LOCATION, ERECTION AND ASSEMBLY

GENERAL SAFETY PRECAUTIONS

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2. GENERAL

2.1 Scope

2.11 This section covers the procedures that may be applied in preventing personal injury, damage to equipment and building, and service interruptions in connection with the operations covered in this handbook.

2.12 Specific precautions, requirements and methods covering the necessary safeguards for any particular operation are included in the associated sections of this handbook.

2.13 The common fundamental principles which should be used as a guide in preventing personal injury, service interruptions and damage to equipment

and buildings are contained in Handbook 0 and are to be observed at all times, as they apply to the particular operation being performed. Refer to Safety Check List, Section 15 and Section 9 in Handbook 0.

NOTE: ACCIDENT HAZARDS ACCOMPANYING FRAMEWORK OPERATIONS CAN BE AVOIDED BY THE USE OF CORRECT METHODS AND BY USING CAUTION AT ALL TIMES FOR THE PROTECTION OF SELF AND OTHERS.

3. PRECAUTIONS IN WORKING OFFICES

3.1 Causes of Service Inter uptions

3.11 The utmost precautions should be taken while performing operations on working equipment. Also work should be done only at such hours as specified by the telephone company.

3.12 An analysis of past service interruptions has indicated that they are frequently caused by one of the following conditions:

3.121 Proceeding with work without reaching an agreement as to the steps to be followed and the time of day during which the work is to be performed.

3.122 Changing plans after an agreement has been reached without advising all interested parties of such changes. For example, an agreed upon intermediate step may be held up because of a shortage of equipment. Before proceeding with subsequent steps, a new agreement should be reached with all interest parties.

3.1221 Misunderstandings with regard to the release of equipment.

3.1222 Misunderstandings by the installer as to the proper Operating Company representative to be contacted to obtain approval for proceeding with the planned work.

3.2 Preventative Action

3.21 The installation representative in charge of the job should obtain permission from the authorized telephone company representative, or someone delegated by him, before starting work on working equipment.

3.22 When circuits or equipment are to be released from service, be sure that a complete understanding is reached as to exactly what circuits or equipment have been released and when the work must be completed.

NOTE: Tests made without the telephone company's approval should not be relied upon to determine that the circuits are not in use.

4. PRECAUTIONS AGAINST PERSONAL INJURY

4.1 Use of Tools

4.11 The misuse of tools has caused many a skinned knuckle, cut, mashed finger, strained back and serious fall. Some of the ways to avoid such injuries are covered in the following paragraphs.

4.12 Hammers

4.121 Make sure that the handle is tight on the head of a hammer.

4.122 Never use a hammer having a split handle.

4.123 When striking chisels, hand chucks and other steel objects, be sure to use a hammer expressly made for that purpose to avoid injury caused by flying chips.

4.13 Wrenches

4.131 Use only wrenches in good condition that are the proper kind and size specified for the job.

4.1311 Never use an adjustable wrench when a fixed solid wrench is available. Adjustable type wrenches are provided to supplement the fixed solid wrenches and are primarily intended for use in miscellaneous nonrepetitive operations where a large assortment of other types of wrenches might otherwise be required.

4.132 Use only wrenches having jaws in good condition.

4.133 Never use a shim to make the wrong size wrench fit the nut or bolt head.

4.134 Never use a wrench as a hammer.

4.135 Always place an adjustable wrench on the nut in such a position that the pull on the handle tends to force the jaws further on the nut. After placing the wrench on the nut, tighten the adjusting knurl so the wrench fits the nut snugly.

4.136 Think twice, before you push on a wrench. The chances are that you will find it is safer to pull on it.

4.137 See that your footing is good before you pull on a wrench. Get the habit of figuring out what is going to happen if the wrench slips, the bolt breaks or the threads strip.

4.138 Extending wrench handles to obtain additional leverage when tightening nuts, bolts, or other threaded parts should be avoided wherever possible, as it may result in stripping the threads, breaking the bolts, or damaging the wrench. (Extending the handle of the R-1543 Adjustable Monkey Wrench when using it to remove cable rack cross straps as covered in Section 13A of this handbook is permissible as it does not produce excessive strain on the wrench.)

4.139 Avoid using socket wrenches and wrench sockets which are worn to the extent that they are apt to slip from or around the nut.

4.14 Electric Tools

4.141 The frames of electric drills and other electric motor appliances should always be grounded while the appliances are in use. If the appliance is not equipped with a three-conductor cord, a ground can be provided by means of a length of wire connecting the frame of the appliance and the nearest grounded framework or a receptacle plate mounting screw.

4.1411 Always check electric tools as outlined in Handbook 28 for crosses between the tool housing and the current supply.

4.1412 Never wear loose clothing or gloves when operating an electric drill.

4.142 Whenever possible, use the R-3032 1/2" Electric and R-3033 Drill Stand combination when performing drilling operations.

4.1421 Do not lock switch in an "on" pin position with the switch holding pin unless the drill is being used in a drill stand.

4.1422 When using an electric drill, the operator should be alert to the necessity of reducing the pressure on the drill just before the drill bit or other cutting tool is about to break through the metal. This will prevent the bit from jamming when it bites through the remaining metal too quickly.

4.1423 For unusually heavy work, such as drilling holes in metal with the R-2541 Hole Saw, it is advisable to replace the removable handle on the drill with a longer pipe handle of the same diameter and pipe size, approximately 3 ft. long, obtained locally. Two men are required to handle the drill with the longer handle.

NOTE: To prevent the long pipe handle from damaging the drill casing, do not screw it too deeply into the socket. The thread penetration can be regulated by screwing a pair of lock nuts on the pipe, allowing only 5/16" of threads protruding at the end of the pipe.

4.1424 Disconnect the drill from the power supply when removing or inserting drill bits.

4.143 The metal shell or housing of the electric hammer is grounded by means of a ground conductor in a 3 conductor cord and an adapter equipped with a ground wire clip for use in 2 wire receptacles. Refer to Handbook 28 for instructions on connecting leads to this tool. Before using the electric hammer, test it for leaks and crosses. Wear R-3055 Safety Goggles and be sure hammer shell is grounded.

4.144 When using the electric hammer in conjunction with star drills for drilling holes in concrete, brick, tile, etc., prevent eye injuries by wearing R-3055 Safety Goggles.

4.145 Plugs on the cords of electrical appliances shall be secured to receptacles in such a manner as to become disconnected when the cord is subjected to a sudden jerk or strain.

4.146 Portable electrical appliances (lamp leads, soldering coppers, drills, etc.) having exposed live parts or cords with outer braid or rubber covering broken, or broken plugs shall not be used until repaired.

4.15 Files

4.151 Files having pointed tangs should never be used without a handle.

4.152 Never use a file for prying. The tang end is soft and bends easily. The body of the file is hard and very brittle. A light bending force will snap it in two.

4.153 Never hammer on a file. This is very dangerous because it may shatter with chips flying in all directions.

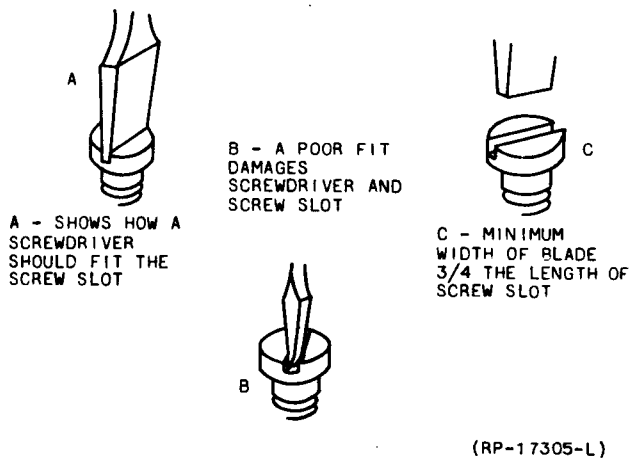


FIG. 1 METHOD OF SELECTING SCREWDRIVERS (PAR. 4.162)

4.16 Screwdrivers

4.161 Avoid using screwdrivers with cracked or splintered handles or with uneven or rounded blades which are apt to slip from the screw head. Tag and return defective screwdrivers to Installation Stockkeeping.

4.162 As far as practicable, use the right size screwdriver to fit the screw. Figure 1 shows the considerations to be given in selecting the proper size blade for various types of screws.

4.163 Avoid injuries caused by slippage of the screwdriver from the screw.

4.164 Be particularly careful to brace yourself well before attempting to drive screws from a position on a ladder.

4.165 Avoid using a screwdriver as a substitute for a punch, chisel, nail puller, etc.

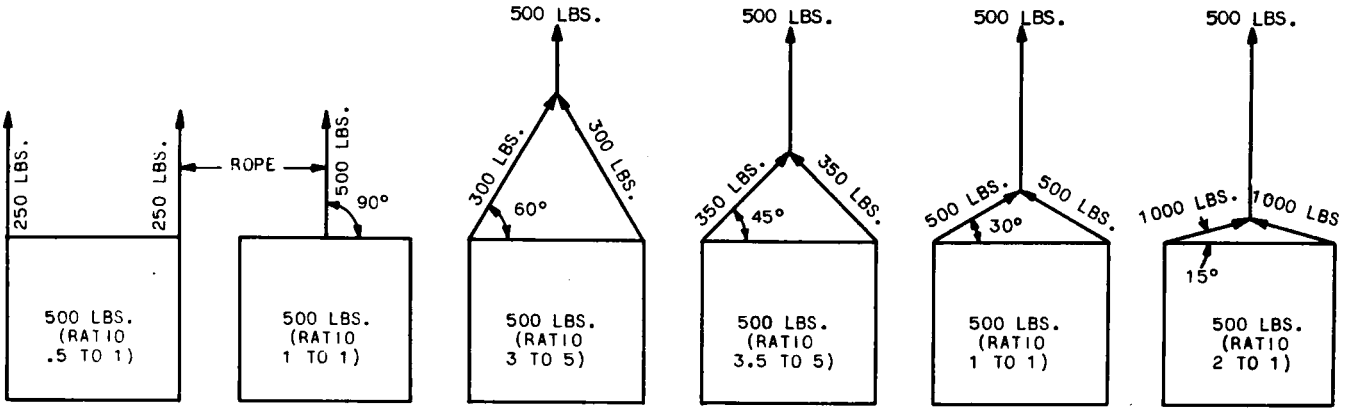
4.17 Drill, Wheel

4.171 Wheel drills with handles riveted in such a manner as to produce burrs that may be injurious to the user or with other defects shall be returned to Installation Stockkeeping.

4.172 To prevent pinching the hand between the pinion and the gear when removing a drill point from the chuck of the wheel drill, hold both the main handle and the handle on the gear in the left hand and turn the chuck with the right hand.

4.2 Common Operations

4.21 R-3055 All Plastic Safety Goggles, shall be worn when grinding, drilling, cleaning or performing other operations where there is danger from flying objects such as dirt or metallic particles getting into the eyes. Also when working underneath another work location from which dust or dirt particles are likely to be released; at any location where it is necessary to "look up" while performing the



ROPE STRENGTH

NEW DRY MANILA ROPE (3 STRAND)	SAFE LOAD IN POUNDS
1/2" DIAMETER	530
3/4" DIAMETER	1080

THE ROPE STRENGTH NEEDED TO RAISE A LOAD OF A GIVEN WEIGHT MAY BE DETERMINED BY USING THE RATIOS SHOWN. THESE RATIOS ARE BASED ON THE ROPE STRENGTH REQUIREMENT DIVIDED BY THE WEIGHT TO BE LIFTED.

(RP-17306-L)

FIG. 2 SAFE LOADS FOR MANILA ROPE (PAR. 6.1)

operation; where obstructions by cable racks, auxiliary framing, framework, etc., make it necessary to perform work operations at, near, or above eye level.

NOTE: In any of the above operations where dust or dirt may enter the ventilating holes in the frame of the R-3055 Goggles, the holes may be covered temporarily with scotch sealing tape (listed in Section 0 of Handbook 250 as item 542.1).

4.22 An R-2764 Face Shield may be worn where a sever impact, or hazard from dirt or dust does not exist but frontal and lateral eye protection is required.

4.23 Protect the hands from injury be wearing gloves when using cold chisels or hand drill chucks, or when handling equipment like auxiliary framing bars, ladder track, etc.

4.24 Washing hands with solvents such as gasoline, kerosene or spirits of petroleum is dangerous.

4.25 File off burrs or sharp edges on ironwork, bus bars and cable hole sheathing at the time of installing, where there is a possibility of personal injury.

4.26 Delay as long as practicable, the mounting of cable brackets and other details which would present accident hazards if installed too soon.

4.27 Where the ends of threaded rods projecting below the auxiliary framing bars are removed by breaking with a pipe or other device, care should be taken to leave no sharp edges on the rods which might cause personal injury.

4.28 Remove protruding nails and splintered wood from boxes and crates immediately after unpacking them.

4.3 Hoisting and Erecting Operations

4.31 WHEN HOISTING EQUIPMENT OF ANY KIND, ALWAYS STAND TO ONE SIDE, WATCH THE EQUIPMENT BEING RAISED, AND BE SURE THAT YOU CAN GET OUT OF THE WAY IN CASE THE EQUIPMENT BEING RAISED SHOULD FALL.

4.32 Make sure that "Eye" bolts or ropes used to attach hoists to the frames are properly placed and secured before attempting to lift the load.

NOTE: The R-72068 U Bolt is made from special hardened and heat treated steel for hoisting and erecting heavy equipment such as frames, racks, bays, cabinets, etc. While these bolts should preferably used used for all hoisting operations, it is permissible to substitute equipment U Bolts (3/8" or 1/2" size) for light hoisting when the R-72068 U Bolt is not available. It is important, however, that the use of equipment U Bolts be restricted to relay rack units and other frame mounted equipment hoisted in conjunction with the R-1497 or R-1844 1/4 Ton Rope or chain hoists. See Section 50A.

4.321 A visual inspection of the R-72068 Chain Hoist "U" Bolt and Nuts should be made before they are placed in use to determine whether any mechanical defects such as cracks, stripped or excessively worn threads, etc., are present. All defective tools should be returned to Installation Stockkeeping immediately and replacing tools requisitioned.

4.33 Do not load the hoists to such an extent as to strain the hooks or cause the operation to become hazardous. Open hooks and stretched load chains are invariably the result of abuse and neglect.

4.331 To avoid excessive strain on the hooks of hoists do not attach them directly to the auxiliary framing bars.

4.34 Make certain that temporary bracing for frames, is installed in such a manner as to preclude the possibility of the frames falling.

4.341 Avoid the use of clamping devices for temporarily bracing frames that might result in accidents due to the clamps becoming disengaged.

4.35 A hoist shall not be used for lifting loads greater than the manufacturer's rated capacity.

4.36 Inspect equipment used for supporting hoists each time the equipment is set up. Also inspect the hoists. (See Handbook 28.)

4.37 The load (top) hook of the R-1279, R-1496 and R-3626 Hoists should be equipped with a safety latch to prevent accidental disengagement of the hook from the hoisting clamp. This might occur if the "taking up" and "slacking off" operations are not performed in exactly the proper sequence and to the right extent. The support hook of these hoists should also have a safety latch to prevent disengagement from the hoist support due to accidental jarring, etc. If these hoists are not equipped with safety latches, they should be returned to Installation Stockkeeping.

5. PRECAUTIONS AGAINST BUILDING AND EQUIPMENT DAMAGE

5.1 When moving frames, ladders or other bulky articles, exercise special care to prevent knocking against any part of the building or equipment. This also applies when erecting frameworks, installing ladder tracks and all mounting operations.

5.2 Do not open boxes near working equipment.

5.3 Clean up packing materials promptly so they will not be tracked around the building and possibly blown into exposed apparatus, especially working equipment.

5.4 To prevent the possibility of damage, do not remove units or panels from shipping frames or cases until ready for mounting or making changes preliminary to mounting. Keep equipment covered at all times when not actually working on it.

5.5 Where equipment is in cabinets or where other protection is provided, such as individual or common can covers, keep the parts covered at all times when not actually working on it.

5.6 Protect can covers against possible damage during the intervals that they are necessarily removed from the apparatus or panels.

6. SAFE LOADS FOR MANILA ROPE

6.1 Safe loads for manila ropes are shown in Figure 2.

7. SAFE LOADS FOR BEAM CLAMPS, CEILING INSERTS, THREADED RODS, LAG SCREWS AND FRAMING BARS

7.1 Safe loads for beam clamps, ceiling inserts, threaded rods, lag screws and framing bars for the purpose of determining the spacing of supports other than normal, may be considered as follows.

5/8" - 11 threaded rods	1200 lbs.
UNISTRUT	1200 lbs.
Ceiling inserts (Kneas sockets or equivalent)	1200 lbs.
Acme beam clamps	800 lbs.
5/8" Loxin shields or equivalent (in rock concrete)	500 lbs.
3/8" lag screws in wood (2" or more)	300 lbs.
Framing Bars (one pair, 2" x 3/8" steel) or channels (one pair 2" x 9/16" x 3/16" steel). Span between supports	
Up to 2'-0"	2000 lbs.
2'-0" to 3'-0"	1500 lbs.
3'-0" to 5'-0"	1000 lbs.
5'-0" to 7'-0"	700 lbs.
7'-0" to 8'-0"	500 lbs.

NOTE: The safe loads shown above are for a single insert, etc. Where loads to be hoisted exceed those limits, the framing bars should be so arranged and the hoists so located that the load will, as far as practicable, be evenly distributed among the several ceiling supports used.

→ Indicates new or changed information.

Engineering Planning Manager
Common Installation Engineering

Reason for Reissue:
1) To change 1/2" manila rope data in Figure 2.
2) To change information in Paragraphs 4.35 and 4.37.
3) To add Unistrut data to Paragraph 7.1.