

ONE-PIECE DOOR JAMB HARDWARE FREQUENTLY ASKED QUESTIONS

11. **Can I just replace one side of my jamb hardware?** If the old hardware was produced before 1988, the new hardware will have a different geometry, and the both sides of the hardware must be replaced. If the old hardware was produced after January 1988, the new hardware will have the same geometry, but Holmes recommends that both sides be replaced.
12. **How big should my door be to properly fit the opening?** Holmes recommends that the door should be $\frac{3}{4}$ " to 1" narrower than the opening width and 1" taller than the opening height. It is also important that the squareness of the door match that of the opening.
13. **My door is rubbing on one side. Why?** There are a few causes for this:
 - The door may be too narrow for the opening. The door should be $\frac{3}{4}$ " to 1" narrower than the opening. This leaves $\frac{3}{8}$ " to $\frac{1}{2}$ " on each side of the door.
 - The door angle may be mounted too far from the edge of the door. This will cause the master arm to pull the door closer to the jamb and cause it to rub.
 - The master plate may not be mounted plumb (vertically straight). This will cause the door to rub on one side when open and rub on the other side when closed.
14. **What is the measure down dimension and why is it so important?** The measure down dimension is the measurement that is used to correctly position the master plate on the jamb. It is the measurement from the bottom of the header to the lag screw hole for the top hole in the master plate. The measure down dimension is important because it positions the hardware so that, when the door is open, it is sitting level. Each model of hardware has a different measure down dimension, and it is always necessary to add the thickness of the door to the measurement.
15. **How do I measure the thickness of the door?** The thickness of the door should be measured from the back of the door, where the door angle is mounted, to the outer most surface of the face of the door. This must include any decorative molding on the face of the door.
16. **My door droops down in the opening. Why?** This has several possible causes:
 - The measure-down dimension may be too short. This will cause the door to be mounted too high which prevents the door from opening all the way.
 - The springs may not have the recommended 1" to 2" of pre-stretch to hold the door fully open.
 - The electric garage door opener may be adjusted to stop before the door is completely open. The customer should refer to the operator instructions or contact the opener manufacturer for the proper steps to adjust the opener.

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17. **Why does my door open too far and slope back into the garage?** This is caused by a measure down dimension that is too large. The hardware is mounted too low on the jamb, and the door opens too far.
18. **Why does my door sag in the middle when it's open?** Wide doors, like most 2-car garage doors, are usually reinforced with truss rods. If the door does not have truss rods, the customer can be referred to purchase them. If the door has truss rods, they may have loosened allowing the door to sag. In this case, the nuts on the end of the rods should be tightened until the sag is eliminated. In some cases, the door has been sitting in a sagging position for many years, and the wood has permanently deformed. In cases like this, it is impossible to remove all of the sag.
19. **My door sits too deep within the doorjamb. Why?** There are a few possible causes:
 - The door may be too thick for the size of the doorjamb.
 - The doorjamb may be too narrow for the thickness of the door.
 - The installer may have omitted Step 5 of the installation instructions that states "Loosen 3/8" carriage bolts on cantilever arms"... This allows the installer to adjust the position of the door angle to accommodate a range of door thickness.
20. **How often should I lubricate my hardware, and what kind of oil should I use?** Holmes recommends that all of the pivot points be lubricated at least monthly with a minimum of 30 weight motor oil and a maximum of 90 weight gear oil.
21. **Should all adjustments and/or first time installation be made with the door open?** Installation and adjustment must be made in accordance with the installation instructions. The hardware must be mounted while the door is in the closed position. The springs must be mounted and adjusted while the door is in the open position. It is always good practice to advise the customer that the door must be safely propped in the open position while making adjustments to the springs.
22. **Are there any adjustments made with the door closed?** Yes, some adjustments should be made with the door in the closed position.
 - If Step 5 of the installation instructions was omitted (see above) during the initial installation, the cantilever arm adjustment should be made with door in the closed position.
 - If, after initial installation, it is determined that there is not enough headroom, the headroom adjustment shown in Step 2 of the installation instructions should be made with the door in the closed position.
23. **My door is not horizontal in the open position. Why is one side lower than the other is?** A common cause for this is that the same measure down dimension was not used on both sides of the door. Another possible cause is that the opening may not be level, making it seem that the door is not level.

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24. **Why is my door not square in the opening?** First, it is important to determine whether or not the door and the opening are square. Ideally, the door and opening will both be square and fit properly. However, if either the door or the opening is not square, then the door will never sit square in the opening. If both the door and the opening are not square, they must be equally out of square in order for the door to fit properly in the opening. If the door is the correct size and shape to fit properly in the opening, the gap on each side of the door will be 3/8" to 1/2" and uniform. If the gap is not uniform, it is possible that the installer did not use the same size shims on both sides of the door. If the door needs to be re-shimmed, the installer must go back to Step 5 in the installation Instructions and re-position the door angle on the door.
25. **What does the slotted hole on the kicker assembly do? My kicker assembly has no bolt in that slot.** At the factory, a 3/8" bolt, bushing, and nut are installed in the kicker slot. The kicker is designed to provide the installer with a method of adjusting the balance of the door in the lower 1/4 of travel. The idea is to provide an additional cushioning effect to keep the door from slamming closed. Refer to Step 11 of the installation instructions. If the bolt, bushing, and nut are missing from the kickers, the customer should contact the factory for replacement.
26. **My door was opening too fast, so I moved the bolt on kicker towards the main pivot point. Now my door is balanced at the top, but it's too heavy from the closed position when I try to open the door. What do I do?** The balance of the door in the lower 1/4 of travel is adjusted using the bolt in the slot in the kicker. See above and refer to Step 11 of the installation instructions.
27. **How much clearance do I need from the top of the garage door to the ceiling of the garage?** The amount of headroom clearance required will depend on the model number of the hardware. The E900 requires 5" in the #1 headroom hole, 3" in the #2 headroom hole, and 1" in the #3 headroom hole. Refer to Table 1 in Step 2 of the installation instructions. For other model numbers, refer to the book of headroom and swing-out curves.
28. **If I have chain at the bottom, what is the best way to stretch the spring?** The best alternative for the average homeowner is to recommend that they purchase the Lower Jamb Connector (LJ-1P) and replace the chain. The LJ-1P makes it much easier to adjust the stretch of the spring, because it allows the customer to use a screwdriver and/or wrench to make the adjustments. If the customer prefers to use the chain, the spring must be removed from the kicker in order to move the lower end of the spring up or down on the chain. The technique for removing or replacing the spring from the kicker requires good hand, leg, and back strength. To remove the spring from the kicker, the person must (1) straddle the springs with legs bent, (2) firmly grip the top of the springs, and (3) straighten the legs and pull up on the spring removing it from the kicker. The same technique is used to replace the spring.

ONE-PIECE DOOR JAMB HARDWARE FREQUENTLY ASKED QUESTIONS

29. **How far above the garage door should the garage door opener rail be mounted?** The customer should (1) refer to the installation instructions that were provided with the opener, (2) contact the opener manufacturer for recommendations, or (3) contact a professional installer.
30. **The 18.5" maximum allowable stretch of the P728, when added to the 28" spring length, totals up to a maximum total length of 46.5". However, what about the 2" of pre-stretch? Shouldn't it be 48.5" maximum total length or only 16.5" maximum stretch?** The 18.5" maximum stretch includes both the pre-stretch and the stretch due to the motion of the master arm. What's important is that the maximum total length of the P728 spring should not exceed 46.5" when the door is closed.



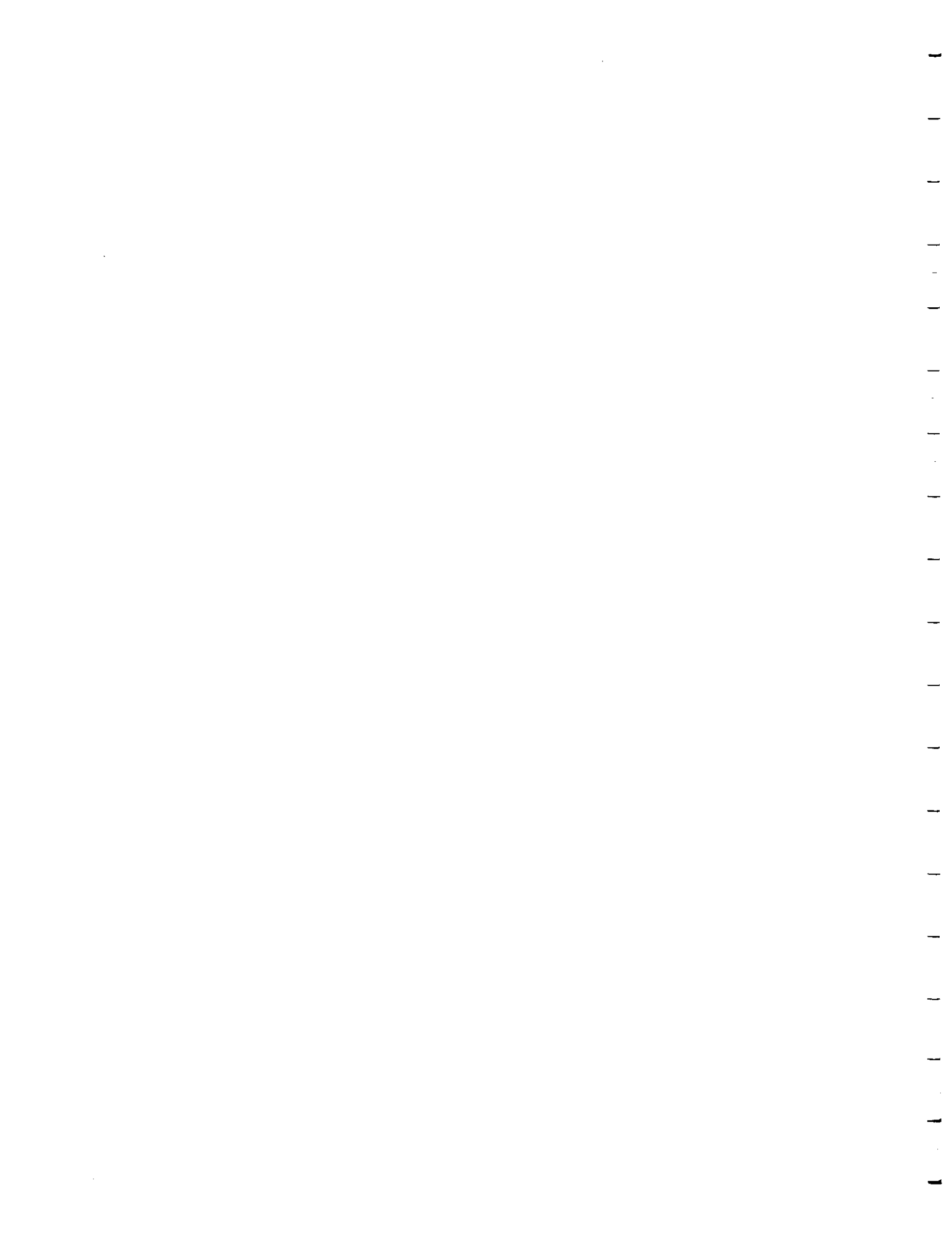
ONE-PIECE DOOR JAMB HARDWARE FREQUENTLY ASKED QUESTIONS

1. **What is the cycle life of our springs?** Holmes springs are designed in compliance with the Uniform Building Code (UBC) which states that the springs must be designed to last a minimum of 9,000 cycles.
2. **What is the life expectancy of a spring?** To comply with the UBC the springs must be designed to last a minimum of 9,000 cycles. The life expectancy will vary depending on how often the door is operated.
3. **How often should I change my springs?** Holmes recommends that the springs should be replaced every five years. The warning label on the hardware master plate states "In the interest of safety, springs that last five years should be replaced".
4. **Should I change out all of my springs or can I replace just the broken one?** If one spring has broken, it is likely that the others will also break soon. For this reason, we recommend that all springs should be replaced.
5. **Where is the "main-pivot" point?** The main pivot point is located where the master arm pivots on the master plate. The master arm is a heavy steel bar, usually 3/8" thick and 1-3/4" wide, to which the kicker and springs are attached. The master arm has between five and seven holes at the end where the springs mount. The master plate is an 8" wide steel plate with a bent flange that mounts to the jamb.
6. **Which way do I move the kicker adjustment bolt if my door feels too heavy?** The bolt should be moved away from the main pivot point or closer to the end of the master arm. Conversely, if the door opens too fast, move the bolt closer to the main pivot point.
7. **Why are some hardware parts not replaceable?** Some of the components are riveted in place in the factory, making it impossible for replacement in the field. Only components that are installed with bolts and nuts are available for replacement.
8. **What are the "door jambs"?** The doorjamb is the wood-framing member to which the master plates are mounted. The UBC requires the jambs to be 2 x 6 pieces of lumber that have the density of Douglas Fir or better.
9. **What is the "header"?** The header is the structural piece of lumber that forms the top of the door opening. It is usually a 4 x 12 piece of lumber or larger, and it supports the weight of the building over the door opening. The garage door should close tightly against the back of the header.
10. **Can I install my new hardware in the old jamb holes?** For two primary reasons it is not recommended that a replacement hardware set be installed in the existing jamb holes. First, the integrity of the hole is diminished after the first lag screw is removed, and the replacement screw will likely pull out. Secondly, the measure down dimension of the old hardware may not match the new hardware. Refer to Step 4 in the Installation Instructions.



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May 20, 1997





Technical Basics

Residential One-Piece Garage Door Hardware

I. TYPES OF ONE-PIECE HARDWARE

a. Jamb type:

Jamb type one-piece door hardware is essentially a pair of hinges (a.k.a. four bar linkages) which mounts to the door and to the door jambs. The motion of the door is controlled by the geometry of the hinges, and the weight of the door is counterbalanced by extension springs which are attached to each hinge. Refer to diagram 1 for drawing of a typical one-piece door hung on jamb type hardware.

Benefits:

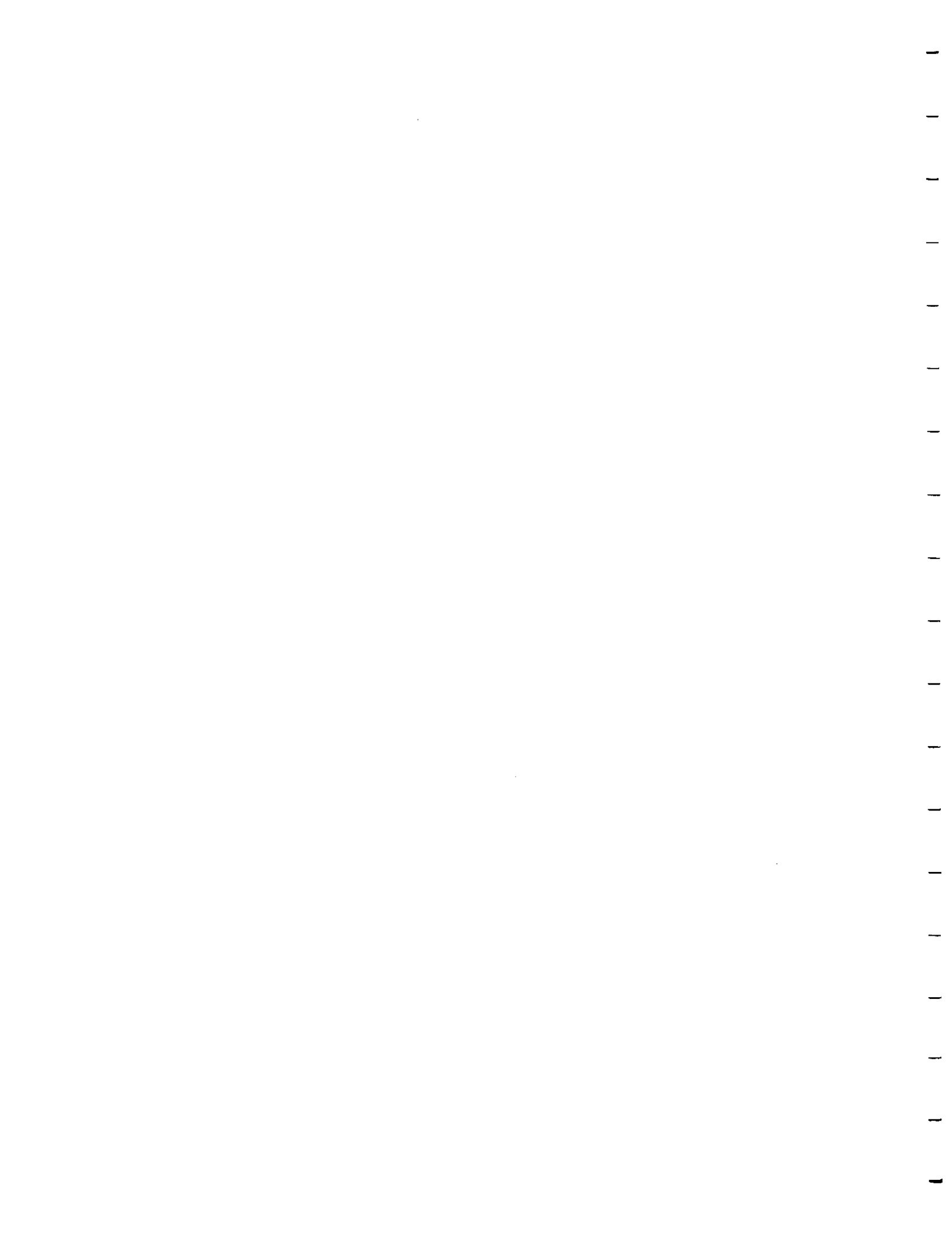
- Fewer components to install compared with jamb type with track or with sectional doors, resulting in less installation time.
- Less interference with beams and floor joists in the garage since the door remains approximately half inside and half outside the garage while in the open position.
- Less headroom required. As little as 1-1/2" needed.
- Smoother operation with electric openers compared with jamb type with track.
- Wide selection of jamb type hardware is available, accommodating door heights from 6'4" to 12'5", and door weights from 200 to 450 pounds. Hardware is also available for specialty applications such as electrically operated doors and flush mounted doors.
- Quieter operation than typical sectional doors.
- Less costly compared with installations using jamb type hardware with tracks or with sectional doors.
- Designer friendly.

b. Jamb Type with Track:

Jamb type one-piece door hardware with tracks is comprised of two pivot arms and two horizontally mounted tracks. The pivot arms mount to each door jamb and support the lower corners of the door, while the upper corners of the door are supported by rollers which ride in the tracks. Refer to diagram 2 for a drawing of a typical one-piece door hung on jamb type hardware with track.

Benefits:

- Fewer components to install compared with sectional doors, resulting in reduced installation time.
- Less costly compared with installations using sectional doors.
- Typically, in the open position, the door is almost entirely inside the garage. This is beneficial if a door which extends beyond the building is undesirable or not in compliance with building codes.
- Designer friendly.





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Residential One-Piece Garage Door Hardware

II. MAJOR COMPONENT PARTS OF ONE-PIECE JAMB TYPE

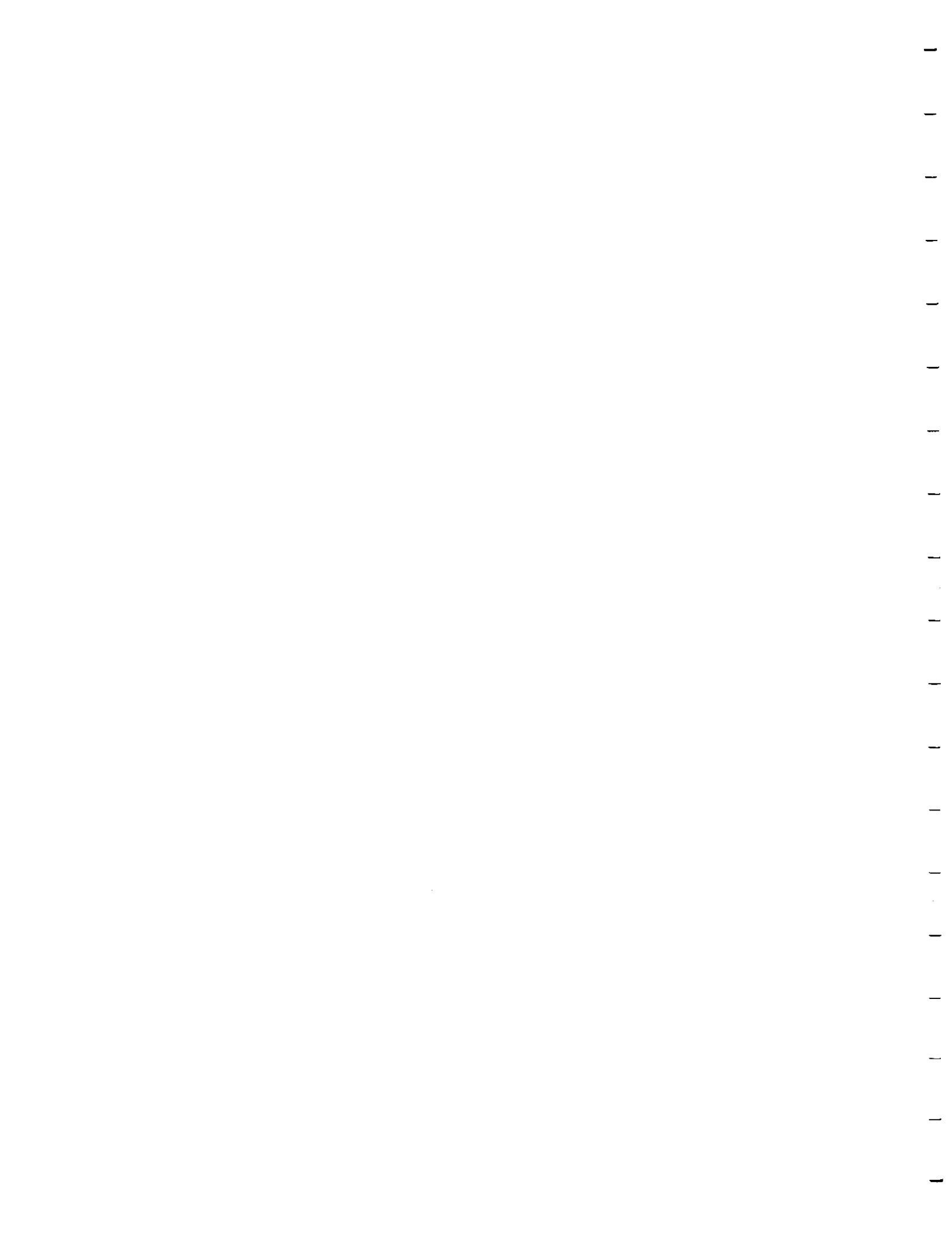
Refer to diagram 3 for a visual description of the following parts.

- a. Master Plate: for attachment to the door jamb.
- b. Master Arm: the main load carrying member.
- c. Door Angle: for attachment to the door.
- d. Kicker Assembly: for the attachment of springs to the master arm, for adjustment of spring tension, and, by using the bolt in the slot, for adjustment of spring force in the last 1/4 of door travel.
- e. Spring Connector Assembly: for the attachment of springs to the kicker and to the chain or lower jamb connector. Also serves to contain the spring if the spring breaks.
- f. Cantilever Arms: for adjusting the vertical position and angle of the door when in the closed position.
- g. Extension Springs: for counter balancing the weight of the door.
- h. Spring Anchor Chain: for attachment of springs to the jamb.
- i. Lower Jamb Connector: another method for attachment of springs to the jamb. Makes it easier to install and adjust the tension on the springs.
- j. Fasteners: including pivot points which hold hinge components together, bolts which are used to adjust headroom, spring tension, etc., and mounting hardware.
- k. Main Pivot: the pivot point connecting the master arm to the master plate.

III. MAJOR COMPONENT PARTS OF ONE-PIECE JAMB TYPE WITH TRACK

Refer to diagram 4 for a visual description of the following parts.

- a. Master Plate: for attachment to the door jamb.
- b. Master Arm: the main load carrying member.
- c. Anti-Sway Brace: to help prevent the door from rubbing against the door jambs by stiffening the master arms against swaying.
- d. Upper and Lower Weather-strip: for closing the air gap between the door and the door jambs.
- e. Roller Bracket Assembly: for mounting rollers to the top two corners of the door.
- f. Tracks: support the top corners of the door.
- g. Track End Bracket: attaches the tracks to the header or jambs.
- h. Door Shoe: attaches the master arm to the lower corners of the door.
- i. Extension Springs: for counterbalancing the weight of the door.
- j. Spring Connector Assembly: attaches the extension springs to the master arm.
- k. Spring Anchor Assembly: attaches the extension springs to the door jamb and provides a means for adjusting the tension on the springs.





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- l. **Main Pivot:** the pivot point connecting the master arm to the master plate.
- m. **Fasteners:** including pivot points which hold hinge components together, bolts which are used to adjust spring tension, and mounting hardware.

IV. MAXIMUM DOOR WEIGHTS AND SIZES

a. **Light duty jamb type:** for doors weighing up to 200 pounds, and measuring between 6'-10" and 7'-4" tall. Light duty hardware is generally used on single car garage doors up to 10' wide, but it is also used on up to 16' wide aluminum and light weight steel doors.

b. **Medium duty jamb type:** for doors weighing up to 325 pounds, and measuring between 6'-10" and 7'-4" tall. Medium duty hardware is generally used on double car garage doors up to 16' wide. Wood doors wider than 10' are required to have added stiffening supports, such as truss rods, to prevent the door from sagging while in the open position. Medium duty hardware is also available with a heavy duty main pivot for longer cycle life.

c. **Heavy duty jamb type:** for doors weighing up to 350 pounds, and measuring between 6'-10" and 7'-4" tall. Heavy duty hardware is generally used on double car garage doors up to 16' wide. Wood doors wider than 10' are required to have added stiffening supports, such as truss rods, to prevent the door from sagging while in the open position.

d. **Jamb type for special applications:** Jamb type hardware is available for special residential applications such as (1)hardware designed with a smoother operation for use with electric openers, (2)hardware designed for installations that require the door to be flush to the exterior surface of the garage (a.k.a. flush hung), and (3)heavy duty hardware (commercial grade) for doors exceeding the height and weight capacity of residential hardware.

e. **Jamb type with track:** for doors weighing up to 300 pounds, and measuring between 6'-6" and 7'-8" tall. This hardware is generally used on doors up to 16' wide. Wood doors wider than 10' are required to have added stiffening supports, such as truss rods, to prevent the door from sagging while in the open position.

V. SAFETY ISSUES

a. **Minimum Specifications for Garage Door Jamb:**

It is recommended that both jamb type hardware and jamb type hardware with track be mounted on wood door jambs which comply with the following minimum specifications:





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(1) National Forest Products Association, National Design Standards Table 8.1A, Group II or better material (i.e. Douglas Fir), (2) Minimum Specific Gravity of 0.51 (32 lb. per cubic ft.), and (3) Minimum Dressed Size of 1-1/2" x 5-1/2". If the door jambs are not made from wood, follow the manufacturers recommendations for jamb materials.

b. Safety Containment of Extension Springs:

Garage door springs must be equipped with a device capable of restraining the spring (or spring pieces) in the event that it breaks. Usually the springs will include an integral containment device. In the event a spring is not equipped with a containment device, replace the spring with one that is properly equipped, or contact the manufacturer for recommendations.

c. Spring Design Standard:

Garage door extension springs are designed for a minimum cycle life of 9,000 cycles. (One cycle is equal to one door opening and one door closure.)

NOTE: All of the above are required by law in California as stated in section 312.7 of the California Building Code (Part 2, Title 24, California Code of Regulations). See attachment 1.

VI. WOOD DOOR WEIGHT CALCULATION CHART

See attachments 2-4.

VII. JAMB TYPE SWING OUT CHART

See attachment 5.

VIII. JAMB TYPE HEAD ROOM CHART

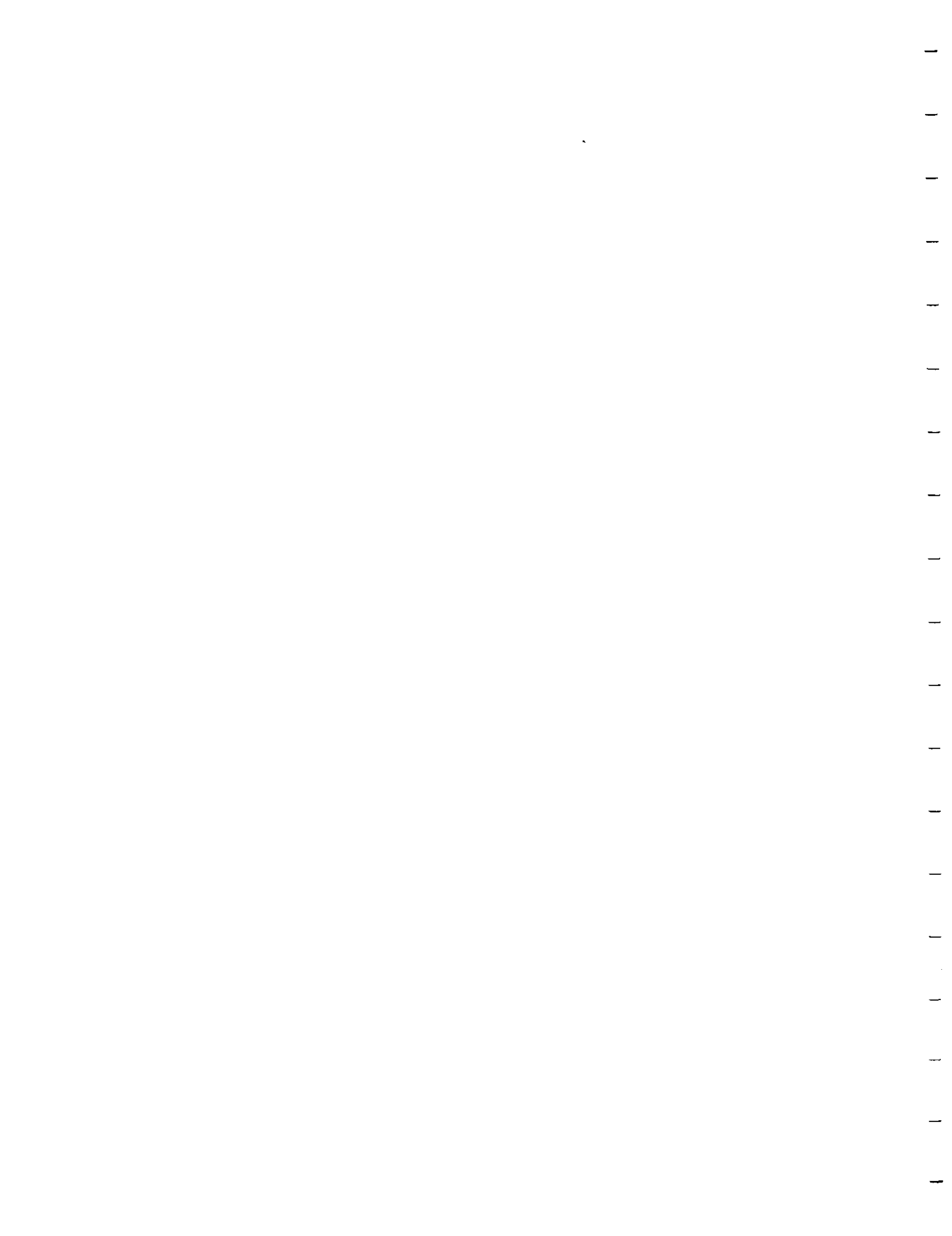
See attachment 6.

IX. JAMB TYPE WITH TRACK SWING OUT CHART

See attachment 7.

X. ADJUSTMENT OF HARDWARE AND SPRINGS

a. Three Headroom Adjustment holes: used to adjust the path of the door to fit within available space between the top of the door and the garage ceiling or other obstructions such as beams or ducts. The offset cantilever arm is bolted to the appropriate hole in the master plate (refer to diagram 1).





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b. Five Power Settings for Spring Adjustment: used to increase or decrease leverage in order to adjust spring tension and achieve a balanced door. The kicker is moved from hole to hole on the master arm (See diagram 5).

c. Cantilever Arm Adjustment: used to adjust the position of the door angle. Two carriage bolts are loosened allowing the length of the arm to be increased or decreased. Adjusting the length of the arm allows the installer to position the door angle against the back of the door for mounting purposes and allows the angle of the door to be adjusted to plumb in the closed position (refer to diagram 3).

d. Spring Pre-Stretch: this is the amount of stretch on the spring(s) when the door is in the open position. Springs should typically have between 1" and 2" of pre-stretch. If the spring is attached to the jamb using chain, adjustment is achieved by moving up or down one link in the chain. If an adjusting bolt is used to attach the spring, adjustment is made by loosening or tightening the nut on the bolt. (See diagram 6)

e. Kicker Adjustment: used to adjust the balance of the door in the last quarter of door travel when the door typically gets heavy and tends to fall closed. A bolt is adjusted up or down in the kicker slot to increase or decrease the "kick", respectively (refer to diagram 5).

XI. ATTACHMENT OF GARAGE DOOR OPENER

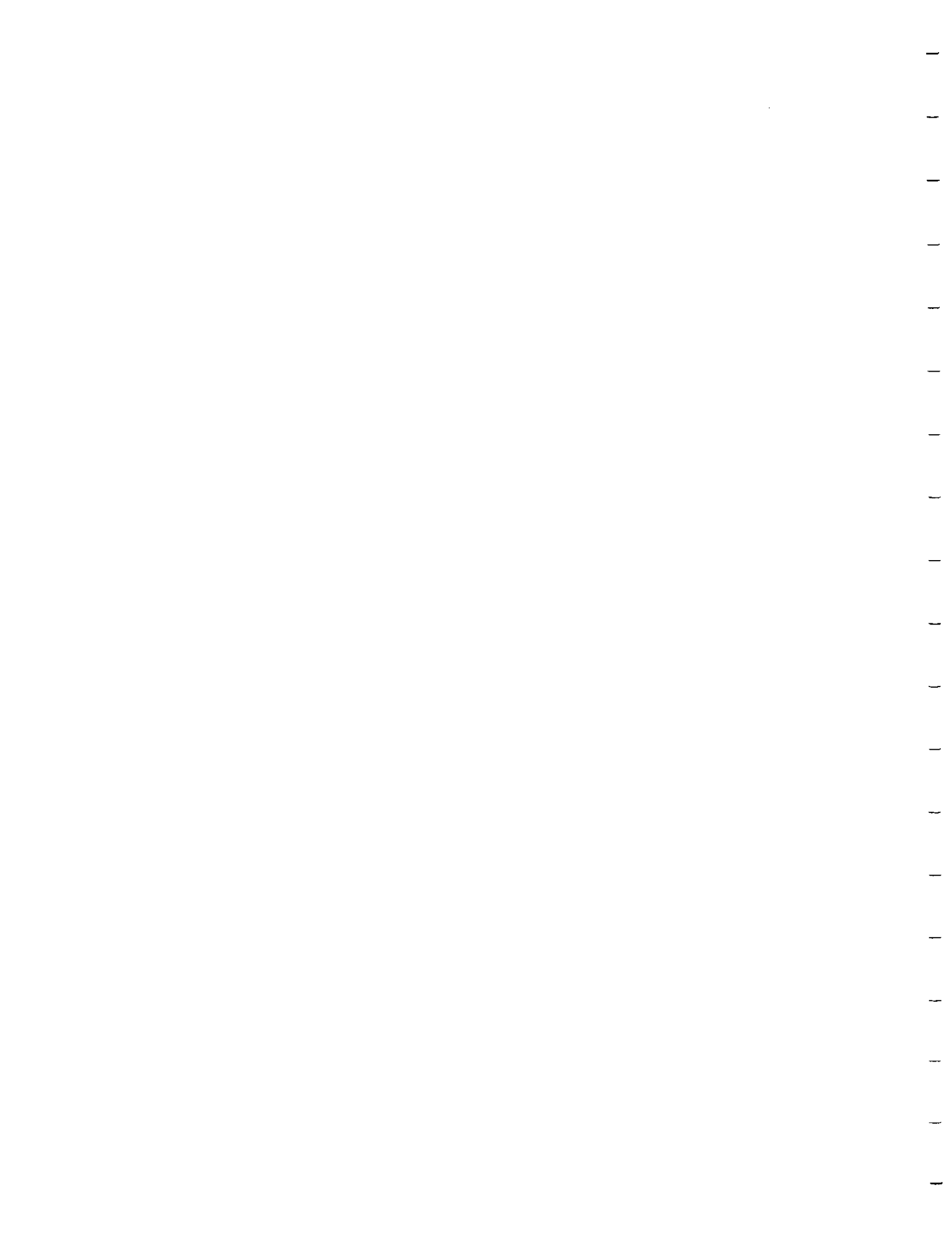
Refer to garage door opener manufacturer's installation instructions for attachment to one-piece type garage doors.

XII. MAINTENANCE

a. Lubrication: all pivot points should typically be lubricated monthly. Follow manufacturer's recommendations for lubrication type and frequency.

b. Door Balance/Spring Adjustment: garage doors should be inspected periodically for proper balance. If the door is electrically operated, the operator should be disconnected per the manufacturer's instructions before testing or adjusting the balance of the door. Springs must be adjusted with the door securely propped in the open position.

- If the door is hard to pull down or goes up too fast in its upper $\frac{3}{4}$ of travel, move the kicker up one hole at a time (both sides) in the master arm until door is balanced.





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- If the door comes down too fast or is hard to lift up in its upper $\frac{3}{4}$ of travel, the kicker must be moved down one hole at a time (both sides) in the master arm until the door is balanced.
- In the lower quarter of travel, the kicker can be adjusted as described in Section X,e.
- It is the best practice to adjust the springs in the same manner on both sides of the door.

c. Visual Inspection: The hardware and the door should be inspected regularly for signs of excessive wear, rubbing or binding which can be an indication of damaged or maladjusted hardware.

XIII. REPAIR/REPLACEMENT

a. Spring Replacement: when replacing a broken spring, a minimum of one spring per side should be replaced to maintain even balancing. Springs tend to lose tension after years of operation. The best practice is to replace all springs if they are more than five years old. Refer to manufacturers instructions for spring replacement.

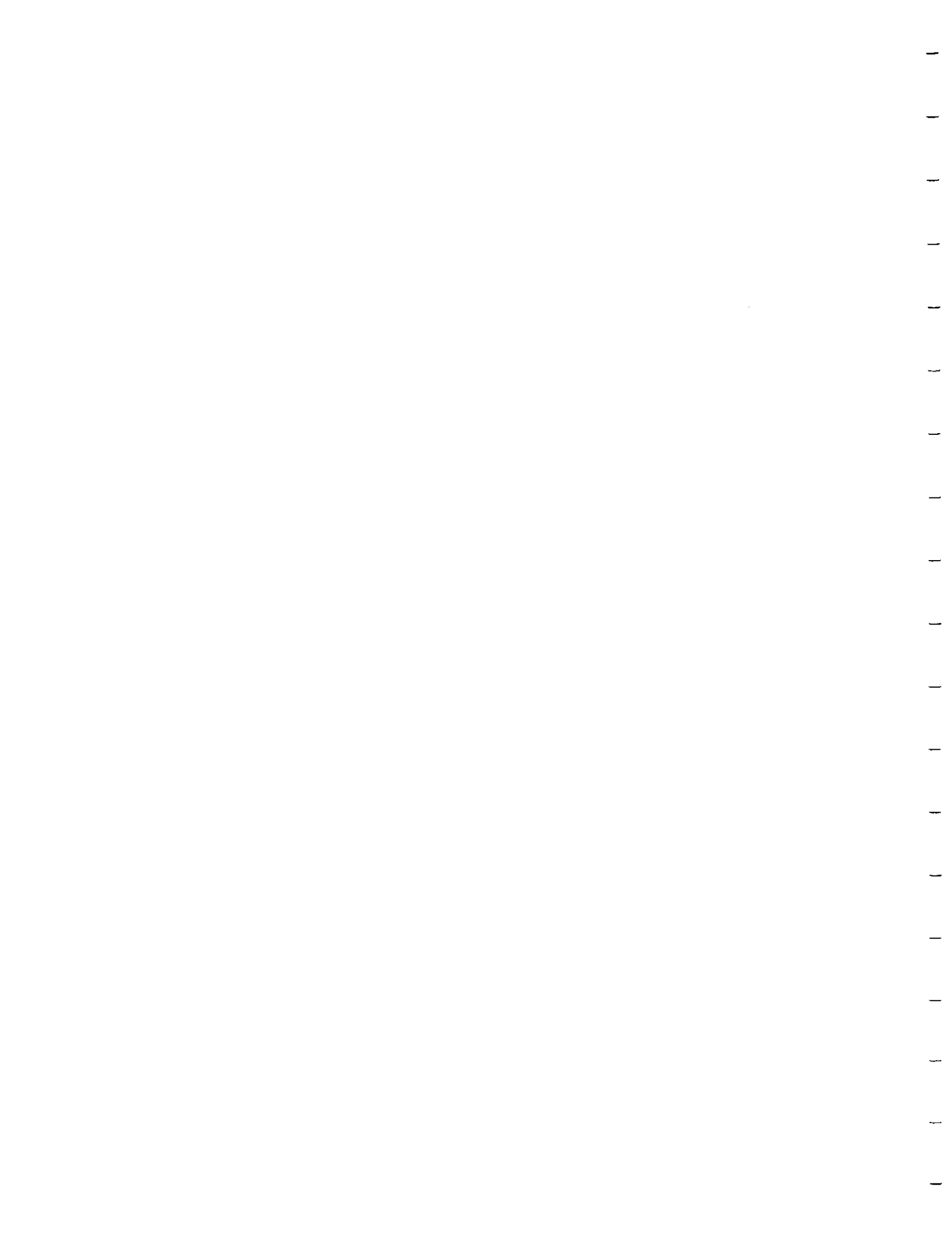
b. Hardware Replacement: when replacing hardware, it is very important to inspect the jambs for damage such as splits, cracks, termite damage, dry rot, or excessive numbers of drilled holes. The integrity of the jambs is of utmost importance, because the weight of the door and the force of the springs are both acting on the lag screws that secure the master plate to the jamb. It is never acceptable to mount a new set of hardware using existing lag screw holes unless at least one of the following is done:

- Plug the existing holes using glue and wooden dowels.
- Drill through the entire jamb and bolt the hardware in place using grade 5 bolts and nuts.
- Add a steel support from the master plate up to the jamb.
- Replace the existing jambs with new jambs.

Refer to Section V-a for minimum jamb specifications. Refer to manufacturers instructions for hardware replacement.

XIV. ACCESSORIES

a. Truss Rod Kits: used for wood garage doors exceeding 10' in width to prevent door from sagging in the open position. Rods are typically mounted to the top and bottom rails of the door. Over an extended period of time, a door may tend to sag, in which case the truss rods may require tightening. Refer to manufacturers instructions for installation and adjustment of truss rods.





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- b. Slide Bolt Lock: for locking the garage door with a padlock. Typically, the slide bolt is mounted 2 to 3 feet from the floor. A slide bolt may be used on each side of the door if desired.
- c. Center Lock: an alternative to a slide bolt lock that is operated from the center of the door and can provide locking on both ends of the door. Some center locks may also be operated from the inside of the garage.
- d. Rubber Bumpers: to prevent damage to the face of the door as it opens against the header. Bumpers are typically mounted to both ends of the header. Extra decorations on the face of the door must be considered when mounting the rubber bumpers. Bumpers can either be positioned to engage the thickest decorations, or they can be shimmed accordingly so that the decorations do not interfere with the header.
- e. Lift Handle: for manual operation of the door. Typically, door handles are mounted 18" to 24" from the floor.
- f. Weatherstrip: mounted to the bottom and sides of the door to close the air gap around the door. Typically, weatherstrip is mounted to the sides of the door below the level of the master plate, and it is mounted to the door jambs above the level of the master plate. Refer to manufacturers installation instructions.

XV. INSTALLATION

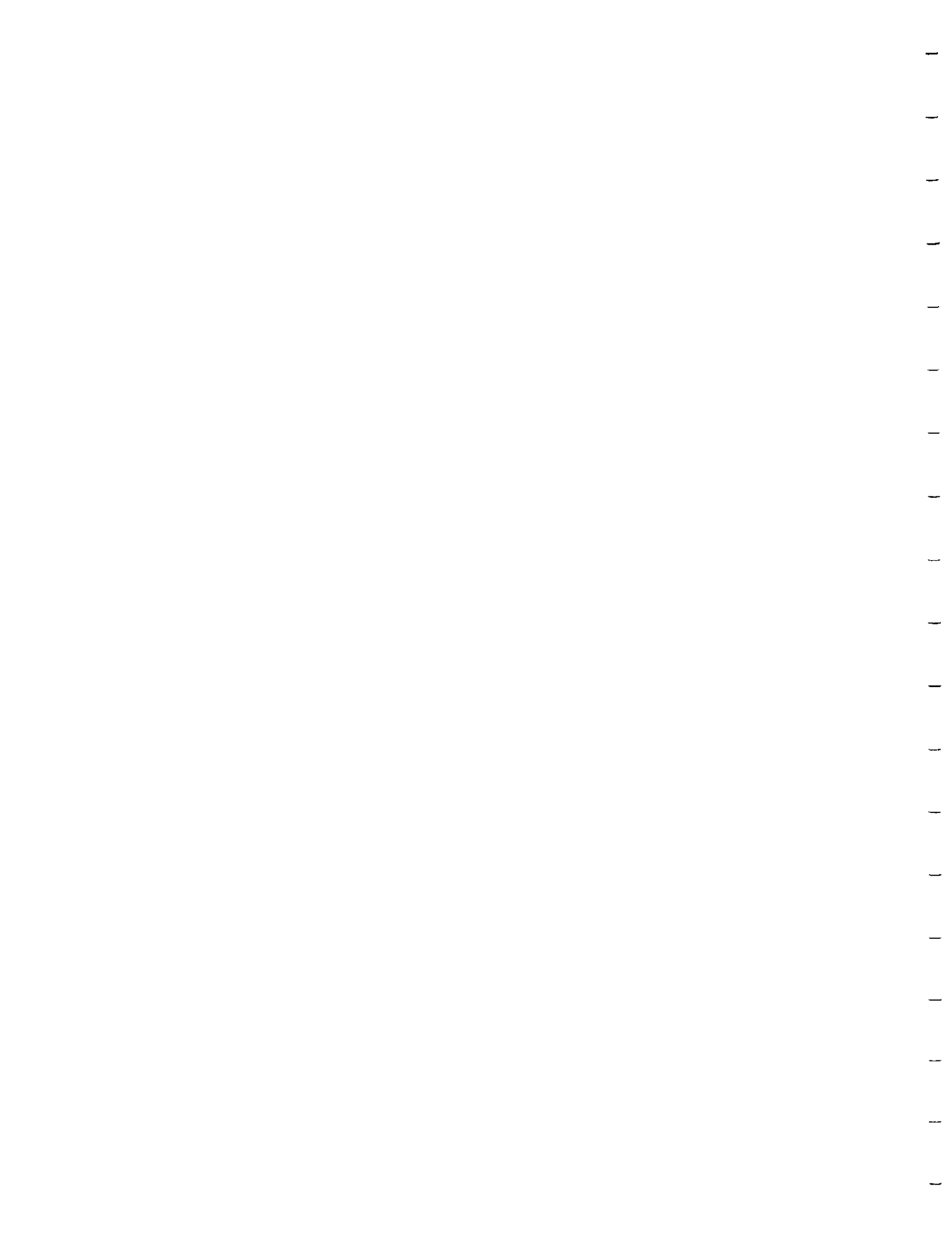
a. Tools:

The following tools are required and/or useful for the installation of one piece garage door hardware:

- Measuring tape
- Hammer
- Power drill
- Drill bit for lag screw pilot holes
- Impact wrench
- Drive socket to fit lag screws
- Slotted screw driver
- Locking type pliers
- Prop stick
- Power saw (if final trim of door is done on site)

b. Installation:

Follow manufacturers installation instructions.





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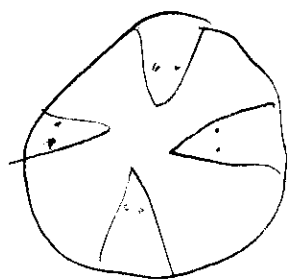
XVI. DOOR CONSTRUCTION

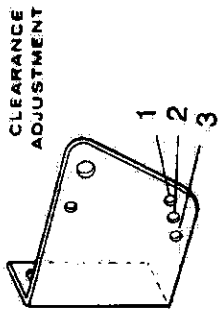
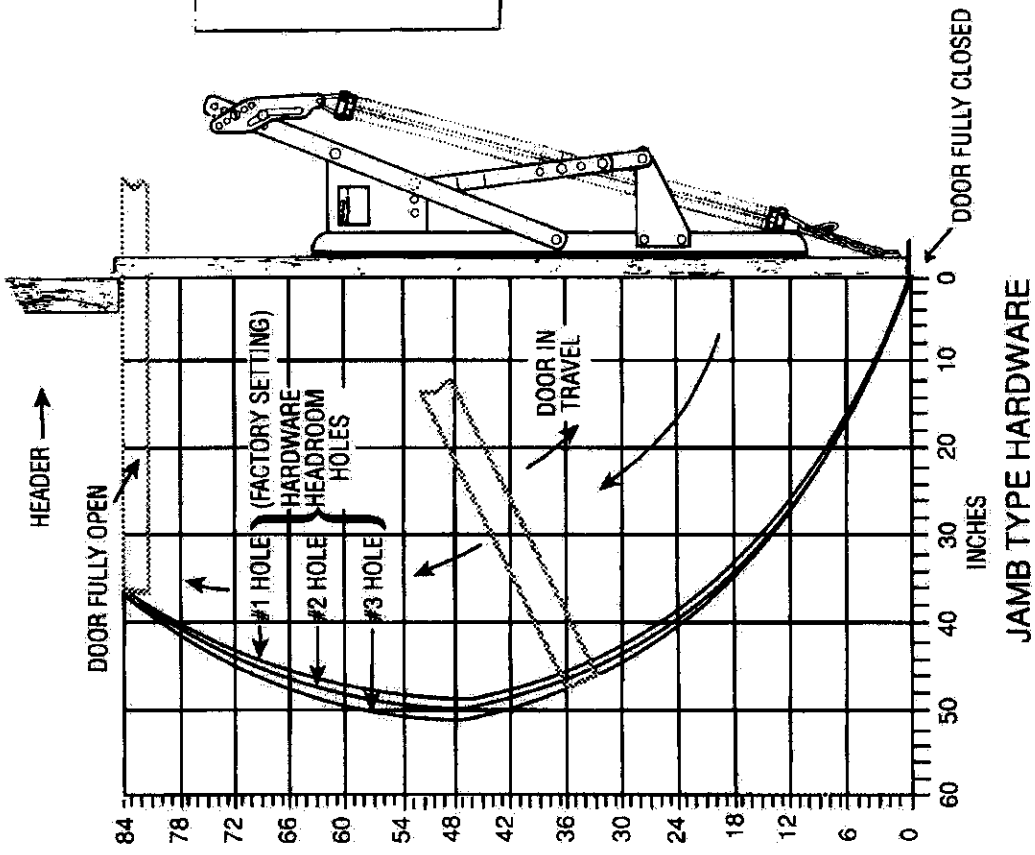
a. Benefits:

In addition to the benefits described in Section I, above, a major benefit of one-piece type doors is the ability to maintain architectural integrity in the construction of the garage and garage door. See attachments 8 & 9 showing some of the design possibilities using one-piece type doors.

b. Construction Guidelines:

- See attachment 10 describing general specifications for wood one-piece type garage doors.
- See attachment 11 describing step by step instructions for manufacturing wood one-piece garage doors.
- See attachment 12 describing fast and efficient production and installation methods.
- See attachments 13 & 14 describing uniform standards for the construction of one-piece garage doors developed by the California Operator & Door Association (CODA).





The necessary distance between the ceiling and the top of the door. It is determined by the travel of the top of the door, as shown in 1, 2 & 3 adjustments in the graph.

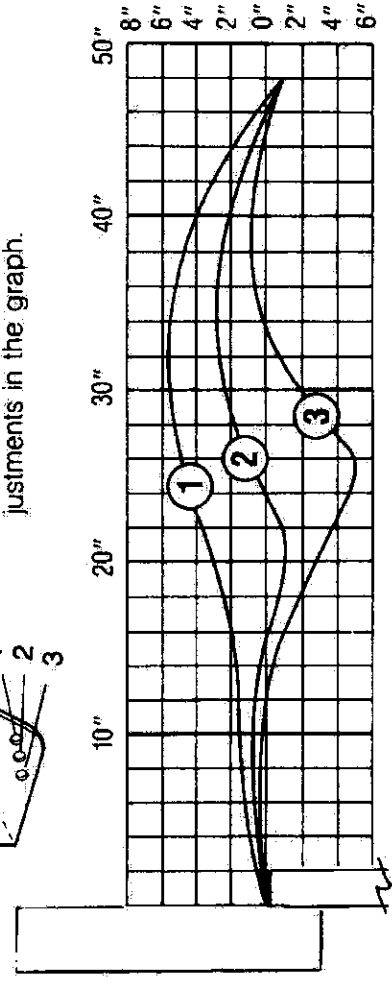
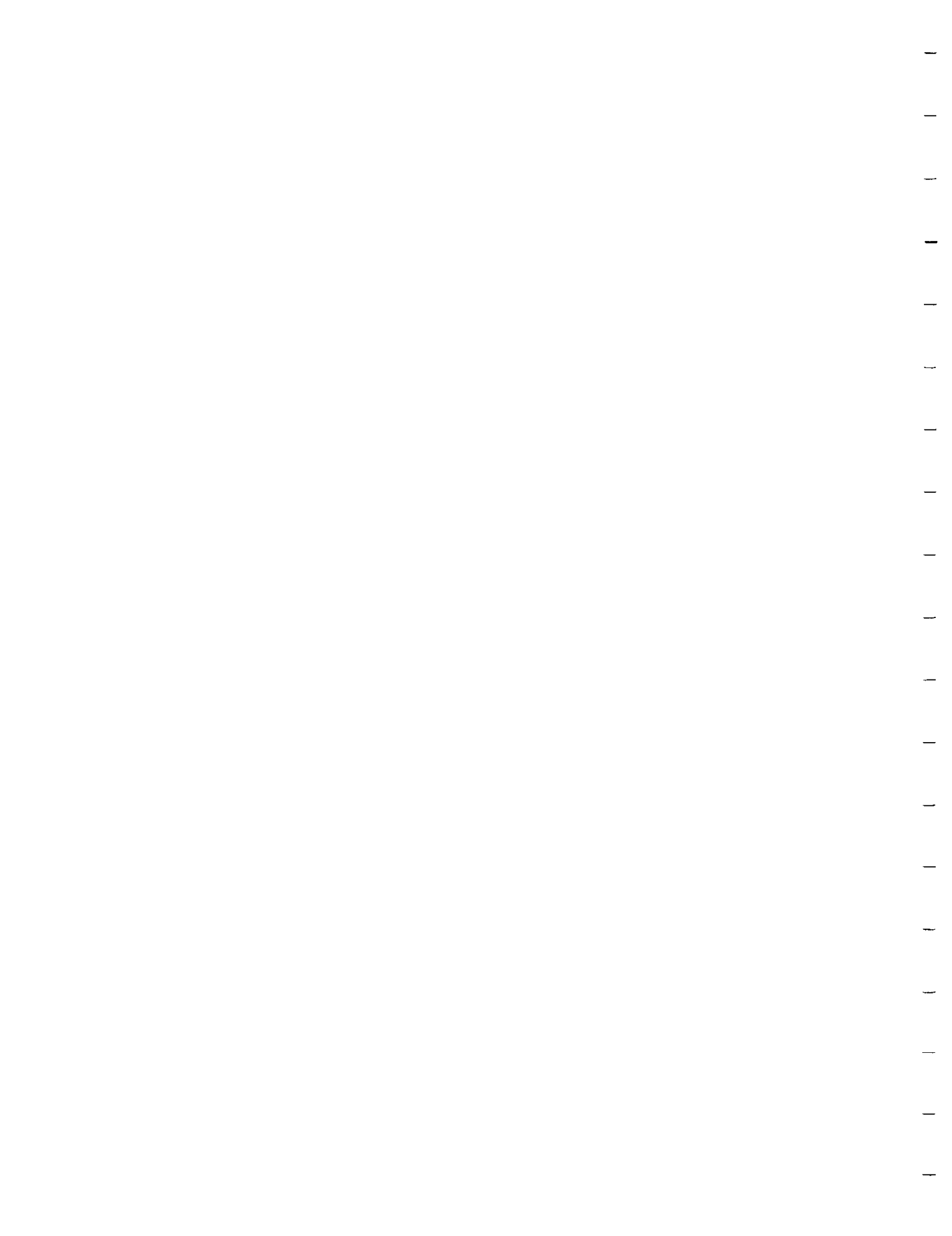
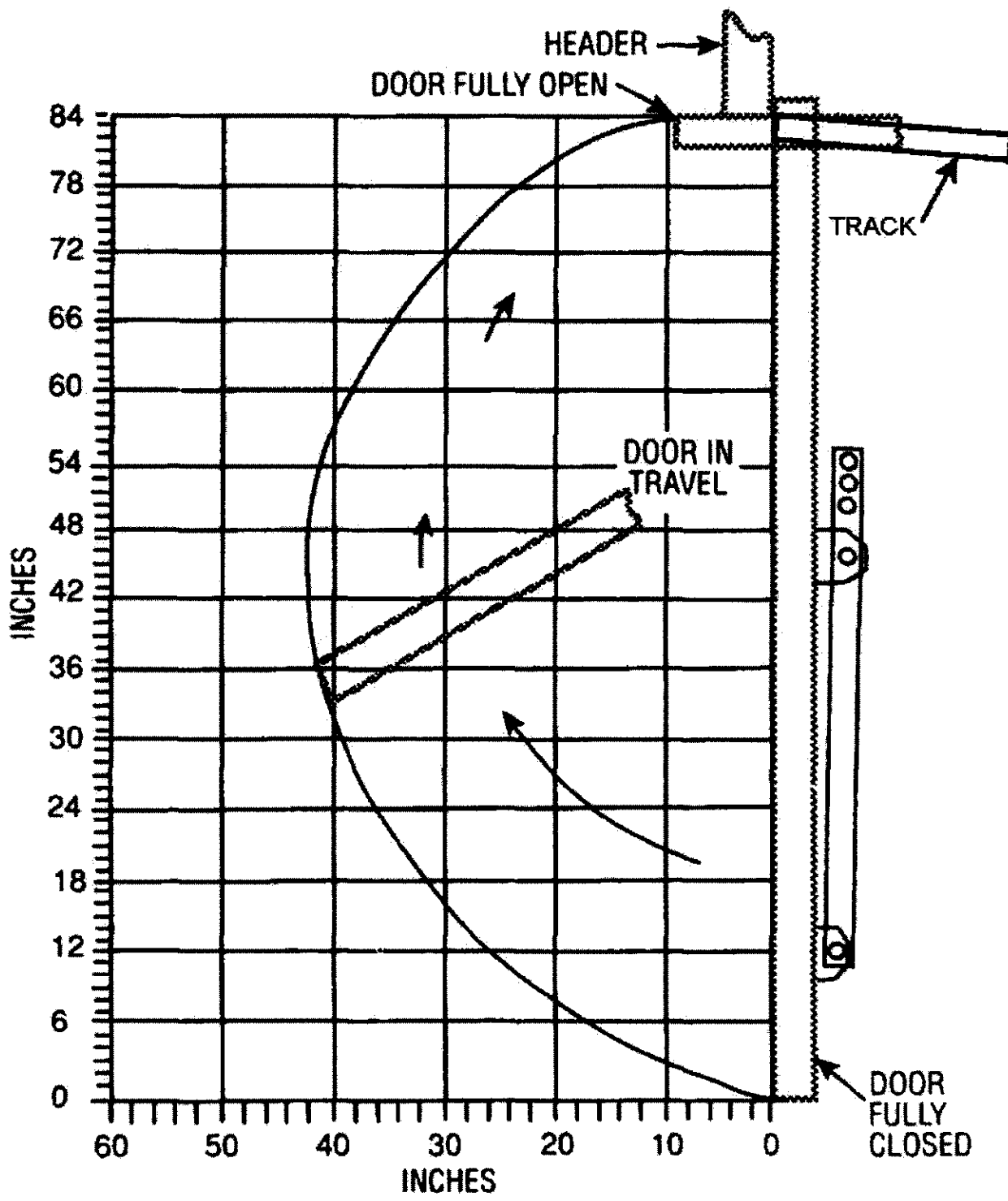
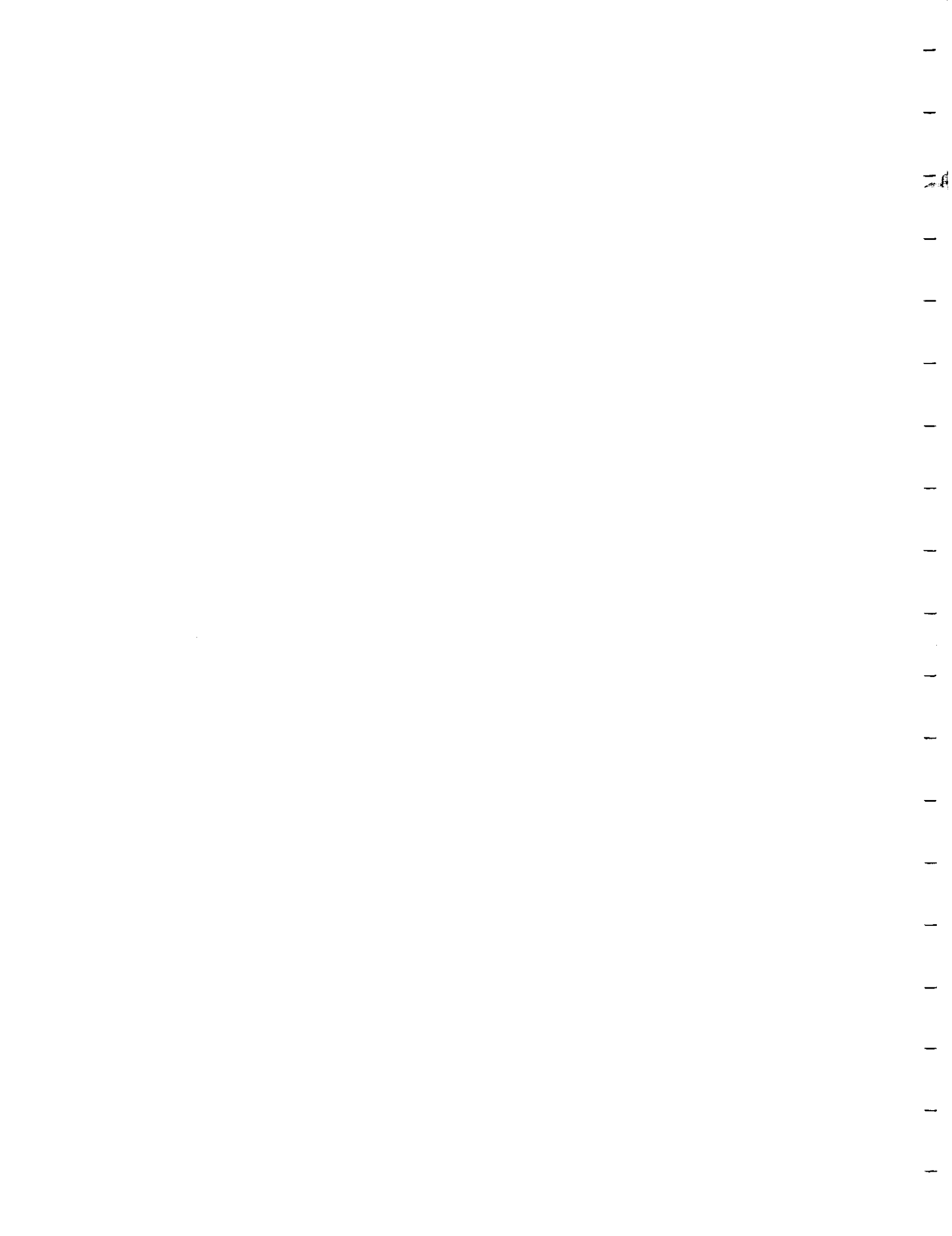


DIAGRAM 1
JAMB TYPE HARDWARE





JAMB TYPE HARDWARE
WITH TRACK
DIAGRAM 2



NOMENCLATURE FOR JAMB TYPE ONE-PIECE GARAGE DOOR HARDWARE

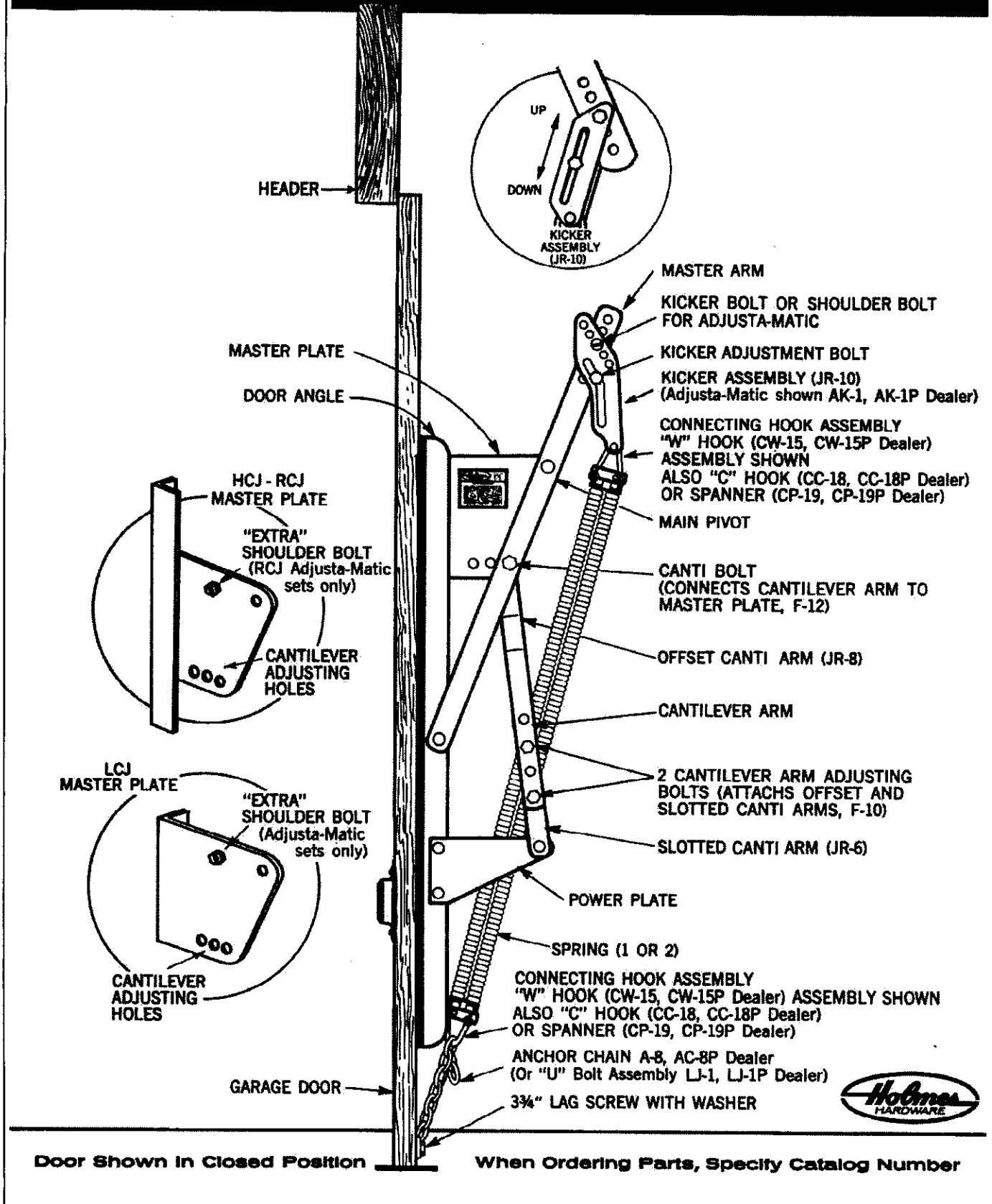


DIAGRAM 3



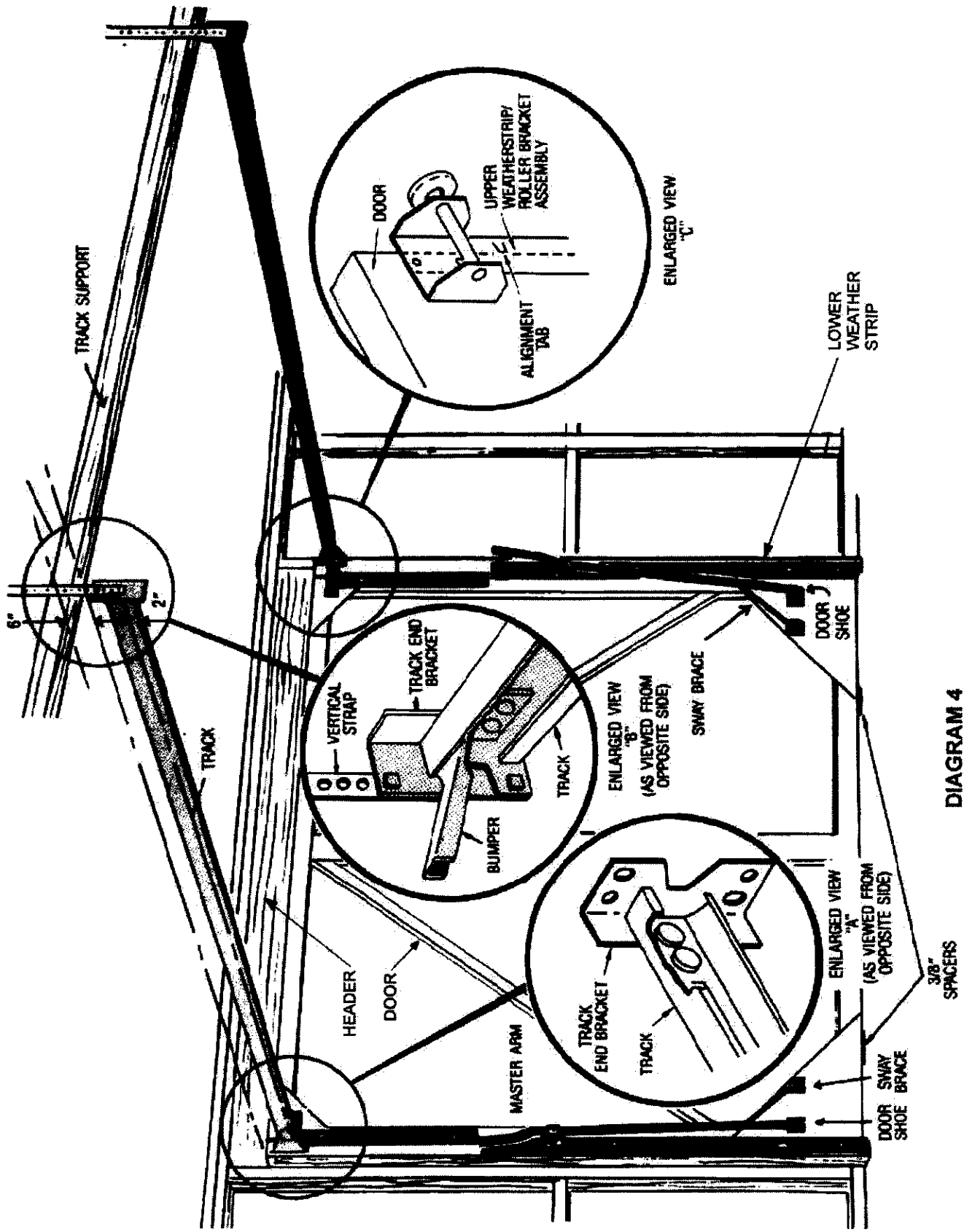
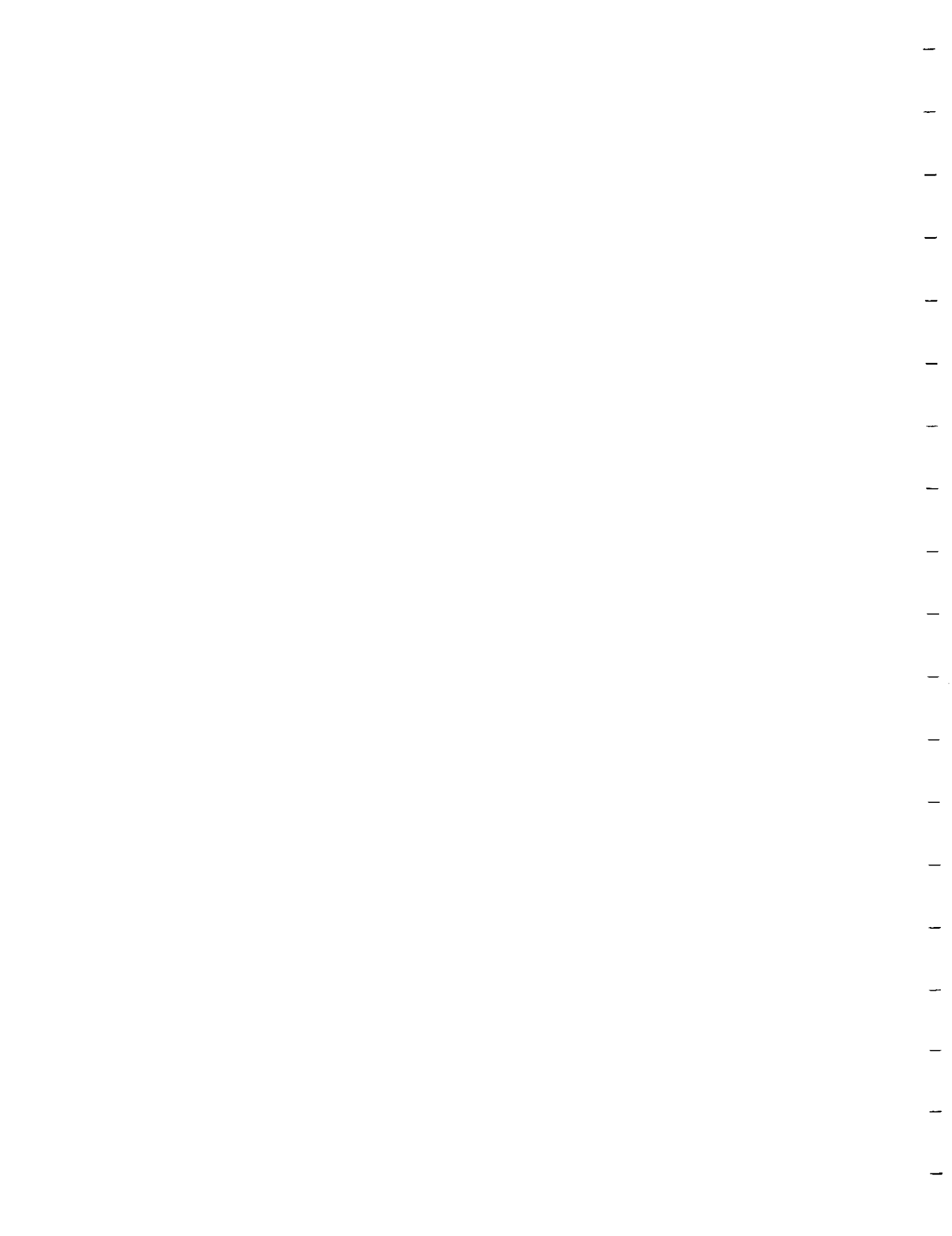


DIAGRAM 4



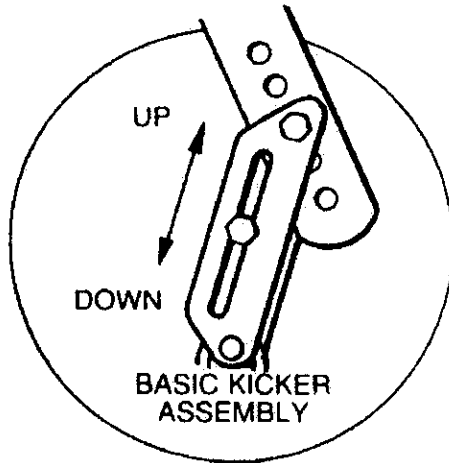


DIAGRAM 5

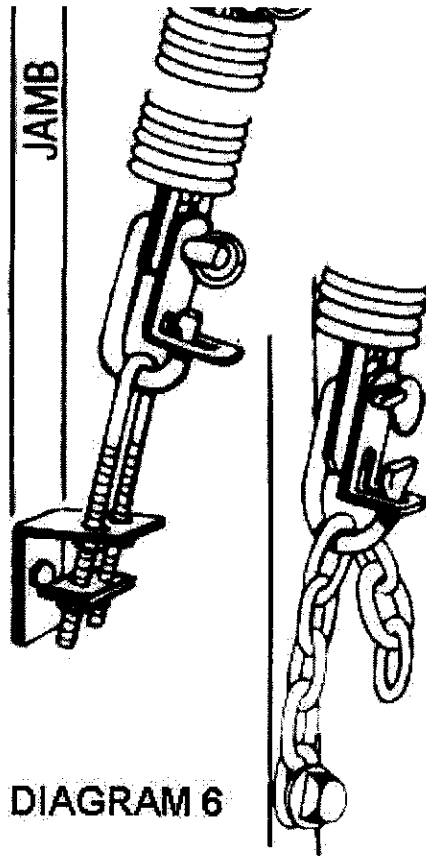
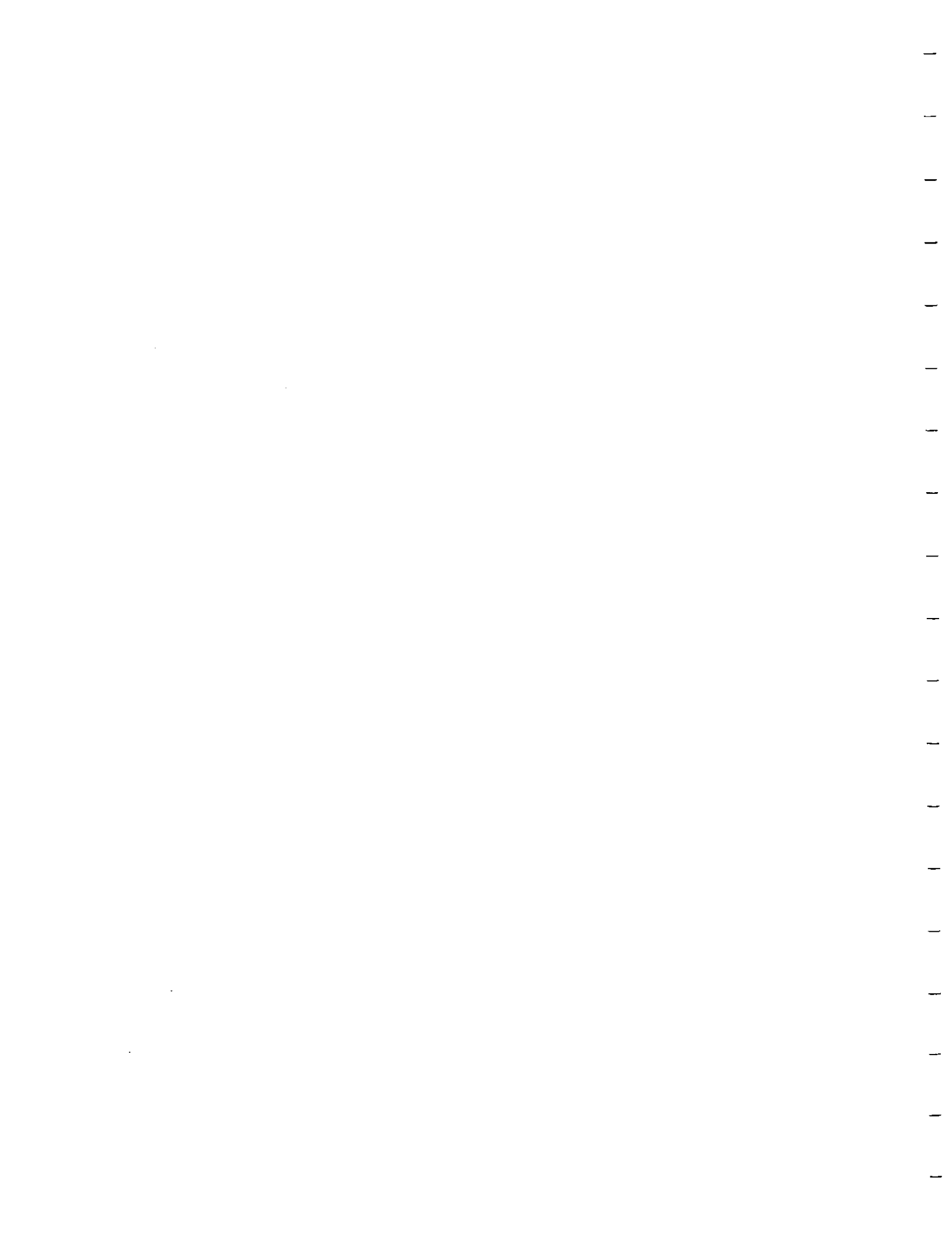


DIAGRAM 6



ATTACHMENT 1

1994 UNIFORM BUILDING CODE

312.7 [For HCD 1 & 2] Springs.

312.7.1 Extension Garage Door Springs. Every garage door spring sold or offered for sale, whether new or as a replacement, or installed in any garage or carport which is accessory to an apartment house, hotel, motel or dwelling shall conform to the following requirements:

312.7.1.1 Hard-drawn spring wire shall conform to ASTM A 227-71, and shall be made by the steel processes described therein, conforming to the chemical compositions requirements listed and meeting the standards of steel heat as set forth by the ladle analysis. Wire tensile strength and dimension variations shall meet the prescribed properties of established standards.

312.7.1.2 Oil-tempered wire shall conform to ASTM A 229-71, and shall be made by the steel processes described therein conforming to the chemical compositions requirements listed and meeting the standards of steel heat as set forth by the ladle analysis. Wire tensile strength and dimension variations shall meet the prescribed properties of established standards.

312.7.1.3 Extension springs shall be fabricated from either hard drawn spring wire or oil-tempered wire as required in Sections 312.7.1.1 and 312.7.1.2 above.

312.7.2 Design Standards. Minimum design standard shall be 9,000 cycles. (One cycle is equal to door opening plus door closing at maximum working load.)

312.7.3 Certification.

312.7.3.1 Mill certification of wire physical tests and chemical properties shall be kept on file by the spring manufacturer.

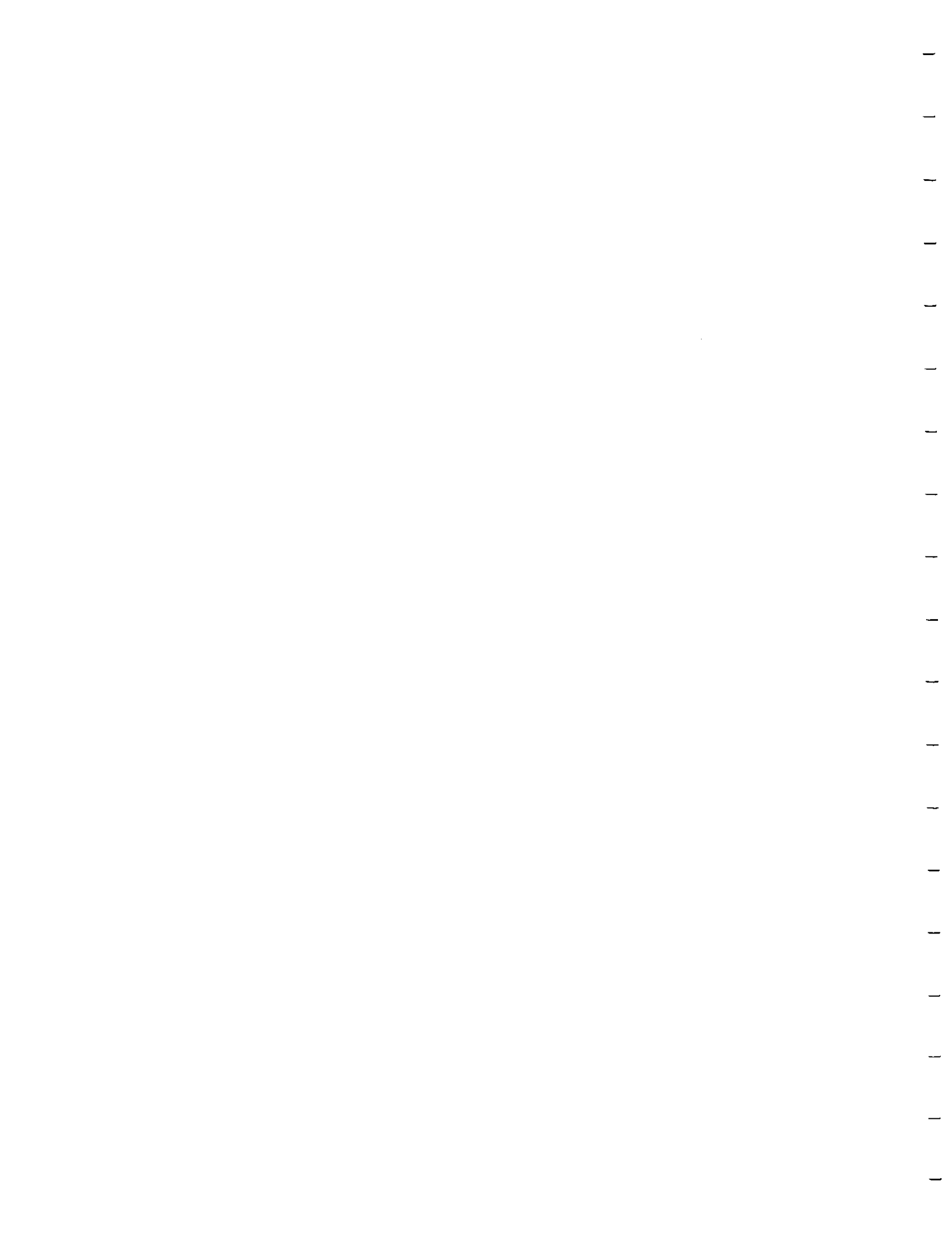
312.7.3.2 Physical cycling tests shall be performed for each spring design and shall be certified by an approved testing agency acceptable to the department and reports kept on file by the manufacturer.

Containment devices shall be physically tested for each spring design by installing the device on the spring and by destroying the spring at maximum recommended stretch. Containment tests shall be certified by an approved testing agency acceptable to the department and reports kept on file by the manufacturer.

312.7.4 Containment Devices. Each spring shall be equipped with an approved device capable of restraining the spring or any part thereof in the event it breaks.

312.7.5 Identification. Springs shall be permanently identified as to manufacturer and also to indicate maximum recommended stretch. Both springs and containment devices shall bear information stating that they have been manufactured in accordance with requirements of the California Department of Housing and Community Development.

312.7.6 Installation. Installation of springs, containment devices and hardware shall be in accordance with the manufacturer's installation instructions. Instructions shall be provided by the manufacturer and shall specify the approved method of restraint and maximum recommended stretch. Unless otherwise permitted by the manufacturer's installation instructions, the hardware and springs shall be mounted to nominal 2 by 6 framing members which shall be of a species identified as Group I or II in Volume 3, Chapter 23, Division 111.



ATTACHMENT 2

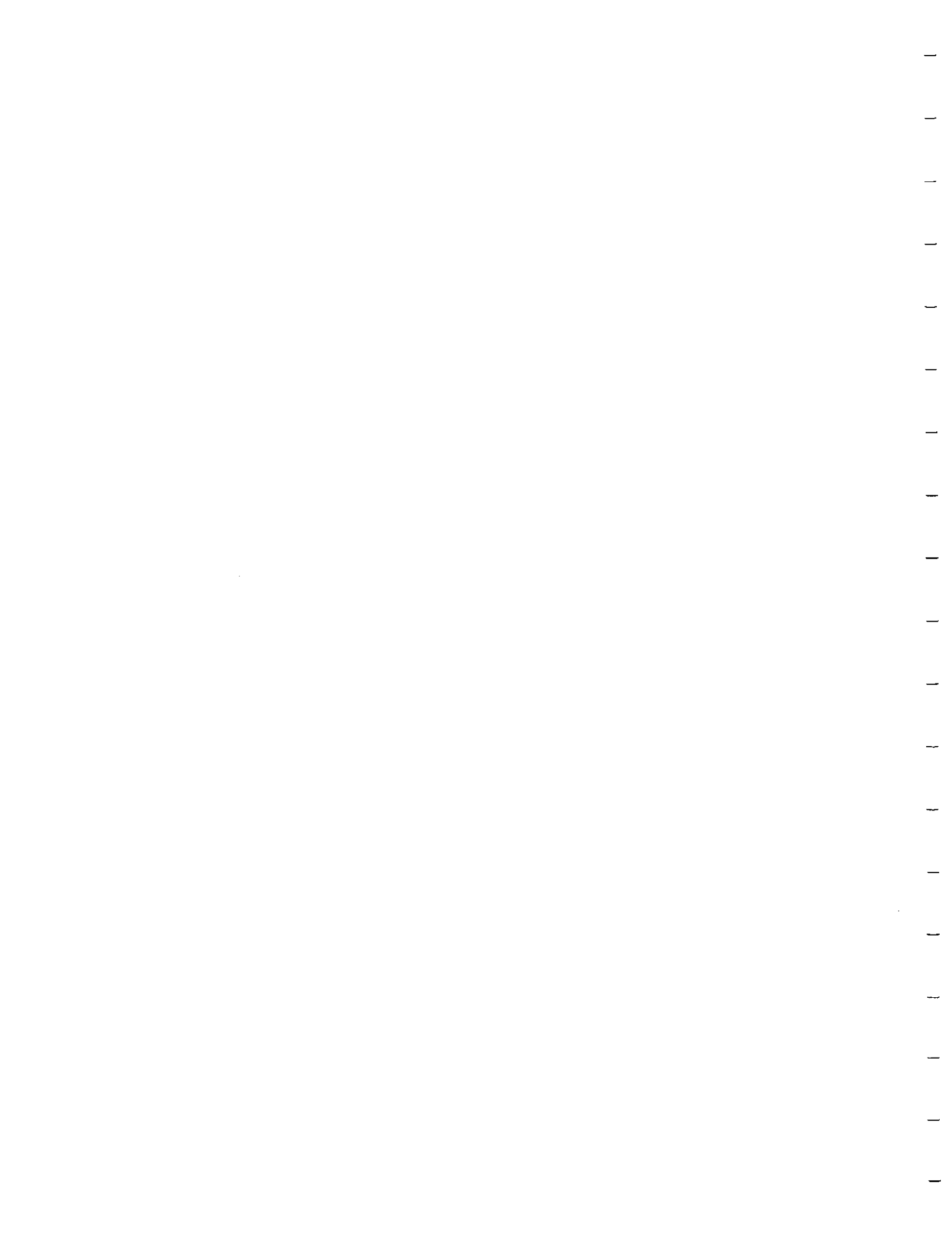
WOOD GARAGE DOOR WEIGHT CALCULATION CHART

CUSTOMER: _____

DATE: _____

PREPARED BY: _____

DOOR SIZE: DETERMINE THE SIZE AND CONFIGURATION OF THE DOOR.		NO. OF VERTICALS: _____ NO. OF HORIZONTALS: _____ NO. OF DIAGONALS: _____ LENGTH OF DIAGONALS: _____
DOOR HEIGHT: _____ (FT.) and _____ (IN.) <div style="margin-left: 40px;">A B</div>		
DOOR WIDTH: _____ (FT.) and _____ (IN.) <div style="margin-left: 40px;">C D</div>		
CONVERT THE DOOR HEIGHT AND WIDTH DIMENSIONS TO "FEET":		
DOOR HEIGHT: $B/12 + A =$ _____ (FT.)		
DOOR WIDTH: $D/12 + C =$ _____ (FT.)		
FRAME WEIGHT: DETERMINE THE SIZE AND TYPE OF WOOD THAT MAKE UP THE VARIOUS FRAME MEMBERS. SELECT THE WEIGHT (LB.) PER FOOT FROM TABLE 1 ON THE "WOOD GARAGE DOOR WEIGHT DATA SHEET".		
VERTICAL MEMBERS:	$\frac{\text{NO. OF VERTICALS}}{\text{NO. OF VERTICALS}} \times \frac{\text{DOOR HEIGHT (FT.)}}{\text{DOOR HEIGHT (FT.)}} \times \frac{\text{LB. / FT.}}{\text{LB. / FT.}} =$	1 _____
HORIZONTAL MEMBERS:	$\frac{\text{NO. OF HORIZONTALS}}{\text{NO. OF HORIZONTALS}} \times \frac{\text{DOOR WIDTH (FT.)}}{\text{DOOR WIDTH (FT.)}} \times \frac{\text{LB. / FT.}}{\text{LB. / FT.}} =$	2 _____
DIAGONAL MEMBERS:	$\frac{\text{TOTAL LENGTH (FT.)}}{\text{TOTAL LENGTH (FT.)}} \times \frac{\text{LB. / FT.}}{\text{LB. / FT.}} =$	3 _____
FASCIA WEIGHT: DETERMINE THE TYPE OF WOOD THAT MAKES UP THE DOOR FASCIA, AND SELECT THE WEIGHT (LB.) PER SQUARE FOOT FROM TABLE 2 ON THE "WOOD GARAGE DOOR WEIGHT DATA SHEET".		
$\frac{\text{DOOR HEIGHT (FT.)}}{\text{DOOR HEIGHT (FT.)}} \times \frac{\text{DOOR WIDTH (FT.)}}{\text{DOOR WIDTH (FT.)}} \times \frac{\text{LB. / SQ. FT.}}{\text{LB. / SQ. FT.}} =$		4 _____
PLANT-ON DESIGN (DECORATION) WEIGHT: DETERMINE THE TYPE OF WOOD AND THE TOTAL LENGTH OF THE DOOR'S PLANT-ON DESIGN. SELECT THE WEIGHT (LB.) PER FOOT FROM TABLE 1 ON THE "WOOD GARAGE DOOR WEIGHT DATA SHEET".		
$\frac{\text{TOTAL LENGTH (FT.)}}{\text{TOTAL LENGTH (FT.)}} \times \frac{\text{LB. / FT.}}{\text{LB. / FT.}} =$		5 _____
ACCESSORIES WEIGHT: FOR DOOR WIDTHS BETWEEN 8' TO 10': 5 LB. FOR DOOR WIDTHS BETWEEN 15' TO 16': 17 LB.		6 _____
TOTAL WEIGHT (LB.) =		
(ADD LINES 1 THROUGH 6)		



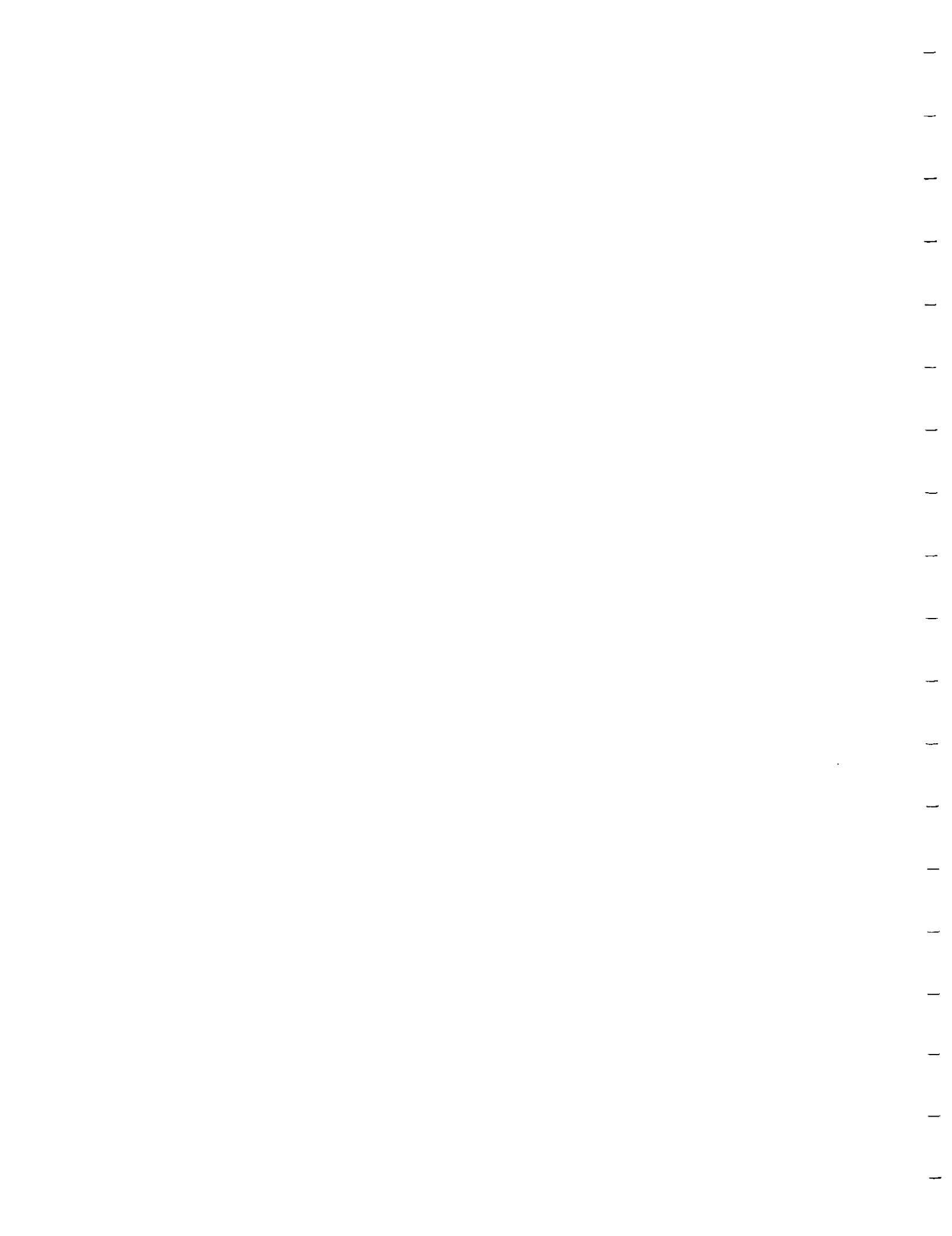
**ATTACHMENT 3
WOOD GARAGE DOOR WEIGHT CALCULATION DATA SHEET**

TABLE 1:

NOMINAL SIZE (ACTUAL SIZE)	WEIGHT PER LINEAR FOOT (LB./FT.)			SOUTHERN PINE
	DOUGLAS FIR-LARCH	CALIFORNIA REDWOOD; RED PINE; HEM-FIR; EASTERN SOFTWOODS; NORTHERN ASPEN	DOUGLAS FIR, SOUTH; WESTERN HEMLOCK; SOUTHERN CYPRESS	
2X6 (1-1/2 X 5-1/2)	1.82	1.50	1.72	1.97
2X4 (1-1/2 X 3-1/2)	1.16	0.96	1.09	1.25
2X3 (1-1/2 X 2-1/2)	0.83	0.68	0.78	0.89
1X6 (3/4 X 5-1/2)	0.91	0.75	0.86	0.98
1X4 (3/4 X 3-1/2)	0.58	0.48	0.55	0.63
1X3 (3/4 X 2-1/2)	0.41	0.34	0.39	0.45
1/2 X 6 (FULL SIZE)	0.66	0.55	0.62	0.72
1/2 X 4 (FULL SIZE)	0.44	0.36	0.42	0.48
1/2 X 3 (FULL SIZE)	0.33	0.27	0.31	0.36
1/2 X 2 (FULL SIZE)	0.22	0.18	0.21	0.24

THE ABOVE TABLE WAS COMPILED USING THE FOLLOWING DENSITIES FOR EACH WOOD:

DOUGLAS FIR-LARCH: 31.84 LB. / CUBIC FT.
 CALIFORNIA REDWOOD, etc.: 26.22 LB. / CUBIC FT.
 DOUGLAS FIR, SOUTH, etc.: 29.97 LB. / CUBIC FT.
 SOUTHERN PINE: 34.34 LB. / CUBIC FT.



**ATTACHMENT 4
WOOD GARAGE DOOR WEIGHT CALCULATION DATA SHEET**

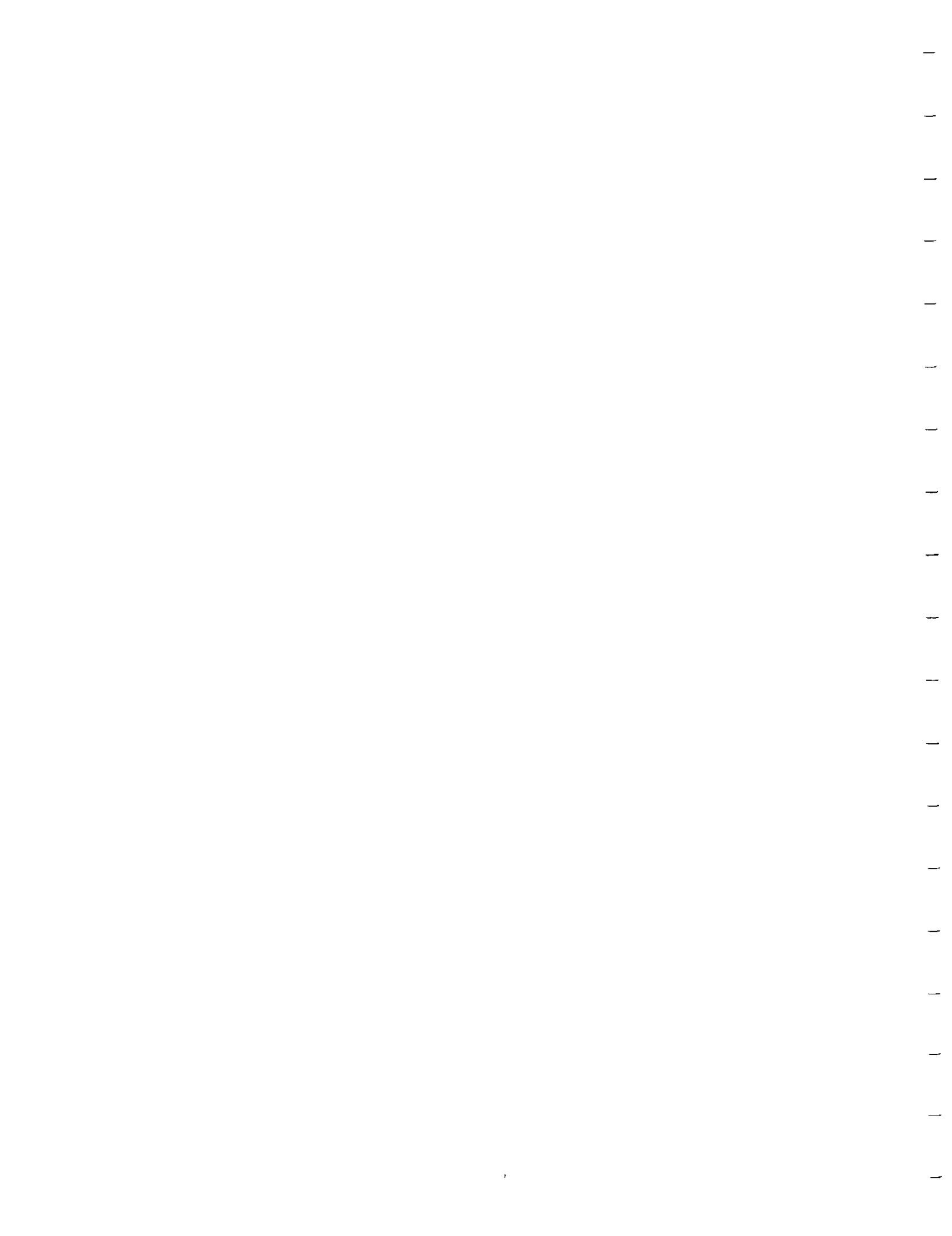
TABLE 2:

PLYWOOD		APPROX. WEIGHT (LB. / SQ. FT.)
NOMINAL THICKNESS AND TYPE (IN.)		
1/4 - S		0.80
5/16 - U , 11/32 - S		1.00
3/8 - U , S		1.10
15/32 - S		1.40
15/32 - U & 1/2 - U , S , T		1.50
19/32 - S		1.70
19/32 - U , T & 5/8 - U , S , T		1.80
23/32 - S		2.10
23/32 - U , T & 3/4 - U , S , T		2.20
7/8 - U , S		2.60
1/4 A.C. FIR PLY		0.79
3/8 A.C. FIR PLY		1.13
3/8 OVERLAY (1-SIDE) MED. DEN.		1.19
3/8 OVERLAY (2-SIDES) MED. DEN.		1.26
5/8 TEXTURE 111 - GROOVED 2" O.C.		1.67
5/8 TEXTURE 111 - GROOVED 4" O.C.		1.75
5/8 A.C. FIR PLY		1.83

HARDBOARD		APPROX. WEIGHT (LB. / SQ. FT.)
NOMINAL THICKNESS AND TYPE (IN.)		
1/4 A.C. TEMP. PRESWOOD - PLAIN		1.38
1/4 TEMP. RIDGELINE		1.32
5/16 PANEL GROOVE 2" O.C.		1.68
5/16 RIDGE GROOVE 4" O.C.		1.59
5/16 TEMP. PRESWOOD		1.85

CLADWOOD		APPROX. WEIGHT (LB. / SQ. FT.)
THICKNESS (IN.)		
7/16 (FULL SIZE)		1.25
1/2 (FULL SIZE)		1.63

U = UNSANDED PANELS; S = SANDED PANELS; T = TOUCH-SANDED PANELS.



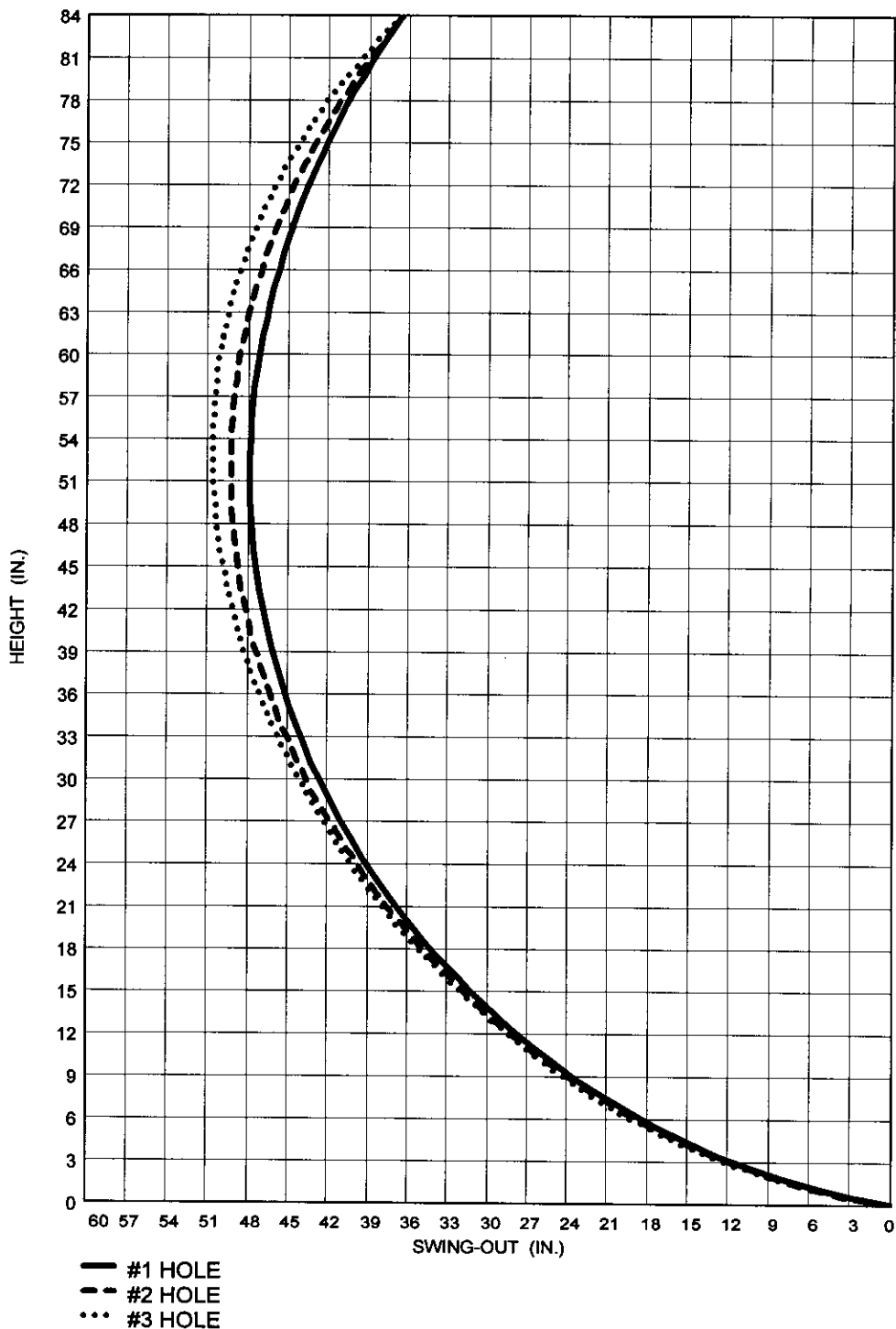
ATTACHMENT 5

SWING-OUT CURVES

JAMB HARDWARE FOR 1-PIECE DOORS

THE CURVES ARE TYPICAL FOR THE FOLLOWING CONDITIONS:

- 0" OFFSET
- 7'-1" HIGH AND 2" THICK DOOR
- 7' HIGH OPENING

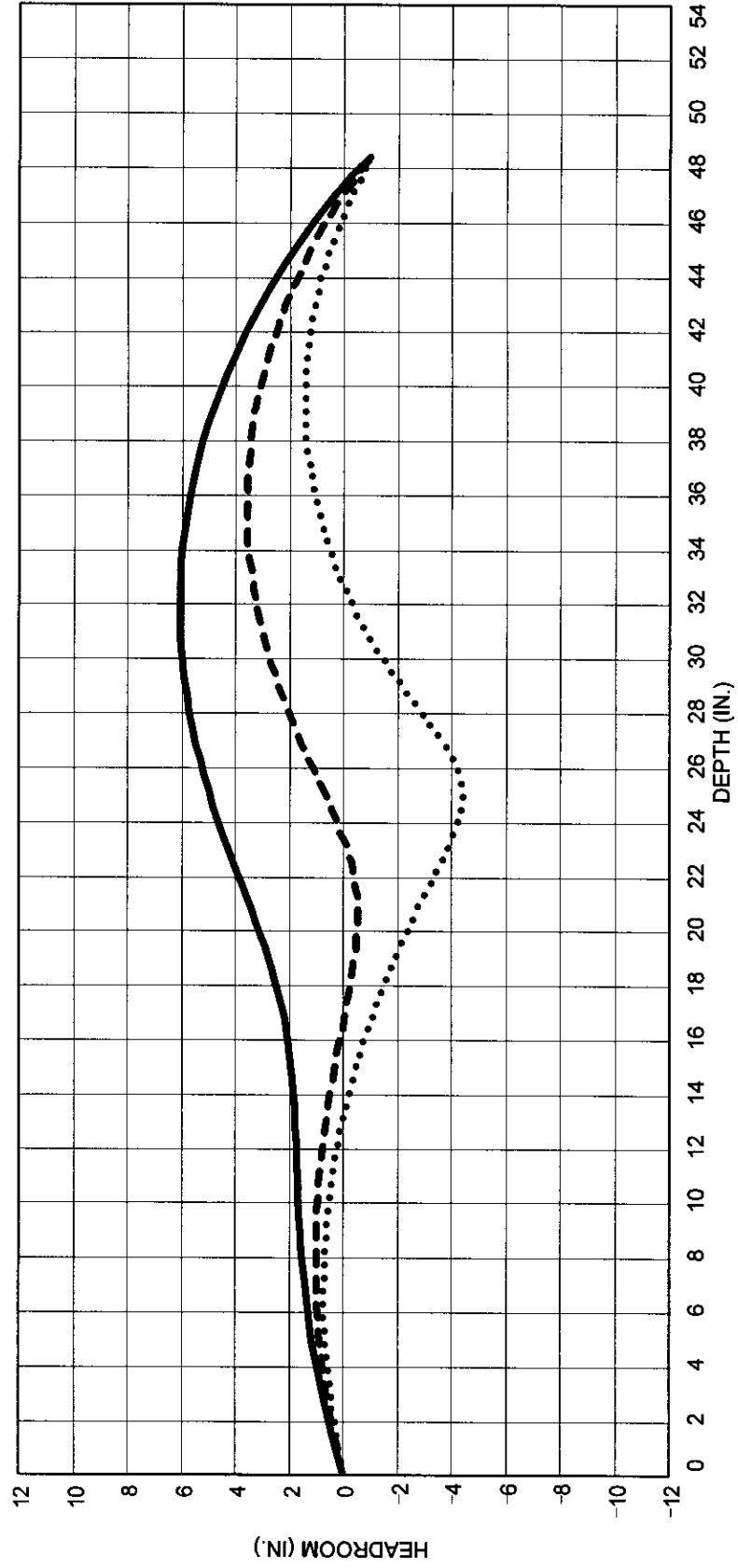


HEADROOM CURVES

JAMB HARDWARE FOR 1-PIECE DOORS

THE CURVES ARE FOR THE FOLLOWING CONDITIONS:

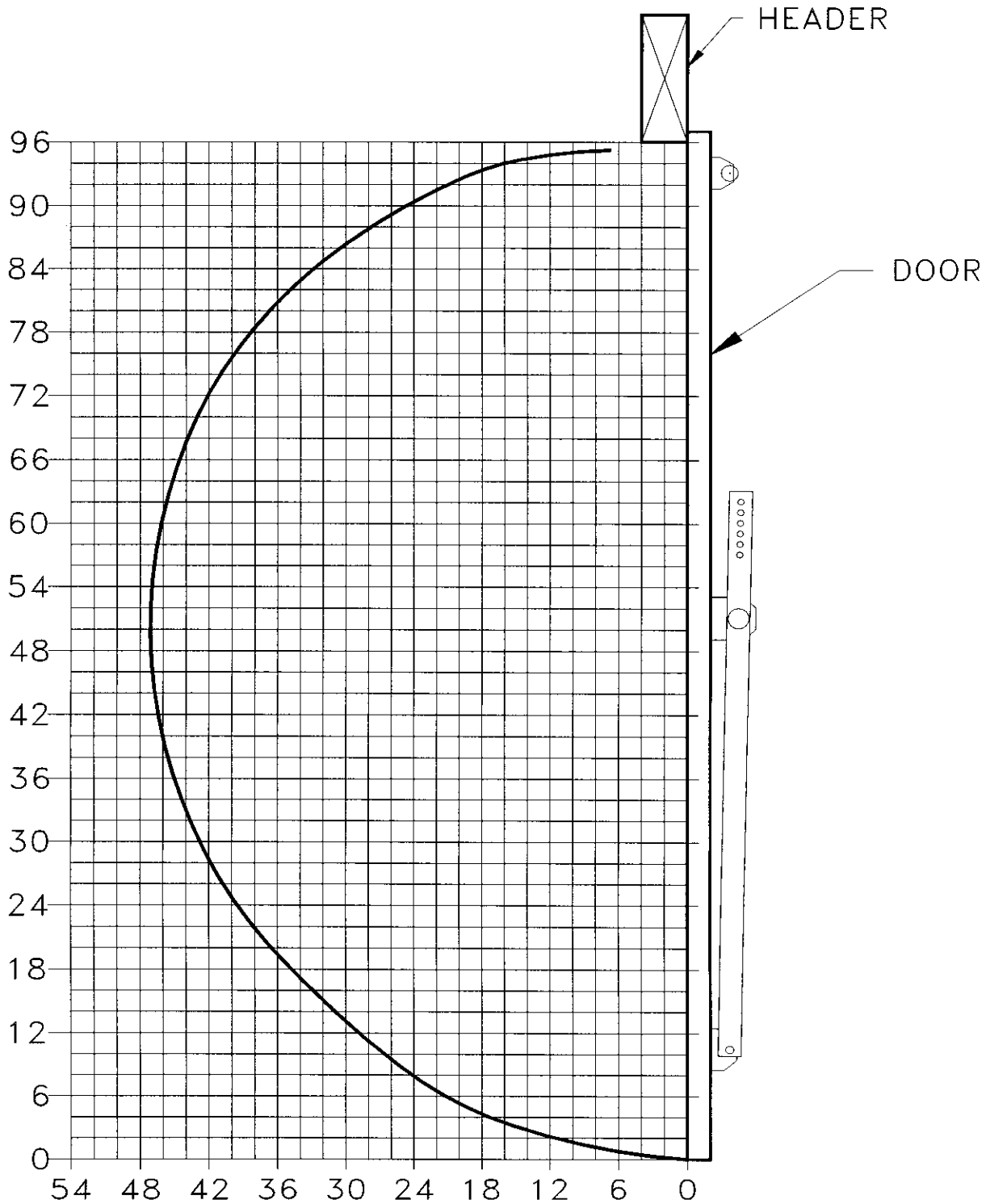
- 0" OFFSET
- 7'-1" HIGH AND 2" THICK DOOR
- 7' HIGH OPENING



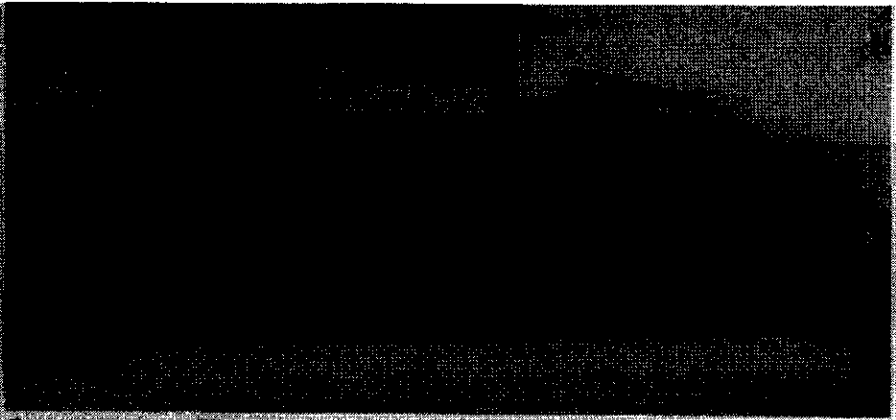
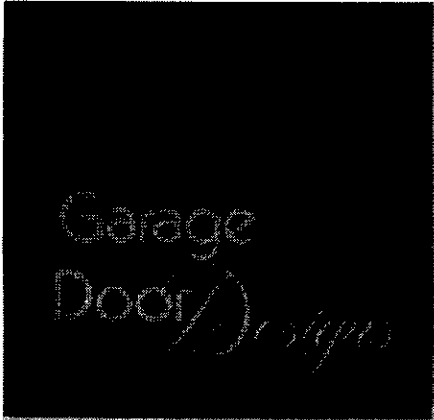
- #1 HOLE
- - #2 HOLE
- ... #3 HOLE

JAMB HARDWARE WITH TRACK

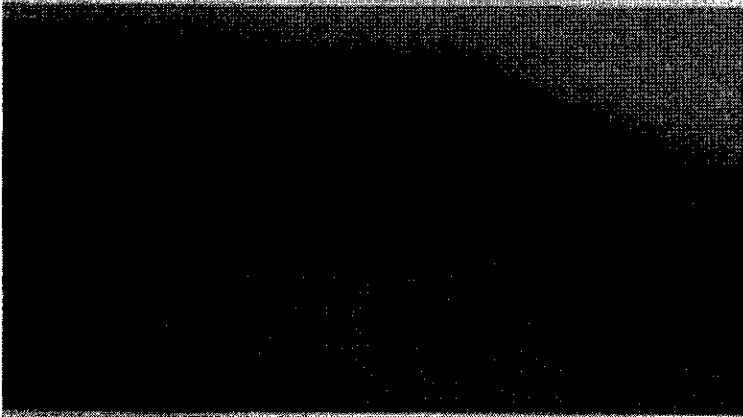
TYPICAL SWING-OUT CURVE FOR 8' DOOR







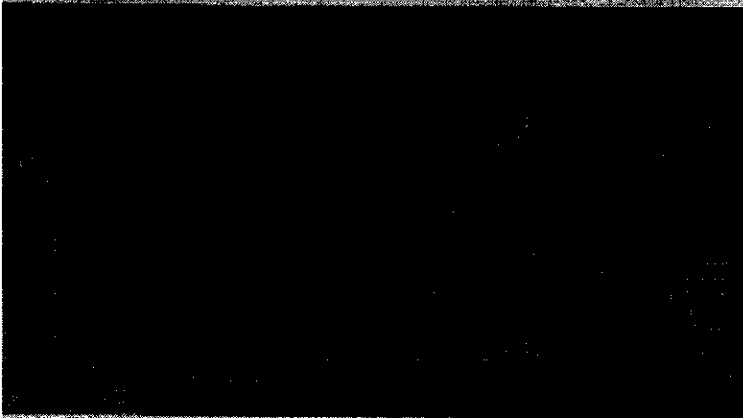
Southwestern Elegance



Curved Moldings



Straight Moldings

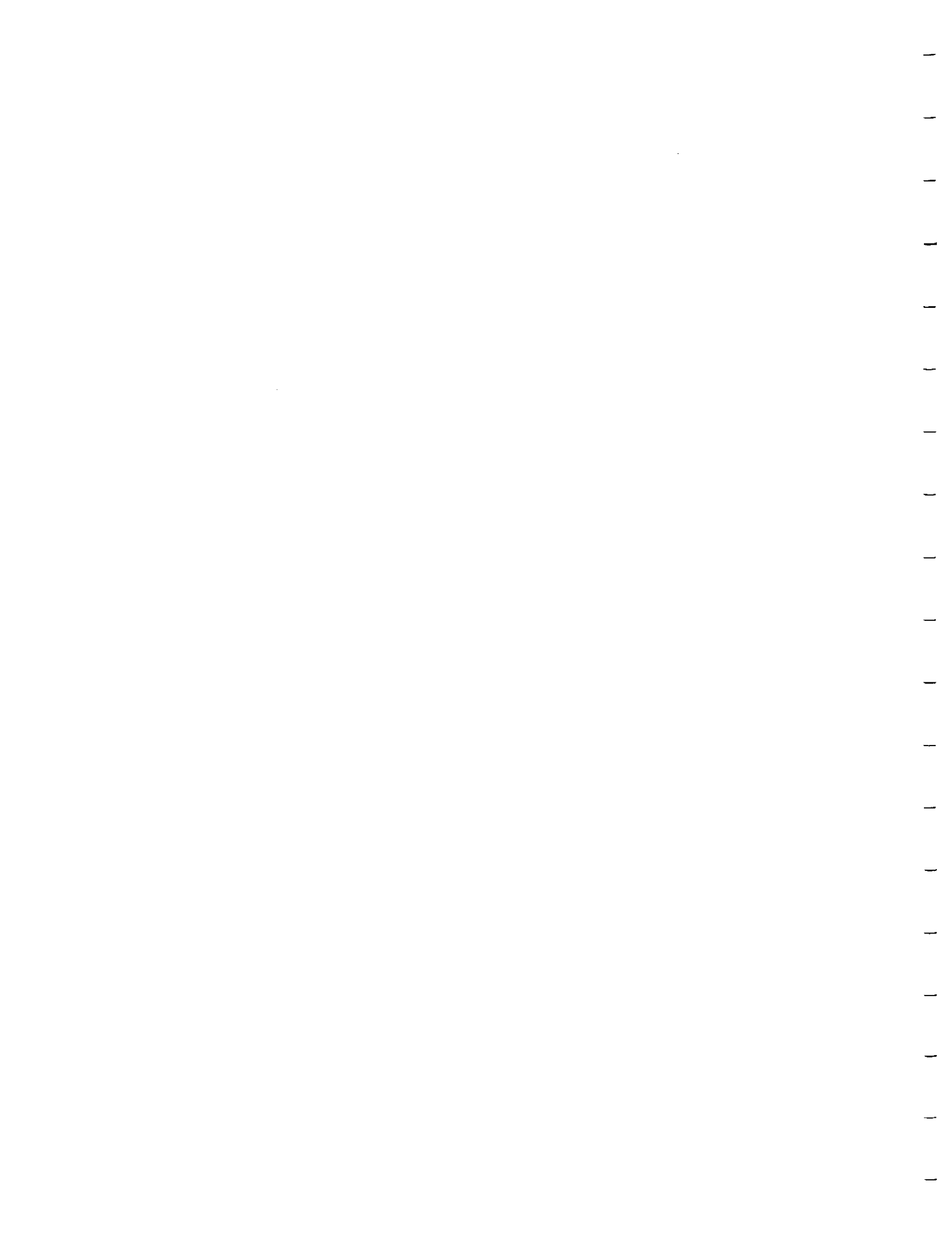


Matching Horizontal Cedar

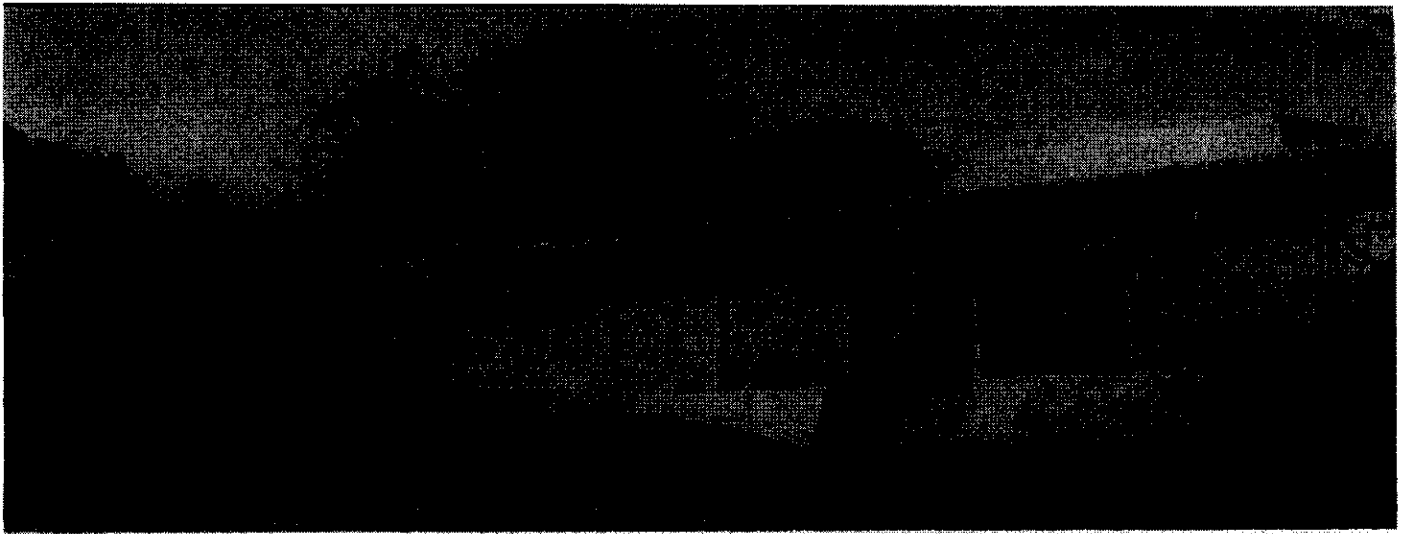
Doors pictured are all on actual installations and were photographed from coast to coast. Write for details on how to build and install one piece, decorator garage doors.

The Barn Door





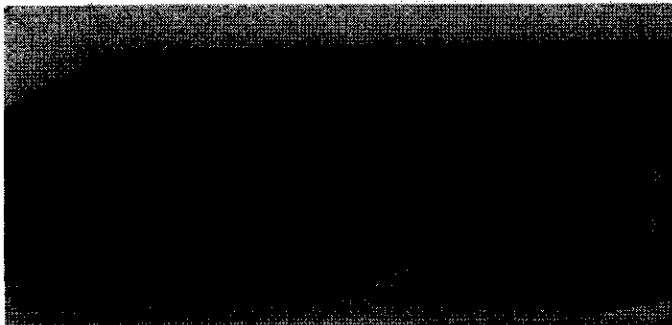
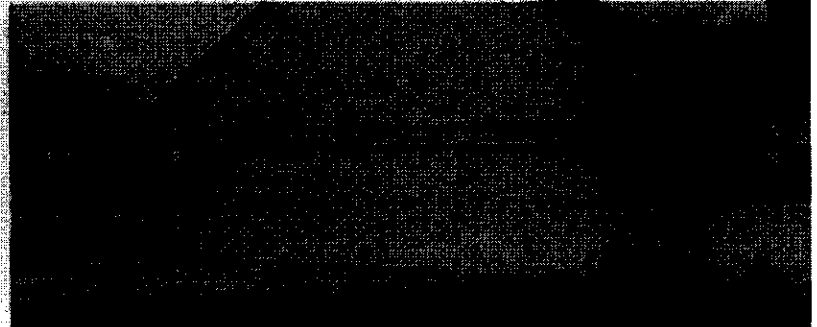
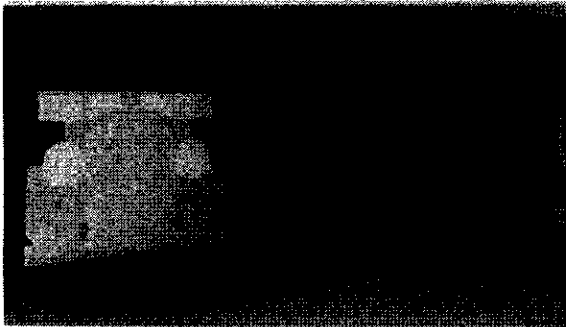
ATTACHMENT 9



Funtime California Doors

New England

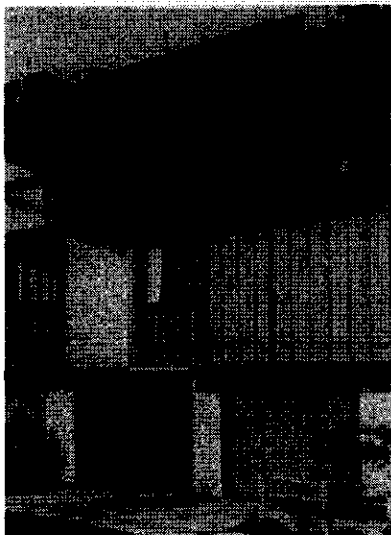
Texas Ranchstyle — Hidden Doors



Perfect Proportions

Vertical Groove — The Florida Look

"Louvered" Doors





One piece, decorator garage doors

Millions of one piece, jamb mounted garage doors have been built and installed . . . and are still operating . . . in the western regions of the United States. Doors made of wood to the following specifications are not to be compared or confused with light weight, and often flimsy, one piece doors that have been available in many markets in the past.

The following information is taken from the CALIFORNIA OVERHEAD DOOR ASSOCIATION'S UNIFORM STANDARDS FOR OVERHEAD DOORS:

It is recommended that residential overhead garage doors be fabricated and installed as suggested in these uniform commercial standards developed by the Association, a non-profit corporation devoted to promoting safety, dependability, and quality craftsmanship within the overhead door industry.

general specifications

WOOD FRAMING:

FRAMING MATERIAL: Wood frame shall have stiles and rails of Douglas Fir, construction grade, or suitable equal material.

CONSTRUCTION: See corner details. Construction shall consist of 2" x 3" top and bottom rails and 2" x 3" vertical stiles. (2" x 4"s may be substituted)

SPACING OF RAILS AND STILES:

For application of PLYWOOD FACING; a framing design consisting of seven vertical nailing pieces including end stiles, top and bottom rails and horizontal blocking between stiles running the width of the door to form twelve sections. Horizontal pieces must be in contact with vertical members where they meet.

NAILING OF FRAME: Galvanized or aluminum nails shall be used. A combination of end nailing with 16d nails and toe nailing shall be used at all points where horizontal and vertical frame members intersect. In cases where two members butt up against each side of an intersecting member, at least one member shall be end nailed.

OPENING SIZES

DOUBLE DOOR: The standard double garage door opening shall be at least 15'6" wide between the jambs, but shall not exceed 16' in width between the jambs. Minimum clearance from garage floor to the head jamb shall be 6'11½" and the maximum opening shall not exceed 7'0".

SINGLE DOOR: The minimum opening size for a single door is 8' in width. Height specifications to be the same as for Double Doors.

Door sizes departing from the minimum and maximum as set forth shall be considered custom style doors, but might not conform to FHA and VA requirements.

SURFACE PANELING:

KIND	MINIMUM THICKNESS
Plywood	3/8" exterior grade

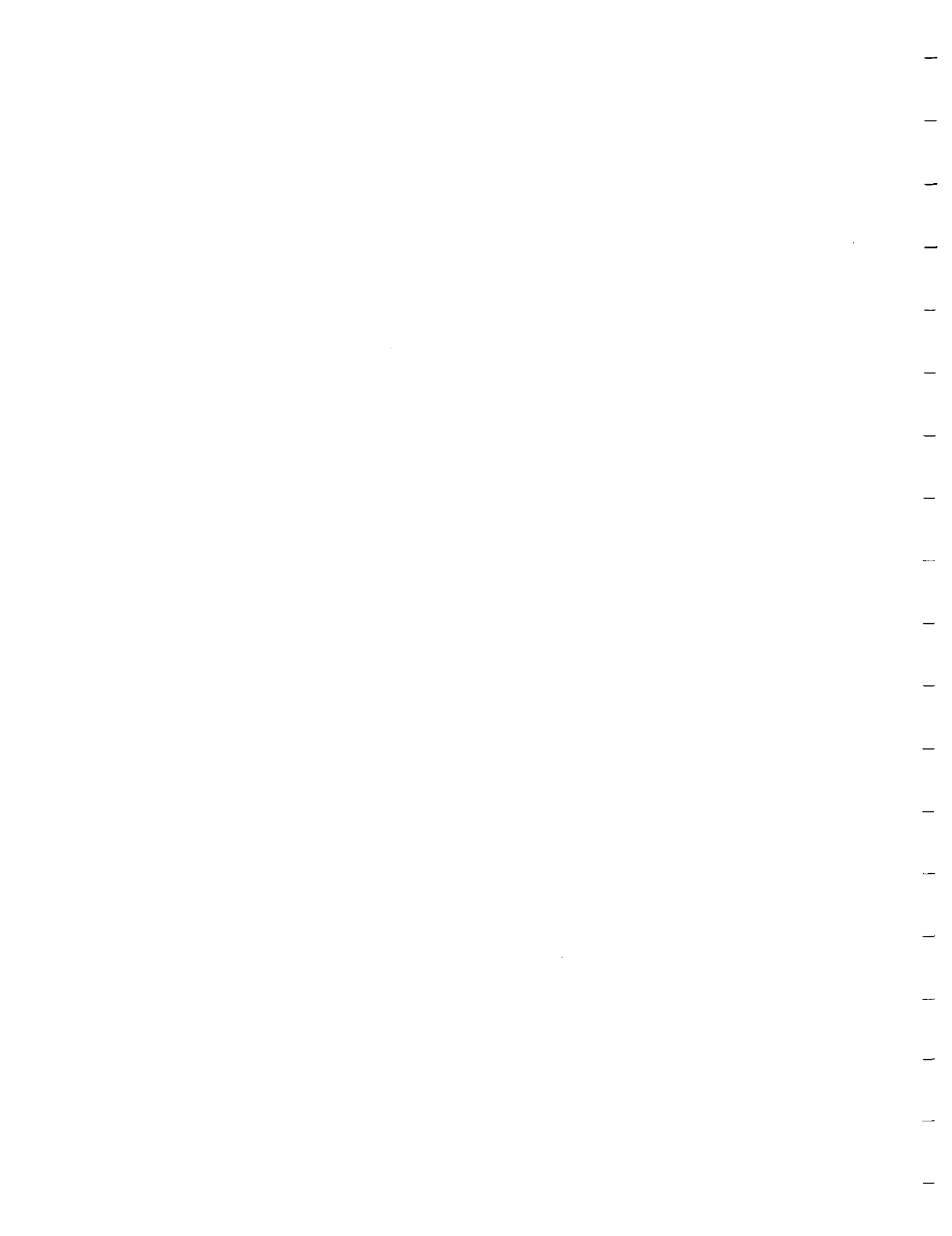
Nailed six inches o.c. around edges, and eight inches o.c. along intermediates with galvanized or aluminum nails. When decorative plant-ons are used on facing of door, they are to be nailed on with galvanized or cement coated nails. All nails or fasteners protruding beyond the surface shall be clinched (to fix firmly by folding over) with hammer or blunt instrument, so that the point of nail or fastener is turned toward the facing material. Moisture content shall not exceed 12%. In arid areas, 8% shall be the maximum.

PLYWOOD EDGES MUST BE PROTECTED AGAINST SPLINTERING AND PLY SEPARATION BY SETTING BACK ¼" FROM BOTTOM EDGE OF FRAME.

NAILING: Galvanized or aluminum nails or staples shall be used. For nailing plywood, spacing of nails shall not exceed 6" on the edge or 8" away from the edge. Stapling of plywood is permissible as set forth in FHA bulletin MPS, Section 900, dated April 1, 1972. For nailing plywood ½" and under in thickness 5d nails shall be used.

HARDWARE:

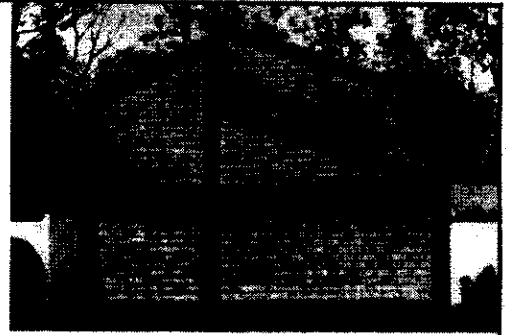
1. Minimum thickness truss rods of 5/16" shall be acceptable trussing material. It shall be mounted with the appropriate brackets in preference to being mounted through end stiles. Doors 10' and over must have at least one truss rod and 12' and over must have at least two truss rods. 10' doors constructed with 2 x 4 top and bottom rails shall not require truss rods. Truss rod threading is required in one end of rod only.
2. Hardware manufacturers shall be responsible for the limits recommended on each particular model of hardware.
3. Hardware shall have designated on it by decal or other appropriate inscription, the maximum limitations for said hardware. This information shall specify maximum weight of door on which it is to be mounted.
4. Center mounted keyed locks are usually installed at the job site . . . as are economy side mounted slide bolts.
5. Side weather strip is usually mounted to the door and the jambs at the job site, while bottom weather strip is mounted at the door factory.



STEP BY STEP PROCEDURE FOR MANUFACTURING A

Decorator, one piece double garage door using plywood panels

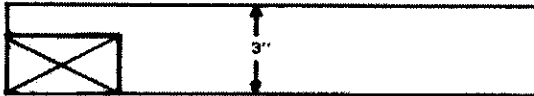
AT JOB SITE OR IN A SHOP



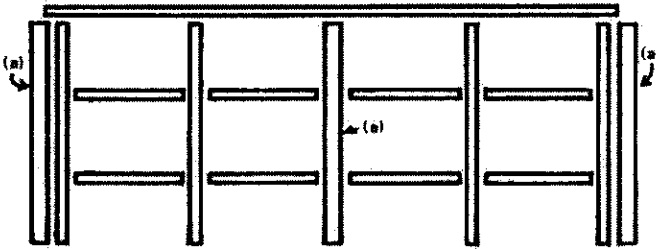
Note: Door opening to be 16' x 7' ±
Finished door to be 3/4" narrower than opening
Frame to be 1" narrower than opening and the same height as opening

Step 1. Precut your frame members to length as shown on the Material Schedule.

Step 2. Prench the top and bottom frame rails to the exact size of the 2 x 3 framing members



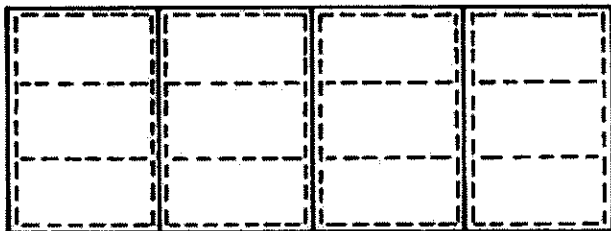
Step 3. Lay out frame members on work table, as shown



Note: All pieces to be on edge except the three marked (a). Place these flat and fit the end pieces into notches in top & bottom rails.

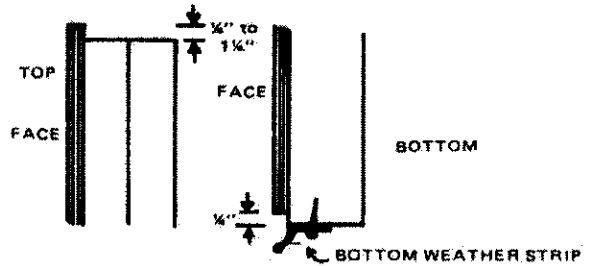
Step 4. Nail frame members together.

Step 5. Lay precut plywood panels on completed frame. They will overhang each end of the door by 1/2". Door width can be trimmed at the job site, if desired.



Step 6. Nail plywood panels to frame.

Plywood can be set up 1/4" at top if head room allows and should be set back 1/4" at bottom to prevent splintering.



Step 7. Add trim and bottom weather strip as desired. Keep door balanced, top and bottom.

(Truss rods, side weather stripping, if desired, and locking hardware is applied at job site)

Paint door on all exposed sides and edges. Front and Back!

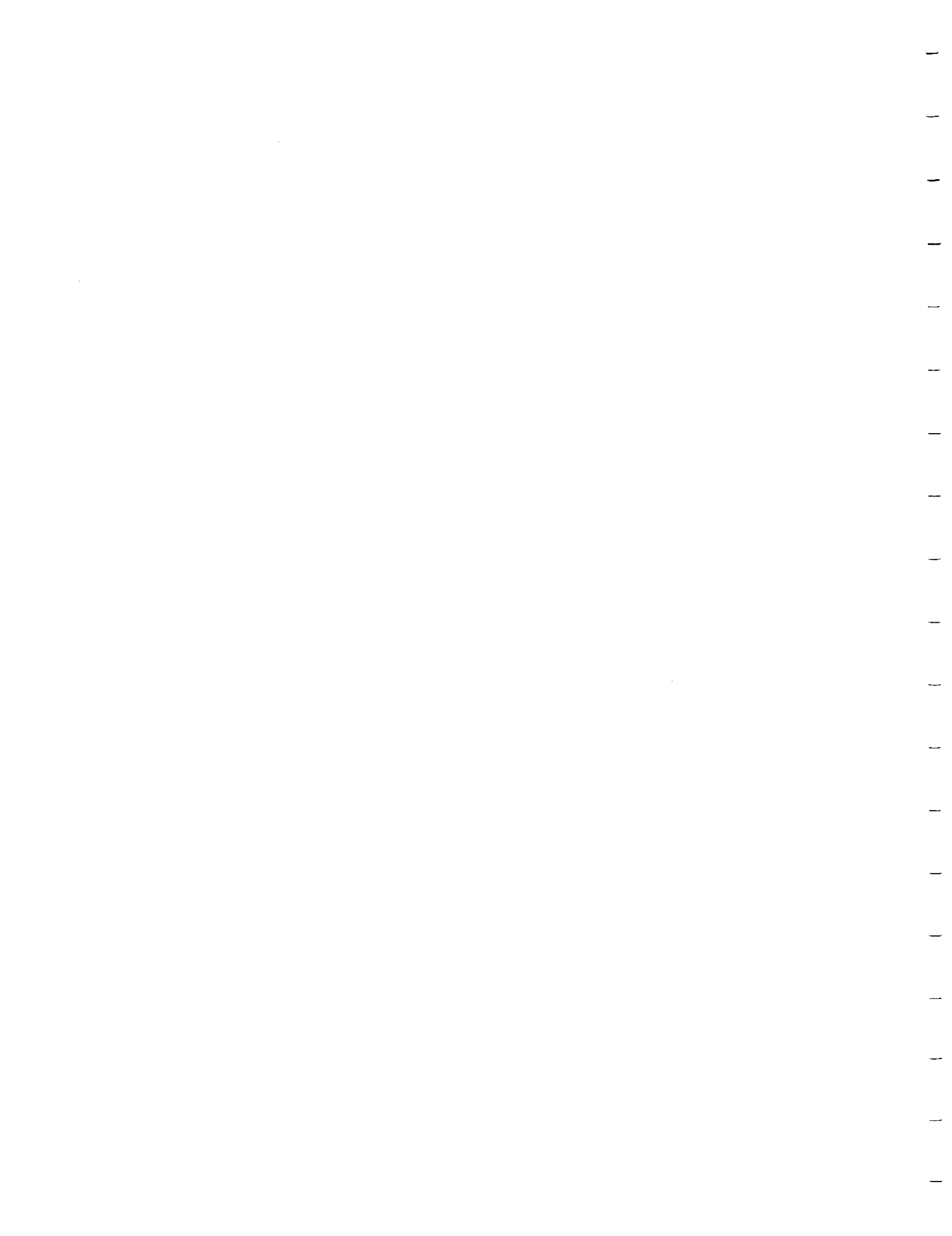
Note: IF DESIRED, OTHER MATERIAL SUCH AS SIDING, FIBERGLASS OR ALUMINUM MAY BE USED IN PLACE OF PLYWOOD.

MATERIAL SCHEDULE FOR ONE PIECE PANEL DOOR:

All rails and stiles to be Construction grade Douglas Fir or equal.

- 2 ea. 2 x 3 x 15'11" rails w/notched ends
- 2 ea. 2 x 3 x 7'0" side stiles
- 5 ea. 2 x 3 x 6'9" stiles
- 4 ea. 2 x 3 x 3'10 1/2" rails
- 4 ea. 2 x 3 x 3'6 1/2" rails
- 4 panels 3/8" exterior type plywood-48" x 85"
- 10 doz. galvanized 5d nails
- 3 doz. galvanized 16d nails
- DECORATIVE TRIM AS DESIRED

NOTE:
Lengths may be varied to fit local market's unusual lumber dimensioning. 2 x 4 lumber may be used in place of 2 x 3. Adjust calculated weight accordingly.



ATTACHMENT 12

Surprisingly little equipment is required to produce one piece garage doors in quantity. Power nailers and staplers are advisable in the factory, as are jig-tables for fabricating the frames and applying the exterior surface and decoration to the door.

The door itself consists of a frame work of 2" x 3" dimensional lumber and the surface skin, usually plywood. Aluminum and fibreglass skins are also in use. Decorative add-ons are often applied to the skin.

The door is "factory complete" without any special hinges or wheels. Once delivered to the job site, truss rods, locks and pulls are quickly added.

Field installation and adjustment is fast and simple, largely because the door is delivered and hung in one piece. The door sits straight up in the opening during installation and no ladders are required.

The springs (and everything else) are put in place while the installer has his feet on the ground!

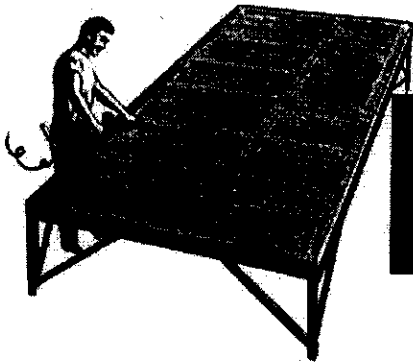
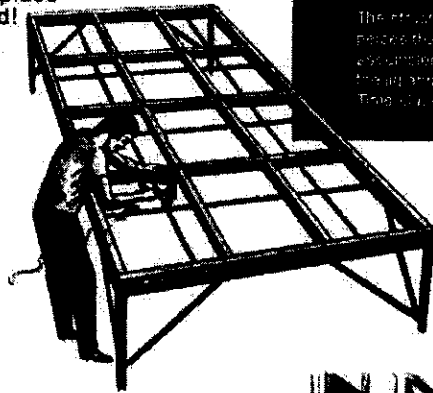
Adjustment is a snap. It takes very little time to "fine tune" the door for either manual operation or for an electric door opener.

NOTE:

The most efficient use of manpower in the plant is to have three men building two doors on two different jig-tables at a time. These three men can build as many as 30 doors a day. Ideally a field installation team consists of two men. They will install and adjust between 15 and 30 doors. The exact number is dependent on the driving distance between garages.

FRAME CONSTRUCTION

The structural framework consists of pieces that are pre-cut to size. The assembler simply fits the pieces together and the power nails them together. Total elapsed time is approximately 12 minutes.



FINISHED DOOR CONSTRUCTION

The standard door consists of 4" x 8" plywood panels. The panels are set on the door frame and power nailed to the frame. Total elapsed time for double door is approximately 9 minutes.

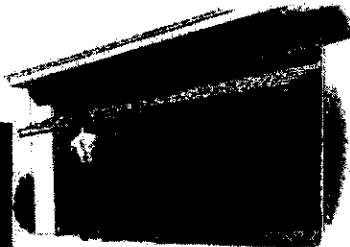


INSTALLATION

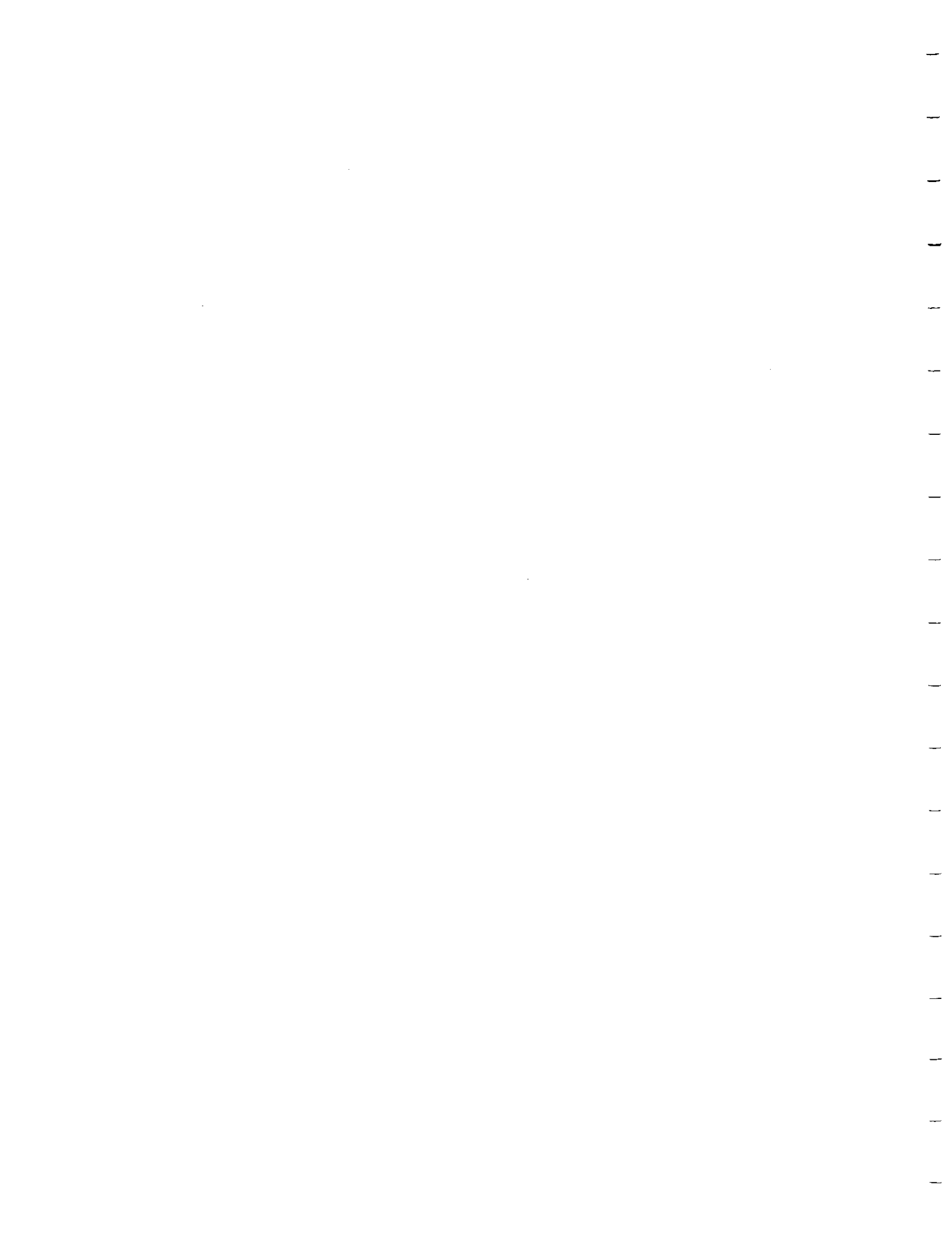
Doors are delivered to job site. Hardware is attached to frame. Door is set in place in the opening and hardware is attached to door. Door is lowered into place. Springs are attached. Time elapsed for double door is 15 minutes.

ADJUSTMENT

Doors do not require adjustment if the job at door has been installed reasonably accurately and if proper springs have been provided. If adjustment is required, it is fast and easy, and you will never have to leave the ground.



*Note: Time elapsed based on proven production methods using a three man team in the factory and a two man team for installation.



California Operator & Door Association

UNIFORM STANDARDS FOR OVERHEAD DOORS

It is recommended that residential overhead garage doors be fabricated and installed as suggested in these uniform commercial standards developed by the California Overhead Door Association, a non-profit corporation devoted to promoting safety, dependability, and quality craftsmanship within the overhead door industry. Nothing in this minimum standard is intended to reduce the quality of any plan or specification for a particular product which may have been specified and accepted.

GENERAL SPECIFICATIONS

WOOD FRAMING:

FRAMING MATERIAL: Wood framing shall have stiles and rails of Douglas Fir, construction grade or suitable equal material.

CONSTRUCTION: See corner details A & B.

Construction shall consist of 2" x 3" top and bottom rails mounted on edge.

SPACING OF NAILING PIECES: To accommodate *Horizontal Siding* (per design diagram A) doors shall be framed so that stiles form vertical nailing pieces approximately 24" on center, but may vary in spacing with increased thickness of facing material.

Maximum acceptable spacing is 24" o.c. with minimum thickness drop or ship lap siding of 1/2". When using 3/4" and up facing material, the maximum spacing of 30" o.c. is acceptable.

For tongue and groove siding the o.c. spacing may be increased by 4" to a maximum of 28" o.c. for 5/8" siding and a maximum of 34" o.c. under any conditions.

To accommodate *Vertical Siding* (per design diagram B) doors shall be framed with center stile consisting of 1 - 2" x 3" mounted on edge between top and bottom rails. A minimum of three horizontal 2" x 3" shall be used, mounted on edge between the center stile and each end stile to form nailing pieces approximately 21" o.c. Center stile is unnecessary in doors under 10' wide.

To accommodate *Half and Half Siding* (per design diagram C and D) doors shall be framed according to the appropriate diagram on design sheet as indicated in diagram D, with a maximum of 25" o.c. nailing provided for vertical siding on top half of door by providing a maximum of 50" between top rail and bottom horizontal nailing piece to accommodate the vertical siding. For water table see details.

For application of *Plywood Facing* and *Hard Board* (per design diagram E and F) as a special framing design consisting of five vertical nailing pieces including end stiles, top and bottom rail and horizontal blocking between stiles running the width of the door to form twelve sections. Horizontal pieces must be in contact with vertical members where they meet.

BRACING OF FRAME: A 1" x 3" "A" brace shall be provided and installed at approximately 45 deg. angle rail too Style. Nailing of "A" brace on rear side of frame is acceptable. Notching of frame to accept "A" brace is permissible, but not required. Corner bracing is not acceptable. It is permissible to anchor "A" brace to end stiles. "A" brace to be used on 4" to 12" siding only; not necessary on Plywood or Hardboard Facing.

NAILING OF FRAME: Hot dipped galvanized or aluminum nails shall be used when nails are exposed to weather. A combination of end nailing with 16d nails and toe nailing with 2 8d nails shall be used at all points where horizontal and vertical frame members intersect. In cases where two members butt up against each side of an intersecting member, at least one member shall be end nailed.

DOOR SIZES:

Size of doors shall conform to plans and specifications.

DOUBLE DOOR: The standard double garage door shall be at least 15'6" wide between the jambs, but shall not exceed 16' in width between the jambs. *Minimum* clearance from garage floor to the head jamb shall be 6' 11 1/2" and the maximum clearance shall not exceed 7'.

SINGLE DOOR: The minimum size for a single door shall not be less than 8' in width.

Door sizes departing from the minimum and maximum as set forth shall be considered custom style doors, but might not conform to FHA and VA requirements.

SIDING:

Kind	Minimum Thickness	Minimum Quality
Redwood	1/2" ship-lap or drop siding/16x7/16x8 beveled siding and 3/16x9/16x10	A Grade Clear All Heart
Ponderosa Pine	5/8" tongue and groove	C Select
Ponderosa Pine	3/4" drop siding	C Select
D. F. Plywood	3/8" exterior grade	A- C
Hard Board	1/4" tempered	

Nailed six inches o.c. around edges, and eight inches o.c. along intermediates with hot dipped galvanized nails. When decorative plant-ons are used on facing of door, they are to be nailed on with fasteners or hot dipped galvanized or cement coated nails. All nails or fasteners protruding beyond the surface of Hard Board shall be clinched (to fix firmly by folding over) with hammer or blunt instrument so that the point of nail or fastener is turned toward the face of the Hardboard product.

Moisture content shall not exceed 12%. In arid areas, 8% shall be the maximum.

Splicing of boards is permissible with a maximum of one splice per board. Top and bottom boards shall be full length (not spliced).

No two adjacent splices or end joints shall occur over the same nailing piece.

Plywood edges must be protected against splintering and ply separation by setting back 1/4" from bottom edge of frame.

NAILING: Hot dipped galvanized or aluminum nails shall be used. A minimum of two nails per bearing shall be used on a 6" board, 3 to an 8" board, and 4 to a board 10" in width. For nailing plywood or hard board, spacing of nails shall not exceed 6". Stapling of plywood is permissible as set forth in FHA bulletin MPR, Section 419A, dated October 7, 1955. For nailing boards 1/2" and under in thickness 8d nails shall be used and 6d nails for 4" boards.

HARDWARE:

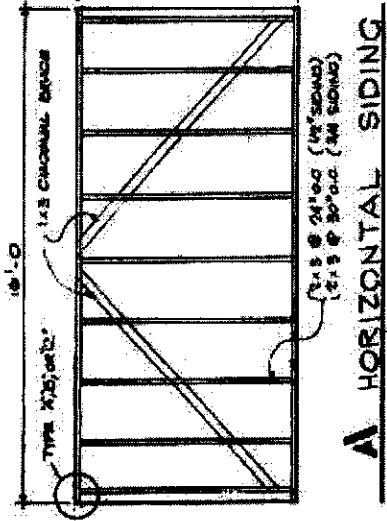
1. Minimum thickness truss rods of 5/16" shall be acceptable trussing material in Southern California. It shall be mounted with the appropriate brackets in preference to being mounted through end styles. Doors 10' and over must have at least one truss rod and 12' and over must have at least two truss rods. 10' doors construction with 2 x 4 T & B rails shall not require truss rods. Truss rod threading is required in one end of rod only.
2. Hardware manufacturers shall be responsible for the limits recommended on each particular model of hardware.
3. Hardware shall have designated on it by decal or other appropriate inscription, the maximum limitations for said hardware. This information shall specify maximum weight of door it is to be used upon.
4. Metal keeper shall be used around female member of bolt type locking device.

ADDENDUM

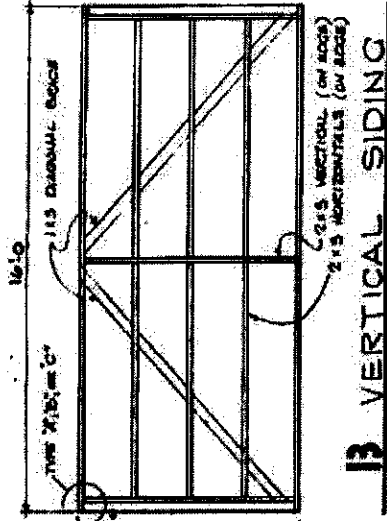
1. SIDING --- 5/8" shall be the minimum thickness for siding 10" wide and over.



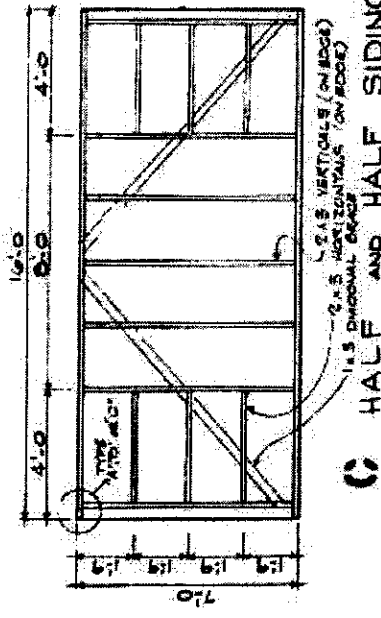
ATTACHMENT 14



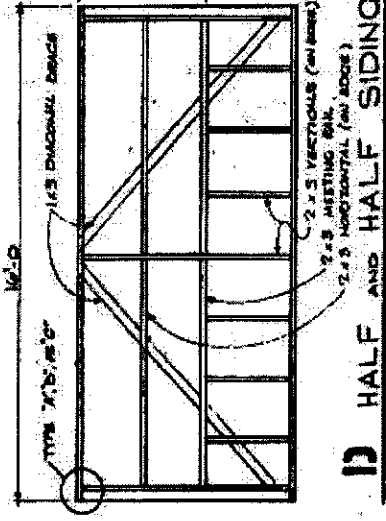
A HORIZONTAL SIDING



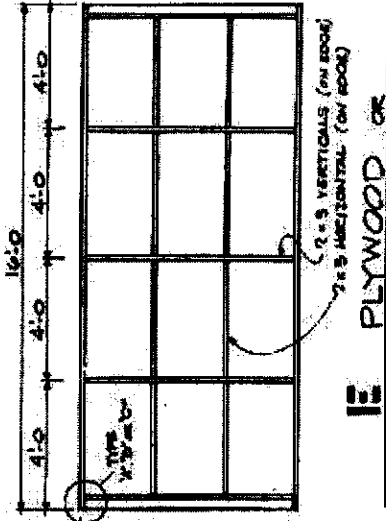
B VERTICAL SIDING



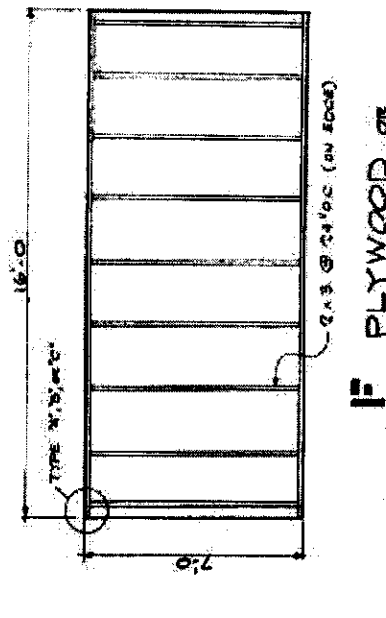
C HALF AND HALF SIDING



D HALF AND HALF SIDING



E PLYWOOD OR 1/4" HARDBOARD



F PLYWOOD OR 1/4" HARDBOARD

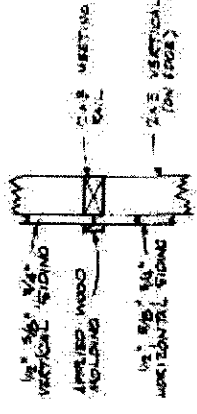
NOTE: ALLOW TOP RAILS FOR CLIP AND BOLTS TO BE VERTICALS AND END RAIL.



NOTE: NOTICE OF 2x5 VERTICALS, METAL ANGLE CLIP WITH 1/2" DIA. BOLTS THROUGH BOLTS AND 5/16" ANGLE TUBES END AT TOP AND BOTTOM RAIL OF GARAGE DOOR.



OVERHEAD GARAGE DOOR STANDARDS
as adopted by
CALIFORNIA OVERHEAD DOOR ASSOCIATION



WATER TABLE DET.

