| Federal stock No. | Nomenclature | Quantity | Use |
|---|---|---|---|
| 5305–753–4443 | SCREW, CAP, HEXAGON HEAD: alloy-S, cd- or zn-pltd, 7/16–20 UNC–2A x 3 ½. | 12 | Steel angle to wall of semitrailer (par. 4*b*(3) ). |
| 5305–206–0021 | SCREW, CAP, HEXAGON HEAD: alloy-S, cd- or zn-pltd, ½–20UNC–2A x 3½. | 4 | Generator test stand (par. 4*a*(1) (*b*) ). |
| 5305–022–3518 | SCREW, CAP, HEXAGON HEAD: alloy-S, cd- or zn-pltd, ⅝–1 1UNC–2A x 3 ¼. | 8 | Steel angle to work tables (par. 4*b*(3) ). |
| 5305–042–8685 | SCREW, CAP, HEXAGON HEAD: S, cd, or zn-pltd, ⅝–11UNC–2A x 1¾. | 10 | Generator set and generator mounting supports (pars. 5*a* (2) and 5*b*(2) ). |
| 5305–515–8288 | SCREW, MACHINE: fil-hd, S, cd- or zn-pltd, ¼–20U NC–2A x ⅞ . | 2 | Modified window to semitrailer (par. 4*a*2(2) (*j*) ). |
| 5305–012–7847 | SCREW, TAPPING, THREAD FORMING: pan-hd, blunt-pt, S, cd- or zn-pltd, No. 2–32 x ¼. | 25 | Generator test stand air intake and exhaust connections (par. 4*a*(2) (*k*) ). |
| 5305–015–1878 | SCREW, WOOD: cross-recess-oval-hd, S, cd- or zn-pltd, No. 6 (0.142) x 1. | 4 | Armature test set (par. 4*e*). |
| 9520–277–4913 | STEEL ANGLE: ¼ in. thk, 2 in. legs, 3.19 lb per linear ft, 20–30 ft lg (MIL–S–20166, grade M, type A), 2 pc 131 in. lg. | 22 ft | Work tables (par. 4*b* (3) ). |
| 9520–287–9417 | STEEL CHANNEL: carb S, for welded structures, 3 in. deep, 1½ in. flanges, 18–22 ft lg (QQ–S–741 ), 1 pc 94 in. lg, 1 pc 18 in. lg. | 9½ ft | Generator test stand (par. 4*a*(1) (*a*) ). |
| 5340–505–6393 | STRAP, WEBBING: 1 in. w x 25 in. lg, w/buckle and end clip. | 1 | Armature test set (par. 4*e*). |
| | STRIP, WOOD: hardwood, plywood, or softwood, 2 pc ½ in. w x ⅝ in. thk x 19¾ in. lg, 2 pc ½ in. w x ⅝ in. thk x 21¾ in lg. | ..... | Modification of semitrailer window (par. 4*a*(2) (*g*) ). |
| 5310–209–0061 | WASHER, FLAT: rect, S, 7/16 in. hole dia, 2 in. w, 4 in. lg, ¼ in. thk, cd fin. | 24 | Work tables (par. 4*b* (2) ). |
| 5310–059–4261 | WASHER, FLAT: rd, S, 9/32 in. id, 15/16 in. od, 0.032 in. thk, zn-chromate fin. | 4 | Spark plug cleaner and tester (par. 4*g*). |
| 5310–050–2246 | WASHER, FLAT: rd, S, 11/32 in. id, 1 in. od, 0.094 in. thk, cd- or zn-pltd. | 30 | Arbor press (par. 4*h*). Portable electric drill w/stand (par. 4*c*). |
| 5310–012–0394 | WASHER, FLAT: rd, S, 13/32 in. id, 13/16 in. od, 0.065 in. thk, cd- or zn-pltd. | 4 | Engine distributor tester (par. 4*f*). |
| 5310–619–4779 | WASHER, FLAT: rd, S, 15/32 in. id, 1 in. od, 0.088 in. thk, zn-phos fin. | 12 | Steel angle to wall of semitrailer (par. 4*b*(3) ). |
| 5310–012–0396 | WASHER, FLAT: rd, S, 17/32 in. id, 1 1/16 in. od, 0.095 in. thk, cd- or zn-chromate fin. | 8 | Machinists's vise (par. 4*d*). Generator test stand (par. 4*a*(1) (*b*) ). |
| 5310–753–8683 | WASHER, FLAT: rd, S, 21/32 in. id, 1⅜ in. od, 0.179 in. thk, zn-pltd. | 8 | Steel angle to work tables (4*b* (3) ). |
| 5310–010–3319 | WASHER, LOCK: split, med, S, cd- or zn-chromate fin., ¼ in. screw size. | 6 | Modified window frame assembly to semitrailer (par. 4*a* (12) (*j*) ). Spark plug cleaner and tester (par. 4*d*). |
| 5310–012–0214 | WASHER, LOCK: split, med, S, cd- or zn-chromate fin., 5/16 in. screw size. | 30 | Arbor press (par. 4*h*). Portable electric drill w/stand (par. 4*c*). |
| 5310–012–0381 | WASHER, LOCK: split, lt, S, cd- or zn-chromate fin., ⅜ in. screw size. | 4 | Engine distributor tester (par. 4*f*). |
| 5310–194–0743 | WASHER, LOCK: split, med, S, cd- or zn-chromate fin., 7/16 in. screw size. | 12 | Steel angle to wall of semitrailer (par 4*b*(3) ). |

TABLE I. *Hardware for Shop Set Installation: Field Maintenance, Automotive Fuel and Electrical System, Shop Set, and Supplement No. 1* - Continued

| Federal stock No. | Nomenclature | Quantity | Use |
|---|---|---|---|
| 5310–012–0384 | WASHER, LOCK: split, med, S, cd- or zn-pltd, ½ in. bolt size. | 8 | Machinist's vise (par. 4*d*). |
| 5310–010–3331 | WASHER, LOCK: split, hv, S, plain fin., ⅝ in. bolt size. | 8 | Steel angle to work tables (par. 4*b*(3)). |

TABLE II. *Electrical and Hardware Supplies for Shop Set Installation: Wiring, Field Maintenance, Automotive Fuel and Electrical System, Shop Set, and Supplement No. 1*

| Federal stock No. | Nomenclature | | Use |
|---|---|---|---|
| 5975–280–7196 | BOX CONNECTOR, ELECTRICAL: I or S, cd- or zn-fin., stght type, designed for 1 ¼ in. conduit, secured to connector by squeeze clamp, externally thd connection for 1¼ in. knockout, designed for armored cable and flex metallic conduit. | 1 | Circuit breaker box (par. 3*a*(2)). |
| 5975–152–1098 | BUSHING, ELECTRICAL CONDUIT: I or S, glvd or cd fin., designed for 1 ¼ in. rigid conduit, any acceptable lg, 1.750 in. min to 1.933 in. max dia overall dim, 1 pc construction, thd, stght thd, 1¼–11½ thd size. | 2 | Main switch box (par. 3*a*(1)). Circuit breaker box (par. 3*a*(3)). |
| 5925–242–2266 | CIRCUIT BREAKER: deion arc quenching, three pole, ac, 250 v, 60 c, 100 amp, dc, 250 v, 100 amp, 5000 amp interrupting cap., overload protection, armature and thermal trip release, provided w/toggle lever manual trip release, 125% continuous load min tripping current, tripping time 240 to 330 sec at 125% of continuous load, 25 to 40 sec at 200% of continuous load, 5 to 10 sec at 300% of continuous load, 25 deg C. ambient temp, same ac uator is used for normal trip release, trip free and separate reset position, steel inclosure dustproof, silver main contacts, 13 ¼ in. lg, 9 5/16 in. w, 4 13/16 in. deep, 4 mtg holes on 11 in. x 5½ in. mtg centers, 6 front connected screw type terminals, for general purpose use. | 1 | Shop-van semitrailer (par. 3*a*). |
| 5975–178–1225 | CONDUIT, METAL, FLEXIBLE: 1¼ in. nom. size. | 10 ft | Connecting generator test stand to circuit breaker (par. 4*a*(3)(*a*)). |
| 5935–642–1694 | CONNECTOR, RECEPTACLE, ELECTRICAL: 4 female contacts, rd or pin type, 100 amp, 250 v, dc, 600 v, ac, 6 9/16 in. lg, 4¼ in. w, 4 ¼ in. h, w/aluminum base alloy shell, watertight. | 1 | Shop-van semitrailer (par. 3*b*). |
| 5975–295–9986 | LOCKNUT, ELECTRICAL CONDUIT: glvd-fin., accommodates 1 ¼ in. conduit, stght thd, 1¼–11½. | 2 | Main switch box (par. 3*a* (1)). |
| 4730–196–1470 | NIPPLE PIPE: S, glvd, std wt, 1¼–11½ NPT x 1⅝ in. lg. | 1 | Main switch box (par. 3*a*(1)). |
| 5310–012–0375 | NUT, PLAIN, HEXAGON: S, cd- or zn-chromate fin., ¼–20UNC–2B, 7/16 w, 7/32 thk. | 1 | Circuit breaker box (par. 3*a*(2)). |

TABLE II. *Electrical and Hardware Supplies for Shop Set Installation: Wiring, Field Maintenance, Automotive Fuel and Electrical System, Shop Set, and Supplement No. 1* - Continued

| Federal stock No. | Nomenclature | | Use |
|---|---|---|---|
| 5305–531–1783 | SCREW, CAP, HEXAGON HEAD: S, cd- or zn-chromate fin., ¼–20UNC–2A x 1 in. | 1 | Circuit breaker box (par. 3*a*(2) ). |
| 5305–014–4824 | SCREW TAPPING, THREAD FORMING: pan-hd, gimlet-pt, sh-mtl-thd, S, cd- or zn-pltd, No. 14 (0.254)–10 x ¾. | 9 | Circuit breaker box (pars. 3*a*(3) and 4*a*(3) (*b*) ). |
| 5340–050–4659 | STRAP, RETAINING: open type, S or MI, cd- or zn-chromate fin., $1^{29}/_{32}$ id. | 5 | Circuit breaker box (par. 4*a* (3) (*b*) ). |
| 5940–500–7667 | TERMINAL LUG: solder, rd-end tongue, tubr shk, tnd cop., 70 amp, No. 4 AWG, hole for ¼ in. bolt. | 1 | Circuit breaker box (par. 4*a*(3) (*b*) ). |
| 5310–017–8532 | WASHER, LOCK: int-ext teeth, S, cd- or zn-chromate fin., 5/16 in. screw size. | 1 | Circuit breaker box (par. 3*a*(2) ). |
| 6145–635–0047 | WIRE, ELECTRICAL: building, 600 v, cop. cond, No. 4 AWG, stranded, 7 strands, 0.0777 in. dia, ins, covering in sequence from conductor is thermoplastic. | 53 ft | Electrical receptacle connector (par. 3*b*(2) ).<br>Generator test stand (par. 4*a*(3) (*b*) ). |
| 6145–299–4398 | WIRE, ELECTRICAL: building, 600 v, cop. cond, No. 6 AWG, stranded, 7 strands, 0.0612 in. dia, ins, covering in sequence from conductor is ru, braid. | 21 | Electrical receptacle connector (par. 3*b*(2) ).<br>Generator test stand (par. 4*a*(3) (*b*) ). |

TABLE III. *Items to be Mounted in Shop-Van Semitrailer and Generator Trailer Chassis*

| Federal stock No. | Nomenclature | Figure No. | Quantity | Location |
|---|---|---|---|---|
| 4910–261–5868 | CLEANER AND TESTER, SPARK PLUG: bench mtd, spark plug sizes 10-mm, 14-mm, 18-mm, and ⅞ in., 120 to 150 psi air pressure required, ¼ NPSH, variable pressure type, ac, 110 v, 60 c, sgle-ph, spark plug reflection observed in steel mirror. | 2 | 1 | For mounting on work table on right side at rear of semitrailer. |
| 4310–265–7917 | COMPRESSOR, RECIPROCATING, POWER DRIVEN: air, base, mtd, elec motor, ac, 115 v, sgle-ph, 60 c, ⅓ hp, 2.7 cfm air delivered, 80 psi discharge pressure, air surge chamber. | 2 | 1 | For mounting on floor on right side at rear of semitrailer. |
| 5130–204–2718 | DRILL, ELECTRIC, PORTABLE: ½ in. size, hv-duty, ac/dc, 115 v, w/vertical stand. | 1 | 1 | For mounting on work table on left side at rear of semitrailer. |
| 6115–635–9954 | GENERATOR SET, DIESEL ENGINE : 60 kw, ac, 120/208 v, 240/416 v, 3 ph, 60 c, convertible to 50 kw, 50 c operation, liquid cooled, fully inclosed, skid mtd. | 9 | 1 | For mounting on generator trailer chassis. |
| 6115–240–0393 | GENERATOR SET, GASOLINE ENGINE : skid mtd, 2 kw, 12 v, self-excited, air cooled, btry cranked, manually cranked by rope, 12 v cranking voltage open, 32 in. lg, 24 in. w, 30 in. h, w/radio suppression, winterized, w/component listing in carrying case. | 1 | 1 | For mounting on floor on left side at rear of semitrailer. |
| 3444–243–2654 | PRESS, HARBOR, HAND OPERATED: mechanical, bench mtg, ½ ton pressure, sgle | 2 | 1 | For mounting on work table on right side |

TABLE III. *Items to be Mounted in Shop-Van Semitrailer and Generator Trailer Chassis* - Continued

| Federal stock No. | Nomenclature | Figure No. | Quantity | |
|---|---|---|---|---|
| | column, 4 in. travel of ram, 6½ in. work dia, 4½ in. distance between ram and bed, w/swivel plate. | | | at rear of semitrailer. |
| 4910–543–7772 | TABLE, WORK, AUTOMOTIVE MAINTENANCE: laminated hardwood working surface, 60 in. lg, 25 in. w, 35½ in. h of working surf ace above floor, steel cabinet base, w/shelf. | 1 & 2 | 2 | For right and left side mounting at front of semitrailer. |
| 4910–543–7771 | TABLE, WORK, AUTOMOTIVE, MAINTENANCE: laminated hardware working surface, 72 in. lg, 25 in. w, 35 ½ in. h of working surf ace above floor, steel cabinet base, w/shelf and drawers, two front opening bins w/doors and provisions for locking. | 1 & 2 | 2 | For right and left side mounting at rear of semitrailer. |
| 4910–392–2939 | TESTER, ENGINE DISTRIBUTOR: bench type, 115 v, 60 c, sgle-ph, for testing 6, 12, and 24 v distributors. | 1 | 1 | For mounting on work table on left side at front of semitrailer. |
| 6625–238–1459 | TEST SET, ARMATURE, audible and visual indicator, ac, 110 v, 60 c, sgle-ph, tests 2½ in. to 6 in. dia armatures, 15 in. lg, 10 in. w, 9 in. h overall. | 1 | 1 | For mounting on work table on left side at front of semitrailer. |
| 4910–316–5251 | TEST STAND, AUTOMOTIVE GENERATOR AND STARTER: floor mtd, cap, 6 to 24 v range, 150 amp max output, 800 to 11,000 rpm speed range, elec motor drive, ac, 220 to 440 v, 60 c, 3 ph, equiped to test generator regulator. | 1 & 2 | 1 | For mounting on floor at front of semitrailer. |
| 5120–293–1439 | VISE, MACHINIST'S: swivel base, 4 in. jaw w, 6 in. jaw opng, replaceable jaw faces. | 1 | 1 | For mounting on work table on left side at rear of semitrailer. |

BY ORDER OF THE SECRETARY OF THE ARMY:

EARLE G. WHEELER,
*General, United States Army,*
*Chief of Staff.*

Official:

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*Major General, United States Army,*
*The Adjutant General.*

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| CofT (1) | 7 |
| CSigO (1) | 9–7 |
| TSG (1) | 9–9 |
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| USAMC (12) | 9–26 |
| USASMCOM (6) | 9–65 |
| USAWECOM (70) | 9–66 |
| ARADCOM (2) | 9–67 |
| ARADCOM Rgn (2) | 9–127 |
| OS Maj Comd (1) | 9–197 |
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| Seventh & EUSA (5) | 10–448 |
| Corps (2) | 17 |
| USA Corps (2) | 29–51 |
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*NG:* State AG (4); units same as active Army except allowance is one copy to each unit.

*USAR:* None.

For explanation of abbreviations used, see AR 320-50.

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# The Metric System and Equivalents

### *Linear Measure*

1 centimeter = 10 millimeters = .39 inch
1 decimeter = 10 centimeters = 3.94 inches
1 meter = 10 decimeters = 39.37 inches
1 dekameter = 10 meters = 32.8 feet
1 hectometer = 10 dekameters = 328.08 feet
1 kilometer = 10 hectometers = 3,280.8 feet

### *Weights*

1 centigram = 10 milligrams = .15 grain
1 decigram = 10 centigrams = 1.54 grains
1 gram = 10 decigram = .035 ounce
1 dekagram = 10 grams = .35 ounce
1 hectogram = 10 dekagrams = 3.52 ounces
1 kilogram = 10 hectograms = 2.2 pounds
1 quintal = 100 kilograms = 220.46 pounds
1 metric ton = 10 quintals = 1.1 short tons

### *Liquid Measure*

1 centiliter = 10 milliliters = .34 fl. ounce
1 deciliter = 10 centiliters = 3.38 fl. ounces
1 liter = 10 deciliters = 33.81 fl. ounces
1 dekaliter = 10 liters = 2.64 gallons
1 hectoliter = 10 dekaliters = 26.42 gallons
1 kiloliter = 10 hectoliters = 264.18 gallons

### *Square Measure*

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch
1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches
1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet
1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet
1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

### *Cubic Measure*

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches
1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

# Approximate Conversion Factors

| *To change* | *To* | *Multiply by* | *To change* | *To* | *Multiply by* |
|---|---|---|---|---|---|
| inches | centimeters | 2.540 | ounce-inches | newton-meters | .007062 |
| feet | meters | .305 | centimeters | inches | .394 |
| yards | meters | .914 | meters | feet | 3.280 |
| miles | kilometers | 1.609 | meters | yards | 1.094 |
| square inches | square centimeters | 6.451 | kilometers | miles | .621 |
| square feet | square meters | .093 | square centimeters | square inches | .155 |
| square yards | square meters | .836 | square meters | square feet | 10.764 |
| square miles | square kilometers | 2.590 | square meters | square yards | 1.196 |
| acres | square hectometers | .405 | square kilometers | square miles | .386 |
| cubic feet | cubic meters | .028 | square hectometers | acres | 2.471 |
| cubic yards | cubic meters | .765 | cubic meters | cubic feet | 35.315 |
| fluid ounces | milliliters | 29,573 | cubic meters | cubic yards | 1.308 |
| pints | liters | .473 | milliliters | fluid ounces | .034 |
| quarts | liters | .946 | liters | pints | 2.113 |
| gallons | liters | 3.785 | liters | quarts | 1.057 |
| ounces | grams | 28.349 | liters | gallons | .264 |
| pounds | kilograms | .454 | grams | ounces | .035 |
| short tons | metric tons | .907 | kilograms | pounds | 2.205 |
| pound-feet | newton-meters | 1.356 | metric tons | short tons | 1.102 |
| pound-inches | newton-meters | .11296 | | | |

# Temperature (Exact)

| | | | | |
|---|---|---|---|---|
| °F | Fahrenheit temperature | 5/9 (after subtracting 32) | Celsius temperature | °C |

**PIN: 022590-000**