



October 19, 2020

ADDENDUM NO. B

TO THE CONTRACT DOCUMENTS

FOR

PACIFIC HIGH SCHOOL – DIESEL TECHNOLOGY CENTER C.T.E.

FOR THE

SAN BERNARDINO CITY UNIFIED SCHOOL DISTRICT

777 North F Street

San Bernardino, CA 92410

DSA No. 04-117817

File No. 36-H7

RCA Job No. 1-78-23

NOTICE TO BIDDERS

This Addendum forms a part of the Contract and modifies the original documents DSA Approved on May 3, 2019. It is intended that all work affected by the following modifications shall conform with related provisions and general conditions of the contract of the original drawings and specifications. Modify the following items wherever appearing in any drawing or sections of the specifications. Acknowledge receipt of Addendum No. B in the space provided on the Bid Form. Failure to do so may subject bidder to disqualification.

GENERAL

Item No. B.1 Reference schedule of equipment (Exhibits A1.3 & E2.12 and Equipment Cutsheets):
Contractor to provide all M/E/P infrastructure and backing/support/mounts required for complete installation of Owner Furnished Contractor Installed (OFCI) and Owner Furnished Owner Installed (OFOI) equipment.

ATTACHMENTS

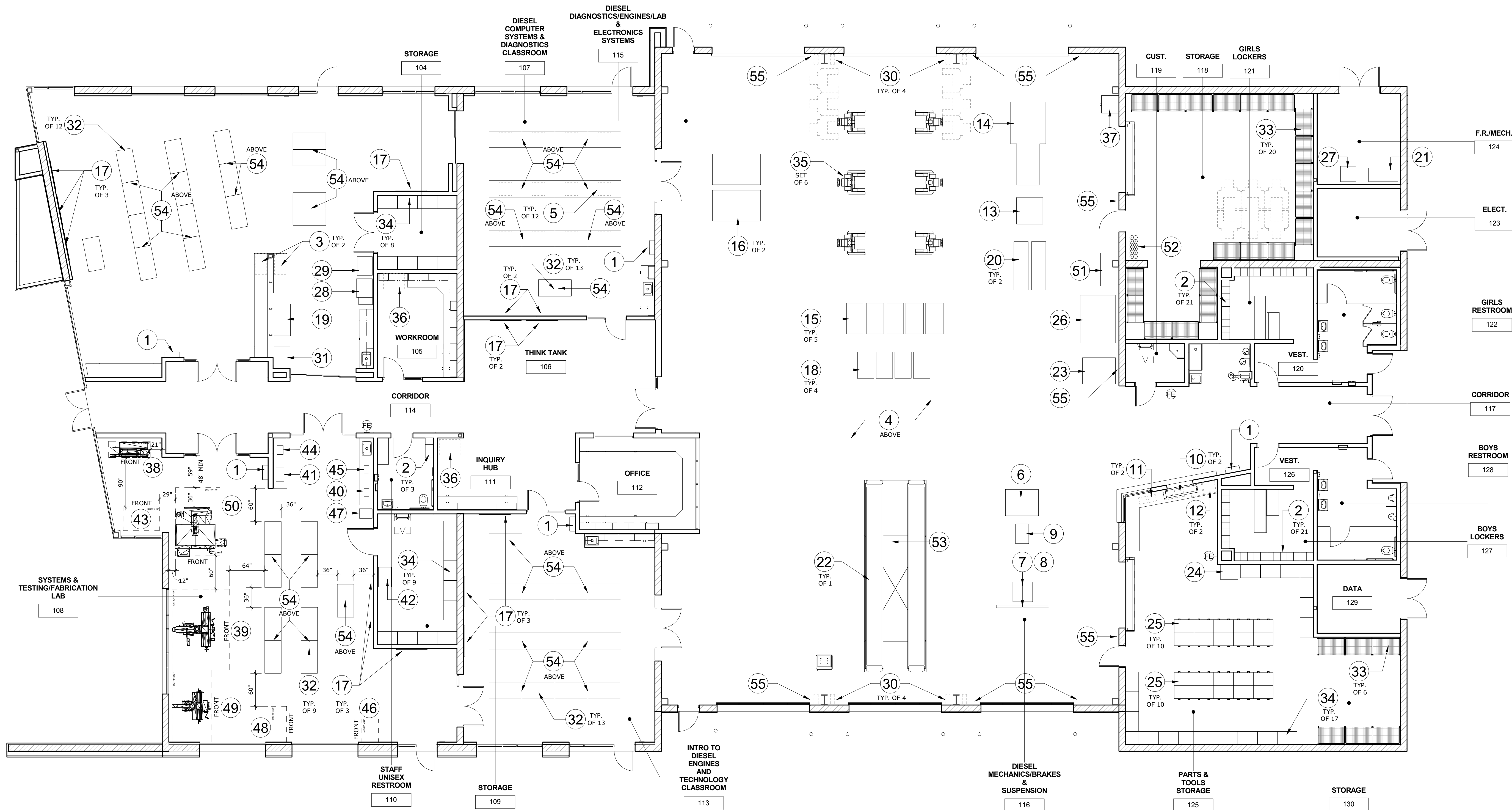
Exhibits	A1.3, E2.12
General	Equipment Cutsheets
Specifications	N/A
Sketches	N/A
Sheets	N/A

END OF ADDENDUM NO. B

Roger Clarke, Principal

#C-21340

EQUIPMENT SCHEDULE													
KEYNOTE NO.	EQUIPMENT NAME	MANUFACTURER	MODEL	EQUIP. FOOTPRINT (W x L x H)	INSTALLATION TYPE	PURCHASE/INSTALLATION	METAL STUD BACKING	AIR	WATER	POWER	VENTING	KEYNOTE NO.	NOTES
1	SAFETY GOGGLE STORAGE/SANITIZER CABINET	FLINN SCIENTIFIC	SE1000	26 1/4" x 10 1/4" x 28 1/2"	FIXED	CFCI	14/AD1.2	NO	NO	YES	NO	1	
2	LOCKERS	PENCO		12" x 15" x 72"	FIXED	CFCI	8/AD1.2	NO	NO	NO	YES/SPECS	2	
3	3D OBJECT SCANNER	VERISURF	MASTER 3D GAGE	21" x 38" x 12"	HANDHELD	OF01	NO	NO	NO	YES/E2.11	NO	3	
4	OVERHEAD CRANE	KONE	CACLR18 7.5 TON OPTION-O	N/A	OVERHEAD	CFCI	NO	NO	NO	YES/E2.12	NO	4	
5	GM SPECIALIZED ELECTRONIC TRAINING S.E.T.	ATECH	18002TR	24" x 24" x 8"	TABLETOP	OF01	NO	NO	NO	YES/E2.11	NO	5	POWER PROVIDED BY OVERHEAD POWER CORD REEL
6	COMPUTER ALIGNMENT SYSTEM & ACCESSORIES	BEE LINE	LC7500	60" x 48" x 72"	MOBILE	OF01	NO	NO	NO	YES/E2.12	NO	6	ADD'L ACCESSORIES NEEDED: (2) FPT8500 STEEL PORTABLE TURN PLATES (14 1/2"W x 19"L x 1 5/8" H), (2) LC4101.1 - CAM ADVANCER WHEEL MOUNTS (8"W x 3"D x 22"H), (1) 1500 SPRING LIFT (24"W x 7 1/2" D x 7"H)
7	REAR AXLE ALIGNER & ACCESSORIES	BEE LINE	22000	5" x 96" x 5"	MOBILE	OF01	NO	NO	NO	YES	NO	7	ADD'L ACCESSORIES NEEDED: (1) 21130 PORTABLE REAR AXLE ALIGNER CART (36"W x 36"L x 96") / POWER PROVIDED BY NEARBY WALL OUTLET IF NEEDED
8	FRONT AXLE TOOLS - CHAIN ASSEMBLY	BEE LINE	15015	-	FIXED	OF01	NO	NO	NO	NO	NO	8	
9	ON-THE-VEHICLE BALANCER COMPUTERIZED CONTROL SYSTEM	BEE LINE	4088 SMART BALANCER II	12" x 12" x 6"	MOBILE	OF01	NO	NO	NO	NO	NO	9	ADD'L ACCESSORIES NEEDED: (1) 2600 3-PHASE SPINNER (24"W x 36"L x 45" H) / POWER PROVIDED BY NEARBY WALL OUTLET IF NEEDED
10	CUTAWAY TURBOCHARGER	CONSULAB	EC-480	14" x 16" x 11"	TABLETOP	OF01	NO	NO	NO	NO	NO	10	
11	CUTAWAY DIESEL ALTERNATOR	CONSULAB	EC-500HV	14" x 12" x 7"	TABLETOP	OF01	NO	NO	NO	NO	NO	11	
12	CUTAWAY DIESEL STARTING SYSTEM TRAINER	CONSULAB	EC-510HV	22" x 22" x 8.5"	TABLETOP	OF01	NO	NO	NO	NO	NO	12	POWER PROVIDED BY PORTABLE O.F.O.I. VEHICLE BATTERY
13	CUTAWAY DIESEL ENGINE	CONSULAB	EC-950	48" x 48" x 72"	MOBILE	OF01	NO	NO	NO	NO	NO	13	
14	HYDROSTATIC TRANSMISSION TRAINING SIMULATOR	CONSULAB	MF500-H-TSE	64" x 76" x 74"	MOBILE	OF01	NO	NO	NO	YES/E2.12	NO	14	ADD'L ACCESSORIES NEEDED: (1) MF500-IS IMPLEMENT & STEERING SYSTEM TRAINING MODULE
15	COMBINATION HEAVY TRUCK & MULTIPLEXED LIGHTING SYSTEM TRAINER	CONSULAB	HV-1918-MP (53129)	32" x 56" x 76"	MOBILE	OF01	NO	NO	NO	YES/E2.12	NO	15	MOBILE EQUIPMNT SO POWER CAN BE PROVIDED BY WALL MOUNTED POWER CORD REELS IF NEEDED
16	DIESEL ENGINE TRAINER	CONSULAB	HV-950-ISX DIESEL ENGINE BENCH - CUMMINS ISX15 EPA	87.5" x 56" x 72"	MOBILE	OF01	NO	NO	NO	YES	YES/M1.1	16	POWER PROVIDED BY ON-BOARD BATTERY / VENTILATION PROVIDED BY C.F.C.I. OVERHEAD EXHAUST REMOVAL HOSE REEL
17	TOUCHSCREEN	CLEVERTOUCH / DIGITAL NETWORKS GROUP	1546SLUX	60 3/32" x 3 57/64" x 35 29/32"	FIXED	OF01	18/AD1.2	NO	NO	YES/E2.11	NO	17	
18	HYDRAULIC TRAINING SYSTEM	FLUIDPOWER TRAINING INSTITUTE	MF102-H-TSE	48" x 30" x 77"	MOBILE	OF01	NO	NO	NO	YES/E2.12	NO	18	MOBILE EQUIPMENT SO POWER CAN BE PROVIDED BY WALL MOUNTED POWER CORD REELS IF NEEDED
19	DESKTOP VACUUM FORMING MACHINE	FORMTECH	508FS	28.4" x 54.9" x 21.2"	FIXED	OF01	NO	YES/P-1.1	NO	YES/E2.12	NO	19	
20	HEAVY-DUTY CRANE	OTC	6,000 LB. CAPACITY	26" x 88" x 53"	MOBILE	OF01	NO	NO	NO	NO	NO	20	
21	COMPRESSOR	CHAMPION	HRA10D-12	86 1/2" x 29" x 57"	FIXED	CFCI	NO	YES/P-1.1	NO	YES/E2.12	NO	21	
22	DRIVE-ON LIFT	ROTARY	V-REX44 44,000 LBS. CAPACITY W/ 28" RUNWAY LENGTH	109" x 28" x 16 1/4"-77 3/4"	FIXED	CFCI	NO	NO	NO	YES/E2.12	NO	22	
23	WHEEL BALANCER	ROTARY	544 PROTRUCK 2D	-	FIXED	OF01	NO	YES/PSK-2.5	NO	YES/E2.12	NO	23	
24	PARTS WASHER	SAFETY-KLEEN	250/260	32" x 27" x 61.5"	FIXED	OF01	NO	NO	NO	YES/E2.12	NO	24	
25	ROLLING CABINET TOOLS STORAGE	SNAP-ON	RRL756PCM / 35" 7 DRAWER SINGLE BANK MASTERS SERIES	35 5/8" x 24" x 39"	MOBILE	OF01	NO	NO	NO	NO	NO	25	
26	HEAVY-DUTY TIRE CHANGER	JOHN BEAN	EEWHT8026	67.7" x 75.6" x 89"	FIXED	OF01	NO	YES/PSK-2.5	NO	YES/E2.12	NO	26	
27	AIR DRYER	CHAMPION	125	29" x 20" x 38"	FIXED	CFCI	NO	YES/P-1.1	NO	YES/E2.12	NO	27	
28	3D PRINTER	STRATASYS	OBJET260 CONNEX3	34.2" x 29" x 47.2"	MOBILE	OF01	NO	NO	NO	YES/E2.12	NO	28	
29	3D PRINTER	STRATASYS	F370	34" x 28" x 64"	MOBILE	OF01	NO	NO	NO	YES/E2.12	NO	29	
30	WALL-MOUNTED AIR & WATER REELS	FISHER MANUF.	2980	87" x 17 3/4" x 17 3/4"	FIXED	CFCI	NO	YES/P-1.1	YES/P-1.1	NO	NO	30	
31	3D PRINTER	STRATASYS	DIMENSION 1200ES	33" x 29" x 45"	MOBILE	OF01	NO	NO	NO	YES/E2.12	NO	31	
32	WORK BENCH	DIVERSIFIED WOODCRAFTS	AMT-6030M	60" x 30" x 34"	MOBILE	OF01	NO	NO	NO	NO	NO	32	
33	WIRE SHELVING	LYON	MODEL DD8348WS, 8000 SERIES 6 WIRE SHELVES STARTER	48" x 24" x 84"	FIXED	OF01	20/S0.8	NO	NO	NO	NO	33	DEPENDING ON ACTUAL MODEL SELECTED BY DISTRICT, IT MIGHT REQUIRE METAL STUD BACKIN. CONTRACTOR TO COORDINATE WITH DISTRICT.
34	OPEN SHELVING	LYON	MODEL DD8007SM, 8000 SERIES 5 MEDIUM DUTY SHELVES STARTER	36" x 24" x 84"	FIXED	OF01	20/S0.8	NO	NO	NO	NO	34	CONTRACTOR TO COORDINATE WITH DISTRICT ON LOCATION OF METAL STUD BACKING
35	COLUMN LIFTS	ROTARY	MCHE614 / 84,000 LBS. PER SET	43" x 43" x 69"	MOBILE	OF01	NO	NO	NO	YES/E2.12	NO	35	SET OF 6
36	OFFICE PRINTER	TBD	TBD	-	FIXED	OF01	NO	NO	NO	YES/E2.12	NO	36	
37	FLAMMABLE LIQUIDS STORAGE CABINET	LYON	5461	32" x 32" x 65"	FIXED	CFCI	NO	NO	NO	NO	YES/PSK-2.1	37	
38	PRECISION LATHE	CLARK	1440	29 1/2" x 75 3/4" x 47 1/4"	FIXED	OF01	NO	NO	NO	YES/E2.12	NO	38	
39	VERTICAL MILL MACHINE	CLARK	83V	104" x 79" x 84"	FIXED	OF01	NO	NO	NO	YES/E2.12	NO	39	
40	INDUSTRIAL GRINDER	BALDOR	600E	14.88" x 9.08" x 8.56"	TABLETOP	OF01	NO	NO	NO	YES/E2.12	NO	40	
41	CARBIDE TOOL GRINDER	BALDOR	500	24.94" x 14.38" x 15.87"	TABLETOP	OF01	NO	NO	NO	YES/E2.12	NO	41	
42	GRANITE SURFACE PLATE	PRECISION GRANITE	GRADE A 24"x36"	24" x 36" x 4"	MOBILE	OF01	NO	NO	NO	NO	NO	42	ADD'L ACCESSORIES NEEDED: (1) MOBILE STEEL STAND
43	SURFACE GRINDER	GRIZZLY	G7948 12 SPEED 20"	23" x 18" x 70 3/4"	FIXED	OF01	NO	NO	NO	YES/E2.12	NO	43	
44	GRINDER BUFFER	BALDOR	602E	16.22" x 11.41" x 26.21"	TABLETOP	OF01	NO	NO	NO	YES/E2.12	NO	44	
45	BIG RED GRINDER	BALDOR	600RE	14.88" x 9.08" x 8.56"	TABLETOP	OF01	NO	NO	NO	YES/E2.12	NO	45	
46	VERTICAL BANDSAW	JET	VBS-2012, 20"	42" x 30" x 79"	FIXED	OF01	NO	NO	NO	YES/E2.12	NO	46	
47	DRILL PRESS	JET	J-2221VS, 20" VARIABLE SPEED 115/230V 1PH	23" x 18" x 70 3/4"	FIXED	OF01	NO	NO	NO	YES/E2.12	NO	47	
48	HORIZONTAL BANDSAW	JET	HBS-916 9"x16"	28" x 65" x 42"	FIXED	OF01	NO	NO	NO	YES/E2.12	NO	48	
49	KNEE MILL	TRAK	TRAK-K3-KMX	59" x 71" x 84"	FIXED	OF01	NO	NO	NO	YES/E2.12	NO	49	
50	CNC MACHINE	HAAS	MINI MILL-EDU	86" x 81" x 106"	FIXED	OF01	NO	YES/PSK-2.6	NO	YES/E2.12	NO	50	
51	TIRE RACK	BORROUGHS	MODEL B	60" x 15" x 96"	FIXED	OF01	NO	NO	NO	NO	NO	51	
52	SAFETY POLE & CHAIN ASSEMBLY	ULINE	H-3361	-	MOBILE	OF01	NO	NO	NO	NO	NO	52	6 SETS (12 POSTS) W/ CHAINS INCLUDED (ORANGE COLOR SELECTION FOR BOTH POSTS & CHAINS)
53	ROLLING BRIDGE JACK	ROTARY	MODEL RJ22000LBK	-	FIXED	CFCI	NO	NO	NO	NO	NO	53	SET OF 2 - NOTE: THIS IS AN OPTIONAL ACCESSORY, CONFIRM WITH DISTRICT IF ACCESSORY IS REQUIRED
54	OVERHEAD POWER CORD REEL	KH INDUSTRIES	RTAN3LW-WDD520-112F	-	FIXED	CFCI	NO	NO	NO	YES/E2.11	NO	54	
55	WALL-MOUNTED POWER CORD REEL	KH INDUSTRIES	RTB83L-WDD520-112K	-	FIXED	CFCI	NO	NO	NO	YES/E2.11	NO	55	



SHOP EQUIPMENT CONNECTION SCHEDULE

MECHANICAL/PLUMBING EQUIPMENT CONNECTION NOTES:

- ALL ELECTRICAL EQUIPMENT EXPOSED TO DAMP/WET CONDITIONS SHALL BE PROVIDED WITH WEATHERPROOF HARDWARE/ACCESSORIES AND/OR NEMA 3R RATED ENCLOSURES.
- FINAL CONNECTION TO EQUIPMENT SHALL BE MADE WITH FLEXIBLE METAL CONDUIT.
- ALL OVER CURRENT AND OVERLOAD PROTECTIVE DEVICES SHALL BE SIZED PER EQUIPMENT MANUFACTURER'S NAMEPLATE INCLUDING FUSEZ AND CIRCUIT BREAKERS.
- ALL OVER CURRENT PROTECTIVE DEVICES SHALL BE RATED 300V OR 600V, AS REQUIRED, HEAVY-DUTY TYPE.
- REFER TO ARCHITECTURAL DRAWINGS FOR LOCATION OF ALL MECHANICAL EQUIPMENT. COORDINATE LOCATION IN FIELD PRIOR TO ROUGH-IN.
- ALL BRANCH CIRCUIT PENETRATIONS THROUGH RATED WALLS, FLOORS OR CEILINGS SHALL BE SEALED WITH UL LISTED AND APPROVED RATED SEALANTS/ASSEMBLIES. PERFORM PENETRATIONS SUCH THAT FIRE RATING OF ROOF AND/OR WALLS IS MAINTAINED.
- ELECTRICAL CONTRACTOR SHALL VERIFY EQUIPMENT VOLTAGES AND PHASE, AND COORDINATE WITH EQUIPMENT SHOP DRAWINGS.
- MOUNT DISCONNECT SWITCHES SUCH THAT NEC REQUIRED WORKING CLEARANCE IS MAINTAINED.

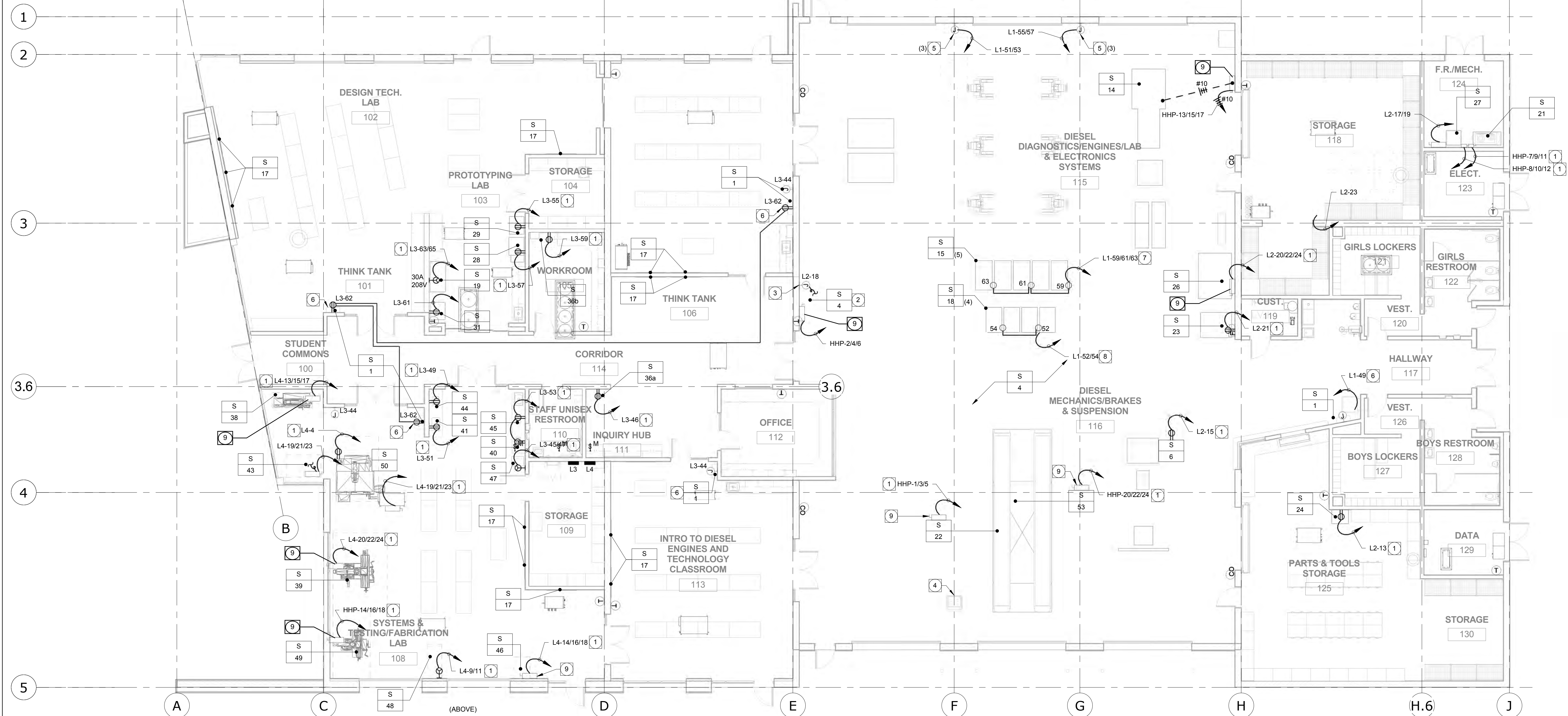
TAG	DESCRIPTION	EQUIPMENT RATING						CONNECTION DATA			NOTES	TAG	DESCRIPTION	EQUIPMENT RATING						CONNECTION DATA			NOTES	
		VOLTS	PHASE	FLA	MCA	MOCP	HP	STARTER SIZE	WIRE SIZE	DISCONNECT SWITCH				VOLTS	PHASE	FLA	MCA	MOCP	HP	STARTER SIZE	WIRE SIZE	DISCONNECT SWITCH		
S 1	GOOGLE CABINET	120	1	25W	-	-	-	-	3/4"C-2#12,1#12G	SEE PLAN		S 38a	OFFICE PRINTER	120	1	10	-	-	-	-	-	3/4"C-2#12,1#12G	-	
S 4	OVERHEAD CRANE	480	3	25.3	-	-	-	-	3/4"C-3#8,1#10G			S 38b	OFFICE PRINTER	120	1	10	-	-	-	-	-	3/4"C-2#12,1#12G	-	
S 6	COMPUTER ALIGNMENT SYSTEM	120	1	-	-	-	-	-	-			S 38	PRECISION LATHE	208	3	10.6	-	-	-	3	-	3/4"C-3#12,1#12G	30AS/20AF	
S 14	TRANSMISSION TRAINING	480	3	-	-	-	20	-	3/4"C-3#10,1#10G	30AS/30AF		S 39	VERTICAL MILL	208	3	-	-	-	-	3	-	3/4"C-3#12,1#12G	30AS/20AF	
S 15	COMBINATION HEAVY TRUCK & MULTIPLEXED LIGHTING SYSTEM TRAINER	120	1	-	-	-	-	-	-	-		S 40	INDUSTRIAL GRINDER	120	1	3.1	-	-	-	-	-	3/4"C-2#12,1#12G	-	
S 17	TOUCH SCREENS	120	1	350W	-	-	-	-	3/4"C-2#12,1#12G SEE PLANS	-		S 41	TOOL GRINDER	120	1	5	-	-	-	-	-	3/4"C-2#12,1#12G	-	
S 18	HYDRAULIC TRAINING SYSTEM	120	1	-	-	-	-	-	-	-		S 43	SURFACE GRINDER	208	3	6.8W	-	-	-	-	-	3/4"C-3#10,1#10G	30AS/30AF	
S 19	VACUUM FORMING MACHINE	208	1	3.5kW	-	-	-	-	3/4"C-2#10,1#10G	-		S 44	GRINDER BUFFER	120	1	-	-	-	-	1/3	-	3/4"C-2#12,1#12G	-	
S 20	HEAVY DUTY CRANE	-	-	-	-	-	-	-	-	-	SEE SHEET A1.3 FOR LOCATION	S 45	BIG RED GRINDER	120	1	3.1	-	-	-	-	-	3/4"C-2#12,1#12G	-	
S 21	AIR COMPRESSOR	480	3	-	-	-	(2)10	-	3/4"C-3#10,1#10G	30AS/30AF		S 46	VERTICAL BANDSAW	208	3	-	-	-	-	2	-	3/4"C-3#12,1#12G	30AS/15K	
S 22	DRIVE ON LIFT	480	3	27	-	-	20	-	3/4"C-3#8,1#10G	60AS/40AF		S 47	DRILL PRESS	208	1	-	-	-	-	2	-	3/4"C-2#12,1#12G	-	
S 23	WHEEL BALANCER	120	1	-	-	-	-	-	3/4"C-2#12,1#12G	-		S 48	HORIZONTAL BANDSAW	208	1	-	-	-	-	1.5	-	3/4"C-2#12,1#12G	-	
S 24	PARTS WASHER	120	1	13	-	-	-	-	3/4"C-2#12,1#12G	-		S 49	KNEE MILL	120	1	10	-	-	-	-	-	3/4"C-2#12,1#12G	-	
S 26	HEAVY-DUTY TIRE CHANGER	208	3	-	-	-	3 2	-	3/4"C-3#10,1#10G	30AS/30AF		S 50	CNC MACHINE	480	3	13	-	-	-	-	-	3/4"C-3#12,1#12G	30AS/20AF	
S 27	AIR DRYER	208	1	1.28kW	-	-	-	-	3/4"C-2#12,1#12G	-		S 53	ROLLING BRIDGE JACK	480	3	27	-	-	-	20	-	3/4"C-3#8,1#10G	60AS/40AF	
S 28	3D PRINTER	120	1	1.5kW	-	-	-	-	3/4"C-2#1C,1#12G	-		S 54	OVERHEAD POWER CORD REEL	120	1	-	-	-	-	-	-	-	-	SEE SHEET E2.11
S 29	3D PRINTER	120	1	1.5kW	-	-	-	-	3/4"C-2#1C,1#12G	-		S 55	WALL-MOUNTED POWER CORD REEL	120	1	-	-	-	-	-	-	-	-	SEE SHEET E2.11
S 31	3D PRINTER	120	1	1.5kW	-	-	-	-	3/4"C-2#1C,1#12G	-														

PLAN NOTES

- REFER TO SHOP EQUIPMENT CONNECTION SCHEDULE FOR BRANCH CIRCUIT AND OVER CURRENT PROTECTION REQUIREMENTS
- CONNECT TO OVERHEAD CRANE MOTOR AS REQUIRED. VERIFY EXACT LOCATION.
- PROVIDE 120V, 20A CONTROL CIRCUIT FOR CRANE CONTROLS
- DRIVE ON LIFT CONTROLLER LOCATION. SEE E2.11 FOR CONTROL PARTWAY.
- MOBILE VEHICLE LIFT CHARGING. PROVIDE (2) DEDICATED 120V, 20A CONDUITS.
- PROVIDE 120V, 20A CIRCUIT AND CONNECT TO GOOGLE CABINET(S) AS REQUIRED.
- PROVIDE 120V, 20A CIRCUITS FOR CONNECTION TO LIGHTING SYSTEM TRAINER.
- PROVIDE 120V, 20A CIRCUIT(S) FOR CONNECTION TO HYDRAULIC SYSTEM TRAINER.
- CONTRACTOR TO COORDINATE LOCATIONS OF DISCONNECT SWITCHES WITH ARCHITECT AND ELECTRICAL ENGINEER.

GARAGE GENERAL NOTES

- ALL WALL MOUNTED DEVICE IN GARAGE SHALL BE MOUNTED ABOVE 18" A.F.F. TO BOTTOM. U.N.O.
- HAZARDOUS AREA CLASSIFICATIONS WITHIN GARAGE:
2.A. ENTIRE GARAGE FROM GRADE TO 18" A.F.F. SHALL BE CLASS 1, DIV. 2 (CEC TABLE 511.3(C)).
2.B. ENTIRE GARAGE FROM 18" AND ABOVE SHALL BE UNCLASSIFIED LOCATION. (CEC TABLE 511.3(C)).
2.C. GARAGE PIT SHALL BE CLASS 1, DIV. 1 (CEC TABLE 511.3(C)).
GARAGE AREA CLASSIFICATION HATCHES PER DESCRIPTIONS 2.A. & 2.C.
2.A. 2.C.
- WIRING AND EQUIPMENT INSTALLED OR OPERATED WITHIN ANY CLASS 1 LOCATION SHALL COMPLY WITH APPLICABLE PROVISIONS OF ARTICLE 501 THRU 516.
- PLUGS AND RECEPTACLES IN CLASS 1 LOCATIONS SHALL BE IDENTIFIED FOR CLASS 1 LOCATIONS AND SHALL BE DESIGNED SUCH THAT THEY CAN NOT BE ENERGIZED WHILE THE CONNECTIONS ARE BEING MADE OR BROKEN.
- PROVIDE CONDUIT SEALS AT BOUNDARIES OF HAZARDOUS AREAS. MAXIMUM PERMITTED CROSS-SECTION FILL OF SEALS SHALL NOT EXCEED 25% OF THE CROSS-SECTIONAL AREA OF A CONDUIT OF THE SAME TRADE SIZE UNLESS SPECIFICALLY APPROVED. (NEC 501.15(C)(8)).
- ALL OUTLETS INSTALLED IN GARAGE SHALL BE GFCI.
- MANUALLY OPERATED CONTROLS SHALL BE PROVIDED AT AN APPROVED LOCATION TO SHUT OFF FANS OR BLOWERS INSTALLED AS PART OF VENTILATION SYSTEMS THAT ARE LOCATED IN FLAMMABLE VAPOR OR DUST SYSTEMS.
- ELECTRICAL EQUIPMENT LOCATED IN AREAS THAT GENERATE EXPLOSIVE OR FLAMMABLE VAPORS, FUMES, OR DUST SHALL BE INTERLOCKED WITH THE VENTILATION SYSTEM SO THAT THE EQUIPMENT CAN NOT BE OPERATED UNLESS THE VENTILATION FANS ARE IN OPERATION.



ELECTRICAL PLAN SHOP EQUIPMENT

Scale: 1/8" = 1'-0"
PROJECT No.: 0-00-03
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ISSUE No.	DATE	DESCRIPTION	REVISION No.	DATE	DESCRIPTION
1	9/25/20	ADDENDUM 1	1	9/25/20	ADDENDUM 1
2			2		
3			3		
4			4		
5			5		

RUHNAUCLARKE.COM

3775 TENTH STREET, RIVERSIDE CALIFORNIA 92501 (951) 684-4654 / 5751 PALMER WAY, SUITE C, CARLSBAD CALIFORNIA 92008 (760) 438-5899

DIESEL TECHNOLOGY CENTER C.T.E.

PACIFIC HIGH SCHOOL
1020 PACIFIC STREET SAN BERNARDINO, CA 92404
SAN BERNARDINO CITY UNIFIED SCHOOL DISTRICT

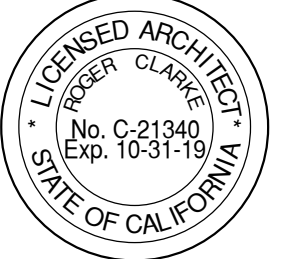
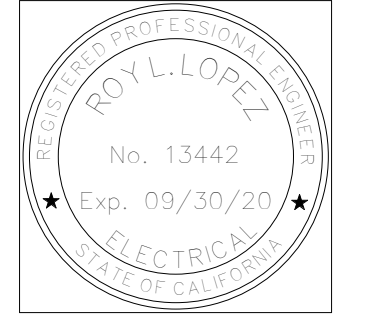
ELECTRICAL PLAN
SHOP EQUIPMENT

E2.12

OMB
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OMB #18118

RUHNAU
CLARKE
ARCHITECTS



1



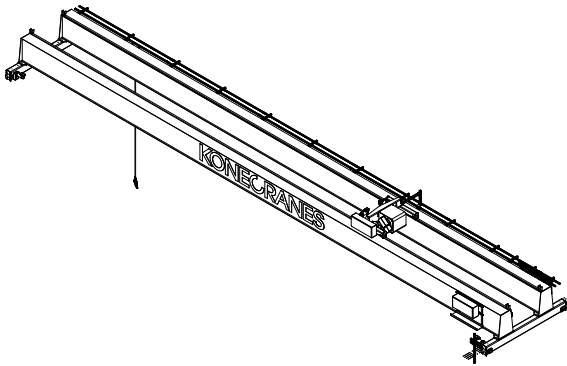
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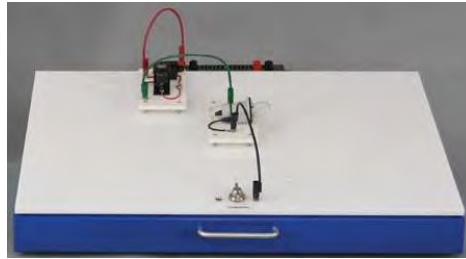
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4



5



6



7



8



9



10



11



12



13



14



15



16



17



18



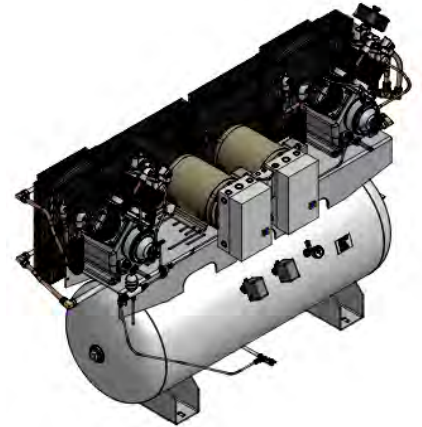
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20



21



22



23



24



25



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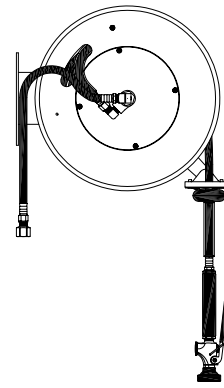
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Flinn Goggle Sanitizer Instruction Manual

For Digital and Analog Models
SE1000, SE1093, SE1094



SE1000



SE1093



SE1094

HOLDS 36 GOGGLES

28-1/2" H x 26-1/4" W x 10-1/4" D

**FLINN
SCIENTIFIC**
flinn@flinnsci.com | 800-452-1261

Flinn Goggle Sanitizer Instruction Manual



Introduction

Congratulations on purchasing the finest goggle sanitizer made. We know you'll be pleased with our goggle sanitizer's craftsmanship and durability!

Receiving

Please unpack the goggle sanitizer slowly and carefully. Once unpacked, verify that all the component parts are accounted for:

- 1 each Flinn Goggle Sanitizer
- 1 each 25-watt germicidal lamp (installed in sanitizer)
- 4 each Rubber feet for countertop use
- 2 each Door lock keys

Please advise us of any breakage or shortage by calling 1-800-452-1261. No sale is complete unless you are satisfied!

Instructions

1. The germicidal lamp is secured in place with temperature rated electrical tape for shipping purposes only. The tape is not necessary for operation. It can be removed or left in place. Please verify that the germicidal lamp did not dismount during shipping. The lamp should be secured in each socked with the pins seated horizontally.
2. If the goggle sanitizer is to be placed on the top of a bench or table, the four rubber feet should be used. Apply a rubber foot to each corner of the bottom of the cabinet.
3. The goggle sanitizer may be all mounted using the two keyhole-shaped mounting holes in the upper back of the cabinet (covered by white tape). Two additional screws will be needed to secure the lower portion of the cabinet against the wall and to prevent the cabinet from being lifted off the upper set of screw. Pretest the goggle sanitizer prior to wall mounting.
4. Plug the goggle sanitizer into a properly grounded receptacle only.
5. Place each pair of safety goggles of glasses in a separate bin, centered front to back. The goggles should be placed in the bin with the lens down. This will prevent any slippage of the goggles. Load the goggles from top to bottom so that less than full loads can benefit from shorter UV exposure times. The surfaces of the eyewear that touch the skin should face the light source (i.e., place the eyewear with the lenses down).
6. Close and lock the doors. Door interlock safety switches will not allow the unit to operate unless both doors are fully closed. Do not operate this unit if these switches are not functioning properly. Contact Flinn Scientific for switch replacement.
7. The goggle sanitizer can be started by:
 - Analog Model: Turning the timer knob clockwise to the desired exposure time.
 - Digital Model: Depressing the power switch and setting the desired exposure time.
8. If time is available between each use of safety goggles, a UV dose of 15 minutes is recommended for optimum results, especially at full capacity. Five minutes is the minimum effective dosage time. Look through the viewing lens on the front of the cabinet to ensure that the UV lamp is functioning with each use.
9. This goggle sanitizer is equipped with a 25-watt germicidal lamp that is rated at 5,000 hours of continuous use. Short periods of on/off cycling, as in this application, will reduce lamp life. With normal use of this lamp, the ultraviolet portion of the lamp will wear out before the visible portion, further reducing the effective lamp life. In order to maintain optimum performance, it is recommended that the lamp be replaced after 2,000 to 3,000 hours of use. As an example, if the unit is run for 15 minutes, 5 times a day, 5 days a week, for 40 weeks, the lamp should be replaced in approximately 8 years. A lamp replacement record has been provided on the inside surface of the right-hand door. Write in the date of the first use and subsequent lamp changes. If a new lamp is needed, please order Catalog No. SE1001.
10. Please remember that exposure to UV light can cause vision loss. Prolonged exposure to ultraviolet light causes conjunctivitis, cataracts and/or permanent damage to the retina. Do not attempt to operate the unit with the doors open or unlocked.



Lockers

Penco's Full Range of Lockers



About Penco

The need for storage products is universal and Penco has a broad selection of solutions to fill that need. In doing so, Penco has become one of America's largest and most trusted suppliers of storage and work-area products. With state-of-the-art US manufacturing facilities and QuickShip Distribution Centers strategically located throughout the United States, Penco is positioned to best serve your needs.

Market sectors served by Penco include educational, healthcare, and government facilities, as well as offices, manufacturing companies, distribution warehouses, retail outlets, sports arenas and community parks.

Shelving and pallet rack products are popular with warehousing and manufacturing applications, ranging from a few units to multi-level and high rise applications.

Lockers are widely used in educational facilities, fitness centers, healthcare, military, emergency response, commercial and industrial locations. All products manufactured by Penco Products are GREENGUARD Gold Certified through UL Environment's GREENGUARD Certification Program. More information on page 46.



Penco's History

In 1869, a man named L. Lewis Sagendorph fulfilled his ambition to begin his own company that would produce the finest metal products in America. He called his fledgling business the Penn Metal Corporation of Pennsylvania, and began by making steel culvert pipe on Oregon Avenue in South Philadelphia.



Over the years, Penn Metal's product lines broadened to include lockers, shelving and even aircraft landing mats. A reputation for quality fabrication spread, and the company's influence became nationwide. In the 1950's, the name was shortened to Penco Products and the plant and offices were expanded to a modern facility in Oaks, Pennsylvania, near Valley Forge.

In 2001, the manufacturing facility was moved from Oaks to a 475,000 square foot manufacturing facility in Hamilton, North Carolina, allowing significant room for expansion. In 2013, the corporate headquarters was moved from Skippack, Pennsylvania to Greenville, North Carolina.

Headquarters in Greenville, NC



Customer Service

Penco's Customer Service staff is a customer friendly, knowledgeable team that is dedicated to excellence in service delivery and communication. The team is based at Penco's Greenville, NC headquarters.

Our goal is to provide professional, courteous, timely and accurate service to every customer in a fair, consistent and accessible manner. Penco's distributor partners and customers are our number one priority and focus.

pencoproducts.com | 800.562.1000

Manufacturing facility in Hamilton, NC



Lockers

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Guardian™ Lockers

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QUICKSHIP Locker Program

3 Strategic Locations for Locker Shipments



Penco Products leads the industry with our comprehensive QuickShip program. Penco's QuickShip Distribution Centers have been strategically located throughout North America to best serve customer needs with prompt delivery of products from the shortest distance possible. Penco's QuickShip program saves time, delivery cost and energy, thus reducing the impact on our environment.

Visit pencoproducts.com/penco-programs/quickship for a listing of product availability at each distribution center.

Americans with Disabilities Act information on page 46.

Environmental information on page 46.



Chart of
24 Brilliant Colors
See Page 47

Steel Lockers

pencoproducts.com | 800.562.1000

Overview

Penco has been building lockers for nearly 150 years that last for decades and has become a part of the fabric of American life. Look in any school and chances are you'll find Penco's lockers in the athletic department, field house, faculty break room and of course, lining the corridors.

School lockers may be Penco's foundation, but the spectrum of products doesn't end there. Penco has locker solutions for recreation centers, health clubs, hospitals, back office and industry break rooms, while at the same time delivering the widest range of solutions to serve first responders in the military, law enforcement and fire and rescue profession.

For locker specifications, see pages 36 - 45.

Terms Used in This Catalog

KD: Knocked Down, or lockers that are shipped unassembled for assembly and installation at their destination.

GA: Gauge of steel - indicates the thickness. The lower the number the thicker the steel.

LH & RH: Left Hand and Right Hand side of a locker, as seen standing in front of a locker.

Tier: A "level" of a locker defined by the number of doors in a vertical row. This can range from 1 to 9 tiers.

Opening & Frame: Opening is what is behind a door. A frame is the unit that holds the doors. There can be multiple doors per frame.

Double Row: "Back-to-back" lockers.

Double Door Locker: A locker with two full length doors that open in the center.

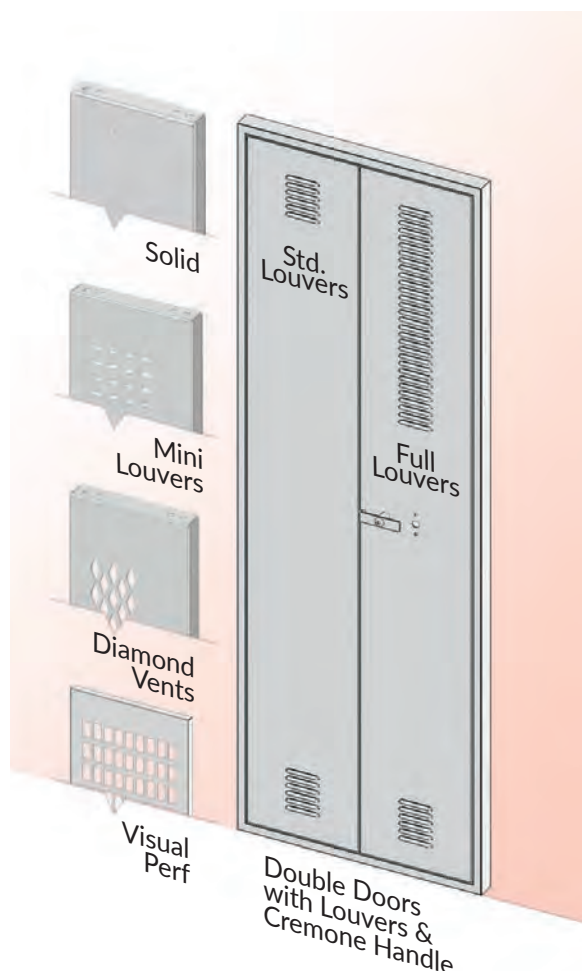
W, D & H: Width, Depth & Height dimensions (inches).



NOTE: All-Welded, Stadium and Patriot lockers are not shown above.

Construction Variations

Ventilation Options



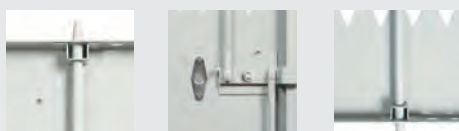
Cremone Multi-Point Handle.



An unbreakable steel handle securely bolted to a 3 point latching system.

A 3/8" diameter latching rod engages at the top and bottom of the door frame. A 1/8" thick center latch locks the center of the door to the frame. The cremone handle is available on a variety of KD and welded heavy duty locker doors; it is standard on Patriot Gear and Duty lockers.

3 views at right: top, middle and bottom of inside of door with cremone handle.



Handles & Latching



Die-Cast Handle. This patented die-cast handle opens multi-point latch lockers with one simple motion. Standard on 1, 2 & 3 tier, 2-Person and Duplex Vanguard lockers.



Automatic Multi-Point Latching. Allows the door to be closed without locking. Standard on all multi-point doors except box lockers, Single Point Latch doors and Cremone Handle lockers.



Classic III Stainless Steel Recessed Handle. Seamless deep drawn design is attractive as well as strong. Utilizes the Automatic Multi-Point Latching feature.

Standard on all 1, 2 & 3 tier 2-Person and Duplex, Vanguard Recessed, Guardian & Guardian PLUS lockers. Also standard on Invincible II and All-Welded 1, 2 and 3 tier lockers. This is the preferred handle for ADA lockers.

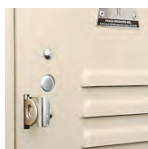


Defiant II Single Point Latch. Stainless steel deep drawn pocket with no moving parts (single point latch). Used with a vertical or horizontal pan welded to door. Standard on 1, 2 and 3 tier Defiant II Locker models.



Anti Pry Lug. Defeats prying attempts by capturing the door flange and preventing separation from the door channel.

See Defiant II details on page 43.



Friction Catch Door Pull.

All box lockers come standard with this friction catch door pull handle with padlock hasp.



Spring Loaded Positive Latch. This latch, also known as a "Slam Latch", is available as an option on heavy duty box lockers.

At a Glance

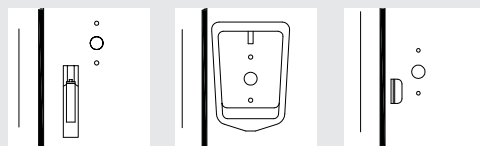
- Knocked down construction
- Standard louvers for ventilation
- Classic III handle standard on QuickShip multi-point latch models
- 24 ga. body painted to match door frame
- Many sizes available through QuickShip

Ventilation Options



Standard Louvers (S) Full Louvers (O) Mini Louvers (O) Solid Door (O) Visual Perf (O)

Door Handle Options



Die-Cast (S) Classic III Recessed (S) Friction Catch (SB)

S = Standard **O** = Optional* **SB** = Standard on Box Lockers
**additional charges may apply*

For Vanguard specifications, see page 36.

Penco has been manufacturing lockers for decades that last for decades, and the Vanguard line is the embodiment of what it takes to withstand the daily use and abuse typically dealt to a locker.

The powder coat baked enamel finish is tough and available in all standard colors. Body parts are finished the same color as the doors, as standard. For quieter operation, each latch hook features a noise reducing rubber bumper.

The welded door frames have mortise and tenon construction and are spot welded for lifetime rigidity. Every door has a continuous door strike. All hinges are full loop, 5-knuckle design.

Note that different types of handles are available on many Vanguard lockers and that 3-tier Vanguard lockers have **3** handle choices.

Additional specialty Vanguard models are shown on page 8. Also, many popular Vanguard lockers are available in our QuickShip program with a limited color selection, as shown on pages 9 through 11.



Chart of
24 Brilliant Colors
See Page 47

With Classic III Recessed Pocket Handles



With Vanguard Cast Pull-out Handles



With Box Locker Friction Catch Door Pull Handles



Sizes and Dimensions

Vanguard 1, 2 & 3 Tier Lockers																	
		1 Tier						2 Tier						3 Tier			
Overall Height*		60"	72"	84"	60"	72"	84"	60"	72"	84"	60"	72"	84"	60"	72"	60"	72"
Opening Height*		60"	72"	42"	60"	72"	42"	30"	36"	42"	30"	36"	42"	20"	24"	20"	24"
Width	Depth	Die-Cast Handle			Classic III Handle			Die-Cast Handle			Classic III Handle			Die-Cast Handle		Classic III Handle	
9"	12"	6101V	6151V	-	6101R	6151R	-	6201V	6221V	-	6201R	6221R	-	-	-	6401R	6413R
	15"	6103V	6153V	-	6103R	6153R	-	6203V	6223V	-	6203R	6223R	-	-	-	6403R	6415R
	18"	6105V	6155V	-	6105R	6155R	-	6205V	6225V	-	6205R	6225R	-	-	-	6405R	6417R
12"	12"	6111V	6161V	6013V	6111R	6161R	6013R	6211V	6231V	6251V	6211R	6231R	6251R	6407V	6419V	6407R	6419R
	15"	6113V	6163V	6014V	6113R	6163R	6014R	6213V	6233V	6253V	6213R	6233R	6253R	6409V	6421V	6409R	6421R
	18"	6115V	6165V	6015V	6115R	6165R	6015R	6215V	6235V	6255V	6215R	6235R	6255R	6411V	6423V	6411R	6423R
	21"	6117V	6167V	-	6117R	6167R	-	6217V	6218V	-	6217R	6218R	-	6449V	-	6449R	6499R
	24"	6118V	6168V	-	6118R	6168R	-	6200V	6220V	-	6200R	6220R	-	-	-	-	-
15"	12"	6119V	6179V	6016V	6119R	6169R	6016R	6227V	6239V	6073V	6227R	6239R	6073R	-	6472V	-	6472R
	15"	6121V	6171V	6017V	6121R	6171R	6017R	6229V	6241V	6261V	6229R	6241R	6261R	-	6494V	-	6494R
	18"	6123V	6173V	6018V	6123R	6173R	6018R	6237V	6243V	6263V	6237R	6243R	6263R	-	6496V	-	6496R
	21"	6125V	6175V	-	6125R	6175R	-	6257V	6245V	-	6257R	6245R	-	-	-	-	-
	24"	6126V	6177V	-	6126R	6177R	-	6258V	6246V	-	-	6246R	-	-	-	-	-
18"	15"	6134V	6180V	-	6134R	6180R	-	-	6259V	-	-	6259R	-	-	-	-	-
	18"	6131V	6181V	-	6131R	6181R	-	-	6247V	-	-	6247R	-	-	-	-	-
	21"	6133V	6183V	-	6133R	6183R	-	-	6249V	-	-	6249R	-	-	-	-	-
	24"	6135V	6185V	-	6135R	6185R	-	-	6250V	-	-	6250R	-	-	-	-	-
24"	18"	6149V	6196V	-	6149R	6196R	-	-	-	-	-	-	-	-	-	-	-
	21"	6158V	6198V	-	6158R	6198R	-	-	-	-	-	-	-	-	-	-	-
	24"	6160V	6199V	-	6160R	6199R	-	-	6274V	-	-	6274R	-	-	-	-	-

Vanguard 2 Person and Duplex Lockers									
		2 Person				Duplex			
Overall Height*		60"	72"	60"	72"	60"	72"	60"	72"
Opening Height*		60"	72"	42"	60"	72"	42"	60"	72"
Unit Width	Unit Depth	Die-Cast Handle		Classic III Handle		Die-Cast Handle		Classic III Handle	
15"	12"	6510V	6500V	6510R	6500R	-	-	-	-
	15"	6506V	6501V	6506R	6501R	6519V	6531V	6519R	6531R
	18"	6437V	6503V	6437R	6503R	6521V	6533V	6521R	6533R
	21"	-	6505V	-	6505R	-	6535V	-	6535R
18"	15"	-	6509V	-	6509R	-	-	-	-
	18"	-	6515V	-	6515R	-	-	-	-
	21"	-	6525V	-	6525R	-	-	-	-

* All dimensions are in inches. Overall Height is the overall height of the locker frame, NOT including legs. Opening Height is the nominal height of the individual door opening. Opening Height for 2 Person Lockers: for 60" high models, bottom doors are nominal 42" high; for 72" high models, bottom doors are nominal 54" high. Book compartment doors are nominal 9" high each.

Vanguard Box Lockers - 3, 4, 5 & 6 Tier								
		3 Tier		4 Tier		5 Tier		6 Tier
Overall Ht.*		60"	72"	60"	72"	60"	72"	72"
Opening Ht.*		20"	24"	15"	18"	12"	14-2/5"	12"
Unit Width	Unit Depth	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.
9"	12"	6301V	6313V	-	-	-	-	-
	15"	6303V	6315V	-	-	-	-	-
	18"	6305V	6317V	-	-	-	-	-
12"	12"	6307V	6319V	6325V	6331V	6343V	6353V	6365V
	15"	6309V	6321V	6327V	6337V	6345V	6355V	6367V
	18"	6311V	6323V	6329V	6339V	6347V	6357V	6369V
	21"	6349V	6399V	6393V	6395V	-	6435V	6371V
15"	12"	-	6372V	-	-	-	-	6363V
	15"	-	6394V	6333V	6431V	6351V	6359V	6373V
	18"	-	6396V	-	6433V	6397V	6361V	6375V
	21"	-	-	-	-	-	-	6377V
18"	18"	-	6335V	-	-	-	-	6379V
	21"	-	-	-	-	-	-	6378V

Specialty Lockers



Dual Lockers

A dual locker is a single tier locker with a vertical partition separating the area beneath the shelf into two compartments. It is ideally suited for situations where street clothes and work clothes are to be kept apart. It is generally used with lockers 15" or 18" wide and 18" or 21" deep. Guardian and

Invincible II lockers can also be supplied as dual lockers.



The Executive

The Executive is a custom-outfitted 24" wide double door locker which offers such optional personal amenities as multiple storage shelves, lockable inner storage compartment, and combination comb & brush tray with towel bar. Shown

here with the available Classic III stainless steel recessed handle and optional front and end bases. Note that the depth of shelves and partitions are 3" less than the locker depth.

It is especially appropriate for golf clubs. Other accessories available include golf ball tray, acrylic mirror and name card holder. For ordering information contact your Penco representative.

Optional Accessories



Comb & Brush Tray with Towel Bar



Card Holder



Inner storage compartment and golf ball tray

16 Person Locker

Accommodates 16 users in only 69" of floor space. Includes a 45" wide coat rod. Ideal for employee lockers. Accepts built-in locks or padlocks.

69"W x 18" D x 72"H. Cat. No. 6579V



Wall Mounted Locker with Coat Rod



A practical storage unit where space is at a premium. Four private compartments with a hanging area for 16 coats. When wall mounted, the floor below is kept clear for easy cleaning (wall anchors are not included). Can also be set on counters or cabinets (without coat rod).

45"W x 18"D x 13-5/8" H.

Cat. No. 68242



One High Box Locker

This 12" wide individual one high box locker provides storage for personal

items and features standard box locker construction with friction catch door pull. Actual overall height is 13-5/8".

Half Height Locker, 1 Tier



Available in 30-1/2", 36-1/2" and 48-1/2" heights; Available in 12", 15" and 18" depths; 12" wide. Only 48-1/2" high lockers include a shelf for storage of books and small articles.



Box Over Lockers

Provides a compact independent lockable door above a 60" high standard Vanguard Door. If a shelf is required in the lower compartment, it must be ordered separately.

Box Over Lockers - 72" High

Unit Width	Unit Depth	Cat. No.
12"	12"	6439V
12"	15"	6441V
12"	18"	6443V
15"	15"	6436V
18"	18"	6445V
18"	21"	6447V

7 and 8 Person Lockers



These efficient lockers are ideal for multiple user situations such as school gymnasium locker rooms. The box compartments (18"W x 12"H) are for permanent storage of athletic gear. When a user is present, the large locker (18"W x 60"H) is used for street clothes.

7 Person Locker

Unit Width	Unit Depth	Unit Height	Cat. No.
36"	18"	72"	6573V
36"	21"	72"	6575V

8 Person Locker

Unit Width	Unit Depth	Unit Height	Cat. No.
54"	18"	72"	6577V






For product listing by distribution center location, go to:
pencoproducts.com/penco-programs/quickship/


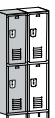
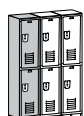





QuickShip Lockers

Lockers in 5 working days

- KD lockers ship in 72 hours
- 1, 2 & 3 Tier models have Recessed Handles
- 6" Legs standard (available with no legs by request)
- Many QuickShip accessories are available (see next pages)
- Assembly available by request
- Number plates included
- 1, 2 and 3-Wide groupings

QuickShip Vanguard 1 Tier						
Grp.	Illustration	Width	Depth	Opn.Ht.*	028 Gray	073 Champagne
1-Wide		12"	12"	60"	68001R028	68001R073
		12"	15"	60"	68011R028	68011R073
		12"	18"	60"	68021R028	68021R073
		12"	12"	72"	68051R028	68051R073
		12"	15"	72"	68061R028	68061R073
		12"	18"	72"	68071R028	68071R073
		15"	18"	72"	68091R028	68091R073
		18"	18"	72"	68101R028	68101R073
2-Wide		12"	12"	60"	68002R028	68002R073
		12"	15"	60"	68012R028	68012R073
		12"	18"	60"	68022R028	68022R073
		12"	12"	72"	68052R028	68052R073
		12"	15"	72"	68062R028	68062R073
		12"	18"	72"	68072R028	68072R073
		15"	18"	72"	68092R028	68092R073
		18"	18"	72"	68102R028	68103R073
3-Wide		12"	12"	60"	68003R028	68003R073
		12"	15"	60"	68013R028	68013R073
		12"	18"	60"	68023R028	68023R073
		12"	12"	72"	68053R028	68053R073
		12"	15"	72"	68063R028	68063R073
		12"	18"	72"	68073R028	68073R073
		15"	18"	72"	68093R028	68093R073
		18"	18"	72"	68103R028	68103R073




QuickShip Vanguard 2 Tier						
Grp.	Illustration	Width	Depth	Opn.Ht.*	028 Gray	073 Champagne
1-Wide		12"	12"	30"	68111R028	68111R073
		12"	15"	30"	68031R028	68031R073
		12"	18"	30"	68041R028	68041R073
		12"	12"	36"	68121R028	68121R073
		12"	15"	36"	68131R028	68131R073
		12"	18"	36"	68141R028	68141R073
		15"	18"	36"	68261R028	68261R073
2-Wide		12"	12"	30"	68112R028	68112R073
		12"	15"	30"	68032R028	68032R073
		12"	18"	30"	68042R028	68042R073
		12"	12"	36"	68122R028	68122R073
		12"	15"	36"	68132R028	68132R073
		12"	18"	36"	68142R028	68142R073
		15"	18"	36"	68262R028	68262R073
3-Wide		12"	12"	30"	68113R028	68113R073
		12"	15"	30"	68033R028	68033R073
		12"	18"	30"	68043R028	68043R073
		12"	12"	36"	68123R028	68123R073
		12"	15"	36"	68133R028	68133R073
		12"	18"	36"	68143R028	68143R073
		15"	18"	36"	68263R028	68263R073

QuickShip Vanguard 3 Tier						
Grp.	Illustration	Width	Depth	Opn.Ht.*	028 Gray	073 Champagne
1-Wide		12"	12"	24"	68331R028	68331R073
		12"	15"	24"	68341R028	68341R073
		12"	18"	24"	68351R028	68351R073
2-Wide		12"	12"	24"	68332R028	68332R073
		12"	15"	24"	68342R028	68342R073
		12"	18"	24"	68352R028	68352R073
3-Wide		12"	12"	24"	68333R028	68333R073
		12"	15"	24"	68343R028	68343R073
		12"	18"	24"	68353R028	68353R073

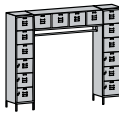

QuickShip Vanguard 5 Tier

Grp.	Illustration	Width	Depth	Opn.Ht.*	028 Gray	073 Champagne
1-Wide		12"	12"	12"	68161X028	68161X073
		12"	15"	12"	68171X028	68171X073
2-Wide		12"	12"	12"	68162X028	68162X073
		12"	15"	12"	68172X028	68172X073
3-Wide		12"	12"	12"	68163X028	68163X073
		12"	15"	12"	68173X028	68173X073

QuickShip Vanguard 6 Tier

Grp.	Illustration	Width	Depth	Opn.Ht.*	028 Gray	073 Champagne
1-Wide		12"	12"	12"	68191X028	68191X073
		12"	15"	12"	68201X028	68201X073
		12"	18"	12"	68211X028	68211X073
2-Wide		12"	12"	12"	68192X028	68192X073
		12"	15"	12"	68202X028	68202X073
		12"	18"	12"	68212X028	68212X073
3-Wide		12"	12"	12"	68193X028	68193X073
		12"	15"	12"	68203X028	68203X073
		12"	18"	12"	68213X028	68213X073

QuickShip Vanguard Specialty Lockers

16 Person						
Illustration	Width	Depth	Frame Ht.*	028 Gray	073 Champagne	
	69"	18"	72"	68231X028	68231X073	
Wall Mount						
	45"	18"	13-5/8"	68242X028	68242X073	

* Height shown is the nominal opening height for 1 through 6 tier, and overall frame height for others, not including 6" legs which are standard on all except the Wall Mount Locker. Width is the nominal outside dimension for 1 frame.

** Shaded area in illustrations indicates the unit of sale; i.e. Cat. No. 68003R028 is for one frame of a 12" x 12" x 60" 1 tier locker, but since it is packaged in a group of 3, it must be ordered in multiples of 3.

QuickShip Locker Accessories

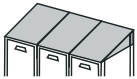
QuickShip Slope Top Kits

1- Wide



Width	Depth	Height	028 Gray	073 Champagne
12"	12"	4"	60229H028	60229H073
12"	15"	5"	60231H028	60231H073
12"	18"	6"	60233H028	60233H073
15"	18"	6"	60239H028	60239H073
18"	18"	6"	60243H028	60243H073

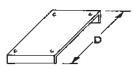
3-Wide



12"	12"	4"	60230H028	60230H073
12"	15"	5"	60232H028	60232H073
12"	18"	6"	60234H028	60234H073
15"	18"	6"	60240H028	60240H073
18"	18"	6"	60244H028	60244H073

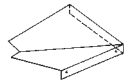
QuickShip Slope Top Fillers

Slope Top Fillers



15"	12"	-	661371-028	661371-073
15"	15"	-	661372-028	661372-073
15"	18"	-	661373-028	661373-073

Slope Top Corner Fillers



12"	12"	-	66100-028	66100-073
15"	15"	-	66101-028	66101-073
18"	18"	-	66102-028	66102-073

QuickShip Hoods

Slope Hood (18 Ga.)



72"	12"	5"	66144H028	66144H073
72"	15"	6"	66147H028	66147H073
72"	18"	7"	66150H028	66150H073

Hood Splice



-	12"	-	66168-028	66168-073
-	15"	-	66169-028	66169-073
-	18"	-	66170-028	66170-073

Left Hand Slope End



-	12"	-	66158H028	66158H073
-	15"	-	66160H028	66160H073
-	18"	-	66162H028	66162H073

Right Hand Slope End



-	12"	-	66159H028	66159H073
-	15"	-	66161H028	66161H073
-	18"	-	66163H028	66163H073

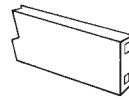
Universal Hood Support



-	-	-	66070	-
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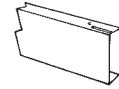
QuickShip Locker Bases, 6" High (for lockers with 6" Legs)

Front Bases



Width	Depth	Height	028 Gray	073 Champagne
12"	-	6"	60217-028	60217-073
15"	-	6"	60218-028	60218-073
18"	-	6"	60219-028	60219-073

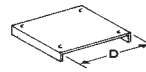
End Bases



-	12"	6"	60204-028	60204-073
-	15"	6"	60205-028	60205-073
-	18"	6"	60206-028	60206-073

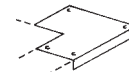
QuickShip Flat Top Fillers

Flat Top Fillers (Overlaps Standard Tops)



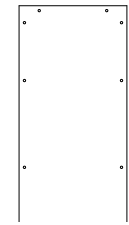
15"	12"	-	661321C028	661321C073
15"	15"	-	661322C028	661322C073
15"	18"	-	661323C028	661323C073

Flat Top Corner Fillers



12"	12"	-	66138-028	66138-073
15"	15"	-	66139-028	66139-073
18"	18"	-	66140-028	66140-073

Flat Top Exposed Ends/Divisions (16 Ga.)



-	12"	60"	601660-028	601660-073
-	15"	60"	601670-028	601670-073
-	18"	60"	601680-028	601680-073
-	12"	72"	601760-028	601760-073
-	15"	72"	601790-028	601790-073
-	18"	72"	601800-028	601800-073

Hardware Kit - Locker Groupings

Description

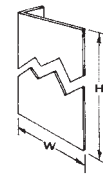
Cat.No.

Hardware kit to join locker grouping together - 100 - 1/2" bolts and 100 - nuts

8633/72-Hkit

QuickShip Fillers

Vertical Angles



Width	Depth	Height	028 Gray	073 Champagne
12"	-	60"	66113-028	66113-073
12"	-	66"	661221-028	661221-073
12"	-	72"	661141-028	661141-073
12"	-	78"	66116-028	66116-073

Wall Angles (Slip Joint)



-	-	60"	66118-028	66118-073
-	-	66"	66120-028	66120-073
-	-	72"	66119-028	66119-073
-	-	78"	66121-028	66121-073

Touch Up Spray Paint - 12 oz.

Must be ordered with lockers, shelving, or RivetRite products.

723 Light Putty	028 Gray	073 Champagne
97723Z	97028Z	97073Z



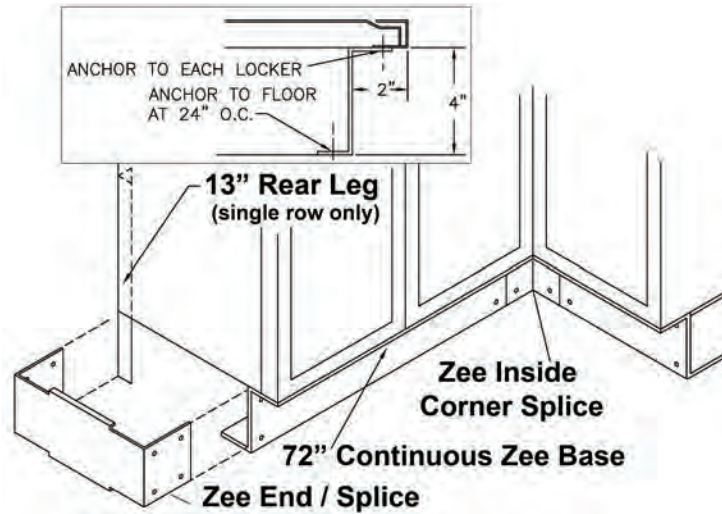
For product listing by distribution center location, go to:
pencoproducts.com/penco-programs/quickship/




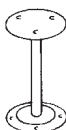
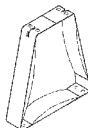
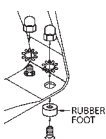

QuickShip Locker Accessories

QuickShip Zee Bases For Lockers without Legs

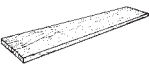
See illustration at right	Width	Depth	Height	949 Black	028 Gray	073 Champagne
	Front Zee Base (14 Ga.)					
	72"	-	4"	66700H949	66700H028	66700H073
	Splice/End Base					
	-	12"	4"	66701H949	66701H028	66701H028
	-	15"	4"	66702H949	66702H028	66702H028
	-	18"	4"	66703H949	66703H028	66703H028
	Zee Inside Corner Splice					
	-	-	4"	66709H949	66709H028	66709H073
	Rear Leg (for use with 4" high Zee Base)					
	-	-	13"	60092-949	60092-028	60092-073



QuickShip Locker Room Benches & Accessories


	Width	Depth	Height	Cat. No.	Description
	Hardwood Bench Tops				
	36"	9-1/2"	1-1/4"	9611	Finished with clear lacquer. Use 2 pedestals per bench through 96".
	48"	9-1/2"	1-1/4"	9600	
	72"	9-1/2"	1-1/4"	9602	
	96"	9-1/2"	1-1/4"	9604	
	Steel Tube Heavy Duty Pedestals				
	028 Gray		16-1/4"	60822H028	Includes hardware to mount to bench. Pedestal must be anchored to floor for safety - see concrete floor anchor.
	073 Champagne		16-1/4"	60822H073	
	Stainless Steel Pedestal				
	-		16-1/4"	60827H	Includes hardware to fasten to bench. See non-skid kit below.
	Non-Skid Pedestal Kit for Stainless Pedestal				
	-		-	68420	Set of 4 rubber feet and hardware for Stainless Steel Pedestals. Order 1 set per pedestal.
	Concrete Floor Anchor 1/4" Diameter				
	-		2"	9680	

ADA Benches/Bracket/Shelves/Logo




Width	Depth	Height	Cat. No.	Description
Hardwood Benches for ADA Applications				
42"	18"	1-1/4"	9625	These benches are used with the Bench Bracket (below).
42"	24"	1-1/4"	9624	
48"	18"	1-1/4"	9628	
48"	24"	1-1/4"	9623	
Bench Bracket for ADA Bench				
Width	Depth	Height	028 Gray	073 Champagne
-	20"	20"	6ACXHP61H028	6ACXHP61H073

To provide back support with 18" bench and 24" seat.



Width	Depth	Height	Cat. No.	Description
ADA Logo Label				
-	-	-	8690	




Extra shelves must be installed in the field - may require drilling.

Width	Depth	Height	028 Gray	073 Champagne
Locker Shelves for ADA Applications				
12"	12"	-	60400-028	60400-073
12"	15"	-	60402-028	60402-073
12"	18"	-	60404-028	60404-073
15"	18"	-	60408-028	60408-073
18"	18"	-	60412-028	60412-073

Extra shelves must be installed in the field - may require drilling.

QuickShip Locks

	Description	Cat.No.
	Dead Bolt, Flat Key Lock	9617
	Master Key for Dead Bolt Flat Key Lock	96171

At a Glance

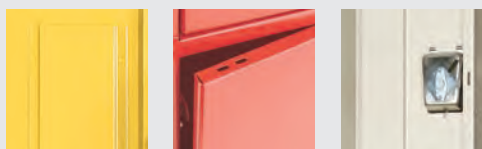
- Knocked down construction
- Standard solid 16 ga. door and Classic III handle
- 14 ga. door available
- Optional Defiant II single point latching

Ventilation Options



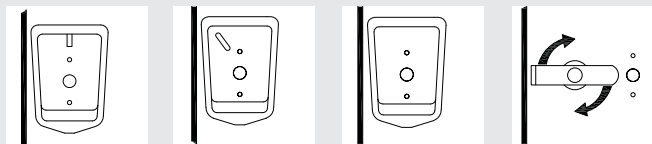
Solid Door (S) Standard Louvers (O) Full Louvers (O) Mini Louvers (O) Diamond Shaped (A)

Door Options



Medallion (O) Guardian PLUS (A) Guardian Defiant II (A)

Door Handle Options



Classic III Recessed (S) Defiant II Recessed (A) Defiant II Rotary Recessed (A) Cremone Turn Handle A - On most Guardian "Plus" models

S = Standard O = Optional* A = Available with 14 gauge door only*
*additional charges may apply

For Guardian specifications, see page 37.
For Defiant Doors, see page 43.



Standard Guardian lockers build upon the design features of the Vanguard series with several enhancements and options that give it a distinctive look.

Our one piece deep drawn Classic III stainless steel recessed pocket is part of every Guardian. It eliminates protrusions from the locker front and accepts a padlock or a built-in lock.

The 16 gauge door front has a solid exterior, aiding quiet operation. Ventilation is achieved by slots in the top and bottom flanges of the door.

Medallion Option: This upgrade has a sound damping panel welded to the door reducing noise levels when doors are slammed.

Guardian PLUS: This upgrade increases the thickness of the door to 14 gauge. The Guardian PLUS locker is ideally suited for corridors and situations where the locker is likely to encounter harsher than normal usage.

Guardian Defiant II: This combines a 14 gauge door with a single point latch stainless steel pocket and a reinforcing pan that stiffens the door. See page 43 for more information.



1 Tier 2 Tier 3 Tier 2 Person Duplex

Sizes and Dimensions

Guardian 1 Tier Lockers

		Standard Door 16 ga.*		Medallion Door 16 ga.*		Guardian PLUS 14 ga.		Defiant II Latch- 14 ga.	
Opening Height		60"	72"	60"	72"	60"	72"	60"	72"
Width	Depth	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.
9"	12"	6101G	6151G	6101M	6151M	6C101	6C151	-	-
	15"	6103G	6153G	6103M	6153M	6C103	6C153	-	-
	18"	6105G	6155G	6105M	6155M	6C105	6C155	-	-
12"	12"	6111G	6161G	6111M	6161M	6C111	6C161	6E111	6E161
	15"	6113G	6163G	6113M	6163M	6C113	6C163	6E113	6E163
	18"	6115G	6165G	6115M	6165M	6C115	6C165	6E115	6E165
	21"	6117G	6167G	6117M	6167M	6C117	6C167	6E117	6E167
	24"	6144G	6168G	-	6168M	6C144	6C168	-	-
15"	12"	6119G	6169G	6119M	6169M	6C119	6C169	6E119	6E169
	15"	6121G	6171G	6121M	6171M	6C121	6C171	6E121	6E171
	18"	6123G	6173G	6123M	6173M	6C123	6C173	6E123	6E173
	21"	6125G	6175G	6125M	6175M	6C125	6C175	6E125	6E175
18"	18"	6131G	6181G	-	6181M	6C131	6C181	6E131	6E181
	21"	6133G	6183G	-	6183M	6C133	6C183	6E133	6E183
	24"	6135G	6185G	-	6185M	6C135	6C185	6E135	6E185

Guardian 2 Tier Lockers

		Standard Door 16 ga.*		Medallion Door 16 ga.*		Guardian PLUS 14 ga.		Defiant II Latch - 14 ga.	
Overall Height		60"	72"	60"	72"	60"	72"	60"	72"
Opening Height		30"	36"	30"	36"	30"	36"	30"	36"
Width	Depth	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.
12"	12"	6211G	6231G	6211M	6231M	6C211	6C231	6E211	6E231
	15"	6213G	6233G	6213M	6233M	6C213	6C233	6E213	6E233
	18"	6215G	6235G	6215M	6235M	6C215	6C235	6E215	6E235
	21"	6217G	6218G	6217M	6218M	6C217	6C218	6E217	6E218
	24"	-	6220G	-	6220M	-	-	-	6E220
15"	12"	6227G	6239G	-	6239M	6C227	6C239	6E227	6E239
	15"	6229G	6241G	-	6241M	6C229	6C241	6E229	6E241
	18"	6237G	6243G	-	6243M	6C237	6C243	6E237	6E243
	21"	6257G	6245G	-	6245M	6C257	6C245	6E257	6E245
	24"	-	6246G	-	6246M	-	-	-	-
18"	18"	-	6247G	-	-	-	6C247	6E281	6E247
	21"	-	6249G	-	-	-	6C249	6E283	6E249

Guardian 3 Tier Lockers

		Standard 16 ga.		Medallion 16 ga.	Guardian PLUS 14 ga.		Defiant II Latch 14 ga.	
Overall Height		60"	72"	72"	60"	72"	60"	72"
Opening Height		20"	24"	24"	20"	24"	20"	24"
Width	Depth	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.
12"	12"	6407G	6419G	6419M	6C407	6C419	6E407	6E419
	15"	6409G	6421G	6421M	6C409	6C421	6E409	6E421
	18"	6411G	6423G	6423M	6C411	6C423	6E411	6E423
	21"	6449G	6499G	6499M	6C449	6C499	6E449	6E499
15"	12"	-	6425G	-	-	6C425	-	6E425
	15"	6451G	6427G	-	-	6C427	6E451	6E427
	18"	6453G	6429G	-	-	6C429	6E453	6E429
	21"	6455G	6437G	-	-	6C437	6E455	6E437

Guardian 2 Person Lockers

		Standard 16 ga.	Medallion 16 ga.
Overall Height		72"	72"
Opening Height		52"	52"
Width	Depth	Cat. No.	Cat. No.
15"	15"	6501G	6501M
	18"	6503G	6503M

Guardian Duplex Lockers

		Standard 16 ga.
Opening Height		72"
Width	Depth	Cat. No.
15"	15"	6531G
	18"	6533G

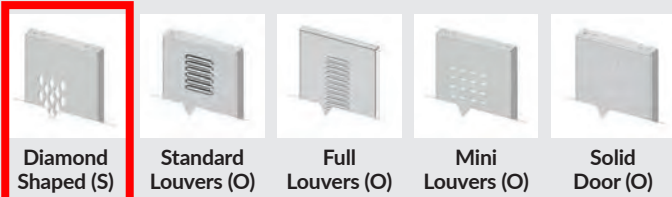
* Standard Guardian & Medallion Option doors less than 12" wide are 18 gauge.

NOTE: 1, 2 & 3 Tier, 2 Person and Duplex lockers are ordered by the FRAME. Overall heights do NOT include legs.

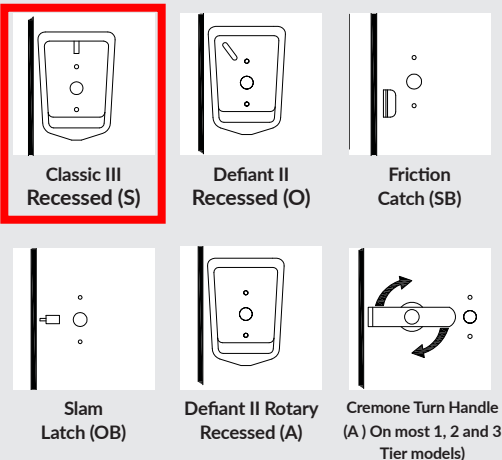
At a Glance

- Knocked down construction
- Diamond perforations on door and sides
- 14 ga. door, 16 ga. body & 18 ga. back
- Classic III or Defiant II pocket available on 1, 2 and 3 tier
- Friction or spring latch on 4 through 9 tier

Ventilation Options



Door Handle Options



S = Standard O = Optional* A = Available*

SB = Std. on Box Lockers OB = Optional on Box Lockers*

*additional charges may apply

For Invincible II specifications, see page 38.
For Defiant Doors, see page 43.



Penco's Invincible II athletic lockers are an exceptionally attractive and durable choice for gym lockers. Ideal for applications that require a high degree of ventilation and strength, or where visual inspection of locker contents is desired.

Doors are made from heavy 14 gauge steel. Sides, tops, bottoms and shelves are 16 gauge steel. Backs are 18 gauge. Doors and sides are perforated with a diamond-shaped pattern allowing maximum air circulation while maintaining security. Solid doors are an option.

Invincible II lockers come in a variety of styles: 1 tier, 2 tier and 3 tier all have as standard the Classic III stainless steel recessed pocket and multi-point latching. Standard 4, 5, 6, 8 and 9 tier box lockers doors have a padlock hasp and a friction catch, and will accept built-in locks. Available at extra cost is a spring-loaded catch.

Both 2 & 3 tier lockers have horizontal frame members welded between the doors for added strength and security. 24" wide lockers have full width doors. If slope tops are required, use hoods. All lockers accept built-in locks or padlocks and have rubber bumpers on the frame to help reduce noise.



Sizes and Dimensions

Invincible II 1 Tier Lockers					
		Std. Cat. No.		Defiant II	
Overall Ht.		-	-	-	-
Opening Ht.		60"	72"	60"	72"
Width	Depth	Cat. No.	Cat. No.	Cat. No.	Cat. No.
9"	12"	6A101	6A107	-	-
	15"	6A103	6A109	-	-
	18"	6A105	6A111	-	-
12"	12"	6A129	6A157	6P129	6P157
	15"	6A131	6A159	6P131	6P159
	18"	6A135	6A161	6P135	6P161
	21"	6A133	6A163	-	-
15"	15"	6A143	6A169	6P143	6P169
	18"	6A145	6A171	6P145	6P171
	21"	6A147	6A173	6P147	6P173
	24"	-	6A172	-	-
18"	15"	6A149	6A175	6P149	6P175
	18"	6A151	6A177	6P151	6P177
	21"	6A153	6A179	6P153	6P179
	24"	6A155	6A181	6P155	6P181
24"	15"	-	6A182	-	-
	18"	6A117	6A123	6P117	6P123
	21"	6A119	6A125	6P119	6P125
	24"	6A121	6A127	6P121	6P127

Invincible II 2 Tier Lockers					
		Std. Cat. No.		Defiant II	
Overall Ht.		60"	72"	60"	72"
Opening Ht.		30"	36"	30"	36"
Width	Depth	Cat. No.	Cat. No.	Cat. No.	Cat. No.
9"	12"	-	-	-	-
	15"	-	-	-	-
	18"	-	-	-	-
12"	12"	6A213	6A245	6P213	6P245
	15"	6A215	6A247	6P215	6P247
	18"	6A217	6A249	6P217	6P249
	21"	-	6A251	-	-
15"	15"	6A225	6A257	6P225	6P257
	18"	6A239	6A259	6P239	6P259
	21"	6A241	6A261	6P241	6P261
	24"	-	6A253	-	-
18"	15"	6A223	6A263	6P223	6P263
	18"	6A227	6A265	6P227	6P265
	21"	6A229	6A267	6P229	6P267
	24"	6A231	6A269	6P231	6P269
24"	15"	-	-	-	-
	18"	6A233	6A271	6P233	6P271
	21"	6A235	6A273	6P235	6P273
	24"	6A237	6A275	6P237	6P275

Invincible II 3 Tier Lockers					
		Std. Cat. No.		Defiant II	
Overall Ht.		60"	72"	60"	72"
Opening Ht.		20"	24"	20"	24"
Width	Depth	Cat. No.	Cat. No.	Cat. No.	Cat. No.
9"	12"	-	-	-	-
	15"	-	-	-	-
	18"	-	-	-	-
12"	12"	6A287	6A281	6P287	6P281
	15"	6A289	6A283	6P289	6P283
	18"	6A291	6A285	6P291	6P285
	21"	-	-	-	-
15"	15"	6A293	6A301	6P293	6P301
	18"	6A295	6A303	6P295	6P303
	21"	6A297	6A305	6P297	6P305
	24"	-	-	-	-
18"	15"	-	-	-	-
	18"	6A220	6A221	-	-
	21"	-	-	-	-
	24"	-	-	-	-
24"	15"	-	-	-	-
	18"	-	-	-	-
	21"	-	-	-	-
	24"	-	-	-	-

Invincible II 4, 5, 6, 8 & 9 Tier Box Lockers

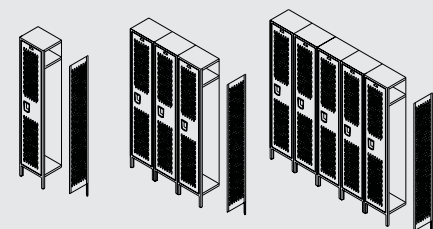
		4 Tier		5 Tier		6 Tier	8 Tier	9 Tier
Overall Height		60"	72"	60"	72"	72"	72"	72"
Opening Height		15"	18"	12"	14-2/5"	12"	9"	8"
Width	Depth	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.
12"	12"	6A307	6A319	6A351	6A363	6A375	6A393	6A407
	15"	6A309	6A321	6A353	6A365	6A377	6A395	6A409
	18"	6A311	6A323	6A355	6A367	6A379	6A397	6A411
	21"	-	-	-	-	6A381	-	-
15"	15"	6A313	6A331	6A357	6A369	6A383	6A401	6A413
	18"	6A315	6A335	6A359	6A371	6A385	6A403	6A415
	21"	-	-	6A361	6A373	6A389	6A405	6A417
18"	18"	-	-	6A419	6A445	6A423	-	-
	21"	-	-	6A421	6A447	6A425	-	-

Group Ends for Invincible II Lockers

		Perforated Single Row		Solid Single Row	
Height	Depth	1 - 6 Tier Cat. No.	8 & 9 Tier Cat. No.	1 - 6 Tier Cat. No.	8 & 9 Tier Cat. No.
36-1/2"	12"	603600V	-	603601S	-
	15"	603602V	-	603603S	-
	18"	603704V	-	603605S	-
48-1/2"	12"	603606V	-	603607S	-
	15"	603608V	-	603609S	-
	18"	603700V	-	603701S	-
60"	12"	602100V	-	602101S	-
	15"	602102V	-	602103S	-
	18"	602104V	-	602105S	-
	21"	602106V	-	602107S	-
	24"	602108V	-	602109S	-
72"	12"	602110V	602120V	602111S	602121S
	15"	602112V	602122V	602113S	602123S
	18"	602114V	602124V	602115S	602125S
	21"	602116V	602126V	602117S	602127S
	24"	602118V	-	602119S	-

Ordering Group Ends for Invincible II Lockers

You must order a Group End to finish each group of Invincible II lockers, regardless of length of each group or row. Specify Perforated or Solid.



1 Basic Unit
1 Group End

3 Basic Units
1 Group End

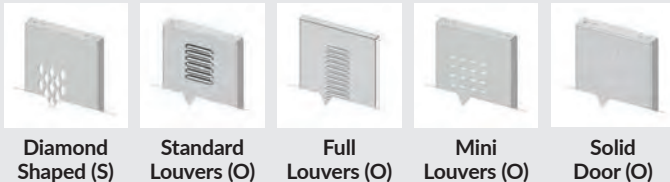
5 Basic Units
1 Group End

All-Welded

At a Glance

- 16 ga. body & 18 ga. back for durability
- 14 ga. door and Classic III pocket standard
- Optional Defiant II single point latching
- Ships fully assembled

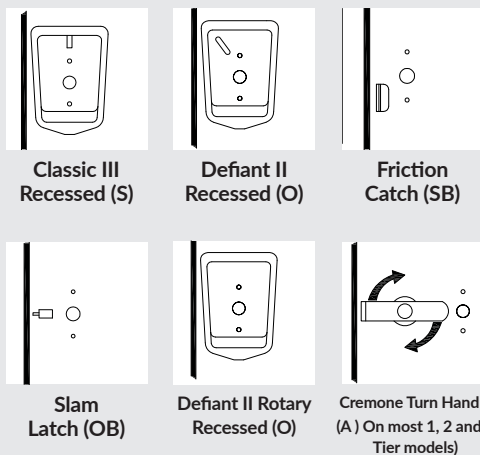
Ventilation Options



Base Options



Door Handle Options



S = Standard O = Optional* A = Available*

SB = Standard on Box Lockers OB = Optional on Box Lockers*

*additional charges may apply

For All-Welded specifications, see page 39.
For Defiant Doors, see page 43.



The All-Welded Alternative

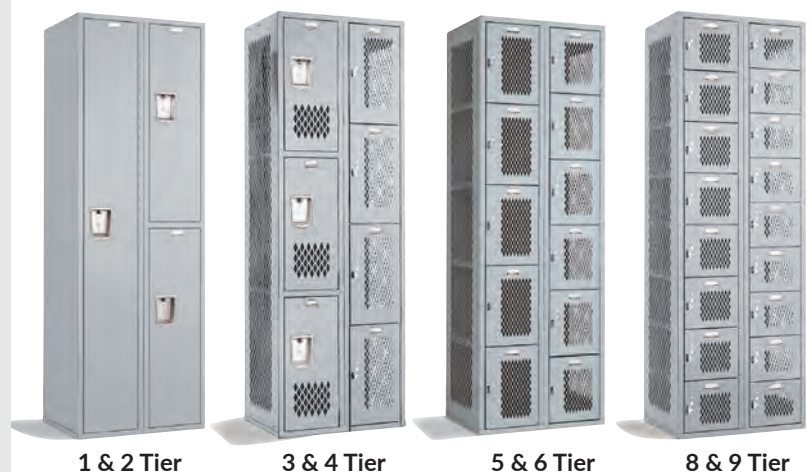
In Penco's All-Welded Lockers give you a choice between our traditional Knocked Down locker lines, and our All-Welded setup lockers.

All-Welded lockers offer superior resistance to hard use and abuse. All body parts are welded into a single rigid unit to resist damage for the life of the product. The door frame and locker side are 16 gauge. The backs, tops and bottoms of each group of lockers are made from single pieces of steel that span multiple lockers. The doors are made from 14 gauge steel and include a continuous hinge. Sides, tops, bottoms and shelves are 16 gauge steel. Backs are 18 gauge.

Since All-Welded lockers are shipped pre-assembled, the time and expense of on-site installation is greatly reduced. This is a great help where labor is either extremely expensive, or hard to find. Groupings will be determined by Penco based upon the floor plan layout drawings submitted with the order (not to exceed 54").

All-Welded lockers are available as standard in ventilated models with diamond-shaped perforations in the doors and sides for maximum visibility and ventilation, or with solid door and side construction, with or without door louvers. The perforated models are ideal for heavy duty athletic use, where ventilation is important to aid the drying of athletic gear.

Standard construction is flat top without legs. Lockers can be ordered with 4" high legs or 4" high 16 gauge integral Channel Bases, as options.



Sizes and Dimensions

All-Welded 1 Tier Lockers					
		Standard Cat. No.		Defiant II Latch	
Opening Height		60"	72"	60"	72"
Unit Width	Unit Depth	Cat. No.	Cat. No.	Cat. No.	Cat. No.
9"	12"	6WP100	6WP120	-	-
	15"	6WP101	6WP121	-	-
	18"	6WP102	6WP122	-	-
12"	12"	6WP103	6WP123	6WD103	6WD123
	15"	6WP104	6WP124	6WD104	6WD124
	18"	6WP105	6WP125	6WD105	6WD125
	21"	6WP106	6WP126	-	-
	24"	6WP107	6WP127	-	-
15"	12"	6WP108	6WP128	-	6WD128
	15"	6WP109	6WP129	6WD109	6WD129
	18"	6WP110	6WP130	6WD110	6WD130
	21"	6WP111	6WP131	6WD111	6WD131
	24"	6WP112	6WP132	-	-
18"	12"	6WP172	6WP182	6WD172	-
	15"	6WP173	6WP183	6WD173	-
	18"	6WP113	6WP133	6WD113	6WD133
	21"	6WP114	6WP134	6WD114	6WD134
	24"	6WP115	6WP135	6WD115	6WD135
24"	18"	6WP116	6WP136	6WD116	6WD136
	21"	6WP117	6WP137	6WD117	6WD137
	24"	6WP118	6WP138	6WD118	6WD138

All-Welded 2 Tier Lockers					
		Standard Cat. No.		Defiant II Latch	
Overall Height		60"	72"	60"	72"
Opening Height		30"	36"	30"	36"
Unit Width	Unit Depth	Cat. No.	Cat. No.	Cat. No.	Cat. No.
12"	12"	6WP203	6WP223	6WD203	6WD223
	15"	6WP204	6WP224	6WD204	6WD224
	18"	6WP205	6WP225	6WD205	6WD225
	21"	6WP206	6WP226	-	-
	24"	6WP207	6WP227	-	-
15"	12"	6WP208	6WP228	6WD208	6WD228
	15"	6WP209	6WP229	6WD209	6WD229
	18"	6WP210	6WP230	6WD210	6WD230
	21"	6WP211	6WP231	6WD211	6WD231
	24"	6WP212	6WP232	-	6WD232
18"	12"	-	6WP282	-	-
	15"	6WP273	6WP283	-	-
	18"	6WP213	6WP233	6WD213	6WD233
	21"	6WP214	6WP234	6WD214	6WD234
	24"	6WP215	6WP235	6WD215	6WD235
24"	18"	6WP216	6WP236	-	-
	21"	6WP217	6WP237	-	-
	24"	6WP218	6WP238	-	-

All-Welded 3 Tier Lockers					
		Std. Cat. No.		Defiant II Latch	
Overall Height		60"	72"	60"	72"
Opening Height		20"	24"	20"	24"
Unit Width	Unit Depth	Cat. No.	Cat. No.	Cat. No.	Cat. No.
12"	12"	6WP303	6WP323	6WD303	6WD323
	15"	6WP304	6WP324	6WD304	6WD324
	18"	6WP305	6WP325	6WD305	6WD325
	21"	6WP306	6WP326	-	-
	24"	6WP307	6WP327	-	-
15"	12"	6WP308	6WP328	-	-
	15"	6WP309	6WP329	6WD309	6WD329
	18"	6WP310	6WP330	6WD310	6WD330
	21"	6WP311	6WP331	6WD311	6WD331
	24"	6WP312	6WP332	-	-
18"	12"	-	-	-	-
	15"	-	-	-	-
	18"	6WP313	6WP333	-	6WD333
	21"	6WP314	6WP334	-	6WD334
	24"	6WP315	6WP335	-	6WD335

All-Welded 4, 5, 6, 8 & 9 Tier Box Lockers								
		4 Tier		5 Tier		6 Tier	8 Tier	9 Tier
Overall Ht.		60"	72"	60"	72"	72"	72"	72"
Opening Ht.		15"	18"	12"	14-2/5"	12"	9"	8"
Unit Width	Unit Depth	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.
12"	12"	6WP403	6WP423	6WP503	6WP523	6WP623	6WP823	6WP923
	15"	6WP404	6WP424	6WP504	6WP524	6WP624	6WP824	6WP924
	18"	6WP405	6WP425	6WP505	6WP525	6WP625	6WP825	6WP925
	21"	6WP406	6WP426	6WP506	6WP526	6WP626	-	-
	24"	6WP407	6WP427	6WP507	6WP527	6WP627	-	-
15"	12"	6WP408	6WP428	6WP508	6WP528	6WP628	6WP828	6WP928
	15"	6WP409	6WP429	6WP509	6WP529	6WP629	6WP829	6WP929
	18"	6WP410	6WP430	6WP510	6WP530	6WP630	6WP830	6WP930
	21"	6WP411	6WP431	6WP511	6WP531	6WP631	-	-
	24"	6WP412	6WP432	6WP512	6WP532	6WP632	-	-
18"	18"	-	-	6WP513	-	6WP633	-	-
	21"	-	-	6WP514	-	6WP634	-	-

At a Glance

- Knocked down or welded construction
- Open fronts and smooth frame channels
- 2 lockable compartment options
- 18", 24" and 33" wide models
- Tops, bottoms, sides, shelf and frames are 16 gauge
- Back is 18 gauge

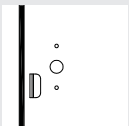
Ventilation



Mini Louvers

Diamond perforated sides. Lockers equipped with a footlocker have Mini Louvers punched in the front panel.

Door Handle Option



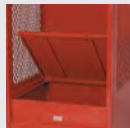
Friction Catch (O)

On models equipped with a Security Box

Accessories



Locking Security Box (O)



Footlocker (O)

O = Optional* *additional charges may apply

For Stadium specifications, see page 41.

The Right Locker for Athletes and Their Equipment

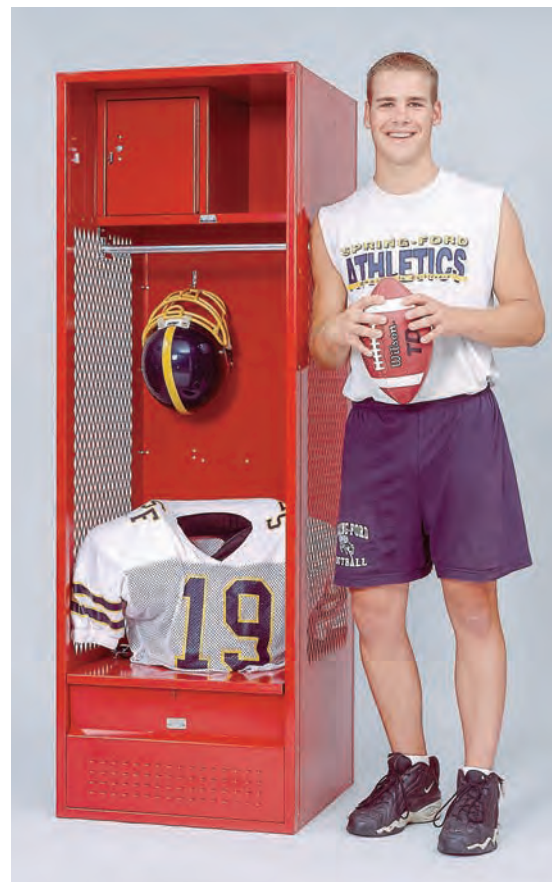
Penco's Stadium lockers are ideally suited for athletic team rooms, firefighter's equipment or any other application where easy access to uniforms and/or equipment is required.

They are available in different configurations: the minimum configuration has a full width shelf, 2 coat hooks and a coat rod. You can add a lockable security box, a lockable foot locker that doubles as a bench, or both. The open front and diamond perforated sides create full ventilation while allocating a specific storage space to each individual.

Fully accessorized, Stadium lockers are outfitted with a security box fastened to a full width shelf, and a footlocker with a hinged, reinforced seat at the base. Both compartments are lockable to secure valuable items. The front of the footlocker is recessed for an external padlock, and a stainless steel strike plate protects the finish. The footlocker design saves floor space by eliminating the clutter of open locker doors and the need for separate locker room benches.

Stadium lockers are available in welded construction or KD (knocked down or unassembled). They are available in 18", 24" or 33" widths and 18", 21" or 24" depths. KD lockers are 72" high; welded models have an integral 4" base bringing the total height to 76".

Color selection is from any one of Penco's 24 brilliant colors.



Sizes and Dimensions

KD Stadium Lockers with Perforated Sides

Width	Depth	Height	With Shelf	With Shelf & Security Box	With Shelf & Footlocker	With Shelf, Footlocker & Security Box
18"	18"	72"	6KFD01	6KFD09	6KFD02	6KFD03
24"	18"	72"	6KFD10	6KFD11	6KFD12	6KFD13
	21"	72"	6KFD20	6KFD21	6KFD22	6KFD23
	24"	72"	6KFD30	6KFD31	6KFD32	6KFD33
33"	18"	72"	6KFD40	6KFD41	6KFD42	6KFD43
	21"	72"	6KFD50	6KFD51	6KFD52	6KFD53
	24"	72"	6KFD60	6KFD61	6KFD62	6KFD63

Welded Stadium Lockers with Perforated Sides

Width	Depth	Height	With Shelf	With Shelf & Security Box	With Shelf & Footlocker	With Shelf, Footlocker & Security Box
18"	18"	76"	6WFD01	6WFD09	6WFD02	6WFD03
24"	18"	76"	6WFD10	6WFD11	6WFD12	6WFD13
	21"	76"	6WFD20	6WFD21	6WFD22	6WFD23
	24"	76"	6WFD30	6WFD31	6WFD32	6WFD33
33"	18"	76"	6WFD40	6WFD41	6WFD42	6WFD43
	21"	76"	6WFD50	6WFD51	6WFD52	6WFD53
	24"	76"	6WFD60	6WFD61	6WFD62	6WFD63



Welded
With 4" Base



KD
w/ Shelf



KD w/ Shelf
& Security Box



KD w/ Shelf
& Footlocker



KD w/ Shelf,
Security Box & Footlocker

Lockers for First Responders - Introduction

Penco Patriot® lockers are designed exclusively for first responders of all types: police, fire, military, EMS, etc. They are available in three basic versions: *Gear*, *Turnout* and *Duty*, all of which can be accessorized to suite your specific needs. See below and the following pages for detailed information, sizes and accessories.

For Patriot specifications, see page 42.



See Page 23

Patriot Gear Lockers

When storing bulky protective or tactical gear, the size of the locker you select quickly becomes a factor. Gear models range from a big 24 inches wide to a massive 48 inches. All come standard with full height 14 gauge doors, beefy coat hooks and a 1" diameter coat rod.

- Construction – Welded or KD
- Height Available – 72". Welded Models Are 76" With Integral Base
- Widths Available – 24, 30, 36, 42 or 48"
- Ventilation – Louvered Doors. Diamond Perforated Sides.
- Lockable Compartments – Main doors, optional security box, drawer or footlocker
- Hanging – Heavy Duty Coat Rod and Hanging Hooks
- Latching – Cremone Handle



See Page 24

Patriot Turnout Lockers

Seconds count when it's your job to be the first to respond. The Patriot Turnout locker shares the same heavy gauge steel construction as the Gear and Duty lockers, but its open front and smooth frame mean you can retrieve your equipment in a flash.

- Construction – Welded or KD
- Height Available – 72". Welded Models Are 76" With Integral Base
- Widths Available – 24, 30, 36, 42 or 48"
- Ventilation – Open Front. Diamond Perforated Sides.
- Lockable Compartments – Main doors, optional security box, drawer or footlocker
- Hanging – Heavy Duty Coat Rod and Hanging Hooks
- Latching – Open Front



See Page 26

Patriot Duty Lockers

Duty lockers answer the call with law enforcement and security professionals in mind. A fully equipped interior featuring preconfigured compartments and additional private storage means what you need is where you need it when you need it.

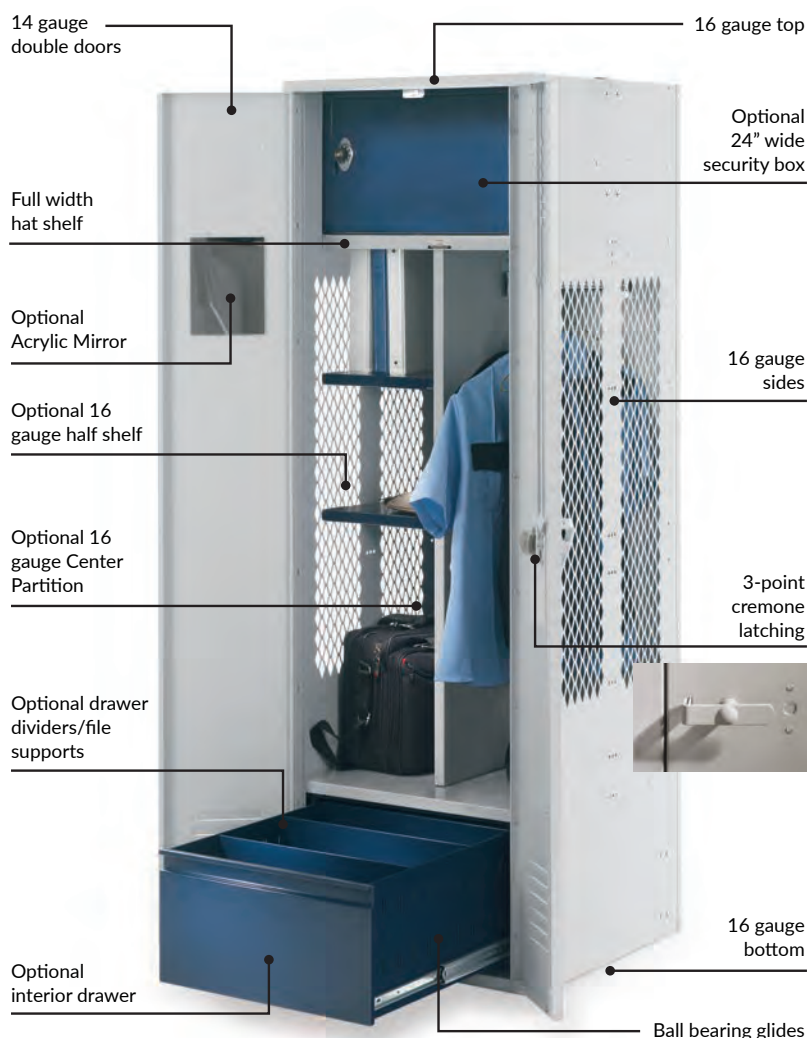
- Construction – Welded or KD
- Heights Available – 60 or 72"
- Widths Available – 18 or 24"
- Ventilation – Perforated Top, Hat Shelf. Louvered Doors and Drawer
- Lockable Compartments – Main doors, drawer and interior side compartment
- Hanging – Heavy Duty Coat Rod and Hanging Hooks
- Latching – Cremone Handle
- Electrical Access – Single Gang Duplex Knockout In Top Panel

Patriot Gear Lockers

A properly equipped double door Patriot Gear locker can be the ideal solution for a variety of specialized storage challenges. The ample storage areas at both top and bottom of the 24" wide model shown on this page still leave almost 4 feet between the shelves for hanging uniforms and other gear.

Distinguishing Features:

- All sizes are offered in welded or knocked down construction
- Integral channel base is standard on welded models
- Factory assembly available on KD models
- Double doors require less clear area in front of the locker to open
- 24 inch deep locker available in 24, 30, 36, 42 or 48 inch widths
- 18 inch deep locker available up to 36 inches wide
- Optional centered divider allows shelves and coat rods to be placed on either side during assembly
- Cremone handle standard on all Gear Lockers



Patriot® Gear Lockers - 18" and 24" Deep

W x D		KD (Knocked Down) Construction		Welded Construction	
With 15" Deep Shelf					
W	D	H	Cat. No.	H	Cat. No.
18 (SD)	18	72	6KGDA84	76	6WGDA84C
24 (SD)	18	72	6KGDA94	76	6WGDA94C
24	18	72	6KGDA04	76	6WGDA04C
30	18	72	6KGDA14	76	6WGDA14C
36	18	72	6KGDA24	76	6WGDA24C
24	24	72	6KGDA00	76	6WGDA00C
30	24	72	6KGDA10	76	6WGDA10C
36	24	72	6KGDA20	76	6WGDA20C
42	24	72	6KGDA30	76	6WGDA30C
48	24	72	6KGDA40	76	6WGDA40C
With 21" Deep Shelf					
18 (SD)	24	72	6KGDA82	76	6WGDA82C
24 (SD)	24	72	6KGDA92	76	6WGDA92C
24	24	72	6KGDA02	76	6WGDA02C
30	24	72	6KGDA12	76	6WGDA12C
36	24	72	6KGDA22	76	6WGDA22C
42	24	72	6KGDA32	76	6WGDA32C
48	24	72	6KGDA42	76	6WGDA42C

NOTE: "(SD)" denotes Single Door. All others have Double Doors.



Turnout Lockers

Patriot Turnout Locker

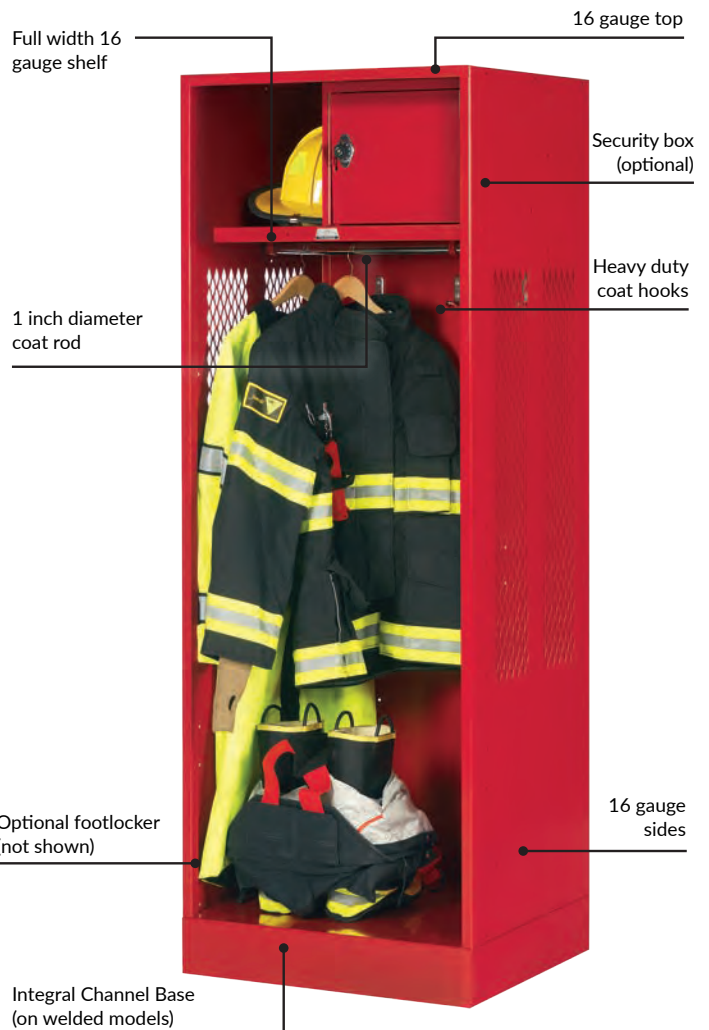
The key to any turnout locker is the ability to grab and go. The Patriot Turnout locker puts everything from flight gear to EMS equipment within reach. The open front and perforated sides aid in drying gear while available security boxes, drawers and footlocker provide a secure space for personal items.

Distinguishing Features:

- All sizes are offered in welded or knocked down construction
- Integral channel base is standard on welded models.
- Factory assembly available on KD models
- Open front and hemmed frame.
- 24 inch deep locker available in 24, 30, 36, 42 or 48 inch widths
- 18 inch deep locker available up to 36 inches wide.
- Number plates mount to the shelf face for easy visibility
- Sides are pre-punched on 12 inch vertical centers to accept additional shelves.



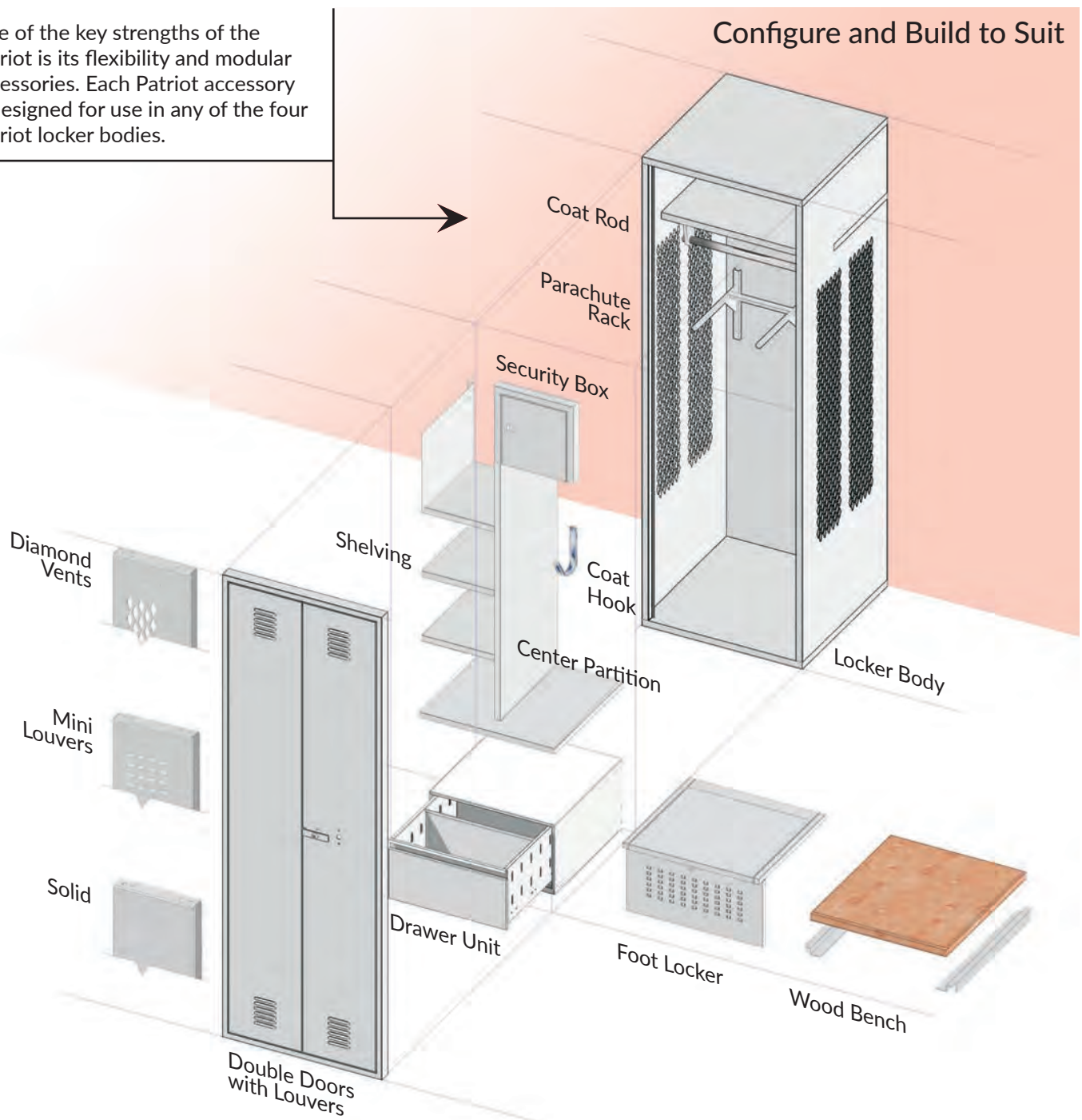
Patriot® Turnout Lockers – 18” and 24” Deep					
W x D		KD (Knocked Down) Construction		Welded Construction	
With 15” Deep Shelf					
W	D	H	Cat. No.	H	Cat. No.
18	18	72	6KTDA84	76	6WTDA84C
24	18	72	6KTDA04	76	6WTDA04C
30	18	72	6KTDA14	76	6WTDA14C
36	18	72	6KTDA24	76	6WTDA24C
24	24	72	6KTDA00	76	6WTDA00C
30	24	72	6KTDA10	76	6WTDA10C
36	24	72	6KTDA20	76	6WTDA20C
42	24	72	6KTDA30	76	6WTDA30C
48	24	72	6KTDA40	76	6WTDA40C
With 21” Deep Shelf					
18	24	72	6KTDA82	76	6WTDA82C
24	24	72	6KTDA02	76	6WTDA02C
30	24	72	6KTDA12	76	6WTDA12C
36	24	72	6KTDA22	76	6WTDA22C
42	24	72	6KTDA32	76	6WTDA32C
48	24	72	6KTDA42	76	6WTDA42C



Gear and Turnout Locker Variations

One of the key strengths of the Patriot is its flexibility and modular accessories. Each Patriot accessory is designed for use in any of the four Patriot locker bodies.

Configure and Build to Suit



Heavy Duty 1" Coat Rod with Brackets



Cell Phone/Key Tray



Boot Tray

Duty Lockers

Patriot Duty Lockers

Built for law enforcement applications, the big story behind the Duty locker is actually under it. The 14-gauge welded shell drawer with 16-gauge welded drawer insert and ball bearing glides provide at no less than 3.4 cubic feet of usable storage in the drawer base. The 33" deep base also accepts individual or continuous lengths of hardwood locker benches for seating.

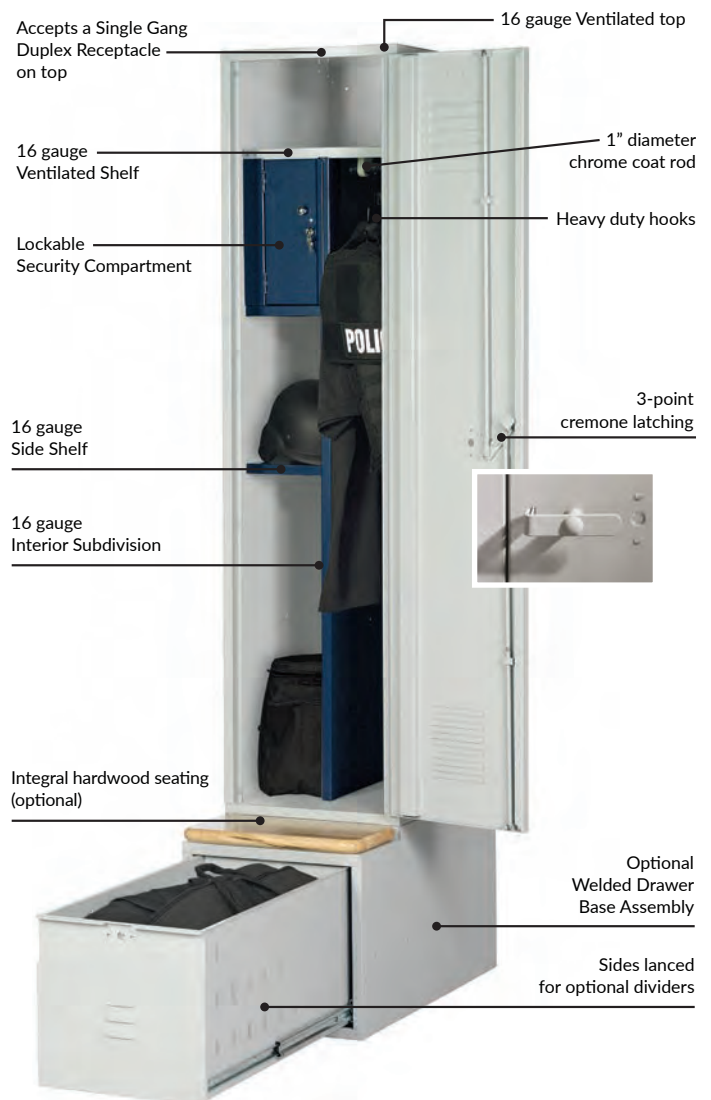
Distinguishing Features:

- All sizes offered in welded or KD construction
- Factory assembly available on KD models
- 16 gauge Interior Divider and Side Shelf
- Ventilation slots on Locker Top
- Hat Shelf Ventilated on Garment Side
- Heavy Duty Coat Rod and Hooks on Garment Side
- Lockable Security Compartment
- Duplex knockout on locker top
- 24 inch deep Locker with 21 inch deep accessories
- 60 inch and 72 inch heights available
- Available with or without the drawer base

Duty Locker Quick Facts

18" wide Duty lockers have single doors; 24" wide have double doors. Drawer bases are welded and bolt to the lockers. All Part numbers represent 1-wide units. Cremone handles are standard on all models.

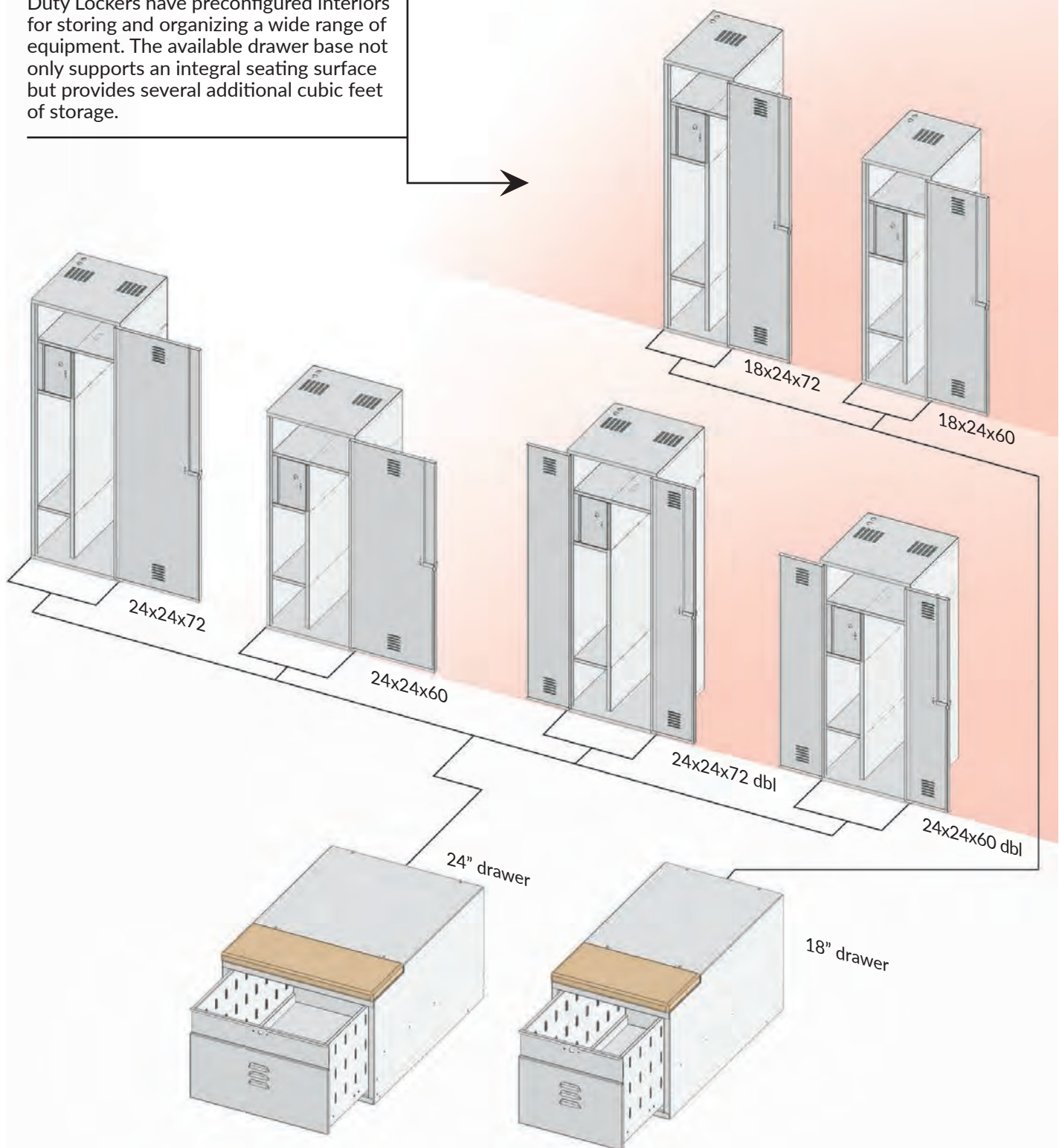
Patriot® Duty Lockers				
Size			KD (Knocked Down) Construction	Welded Construction
With 18" High Drawer Base				
W	D	H	Cat. No.	Cat. No.
18	24	60/78	64KD182478	64WD182478C
24	24	60/78	64KD242478	64WD242478C
18	24	72/90	64KD182490	64WD182490C
24	24	72/90	64KD242490	64WD242490C
With NO Base and NO Legs				
W	D	H	Cat. No.	Cat. No.
18	24	60	64KN182460	64WN182460C
24	24	60	64KN242460	64WN242460C
18	24	72	64KN182472	64WN182472C
24	24	72	64KN242472	64WN242472C
With 4" High Integral Channel Base				
W	D	H	Cat. No.	Cat. No.
18	24	64	-	64WCB182464C
24	24	64	-	64WCB242464C
18	24	76	-	64WCB182476C
24	24	76	-	64WCB242476C



Duty Locker Variations

Duty Lockers have preconfigured interiors for storing and organizing a wide range of equipment. The available drawer base not only supports an integral seating surface but provides several additional cubic feet of storage.

Configure and Build to Suit



Duty Lockers, continued / Duty Locker Accessories

Duty Locker Details

There is more to the Duty locker than hand-picked features and a range of popular sizes.

Aside from continuous hinges, turn handles and heavy gauge bodies, they stand apart from their Gear and Turnout counterparts with features standard only on Duty models.

We've perforated the hat shelf over the garment side of the locker so you get air flow where it's needed without sacrificing storage.

The tops of all Duty lockers are punched with special 1/8 x 1 inch slots to provide ventilation without compromising security.

If you need power for charging radios, phones and laptops, your local electrician can remove the factory knockouts, mount receptacles and tie them into your building's electrical service.

The use of standard locker benches to span multiple drawer bases is recommended to provide smooth and continuous seating. Your installer can field cut as necessary, or we can provide custom lengths with field joints, mitered corners, and right or left hand ends based upon your layout drawing.

For Patriot specifications, see page 42.

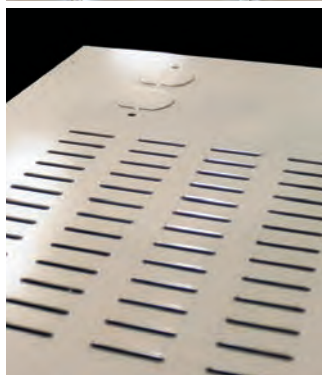
Accessories for Patriot Duty Lockers Only

Description	W	D	H	Cat. No.
Extra Side Shelves (Duty Only)	10	21	-	6SHX297C
Drawer Dividers (Duty Only)	18	-	18	64DD1818C
	24	-	18	64DD2418C
Individual Hardwood Seat (Duty Only)	18	9-1/2	1-1/4	6RQ1242
	24	9-1/2	1-1/4	6RQ0575
Bulk Length Hardwood Bench	-	9-1/2	1-1/4	Varies

For more Patriot accessories, see the next page.



1" diameter coat rod and brackets fastened beneath ventilated shelf on garment side

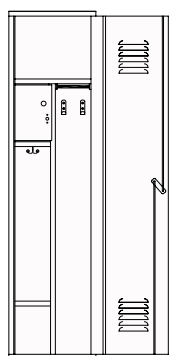


Duty Locker top with single gang duplex electrical knockout and ventilation slots

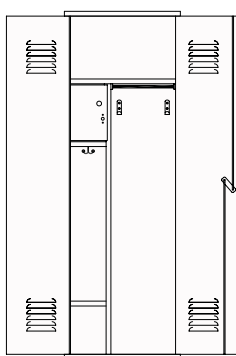


Duty Locker with drawer base and optional continuous hardwood bench and extra half shelves

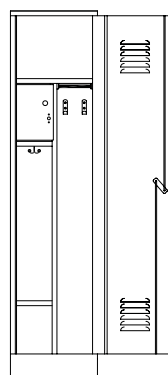
Duty Locker Elevations



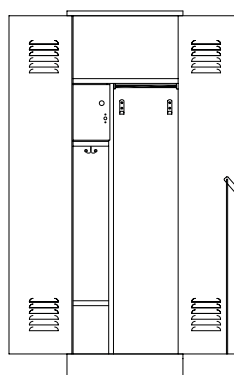
18" Wide/No Base
Welded or KD



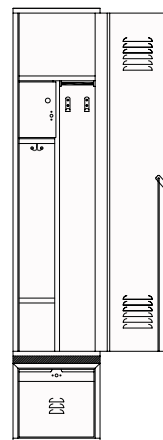
24" Wide/No Base
Welded or KD



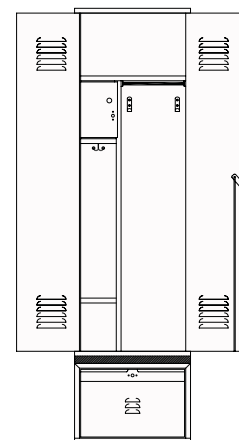
18" Wide/4" Base
Welded



24" Wide/4" Base
Welded



18" Wide/Drawer Base
Welded or KD



24" Wide/Drawer Base
Welded or KD

Letter Codes below indicate where used: D=Duty, G=Gear, T=Turnout

Description		W	D	H	Cat. No.
Center Partitions (G, T)	Hat Shelf to Locker Bottom	-	15	58	6CPX269C
	Hat Shelf to Optional Bottom Shelf At 12 In.	-	15	45	6CPX270C
	Hat Shelf to Locker Bottom	-	21	58	6CPX300C
	Hat Shelf to Optional Bottom Shelf At 12 In.	-	21	45	6CPX301C
Full Width Bottom Shelf (G, T) (Required with Drawers)		18	18	-	6SHX695C
		24	18	-	6SHX575C
		30	18	-	6SHX576C
		36	18	-	6SHX577C
		18	24	-	6SHX696C
		24	24	-	6SHX530C
		30	24	-	6SHX531C
		36	24	-	6SHX532C
Full Width Intermediate Shelf (G, T) (Punched for Center Partition. Face is NOT punched for number plate.)		42	24	-	6SHX533C
		48	24	-	6SHX534C
		18	15	-	6SHX700C
		24	15	-	6SHX708C
		30	15	-	6SHX709C
		36	15	-	6SHX710C
		42	15	-	6SHX803C
		48	15	-	6SHX804C
Half Shelves for use with Center Divider (G, T) (Match Half Shelf and Divider to Hat Shelf depth)		18	21	-	6SHX699C
		24	21	-	6SHX703C
		30	21	-	6SHX704C
		36	21	-	6SHX705C
		42	21	-	6SHX706C
		48	21	-	6SHX707C
		9	15	-	6SHX697C
		12	15	-	6SHX521C
		15	15	-	6SHX522C
		18	15	-	6SHX523C
		21	15	-	6SHX524C
		24	15	-	6SHX525C
Footlocker (G, T) (Not for use with Center Dividers)		9	21	-	6SHX698C
		12	21	-	6SHX561C
		15	21	-	6SHX562C
		18	21	-	6SHX563C
		21	21	-	6SHX564C
		24	21	-	6SHX565C
		18	18	12	6ACXHK58H
		24	18	12	6ACXHK90H
		30	18	12	6ACXHK91H
		36	18	12	6ACXHK92H
		18	24	12	6ACXHK59H
		24	24	12	6ACXAB93H
Security Box (G, T) (Select by Hat Shelf depth)		30	24	12	6ACXAB94H
		36	24	12	6ACXAB95H
		42	24	12	6ACXAB96H
		48	24	12	6ACXAB97H
Drawer Unit - Requires Bottom Shelf (G, T)		12	15	12	6ACXAB98H
		24	15	12	6ACXAB99H
		12	21	12	6ACXHM53H
		24	21	12	6ACXHM54H
Drawer Unit for 18" Wide Used when ordering an 18" wide Patriot locker and one 18" drawer unit is required.		18	18	12	6ACXHN70C
		18	24	12	6ACXHN10C
		18	18	15	6ACXHN80C*
		18	24	15	6ACXHN20C*
18" Drawers for 36" & 42" Wide Used when ordering a 36" wide Patriot locker & either one 18" drawer or two 18" drawer units are required.		18	18	12	6ACXFF82C
		18	24	12	6ACXFF60C
		18	18	15	6ACXFF87C*
		18	24	15	6ACXFF20C*
		24	18	12	6ACXFF83C
		30	18	12	6ACXFF84C
		24	18	15	6ACXFF88C*
		30	18	15	6ACXFF89C*
		24	24	12	6ACXFF61C
		30	24	12	6ACXFF62C
		24	24	15	6ACXFF21C*
		30	24	15	6ACXFF22C*

* 15" high Drawer Units are not for use with Center Divider

Description		W	D	H	Cat. No.
Drawer Divider (G, T) (Two required for Hanging File Folders)		18	-	12	6ACXAB80C
		24	-	12	6ACXAB81C
		30	-	12	6ACXAB82C
		18	-	15	6ACXAB83C
		24	-	15	6ACXAB84C
Document Sleeves (G, T, D)		30	-	15	6ACXAB85C
		12	3	8	6ACXFF54C
Parachute / Body Armor Rack (G, T)		10	3	8	6ACXAB32C
		-	18	-	6ACXAB33C
Adhesive Acrylic Mirror (G, T, D)		6	-	8	96370
Cell Phone/Key Tray (G, T, D)		8	2	2	60830H
Heavy Duty Coat Hook (G, T, D)		-	2	3	6ACXAB37H
Coat Rods (G, T) 1" Diameter, shelf mount only (with light gray brackets)		9	-	-	6ACXHM50H
		12	-	-	6ACXAB38H
		15	-	-	6ACXAB39H
		18	-	-	6ACXAB40H
		21	-	-	6ACXAB41H
		24	-	-	6ACXAB42H
		30	-	-	6ACXAB43H
		36	-	-	6ACXAB44H
Garment Separators (G, T)		42	-	-	6ACXAB45H
		48	-	-	6ACXAB46H
		12	-	5	6ACXFF00H
		15	-	5	6ACXFF01H
		18	-	5	6ACXFF02H
		21	-	5	6ACXFF03H
		24	-	5	6ACXFF04H
		30	-	5	6ACXFF05H
Boot Tray ** (G, T, D)		36	-	5	6ACXFF06H
		42	-	5	6ACXFF07H
		48	-	5	6ACXFF08H
		14	12	-	6ACXFF09H
Accessory Mounting Plate (G, D) (To mount accessories to left side door)		12	-	24	6ACXFF10H
		15	-	24	6ACXFF11H
		18	-	24	6ACXFF12H
		21	-	24	6ACXFF13H
Hardwood Bench Seat (G, T) (Not for use with Center Divider)		24	-	24	6ACXFF14H
		18	18	-	6RQ1317BH
		24	18	-	6RQ1305BH
		30	18	-	6RQ1306BH
		36	18	-	6RQ1307BH
		18	24	-	6RQ1318BH
		24	24	-	6RQ1232BH
		30	24	-	6RQ1233BH
Metal Seat (G, T) (Not for use with Center Divider)		36	24	-	6RQ1234BH
		42	24	-	6RQ1235BH
		48	24	-	6RQ1236BH
		18	18	-	6ACXHM51H
		24	18	-	6ACXHK97AH
		30	18	-	6ACXHK98AH
		36	18	-	6ACXHK99AH
		18	24	-	6ACXHM52H
Name Card Holder (G, D)		24	24	-	6ACXFF49AH
		30	24	-	6ACXFF50AH
		36	24	-	6ACXFF51AH
		42	24	-	6ACXFF52AH
		48	24	-	6ACXFF53AH

** When a Boot Tray is used in a DUTY locker, it must be a 24 inch wide locker ONLY.

At a Glance

- Knocked Down construction, shipped unassembled, assembly available
- Heavy duty 14 gauge doors with continuous hinges, 16 gauge body, 18 gauge back
- Heavy duty Cremone handle with 3-point latching
- Door and Frames 30", 36", 42" and 48" wide, the doors ship separate from frame to be field installed with rivets
- On 48" wide lockers, backs supplied as two 24" wide backs

Ventilation Options



Diamond Shaped (S)

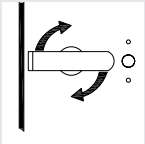


Solid Door (O)



Full Louvers (O)

Door Handle Option



Cremone 3 Point (S)

S = Standard O = Optional* *additional charges may apply



When Every Second Counts™

The Rapid Response Duffel Locker is designed to meet the needs of first responders for the secure and economical storage of their gear. Whether called to action or waiting for their return, these lockers will keep users' belongings and gear safe and ready for that critical first response.

- Individually locked compartments for quick user access
- Sized to fit pre-loaded and oversized TA-50 duffel bags and backpacks and cases
- Lockers will be provided as individual units for ease of mobility and relocation as the mission demands



Two Tier



Three Tier



Four Tier

For Rapid Response specifications, see page 44.

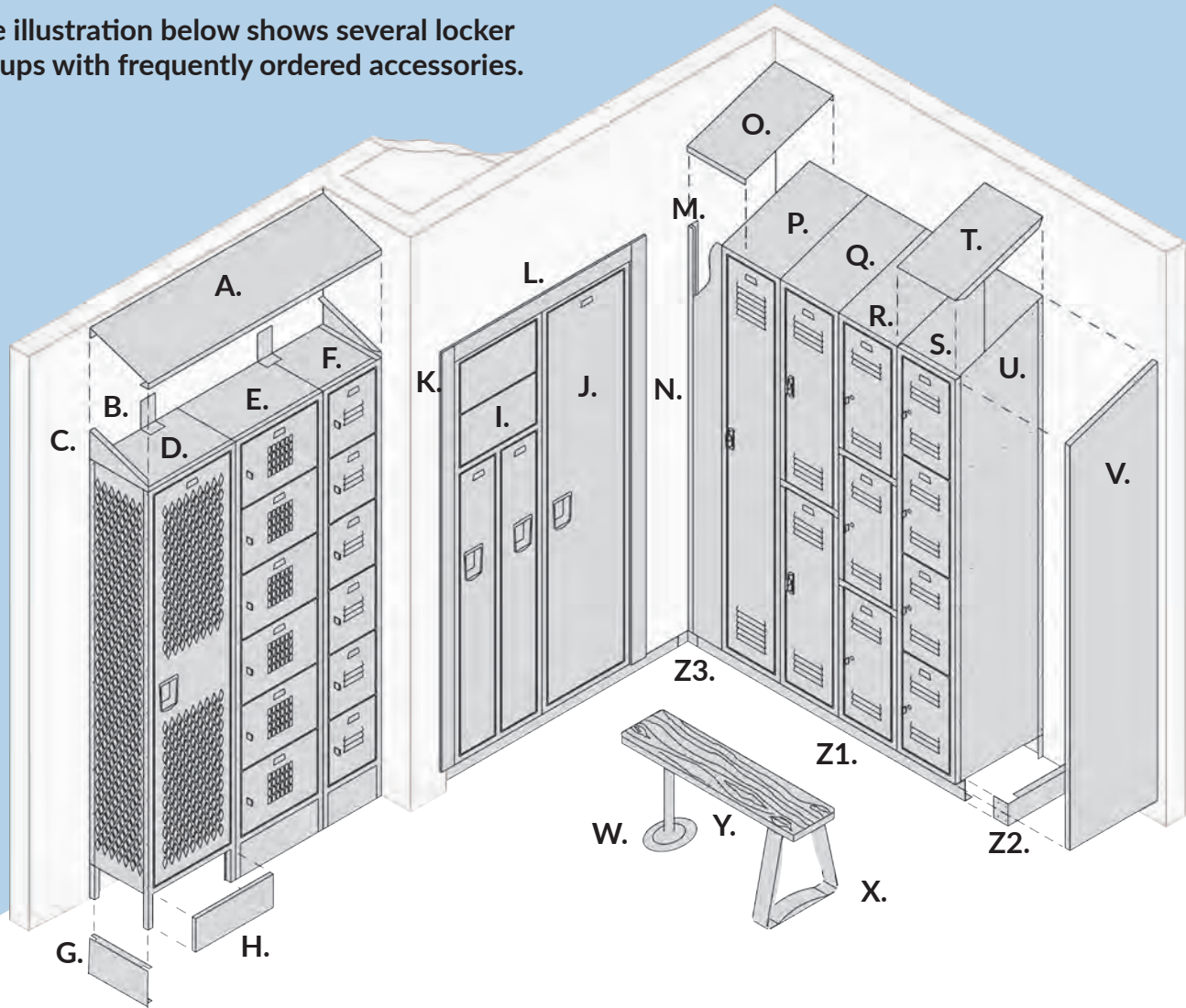


Lockers for First Responders

Rapid Response Duffel Lockers												
Overall Height				2 Tier			3 Tier			4 Tier		
				72"	78"	84"	72"	78"	84"	72"	78"	84"
W	D	Division	Door	Cremone Handle			Cremone Handle			Cremone Handle		
24"	24"	Solid	Solid	6KF2A2472	6KF2A2478	6KF2A2484	6KF3A2472	6KF3A2478	6KF3A2484	6KF4A2472	6KF4A2478	6KF4A2484
30"	24"	Solid	Solid	6KF2A3072	6KF2A3078	6KF2A3084	6KF3A3072	6KF3A3078	6KF3A3084	6KF4A3072	6KF4A3078	6KF4A3084
36"	24"	Solid	Solid	6KF2A3672	6KF2A3678	6KF2A3684	6KF3A3672	6KF3A3678	6KF3A3684	6KF4A3672	6KF4A3678	6KF4A3684
42"	24"	Solid	Solid	6KF2A4272	6KF2A4278	6KF2A4284	6KF3A4272	6KF3A4278	6KF3A4284	6KF4A4272	6KF4A4278	6KF4A4284
48"	24"	Solid	Solid	6KF2A4872	6KF2A4878	6KF2A4884	6KF3A4872	6KF3A4878	6KF3A4884	6KF4A4872	6KF4A4878	6KF4A4884
24"	24"	Solid	Louver	6KF2B2472	6KF2B2478	6KF2B2484	6KF3B2472	6KF3B2478	6KF3B2484	6KF4B2472	6KF4B2478	6KF4B2484
30"	24"	Solid	Louver	6KF2B3072	6KF2B3078	6KF2B3084	6KF3B3072	6KF3B3078	6KF3B3084	6KF4B3072	6KF4B3078	6KF4B3084
36"	24"	Solid	Louver	6KF2B3672	6KF2B3678	6KF2B3684	6KF3B3672	6KF3B3678	6KF3B3684	6KF4B3672	6KF4B3678	6KF4B3684
42"	24"	Solid	Louver	6KF2B4272	6KF2B4278	6KF2B4284	6KF3B4272	6KF3B4278	6KF3B4284	6KF4B4272	6KF4B4278	6KF4B4284
48"	24"	Solid	Louver	6KF2B4872	6KF2B4878	6KF2B4884	6KF3B4872	6KF3B4878	6KF3B4884	6KF4B4872	6KF4B4878	6KF4B4884
24"	24"	Solid	Diamond	6KF2C2472	6KF2C2478	6KF2C2484	6KF3C2472	6KF3C2478	6KF3C2484	6KF4C2472	6KF4C2478	6KF4C2484
30"	24"	Solid	Diamond	6KF2C3072	6KF2C3078	6KF2C3084	6KF3C3072	6KF3C3078	6KF3C3084	6KF4C3072	6KF4C3078	6KF4C3084
36"	24"	Solid	Diamond	6KF2C3672	6KF2C3678	6KF2C3684	6KF3C3672	6KF3C3678	6KF3C3684	6KF4C3672	6KF4C3678	6KF4C3684
42"	24"	Solid	Diamond	6KF2C4272	6KF2C4278	6KF2C4284	6KF3C4272	6KF3C4278	6KF3C4284	6KF4C4272	6KF4C4278	6KF4C4284
48"	24"	Solid	Diamond	6KF2C4872	6KF2C4878	6KF2C4884	6KF3C4872	6KF3C4878	6KF3C4884	6KF4C4872	6KF4C4878	6KF4C4884
24"	24"	Diamond	Solid	6KF2D2472	6KF2D2478	6KF2D2484	6KF3D2472	6KF3D2478	6KF3D2484	6KF4D2472	6KF4D2478	6KF4D2484
30"	24"	Diamond	Solid	6KF2D3072	6KF2D3078	6KF2D3084	6KF3D3072	6KF3D3078	6KF3D3084	6KF4D3072	6KF4D3078	6KF4D3084
36"	24"	Diamond	Solid	6KF2D3672	6KF2D3678	6KF2D3684	6KF3D3672	6KF3D3678	6KF3D3684	6KF4D3672	6KF4D3678	6KF4D3684
42"	24"	Diamond	Solid	6KF2D4272	6KF2D4278	6KF2D4284	6KF3D4272	6KF3D4278	6KF3D4284	6KF4D4272	6KF4D4278	6KF4D4284
48"	24"	Diamond	Solid	6KF2D4872	6KF2D4878	6KF2D4884	6KF3D4872	6KF3D4878	6KF3D4884	6KF4D4872	6KF4D4878	6KF4D4884
24"	24"	Diamond	Louver	6KF2E2472	6KF2E2478	6KF2E2484	6KF3E2472	6KF3E2478	6KF3E2484	6KF4E2472	6KF4E2478	6KF4E2484
30"	24"	Diamond	Louver	6KF2E3072	6KF2E3078	6KF2E3084	6KF3E3072	6KF3E3078	6KF3E3084	6KF4E3072	6KF4E3078	6KF4E3084
36"	24"	Diamond	Louver	6KF2E3672	6KF2E3678	6KF2E3684	6KF3E3672	6KF3E3678	6KF3E3684	6KF4E3672	6KF4E3678	6KF4E3684
42"	24"	Diamond	Louver	6KF2E4272	6KF2E4278	6KF2E4284	6KF3E4272	6KF3E4278	6KF3E4284	6KF4E4272	6KF4E4278	6KF4E4284
48"	24"	Diamond	Louver	6KF2E4872	6KF2E4878	6KF2E4884	6KF3E4872	6KF3E4878	6KF3E4884	6KF4E4872	6KF4E4878	6KF4E4884
24"	24"	Diamond	Diamond	6KF2F2472	6KF2F2478	6KF2F2484	6KF3F2472	6KF3F2478	6KF3F2484	6KF4F2472	6KF4F2478	6KF4F2484
30"	24"	Diamond	Diamond	6KF2F3072	6KF2F3078	6KF2F3084	6KF3F3072	6KF3F3078	6KF3F3084	6KF4F3072	6KF4F3078	6KF4F3084
36"	24"	Diamond	Diamond	6KF2F3672	6KF2F3678	6KF2F3684	6KF3F3672	6KF3F3678	6KF3F3684	6KF4F3672	6KF4F3678	6KF4F3684
42"	24"	Diamond	Diamond	6KF2F4272	6KF2F4278	6KF2F4284	6KF3F4272	6KF3F4278	6KF3F4284	6KF4F4272	6KF4F4278	6KF4F4284
48"	24"	Diamond	Diamond	6KF2F4872	6KF2F4878	6KF2F4884	6KF3F4872	6KF3F4878	6KF3F4884	6KF4F4872	6KF4F4878	6KF4F4884

Accessories / Locker Growth

The illustration below shows several locker groups with frequently ordered accessories.



Key for Illustration

- A. Slope Hood
- B. Universal Rear Hood Support
- C. Slope End for Hood L.H. (Left Hand)
- D. Single Tier Invincible
- E. 6 Tier Box Locker w/Visual Doors
- F. 6 Tier Box Locker w/std. Louvers
- G. End Base, 6" High
- H. Front Base, 6" High

- I. Two Person Guardian
- J. Single Tier Guardian
- K. Side Recess Trim
- L. Top Recess Trim
- M. Wall Angle Slip Joint
- N. Vertical Filler
- O. Filler, Slope Top
- P. Single Tier Vanguard
- Q. Double Tier Vanguard
- R. Three Tier Vanguard

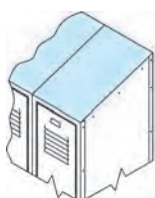
- S. Four Tier Vanguard
- T. Slope Top, Unit Construction
- U. Slope Top Division (Side)
- V. Boxed Finished End Panel (Right Hand)
- W. Heavy Duty Bench Pedestal
- X. Stainless Steel Bench Pedestal
- Y. Hardwood Bench
- Z1. Zee Base, 4" high
- Z2. Zee End Base/Splice
- Z3. Zee Inside Corner Splice

Locker "Growth"

When planning an installation of KD lockers, allow an additional 1/16" for each frame. When planning an installation of Welded lockers, allow an additional 1/16" per group. For Angle Iron lockers, contact your Penco representative.

Slope Top Construction

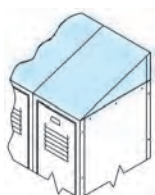
Slope tops are often used instead of flat tops to prevent the accumulation of dust and debris, and to discourage the use of locker tops as storage areas. There are three different types of slope top construction: Unit Slope Tops, Slope Hoods, and Slope Top Kits. Each is explained below.



Unit Slope Tops

Unit Slope Tops cover the width of one locker frame only. Lockers with Unit Slope Tops have sides with mitered top ends with a rise equal to 1/3 of the locker depth, plus longer backs that meet the rear edge of the slope top. Unit slope tops are used in place of the standard flat tops.

Order the appropriate locker plus the proper slope top size. Not for use on Invincible II, Welded, Stadium or Patriot lockers.



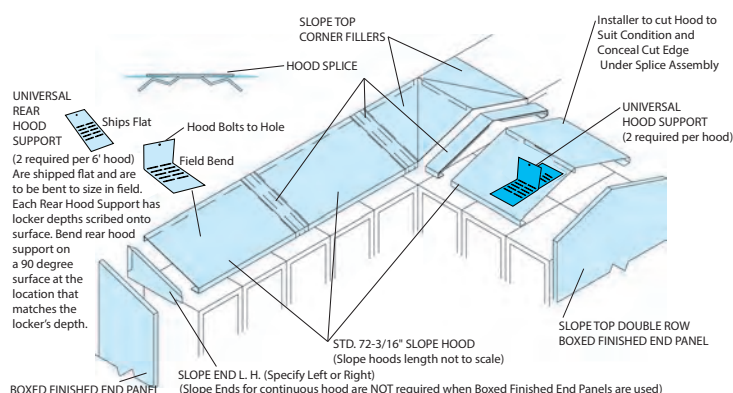
Slope Top Kits

Designed to convert stock flat top lockers into slope top lockers in groups of 3 wide. Each kit contains 3 tops, 3 backs and 4 ends. Not for use on Invincible II, Welded, Stadium or Patriot lockers.

Universal Rear Hood Support

Used with 12", 15" 18", 21" and 24" deep hood only.

Typical Slope Hood Installation



Continuous Slope Hoods

Continuous slope hoods fit on top of flat top lockers. They can be used on new lockers or on a retrofit basis. All hoods are furnished in 72" lengths and must be cut to length during installation. Intermediate splices and hood ends complete the installation and must be ordered separately. Hoods comes with 2 rear supports, if extra supports are needed, order separately.

Continuous Slope Splice	
Unit Depth	Cat. No.
13"	6HDX484C
16"	6HDX127C
19"	6HDX473C

Unit Slope Tops		
Unit Width	Unit Depth	Cat. No.
9"	12"	60332C
	15"	60334C
	18"	60336C
12"	12"	60338C
	15"	60340C
	18"	60342C
	21"	60344C
15"	12"	603450C
	15"	60346C
	18"	60348C
	21"	60350C
18"	18"	60352C
	21"	60354C
	24"	60356C
24"	18"	60364C
	21"	60366C
	24"	60368C

Slope Ends			
Unit Depth	Unit Height	Left Hand Cat. No.	Right Hand Cat. No.
12"	5"	66158H	66159H
15"	6"	66160H	66161H
18"	7"	66162H	66163H
21"	8"	66164H	66165H
24"	9"	66166H	66167H

Continuous Slope Hoods			
Unit Length	Unit Depth	Unit Height	Cat. No.
72"	13"	5.3"	6HDX330H
	16"	6.3"	6HDX124H
	19"	7.3"	6HDX471H

Use only when lockers need to be 1 inch away from wall. Includes 1 piece of hood and 2 hood supports. Do NOT use with STANDARD size Slope Ends, Slope Top Corner Fillers, Hip Fillers or Finished End Panels. See special Splices & Hood Supports for these hoods below.

Slope Hoods*			
Unit Depth	Unit Height	Unit Width	Cat. No.
12"	5"	72"	66144H
15"	6"	72"	66147H
18"	7"	72"	66150H
21"	8"	72"	66153H
24"	9"	72"	66156H

*Includes 1 piece of hood and 2 hood supports.

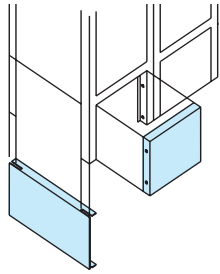
Hood Splice		
Unit Depth	Unit Height	Cat. No.
12"	5"	66168C
15"	6"	66169C
18"	7"	66170C
21"	8"	66171C
24"	9"	66172C

Continuous Slope Supports	
Unit Height	Cat. No.
5.3"	6HDX480C
6.3"	6HDX481C
7.3"	6HDX474C

Continuous Hood Ends			
Left/Right	Unit Depth	Unit Height	Cat. No.
LH	13"	5.3"	6HDX642H
RH	13"	5.3"	6HDX643H
LH	16"	6.3"	6HDX125H
RH	16"	6.3"	6HDX126H
LH	19"	7.3"	6HDX694H
RH	19"	7.3"	6HDX695H

Slope Top Kits - 3 Wide			
Unit Width	Unit Depth	Unit Height	Cat. No.
12"	12"	4"	60230H
	15"	5"	60232H
	18"	6"	60234H
15"	15"	5"	60238H
	18"	6"	60240H
18"	18"	6"	60244H

Accessories

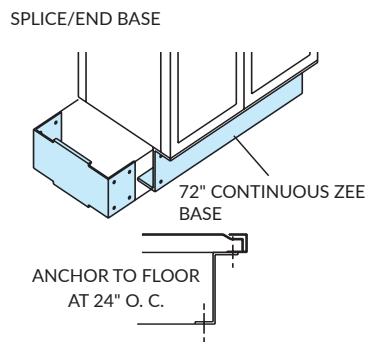


Individual Closed Bases

Front and end bases are designed to fit between standard Penco 6" legs. They present a clean flush appearance and prevent the accumulation of dust and dirt under the lockers. Front Base snaps in; End Base slips over legs during locker assembly. Only available for knocked down lockers with 6" legs.

Zee Bases

Zee bases raise lockers without legs 4" off the floor when there is no concrete or wood base. They provide a toe space in the front and a concealed flange for floor anchoring at the rear. A special 4" high rear leg can be ordered to support the back of the locker. (6" high zee bases are also available.)



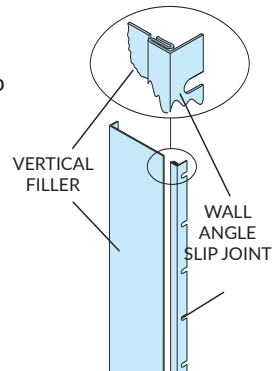
Zee bases are available only in 72" lengths, and may need to be cut to fit at the time of installation. Splices/End Bases are used at ends of rows, and where the front sections join. Not for use on Welded, Stadium or Patriot lockers.

Fillers

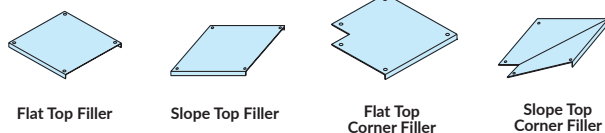
Penco provides standard fillers to adapt lockers to a wide range of field conditions and provide a professional, finished appearance. Fillers can be used to cover columns, pipes or other obstacles in a row of lockers, or fill the gap between the lockers and a wall.

Vertical Fillers. These come in three widths and are designed to be used in conjunction with Wall Angle Slip Joints for a solid fit and smooth finish. The slip joint conceals any raw edges caused by field cutting. Additional sizes are available. (Illustration at right.)

Top Fillers. Top Fillers cover gaps between tops of lockers. They overlap the locker tops and can be field cut to allow for pipes, etc. There are separate designs for flat top and slope top, and in-line vs. corner applications (illustration below).



Slope Top Fillers are not to be used with slope hoods. Slope Top Corner Fillers can be used with Slope Hoods or Unit Slope Tops



Individual Closed Bases - 6" High		
Unit Width	Unit Depth	Cat. No.
Front Bases		
9"	-	60216C
12"	-	60217C
15"	-	60218C
18"	-	60219C
24"	-	60220C
End Bases Single Row		
-	12"	60204C
-	15"	60205C
-	18"	60206C
-	21"	60207C
-	24"	60208C
End Bases Double Row		
-	24"	60209C
-	30"	60210C
-	36"	60211C

Zee Bases - 72" Width		
Unit Depth	Unit Height	Cat. No.
Front Zee Bases		
-	4"	66700H
Splice/End Base Single Row		
12"	4"	66701H
15"	4"	66702H
18"	4"	66703H
21"	4"	66704H
24"	4"	66705H
Splice/End Base Double Row		
30"	4"	66707H
24"	4"	66706H
36"	4"	66708H
Zee Inside Corner Splice		
-	4"	66709H
Rear Leg for Zee Base		
-	4"	60092C

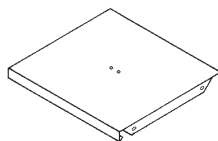
Vertical Fillers		
Unit Width	Unit Height	Cat. No.
Vertical Angles		
5"	60"	66112C
	72"	66115C
9"	60"	66114C
	72"	66117C
	78"	66127C
12"	60"	66113C
	72"	661141C
	78"	66116C
Wall Angle Slip Joints		
-	60"	66118C
-	72"	66119C
-	78"	66121C

Top Fillers		
Unit Width	Unit Depth	Cat. No.
Flat Top Fillers		
15"	12"	661321C
	15"	661322C
	18"	661323C
Slope Top Fillers		
15"	12"	661371C
	15"	661372C
	18"	661373C
Flat Top Corner Fillers		
12"	12"	66138C
15"	15"	66139C
18"	18"	66140C
Slope Top Corner Fillers		
12"	12"	66100C
15"	15"	66101C
18"	18"	66102C



Extra Steel Locker Shelves

Extra locker shelves can be added to K.D. lockers to meet special user requirements. Most lockers have extra holes already punched into side panels for mounting. In some cases shelf mounting holes may need to be drilled. Please consult your Penco sales representative for shelf mounting requirements.



Pictured: Single Tier Vanguard Locker with 5 shelves.

Recess Trim

Recess trim is 3" wide and bridges the gap between lockers and wall and/or soffits when the lockers are recessed into a wall. Side trim for left hand (LH) and right hand sides (RH) are different. Side Trim comes in three types: 1) for use with lockers with no legs, 2) with 6" legs and 3) for use with Bottom Recess Trim.

The soffit is to be constructed by general contractor. Face of soffit must be flush with face of locker. There should be 1" between top of locker and bottom of soffit. The recessed trim extends 3/8" from face of soffit.



Recess Trim - 3" High

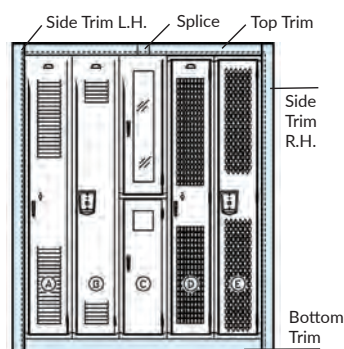
Unit Width	Unit Depth	Cat. No.
Top Trim		
74"	-	60456H
Splice		
2"	-	66105C
Outside Corner Splice		
2"	2"	66108C
Bottom Trim		
72"	-	60458C

Recess Side Trim - 3" Wide

Unit Height	Cat. No.
Side Trim - LH (Use with lockers that have No Legs)	
63"	60465C
75"	60469C
87"	60473C
Side Trim - RH (Use with lockers that have No Legs)	
63"	60466C
75"	60470C
87"	60474C
Side Trim - LH (Use with Top Trim & 6" Legs)	
69"	60467C
81"	60471C
93"	60475C
Side Trim - RH (Use with Top Trim & 6" Legs)	
69"	60468C
81"	60472C
93"	60476C
Side Trim - LH (Use with Top & Bottom Trim)	
66"	60477C
78"	60479C
90"	60481C
Side Trim - RH (Use with Top & Bottom Trim)	
66"	60478C
78"	60480C
90"	60482C

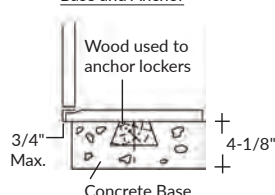
Front View of Locker with Recessed Trim

Lockers must be anchored to base (base and wood to be completed by General Contractor)

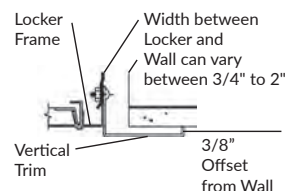


- A. Vanguard with optional full louvers
- B. Vanguard with recessed handle
- C. Fire extinguisher/waste bin door
- D. Vanguard w/optional visual perf
- E. Invincible II

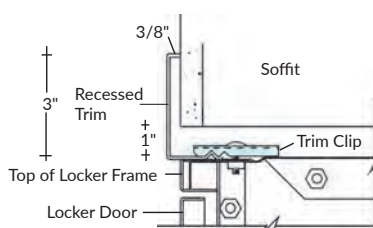
Example of Side View of Base and Anchor



Top View of 3" Vertical Trim R.H.

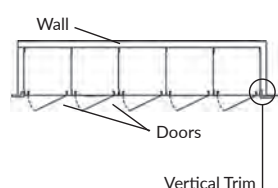


Side View of Top Recessed Trim



Top View of a Recessed Locker Grouping

Recessed Opening = Length of Locker Group (w/growth) + 3"



Steel Lockers

Accessories

Locking System Options



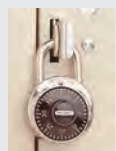
Built-in Key Locks

Available in flat key or grooved key models. Dead bolt and spring bolt construction. Reversible for LH & RH applications.



Built-in Combination Locks

Available with five combination changes for security year to year. Master key controlled. Stainless steel escutcheon plate. Use dead bolt models for all but box lockers, which use spring bolt. Available in LH & RH.



Combination Padlocks

Available with and without master keying. 3 number dialing. Rust resistant. Fits box lockers, Die-Cast Handles, recessed handles, cremone handles and basket racks.

Note: For proper fit and security, padlock shackle must have a diameter of 9/32" or 5/16" and a distance of .75" to .81" between the top of the case and the underside of the shackle when in the locked position.



Coin Operated

Ideal for public or private applications that require security with the assurance that keys will be returned, or as a revenue producer. Fits most Penco lockers. Available in 3 types:

coin return, coin collect and token operation. Not available for Defiant lockers.

ADA Compliant Locks



Key Lock Model No. 9707

Just insert key (turning not required) and lift latch pull to open door.

Key Lock Model No. 9676A

Has an oversized keyhead to facilitate turning.



Battery Powered Lock

ADA compliant lock that opens by touching a Button Key to the lock. When opened, an LED light flashes and audio indicator sounds. Lock uses programming key to set user access and a master key for administrative or management use.

Bench Tops			
Unit Width	Unit Depth	Unit Thickness	Cat. No.
Standard Bench Tops			
36"	9-1/2"	1-1/4"	9611
48"	9-1/2"	1-1/4"	9600
48"	12"	1-1/4"	9622
60"	9-1/2"	1-1/4"	9601
72"	9-1/2"	1-1/4"	9602
84"	9-1/2"	1-1/4"	9603
96"	9-1/2"	1-1/4"	9604
108"	9-1/2"	1-1/4"	9605
120"	9-1/2"	1-1/4"	9606
132"	9-1/2"	1-1/4"	9607
144"	9-1/2"	1-1/4"	9608
ADA Compliant Benches			
42"	16"	1-1/4"	9634
48"	16"	1-1/4"	9635
42"	18"	1-1/4"	9625
48"	18"	1-1/4"	9628
42"	20"	1-1/4"	9636
48"	20"	1-1/4"	9632
42"	24"	1-1/4"	9624
48"	24"	1-1/4"	9623

Benches and Pedestals

A natural accessory for any locker room. Benches add permanent comfort and order to the floor plan arrangement.

Penco offers a choice of bench pedestal styles. Order two pedestals for standard benches 96" long or less; order three pedestals for benches over 96" long. The seat portion of ADA benches require a minimum of 4 pedestals, placed as shown in the photo of the Bench Bracket.

Hardwood Bench Tops

Exceptionally strong wood locker room benches finished with clear lacquer.

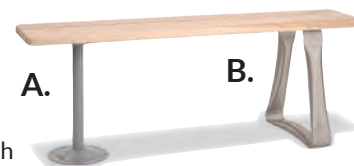
For ADA (Americans With Disabilities Act) compliant benches, use 16" or 18" deep bench backs and 20" or 24" deep seats plus Bench Brackets to support the backs. Order Pedestals separately.

A. Heavy Duty Bench Pedestal

16-1/4" high pedestal consists of a heavy duty steel tube welded to top and bottom flanges. Hardware for fastening to the bench only is included. Pedestal must be anchored to the floor. Order two or more per standard bench; four or more for ADA compliant bench. Available for quick shipment in 028 Gray and 073 Champagne. Available on production schedules in all standard colors. Cat. No. 60822H

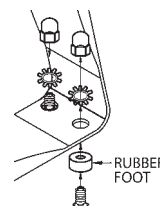
B. Stainless Steel Free Standing Pedestal

This pedestal has a 14" wide base which allows for moveable free standing use. Holes in the bottom are provided for optional floor anchoring or for attachment of non-skid bumpers (see below). Hardware is supplied for fastening to the bench top. Height is 16-1/4". Cat. No. 60827H each.



Non-Skid Pedestal Kit for Stainless Steel Pedestal

Rubber non-skid bumpers to prevent damage to floors. Consists of set of 4 non marking rubber feet and fastening hardware. Order 1 kit per pedestal. Cat. No. 68420



Bench Bracket for Back of ADA Benches

For attaching 16" or 18" backrest to 20" or 24" deep benches for ADA use. Sturdy steel construction. Order a minimum of 2 per back. Size is 19" x 19" x 2". Hardware included. Cat. No. 6ACXHP61H



Benches and Pedestals

An economical shelving rack specially designed to accommodate wire baskets for storage of athletic apparel, swimming trunks, etc. Ideal for schools, YMCA's, clubs and other organizations with swimming pools and gym facilities.

Penco basket racks' open type construction with 13 ga. posts and 20 gauge shelves permits free circulation of air and easy visual inspection. Stability is achieved through the use of 12 ga. cross braces. 3" high 20 ga. dividers between baskets and at ends of rows make basket contents inaccessible from adjacent openings.

Backs of shelves are turned down to form a backstop to prevent baskets from being removed from the rear. Aluminum number plates with 3/8" high black letters and 14 gauge padlock hasp are furnished for each opening and fasten to the front edge of the shelf. Number plate sequence must be specified when ordering. Units may be bolted together to form a double faced rack. Racks are 40" wide x 13-3/16" deep. Units can be equipped with casters. Order baskets separately.

Basket Racks

Levels/ Basket Capacity	Unit Width	Unit Depth	Unit Height	Cat. No.
9" Wide Baskets, 4 Baskets Wide				
7/28	40"	13"	70"	65910
8/32	40"	13"	79"	65930
12" Wide Baskets, 3 Baskets Wide				
7/21	40"	13"	70"	65800
8/24	40"	13"	79"	65830

Baskets

Unit Width	Unit Depth	Unit Height	Cat. No.
A. Perforated Front			
9"	13"	8"	9646
12"	13"	8"	9641
B. Perforated Front w/ Pilfer Guard			
9"	13"	8"	9642
12"	13"	8"	9643
C. All Wire			
9"	13"	8"	9621
12"	13"	8"	9620

Food Industry Locker Conversion

Unit Width	Unit Depth	Unit Height	Cat. No.
Kits, 18" Depth			
1 Wide	-	16"	64001
3 Wide	-	16"	64003
Rear Leg			
-	-	16"	65540H
Bench Support			
-	18"	-	65541H
End Front Leg			
-	-	16"	65542H
Intermediate Front Leg			
-	-	16"	65543H

Basket Racks/Special Purpose Lockers

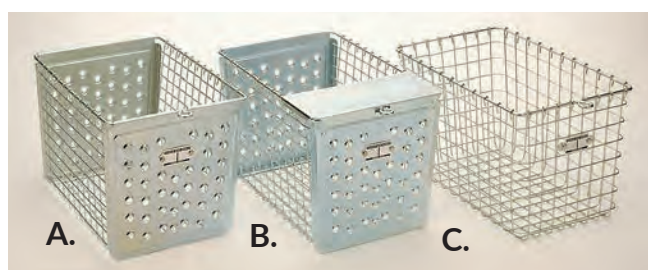


Fire Extinguisher Door and Waste Bin door

Lockers can be designated to contain a fire extinguisher door and/or a waste receptacle. The opening on the fire extinguisher door is glazed with wire-reinforced glass.

Waste bin doors have a cut-out with an internal flap and a top spring-loaded hinge to keep the opening closed when not being used. There is a small metal chute inside the door to direct the waste to a waste container (container is not included).

These items are typically ordered in 12" or 15" wide 1 and 2 tier lockers. If recessed handles are used, the width must be a minimum of 15" wide. Locks should not be used on fire extinguisher doors or waste bin doors.



Baskets

Three styles of baskets are available: **A.** Perforated plate front and rear with wire on sides and bottom; **B.** Same as above, except with "Pilfer Guard", and extra plate that covers the top front of the basket; **C.** All plated wire construction. All are nominally 13" D x 8" H. Baskets can be supplied with number plates corresponding to shelf position. Number sequence must be furnished with the order.



Food Industry Lockers

For ease of cleaning beneath lockers. Leg extensions increase the 6" height to 16". Order as piece parts or in a kit specially designed for 18" deep lockers. Kits include supports for a hardwood bench (order bench separately). Lockers must have standard 6" legs. **Not** for use with Welded, Stadium or Patriot lockers.

Mirror

Made of acrylic plastic that will not break in normal usage. Mirror has an adhesive backing for easy installation. Size is 6" wide x 8" high. Cat. No. 96370

Vanguard™ Lockers (KD)

PART 1 - GENERAL

1.01 SECTION INCLUDES

Standard Knocked Down Lockers

1.02 REFERENCES

ADAAG - Americans with Disabilities Act, Accessibility Guidelines.

1.03 SUBMITTALS

Submit under provisions of Section 01 33 00. Shop Drawings shall show dimensioned plans, elevations, and sections.

1.04 DELIVERY, STORAGE AND HANDLING

Store products in manufacturer's unopened packaging until ready for installation to protect the locker finish and adjacent surfaces from damage.

PART 2 - PRODUCTS

2.01 MANUFACTURER

Penco Products, Inc. or approved equal based upon ability to provide product compliant with specifications of the product selected. Provide only metal lockers fabricated in the United States by a single domestic manufacturer.

2.02 MATERIALS

Steel: All Penco standard lockers are constructed using prime grade mild cold-rolled sheet steel free from surface imperfection meeting ASTM A1008 and capable of taking a high-grade enamel powder coat finish. Alternate material: Sheet steel components shall be fabricated using zinc-coated steel meeting ASTM A879 and finished in the same manner. Forged steel coat hooks with balled ends and truss fin head bolts and hex nuts will be zinc coated and supplied for all lockers unless otherwise indicated.

Greenguard: Lockers shall be GREENGUARD Gold Certified by UL Environment through the GREENGUARD Certification Program.

2.03 STANDARD LOCKERS

Acceptable Product: Penco Vanguard, knock-down lockers. Tops, Bottoms, Backs, Sides, and Shelves fabricated from 24 gauge sheet steel. Locker doors measuring less than 12 inches wide are 18 gauge steel. All others are fabricated from 16 gauge sheet steel. 6 inch legs are standard and can be deleted as a no cost option.

Door Frame: Channel shape, not less than 16 gauge steel. Provide vertical door frame members with additional 3/8 inch (9.5 mm) flange as a continuous door strike. Intermediate cross frame members are standard on double and triple tier lockers.

Multi-Point Latch Doors: One piece sheet steel with full channel formation of

adequate depth to fully conceal lock bar on lock side, channel formation on hinge side, right angle formations across top and bottom, with holes for attaching number plates. Doors over 15 inches wide by 60 inches or 72 inches high will include a 3 inch wide 20 gauge full height reinforcing pan welded to inside face of door at 6 inch centers.

Box Lockers: One piece sheet steel with channel formations on lock and hinge sides, right angle flanges on top and bottom; pre-punch doors for padlock latch and friction catch and built-in combination and key locks.

Ventilation: Provide louvered doors in manufacturer's standard louver pattern.

Hinges: Two inch high, double spun, full loop, tight pin, projection welded to door frame and securely fastened to the door with steel rivets. Provide three 2 inch five-knuckle hinges on doors over 48 inches high and two 2 inch high five-knuckle hinges on all other doors.

2.04 DOOR HANDLES AND LATCHING

Two Person and Duplex Lockers, 1, 2 and 3 Tier featuring multi-point latching:

Recessed Handle: Classic III Multi-point latching with recessed handle activated by a 14 gauge finger-lift control handle in a 22 gauge drawn and brushed stainless steel pocket fastened to the door with two tabs and a positive tamper-resistant decorative fastener. Depth shall be sufficient to prevent a standard combination padlock, built-in combination lock, or key lock from protruding beyond door face. Nylon lift trigger accommodates use of 9/32 inch padlock.

Die-Cast Handle: Chrome-plated zinc alloy die-cast case and handle attached to latch bar concealed inside door and tamperproof. Pulling handle out shall move latch bar up and open door in one motion and providing for use of 9/32 inch diameter padlock, integral with handle and located so that extension of handle forms padlock strike. Doors over 48 inches high shall use glass-filled nylon clips to engage the door frame and hold the door shut at three points. All other doors engage at two points.

Locking Device: Positive, automatic type, whereby locker may be locked when open, then closed without unlocking. Firmly secure one rubber silencer in frame at each latch hook.

Box Lockers (3 to 6 Tier): Punch doors for use with padlocks or built-in locks and configure doors for use with padlocks with an 18 gauge combination door pull, staple, and lock hole cover plate with integral friction catch.

2.05 INTERIOR EQUIPMENT

ADA-Compliant Lockers (Recessed Handles with Multi-Point Latch): Single Tier: Hat shelf 48 inches from locker bottom or lower as required by base condition. Double Tier: Only bottom opening, a shelf placed 15 inches off the floor or lower as required by base condition.

2.07 FABRICATION

Fabrication shall be on the unit principle, each locker with individual door and frame, individual top, bottom, back, and shelves, with common intermediate divisions separating compartments.

Finish: High quality powder coat paint finish applied in strict adherence to paint manufacturer's specifications to provide optimum appearance and performance. Finishes releasing VOCs are not acceptable. Standard coating thickness is 1 mil dry film thickness minimum. Powder Coat Plus option increases thickness to 2 mil minimum. Colors as selected from manufacturer's standard colors. All locker body components shall match color of door and frame.

Alternative finishes: Custom color match, Anti Graffiti, antimicrobial, TGIC and high performance finishes are available.

PART 3 - EXECUTION

3.01 EXAMINATION

Do not begin installation until substrates and bases have been properly prepared. If substrate and bases are the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 INSTALLATION

Install metal lockers and accessories at locations shown in accordance with manufacturer's instructions. Install lockers plumb, level, and square. Anchor lockers to floor and wall at intervals recommended by the manufacturer. Bolt adjoining locker units together to provide rigid installation.

3.03 ADJUSTING

Adjust doors and latches to operate without binding. Verify that latches are operating satisfactorily. Adjust built-in locks to prevent binding of dial or key and ensure smooth operation prior to substantial completion.

Touch-up with factory-supplied paint and repair or replace damaged products before substantial completion.

3.04 PROTECTION

Protect installed products until completion of project.

Full MasterFormat Specifications can be found on pencoproducts.com.

Guardian™ Lockers (KD)

PART 1 - GENERAL

1.01 SECTION INCLUDES

Standard Knocked Down Lockers

1.02 REFERENCES

ADAAG - Americans with Disabilities Act, Accessibility Guidelines.

1.03 SUBMITTALS

Submit under provisions of Section 01 33 00. Shop Drawings shall show dimensioned plans, elevations, and sections.

1.04 DELIVERY, STORAGE, AND HANDLING

Store products in manufacturer's unopened packaging until ready for installation to protect the locker finish and adjacent surfaces from damage.

PART 2 - PRODUCTS

2.01 MANUFACTURER

Penco Products, Inc. or approved equal based upon ability to provide product compliant with specifications of the product selected. Provide only metal lockers fabricated in the United States by a single domestic manufacturer.

2.02 MATERIALS

Steel: All Penco standard lockers are constructed using prime grade mild cold-rolled sheet steel free from surface imperfection meeting ASTM A1008 and capable of taking a high-grade enamel powder coat finish. Alternate material: Sheet steel components shall be fabricated using zinc-coated steel meeting ASTM A879 and finished in the same manner. Forged steel coat hooks with ball ends and truss fin head bolts and hex nuts will be zinc coated and supplied for all lockers unless otherwise indicated.

Greenguard: Lockers shall be GREENGUARD Gold Certified by UL Environment through the GREENGUARD Certification Program.

2.03 STANDARD LOCKERS

Acceptable Product: Penco Guardian, knock-down lockers. Tops, Bottoms, Backs, Sides, and Shelves fabricated from 24 gauge sheet steel. Locker doors measuring less than 12 inches wide are 18 gauge steel. All others are fabricated from 16 gauge sheet steel. 6 inch legs are standard and can be deleted as a no cost option.

Door Frame: Channel shape, not less than 16 gauge steel. Provide vertical door frame members with additional 3/8 inch (9.5 mm) flange as a continuous door strike. Intermediate cross frame members are standard on double and triple tier lockers.

Multi-Point Latch Doors: One piece sheet

steel with full channel formation of adequate depth to fully conceal lock bar on lock side, channel formation on hinge side, right angle formations across top and bottom, with holes for attaching number plates. Doors over 15 inches wide by 60 inches or 72 inches high will include a 3 inch wide 20 gauge full height reinforcing pan welded to inside face of door at 6 inch centers.

Ventilation: Flush door front with no exposed louvers and air flow slots located in top and bottom flanges of door.

Hinges: Two inch high, double spun, full loop, tight pin, projection welded to door frame and securely fastened to the door with steel rivets. Provide three 2 inch five-knuckle hinges on doors over 48 inches high and two 2 inch high five-knuckle hinges on all other doors.

2.04 DOOR HANDLES AND LATCHING

Two Person and Duplex Lockers, 1, 2 and 3 Tier Featuring Multi-point Latching: Classic III Multi-point latching with recessed handle activated by a 14 gauge finger-lift control handle in a 22 gauge drawn and brushed stainless steel pocket fastened to the door with two tabs and a positive tamper-resistant decorative fastener. Depth shall be sufficient to prevent a standard combination padlock, built-in combination lock, or key lock from protruding beyond door face. Nylon lift trigger accommodates use of 9/32 inch padlock. Doors over 48 inches high shall use glass-filled nylon clips to engage the door frame and hold the door shut at three points. All other doors engage at two points.

Locking Device: Positive, automatic type, whereby locker may be locked when open, then closed without unlocking. Firmly secure one rubber silencer in frame at each latch hook.

2.05 INTERIOR EQUIPMENT

ADA-Compliant Lockers: Single Tier: Hat shelf 48 inches from locker bottom or lower as required by base condition. Double Tier: Only bottom opening, a shelf placed 15 inches off the floor or lower as required by base condition.

2.06 FABRICATION

Fabrication shall be on the unit principle, each locker with individual door and frame, individual top, bottom, back, and shelves, with common intermediate divisions separating compartments.

Finish: High quality powder coat paint finish applied in strict adherence to paint manufacturer's specifications to provide optimum appearance and performance. Finishes releasing VOCs are not

acceptable. Standard coating thickness is 1 mil dry film thickness minimum. Powder Coat Plus option increases thickness to 2 mil minimum. Colors as selected from manufacturer's standard colors. All locker body components shall match color of door and frame.

Alternative Finishes: Custom color match, Anti Graffiti, antimicrobial, TGIC and high performance finishes are available.

PART 3 - EXECUTION

3.01 EXAMINATION

Do not begin installation until substrates and bases have been properly prepared. If substrate and bases are the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 INSTALLATION

Install metal lockers and accessories at locations shown in accordance with manufacturer's instructions. Install lockers plumb, level, and square. Anchor lockers to floor and wall at intervals recommended by the manufacturer. Bolt adjoining locker units together to provide rigid installation.

3.03 ADJUSTING

Adjust doors and latches to operate without binding. Verify that latches are operating satisfactorily. Adjust built-in locks to prevent binding of dial or key and ensure smooth operation prior to substantial completion.

Touch-up with factory-supplied paint and repair or replace damaged products before substantial completion.

3.04 PROTECTION

Protect installed products until completion of project.

DOOR OPTIONS

Guardian Medallion: Doors will include sound-deadening material enclosed in a 3 inch wide 22 gauge partial height pan welded to inside face of door.

Guardian Plus: Locker doors are fabricated from 14 gauge sheet steel.

Penco Products, Inc. reserves the right to vary specifications consistent with a policy of continuous product improvement.

Full MasterFormat Specifications can be found on pencoproducts.com.

Invincible II™ Lockers (KD)

PART 1 – GENERAL

1.01 SECTION INCLUDES

Heavy Duty Knocked Down Lockers

1.02 REFERENCES

ADAAG - Americans with Disabilities Act, Accessibility Guidelines.

1.03 SUBMITTALS

Submit under provisions of Section 01 33 00. Shop Drawings shall show dimensioned plans, elevations, and sections.

1.04 DELIVERY, STORAGE, AND HANDLING

Store products in manufacturer's unopened packaging until ready for installation to protect the locker finish and adjacent surfaces from damage.

PART 2 – PRODUCTS

2.01 MANUFACTURER

Penco Products, Inc. or approved equal based upon ability to provide product compliant with specifications of the product selected. Provide only metal lockers fabricated in the United States by a single domestic manufacturer.

2.02 MATERIALS

Steel: All Penco standard lockers are constructed using prime grade mild cold-rolled sheet steel free from surface imperfection meeting ASTM A1008 and capable of taking a high-grade enamel powder coat finish. Alternate material: Sheet steel components shall be fabricated using zinc-coated steel meeting ASTM A879 and finished in the same manner. Forged steel coat hooks with balled ends and truss fin head bolts and hex nuts will be zinc coated and supplied for all lockers unless otherwise indicated.

Greenguard: Lockers shall be GREENGUARD Gold Certified by UL Environment through the GREENGUARD Certification Program.

2.03 HEAVY DUTY LOCKERS

Acceptable Product: Penco Invincible II, knocked-down lockers. Tops, Bottoms, Sides, and Shelves shall be fabricated from 16 gauge and backs from 18 gauge sheet steel. Locker doors shall be 14 gauge. 6 inch legs are standard and can be deleted as a no cost option.

Door Frame: Channel shape, not less than 16 gauge steel. Provide vertical door frame members with additional 3/8 inch (9.5 mm) flange as a continuous door strike. Intermediate cross frame members are standard on double and triple tier lockers.

Multi-Point Latch Doors: One piece sheet steel with full channel formation of adequate depth to fully conceal lock bar on lock side, channel formation on hinge side, right angle formations across top and bottom, with holes for attaching number plates. Doors over 15 inches wide by 60 inches or 72 inches high will include a 3 inch wide 20 gauge full height reinforcing pan welded to inside face of door at 6 inch centers.

Ventilation: Doors and locker sides have standard 3/4 inch (19 mm) wide by 1-1/2 inch (38 mm) high diamond-shaped perforations. Doors less than 20 inches tall have 7/16 inch (11 mm) wide by 15/16 inch (24 mm) high diamond-shaped perforations.

Hinges: Two inch high, double spun, full loop, tight pin, projection welded to door frame and securely fastened to the door with steel rivets. Provide three 2 inch five-knuckle hinges on doors over 48 inches high and two 2 inch high five-knuckle hinges on all other doors.

2.04 DOOR HANDLES AND LATCHING 1, 2 and 3 Tier Featuring Multi-point Latching:

Classic III Multi-point latching with recessed handle activated by a 14 gauge finger-lift control handle in a 22 gauge drawn and brushed stainless steel pocket fastened to the door with two tabs and a positive tamper-resistant decorative fastener. Depth shall be sufficient to prevent a standard combination padlock, built-in combination lock, or key lock from protruding beyond door face. Nylon lift trigger accommodates use of 9/32 inch padlock. Doors over 48 inches high shall use glass-filled nylon clips to engage the door frame and hold the door shut at three points. All other doors engage at two points.

Locking Device: Positive, automatic type, whereby locker may be locked when open, then closed without unlocking. Firmly secure one rubber silencer in frame at each latch hook.

4-9 Tier Box Lockers: Punch doors for use with padlocks or built-in locks. Equip doors for use with padlocks with an 18 gauge combination door pull, staple, and lock hole cover plate with integral friction catch.

2.05 INTERIOR EQUIPMENT

ADA-Compliant Lockers: Single Tier: Hat shelf 48 inches from locker bottom or lower as required by base condition. Double Tier: Only bottom opening, a shelf placed 15 inches off the floor or lower as required by base condition.

2.06 FABRICATION

Fabrication shall be on the unit principle, each locker with individual door and frame, individual top, bottom, back, and shelves, with common intermediate divisions separating compartments.

Finish: High quality powder coat paint finish applied in strict adherence to paint manufacturer's specifications to provide optimum appearance and performance. Finishes releasing VOCs are not acceptable. Standard coating thickness is 1 mil dry film thickness minimum. Powder Coat Plus option increases thickness to 2 mil minimum. Colors as selected from manufacturer's standard colors. All locker body components shall match color of door and frame.

Alternative Finishes: Custom color match, Anti Graffiti, antimicrobial, TGIC and high performance finishes are available.

PART 3 – EXECUTION

3.01 EXAMINATION

Do not begin installation until substrates and bases have been properly prepared. If substrate and bases are the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 INSTALLATION

Install metal lockers and accessories at locations shown in accordance with manufacturer's instructions. Install lockers plumb, level, and square. Anchor lockers to floor and wall at intervals recommended by the manufacturer. Bolt adjoining locker units together to provide rigid installation.

3.03 ADJUSTING

Adjust doors and latches to operate without binding. Verify that latches are operating satisfactorily. Adjust built-in locks to prevent binding of dial or key and ensure smooth operation prior to substantial completion.

Touch-up with factory-supplied paint and repair or replace damaged products before substantial completion.

3.04 PROTECTION

Protect installed products until completion of project.

Penco Products, Inc. reserves the right to vary specifications consistent with a policy of continuous product improvement.

Full MasterFormat Specifications can be found on pencoproducts.com.

All-Welded Lockers (Welded)

PART 1 - GENERAL

1.01 SECTION INCLUDES

Heavy Duty Welded Lockers

1.02 REFERENCES

ADAAG - Americans with Disabilities Act, Accessibility Guidelines.

1.03 SUBMITTALS

Submit under provisions of Section 01 33 00. Shop Drawings shall show dimensioned plans, elevations, and sections.

1.04 DELIVERY, STORAGE, AND HANDLING

Store products in manufacturer's unopened packaging until ready for installation to protect the locker finish and adjacent surfaces from damage.

PART 2 - PRODUCTS

2.01 MANUFACTURER

Penco Products, Inc. or approved equal based upon ability to provide product compliant with specifications of the product selected. Provide only metal lockers fabricated in the United States by a single domestic manufacturer.

2.02 MATERIALS

Steel: All Penco standard lockers are constructed using prime grade mild cold-rolled sheet steel free from surface imperfection meeting ASTM A1008 and capable of taking a high-grade enamel powder coat finish. Alternate material: Sheet steel components shall be fabricated using zinc-coated steel meeting ASTM A879 and finished in the same manner. Forged steel coat hooks with ball ends and truss fin head bolts and hex nuts will be zinc coated and supplied for all lockers unless otherwise indicated.

Greenguard: Lockers shall be GREENGUARD Gold Certified by UL Environment through the GREENGUARD Certification Program.

2.03 HEAVY DUTY LOCKERS

Acceptable Product: Penco All-Welded lockers. Tops, Bottoms, Sides, and Shelves shall be fabricated from 16 gauge and backs from 18 gauge sheet steel. Locker doors shall be 14 gauge.

Door Frame: Channel shape, not less than 16 gauge steel. Provide vertical door frame members with additional 3/8 inch (9.5 mm) flange as a continuous door strike. Intermediate cross frame members are standard on double and triple tier lockers.

Multi-Point Latch Doors: One piece sheet steel with full channel formation of

adequate depth to fully conceal lock bar on lock side, channel formation on hinge side, right angle formations across top and bottom, with holes for attaching number plates. Doors over 15 inches wide by 60 inches or 72 inches high will include a 3 inch wide 20 gauge full height reinforcing pan welded to inside face of door at 6 inch centers.

Ventilation: Doors and locker sides have standard 3/4 inch (19 mm) wide by 1-1/2 inch (38 mm) high diamond-shaped perforations. Doors less than 20 inches tall have 7/16 inch (11 mm) wide by 15/16 inch (24 mm) high diamond-shaped perforations.

Hinges: Continuous type: 16 gauge piano hinge measuring full height of door. Welded to door and attached to locker frame using steel rivets.

2.04 DOOR HANDLES AND LATCHING

1, 2 and 3 Tier Featuring Multi-point Latching: Classic III Multi-point latching with recessed handle activated by a 14 gauge finger-lift control handle in a 22 gauge drawn and brushed stainless steel pocket fastened to the door with two tabs and a positive tamper-resistant decorative fastener. Depth shall be sufficient to prevent a standard combination padlock, built-in combination lock, or key lock from protruding beyond door face. Nylon lift trigger accommodates use of 9/32 inch padlock. Doors over 48 inches high shall use glass-filled nylon clips to engage the door frame and hold the door shut at three points. All other doors engage at two points.

Locking Device: Positive, automatic type, whereby locker may be locked when open, then closed without unlocking. Firmly secure one rubber silencer in frame at each latch hook.

4-9 Tier Box Lockers: Punch doors for use with padlocks or built-in locks. Equip doors for use with padlocks with an 18 gauge combination door pull, staple, and lock hole cover plate with integral friction catch.

2.05 INTERIOR EQUIPMENT

ADA-Compliant Lockers (Recessed Handles with Multi-Point Latch): Single Tier: Hat shelf 48 inches from locker bottom or lower as required by base condition. Double Tier: Only bottom opening, a shelf placed 15 inches off the floor or lower as required by base condition.

2.06 FABRICATION

Pre-assemble lockers by welding into one piece structures in groupings most practical for job requirements, welds free of burrs; maximum width of group to be

54 inches (1.371 m); no bolts, nuts, or rivets allowed in assembly of main locker groups.

Finish: High quality powder coat paint finish applied in strict adherence to paint manufacturer's specifications to provide optimum appearance and performance. Finishes releasing VOCs are not acceptable. Standard coating thickness is 1 mil dry film thickness minimum. Powder Coat Plus option increases thickness to 2 mil minimum. Colors as selected from manufacturer's standard colors. All locker body components shall match color of door and frame.

Alternative finishes: Custom color match, Anti Graffiti, antimicrobial, TGIC and high performance finishes are available.

PART 3 - EXECUTION

3.01 EXAMINATION

Do not begin installation until substrates and bases have been properly prepared. If substrate and bases are the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 INSTALLATION

Install metal lockers and accessories at locations shown in accordance with manufacturer's instructions. Install lockers plumb, level, and square. Anchor lockers to floor and wall at intervals recommended by the manufacturer. Bolt adjoining locker units together to provide rigid installation.

3.03 ADJUSTING

Adjust doors and latches to operate without binding. Verify that latches are operating satisfactorily. Adjust built-in locks to prevent binding of dial or key and ensure smooth operation prior to substantial completion.

Touch-up with factory-supplied paint and repair or replace damaged products before substantial completion.

3.04 PROTECTION

Protect installed products until completion of project.

Penco Products, Inc. reserves the right to vary specifications consistent with a policy of continuous product improvement.

Full MasterFormat Specifications can be found on pencoproducts.com.

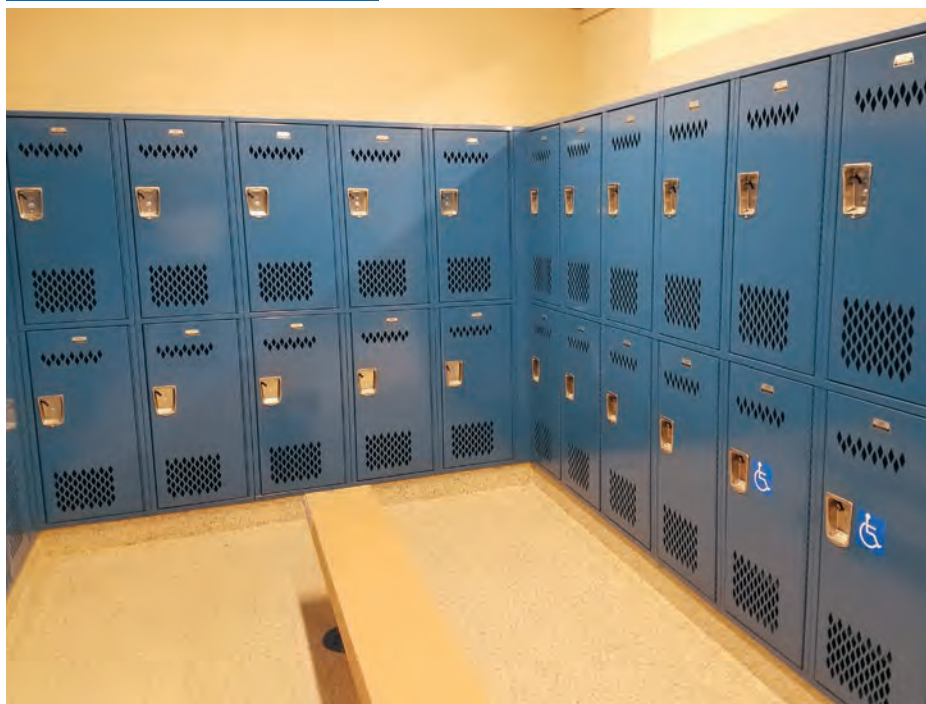
Steel Lockers

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Installations



submit your
PENCO
installation pictures to:
general@pencoproducts.com





Stadium® Lockers (KD or Welded)

Welded: Pre-assemble lockers by welding into one piece structures as single units with integral 4" channel base. Welds free of burrs; no bolts, nuts, or rivets allowed in assembly of main locker groups.

Finish: High quality powder coat paint finish applied in strict adherence to paint manufacturer's specifications to provide optimum appearance and performance. Finishes releasing VOCs are not acceptable. Standard coating thickness is 1 mil dry film thickness minimum. Powder Coat Plus option increases thickness to 2 mil minimum. Colors as selected from manufacturer's standard colors. All locker body components shall match color of door and frame.

Alternative Finishes: Custom color match, Anti Graffiti, antimicrobial, TGIC and high performance finishes are available.

PART 1 - GENERAL

1.01 SECTION INCLUDES

Heavy Duty Knocked Down or Welded Lockers

1.02 REFERENCES

ADAAG - Americans with Disabilities Act, Accessibility Guidelines.

1.03 SUBMITTALS

Submit under provisions of Section 01 33 00. Shop Drawings shall show dimensioned plans, elevations, and sections.

1.04 DELIVERY, STORAGE, AND HANDLING

Store products in manufacturer's unopened packaging until ready for installation to protect the locker finish and adjacent surfaces from damage.

PART 2 - PRODUCTS

2.01 MANUFACTURER

Penco Products, Inc. or approved equal based upon ability to provide product compliant with specifications of the product selected. Provide only metal lockers fabricated in the United States by a single domestic manufacturer.

2.02 MATERIALS

Steel: All Penco standard lockers are constructed using prime grade mild cold-rolled sheet steel free from surface imperfection meeting ASTM A1008 and capable of taking a high-grade enamel powder coat finish. Alternate material: Sheet steel components shall be fabricated using zinc-coated steel meeting ASTM A879 and finished in the same manner. Forged steel coat hooks with balled ends and truss fin head bolts and hex nuts will be zinc coated and supplied for all lockers unless otherwise indicated.

Greenguard: Lockers shall be GREENGUARD Gold Certified by UL Environment through the GREENGUARD Certification Program.

2.03 HEAVY DUTY LOCKERS

Acceptable Product: Penco Stadium, knocked-down or welded lockers. Tops, Bottoms, Sides, and Shelves shall be fabricated from 16 gauge and backs from 18 gauge sheet steel.

Door Frame: Channel shape, not less than 16 gauge steel.

Ventilation: Locker sides have standard 3/4 inch (19 mm) wide by 1-1/2 inch (38 mm) high diamond-shaped perforations.

2.05 INTERIOR EQUIPMENT

Full Width Locker Shelf: Includes coat rod and 2 single prong coat hooks. Shelf face shall be punched to accept a standard number plate.

Security Box: Locate above shelf. Door shall be 14 gauge steel, punched for built-in lock or padlock. Lock hole cover with door pull shall be provided for padlock use. Hinges shall be 16 gauge continuous and riveted to 16 gauge welded frame. One side of the compartment is formed by the locker side; exposed compartment side is 16 gauge steel.

Footlocker: Hinged bench seat features a padlock hasp and is hinged at rear. Front panel shall have a stainless steel padlock strike, padlock eye and a pattern of mini louvers that measure 1/2" (12.7 mm) wide by 1/4" (6.35 mm) high.

2.06 FABRICATION

KD: Fabrication shall be on the unit principle, each locker with individual frame, individual top, bottom, back, and shelves.

PART 3 - EXECUTION

3.01 EXAMINATION

Do not begin installation until substrates and bases have been properly prepared. If substrate and bases are the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 INSTALLATION

Install metal lockers and accessories at locations shown in accordance with manufacturer's instructions. Install lockers plumb, level, and square. Anchor lockers to floor and wall at intervals recommended by the manufacturer. Bolt adjoining locker units together to provide rigid installation.

Install sloping tops and metal fillers using concealed fasteners. Provide flush hairline joints against adjacent surfaces.

3.03 ADJUSTING

Adjust doors and latches to operate without binding. Verify that latches are operating satisfactorily. Adjust built-in locks to prevent binding of dial or key and ensure smooth operation prior to substantial completion.

Touch-up with factory-supplied paint and repair or replace damaged products before substantial completion.

3.04 PROTECTION

Protect installed products until completion of project.

Penco Products, Inc. reserves the right to vary specifications consistent with a policy of continuous product improvement.

Full MasterFormat Specifications can be found on pencoproducts.com.

Patriot® Lockers (KD or Welded)

PART 2 – PRODUCTS

2.01 MANUFACTURER

Penco Products, Inc. or approved equal based upon ability to provide product compliant with specifications of the product selected. Provide only metal lockers fabricated in the United States by a single domestic manufacturer.

2.02 MATERIALS

Steel: All Penco standard lockers are constructed using prime grade mild cold-rolled sheet steel free from surface imperfection meeting ASTM A1008 and capable of taking a high-grade enamel powder coat finish. Alternate material: Sheet steel components shall be fabricated using zinc-coated steel meeting ASTM A879 and finished in the same manner. Forged steel coat hooks with balled ends and truss fin head bolts and hex nuts will be zinc coated and supplied for all lockers unless otherwise indicated.

Greenguard: Lockers shall be GREENGUARD Gold Certified by UL Environment through the GREENGUARD Certification Program.

Patriot® Knockdown Build Turnout Locker Models

2.03 HEAVY DUTY LOCKERS

Heavy Duty Lockers: All locker body components made of cold rolled steel specially formed for added strength and rigidity and to ensure tight joints at fastening points.

Locker Body: Sides, bottoms, tops and shelves: 16 gauge steel. Sides punched for shelf locations on nominal 12 inch centers.

Backs: Solid 18 gauge steel. One-piece through 42 inches wide; supplied as two 24 inch panels on 48 inch wide lockers.

Sides: 16 gauge sheet steel with 3/4 inch (19mm) wide by 1-1/2 inch (38mm) high diamond-shaped perforations. Optional: solid sides without ventilation.

Tops and bottoms: Three sides formed 90 degrees, the front offset formed to be flush with horizontal frame member.

Shelves: 16 gauge, full width, flanged on four sides formed to 90 degrees, front edge having a second bend to increase strength.

Face Frame: Vertical frame member to be not less than 16 gauge formed to a channel shape and hemmed to create a smooth interior edge. Interconnecting parts to be mortised and tenoned and electrically welded together in a rigid assembly capable of resisting strains.

Assembly hardware for Knockdown build: Zinc plated truss fin head bolts and hex nuts. Hole spacing in locker body construction not exceeding 9 inches (225 mm). Optional factory assembly of locker bodies using rivets.

2.05 INTERIOR EQUIPMENT

Shelf: 16 gauge full width located approximately 12 inches (304.8 mm) below top of locker.

Hooks and coat rod: Two heavy duty 3 inch high, 7/8 inch wide 2-1/2 inch deep and one chrome plated 1 inch diameter coat rod.

2.06 FABRICATION

Fabricate lockers square, rigid, without warp, with metal faces flat and free of distortion.

Fabricate Knockdown lockers on the unit principle, each locker with individual face frame, individual top,

bottom, back, and shelves, with two sides forming one complete unit. Verify dimensions and arrangement before fabrication.

Finish: Finish coat shall be electrostatically applied powder coat enamel properly cured to paint manufacturer specifications to achieve optimum performance. All lockers shall be painted inside and outside with the same color.

Powder Coat: Dry Thickness: 1 to 1.2 mils (0.025 to 0.03 mm).

Color: As selected from manufacturer's standard colors.

Gear Locker Models

Same as previous with the following substitutions and additions:

Doors: One piece 14 gauge sheet steel.

Standard Door Ventilation: 6 inch (152.4 mm) wide by 3/4 inch (19 mm) high horizontal louvers arranged two groups of six.

Optional Door Ventilation: 3/4 inch (19 mm) wide by 1-1/2 inch (38 mm) high diamond-shaped perforations, or 3/4 inch (19 mm) by 1/4 inch (6.4 mm) high security mini louvers, or solid doors

Door frames: 16 gauge formed in a channel shape with continuous vertical door strikes.

Hinges: Continuous type: 16 gauge piano hinge measuring full height of door. Welded to door and attached to locker frame using steel rivets.

2.04 DOOR HANDLES AND LATCHING

Cremone Latching: Handle shall be a heavy duty turn handle that secures the door at three points. The top and bottom frames are engaged with 3/8 inch (9.5 mm) steel rods, and a 1/8 inch (3 mm) thick center latch engages at the side. Double door configurations shall consist of a left hinged door secured its full length by the right hinged door when latched.

Handle assembly shall be secured to door using a threaded lock nut to facilitate adjustment and removal for repair if necessary. Welded handle assemblies shall not be accepted.

Optional Single Point Latching: 24 inch wide single door only. Recessed handle with integral pull and 11 gauge steel hasp welded to locker frame.

Optional Multiple Point Latching: 24 inch wide single door only. Recess finger-lift control handle in door, positive automatic type latching, whereby locker may be locked when open, then closed without unlocking.

Duty Locker Models

Same as Knockdown Gear model above except as noted below:

2.03 HEAVY DUTY LOCKERS

Sides: 16 gauge sheet steel, solid.

Tops and Bottoms: Three sides formed 90 degrees, the front offset formed to be flush with horizontal frame member. Tops accept a single gang duplex receptacle and are ventilated with a pattern of 1 inch x 1/8 inch slots.

2.05 INTERIOR EQUIPMENT

Shelf: 16 gauge full width, located approximately 12 inches (304.8 mm) below top of locker and perforated to promote movement of air.

Interior Divider: 16 gauge, with lockable compartment and additional side shelf.

Optional Drawer Base: Fully welded 14 gauge case with 16 gauge welded drawer insert and supported by ball bearing glides. Sides lanced to accept vertical dividers. Adds 18 inches to locker height when so equipped.

Patriot® Welded Build Turnout Locker Models

Same as Knockdown Turnout model above except as noted below:

2.06 FABRICATION

Lockers shall be pre-assembled of welded construction; all welds shall be free of burrs. No bolts, nuts or rivets shall be allowed in the assembly of main locker groups. Each locker group shall be securely welded into a one-piece structure.

Face Frame: 16 gauge formed in a channel shape with hemmed edge and integral with locker side.

Top: 16 gauge, integral with top horizontal face frame.

Channel Base: Notched and formed sheet suitable for anchoring to wood or concrete bases. Integral with locker bottom; adds 4 inches to the overall height of locker.

Gear Locker Models

Same as Knockdown Gear lockers above with the following substitutions and additions:

2.06 FABRICATION

Lockers shall be pre-assembled of welded construction; all welds shall be free of burrs. No bolts, nuts or rivets shall be allowed in the assembly of main locker groups. Each locker group shall be securely welded into a one piece structure.

Door frames: 16 gauge formed in a channel shape with continuous vertical door strikes and integral with locker side.

Top: 16 gauge, integral with top horizontal door frame.

Channel Base: Notched and formed sheet suitable for anchoring to wood or concrete bases. Integral with locker bottom; adds 4 inches to the overall height of locker.

Duty Locker Models

Same as Patriot Duty Knockdown except as noted below:

2.03 HEAVY DUTY LOCKERS

Shelf: 16 gauge full width, located approximately 12 inches (304.8 mm) below top of locker and perforated to promote movement of air.

Interior Divider: 16 gauge, with lockable compartment and additional side shelf

Door Frames: 16 gauge, formed in a channel shape with continuous vertical door strikes and integral with locker side.

Tops: 16 gauge, integral with top horizontal door frame. Tops accept a single gang duplex receptacle and are ventilated with a pattern of 1 inch x 1/8 inch slots.

Optional Bases: **Channel Base:** Notched and formed sheet, suitable for anchoring to wood or concrete bases that adds 4 inches to locker height when so equipped, or **Drawer Base:** Fully welded 14 gauge case with 16 gauge welded drawer insert and supported by ball bearing glides. Sides lanced to accept vertical dividers. Adds 18 inches to locker height when so equipped.

2.06 FABRICATION

Lockers shall be pre-assembled of welded construction; all welds shall be free of burrs. No bolts, nuts or rivets shall be allowed in the assembly of main locker groups. Each locker group shall be securely welded into a one-piece structure.

Full MasterFormat Specifications can be found on pencoproducts.com.

Defiant™ II Single Point Latch (SPL)

When specifying Guardian, All-Welded, Invincible II, Angle Iron or Patriot® lockers with Defiant II Single Point Latch doors, substitute the following specifications for the "Door Handle & Latching ..." section referring to 1-tier to 3-tier doors.

Doors: All doors shall be formed from 14 gauge steel. Formations shall be channel shape on the hinge and latch sides, and right angle formations across the top and bottom. Top and bottom flanges shall have one 90 degree bend. The latch side formation shall include a slot to fully engage an additional anti-pry lug integral with the padlock hasp limiting motion in any direction. On doors measuring 12" through 18" wide, additional reinforcement shall be in the form of a vertical 18 gauge pan measuring 3-1/2" wide MIG-welded to the top and bottom flanges and hinge side channel, with an additional 1/2" flange spot welded a maximum of 8" on center to the door skin to maximize door rigidity. Doors measuring more than 18" wide shall be reinforced using a 20 gauge horizontal box pan MIG-welded a maximum of 8" on center to the hinge and latch side channels, and spot welded to the door skin a maximum of 8" on center along the upper and lower pan edge for optimum strength, quiet operation and stiffness. Door shall be manufactured to allow ventilation and stiffness.

Hinge: 16 gauge continuous hinges (full length of the door) are welded to the door and riveted to the frame.

Door Handle & Latching 1, 2 & 3 Tier: Handles shall be recessed in the door. The formed pocket shall be brushed stainless steel securely fastened to the door with two lugs plus a positive tamper resistant fastener. The pocket shall be of sufficient depth to prevent a combination padlock, built-in combination lock or key lock from protruding beyond the face of the door. An anti-pry lock alignment bracket shall be supplied for use with built-in combination locks to facilitate installation, adjustment and to increase resistance to prying by mechanically engaging the hasp assembly. A lock hole cover plate shall be provided for use with padlocks. All pockets shall be 22 gauge drawn stainless steel for superior strength. Door pull shall be formed in the pocket. Pocket and pull shall be integral. Doors shall have a catch to retain unlocked doors in the closed position. Locking shall be accomplished by an 11 gauge lug welded to the locker frame. The lug shall include a surface for the bolt of a built-in combination or key lock to engage. A padlock staple shall protrude through the 22 gauge pocket. The hasp assembly shall include an additional lug that mechanically engages a slot on the latch side door formation preventing the spreading of the door from the frame channel. A separate bracket shall be field installed to brace the lock hasp assembly against the locker side to prevent twisting of the frame. Rubber door silencers shall be firmly attached to the locker frame.

Penco Products, Inc. reserves the right to vary specifications consistent with a policy of continuous product improvement.

Full MasterFormat Specifications can be found on pencoproducts.com.

Defiant II 1-tier lockers with built-in combination locks, finished end panels and custom flat tops.

The Single Point Alternative

- Greater tamper resistance
- Increased rigidity
- Improved Performance with built-in locks

The Defiant II Single Point Latch (SPL) option is for those desiring a heavy gauge door offering improved security with the low maintenance inherent in a door with no moving parts.

Each door has a patented deep drawn stainless steel pocket handle with an integral door pull. The doors can be locked with a conventional padlock, using the padlock staple protruding through the recessed handle (recommended) or with a built-in lock.

Doors are stiffened with either a vertical or horizontal pan, as shown at the right.

Doors that have any type of perforations including louvers will require the perforations/louvers to be modified from the standard patterns and sizes to allow for either type of pan to be used. Contact a Penco representative for details.



For KD Lockers



For Welded Lockers



Vertical Pan

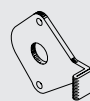


Horizontal Pan



Anti-Pry/Lock Alignment Bracket

Defeats prying attempts by capturing the door flange and preventing separation from the door channel.



Side Stiffener

This full-depth stiffener prevents frame channel and side-sheet torquing during break-in attempts. For use at left ends of 24 gauge Guardian K.D. bodies of 1 & 2 tier lockers with combination locks only.



Defiant II 2-tier All-Welded lockers with slope hoods, boxed finished end panels and custom bases & benches.



Rapid Response Duffel Locker™

PART 1 - GENERAL

1.01 SECTION INCLUDES

Heavy Duty Welded Lockers

1.02 REFERENCES

ADAAG - Americans with Disabilities Act, Accessibility Guidelines.

1.03 SUBMITTALS

Submit under provisions of Section 01 33 00. Shop Drawings shall show dimensioned plans, elevations, and sections.

1.04 DELIVERY, STORAGE, AND HANDLING

Store products in manufacturer's unopened packaging until ready for installation to protect the locker finish and adjacent surfaces from damage.

PART 2 - PRODUCTS

2.01 MANUFACTURER

Penco Products, Inc. or approved equal based upon ability to provide product compliant with specifications of the product selected. Provide only metal lockers fabricated in the United States by a single domestic manufacturer.

2.02 MATERIALS

Steel: All Penco standard lockers are constructed using prime grade mild cold-rolled sheet steel free from surface imperfection meeting ASTM A1008 and capable of taking a high-grade enamel powder coat finish. Alternate material: Sheet steel components shall be fabricated using zinc-coated steel meeting ASTM A879 and finished in the same manner.

Greenguard: Lockers shall be GREENGUARD Gold Certified by UL Environment through the GREENGUARD Certification Program.

2.03 HEAVY DUTY PERSONAL DUFFEL LOCKERS

Acceptable Product: Penco Rapid Response Duffel Knocked Down Locker. Tops, Bottoms, and Sides shall be fabricated from 16 gauge and backs from 18 gauge sheet steel. Locker doors shall be 14 gauge.

Door Frame: Channel shape, not less than 16 gauge steel. Provide vertical door frame members with additional 3/8 inch (9.5 mm) flange as a continuous door strike. Intermediate cross frame members are standard on double and triple tier lockers.

Multi-Point Latch Doors: One piece sheet steel with full channel formation of adequate depth to fully conceal lock bar on lock side, channel formation on hinge

side, right angle formations across top and bottom, with holes for attaching number plates. Doors over 15 inches wide by 60 inches or 72 inches high will include a 3 inch wide 20 gauge full height reinforcing pan welded to inside face of door at 6 inch centers.

Ventilation: Standard Ventilation: 3/4 inch (19 mm) wide by 1-1/2 inch (38 mm) high diamond-shaped perforations on doors and sides. Optional 6 inch (152.4 mm) wide by 3/4" high (19.05 mm) high horizontal louvers or solid.

Hinges: Continuous type: 16 gauge piano hinge measuring full height of door. Welded to door and attached to locker frame using steel rivets.

2.04 DOOR HANDLES AND LATCHING

Two, Three and Four Tier Lockers: Cremone Latching: Handle shall be a heavy duty turn handle that engages the door frame on three sides. The top and bottom frames are engaged with 3/8 inch (9.5 mm) steel rods, and a 1/8 inch (3 mm) thick center latch engages at the side. Double door configurations shall consist of a left hinged door secured its full length by the right hinged door when latched. Handle assembly shall be secured to door using a threaded lock nut to facilitate adjustment and removal for repair if necessary. Welded handle assemblies shall not be accepted. Double door configurations delivered knocked down will have doors shipped separately for attachment on site using supplied hardware.

Locking Device: Positive, automatic type, whereby locker may be locked when open, then closed without unlocking. Firmly secure one rubber silencer in frame at each latch hook.

2.05 FABRICATION

Fabrication shall be on the unit principle, each locker with individual door and frame, individual top, bottom, back, and shelves, with common intermediate divisions separating compartments.

Finish: High quality powder coat paint finish applied in strict adherence to paint manufacturer's specifications to provide optimum appearance and performance. Finishes releasing VOCs are not acceptable. Standard coating thickness is 1 mil dry film thickness minimum. Powder Coat Plus option increases thickness to 2 mil minimum. Colors as selected from manufacturer's standard colors. All locker body components shall match color of door and frame.

Alternative Finishes: Custom color match, Anti Graffiti, antimicrobial, TGIC and high performance finishes are available.

PART 3 - EXECUTION

3.01 EXAMINATION

Do not begin installation until substrates and bases have been properly prepared. If substrate and bases are the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 INSTALLATION

Install metal lockers and accessories at locations shown in accordance with manufacturer's instructions. Install lockers plumb, level, and square. Anchor lockers to floor and wall at intervals recommended by the manufacturer. Bolt adjoining locker units together to provide rigid installation.

3.03 ADJUSTING

Adjust doors and latches to operate without binding. Verify that latches are operating satisfactorily. Adjust built-in locks to prevent binding of dial or key and ensure smooth operation prior to substantial completion.

Touch-up with factory-supplied paint and repair or replace damaged products before substantial completion.

3.04 PROTECTION

Protect installed products until completion of project.

Penco Products, Inc. reserves the right to vary specifications consistent with a policy of continuous product improvement.

Full MasterFormat Specifications can be found on pencoproducts.com.



Steel Locker Accessories

Closed Bases: Provide 18 gauge closed metal front and end bases on knocked down lockers having legs. Front bases shall be installed between legs without overlap or exposed fasteners. Provide end bases on exposed ends. Bases shall be finished to match lockers.

Locks: (Specify lock brand if desired, location and locker type if appropriate.) All locks shall have bolt types appropriate to the mode of locker operations.

Built-In Flat Key Locks: Lockers shall be equipped with built-in flat key type locks. All locks shall be master keyed to the same series. Provide two (2) keys for each lock and two (2) master keys for the system.

Built-In Grooved Key Locks (Pin Tumbler): Lockers shall be equipped with built-in grooved key type locks. All locks shall be master keyed to the same series. Provide two (2) keys for each lock and two (2) master keys for the system.

Built-in Combination Locks: Lockers shall be equipped with built-in combination locks. Locks shall have three-number combination dialing and be capable of at least five different combination changes. Master key, combination change key, if required, and combination control charts shall be provided to the owner.

Padlocks-Combination Type: Master keyed combination type padlocks shall be provided for all locker doors. Locks shall have three-number combination dialing. Master key shall be provided to the owner.

Coin Operated Locks: (Certain locker types and sizes will not accept coin locks; verify with locker manufacturer). Coin operated locks shall be provided for lockers. Locks shall be (select one): Coin return/deposit type; Coin collect/pay type; Card Lock. Coin fee shall be (select one): Token; One (1) Quarter; Two (2) Quarters; Card Lock. Locks are to be installed on lockers using security-type machine screws.

Visual Perforation 16 Ga. & 18 Ga.: Locker doors shall be provided with 5/8" x 1-1/8" rectangular visual perforations.

Round Perforation: 24 gauge (Backs, Sides, Tops, Bottoms or Shelves) are to be punched with 1/2" diameter perforations grouped in 42 hole patterns. (For sides and backs, specify full perforations for maximum number of holes in the part, or standard perforations consisting of one group top and bottom in single-tier; one group each compartment in double-tier or box lockers).

Fire Extinguisher Door: Lockers designated on drawings to contain fire extinguisher shall be double tier type with upper door to have a glazed opening. Locks are to be omitted on fire extinguisher doors.

Waste Bin Doors: Lockers designated on drawings to contain waste bins shall be provided with a door cut-out with a top hinged internal flap door over the cut-out. Locks are to be omitted on waste bin doors.

Center Partitions: Lockers shall have 24 gauge, full depth, vertical partitions between bottom and shelf.

Recess Trim: Vertical and/or horizontal recessed trim shall be provided where shown. Trim shall be formed from 18 gauge sheet steel and have a 3" face dimension. Trim shall be furnished in standard lengths as long as practical and attached to lockers with concealed clips. Finish caps and splices shall be provided as required. Trim shall be finished to match lockers.

Zee Bases: Knocked down lockers shall be furnished with 4" high or 6" high 14 gauge zee base flanged outward at top for support of lockers and inward at bottom for anchoring to the floor. Not for use for Stadium and Welded Lockers.

Front Filler: Fillers for spaces between lockers or between lockers and a wall shall be fabricated from 20 gauge sheet steel and formed in an angle shape. Slip joint angles shall be 20 gauge sheet steel formed in an angle shape with a slot on one leg to form a pocket which provides adjustable mating with the angle filler. Attachment shall be by means of concealed fasteners. Fillers shall be finished to match lockers.

Exposed Locker Sides: Shall be furnished in 16 gauge without any extra holes.

Boxed Finished End Panels: Boxed finished end panels shall be installed on all exposed ends of lockers. They shall be formed from minimum 16 gauge sheet steel to match locker depth and height, and shall have a 1" edge dimension. All panels shall be installed with concealed fasteners. Panels shall be finished to match lockers.

Continuous Slope Hood: Lockers shall be provided with continuous slope hoods formed from 18 gauge sheet steel with a slope that has a rise equal to 1/3 of the locker depth (18-1/2"), plus a 1" vertical rise at the front. Tops shall be provided in lengths as long as practical. Provide slip joints without visible fasteners at splice locations. Necessary end closures shall be provided. Tops shall be finished to match lockers.

Unit Slope Tops Vanguard and Guardian Lockers: Lockers shall be provided with 24 gauge individual sloping tops. Tops shall be formed to a slope which rises 1/3 of the locker depth. Tops shall be finished to match lockers.

Benches: Locker benches shall be laminated selected hardwood, 1-1/4" full finished thickness. All corners are to be rounded and sanded. Surfaces shall be finished with two coats of clear lacquer. Bench tops are to be 9-1/2" wide and furnished in lengths of 3' through 12' (even foot increments).

Heavy Duty Bench Pedestal: Pedestals shall consist of steel tubing with 11 gauge steel flanges welded to each end. The overall height of pedestal shall be 16-1/4". Pedestals are to be finished to match the lockers.

Stainless Steel Free Standing Bench Pedestal: Shall be 2" diameter brushed 16 ga. stainless steel formed into a trapezoid. Bottom shall be 14" wide with two 5/16" diameter holes. Pedestal shall be 16-1/4" high for an overall bench height of 17-1/2". Top flange shall have four 5/16" diameter holes for fastening to the bench. Bench can be moveable or may be anchored.

Wire Basket Racks

Shelving: Shelving units shall consist of 1" x 1" x 13 gauge angle posts punched for bolting shelves. Sway braces of 12 gauge steel shall be provided for the back and sides of the unit. Shelves shall be 20 gauge formed with downturned flanges at the back to act as a backstops.

Dividers: Dividers shall be 20 gauge, 3" in height with an attaching flange formed at right angles. Dividers are bolted to shelves.

Padlock Attachment: A padlock staple attachment shall be provided at the front edge of each shelf located to match the locking loop formed in the basket rim.

Casters (option): Mobility casters shall be 3" diameter, swivel-type bolted to each corner post.

Number Plates: Numbering shall consist of Penco standard aluminum number plates pop riveted to shelf face at each basket opening, and on the front of the basket.

Baskets: Baskets shall be (select size) 12" x 13" x 8" or 9" x 13" x 8" of (select type) all wire or wire mesh or perforated steel front type.

Pilfer Guards (option): Provide a sheet steel pilfer guard designed for field attachment to the top of the basket to cover the first 3" of depth.

Finish: Finish on baskets and pilfer guards consists of electroplating with bright zinc chromate. Basket rack posts, shelves and braces to be finished in color selected from manufacturer's standard colors.

Penco Products, Inc. reserves the right to vary specifications consistent with a policy of continuous product improvement.



ADA / Environmental

Americans with Disabilities Act Information (ADA)

Penco lockers commonly accepted for ADA or barrier-free assignments are single tier and double-tier (lower tier only) when equipped with the Classic III recessed handle with multi-point latching: Vanguard, Guardian, Invincible II, All-Welded and Angle Iron (with available modifications). Other handle types and certain lock selections may not be recognized as ADA compliant without modification.

Single tier 60" or 72" high lockers with the Classic III recessed multi-point latch handles must have shelves relocated and/or added to accommodate ADAAG mandated reach ranges. Two tier 36" high openings with the Classic III recessed handle may be used by designating the lower tier for ADA compliance. An extra shelf should be ordered to bring the lowest reach point within the prescribed ADAAG range based upon side or forward reach. Field drilling for these shelf locations on smaller



requirements is recommended. The owner or architect may also require a handicapped access sign be placed on the door.

Other handles and configurations may be specified, but these are the most appropriate based upon a literal interpretation. Attention should also be paid to the clear area

in front of the lockers to meet other separate but related guidelines. Contact your Penco Representative for assistance or go to www.access-board.gov to view the ADA Accessibility guidelines in full.



ADA locker can optionally be marked with a decal.



ADA locker has shelf at least 15 inches from floor.



GREENGUARD

All products manufactured by Penco Products are GREENGUARD Gold Certified through UL Environment's GREENGUARD Certification Program. This certification signifies that Penco's products are now in compliance with the stringent chemical emissions guidelines set by UL Environment.

Accredited courses are available to design professionals and fulfill credit requirements for AIA, GBCI, IDCEC. Contact a Penco Sales Manager for more information.

Environmental Information

- Based upon the most recent information from our source mills, the recycled content of our steel lockers can range from 25% to over 50%. Because the percentage of recycled content may vary from project to project based on a number of variables, please contact our offices for detailed information on your specific requirement.
- Powder coating drastically reduces waste through high efficiency application & recovery methods.
- Penco's powder coat paint contains no solvents and as a result releases no Volatile Organic Compounds (VOC's) normally associated with wet paint processes.
- Our packaging contains at least 20% post-consumer recycled content.
- Approximately 34% of the U.S. population lives within a 500 mile radius of our manufacturing facility, requiring less fuel to ship our products to many destinations.

Made in USA

Penco continues to manufacture every storage locker featured in this catalog in the United States. We believe that by capitalizing on the efficiency of our North Carolina plant as well as our experienced workforce and formidable buying power, we can remain the industry leader from right here at home.

With 375,000 square feet of manufacturing space and over 150,000 square feet at multiple QuickShip Distribution Centers throughout the United States, Penco is also able to deliver the industry's shortest lead times while reducing shipping time and mileage. This is the result of our company's ongoing commitment to delivering America's best storage solutions to both domestic and global marketplaces.



24 Brilliant Colors

054 Canvas	021 Gray Ash	028 Gray	073 Champagne	723 Light Putty	012 Tawny Tan	701 Spray Green	952 Turquoise Teal
055 Shamrock	812 Hunter Green	715 Lake Blue	826 Slate Blue	806 Marine Blue	052 Reflex Blue	822 Regal Blue	058 Nordic Purple
056 Sunburst	710 Sagebrush Yellow	720 Mandarin Orange	722 Patriot Red	767 Cardinal Red	736 Burgundy	848 January White	949 Jet Black

NOTE: Colors shown are as close to actual finishes as the printing process allows. Do not make your final color selection based on the color shade shown on this page. Penco Color Charts are available for a more accurate color match. Exposure to high humidity, chlorine salts, abrasive cleaners, germicidal cleaners and acids can damage the finish and will void the guarantee. For outdoor applications or other harsh environmental conditions, contact your Penco Representative.



Standard Colors

To assure rust resistance and paint adhesion, all Penco steel products receive a state of the art pre-paint conditioning that includes a thorough cleansing by a hot spray washing process, then a specially formulated coating is applied creating a surface that resists corrosion and improves paint adhesion. Virtually all steel products are available in the 24 colors shown above.

All Penco parts are painted the same color, as standard. Two-tone color combinations are also available. Contact your Penco sales representative for complete information.

Standard Powder Coat Finish

Penco's standard 1 mil thick paint finish is perfect for most applications. The paint surface is tough and durable and offers a beautiful drip-free surface, excellent edge coverage and environmentally friendly application.

PowderCoatPlus™

PowderCoatPlus is an optional cost-effective way of improving the durability and rust resistance. After a specialized cleaning and pre-treatment of the steel, a 2 mil thick coating of powder coat enamel is applied and baked onto the steel surface.

X-Off™ Anti-Graffiti Paint

Penco's optional X-Off Anti-Graffiti Paint for lockers provides a surface coating that allows easy removal of graffiti with alcohol and water. This specially formulated paint has a tight molecular structure that completely seals the locker surface, preventing graffiti and corrosive agents from penetrating the finish.



Supplies needed:
99% isopropyl alcohol, water, cleaning cloths, eye and hand protection.



Hanging Garment Dispensers

Penco Products builds upon 50 years of experience in the design, fabrication and sales support of garment lockers through its acquisition of Steiner Systems, an industry trailblazer and leader. This experience, combined with Penco's long history of providing a full range of storage solutions, achieves an unmatched level of expertise to ensure a superior product and high level of customer support.

Our wide spectrum of professional garment distribution lockers includes hanging garment dispensers, folded garment dispensers, laundry lockups and towel and linen control centers. These robust products are designed and built to provide the end user with many years of uninterrupted service.

- Individual locker provides each user with a locked compartment for personal belongings including uniforms, equipment, supplies or tools
- Simultaneous access to all lockers by management is available through the master door
- All hardware is zinc plated and assembly rivets are rust-proof aluminum
- All Hanging Garment Lockers can be personalized with your company's logo. Ask your sales representative for more details.



4 Compartment

6 Compartment

8 Compartment

Big 8 Compartment

Sales Managers - Hygiene and Textile Rental Products

Sales Manager	Areas Served	Phone
Bob Brett, Northeast Regional Manager	CT, DC, DE, MA, MD, ME, NH, NJ, NY, OH, PA, RI, VT	215-375-2935
Tony Taylor, Southeast Regional Manager	AL, AR, FL, GA, KY, LA, MS, NC, TN, SC, VA, WV	770-331-0451
Mike Rochon, Central Regional Manager	IL, IN, IA, MI, MN, NE, ND, KS, MO, OK, SD, TX, WI	815-566-1691
Randy Polen, Western Regional Manager	AK, AZ, CA, CO, HI, ID, MT, NM, NV, OR, US, WA, WY	805-490-1551
Yves L'Esperance, Canada Regional Manager	CANADA	514-594-2354

Hanging Garment Dispensers

Description	Garment Gray Part #	Silver Vein Part #	Lock Type	Overall Dimensions	Compartment Dimensions	Door Dimensions	Wt. (lbs.)	Height
4 Compartment "2 Over 2"	LF-2/2-GRY-CAM	LF-2/2-SLV-CAM	Cam	23-15/16"W	11-1/2"W	9-1/4"W 35-9/16"H	158	Standard Height 80-13/16"
	LF-2/2-GRY-TRNB	LF-2/2-SLV-TRNB	Turn Knob	21-7/16"D	21-7/16"D			
	LF-2/2-GRY-COM	LF-2/2-SLV-COM	Combo	80-13/16"H	35-11/16"H			
6 Compartment	LF-6C-GRY-CAM	LF-6C-SLV-CAM	Cam	23-15/16"W	7-10/16"W	6-5/16"W 35-9/16"H	158	Heights With Accessories With Base: 85"
	LF-6C-GRY-TRNB	LF-6C-SLV-TRNB	Turn Knob	21-7/16"D	21-7/16"D			
	LF-6C-GRY-COM	LF-6C-SLV-COM	Combo	80-13/16"H	35-11/16"H			
8 Compartment	LF-8C-GRY-CAM	LF-8C-SLV-CAM	Cam	23-15/16"W	5-3/4"W	4-3/4"W 35-9/16"H	158	With Slope Top: 87"
	LF-8C-GRY-TRNB	LF-8C-SLV-TRNB	Turn Knob	21-7/16"D	21-7/16"D			
	LF-8C-GRY-COM	LF-8C-SLV-COM	Combo	80-13/16"H	35-11/16"H			
Big 8 Compartment	LF-BG8-GRY-CAM	LF-BG8-SLV-CAM	Cam	30-19/32"W	7-1/2"W	6-5/16"W 35-9/16"H	163	With Base & Slope Top: 91"
	LF-BG8-GRY-TRNB	LF-BG8-SLV-TRNB	Turn Knob	21-7/16"D	21-7/16"D			
	LF-BG8-GRY-COM	LF-BG8-SLV-COM	Combo	80-13/16"H	35-11/16"H			

Folded Garment Dispensers & Laundry Lockups



9 Compartment

10 Compartment

16 Compartment

Laundry Lockups

Description	Garment Gray Part #	Silver Vein Part #	Laundry Lockup Dimensions	Swing Door Dimensions	Wt. (lbs.)
Maxi Laundry Lockup	LF-LDM-GRY	LF-LDM-SLV	23-15/16"W 21-7/16"D 80-13/16"H	21-11/16"W 12-1/2"H	105
Standard Laundry Lockup	LF-LDS-GRY	LF-LDS-SLV	16-1/4"W 21-7/16"D 80-13/16"H	13-3/4"W 12-1/2"H	78
Mini Laundry Lockup	10200-GRAY	10200-SLVN	16-1/2"W 16"D 39-1/4"H	11"W 8-3/4"H	35

Laundry Lockups

- Choose from three sizes: mini, standard and maxi Laundry Lockups
- Holds between 35 and 140 plus pounds of soiled products
- Provides security of soiled merchandise
- Prevents theft and misuse of secured merchandise
- Reduces fire and sanitation hazards

Folded Garment Dispensers

Description	Garment Gray Part #	Silver Vein Part #	Lock Type	Overall Dimensions	Door Dimensions	Wt. (lbs.)
9 Compartment	13100-GRAY	N/A	Cam	24"W 16"D 80"H	19-1/2"W 8"H	122
	13700-GRAY	N/A	Turn Knob			
10 Compartment	12100-GRAY	N/A	Cam	16-1/2"W 16"D 77-1/2"H	12"W 7"H	100
	12700-GRAY	N/A	Turn Knob			
	N/A	12200-SLVN	Padlock Attachment			
	N/A	12300-SLVN	Combo			
16 Compartment	11100-GRAY	N/A	Cam	16-1/2"W 16"D 77-1/2"H	12"W 4-1/2"H	111
	11700-GRAY	N/A	Turn Knob			

Folded Garment Dispensers

- Individual locker gives the user their own locked compartment for personal belongings including uniforms, equipment, supplies, or tools
- Simultaneous access to all lockers by management is available through the master door
- Simply turn one key and open all locker compartments at once
- Penco folded garment lockers are furnished with standard cam locks or turn knobs



Maxi Laundry Lockup

Standard Laundry Lockup

Mini Laundry Lockup

Locks & Knobs



Cam Lock with 2 keys

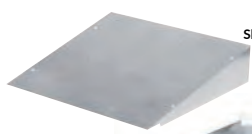


Master Keyed Combination Lock

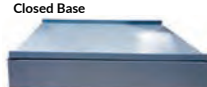


Turn Knob (padlock not included)

Optional Accessories



Slope Top



Closed Base



Open Base



Garment Gray



Silver Vein

Choice of two powder coated colors on most models.

Shelving Systems

pencoproducts.com | 800.562.1000

Solutions for Every Application

Penco Products has set the standard for quality and design in material handling products, systems and equipment. We have earned a reputation for well-built products, excellent engineering and attentive customer service. All shelving products are designed and constructed from structural steel components for optimum strength, rigidity and safety.

Commercial shelving systems and pallet storage racks are popular with warehousing and manufacturing applications, ranging from a few units to multi-tier installations.

Penco's Clipper® and Erectomatic® Shelving lines are each completely configurable and can be integrated seamlessly with other Penco product lines by our engineering department.

Both Clipper and Erectomatic shelving lines share the same shelf. Penco Hi-Performance® shelves are made with a box-beam construction that produces a high strength-to-weight ratio. Carrying capacities vary depending on whether a

medium duty, heavy duty or extra heavy duty shelf is used. Many sizes are available.

Shelving systems can be designed as "closed" installations with solid backs and welded side panels, or as "open" style structures that are held together with side and rear sway bracing.

All Penco Storage Systems are available with drawings that have been reviewed and approved by a structural engineer licensed in the state where the installation will take place.

Each engineered shelving system is custom designed to account for all the specific conditions such as building columns and door locations. Careful consideration is given to insure that they are designed to comply with structural requirements for the seismic zone where the project will be installed.



Corporate Information



The parent company of Penco Products and its affiliates is Industrial Manufacturing Company (IMC). IMC and its international arm, IMCI, are a proud family of companies that produce a wide variety of innovative products for industry.

With more than 3,500 direct employees and over 34 worldwide manufacturing, sales and distribution facilities, we provide tier-one products and services to some of the most demanding industries imaginable.

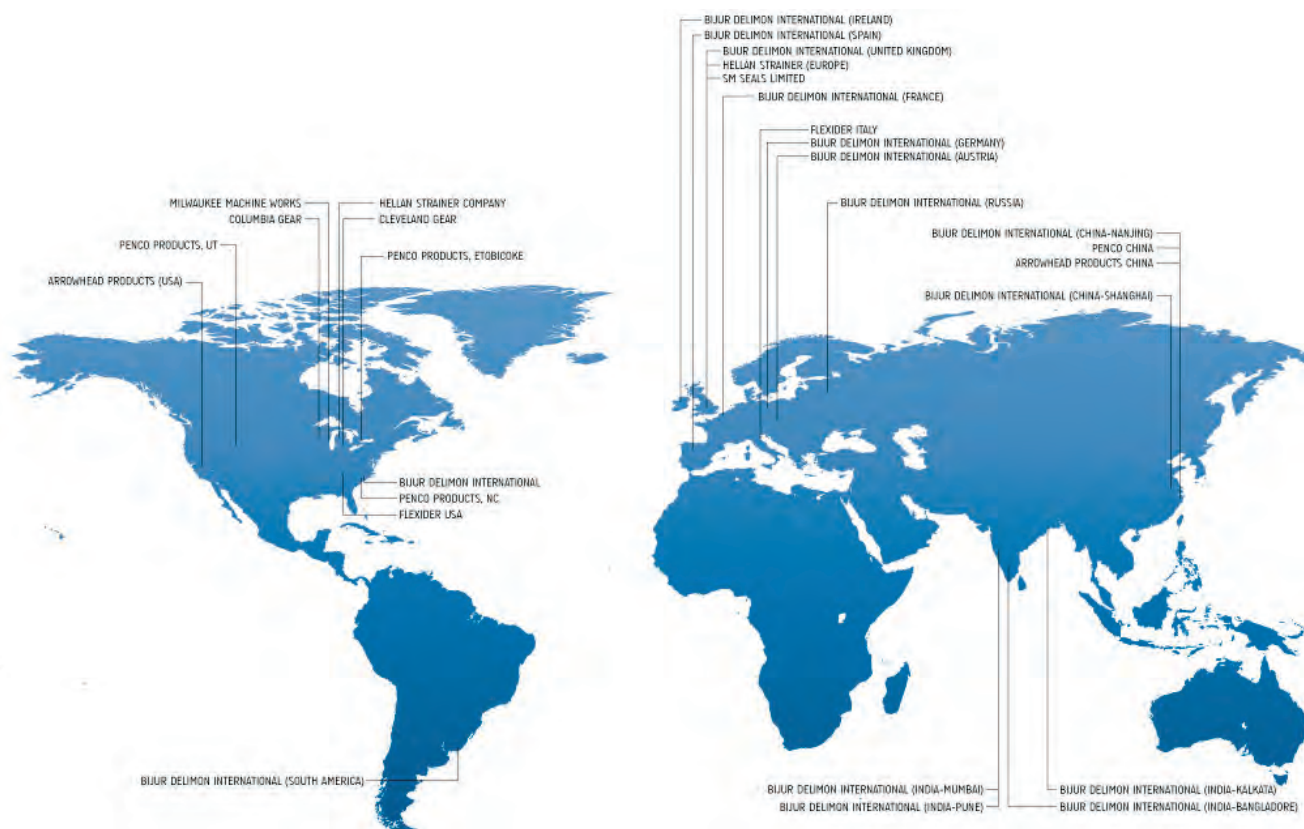
This vast diversity of global resources and networking infrastructure allows us to utilize the strengths of each company, learn from each other and create a technological advantage within each industry. Common to every associate in our family

of companies, is the profound respect for and the integrity of established industrial principles and practical openness to applications of new technology. With individual company histories spanning decades, and in two cases, more than a century, the IMC and IMCI companies are time-tested leaders in their national and global markets.



INDUSTRIAL MANUFACTURING
COMPANY INTERNATIONAL

www.mfgco.com



Your source for quality steel storage products and more!



Lockers

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Every customer's first choice to transform space into safe, secure and effective storage.

PENCO PRODUCTS, INC. | 1820 Stonehenge Drive, Greenville, NC 27858
800-562-1000 | Fax: 800-248-1555 | pencoproducts.com



Automated Inspection & Reporting
3D Scanning and Reverse Engineering

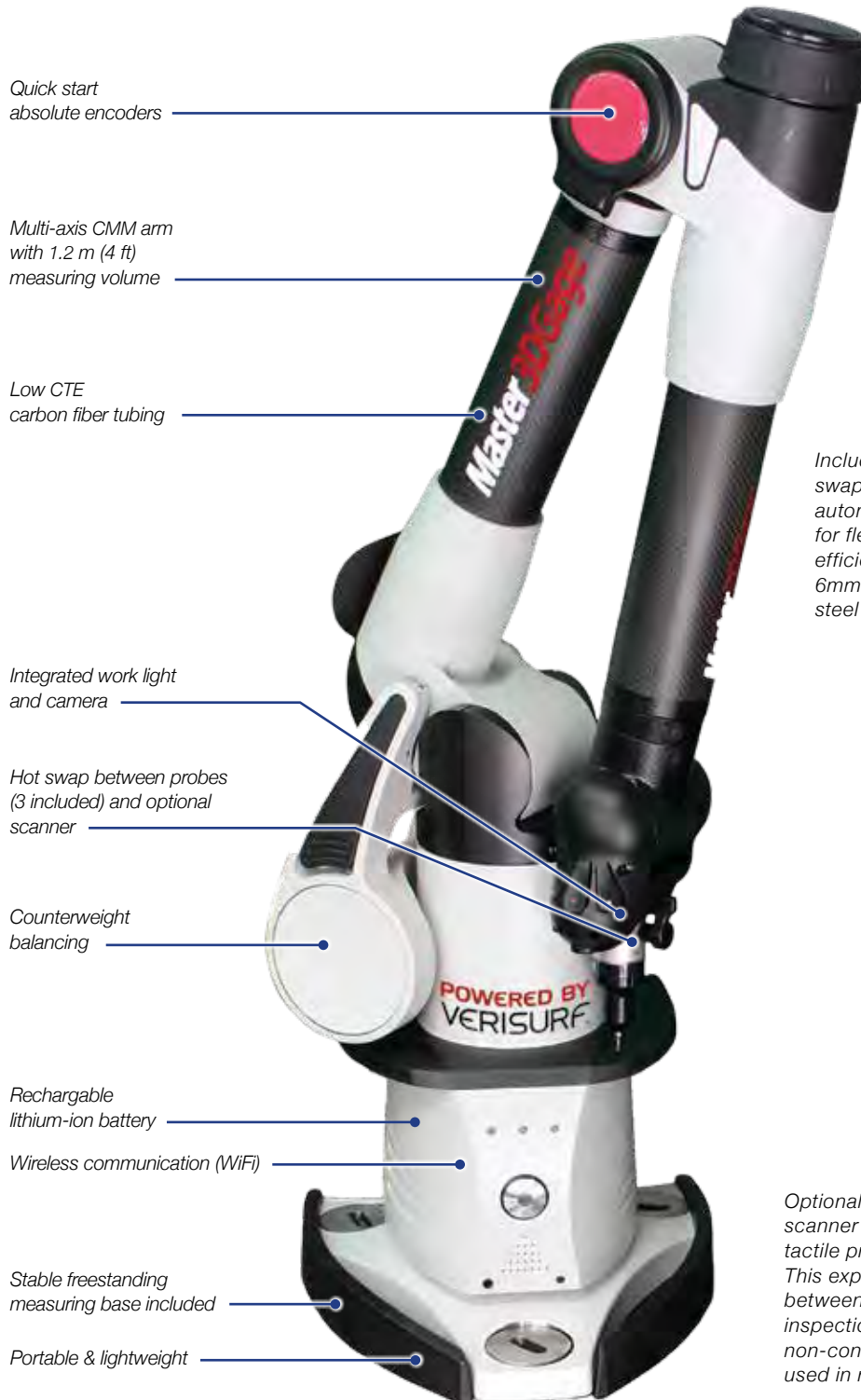
POWERED BY
VERISURF.

Reduce Scrap, Improve Quality, and Increase Productivity

The flexibility of Master3DGage™ makes it ideal for inspection and reverse engineering. The multi-axis CMM arm features absolute encoders for quick start-up and ultra-high precision measurements while its highly articulated wrist enables you to measure hard to access surfaces by reaching

around and under parts. The lightweight, wireless design makes it easy to place the Master3DGage right into your CNC machine while the magnetic base locks it into place on the machine bed to quickly inspect parts while maintaining critical part to machine alignment. Optional 3D scanner

and hot swappable probes with automatic probe recognition make it easy to change from scanning a complex profile to probing a small feature in seconds. Implementing Master3DGage in-process inspection identifies out-of-tolerance conditions sooner enabling immediate corrective action.



Quick start absolute encoders

Multi-axis CMM arm with 1.2 m (4 ft) measuring volume

Low CTE carbon fiber tubing

Integrated work light and camera

Hot swap between probes (3 included) and optional scanner

Counterweight balancing

Rechargeable lithium-ion battery

Wireless communication (WiFi)

Stable freestanding measuring base included

Portable & lightweight

POWERED BY VERISURF

The Master3DGage is powered by Verisurf Software, which is available in Solution Suites to configure the right functionality for your application and budget.



Includes three hot-swappable probes with automatic recognition for flexibility and efficiency: 3mm ruby; 6mm ruby; 15mm steel spherical.



Optional non-contact laser scanner is interchangeable with tactile probes on the Master3DGage. This expands application flexibility between contact probing used in many inspection processes and high-speed non-contact 3D scanning, typically used in reverse engineering.



Inspection and Reporting in Minutes

First article inspections that used to take hours now take just minutes using three easy steps.



Align Part to CAD Model



Inspect Part to CAD Datums



Report Part Deviations Compared to Nominal CAD

Scanning and Reverse Engineering

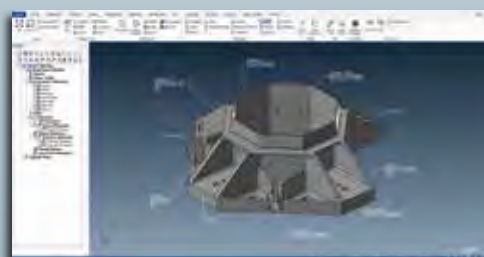
Software productivity features make scanning and reverse engineering fast and easy.



Scan Measurements to Point Cloud



Mesh Watertight Geometry



Model Intelligent 3D CAD

Hardware Specifications

PCMM Standard System

Portable measuring arm

- Master3DGage™ articulated arm PCMM
- 6-Axis 1.2m (4 ft.)
- Ergonomic counterweight design
- USB and power cables, Universal worldwide voltage 110V-240V, CE compliant
- Quick setup guide and mouse pad
- Calibration certificate

Standard probes (including case)

- 3mm ruby, 6mm ruby, 15mm steel spherical hard probes
- Quick disconnect, automatic probe identification

Certified qualification sphere

- Size $\pm 0.0005\text{mm}$ (0.00002 in.)
- Spherical within 0.0001mm (0.000005 in.)

Feature pack

Internal lithium-ion battery and WiFi

Magnetic base kit

Base anchor with 3 precision ground magnetic blocks

Anodized aluminum training part

Rugged wheeled transport case

1-year hardware warranty



Master3DGage™ training part

not to scale



Standard probes

PCMM Specifications

Calibration certificate

B89.4.22

Probing volumetric accuracy

$\pm 0.025\text{mm}$ (.00098 in.)

Probing point repeatability

0.014mm (.00055 in.)

Measuring volume

1.2m (4 ft.) with absolute encoders

Weight (system with transit case)

10.2 kg/22.49 lb. (33.5 kg/74 lb.)

Universal power supply

110-240 VAC, 50/60 Hz

Operating temperature

0° C to 50° C (32° F to 122° F)

Storage temperature

-30° C to 70° C (-22° F to 158° F)

Relative humidity

10% to 90% non-condensing

Transit case size

30.5 x 53.3 x 96.5cm (12 x 21 x 38 in.)



Hardware Options

PCMM Options

Short probe kit

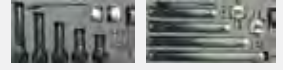
Long probe kit

Custom probes

NIST traceable length bar

Threaded stand adapter

1, 2 & 3-year extended warranties



Laser Scanner Option

3D laser scanner

Scanner cable

Calibration sphere

Rugged transport case



Laser Scanner Specifications

Accuracy	$\pm 40\mu\text{m}$ 2 sigma
Point acquisition rate	45,000 points/second
Points per line	750 @60Hz
Line rate	60Hz
Line width (mid-field)	80mm (3.1 in.)
Stand-off distance	135mm $\pm 45\text{mm}$ (5.3in. ± 1.8)
Minimum point spacing	0.08mm (.0031 in.)
Laser power adjustment	Semi-automatic
Probe/Scanner Mount	Hot swappable

Software Specifications

Verisurf Software

Coordinate Metrology Software

NIST Tested

PTB Certified

Windows 7, 8 and 10 Operating Systems

Modules

Verisurf software is available in Solution Suite configurations to deliver the right functionality for your application and budget.



Standard File Formats

Native CAD: Mastercam, SolidWorks, AutoCAD, Inventor, SpaceClaim, Solid Edge, Rhino 3D, KeyCreator, Cadkey, Alibre

Neutral CAD: STL, STEP, IGES, ACIS, Parasolid, VDA, HPGL

Optional File Formats

Native CAD: Native CAD: CATIA V4, V5, V6, PTC Creo, Siemens UG/NX

REVERSE Module: OBJ, PLY, Collada, ASCII, XYZ Cloud, XYZRGB Cloud

Report Formats

3D PDF, Excel, PowerPoint, Word, HTML, Text, Database

Master3DGage™
AFFORDABLE, PORTABLE CMM

Schedule a Demo Today

See a Master3DGage™ powered by Verisurf or to help configure and quote your ideal system.

www.verisurf.com/request-a-quote



Visit our YouTube channel

www.youtube.com/user/verisurfchannel

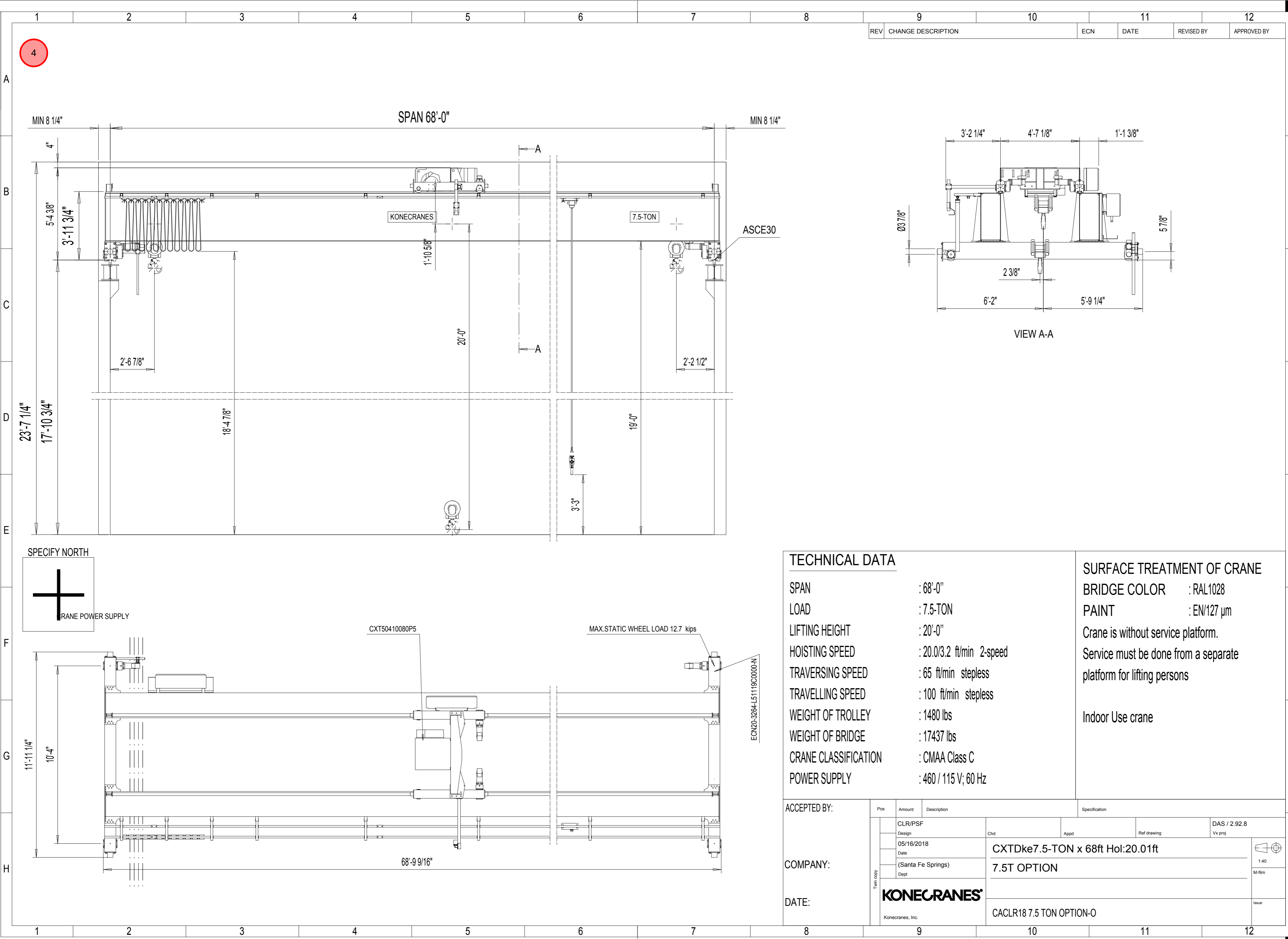


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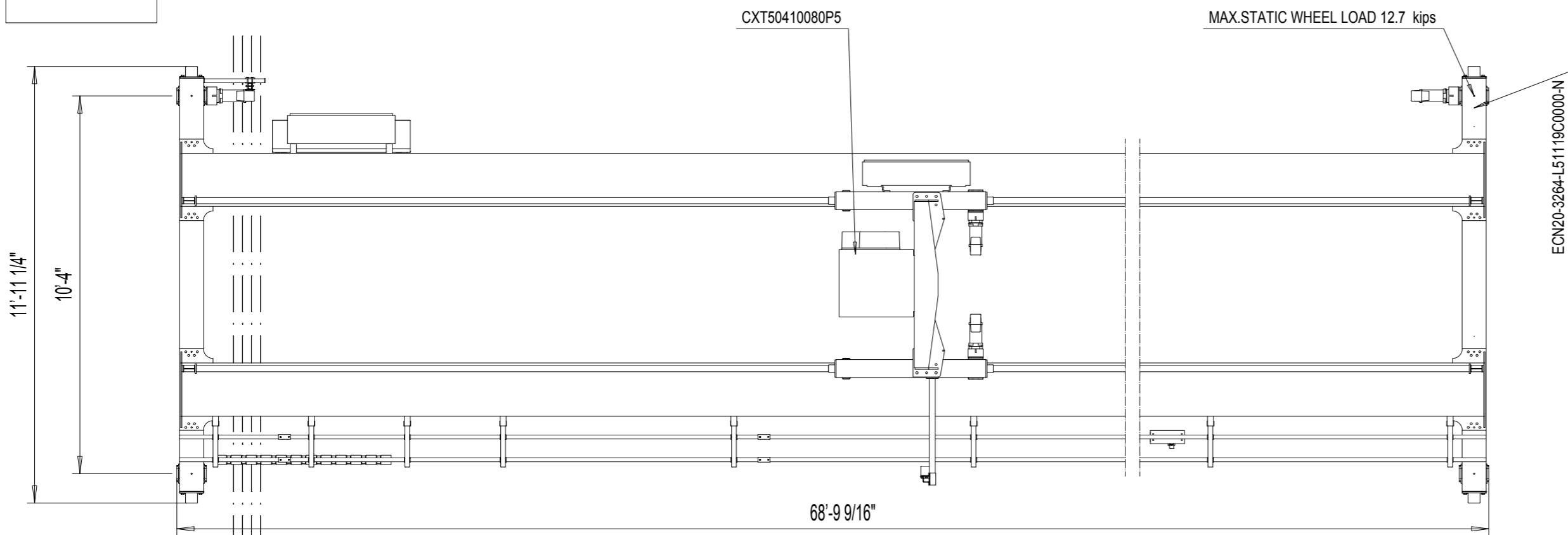
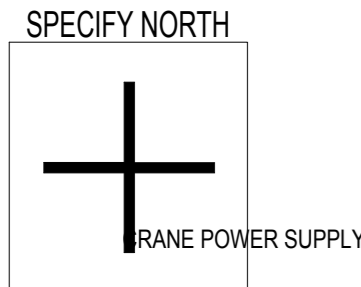
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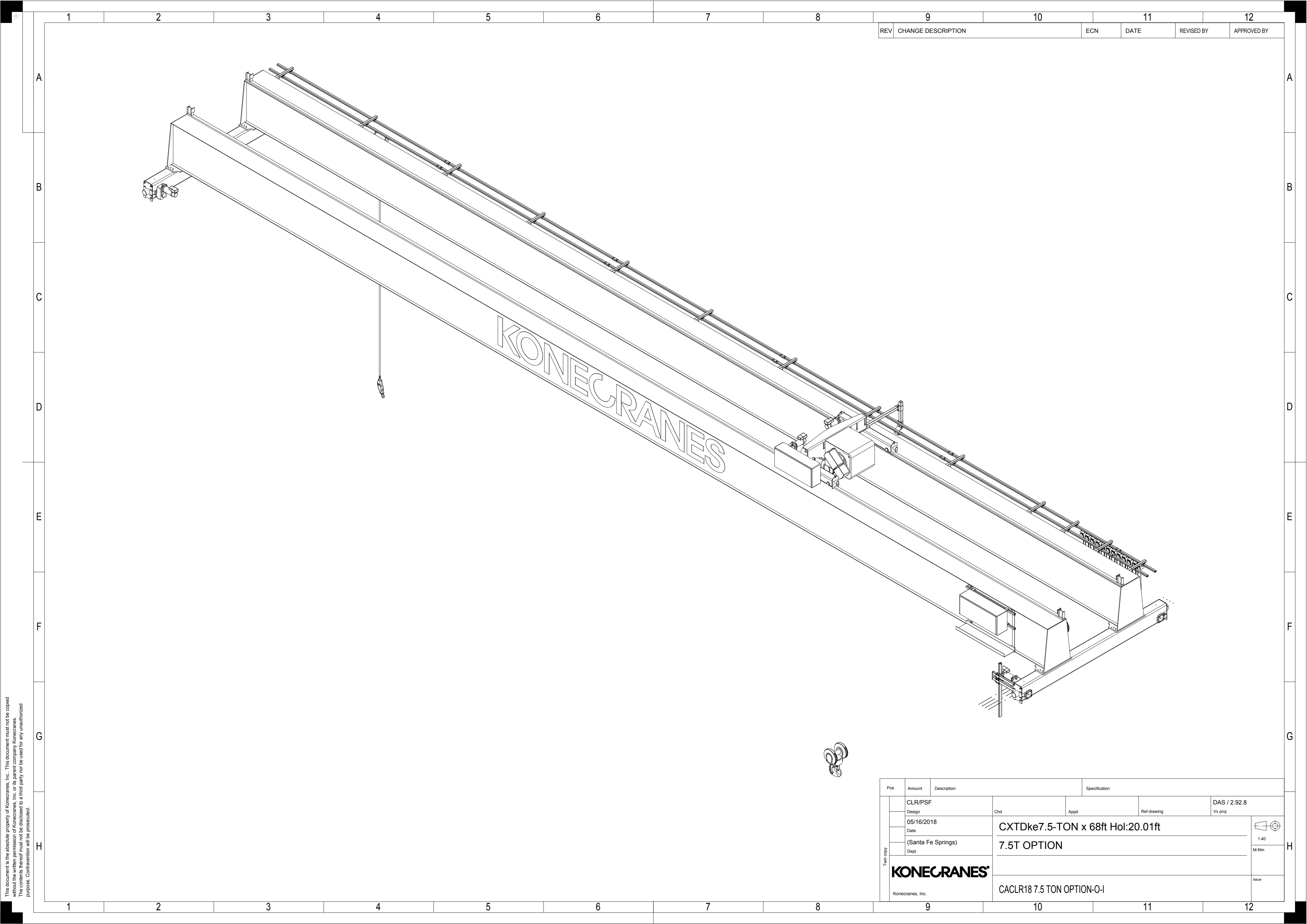
Authorized Master3DGage Reseller

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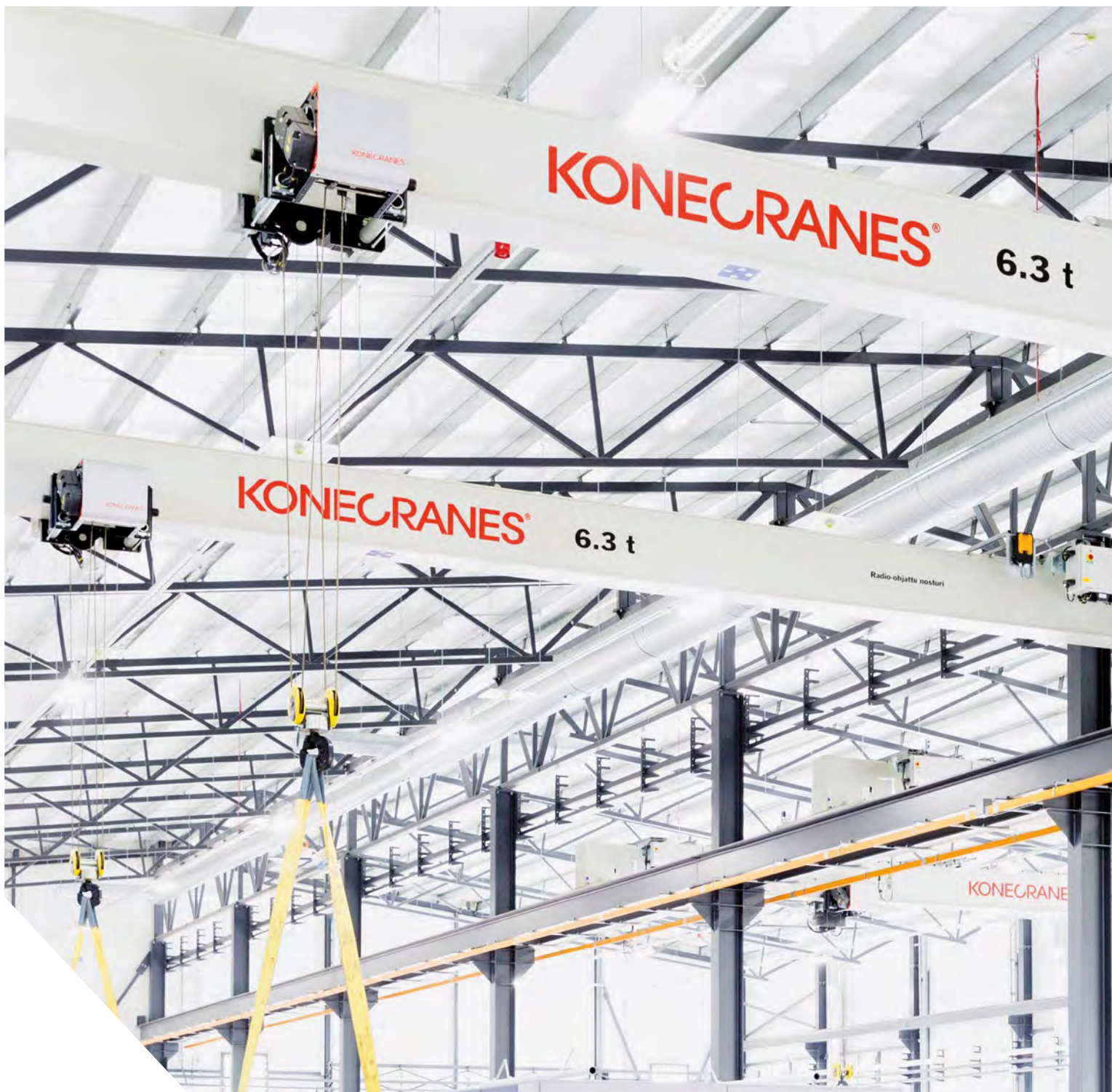
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PORT CRANES
HEAVY-DUTY LIFT TRUCKS
SERVICE
MACHINE TOOL SERVICE

CXT CRANE

KONECRANES®
Lifting Businesses™

CXT CRANE

LIFT, EVERY DAY.





RAISE YOUR LIFTING TO A NEW LEVEL

The Konecranes CXT is ideal for various industrial settings. This strong, long-lasting and multi-purpose crane is the industry leader in medium-heavy lifting indoor cranes. Over 10,000 CXT hoists are sold around the world every year, a number that proves its reliability, efficiency, and value.

WIDE PORTFOLIO

With specially-tailored girder designs and trolley configurations, the strong and reliable CXT can fit into all kinds of buildings and lift almost any kind of load, up to 80 tons.

TESTED THROUGHOUT THE PROCESSES

The goal of factory acceptance test (FAT) and site acceptance test (SAT) is to ensure your CXT works as it should and is as safe as it can be in use.

VAST VARIETY OF FEATURES

Whatever you want this crane to do, it has features that help you to do it faster, safer, and more reliably.

ROBUST DESIGN

The CXT crane maximizes the use of space around it, so it adjusts to you, and you don't have to adjust to it. It is also very long-lasting, so you have to replace the crane less frequently.

COMPONENTS DEVELOPED AND MADE IN-HOUSE

All the core components are designed and manufactured by us, so you know that every crane component is fully compatible and your equipment is reliable.

EXTENSIVE MAINTENANCE SERVICES

Preventive maintenance is essential to the health of your equipment. And TRUCONNECT gives you the benefits of the Industrial Internet by connecting data, machines and people.



ADVANCED TECHNOLOGY

Optimize your lifting and maintenance processes with industrial internet and one of the most advanced crane technology on the market today.

LIFT SAFELY AND PRODUCTIVELY

19 intelligent Smart Features are designed to improve safety and reduce load cycle times by giving you total control over material handling in your production process.

TRUCONNECT REMOTE SERVICE

TRUCONNECT® Remote Service connects data, machines and people to help businesses address potential maintenance and performance issues before these issues become critical and threaten employee safety, productivity and revenue.

EXPLORE MORE ABOUT
TRUCONNECT AND SEE SMART
FEATURES IN ACTION



bit.ly/lift-smart



EFFICIENT AND RELIABLE LIFTING

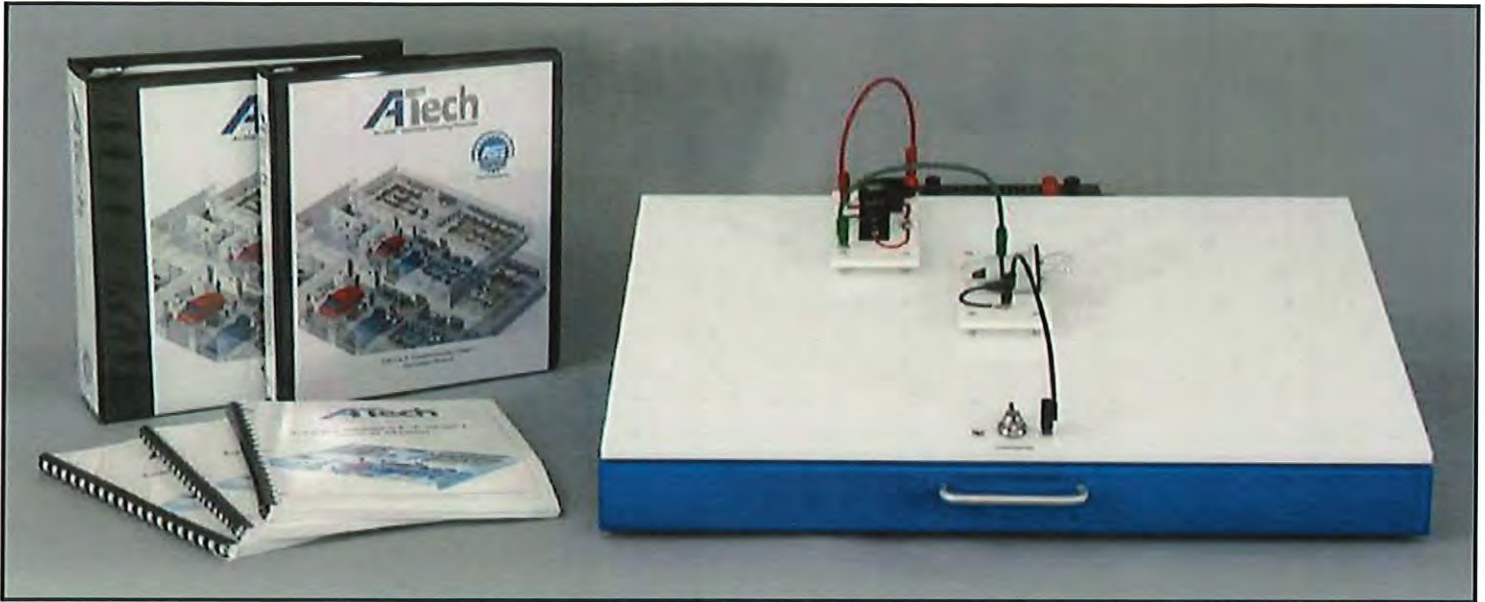
CXT crane has lifting capacity up to 80 tons. With various girder designs and trolley configurations it adapts to your specific lifting needs.

- Operates close to walls
- Maximizes lifting height
- Maximizes floor coverage

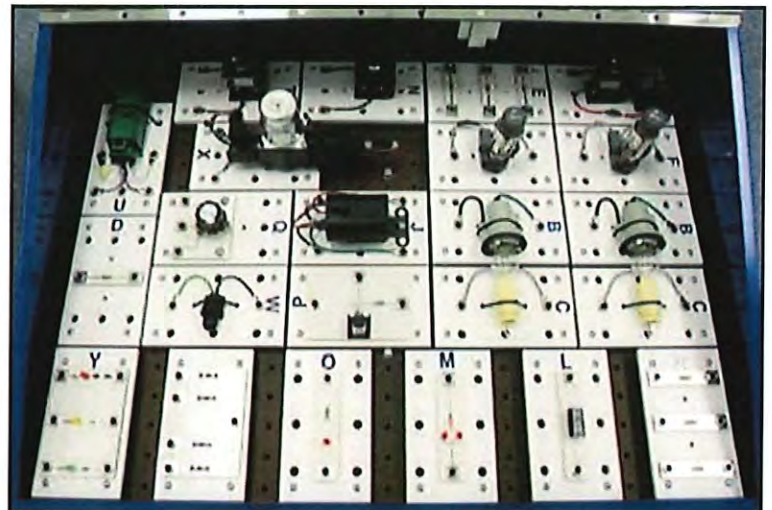


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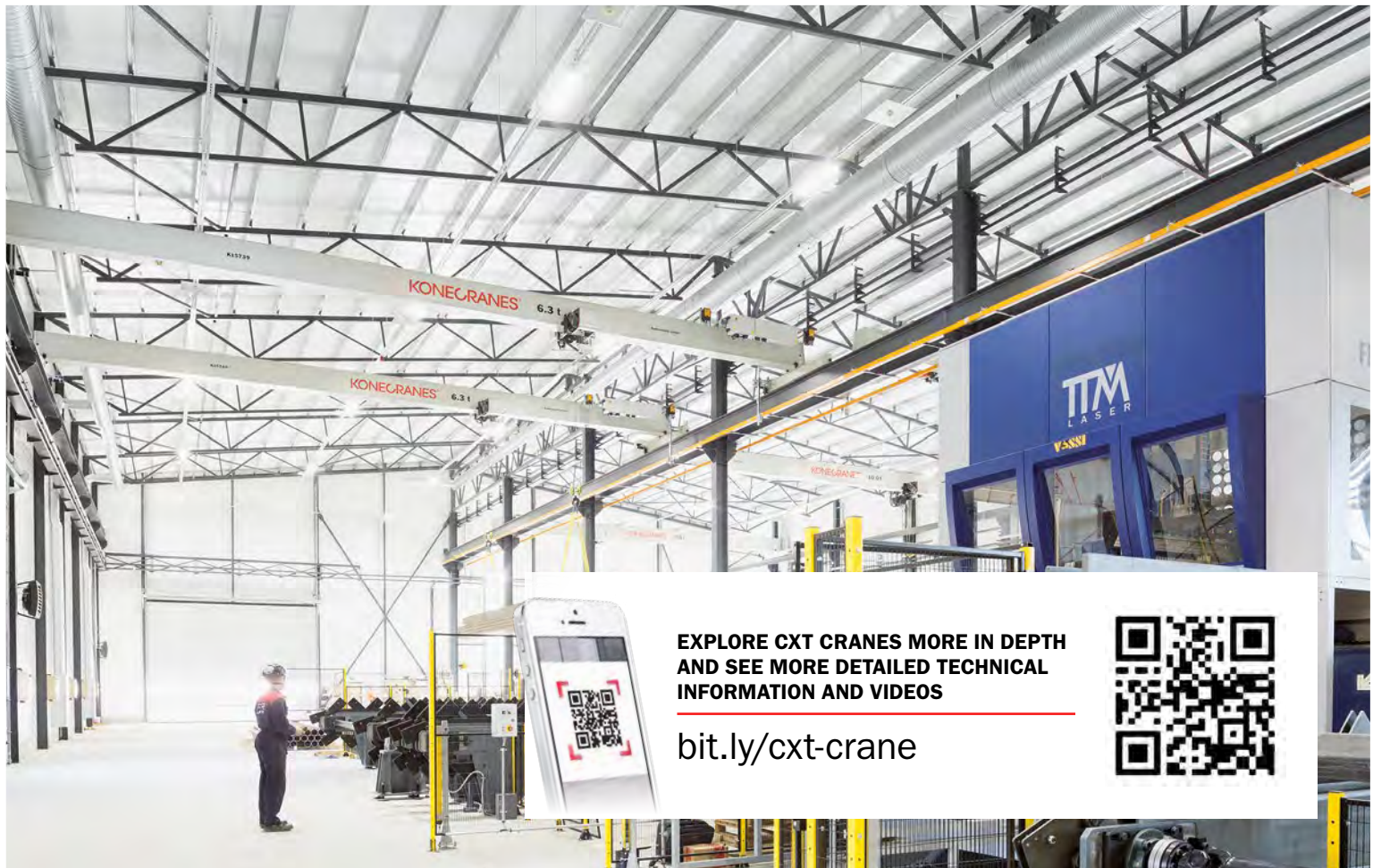


MACHINE
TOOL
SERVICE



Konecranes is a world-leading group of Lifting Businesses™ offering lifting equipment and services that improve productivity in a wide variety of industries. The company is listed on Nasdaq Helsinki Ltd (symbol: KCR1V). With approximately 12,000 employees at 600 locations in nearly 50 countries we have the resources, technology and determination to deliver on the promise of Lifting Businesses™.

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REDEFINING LASER ACCURACY

Product Catalog

Wheel Alignment | Elevated Solutions
Axle Correction

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REDEFINING LASER ACCURACY

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Bee Line is the world's leading manufacturer of Wheel Alignment, On-truck Tire Balancing and Frame Correction Equipment for Heavy Duty Trucks and Trailers. Located in Bettendorf, Iowa USA, Bee Line designs, manufactures and sells a variety of cutting edge products while providing unparalleled training and customer service to its valuable clients around the world.

*With an absolute commitment to superior products, Bee Line utilizes the finest materials, advanced technologies and proven processes to deliver long-lasting, reliable performance. Bee Line applies the technology and expertise gained in the very demanding commercial vehicle maintenance industry to offer a full range of products to service every application. Bee Line offers the **ONLY COMPLETE Truck Alignment System** that allows you to accurately measure AND correct toe, caster, camber and KPI to assure optimum vehicle performance and driver handling.*

Bee Line built its exceptional reputation by producing state-of-the-art, quality equipment and innovating with every challenge. Continuous process improvement, providing the very best in testing, maintenance and alignment technology results in the innovative products which fulfill our ambitious standards. Our strategy continues to be a model for flexibility, emphasizing technological developments and problem solving to meet the ever-changing market conditions.

Leaders in Quality

Customers want to be confident that they are doing business with an organization that can meet or exceed their requirements in a timely manner. Because it is an internationally recognized quality management system, **ISO 9001:2008** certification gives Bee Line customers a reason to have that confidence. Our products guarantee the highest in precision and quality, resulting in the finest heavy duty workshop equipment on the market.



Leaders in Innovation

Being an innovation leader requires a highly qualified, skilled and inspired staff. Careful personnel planning, internal and external collaboration and on-going research ensures that industry standards are constantly surpassed. In-house design and assembly, along with an internal software development team and superior manufacturing capabilities, make Bee Line uniquely self-reliant.



100 Years Experience. Proven Results.



Leaders in Expertise

Before World War I, George L. Hunt invented and marketed many of the early tools for the maintenance and repair field. As the need for better methods of wheel alignment became necessary, the George L. Hunt Company began developing "on vehicle" wheel alignment and correction tools.

By early 1920, the first Frame Correction Machine was designed and built and in 1927, the company name was changed from the George L. Hunt Company to Bee Line Company. In 1979, Bee Line became a McLaughlin Company, thus continuing the tradition of product quality and customer service.

The introduction of superior Bee Line Systems for Wheel Alignment and Truck Frame Straightening led to world leadership in the commercial vehicle markets. This Bee Line equipment has enabled millions of trucks and trailers to return to the highway as safe, efficient and productive vehicles.

Today Bee Line applies the technology and expertise gained in the very demanding commercial vehicle industry to offer a full range of products to service commercial vehicles in over-the-road, off-road, military and specialty applications. By answering the needs of a changing industry for more than a century, Bee Line will continue to be the leader of the complete alignment market and the company setting the trends in the future.



Alignment Basics



Alignment Philosophy

Although Wheel Alignment is often overlooked on the preventative maintenance programs in the trucking industry, more importance is increasingly being placed on the cost savings and handling characteristics of routine complete alignments. Fleet executives are continually putting more emphasis on maintaining skilled drivers by performing alignments, which create considerable fuel and tire savings while improving drivability.

Studies continue to find that only setting the toe and tracking on vehicles is **not a complete solution**. Camber is recognized as a major contributor to tire wear and caster is a major contributor to suspension life and drivability.

Bee Line is a leading manufacturer of equipment that **MEASURES AND CORRECTS** caster and camber - resulting in **TOTAL** wheel alignment. The company manufactures heavy duty truck frame correction equipment in addition to the alignment equipment, thus providing a complete solution. While vehicles continue to get lower to the ground and axles continue to get stronger, Bee Line produces new products to keep up with these trends. Bee Line systems are designed to fit each shop's specific needs and expand to accommodate changing conditions.

ALIGNMENT BENEFITS

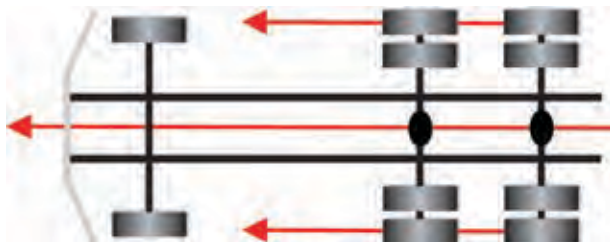
Proper wheel alignments result in:

- Increased tire performance – up to 30% – and even more miles.
- Decreased fuel consumption – 1 to 3% better fuel mileage.
- Improved drivability – increased driver satisfaction / less fatigue.
- Improved performance from suspension parts.

What Is Proper Alignment?

Positioning the interrelated angles of a front suspension and rear axle for maximum tire life, lower rolling resistance and ease of steering. Ideally, when a truck is traveling in a straight line, all of the axles are parallel – and perpendicular to the vehicle centerline – and all of the tires are rolling in a straight line too.

Alignment isn't just for tractor steer and drive tires – it's for trailer tandems too. Misaligned trailer axles will cause irregular wear on the trailer tires and the power unit tires.



Alignment Basics

Leading Wheel Alignment Factors



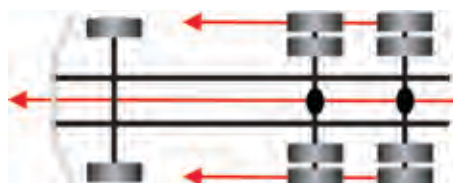
Wheel alignment is the positioning of the interrelated angles of a front suspension, rear axle or housing to give the maximum amount of tire life, steering ease, steering stability and increased life of suspension components. Improper wheel alignment results in excessive or irregular tire wear, hard steering, poor drivability and premature failure of suspension parts.

Several alignment factors must be considered in order to achieve proper wheel alignment. The top four factors are Toe, Tracking, Camber and Caster.

Toe and Tracking

Toe and tracking are the two most critical alignment settings for front end tire wear.

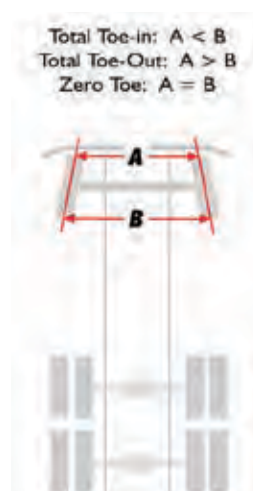
Bee Line gauging equipment incorporates lasers to measure for proper steer axle toe. Toe is adjustable to reduce tire wear and reduce (eliminate) shimmy (vibration) in the steering wheel. Excess or too little toe will make the front wheels fight each other, thus increasing wear. An out-of-toe condition leads to rapid inside or outside wear of steer tires. Tracking misalignment will also cause irregular tire wear in the steer tires. Tracking, or thrust, is gauged relative to the vehicle centerline.



The Bee Line method uses the chassis center line as a reference for optimum vehicle performance.



Tracking refers to rear axles. They must be parallel to each other and perpendicular to the center line. If not, the driver must compensate by holding the steering wheel off-center, causing rapid and irregular steer tire wear.

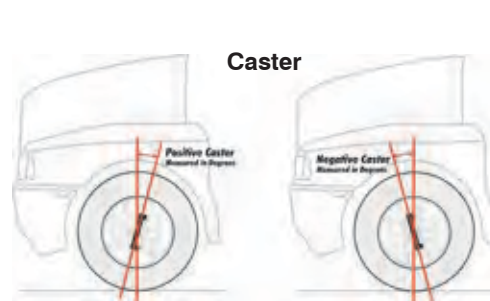
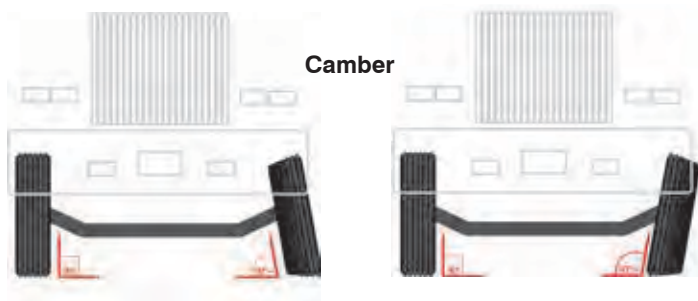


Toe refers to steer tires either pointing inward or outward.

Camber and Caster

Camber and Caster are the third and fourth most critical alignment settings for front end tire wear.

Camber is defined as the inward or outward tilt of the top of the wheel. It is important for several reasons; the main purpose of camber is to keep the tire flat on the road while the vehicle is loaded and in motion. If camber is excessive, it will create shoulder wear. Caster is the forward or rearward tilt of the king pin. Extreme caster settings can cause handling problems leading to driver fatigue.



Alignment Solutions

Total Vehicle Wheel Alignment



In the Heavy Duty Truck Alignment industry there are several concepts that establish accurate truck alignment to achieve maximum efficiency. Alignment equipment on the market today varies widely in areas of overall design, technology and the extent of capabilities. Inexpensive and basic systems may only use mechanical equipment that depends on technician interpretation to gauge some alignment angles. More expensive equipment may take only a few basic alignment measurements and then input the findings into a computer to analyze the alignment condition. Even some computerized alignment equipment still may only allow you to measure and adjust basic toe and tracking errors.

Bee Line recognized a long time ago that measurement and correction of all the major alignment angles is necessary to achieve maximum truck efficiency. **That is why Bee Line promotes the concept of "Total Vehicle Wheel Alignment" to extend tire life, maximize fuel efficiency and improve vehicle handling.**

Total Vehicle Wheel Alignment means measuring and correcting all alignment angles, not just toe and rear tracking. What good is it knowing the truck is out of alignment if you cannot correct the problems? This means not just correcting toe and/or rear tracking, but also **correcting camber and caster.**

TOTAL SOLUTION

"With the ability to correct toe, rear tracking, camber and caster, Bee Line offers the only heavy duty Total Vehicle Wheel Alignment Solution."



Advanced Aligner Runway System

The Bee Line Advanced Aligner Runway machine and our alignment tooling is designed to allow a shop to perform all necessary alignment corrections. The machine places the truck at a comfortable working height, either in a pit or above ground. It allows room to make adjustments not only to toe and tracking, but also camber and caster. There is no fixed beam or equipment in the way to hinder access or make it difficult to work on the vehicle.



Suspension Inspection

The first step in a professional alignment is to raise the vehicle and inspect the suspension for problems like damaged springs, worn king pins, loose bearings or worn steering linkage. Without raising the vehicle, these problems can go unnoticed and continue to cause tire wear and handling problems. Using a Bee Line alignment machine along with our heavy duty air jack allows you space to inspect the vehicle. Our popular Advanced Aligner Runway machine is available in a variety of lengths and widths from two sections to whatever meets your needs. Once on the runway, the heavy duty air jack is used to lift the front of the vehicle. Inspection, maintenance and runout can easily be performed.

Computer Alignment System

Bee Line's state-of-the-art computerized alignment system utilizes lasers, which are more accurate than manual or infrared sensors. The bright laser beams are highly visible and show any alignment errors on the vehicle. Bee Line lasers provide the most accurate alignment readings on the market today. While most systems only measure to one hundredths of an inch (0.01), Bee Line uses a system capable of measuring alignment variables to five thousandths of an inch (0.005).

All corrections and adjustments to a vehicle's alignment are done with a "live" reading. The readings for toe, rear tracking and camber are shown on the computer screen or a wireless Remote Display and reflect all changes as corrections are being made to ensure accuracy.

Calibration is built-in on Bee Line equipment. Calibration is an important part of any alignment system and should be done frequently to ensure accurate alignment readings. Bee Line's equipment has built in calibration capability and can be calibrated by the operator at any time in just a few minutes. There is **no long wait** between calibrations and **no extra expense** while waiting for an outside party to come and calibrate the equipment.



Built-in calibration capability minimizes downtime.

Axle Correction Tools

Complete alignment does not stop with a measuring system. Why take readings if they are not used? Improper camber causes tire wear and improper caster causes handling problems. To correct caster and camber on trucks, Bee Line developed the "Floating Beam System" and when used with the Bee Line AA machine, one technician can correct heavy duty truck axles right on the vehicle.

Bee Line's patented camber tooling can correct out of tolerance camber on all axle sizes and also correct caster due to axle twist. The floating beam system is designed to be easily attached to the vehicle axle for corrections and removed and placed out of the way when the correction is finished. Special Bee Line Spring Lift also allows easy removal and replacement of caster wedges.



To correct caster and camber on trucks, Bee Line developed the "Floating Beam System."

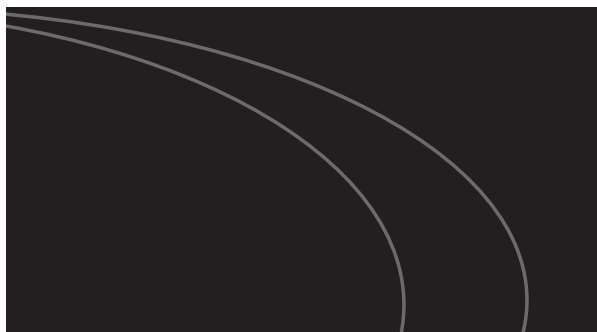
Rear Axle Aligner

Complete your total alignment system with a 22000 Rear Axle Aligner. For a vehicle to track properly, the rear axles must be perpendicular to the vehicle's centerline and parallel to each other. The Rear Axle Aligner is fast, accurate and easy to learn and use. A technician can set up the system and take all necessary measurements in less than five minutes. If adjustments are needed, they can be made with the Rear Axle Aligner in place, using it as a guide for the adjustment.



The Rear Axle Aligner is fast, accurate and easy to learn and use.

Laser Guided Alignment System



LC7500 Computer Alignment System

The LC7500 Laser Guided Computer Wheel Alignment System was developed to significantly lower your cost of performing alignments, increase productivity therefore improving profit potential.

Advanced features and functionality are based on extensive in-house research, a thorough understanding of user needs and invaluable suggestions and feedback received from our customers.

The LC7500 is unique to the industry because it gives the technician the ability to continually maintain the precision of most Bee Line alignment equipment. **The entire system can be calibrated in a few minutes right in your shop.** Exclusively through Bee Line, there is no downtime and no additional bills from service reps to maintain the accuracy of your alignment system.

Windows-based WindSpeed 7500 software has integrated **help videos and service manuals** that are uncomplicated and straightforward, making training simple. Several help videos appear in the help section that guide the user through the specific procedure. If more complex assistance is needed, Bee Line provides **remote diagnostics**. Our technology experts virtually access your machine from our headquarters to speed up diagnosis and offer a solution.

This system allows technicians to gauge toe, camber, caster, KPI and steering stops, as well as rear tracking on tractors and trailers when combined with the 22000 Rear Axle Aligner.

Using cutting edge technologies, Bee Line has engineered the LC7500 to provide the lowest cost of ownership of any system on the market today.

ALIGNMENT SOFTWARE



WINDSPEED7500
ALIGNMENT SOFTWARE



Interactive alignment heads are a "workstation" for the technician. Wireless up to 1,000 feet.

Redefining Laser Accuracy from the Inside Out

Free Software Updates

Minimize Downtime

- Bee Line Windows-based software works with any PC.

Increased Visibility

- An impressive 32" HD Monitor is easily visible at a greater distance.

Superior Design Maximizes Efficiency

- Technician becomes more productive
- Heads stored vertically to minimize risk of damage
- Stable cabinet prevents tipping
- Printer storage drawer built-in

Built-in Calibration

- fixtures and on-board help videos show the technician how to easily calibrate the equipment in the shop.

- No service call required.
- No additional cost.

On-Board Assist/Remote Access

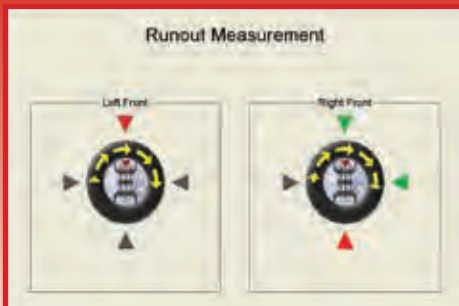
- F1 Help Section
- Training Videos
- Virtual Software Updates
- Minimizes Downtime and Costs

Improved Durability

- Fewer moving parts in the laser assembly reduces wear, loss of accuracy and the need for repair.

Accuracy

- More than 1800 sensors calculate the laser strike to an accuracy of 1/1000th of a degree.



When a step is illustrated on the computer monitor...



...the same step is displayed with live readings on the head.

Front End Alignment

LC7500 Series Features:

- LCD monitors built into wireless alignment heads with live readings save overall alignment time.
- Lasers instantly find optimum target on all target boards to ensure accurate and fast measurements.
- User friendly built-in system calibration fixture allows the user to calibrate system accuracy in minutes.
- Advanced steering wheel centering process applies the tracking calculation to the front toe, allowing the vehicle to be accurately aligned and the steering wheel centered on the first attempt.
- PC with Microsoft Windows based software, 32 inch monitor and color printer.
- Lightweight lithium ion batteries power unit for 10 hours of continuous use in each alignment head.
- Power-save feature automatically powers down alignment heads that are left on unintentionally.

Key Product Attributes 7500 Series

Each Bee Line gauging system within the 7500 Series share similar features, but are individually designed to meet specific needs. The products within the series include:

- LC7500
- LC7550
- LC7580

Superior design, smarter technology increases efficiency and speed

The LC7500 computer alignment system redefines laser accuracy from the inside, out. Technological refinements, such as advanced target board sensors and processors, allow for quicker calculations and more immediate, precise laser positioning than could previously be performed in your shop. The result: faster, more accurate alignment.

An impressive 32-inch TV monitor is more user-friendly than ever, with software screens that have been redesigned to maximize font size for ease of viewing and drop-down menus that are a snap to navigate. Pop-up reminders, help screens and help videos are available to assist those with questions. For mobile technicians, the WindSpeed 7500 software runs on a powerful laptop computer that obtains readings exactly like any other Bee Line computerized alignment system.

Unmatched productivity

Faster processing, extraordinary accuracy and increased speed all come together in the LC7500 Series to deliver the ultimate return on your investment by enhancing productivity. Users have performed at least one more alignment per day, generating additional revenue each week – all without adding more technicians or working overtime.

Front End Alignment

LC7550 & LC7580

LC7550 - Our Mobile Alignment laser guided computer alignment system features the acclaimed WindSpeed 7500 software running on a powerful Bee Line laptop computer.

Technicians obtain readings exactly like any other Bee Line computerized alignment system. WindSpeed 7500 instructs the technician through each step of the process and displays live readings during adjustments. The data for each alignment performed is saved to the hard drive and can be printed for each customer showing before-and-after results. Gyro equipped heads feature color LCD screens that guide the technician through the alignment process. Each head includes no seek lasers that dramatically speed up the gauging process.



LC7580 - Adaptability for ALL vehicles

The Bee Line LC7580 Laser computer wheel alignment system revolutionizes Bee Line four wheel alignment and allows your shop to align independent rear suspension vehicles, twin steer vehicles and everything in between. It is the ultimate Bee Line Alignment machine.

The LC7580 continues the excellence of laser accurate measurements up to 1/1000th of an inch by using a no-seek laser to instantly produce live measurements that are consistently repeatable. When making corrections, live readings guide the technician in achieving optimum alignment settings.

The LC7580 comes standard with four alignment heads that accurately and efficiently align all passenger vehicles. The LC7580 features Bee Line's WindSpeed 7500 Alignment software that accommodates alignments on commercial vehicles utilizing two LC7580 alignment heads and our optional proven 22000 Rear Axle Aligner. The result is one computer alignment system that can align any vehicle that comes into your shop.



Front End Alignment

Mechanical Gauges

Caster-Camber Gauges With 2-Dial Run-Out Eliminator

The Bee Line 18305 and 19305 gauges come complete with these great features:

- Bee Line Micrometer Dial, which has proven itself time and again in the industry as the most accurate and easy to read mechanical Caster-Camber gauge.
- Complete horizontal and vertical run-out compensation with exclusive two dial system eliminates any guesswork.
- The cam system locks easily and securely to bead, fellow or any other part of the rim or wheel.
- The reversible advancer will mount securely to the inside or the outside of the rim.
- Quality construction of lightweight durable materials ensure a long dependable life.

**Part No. 18305 Caster-Camber Gauge - Cars***

Fits car, light truck and SUV wheels from 12" through 18". These gauges are designed to fit most recessed or partially enclosed wheels such as those commonly found on mobile homes.

Part No. 19305 Caster-Camber Gauge - Trucks*

Comes complete with necessary foot extensions to fit truck wheels through 24".

**Part No. 18334 Calibration Bar - Need Qty of 1 for use with 18305 and 19305 Mechanical Caster Camber Gauges.*

**Part No. 2300 Toe-In Gauge**

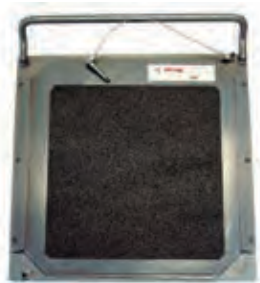
Model 2300 for trucks extends to a 96" (243.84 cm) width with adjustable legs that extend up to 17½" (44.45 cm) high.

**Part No. 1790 Tire Scribe Gauge**

To determine a precise reading of toe, manually use the tire scribe gauge and spin each of the front tires. The 1790 is spring loaded to easily scribe any size tire. It can also be used for checking wheel run-out.

Front End Alignment

Alignment Accessories



Part No. FPT7860 Rear Slip Plates

For a free sideways motion when making rear measurements and adjustments. Built with a triple row of steel roller bearings for a long life. These plates also have a convenient handle for easy positioning. The size of the Rear Slip Plate is 14" wide x 13 1/2" long.



Part No. FPT8000 Aluminum Portable Turn Plate

The free floating design of this portable turning aligner – complete with a convenient handle for easy positioning – allows wheels to be easily and smoothly maneuvered during the alignment process with help from heavy duty steel ball bearings positioned underneath the rust-resistant aluminum plate. The FPT8000 sits slightly higher than its successor with dimensions of 15 1/2" wide x 17" long x 2 1/8" high, and is rated to accept 10,000 pounds.



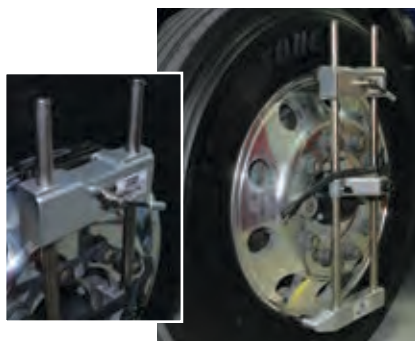
Part No. FPT8500 Steel Portable Turn Plate

Our most popular turning aligner's sleek steel topped design is our sturdiest yet, capable of accepting a substantial 10,000 pounds of weight. A convenient handle enables effortless positioning, and the free floating turning plate resting on steel ball bearings allows for superior wheel mobility during the alignment process. The FPT8500 model weighs 35 pounds per plate and, at 14 1/2" wide x 19" long x 1 5/8" high, sits closer to the ground for easier drive-on access.



Part No. FPT9500 Heavy Duty Turn Plate

The steel-topped portable Heavy Duty Turn Plate has the same unique king pin action as the full-sized turning aligner and allows a wide turning angle to accurately align steer tires. At 74 pounds per plate, the FPT9500 is designed to handle larger loads – up to 16,000 pounds. The Heavy Duty Turn Plate measures 24" wide x 18" long x 2 1/8" high and can be used on the floor or on the machine.



Part No. LC4101.1 Cam Advancer Wheel Mount

This wheel mount has a long history of reliability and functionality. The LC4101.1 converts rapidly from small to large rims for shops aligning a wide range of vehicles.

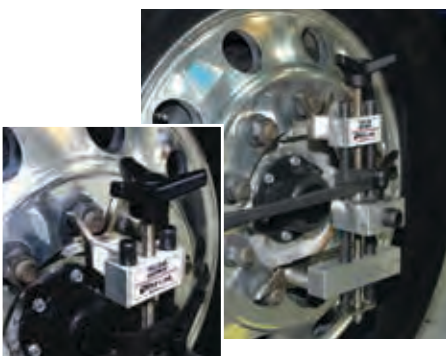
Front End Alignment

Alignment Accessories



Part No. LC4102.1 Self-Centering Wheel Mount

The LC4102.1 for heavy trucks (and the BLC250.1 Self Centering Wheel Mounts for automobiles) provides users with the self-centering capability. Self-centering mounts maintain the computer head balance to prevent the wheel and head from turning when lowering the vehicle. Wheel turning during lowering has the potential to damage the head and unfavorably affect the accuracy of the alignment. The BLC250.1 fits wheels with a rim diameter of 12" to 18" and the LC4102.1 fits wheels with a rim diameter of 17" to 29.5".



Part No. LC4195B.1 Center Mount Wheel Mount

Designed for use on truck wheels with a 10 hole pattern, the Bee Line LC4195B.1 holds standard Bee Line computer heads. The LC4195B.1 wheel mount clamps securely to the front wheel studs or nuts when axle hub extends through rim. The lower bracket pivots to produce true 3 point contact and holds securely during and after run-out, which facilitates a fast and accurate alignment.



Part No. Spring Seat Gauges

19020 Spring Seat Gauge

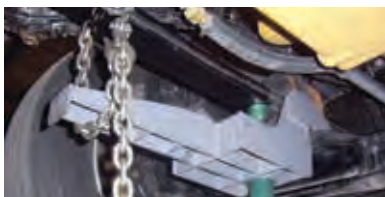
19020A Digital Spring Seat Gauge

Twisted spring seats can cause trucks to shimmy and/or wander and also cause damage to the truck springs. The Bee Line 19020A Digital Spring Seat Gauge is designed to measure the difference or amount of twist found between spring seats. If the axle is found to be twisted, the 405 or 406 floating beam systems can easily and accurately correct the problem. This gauge can also be used to measure caster wedges (Shims).



Part No. EPM715 Tread Depth Gauge

An optional Tread Depth Gauge allows technicians to measure tire wear for every tire on virtually every type of vehicle. The tire wear data is stored in WindSpeed 7500 Software and, if desired, tread depth measurements can also be taken as a stand-alone from an alignment.



Part No. 15000 Spring Lift

Used to safely install caster shims.
(10 ton ram not included)

Front End Alignment

Alignment Accessories

Part No. EPM720 Remote Display

The new Remote Display is simply a must-have tool for the LC7500 Computer Alignment System. Users have grown accustomed to the advantages of color LCD screens built into the Alignment Heads. The Remote Display puts those same advantages in a lightweight wireless package that a technician can use anywhere.

Part No. EPE261W Wireless Wall Charging Station

Bee Line offers the Wireless Wall Charging Station, which stores and recharges the wireless head and tube unit.

Part No. LC7060 Portable Case

As with any precision equipment, the transport of the alignment system components can be harder on the equipment than the actual use. This portable carrying case reduces the risk of damage and provides secure storage for our Gyro Alignment Heads, Wireless Radios, Charging Units and more.

Part No. Spindle Gauges

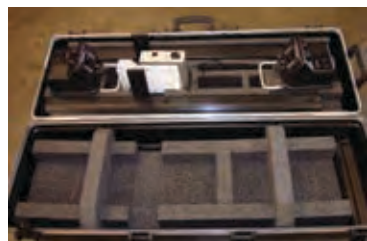
- 19356** Car
19358 Truck

Spindle Run-Out Gauges will detect bent spindles by detecting run-out of the bearing seats. Run-out is defined as the maximum change in the dial indicator from the initial zero position during one revolution of the gauge.

Part No. 7700 Floor Jack*

The 7700 can lift vehicles from any two separate points of contact along its 33-inch beam. This feature alone produces a far greater degree of safety than the conventional single point floor jack. An operator has the option to utilize different sized axle supports that slide to any position on the beam and guarantee the desired lift.

**Optional Accessory 7710 Set of 2 trailer extensions.*



Centerline Alignment for Rear Axles



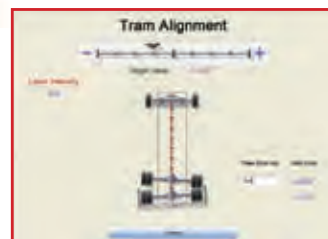
The wheel cradles feature rack and pinion frame gauges that assure accuracy when determining the axle center.

Rear Tandem/Axle Alignment:

- Fast, simple to use
- Tractor or Trailer gauging
- Gauge to vehicle centerline
- Versatile – use with computer or without
- Eliminate “dog tracking”



Rear/Tandem Axle Alignment



In order for a vehicle to achieve proper tracking, the wheels must travel parallel to the centerline. All rear axles, including offset axles and axles with different tire spacers or different size tires are set perfectly at 90 degrees to the centerline of the vehicle regardless of whether the chassis is centered over the axle.

If the rear axles are not traveling 90 degrees to the center line of the vehicle, there will be excessive tire wear on the front and rear tires.

The rear axle alignment is usually thought of as the second most critical tire wearing angle, although the rear axle tracking can be the most costly due to it causing premature tire wear on all of the vehicle's tires – front and rear. Proper rear axle tracking will also increase fuel mileage since wheel dragging is relieved.

The Proven Bee Line self-centering Wheel Cradles assure the correct position of the laser when seated on the cradles in relation to the axle. Wheel Cradles eliminate the need for run-out and raising the vehicle off the floor, allowing the operator to gauge the suspension alignment in its operational position.

**Save up to 30% on tire costs
and up to 2% on fuel costs.**



The laser beam is aimed forward in a line identical to the axle's thrust line and strikes the front target, which measures the amount of axle error from the centerline of the vehicle.

Achieve Proper Tracking

Rear/Tandem Axle Alignment System

Bee Line 22000 Rear Axle Aligner

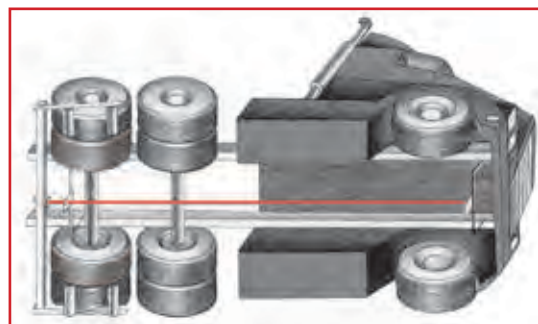
With the newly redesigned Bee Line 22000 Portable Rear Axle Aligner, you can take rear axle alignment to your customers' shops, terminals or wherever they might be located.

The 22000 can be used as a stand-alone manual gauging system for tractors and trailers or as a part of our computerized gauging system. The design of the equipment allows the axles to be aligned to the centerline of the vehicle, ensuring maximum tire life and the safest vehicle operation. Self-centering frame gauges and a calibrated laser provide the highest level of accuracy on the market.

Tracking error can be diagnosed in less than five minutes. The 22000 is the latest version of our intelligent, time tested design that continues to be the industry benchmark for tractor and trailer axle alignment.



The proven 22000 lets you accurately position your rear axles perpendicular to the vehicle's centerline, allowing the wheels to travel in a straight line.



Trailer Tracking

Trailer cone effect with driver steering correction leading truck to pull.

Trailer cone effect results in:

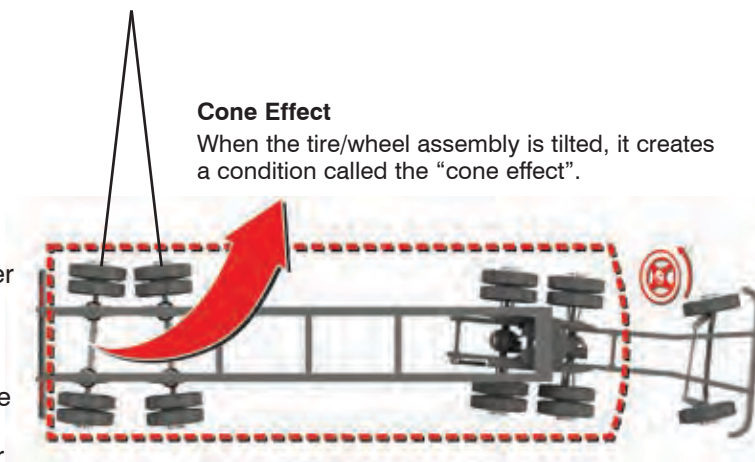
- Tractor steer tires will feather/razor edge towards the direction of pull.
- Once feathering is established in front steer tires, the tires should be replaced or trued before a complete alignment.

Many fleets disregard trailer axle misalignment, but it can also cause irregular steer tire wear. Why? If the trailer is tracking in one direction instead of straight ahead, the driver must constantly steer the truck in the opposite direction. This will cause a wear pattern on the steers that looks like drive axle misalignment.

Available System configurations listed on page 21.

Cone Effect

When the tire/wheel assembly is tilted, it creates a condition called the "cone effect".



Rear/Tandem Axle Alignment System

Rear/Tandem Axle Alignment Accessories



Part No. 21130 Portable Rear Axle Aligner Cart

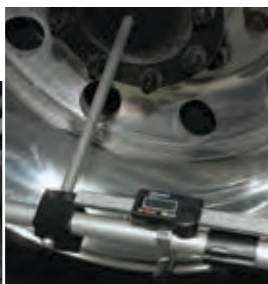
The Portable Rear Axle Aligner Cart safely stores every piece of the 22000 Rear Axle Aligner, including the laser recharging unit and two optional FPT8500 Floor Plates. The compact design allows shops to save valuable space while keeping their equipment away from any danger of being damaged. When an alignment is required, simply grab the handles and roll it to where it is needed. Each piece of equipment can be easily removed and returned before and after the alignment. The 21130 is a time and money saver for any shop that performs Rear Axle Alignments with our 22000 Portable Rear Axle Aligner.

(Standard with computer system)



Part No. EPM940 Electronic Target

Laser photo cell receiver allows computer entry of Rear Axle Alignment data when used with the computer alignment system. The electronic target hangs from the king pin. (Used with 19225CL, 21000 or 22000)



Part No. 18410A Mechanical Tram Gauge

This tram gauge can be used where precise tram readings are a must. Easily measure the parallelism of your tandem axle with this gauge. Comes standard with 22000.

Part No. 18410E Electronic Tram Gauge (Upgrade)

The Telescoping Electronic Tram Gauge incorporates several new features that simplify the gauging process, including a lightweight design, exceptional accuracy and repeatability and a built-in electronic digital scale.

18410E

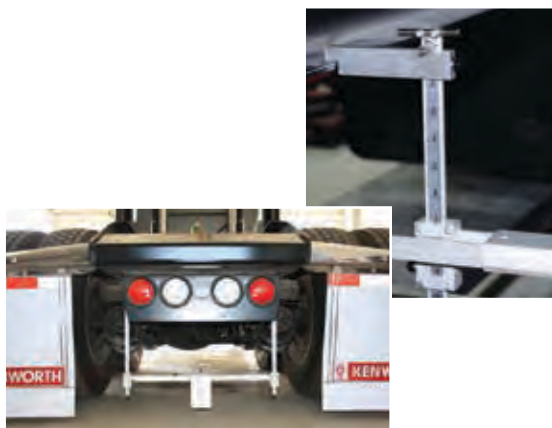


Part No. 19290 Dolly Aligner Target

Dolly target assembly is used to adjust tracking on dollies or trailers with a pintle-style hitch.

Rear/Tandem Axle Alignment System

Rear/Tandem Axle Alignment Accessories



Part No. Web / Flange Feelers

21320 4" Web / Flange Feelers

21321 8" Web / Flange Feelers

The web feelers allow accurate gauging of the rails even when a uniform flange is not available. (Used with 19225CL, 21000 or 22000) These instruments enable longer reach and more surface to grab the frame web.



Part No. 19968 Trailer Centering Gauge

A trailer centering gauge can be used with the Electronic target when gauging trailers. Vise-grip clamps attach to the outer edge of the trailer. Designed for use when the tractor and trailer are attached.

Alternative System Configurations

For trailer axle only alignment, pair the 22000 Bee Line Tandem Axle Aligner with a computer system and you will be equipped with all of the components needed to communicate and store the readings.

TLC750W Cabinet Computer System

Cabinet setup for use with the 22000 tandem aligner that has a monitor, keyboard, computer, and printer on-board. The system also includes an electronic tandem target, programming cable and a network cable - all needed to communicate and store the readings.



PLC750W Laptop Computer System

Laptop setup for use with the 22000 tandem aligner. The system includes an electronic tandem target, programming cable, network cable, AC Interface, Radio Transceiver, serial cables and power supplies - all needed to communicate and store the readings on the laptop.



Taking Alignments to the Vehicle



Mobile Alignment

- Portable - Take to the job site or use in the service bay
- Full capability - all steer, drive and trailer axle measurements

Mobile Alignment

Bee Line introduces the ultimate Mobile Alignment Package designed for maximum speed, accuracy and portability. Take alignments to the vehicle with a portable version of our acclaimed LC7500 series computer alignment gauging system. This system is ideal for gauging truck wheel alignment on location, inside or out and utilizes a laptop computer loaded with our WindSpeed 7500 software. This system allows technicians to gauge toe, camber, caster, KPI and steering stops, as well as rear tracking on tractors and trailers when combined with the 22000 Rear Axle Aligner.

Take Alignments to the Customer

Many full service commercial tire dealers and independent service shops have capitalized on providing a convenient alignment service at the customer's location. Utilizing custom trailers or vans allows them to store all the gauging equipment and tools to perform the alignment on-site. Bee Line can help outfit mobile alignment vehicles with all the necessary equipment to make the job easy.

Precision Calibration Fixtures

Like all Bee Line equipment, we give you the ability to maintain the precision of your mobile alignment system. Unlike our competition, our entire system can be calibrated in a few minutes by any technician on location or in the shop.

*To request an
on-site demonstration
of this product*

Call 1-800-728-7828

Taking Alignments to the Vehicle

7700 Floor Jack

Outstanding design and performance make our 7700 the ultimate Air/ Hydraulic floor jack on the market for your alignment shop.



LC4195B.1 Center Mount Wheel Mount

Our most popular mount. Extremely lightweight and simple to install. The lower bracket pivots to produce true 3 point contact and holds securely during and after run-out, which facilitates a fast and accurate alignment.

FPT8500 Portable Turn Plate

These heavy duty steel-topped plates are wireless thanks to our Gyro Alignment Heads. They can rest on a flat, solid surface or on our optional portable aluminum runways.

LC7550 Portable Alignment System

Mobile Alignments can be performed on any reasonably level surface inside or out. Alignment heads mount to the wheel with LC4195B.1 mounts and the tire rests on wireless FPT8500 Turn Plates.

LC7060 Portable Case

Provides secure storage for our Gyro Alignment Heads, wireless radios, charging units and more.

402600TA Aluminum Runway with Turning Aligner Cut-Out

402601 Portable Aluminum Ramp

Bee Line adds a new dimension to Portable alignments by designing aluminum runways that raise vehicles 8 inches off shop floors. This extra clearance allows access under the vehicle when making alignment adjustments and also when performing general vehicle maintenance.



Complete Alignment Checks with No Dedicated Alignment Bay



On the Floor Features:

- Cabinet work station on wheels – can be moved to any bay
- Full capability – all steer, drive and trailer axle measurements

On the Floor Alignment

The Bee Line On The Floor Alignment configuration is a popular setup for trucking fleets and shops that perform routine alignment checks but do not have a dedicated alignment bay. When needed, the alignment system can be easily rolled into the bay.

All the same great gauging features of the LC7500 Series Computer Alignment System are available with our On The Floor System. This gives your shop the ability to accurately diagnose any misalignment condition and even correct the rear



tracking and set the toe in any bay of your shop. If more extensive misalignment conditions are detected or if parts need to be replaced, the truck can be sent out to a facility with a complete Bee Line Alignment system for these corrections. Our On The Floor Alignment configuration is a fast, easy and less expensive way to make sure your trucks are performing at optimum efficiency.

*A fast, easy and
portable alternative.*

**Call 1-800-728-7828
for more information**

LC7500 **Alignment Gauging System**

The LC7500 computer alignment system redefines laser accuracy, from the inside, out.



FPT8500 **Portable Turn Plates**

These lightweight yet durable plates are wireless thanks to our new Gyro Alignment Heads. They can rest on level ground or on our runways.

7700 **Floor Jack**

Outstanding design and performance make our 7700 the ultimate Air/ Hydraulic floor jack on the market for your alignment shop.

22000 **Portable Rear Axle Aligner**

Centerline alignment ensures the vehicle operates in the optimal condition with the least resistance for maximum tire performance, fuel efficiency and handling.



EPM720 **Remote Display**

The Remote Display is simply a must-have tool for the LC7500 Computer Alignment System. The Remote Display puts those same advantages in a lightweight wireless package that a technician can use anywhere.

FEATURED PRODUCT



7700 **Floor Jack**

The 7700 can lift vehicles from any two separate points of contact along its 33-inch beam. This feature alone produces a far greater degree of safety than the conventional single point floor jack. An operator has the option to utilize different sized axle supports that slide to any position on the beam and guarantee the desired lift needed whether the truck is on the floor, on portable turn plates or on portable runways. Converting the jack into a single point floor jack for operations such as wheel balancing can be done by simply sliding one of the short axle supports to the center of the beam.

Elevated Solutions/ Configurations



Advanced Aligner Runway Features:

- AA Machine provides great access
- Special tooling allows technician to correct the axle and return camber or caster to spec
- Value added service and differentiated capability

Stationary

Advanced Aligner Runways

Bee Line Advanced Aligners are multi-functional workhorses for alignment shops, body shops, garages, dealer service centers, tire centers and fleets. They handle all makes of small cars through the heaviest trucks. Each Advanced Aligner features a choice of 24" or 30" Runway Legs to achieve the best working height.

Bee Line Advanced Aligners accommodate vehicles with tread widths from 39" to 94" or 54" to 108". Numerous pit or above ground models are available for alignments from either direction.

Mixing and matching Bee Line alignment equipment lets you custom design an aligner system to best fit your facilities and your production requirements.

The Bee Line add-a-unit design safeguards your investment against obsolescence and is expandable to meet your needs. Each piece is engineered to assure safety and flexibility through a wide range of vehicles. The alignment machine can be used for truck frame correction by adding the Bee Line Frame Press.



CONFIGURATION OPTIONS



AA 2D2 - 2-Section pit machine (24" deep x 15' wide minimum x 17' 2" long minimum) (60.96 cm deep x 457.2 cm wide minimum x 523.24 cm long minimum)
Add 45" (114.3 cm) for each additional section.

Custom Design a Machine to Best Fit Your Facility



AR330D 24" Double Approach Ramps

Fixed approach ramps are used with the Advanced Aligner Runways. These are available in 24" or 30" (AR330D) height.

174 24" Runway Legs

Standard runway legs are interchangeable and can be used with any new or existing installation. Available in 24" or 30" height (175).

176 24" Support End Leg

Developed to prevent the runway top from deflecting when driving on and off the Turning Aligners. These legs are interchangeable and available in 24" or 30" height (178).

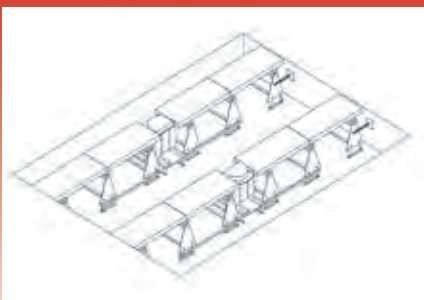
29540 King Pin Turning Aligners (Pair)

Use with WindSpeed 7500 to electronically measure and display Ackerman Angle, turn radius, KPI and caster without pushing buttons or interpreting a scale. One person can do the alignment measurements, saving time and increasing profits in your shop.

Load Capacity: 32,000 lbs. per axle.

885.12D 24" Heavy Duty Dual Air Jack

Bee Line's Heavy Duty Air Jack provides safe and easy lifting on all Advanced Aligner Runways. Available in 24" or 30" height (878.12D). 3,500 lbs. capacity for every 25 lbs. of air line pressure.



AA 4D4 - 4-Section drive thru wheel alignment (24" deep x 15' wide minimum x 17' 2" long) (60.96 cm deep x 457.2 cm wide minimum x 523.24 cm long)



AA 7D2 WITH AR 330C - 7-Section above ground wheel alignment machine with double approaches (43' 6" long x 24" high) (1325.88 cm long x 60.96 cm high)

Elevated Solutions/ Configurations



Space Saver Ramp Features:

The Space Saver Alignment System is totally above ground adding these great benefits:

- Save valuable space.
- Gradual incline.

Stationary Space Saver Ramp

Bee Line designed the Space Saver Ramp to be installed in a smaller area than a standard ramp alignment system by reducing the total number of machine sections required. The design of the Space Saver allows a major portion of the ramp to be raised hydraulically to an operating level equal to the height of the Advanced Aligner Runways.

The longer design of the Space Saver lifting ramp creates a more gradual incline, therefore requiring less runway sections.

Once the truck is in position, the Runways are hydraulically lifted with the touch of a button. The approach ramp incline angle allows low profile buses and RVs to drive on without bottoming out.

The Bee Line Space Saver Approach Ramp System is another example of how Bee Line continues to set the standard for wheel and frame alignment in the heavy-duty trucking industry.

Space Saver Ramp Specifications:

- Length of runway section: 45" x 19".
Optional 45" x 25"
- Length of Approach Ramp: 23 feet 4 inches

CONFIGURATION SPECIFICATIONS

- Lifting Length: 16 feet
- Ramp Height: 24 inches or 30 inches
- Lifting Capacity: 11 tons, hydraulically powered
- AR400 & AR401 models are used with 24 inch high Runway Sections. Incline angle: 4.5 Degrees
- AR400.30 & AR401.30 models are used with 30 inch high Runway Sections. Incline angle: 5.7 Degrees
- Can be configured in any number of sections.

Designed for the Shop Where Space is at a Premium



885.12D 24" Heavy Duty Dual Air Jack

Bee Line's Heavy Duty Air Jack provides safe and easy lifting on all Advanced Aligner Runways. Available in 24" or 30" height (878.12D). 3,500 lbs. capacity for every 25 lbs. of air line pressure.

29540 King Pin Turning Aligners (Pair)

Use with WindSpeed 7500 to electronically measure and display Ackerman Angle, turn radius, KPI and caster without pushing buttons or interpreting a scale. One person can do the alignment measurements, saving time and increasing profits in your shop. Load Capacity: 32,000 lbs. per axle.

4 Ft. Removable Sections

Runway Legs are available in 24" and 30" high. The length of the runway section is 45" x 19" wide. Optional 45" x 25" section. Adjustable runway/tire width 45" to 100". Load capacity is 16 ton per vehicle axle.

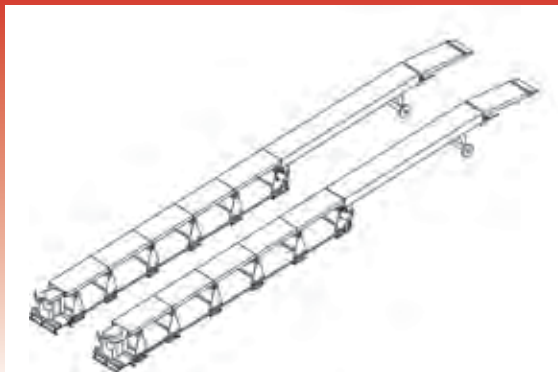
900 Series Electric Hydraulic Pump

The pumps allow operation of rams together or separately. They operate on 115V, 3,500 PSI and require 20 amp service. (See page 45 for complete list of available styles)

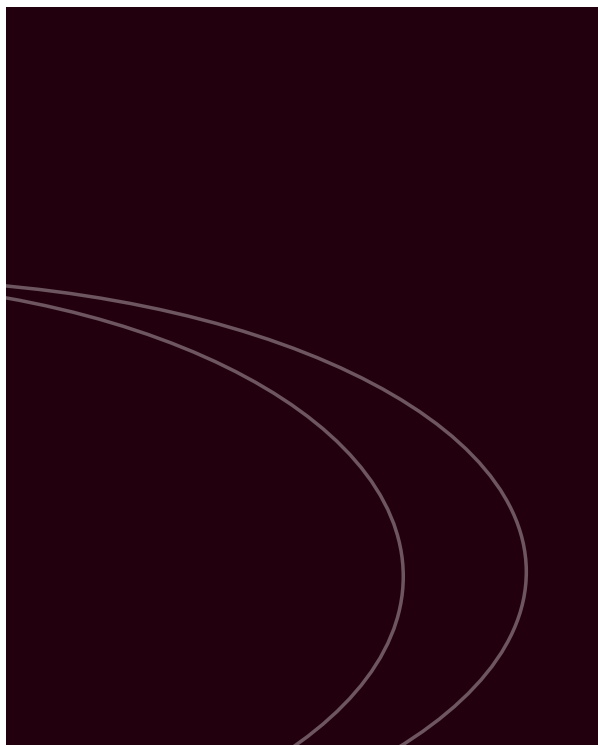
AR400

Space Saver Ramp

The design of the Space Saver allows a major portion of the ramp to be raised hydraulically to an operating level equal to the height of the Advanced Aligner Runways. AR400 - 24" AR400.30 - 30"



Elevated Solutions/ Configurations



Stationary Pit Models

Common Configurations are:

- "L" Pit Model
- "T" Style Center Pit Model
- Eight Section Step Down Model
- Four Section Drive Thru Pit Model
- Twelve Section Drive Thru Model

Key Features:

- Custom configurations to meet your shop's needs
- Ergonomic design optimized for alignment
- Multi-Purpose
- A walk-under center pit saves time spent raising and lowering a vehicle
- Choose between 24" or 30" Runway Legs

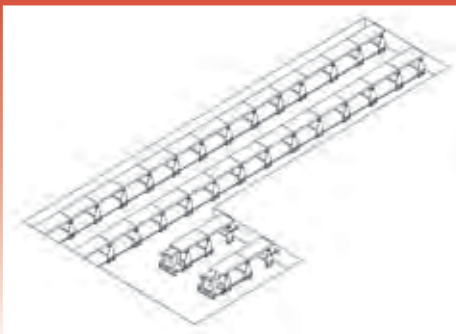
Specifications and site requirements vary. Please speak with a Bee Line Authorized Representative to maximize efficiency and optimize work space.



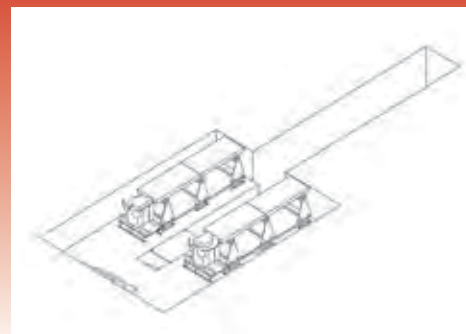
PIT CONFIGURATION OPTIONS



"L" Pit Model



"T" Style Center Pit Model



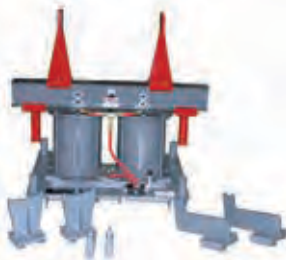
Turn Your Shop into a Profit Center

24" or 30" **Runway Legs**

Standard Runway Legs are available in 24" and 30" tall models, are interchangeable and can be used with any new or existing installation.

29540 **King Pin Turning Aligners (Pair)**

Use with WindSpeed 7500 to electronically measure and display Ackerman Angle, turn radius, KPI and caster without pushing buttons or interpreting a scale. One person can do the alignment measurements, saving time and increasing profits in your shop. Load Capacity: 32,000 lbs. per axle.



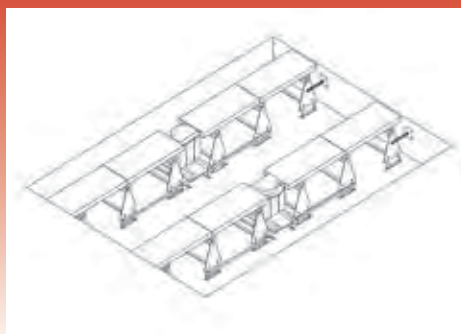
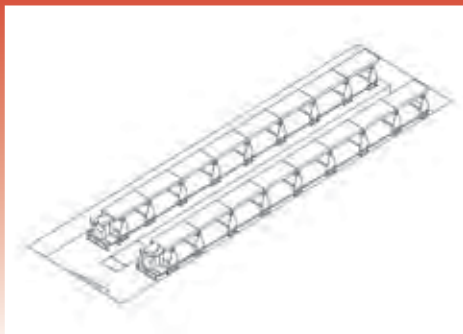
885.12D (24") **Heavy-Duty Air Jack**

Bee Line's Heavy-Duty Air Jacks provide safe and easy lifting on all Advanced Aligner Runways.

Eight Section Step Down Model

Four Section Drive Thru Pit Model

Twelve Section Drive Thru Model



Elevated Solutions/ Configurations

Four-Post Lift Features:

- Diamond plated ramps and runways
- Safety locking legs on each post
- Hydraulic velocity fuse backup safeties
- Front wheel stops
- Available as an optional open front beam type
- Optional alignment lift radius and slip plates
- Remote pendant control (25")

Stationary

Four-Post Lift, Scissor Lift & Mobile Column Lift



Quality Workmanship and more than 40 years experience, collectively in the Lift Industry, goes into every product. Being the leader in lift innovation and utilizing a wide range of the newest technologies in lift controls and hydraulic fluid power makes these products superior. A wide variety of lifts are manufactured for use in maintenance shops, including Heavy Duty 4-Post Drive on Lifts, Mobile Column Lifts and Scissor Lifts.

All products are tested under numerous temperature and structural stress conditions using Innovative Methods. These test systems lead to cost savings and enhanced superior quality.

Every Lift produced is built to the ANSI ALI-ALCTV-2008 Standard for Automotive Lifts Safety Requirements for Operation, Inspection and Maintenance. The majority of the lifts have been tested and certified to meet or exceed the ETL requirements for lift safety.

Elevated Solutions/ Configurations



402620 **Aluminum
Storage Cart**

Aluminum Runway Features:

- Runway Sections can be assembled in a matter of minutes
- Sections securely stack on a portable cart that significantly helps speed set up and take down time
- Portable runways are ideal for use with Bee Line's Drive Over Frame Press

Portable Aluminum Runways

402601 **Portable
Aluminum Ramps**



402600 **Portable
Aluminum Runway
Section**

29540P **Paired Portable
Turning Aligners**

Bee Line adds a new dimension to Portable alignments by designing aluminum runways that raise vehicles eight inches off shop floors. This extra clearance allows access under the vehicle when making alignment adjustments and also when performing general vehicle maintenance.

Bee Line designed this runway system with your shop's valuable time and floor space in mind. When runways are used with the Bee Line 7700 Floor Jack, all alignment measurements can be taken, including runout, toe, camber, caster, steering stops, toe-out on turns and KPI. Toe can easily be adjusted with the vehicle on the runways.

When used in conjunction with a frame press, after the the press raises the vehicle, runway sections can be removed and stacked to keep the vehicle elevated while frame adjustments are being performed. Cab corrections can also be made by utilizing the Bee Line Power Tower.

402600 Portable Runway Sections Specifications:

Weight per section: 52 pounds

Load Capacity: 5 tons per section

Runway Sections: 20" wide x 48" long x 8" tall

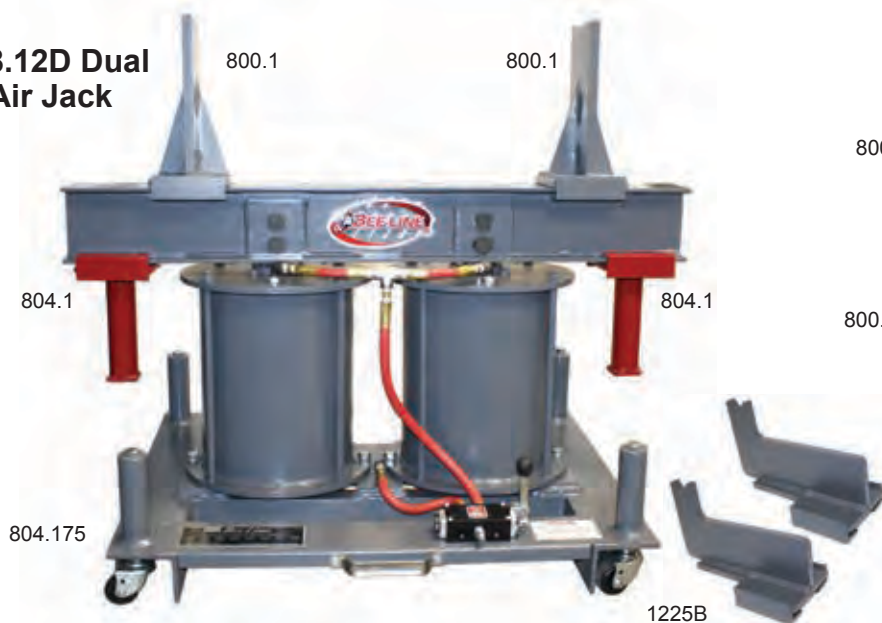
402600TA - Also available with a cut-out (recess) to accomodate standard floor style turn plates.

Elevated Solutions/ Configurations

Components & Accessories

These accessories can be valuable add-ons to your existing alignment systems. Contact your local Sales Representative or Bee Line to learn what accessories best suit your shop's needs.

878.12D Dual Air Jack



Optional Parts



Heavy-Duty Air Jacks & Components

Bee Line's Heavy-Duty Air Jack provides safe and easy lifting on all Advanced Aligner Runways. Available in a dual model. The dual air jack (pictured) has a capacity of 3500 lbs. (1590.91 kg) for each 25 PSI (1.76 kg/cm²). 885.12D (dual) are 24" models and 878.12D (dual) are 30" models. Different base widths are also available. The following components can be utilized with the dual air jack.

Heavy-Duty Air Jacks and Components

Qty	24" Part No.	30" Part No.	Description	Capacity/25 PSI
1	885.12D	878.12D	Dual Air Jack	3500
2	800.1	--	10" Axle Support	
2	804.175	--	7.5" Safety Stands	
2	1225B	--	6 5/8" Axle Support	

Optional

Qty	24" Part No.	30" Part No.	Description	Capacity/25 PSI
2	800.175	--	7 1/2" Axle Support	
2	800.2	--	Fabricated Axle Support	
2	814.1	--	14 1/4" Extra Long Axle Support	
2	1230	--	4" Axle Support	
2	1225EXT	--	3" Extension Assembly	

Components & Accessories



Part No. 18546 Removable Leg Step

This lightweight step locks into existing holes on Runway Legs and can easily be moved to the Leg where it is needed. Supports one person.



Part No. 29070 Runway Service Step

Step attaches between any two Runway Legs and allows easy access to Truck or Auto.



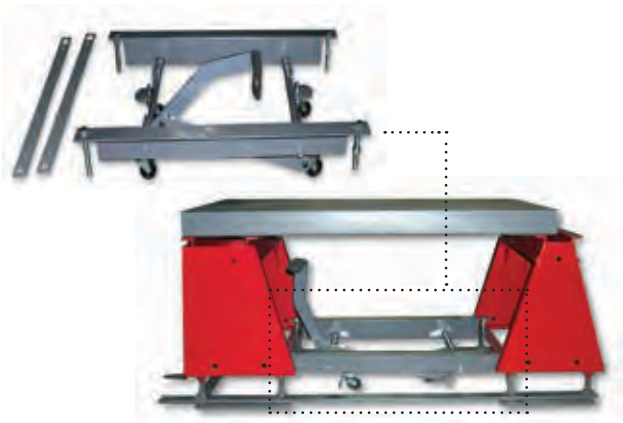
Part No. 29090 Turning Aligner Service Step

Step attaches to the side of 29540 King Pin Turning Aligners and allows easy access to Truck or Auto.



Part No. 29544 Toe Gauge Support

Supports provide a convenient resting place for Toe-In Gauges when performing manual alignments. **Not for standing.**



Part No. 29600 Runway Lift Assembly

Easy to operate lift makes moving removable sections a snap. The Runway Lift Assembly uses four caster wheels that allow for easy movement in any direction and does not require the use of electric, air or hydraulic power. The lift can be assembled onto any existing removable section in a matter of minutes and contains leveling and height adjustments to accommodate variations in installation heights.

Axle Correction Tools



Camber Correction

Bee Line has long been a proponent of the benefits of camber correction, which, as part of a total vehicle wheel alignment, allows vehicle owners to achieve maximum tire life and fuel efficiency from their vehicle. The following information is designed to help you understand the benefits of camber correction.

Camber Correction Innovation

Nearly all passenger cars and light trucks have adjustments for camber, or have aftermarket shim adjustments so camber can be changed and fine-tuned. It is known that adjusting the camber to preferred settings

increases tire life while improving vehicle handling. Conversely, most heavy duty trucks have straight axles that do not have similar accommodations for camber adjustment. As a result, the only way to change the camber is to correct set, or hydraulically adjust the axle.

This is where Bee Line technology has been utilized for more than 90 years. George L. Hunt, early inventor and automotive enthusiast, put Bee Line on the map by manufacturing the first axle correction equipment in the 1920s. Since then, Bee Line's mission has been to effectively manufacture cutting-edge wheel alignment equipment that helps solve irregular handling and tire wear conditions.

TOTAL SOLUTION

Our equipment and patented methodology represent the safest and most effective way to correct camber on truck axles.

Maximum Performance

Thousands of shops and trucking fleets that perform truck alignment, including camber correction, realize the only practical way to change camber is to correct set. They do this because they and the vehicle owners see firsthand the benefits of a proper camber setting in relation to tire wear, fuel efficiency and the overall operating costs of the vehicle.

Bee Line is confident that our equipment and patented methodology represent the safest and most effective way to correct camber on truck axles.

Owner Choice and Responsibility

It is also important to note that the camber setting recommended by the Truck Maintenance Council (TMC) is tighter than most axle manufacturer's original specifications, and Bee Line's preferred settings are even tighter than the TMC specs. Therefore, a lot of axles will be outside the TMC and Bee Line specs. That is why the TMC suggests that if camber specifications exceed those listed in the TMC manual, "consult the vehicle, axle, and/or alignment equipment manufacturer." Bee Line does not promote that camber is a warranty issue. Nearly all manufacturers leave the decision of correcting the camber to preferred settings up to the vehicle owner.

If the camber is within the axle or truck manufacturer's tolerances, but outside the TMC or Bee Line specs, it is the vehicle owner's responsibility to adjust their camber to the preferred settings. Bee Line has proven that our preferred camber settings make a significant difference in tire life, which is why truck owners across the country choose to reset their camber to meet Bee Line specifications.

Effects of Camber and Toe

There have been studies over the years on wheel alignment conditions and tire wear.

The chart at right summarizes the effect of camber on trucks in a controlled experiment over two years. This illustrates the outcome of having identical toe settings while varying camber setting vs. the average tire life for each group.

It was concluded that +1/4 Left Camber and -1/8 Right Camber was the optimal setting. Other settings varied as much as 27% from the optimal setting before the tires needed to be replaced. This study justified what Bee Line has known for decades. Camber is a vital characteristic in extending tire life and significantly lowering the vehicles operating costs.

If you would like to know more about Bee Line's proven alignment philosophy and our cutting edge technology featuring our camber correction tools, contact us today at 800-728-7828 or visit us online at www.beeline-co.com.

Camber Setting (in degrees)		Toe Setting (in inches)
Left	Right	+0.040 This is the Industry Standard Setting
-3/4	-1	157,000 Miles Average Tire Life 90% of Optimal Setting
-1/4	-1/2	155,000 Miles Average Tire Life 89% of Optimal Setting
+1/4	-1/8	175,000 Miles Optimal Camber and Toe Setting (100%)
+3/4	+1/2	137,000 Miles Average Tire Life 78% of Optimal Setting
+2	+1 3/4	127,000 Miles Average Tire Life 73% of Optimal Setting



Axle Correction Tools



Most passenger cars and light trucks have adjustments or aftermarket kits to adjust camber and caster to preferred specifications vs. OEM tolerances. It only makes sense to set a Heavy Duty Truck to preferred specifications also.

Floating beam systems allow the operator to fine-tune the axles to these preferred specifications.

Truck Axle Correction

Heavy duty over the road truck tires are normally more than 3 times the cost of passenger car tires and average 4 times the miles per year. This allows equipment payback in tire savings over a very short period of time.

Bee Line promotes preferred Bee Line Wheel Alignment Specifications vs. the OEM manufacturing tolerances, and now the Truck Maintenance Council (TMC) also recognizes the importance of setting to a preferred target specification. The patented Bee Line Floating Beam allows you to adjust the axle into these preferred specifications.

The Floating Beam can be mounted parallel or at an angle to the axle, allowing the operator to correct both camber and caster conditions. Specific tools were designed to be used safely with the beam. When used with the Bee Line AA Machine, one technician can correct heavy-duty truck axles on the vehicle.

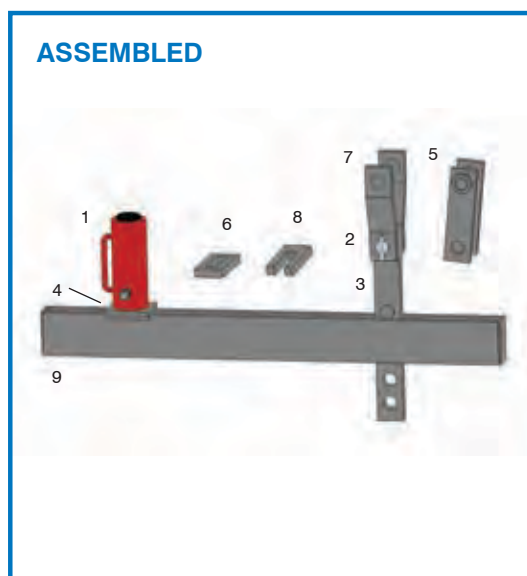
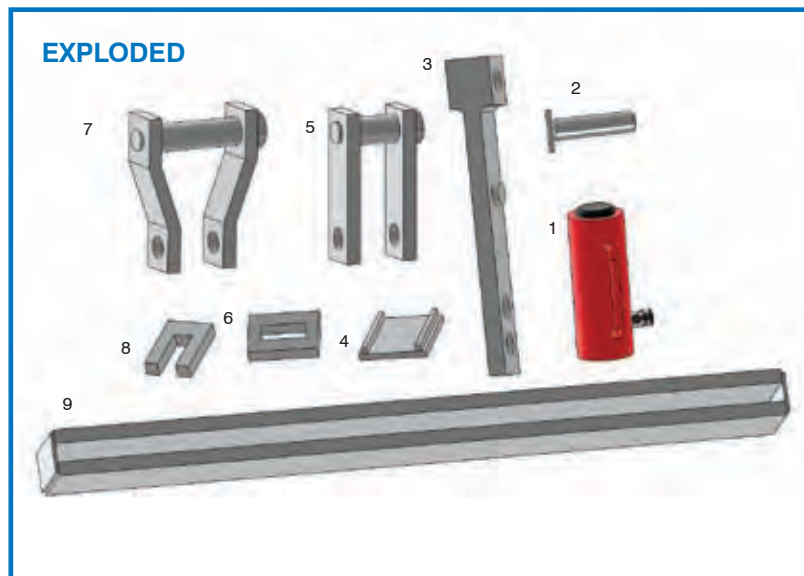
Camber corrections are accomplished by using bridge hanger-type tie-downs to hold the axle in place while powerful Bee Line Hydraulic Rams (up to 125 tons) correct camber by pushing the axle upward.

Bee Line's exclusive axle correction equipment is a must for the Truck Repair facility that wants to perform Complete Truck Alignment Service.

Axle Correction Tools

Front Axle Tools

404 Tool Group - Light Axle Tools



Number	Part Numbers		Description	Qty
	404	404AL		
1	FR30	FR30	30 Ton Ram	2
2	404067	404067	Pin Assembly 1 1/2" dia. X 6"	4
3	404116	404116	Connector	2
4	404102	404102	Jack Base	2
5	404105	404105	Narrow Clevis	2
6	404119	404119	Pin Adaptor Plate	2
7	404110	404110	Spring Pad Clevis	2
8	404120	404120	Spacer	2
9	404100SP	404100AL	Beam / Aluminum Beam	1

OPTIONAL ACCESSORIES

404150 Medium Duty Clevis



2-1416 Twisting Hook for Caster Correction - Not Shown

404151 Caster Correcting Yoke - Not Shown

404 TOOL CONFIGURATION



404 Equal Decrease



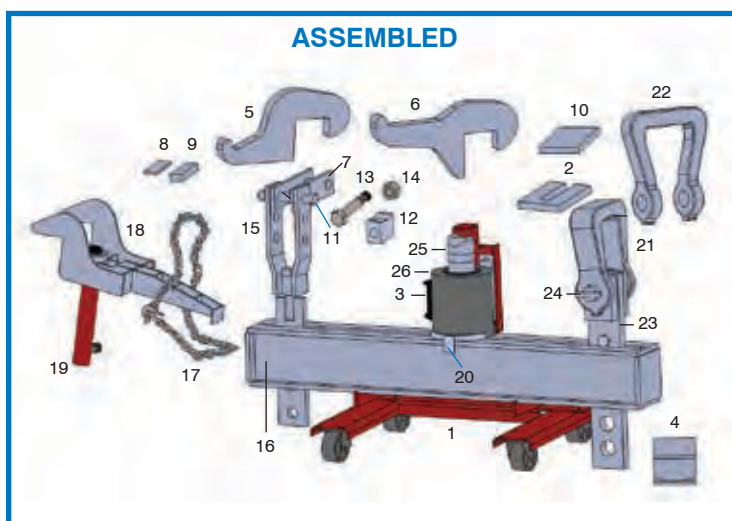
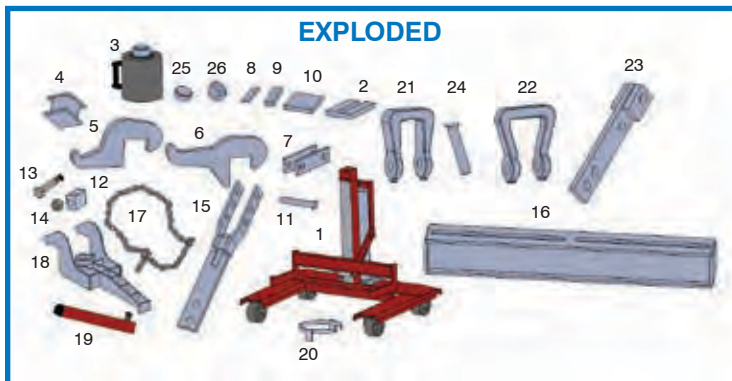
404 Equal Increase

Axle Correction Tools

Front Axle Tools

Tool Group 405BL - Heavy Duty Axle Tools

Number	Part Numbers	Description	Qty
1	15150A	Beam Lift	1
2	404005	Spacer	2
3	100AL	100 Ton Aluminum Ram	2
4	1638	Jack Pad Weld - 4 1/4-inch high	2
5	404030	Axle Hook 5" Wide x 5 1/2" Deep	1
6	404052A	Twisting Hook	1
7	404055	Connecting Link Weld (New Style)	1
8	1510A	3/8" x 1 3/4" x 5 Blocking	4
9	1512A	1" x 1 3/4" x 5 Blocking	2
10	1588	Jack Base	1
11	403003	Pins	2
12	1589	Block	2
13	609024	1 1/4" - 7 x 6" Cap Screws	2
14	620013	1 1/4" - 7 Hex Nuts	2
15	1590	Axle Twisting Yokes	2
16	404000	Axle Camber Beam 56" Weld	1
17	15015	Chain 5/16"	1
18	15000X	Spring Depressor Weld	1
19	FR10	10 Ton Ram	1
20	100AL.3B	Transport Ring	2
21	404010A	Axle Clevis	2
22	404011A	Spring Pad Clevis	2
23	404012	Connector Weld	2
24	404016	Clevis Pin	4
25	404167	Middle Ram to Axle Space	4
26	404166S	Beam to Axle Spacer	2



* See upgrade to this package on page 42, Tool Group 406U

405BL TOOL CONFIGURATION



405BL Equal Decrease



405BL Dissimilar

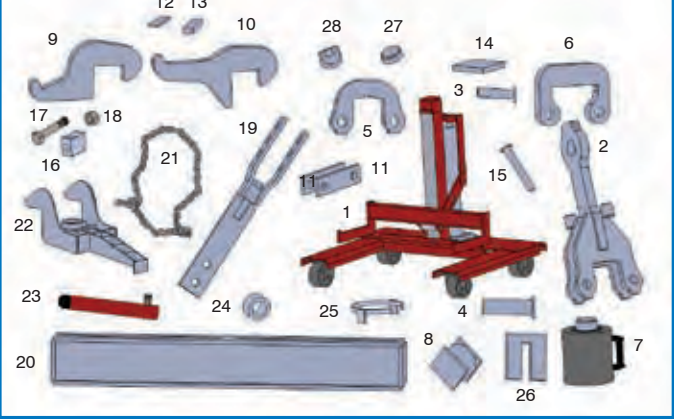
Axle Correction Tools

Front Axle Tools

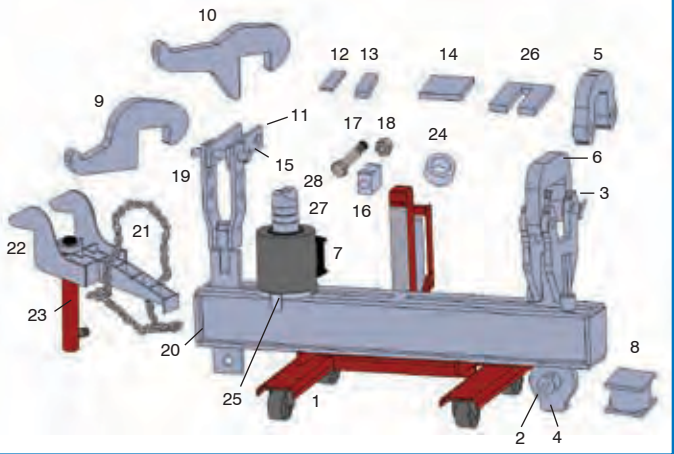
Tool Groups 406HDL and 406L - Ultra Axle Tools 125 or 100 Ton Aluminum

Number	Part Numbers		Description	Qty
	406HDL	406L		
1	15150A	15150A	Beam Lift Assembly Omega Jack	1
2	404060	404060	Connector SD Weld	2
3	404067	404067	6 Inch Yoke Clevis Pin Weld	4
4	404065	404065	8 Inch Yoke Clevis Pin Weld	4
5	404063	404063	Narrow Clevis	2
6	404064	404064	Spring Clevis Pad	2
7	125AL	100AL	125 / 100 Ton Aluminum Ram	2
8	1638	1638	4 1/4" High Jack Pad Weld	2
9	404030	404030	Front Twisting Hook	1
10	404052A	404052A	Rear Twisting Hook	1
11	404055	404055	Connecting Link Weld (New Style)	1
12	1510A	1510A	Block, Spacer 3/8" x 1 - 3/4" x 5	4
13	1512A	1512A	Block, Spacer 1" x 1 - 3/4" x 5	2
14	1588	1588	Plate, Jack Base	1
15	403003	403003	Pin, Long 1 1/4 x 8 1/2	2
16	1589	1589	Block	2
17	609024	609024	1 1/4-7 x 6 HX HD GR5 Black	2
18	620013	620013	1 1/4-7 HX NT Zinc	2
19	1590	1590	Axle Twisting Yoke Weld	2
20	404000	404000	Axle Camber Beam 56" Weld	1
21	15015	15015	5/16" Chain Assembly	1
22	15000X	15000X	Spring Depressor Weld	1
23	FR10	FR10	10 Ton Ram 6 1/8" Stroke	1
24	403098	403098	Spacer	2
25	125AL.3B	100AL.3B	125 / 100T Transport Ring Assembly	2
26	404005	404005	Spacer	2
27	404166S	403098	Middle Ram to Axle Spacer	4
28	404167	403098	Beam to Axle Spacer	2

EXPLODED



ASSEMBLED



406 HDL TOOL CONFIGURATION



406 Equal Decrease



406 Equal Increase

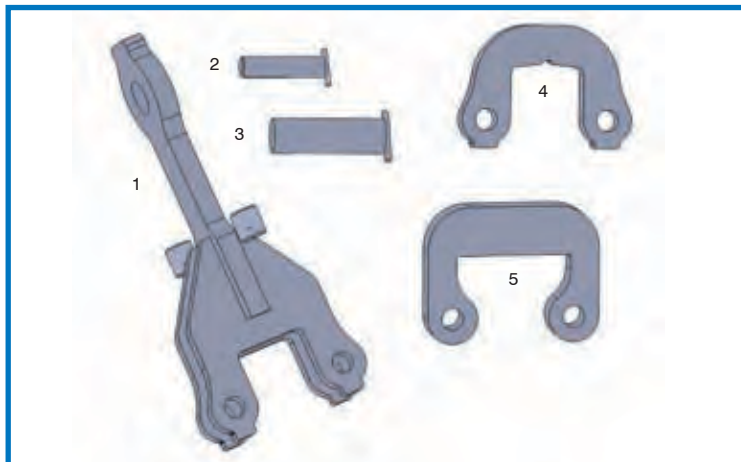
Axle Correction Tools

Front Axle Tools

Tool Group 406U - Heavy Duty Axle Tools Upgrade

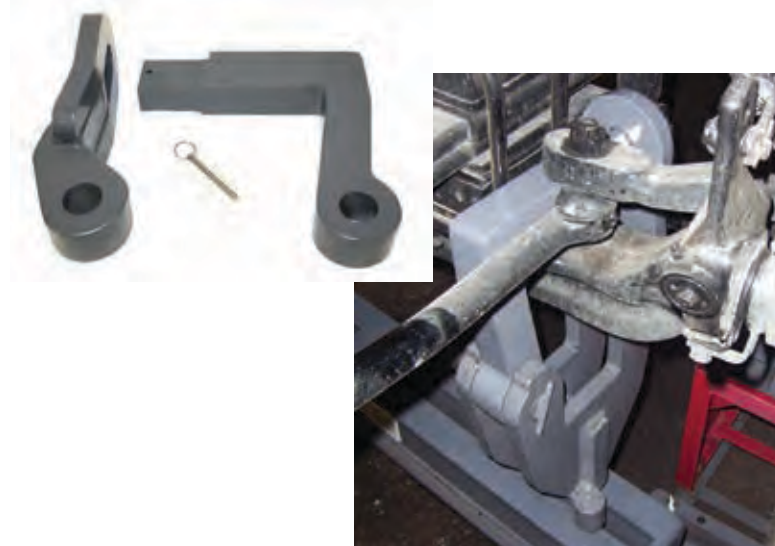
Part Numbers			
Number	406U	Description	Qty
1	404060	Connector SD Weld	2
2	404067	6 Inch Yoke Clevis Pin Weld	4
3	404065	8 Inch Yoke Clevis Pin Weld	4
4	404063	Narrow Clevis	2
5	404064	Spring Clevis Pad	2

* Upgrade to Tool Group 405BL on page 40



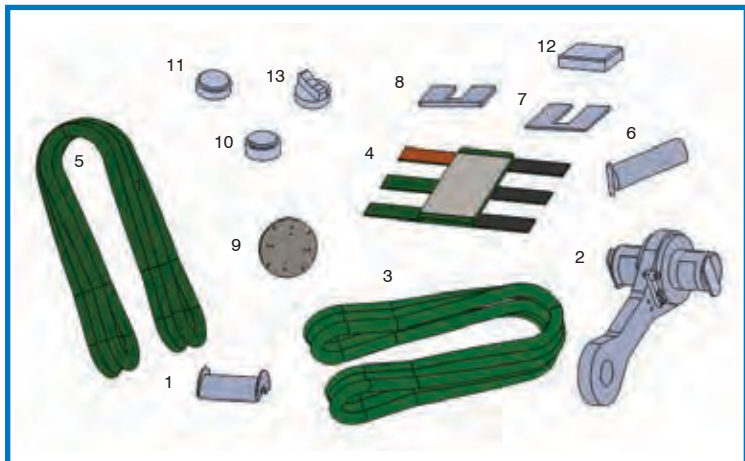
Part No. 404075 Confined Area Clevis

This clevis is an essential heavy duty axle clevis that expands the functionality of our proven 406 Axle Tools. The new 404075 Confined Area Clevis is designed to slip around the axle on the outside of the spring seat on most trucks with 16,000 pounds or greater axles. The universal design eliminates the removal of the tie rod and in most cases the drag link when making a positive camber correction.



Tool Group 407U - Tools Upgrade

Part Numbers			
Number	407U	Description	Qty
1	404180	Saddle	2
2	404163	Axle Connector	2
3	404170	36" High Capacity Axle Strap	1
4	404170A	Boot	2
5	404170.4	40" High Capacity Axle Strap	2
6	404065	8" Yoke Clevis Pin Weld	2
7	404165	1/2" Spacer Beam to Conn	4
8	404165A	1/4" Spacer Beam to Conn	2
9	404172	Adaptor Cap	2
10	404168	Aluminum Ram Spacer Head	2
11	404167	Middle Ram to Axle Spacer	4
12	403705	60 Ton Push Block	2
13	404166S	Ram to Axle Spacer	2
14	610016	1/4-20 x 3/4 Bolt	8*
15	610014	1/4-20 x 1/2 Bolt	4*



*Not pictured

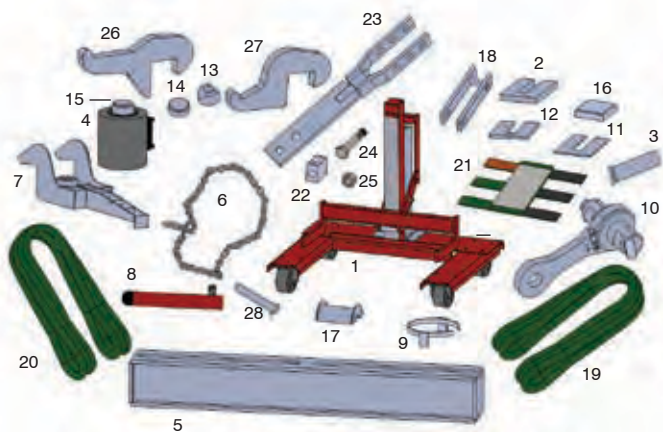
Axle Correction Tools

Front Axle Tools

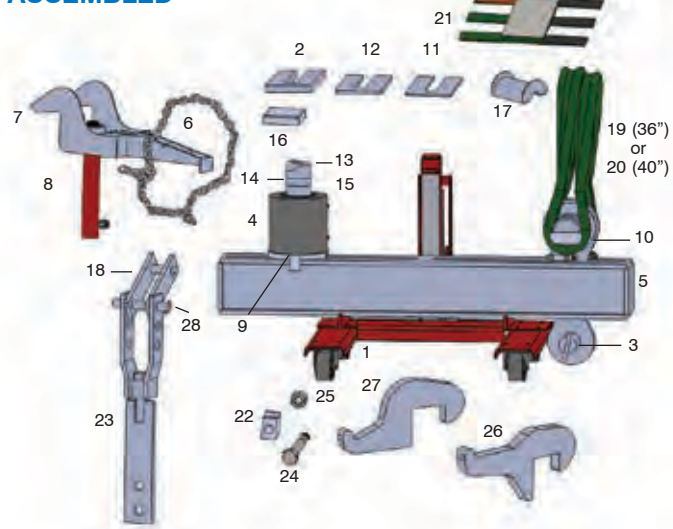
Tool Groups 407CU and 407HU - Heavy Duty Axle Tools

Part Numbers				
Number	407CU	407HU	Description	Qty
1	15150A	15150A	Beam Lift Assembly Omega Jack	1
2	404005	404005	Spacer	2
3	404065	404065	8" Yoke Clevis Pin Weld	2
4	100AL	125AL	100 / 125 Ton Aluminum Ram Ass'y	2
5	404000	404000	Axle Camber Beam 56" Weld	1
6	15015	15015	5/16" Chain Assembly	1
7	15000X	15000X	Spring Depressor Weld	1
8	FR10	FR10	10 Ton Ram	1
9	100AL.3B	125AL.3B	Transport Ring 100AL / 125AL Weld	2
10	404163	404163	Axle Connector	2
11	404165	404165	1/2" Spacer Beam to Conn	4
12	404165A	404165A	1/4" Spacer Beam to Conn	2
13	404166S	404166S	Ram to Axle Spacer	2
14	404167	404167	Middle Ram to Axle Spacer	4
15	404168	404168A	Aluminum Ram Spacer Head	2
16	403705	403705	60 Ton Push Block	2
17	404180	404180	Saddle	2
18	404055	404055	Connecting Link Weld	1
19	404170PP	404170PP	36" High Capacity Axle Strap	1
20	404170.40PP	404170.40PP	40" High Capacity Axle Strap	2
21	404170C	404170C	Boot	2
22	1589	1589	Block	2
23	1590	1590	Axle Twisting Yoke Weld	2
24	609024	609024	1 1/4-7 x 6 HX HD GR5 Black	2
25	620013	620013	1 1/4-7 HX NT Zinc	2
26	404052A	404052A	Rear Twisting Hook	1
27	404030	404030	Front Twisting Hook	1
28	403003	4403003	Pin, Long 1 1/4 x 8 1/2	2

EXPLODED



ASSEMBLED



407 TOOL CONFIGURATION



407 Equal Decrease



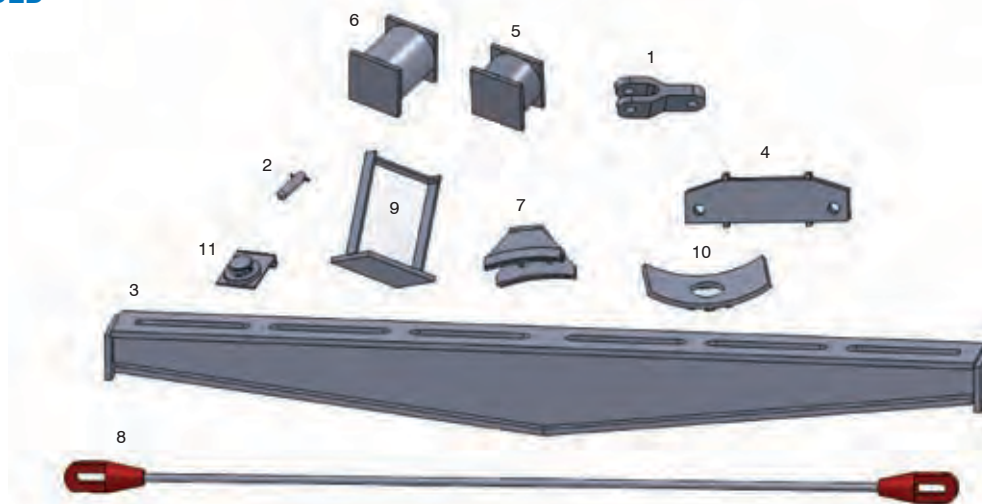
407 Equal Increase

Axle Correction Tools

Rear Axle Tools

Tool Group 6 - Rear Housing Tools

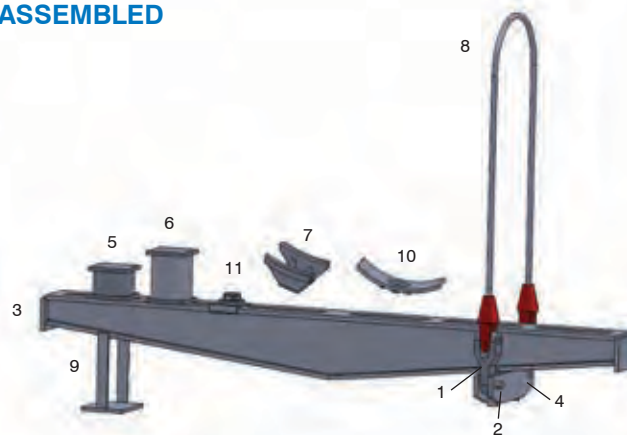
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Part Numbers

Number	Tool Group 6	Description	Qty
1	1607	Extensions	4
2	1122	Short Pins	6
3	1650	84\" Beam	1
4	1624	Cable Slings	2
5	1638	Jack Pad Weld - 4 1/4-inch high	1
6	1639	Jack Stand 7"	1
7	1638A	Housing Cradle	1
8	1614	Cables	2
9	1630	Beam Support	2
10	1670	Housing Cradle Adaptor	1
11	1675	Ram Holder	2

ASSEMBLED



Pumps & Rams

Bee Line Ram Accessories

Get Power Where You Need It...



Pumps come with 875 PSI gauge.

900 Series Electric Hydraulic Pump

The Bee Line Electric Hydraulic Pumps are the finest pumps available on the market. The pumps allow operation of rams together or separately. They operate on 115V, 10,000 PSI and require 30 amp service.

The two stage system has a high volume first stage for output below 300 PSI. It automatically switches to a 10,000 PSI second stage for efficient work.

Listed below are the specifications on the models available from Bee Line.

- 900B** Four valve pump for frame applications
- 900E** Two valve pump for alignment applications
- 900C** Four valve pump with solenoid operated valve
- 900D** Two valve pump with solenoid operated valve

899 Stand for 900 Series Pumps (Optional)



875 PSI Gauge (Standard)

The Bee Line PSI Gauge allows you to know how much pressure you are applying continuously. This gauge plugs directly into the coupler on the pump. With the Bee Line PSI Gauge you will never need to guess again if your pump is working correctly.



Model 7500

This pump operates on air pressure and allows operation of two hydraulic rams individually or together with maximum output of 10,000 psi. The Model 7500 is designed to be foot or hand operated and is equipped with a two gallon reservoir.



Pumps & Rams

Bee Line Ram
Accessories

Bee Line Ram Accessories



Bee Line Ram Specifications (All Rams rated at 10,000psi)

Number	Model	Description	Tons Capacity	Closed Height	RAM Travel	Extended Height	RAM Diameter	RAM Retraction	Wt. (lbs.)	Repair Kit	Repair Kit Option
1	FR10	Standard 10 Ton Ram w/HD Couplers	10	11 3/4"	6"	17 3/4"	2 1/4"	Spring	11	HW80807	RPA82093
2	FR10.5	Short 10 Ton Ram w/HD Couplers	10	4 1/2"	2 1/2"	7"	2 1/4"	Hand	5	HW80808	RPA82093
3	FR10.16	Long 10 Ton Ram w/HD Couplers	10	15 3/4"	10"	25 3/4"	2 1/4"	Spring	15	HW80807	RPA82093
4	FR20	Standard 20 Ton Ram w/HD Couplers	25	11 1/2"	5"	16 1/2"	3 1/2"	Spring	23	HW80809	FR20SEAL
5	FR20.19	Long 20 Ton Ram w/HD Couplers	25	19 1/2"	13"	32 1/2"	3 1/2"	Spring	40	HW80809	ERC2510K
6	FR30.5	Short 30 Ton Ram w/HD Couplers	30	4 3/4"	2 1/4"	7"	4"	Hand	14	HW81067	--
7	FR60	60 Ton Ram w/HD Couplers	60	11"	6"	17"	5 1/2"	Spring	57	HW80812	--
8	402230	20 Ton Telescoping Ram w/HD Couplers	20	10 1/2"	13"	23 1/2"	4 1/2"	Hand	43	402240	--
9	100AL	100 Ton Aluminum Ram (not shown)	100	10"	4"	14"	8"	Spring	40	100AL.17	--
9A	125AL	125 Ton Aluminum Ram	125	11.25"	4"	15.25"	9"	Spring	62	125AL.17	--
10	109170	Short 10 Ton Pull Ram	10	21"	11"	32"	2 1/2"	Air	31	109149	--
11	109140	X-long 10 Ton Pull Ram w/o Valves	10	30 1/2"	21"	51 1/2"	2 1/2"	Air	40	109149	--
12	109200	20 Ton Ram	20	27"	13 1/2"	40 1/2"	3 1/4"	Air	30	109210	--
13	FR30	Long 30 Ton Ram w/HD Couplers	30	10 1/2"	6"	16 1/2"	4"	Spring	3	HW8081000	--
14	402500.1	Short 20 Ton Ram	20	2 7/8"	1 1/4"	4 1/8"	4"	Hand	5	--	--
15	12569	Valve Assembly	--	--	--	--	--	--	--	--	--
16	845	15' Hose	--	--	--	--	--	--	--	--	--
17	845.30	30' Hose	--	--	--	--	--	--	--	--	--

Pumps & Rams

Bee Line Ram
Accessories

109000 10 Ton Ram Extension Kit

Number	Part Number	Description
14	109024	24" Extension Tube
15	109018	18" Extension Tube
16	109012	12" Extension Tube
17	109006	6" Extension Tube
18	109001	Tube Connectors (3)
19	109004	Ram Connectors (2)
20	109007	Tube Cap
21	A1035	Concave 90 Degree Head
22	Z129	Wedge Head
23	A1058	Flat Head

Optional - Not Shown - 1034 10 Ton Ram Base



403200 20 Ton Ram Extension Kit

Number	Part Number	Description
24	403206	6" Extension Tube
25	403209	9" Extension Tube
26	403212	12" Extension Tube
27	403218	18" Extension Tube
28	403224	24" Extension Tube
29	403236	36" Extension Tube
30	403210	Tube Connectors (3)
31	403205	Ram Spade
32	403202	Extension Cap
33	403208	Extension Spade
34	403204	Ram Connectors (2)

Optional - Not Shown - 403235 68" Extension Tube & 1037 20 Ton Ram Base



90 Years of Frame Correction Experience



Frame Correction Products Include:

- Standard Truck Frame Press: Works in conjunction with A.A. Runways.
- "I" Beam Systems that are constructed using in-floor I-beams.
- Drive Over Frame Press: Completely portable press that saves shop space.
- Dump Body Tools: Reshape damaged dump bodies.

Frame Correction and Press System

The Bee Line Truck Frame Machine and Press system is a chassis and suspension correction system for heavy-duty vehicles of all types.

Considered to be the most accurate and efficient chassis and total suspension correction system available today,

Bee Line leads the Truck Frame Correction Industry with its vast experience in equipment manufacturing, safety, training, backup service and profit potential.

With frame correction capabilities in your own shop, you no longer have to rely on outside sources to work the job into their schedule. You can perform the job quickly and cost effectively with reduced down-time.

Built tough and versatile to handle all makes of heavy trucks and equipment

The Bee Line extra heavy duty frame machine is designed to fit into your shop and to help increase your production and correct all chassis to better than new. The runways easily adjust from 39" to 94" tread width. The Bee Line frame machine has the ability to handle all sizes of trucks, buses, trailers and even specialized equipment. Bee Line's design makes corrections without causing additional damage to the vehicle and without heat. The vehicle retains its original tensile strength.

The Bee Line frame straightening system allows the operator full control over every part of the truck frame straightening operation.



FRAME CORRECTION OPTIONS



Frame gauging and equipment set up is done at a convenient height. Runways can be removed to allow easy access.

The Most Accurate and Efficient Chassis and Suspension System Available

Frame Tools

The Bee Line tool selection is versatile, providing the operator the safest hook ups with minimal disassembly of the damaged vehicle. These tool hook ups produce direct pressure in exactly the right location of the damaged frame.

Removable runways simplify locating the damage and positioning the proper tools.

The backbone of the machine is the frame press to which all tie downs, holds, pushes and pulls are connected.



Our Frame Press hydraulically raises to bring the correction tooling to the truck. Runway sections are removed to allow easy access at a comfortable working height.



This diamond correction set up utilizes the force of a pull ram to bring the frame rails even with each other.



This twisted trailer is being corrected with our Trailer Twisting tools. Our Floor "I" Beam set up works primarily with trailer corrections. Also can be ordered for frame press.

Tools for Accuracy and Precision

Shop Equipment

4088 Bee Line's Smart Balancer II

What is On-the-Vehicle Balancing?

On-the-vehicle balancing refers to the Truck Maintenance Council's official recommended practice of truck wheel balancing. On-the-vehicle means the wheel is never removed from the truck during the balancing procedure. By leaving the wheel on, a technician not only balances the tire, he balances the hub and the drum in relationship to the truck's suspension. Balancing the entire wheel assembly provides a far more accurate "smart" balance.

Why Do You Want the Smart Balancer II?

The new Smart Balancer II is easily the most user friendly on-the-vehicle balancer on the market today. The Smart Balancer II is the latest generation of touch screen computerized system that replaces all old strobe type balancer. This balancer is accurate and simple to use. From initial set up through the completion of the balance, the technician is prompted by simple step-by-step instructions. The Smart Balancer II balances wheels extremely fast by taking the guesswork out of placing weights on the tire. In a few short spins the touch screen illustrates the exact amount of weight and the exact position that weight should be added to the wheel. This process removes the chance for error and dramatically decreases the time it takes to balance each wheel. In addition, the Smart Balancer II features customized workflow, increased accuracy and a new rugged design. With the Smart Balancer II, you make more money with a better quality balance in less time.



Extra Retroreflective tape rolls -
PN 3107A

7700 Floor Jack*

Why Work Twice as Hard?

Lift the whole front end or rear end in one go, not ONE corner at a time. Scorpion Jack lifts on the axle or on the frame. Your end lift (Bumper Jack) can't do that. Ideal for all heavy-duty truck and bus repair shops. Perform service on wheels and tires, brakes, suspension, alignment and much more.

- 24,000 lb. capacity
- Easy to use control handle extends to nine feet
- Air/hydraulic design so no pumping required
- Detachable pendant remote
- Lifts over 20" with a built-in safety lock
- Vertical handles provide comfortable working position that eliminates back pain
- At 8.25" tall it glides easily on floating casters under the lowest truck axles and the deepest rear ends
- Includes a selection of three saddles: low/medium/high

*Optional Accessory - Part No. 7710 Pair of Trailer Adapters.



King Pin Gauge EPM718

Bee Line software technology affords the measurement, recording and the ability to print the results of a computer-driven king pin inspection. This one-of-a-kind software was developed to electronically record the movement in king pin bushings to determine if replacement is needed. KPGS readings are accurate, extremely repeatable and available in a customizable hard copy printout through WindSpeed 7000 or WindSpeed 7500.

Increase buyer confidence and add credibility to results with computer measured tolerance variance. Steering knuckle vertical and lateral end play industry standards have been set by TMC and Axle manufacturers to ensure safety. The King Pin Gauging System accurately records these measurements and indicates when a king pin is in or out of tolerance by these standards.

Bee Line's King Pin Gauging System can be quickly and easily installed, allowing you to better serve your customers. What was once a two man job can now be done by one. The results are available instantly and can be handed to a waiting customer or electronically sent to someone off-site.



Model 4000 Porta-Truer

Versatile Design for Absolute Accuracy

Fast, accurate and dependable, the heavy duty 4000 Porta-Truer is designed to roll up to any vehicle and true the tire without removing the wheel. The versatile design means the entire job can be completed within a matter of minutes. Truing the tire on wheel bearings ensures absolute accuracy.

- Self-sharpening blade with manual override and safety blade guard
- Versatile, low maintenance design
- Folding handle design for compact storage
- Built-in tire profile follower
- Cuts up to 17.5" wide on a 24" profile
- Adjustable work light
- 14 foot power cord
- Designed to handle bus, truck, trailer, car, light truck and racing tire applications
- Cutter and drive motor are 60Hz., 110-115 V, single phase. Shipping weight is 379 lbs
- Porta-Truer stand is optional
- Includes Scooter Seat with wheel weight tray



4010 Tire Runout Gauge

Helps Lengthen Tire Life

The 4010 Tire Runout Gauge provides a rugged and sturdy tool that can easily and quickly diagnose irregular wear and potentially dangerous runout in a given tire.

- Eliminate vibration and irregular tire wear issues.
- Properly match the high and low spots of tire and rim runout.
- Radial and lateral tests to show abnormal peaks, bulges, troughs or flat spots; deviation in roundness or a tire's sidewall plane
- The gauge is read by counting the lines separating the sliders and measures 0.01" runout.



ET66 Balancing Machine (PN CG-ET66KIT)

A compact, extremely precise balancing machine for truck wheels, the ET66, is fitted on casters for ease of positioning. Handles rims from 12" to 28".

The ET66 has a dual display control panel which is designed to be user friendly. It is equipped with an integrated lift for raising wheels up to 150kg and is supplied with a wide choice of balancing programs. Available in manual or motor-driven spin device versions, it also can operate with a 12V battery for portable solutions.



HD700 Electrohydraulic Tire Changer (PN CG-HD700KIT)

Electrohydraulic Tire Changer for trucks, buses, tractors and earth moving equipment with groove or elastic ring type rim wheels and with tubeless or inner tube type tires.

- Control pedestal with ergonomic controls.
- Turntable spindle for clamping rim sizes from 14" to 26" with clockwise and counter-clockwise rotation
- Special clamps with plastic insert for alloy rims (optional)
- Hydraulic power unit
- Carriage with hydraulic left-right translation and tool arm with safety lock system
- The HD 700 is capable of handling wheels weighing up to 1,540 Lbs.



Hands-on Training Opportunities

Bee Line Training Courses

Bee Line Company offers training courses focused on the principles and techniques of performing computerized wheel alignment and truck frame correction. These courses have been developed to advance a beginning technician's skills to the next level. A fully equipped training center located near Bee Line's manufacturing facility in Bettendorf, IA provides the ultimate learning environment. Enroll in Bee Line's training courses and take your first step toward advancement. With more than 90 years of experience in wheel alignment and frame correction, you can trust Bee Line to help you succeed.

Log on to www.beeline-co.com or call Bee Line Customer Service to register. 800-728-7828 or 563-332-4066.

Bee Line Alignment Course

5 DAY COURSE:

8 Hours Classroom

32 Hours Hands-On Training

This training course is designed to teach the principles of alignment theory, vehicle (suspension system) inspection and equipment operation to an individual with one year or less service technician experience as well as an experienced alignment technician who wants to refresh their skills and knowledge. The course is a combination of classroom instruction and hands-on training that will provide an overview of suspension and steering systems with detailed instruction in performing proper inspection procedures.

Learning Objective:

The participant who completes this course will be able to:

- Describe the effects that improper wheel alignment will have on tire wear and vehicle handling.
- Recognize the factors that have the largest impact on alignment, including camber, caster, toe and tracking.
- Operate computerized alignment systems to perform measurements.



Bee Line Frame Correction Course

4 DAY COURSE:

4 Hours Classroom

28 Hours Hands-On Training

This training course is designed to teach the principles of truck frame correction. Participants will learn to diagnose, set up and correct common frame misalignment conditions in heavy duty trucks and trailers. Designed for an individual with one year or less correction technician experience as well as an experienced technician who wants to refresh their skills and knowledge. The course is a combination of classroom instruction and hands-on training. When taken in conjunction with the Bee Line Alignment course, the participant will learn to apply all the principles of Total Suspension Alignment.

Learning Objective:

The participant who completes this course will be able to:

- Recognize the factors that have the largest impact on alignment.
- Diagnose and set up misalignment corrections, including side-sway, twist, sag and diamond conditions.
- Operate Bee Line Advanced Aligner Machine to perform measurements and corrections.



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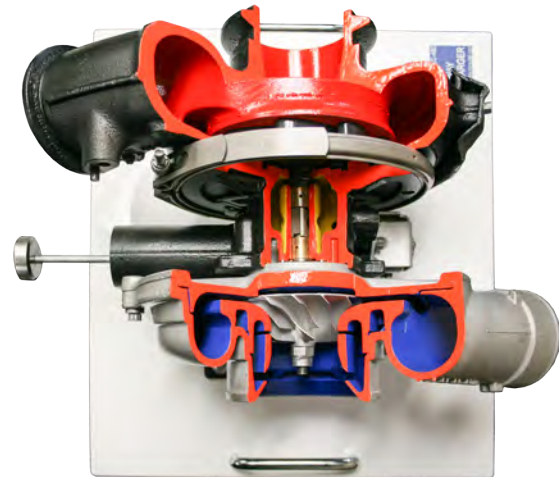


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BL600.3 - 02/15



NON CONTRACTUAL PICTURES

The EC-480 cutaway turbocharger is used to demonstrate the operation of a variable displacement turbocharger. It is based on the platform of a 2005-2015 GM Duramax. This component utilizes a variable output displacement by using variable vane technology (VVT). The trainer is cutaway in such a manner as to clearly show the operation of internal parts that provide the variable displacement.

Educational Advantages

- Students can observe the movement of the variable-vane turbine
- Fully functional vacuum diaphragm that moves turbo plate
- All internal components are visible for better understanding of turbo operation

Main Features

- Variable vane technology (VVT)
- Operational vacuum diaphragm
- Clear demonstration of all internal turbocharger components
- 2005-2015 GM Duramax engine

Operational Description

This product is from a 2005-2015 GM Duramax diesel engine. It features variable displacement turbocharger based on variable vane technology (VVT). Turbocharger boost is controlled by a vacuum diaphragm connected to a linkage rod which moves a plate containing vanes that are able to change the angle at which exhaust gas leaves the turbocharger. A vacuum hose is connected to the intake manifold and uses engine vacuum as a measurement of engine load. A higher blade angle results in a higher turbo boost situation. Lower angles reduces boost and thus, lowers developed power. A high vacuum condition (low load) results in a much shallower blade angle resulting in less boost. As the load increases (low vacuum), a spring inside the diaphragm moves the plate in an opposite direction which causes the vanes to increase the angle at which exhaust gas flows past them resulting in a higher boost level (more developed power).

The primary advantage of this system is for significantly reducing a common operating characteristic of turbocharged engines called "turbo lag" which is described as a temporary lag in time that engine power is increased until a volume of air flow is fast enough to create more power.

EC-500HV (52963)

CUTAWAY DIESEL ALTERNATOR



The ConsuLab EC-500HV Cutaway Diesel Alternator demonstrates the internal operation of a heavy duty diesel alternator and permits the student to visualize and safely rotate the system.

Educational Advantages

- Alternator application of your choice.
- Able to rotate the alternator by hand for demonstration purposes.
- Allows full access to internal components for student visualization without the limitations of an assembled component.



ConsuLab

TRAINING AIDS

CUTAWAY DIESEL STARTING SYSTEM TRAINER

EC-510HV

OPERATION MANUAL

VERSION 2013-1



HELPING YOU TEACH TECHNOLOGY

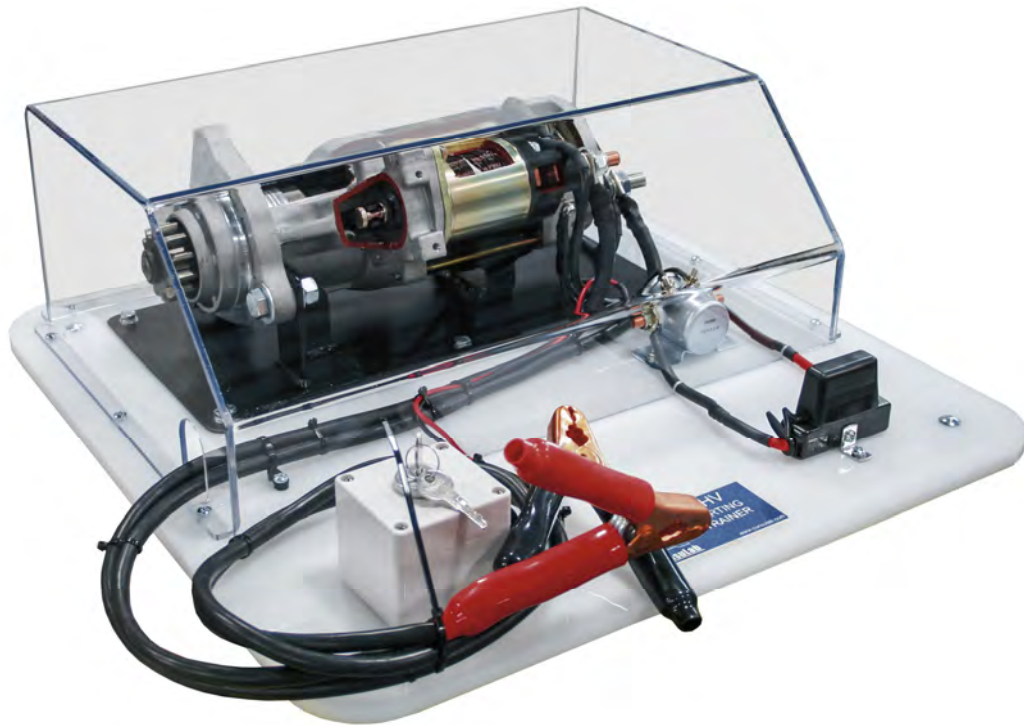
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EC-510HV

CUTAWAY DIESEL STARTING SYSTEM TRAINER

OPERATION MANUAL

Version 2013-1



PRINTED IN CANADA

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Fax : 418-843-3444
E-mail: info@consulab.com
Web site: www.consulab.com

This manual is designed to provide instructors with the necessary information for the proper and safe operation of the EC-510HV Cutaway Diesel Starting System Trainer. Be sure to read and understand each section.

PRODUCT DESCRIPTION:

The EC-510HV Cutaway Diesel Starting System Trainer allows for the demonstration of a complete starting system using real-world components. Key areas of the starter have been cutaway to reveal their function.

WARNINGS AND CAUTIONS:

This trainer must be connected to a fully charged battery.

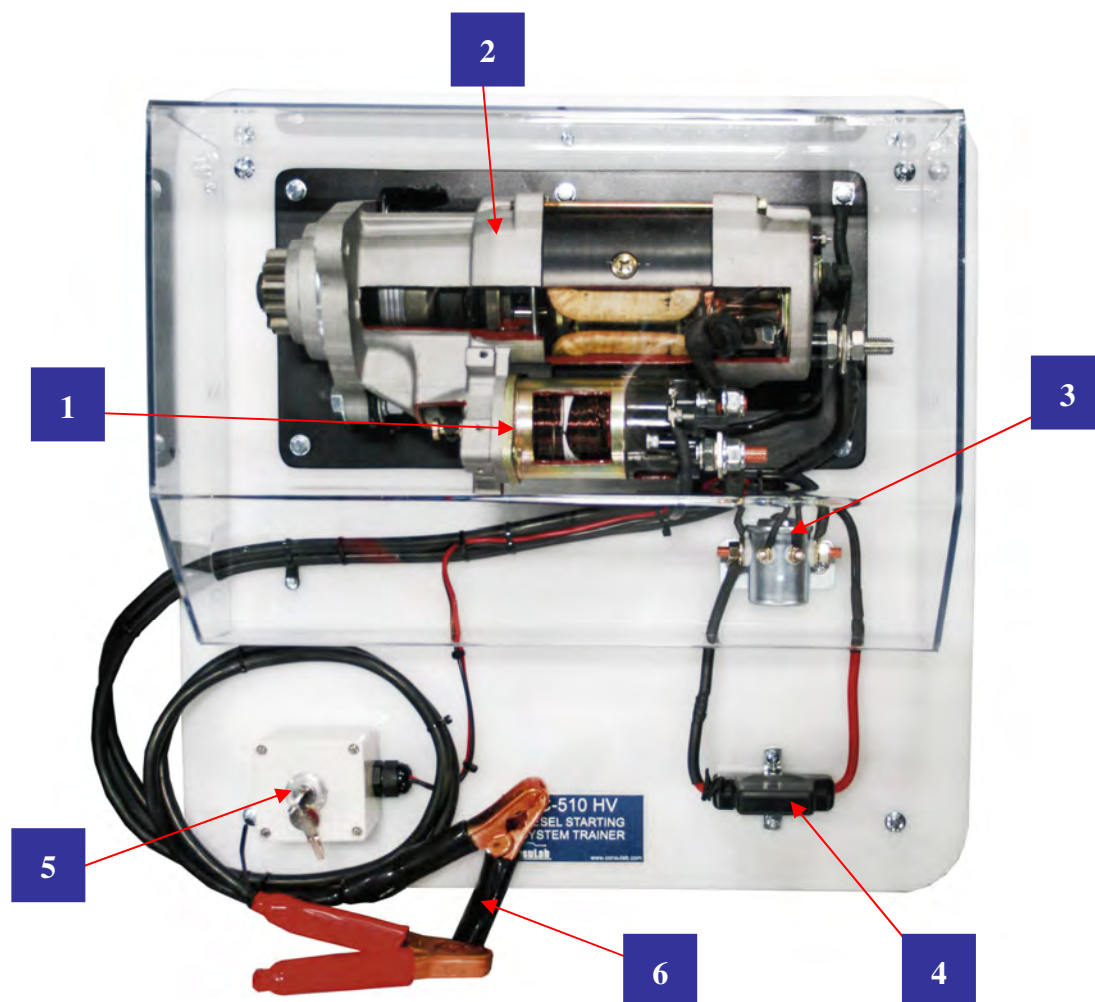
There is a protective cover over the starter motor, this must not be removed at any time as there are many moving parts that could injure a student.

EDUCATIONAL ADVANTAGES:

- Ability to visualize the internal function of a heavy duty diesel starter.
- Demonstrates planetary gear reduction.
- Ability to test and verify a basic starting circuit.
- Protective cover over all moving components.

CUTAWAY DIESEL STARTING SYSTEM STARTER

COMPONENTS IDENTIFICATION



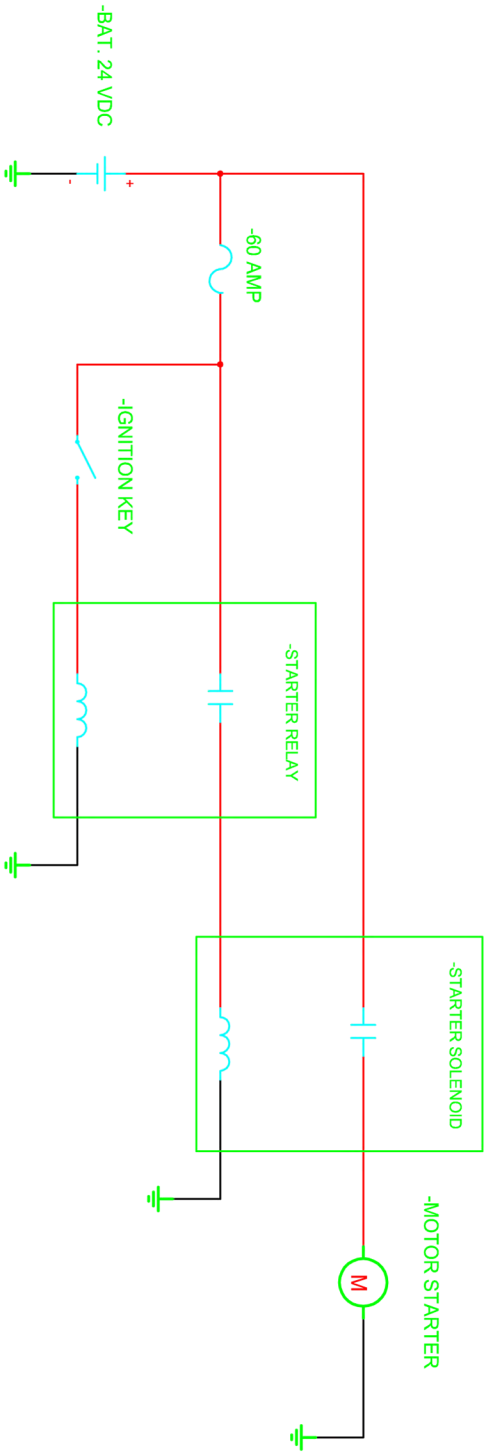
1. Starter Solenoid
2. Starter Motor
3. Starter Relay
4. Battery Fuse
5. Ignition Switch
6. 12V Power Supply Cables w/Alligators

OPERATING INSTRUCTIONS:

The trainer has been designed to operate in the same manner as a “real-life” vehicle starting system.

1. Connect the positive cable to the positive post of a fully charged 12V DC automotive battery.
2. Connect the negative cable to the negative post of a fully charged 12V DC automotive battery.
3. Turn the ignition switch to the start position.
4. The starter solenoid will engage and the starter will turn.

EC-510 HV
CUTAWAY HD STARTER
WIRING DIAGRAM



STARTER RELAY



STARTER SOLENOID



CONSULAB

DESIGNÉ :	MARTIN SIROIS
VÉRIFIÉ :	
DATE DE CRÉATION :	21/02/2012
INCHÉ :	
DATE :	
MODIFICATION :	
DES :	

Document n° :

EC-510 HV WIRING DIAGRAM



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EC-950



A ConsuLab cutaway diesel engine can be developed from any application or component of your choice. The components or component can be provided by ConsuLab or the customer. Example component cutaways: diesel injection pump, fuel injector, cylinder head, transmissions, superchargers, turbochargers etc.

CALLED 1-800-567-0791 ON 3/15/19. REP SAID THIS MODEL IS GENERIC BECAUSE DIESEL ENGINES VARY IN SIZE/WEIGHT. SAID A MEDIUM SIZE/WEIGHT ENGINE, A 6.7 LITER WEIGHTS 2,200# WITH A FOOTPRINT OF 50"x58"

-MICHAEL FIGUEROA, RCA

Features

Photos

Reviews

Educational Advantages

- Engine, transmission and/or component of your choice
- Completely enclosed for safe observation
- Rotating device options to include hand crank or electric motor

TESTIMONIALS

Please let everyone know the C-12 trainers are working great, they are a big hit with all the top brass when they stop by for a site visit. The students love that...

**CM1(SCW) Ingram, Mickey, CM
Advanced School Instructor, NCTC
Gulfport, MS**

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Consulab manufactures educational training materials adapted to meet the needs of technical and vocational schools in the fields of transportation technology electrical engineering.

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Hydraulic Training Systems

Teaching and learning hydraulics in real-time



MF500-HT-TSE Hydrostatic Transmission Training Simulator

Purpose -

The MF500-HT-TSE is an instructors "dream-come-true" with respect to teaching state-of-the-art, electronically-controlled hydrostatic transmission systems - hands-on.

It can even be driven as if it were on a construction site - in real-time. Driving a skid-steer loader around a construction site and operating the MF500-HT-TSE in the lab amounts to the same thing - without the hazards!

The electronically-controlled, infinitely variable, wheel-load system allows students to drive the hydrostatic transmission under any type of operating condition, i.e., up-hill, downhill, level surface - it can even simulate a runaway condition.

Safety - the driving force behind the design and development of the MF500-HT-TSE -

Skid-steer type loaders are today's hydrostatic transmission training simulators - you will find one in the lab of almost every technical college in the country. However, these types of vehicles offer a host of unique safety hazards. Some of the more serious hazards include: unexpected vehicle motion, rotating wheels and shafts; noxious exhaust emissions; hot engine components; improperly supported vehicle, disconnecting of critical manufacturer installed safety devices, confined space, hot oil, etc.

The MF500-HT-TSE eliminates ALL of the hazards associated with using a skid-steer type loader as a hydrostatic transmission training simulator because it is designed for educators not for a construction site.

In addition to the numerous safety hazards posed by skid-steer type loaders in a lab, there are additional distinct disadvantages which include: the compactness of the vehicle makes it impossible for the instructor to engage in any type of demonstration or group activity with regard to component adjustment and or diagnostics procedures. It is also impossible to safely load the hydrostatic drive. These disadvantages erase 90% of the vehicle's educational value.

The MF500-HT-TSE is the solution fluid power instructors have been looking for because:

- It has the look and feel of a skid-steer type loader without outstanding teaching and learning capability.
- The hazards associated with using diesel-driven mobile machinery are eliminated.



MF500-HT-TSE
Hydrostatic
Transmission
Training Simulator

- Instructors can perform meaningful group discussions and demonstrations associated with hydrostatic transmission pre-start, adjustment, and diagnostic procedures while the system is operating under any type of load conditions. The results are guaranteed: students will benefit because they are learning and understanding "need-to-know" information.
- Students can drive it, load it, troubleshoot it, and even "abuse" it, in the confines of a lab without ever putting rubber on the ground.

The MF500-HT-TSE is, without a doubt, the safest and most effective training simulator available for teaching and learning hydrostatic drives.



All FPTI™ simulators are available for operation at any voltage or frequency

MF500-HT-TSE Hydrostatic Transmission Training Simulator

Features and Benefits:

1. Teaching and Learning in real-time -

Bridges the gap between simulated learning and real-world experience. Learning hydrostatic transmission systems on the MF500-HT-TSE more than adequately prepares students to meet the challenges associated with maintaining, servicing, repairing and troubleshooting hydrostatic transmission systems safely and effectively because they learn on a fully functional system.



MF500-HT-TSE shown with optional MF500-IS Implement & Steering System Training Module

2. The MF500 will rapidly transform students into much needed highly-skilled hydrostatic transmission technicians who have the skill-sets to safely and correctly perform the following:

- Pump and/or motor installation procedures
- Pump and/or motor pre-start checks and adjustments
- Pump and/or motor start-up checks and adjustments
- How to set charge pressure relief valves on systems with and without hot oil shuttle valves
- How to set main pressure relief valves and pressure override valves
- How to perform null adjustments on electronic displacement control valves
- How and where to check pump and motor case pressures
- How to perform mechanical adjustments on electronic and mechanical displacement control valves
- How to perform *diagnostic procedures on a hydrostatic transmission system

*for more information about the extent of the diagnostic procedures please refer to the troubleshooting section in the course workbook.

3. Extremely versatile -

Teach any type or make of hydrostatic transmission on the MF500-HT-TSE. The standard trainer is equipped with a dual tandem-pump configuration with dual joysticks and electronic pump displacement controls. You can purchase the MF500-HT-TSE with the hydrostatic transmission of your choice (prices may vary), or you can easily adapt a different type of pump at a later time.

The same applies to the wheel drive motors. The standard MF500-HT-TSE is equipped with dual high torque/low speed motors. However, it can also be equipped with low torque/high speed motors. Or a low speed/high torque motor can be installed on one side and a high speed/low torque motor on the other.

4. Nothing, including an actual vehicle, can

match the MF500-HT-TSE's troubleshooting teaching and learning capability -

The perfect situation for a student to learn how to troubleshoot a hydrostatic transmission is to give them an actual machine, which is experiencing a real-time problem. There is a remote possibility that this can happen. However, what is virtually impossible is to find machines with every type of failure a typical hydrostatic transmission can experience so students can learn broad troubleshooting skills.



Dual tandem-pumps with dual joysticks and electronic pump displacement controls

Hydraulic Training Systems

Teaching and learning hydraulics in real-time

MF500-HT-TSE Hydrostatic Transmission Training Simulator

5. Nothing else matches the MF500-HT-TSE's diagnostic learning capabilities -

Over three decades of hydrostatic transmission troubleshooting experience is designed into the MF500-HT-TSE. Its diagnostic capability is so advanced that every fault a typical hydrostatic transmission can experience in the field can be automatically introduced into the system for real-world troubleshooting in real-time. Faults include worn pump(s), worn motor(s), electronic problems, operation in one direction and not the other, sluggish operation, overheating, etc.

6. MF500-HT-TSE safety features are endless -

- No wheels on the ground equals no unforeseen safety hazards -

Tires and tracks on hydrostatically-propelled vehicles offer unique hazards in a confined space - even when they are elevated. Hydrostatic drives are extremely sensitive and on most machines can "drive-through" their park



brakes. The hazard level is heightened when a group of students are working on a machine with the engine running.

- No hazardous rotating wheels or moving tracks - Rotating wheels and moving tracks present a variety of considerable safety hazards, which include: snagging clothing, crushing, etc. Every moving part on the MF500-HT-TSE was carefully analyzed for potential hazards. The four drive wheels are contained in heavy-duty, transparent plastic enclosures and all moving drive-train components are covered.
- No fatigue because all major components are mounted waist high - Learning while crouched in the "belly" of a compact loader/excavator causes fatigue and frustration. It also results in students having to execute solo activities, which wastes valuable learning time. All hydraulic components on the MF500-HT-TSE are mounted where students work upright in a team-based learning environment.

- No slip hazards or environmental problems - To minimize oil spillage all hydraulic components are equipped with self-draining oil pans. Also, all quick-connect/disconnect connections are flat-face, zero-leak type.
- No confined space hazards - Learning a task is challenging enough without a student having to do it while standing on his/her head. Almost every hydraulic component in a compact mobile machine is extremely difficult to access, which makes team-based learning difficult or impossible. It also decreases retention. The lab is where students must learn and understand how to do the task safely and efficiently - and also generically. Once they know how, they will be able to deal with the access problems they will encounter in the field.
- Four (4) emergency stops - In the unlikely event that something goes wrong, every workstation has easy access to an emergency stop button - pump controls, hydraulic motors (left and right), implement directional control, and steering.
- Equipped with FPTI™'s exclusive Safe-T-Bleed® system - Safe-T-Bleed® is a product developed by FPTI™ and is exclusive to FPTI™ training simulators. The Safe-T-Bleed® system is designed to permit students to learn how to execute critical lockout and tagout procedures in accordance with State and Federal laws. Safe-T-Bleed® provides a means to safely bring a hydraulic system to zero mechanical state, which means no discharging high-pressure oil to atmosphere. Safe-T-Bleed® is also installed on the cylinders so students can learn how to purge air from cylinders without loosening connectors.
- Industry-standard lockout devices - All electrical panels and moving parts are equipped with industry-standard safety lockout/locking devices. The implement and steering mechanisms are equipped with self-contained mechanical locking devices identical to those found on actual machinery.
- Industry-standard Warning and Caution decals - Industry-standard, multi-lingual warning and caution decals are placed appropriately throughout the machine(s).

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Hydraulic Training Systems

Teaching and learning hydraulics in real-time

MF500-HT-TSE Hydrostatic Transmission Training Simulator

Specifications -

Prime mover: Electric motor; 20HP (15 kw); TEFC; C-face;
1800 RPM; 3-phase - 460V
(optional 3-phase - 230V available)



Pumps: Dual, tandem-mount, axial piston type pumps;
138 bar (2000 PSI); 38 Lpm (10 GPM);
electronic displacement control

Motors: Dual, high torque/low speed motors;
fixed displacement 82 cm³/rev. (5.0 in³/rev.)



Reservoir capacity: 643 liters (170 gallons)

Dynamic wheel load: Independent left-hand and right-hand wheel drive with infinitely variable electronic load control in forward and reverse

Panel PC: Panel PC, Microsoft® Windows™ software;
48 cm (19") full-color touch-screen with pre-loaded learning software and diagnostic activities

Diagnostics: Pre-programmed activities covering every fault published in a typical hydrostatic transmission manufacturer's troubleshooting flow charts

Safety features:

- Transparent wheel covers - Drive wheels enclosed in Lexan® enclosures
- Safe-T-Bleed® - Pumps equipped with Safe-T-Bleed® system for safe de-energization and verification
- Emergency stops - The MF500 has four (4) emergency stop switches
- Redundant electrical lockout - Both low voltage and high voltage enclosures are equipped with redundant lockouts



- Oil drip/re-circulating trays - Drip trays, which automatically recycle spilled oil in to the reservoir are located below both wheel motors and pumps
- Industry-standard Warning and Caution decals - Multi-lingual warning and caution decals are placed wherever necessary on the machine

Options:

Prime mover: Diesel drive

Pumps: Any make or type currently available, e.g., Sauer Danfoss®, Rexroth®, Eaton®, Linde®, etc.

Pump controls: Mechanical, hydraulic pilot

Motors: High-speed/Low torque, fixed or variable displacement motors



Hydraulic Training Systems

Teaching and learning hydraulics in real-time

MF500-HT-TSE Hydrostatic Transmission Training Simulator

Shipping Specifications -

Shipping weight (does not include optional MF500-IS-TSE Implement and Steering System training module, pallet or packaging):

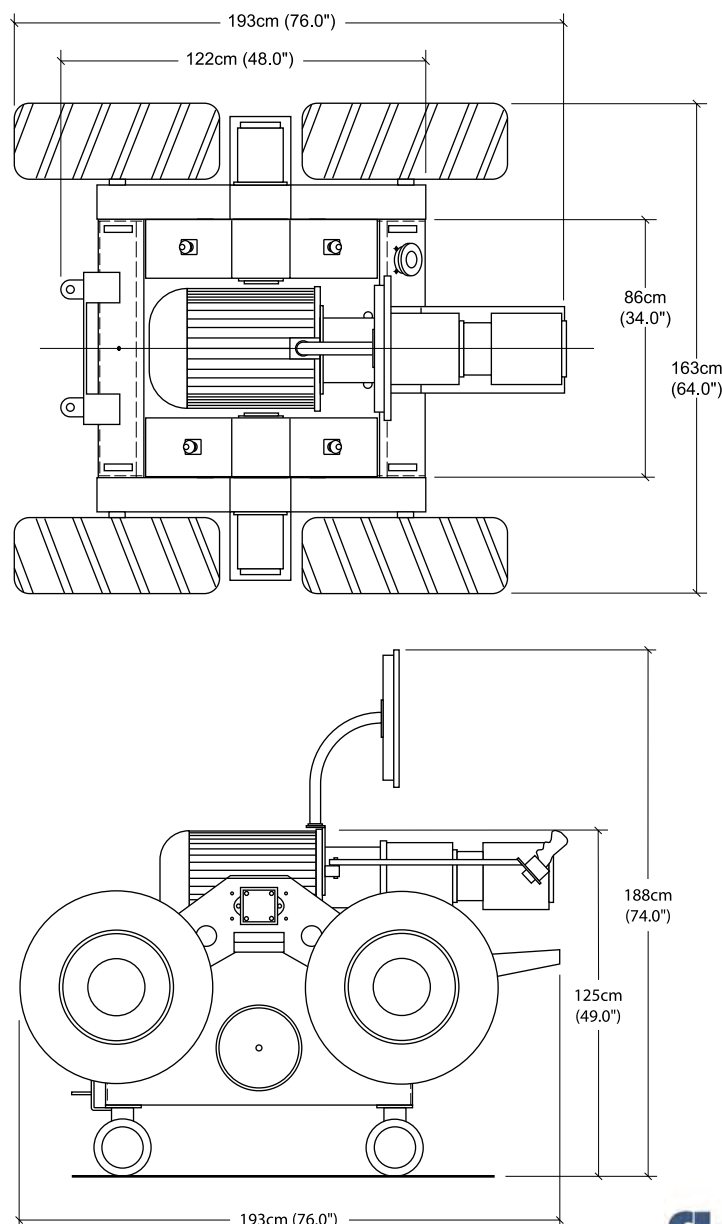
789 kgs (1,740 lbs)

Warranty -

FPTI™ warrants its products against defect in materials or workmanship for a period of two (2) years from date of delivery.

Shipping dimensions:

188cm (74.0") tall x 163cm (64.0") wide x 193cm (76.0") long



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Hydraulic Training Systems

Teaching and learning hydraulics in real-time



MF500-IS-TSE Hydraulic Implement and Articulated Steering System Module (optional)

Adding the optional, and affordable, “plug-and-play” hydraulic implement and articulated steering system trainer to the MF500-HT-TSE hydrostatic transmission trainer transforms it into a fully-functional front-end loader with articulated hydraulic steering, and a cylinder service center.

Purpose -

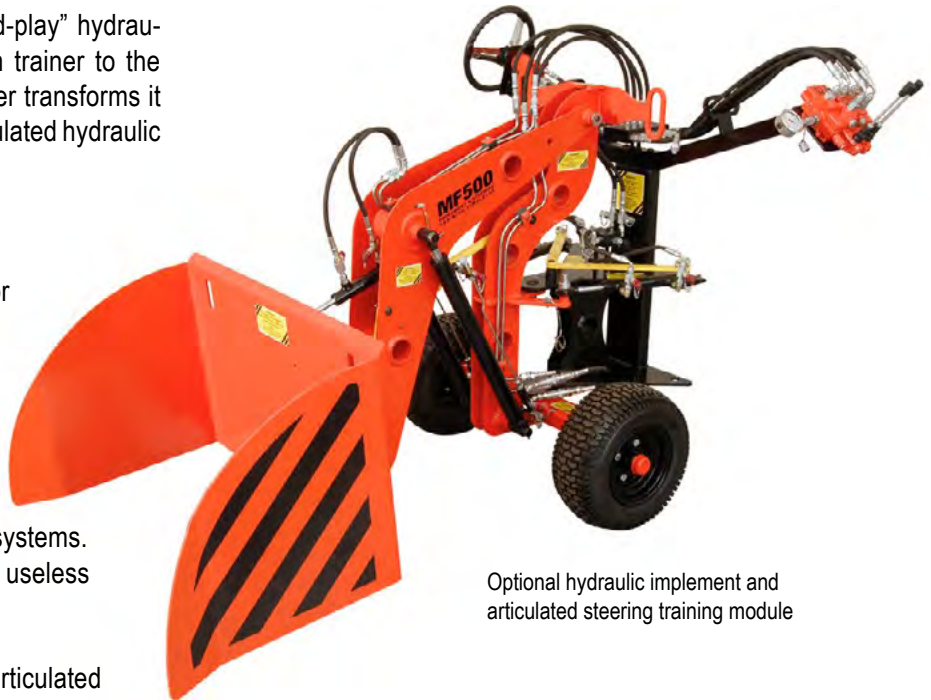
Instructors who use actual front-end loaders for teaching bucket control hydraulic systems and hydraulic steering systems encounter the same problems as they do using a skid-steer type loader for teaching hydrostatic transmission systems - inherent safety hazards and the inability to safely load the bucket control and steering systems. Which arguably makes these types of vehicles useless for the purpose of technical education.

The MF500-IS-TSE hydraulic implement and articulated steering module is designed exclusively for educational purposes, which made safety our number one design objective.

Safety -

The MF500 designers identified four potential hazards associated with the use of front-end loaders in an educational setting:

1. Bucket riding - It is possible for a student to ride in the bucket of a front-end loader.
2. Foot pinch-point - It is possible for the bucket of a front-end loader to be inadvertently lowered onto a student's foot. This problem is of particular concern if the bucket is equipped with a float option. The float option makes it possible for the bucket to free-fall to the ground from any elevation if the float position is inadvertently selected.
3. Unsecured load - If a student placed an object in the bucket of a front-end loader to simulate load there is a possibility the load could fall out if the bucket is inadvertently tipped forward.
4. Lift arm and rollback mechanical locks - Most bucket mechanisms have integrated mechanical locking devices. However, some lock the cylinder rods only. In the event of a cylinder being removed it is possible to compromise safety.



Optional hydraulic implement and articulated steering training module

The MF500 designers eliminated these hazards:

1. No floor surface in the bucket - Without a floor surface to stand on, students are not enticed into “riding” the bucket.
2. Bucket lip and sides do not touch the ground - The entire lower surface of the bucket is designed to stop at least 15cm (6”) off the ground to prevent foot crush hazards.
3. Safe and secure load - No floor means no loose loads, which can fall out accidentally. The load fastens securely to the bucket with redundant safety locks and pins.
4. Mechanical locks - The lift/lower, rollback/dump, and articulated steering mechanisms, are void of pinch-points. However, to give students a sense of reality, safety locking mechanisms identical to those used in industry were added so they can practice and learn how important mechanical locks are and how to properly use them.

In addition, the lift-cylinders are equipped with integral, non-adjustable, safety flow control orifices, which are designed to regulate descent velocity in the event of a hydraulic hose failure and when lowering a loaded bucket.



Hydraulic Training Systems

Teaching and learning hydraulics in real-time

MF500-IS-TSE Hydraulic Implement and Articulated Steering System Module (optional)

Features and Benefits:

Load is mobile, safe, and environmentally friendly -
The load consists of a 265 liter (70 gallon) water tank, which is contained on a mobile fixture. Heavy-duty casters with four-wheel brakes support the load.

Load engagement in the bucket is simple, safe, and semi-automatic. The load assembly has two steel arms welded to a steel support bar. When the load is rolled into the bucket the arms engage two slots (one on either side) in the rear plate of the bucket. Once through the slots, the arms are locked into place with pins (chained to the bucket).

If a student forgets to install the pin(s) a redundant locking system automatically locks onto the bucket as it begins upward movement.



Compact -
Lab floor space is limited and expensive. The MF500-HT-TSE is designed with this in mind. With a footprint of only 163cm (64.0") wide x 193cm (76.0") long, it is a fraction of the size of an actual articulated machine, which makes it easy to maneuver and store.

The optional implement and articulated steering mechanism (MF500-IS-TSE) with a footprint of only 107cm (42.0") wide x 191cm (75.0") long sits on three wheels, which are positioned in the form of a tricycle making it easy to move and store.

Attaching or detaching the module is simple – wheel it into place, install two pins, connect two quick-connect fittings, plug in the 24VDC receptacle – and it's ready to go.

Cylinder rebuild station -

As an added convenience the load mechanism is equipped with an integral cylinder rebuild station, which is designed to permit two groups of students to disassemble/assemble cylinders at the same time.

This feature enhances safety because without it students are forced to wrestle cylinders, which are either locked in a vice, or lying on a workbench. If the parts unexpectedly fall they can cause severe injuries to the legs and feet.



The MF500-IS-TSE ships with one (1) additional bucket lift/lower cylinder, which has defective seals. When teaching troubleshooting, the instructor can install the defective cylinder - no wrenches required.

The cylinder repair station is designed with safety in mind. The student simply slides the cylinder into a cradle (no tools necessary) and installs a locking pin, which not only secures the cylinder but also prevents it from rotating when the student is loosening/tightening the gland.

Even if the student forgets to install the locking pin, the cylinder cannot move even when the load lifts up. To prevent oil from spilling onto the ground, two (2) removeable oil drip trays are strategically located on the table top.

Hydraulic Training Systems

Teaching and learning hydraulics in real-time

MF500-IS-TSE Hydraulic Implement and Articulated Steering System Module (optional)

Specifications -

Pump:	Gear type - 12.61 cm ³ /rev. (0.77 in ³ /rev.) fixed displacement
Pressure:	138 bar (2000 PSI) maximum pressure
Directional control valve:	Sectional type (four sections) - inlet section, two spool sections, and outlet section. Section 1 - Inlet section with integral, adjustable pressure relief valve (cartridge-type) Section 2 - Three-position, four-way, cylinder spool configuration, load check valves, cylinder port relief valve (cartridge-type) and anti-cavitation valve (cartridge-type) Section 3 - Three-position, four-way, cylinder spool configuration, load check valves, two cylinder port/anti-cavitation combination valves (cartridge-type) Section 4 - Outlet section with power-beyond capability
Steering Orbitrol valve:	Closed-center
Differential Pressure Unloading valve:	Cartridge-type
Cross-port Relief valves:	Adjustable, cartridge-type
Cylinders:	Dual lift/lower, double-acting single rod cylinder: Bore - 1.5" (3.81 cm) Rod - 1" (2.54 cm) Stroke - 19" (48.26 cm) Gland type - threaded Rollback/dump cylinder: Bore - 1.0" (2.54 cm) Rod - 5/8" (1.59 cm) Stroke - 4" (10 cm) Steering cylinders: Bore - 1.0" (2.54 cm) Rod - 5/8" (1.59 cm) Stroke - 6" (15.2 cm)
Accumulator:	0.95 Liter (1 quart). Bladder-type.

Safety features:

- Self-contained mechanical lock - lift/lower mechanism
- Self-contained mechanical lock - rollback/dump mechanism
- Self-contained mechanical locks - steering mechanism
- Safe-T-Bleed® installed on all cylinder ports to facilitate safe de-energization and verification procedures and drip-free and safe air-bleeding procedures
- Industry-standard Warning and Caution decals - Multi-lingual warning and caution decals are placed wherever necessary on the machine
- Zero pinch-points

Diagnostics:

Diagnostics on the implement system are in real-time because the implement system operates under actual working and load conditions.

Wear-type faults are designed into the pump, pressure relief valve, directional control valves, and cylinders. Directional control valve diagnostics includes precision leak detection using FPTI™'s exclusive pressure/leak test technology. Students learn to isolate leakage between a cylinder port cartridge valve and wear between the spool and bore.

Options:

Pump:	Pressure-compensated, variable volume Pressure-compensated, variable volume with load-sense
Directional Control Valve:	Electro-hydraulic control Hydraulic pilot with joystick control - - Single-axis Load-sense
Cylinders:	Internal magnet for position feedback

All FPTI™ simulators are available for operation at any voltage or frequency



Hydraulic Training Systems

Teaching and learning hydraulics in real-time

MF500-IS-TSE Hydraulic Implement and Articulated Steering System Module (optional)

Shipping Specifications -

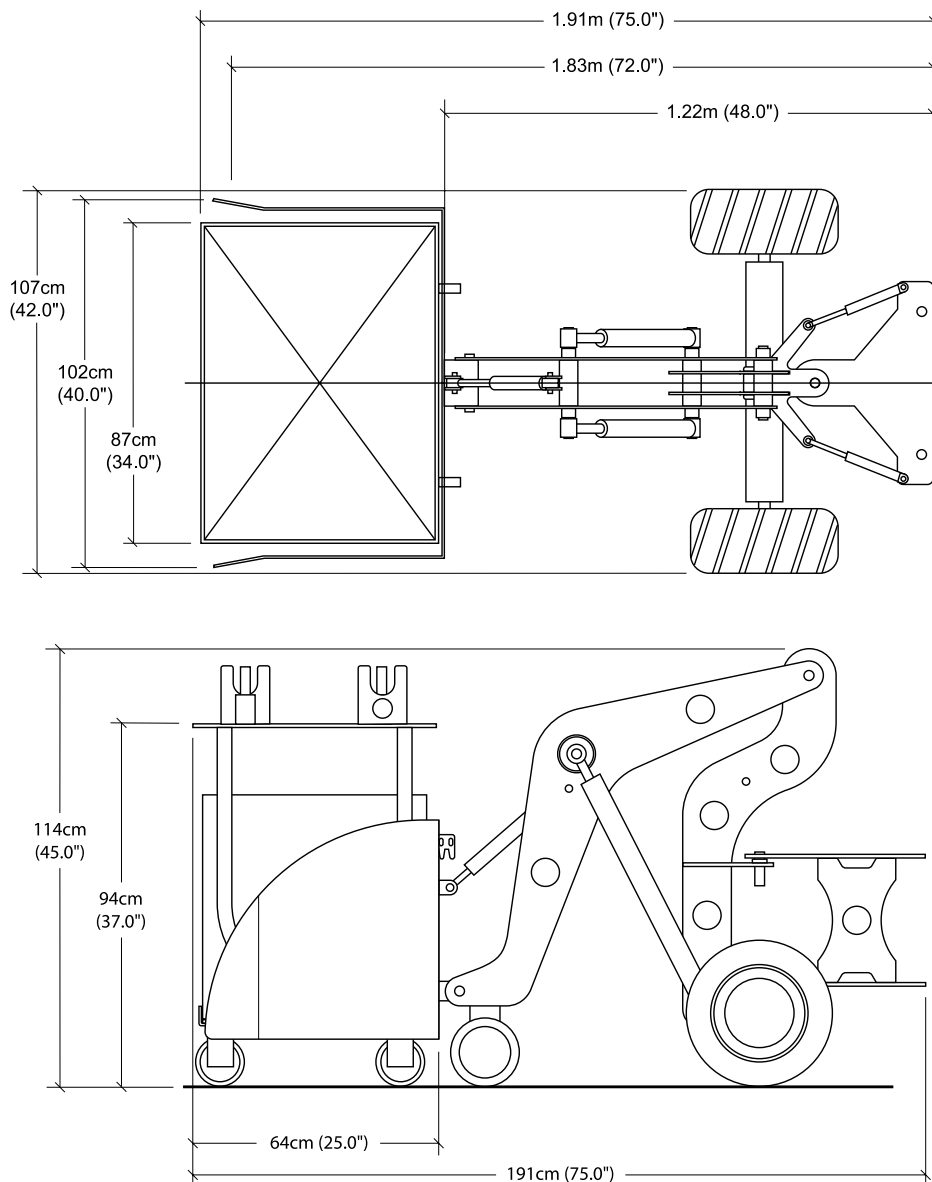
Shipping weight (does not include pallet or packaging):
254 kgs (560 lbs)

Shipping dimensions:

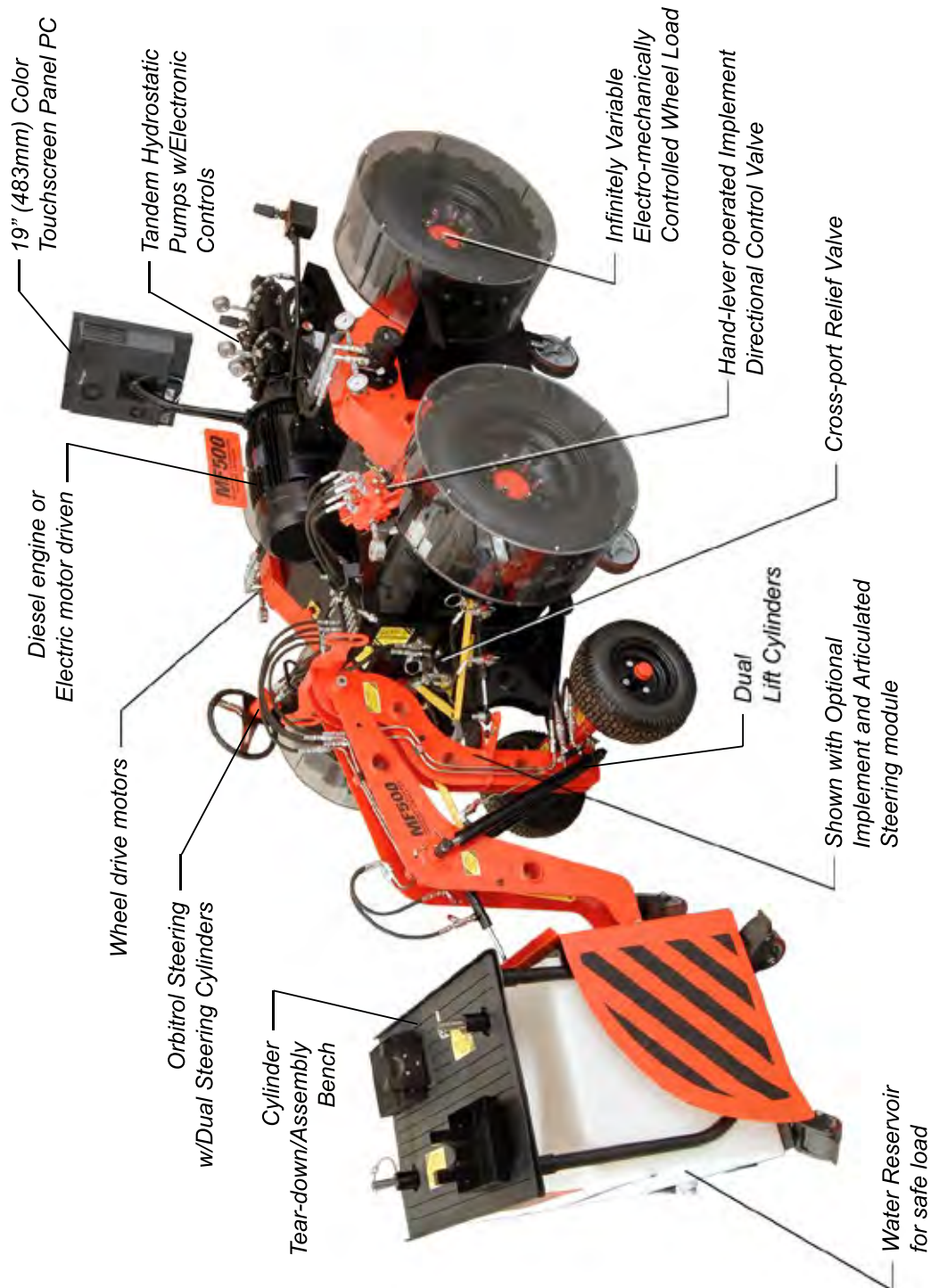
114cm (45.0") tall x 107cm (42.0") wide x 191cm (75.0") long

Warranty -

FPTI™ warrants its products against defect in materials or workmanship for a period of two (2) years from date of delivery.



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COMBINATION HEAVY TRUCK & MULTIPLEXED LIGHTING SYSTEM TRAINER



The ConsuLab HV-1918-MP trainer combines an HV-1918-1S Heavy Vehicle Lighting Systems Trainer on one side, with an MP-1918-1S Heavy Vehicle Multiplex Trainer on the opposite side. The trainer has two completely separate heavy vehicle lighting systems. The trainer utilizes the "Moduponent®" design feature which allows unlimited expansion capabilities. A Moduponent® consists of a clear Plexiglas sheet with components, wiring and socket test points attached. The Moduponent® is attached to the trainer frame using quick connect fasteners which allows easy removal and attachment for different configurations.

COMBINATION HEAVY TRUCK & MULTIPLEXED LIGHTING SYSTEM TRAINER

EDUCATIONAL ADVANTAGES:

- The MP-1918-1S Trainer uses SAE J1929 communications protocol to operate a 4 module CAN Bus network , which includes both a DLC and a Deutch Connector;
- The trainer demonstrates common multiplexing circuit controls via a high speed CAN Bus network;
- Students connect modules and components using included jumper wires;
- The MP-1918-1S can be used as a CAN Bus demonstration trainer, or, using the included comprehensive student lab manual, as a CAN Bus training course;
- Built-in fault insertion can be placed in the trainer for diagnostic training or student evaluation;
- CAN Bus diagnostics can be thought using a DMM and DSO to look at Bus resistance, wake up signal and high speed information packets;
- The HV-1918-1S is a complete heavy vehicle lighting system with front, rear, brake, clearance, turn/hazard and backup lights with a 7 wire connector;
- Meets CSA/UL safety requirements;
- Most complete heavy vehicle lighting and accessory circuit trainer available;
- Modular LED lights (except headlights) that match on-highway truck components;
- Built to train up to four students at a time.

CONTENTS:

- One (1) HV-1918-01 Front Lights Moduponent® (52924);
- One (1) HV-1918-02 Lighting Switch Controls Moduponent® (52925);
- Two (2) HV-1918-03 Rear Lights Moduponents® (52926);
- One (1) HV-1918-08 5-Clearance Lights Kit (52928);
- One (1) HV-1918-07 Daytime Running Lights (52927);
- Two (2) HV-1918-12A Sets of 89 jumper leads (52557);
- One (1) Stand with lockable storage box (52438);
- Two (2) 12VDC Power Supplies (52439);
- One (1) MP-1918-01 Master Moduponent™;
- One (1) MP-1918-02 CAN Bus Moduponent™;
- One (1) MP-1918-13 Network cable.

TECHNICAL INFORMATION

Dimensions: 32" (80 cm) W x 56" (140 cm) L x 76" (190 cm) H

Weight: 325 lb (148 kg)

HV-950-ISX DIESEL ENGINE BENCH - CUMMINS ISX15 EPA 2013

[+ ADD TO WISHLIST](#)

35102



Especially built to meet all diesel engine performance and repair tasks. The Cummins ISX15 EPA 2013 diesel engine bench w/EGR, DPF, SCR, is mounted on a tubing steel stand. Completely operational and safe, this standard trainer is easy to work on and complies with manufacturer rules and specifications related to all OEM codes, colors and electronics.

Features

Photos

Reviews

Educational Advantages

- Demonstration of major engine systems to groups of students without the access limitations of a complete vehicle
- Engine systems respond to inserted faults with real world symptoms, OEM DTC's and check engine light operation
- Functional DLC using SAE J1939 protocols

Application

- Cummins ISX 14.9L EPA 2013 w/EGR, DPF, SCR

Standard Equipment and Features

- New OEM 6-cyl., 4-stroke cycle diesel engine
- Meets EPA 2013 emissions requirements
- OEM Cummins ECM and wiring
- VGT™ turbocharger
- Cummins Direct Flow™ air filter
- Air-to-air aftercooled
- Radiator and cooling fan complete with protective guards
- Fuel pedal
- Tubular steel mounting frame
- Heavy duty casters with 2 locking swivels
- Diesel exhaust fluid (DEF) tank
- 12V batteries (2) w/plastic cases
- Battery cut-off switch
- Panic buttons (2)
- Electronic programmable fault box (12 faults)
- Dashboard including:
 - PowerView-101 Murphy display
 - ECM and ATM breakout box
 - Ignition key switch w/test points
 - Gauges
 - ON/OFF switches
 - Selector switches
 - Indicator lamps
 - DLC using SAE J1939 protocols

Fully Functional OEM Vehicle Systems

- High pressure common rail (HPCR) fuel injection system
- PTO (power take-off)
- Cummins diesel particulate filter (DPF)
- Cooled exhaust gas recirculation (EGR) w/Selective catalytic reduction (SCR)

TESTIMONIALS

The instructors here are very impressed with the craftsmanship of the units that were purchased. We just wanted you to know how pleased they are with the...

Brian Madlem & Deborah Bowling,
Lakeland Community College

PARTNERS

SKILLS CANADA



All Partners

CONSULAB

Consulab manufactures educational training materials adapted to meet the needs of technical and vocational schools in the fields of transportation technology electrical engineering.

[Learn More](#)

CONTACT

+1 (800) 567-0791 . 8pm - 5pm EST

4210 Jean-Marchand Street
Quebec City, QC . Canada, G2C 1Y6

info@consulab.com

[More Information](#)

CLEVERTOUCH

17

Plus Series 65" / 75" / 86"

NEW

Mobile Device Management.
Control all your screens from a single screen.

NEW

Annotation tools let you annotate over internet browsers, documents, apps or desktop.

Over-the-air updates.
Always have the latest firmware and features.

NEW

Internet browser allows you to browse the web without the need to connect to a PC.



2 USB ports left /
2 USB ports right.

Compatible with **Windows**,
Mac OS X and **Chromebook**.



Connectivity includes HDMI IN
& HDMI Out, DisplayPort, VGA,
RS232 and USB.

EDUCATION PRICING:

CLEVERTOUCH PLUS 65" 15465LUXEX	\$3,538
CLEVERTOUCH PLUS 75" 15475LUXEX	\$5,213
CLEVERTOUCH PLUS 86" 15486LUXEX	\$6,599

OPTIONAL:

4TH & 5TH YEAR WARRANTY	\$440
I5 PC MODULE (4K PC MODULE)	\$940
I7 PC MODULE (4K PC MODULE)	\$1,765

PC Module



i5 Model Code: 1541041

i7 Model Code: 1541042

- Operating System: Windows 10 Pro
- i5 model: 4GB RAM, 128GB SSD
- i7 model: 8GB RAM, 256GB SSD
- 1 x Wireless Network Interface 802.11ac (2.4GHz/5GHz)
- 1 x Wired Network Interface (10/100/1000Mbps)
- 6 x USB 3.0
- 1 x Display Port
- 1 x HDMI 4K Video Output
- 1 x VGA Output

Technology for sharing

DNG | Digital Networks Group
AV and IT Systems Integration

The CA exclusive Clevertouch integrator

Schedule a product demo NOW!
clevertouchdemo@digitalnetworksgroup.com
Talk to an expert
949-428-6333



DNG | Digital Networks Group
AV and IT Systems Integration

Communicate. Collaborate. Innovate.

www.digitalnetworkgroup.com
(949) 428-6333

CLEVERTOUCH



For Education

Touchscreen Manufacturer of the Year

Create. Collaborate. Inspire.



clevertouch.com | info@clevertouch.com

#clevertouch

Plus Series

55" / 65" / 70" / 75" / 86"

Designed for education, **Plus Series** is easy to use, highly functional, and full of features. Combining superior connectivity, innovative software, and a simple user interface, **Plus Series** allows complete collaboration in the classroom. **Interactive Screen of the Year 2017**



NEW

Mobile Device Management. Control all your screens from a single screen.

Over-the-air updates. Always have the latest firmware and features.

NEW

Internet browser allows you to browse the web without the need to connect to a PC.

NEW

Annotation tools let you annotate over internet browsers, documents, apps or desktop.

Compatible with **Windows**, **Mac OS X** and **Chromebook**.

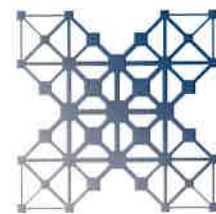


Connectivity includes HDMI IN & HDMI Out, DisplayPort, VGA, RS232 and USB.

2 **USB** ports left / 2 **USB** ports right.

LUX User Interface (Plus Series & V Series)

The LUX user interface has been designed to be simple to use and intuitive. With functionality similar to a tablet or smartphone, every task requires just a quick touch or swipe to action. Clevertouch have created a system that is so simple, anyone can walk into the room and use the screen with no training or prior knowledge.



LUX

Apps

Award-Winning Apps and Software



CLEVERSTORE

Cleverstore is the dedicated free education App store.

The **Cleverstore** offers over a 100 educational Apps that engage and excite children in ways that are so natural to them there is no barrier between the technology and their learning.

Plus Series only.

CLEVERMATHS

Create graphs, record scientific experiments with the diagram builder, input 2D and 3D shapes, and use maths and science tools such as the periodic table, atomic structure, compass, and protractor. Connected PC required.

CLEVERSHARE

Up to 32 wireless connections for bidirectional touch and screen sharing.

Plus Series only.



DisplayNote transforms presentations for presenters and participants. Use it to present wirelessly with your device, and mirror your screen to participant's device. Attendees can view and capture slides on their device and collaborate with each other in real-time.



Create interactive lessons with Lynx, or open and edit old Notebook files. Features include a broad selection of brushes, fonts and shapes, and maths and science tools. Embed videos directly into the lesson slides and annotate over them. Lynx can be used in LUX or PC mode.

NOTE

The instant whiteboarding App makes it easy to make notes, annotations, diagrams and drawings. Notes can be saved and sent out to the group. With an infinity whiteboard and unlimited number of work sheets, you'll never run out of space.



Clever Message

NEW

Clever Message is a unique App driven by SedaoLive CLOUD and connects your Clevertouch screens across the school campus, enabling them to be used as a digital signage messaging solution when not in use during classroom lessons.

Plus Series only.



With Snowflake MultiTeach you can create exciting interactive activities, or use content others have created in the Lessons Community. MultiTeach can be used in LUX or PC mode, and Snowflake Apps also feature in the Cleverstore.

Collaboration & Control

Clevershare App 2.0

NEW

Connect and control from other devices with **Clevershare**

With **Clevershare** you can intuitively share content from your PC, Mac, iPhone/iPad or Android device. Simply download the **Clevershare** App to your computer, phone or tablet and type in the code shown on the Clevertouch. In seconds your device and your Clevertouch are connected, and can cast video, audio and touch in both directions.

Clevershare 2.0 enables you to share up to four devices with your touchscreen.*

- Up to 32 connections
- Windows, Mac, iOS and Android
- Use your mobile device as a document camera
- Live stream video
- Bidirectional touch
- Remote mouse, touch pad and button mode

Included with
Plus Series



Included with
Plus Series



OTA Updates

NEW

Updates delivered instantly

With **Over-the-Air** technology you'll always have all the new features, bug fixes and software updates seamlessly delivered to all your Clevertouch screens.

Your Clevertouch screen will search for the latest firmware update and install it, giving you instant access to the latest apps and features.

*Spring 2018

CLEVERTOUCH

For Education

	55" 4K	65" 4K	70" 4K	75" 4K	86" 4K	65" 4K	75" 4K
Product Code	15455LUX	15465LUX	15470LUX	15475LUX	15486LUX	15465V	15475V
Display							
Touch Points	20	20	20	20	20	20	20
Screen Type	LED	LED	LED	LED	LED	LED	LED
Aspect Ratio	16:09	16:09	16:09	16:09	16:09	16:09	16:09
Resolution	4K Ultra HD	4K Ultra HD	4K Ultra HD	4K Ultra HD	4K Ultra HD	4K Ultra HD	4K Ultra HD
Brightness (cd/m²)	350	350	350	350	350	350	350
Android	✓	✓	✓	✓	✓	✓	✓
Glass	Anti Glare	Anti Glare	Anti Glare	Anti Glare	Anti Glare	Anti Glare	Anti Glare
Response Time (Touch)	<15ms	<15ms	<15ms	<15ms	<15ms	<15ms	<15ms
Contrast Ratio	1200:1	1200:1	1200:1	1200:1	1200:1	1200:1	1200:1
Connectivity							
CVBS	✓	✓	✓	✓	✓	✓	✓
USB 2.0 / 3.0 / Touch	6 / 1 / 2	6 / 1 / 2	6 / 1 / 2	6 / 1 / 2	6 / 1 / 2	4 / 2 / 2	4 / 2 / 2
DisplayPort in	1	1	1	1	1	1	1
HDMI 1.4 In / 2.0 In	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1
HDMI Out	1	1	1	1	1	1	1
PC-Audio	✓	✓	✓	✓	✓	✓	✓
R/L (CVBS)	With video IP	With video IP	With video IP	With video IP	With video IP	With video IP	With video IP
LAN (RJ45)	✓	✓	✓	✓	✓	✓	✓
RS232	✓	✓	✓	✓	✓	✓	✓
Module Slots	2	2	2	2	2	1	1
Power							
Power	<250W	<350W	<350W	<450W	<530W	TBC	<400W
Power (in standby)	<0.5W	<0.5W	<0.5W	<0.5W	<0.5W	<0.5W	<0.5W
Physical Specifications							
Dimensions W x H x D (mm / ")	1318 x 788 x 104 / 51 57/64 x 31 1/32 x 4 3/32	1537 x 912 x 99 / 60 33/64 x 35 29/32 x 3 57/64	1653 x 980 x 108 / 65 5/64 x 38 37/64 x 1 1/4	1778 x 1031 x 99 / 70 x 40 19/32 x 3 57/64	2003 x 1176 x 99 / 78 55/64 x 46 19/64 x 3 57/64	1522 x 944 x 98 / 59 59/64 x 37 11/64 x 3 55/64	1764 x 1063 x 100 / 69 29/64 x 41 27/32 x 3 15/16
Weight	36kg / 79lb 6oz	45kg / 99lb 3oz	55kg / 121lb 4oz	58kg / 127lb 14oz	75kg / 165lb 6oz	46kg / 101lb 6oz	58kg / 127lb 14oz
VESA (mm / ")	400 x 400 / 15 3/4 x 15 3/4	600 x 400 / 23 5/8 x 15 3/4	600 x 400 / 23 5/8 x 15 3/4	800 x 400 / 31 1/2 x 15 3/4	800 x 600 / 31 1/2 x 23 5/8	600 x 400 / 23 5/8 x 15 3/4	800 x 400 / 31 1/2 x 15 3/4
Android Capabilities							
OTA Update	✓	✓	✓	✓	✓	X	X
System Version	Android 6.0 Marshmallow	Android 6.0 Marshmallow	Android 6.0 Marshmallow	Android 6.0 Marshmallow	Android 6.0 Marshmallow	Android 5.1 Lollipop	Android 5.1 Lollipop
CPU	Rockchip 3399 Dual- core ARM Cortex A72 & Quad-core ARM Cortex-A53	Rockchip 3399 Dual- core ARM Cortex A72 & Quad-core ARM Cortex-A53	Rockchip 3399 Dual- core ARM Cortex A72 & Quad-core ARM Cortex-A53	Rockchip 3399 Dual- core ARM Cortex A72 & Quad-core ARM Cortex-A53	Rockchip 3399 Dual- core ARM Cortex A72 & Quad-core ARM Cortex-A53	ARM Rockchip A53 up to 1.8GHz	ARM Rockchip A53 up to 1.8GHz
Android Resolution	2160p/UHD (LUX UI is 2K)	2160p/UHD (LUX UI is 2K)	2160p/UHD (LUX UI is 2K)	2160p/UHD (LUX UI is 2K)	2160p/UHD (LUX UI is 2K)	1080p	1080p
GPU	Mail-T860, OpenGL ES1.1 / 2.0 / 3.0 / 3.1	Mail-T860, OpenGL ES1.1 / 2.0 / 3.0 / 3.1	Mail-T860, OpenGL ES1.1 / 2.0 / 3.0 / 3.1	Mail-T860, OpenGL ES1.1 / 2.0 / 3.0 / 3.1	Mail-T860, OpenGL ES1.1 / 2.0 / 3.0 / 3.1	Quad Core	Quad Core
RAM	4GB	4GB	4GB	4GB	4GB	2G	2G
ROM	12GB	12GB	12GB	12GB	12GB	8GB	8GB
Wi-Fi Enabled	✓	✓	✓	✓	✓	✓	✓
Apps and Android Features							
Email Out	✓	✓	✓	✓	✓	✓	✓
LynxPro	X	X	X	X	X	X	X
LynxPro Meeting	X	X	X	X	X	X	X
Montage Lite	X	X	X	X	X	X	X
Note App	✓	✓	✓	✓	✓	✓	✓
Lynx App	✓	✓	✓	✓	✓	X	X
Cleverstore	✓	✓	✓	✓	✓	X	X
Clevershare App	✓	✓	✓	✓	✓	X	X
Eshare	X	X	X	X	X	✓	✓
Accessories							
USB Camera Ability	✓	✓	✓	✓	✓	✓	✓
Writing Stylus	3	3	3	3	3	3	3
VGA, Audio Cables	✓	✓	✓	✓	✓	✓	✓
HDMI, USB Cables	✓	✓	✓	✓	✓	✓	✓
Clevershare	Available separately	Available separately	Available separately	Available separately	Available separately	X	X
Cleverbable	X	X	X	X	X	X	X
PC Module	Optional extra	Optional extra	Optional extra	Optional extra	Optional extra	Optional extra	Optional extra

MF102-H-TSE Hydraulic Training System -



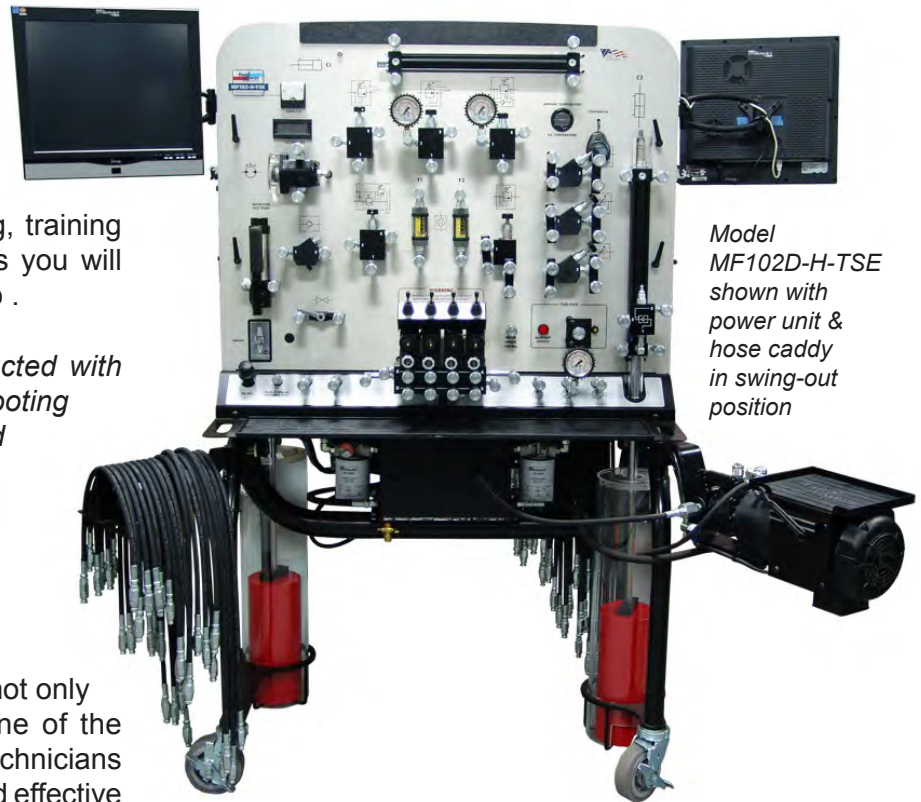
MF102-H-TSE Training System -

The model 102-H-TSE has the same features and capabilities as the model MF102-H-TS but the letter "E" denotes "electronic troubleshooting."

This is FPTI™'s flagship, and best-selling, training system loaded with features and benefits you will NEVER find on any other training simulator.

"In a side-by-side comparison we conducted with competitive products that boast troubleshooting capability the MF102-H-TSE outperformed the entire field so convincingly that it was, quite frankly, embarrassing."

Technical Training Director –
Mine Training Institute



Model
MF102D-H-TSE
shown with
power unit &
hose caddy
in swing-out
position

Over a decade of research -

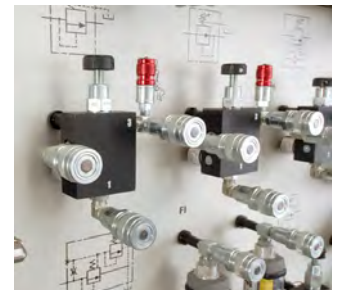
- FPTI™'s founder and chief designer is not only a legendary teacher, but he is also one of the most respected hydraulic diagnostics technicians in the country. His contribution to safe and effective troubleshooting is remarkable:
- He conducted a ten-year study of leakage rates in hydraulic components.
- He developed a technique that makes it possible to test over 95% of the components in any hydraulic system with the power unit safely locked out. There is no need to remove or disassemble the components, and each test averages 15 minutes.
- He wrote a best practices manual on safe techniques for testing hydraulic components.
- He is aware of the critical shortage of hydraulic diagnostic technicians the USA, and indeed the world, faces.

In collaboration with industry and education FPTI™ developed a much-needed solution -

It took FPTI™ over ten years to develop the most effective hydraulic training system on the planet. In the hands of a properly trained teacher the model MF102-H-TSE training system has the power to turn ordinary technicians into extraordinary hydraulic technicians because they will have the skillsets needed to revolutionize the industry.

Here are just a few of the MF102-H-TSE's most outstanding and exclusive features:

- **Safety** – the MF102-H-TSE is equipped with the same lockout system used in industry. It also has FPTI™'s exclusive Safe-T-Bleed® system for de-energizing and air-bleeding hydraulic systems and components. Almost every page in the brilliant textbooks, every Power-Point™ slide, and every trip to the training system is designed to remind students of their most important responsibility – safety.



Hydraulic Training Systems

Teaching and learning hydraulics in real-time

MF102-H-TSE Hydraulic Training System -

- **Load-cycle capable** – At the push of a lever the cylinder lifts an onboard load into the air, and the bi-directional hydraulic motor has infinitely variable torque capability for a realistic training and troubleshooting experience.

- **Pressure/leak Testing** – this revolutionary technique, developed by FPTI™, will teach students how to test 95% of the components in a hydraulic system with the power unit safely locked out. There is no need to remove or disassemble components, and each test averages 10 to 15 minutes. Quite frankly, there is no other way to test these components.

- **Electronic auto-fault insertion** – the onboard panel PC with 19" (48cm) touch-screen makes it possible for almost every component on the MF102-H-TSE to automatically "wear out."

FPTI™ studied wear patterns in hydraulic components for a decade and designed the identical wear patterns into the components on the training system.



- **Masterfully develops thinking skills** – the single most important skill technicians must learn is to think. The MF102-H-TSE teaches this skill masterfully.

When a student is given an assignment, timely and satisfactory completion of the task is determined by how much "thinking" the student applies to the problem. The student starts out with a "chief complaint" and one, or more symptoms: identical to a real world situation.

The training system activities are designed to let students practice what they are taught about theory, protocols, and practical demonstrations performed by their teachers. In no time at all you will have your students challenging each other as to who can troubleshoot a problem in the least amount of time, with the least number of attempts, and having replaced the least number of components:

Isn't that exactly what industry is crying for?

- **Learn in real time on real systems** – You can achieve a level of training on the MF102-H-TSE that's almost impossible to achieve on an actual machine: if, for no other reason than safety.

You can give the student a copy of the hydraulic schematic for any type of machine. Then, while it's operating in real time under actual load cycles, the students can learn to troubleshoot it – in the safety and comfort of the classroom.

The MF102-H-TSE –

A winner that begets winners

When well-trained technicians can troubleshoot hydraulic systems safely, effectively, and time efficiently everyone wins.

The technicians win because they are safe, productive and proud. Their company wins because problems are solved safely, efficiently and cost effectively. Teachers win because they provided students with the tools they needed to become brilliant technicians.

And finally, schools win because they fulfilled their responsibility to the teachers, students, industry, and society.



Hydraulic Training Systems

Teaching and learning hydraulics in real-time

MF102-H-TSE Hydraulic Training System -

Teach any type of system or component -

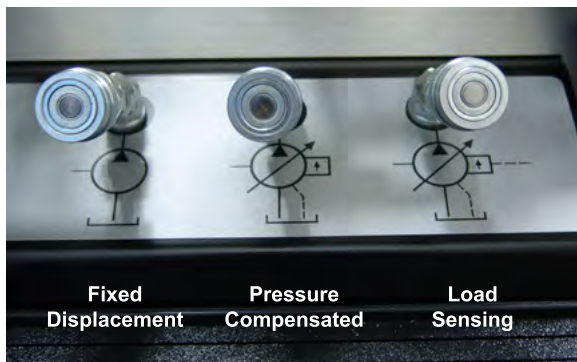
- Fixed displacement pump - standard
- Pressure-compensated pump – standard
- Load-sensing pump – optional

Students advance from fixed displacement pump circuits, to pressure-compensated pump circuits, and, if the curriculum permits, load-sensing circuits, on one training system.

Why this feature is important:

The most logical learning path for a student is to begin with fixed displacement pumps, and then advance to pressure-compensated pumps and then to load-sensing pumps.

The MF102-H-TSE training system provides instructors the opportunity to teach all of these popular systems.



Unprecedented student retention -

MF102-H-TSE training system achieves the highest student retention of any hydraulic training system currently available – bar none!

Hardware in perfect harmony with the software -

The MF102-H-TSE training system works in perfect harmony with the equally as well engineered curriculum, visual aids, textbooks, PowerPoint™ presentations, animations, and support. Why does our course teach pressure control valves before pumps?

Because a pressure compensator is a pressure relief valve. Why does it teach flow control valves before load sensing systems? Because the flow compensator in a load-sensing pump is a pressure-compensated flow control valve.

Six directional control valves -

- Three (3) industrial-type (parallel)
- One (1) industrial-type (series)
- One (1) mobile-type (cylinder spool center)
- One (1) mobile-type (motor spool center)



Why these features are important:

Students graduate from learning simple, single-valve/single actuator, circuits to constructing the types of circuits they will see in any plant or on any construction machine. There is almost no limit to the number and variety of circuits students can construct on the MF102-H-TSE training system.



Hydraulic Training Systems

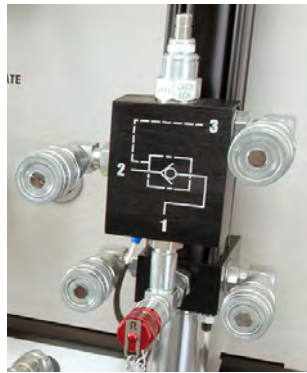
Teaching and learning hydraulics in real-time

MF102-H-TSE Hydraulic Training System -

Port identification consistent with industry standards -

It is absolutely critical that students learn how important it is to make proper transmission line connections when installing hydraulic components or reconnecting transmission lines. An error can result in severe injury or death.

Component manufacturers typically use letters and/or numbers for port identification. All components on FPTI™ training systems are marked with the appropriate identification. Also, all hydraulic schematics in the student activities manuals show the appropriate markings.



Not just a training simulator, an entire turn-key training system -

Not only do you get the most advanced hydraulic training simulator in the world, you also get everything you need to conduct a world-class course:

- Textbooks - written and produced by one of the most successful and renowned hydraulics instructors in the industry - FPTI™'s founder Rory S. McLaren.

Every topic is to the point and safety-based.

- Student workbooks - well written and superbly illustrated with need-to-know information.
- PowerPoint™-based CD's covering at least 40 hours of instruction in hydraulics and another 40 hours of advanced diagnostics.
- Instructor answer books.
- Interactive CD - makes teaching and learning hydraulic symbols fun and challenging.



Everything you need to conduct a "world-class" course is included

It's limits? - Your imagination -

Teach any pump/system – fixed displacement, pressure compensated, load-sensing. Teach any type of component - even the one's it doesn't have – with the optional Flex-Plate modules.

Simply fasten your unique component to a universal mounting plate (available from FPTI™) and when needed clip it on the FlexPlate - no hardware needed.

There is also a convenient 24VDC power supply and illuminated on/off switch for electric valves. Many of the add-on valves are available - ready-to-use - from FPTI™. See the entire assortment at: www.fluidpowertrainingsystems.co

If you don't see what you are looking for on our website let us know and we will build it for you - ready to use.



Flex-Plate modules expand the capability of your MF102 series training system

Plug-and-Play modules give the MF102 series unlimited training flexibility

Want to teach mobile directional control valves; proportional direction/flow control valves; stacked valves; orbitrol steering systems; logic valves; etc? Simply purchase an affordable plug-and-play module, which easily attaches to either side of the MF102 series simulator.



The modules are designed to integrate seamlessly with the components on any model MF102. Most plug-and-play modules are available with diagnostics capability.

fluid power
TRAINING INSTITUTE™

Hydraulic Training Systems

Teaching and learning hydraulics in real-time

MF102-H-TSE Hydraulic Training System -

Specifications (Model MF102-H-TSE)

The model MF102-H-TSE training systems are equipped with the following components:

1. **Pump** - Axial piston-type, variable volume, pressure-compensated; 3.78 Lpm (1.0 GPM); 69 bar (1000 PSI); adjustable pressure compensator; adjustable flow
2. **Electric motor** - Single-phase; 115V; TEFC; 1750 RPM; C-face; thermal overload protection
3. **Electric motor on/off switch** - Lockout/tagout mechanism; thermal overload protection with manual reset
4. **Hydraulic reservoir** - capacity 17 liter (4.5 gallon)
5. **Filtration** - 10 micron, spin on/off element w/bypass gauge
6. **Directional control valves** - six (6) total;
 - One (1) DO3-type; tandem-center; 3-position; 4-way; spring-centered; solenoid-controlled; 24V coils. Also includes sandwich-mounted, knob-adjustable pump port flow control valve
 - Two (2) DO3-type; closed-center; 3-position; 4-way; spring-centered; solenoid-controlled; 24V coils. Also includes sandwich-mounted, dual, knob-adjustable flow control valves
 - One (1) DO3-type; float-center; 3-position; 4-way; spring-centered; solenoid-controlled; 24V coils. Also includes sandwich-mounted, knob-adjustable pump port flow control valve
 - One (1) Monoblock type valve; cylinder spool; 3-position; 4-way; spring-centered; hand-lever operated w/pressure relief valve
 - One (1) Monoblock type valve; motor spool; 3-position; 4-way; spring-centered; hand-lever operated w/pressure relief valve
7. **Pilot-operated pressure relief valve w/knob adjustment**
8. **Direct-operated pressure relief valve w/knob adjustment**
9. **Sequence valve w/knob adjustment**
10. **Pressure reducing valve w/knob adjustment**
11. **Counterbalance valve with internal reverse flow check w/knob adjustment**
12. **Needle valve w/knob adjustment**
13. **Flow control valve w/knob adjustment**
14. **Pressure-compensated flow control valve** restrictor-type; reverse flow bypass; w/knob adjustment
15. **Check valve**
16. **Pilot-operated check valve w/manual override**
17. **Cylinder** - single-rod; double-acting; 36 cm (14") stroke
18. **Cylinder** - double-rod; double-acting; 36 cm (14") stroke; w/load engage/disengage mechanism
19. **Motor** - bi-directional; gear-type; w/ininitely variable torque capability
20. **Flow meters** - two (2); 7.56 Lpm (0-2.0 GPM)
21. **Tachometer** - digital-type; panel-mount; hydraulic motor shaft speed
22. **Ammeter** - analog-type, panel-mount
23. **Dual scale temperature gauge** - digital-type; panel-mount; upper: oil temperature; lower: ambient temperature
24. **Stopwatch** - digital, self-retractable
25. **Pressure gauges** - three (3); 103 bar (0-1500 PSI); PSI and bar scales; 6.35 cm (2.5"); glycerine-filled; Bourdon tube type; w/flat-face type quick-connect/disconnect type valves
26. **Load** - 45 Kg (100 lb); Engage/disengage with mechanical latch. Entire weight is contained within a transparent safety enclosure.
27. **Hose storage caddy** - stow-away/swing-out
28. **Hoses** (per side) -
 - Four (4) - 152 cm (60")
 - Eight (8) - 107 cm (42")
 - Six (6) - 71 cm (28") SAE 100-R1; w/flat-face type quick-connect/disconnect type valves
 - Hose extenders; Two (2) (per side) w/flat-face type quick-connect/disconnect type valves
29. **T's** - eight (8) (per side) w/flat-face type quick-connect/disconnect type valves



Hydraulic Training Systems

Teaching and learning hydraulics in real-time

MF102-H-TSE Hydraulic Training System -

Shipping Specifications

Shipping weight (does not include pallet or packaging):

Double unit: 408 kgs (900 lbs)

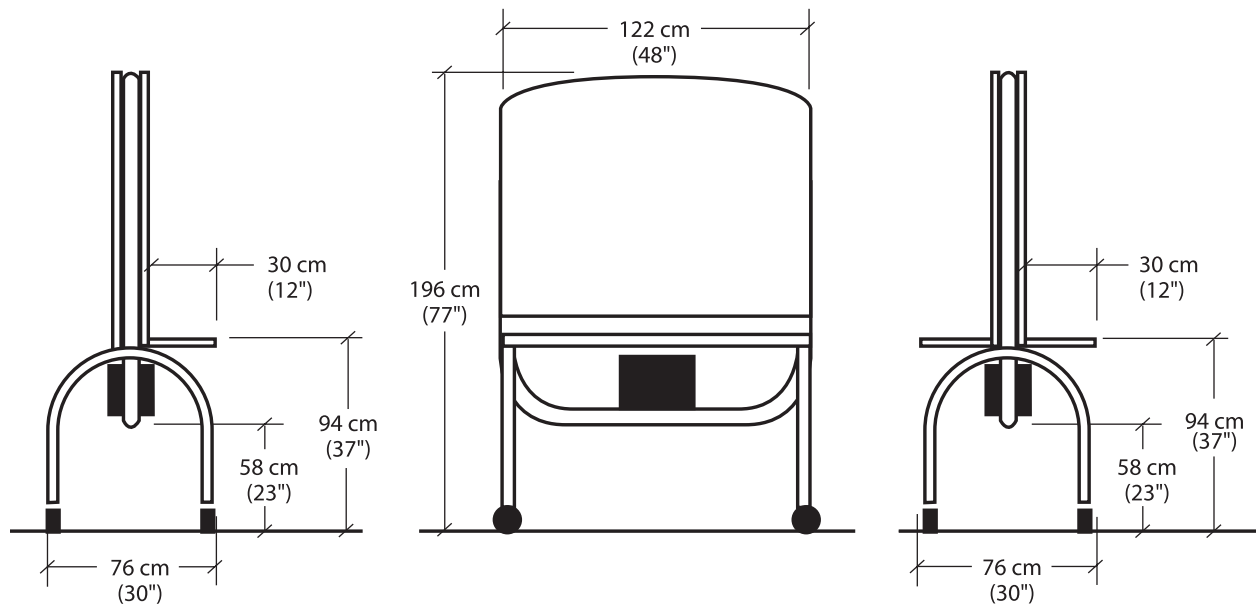
Single unit: 340 kgs (750 lbs)

Warranty -

FPTI™ warrants its products against defect in materials or workmanship for a period of two (2) years from date of delivery.

Shipping dimensions (all models):

196 cm (77.0") tall x 122 cm (48.0") wide x 76 cm (30.0") deep



All FPTI™ training systems are available for operation at any voltage or frequency



MF102-H-TSE (03/13/13) • COPYRIGHT © 2013

Formech 508FS

Floor Standing Vacuum Forming Machine

Formech's 508FS (Floor-Standing) machine offers significant advantages over the desktop series with pre-stretch, auto-level and a much more powerful flow rate for demanding applications. Pre-Stretch allows the user to blow a bubble of air into the heated material, which avoids thinning of material when forming deep shapes. Auto-Level pumps short bursts of air under the heated plastic to maintain an even distance between the heater and sheet, whilst providing

the user an audible indication that the material is ready to form. Intuitive, graphically driven touch-screen control with memory function makes the 508FS very easy to use, whilst powerful forming capabilities provide extensive project versatility. Higher Wattage Quartz heaters (vs. 508DT) further enhance the 508FS capability.

Key Features

- PLC Control with 4" Mono Touch Screen
- 20 Programme Memory
- Pre-stretch
- Auto-level
- Quartz Heaters with Variable Standby
- 4 Independently Controllable Heating Zones
- Vacuum & Release
- Vacuum Gauge
- Dry Rotary Vane Pump 10m³/HR

Options

- Reducing Windows
- Cooling Fan System
- Reel Feed
- Starter Pack of Plastic
- Mobility with Castors
- Vacuum Receiver Tank
- Spare Parts Kit



Technical Specifications

Forming Area (mm / inches)	Sheet Size (mm / inches)	Max Depth of Draw	Max Material Thickness	Heating Zones	Heater Type
482 x 432mm / 19 x 17"	508 x 457mm / 20 x 18"	290mm / 11.5"	*6mm / 0.25"	4	Quartz

Width	Height	Depth	Weight	Single Phase Power Requirements	Europe – 3 Phase Power Requirements	USA – 3 Phase Power Requirements	Power Consumption	Air Requirements
757mm / 29.8"	1140mm / 44.9"	1474mm / 58"	125kg / 275lbs	208-240V / 20A	n/a	n/a	3.5kW	80 PSI / 5 bar

*certain materials over 4mm thick may require turning the sheet mid-cycle

Formech 508FS customers include:

- University of Rochester (Education – USA)
- ETH Zurich (Education – Switzerland)
- KTH (Education – Sweden)
- University of the Arts London (Education – UK)
- University of Teeside (Education – UK)
- Universzita Tomase Bati ve Zline (Education – Czech Republic)
- Universidade do Minho (Education – Portugal)
- Tourbillon Patisserie (Chocolatier – France)
- Sodebo (Chocolatier – France)
- Harmac Medical Products (Medical – USA)
- Serco (Defence R&D – UK)
- Apple Inc (Prototyping/R&D – USA)
- Cyberdroid (Prototyping / R&D / Robotics – France)
- University of Nottingham (Education – UK)
- PT Kawan Lama Sejahtera (Education – Indonesia)
- Blackhawk Industrial (R&D – USA)
- Airborn (Packaging – USA)
- Ligier Group (Automotive – France)

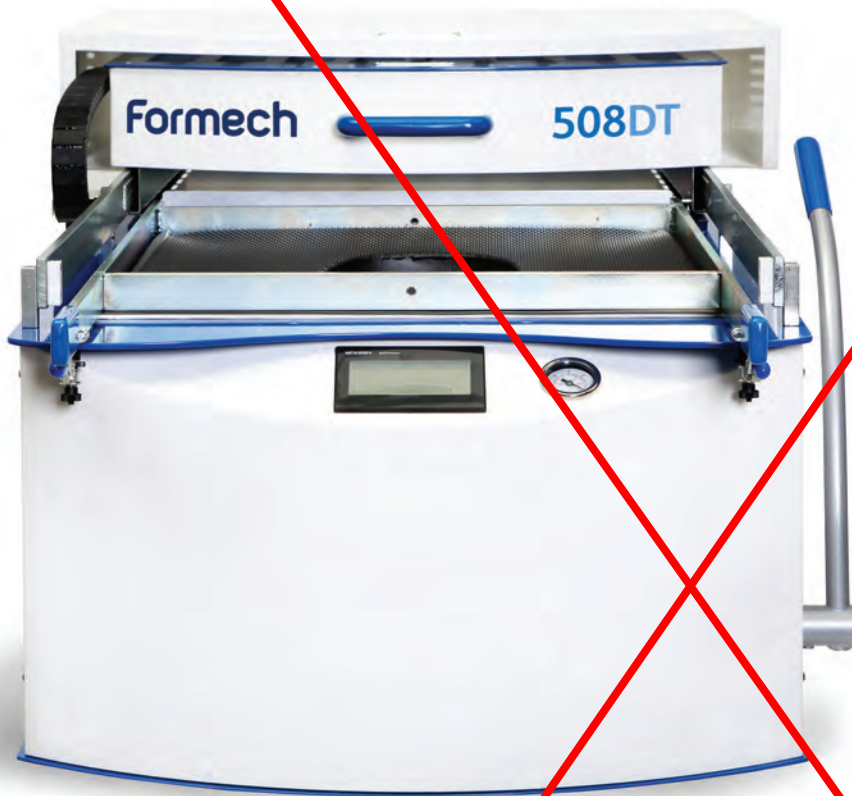
For more information and product videos formech.com

Formech 508DT

Desktop Vacuum Forming Machine

Featuring PLC touch screen control, Formech's plug and play 508DT is a user friendly desktop machine with the power and capability to form demanding shapes and materials. Rapid, energy efficient quartz heaters with variable standby means the 508DT is ready to form in

less than 5 minutes. 20 programme memory to recall heater profile and timing settings for each project. A dedicated trolley option provides a minimal footprint with the convenience of portability and optimum working height.



Key Features

- PLC Control with 4" Mono Touch Screen
- 20 Programme Memory
- Quartz Heaters with Variable Standby
- 4 Independently Controllable Heating Zones
- Safety Interlock
- Vacuum & Release
- Vacuum Gauge

Options

- Reducing Windows
- Dedicated Trolley
- Reel Feed
- Starter Pack of Plastic
- Spare Parts Kit

Technical Specifications

Forming Area (mm / inches)			Sheet Size (mm / inches)		Max Depth of Draw	Max Material Thickness	Heating Zones	Heater Type
482 x 432mm / 19 x 17"			508 x 457mm / 20 x 18"		185mm / 7.3"	*6mm / 0.25"	4	Quartz

Width	Height	Depth	Weight	Single Phase Power Requirements	Europe – 3 Phase Power Requirements	USA – 3 Phase Power Requirements	Power Consumption	Air Requirements
720mm / 28.4"	538mm / 21.2"	1394mm / 54.9"	100kg / 220lbs	208-240V / 13A	n/a	n/a	3.2kW	n/a

*certain materials over 4mm thick may require turning the sheet mid-cycle

Formech 508DT customers include:

- Central St. Martins (Education – UK)
- Yale University of Architecture (Education and Model Making – USA)
- Decathlon (Sports apparel R&D – France)
- Nike (Sports apparel R&D – USA)
- Reebok (Sports apparel R&D – USA)
- Under Armour (Sports apparel R&D – USA)
- Hershey Chocolate (Chocolatier USA)
- Aardman Animation (Film design – UK)
- Siemens (Prototyping/R&D – Italy)
- L'Oréal (Cosmetics – France)
- LaserTag GmbH (Toy Makers – Germany)
- Baumann Dental GmbH (Medical – Germany)
- Fa. Edelmann (Tool makers – Germany)
- Espada Almacenes (Packaging – Spain)
- BDN Packaging Ltd (Packaging – UK)
- Techniks Bvba (Chocolate & Confectionery – Belgium)
- SAS Dupont (R&D – France)

For more information and product videos formech.com



SKU: 1814

CATEGORIES:

- Specialty Tools
- Heavy Duty Tools
- Shop Equipment
- Floor Cranes

6,000 LB. CAP. HEAVY-DUTY CRANE

RATING:

Average: 4.6 (9 votes)

PRODUCT DIMENSIONS: 88 × 53 × 26 in

SHIPPING WEIGHT: 1250 lb

PRODUCT DOCUMENTS:

-  [Parts List \(Document # 100501\)](https://www.otctools.com/sites/default/files/100501_rev0.pdf) (https://www.otctools.com/sites/default/files/100501_rev0.pdf)

HIGH RESOLUTION IMAGES:

- https://www.otctools.com/sites/default/files/1814_7862_0.jpg
(https://www.otctools.com/sites/default/files/1814_7862_0.jpg)



SPX Corporation
655 Eisenhower Drive
Owatonna, MN 55060-0995 USA
Phone: (507) 455-7000
Tech. Serv.: (800) 533-6127
Fax: (800) 955-8329
Order Entry: (800) 533-6127
Fax: (800) 283-8665
International Sales: (507) 455-7223
Fax: (507) 455-7063

Form No. 102453

Assembly & Operating Instructions for:

016-00057	1813	JT01709
016-00058	1814	OEM4105
17-260-3	ACTP-10615	

Heavy Duty Mobile Floor Crane 6,000 lb. Capacity

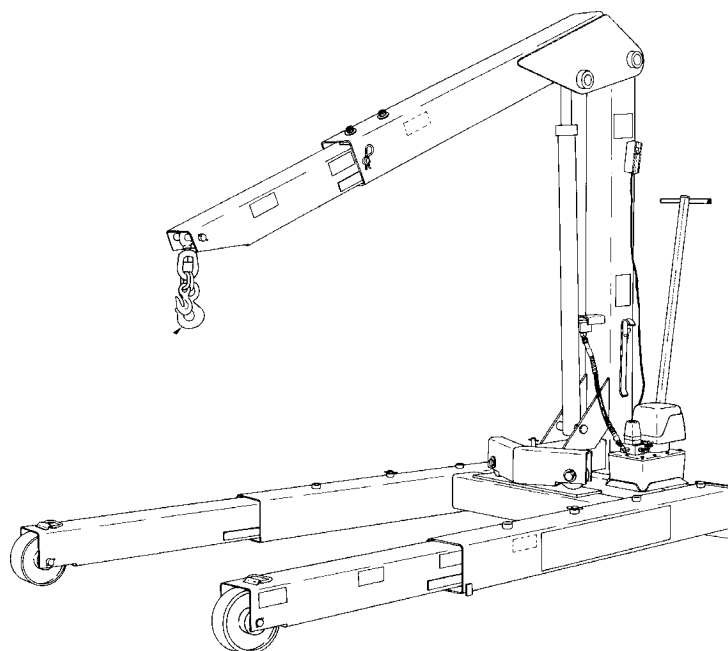
Check the contents of the shipping carton against the parts list to be sure all parts are present before beginning assembly.

Safety Precautions



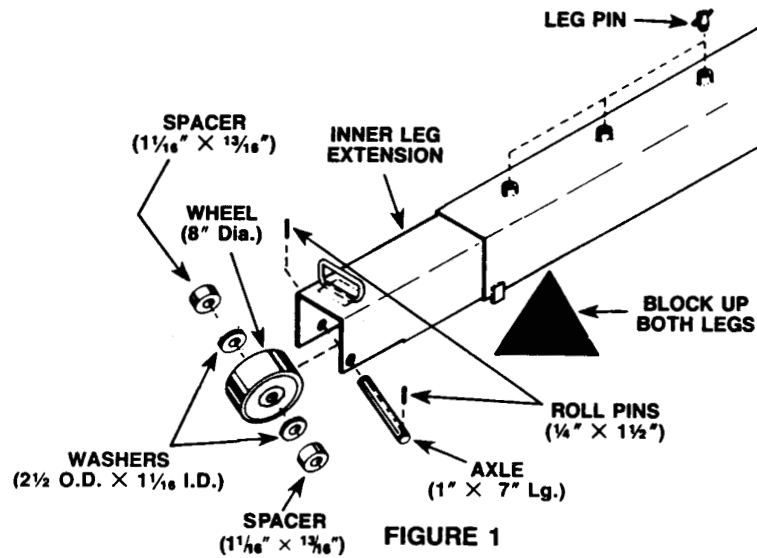
Warning: To help prevent personal injury,

- Read and carefully follow the operating instructions and safety precautions before assembling or using this floor crane. Most problems with new equipment are caused by incorrect operation or assembly.
- Read and carefully follow the operating and safety precautions for the pump and ram used with this floor crane.
- The owner of the crane is responsible for ensuring that the correct operating procedures are followed according to federal, state, and local safety regulations.
- Wear approved eye protection when using this crane.
- Stay out from underneath a load that is being lifted or suspended. Accidental slippage can result in personal injury.
- Never attempt to lift a load that is heavier than the rated capacity of the crane boom. Overloaded equipment can fail and possibly cause personal injury.
- Do not modify any part of this crane. If a modification is needed, contact OTC Technical Services.
- To prevent tipping: do not lift or move a load that has a center of gravity that extends beyond the legs or wheels; do not move a loaded crane unless the load has been lowered as close to the floor as possible; exercise extreme caution when moving a loaded crane on an incline or around a corner. The load can swing out beyond the wheels and cause the crane to tip over.



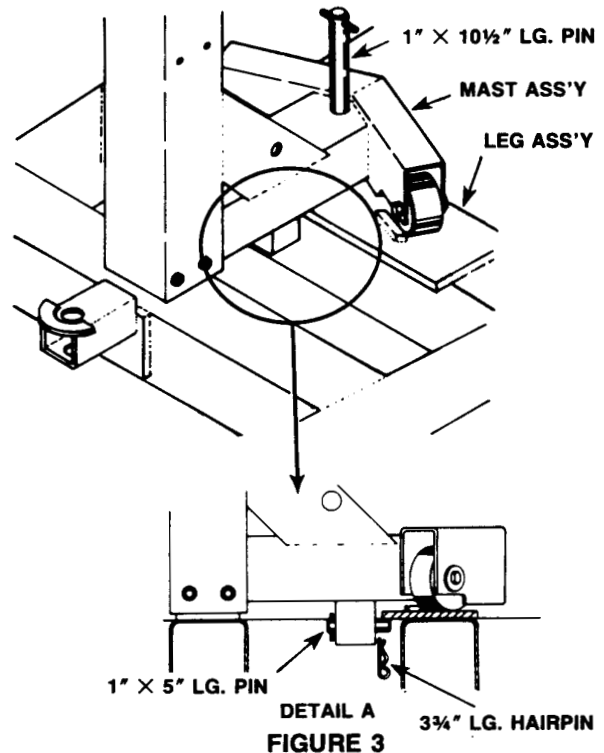
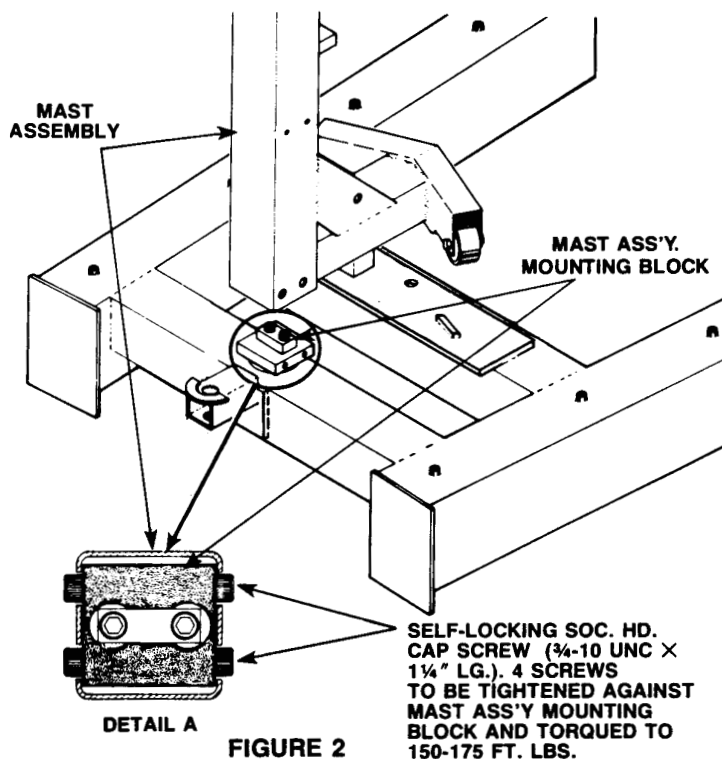
ASSEMBLY INSTRUCTIONS

1. Remove all crane components from the pallet. When removing the legs assembly, block the ends of the legs up off the floor to position them for installation of the front wheels.
2. Insert a leg pin into each leg to secure the adjustable inner leg extension. See Figure 1.
3. Assemble the wheels on the ends of the legs. Begin by placing a wheel (with a washer and spacer on each side of the wheel) inside the end of each leg. Slide the axle through the assembly and secure with a roll pin on each end of the axle. Once assembled, locate the grease zerks for both wheels and grease with Phillips Petroleum Co. "EP-2" or an equivalent grease. Remove the blocking from under the legs.



4. Using a suitable lifting device, lift the mast assembly near the top and lower the assembly down over the mast assembly mounting block. See Figure 2.
5. Thread four self-locking socket hd. cap screws (3/4-10 UNC x 1-1/4 inch lg.) through the mast assembly and into the mounting block. See Figure 2, Detail A. Torque the cap screws to 150-175 ft. lbs.

WARNING: For full thread engagement, the shoulders of the cap screws must butt against the mast assembly mounting block. They do not butt against the mast assembly. See Figure 2, Detail A.



6. Insert a 1" x 5" lg. pin (fitted with a roll pin T-handle) through the tubular fitting and under the lip of the leg assembly. See Figure 3, Detail A. Lock the pin in place with a 3-3/4 lg. hairpin.
7. Insert a 1" x 10-1/2" lg. pin (fitted with a roll pin T-handle) into the boom. See Figure 3. Center the forward part of the mast assembly until the pin drops in place into the leg assembly.
8. Raise the rear of the crane, and slide the dolly assembly pivot pin through the dolly pivot block. See Figure 4. Fasten the pin in place with the 1" outside dia. external retaining ring.

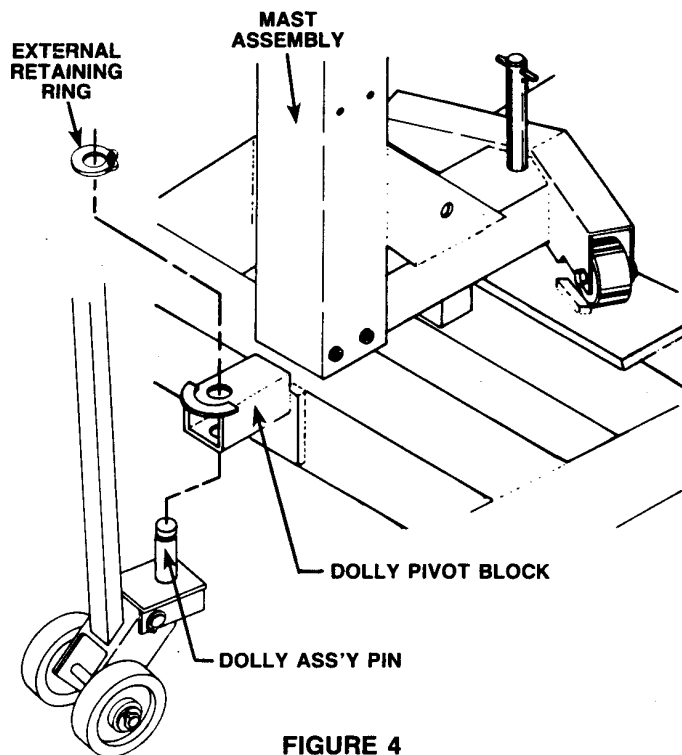


FIGURE 4

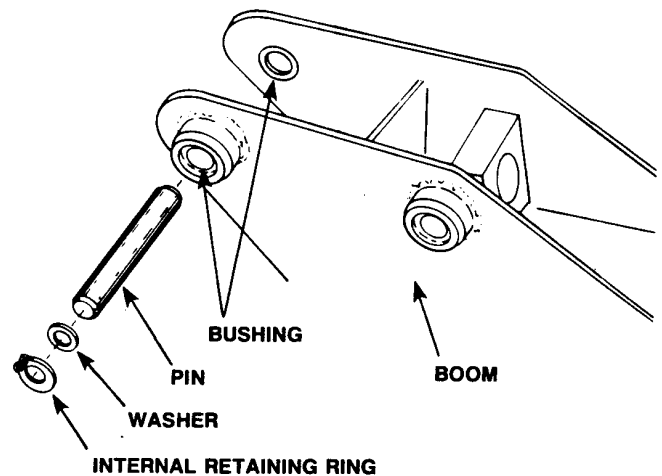
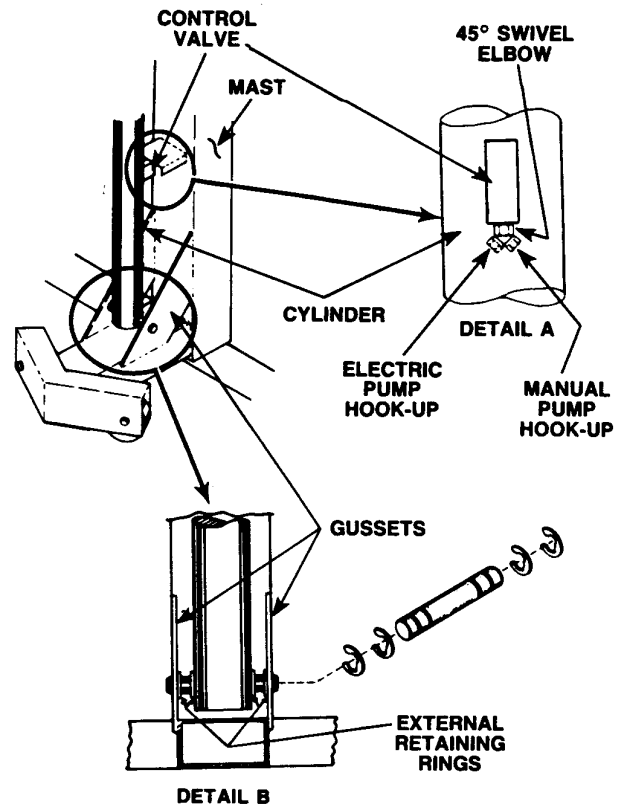
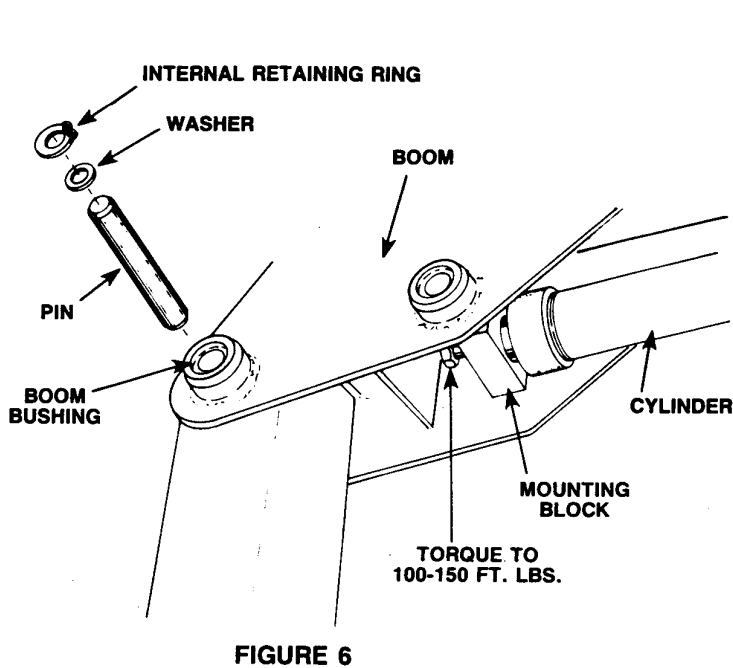


FIGURE 5

9. Remove the boom extension from the inside boom to lighten the weight. Remove the internal retaining ring and washer from one end of the rear boom pin. Remove the pin, but leave the pin bushings inserted in the boom. See Figure 5.

10. Lift and guide the boom into position on the top of the mast assembly. Liberally coat the rear boom pin with grease (Phillips Petroleum Co. "EP-2" or equivalent), and insert the pin through the boom bushings. See Figure 6. Fasten with the washer and internal retaining ring in the order shown.



11. Install the control valve on the cylinder with the female port facing down. Install the 45° swivel elbow on the control valve. See Figure 7, Detail A. **Electric pump:** the elbow must point down and to the left. **Manual pump:** the elbow must point down and to the right.

IMPORTANT: Seal all pipe connections with Bakerseal. Teflon tape can be used to seal hydraulic connections *if only one layer of tape is used*. Apply the tape carefully to prevent it from being pinched by the fitting and broken off inside the pipe end. Any loose pieces of tape could travel through the system and obstruct the flow of oil or cause jamming of precision-fit parts.

12. Fasten the top of the cylinder to the mounting block located in the boom. See Figure 6. Torque the screw to 100-150 ft. lbs. Lower the cylinder, and turn it until the control valve is pointed inward toward the mast. See Figure 7.
13. Align the mounting holes in the bottom of the cylinder with the mounting holes in the gussets located on the bottom of the mast. Insert the 1-1/2" x 6-7/16" lg. pin, and snap the four external retaining rings in place. See Figure 7, Detail B. **NOTE:** The four retaining rings must be located inside the inner walls of the gussets.

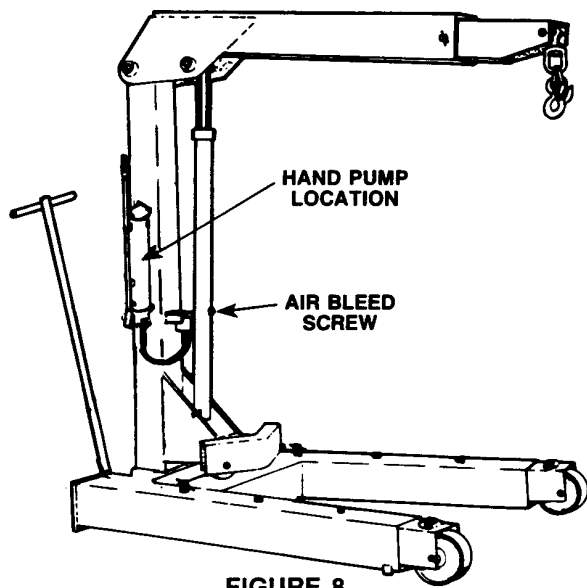


FIGURE 8

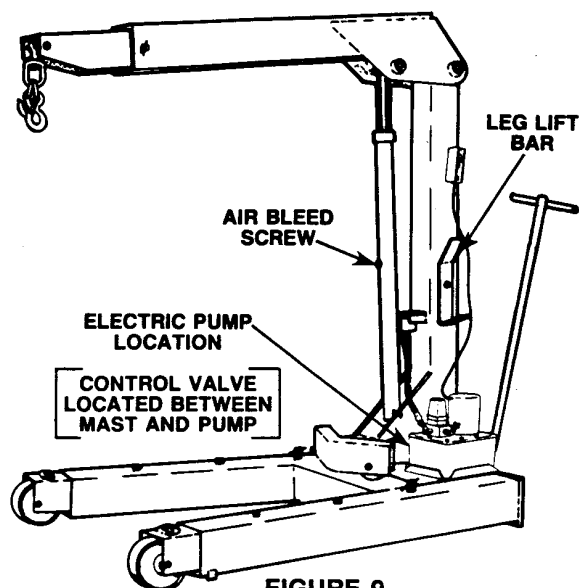


FIGURE 9

14. **IF USING A HAND PUMP**, remove the pipe plug and insert the hose hand tight. Hand tighten the other end of the hose into the 45° elbow located on the crane cylinder. Position the pump outlet port down, and mount the pump on the left side of the crane mast (viewed from the front). See Figure 8. Four 1/4" x 1" lg. cap screws are provided for mounting the hand pump. Wrench tighten all hydraulic fittings.
IF USING AN ELECTRIC PUMP, remove the shipping board from the bottom of the pump. Mount the pump on the right side of the crane (viewed from the front). See Figure 9. **NOTE: Position the pump so the control valve handle faces away from the crane mast.** Remove the pipe plug from the pump's control valve pressure port. (Refer to the parts list or instruction sheet for the pump.) Apply pipe sealant to the external threads of the 90° elbow and the hydraulic hose. Install the elbow into the pump valve pressure port. Install the hose into the 90° elbow and into the 45° swivel elbow on the crane cylinder. Wrench tighten all hydraulic fittings.
15. Lower the crane boom as far as possible. Remove the air bleed screw from the cylinder, and operate the pump until a small amount of hydraulic fluid flows out. Insert the air bleed screw again.

WARNING: The cylinder must be bled to remove air, because air in the hydraulic system could cause a suspended load to drop unexpectedly.

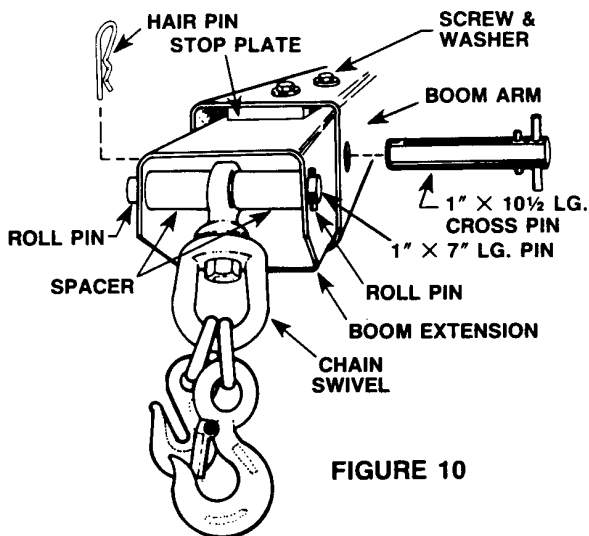


FIGURE 10

16. Slide the boom extension into the boom arm, and fasten the stop plate inside the top surface of the boom arm. See Figure 10. Insert the 1" x 10-1/2" lg. cross pin through the arm and extension. Secure with a 3-3/4" lg. hair pin.
17. Install the chain swivel on the end of the boom, centered by a spacer (1" I.D. x 2-1/8" lg.) located on each side of the swivel. Fasten the 1" x 7" lg. pin in place with a 1/4" x 1-1/2" lg. roll pin set into each end. See Figure 10.
18. Place the leg lift bar on the pin located on the side of the mast, and fasten it in place with the 1-7/8" lg. hair pin. See Figure 9.

OPERATING INSTRUCTIONS

The Heavy Duty Mobile Floor Crane is designed to handle loads from 4,000 to 6,000 lbs., depending upon the load bearing position of the boom. The crane's extendible boom gives increased reaching capacity, and the boom pivots on a base to get into the correct position to raise a load out of a difficult-to-reach area.

LOAD-BEARING POSITIONS

The crane has three load-bearing positions and one storage position. In addition to the load-bearing positions, the crane boom can be pivoted approximately 10° to either side of the center of the base. See Figure 11.



WARNING: To prevent tipping, which could result in personal injury,

- The legs of the crane must be extended beyond the end of the boom **BEFORE** a load is placed on the crane. See Figure 11.
- Do not lift or move a load with a center of gravity that extends either to the side beyond the legs or to the front beyond the front wheels.
- Do not move a loaded crane unless the load has been lowered as close to the floor as possible.
- Use extreme caution when moving a loaded crane on an incline or around a corner. The load can swing out beyond the wheels.

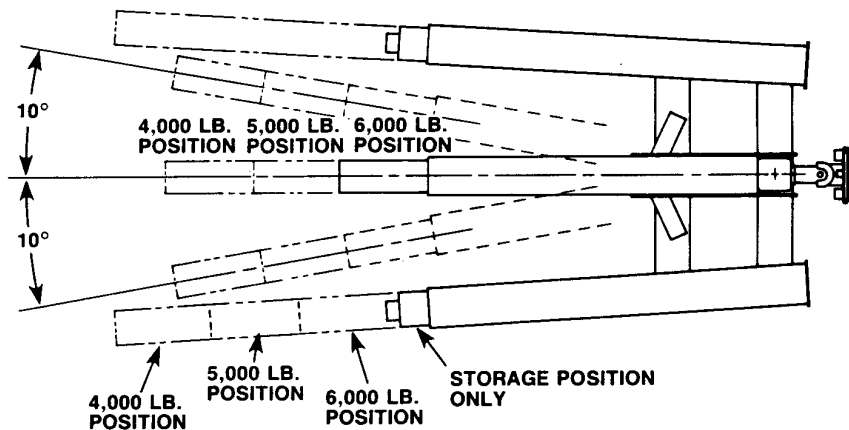


FIGURE 11

BOOM EXTENSION



WARNING: Do not exceed the rated capacity of the crane. The capacity is reduced as the boom is extended outward. Overloaded equipment can fall, possibly resulting in personal injury.

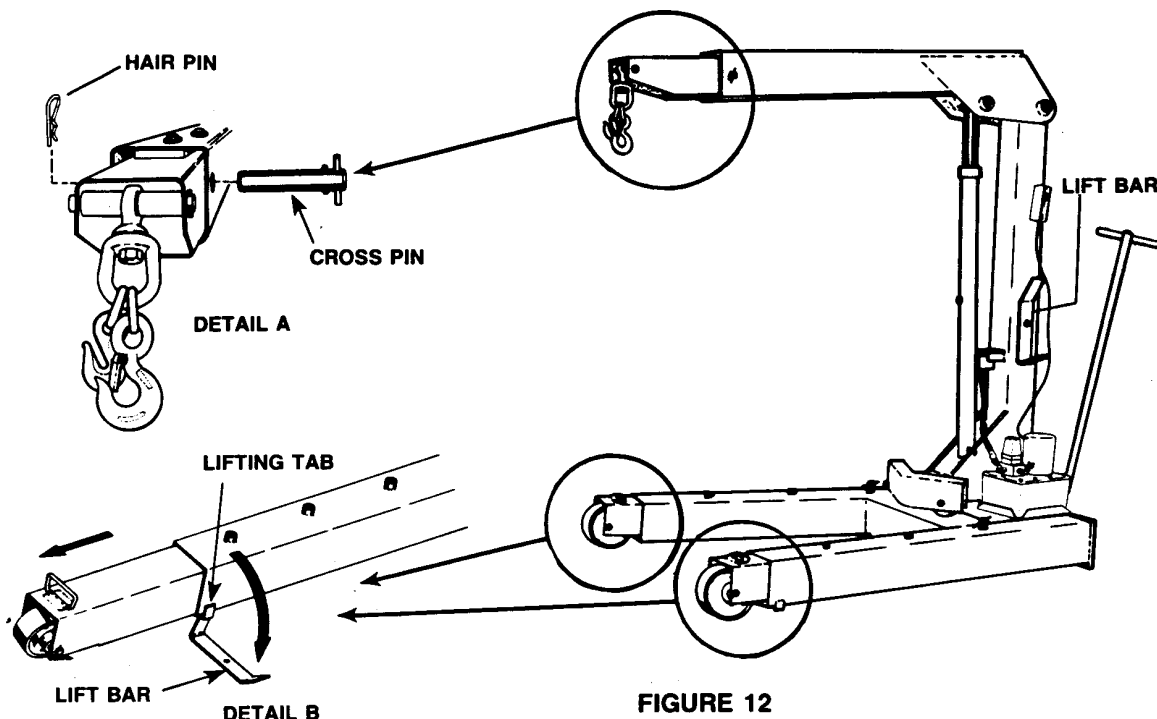
1. To extend the boom, remove the cross pin and slide the boom extension out to a desired length. See Figure 12, Detail A.
2. Place the cross pin back into the arm and extension. Insert the hair pin to lock the cross pin in place.

LEG EXTENSION



WARNING: The crane legs must be extended at least as far as the boom is extended. Accidental tipping can result in personal injury.

1. To extend the legs of the crane, remove the lift bar from the crane mast. Position the lift bar so that it engages the lifting tab located on the crane leg. See Figure 12, Detail B.
2. Push the lift bar down to raise the crane leg.
3. Pull the leg pin out. Place the leg pin in the hole where the leg will be extended.
4. Pull the leg out until the pin drops into the locking hole.
5. Repeat Steps 1-4 to extend the other leg.



⚠ WARNING: In Figure 12, the legs are shown in the retracted (storage) position. Do NOT support a load with the legs in the storage position. To prevent tipping and possible personal injury, the legs must be moved out to a load-bearing position BEFORE using.

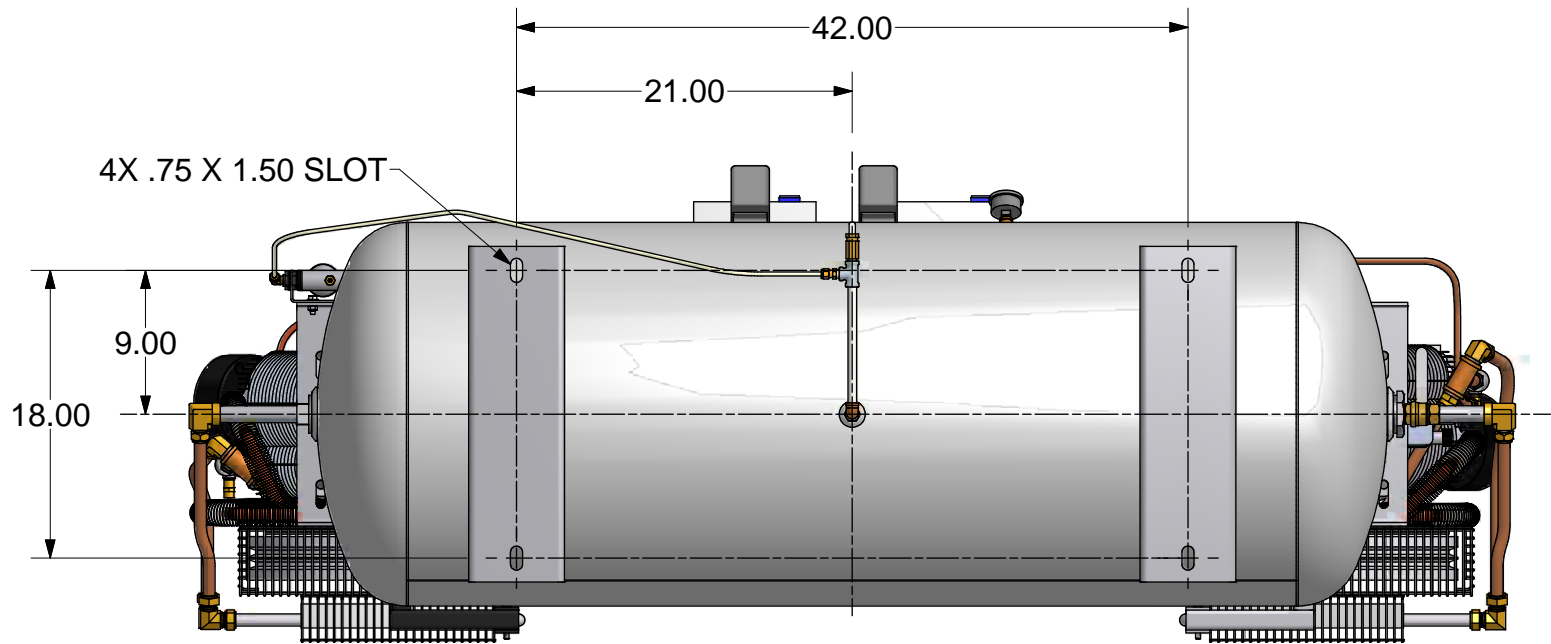
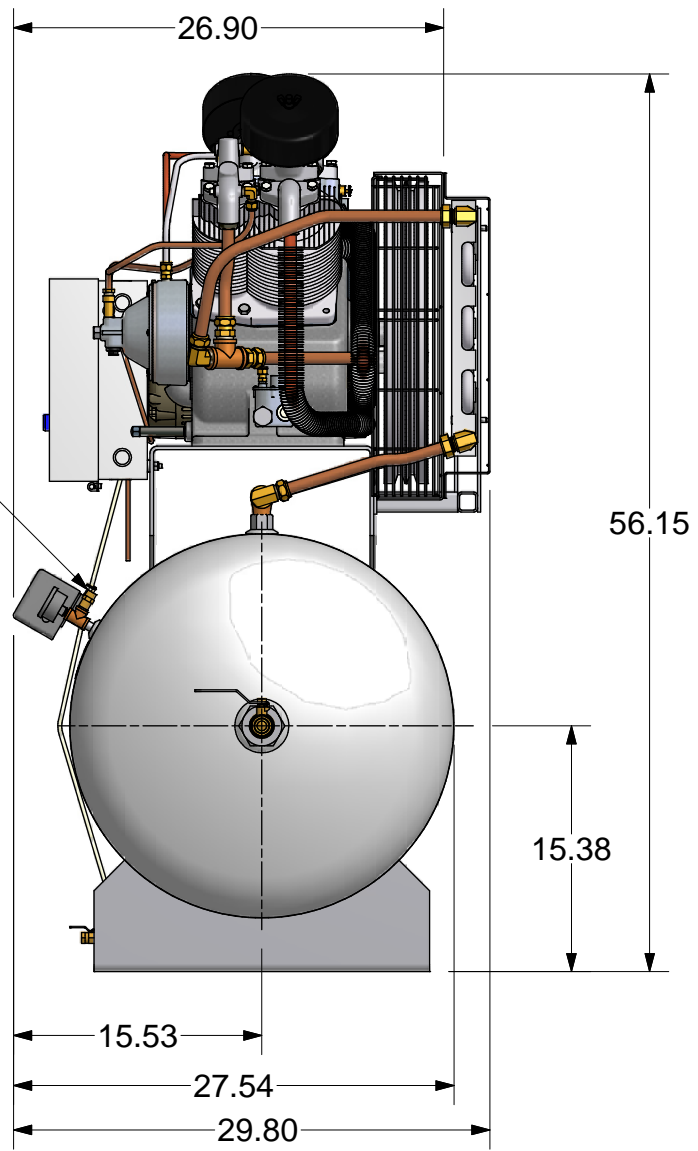
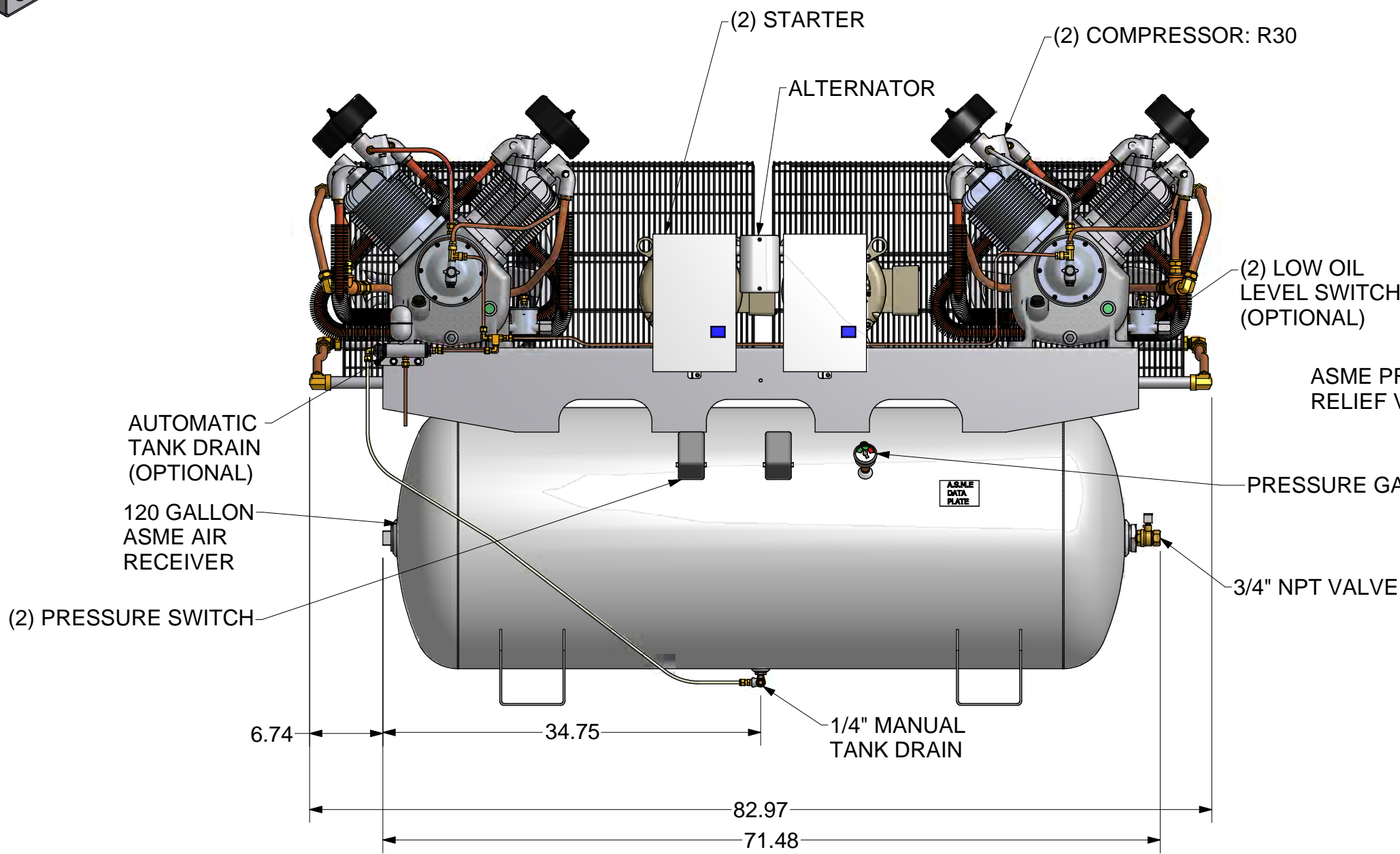
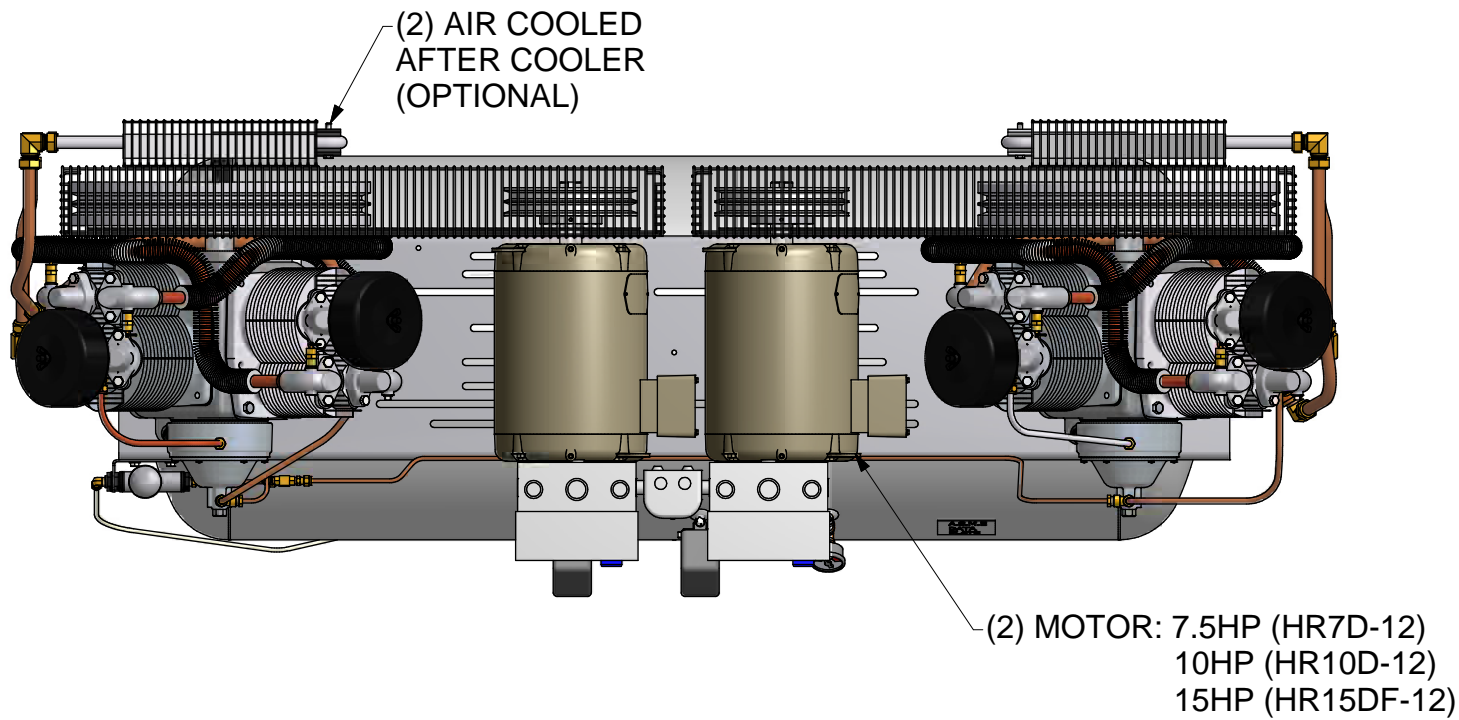
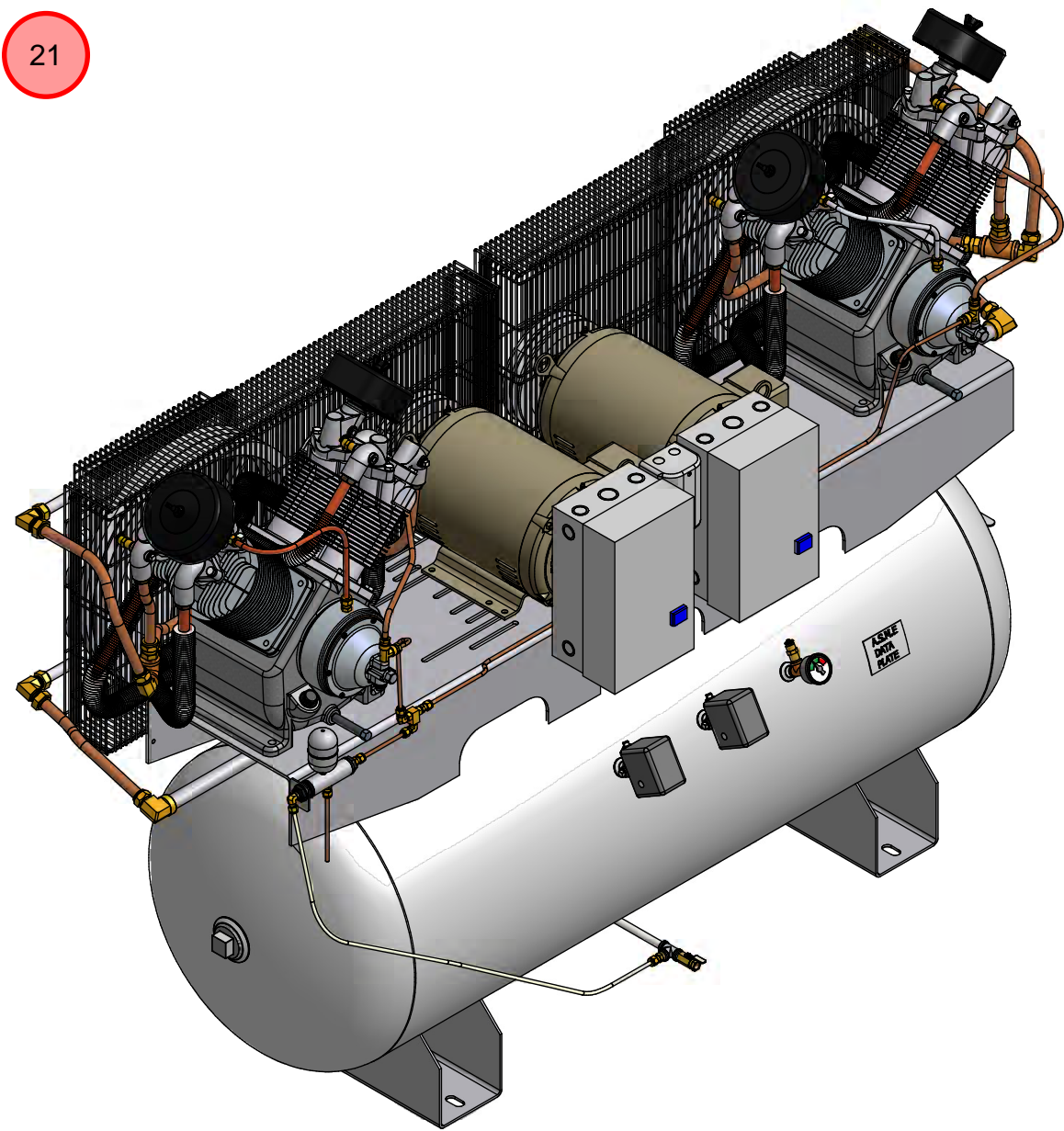
CRANE STORAGE

1. Store the floor crane with the hydraulic pressure released, the hydraulic valve closed, and the legs in the fully retracted position. See Figure 12.

PREVENTIVE MAINTENANCE

1. Grease wheels and pivot points on a regular maintenance schedule.
2. Inspect the hydraulic hose for cuts and abrasions before each use. Worn hoses must be replaced.
3. Lower the crane boom, and close the valve when the crane is not in use.
4. Check the oil level of the pump on a regular basis. (Refer to the operating instructions for the pump.)
NOTE: Lower the crane boom BEFORE adding oil to the hydraulic pump.
5. Under normal shop conditions, drain and flush the oil from the pump once a year. Refill the pump with a high-grade oil, such as OTC #16355. **IMPORTANT: Do not use brake fluid instead of oil in the hydraulic pump. Brake fluid can damage the internal seals.**
6. If the lifting action of the crane appears "spongy," bleed the air out of the cylinder as previously outlined. Refer to "Assembly Instructions," Step 15.

REVISION HISTORY					
ZONE	REV	DESCRIPTION	DATE	DWN	CHK
	A	RELEASED PER ECN 1061463			



- NOTES:
1. DO NOT SCALE DRAWING.
 2. SPECIFICATIONS AND DIMENSIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE OR OBLIGATION.
 3. ALL DIMENSIONS IN INCHES.
 4. ADD 1.00" TO HIEGHT FOR VIBRATION OPTION.

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CHAMPION RECIPROCATING COMPRESSORS...

The Value Leaders

At Champion, air compressor systems are our only products. We know and understand the application of our products in many different operating environments. Our goal is to provide you with the compressors that fulfill — and exceed — your expectations and requirements.

Because compressed air is an essential utility, dependability is an essential compressor quality. If your compressor goes down, it can hurt your reputation — and your bottom line. Champion reciprocating compressors are proven units, known for their reliability over decades of use. In addition to dependability, you want a compressor that is user-friendly. Champion comes through again, with a wide selection of configurations and options designed for trouble-free operation.

You can't beat a Champion!



Proven Design.

Today's Champion Reciprocating Compressors are the product of decades of design and development.

Proven Dependability.

You rely on compressed air to perform many tasks efficiently. Champion knows that reliability is one of the main reasons for a purchase. Our slow speed, built-in efficiency through design and the longest compressor warranty in the industry make Champion compressors the proven choice!

High Performance.

R- and PL-Series compressors are loaded with features designed for day-in, day-out performance. For example, Champion's unique automotive-type domed piston design allows the use of large diameter, low lift valves, while minimizing clearance volume for maximum air delivery.

Long Life.

Features such as slow speed operation, rugged cast iron crankcase construction, corrosion resistant steel valves and tapered roller-type main bearings all contribute to long life.

User-friendly Design.

A wide selection of configurations and available options, coupled with serviceability features make it easy to operate and maintain a Champion compressor. Compare all the features on the pages that follow. You'll discover why Champion is the value leader in reciprocating compressors for a broad range of automotive and industrial applications.

The Solution to Your Application



Select the configuration that matches your application.

With many models from which to choose in both single-stage and two-stage, we can match your needs exactly. These configurations, combined with a wide choice of options, provide all the components for a customized installation. They are available in both R-Series splash-lubricated and PL-Series pressure-lubricated models.

Tank-mounted Air Compressors

Available with horizontal or space-saving vertical tanks, two-stage air compressors compress air to a higher pressure than single stage compressors.

Base-mounted Air Compressors

Designed for installations where air tanks are remotely located.

Duplex Air Compressors

For extra air delivery when you need it without wasted space. Plus the flexibility of single operation, alternating between compressors, or duplex operation to meet high air demand.

Gasoline or Diesel Engine Powered Air Compressors

Truck and utility bed mounting design makes these compressors ideal for fleet and field service. Ideal for applications where electricity is not available.

Bare Compressor Pumps

Provide dependable service for industrial applications, pump replacement or OEM applications. The rugged pump design assures reliability and long maintenance intervals.

Receivers

Receivers are ASME approved and include a pressure gauge, pressure relief valve, drain valve and service valve.



Splash-Lubricated R-Series

Loaded with rugged features, the R-Series splash-lubricated compressors deliver high performance, long life and tremendous value.

1 Multi-finned cylinders

Cooler operating temperatures result in longer life and consistent performance over time.

2 Integral cylinder/head

Gasketless design eliminates the possibility of blown head gaskets for trouble-free operation.

3 Balanced pistons

Aluminum alloy first-stage piston is weight-matched to the cast iron second-stage piston, ensuring proper balance.

4 Piston rings

Two compression rings and one oil control ring provide excellent oil control, and high efficiency air delivery.

5 Lightweight connecting rods

High-density, die-cast aluminum alloy rods minimize reciprocating weight. An integral, precision-bored crankpin bearing and a needle bearing for the piston pin properly distribute bearing loads for longer bearing life than bushings.

6 Pressure relief valves

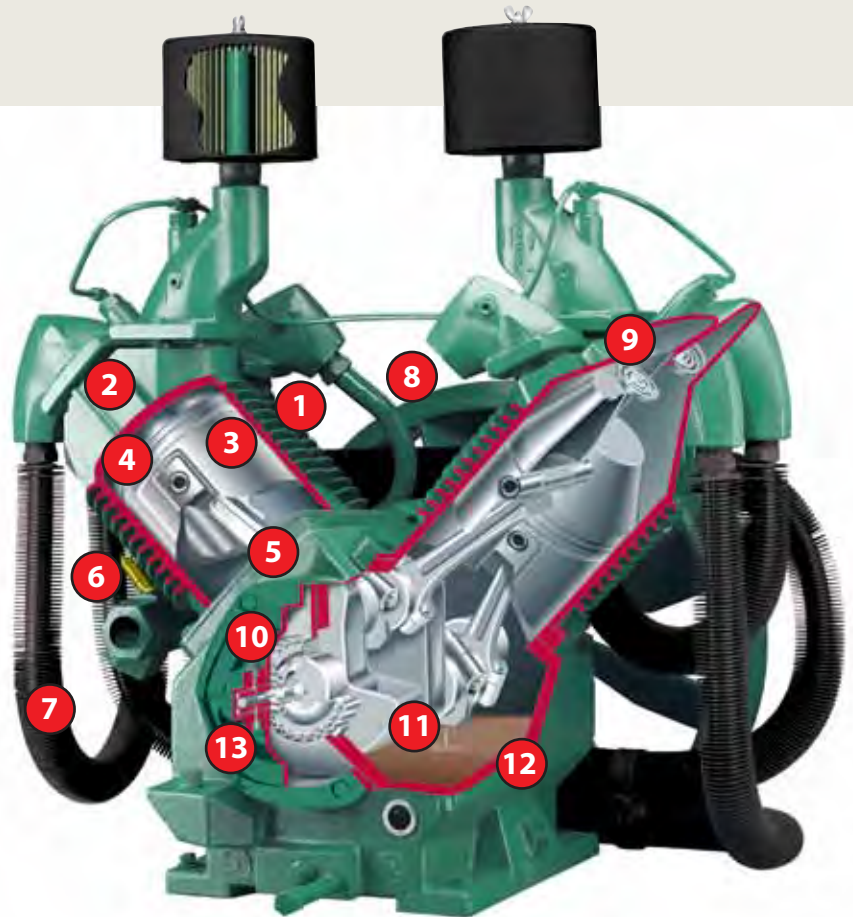
Located in interstage and discharge.

7 Intercoolers

Large-diameter finned tubing is positioned to obtain the greatest cooling effect between stages for maximum compressor efficiency.

8 Optimized cooling fan/flywheel

Precision balanced flywheel has fan blades for optimum compressor cooling and life.



9 Reliable, high-flow valves

Single-unit, disc-type valves provide low lift and long life. Discs are made of corrosion resistant Swedish steel. Valves are easily serviced by removing the manifolds only.

10 Oversized main bearings

Tapered roller-type main bearings provide full contact and support of the crankshaft plus delivers the longest possible life.

11 Balanced crankshaft

Constructed of rugged ductile iron with large diameter throws for minimum bearing loads and counterweights to minimize vibration.

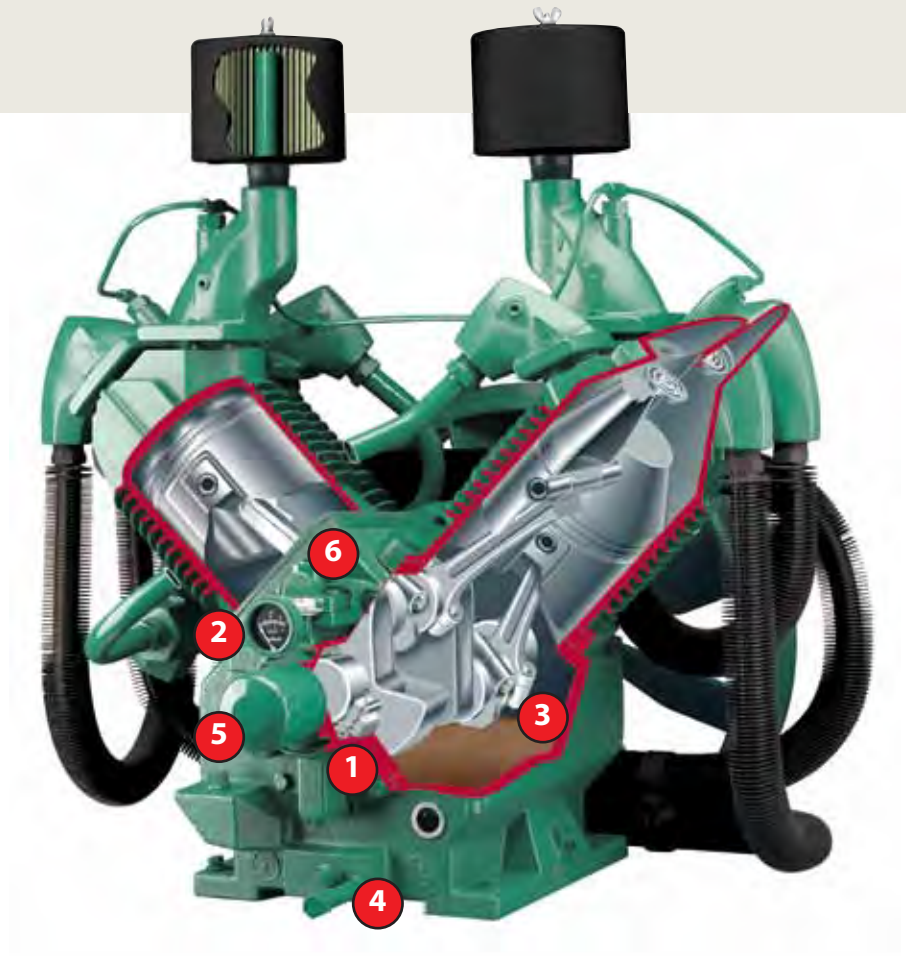
12 Large capacity crankcase

Rugged cast iron oil reservoir has convenient sight gauge glass, corner oil fill boss and large oil drain.

13 Loadless starting

Positive acting, governor-type centrifugal unloader assures longer motor life by allowing the compressor to start unloaded every time.

Pressure-Lubricated PL-Series



The PL-Series compressor has been designed to operate in extreme duty applications and is also an alternative to an R-Series unit. Because the PL-Series can operate up to 250 psi, in remote locations or in off-level operations, it is a true industrial use compressor. Champion is so confident in the way it has engineered and built its products, it offers a 5-year warranty on the compressor pump. The PL-Series features domed pistons, integral cylinder head, disc valves and an oil pump that provides lubricant to all crucial parts of the compressor. From its extra heavy duty design to its ease of maintenance, the Champion PL-Series exemplifies reliability, durability and quality.

1 Pressure lubrication

Crankshaft and connecting rod bearings are pressure lubricated for extended life.

2 Oil pressure gauge

Mounted on the front of the compressor for an excellent view and easy pressure monitoring.

3 Babbitt bearings

Replaceable bearing makes repairs easy and inexpensive.

4 Lubricant filtration

An external spin on oil filter and an internal oil inlet screen protect internal components from damaging debris.

5 Positive displacement oil pump

Provides lubricant to all critical areas of the compressor pump that require lubrication.

6 Loadless starting

Hydraulic unloader with-factory set pilot valve provides easy, loadless starts and low oil pressure protection for unattended operation.

Quality Accessories

Many options are available to help you develop a Champion compressor package that exactly matches your specific operating requirements.



1 Magnetic starter

(included as standard on most models)

For thermal overload protection, a starter is required for units 3 HP and up. May be mounted or unmounted.

2 Air-cooled or water-cooled aftercooler

The factory mounted, heavy duty, air-cooled aftercooler effectively reduces up to 65% of the moisture from discharged compressed air.



3 Automatic tank drain

Pneumatic drain operates from a centrifugal unloader.

4 Vibration isolators

Isolates the compressor unit from the foundation or floor. Reduces noise and protects the unit from any out-of-level floor situation that could cause vibration and damage.



5 Low oil level monitor

Low Oil Level Monitor shuts down the unit when oil levels are below an adequate level. Prevents the unit from restarting if oil levels are not at an adequate level.

6 Refrigerated air dryer

Cools compressed air to a 33°–39° dew point, eliminating additional downstream condensation in the air line. Normally, a dryer should be used in conjunction with an aftercooler. Refrigerated and desiccant dryer types are available.



7 DPR Control Panel

The Microprocessed Duplex Relay Panel was created for controlling a duplex air compressor package. The controller includes visual maintenance and shut down alarms.

8 Champion Compressor Lubricants

ChampLub lubricants are blended specifically for Champion compressors for use in harsh compressor environments. They are sourced from extremely stable base stocks and enhanced with carefully selected additive packages to provide long life and superior protection. ChampLub lubricants are suitable for a variety of applications and are available as a mineral oil, synthetic or food-grade synthetic.

Available in 55-gallon drums, five-gallon pails, one-gallon bottles and one-quart bottles.



Other Options

- ▶ Power Monitor that shuts down unit in the event of single phasing, low voltage or phase reversal
- ▶ Constant Speed Control which prevents excessive motor start/stop cycles while saving energy
- ▶ Dual Control will allow the compressor to run either in start/stop or constant speed mode
- ▶ NEMA 4 rated parts available
- ▶ Alternate voltages and TEFC, ODPHE, TEFCHE Electric Motors