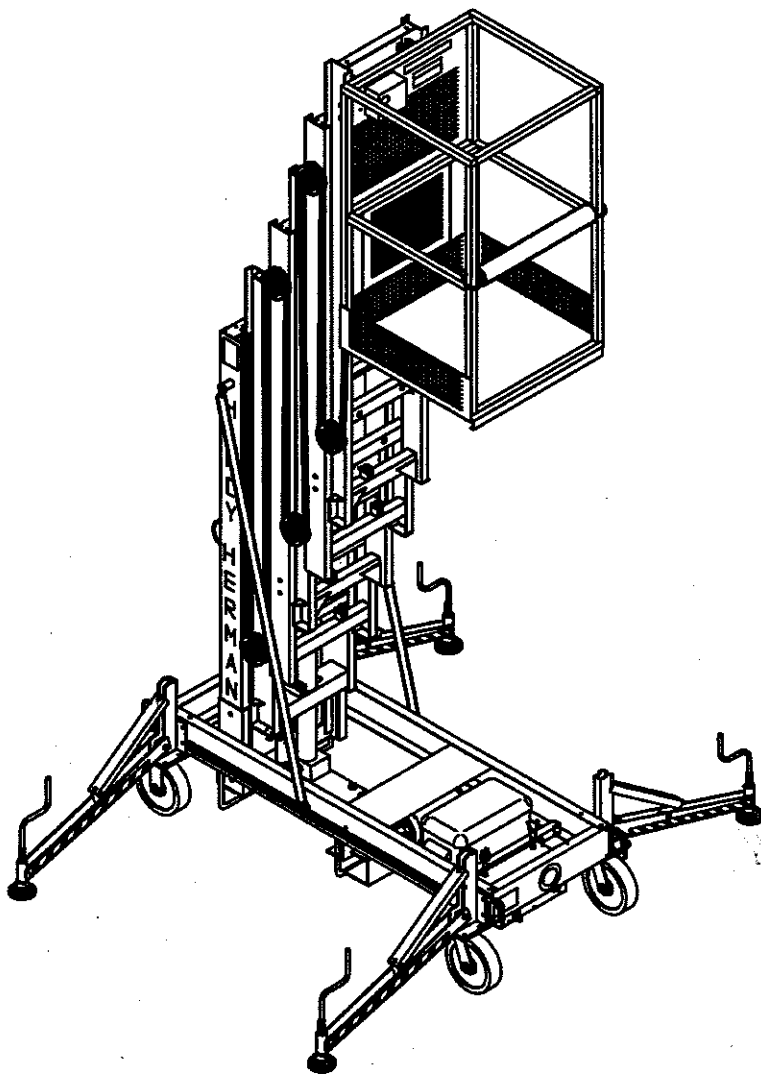


Handy-Herman III Series

16D, 16A, 24D, 24A



Mayville Engineering Company, Inc.
An Employee Owned Company

Aerial Work Platforms

715 South Street • Mayville, WI 53050
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www.mayvl.com

Operating, Maintenance, Parts & Service Manual

9/98

Part Number 6769

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Limited Owner Warranty

Mayville Engineering Company, Inc. (MEC) warrants its equipment to the original purchaser against defects in material and/or workmanship under normal use and service for one (1) year from date of registered sale or date the unit left the factory if not registered. MEC further warrants the structural weldments of the main frame and scissor arms as defined in MEC's current Warranty Policy & Procedures, to be free from defects in material or workmanship for five (5) years from date of registered sale or date unit left the factory if not registered. Excluded from such warranty is the battery(s) which carries a ninety (90) day warranty from described purchase date and prorated thereafter up to one (1) year. Warranty claims within such warranty period shall be limited to repair or replacement, at MEC's option, of the defective part in question and labor to perform the necessary repair or replacement based on MEC's then current flat rate, provided the defective part in question is shipped prepaid to MEC and is found upon inspection by MEC to be defective in material and/or workmanship. Mayville Engineering Company, Inc. shall not be liable for any consequential, incidental or contingent damages whatsoever. Use of other than factory authorized parts, misuse, improper maintenance or modification of the equipment voids this warranty. The foregoing warranty is exclusive and in lieu of all other warranties, express or implied. All such other warranties, including implied warranties of merchantability and of fitness for a particular purpose, are hereby excluded. No Dealer, Sales Representative, or other person purporting to act on behalf of MEC is authorized to alter the terms of this warranty, or in any manner assume on behalf of MEC any liability or obligation which exceeds MEC's obligations under this warranty.

1. INTRODUCTION

OPERATOR QUALIFICATIONS

Handy Herman III is to be operated and maintained by qualified personnel only!

To qualify for operation and maintenance of this unit, an individual must read and thoroughly understand this manual. If a proposed operator or maintenance man fails to understand any segment of this manual, his supervisor can clarify the misunderstanding through written correspondence or a phone call to:

Mayville Engineering Aerial Work Platforms Division
715 South Street
Mayville, Wisconsin 53050
Phone: 920-387-4500
Fax: 920-387-5817

SAFETY AND LIMITATIONS

Mayville Engineering Co. designs Handy Herman III aerial work platforms to be safe and reliable. They are rugged and maneuverable but must be used only for the purposes and ways intended. This is to raise personnel to overhead work areas.

The following precautions are based on common sense and on the code of safe practices developed by the Scaffold Industry Association, Inc. for the elevating work industry.

1. Respect your machine: do not neglect or misuse it.
2. Check jobsite for unsafe working conditions.
3. Inspect machine before using. Do not use machine if it is malfunctioning in any way.
4. Use machine only for purposes for which it was designed.
5. Never take chances. Do not use machine if your physical condition is uncertain in any way.
6. The platform and its enclosures are not insulated. Do not use near electrically energized circuits.
7. An operator of any type of work platform is subject to certain hazards that cannot be protected by mechanical means. It is therefore essential that operators be competent, careful, physically and mentally fit, and thoroughly trained in safe operation of this machine.

DESCRIPTION

General

Handy Herman III aerial work platforms are electrically actuated hydraulically operated units. The platforms is raised and lowered by mast sections. Emergency lower and auxiliary lift controls are located at the base of the machine.

HANDY-HERMAN III SPECIFICATIONS

MODEL NO.	PLATFORM HEIGHT	WORK HEIGHT	ENTRANCE HEIGHT	LIFT CAPACITY	OVERALL LENGTH	OVERALL WIDTH	OVERALL WIDTH OUTRIGGERS EXTENDED	HEIGHT	PLATFORM DIMENSIONS*	POWER SOURCE	WEIGHT	ASCEND TIME (LOADED)	DESCEND TIME (LOADED)
16A	16" (4.88 m)	22" (6.70 m)	20" (5 m)	400# (181 kg)	60" (1.51 m)	30" (.76 m)	80" (2.03 m)	78.5" (1.99 m)	24" x 30"	115 Volt AC	88# (309 kg)	35 Seconds	25 Seconds
16D	16" (4.88 m)	22" (6.70 m)	20" (5 m)	400# (181 kg)	60" (1.51 m)	30" (.76 m)	80" (2.03 m)	78.5" (1.99 m)	24" x 30"	12-Volt DC Battery	745# (372.5 kg)	35 Seconds	25 Seconds
24A	24" (7.32 m)	30" (9.14 m)	20" (5 m)	300# (136 kg)	60" (1.51 m)	30" (.76 m)	80" (2.03 m)	78.5" (1.99 m)	24" x 24"	115 Volt AC	835# (379.5 kg)	35 Seconds	25 Seconds
24D	24" (7.32 m)	30" (9.14 m)	20" (5 m)	300# (136 kg)	60" (1.51 m)	30" (.76 m)	80" (2.03 m)	78.5" (1.99 m)	24" x 24"	12-Volt DC Battery	900# (409 kg)	35 Seconds	25 Seconds

Through our constant efforts to improve our products, specifications may change without notice.
Add 125 lbs. to the unit weight for the shipping skid.
Oil Capacity 1.5 Gal. (US) Full System
Reservoir Only 1.0 Gal. (US)

2. OPERATION

SAFETY FEATURES

1. **Emergency Stop**
The emergency stop is located on the control console. Depress red rocker cover as indicated and all functions of the machine will be de-energized. Pull up on rocker cover and move toggle switch to on position to reactivate circuits. (Fig. 1)

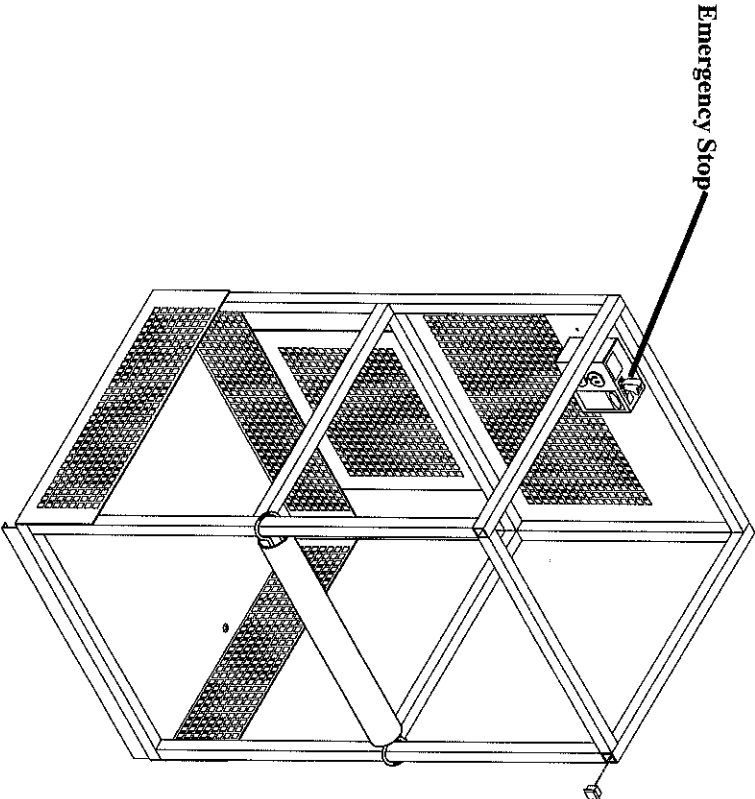


Figure 1. Emergency Stop Control

2. **Emergency Down**

The Emergency Down Control is located above the Control Console in the rear of the unit. Pull handle on cable to allow platform to descend back to the stowed position. (Fig.2)

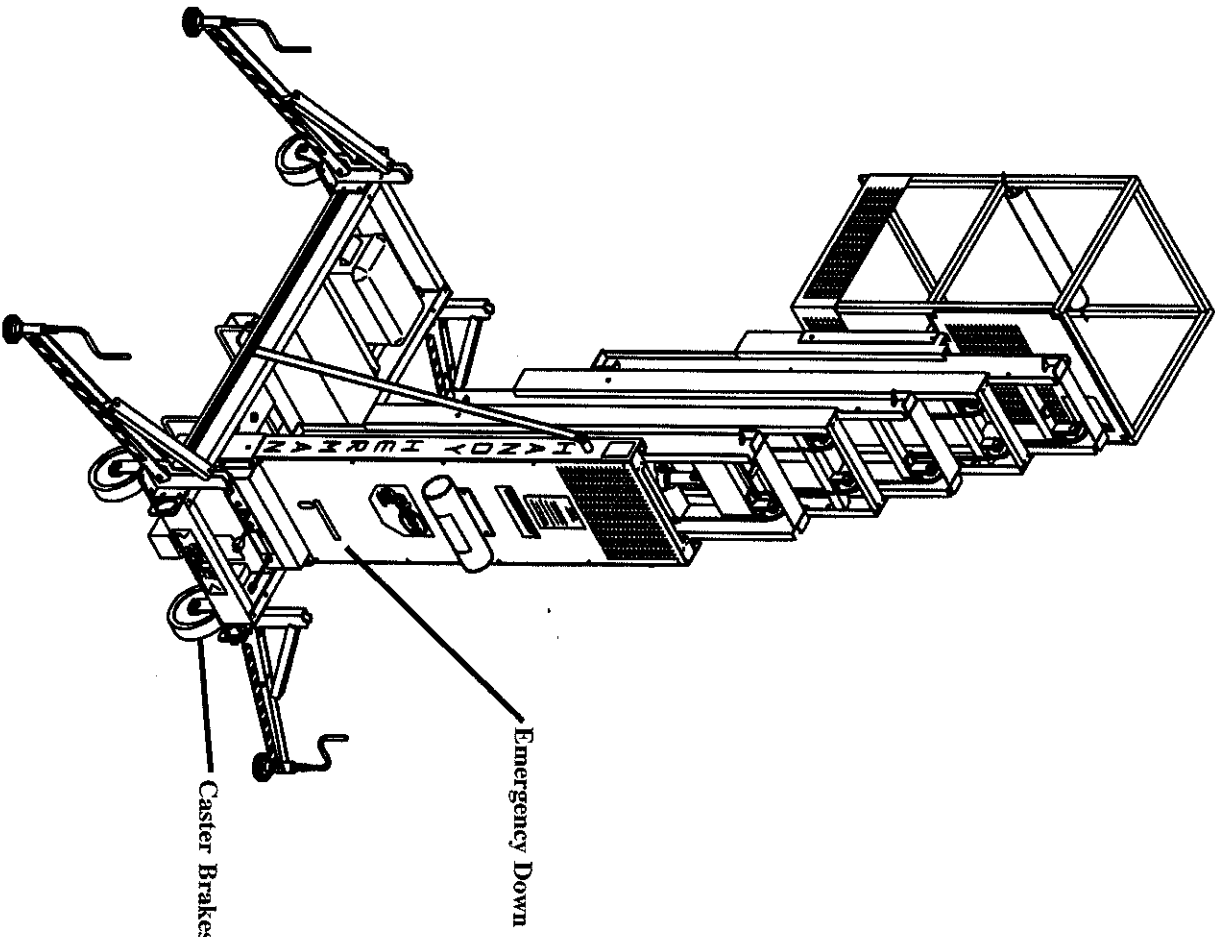


Figure 2. Emergency Down Control and Caster Brakes

3. **Rear Mounted Caster Brakes**

Caster brakes must be set whenever platform is elevated. (Fig.2)

4. **Manual Outriggers**

Outriggers must be extended whenever the platform is elevated. (Fig. 3) When positioning the unit for work, leave approximately 25 inches of space for outrigger extension between the unit and any obstruction on both sides of the machine.

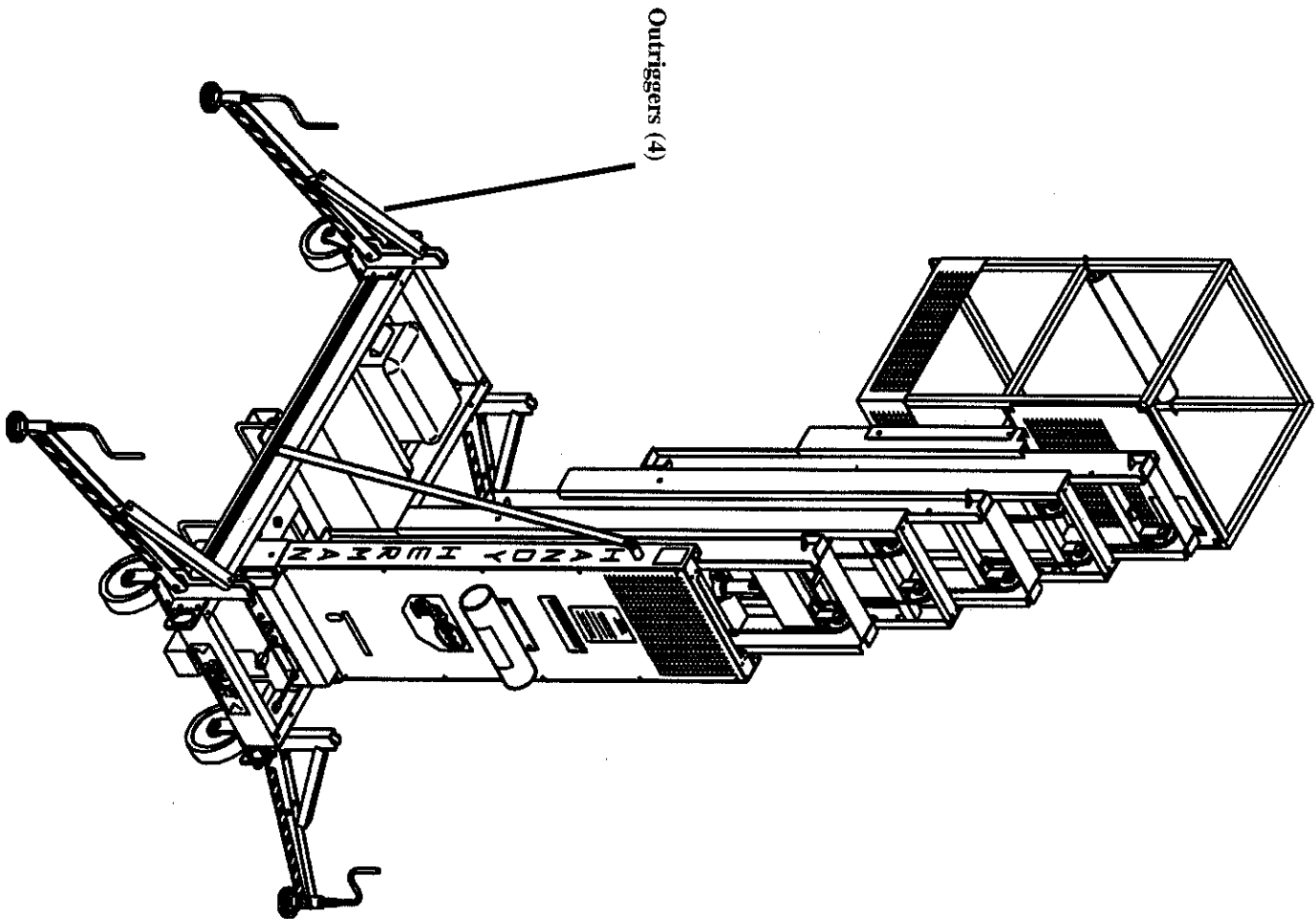


Figure 3. Manual Outriggers

OPERATING INSTRUCTIONS

A. ALL MODELS

- 1. Always extend and adjust all outriggers so base is level before extending.

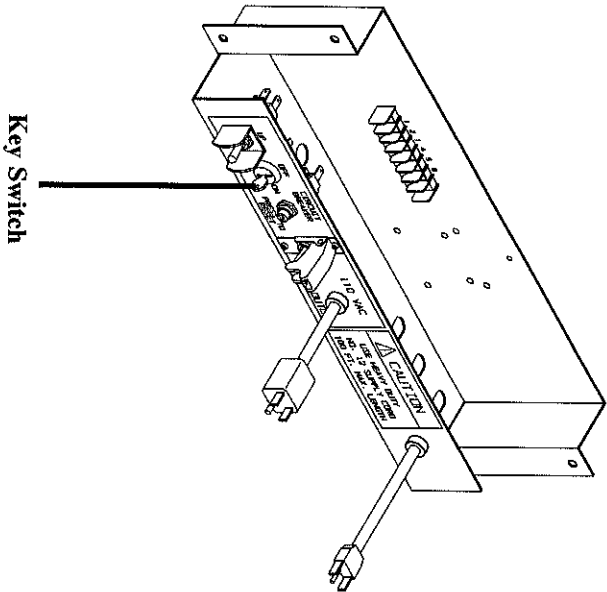


Figure 4. Key Switch Location

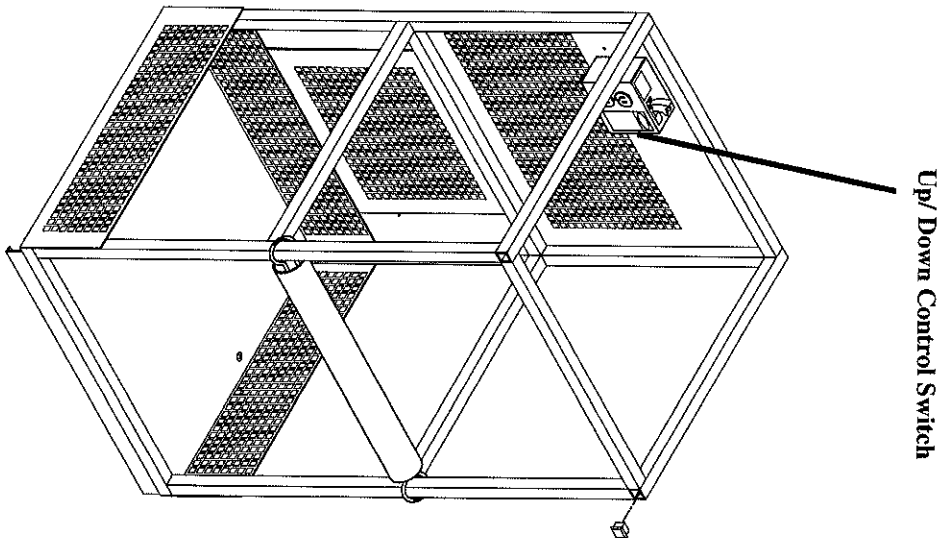


Figure 5. Control Switch Location

- 2. To operate the Handy-Herman III you must first turn the key to the ON position. The key is located on the lower control panel. (Fig. 4)
- 3. **To Raise Platform** – Activate up/down toggle switch to UP position. To stop platform, release switch. (Fig.5) (Along with Motion Switch)
- 4. **To Lower Platform** – Activate up/down toggle switch to DOWN position. To stop platform, release switch. (Along with Motion Switch)

GENERAL OPERATING RULES AND SAFETY

1. The following instructions must be complied with to ensure safe operation of the Handy-Herman work platform.
2. Before operation – Ensure that the machine is properly serviced. (Do Not Use if machine is not working properly.)
3. Inspect the unit for damaged or defective parts before each use. Any damage or defects shall be repaired before operating.
4. Ensure that safety bar is in place whenever someone is on the platform. Do not operate without platform safety bar in place.
5. Follow all applicable city, state, federal, OSHA and ANSI A92.3-1990 safety codes for use of elevating work platforms.
6. **Do Not** use near power lines.... Platform and enclosure are **not** insulated. Stay clear of electric wire, cables, and other overhead obstructions.
7. Do not attempt to use the unit when exposed wind, rain, snow or ice.
8. **Do Not** elevate on incline. **Do Not** operate on uneven or soft terrain. Operate only on a firm and level surface.
9. Always check clearance around machine before elevating or lowering platform.
10. Do not exceed the load capacity of platform.
11. Always lock caster brakes before elevating platform.
12. Always extend and adjust all outriggers so base is level before boarding.
13. Maintain and lubricate unit daily.

WARNING

ELECTRIC SERIESMACHINES SPECIAL MAINTENANCE CONCERNS

To minimize the risk of fire, electric shock or explosion, the following maintenance procedures and inspections are particularly important for electrically powered machines:

1. Keep machine clear of lubricants and other combustible material.
2. Inspect wiring regularly for frayed or deteriorated insulation. Immediately replace or repair a wire harness, or individual wire, that has frayed or deteriorated insulation.
3. Check brakes at the recommended intervals, and make adjustments when required.

3. MAINTENANCE

USE OF NOTES, CAUTIONS, AND WARNINGS

NOTE – Additional information to further understand instructions.

CAUTION – Denotes that failure to comply with instructions could cause damage to the equipment.

WARNING – Denotes that failure to comply with instructions would create a hazardous condition that could result in injury to personnel.

WARNING

Maintenance on the Handy-Herman III series is relatively simple with a minimum of servicing required; however, with any type of lifting device, a hazard to personnel exists when maintenance is performed when platform is raised.

When possible, all maintenance should be performed through the rear of the unit.

The battery on D.C. units should be disconnected whenever working on components. **DO NOT REMOVE ANY HYDRAULIC COMPONENTS WITH PLATFORM RAISED.**

INSPECTION AND LUBRICATION

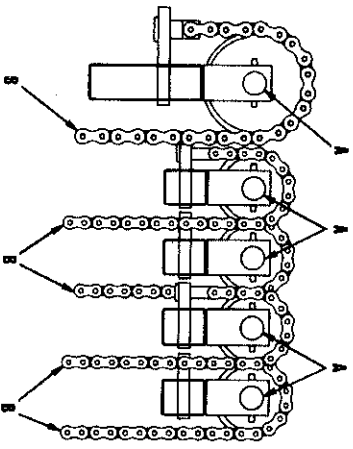
1. Visual Structural Inspection

- a. Visually check unit completely each day to insure the operators safety. Replace or repair any damaged structural members of the unit. Tighten any loose nuts, bolts, or pins. Be sure all plastic guide pads are in place and not damaged in any way. Check to see that all outriggers move freely and adjustment screw turns easily.
- b. Inspect all chains for damage daily. Look for signs of wear, broke rollers, pins or links, kinking, corrosion, heat damage, etc. Replace any chain which is damaged in any way or which shows wear in any way. The chain assemblies must be ordered from your to ensure that the original safety and quality specifications are met. Do not use a unit on which any chain assembly is in need of replacement.
- c. Inspect all mast sections daily to make sure that they are free of dirt or other foreign material which in any way restrict the free movement of the guide pads.

2. Lubrication

Minor lubrication will make the operation of the Handy-Herman III more efficient and extends its useful life.

- a. Grease caster axle axles and swivel raceways monthly.
- b. Oil the leveling screws monthly.
- c. The plastic guide pads in the mast are self lubricating and should not require any maintenance. However, precautions should be taken to be sure that the paths along which the block move are kept clean and lightly lubricated with a dry type silicone lubricant.
- d. Lubricate roller chain and sprockets with EP90 oil monthly.



LUBRICATE THE FOLLOWING AREAS WITH EP90 OIL ONCE EACH MONTH

- A. SPROCKET BEARINGS- BOTH SIDES OF MOUNTING.
- B. CHAIN- 2 TO 3 DROPS EVERY 6 INCHES OF CHAIN.

NOTE: USE OF SERVICE PARTS OTHER THAN THOSE SUPPLIED BY FACTORY VOIDS ALL WARRANTIES AND LIABILITIES OF THIS PRODUCT.

SERVICING, REPLACEMENT AND ADJUSTMENTS

This section contains three basic maintenance functions:
Servicing, Replacement and Adjustments

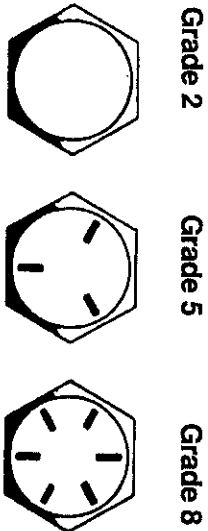
SERVICING describes items to be checked and serviced when necessary, on a daily basis, or prior to using the unit after it has been out of service for a period of time.

REPLACEMENT describes the proper method for removal and installation of replaceable components in case of failure.

ADJUSTMENT describes any adjustments necessary to ensure proper operation of the unit or adjustments required after the replacement of components, if necessary.

CAP SCREWS

NOTE: Any bolt replacement should be of same grade or greater than original bolt. Any questions, call the factory for verification.



Note: Use only service parts supplied by the factory.

1. BATTERY (DC ONLY)

WARNING

NEVER SMOKE OR USE OTHER COMBUSTIBLES NEAR BATTERY WHILE SERVICING BATTERY OR OTHER COMPONENTS. PROVIDE PLENTY OF VENTILATION. PRESENCE OF HYDROGEN FUMES COULD LEAD TO EXPLOSION!

COMPONENT	TIME INTERVAL				
	DAILY	WEEKLY	MONTHLY	6 MONTHS	1 YEAR
Battery 1. Check Wiring 2. Check Fluid Level 3. Clean Battery Connections 4. Coat Terminals	X X	X			
Hydraulic System 1. Check for Leaks 2. Check Fluid Level 3. Inspect Commutator and Brushes 4. Check Hoses 5. Check Fittings 6. Oil Filter (Clean)	X	X		X	X
Mast System 1. Check for Damage 2. Oil Sprockets and Chains 3. Check for Broken Rollers, Pins or Links (Replace Immediately)	X		X		
Main Frame 1. Grease Casters 2. Check Structure 3. Check Pivot Pins on Outriggers	X	X			X
Control System 1. Check Terminals and Plugs 2. Check Cords		X X			
Safety Decals* 1. Check if Missing (Add if Necessary) 2. Check if Legible (Replace if Necessary)	X X				

*See page 24 for safety decals and locations.

Table 3C. Inspection and Lubrication Schedule.

Handy-Herman III battery models are supplied with a heavy-duty deep-cycle battery. The care and maintenance of your battery has much to do with how well your Handy-Herman III functions. Battery wiring and water level should be checked daily. After using Handy-Herman III continuously for a period of time, it is recommended that the battery be brought to a full charge as soon as possible. If the battery is allowed to remain discharged, the lead plates will harden and become sulfated. This will shorten their life as much as over-charging. In this sulfated condition the battery fails to deliver its rated capacity or come up to full charge. Several long, slow charges and fast discharges are necessary to correct the sulfation and hardened plates. It is recommended that once a month the battery be given an equalizing charge of 25% over the regular charge. The equalizing charge must always be given at a low rate to eliminate excessive gassing. Whenever battery temperature reaches 125°F, the charging rate should be reduced or the battery taken off charge and allowed to cool to room temperature.

Do not overfill. When the cells are filled to full, the battery fluid will expand as it becomes warm from charging causing fluid to seep out. Each time this happens, the solution weakens by adding water. Loss of ampere-hour capacity will result.

WARNING

NEVER SMOKE OR USE OTHER COMBUSTIBLES NEAR BATTERY. MAKE SURE THERE IS PLENTY OF VENTILATION. HYDROGEN FUMES COULD LEAD TO EXPLOSION.

a. Checking and Filling (Every 15 hours of use or when recharging)

- (1) Raise platform, remove battery cover.
- (2) If there is any dirt or corrosion on battery, wash with solution of 5 teaspoons baking soda per quart of warm water.
- (3) Remove battery caps and check fluid.
- (4) Fill, if needed, as follows:

(a) Before charging, fluid must be above plates in battery.

(b) After charging, fill to split ring.

CAUTION

Do not overfill. Fluid will expand as it becomes warm from charging and seep out of the battery. When water is then added, the solution is weakened and a loss of ampere-hour capacity results.

Never add acid to battery. The solution is at its proper strength when the battery is manufactured. Use distilled water and keep fluid up to proper level. When required, water should be added to battery **after** charging, unless water level is below the top of the plates.

- (5) Coat terminals with petroleum jelly or equivalent coating.

b. Charging Notes

- (1) The surrounding temperature has a great effect on the power reserve in a battery.

(a) A battery 100% charged at 80°F.

- drops to 65% at 32°F.

- drops to 40% at 0°F.

(a) A battery 46% charged at 80°F.

- drops to 32% at 31°F.

- drops to 21% at 0°F.
- (1) When battery temperature reaches 125°F, battery should be taken off charge and cooled to room temperature or the charging rate should be lowered.

- (1) Battery should be brought to full charge as soon as possible after continuous use. (Lead plates in discharged batteries become hardened and sulfated. The battery eventually will not deliver its rated capacity or come up to a full charge. Several long slow charges and fast discharges help restore plate condition.)
- (2) Once a month, the battery should be given an equalizing charge of 25% over regular charge. Charge must be given at low rate to avoid gassing.

c. Charging

- (1) Raise platform, remove battery cover.
- (2) Remove caps, check fluid level and if needed, fill to cover plates.

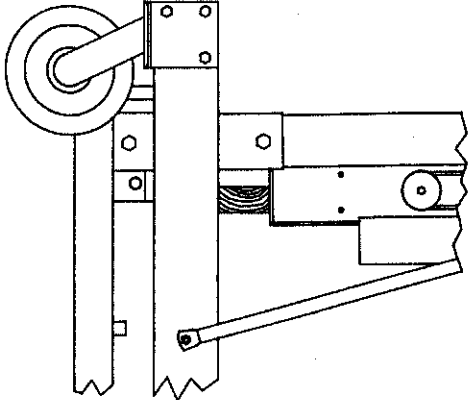
NOTE

After charging, fill to split ring.

- (3) Plug charger into 120 VAC, 60 HZ power source.
- (4) Turn timer clockwise to "ON" position.
- (5) Charge until meter reads in finish area or near zero (0). (Charger will turn off automatically when timer runs out.)
- (6) Unplug charger.
- (7) Check that fluid level is up to split rings and reinstall caps.

d. Battery Replacement

- (1) Raise platform to 7' – 8' high. Place 2 x 4 on edge as shown.
- (2) Remove battery cover.
- (3) Remove battery cables.
- (4) Remove battery.
- (5) Reverse order to insall new battery.



2. HYDRAULIC SYSTEM

a. General Maintenance

CAUTION

It is important to maintain the hydraulic system continually keep the oil clean and to prevent possible damage to the system.

- (1) Check the suction and return hoses and fittings for leakage or damage each day. Tighten or replace when necessary to prevent loss of hydraulic oil.
- (2) If platform does not stay up, check and clean manual valve, solenoid valve and flow control valve in manifold block. Be sure platform is in stowed (down) position and reservoir is drained when removing any components. Replace valves in original position.

b. Check and Fill Hydraulic Reservoir

- (1) Lower platform completely.
- (2) Unscrew the breather cap (Fig. 6) located inside frame member and fill reservoir with hydraulic fluid, Flowmate 150 Hydraulic fluid or a good grade SAE 10W hydraulic fluid.

NOTE

The reservoir should be filled with 1/2" of top of tank with the platform in its lowest position. Do not overfill because when oil warms it will expand and overflow the reservoir.

- (3) Should hydraulic fluid become contaminated, disconnect suction hose and drain reservoir into suitable container. Unscrew suction filter and remove from reservoir. Drain remaining hydraulic fluid from system
- (4) Clean suction filter in solvent.
- (5) Reassemble components and fill reservoir with clean hydraulic fluid.

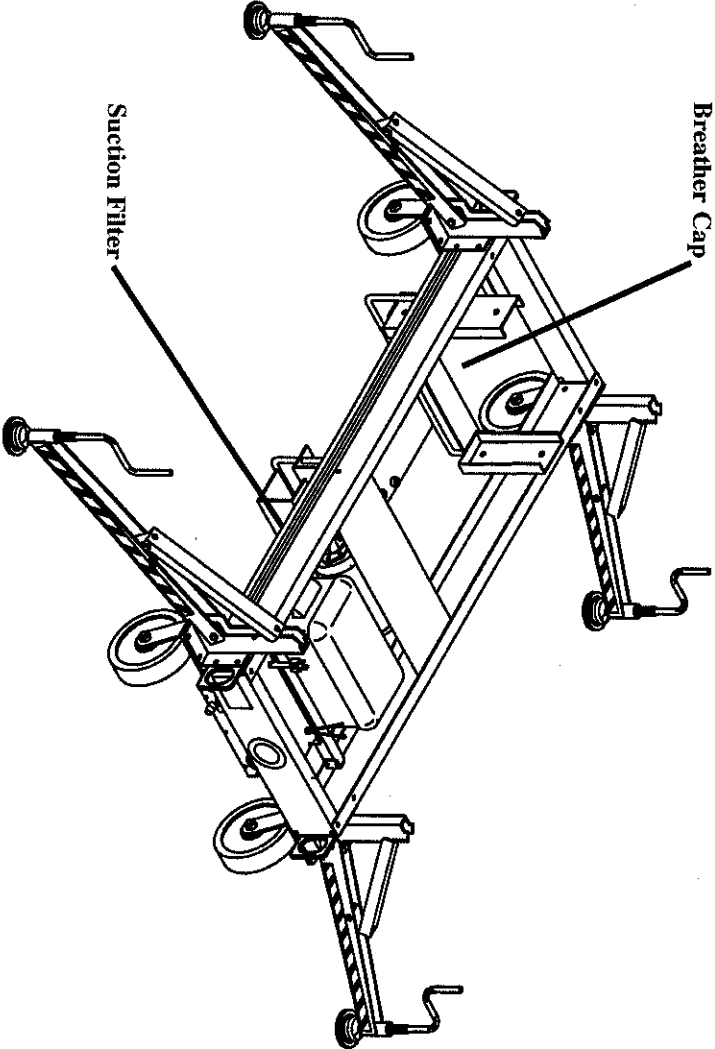


Figure 6. Filling Hydraulic Reservoir and Checking Hydraulic Oil Filter

c. Hydraulic System Bleeding

The Handy-Herman III hydraulic system is self-bleeding. After the system has been drained, such as during the replacement of a hydraulic component, actuate the platform full up and down for two cycles and recheck the reservoir fluid level between each cycle. Fill as required. Continue until you get two cycles in a row where the fluid is at the proper level.

d. Flow Control Valve

- (1) Raise unit to fully extended position.
- (2) Depress DOWN switch and open or close the flow control valve, as necessary, to adjust descent speed of platform to about 9" per second.

e. Hydraulic Pump Motor Servicing

- (1) Common maintenance of DC motors is brush replacement. It is recommended that brushes be checked and replaced if necessary along with commutator inspection approximately every six months. The time element will greatly vary depending on how the machine is being used and the condition of the battery. It is to your advantage to keep the battery fully charged and in top condition to eliminate service problems in general and to extend the life of the motor and brushes.
- (2) Common maintenance on AC motors is minor. It should be kept clean and free of obstructions. The motors need no oil.

f. Hydraulic Pump and Motor Replacement

- (1) The hydraulic pump or motor can be replaced together or separately.
- (2) Pull battery disconnect, then disconnect positive and negative cables from motor.
- (3) If only motor has to be replaced, unbolt the pump from the motor leaving the hoses connected on the pump.
- (4) Remove four bolts securing motor to base and remove motor.
- (5) If only the hydraulic pump has to be replaced disconnect hoses from pump.
- (6) Remove four bolts securing pump to the motor and remove pump.
- (7) Motor and pump can be removed by disconnecting cables, hoses, and removing four bolts from bases.
- (8) Install new or repaired motor or pump in reverse order of removal.
- (9) Refill reservoir to replace fluid lost during disassembly.
- (10) Raise and lower platform twice to bleed system. Check the fluid level after cycling and fill as required.

3. BRAKES

NOTE

Brakes are mounted on two casters and are foot operated.

- a. Adjust brake tension of foot pedal to proper tension while having caster raised for free spinning.

1. HYDRAULIC LIFT CYLINDER

a. Replacement

- (1) Lower platform completely.
- (2) Remove both battery cables.
- (3) Remove two chains which wrap around the first mast section (mast section with cylinder mounted inside).
- (4) Remove pin on top of cylinder rod.
- (5) Wrap chain, sling, or looped cable around top spacer on all mast sections.
- (6) Lift first mast section until the cylinder is clear of all center braces. (All the other mast sections will raise the first.)
- (7) Remove pin from bottom of cylinder, lift out of base mounting bracket and unbolt manifold block from cylinder.
- (8) Replace cylinder and reassemble in opposite order of removal.

2. LIFT ROLLER CHAINS

Adjust the lift chains as follows: Extend all outriggers and level base. Raise the platform to maximum extended height and then lower it while operator and another person check for chain damage or wear as described above. After completely lowering the platform turn power off on machine and remove mast guards. Adjust the chains until they are just snug against the retainer. Do not overtighten the chains so as to raise the platform from its resting position. Make sure that the hex lock nuts are turned onto the threaded ends with as least one thread extending through the nut. Check both ends that connecting links are secure.

Replace all mast guards.

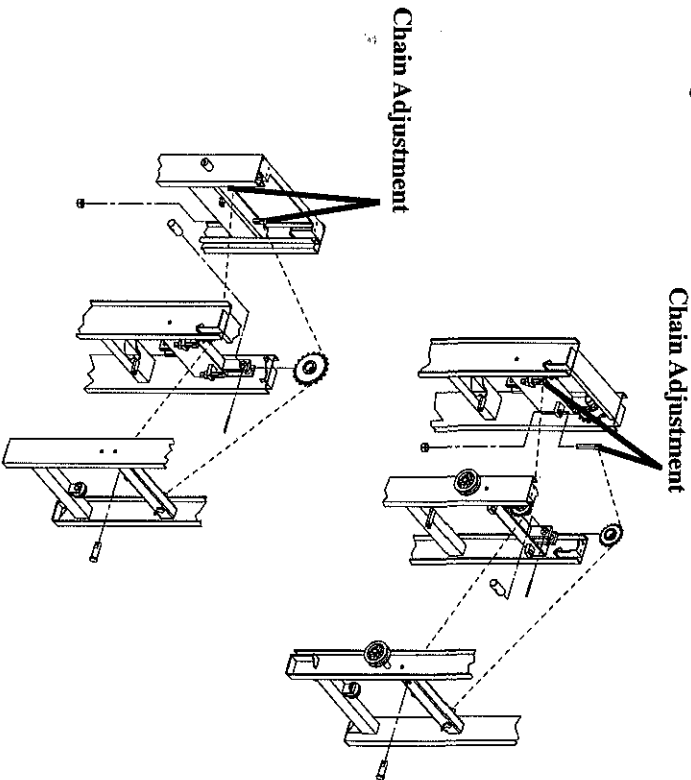


Figure 7. Chain Adjustment

4. TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSES	REPAIR PROCEDURE
No LIFT motion pump not operating). (All Models)	1. Blown fuse.	1. Check fuse and replace if necessary.
	2. Dead battery.	1. Check and charge battery as directed in MAINTENANCE section.
	3. Electrical circuit defective.	1. Refer to electrical schematic.
	4. Worn brushes.	1. Replace.
	5. Shorted armature.	1. Replace motor.
	6. Defective motor start solenoid.	1. Replace start solenoid.
	7. Defective emergency stop switch or solenoid.	1. Replace switch or solenoid.
	8. Defective key switch.	1. Replace key switch.
	9. Defective UP switch.	1. Replace UP switch.
	10. Defective battery disconnect.	1. Replace battery disconnect.
No LIFT motion (pump operating) (All Models)	1. Hydraulic fluid level low.	1. Add fluid (see MAINTENANCE section.)
	2. Pump cavitation caused by improper fluid for temperature conditions.	1. Drain reservoir and bleed system. Use only recommended type fluid (see MAINTENANCE section).
	3. Defective UP valve or coil.	1. Replace UP valve or coil.
	4. Electrical circuitry defective.	1. Refer to electrical schematic.
	5. Defective emergency down valve.	1. Replace emergency down valve.
Ascent speed slow or erratic.	1. Weak battery (DC only).	1. Charge battery (see MAINTENANCE section).
	2. Loose connections in electrical circuitry.	1. Perform visual inspection and ensure all connections are secure.
	3. Momentary short in wiring.	1. Refer to electrical schematic.
	4. Bent structural members.	1. Replace damaged members as necessary (see visual structural inspection in Maintenance section).

Figure 8. Troubleshooting

TROUBLESHOOTING (CONTINUED)

PROBLEM	POSSIBLE CAUSES	REPAIR PROCEDURE
Ascent speed slow or erratic (continued)	5. Restriction in hydraulic hose.	1. Replace defective hydraulic line.
	6. Defective or jammed seals in hydraulic lift cylinder.	1. Replace hydraulic cylinder.
	7. Gear or gear cavity worn or damaged.	1. Replace pump. (See REPLACEMENT section).
	8. Worn brushes in motor.	1. Replace brushes.
	9. Defective valves.	1. Check V1 on cylinder manifold.
	10. Loose intake hose or oil filter.	1. Tighten.
	11. Defective down valve in manifold or in cylinder.	1. Replace.
	12. Defective emergency down valve.	1. Replace.
	1. Flow control out of adjustment.	1. Adjust (see ADJUSTMENT section).
	2. Friction in structural members.	1. Lubricate and check for damaged members and cracked welds. (See MAINTENANCE). 2. Replace damaged structural members. This is to be done by factory authorized personnel only.
	3. Obstruction in hydraulic hose.	1. Replace defective hose.
	4. Defective down valve.	1. Replace valve.
Unit will not descend.	1. Down signal not applied to down solenoid.	1. Check fuse. 2. Check battery charge. 3. Check faulty wiring. Refer to wiring diagram.
Unit creeps down.	2. Faulty down solenoid.	1. Replace worn solenoid.
	1. Damaged seal in lift cylinder.	1. Replace hydraulic cylinder (see MAINTENANCE section).
	2. Defective down valve.	1. Replace valve.
	3. Defective emergency down valve.	1. Replace valve.

Figure 8. Troubleshooting

ELECTRICAL WIRING DIAGRAM
16D 12 VOLT
24D 12 VOLT

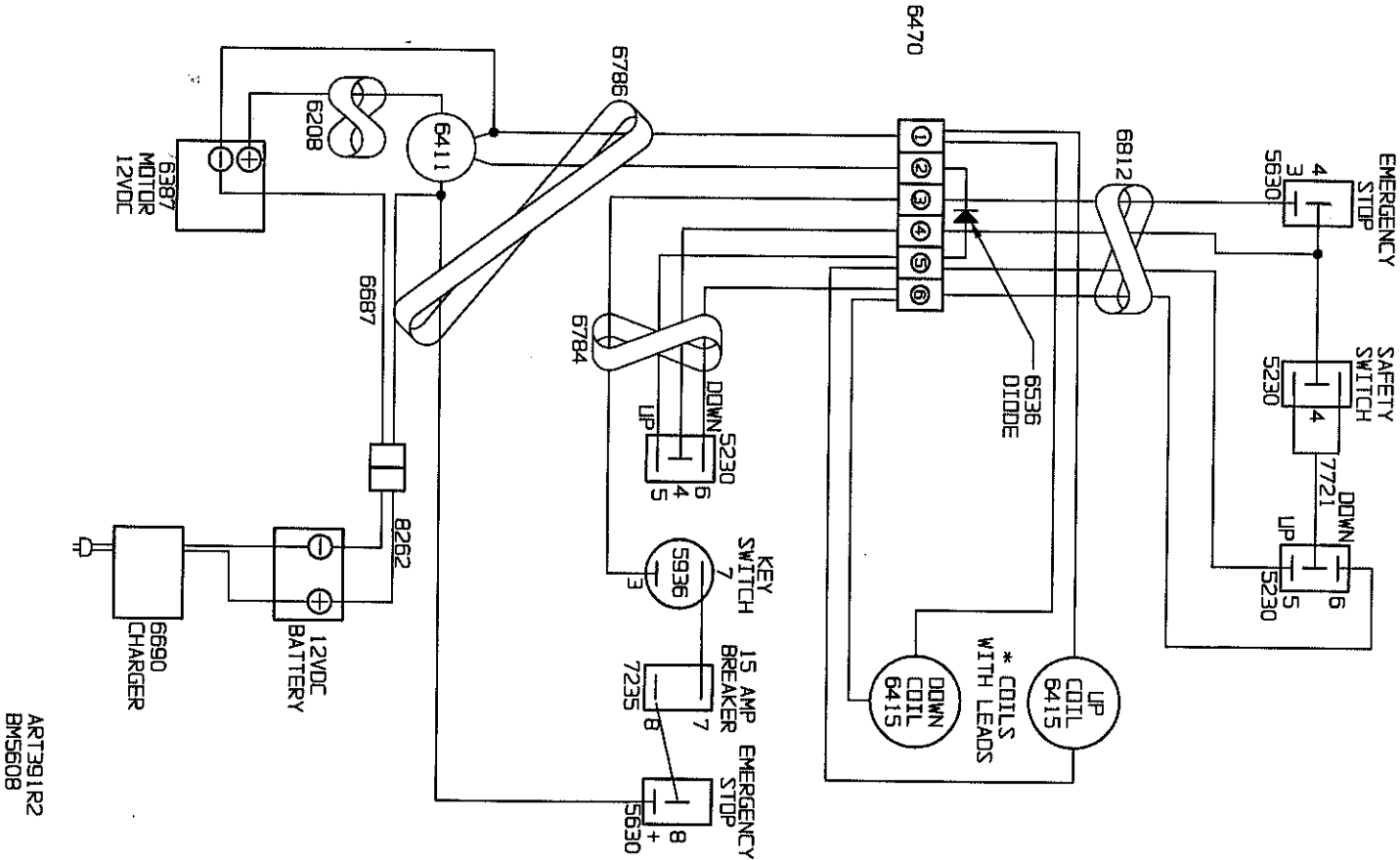


Figure 9. Electrical Schematic DC Units

ELECTRICAL WIRING DIAGRAM

16A
24A

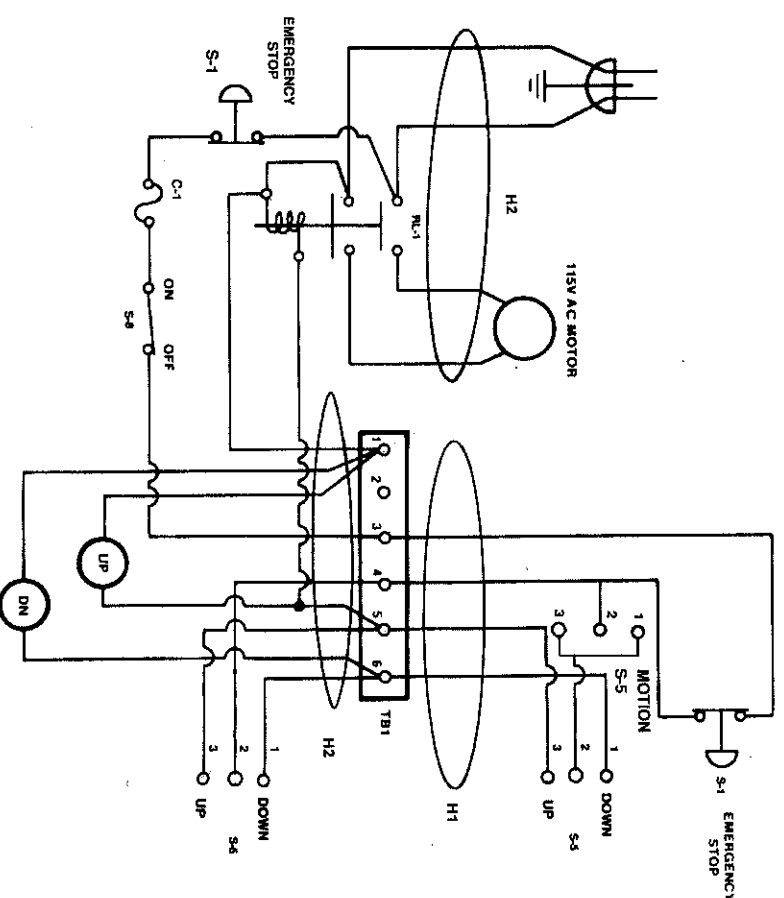


Figure 10.

NOTE: Switch wiring as seen from rear of switch.

Symbol Identification for Figure 10.

Symbol	Description	Part No.	Symbol	Description	Part No.
C-1		6190	S-5	Platform Control	5230
		5265	S-5	Lower Control Switch	5230
H-1	Wire Harness	6812	TB-1	Terminal Board	6470
H-2	Harness -AC-Control-Motor	6829		Coils	6528
RL-1	Relay <i>/20V</i>	7666		AC Motor	6401
S-8	Key Switch	5936	S-5	Motion	5230
S-1	Emergency Stop: Switch Switch Guard	5630 7622			

July 2201 7776

Figure 10. Electrical Schematics AC Units

HYDRAULIC SCHEMATIC MANIFOLD BLOCK (ALL MODELS)

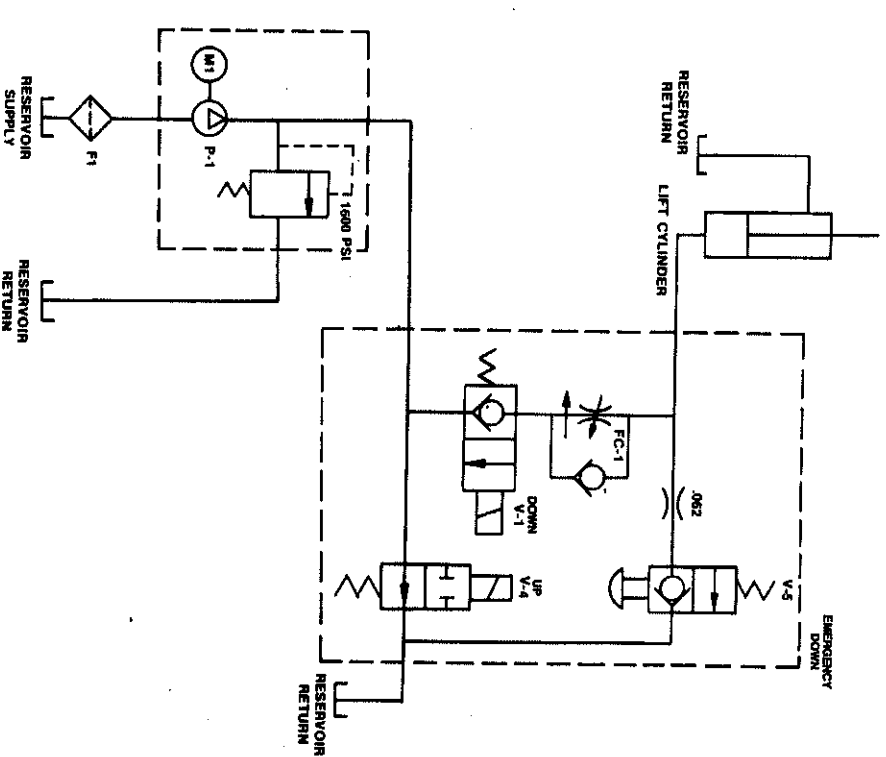


Figure 11.

Symbol Identification for Figure 11.

Symbol	Description	Part Number	
		DC	AC
F-1	Tank Filter	6377	6377
FC-1	Flow Control	5963	5963
	"O" Ring Kit	5475	5475
M-1	Motor	6387	6401
P-1	Pump	6383	6402
V-1	2-Way N.C. (Valve Only)	6973	6973
	"O" Ring Kit	5475	5475
	Coil Only	6415	6528
V-4	2-Way N.O. (Valve Only)	6974	6974
	"O" Ring Kit	5475	5475
	Coil Only	6415	6528
V-5	Manual Pull – Emergency Down "O" Ring Kit	5435 5475	5435 5475

Figure 11. Hydraulic Schematic

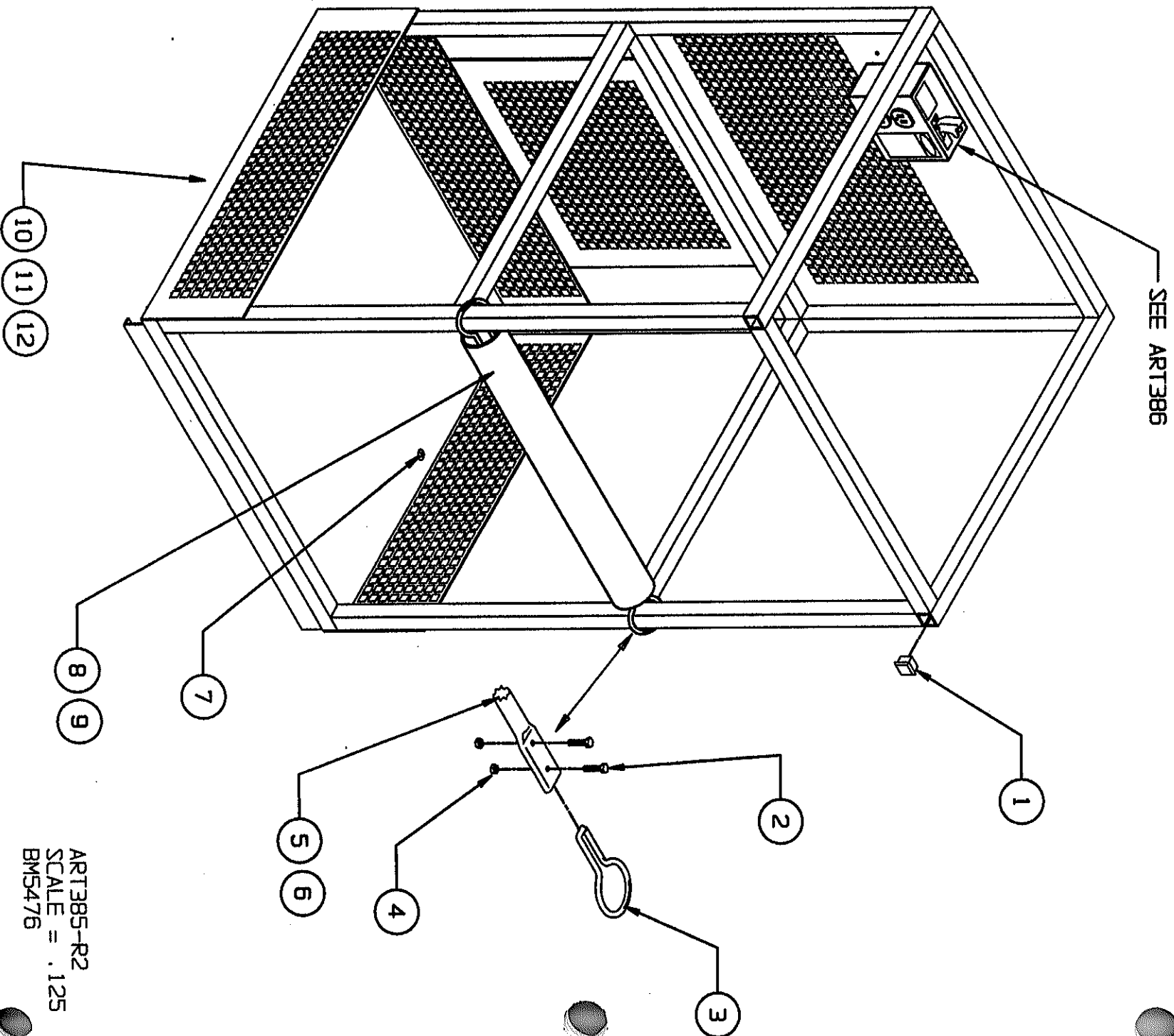


Figure 12. Handy Platform

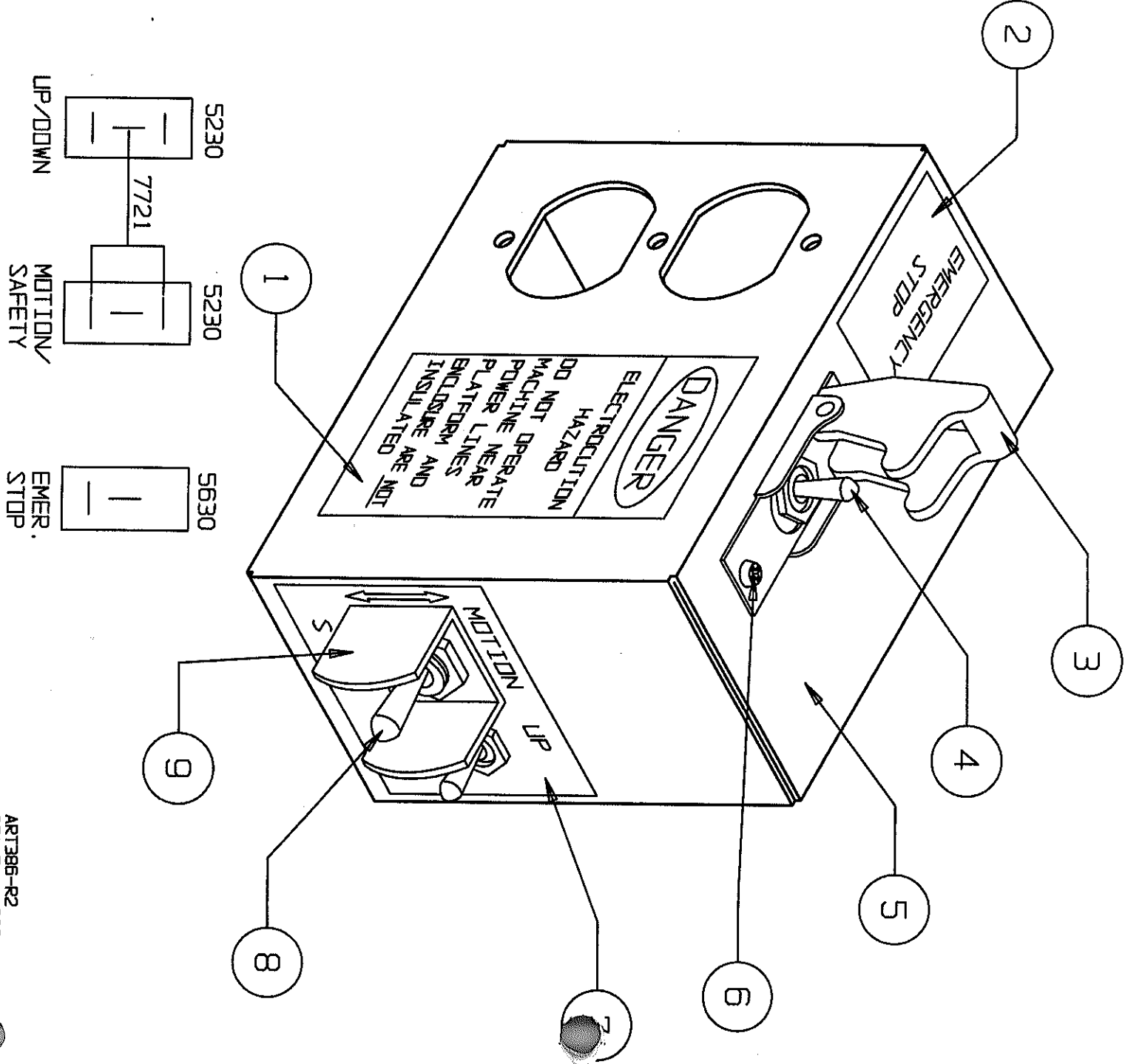
ITEM	PART NO.	QTY.	DESCRIPTION
1	6385	4	TUBING PLUG
2	HDW5723	4	BTSFHEX .250 200.75ZSTLY
3	6622	2	END CAP - SLIDING RAIL
4	HDW6461	4	NTLCC2WY0.250 20Z 5N
5	4285	1	SLIDING RAIL TUBE
6	4286	1	SLIDING RAIL TUBE/NARROW PLTRFM
7	HDW5213	2	BTSFHTCS CRR .250 AB1.25ZSTLY
8	7046	1	COVER-RAIL PAD
9	7805	1	PAD-RAIL
10	4129	1	PLATFORM WELDMENT 24'
	6386	1	FLOOR BOARD 24'
11	4130	1	PLATFORM WELDMENT 16'
	6405	1	FLOOR BOARD 16'
12	4131	1	NARROW PLATFORM WELDMENT
	6501	1	FLOOR BOARD 20'

ART385-R2
SCALE = .125
BMS476

Handwritten signature/initials

Figure 12. Handy Platform

CONTROL BOX



ART386-R2
SCALE = .800
BMS483

Figure 13. Platform Control Box

ITEM	PART NO.	QTY.	DESCRIPTION
1	6055	1	LABEL - ELECTROCUTION
2	7663	1	DECAL-EM, STOP UP-CONT, HANDY DM
3	7622	1	SWITCH GUARD - EMERGENCY STOP
4	5630	1	SWITCH TOGGLE
5	4335	1	CONTROL/DUPLEX BOX WELDMENT
6	HDW5978	2	BISTEPAN CRR #6 320.25Z SY
7	7664	1	DECAL-MOTION UP/DN-HANDY DM
8	5230	2	SWITCH TOGGLE
9	1313	1	SWITCH GUARD

ART386-R2
SCALE = .800
BMS483

Figure 13. Platform Control Box

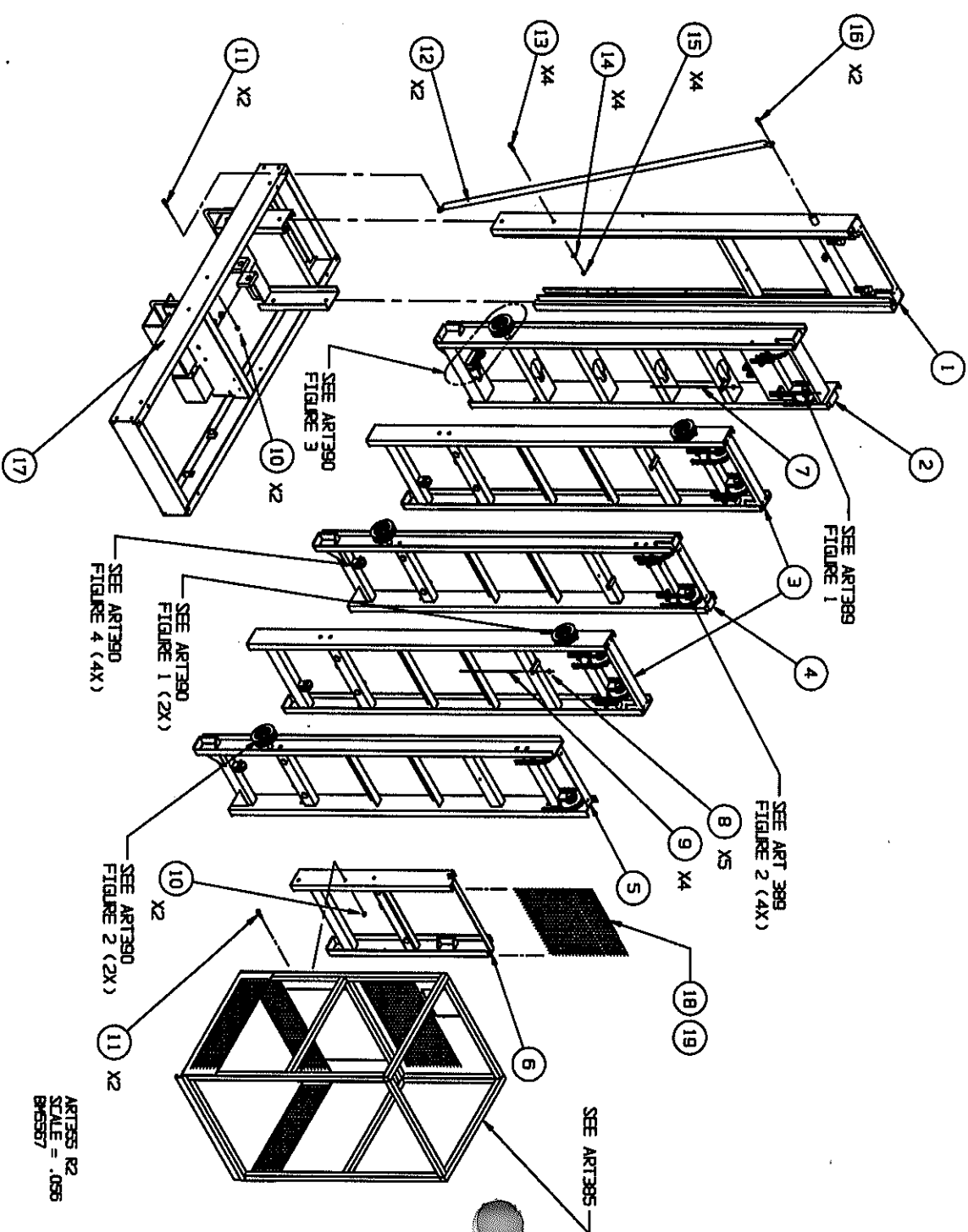
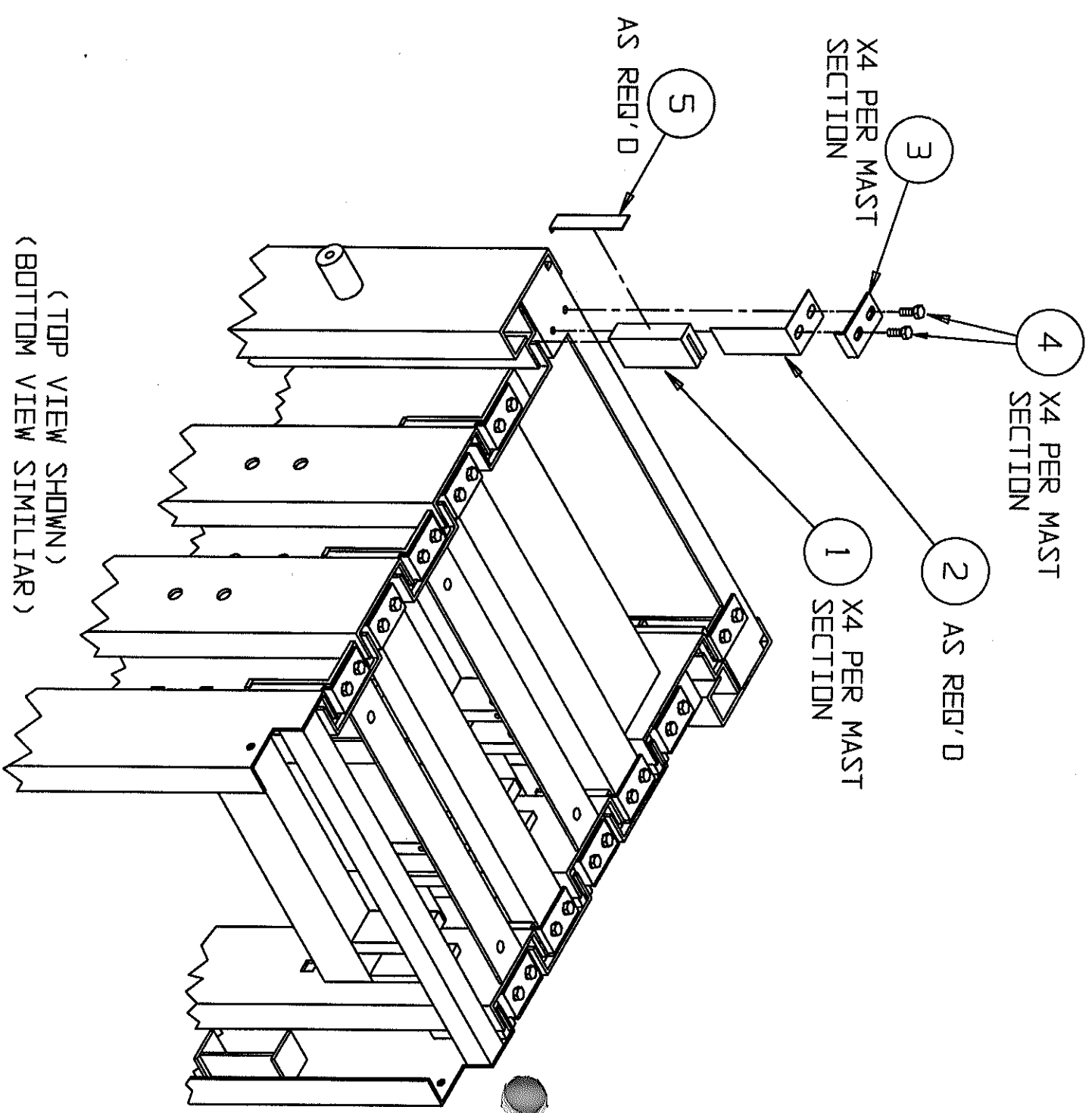


Figure 15. Mast Section Assembly

ITEM	PART NO.	16FT qty.	24/19FT qty.	DESCRIPTION
1	4108	1	1	MAIN MAST WELDMENT
2	4123	1	1	MAST SECTION CYLINDER
	4252		DPT	MAST SECTION CYLINDER 19FT
3	4121	1	2	MAST SECTION
4	4122		1	MAST SECTION
5	2932	1	1	MAST SECTION
6	2935	1	1	MAST SECTION - PLATFORM
	4253		DPT	MAST SECTION 19FT
7	6545	1	1	RETRACTOR CABLE 73"
8	HDW6461	3	5	NUT 1/4-20
9	6403	2	4	RETRACTOR CABLE
10	HDW5039	5	4	NUT 3/8-16
11	HDW6433	2	4	BOLT 3/8-16 X 1.00
12	4127	2	2	BRACE - MAIN MAST
13	HDW5202	4	4	BOLT 1/2-13 X 1.00
14	HDW5012	4	4	LOCKWASHER
15	HDW8414	4	4	NUT 1/2-13
16	HDW6432	2	2	BOLT 3/8-16 X .750
17	4352	1	1	BASE WELDMENT
18	2977	1	1	FRONT GUARD
19	4261		DPT	FRONT GUARD 19FT

ART355 R2
SCALE = .056
BMS567

Figure 15. Mast Section Assembly



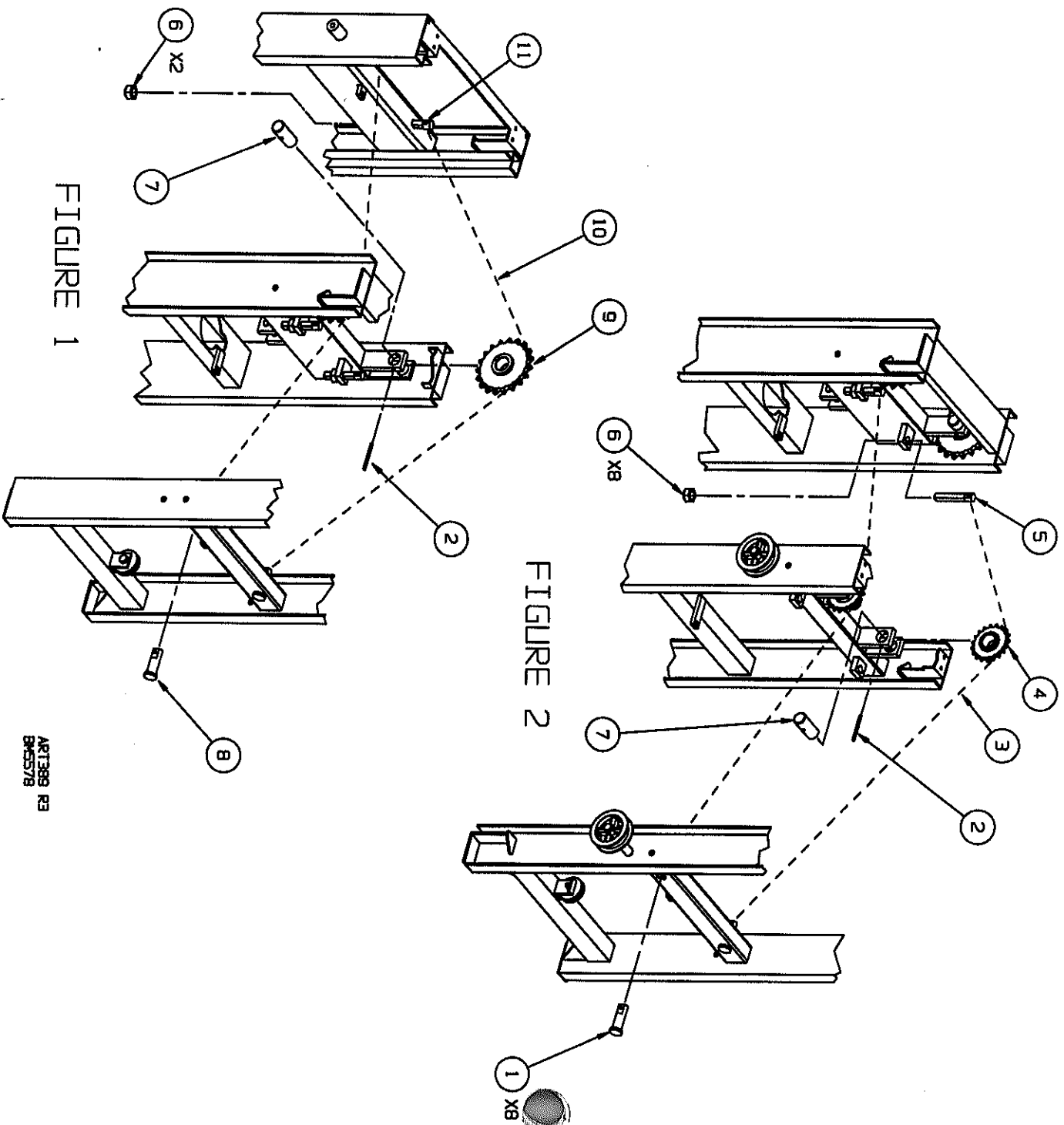
ART388 R2
SCALE = .20
BMS563


Figure 16. Guide Pads & Shims

ITEM	PART NO.	16' qty.	24' qty.	DESCRIPTION
1	6409	16	24	GUIDE PAD
2	3352	A/R	A/R	SHIM ANGLE
3	2769	16	24	RETAINER ANGLE
4	HDW6455	32	48	BOLT 1/4-20 X .500
5	4192	A/R	A/R	SHIM - GUIDE PAD

ART388 R2
SCALE = .20
BMS563

Figure 16. Guide Pads & Shims



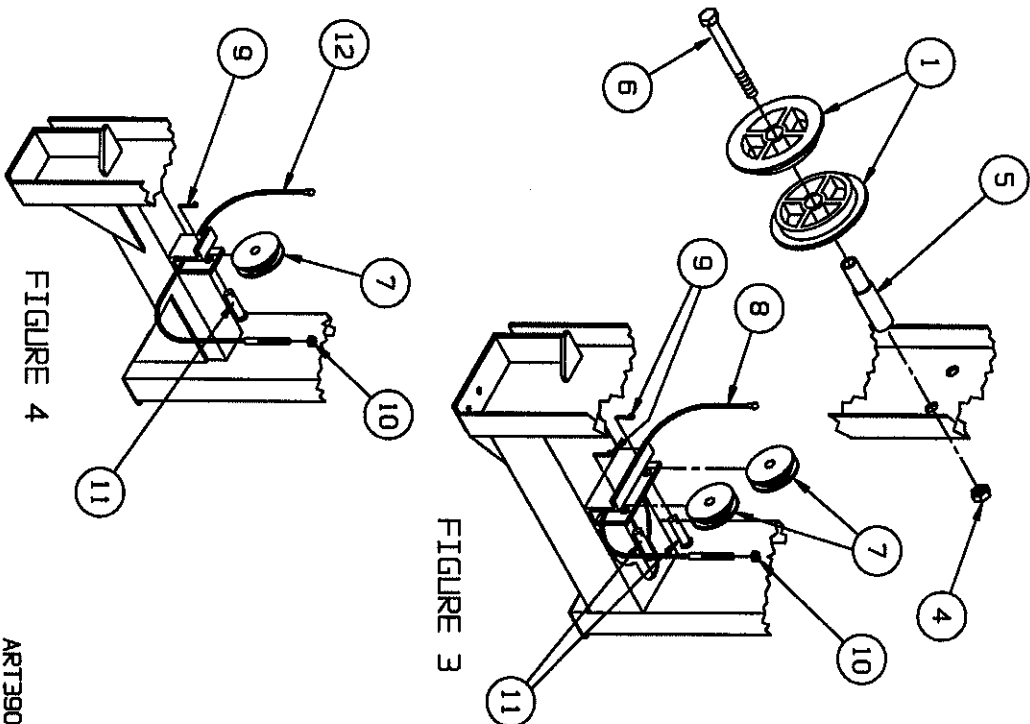
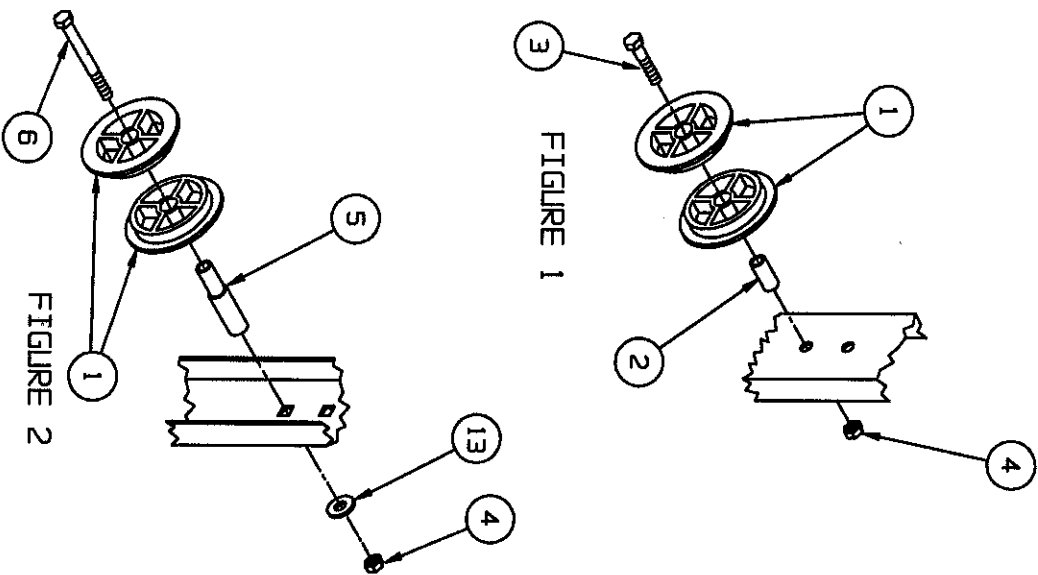
ITEM	PART NO.	16' qty.	24' qty.	DESCRIPTION
1	2944	4	8	CHAIN MOUNTING PIN SMALL
2	HDW6416	6	10	PIN SPRING
3	6539 6541 	4 8	8 16	#50 CHAIN #50 CHAIN LINK CONNECTOR
4	2943	4	8	SPROCKET ASSY - SMALL
5	4114	4	8	CHAIN STUD - SMALL
6	HDW6633	6	10	NUT FLEX TYPE LOCK
7	2959	6	10	SPROCKET PIVOT PIN
8	2945	2	2	CHAIN MOUNTING PIN - LARGE
9	2942	2	2	SPROCKET ASSY - LARGE
10	6538 6542	2 4	2 4	#60 CHAIN #60 CHAIN LINK CONNECTOR
11	4113	2	2	CHAIN STUD - LARGE

6543 - DO Bearings in sprockets

ART389 R3
BMS578

Figure 17. Chain Assembly & Sprockets

Figure 17. Chain Assembly & Sprockets



ART390 REV 1
BMS579

ITEM	PART NO.	16' qty.	24' qty.	DESCRIPTION
1	6641	6	10	PULLEY - SUPPLY CORD
2	4112	1	2	SPACER - PULLEY SHORT
3	HDW6434	1	2	BOLT 3/8-16
4	HDW5039	3	5	NUT 3/8-16
5	4111	2	3	SPACER - PULLEY LONG
6	HDW6748	2	3	BOLT 3/8-16 X 3.50
7	2747	4	6	PULLEY - RETRACTION CABLE
8	6545	1	1	RETRACTOR CABLE 73"
9	HDW5920	5	7	PIN COITER
10	HDW6461	3	5	NUT 1/4-20
11	HDW6450	4	7	PIN CLEVIS
12	6403	2	4	RETRACTOR CABLE - 61.5" Ld49
13	HDW5355	1	1	WASHER, FLAT, ID .438 OD 1.00, .078 THK

ART390 REV 1
BMS579

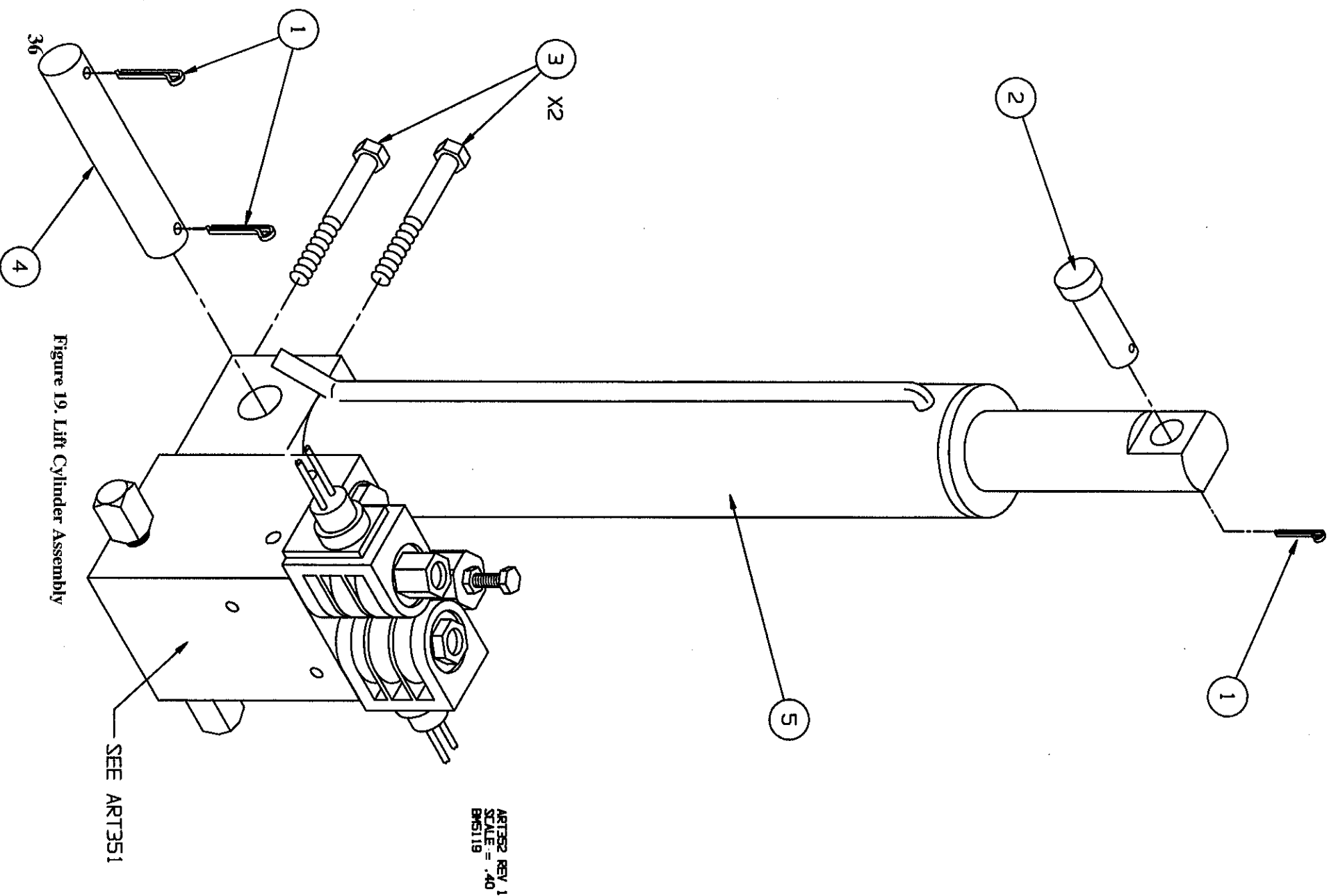
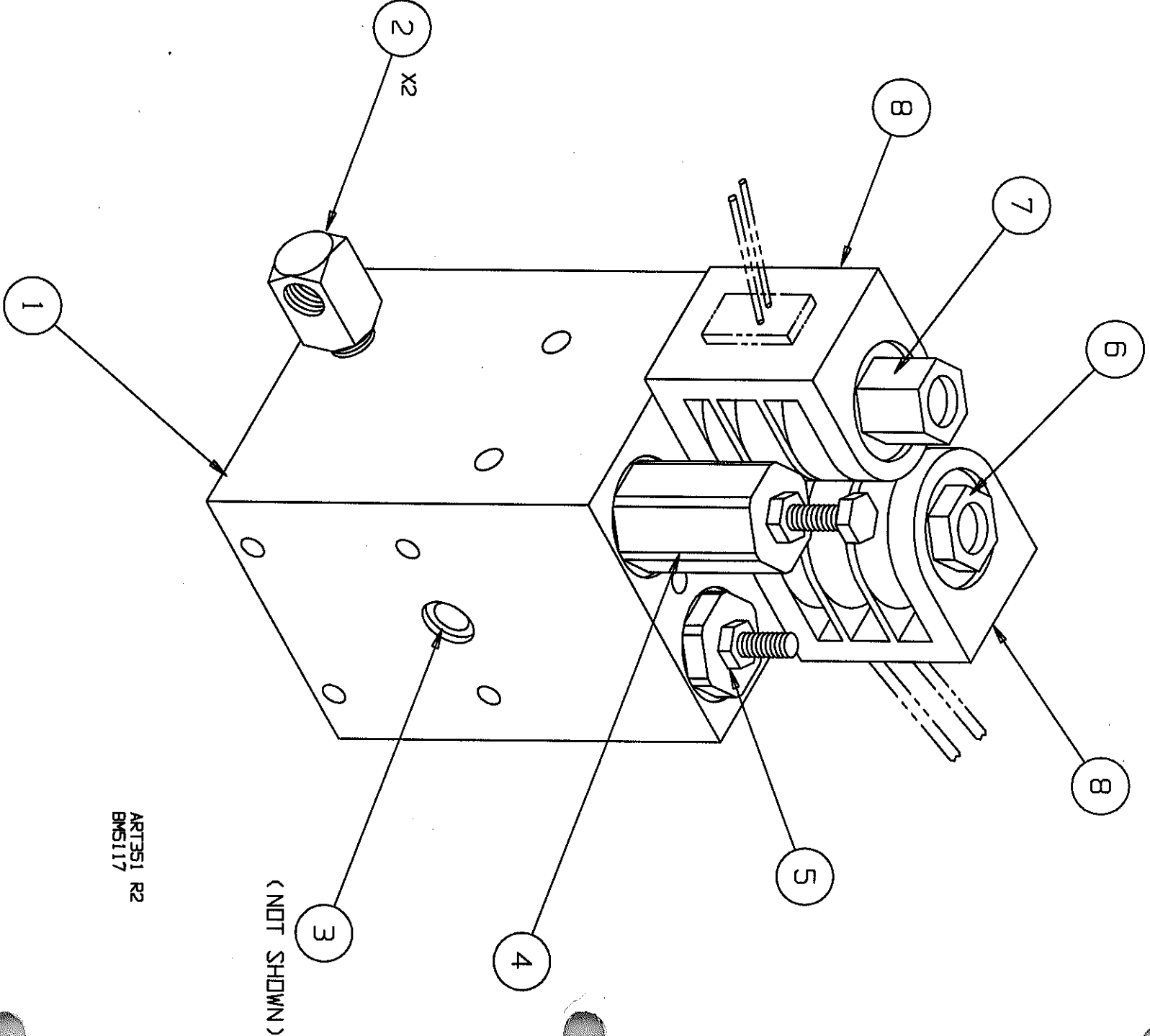


Figure 19. Lift Cylinder Assembly

ITEM	PART NO.	QTY.	DESCRIPTION
1	HDW5920	3	PIN COTTER
2	HDW6406	1	PIN CLEVIS
3	HDW6416	4	BOLT 1/4-20 X 3.50
4	2766	1	CYLINDER PIN LOWER
5	6373	1	CYLINDER LIFT (16' & 24')
	7317	1	CYLINDER LIFT (19' OPTION)
	6597	1	CYLINDER REPAIR KIT FOR 6373

ART352 REV. 1
SCALE = .40
BMS119

Figure 19. Lift Cylinder Assembly



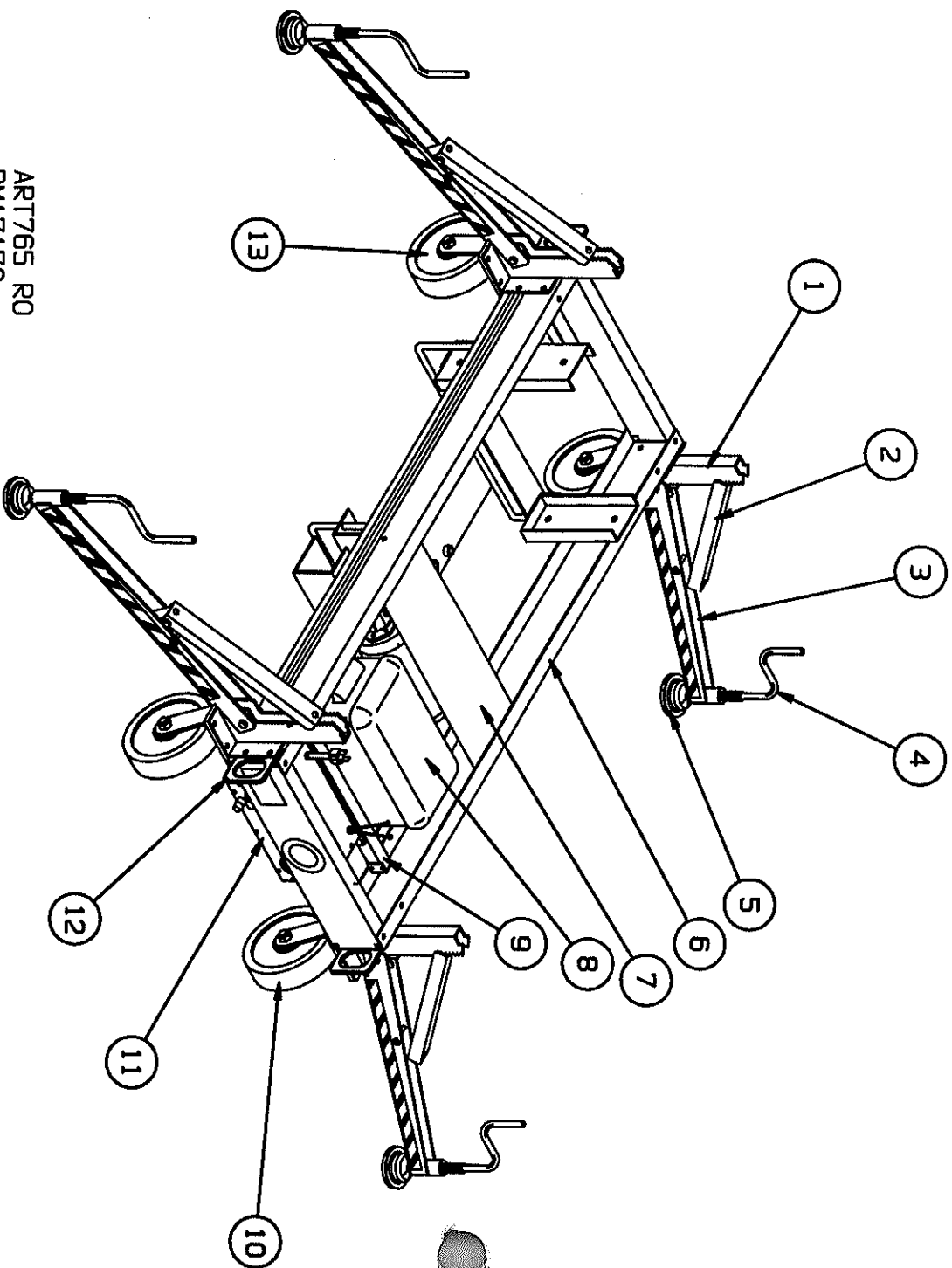
ITEM	PART NO.	QTY.	DESCRIPTION
1	4115	1	MANIFOLD BLOCK - CYLINDER
2	HDW6360 1/4" x 3/8" x 1/2"	2	PIPE F ELBOW 90° 24F
3	6426 10410411	1	O-RING MANIFOLD BLOCK 02E
4	5963 1VJ10231	1	VALVE FLOW CONTROL 144
5	5435 1VJ100012	1	VALVE MANUAL PULL 217 G
6	6974 16L10742	1	VALVE NO POPPET 140
7	6973 1VJ10741	1	VALVE N.C. POPPET 2-WAY
8	6528 1VJ10498	2	110MAC COIL ASSEMBLY 013E
	6415 16L10404	2	12 VOLT SOLENOID ASSEMBLY E20

ART351 R2
BMS117

Figure 20. Manifold Assembly

Figure 20. Manifold Assembly

Hydraulic Oil Cup #6284
 Dipstick #2882
 Leveling Circle #6412
 Tape Circle #6684



ART765 RO
 BM17170
 09/03/98

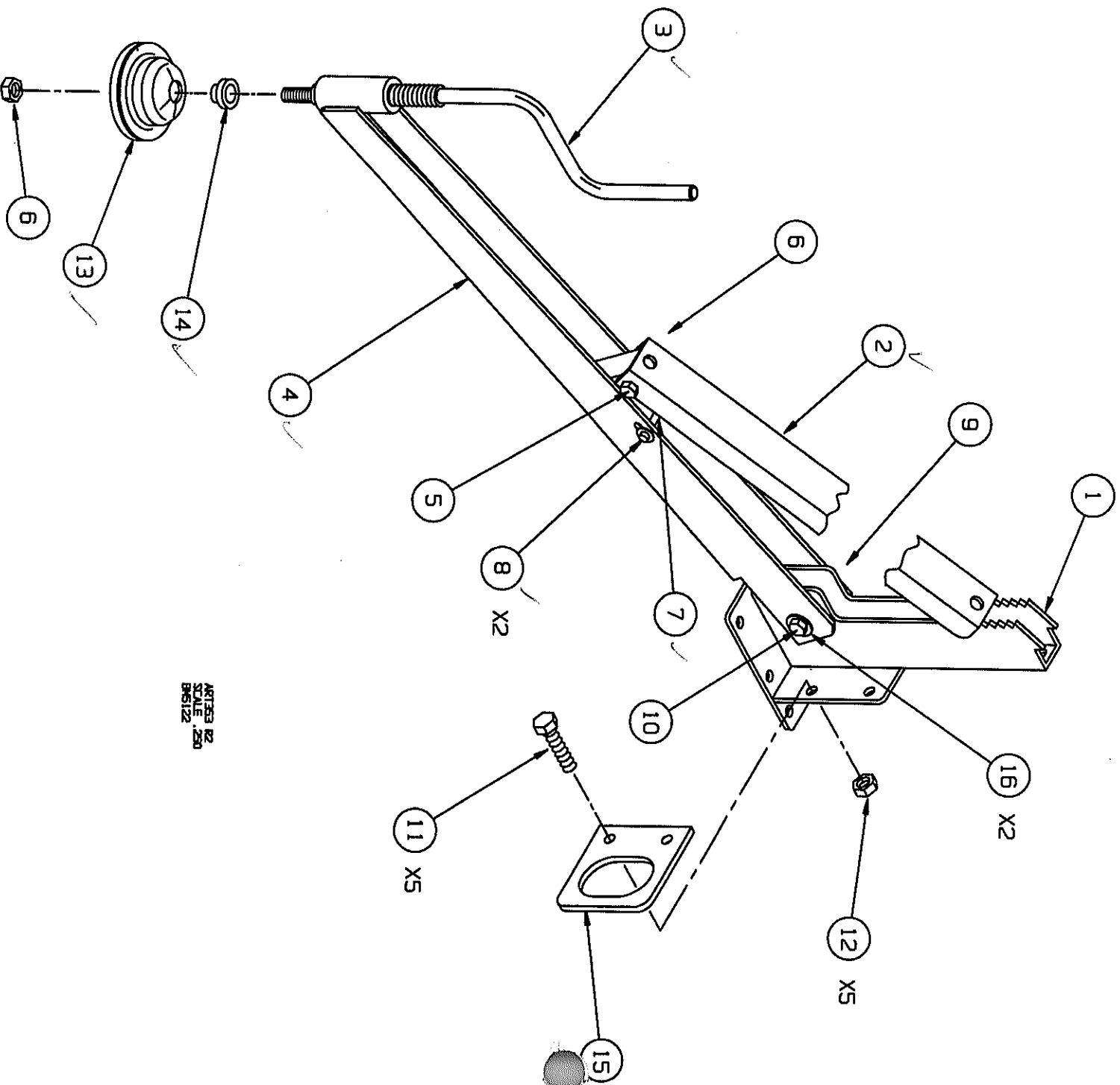
ITEM	PART NO.	QTY.	DESCRIPTION
1	4092	4	OUTRIGGER MTG BRKT WELDMENT
	HDW6433	20	BTCAPHXFLGHXD.375 161.00Z 5N
	HDW5039	20	NTHEXKEP0.375 16Z 5N
2	2657	4	OUTRIGGER BRACE
	4043	4	OUTRIGGER LOCK
	HDW6624	8	1/4" WASHER CAP PUSH NUT
3	4126	4	OUTRIGGER ARM WELDMENT
	HDW5216	8	WASHER, FLAT 1/2 ZN
	HDW6435	4	BTCAPHX .500 132.50Z 5N
	HDW6463	4	NITLDCNYL0.500 13Z 5N
4	4177	4	OUTRIGGER SCREW
	4235	DPT	OUTRIGGER JACK SCREW (LG)
5	2749	4	OUTRIGGER PAD
	HDW4064	4	BUSHING, OUTRIGGER PAD
	HDW6281	4	NITLDC2WY0.375 16Z 5N
6	4352	1	BASE WELDMENT - HANDY
7	4179	1	MOTOR COVER
	HDW6455	4	BTITETAP .250 200.50Z 5Y
8	6706	1	BATTERY CASE (HANDY)
	6390	1	BATTERY-12V
9	4145	1	BATTERY HOLDER WELDMENT
10	6652	2	CASTER-RIGID HANDY <i>with brake</i>
11	8729	1	CHARGER-12V 60HZ 120VAC HANDY
12	4211	4	BRACKET-ATTACH POINT
13	7221	2	CASTER-RIGID HANDY <i>w/brake</i>
	HDW6433	16	BTCAPHXFLGHD.375 161.00Z 5N
	HDW5039	16	NTHEXEP0.375 16Z 5N

Repair Kit 6658
 CASTER SWIVEL WITH BRAKE 6388

Figure 21. Base Assembly

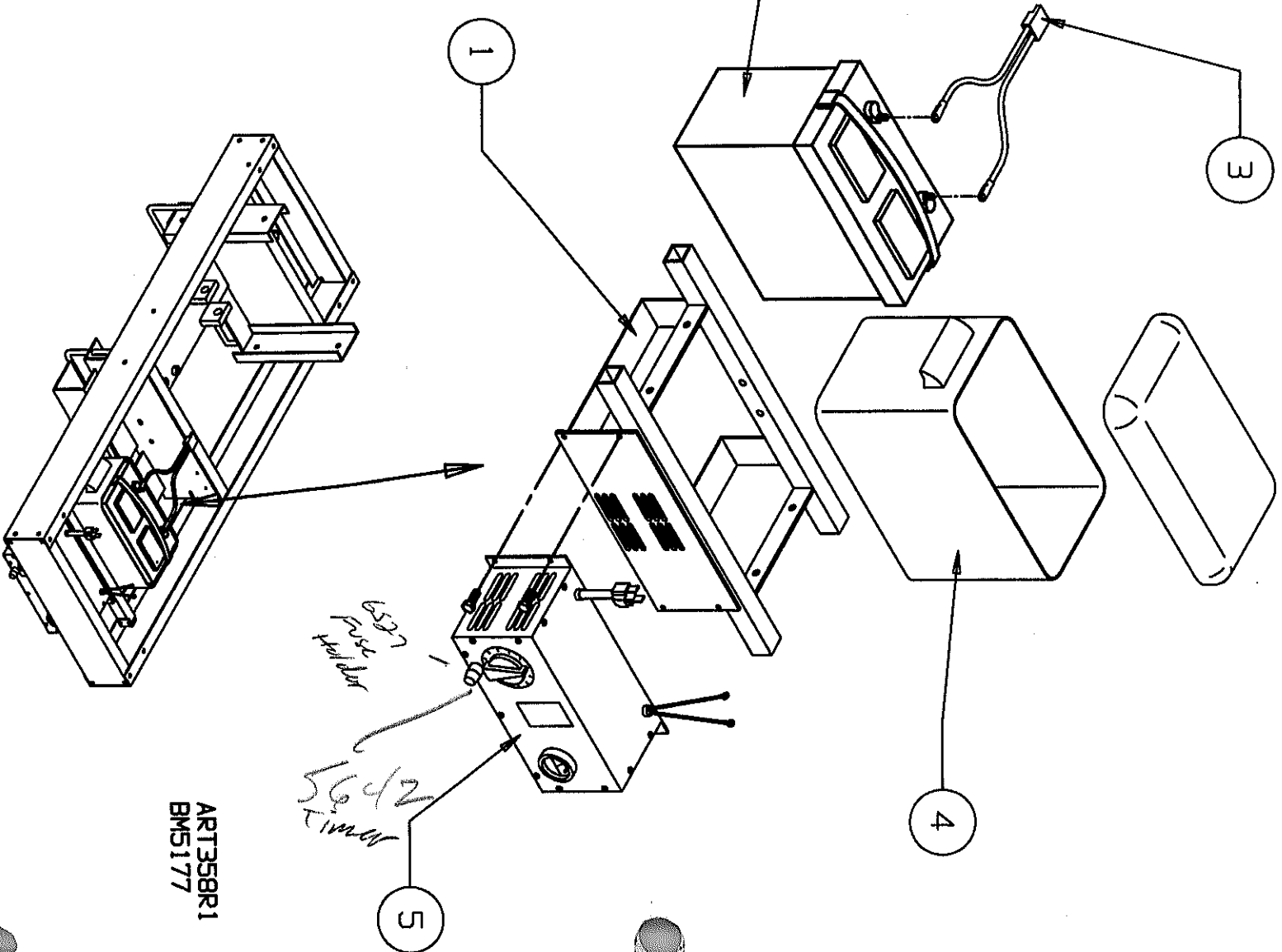
Figure 21. Base Assembly

ART765 RO
 BM17170
 09/03/98



ITEM	PART NO.	QTY.	DESCRIPTION
1	4092	1	OUTRIGGER MTG BKT WELDMENT
2	2657	1	OUTRIGGER BRACE
3	4065 4177	1	16' & 24' OUTRIGGER JACK SCREW
	4235	1	19' OUTRIGGER JACK SCREW
4	4126	1	16' & 24' OUTRIGGER ARM WELDMENT
	4234	1	19' OUTRIGGER ARM WELDMENT
5	HDW6434	1	BOLT 1/2-13 X 2.50
6	HDW6281	2	HEX LOCK NUT 2-WAY 3/8-16
7	4043	1	PIN OUTRIGGER LOCK
8	6624	2	1/4" WASHER CAP PUSH NUT
9	6463	1	NUT 1/2-13
10	HDW6435	1	BOLT 1/2-13
11	HDW6433	5	BOLT 3/8-16
12	HDW5039	5	NUT 3/8-16
13	2749	1	OUTRIGGER PAD
14	4064	1	BUSHING OUTRIGGER PAD
15	4211	1	HOLD DOWN
16	HDW5216	2	WASHER

ART353 R2
SCALE .250
BWS122



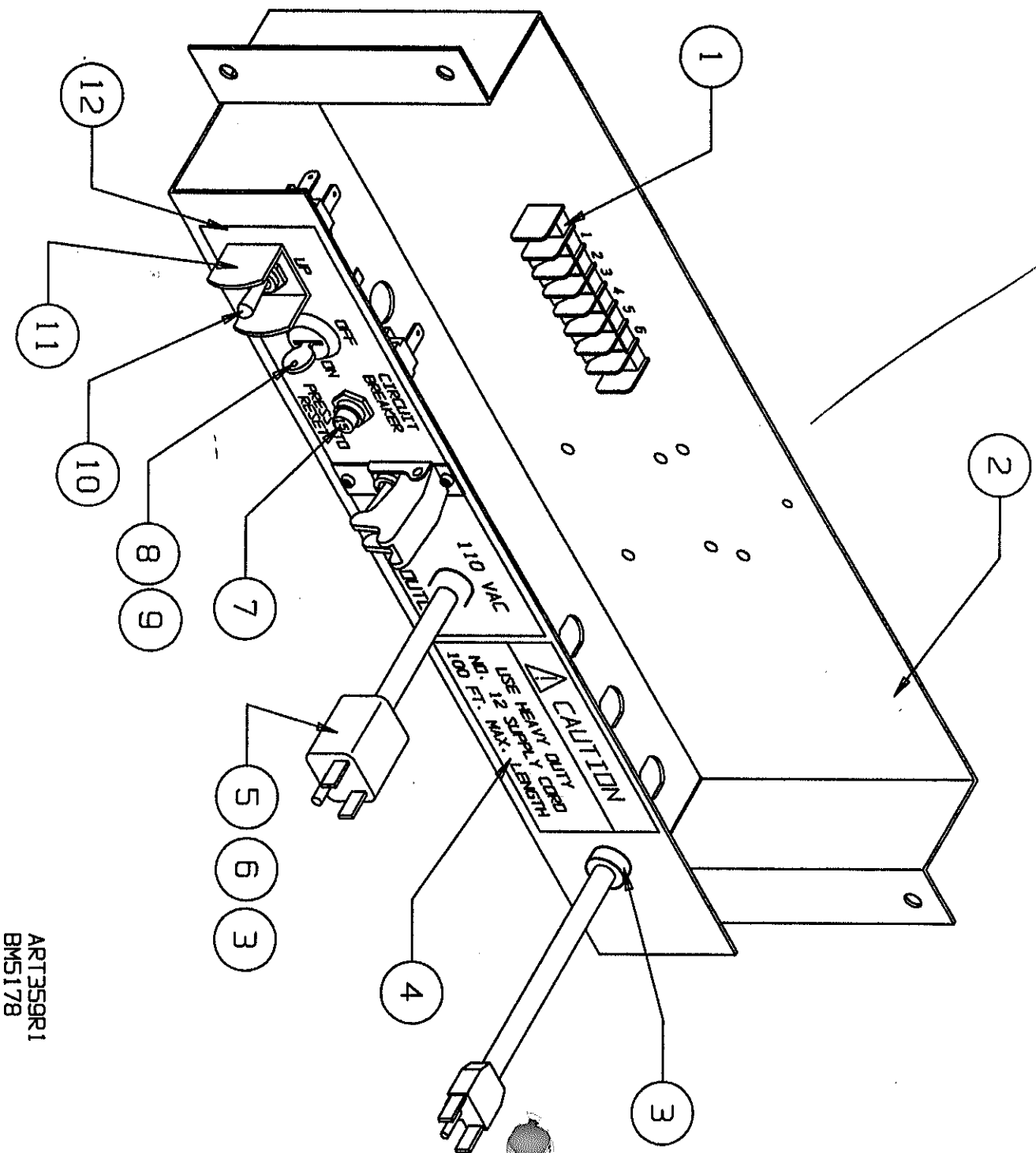
ITEM	PART NO.	QTY.	DESCRIPTION
1	4145	1	BATTERY HOLDER WELDMENT
2	6390	1	BATTERY-12V
3	6687	1	CONNECTOR/CABLE ASSY. -HANDY
4	6706	1	BATTERY CASE-HANDY
5	8729	1	CHARGER-12V 60HZ 120VAC HANDY

ART358R1 8729 → 84967 (MAC)
 BMS177 NO Internal ferts

Figure 23. Battery & Charger Assembly

Figure 23. Battery & Charger Assembly

Hour Master
6-857



ITEM	PART NO.	QTY.	DESCRIPTION
1	6470	1	TERMINAL BLOCK
2	4133	1	CONTROL BOX
3	6033	2	STRAIN RELIEF-STRAIGHT
4	6475	1	DECAL-POWER CORD
5	6674	1	ELECTRICAL CORD
6	5382	1	110V PLUG
7	7235	1	CIRCUIT BREAKER 15 AMP MANUAL
8	5936	1	SWITCH KEY
9	6117	1	KEY (#H2007)
10	5230	1	SWITCH TOGGLE
11	1313	1	SWITCH GUARD
12	7665	1	DECAL-LOWER CONT. BOX HANDY DM

COVER
4134

6034

Strain Relief - 90°

ART359R1
BMS178

Figure 24. Lower Control Panel

Figure 24. Lower Control Panel

