

**ATTACHMENT 7 – CONTRACTOR TRANSMITTAL (SUBMITTAL NUMBER
723.480-009 B) FROM BECHTEL / PARSONS BRINCKERHOFF (AUTHORIZED
REPRESENTATIVE) TO MODERN CONTINENTAL COMPANY DATED
OCTOBER 15, 1999 REGARDING THE CEILING MODULE ERECTION
PROCEDURE**

(14 pages)



Central Artery/Tunnel

OFFICE COPY

TRANSMITTAL DATE: 10/15/99

TRANSMITTAL NO: 1015/99

CONTRACTOR TRANSMITTAL

CONTRACTOR: MORGAN CONSTRUCTION

ATTENTION: ROBERT SHERMAN

CONTRACT NO: 9919-009132

DOCUMENT TYPE

- R - REPRODUCIBLE
- P - PRINT
- C - CATALOG CUT
- E - EQUIPMENT MANUAL
- S - SAMPLE
- T - TECHNICAL DATA OR CALCULATIONS

REVIEW STATUS

- 1 - WORK MAY PROCEED.
- 2N - WORK MAY PROCEED SUBJECT TO THE CHANGES INDICATED. RESUBMITTAL NOT REQUIRED.
- 2R - WORK MAY NOT PROCEED ON INDICATED PART(S). RESUBMITTAL REQUIRED. WORK MAY PROCEED ON OTHER PART(S).
- 3 - WORK MAY NOT PROCEED. REVISE AND RESUBMIT.
- 4 - FOR INFORMATION ONLY.

DATE RECEIVED BY B/PB RE OFFICE: 10/15/99

DATE DUE BACK TO CONTRACTOR: 10/15/99

DATE SENT BACK TO CONTRACTOR: 10/15/99

RESIDENT ENGINEER: [Redacted]

DATE: 10/15/99

ITEM	SUBMITTAL NO. (I.E., 120.010 - 011 - A)			DESCRIPTION	DOC DATE	DOC TYPE	REVIEW STATUS
	SPEC SECT	SEQ#	REV				
1	723.480	0001	1	CEILING ATTACHED TO BEARING WALL		T	2N
2							
3							
4							
5							
6							
7							

COMMENTS TO CONTRACTOR (USE ADDITIONAL SHEETS AS NECESSARY)

CONTRACTOR. MAKE SURE TO PICK LOCATIONS COMFORM TO PREVIOUSLY SUBMITTED CALCULATIONS.

See attached [Redacted]

10/15/99

REVIEWER:

DATE: 10-13-99

WHITE - REVIEWER'S COPY GREEN - RESIDENT ENGINEER'S COPY YELLOW - INFORMATION COPY PINK - PROJECT ENGINEER COPY GOLD - CONTRACTOR'S COPY

CRE051 (8/96)



Ceiling Module Erection Procedure

INDEX STAMP

Contract No. 99119-C09B2	Paragraph 1.04 B
Specification Section (Spec-Seq-Rev)	
723.480 - 009 B	

CENTRAL ARTERY / TUNNEL

Permission To Proceed Does Not Constitute Acceptance Or Approval Of Design Details, Calculations, Analysis, Test Methods, Or Materials Developed Or Selected By The Contractor / Supplier And Does Not Relieve The Contractor / Supplier From Full Compliance With Contract Requirements.

<input type="checkbox"/>	1. Work May Proceed
<input checked="" type="checkbox"/>	2N. Work May Proceed Subject To The Changes Indicated Resubmittal Not Required
<input type="checkbox"/>	2R. Work May Not Proceed On Indicated Parts Resubmittal Required. Work May Proceed on Other Parts.
<input type="checkbox"/>	3. Revise and Resubmit. Work May Not Proceed.
<input type="checkbox"/>	4. For Information Only.

REVIEWER	
<i>Gary Fleming</i>	<i>10.13.99</i>
Company	Date

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The comments by the reviewer are limited to spec submittal reqts.



**CENTRAL ARTERY/TUNNEL PROJECT
99119-C09B2 - I-90 SEAPORT ACCESS TUNNEL FINISHES**

**Specification Section 723.480 - Precast Concrete Ceiling System
Erection Procedures**

General

The precast panel and module ceiling erection operations and equipment must be capable of handling the precast panels, placing them in a module at ground level, and hoisting them into position. The precast panels must be handled gently with careful consideration to the brittleness of the precast due to its thin wall thickness. The fabricated modules must be placed by equipment specifically designed for the purpose, which can handle to substantial weight of the module and still has the flexibility to install the modules in the exact location required.

Control

As-built surveys on the existing cast in place tunnel sections will be performed as soon as these sections can be accessed by MCC's CO9B2 personnel. Determination of module layout and location of special panels will be made from the as-built information and will be forwarded at a later submission. Special emphasis will be placed on locations of existing embedded inserts that hold the modules in place by means of the specified hanger system. The panels will be finely adjusted for elevation using the turnbuckle attachment on the hanger assembly. The panels will be left within the tolerances as dictated by the contract documents.

Equipment and Procedures

Fabrication of ceiling modules will be performed in each contract area as received by MCC in accordance with the contract Access Restraints. These areas will be mobile as each piece of erection equipment has mobile ability. As each area is provided to MCC, a fabrication area will be chosen in which modules will be assembled end-to-end along the barrier line of the tunnel allowing the erection equipment and access to passing vehicles along the alternate side of the tunnel. The intent is to fabricate modules as closely as possible to the final erection destination. Thus, movement of the fabrication area will be ongoing.

Panels will be shipped to the jobsite on flatbed trailers with the panels set flat on the trailers. The panels will be trucked to the module fabrication area and directly installed from the trailer to the associated module. Wood timber beds will be set up within the module erection area to provide a level and clean working area for module assembly. These beds will be approx. 14 ft wide with the

ability of the module lift equipment to span the bed, lift the module vertically, and carry the module to the lift trailer.

Structural steel elements shall be set into position on the wood timbers in the module fabrication area. The precast panels will be unloaded from the trailers using a material handler (i.e. Caterpillar 928 Loader) with a boom attachment, and placed into the support steel. Concrete Inserts shall be cast into the ceiling panels to facilitate handling of the panels in this manner. The precast panels will then be bolted into position, and secured to the structural steel. The module will be inspected and prepared for hoisting onto the ceiling lift.

Upon completion of the module, the module will be lifted onto the trailer mounted ceiling installation lift using a mobile hoisting vehicle and then trucked to its intended location. The mobile hoisting vehicle (specifications attached) will be fabricated to work within the width and height constraints of the tunnel fabrication areas. The ceiling installation lift (specifications attached) is manufactured specifically for this purpose by Lift Systems, Inc. This lift has the ability to lift the heaviest module to the desired elevation and finely adjust the location in transverse and lateral directions to final location, along with the ability to tilt the module to follow the roadway profile. These lifts have proven to be effective on the existing Ted Williams Tunnel currently completed.

Upon lifting the module into place, the hanger assemblies will be fully connected to the module before the lift is lowered. Workers in manlifts will assist in the module installation and hanger attachment. Layout of the ceiling modules and tracking system will be included in alternate submittals.

Site Coordination

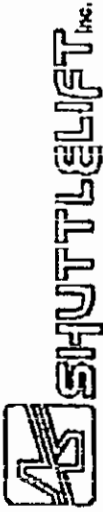
Modern Continental proposes the above referenced ceiling module erection plan in order to address several comments raised during the review of the proposed ceiling erection plan (Submittal No 723.480-009 A). The issues are identified and addressed as follows:

- Drive-in access – Limited drive-in access to either the Westbound or Eastbound location has been provided through the temporary ramp area or the Boat Section Staging Area respectively.
- Interim Ventilation – Modern Continental is committed to working with the mainline tunnel contractors, in order to minimize the impacts of the interim ventilation system on the ceiling module fabrication and erection operations. The position of the interim ventilation system shall be considered when locating the fabrication areas within a given release area.
- Cross Passages & Manways – Modern Continental will evaluate each module fabrication and assembly area for cross passages, utility rooms and manways located in the area, and use best efforts to avoid interference with these structures.
- Time Constraints on Module Fabrication Areas – It is the intent of Modern Continental Construction to utilize areas within the tunnel limits for ceiling module fabrication and laydown areas. Modern Continental has selected mobile fabrication and erection vehicles to optimize the flexibility of our erection system, and address relocation of the fabrication areas if required.
- Ramp HOV Ceiling Erection Plan – It is the intent of Modern Continental Construction to fabricate the HOV Ceiling Modules in the module fabrication area located in the mainline tunnel bore, and transport the modules to Ramp HOV utilizing the mobile ceiling lifts, although

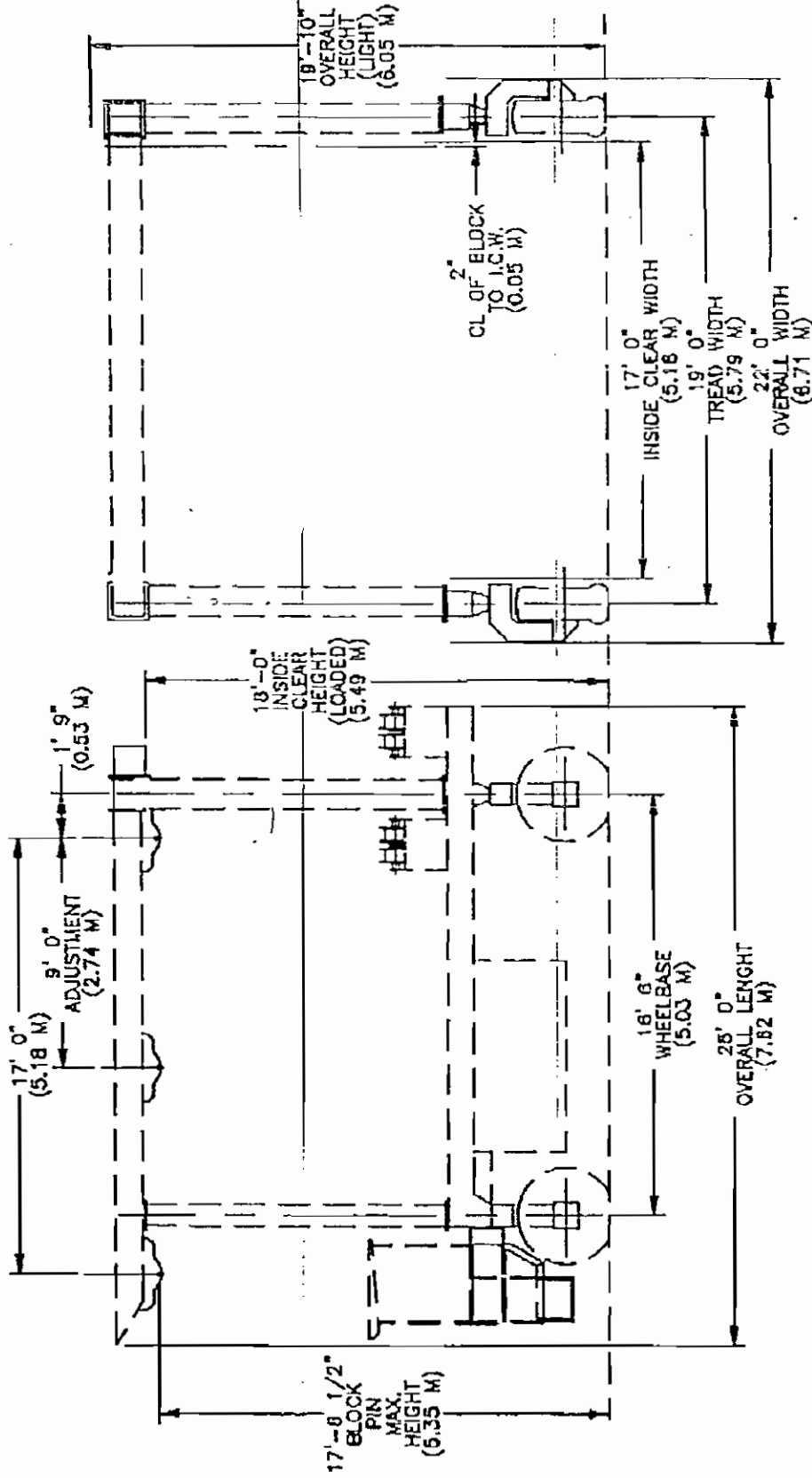
fabrication and assembly in HOV must be evaluated in the future pending allowable work areas and any change to sequencing schedule. Access to Ramp HOV after the opening of Ramp A (Contract Milestone 5) shall be as provided by the Contract Documents. MCC's equipment is certified to travel on public roadways.

- Access to I-90 Westbound during C01A3 Portal Construction – Access to and through the C01A3 work area during the construction of the I-90 Westbound and Ramp F Portals will be a Project Coordinated effort between Modern Continental, the C01A3 Contractor and B/PB. Contractual requirements in this regard are clearly outlined in Division I, Section 5.06. Elements related to this work such as forecasted schedule dates and provisions for restricted access were not addressed in the C09B2 contract documents. Modern Continental Construction is committed to working with the Project and the C01A3 Contract in order to mitigate impacts to either the C09B2 or the C01A3 Contracts as a result of this condition.

Mobile Gantry Crane Specifications



SL 25



NOTE : IS CUSTOM BUILT.
 BASE DIMENSIONS SHOWN.
 HEIGHT, WIDTH AND WHEEL
 BASE DIMENSIONS TAILORED
 TO MEET REQUIREMENTS.
 LIMITATIONS APPLY.

SL 25

SL25 INDUSTRIAL MOBILE HOIST

CAPACITY...26 ton lift capacity makes the SL25 an economical solution to many industrial material handling problems. Load weight indicators with overload alarm are provided to balance loads fore and aft.

HEAVY DUTY CONSTRUCTION...Main frame is high strength, low alloy steel of box section design. Pivot trunnion joint permits side frames to oscillate...neutralizes structural stress under load on uneven terrain.

SIMPLE, RELIABLE HYDRAULIC SYSTEM...A single gear pump with four main and one auxiliary section driven off the engine flywheel. Unit has a return flow hydraulic filter system and hydraulic oil cooler to extend pump and motor life. Hydraulic system has quick connect pressure check points. Hydraulic tubelines are stainless steel for corrosion resistance and extended life.

HYDRAULIC PLANETARY HUB DRIVE insures smooth, reliable operation. Cantilever wheel supports offer easy access to tires.

HYDRAULIC BRAKING...Motion control valve prevents free-wheeling on grades. Spring applied, hydraulic release parking brake.

HYDRAULIC STEERING CONTROL...90° steering for outstanding maneuverability.

FOUR HOIST DESIGN...Includes mechanical anti-two block. Provides simultaneous hoisting of all blocks or each block independently. Loads can be shifted adequately from side to side as well as fore to aft for accurate load positioning. Forward blocks can be set at fixed locations along the upper side beams or an optional hydraulically adjustable block system can be ordered for varying load dimensions.

LARGE DIAMETER, GROOVED HOIST DRUMS assure uniform cable spooling for long life. The load is held at rest position with automatic brakes at each hoist drum and backed up by load hold check valves.

REAR, LOW MOUNT OPERATOR COMPARTMENT for best view of load and surroundings. Canopy over the operator provides protection and has a window for good visibility. Low mounted, enclosed engine and hydraulic compartment offers easy service access and does not obstruct operator visibility.

LIFT ATTACHMENTS...Spreader frames, slings, grapples, magnets, vacuum lifters, rotation/tilt devices, power jibs, and special lift attachments are available.

ADDITIONAL BASE UNIT EQUIPMENT includes 2-wheel drive, gasoline engine (w/choke), aircraft recapped lug tires, horn, travel warning alarm. Instruments include: water temperature gauge, oil pressure gauge, fuel gauge, ammeter, hour meter.

OPTIONAL EQUIPMENT includes 4-wheel drive, diesel engine, cold start, enclosed cab (w/heater, defroster, wipers), lights, travel warning strobe.

SHUTTLELIFT Service Engineer supervises in the assembly and instructs purchaser personnel in operation and maintenance of the SL25.

SPECIFICATIONS

Rated lift capacity	50,000 lbs (22,680kg)
Travel speed (2-wheel drive, maximum)	150 fpm (45.7mpm)
Hoist speed (no load)	16 fpm (4.9mpm)
(rated load)	12 fpm (3.7mpm)
Shipping weight (approximate)	18,500 lbs. (8,390kg)
Engine...gas, Ford 2.3 liter	46HP @ 2100 RPM
Optional engine...diesel, John Deere 4239D	72HP @ 2100 RPM
Cable size	7/16" IWRC, 6 X 19 XIPS, galvanized, 4 parts/block
Tires (number) size	(4) 40 x 14
Tire pressure	95 PSI (586 kpa)
Ground bearing pressure (full load, estimated)	80 PSI (551 kpa)
Outside turning radius @ 90°	28 FT (8.5m)
Gradeability (2-wheel drive, full load)	6.5%
Optional (4-wheel drive, full load)	10%

Gradeability shown is for concrete or asphalt. For other surfaces deduct as follows: hard packed ground or gravel...2%; loose gravel...2 to 7%; mud...2 to 13%; soft sand...4 to 13%

Specifications are shown for base equipped and dimensioned unit. Specifications are subject to change without notice. 12/91

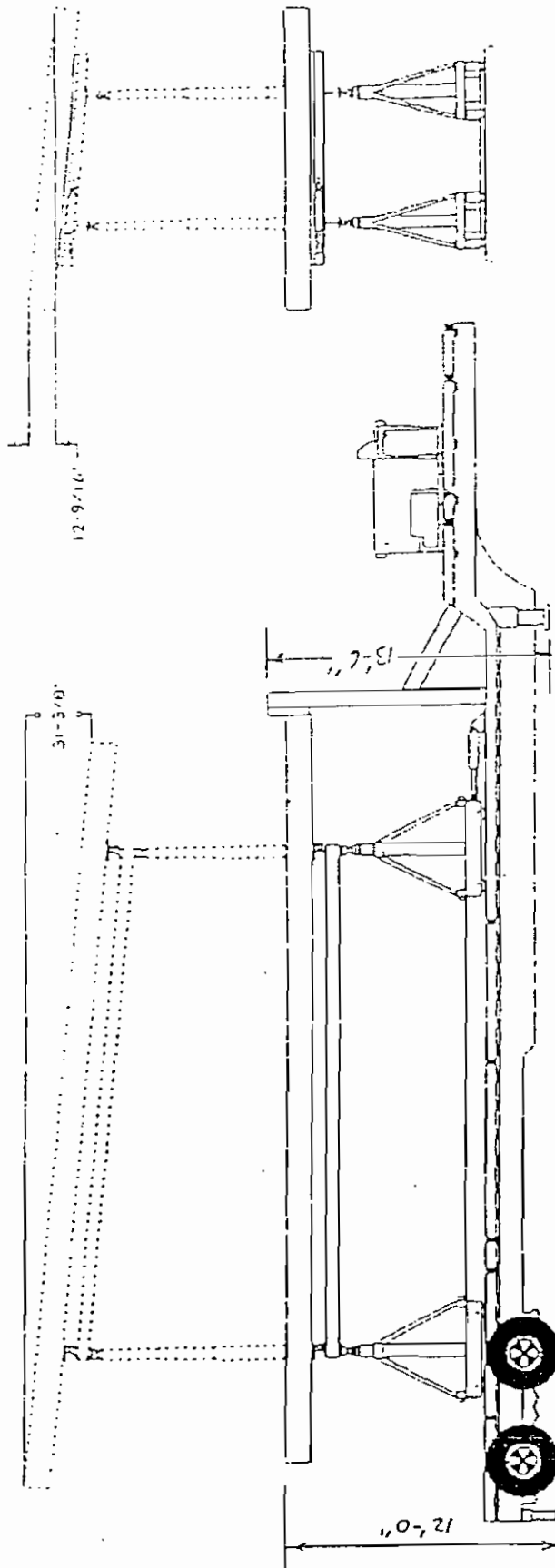
AUTHORIZED REPRESENTATIVE



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Ceiling Lift Specifications

BASED ON A 5 DEGREE TILT



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All interest in the basic design and/or invention, both patented and proprietary, contained in this drawing remains the sole property of Lift Systems and no other without the approval of Lift Systems is prohibited. This drawing is furnished with the understanding that the contractor herein, whose name is set forth, will not be revealed or referred to in any publication without the express written consent of the President of Lift Systems. This drawing must be returned on request.

LIFT SYSTEMS
P.O. BOX 200, WILMINGTON, DELAWARE 19801

APPROVED BY: [Signature]
DATE: 7/27/73
PROJECT: WASH DC PROJECT
DRAWING NO: WSD057

LIFT SYSTEMS EXTENDED HEIGHT

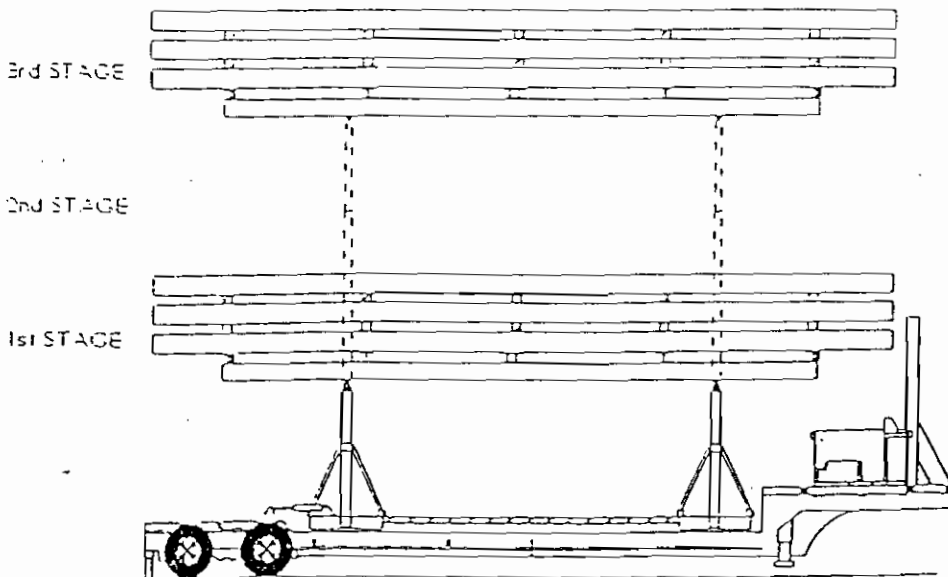
MODEL 4040, 40 (36) TON 4 POINT LIFT SYSTEM

4040LC02



PRESSURE (BAR)	1200 (83)	1000 (69)	800 (55)	600 (41)	400 (28)	200 (14)
22'0" (6,705 mm) 3rd STAGE	3rd STAGE CAPACITIES ARE LIMITED BY STABILITY		32000 (14510) LBS	27600 (12580) LBS	18400 (8360) LBS	9200 (4200) LBS
17'4" (5,293 mm) 2nd STAGE	30000 (36280) LBS	76600 (34820) LBS	61400 (27860) LBS	46000 (20880) LBS	30600 (13920) LBS	15200 (6968) LBS
12'6" (3,860 mm) 1st STAGE	CAPACITIES TO RIGHT OF BOLD LINE ARE STRUCTURAL DO NOT EXCEED		30000 (36280) LBS	67800 (30600) LBS	45200 (2052) LBS	22600 (20400) LBS

LIFT SYSTEMS PATENTS STANDARD
 US PATENTS #4,573,853 (METRIC)
 #5,191,693
 UK PATENT #2,154,543
 AND VARIOUS OTHER PATENTS



MODEL 4040RMT
 40 TON TRAILER MOUNTED JACK SYSTEM

LIFT CAPACITY IN 1st STAGE 18 TONS
 LIFT CAPACITY IN 2nd STAGE 13 TONS
 LIFT CAPACITY IN 3rd STAGE 16 TONS

4040LC03
 CRP
 6/6/94

LEVEL-LIFT SYSTEM

PREFACE

THE UNIQUE DESIGN OF THE LEVEL-LIFT SYSTEM PUTS ACCURATE INFORMATION INSTANTLY AT YOUR FINGERTIPS. THE SENSOR WILL TRANSFER INFORMATION ON THE HORIZONTAL LEVEL OF THE LOAD DIRECTLY TO THE READOUT. LOAD CORRECTIONS CAN BE MADE IMMEDIATELY, FRONT TO BACK, AS WELL AS SIDE TO SIDE.

THE LEVEL-LIFT SYSTEM CONSISTS OF FOUR (4) MAIN COMPONENTS PACKAGED IN A CARRYING CASE FOR EASY STORAGE AND MOBILITY. THE INTERIOR OF THE CASE IS CUSTOM FIT TO THE LEVEL-LIFT COMPONENTS GIVING DURABLE AND SAFE TRANSPORT FROM JOB TO JOB. ALL COMPONENTS ARE CALIBRATED AND TESTED AT THE FACTORY.

LEVEL-LIFT COMPONENTS

1. SENSOR:

- *UNIT IS MARKED LEFT, RIGHT, FRONT AND BACK FOR SPEEDY SET-UP.
- *COMES EQUIPPED WITH MAGNETIC FOOT FOR SECURE MOUNTING TO ANY METAL SURFACE.
- *PLUG OUTLETS ARE KEYED FOR CORRECT HOOK-UP EVERY TIME.
- *"ZERO" OR LEVEL POINT CAN BE SET BEFORE EACH LIFT WITH A STANDARD 7/16" NUT DRIVER OR SOCKET.

2. 100' BLACK POWER CORD:

- *KEYED PLUG ENDS ONLY FIT ONE WAY IN OUTLETS.
- *CABLE IS REVERSIBLE.
- *DURABLE CONSTRUCTION.

3. POWER SOURCE CORD:

- *5' CORD.
- *PLUG IS KEYED TO FIT PROPERLY IN THE OUTLET.

4. READOUT:

- *LABELED OUTLETS FOR SENSOR AND POWER SOURCE CORD.
- *MAGNETIC FOOT FOR HORIZONTAL OR VERTICAL MOUNTING.
- *BAR LIGHTS INDICATE HIGH SIDE OF LOAD FOR EASY CORRECTION.
- *CENTER LIGHT FOR POWER INDICATION.
- *ON-OFF SWITCH TO PRESERVE BATTERY LIFE.

POWER SOURCE SPECIFICATION (CUSTOMER SUPPLIED):

- * 9-30 VOLTS DC.
- * READOUT WILL AUTOMATICALLY REGULATE INPUT AMPS.
- * CAN BE RUN USING POWERUNIT BATTERY.

SETTING UP YOUR LEVEL-LIFT SYSTEM

TO SET UP YOUR LEVEL-LIFT SYSTEM, PLACE THE READOUT NEAR THE DIRECTIONAL CONTROL VALVE LEVERS AT THE POWER UNIT SO YOU CAN MONITOR THE READOUT DURING THE LIFT. PLACE THE BATTERY CLOSE BY (CUSTOMER SUPPLIED) AND PLUG IT INTO THE READOUT WITH THE RED/BLACK POWER CABLE PROVIDED. BATTERY CONNECTIONS ARE LABELED AND THE READOUT PLUG ONLY FITS ONE WAY.

THE NEXT STEP IS TO PLACE THE SENSOR ON YOUR HEADER BEAM, IF READING DEFLECTION, OR ON THE PIECE YOU ARE LIFTING, IF READING LEVELNESS OF LIFT. THEN PLUG THE 100' BLACK POWER CORD INTO THE SENSOR AND PLUG THE OTHER END INTO THE READOUT. THESE CORDS ARE REVERSIBLE AND CANNOT BE PLUGGED IN WRONG, AS LONG AS THE CORD RUNS FROM SENSOR TO READOUT.

TURN THE POWER SWITCH ON THE READOUT TO THE ON POSITION.

FIRST, USING A LEVEL, DETERMINE THAT THE LOAD IS IN A LEVEL CONDITION OR IN THE ANGLE THAT IS DESIRED FOR THE DURATION OF THE LIFT. WITH THE MAGNETIC SENSOR ATTACHED TO LOAD OR LIFT BEAMS, THE SENSOR MAY BE ZEROED BY ONE PERSON TAKING THE READOUT AND BATTERY TO THE SENSOR AND ZEROING THE SENSOR (TURN OUT ALL LIGHTS ON ALL LIGHT PATHS) OR BY ONE PERSON AT THE SENSOR ACTING ON INSTRUCTIONS FROM ANOTHER AT THE READOUT AND USING A NUT DRIVER OR SOCKET AND EXTENSION TO ADJUST THE SENSOR TO A "LIGHTS OUT" CONDITION.

LEVEL-LIFT CALIBRATION

THE LEVEL-LIFT SYSTEMS ARE CALIBRATED AT OUR FACTORY FOR ACCURACY IN BOTH DIRECTIONS ON BOTH AXIS, BUT IT WILL BE NECESSARY TO ZERO THE SENSOR BEFORE STARTING.

THE READOUT SHOULD HAVE ONLY THE CENTER RED LIGHT ON. THIS LIGHT SHOWS THAT THE POWER IS ON AND THE SENSOR IS AT ZERO. AS THE SENSOR TILTS, BAR LIGHTS WILL TURN ON PROGRESSIVELY, THIS READING SHOWS THE HIGH SIDE OF YOUR PICK. EACH BAR REPRESENTS APPROXIMATELY 1/2" IN 20'.

EACH SENSOR HAS A THREE (3) POINT ZERO ADJUSTMENT MOUNT IN THE SENSOR BOX. AGAIN, YOU MUST MAKE SURE THE READOUT IS AT ZERO BEFORE USE. THIS COORDINATES FRONT, BACK, LEFT AND RIGHT. USE A 7/16" SOCKET HEAD TO ZERO THE SENSOR.

ONCE YOU HAVE ZEROED THE SENSOR AND READOUT, YOU CAN BEGIN YOUR LIFT. IF A LIGHT ON ONE OF THE BARS COMES ON WHILE YOU ARE LIFTING, THAT MEANS THAT A LIFTING UNIT IS LIFTING TOO FAST AND THE LOAD IS HIGH IN THE DIRECTION THE LIGHT INDICATES (FRONT, BACK, LEFT OR RIGHT). CORRECT BY SLOWING THE CYLINDER THAT CONTROLS THAT PART OF THE LOAD.