



LOADMASTER

SCALE & ELECTRONICS

SPECIFICATIONS FOR MOTOR TRUCK SCALES

GENERAL

Scale furnished under these specifications shall be of welded steel pipe lever design consisting of two sections or more. The levers shall be made of weldments of heavy steel tubing, steel plates and structural steel shapes. The levers shall be clean, smooth, uniform and free from imperfections. The initial load is suspended from the center of the main lever bearings and each section of main or primary levers shall be directly connected to a longitudinal transverse lever, thence to the indicating element.

CAPACITY AND PLATFORM SIZE

The specifications apply to the standard capacities and platform sizes listed below:

20 Ton - 24' x 10'
30 Ton - 30' x 10' - 35' x 10'
50 ton - 35' x 10' - 40' x 10'
60-75 & 100 ton - 45' x 10' - 50' x 10' - 60' x 10'
70' x 10' - 80' x 12'

MAIN SUSPENSION

The main suspension consists of a steel load bearing block having a self-aligning steel bearing resting upon the main lever load knife edges. Two parallel steel links with heat treated inserts suspended from the bearing block support the cross bar which in turn receives the girder chair legs supporting treated at points of contact for resisting wear. All like parts shall be interchangeable.

PIVOTS AND BEARINGS

The material used for pivots and bearings in scales shall be either:

- a. High Carbon Steel SAE 1095, hardened to not less than 60 Rockwell C., or
- b. Special Alloy Pivot Steel, SAE 6195 or 52100, hardened to not less than 58 Rockwell C.

SPECIFICATIONS FOR MOTOR TRUCK SCALES

GENERAL

Scale furnished under these specifications shall be of welded steel pipe lever design consisting of two sections or more. The levers shall be made of weldments of heavy steel tubing, steel plates and structural steel shapes. The levers shall be clean, smooth, uniform and free from imperfections. The initial load is suspended from the center of the main lever bearings and each section of main or primary levers shall be directly connected to a longitudinal transverse lever, thence to the indicating element.

CAPACITY AND PLATFORM SIZE

The specifications apply to the standard capacities and platform sizes listed below:

20 Ton - 24' x 10'
30 Ton - 30' x 10' - 35' x 10'
50 Ton - 35' x 10' - 40' x 10'
60-75 & 100 Ton - 45' x 10' - 50' x 10' - 60' x 10'
70' x 10' - 80' x 12'

MAIN SUSPENSION

The main suspension consists of a steel load bearing block having a self-aligning steel bearing resting upon the main lever load knife edges. Two parallel steel links with heat treated inserts suspended from the bearing block support the cross bar which in turn receives the girder chair legs supporting the main girders of the weighbridge. All suspension parts shall be heat treated at points of contact for resisting wear. All like parts shall be interchangeable.

PIVOTS AND BEARINGS

The material used for pivots and bearings in scales shall be either:

- a. High Carbon Steel SAE 1095, hardened to not less than 60 Rockwell C., or
- b. Special Alloy Pivot Steel, SAE 6195 or 52100, hardened to not less than 58 Rockwell C.

The load per lineal inch of knife edge shall not exceed 5,000 lbs. for SAE 1095 steel, or 6,000 lbs. per lineal inch for SAE 6195 or 52100 steel.

All bearings shall be mounted so as to obtain equal and continuous contact of the knife edges with their respective bearings for the full length of the parts designed to be in contact. In loop bearings, the knife edges shall project slightly beyond the bearings in the loops.

Bearings shall be of the same material as the pivots and shall be at least as hard. All like pivots and bearings shall be interchangeable, scientifically hardened and ground to exact limits.

The side forming the knife edge of each pivot shall make an angle of 90 degrees and the knife edge shall be on the center of the pivot section.

CONNECTIONS

All connections between levers shall be vertically adjustable and provided with a means of aligning the steel bearing blocks.

NOSE IRONS

That portion of the nose iron which comes in contact with the lever shall be accurately fitted in or on the lever and shall be fastened firmly in position by means of bolts of recognized standard size and thread.

The means of clamping nose irons in position will force or hold them against the lever in the same direction as they would be forced by the load.

The position of each nose iron as determined by the factory adjustment will be accurately, clearly and permanently indicated by well defined marks on the lever and nose irons which meet on a common line.

SCALE LEVERS

The lever weldments shall be made of heavy steel tubing, steel plates and structural steel shapes and shall be clean, smooth, uniform and free from imperfections.

Leveling lugs shall be provided on each lever, placed approximately 11" apart. The leveling surface of each pair of lugs shall be finished to a common plane parallel to the knife edges of the end pivot.

The design, workmanship and factory adjustment of the levers shall be such that the proper ratio of the lever arms will be maintained.

LEVER FULCRUM STAND

Fabricated mild steel for lever stands shall be clean, smooth, and uniform.

Lever stands shall be finished parallel to the line of the knife edge bearings. Two anchor bolt holes not less than $1\frac{1}{2}$ " in diameter shall be provided in the bases of all stands. Bearing pressure on the base of the stands shall not exceed 300 lbs. per square inch.

GIRDER CHAIRS

All steel girder chairs will have smooth finished surfaces where engaging flanges of girders.

CHECKS

All scales shall have a minimum of two adjustable bumper checks at each end of the scale to effectively restrict the lateral motion of the weighbridge.

ANTI-FRICTION HEADS

Hardened steel anti-friction heads shall be provided to limit the relative lengthwise displacement of all knife edges with respect to their bearings.

CLEARANCES

The clearance around and between the fixed and live parts of the lever systems shall be such as to insure good scale operation.

WEIGHBRIDGE

Main girders for Weighbridge shall be of such section moduli that the rated capacity loads will not cause undue deflection which would cause inaccuracies in weighing. Not less than one pair of stiffener bars shall be coped to fit the girder flanges where the bearing stress is transmitted from the stiffener to the flange. The main girder shall be supplemented with necessary crossmembers, hook on outriggers, etc., made of steel and designed in accordance with approved structural practices.

Concrete platform shall be at least 5" thick and adequately reinforced. Surfaced planking for timber decks shall be minimum of 3 3/4" thick.

WORKMANSHIP

Workmanship to be first class in every respect. Steel tubing, structural shape and steel plates shall be clean, smooth, uniform and shall not be warped.

PROTECTIVE FINISH OF PARTS

The finish and treatment of all parts of the scale shall be such as to insure good appearance and adequate protection against corrosion.

PERFORMANCE AND GENERAL REQUIREMENTS

The performance requirements and tolerance values shall be as set forth for vehicle scales in the Scale Code of National Bureau of Standards Handbook H-44, Third Edition or its successor. In addition to the provisions set out herein, all applicable requirements of National Bureau of Standards Handbook H-44, Third Edition or its successor, shall be met in every respect.

LOADMASTER MOTOR TRUCK SCALES
LOAD REACTIONS FROM CONCENTRATED LOADS
ON 2 SECTION SCALES

Distance from center of section	1'	2'	3'	4'	5'	6'	7'	8'	9'	10'	11'	12'	13'	14'	15'	16'	17'	18'
Span 8' c. to c.	87.5	75	62.5	50														
" 10'	90	80	70	60	50													
" 12'	91.5	83.5	75	66.5	58	50												
" 14'	93	86	78.5	71.5	64	57	50											
" 16'	94	87.5	81	75	69	62.5	56	50										
" 20'	95	90	85	80	75	70	65	60	55	50								
" 24'	96	91.5	87.5	83.5	79	75	71	66.5	62.5	58.5	54	50						
" 30'	96.5	93.5	90	86.5	83.5	80	76.5	73.5	70	66.5	63.5	60	56.5	53.5	50			
" 36'	97	94.5	91.5	89	86	83.5	80.5	78	75	72	69.5	66.5	64	61	58.5	55.5	53	50

The above table is for use in calculating the approximate load reaction on the sections of two section Industrial Scales.

The table shows the percentage of a load that is transmitted to the section, when concentrated on the platform at a certain distance from the center line of the section.

The percentages are given for each 12" (inclusive) on various lengths of span between sections. For intermediate lengths, not shown, use next longer span.

The greatest reactions come from loads concentrated by wheels of a truck or other fixed points of support where 100% of the load on one axle or point of support may come on one section and to which must be added the percentage of load carried by other points of support at their respective distances from the center line of the section.

Where the load is equally distributed for its entire length or area on the scale platform the reaction can be computed by multiplying the total load by the percentage shown for the distance from the center line of the section to the center line to the load.

Where loads are placed on the scale by a crane, multiply the normal load reaction by 5 to include impact.



holtgreven

SCALE & ELECTRONICS
CORPORATION

420 E. LINCOLN ST. FINDLAY, OHIO 45840
PHONE (419) 422-4779

DIRECTIONS FOR INSTALLATION OF MOTOR TRUCK SCALES

Build the pit according to the certified plans furnished when the scale is purchased, following the dimensions called out in the plans. Foundation piers must be smooth, level and true to plane. The footings of the piers should be placed below the frost line.

Your Loadmaster Scale is constructed from the finest materials and superior workmanship and built to exacting standards. If properly installed, it will give years of satisfaction and dependable service. It is important, however, that competent men, preferably those trained in Motor Truck Scale installation, do this work. Your nearest Loadmaster Distributor is trained and fully equipped to perform this work.

When the scale is received, store in a dry place until ready for installation. When unpacking the parts, examine all packing for any loose parts and check the parts against the packing list. If a shortage occurs, refer to the packing list packed with the scale. The Weighbeam or Dial Head should be unpacked very carefully so as not to damage any of the parts or printing type. Furthermore, it should be unpacked at once to prevent any condensation forming inside the box.

As water in the pit causes rapid rusting of vital parts and floating materials lodge between the scale parts, the scale should be located so that the least amount of water will come to it. If placed close to a building, eaves water should be spouted away from the scale. A drain should be provided to avoid the necessity of pumping water out of the pit.

Inside face and center line dimensions of the pit must be maintained, but outside dimensions given on the prints are based on average conditions, and may be increased. The walls must be made strong enough to resist any outside forces, which may be considerable with heavy traffic along the side of the scale.

Build the forms of 1" lumber of plywood surfaced on at least one side, with the smooth surface against the concrete. Use 2" x 4" studding spaced 2' on centers, braced to prevent tipping. Care must be taken to build the forms at the correct distance from the desired locations of the indicating element.

Assemble the suspension parts in the main levers by placing bearing steels in the bearing clocks and hanging the suspension links on each side of the bearing blocks. Install the link pins across the bottom of the links and place the girder chairs in position making certain the locating pins in the bottom of the girder chairs are installed in the holes of the link pins.

The next step is to refer to the plan for the elevations and actually measure the heights of all structural steel for both the weighbridge and platform. After obtaining the correct over-all dimensions of the steel, check the height of the girder chairs to the top of the wall. If necessary, adjust the 5/8" adjusting screws in the base of the main lever stands, re-leveling the main levers as required. At this point the length of the connection bolts should be correct and should be locked in place, using the double nuts provided. It is rarely necessary to make any adjustments to the transverse lever stands as there is ample clearance provided between the main levers and transverse levers.

If the weighbridge is of the welded sectional type, each section can now be lowered directly to the girder chairs, or if for all bolted connections, it is recommended the sections be assembled on top of the pit wall, resting on members placed across the pit and then lowered in place, one section at a time.

Before bolting the main girders to the girder chairs, the completely assembled steel weighbridge may now be centered in the pit by checking clearances at the ends and sides of pit. After the weighbridge is centered in the pit, relieve the weight on each individual girder chair, one at a time, by means of a jack and position the top of the girder chair level in both directions. Lower this portion of the weighbridge carefully down to the up-right girder chair and install the girder chair bolts only finger tight.

After each individual girder chair is placed in the correct position under the weighbridge with the girder chair bolts finger tight, it is time to tighten all of the girder chair bolts securely with a wrench. At this point the weighbridge should be floating correctly and freely in the pit. Pack the bumper bolts threads with grease and adjust for 1/8" clearance between the end of the bumper bolts and the bumper plates in the concrete wall.

The installation is now complete enough to grout all the lever stands in place to keep them from settling or shifting. After grouting sets up, retighten all lever stand bolts permanently with a wrench.

The Weighbridge and Short Iron Pillar Outfit or Load Cell can now be positioned in the office and fastened in place with the shields and bolts supplied with the scale. The steelyard rod with its turnbuckle connecting the beam outfit or dial head with the top of the transverse lever can now be installed. Make certain that at least 1" of clearance is provided around the steelyard rod and the floor.

The installation is now ready to receive the platform steel and deck. Since these Motor Truck Scales are provided for installation with timber or concrete decks, all that is necessary to complete the entire installation is to refer to the plans for installing the particular type of deck with which the scale is equipped.

Locate anchor bolts by wooden templates, made by boring holes in 1" pieces nailed across 1" above the top of the pier forms. Make certain the anchor bolts are held to the correct elevation from top of pier. The correct positions of the bolts are given on the prints.

The concrete must be well mixed and worked in the forms. Care must be taken not to move the anchor bolts. The tops of the piers must all build to the same elevation and be accurately level. Check these with a straight edge and a level. Coarse gravel should be worked well below the surface of the piers and some clear dry cement troweled into the surface to make it smooth.

Before starting the installation of the scale, check over all the dimensions on the drawings against the pit to make certain the foundation bolts in the piers, over-all dimensions of the pit and the elevations coincide with the dimensions on the drawing. Prior to installing the lever system, clean the paint from all surfaces of pivots and bearing steels and pack them lightly with grease.

The main lever and transverse lever fulcrum stands are provided with four 5/8" adjusting screws to properly level and adjust the stands to the proper height. The taller stands are for the transverse lever and the shorter stands are for the main levers. Set the fulcrum stands with the bearing steels over the foundation bolts with the adjusting screws projecting one inch from the bottom of the stand. Place 1/2" cut washers under 5/8" adjusting screws to prevent adjusting screws from digging into the concrete pier while setting the scale. Install the main levers with the fulcrum pivots resting in their respective bearing steels in the main lever stands and block up the tip end of each main lever until it is level. Level both ways directly on top of the lever.

The next step is to bolt the transverse lever to the splice arm which extends into the neck of the pit. Block up the tip of the transverse lever in the neck and level splice arm after fulcrum pivots are setting in the bearing steels in the transverse lever stands. Level the transverse lever directly on top of the pipe and make certain all fulcrum pivots bear equally on their respective bearing steels by raising or lowering the transverse lever stands with the 5/8" adjusting screws.

Connect all main levers to the transverse lever by installing the bearing steels and places with their connecting bolts and re-level the main levers by adjusting the length of the connecting bolts.

Place center line in both directions just above the transverse lever. If necessary, shift center transverse lever so the load pivots are directly below the center line running lengthwise of the pit and at the same time line up the transverse lever extension arm with the center line running across pit. If transverse lever was moved for alignment, re-check for level and pivot and bearing contact as mentioned above.

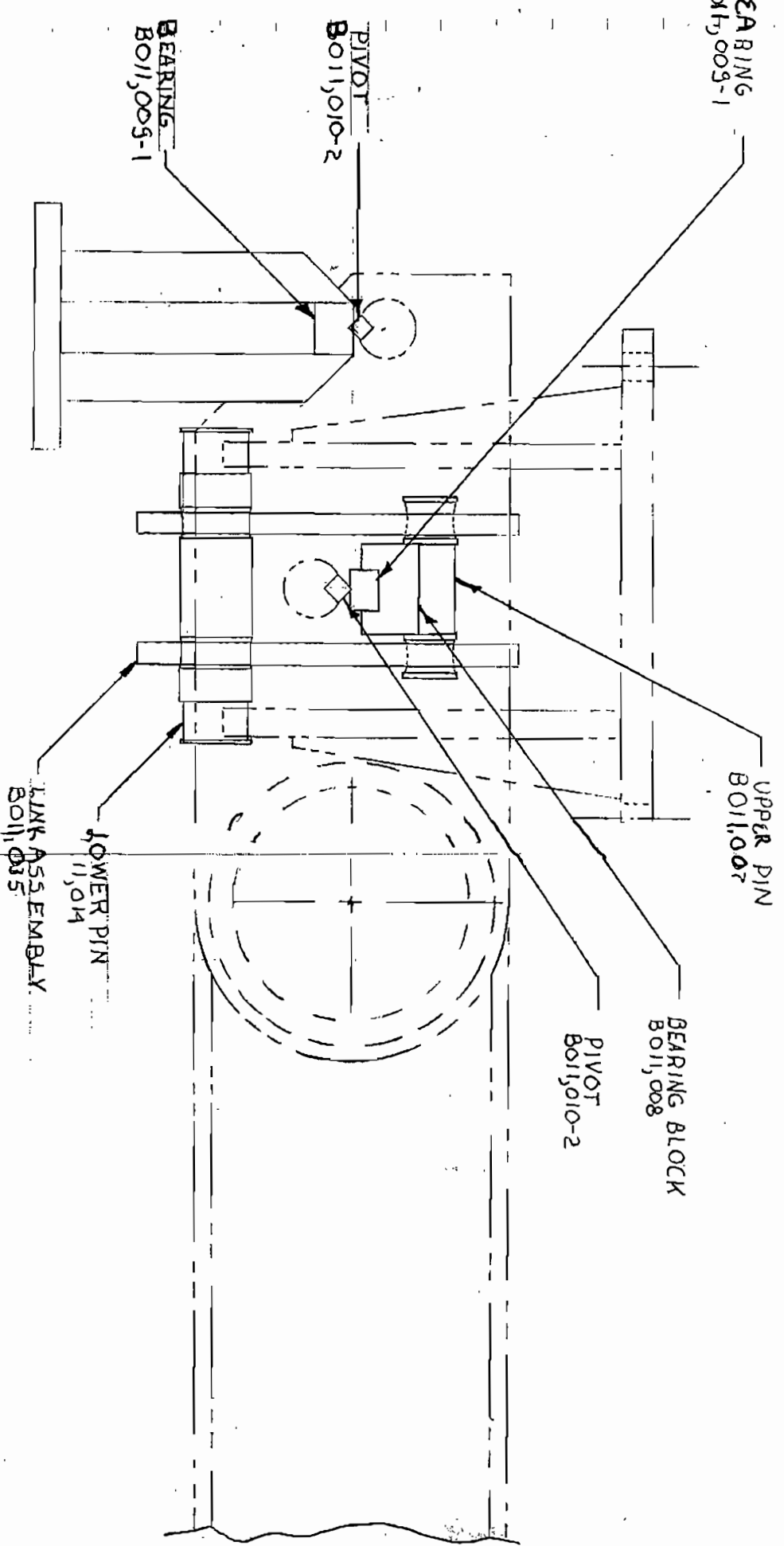
It is now time to line up the main levers which is a rather simple procedure. Like the transverse lever stands, the main lever stands are also provided with holes large enough to permit shifting for proper alignment with the transverse lever. Shift the main levers to the center of the nose iron pivot is directly under the center of the transverse lever load pivot, at the same time making certain the main levers are in their correct position in relation to the center of the pit.

All like parts of the Loadmaster Motor Truck Scale, including the pivots and bearings, are interchangeable and replaceable. All main levers are fitted with adjustable nose irons for correcting any errors that may develop in the scale sections. Also, for correcting the over-all accuracy of the scale, adjustable nose irons are provided at the tip ends of the transverse and any shelf levers.

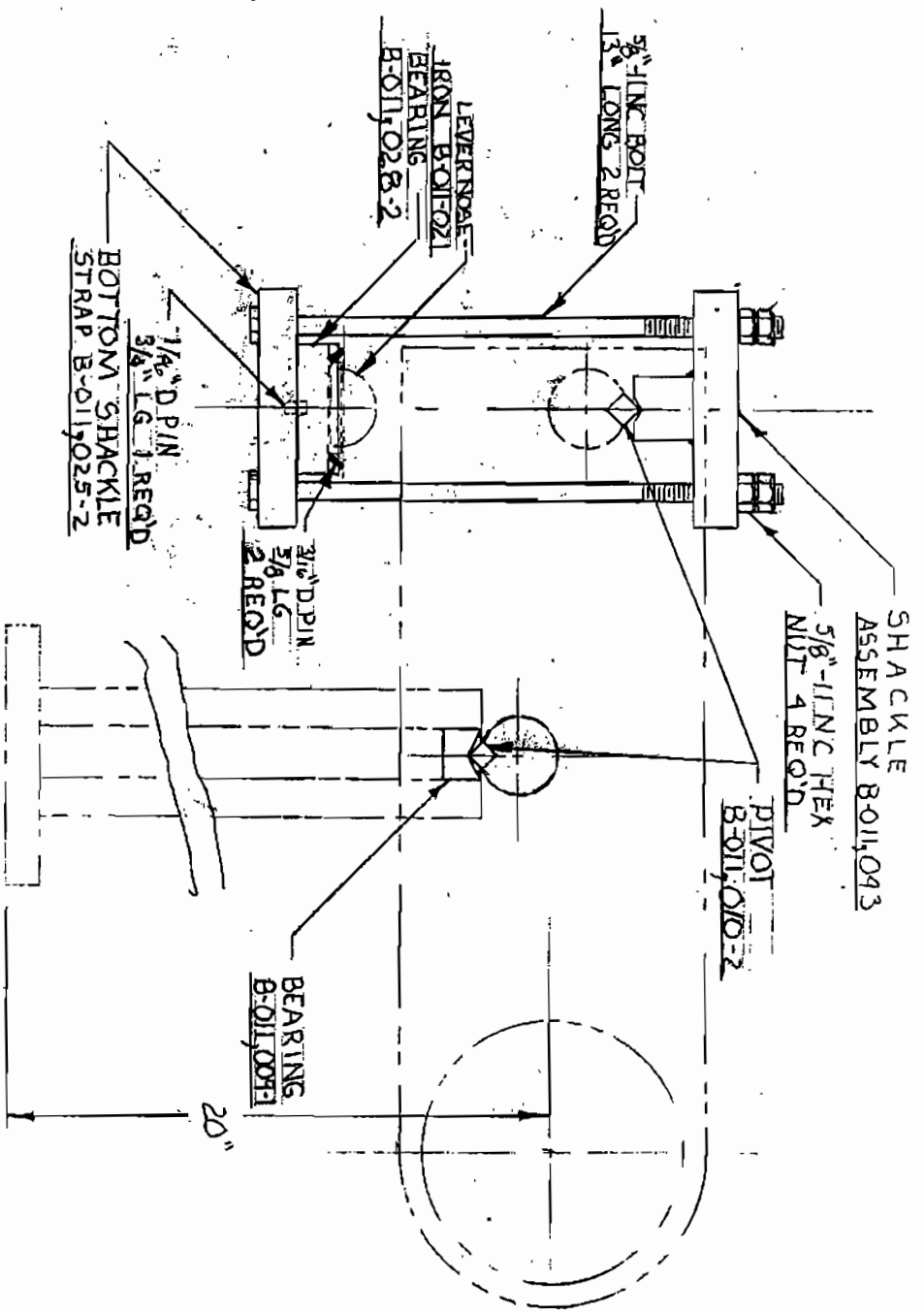
Make a simple test to see that the beam indicates the same at any place on the platform. If any corner of section shows a variation from the rest, a close inspection at that locally will undoubtedly reveal some binding or out of plumb condition.

MODEL 151-2201-0 M, 30/25T, 10' X 10', CONC.

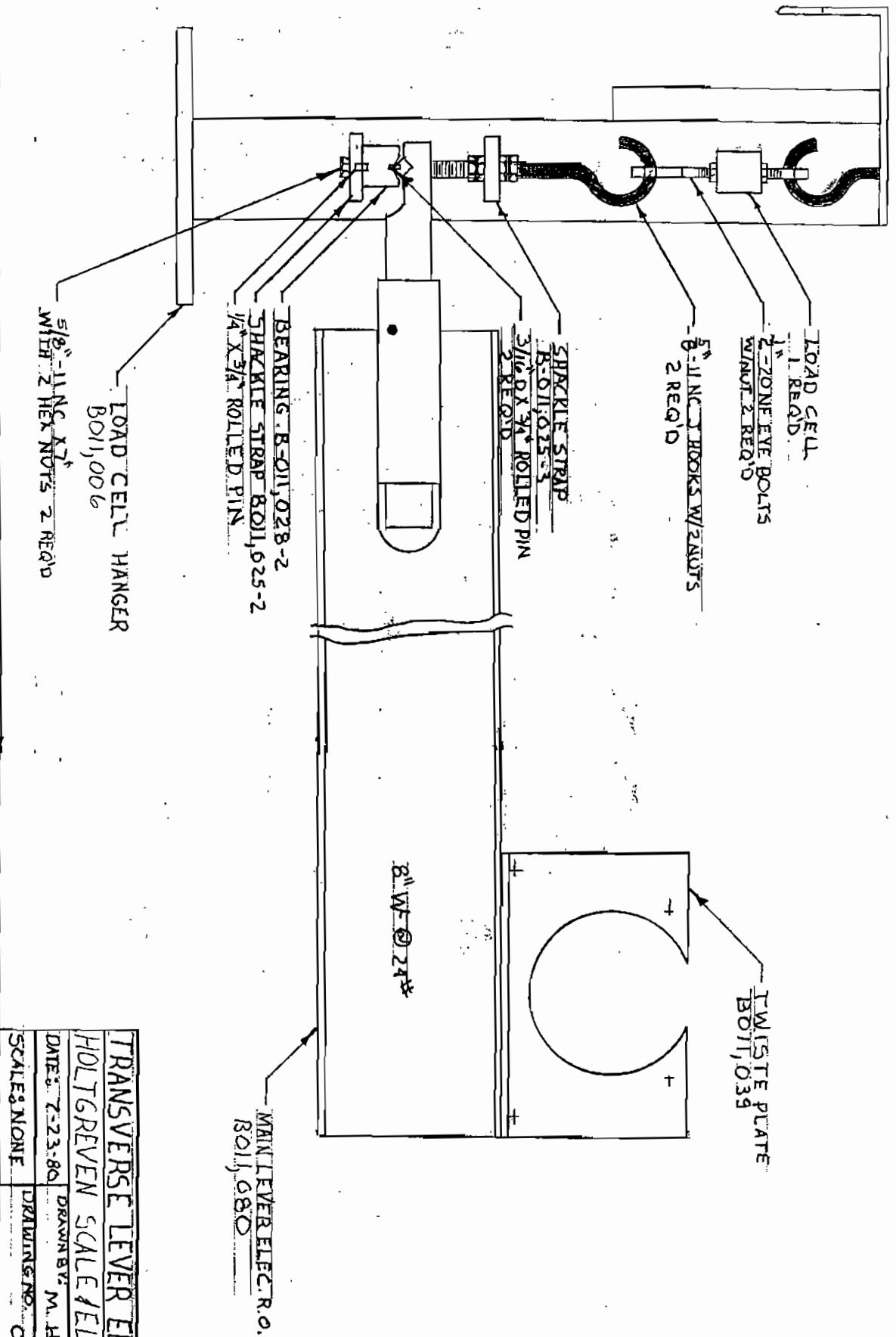
PART NUMBER	DESCRIPTION	UNIT OF MEAS	QTY USED
231-1002-0	CHAIR, 30T GIRDER	EA	4.00
231-2005-0	STAND, L/C HANGER ASS'Y. MIS	EA	1.00
231-2006-0	STAND, 30T MAIN LEVER	EA	4.00
233-1003-0	PLATE, ASSEMBLY PIT BUMPER	EA	4.00
233-2003-0	BUMPER ASSEMBLY SERIES M	EA	4.00
331-4001-0	HUB, 30T MAIN LEVER	PR	4.00
331-4002-0	HUB, BACKBONE	EA	2.00
331-4005-0	TWISTER, BACKBONE PAIR	PR	1.00
411-3002-0	LINK, 30T SUSPENSION	EA	8.00
411-5003-0	PIN, 30T UPPER PIVOT	EA	4.00
411-5004-0	PIN, 30T LOWER PIVOT	EA	4.00
411-6001-0	PIVOT, 1/2" SQ X 6"	EA	12.00
411-7001-0	BEARING, 1" SQ. 3-HOLE	EA	3.00
411-7002-0	BEARING, 1" SQ. X 6"	EA	10.00
411-7003-0	BEARING, 1" SQ. 0-HOLE	EA	2.00
421-4002-0	NOSE IRON, 2" X 16-1/4"	EA	3.00
421-8002-0	BLOCK, 30T BEARING	EA	4.00
421-8003-0	STRAP, UPPER SHACKLE	EA	2.00
421-8004-0	STRAP, LOWER SHACKLE	EA	3.00
421-8007-0	STRAP SHACKLE UPPER TVL	EA	1.00
545-1296-1	3/4" X 12" CONCR.T.ANCHOR	EA	16.00
558-0860-1	101053008 STUD, 1/2" X 6"	C	0.20
558-1436-1	101098029 STUD, 7/8" X 3-11/16"	C	0.34
581-1101-0	42-254 PAINT, 42-254 RED OXIDE ZINC	GA	0.10
581-1201-0	91-580 PAINT, NEW CAT YELLOW	GA	0.10
581-2102-0	25120 THINNER, TOLUOL	GA	0.50
611-6160-4	ANGLE, 2" X 2" X 1/4"	CWT	1.05
620-3205-7	S-BEAM, 3" X 5.7#	CWT	0.46
630-8228-0	WF-BEAM, 8" X 28#/FT	CWT	1.40
631-0226-0	WF-BEAM, 10" X 26" FT	CWT	1.04
631-6226-0	WF-BEAM, 16" X 26#/FT	CWT	5.20
640-5167-0	CHANNEL, 5"X6.7#/FT	CWT	5.64
653-2005-0	PLATE, FLOOR 5/16"	CWT	0.55
665-0800-0	REBAR, #4 UNGRADED	CWT	6.50
677-0604-0	PIPE, 6" SCH 40 STRUCTURAL	CWT	0.46
677-0804-0	PIPE, 8" SCH 40 STRUCTURAL	CWT	4.48



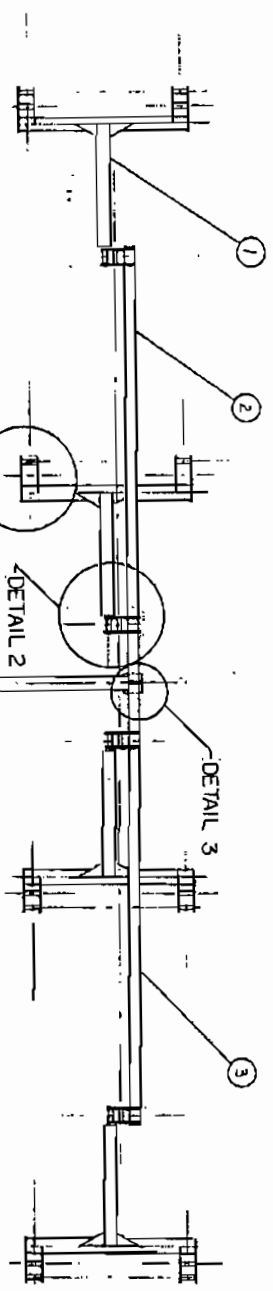
MAIN LEVER SUSPENSION
HOLTGREVEN SCALE #ELEC. COR.
 DATE: 7-21-80 DRAWN BY: M. HOLTGREVEN
 SCALE: NONE DRAWING NO. OIL-0000



MAIN LEVER TO BACKBONE	DRAWN BY	M. HOLTGRE
HOLTGREVEN SCALE/ELEC.	DATE:	7-22-80
SCALE: NO. 15	DRAWING NO.	DTI, 801



TRANSVERSE LEVER ELEC. R.O.	
HOLTGREVEN SCALE/ELEC. CORP.	
DATE: 7-23-80	DRAWN BY: M. HOLTGREVEN
SCALE: NONE	DRAWING NO. 011,305



1. DRAWING NO. 044

ITEM	DESCRIPTION	QTY
1	BACKBONE	1
2	BACKBONE RIGID	1
3	FRONT LEVER	1
4	FRONT LEVER PIVOT	1
5	FRONT LEVER PIVOT	1
6	FRONT LEVER PIVOT	1
7	FRONT LEVER PIVOT	1
8	FRONT LEVER PIVOT	1
9	FRONT LEVER PIVOT	1
10	FRONT LEVER PIVOT	1
11	FRONT LEVER PIVOT	1
12	FRONT LEVER PIVOT	1
13	FRONT LEVER PIVOT	1
14	FRONT LEVER PIVOT	1
15	FRONT LEVER PIVOT	1
16	FRONT LEVER PIVOT	1
17	FRONT LEVER PIVOT	1
18	FRONT LEVER PIVOT	1
19	FRONT LEVER PIVOT	1
20	FRONT LEVER PIVOT	1
21	FRONT LEVER PIVOT	1
22	FRONT LEVER PIVOT	1
23	FRONT LEVER PIVOT	1
24	FRONT LEVER PIVOT	1
25	FRONT LEVER PIVOT	1
26	FRONT LEVER PIVOT	1
27	FRONT LEVER PIVOT	1
28	FRONT LEVER PIVOT	1
29	FRONT LEVER PIVOT	1
30	FRONT LEVER PIVOT	1
31	FRONT LEVER PIVOT	1
32	FRONT LEVER PIVOT	1
33	FRONT LEVER PIVOT	1
34	FRONT LEVER PIVOT	1
35	FRONT LEVER PIVOT	1
36	FRONT LEVER PIVOT	1
37	FRONT LEVER PIVOT	1
38	FRONT LEVER PIVOT	1
39	FRONT LEVER PIVOT	1
40	FRONT LEVER PIVOT	1
41	FRONT LEVER PIVOT	1
42	FRONT LEVER PIVOT	1
43	FRONT LEVER PIVOT	1
44	FRONT LEVER PIVOT	1
45	FRONT LEVER PIVOT	1
46	FRONT LEVER PIVOT	1
47	FRONT LEVER PIVOT	1
48	FRONT LEVER PIVOT	1
49	FRONT LEVER PIVOT	1
50	FRONT LEVER PIVOT	1
51	FRONT LEVER PIVOT	1
52	FRONT LEVER PIVOT	1
53	FRONT LEVER PIVOT	1
54	FRONT LEVER PIVOT	1
55	FRONT LEVER PIVOT	1
56	FRONT LEVER PIVOT	1
57	FRONT LEVER PIVOT	1
58	FRONT LEVER PIVOT	1
59	FRONT LEVER PIVOT	1
60	FRONT LEVER PIVOT	1
61	FRONT LEVER PIVOT	1
62	FRONT LEVER PIVOT	1
63	FRONT LEVER PIVOT	1
64	FRONT LEVER PIVOT	1
65	FRONT LEVER PIVOT	1
66	FRONT LEVER PIVOT	1
67	FRONT LEVER PIVOT	1
68	FRONT LEVER PIVOT	1
69	FRONT LEVER PIVOT	1
70	FRONT LEVER PIVOT	1
71	FRONT LEVER PIVOT	1
72	FRONT LEVER PIVOT	1
73	FRONT LEVER PIVOT	1
74	FRONT LEVER PIVOT	1
75	FRONT LEVER PIVOT	1
76	FRONT LEVER PIVOT	1
77	FRONT LEVER PIVOT	1
78	FRONT LEVER PIVOT	1
79	FRONT LEVER PIVOT	1
80	FRONT LEVER PIVOT	1
81	FRONT LEVER PIVOT	1
82	FRONT LEVER PIVOT	1
83	FRONT LEVER PIVOT	1
84	FRONT LEVER PIVOT	1
85	FRONT LEVER PIVOT	1
86	FRONT LEVER PIVOT	1
87	FRONT LEVER PIVOT	1
88	FRONT LEVER PIVOT	1
89	FRONT LEVER PIVOT	1
90	FRONT LEVER PIVOT	1
91	FRONT LEVER PIVOT	1
92	FRONT LEVER PIVOT	1
93	FRONT LEVER PIVOT	1
94	FRONT LEVER PIVOT	1
95	FRONT LEVER PIVOT	1
96	FRONT LEVER PIVOT	1
97	FRONT LEVER PIVOT	1
98	FRONT LEVER PIVOT	1
99	FRONT LEVER PIVOT	1
100	FRONT LEVER PIVOT	1

