

**MANUFACTURING EQUIPMENT  
PURCHASE SPECIFICATION  
DELPHI STEERING**

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<b>TITLE:</b> SPECIFICATIONS FOR MECHANICAL PRESSES	<b>NUMBER:</b> SD-1015
<b>ISSUED BY:</b> J.W. Cron	<b>DATE:</b> 02/12/96
<b>REVISION:</b> 001	<b>DATE:</b> 06/06/07

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**APPROVED BY:** *Jerry D. Jablonski*  
**SHEET:** 1 of 16

**TABLE OF CONTENTS**

<u>DESCRIPTION</u>	<u>PAGE NO.</u>
I. QUOTATION AND INVOICES .....	2
II. DELPHI SAGINAW STEERING SYSTEMS PRESS .....	2
SPECIFICATION SHEETS T99-0175.....	2
III. DRAWINGS .....	2
IV. APPROVAL OF DRAWINGS PRIOR TO FABRICATION & TIMELINES.....	4
V. SERVICE MANUALS .....	4
VI. PRESS STANDARDS .....	5
VII. MACHINE RUNOFF AND APPROVAL FOR SHIPMENT.....	5
VIII. TEARDOWN AND SHIPPING .....	6
IX. VENDOR SERVICE REPRESENTATIVE .....	7
X. PRESS COLORS .....	8
XI. PRESS GUARDRAILS AND LADDERS .....	9
XII. REVISIONS.....	16

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**SHEET:** 2 of 16

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**I. QUOTATION AND INVOICES**

All quotations and invoices are to be subdivided as far as practical; at a minimum, the following items shall be subdivided and priced separately.

- A. Press
- B. Feed Units & Transfers
- C. Options

**II. DELPHI SAGINAW STEERING SYSTEMS PRESS  
SPECIFICATION SHEETS T99-0175**

Press specification sheets shall be completed by vendor before a proposal will be considered.

**III. DRAWINGS**

The following list of drawings must be approved by Delphi Saginaw Steering Systems and then supplied in reproducible form.

- A. MECHANICAL
  - 1. General Assembly (to include)
    - a. Overall dimensions
    - b. Major assembly weights (crown-bed-side columns-slide assembly)
    - c. Number and size of conductors for each conduit run to main panel including conduit size.
    - d. All utility requirements
    - e. Required clearances to remove gears and shafts from crown and bed
    - f. Belt and motor description for main drive
    - g. Center of gravity of press
    - h. Distance between centerline of connections
    - i. Square inch area of hydraulic overload pistons

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2. Die Space including sectional views of liftout and knockout systems
3. Certified Foundation Drawing
4. Perishable liftout overload detail
5. Slide face machining
6. Motion Curves (slide, lift-out, transfer)
7. Die Space Guards
8. Bolster
9. Press Capacity Curve (slide and lift-out)
10. Lift-out Assemblies (including drive)
11. Transfer Assemblies (including drive)
12. Plan View Platform and Ladder

**B. LUBRICATION**

1. Schematics
2. Parts List
3. Bearing Charts (including size and number of bearings as required by T99-0175 and type of motion of each.
4. Lubrication Point Location Layout

**C. PNEUMATIC**

1. Schematics
2. Parts List

**D. HYDRAULIC**

1. Schematics
2. Parts List

**E. WATER**

1. Schematics
2. Parts List

**F. ELECTRICAL**

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1. Panel Layouts (including machine operator's station)
2. Panel Parts List
3. Schematics including Sequence of Operations
4. Press Electrical Components Parts List
5. Wire No. Usage Chart

NOTE: Drawings are required to indicate clearance dimensions for all access door provisions for removal of all components for service, and locations of control panels, operator's stations, stroke position indicator, air manifolds, etc. Each press purchased in multiple orders must include a complete and unique set of drawings. These presses may or may not be identical.

**IV. APPROVAL OF DRAWINGS PRIOR TO FABRICATION & TIMELINES**

All above drawings must be approved by Delphi Saginaw Steering Systems prior to fabrication and ordering of purchased components. The drawing approval will not constitute final approval. The machine must perform to the specifications quoted at vendor's plant during machine runoff and at Delphi Saginaw Steering Systems after final installation.

A timeline must be submitted once a month until 12 weeks before the equipment delivery date, at which time reports are required every two weeks.

**V. SERVICE MANUALS**

(3) copies must be supplied per machine. These manuals must be in Delphi Saginaw Steering System's possession prior to shipping machine. Manuals must contain the following:

- A. General Assembly Drawing
- B. Complete Parts List of Manufactured and Purchased Components (by manufacturer's name and part number)
- C. Preventive Maintenance Instructions
- D. Operating and Maintenance Instructions for the Press and Each Purchased Component
- E. List of Settings (regulators, timers, pressure switches, etc.)

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- F. Start-Up Instructions after Assembly
- G. Safety Precautions
- H. All Mechanical Assemblies & Sub-Assemblies coordinated with Parts List
- I. Die Space Drawing
- J. Perishable Overload Details (shear pins, etc.)
- K. All Motion Curves and Capacity Curves
- L. Recommended Spare Parts List

Note: Electrical drawing shall not be included in service manual.

It is recommended that manuals be done in Word for Windows (Version 6.0). In addition to hard copies, all electronic files associated with manuals should also be provided to Delphi Saginaw Steering Systems.

**VI. PRESS STANDARDS**

- A. Press must conform to all current GM Standards except as modified by Delphi Saginaw Steering System Standards.
- B. Press must conform to current Federal and State safety regulations.
- C. Press must conform to Delphi Saginaw Steering Systems requirements in T99-0175 (Specification Sheets).

Note: Any deviation from these specifications must be stated in detail with quote.

**VII. MACHINE RUNOFF AND APPROVAL FOR SHIPMENT**

Delphi Saginaw Steering Systems must be contacted ten days before the press is ready for runoff. This will be done by a Delphi Saginaw Steering Systems engineer from the Process Engineering Department.

Press runoff will consist of the Process Engineer examining the equipment for the following features.

- A. Ram to bed parallelism at top, bottom, and midstroke (L.H. and R.H. front and rear)
- B. Gib clearances
- C. Bearing clearance using slide height variation when counterbalance cylinders are being pressurized.

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**SHEET:** 6 of 16

- D. Motor amperage at no load and during run-in using a simulated load exerting 50% rated tonnage.
- E. Sound level recordings
- F. Die space
- G. Ram face and bolster machining (holes, T-slots, etc.)
- H. Press speed
- I. Shut height
- J. Slide adjustment
- K. Permanent marking on flywheel and motors showing direction of rotation
- L. Bolster thickness, etc.
- M. General workmanship
- N. Items listed in Delphi Saginaw Steering Systems T99-0175 (Press Specification Sheets) and the purchase order
- O. Compliance with all applicable standards as listed in Section VI of this specification.
- P. Slide adjustment motor current draw in both directions
- Q. Vibration analysis and signatures

In addition, the press must be run-in for eight hours minimum with a simulated load exerting 50% of the rated tonnage. If urethane load simulators are used for this run-in, they should be allowed to cool after each hour's run. The vendor shall provide the Delphi Saginaw Steering Systems engineer with four copies of the vendor's completed final inspection form, and Delphi Saginaw Steering Systems will insert a copy of report in each service manual.

After the above checkout has been completed, the Delphi Saginaw Steering Systems engineer will furnish the vendor a list of corrections that must be made before the equipment can be shipped. He may require another inspection trip to verify that the corrections have been completed before approval to ship is given.

### **VIII. TEARDOWN AND SHIPPING**

- A. Each tie rod nut to be stamped uniquely and each end of the tie rod stamped correspondingly. Also identify the top of the rods. Tie rod nuts to be shipped on the tie rods.

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**SHEET:** 7 of 16

- B. Serial numbers to be painted on all boxes of parts.
- C. Serial number to be painted on all major components.
- D. All machined surfaces must be protected.
- E. All crown openings must be covered.
- F. If possible, crown to be shipped in upright position.
- G. Motor and jackshaft to be shipped as a unit.
- H. Only minimum teardown for shipping desired.
- I. Eccentric straps to be shipped in crown if practical.
- J. All items that could be damaged by rail road car humping must be properly blocked or otherwise protected against damage.

**IX. VENDOR SERVICE REPRESENTATIVE**

The vendor shall provide mechanical and control service representatives to supervise installation and start up at no additional charge until equipment furnished runs reliably to specifications quoted with normal maintenance as specified by the vendor in his quotation.

At the time of set-up, the service representative shall verify the following features and record data in the service manual.

- A. Ram to bed parallelism at top, bottom, and midstroke (L.H. and R.H. front and rear)
- B. Gib clearances
- C. Bearing clearance using slide height variation when counterbalance cylinders are being pressurized.
- D. Motor amperage at no load and during run-in using a simulated load exerting 50% rated tonnage.
- E. Sound level recordings

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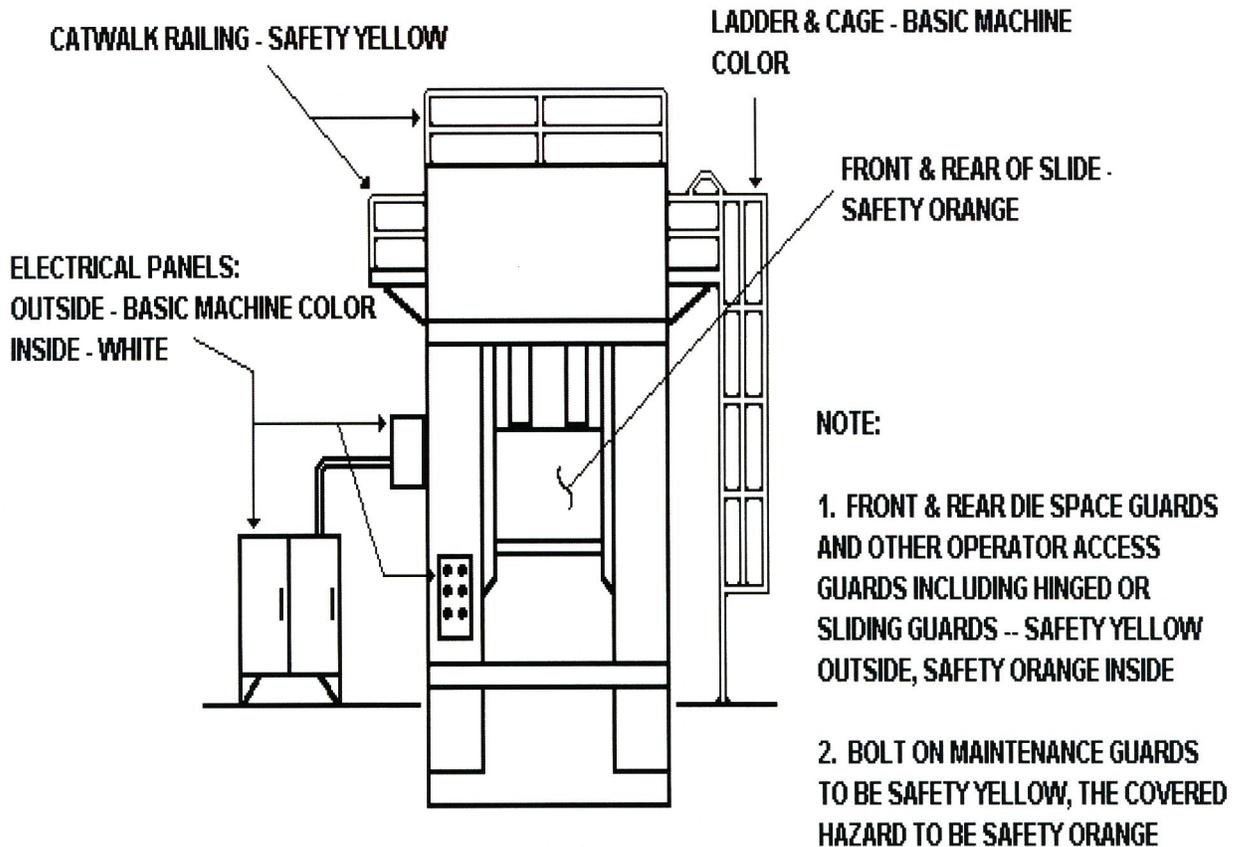
**APPROVED BY:** *J. D. Dabkowski*

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**SHEET:** 8 of 16

**X. PRESS COLORS**



**ALL ROTATING OR OSCILLATING POWER TRANSMISSION SHAFTS OR LEVERS TO BE SAFETY ORANGE**

**REMAINDER OF PRESS TO BE BASIC MACHINE COLOR, WHICH WILL BE SPECIFIED LATER**

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**SHEET:** 9 of 16

**XI. PRESS GUARDRAILS AND LADDERS**

- A. All elevated platforms or open sided floors four or more feet above the adjacent floors or ground level or adjacent to hazardous machinery shall be guarded by a standard guardrail or other structure which affords equivalent protection.
1. A standard guardrail consists of a top rail, an intermediate rail, and vertical posts.
    - a. The top surface of the top rail must be approximately 42" above the elevated platform or floor.
    - b. The top rail must be smooth surfaced.
    - c. The intermediate rail must be positioned approximately midway between the top rail and the elevated platform or floor.
    - d. Suitable materials for standard railings include, but are not limited to, the following: (other materials which afford equal protection are acceptable)
      - 1). For pipe railings, posts and top and intermediate railings shall be at least 1 ½ inches outside diameter with posts spaced not more than 8 feet on centers.
      - 2). For structural steel railings, posts and top and intermediate rails shall be of 2-inch by 2-inch by 3/8-inch angles or other metal shapes of equivalent bending strength with posts spaced not more than 8 feet on centers.
  2. Other types, sizes, and arrangements of railing construction are acceptable provided they meet the following conditions:
    - a. A smooth-surfaced top rail at the height above floor, platform, runway, or ramp level of approximately 42 inches.
    - b. A strength to withstand at least the minimum requirement of 300 pounds top rail pressure.

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**SHEET:** 10 of 16

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- c. Protection between top rail and floor or platform equivalent at least to that afforded by a standard intermediate rail; (ex. scrollwork or solid panels)
  - d. Elimination of rail ends unless such overhand does not constitute a hazard.
- B. Toe boards:
- 1. Toe boards are required on all elevated platforms or open sided floors beneath which:
    - a. Persons can pass.
    - b. There is moving machinery.
    - c. There is equipment with which falling material could create a hazard.
  - 2. A standard toe board shall measure 4" high from its top edge to the platform or floor, and must extend to within ¼" of the platform floor.
  - 3. Toe board material must be solid or have openings not over 1" in their greatest dimension.

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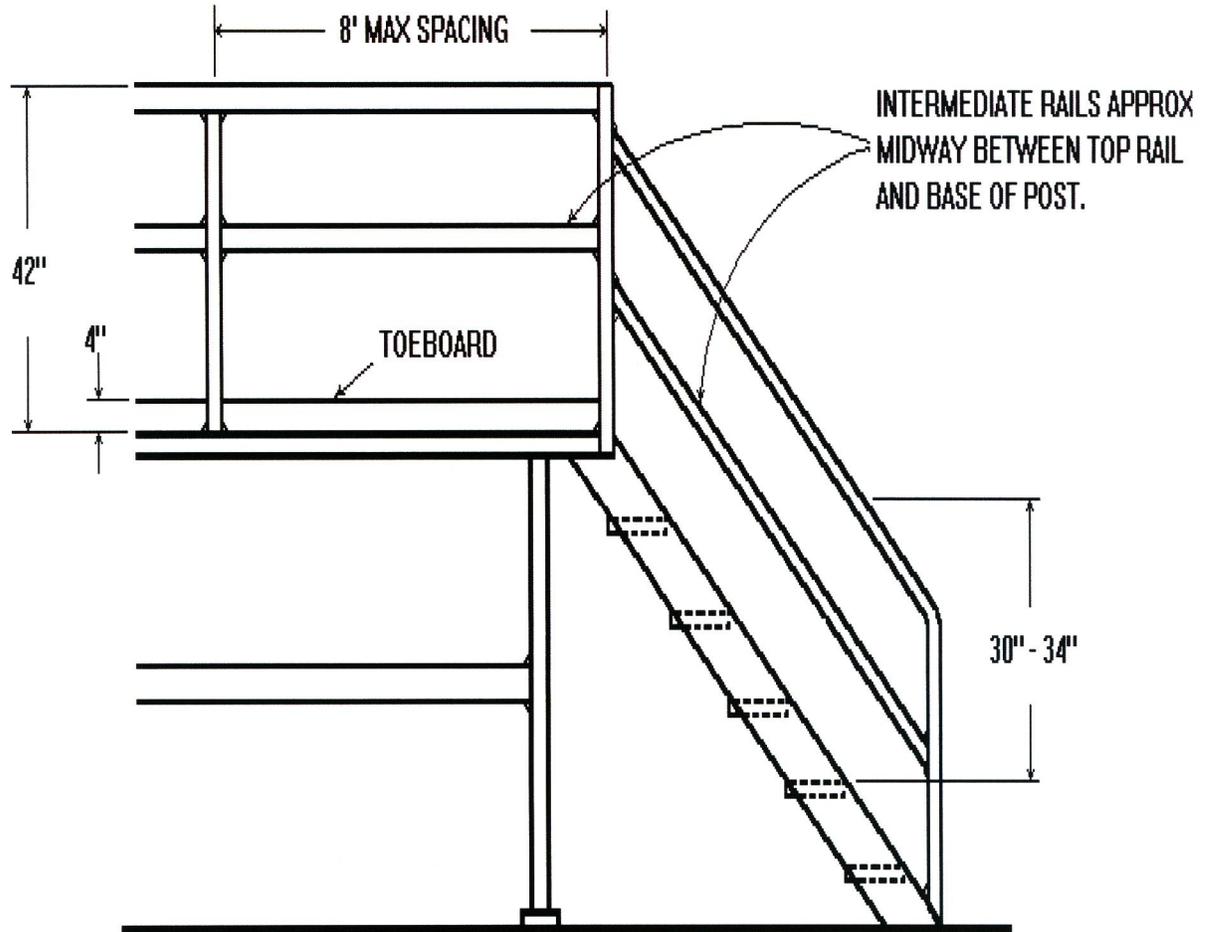
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**SHEET:** 11 of 16



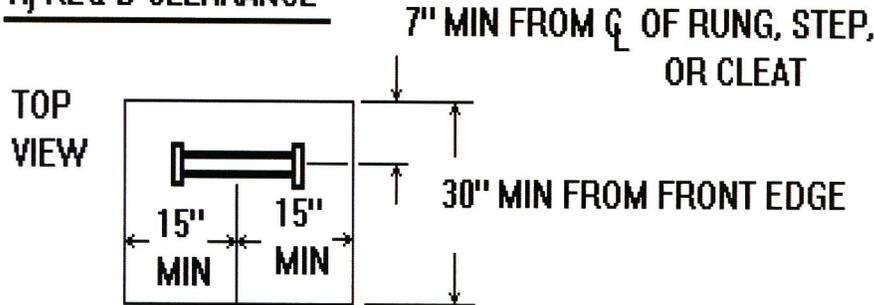
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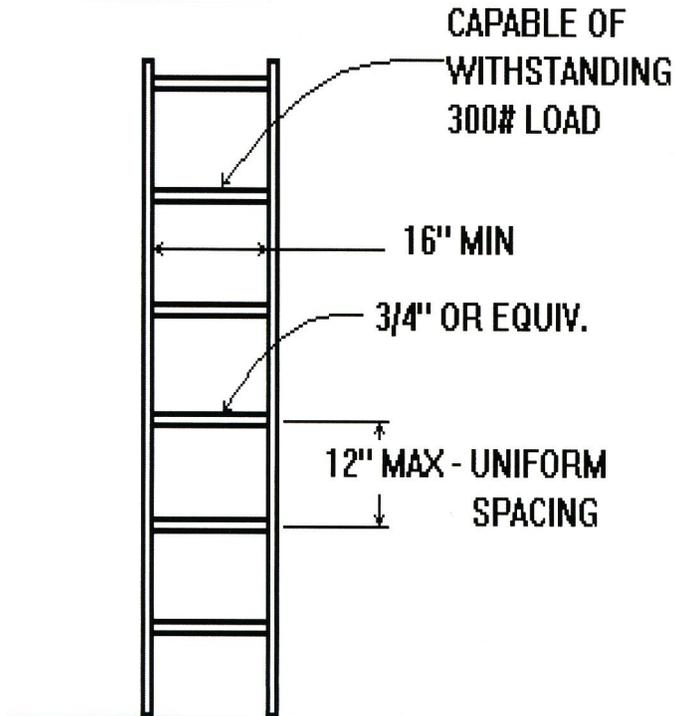
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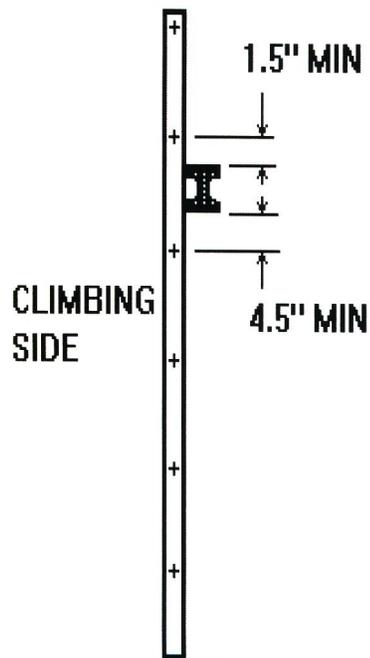
**A) REQ'D CLEARANCE**



**C) CONSTRUCTION**



**B) UNAVOIDABLE OBSTRUCTIONS**



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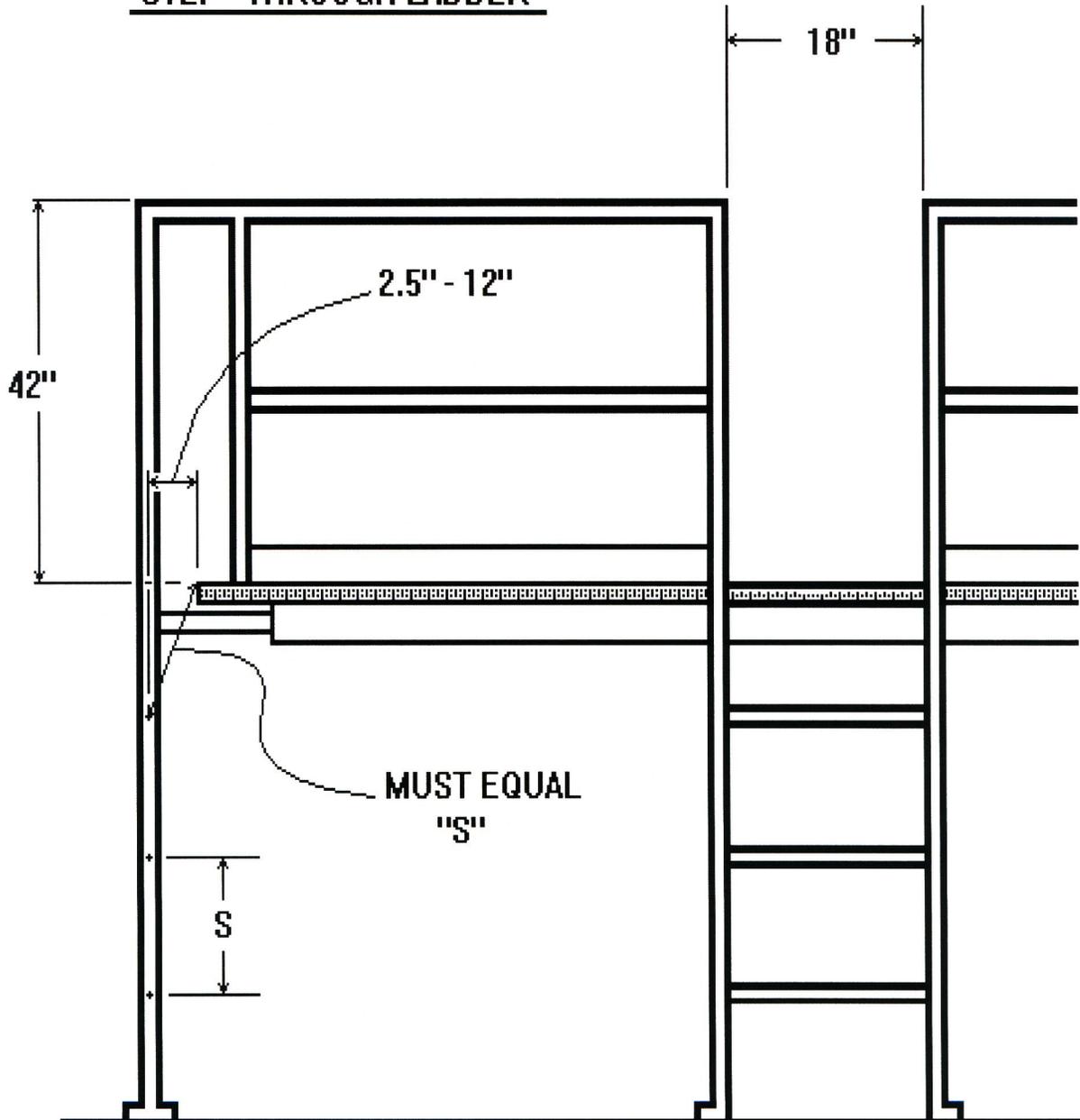
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**SHEET:** 13 of 16

**STEP - THROUGH LADDER**



SD2449 DIV PROC 100 REV 5/29/96

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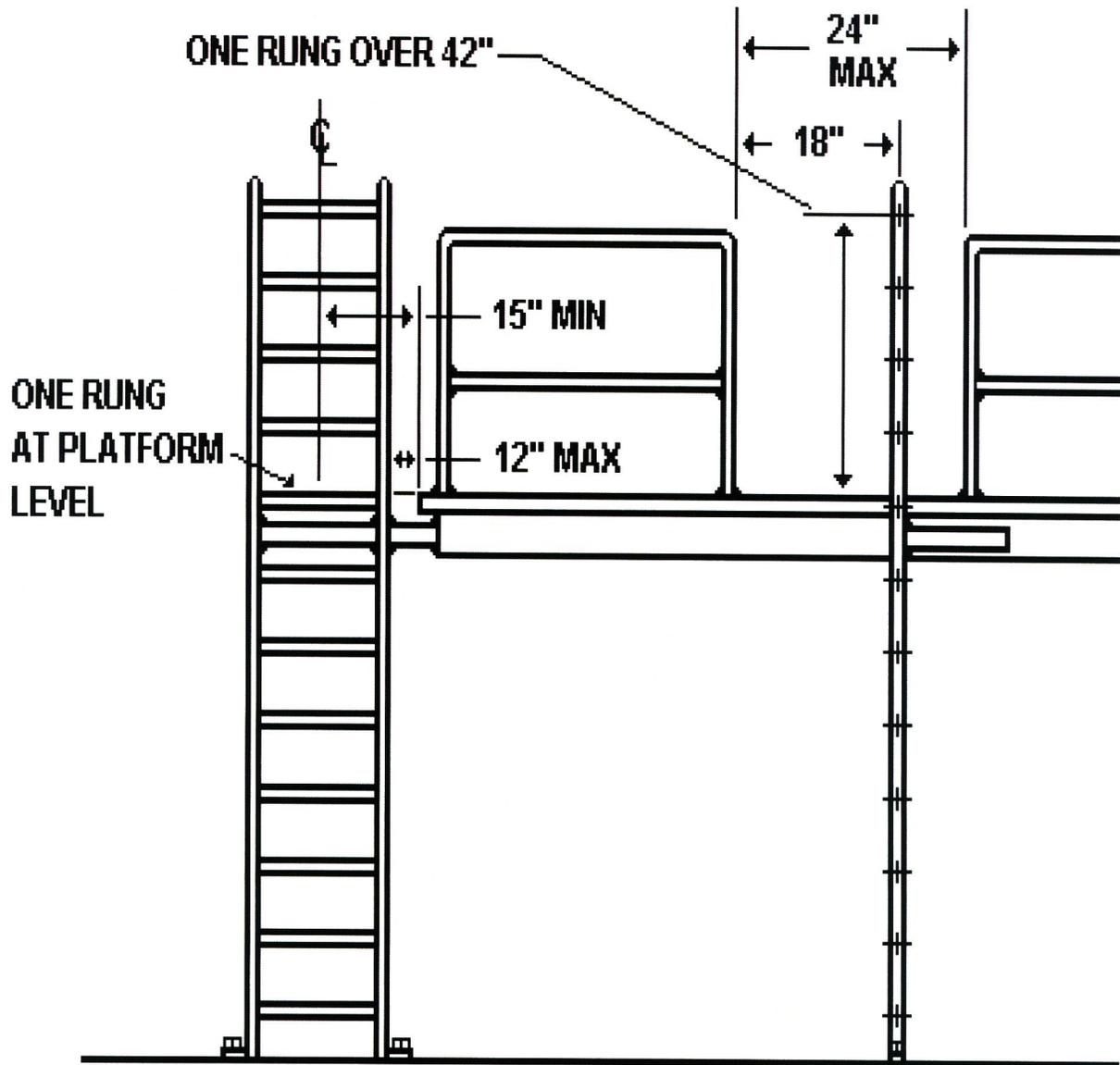
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**SHEET:** 14 of 16

**SIDE STEP LADDER**



SD2449 DIV PROC 100 REV 5/29/96

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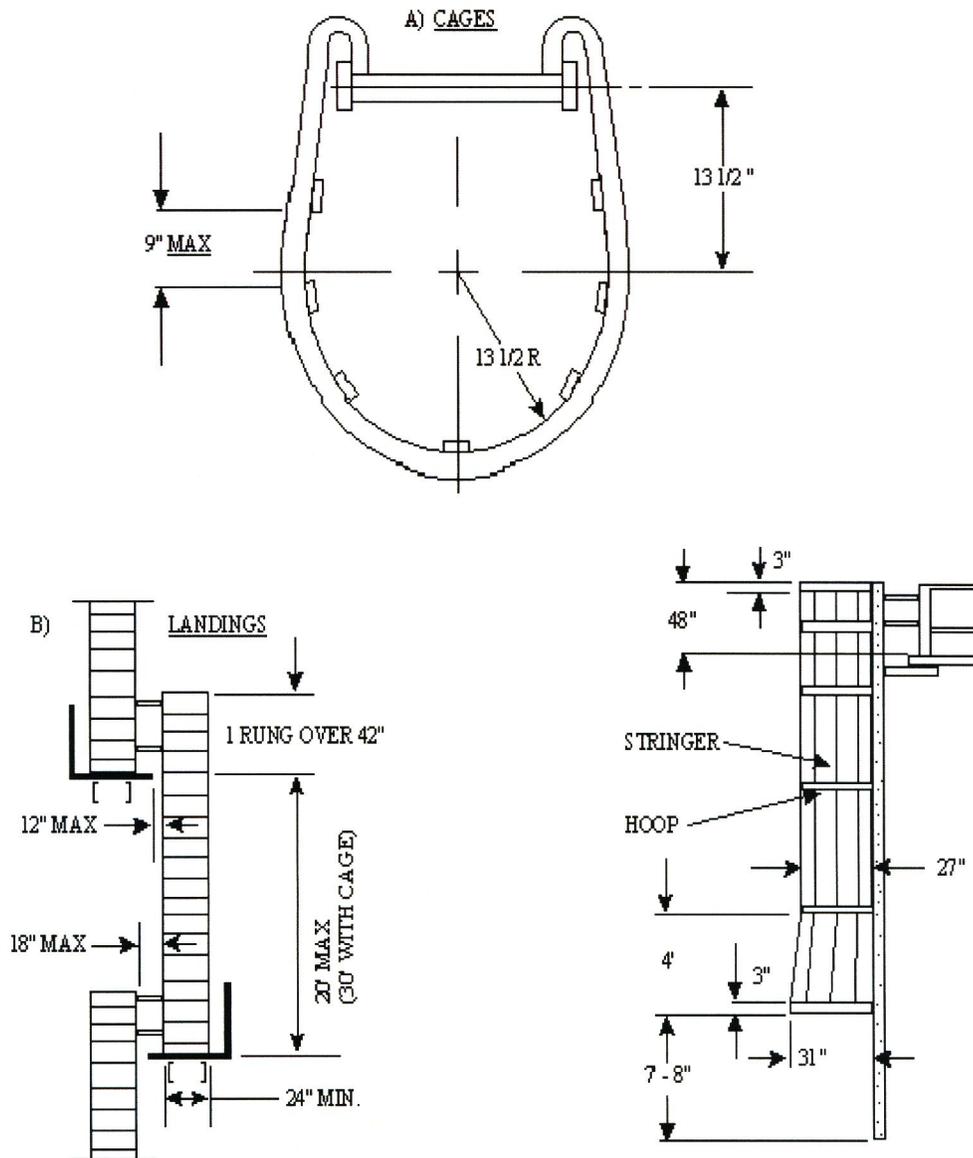
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**SHEET:** 15 of 16



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**XII. REVISIONS**

<b>Revision</b>	<b>Date</b>	<b>Section</b>	<b>Description</b>	<b>Revised By</b>
001	06/06/07	All	Retyped	Amanda Parkinson

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