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HDC-305 SERIES DRUM LIFTERS



NOTE: If your HDC-305 is powered (AC or DC), you should receive a separate owner's manual for the onboard power unit:

MPU-AC-GEN2 (plugs into wall socket)
MPU-DC-GEN2 (battery powered)

Receiving Instructions

After delivery, remove the packaging from the product. Inspect the product closely to determine whether it sustained damage during transport. If damage is discovered, record a complete description of it on the bill of lading. If the product is undamaged, discard the packaging.

NOTE: The end-user is solely responsible for confirming that product design, use, and maintenance comply with laws, regulations, codes, and mandatory standards applied where the product is used.

Technical Service & Replacement Parts

For answers to questions not addressed in these instructions and to order replacement parts, labels, and accessories, call our Technical Service and Parts Department at (260) 665-7586. The department can also be contacted online at https://www.vestil.com/page-parts-request.php.

Electronic copies of Instruction Manuals

This instruction manual may be downloaded from https://www.vestil.com/page-manuals.php

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*NOTE: Pages 12–19 address the composition and operation of the modular power unit. These pages only apply to powered HDC-305 units manufactured **before** 12-01-2018. Units manufactured on or after 12-01-2018 receive a 2nd generation modular power unit (MPU GEN2). Diagrams and operating instructions for GEN2 power units are provided in

SIGNAL WORDS

SIGNAL WORDS in this manual draw the reader's attention to important safety-related messages.

SIGNAL WORDS III III	SIGNAL WORDS IN This mandar draw the reader's affermon to important safety-related messages.					
▲ DANGER	Identifies a hazardous situation which, if not avoided, <u>WILL</u> result in DEATH or SERIOUS INJURY. Use of this signal word is limited to the most extreme situations.					
A WARNING	Identifies a hazardous situation which, if not avoided, COULD result in DEATH or SERIOUS INJURY.					
▲ CAUTION	Indicates a hazardous situation which, if not avoided, COULD result in MINOR or MODERATE injury.					
NOTICE	Identifies practices likely to result in product/property damage, such as operation that might damage the product.					

SAFETY INSTRUCTIONS

Vestil strives to identify all foreseeable hazards associated with the use of its products. However, material handling is dangerous and no manual can address every conceivable risk. The most effective means for preventing injury is the application of good judgment and common sense by the end-user.

A WARNING

Serious personal injuries might result from improper or careless use of this product.

- Failure to read & understand the entire manual before using or servicing the product is a misuse of the product. Read the manual to refresh your understanding of proper use and maintenance procedures.
- DO NOT attempt to resolve any problem(s) with the product unless you are both authorized to do so and <u>certain</u> that it will be safe to use afterwards.
- DO NOT modify the product in any way UNLESS you first obtain written approval from Vestil. Unapproved modifications might make the lift unsafe to use and automatically void the Limited Warranty (see p. 24).
- DO NOT exceed the capacity of the drum handler. The product is labeled with its capacity. See Label 1153 in See <u>LABELING DIAGRAM</u> on p. 23. Capacity is reduced to 500 pounds whenever a drum is half-full or less.
- Inspect the product as directed in <u>INSPECTIONS AND MAINTENANCE</u> on p. 21. ONLY use the drum handler if it is in satisfactory condition. If repairs are necessary, only install manufacturer-approved replacement parts.
- DO NOT change the setting of the pressure relief valve.
- ALWAYS carefully watch the drum handler and drum during use.
- DO NOT use this device UNLESS all product labels are readable and undamaged AND all machine guards are in place. See <u>LABELING DIAGRAM</u> on p. 23.
- DO NOT ride on the drum handler or use it to move people.
- ALWAYS lower the drum until it is entirely supported by the ground before leaving the unit unattended.
- If part of the hydraulic system is damaged, AVOID contact with pressurized oil. High pressure oil easily punctures skin which can cause injury, gangrene, or death.
- Unload the drum handler before performing any service work on it.
- The unit should always be labeled as shown in the <u>LABELING DIAGRAM</u> on p. 23. Replace all labels that are damaged, missing, or not easily readable.
- DO NOT use the drum handler if it cannot securely clamp the drum you are trying to handle.
- Only use this product on compacted, improved surfaces that are level and even. Do not traverse sloped terrain.

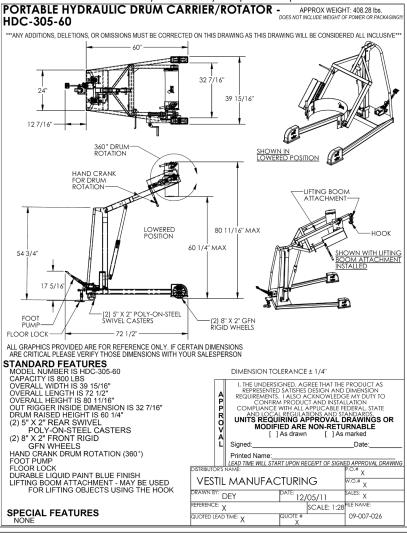
NOTICE

Proper use, maintenance, and storage are essential for this product to function properly.

- o Always use this product in accordance with the instructions in this manual.
- o Relieve hydraulic pressure whenever the unit is not in use by fully lowering the carriage.
- o Keep the product clean & dry. Lubricate moving parts at least once per month.
- o ONLY use manufacturer-approved replacement parts. Vestil is not responsible for issues or malfunctions that result from the use of unapproved replacement parts.
- o Do not use brake fluid or jack oils in the hydraulic system. If oil is needed, use an anti-wear hydraulic oil with a viscosity grade of 150 SUS at 100°F, (ISO 32 cSt @ 40°C), or Dexron transmission fluid.
- o Contact the manufacturer for SDS information.

SPECIFICATIONS

Documents that provide specifications for HDC-305 series drum lifters are available online to anyone who visits Vestil's website. Specifications include dimensions, net weight, and capacity information. To access the appropriate specifications document, navigate to the HDC-305 webpage at https://www.vestil.com/product.php?FID=764. Scroll the page to the entry for the model you purchased. Click the button in the "PDF" column that looks like a pencil inside a blue box. A PDF file will open. This file is the specifications document. Print a copy of the document and keep it with your copy of this manual. The following specifications are provided for convenience only. Refer to your printed specifications document.



BOOM ATTACHMENT

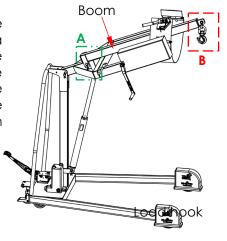
A removable boom can be pinned to the pivot arm to convert the drum carrier into a shop crane. To install the boom, slide the mounting bracket over the pivot arm. There are pin holes in the pivot arm as well as the bracket. Align the pins holes and insert the clevis pin. Secure the clevis pin with a hitch clip.

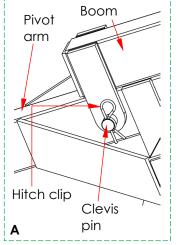
Shackle

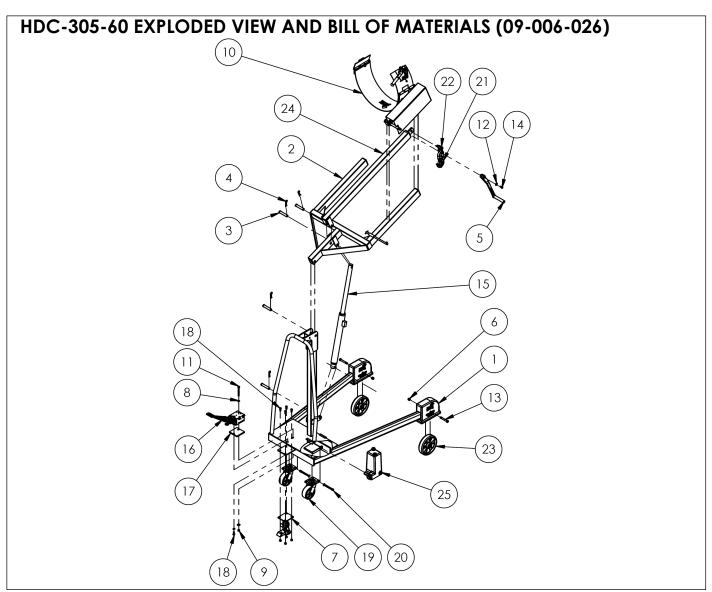
В

Shackle

pin

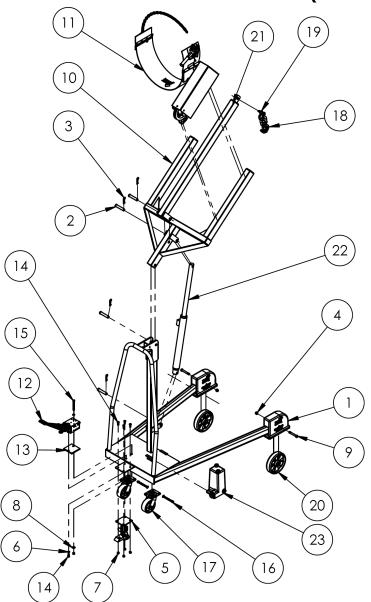






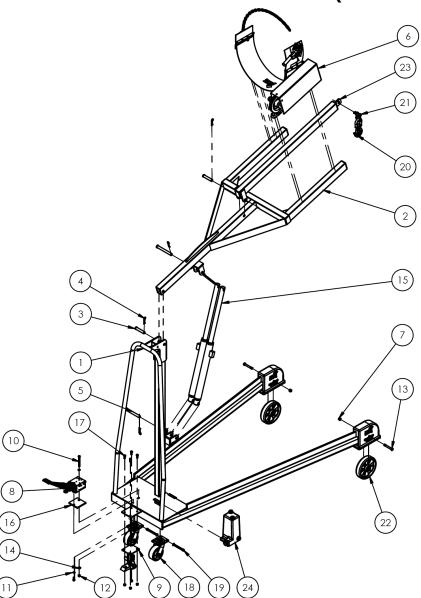
Item	Part no.	Description	Qty.	ltem	Part no.	Description	Qty.
1	09-514-015	WELDMENT, BASE W/ MAST	1	14	11103	HEX BOLT, GRADE A, ZINC PLATED, 3/8- 16X3/4	1
2	09-514-006	WELDMENT, PIVOT ARM	1	15	99-021-904- 001	CYLINDER, HYDRAULIC, Ø1 1/2" x 18", RAM STYLE	1
3	33-112-034	CLEVIS PIN, ZINC PLATED, Ø3/4" X 3 3/4" LG	4	16	99-640-005	HYDRAULIC FOOT PUMP, AUTO-SHIFTER, 2-SPEED	1
4	45286	#11 HITCH PIN CLIP, Ø1/8" X 2 5/8 LG	4	17	01-016-018	PUMP, MANUAL BASE PLATE	1
5	14-025-001	HANDLE, CRANK, 5/8" SQR END	1	18	11105	HEX BOLT, GRADE A, ZINC PLATED, 3/8"- 16 X 1"	5
6	37030	1/2"-13 NYLON INSERT LOCK NUT, GRADE 2	2	19	16-132-021	PU-5/2-S, SWIVEL CASTER	2
7	16-132-350	FLOOR LOCK	1	20	99-612-001	PIN, BULLDOG BOLT AND NUT ASSEMBLY	2
8	33622	SPLIT LOCK WASHER, CARBON STEEL, MEDIUM ZINC FINISH, 3/8"	2	21	08-145-001	SPEC HDW, SWIVEL HOOK 2-TON	1
9	37024	NYLON INSERT LOCK NUT, GRADE 2, ZINC FINISH, 3/8"-16	5	22	08-145-010	SPECIALTY HARDWARE, Ø1/2"-2 TON SHACKLE	1
10	09-002- 004-008	DRUM SADDLE, ASSEMBLY, HAND CRANK, HDC	1	23	16-132-216	CASTER, WHEEL, GFN-8/2-W	2
11	11119	HEX BOLT, GRADE A, ZINC FINISH, 3/8"- 16 x 4"	1	24	09-514-031	WELDMENT, FRAME, BOOM	1
12	33008	FLAT WASHER, LOW CARBON, USS, ZINC PLATED, 3/8"	2	25	15-023-001	reservoir, non-structural	1
13	16-145-031	BOLT W/GREASE ZERK, 1/2-13 X 3 1/2 LG.	2				

HDC-305-72 EXPLODED VIEW AND BILL OF MATERIALS (09-006-026-001)



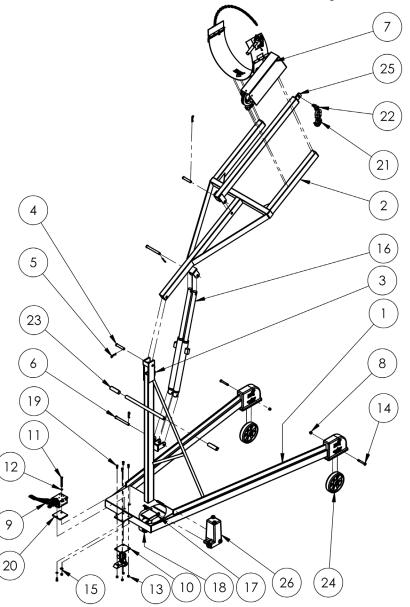
Item	Part no.	Description	Qty.	Item	Part no.	Description	Qty.
1	09-514-155	WELDMENT, BASE W/ MAST	1	13	01-016-018	PUMP, MANUAL BASE PLATE	1
2	33-112-034	CLEVIS PIN, ZINC PLATED, Ø3/4" X 3 3/4" LG	4	14	11105	HEX BOLT, GRADE A, ZINC PLATED, 3/8"- 16 X 1"	5
3	45286	#11 HITCH PIN CLIP, Ø1/8" X 2 5/8 LG	4	15	11119	HEX BOLT, GRADE A, ZINC FINISH, 3/8"- 16 x 4"	1
4	37030	1/2"-13 NYLON INSERT LOCK NUT, GRADE 2	2	16	99-612-001	PIN, BULLDOG BOLT AND NUT ASSEMBLY	2
5	16-132-350	FLOOR LOCK	1	17	16-132-021	PU-5/2-S, SWIVEL CASTER	2
6	33622	SPLIT LOCK WASHER, CARBON STEEL, MEDIUM ZINC FINISH, 3/8"	2	18	08-145-001	SPEC HDW, SWIVEL HOOK 2-TON	1
7	37024	NYLON INSERT LOCK NUT, GRADE 2, ZINC FINISH, 3/8"-16	5	19	08-145-010	SPECIALTY HARDWARE, Ø1/2"-2 TON SHACKLE	1
8	33008	FLAT WASHER, LOW CARBON, USS, ZINC PLATED, 3/8"	1	20	16-132-216	CASTER, WHEEL, GFN-8/2-W	2
9	16-145-031	BOLT W/GREASE ZERK, 1/2-13 X 3 1/2 LG.	2	21	09-514-031	WELDMENT, FRAME, BOOM	1
10	09-514-092	WELDMENT ASS'Y, PIVOT ARM	1	22	99-021-904- 001	CYLINDER, HYDRAULIC, Ø1 1/2" x 18", RAM STYLE	1
11	09-002-004	DRUM SADDLE, ASSEMBLY, PULL CHAIN	1	23	15-023-001	reservoir, non-structural	1
12	99-640-005	HYDRAULIC FOOT PUMP, AUTO-SHIFTER, 2-SPEED	1				

HDC-305-84 EXPLODED VIEW AND BILL OF MATERIALS (09-006-038)



Item	Part no.	Description	Qty.	Item	Part no.	Description	Qty.
1	09-514-038	WELDMENT, BASE W/ MAST	1	13	16-145-031	BOLT W/GREASE ZERK, 1/2-13 X 3 1/2 LG.	2
2	09-514-036	WELDMENT ASS'Y, PIVOT ARM	1	14	33008	FLAT WASHER, LOW CARBON, USS, ZINC PLATED, 3/8"	1
3	33-112-034	CLEVIS PIN, ZINC PLATED, Ø3/4" X 3 3/4" LG	2	15	99-021-904- 001	CYLINDER, HYDRAULIC, Ø1 1/2" x 18", RAM STYLE	2
4	45286	#11 HITCH PIN CLIP, Ø1/8" X 2 5/8 LG	4	16	01-016-018	PUMP, MANUAL BASE PLATE	1
5	09-112-029	PIN, CLEVIS	2	17	11105	HEX BOLT, GRADE A, ZINC PLATED, 3/8"-16 X 1"	5
6	09-002-004	DRUM SADDLE,ASSEMBLY,PULL CHAIN	1	18	16-132-021	PU-5/2-S, SWIVEL CASTER	2
7	37030	1/2"-13 NYLON INSERT LOCK NUT, GRADE 2	2	19	99-612-001	PIN, BULLDOG BOLT AND NUT ASSEMBLY	2
8	99-640-005	HYDRAULIC FOOT PUMP, AUTO-SHIFTER, 2-SPEED	1	20	08-145-001	SPEC HDW, SWIVEL HOOK 2-TON	1
9	16-132-350	FLOOR LOCK	1	21	08-145-010	SPECIALTY HARDWARE, Ø1/2"-2 TON SHACKLE	1
10	11119	HEX BOLT, GRADE A, ZINC FINISH, 3/8"-16 x 4"	1	22	16-132-216	CASTER, WHEEL, GFN-8/2-W	2
11	33622	SPLIT LOCK WASHER, CARBON STEEL, MEDIUM ZINC FINISH, 3/8"	2	23	09-514-031	WELDMENT, FRAME, BOOM	1
12	37024	NYLON INSERT LOCK NUT, GRADE 2, ZINC FINISH, 3/8"-16	5	24	15-023-001	reservoir, non-structural	1

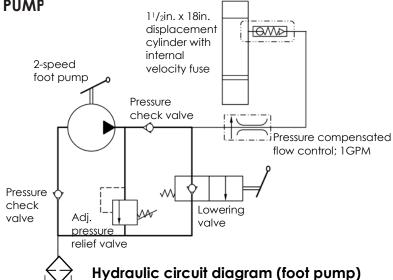
HDC-305-96 EXPLODED VIEW AND BILL OF MATERIALS (09-006-038-001)



Item	Part no.	Description	Qty.	Item	Part no.	Description	Qty.
1	09-514-158	WELDMENT, BASE W/ MAST	1	13	16-145-031	BOLT W/GREASE ZERK, 1/2-13 X 3 1/2 LG.	2
2	09-514-093	WELDMENT ASS'Y, PIVOT ARM	1	14	33008	FLAT WASHER, LOW CARBON, USS, ZINC PLATED, 3/8"	1
3	33-112-034	CLEVIS PIN, ZINC PLATED, Ø3/4" X 3 3/4" LG	2	15	99-021-904- 001	CYLINDER, HYDRAULIC, Ø1 1/2" x 18", RAM STYLE	2
4	45286	#11 HITCH PIN CLIP, Ø1/8" X 2 5/8 LG	4	16	99-612-001	PIN, BULLDOG BOLT AND NUT ASSEMBLY	2
5	09-112-029	PIN, CLEVIS	2	17	16-132-021	PU-5/2-S, SWIVEL CASTER	2
6	09-002-004	DRUM SADDLE,ASSEMBLY,PULL CHAIN	1	18	11105	HEX BOLT, GRADE A, ZINC PLATED, 3/8"-16 X	5
7	37030	1/2"-13 NYLON INSERT LOCK NUT, GRADE 2	2	19	01-016-018	PUMP, MANUAL BASE PLATE	1
8	99-640-005	HYDRAULIC FOOT PUMP, AUTO-SHIFTER, 2-SPEED	1	20	08-145-001	SPEC HDW, SWIVEL HOOK 2-TON	1
9	16-132-350	FLOOR LOCK	1	21	08-145-010	SPECIALTY HARDWARE, Ø1/2"-2 TON SHACKLE	1
10	11119	HEX BOLT, GRADE A, ZINC FINISH, 3/8"-16 x 4"	1	22	16-132-216	CASTER, WHEEL, GFN-8/2-W	2
11	33622	SPLIT LOCK WASHER, CARBON STEEL, MEDIUM ZINC FINISH, 3/8"	2	23	09-514-031	WELDMENT, FRAME, BOOM	1
12	37024	NYLON INSERT LOCK NUT, GRADE 2, ZINC FINISH, 3/8"-16	5	24	15-023-001	reservoir, non-structural	1

HYDRAULIC SYSTEM - AUTOSHIFTER FOOT PUMP

Your new lift equipment includes a twospeed pump that automatically shifts between speeds based on the output pressure of the hydraulic system. The pump extends and retracts the hydraulic cylinder (part number 99-021-904-001 in the exploded parts drawings on pages 4-7), which raises or lowers the pivot arm and drum saddle/carriage. Internal features of the pump include primary pressure relief and pressure compensated return flow mechanisms, an integrated lowering valve, and an autoshifting valve assembly. The pump also utilizes replaceable sleeve bearings, valve components, and seals to simplify maintenance requirements and maximize service life.



Operation

Pump speed is automatically adjusted based on the output pressure of the hydraulic system. For example, when the drum saddle is unloaded, pressure in the hydraulic system is low. Under these conditions, the pump operates in high speed mode. Each stroke of the foot pedal pumps approximately 1.2 cubic inches of oil and the pivot arm (and drum) rises rapidly. When a drum is connected to the drum saddle, hydraulic system pressure increases as the drum lifts off of the ground. At pressures in the range of 800-1000 psi the pump automatically shifts to low speed mode. In low speed mode, each stroke pumps approximately 0.44 cubic inches of oil. Less effort is required to move the pedal when the pump is in low speed mode, by the cylinder extends much more slowly, i.e. the pedal has to be pumped many more times to raise the arm.

The pivot arm rises with each stroke of the foot pedal. If too much weight is applied to the saddle, i.e. weight exceeding the capacity, a pressure relief valve opens and directs oil back into the reservoir rather than to the cylinder. As a result, the arm will not rise until the weight of the load is either equal to or less than the capacity of the lifter.

To lower the pivot arm, press the release lever. See Autoshifter item no. 21 on <u>pages 9 & 10</u>). As the arm lowers, a pressure compensated flow control valve ensures that it lowers at a controlled rate. Do not increase the pressure relief setting more than necessary, i.e. be sure that you do not exceed the pressure rating of the components in the hydraulic system.

Purging Air from the Pump

Whether your pump is new or used, air probably is trapped inside the pump and must be removed. When air is present in the hydraulic system, you might notice that the foot pedal feels spongy. To remove air from the system:

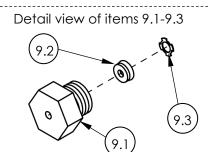
- 1. Lower the pivot arm.
- 2. Remove the cover from the modular power unit and unscrew fill plug from the oil reservoir.
- 3. Disconnect the hydraulic hose from the cylinder port; insert the free end of the hose into the reservoir.
- 4. Pump the foot pedal several times. Pay close attention to the stream of oil flowing from the hose. Pockets of air will escape as oil flows into the reservoir.
- 5. Once air is no longer present, reconnect the pump to the cylinder by reattaching the hydraulic hose to the cylinder port. Check all of the hydraulic lines for oil leaks; then return the table to service.
- 6. Although air has been removed from the pump, air could still be trapped in the cylinder. The next procedure explains how to remove air from the cylinder.

Purging air from the cylinder:

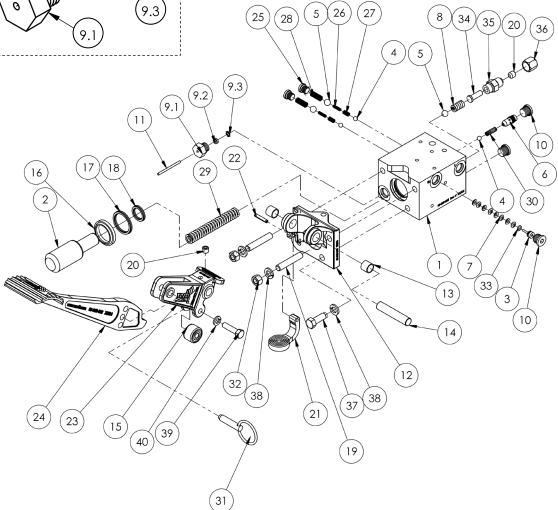
A bleeder screw is located at the top of the cylinder. The bleed screw includes a hose fitting to allow attachment of a small diameter hose. By attaching a hose to the screw, any oil that escapes during the bleeding process can be directed into a container for proper disposal. To bleed air from the cylinder:

- 1. Lower the pivot arm.
- 2. Pump the foot pedal once.
- 3. Carefully open the bleeder screw. The pressure in the system generated by pumping the pedal causes air (and oil) to flow out of the bleeder screw. Pressure will drop as air and oil flow from the cylinder. To pressurize the system, close the bleed screw and pump the pedal once. Open the bleeder screw again to allow more trapped air to escape.
 - 4. Repeat step 3 until air is completely removed from the cylinder, i.e. only oil flows from the bleeder screw.
 - 5. Check all of the hydraulic lines for oil leaks.
 - 6. Return the unit to service.

AUTOSHIFTER FOOT PUMP EXPLODED VIEW [BILL OF MATERIALS ON NEXT PAGE]



Item	Part no.	Description	Quantity
9.1	99-031-022	Release valve pin seal retainer	1
9.2	99-144-017	Seal, release valve	1
9.3	99-145-127	Star washer	1



Pump repair kit (part no. 99-136-013)

Temp repair kii (pair iie: 77 100 010)				
Part no.	Description	Qty.		
99-144-017	Polypack, 1/8" x 3/8" x 1/8"	1		
99-145-127	Retaining ring, STPA (star washer)	1		
99-031-067	D-wiper, 1 ¹ / ₄ " x 1.625 x 0.187	1		
PP- 12501250- 125B	Seal, 1.25 inner diameter x 0.125 cs	1		
99-144-015	U-cup, twin lip rod, 3/4" x 1.000 x 0.125	1		
99-144-019	O-ring, ⁷ / ₃₂ " x ¹¹ / ₃₂ " x ¹ / ₁₆ " 70D NBR	1		
OR-904-N70	O-ring, #4 SAE port	3		
OR-906-N70	O-ring, #6 SAE port	3		
01-111-013	Bearing, self-lubricating, 1/2" x 1/2"	2		

Ports in pump body ("1" in diagram):

The auto-shifter foot pump has four possible circuit connections.

- 2 pressure ports: marked "P" and "FC/P";
- 2 intake/return ports: marked "T" one is located on the rear and the other is located on the right side.

Including 2 pressure ports and 2 intake/return ports allows the circuit configuration to be adapted to varied applications. The unused pressure and intake/return ports are each plugged with an SAE #6 port plug.

AUTOSHIFTER FOOT PUMP BILL OF MATERIALS

1			PUMP BILL OF MATERIALS	T
2 99-041-001 Piston, pump, 11/a" x ³/4" 3 99-041-002 Piston, pump, unloader 4 99-110-006 Bearing, ball, ³/4" 5 99-110-006 Bearing, ball, ³/8" 6 99-153-038 Flow control, pressure compensated, 1.0 gal. 7 99-114-001 Washer, beveled spring washer 8 99-146-008 Spring, relief 9 99-653-005 Assembly, release valve packing 9.1 99-653-005 Assembly, release valve packing 9.1 99-031-022 Accessory, hydraulic, relief valve pin seal retainer 9.2 99-144-017 Seal, release valve 10 99-031-066 Plug, SAE #6 port 11 99-013-066 Plug, SAE #6 port 12 99-016-018 Bracket, pivot plate 13 01-111-013 Bushing, polygon 1/2" inner diameter x 1/2" long 14 99-112-008 Pin, pivot 15 20-110-003 Cam roller with seal 16 99-031-067 Wiper, 11/4" inner diameter x 11/2" outer diameter x ³/16" 17 99-144-018 Seal, 11/4" x 1/8" CS 18 99-031-068 U-c-up, ³/4" outer diameter x 1/2" CS 19 25547 Socket head set screw, black oxide finish, ³/s" - 16 x 2" 20 25537 SSS, CP, utility grade, ³/s8" - 16 x ³/s8" 21 99-040-001 Lever, release pedal 22 64133 Pin, spring pin, ³/16" - 1" long 23 99-016-017 Bracket, pedal link 24 99-040-005 Lever, release pedal 25 99-146-004 Spring, compression, retainer 26 99-146-005 Spring, compression, retainer 27 99-146-005 Spring, compression, retainer 28 99-146-005 Spring, compression, retainer 29 99-146-005 Spring, compression, retainer 30 99-031-069 Cap, #6 JIC 31 1105 Hex bott, grade A, zinc plated, ³/s" - 16 x 11/16" CS 31 99-13-070 Valve, relief	Item	Part No.	Description	Quantity
3	•			1
4 99-110-007 Bearing, ball, ½" 3 5 99-110-006 Bearing, ball, ½" 3 6 99-153-038 Flow control, pressure compensated, 1.0 gal. 1 7 99-114-001 Washer, beveled spring washer 8 8 99-146-008 Spring, relief 1 9 99-653-005 Assembly, release valve packing 1 9.1 99-031-022 Accessory, hydraulic, relief valve pin seal retainer 1 9.2 99-144-017 Seal, release valve 1 9.3 99-145-127 Washer, star 1 10 99-014-016 Plug, SAE #6 port 3 11 99-112-009 Pin, release pin 1 12 99-016-018 Bracket, pivot plate 1 13 01-111-013 Bushing, polygon ½" inner diameter x ½" long 2 14 99-112-008 Pin, pivot 1 15 20-110-003 Cam roller with seal 1 16 99-031-067 Wiper, 1½" inner diameter x ½" otter diameter x ½" otter				1
5 99-110-006 Bearing, ball, 3/8" 3 6 99-13-0338 Flow control, pressure compensated, 1.0 gal. 1 7 99-114-001 Washer, beveled spring washer 8 8 99-146-008 Spring, relief 1 9 99-653-005 Assembly, release valve packing 1 9.1 99-031-022 Accessory, hydraulic, relief valve pin seal retainer 1 9.1 99-031-022 Accessory, hydraulic, relief valve pin seal retainer 1 9.2 99-144-017 Seal, release valve 1 9.3 99-145-127 Washer, star 1 10 99-031-066 Plug, SAE #6 port 3 11 99-112-009 Pin, release pin 1 12 99-014-018 Bracket, pivot plate 1 13 01-111-013 Bushing, polygon 1/2" inner diameter x 1/2" long 2 14 99-112-008 Pin, pivot 1 15 20-110-003 Cam roller with seal 1 16 99-031-067 Wiper, 11/4"				1
6 99-153-038 Flow control, pressure compensated, 1.0 gal. 7 99-114-001 Washer, beveled spring washer 8 99-144-008 Spring, relief 9 99-653-005 Assembly, release valve packing 9.1 99-031-022 Accessory, hydraulic, relief valve pin seal retainer 1.2 99-144-017 Seal, release valve 9.2 99-144-017 Seal, release valve 10 99-031-066 Plug, SAE #6 port 11 99-112-009 Pin, release pin 12 99-016-018 Bracket, pivot plate 13 01-111-013 Bushing, polygon 1/2" inner diameter x 1/2" long 14 99-112-008 Pin, pivot 15 20-110-003 Cam roller with seal 16 99-031-067 Wiper, 11/4" inner diameter x 11/2" outer diameter x 3/16" 17 99-144-018 Seal, 11/4" x 1/6" CS 18 99-031-068 U-cup, 3/4" outer diameter x 1/8" CS 19 25537 Socket head set screw, black oxide finish, 3/6" − 16 x 2" 20 25537 SSS, CP, utility grade, 3/6" − 16 x 3/8" − 16 x 2." 21 99-040-001 Lever, release pedal 22 64133 Pin, spring pin, 3/16" − 1" long 23 99-016-017 Bracket, pedal link 24 99-040-002 Lever, foot pedal, 2-speed, auto-shifter 25 99-116-005 Morb hollow hex plug, SAE 4 26 99-146-004 Spring, compression, retrainer 27 99-146-005 Spring, compression, retrainer 28 99-146-007 Spring, compression, retrainer 29 99-146-007 Spring, compression, retrainer 20 33 99-146-007 Spring, compression, retrainer 21 39-014-019 Pin, detent ring 22 36106 Hex nut, grade A, zinc plated, 3/6" − 16 x 1" 31 99-153-070 Valve, relief 33 99-153-070 Valve, relief 36 99-031-069 Cap, #6 JIC 37 11105 Hex bolt, grade A, zinc plated, 3/6" − 16 x 1" 38 33622 Spilit lock washer, carbon steel, medium zinc finish, 3/6"		99-110-007	Bearing, ball, 1/4"	3
7 99-114-001 Washer, beveled spring washer 8 99-146-008 Spring, relief 9 99-653-005 Assembly, release valve packing 9.1 99-031-022 Accessory, hydraulic, relief valve pin seal retainer 1 99-031-022 P9-144-017 Seal, release valve 9.3 99-145-127 Washer, star 1 10 99-031-066 Plug, SAE #6 port 1 11 99-112-009 Pin, release pin 1 12 99-016-018 Bracket, pivot plate 1 3 01-111-013 Bushing, polygon 1/2" inner diameter x 1/2" long 1 4 99-112-008 Pin, pivot 1 5 20-110-003 Cam roller with seal 1 6 99-031-067 Wiper, 11/4" inner diameter x 11/2" outer diameter x 3/16" 1 7 99-144-018 Seal, 11/4" x 1/8" CS 1 1 99-031-068 U-cup, 3/4" outer diameter x 1/8" CS 1 1 99-031-068 U-cup, 3/4" outer diameter x 1/8" CS 1 1 99-040-001 Lever, release pedal 2 64133 Pin, spring pin, 3/16" - 116 x 3/8" 2 1 99-040-001 Lever, release pedal 2 2 64133 Pin, spring pin, 3/16" - 11 long 2 3 99-016-017 Bracket, pedal link 2 4 99-040-002 Lever, foot pedal, 2-speed, auto-shifter 2 5 99-116-005 Morb hollow hex plug, SAE 4 2 99-146-006 Spring, compression, inlet check 2 99-146-007 Spring, compression, retainer 2 99-146-009 Spring, compression, retainer 2 99-146-009 Spring, compression, return piston 3 1 99-112-049 Pin, detent ring 3 2 36106 Hex nut, grade A, zinc plated, 3/6" - 16 x 1" 3 8 33622 Spilt lock washer, carbon steel, medium zinc finish, 3/6" 3 10	5	99-110-006	Bearing, ball, 3/8"	3
8 99-146-008 Spring, relief 9 99-653-005 Assembly, release valve packing 9.1 99-031-022 Accessory, hydraulic, relief valve pin seal retainer 9.2 99-144-017 Seal, release valve 10 99-031-066 Plug, SAE #6 port 11 99-112-009 Pin, release pin 1 12 99-016-018 Bracket, pivot plate 1 13 01-111-013 Bushing, polygon 1/2" inner diameter x 1/2" long 2 14 99-112-008 Pin, pivot 1 15 20-110-003 Cam roller with seal 1 16 99-031-067 Wiper, 11/4" inner diameter x 11/2" outer diameter x 3/16" 1 17 99-144-018 Seal, 11/4" x 1/8" CS 1 18 99-031-068 U-cup, 3/4" outer diameter x 1/8" CS 1 19 25547 Socket head set screw, black oxide finish, 3/8" - 16 x 2" 2 20 25537 SSS, CP, utility grade, 3/8" - 16 x 3/8" 2 21 99-040-001 Lever, release pedal 22 </th <th></th> <th>99-153-038</th> <th></th> <th>1</th>		99-153-038		1
9.1 99-653-005 Assembly, release valve packing 9.1 99-031-022 Accessory, hydraulic, relief valve pin seal retainer 9.2 99-144-017 Seal, release valve 10 99-031-066 Plug, SAE #6 port 11 99-131-009 Pin, release pin 12 99-016-018 Bracket, pivot plate 13 01-111-013 Bushing, polygon 1/2" inner diameter x 1/2" long 14 99-112-008 Pin, pivot 15 20-110-003 Cam roller with seal 16 99-031-067 Wiper, 11/4" inner diameter x 11/2" outer diameter x 3/16" 17 99-144-018 Seal, 11/4" x 1/6" CS 18 99-031-068 U-cup, 3/4" outer diameter x 1/6" CS 19 25547 Socket head set screw, black oxide finish, 3/6" - 16 x 2" 20 25537 SSS, CP, utility grade, 3/6" - 16 x 3/8" 21 99-040-001 Lever, release pedal 22 64133 Pin, spring pin, 3/16" - 1" long 23 99-016-017 Bracket, pedal link 24 99-040-002 Lever, foot pedal, 2-speed, auto-shifter 25 99-116-005 Morb hollow hex plug, SAE 4 26 99-146-004 Spring, compression, inlet check 27 99-146-005 Spring, compression, inlet check 29 99-146-005 Spring, compression, retainer 20 99-146-007 Spring, compression, retainer 21 99-146-009 Spring, compression, retainer 22 99-146-007 Spring, compression, retainer 23 99-146-007 Spring, compression, retainer 24 99-146-007 Spring, compression, retainer 25 99-116-007 Spring, compression, retainer 26 99-146-007 Spring, compression, retainer 27 99-146-007 Spring, compression, retainer 28 99-146-009 Spring, compression, retainer 29 99-146-009 Spring, compression, return piston 30 99-146-007 Spring, release ball 31 99-112-049 Pin, detent ring 32 36106 Hex nut, grade A, zinc plated, 3/6" - 16 x 1" 34 99-112-050 Pin, spring guide 35 99-153-070 Valve, relief 36 99-031-09 Cap, #6 JIC 37 11105 Hex bolt, grade A, zinc plated, 3/6" - 16 x 1" 38 33622 Split lock washer, carbon steel, medium zinc finish, 3/6"	7	99-114-001	Washer, beveled spring washer	8
9.1 99-031-022 Accessory, hydraulic, relief valve pin seal retainer 1 9.2 99-144-017 Seal, release valve 1 9.3 99-145-127 Washer, star 1 10 99-031-066 Plug, SAE #6 port 3 11 99-112-009 Pin, release pin 1 12 99-016-018 Bracket, pivot plate 1 13 01-111-013 Bushing, polygon 1/2" inner diameter x 1/2" long 2 14 99-112-008 Pin, pivot 1 15 20-110-003 Cam roller with seal 1 16 99-031-067 Wiper, 11/4" sinner diameter x 11/2" outer diameter x 3/16" 1 17 99-144-018 Seal, 11/4" x 1/6" CS 1 18 99-031-068 U-cup, 3/4" outer diameter x 1/6" CS 1 19 25547 Socket head set screw, black oxide finish, 3/6" - 16 x 2" 2 20 25537 SSS, CP, Utility grade, 3/6" - 16 x 3/8" 2 2 21 99-040-001 Lever, release pedal 1 1 <t< th=""><td>8</td><td>99-146-008</td><td>Spring, relief</td><td>1</td></t<>	8	99-146-008	Spring, relief	1
9.2 99-144-017 Seal, release valve 9.3 99-145-127 Washer, star 10 99-031-066 Plug, SAE #6 port 11 99-112-009 Pin, release pin 12 99-016-018 Bracket, pivot plate 13 01-111-013 Bushing, polygon 1/2" inner diameter x 1/2" long 14 99-112-008 Pin, pivot 15 20-110-003 Cam roller with seal 16 99-031-067 Wiper, 11/4" inner diameter x 11/2" outer diameter x 3/16" 17 99-144-018 Seal, 11/4" x 1/8" CS 18 99-031-068 U-cup, 3/4" outer diameter x 1/8" CS 19 25547 Socket head set screw, black oxide finish, 3/8" − 16 x 2" 20 25537 SSS, CP, utility grade, 3/8" − 16 x 3/8" 21 99-040-001 Lever, release pedal 22 64133 Pin, spring pin, 3/16" − 1" long 23 99-016-017 Bracket, pedal link 24 99-040-002 Lever, foot pedal, 2-speed, auto-shifter 25 99-116-005 Morb hollow hex plug, SAE 4 26 99-146-004 Spring, compression, inlet check 27 99-146-005 Spring, compression, retainer 28 99-146-005 Spring, compression, retainer 29 99-146-007 Spring, compression, retainer 20 39-146-007 Spring, release ball 31 99-112-049 Pin, detent ring 32 36106 Hex nut, grade A, zinc plated, 3/8" − 16 x 1" 34 99-012-050 Pin, spring guide 35 99-153-070 Valve, relief 36 99-031-069 Cap, #6 JIC 37 11105 Hex bott, grade A, zinc plated, 3/8" − 16 x 1" 38 33622 Split lock washer, carbon steel, medium zinc finish, 3/6"	9	99-653-005	Assembly, release valve packing	1
9.3 99-145-127 Washer, star 10 99-031-066 Plug, SAE #6 port 11 99-112-009 Pin, release pin 12 99-016-018 Bracket, pivot plate 13 01-111-013 Bushing, polygon 1/2" inner diameter x 1/2" long 14 99-112-008 Pin, pivot 15 20-110-003 Cam roller with seal 16 99-031-067 Wiper, 11/4" inner diameter x 11/2" outer diameter x 3/16" 17 99-144-018 Seal, 11/4" x 1/8" CS 18 99-031-068 U-cup, 3/4" outer diameter x 1/8" CS 19 25547 Socket head set screw, black oxide finish, 3/8" - 16 x 2" 20 25537 SSS, CP, utility grade, 3/8" - 16 x 3/8" 21 99-040-001 Lever, release pedal 22 64133 Pin, spring pin, 3/16" - 1" long 23 99-016-017 Bracket, pedal link 24 99-040-002 Lever, foot pedal, 2-speed, auto-shifter 25 99-116-005 Morb hollow hex plug, SAE 4 26 99-146-004 Spring, compression, inlet check 27 99-146-005 Spring, compression, retainer 28 99-146-007 Spring, compression, retainer 29 99-146-009 Spring, compression, return piston 30 99-146-007 Spring, release ball 31 99-12-049 Pin, detent ring 32 36106 Hex nut, grade A, zinc plated, 3/8" - 16 x 1" 33 99-144-019 O-ring, 7/32" inner diameter x 11/32" outer diameter x 1/16" CS 34 99-13-050 Pin, spring guide 35 99-13-069 Cap, #6 JIC 37 11105 Hex bolt, grade A, zinc plated, 3/8" - 16 x 1" 38 33622 Split lock washer, carbon steel, medium zinc finish, 3/8"	9.1	99-031-022	Accessory, hydraulic, relief valve pin seal retainer	1
10 99-031-066 Plug, SAE #6 port 11 99-112-009 Pin, release pin 12 99-016-018 Bracket, pivot plate 13 01-111-013 Bushing, polygon ¹/₂" inner diameter x ¹/₂" long 14 99-112-008 Pin, pivot 15 20-110-003 Cam roller with seal 16 99-031-067 Wiper, 1¹/₄" inner diameter x 1¹/₂" outer diameter x ³/₁₅" 17 99-144-018 Seal, 1¹/₄" x ¹/₅" CS 18 99-031-068 U-cup, ³/₄" outer diameter x ¹/₅" CS 19 25547 Socket head set screw, black oxide finish, ³/₅" − 16 x 2" 20 25537 SSS, CP, utility grade, ³/₅" − 16 x 3¹/₅" 21 99-040-001 Lever, release pedal 22 64133 Pin, spring pin, ³/₁₅" − 1" long 23 99-016-017 Bracket, pedal link 24 99-040-002 Lever, foot pedal, 2-speed, auto-shifter 25 99-116-005 Morb hollow hex plug, SAE 4 26 99-146-004 Spring, compression, inlet check 27 99-146-005 Spring, compression, inlet check 28 99-146-005 Spring, compression, outlet check 29 99-146-007 Spring, compression, retainer 20 99-146-007 Spring, compression, return piston 30 99-146-007 Spring, compression, return piston 31 99-112-050 Pin, grade A, zinc plated, ³/₅" − 16 33 99-144-019 O-ring, ⁷ /₃²" inner diameter x ¹¹/₃²" outer diameter x ¹/₁₅" CS 34 99-112-050 Pin, spring guide 35 99-13-069 Cap, #6 JIC 37 11105 Hex bolt, grade A, zinc plated, ³/₅" − 16 x 1" 38 33622 Split lock washer, carbon steel, medium zinc finish, ³/₅"	9.2	99-144-017	Seal, release valve	1
11	9.3	99-145-127	Washer, star	1
12	10	99-031-066	Plug, SAE #6 port	3
13 01-111-013 Bushing, polygon 1/2" inner diameter x 1/2" long 2 14 99-112-008 Pin, pivot 1 15 20-110-003 Cam roller with seal 1 16 99-031-067 Wiper, 11/4" inner diameter x 11/2" outer diameter x 3/16" 1 17 99-144-018 Seal, 11/4" x 1/8" CS 1 18 99-031-068 U-cup, 3/4" outer diameter x 1/8" CS 1 19 25547 Socket head set screw, black oxide finish, 3/8" - 16 x 2" 2 20 25537 SSS, CP, utility grade, 3/8" - 16 x 3/8" 2 21 99-040-001 Lever, release pedal 1 22 64133 Pin, spring pin, 3/16" - 1" long 1 23 99-016-017 Bracket, pedal link 1 24 99-040-002 Lever, foot pedal, 2-speed, auto-shifter 1 25 99-116-005 Morb hollow hex plug, SAE 4 2 26 99-146-004 Spring, compression, inlet check 2 27 99-146-006 Spring, compression, retainer 2	11	99-112-009	Pin, release pin	1
14 99-112-008 Pin, pivot 1 15 20-110-003 Cam roller with seal 1 16 99-031-067 Wiper, 11/4" inner diameter x 11/2" outer diameter x 3/16" 1 17 99-144-018 Seal, 11/4" x 1/8" CS 1 18 99-031-068 U-cup, 3/4" outer diameter x 1/8" CS 1 19 25547 Socket head set screw, black oxide finish, 3/8" - 16 x 2" 2 20 25537 SSS, CP, utility grade, 3/8" - 16 x 3/8" 2 21 99-040-001 Lever, release pedal 1 22 64133 Pin, spring pin, 3/16" - 1" long 1 23 99-016-017 Bracket, pedal link 1 24 99-040-002 Lever, foot pedal, 2-speed, auto-shifter 1 25 99-116-005 Morb hollow hex plug, SAE 4 2 26 99-146-004 Spring, compression, retainer 2 27 99-146-005 Spring, compression, retainer 2 28 99-146-006 Spring, release ball 1 31	12	99-016-018	Bracket, pivot plate	1
15 20-110-003 Cam roller with seal 1 16 99-031-067 Wiper, 1¹/₄" inner diameter x 1¹/₂" outer diameter x ³/1₆" 1 17 99-144-018 Seal, 1¹/₄" x ¹/₆" CS 1 18 99-031-068 U-cup, ³/₄" outer diameter x ¹/₆" CS 1 19 25547 Socket head set screw, black oxide finish, ³/₆" – 16 x 2" 2 20 25537 SSS, CP, utility grade, ³/₆" – 16 x ³/₆" 2 21 99-040-001 Lever, release pedal 1 22 64133 Pin, spring pin, ³/₁₆" – 1" long 1 23 99-016-017 Bracket, pedal link 1 24 99-040-002 Lever, foot pedal, 2-speed, auto-shifter 1 25 99-116-005 Morb hollow hex plug, SAE 4 2 26 99-146-004 Spring, compression, inlet check 2 27 99-146-004 Spring, compression, retainer 2 28 99-146-005 Spring, compression, return piston 1 30 99-146-007 Spring, release ball 1	13	01-111-013	Bushing, polygon 1/2" inner diameter x 1/2" long	2
16 99-031-067 Wiper, 11/4" inner diameter x 11/2" outer diameter x 3/16" 1 17 99-144-018 Seal, 11/4" x 1/8" CS 1 18 99-031-068 U-cup, 3/4" outer diameter x 1/8" CS 1 19 25547 Socket head set screw, black oxide finish, 3/8" – 16 x 2" 2 20 25537 SSS, CP, utility grade, 3/8" – 16 x 3/8" 2 21 99-040-001 Lever, release pedal 1 22 64133 Pin, spring pin, 3/16" – 1" long 1 23 99-016-017 Bracket, pedal link 1 24 99-040-002 Lever, foot pedal, 2-speed, auto-shifter 1 25 99-116-005 Morb hollow hex plug, SAE 4 2 26 99-146-004 Spring, compression, inlet check 2 27 99-146-006 Spring, compression, retainer 2 28 99-146-007 Spring, compression, outlet check 2 29 99-146-009 Spring, release ball 1 31 99-12-049 Pin, detent ring 1 <th< th=""><th>14</th><th>99-112-008</th><th>Pin, pivot</th><th>1</th></th<>	14	99-112-008	Pin, pivot	1
17 99-144-018 Seal, 11/4" x 1/8" CS 1 18 99-031-068 U-cup, 3/4" outer diameter x 1/8" CS 1 19 25547 Socket head set screw, black oxide finish, 3/8" – 16 x 2" 2 20 25537 SSS, CP, utility grade, 3/8" – 16 x 3/8" 2 21 99-040-001 Lever, release pedal 1 22 64133 Pin, spring pin, 3/16" – 1" long 1 23 99-016-017 Bracket, pedal link 1 24 99-040-002 Lever, foot pedal, 2-speed, auto-shifter 1 25 99-116-005 Morb hollow hex plug, SAE 4 2 26 99-146-004 Spring, compression, inlet check 2 27 99-146-006 Spring, compression, retainer 2 28 99-146-005 Spring, compression, outlet check 2 29 99-146-007 Spring, release ball 1 31 99-146-007 Spring, release ball 1 31 99-112-049 Pin, detent ring 1 33 99-144-019	15	20-110-003	Cam roller with seal	1
18 99-031-068 U-cup, ³/₄" outer diameter x ¹/₅" CS 1 19 25547 Socket head set screw, black oxide finish, ³/₅" – 16 x 2" 2 20 25537 SSS, CP, utility grade, ³/₅" – 16 x ³/₅" 2 21 99-040-001 Lever, release pedal 1 22 64133 Pin, spring pin, ³/₁₅" – 1" long 1 23 99-016-017 Bracket, pedal link 1 24 99-040-002 Lever, foot pedal, 2-speed, auto-shifter 1 25 99-116-005 Morb hollow hex plug, SAE 4 2 26 99-146-004 Spring, compression, inlet check 2 27 99-146-006 Spring, compression, retainer 2 28 99-146-005 Spring, compression, outlet check 2 29 99-146-007 Spring, compression, return piston 1 30 99-146-007 Spring, release ball 1 31 99-112-049 Pin, detent ring 1 32 36106 Hex nut, grade A, zinc plated, ³/₅" – 16 2 34	16	99-031-067	Wiper, 11/4" inner diameter x 11/2" outer diameter x 3/16"	1
19 25547 Socket head set screw, black oxide finish, 3/8" – 16 x 2" 2 20 25537 SSS, CP, utility grade, 3/8" – 16 x 3/8" 2 21 99-040-001 Lever, release pedal 1 22 64133 Pin, spring pin, 3/16" – 1" long 1 23 99-016-017 Bracket, pedal link 1 24 99-040-002 Lever, foot pedal, 2-speed, auto-shifter 1 25 99-116-005 Morb hollow hex plug, SAE 4 2 26 99-146-004 Spring, compression, inlet check 2 27 99-146-006 Spring, compression, retainer 2 28 99-146-005 Spring, compression, outlet check 2 29 99-146-009 Spring, compression, return piston 1 30 99-146-007 Spring, release ball 1 31 99-112-049 Pin, detent ring 1 32 36106 Hex nut, grade A, zinc plated, 3/8" – 16 2 33 99-144-019 O-ring, 7/32" inner diameter x 11/32" outer diameter x 1/16" CS 1 34 99-153-070 Valve, relief 1	17	99-144-018	Seal, 11/4" x 1/8" CS	1
20 25537 SSS, CP, utility grade, 3/8" – 16 x 3/8" 2 21 99-040-001 Lever, release pedal 1 22 64133 Pin, spring pin, 3/16" – 1" long 1 23 99-016-017 Bracket, pedal link 1 24 99-040-002 Lever, foot pedal, 2-speed, auto-shifter 1 25 99-116-005 Morb hollow hex plug, SAE 4 2 26 99-146-004 Spring, compression, inlet check 2 27 99-146-006 Spring, compression, retainer 2 28 99-146-005 Spring, compression, outlet check 2 29 99-146-007 Spring, compression, return piston 1 30 99-146-007 Spring, release ball 1 31 99-112-049 Pin, detent ring 1 32 36106 Hex nut, grade A, zinc plated, 3/8" – 16 2 33 99-144-019 O-ring, 7/32" inner diameter x 11/32" outer diameter x 1/16" CS 1 34 99-112-050 Pin, spring guide 1 35 99-153-070 Valve, relief 1 36 9	18	99-031-068	U-cup, 3/4" outer diameter x 1/8" CS	1
21 99-040-001 Lever, release pedal 1 22 64133 Pin, spring pin, 3/16" – 1" long 1 23 99-016-017 Bracket, pedal link 1 24 99-040-002 Lever, foot pedal, 2-speed, auto-shifter 1 25 99-116-005 Morb hollow hex plug, SAE 4 2 26 99-146-004 Spring, compression, inlet check 2 27 99-146-006 Spring, compression, retainer 2 28 99-146-005 Spring, compression, outlet check 2 29 99-146-007 Spring, compression, return piston 1 30 99-146-007 Spring, release ball 1 31 99-112-049 Pin, detent ring 1 32 36106 Hex nut, grade A, zinc plated, 3/8" – 16 2 33 99-144-019 O-ring, 7/32" inner diameter x 11/32" outer diameter x 1/16" CS 1 34 99-112-050 Pin, spring guide 1 35 99-153-070 Valve, relief 1 36 99-031-069 Cap, #6 JIC 1 37 11105 Hex	19	25547	Socket head set screw, black oxide finish, 3/8" – 16 x 2"	2
22 64133 Pin, spring pin, 3/16" – 1" long 1 23 99-016-017 Bracket, pedal link 1 24 99-040-002 Lever, foot pedal, 2-speed, auto-shifter 1 25 99-116-005 Morb hollow hex plug, SAE 4 2 26 99-146-004 Spring, compression, inlet check 2 27 99-146-006 Spring, compression, retainer 2 28 99-146-005 Spring, compression, outlet check 2 29 99-146-007 Spring, compression, return piston 1 30 99-146-007 Spring, release ball 1 31 99-112-049 Pin, detent ring 1 32 36106 Hex nut, grade A, zinc plated, 3/8" – 16 2 33 99-144-019 O-ring, 7/32" inner diameter x 11/32" outer diameter x 1/16" CS 1 34 99-112-050 Pin, spring guide 1 35 99-153-070 Valve, relief 1 36 99-031-069 Cap, #6 JIC 1 37 11105 Hex bolt, grade A, zinc plated, 3/8" – 16 x 1" 1 38 3362	20	25537	SSS, CP, utility grade, 3/8" – 16 x 3/8"	2
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24 99-040-002 Lever, foot pedal, 2-speed, auto-shifter 1 25 99-116-005 Morb hollow hex plug, SAE 4 2 26 99-146-004 Spring, compression, inlet check 2 27 99-146-006 Spring, compression, retainer 2 28 99-146-005 Spring, compression, outlet check 2 29 99-146-009 Spring, compression, return piston 1 30 99-146-007 Spring, release ball 1 31 99-112-049 Pin, detent ring 1 32 36106 Hex nut, grade A, zinc plated, 3/8" – 16 2 33 99-144-019 O-ring, 7/32" inner diameter x 11/32" outer diameter x 1/16" CS 1 34 99-112-050 Pin, spring guide 1 35 99-153-070 Valve, relief 1 36 99-031-069 Cap, #6 JIC 1 37 11105 Hex bolt, grade A, zinc plated, 3/8" – 16 x 1" 1 38 33622 Split lock washer, carbon steel, medium zinc finish, 3/8" 3	22	64133	Pin, spring pin, 3/16" – 1" long	1
25 99-116-005 Morb hollow hex plug, SAE 4 2 26 99-146-004 Spring, compression, inlet check 2 27 99-146-006 Spring, compression, retainer 2 28 99-146-005 Spring, compression, outlet check 2 29 99-146-009 Spring, compression, return piston 1 30 99-146-007 Spring, release ball 1 31 99-112-049 Pin, detent ring 1 32 36106 Hex nut, grade A, zinc plated, 3/8" – 16 2 33 99-144-019 O-ring, 7/32" inner diameter x 11/32" outer diameter x 1/16" CS 1 34 99-112-050 Pin, spring guide 1 35 99-153-070 Valve, relief 1 36 99-031-069 Cap, #6 JIC 1 37 11105 Hex bolt, grade A, zinc plated, 3/8" – 16 x 1" 1 38 33622 Split lock washer, carbon steel, medium zinc finish, 3/8" 3	23	99-016-017	Bracket, pedal link	1
26 99-146-004 Spring, compression, inlet check 2 27 99-146-006 Spring, compression, retainer 2 28 99-146-005 Spring, compression, outlet check 2 29 99-146-009 Spring, compression, return piston 1 30 99-146-007 Spring, release ball 1 31 99-112-049 Pin, detent ring 1 32 36106 Hex nut, grade A, zinc plated, 3/8" – 16 2 33 99-144-019 O-ring, 7/32" inner diameter x 11/32" outer diameter x 1/16" CS 1 34 99-112-050 Pin, spring guide 1 35 99-153-070 Valve, relief 1 36 99-031-069 Cap, #6 JIC 1 37 11105 Hex bolt, grade A, zinc plated, 3/8" – 16 x 1" 1 38 33622 Split lock washer, carbon steel, medium zinc finish, 3/8" 3	24	99-040-002	Lever, foot pedal, 2-speed, auto-shifter	1
27 99-146-006 Spring, compression, retainer 2 28 99-146-005 Spring, compression, outlet check 2 29 99-146-009 Spring, compression, return piston 1 30 99-146-007 Spring, release ball 1 31 99-112-049 Pin, detent ring 1 32 36106 Hex nut, grade A, zinc plated, 3/8" – 16 2 33 99-144-019 O-ring, 7/32" inner diameter x 11/32" outer diameter x 1/16" CS 1 34 99-112-050 Pin, spring guide 1 35 99-153-070 Valve, relief 1 36 99-031-069 Cap, #6 JIC 1 37 11105 Hex bolt, grade A, zinc plated, 3/8" – 16 x 1" 1 38 33622 Split lock washer, carbon steel, medium zinc finish, 3/8" 3	25	99-116-005	Morb hollow hex plug, SAE 4	2
28 99-146-005 Spring, compression, outlet check 2 29 99-146-009 Spring, compression, return piston 1 30 99-146-007 Spring, release ball 1 31 99-112-049 Pin, detent ring 1 32 36106 Hex nut, grade A, zinc plated, ³/8" – 16 2 33 99-144-019 O-ring, ⁷ / ₃₂ " inner diameter x ¹¹ / ₃₂ " outer diameter x ¹ / ₁₆ " CS 1 34 99-112-050 Pin, spring guide 1 35 99-153-070 Valve, relief 1 36 99-031-069 Cap, #6 JIC 1 37 11105 Hex bolt, grade A, zinc plated, ³/8" – 16 x 1" 1 38 33622 Split lock washer, carbon steel, medium zinc finish, ³/8" 3	26	99-146-004	Spring, compression, inlet check	2
29 99-146-009 Spring, compression, return piston 1 30 99-146-007 Spring, release ball 1 31 99-112-049 Pin, detent ring 1 32 36106 Hex nut, grade A, zinc plated, 3/8" – 16 2 33 99-144-019 O-ring, 7/32" inner diameter x 11/32" outer diameter x 1/16" CS 1 34 99-112-050 Pin, spring guide 1 35 99-153-070 Valve, relief 1 36 99-031-069 Cap, #6 JIC 1 37 11105 Hex bolt, grade A, zinc plated, 3/8" – 16 x 1" 1 38 33622 Split lock washer, carbon steel, medium zinc finish, 3/8" 3	27	99-146-006	Spring, compression, retainer	2
30 99-146-007 Spring, release ball 1 31 99-112-049 Pin, detent ring 1 32 36106 Hex nut, grade A, zinc plated, 3/8" – 16 2 33 99-144-019 O-ring, 7/32" inner diameter x 11/32" outer diameter x 1/16" CS 1 34 99-112-050 Pin, spring guide 1 35 99-153-070 Valve, relief 1 36 99-031-069 Cap, #6 JIC 1 37 11105 Hex bolt, grade A, zinc plated, 3/8" – 16 x 1" 1 38 33622 Split lock washer, carbon steel, medium zinc finish, 3/8" 3			Spring, compression, outlet check	2
31 99-112-049 Pin, detent ring 1 32 36106 Hex nut, grade A, zinc plated, 3/8" – 16 2 33 99-144-019 O-ring, 7/32" inner diameter x 11/32" outer diameter x 1/16" CS 1 34 99-112-050 Pin, spring guide 1 35 99-153-070 Valve, relief 1 36 99-031-069 Cap, #6 JIC 1 37 11105 Hex bolt, grade A, zinc plated, 3/8" – 16 x 1" 1 38 33622 Split lock washer, carbon steel, medium zinc finish, 3/8" 3		99-146-009	Spring, compression, return piston	1
32 36106 Hex nut, grade A, zinc plated, 3/8" – 16 2 33 99-144-019 O-ring, 7/32" inner diameter x 11/32" outer diameter x 1/16" CS 1 34 99-112-050 Pin, spring guide 1 35 99-153-070 Valve, relief 1 36 99-031-069 Cap, #6 JIC 1 37 11105 Hex bolt, grade A, zinc plated, 3/8" – 16 x 1" 1 38 33622 Split lock washer, carbon steel, medium zinc finish, 3/8" 3				1
33 99-144-019 O-ring, 7/32" inner diameter x 11/32" outer diameter x 1/16" CS 1 34 99-112-050 Pin, spring guide 1 35 99-153-070 Valve, relief 1 36 99-031-069 Cap, #6 JIC 1 37 11105 Hex bolt, grade A, zinc plated, 3/8" – 16 x 1" 1 38 33622 Split lock washer, carbon steel, medium zinc finish, 3/8" 3		99-112-049	Pin, detent ring	1
34 99-112-050 Pin, spring guide 1 35 99-153-070 Valve, relief 1 36 99-031-069 Cap, #6 JIC 1 37 11105 Hex bolt, grade A, zinc plated, ³/8" – 16 x 1" 1 38 33622 Split lock washer, carbon steel, medium zinc finish, ³/8" 3	32	36106		2
35 99-153-070 Valve, relief 1 36 99-031-069 Cap, #6 JIC 1 37 11105 Hex bolt, grade A, zinc plated, 3/8" – 16 x 1" 1 38 33622 Split lock washer, carbon steel, medium zinc finish, 3/8" 3	33	99-144-019	O-ring, 7/32" inner diameter x 11/32" outer diameter x 1/16" CS	1
36 99-031-069 Cap, #6 JIC 1 37 11105 Hex bolt, grade A, zinc plated, 3/8" – 16 x 1" 1 38 33622 Split lock washer, carbon steel, medium zinc finish, 3/8" 3	34		Pin, spring guide	1
37 11105 Hex bolt, grade A, zinc plated, 3/8" – 16 x 1" 1 38 33622 Split lock washer, carbon steel, medium zinc finish, 3/8" 3				1
38 33622 Split lock washer, carbon steel, medium zinc finish, 3/8" 3		99-031-069		1
	37	11105		1
39 11057 Hex bolt grade A zinc plated 5/14" - 18 x 11/4" 1	38	33622	•	3
	39	11057	Hex bolt, grade A, zinc plated, 5/16" – 18 x 11/4"	1
40 33620 Lock washer, medium split, 5/16"	40	33620	Lock washer, medium split, 5/16"	1

INSPECTIONS AND MAINTENANCE (AUTOSHIFTER FOOT PUMP)

Before putting the drum carrier into service, create a written record of the appearance and operation of the foot pump, cylinder, and hydraulic hoses. Use the foot pump to extend the cylinder and then retract it by pressing the release lever. Include details in your record about the amount of effort necessary to move the foot pedal as well as how the pump and cylinder look and sound during extension and retraction. This record establishes satisfactory condition of the pump and cylinder. During subsequent inspections, compare observations to this record to determine whether the pump and cylinder are in satisfactory condition.

Unload the drum carriage and lower the pivot arm before inspecting the pump or performing maintenance on it.

- (A) Before Each Use Check For Any of the Following Conditions. Do not return the unit to service unless it is in satisfactory condition.
 - Oil leaks from the pump, hoses, hose fittings, etc.
 - Pinched or chafed hoses
 - Unusual noise or binding

(B) Monthly

- Determine the oil level. Oil should be 1" to 1-1/2" below the top of the reservoir/tank with the pivot arm fully lowered. Add oil, if necessary.
- Check for oil leaks. Resolve the issue as described in "Troubleshooting" section.
- Check the hydraulic system for worn or damaged hoses. Replace damaged hoses as necessary.
- Cycle the deck and listen for unusual noise. See TROUBLESHOOTING (AUTOSHIFTER PUMP).

(C) Yearly

Change the oil at least once a year or sooner if it darkens, is gritty, or appears milky. Milky appearance indicates the presence of water. Replace the oil with AW-32 hydraulic fluid or its equivalent.

Remedy

TROUBLESHOOTING (AUTOSHIFTER FOOT PUMP)

Evolanation

Issue	Explanation	Remedy
Pivot arm does not rise despite pumping pedal	a. Too much weight applied to the saddle (load exceeds capacity).b. Too little oil in hydraulic system	 a. Remove enough of load that weight of load is within capacity of carrier b. Add oil until level is within one inch of top of reservoir
	c. Pinched hydraulic hose d. Relief valve pressure setting too low	c. Correct as appropriated. Increase pressure setting as necessary, but NEVER more than 3,000psi
A lot of force is required to pump the pedal and the arm does not rise or rises slowly	e. Debris under pressure relief valve f. Debris under inlet check valve	 e. Remove, disassemble, clean (with mineral spirits or kerosene), reassemble and reinstall pressure relief valve assemblies. f. Remove, disassemble, clean (with mineral spirits or kerosene), reassemble and reinstall check valve assemblies.
3. Pivot arm rises only when unloaded or pedal pumped rapidly OR I can pump the pedal but the arm does not move.	 g. Pump is air locked h. Debris on seat of inlet check valve i. Pressure setting of relief valve needs adjustment 	 g. Remove air from the pump. See "Purging air from the pump," p. 8. h. Remove inlet check valve and clean debris from valve seat (the bottom of the cavity in pump body that valve fits into). i. Increase pressure setting as necessary, but NEVER more than 3,000psi.
A Agrania a alvaiga a Harada ya	j. Debris on seat of relief valve	j. Remove relief valve and clean debris from valve seat in pump body.
4. Arm rises during the down stroke of the pedal, but lowers during the upstroke.	k. Outlet check valve stuck in open position	k. Remove, disassemble, clean (with mineral spirits or kerosene), reassemble and reinstall outlet check valve assemblies.
5. Pivot arm rises and maintains elevation, but have to pump the pedal a million times	Autoshifter valve stuck in closed/deactivated position (piston out).	Remove port plug from port marked "UL" (on pump body); then remove piston. Inspect piston and springs
6. Pivot arm rises very slowly	m. Autoshifter valve stuck in open/ activated position (piston in)	m. Remove port plug from port marked "UL" (on pump body); then remove piston. Inspect piston and springs
7. Pump pedal feels spongy or pivot arm rises in jerks	n. Oil level is low o. Air present in pump and/or cylinders	 n. Add oil until level is within 1 in. of top of reservoir. o. Purge air by following "Purging air from the pump" and "Purging air from the cylinder" on p. 8.
8. Pivot arm lowers very slowly	p. Flow control valve obstructed	p. Remove valve and inspect for debris or non-operating spool
9. Arm lowers too rapidly	q. Flow control valve obstructed or not moving freely	q. Remove valve and inspect for debris or non-operating spool
10. Pivot arm rises part way and then stops	r. Air trapped in small pump chamber	r. Perform "Purging air from the pump" on <u>p.</u> <u>8</u> .

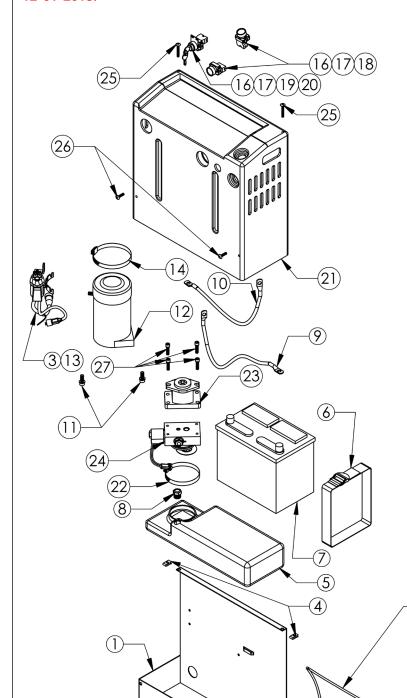
ELECTRICALLY POWERED DRUM CARRIERS (OPTIONS HDC-DC AND HDC-AC)

A modular power unit (MPU) provides power to raise and lower the pivot arm.

- Option HDC-DC utilizes a 12V battery with an onboard battery charger.
- Option HDC-AC is an AC powered MPU's that must be connected to an electrical outlet.

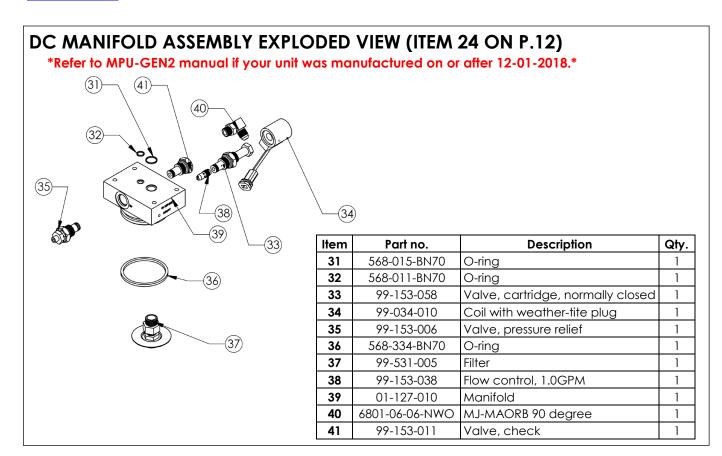
DC MODULAR POWER UNIT EXPLODED VIEW AND BILL OF MATERIALS

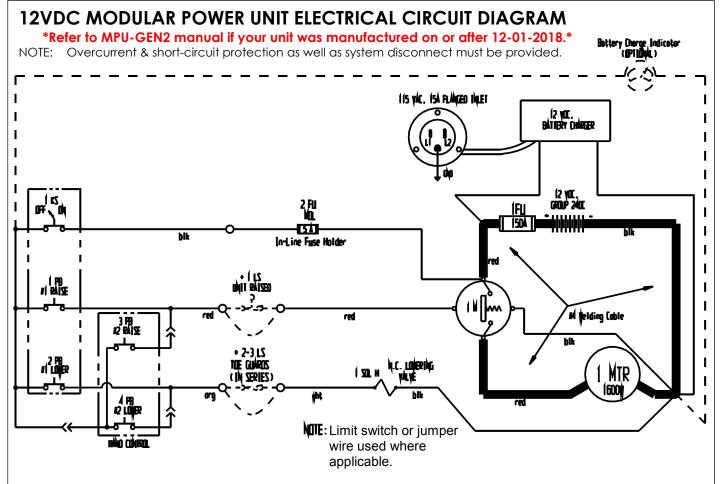
Refer to MPU-GEN2 manual if unit manufactured on or after 12-01-2018.

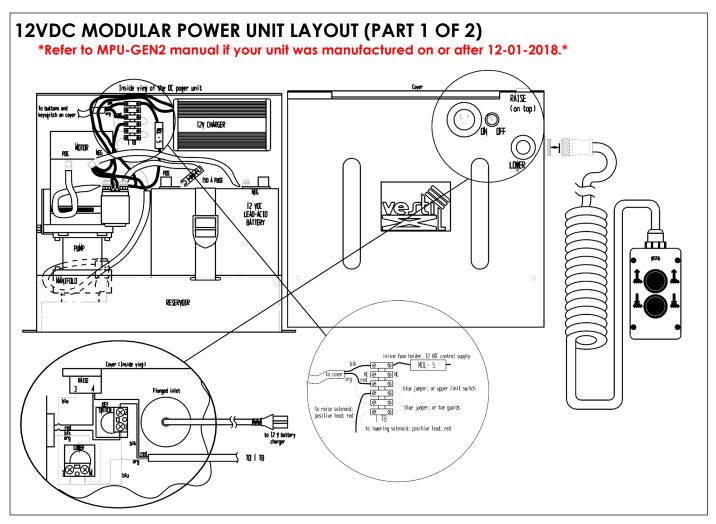


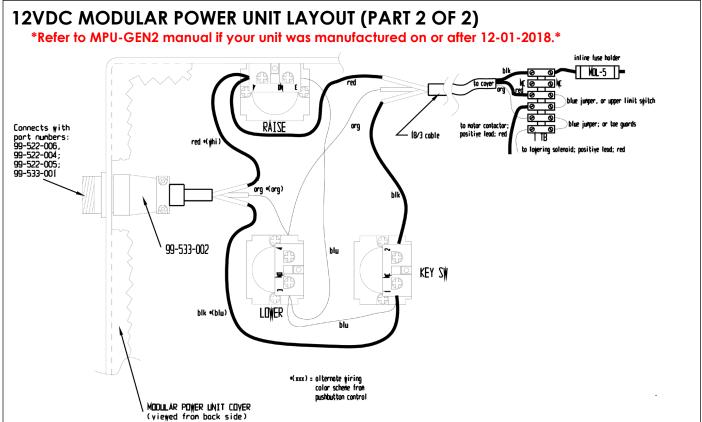
Part no.	Description	Quantity
99-016-933	Base bracket	1
21-034-008	Charger (Soniel)	1
01-033-024	24", 18/3, 4-pin plug	1
37927	Tinnerman clip	4
99-023-001	Reservoir	1
99-034-013	Battery strap	1
24DC36	Battery	1
BV-48	Breather	1
15-533-013	Cable, battery, 23" black	1
15-533-014		1
23305 33688 33008	3/8" – 16 x 1" utility grade bolt 3/8" high collar lock washer	2 2 2
99-135-011	4", 12VDC motor w/ tang dr.	1
15-022-004	12V start solenoid relay	1
HS64	Worm gear hose clamp	1
BG-12V	Battery gauge	1
ZB2BZ009	Base, contact block	3
ZB2BE101	Contact block N.O.	3
ZB2BA2C	Operator, black, non- illuminated	2
ZB2BG4C	Key switch, 2-position	1
01-134-007	Legend, ON - OFF	1
091802JY	Fiberglass cover	1
HS52	Clamp, worm gear	1
01-143-906	Pump	1
01-627-010	Manifold assembly (exploded view on p. 13)	1
29201	¹/₄in. – 20 x 1³/₄in. TPHMS zinc-plated	2
29185	zinc-plated	2
23255 33687	SHCS utility grade High collar lock washer	4
152400-03	Molded cord	1
150CCTM.OEM	Connector, charge	1
3MT ST3540	1in. hook and loop press	10''
	99-016-933 21-034-008 01-033-024 37927 99-023-001 99-034-013 24DC36 BV-48 15-533-014 23305 33688 33008 99-135-011 15-022-004 HS64 BG-12V ZB2BZ009 ZB2BE101 ZB2BA2C ZB2BG4C 01-134-007 091802JY HS52 01-143-906 01-627-010 29201 29185 23255 33687 152400-03	99-016-933 Base bracket 21-034-008 Charger (Soniel) 01-033-024 24", 18/3, 4-pin plug 37927 Tinnerman clip 99-023-001 Reservoir 99-034-013 Battery strap 24DC36 Battery BV-48 Breather 15-533-013 Cable, battery, 23" black 15-533-014 Cable, battery, 23" red 23305 3/8" - 16 x 1" utility grade bolt 33688 3/8" high collar lock washer 33008 3/8" flat washer 99-135-011 dr. 15-022-004 12V start solenoid relay HS64 Worm gear hose clamp BG-12V Battery gauge ZB2BZ009 Base, contact block ZB2BE101 Contact block N.O. Operator, black, non-illuminated ZB2BG4C Key switch, 2-position 01-134-007 Legend, ON - OFF 091802JY Fiberglass cover HS52 Clamp, worm gear 01-143-906 Pump 01-627-010 (exploded view on p. 13) 29201 1/4in 20 x 13/4in. TPHMS zinc-plated 23255 SHCS utility grade 152400-03 Molded cord

(30)





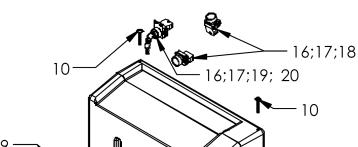


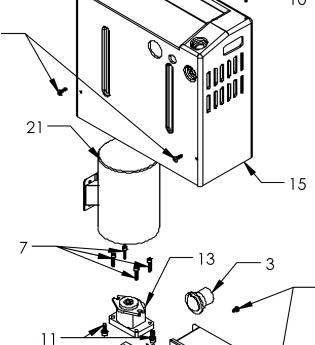


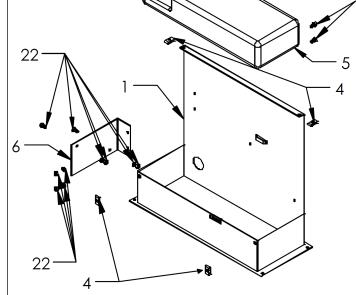
22

AC MODULAR POWER UNIT EXPLODED VIEW AND BILL OF MATERIALS

Refer to MPU-GEN2 manual if your unit was manufactured on or after 12-01-2018.







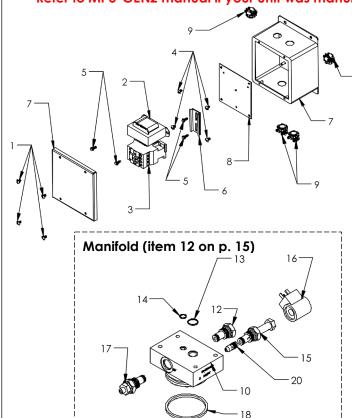
	Item	Part no.	Description	Quantity
	1	99-016-933	Base bracket	1
	2	21-034-008	Electrical box (see FIG. 6B)	1
	3	21-034-005	AC adaptor plug	1
	4	37927	Tinnerman clip	4
	5	99-023-001	Reservoir	1
	6		Motor brace	1
	7	23255 33687	5/16" – 18 x 1" utility grade bolt 5/16" high collar lock washer	4 4
	8	BV-48	Breather	1
	9	29185	¹ / ₄ " – 20 x 1" TPHMS z-plated screw	1
	10	29201	¹ / ₄ " – 20 x 1 ³ / ₄ " TPHMS z- plated screw	1
	11	23305 33688 33008	3/8" – 16 x 1" utility grade bolt 3/8" high collar lock washer 3/8" flat washer	2 2 2
	12	01-627-010	Manifold (see FIG. 6C)	1
22	13	01-143-906	Pump	1
	14	HS52	Worm gear hose clamp	1
	15	091802JY	Fiberglass cover	1
	16	ZB2BZ009	Base, contact block	3
	17	ZB2BE101	Contact block N.O.	3
	18	ZB2BA2C	Operator, black, non- illuminated	2
	19	ZB2BG4C	Key switch, 2-position	1
	20	01-134-007	Legend, ON - OFF	1
	21			1
00	22	HS52	Clamp, worm gear	1
22	23	01-143-906	Pump	1
	24	01-627-010	Manifold assembly (exploded view on p. 12)	1
	25	29201	¹/₄in. – 20 x 1³/₄in. TPHMS zinc-plated	2
	26	29185	¹/₄in. – 20 x 1in. TPHMS zinc- plated	2
	27	23255 33687	SHCS utility grade High collar lock washer	4 4
	28	152400-03	Molded cord	1
	29	150CCTM.OEM	Connector, charge	1
	30	3MT ST3540	1in. hook and loop press	10"

12

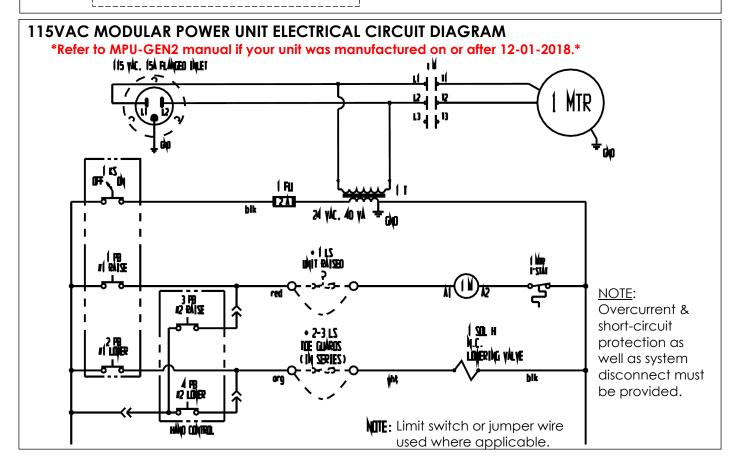
8

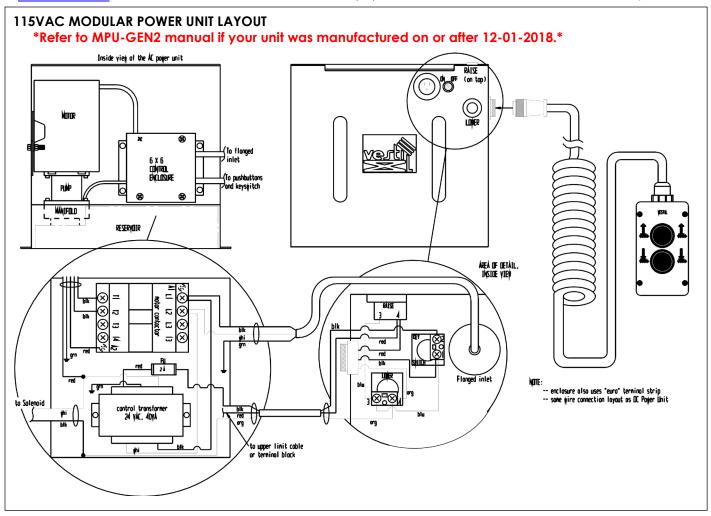
ELECTRICAL BOX AND MANIFOLD EXPLODED VIEW (ITEMS 2 AND 12 ON P. 15)

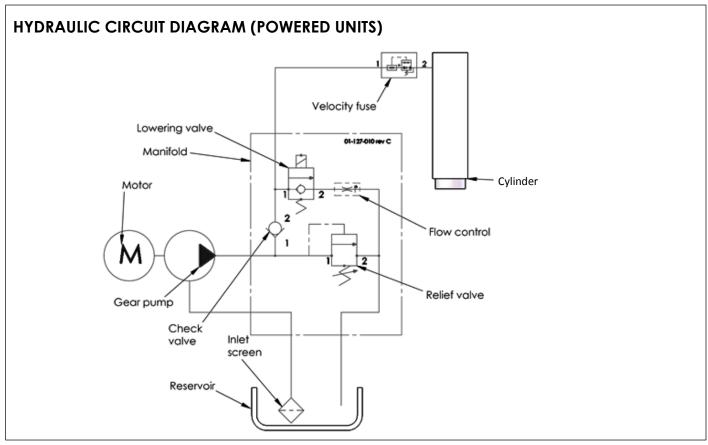
Refer to MPU-GEN2 manual if your unit was manufactured on or after 12-01-2018.



Item	Part no.	Description	Qty.
1	71616	10 – 32 x ⁵ / ₈ " TSHMS screws	4
2	01-129-001	Transformer	1
3	132560	Motor contactor	1
4	27531	10 – 32 x 1/4" PSHMS zinc-plated screws	4
5	32028	8 – 18 x ¹ / ₂ " HWH TEK drill and tap screws	4
6	TB-TRACK	Aluminum din rail	3"
7	01-029-006	5/16" – 18 x 1" utility grade bolt	1
8	AB66JP	6" x 6" enclosure plate	1
9	C500	³ / ₈ " (¹ / ₂ " knockout) Romex 2- screw NM clamp connector	4
10	01-127-010	LHL standard manifold, 3" boss	1
11	6801-06-06- NOW	³ / ₈ " – 16 x 1" utility grade bolt	2
12	99-153-011	Check valve	1
13	568-015-BN70	O-ring	1
14	568-011-BN70	O-ring	1
15	99-153-015	Normally closed cartridge valve	1
16	99-034-008	24VAC coil	1
17	99-153-006	Pressure relief valve	1
18	568-334-BN70	O-ring	1
19	99-531-005	Filter	1
20	99-153-038	Flow control, 1.0GPM	1







OPERATING A POWERED HDC-305 (RAISING & LOWERING THE PIVOT ARM)

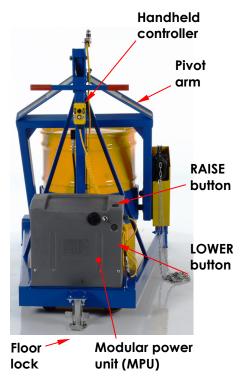
NOTE: If your HDC was manufactured on or after Dec. 1, 2018, see the NOTE in the Table of Contents on the cover page. Refer to the separate MPU-GEN2 manual provided with this manual.

The drum carriage of electrically powered units is controlled by a handheld controller as well as pushbuttons on the power unit housing. To raise or lower the carriage, press the appropriately marked button. When either button is released, the carriage will maintain position.

To raise the carriage, press the BLACK button on the handheld controller (or the RAISE pushbutton on the housing). Pressing a button starts the electric motor which turns the hydraulic pump. Oil from the reservoir (inside the modular power unit) flows through a suction filter and into the pump. The pump delivers pressurized oil to the hydraulic cylinder through a check valve. The check valve allows oil to flow only in one direction, i.e. to the cylinders, and prevents oil from flowing back into the pump circuit when the pump stops. This allows the carriage to maintain elevation after the control button is released.

If a load exceeds the capacity of the lifter, pressure will build up in the circuit between the pump and the cylinders when the BLACK button is pressed. This pressure forces the relief valve to unseat which in turn allows oil to circulate back to the reservoir rather than pushing it into the cylinder. This pressure relief mechanism prevents damage to the hydraulic system.

To lower the carriage, press the WHITE button (or LOWER pushbutton on the housing). This energizes the lowering solenoid valve coil, which unseats the poppet valve and allows oil to return to the reservoir from the cylinder through the pressure-compensated flow control valve. Releasing the WHITE button de-energizes the solenoid and closes the valve poppet. The poppet valve and check valve together prevent oil from returning to the reservoir and cause the cylinders to stop retracting. The carriage will maintain its position until another command is received.



LOWERING SOLENOID VALVE

The lowering valve might occasionally need to be cleaned. See <u>Troubleshooting</u> on p. 22. Before working on any part of the hydraulic system, always lower the carriage.

- 1. Remove the cover from the power unit.
- 2. Identify the lowering valve (port LL in the manifold) and remove it.
- 3. Use a thin tool to press the poppet in (from the bottom of the valve) and open the valve.
- 4. Repeat several times while immersing the valve in kerosene or mineral spirits.
- 5. Blow compressed air through the valve while holding it open as described in step 3.
- 6. Inspect O-rings and the PTFE washer (polytetrafluoroethylene). If either is damaged, replace it.
- 7. Reinstall the valve. The valve should be tightened to approximately 20 ft.-lb. of torque.

VELOCITY FUSE

In the base of the cylinder is a brass velocity fuse with a stainless steel spring. If a fitting begins to leak or a hose is punctured, the pivot arm descends rapidly. If the rate of descent exceeds the preset activation speed of the velocity fuse, the fuse closes. While the fuse is shut oil cannot flow. The pivot arm remains stationary until pressure is reestablished.

The velocity fuse can activate although no failure occurs (e.g. air gets into the hydraulic system). To be able to raise or lower the pivot arm requires resetting the velocity fuse. To reset the fuse, activate the pump by jogging the BLACK (or RAISE) button. Immediately lower the carriage and disconnect the drum from the saddle. Cycle the pivot arm by raising it all the way up and then bringing it all the way down. Do this several times to purge air from the system.

BLEEDING AIR FROM THE HYDRAULIC CIRCUIT

If the pivot arm lowers very slowly (or not at all), air probably is trapped in the hydraulic circuit. To remove air from the hydraulic circuit, follow these directions.

- 1. Lower the arm and disconnect the drum from the saddle.
- 2. A "bleeder" screw is located at the top of the cylinder. Loosen the bleeder screw by 1/4 to 1/2 turn to allow trapped air to escape. Jog the motor to push air out of the system.
- 3. Only clear hydraulic fluid will flow from the bleeder screw opening when air has been completely removed. At that point, reinstall the bleeder screw.

USING THE BATTERY CHARGER (HDC-DC UNITS ONLY)

Batteries contain sulfuric acid and produce explosive gases. A battery explosion could result in loss of eyesight and/or serious burns. Always have plenty of fresh water and soap nearby.

- DO NOT smoke near the battery or expose the battery to a spark or flame.
- ONLY charge batteries in dry, well-ventilated locations.
- DO NOT lay metallic items, like tools, on top of a battery.
- NEVER touch both terminals simultaneously! Remove personal jewelry items such as rings and watches.
- Operating the battery with low voltage can cause premature motor contact failure.
- The charger is equipped with an external ground wire (small green wire). During installation the charger must be grounded to the equipment. Be sure this wire is always connected to the chassis, frame, or other metallic surface considered to be ground.
- Remove accumulated deposits from the terminals. Confirm that all battery connections are sound.
- Replace defective electrical cords and wires immediately.
- DO NOT use the charger if the flanged inlet is damaged.
- DO NOT connect the charger to a damaged extension cord.

DC-powered drum carriers are equipped with an onboard battery charger with a flanged electrical inlet. The inlet projects through the cover/housing of the power unit. The user must provide a 3-prong charging cord appropriate for line and motor voltages. The charger is current limited and will not exceed its rated output even if loads are placed on the battery while it is charging. The charger fuse will blow if it is connected in reverse polarity. To charge the battery:

- 1) Plug an extension cord into the flanged inlet. Plug the other end of the cord into an 115V, 60 Hz receptacle (or receptacle that matches the unit's voltage rating). Use a short, thick extension cord to minimize voltage drop (no smaller than 18ga. or longer than 50 ft.).
- 2) The charge LED indicates the status of charge current flowing to the battery.
 - Red LED only: charger is providing full output to the battery.
 - Red and green LED's: charger is "topping off" the battery.
 - Green LED only: unit is providing a "float" (maintenance) charge.
 - DO NOT leave the charger on for long periods after the battery is fully charged.
- 3) Unplug the charger before using the unit to avoid damaging cords, receptacles, etc.

CHARGER TROUBLESHOOTING -- If the charger does not work:

- 1) Make sure all battery connections sound.
- 2) Confirm that the AC power source (e.g. wall socket) is supplying power.
- 3) Examine the fuse. See diagrams on pages 13-14 (DC-powered) or 16-17 (AC-powered). Replace only with a fuse having the same rating as the original fuse.
- 4) It will take time before current begins to flow through a highly sulfated battery.

USING THE BOOM ATTACHMENT

- 1) Prepare the load with appropriate rigging.
- 2) Attach the rigging to the load hook. The load hook must be centered above the load to prevent load swing when the boom lifts it off of the ground.
 - <u>NOTE</u>: The capacity of the unit while in crane configuration is 800 pounds (364kg). Rigging and all other equipment attached to the load must be added to the weight of the load to determine the net weight of the load. The net weight must be less than the capacity of the unit in crane configuration.
- 3) Slowly raise the load until it is suspended by the boom. Only raise the load a few inches above the ground.
 - a. The load should not swing as it rises.
 - b. The crane should not tip or rock when the load is suspended.
 - c. If the crane is unstable when the load is suspended, return the load to the ground and disconnect it from the hook. Do not use the crane to transport the load.
- 4) Transport the load by carefully/slowly pushing the crane. Only traverse even, level ground. Do not leave the crane while a load is suspended.

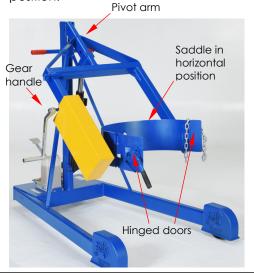
AWARNING Improper use might result in serious personal injuries.

- ONLY use the unit on <u>even</u>, <u>level</u>, improved surfaces capable of supporting the combined weight of the crane and a full capacity load.
- Stand clear of the load while raising and lowering it! ALWAYS watch the boom while raising and lowering a load. It should rise smoothly. Watch for binding or jerky movement and listen for unusual noises.
- Before leaving the crane unattended, unload it and relieve hydraulic pressure by turning the release lever counterclockwise until the boom begins to descend. Lower the boom completely; then close the release valve.
- Always tighten the shackle pin before each use. See <u>BOOM ATTACHMENT</u> on p. 3.

LIFTING DRUMS (STANDARD AND POWERED UNITS)

Only use this drum carrier on level, even, improved surfaces, i.e. concrete or asphalt, capable of supporting the combined weight of the unit and a full capacity load. Full capacity load = 800 pounds for all units; also refer to <u>SPECIFICATIONS</u> document, p. 3; refer to label 1153 in <u>LABELING DIAGRAM</u>, p. 23. For all models, capacity is reduced to 500 pounds whenever a drum is half-full or less.

1. Move the unit into position around the drum. Open the hinged saddle doors so the drum can fit inside the saddle. Use the gear handle (HDC-305-60) or gear chain (all of models) to adjust the rotation of the saddle. The saddle should be in the horizontal position.



- 4. Lift the drum just a few inches above the ground using either the foot pump (standard units) or modular power unit (HDC-DC and HDC-AC options):
 - Instructions for operating the foot pump appear on pages 8-11.
 - Instructions for operating the MPU are given on pages 15-17.

2. Adjust the elevation of the pivot arm to bring the top of the drum saddle into contact with the drum just below the middle rim of the drum. Close the hinged doors against the side of the drum.



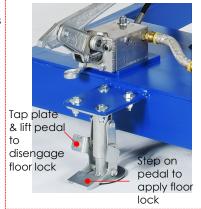
Top of saddle just below middle rim

3. Wrap the chain around the drum. Feed the chain through the chain clamp. Press down on the clamp handle to firmly pinch the chain between the bottom of the clamp handle and the clamp stud. There should be no slack in the chain when the clamp is properly applied. To release the clamp, see instruction 6 (below).



- 5. Apply the floor lock and elevate the drum as the application requires. Rotate the drum using either the gear handle or gear chain:
- HDC-305-60: turning a handle on the gear box rotates the saddle. Turn the handle clockwise to rotate the drum forwards.
 Turn it counter-clockwise to tip the drum backwards.
- All other models use a chain drive to rotate the saddle. Pull down the right side of the chain to rotate the saddle and drum forwards. Pulling on the left side of the chain rotates the saddle and drum backwards.





6. Rotate the drum to the upright position and return it to the ground (press the release lever or the white button on the handheld controller. Once the drum rests on the ground, press down on the clamp release (refer to step 3) and rotate the handle counterclockwise to release the chain.

INSPECTIONS & MAINTENANCE

Regular maintenance is required to keep this product in satisfactory condition.

- o Relieve hydraulic pressure whenever the unit is not in use by fully lowering the pivot arm.
- o Keep the product clean & dry. Lubricate moving parts at least once per month.
- o If repairs are necessary, only install manufacturer-approved replacement parts. Vestil is not responsible for issues or malfunctions that result from the use of unapproved replacement parts.
- ONLY use ISO AW-32 hydraulic fluid or its equal in the hydraulic system. Do not use brake fluid or jack oils in the hydraulic system. If oil is needed, use an anti-wear hydraulic oil with a viscosity grade of 150 SUS at 100°F, (ISO 32 cSt @ 40°C), or Dexron transmission fluid.

RECORD OF SATISFACTORY CONDITION - Before using the unit for the first time, make a written record of its appearance. Include observations about each component. Include details about the appearance and function of the saddle, chain clamp, and gear train mechanisms. How much effort is required to turn the saddle handle (HDC-305-60) or to pull the gear chain (all other models)? Raise and lower the pivot arm. Include observations about how the unit sounds as the arm rises and descends. Make note of how much effort is required to move the pump pedal (standard models) or how quickly the unit responds to pushbutton signals (electric powered models). Install the boom attachment (see p. 3) and apply a full capacity load. Record observations about how the frame and boom respond to the load. Photograph the unit from multiple perspectives. Include close range photos of all features listed in subparts (A) and (B) (below). Collect all writings and photos in a file. This file is a record of the unit in satisfactory condition. DO NOT use the unit unless it is in satisfactory condition.

(A) <u>Before Each Use</u>--Inspect the following:

- 1. Wiring: inspect the electrical wiring for cuts and frays.
- 2. <u>Casters</u>: examine the casters. Casters should be solidly fastened to the frame. Look for areas of severe wear and damage. Each caster should roll smoothly and without wobbling.
- 3. Hydraulic hoses: check for pinches, punctures, and loose connections.
- 4. Frame elements: inspect the legs, vertical members, and braces for cracked welds, bends, etc.
- 5. Saddle and pivot arm: visually examine the saddle and arm for damage.
- 6. <u>Pushbutton controller and modular power unit (MPU)</u>: inspect the controller and look for damage that exposes internal components. Make sure that the cover of the MPU is not punctured or in other ways noticeably damaged.

(B) Monthly Inspections--at least once per month check the following:

- 1. Oil level: oil should be 1" to 1-1/2" below the top of the tank with the arm in the lowered position. Add oil as necessary. Look for oil leaks, e.g. from hoses, the cylinder, or the reservoir.
- 2. <u>MPU, hand control, and battery (electric powered models only)</u>: Remove the cover of the MPU and visually inspect the components. Check the water level in the battery. Check for worn or damaged hydraulic hoses, electrical wires, and cords. Repair as necessary.
- 3. Clevis pins and pivot points: inspect for excessive wear.
- 4. <u>Cylinder, foot pump or modular power unit</u>: confirm that the cylinder extends and retracts smoothly. The cylinder should not be bent, cracked, etc. No more than normal effort should be required to work the foot pump.
- 5. Chains: inspect chain links for elongations, breaks, etc.
- 6. <u>Saddle and pivot arm</u>: observe the arm as it cycles up and down. Make note of unusual noise and motion (e.g. binding). Rotate the saddle in both directions. Watch and listen for unusual behaviors.
- 7. <u>Labels</u>: confirm labels are in place, undamaged, & easily readable. See <u>LABELING DIAGRAM</u>, p. 23.
- 8. (Boom attachment) Boom, load hook, & shackle: Closely examine the boom, particularly the mounting bracket, load hook & shackle. Refer to BOOM ATTACHMENT on p. 3. Confirm that the safety latch (of the hook) operates correctly. The mounting bracket must be square, rigid, and free of cracks and significant bends. Pin holes (in mounting bracket & pivot arm) should not be elongated.
- 9. Surfaces: wash the unit to remove dirt and debris.

(C) Yearly Inspection

Hydraulic oil should be changed at least once a year or sooner if the oil darkens or becomes gritty. Oil should also be changed if it has a milky appearance, which indicates that water is present. If oil is needed, use HO150 hydraulic fluid. Any anti-wear hydraulic fluid with a viscosity grade of 150 SUS at 100° F (ISO 32 @ 40° C) such as AW32 or Dexron transmission fluid is acceptable. Flush the reservoir with new oil before refilling it.

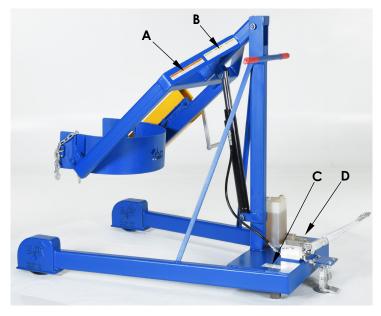
TROUBLESHOOTING (HDC-DC & HDC-AC)

Contact <u>TECHNICAL SERVICE</u> to resolve issues not addressed in this guide. Also refer to the <u>MPU-AC-GEN2</u> or <u>MPU-DC-GEN2</u> manual.

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breather cap, or a hose is pinched. m. Low motor voltage. n. Unit overloaded. n. Low motor voltage, n. Unit overloaded. n. Low motor voltage, n. Unit overloaded. n. Low motor voltage, n. Unit overloaded. n. Low it is occurs, pump can be permanently damaged. r. Binding cylinder. r. Rinding cylinder. r. Finding cylinder. r. Finding cylinder. r. Finding cylinder. r. Finding cylinder. r. Foreign material in flow control valve. r. Foreign material in velocity fuse. r. Foreign material in velocity fuse. r. Foreign material in velocity fuse. r. Finding cylinders correctly. r. Finding cylinders. r. Foreign material in velocity fuse. r. Align cylinders correctly. r. Align cylinder correctly.		I. Foreign material clogging suction filter or	I. Correct as appropriate. See also, 2(f), (h).
m. Low motor voltage. n. Unit overloaded. o. Inoperative pump. p. (HDC-DC) Battery voltage too low. q. Oil starvation causing pump to bind & overheat. [NOTE: If this occurs, pump can be permanently damaged.] r. Binding cylinder. s. Flivot arm rises in jerks or is spongy when elevated. f. Air in system. spongy when elevated. c. Pinched tube or hose. w. Foreign material in flow control valve. y. Foreign material in velocity fuse. s. Fivot arm lowers too quickly. c. Pivot arm lowers too quickly. s. Binding cylinders. y. Foreign material stuck in flow control valve. g. Pivot arm lowers too quickly. c. Lowering solenoid valve may be incorrectly when so mits own. s. Pivot arm lowers too duickly. c. Cleck valve stuck open. b. Check valve stuck open. b. Check valve stuck open. c. Ledking boses, fiftings, pipes. d. Cylinder packing is wom or damaged. g. Faulty lowering solenoid valve wiring. ff. Lowering solenoid valve is stuck. h. Binding cylinders. ii. Air present in the hydraulic system. m. See 1 (b). n. See 2 (d). p. See 2 (d), (f), (g), (f) c. See 2 (d), (f), (g), (g) c. See 2 (d			
o. Inoperative pump. d. Motor labors or is extremely hot. p. [HDC-DC] Battlery voltage too low. q. Oil starvation causing pump to bind & overheat. [NOTE: If this occurs, pump can be permanently damaged.] r. Binding cylinder. s. Flivot arm rises in jerks or is spongy when elevated. f. Air in system. s. Flivot arm lowers too slowly when loaded. v. Pinched tube or hose. w. Foreign material in flow control valve. x. Binding cylinders. y. Foreign material in velocity fuse. 7. Pivot arm lowers too quickly. 2. Foreign material stuck in flow control valve. (In this case, carriage initially lowers at a normal rate but accelerates as the carriage descends). 8. Pivot arm rises then slowly lowers on its own. 2. Pivot arm elevates but does not lower. 9. Pivot arm elevates but does not lower. 9. Pivot arm elevates but does not lower. 9. Pivot arm elevates but does not lower. 1. Binding cylinders. y. Foreign material stuck in flow control valve. (In this case, carriage initially lowers at a normal rate but accelerates as the carriage descends). 2. Remove and clean velocity fuse. Provincers on p. 1.7. 2. Remove flow control valve from the valve block and clean. Refer to Hydraulic Circuit Diagram on p. 1.7. 2. Remove and clean check valve. cc. See 2 (c). 3. See 2 (d), (f), (g), (j) 1. See 2 (d), (f)			m. See 1 (b).
4. Motor labors or is extremely hot. 4. Motor labors or is extremely hot. 5. Pivot arm ises in jerks or is spongy when elevated. 5. Pivot arm lowers too slowly when loaded. 6. Pivot arm lowers too slowly when loaded. 7. Pivot arm lowers too slowly when loaded. 7. Pivot arm lowers too slowly when loaded. 7. Pivot arm lowers too slowly when loaded. 8. Pivot arm lowers too quickly. 7. Pivot arm lowers too quickly. 8. Pivot arm lowers too quickly. 9. Pivot arm lowers too quickly. 10. Lowering solenoid valve filter screen clogged. 10. Lowering solenoid valve filter screen clogged. 10. Lowering solenoid valve filter screen clogged. 10. Lowering solenoid valve and clean filter screen. 10. Remove lowering solenoid valve and clean filter screen. 10. Remove lowering solenoid valve and clean filter screen. 10. Remove lowering solenoid valve and clean filter screen. 10. Remove lowering solenoid valve and clean filter screen. 10. Remove lowering solenoid valve and clean filter screen. 10. Remove lowering solenoid valve and clean filter screen. 10. Remove lowering solenoid valve and clean filter screen. 10. Remove lowering solenoid valve and clean filter screen. 10. Remove lowering solenoid valve and clean filter screen. 10. Remove lowering solenoid valve and clean filter screen. 10. Remove lowering solenoid valve and clean filter screen. 10. Remove lowering solenoid valve and clean filter screen. 10. Remove lowering solenoid valve and clean filter screen. 10. Remove lowering solenoid valve and clean filter screen. 10. Remove lowering solenoid valve and clean filter screen. 10. Remove lowering solenoid valve and clean filter screen. 10. Remove lowering solenoid valve and clean filter screen. 10. Remove lowering solenoid valve and clean filter screen. 10. Remove lowering solenoid valve screen. 10. Remove flow control valve from the block because the carriage will descend dangerously quickly. 10. Remove lowering solenoid valve wiring solenoid valve wiring. 11. Lie screen. 12. Remove flow c		n. Unit overloaded.	n. See 2 (e).
hot. a, Oil starvation causing pump to bind & overheat. [NOTE: If this occurs, pump can be permanentily damaged.] f. Binding cylinder. 5. Pivot arm rises in jerks or is spongy when elevated. 6. Pivot arm lowers too slowly when loaded. 7. Pivot arm lowers too slowly when loaded. 8. Pivot arm lowers too slowly when loaded. 9. Pivot arm lowers too guickly. 7. Pivot arm lowers too quickly. 8. Pivot arm lowers too quickly. 9. Pivot arm lowers too quickly. 8. Pivot arm lowers too quickly. 9. Pivot arm lowers too quickly. 10. Lowering solenoid valve and clean filter screen. 11. Zeroeign material in velocity fuse. 12. Foreign material stuck in flow control valve. (In this case, carriage initially lowers at a normal rate but accelerates as the carriage descends). 13. Pivot arm rises then slowly lowers on its own. 14. Air ri system. 15. Pivot arm lowers too guickly. 16. Pivot arm lowers too dickly. 17. Pivot arm lowers too quickly. 28. Pivot arm rises then slowly lowers on its own. 29. Pivot arm elevates but does not lower. 20. Remove and clean flow control valve. Refer to Hydraulic Circuit Diagram on p. 17. 20. Remove and clean reloative from the valve block and clean. Refer to Hydraulic Circuit Diagram on p. 17. 21. Remove flow control valve from the valve block and clean. Refer to Hydraulic Circuit Diagram on p. 17. 22. Remove and clean clean clean the valve block and clean. Refer to Hydraulic Circuit Diagram on p. 17. 23. Remove and clean clean clean the valve block because the carriage will be decared and percusty quickly. 24. Remove and clean clean clean the valve block because the carriage will descend dangerously quickly. 25. See 2 (c). 26. Remove and clean clean flow control valve and clean clean flow control valve arm clean fliter screen. 27. Remove and clean clean flow control valve arm clean fliter screen.		o. Inoperative pump.	o. See 2 (j).
overheat. [NOTE: If this accurs, pump can be permanently damaged.] r. Binding cylinder. s. Fivot arm rises in jerks or is sprongy when elevated. s. Fivot arm lowers too slowly when loaded. s. Pivot arm lowers too slowly when loaded. s. Pinched tube or hose. w. Foreign material in flow control valve. y. Foreign material in velocity fuse. 7. Pivot arm lowers too quickly. s. Binding cylinders. y. Foreign material stuck in flow control valve. this case, carriage initially lowers at a normal rate but accelerates as the carriage descends). s. Pivot arm rises then slowly lowers on its own. s. Pivot arm given the stuck open. c. Leaking hoses, fiftings, pipes. dd. Cylinder packing is worn or damaged. c. Leaking hoses, fiftings, pipes. dd. Cylinder packing is worn or damaged. f. Align cylinder correctly. s. See 2 (a), (b) (g), (f) (g), (g) s. See 2 (a), (g), (g), (g) see (an interval spendiod valve and clean fibraction on p. 17. s. Align cylinders correctly. s. Align cylinder correctly. s. See 2 (a), (f) (g), (g) s. See 2 (a), (f) (g), (g), (g) s. See 2 (a), (g), (g), (g) see (an interval spendiod valve correctly on p. 18. s. Align cylinder correctly. s. A	4. Motor labors or is extremely		
overheat. [NOTE: If this accurs, pump can be permanently damaged.] r. Binding cylinder. s. Fivot arm rises in jerks or is sprongy when elevated. s. Fivot arm lowers too slowly when loaded. s. Pivot arm lowers too slowly when loaded. s. Pinched tube or hose. w. Foreign material in flow control valve. y. Foreign material in velocity fuse. 7. Pivot arm lowers too quickly. s. Binding cylinders. y. Foreign material stuck in flow control valve. this case, carriage initially lowers at a normal rate but accelerates as the carriage descends). s. Pivot arm rises then slowly lowers on its own. s. Pivot arm given the stuck open. c. Leaking hoses, fiftings, pipes. dd. Cylinder packing is worn or damaged. c. Leaking hoses, fiftings, pipes. dd. Cylinder packing is worn or damaged. f. Align cylinder correctly. s. See 2 (a), (b) (g), (f) (g), (g) s. See 2 (a), (g), (g), (g) see (an interval spendiod valve and clean fibraction on p. 17. s. Align cylinders correctly. s. Align cylinder correctly. s. See 2 (a), (f) (g), (g) s. See 2 (a), (f) (g), (g), (g) s. See 2 (a), (g), (g), (g) see (an interval spendiod valve correctly on p. 18. s. Align cylinder correctly. s. A	hot.	q. Oil starvation causing pump to bind &	q. See 2 (d), (f), (g), (h), (j)
f. Binding cylinder. 5. Pivot arm rises in jerks or is spongy when elevated. 5. Pivot arm lowers too slowly when loaded. 6. Pivot arm lowers too slowly when loaded. 6. Pivot arm lowers too slowly when loaded. 7. Pivot arm lowers too slowly when loaded. 8. Binding cylinders. 9. Pivot arm lowers too quickly. 7. Pivot arm lowers too quickly. 8. Pivot arm lowers too quickly. 9. Pivot arm lowers too quickly. 8. Pivot arm siess then slowly lowers an is own. 9. Pivot arm elevates but does not lower. 9. Pivot arm elevates but does not lower. 1. Binding cylinders. 1. Air present in the hydraulic system. 1. See "Bleeding air from the hydraulic circuit" on p. 18. 1. See "Bleeding air from the hydraulic circuit" on p. 18. 1. See "Bleeding air from the hydraulic circuit" on p. 18. 1. See "Bleeding air from the hydraulic circuit" on p. 18. 1. See "Bleeding air from the hydraulic circuit" on p. 18. 1. See "Bleeding air from the hydraulic circuit" on p. 18. 1. See "Bleeding air from the hydraulic circuit" on p. 18. 1. See "Bleeding air from the hydraulic air flow care loaged. 1. See "Bleeding air from the hydraulic circuit" on p. 18. 1. See "Bleeding air from the hydraulic circuit" on p. 18. 1. See "Bleeding air from the hydraulic circuit" on p. 18. 1. See "Bleeding air from the hydraulic circuit" on p. 18. 1. See "Bleeding air from the hydraulic circuit" on p. 18. 2. Correct as appropriate. 2. Correct as appropriate. 2. Correct as appropriate. 2. Remove and clean flow control valve. Refer to Hydraulic Circuit Diagram on p. 17. 2. Remove flow control valve from the valve block and clean. Refer to Hydraulic Circuit Diagram on p. 17. 2. Remove flow control valve from the valve lock and clean. Refer to Hydraulic Circuit Diagram on p. 17. 2. Remove flow control valve from the valve lock and clean. Refer to Hydraulic Circuit Diagram on p. 17. 2. Remove flow control valve from the valve lock and clean flow control valve from the valve lock and clean. Refer to Hydraulic Circuit Diagram on p. 18. 2		overheat. [NOTE: If this occurs, pump can be	
5. Flivot arm isses in jerks or is spongy when elevated. 5. Flivot arm lowers too slowly when loaded. 6. Pivot arm lowers too slowly when loaded. 7. Pivot arm lowers too quickly. 7. Pivot arm lowers too quickly. 8. Pivot arm lowers too quickly. 8. Pivot arm sies then slowly lowers on its own. 8. Pivot arm elevates but does not lower. 9. Pivot arm elevates but does not lower. 1. Air in system. 1. See "Bleeding air from the hydraulic circuit" on p. 17. 2. Remove and clean the valve block and clean. Refer to Hydraulic Circuit Diagram on p. 17. 2. Remove flow control valve from the block valve. 2. See 3 (k). 2. See 3 (k). 2. Benove and clean check valve. 3. See 2 (c). 4. Replace		permanently damaged.]	
t. Air in system. t. See "Bleeding air from the hydraulic circuit" on p. 18. u. Remove lowering solenoid valve and clean filter screen. v. Correct as appropriate. w. Remove and clean flow control valve. Refer to Hydraulic Circuit Diagram on p. 17. x. Align cylinders correctly. y. Remove and clean velocity fuse. Refer to Hydraulic Circuit Diagram on p. 17. x. Air present in the hydraulic Circuit Diagram on p. 17. x. Air present in the hydraulic Circuit Diagram on p. 17. a. Remove and clean check valve block and clean. Refer to Hydraulic Circuit Diagram on p. 17. a. See 3 (k). b. Remove and clean check valve. c. See 2 (c). d. Replace packing (contact factory for replacement parts). e. Correct per bydraulic Circuit Diagram on p. 17. x. Align cylinders correctly. y. Remove and clean check valve block and clean. Refer to Hydraulic Circuit Diagram on p. 17. a. See 3 (k). b. Remove and clean check valve. c. See 2 (c). d. Replace packing (contact factory for replacement parts). e. Correct per diagram (p. 13 (DC) or 16 (AC)). ff. Lightly tap down the solenoid coil body to seat if properly. DO NOT if it coil hard as it will permanently damage the internal system. DO NOT remove the carriage will lower in an uncontrolled manner. hh. See 4 (r). ii. Air present in the hydraulic system causing ii. Air present in the hydraulic system causing iii. Air pressurize the hydraulic system.			
6. Pivot arm lowers too slowly when loaded. 7. Pivot arm lowers too quickly. 8. Pivot arm lowers too quickly. 8. Pivot arm lowers too quickly. 8. Pivot arm rises then slowly lowers on its own. 8. Pivot arm elevates but does not lower. 9. Pivot arm elevates but does not lower. 10. Lowering solenoid valve filter screen clogged. 11. V. Remove lowering solenoid valve. Refer to Hydraulic Circuit Diagram on p. 17. 12. Remove and clean velocity fuse. Refer to Hydraulic Circuit Diagram on p. 17. 13. Remove flow control valve from the valve block and clean. Refer to Hydraulic Circuit Diagram on p. 17. 14. Remove flow control valve from the valve block and clean. Refer to Hydraulic Circuit Diagram on p. 17. 15. Remove and clean check valve. 16. See 3 (k). 17. Pivot arm elevates but does not lower. 18. Pivot arm elevates but does not lower in golenoid valve wiring. 19. Pivot arm elevates but does not lower. 19. Pivot arm elevates but does not lower in golenoid valve is stuck. 19. Pivot arm elevates but does not lower in golenoid valve is stuck. 19. Pivot arm elevates but does not lower in golenoid valve wiring. 19. Pivot arm elevates but does not lower in golenoid valve is stuck. 10. Lightly tap down the solenoid coil body to seat it property. Do NOT into coil hard as it will permanently damage the internal system. Do NOT remove the lowering solenoid valve from the block because the carriage will lower in an uncontrolled manner. 10. Remove and replace. Do NOT remove the lowering solenoid valve from the block because the carriage will lower in an uncontrolled manner. 11. To unlock, pressurize the hydraulic system.	5. Pivot arm rises in jerks or is	s. Fluid starvation.	
4. Pivot arm lowers too slowly when loaded. 4. V. Pinched tube or hose. 5. V. Pinched tube or hose. 6. V. Pinched tube or hose. 7. Pivot arm lowers too quickly. 8. Pivot arm lowers too quickly. 8. Pivot arm lowers too quickly. 8. Pivot arm ises then slowly lowers on its own. 8. Pivot arm elevates but does not lower. 9. Pivot arm lowers too slowly lowers are levates as the carriage descends and lowers or lowering solenoid valve and clean filter screen. 9. Pivot arm lowers too quickly. 1. Foreign material stuck in flow control valve. 1. Earnove flow control valve and clean filter screen. 1. Correct as appropriate. 1. Remove and clean flow control valve. Refer to Hydraulic Circuit Diagram on p. 17. 2. Remove flow control valve. Refer to Hydraulic Circuit Diagram on p. 17. 3. Remove flow control valve in property. 4. Align cylinders correctly. 5. Pivot arm lowers too quickly. 5. Foreign material stuck in flow control valve. 6. Remove flow control valve and clean flow control valve. Refer to Hydraulic Circuit Diagram on p. 17. 7. Pivot arm lowers too quickly. 8. Pivot arm ises then slowly lowering solenoid valve may be incorrectly with and clean flow control valve. Refer to Hydraulic Circuit Diagram on p. 17. 7. Pivot arm ises then slowly lowers at a normal rate but accelerates as the carriage descends). 8. Pivot arm rises then slowly lowering solenoid valve may be incorrectly with and clean flow control valve. Refer to Hydraulic Circuit Diagram on p. 17. 8. Remove flow control valve flow the valve block and clean flow control valve flow the valve block and clean flow control valve flow the valve block and clean flow control valve flow the valve block and clean flow control valve flow the sole of the Hydraulic Circuit Diagram on p. 17. 8. Prove flow control valve flom the valve block and clean flow control valve flow the valve block and clean flow control valve fl			
when loaded. v. Pinched tube or hose. w. Foreign material in flow control valve. v. Pinched tube or hose. w. Foreign material in flow control valve. v. Binding cylinders. y. Foreign material in velocity fuse. 7. Pivot arm lowers too quickly. T. Pivot arm lowers too quickly. 7. Pivot arm lowers too quickly. 8. Pivot arm rises then slowly lowers on its own. 8. Pivot arm rises then slowly lowers on its own. 9. Pivot arm elevates but does not lower. 9. Pivot arm elevates but does not lowering solenoid valve is stuck. 9. Pivot arm elevates but does not lowering solenoid valve wiring. 9. Pivot arm elevates but does not lowering solenoid valve wiring. 9. Pivot arm elevates but does not lowering solenoid valve wiring. 9. Pivot arm elevates but does not lowering solenoid valve wiring. 9. Pivot arm elevates but does not lowering solenoid valve wiring. 9. Pivot arm elevates but does not lowering solenoid valve wiring. 9. Pivot arm elevates but does not lowering solenoid valve wiring. 9. Pivot arm elevates but does not lowering solenoid valve wiring. 9. Pivot arm elevates but does not lowering solenoid valve wiring. 9. Pivot arm elevates but does not lowering solenoid valve wiring. 9. Pivot arm elevates but does not lowering solenoid valve wiring. 10. Lowering solenoid valve from the block because the carriage will descend dangerously quickly. 11. Lowering solenoid valve from the block because the carriage will	spongy when elevated.	t. Air in system.	
v. Pinched tube or hose. w. Foreign material in flow control valve. x. Binding cylinders. y. Foreign material in velocity fuse. 7. Pivot arm lowers too quickly. 2. Foreign material stuck in flow control valve. (In this case, carriage initially lowers at a normal rate but accelerates as the carriage descends). 8. Pivot arm rises then slowly lowers on its own. 8. Pivot arm sees then slowly lowers on its own. 9. Pivot arm elevates but does not lower. 9. Pivot arm elevates but does not lower. 9. Pivot arm elevates but does not lower. 17. Pivot arm elevates but does not lower. 18. Pivot arm sees then slowly lowers on its own. 18. Pivot arm sees then slowly lowers on its own. 18. Pivot arm sees then slowly lowers on its own. 29. Pivot arm elevates but does not lower. 20. Pivot arm elevates but does not lower solenoid valve is stuck. 21. Remove and clean check valve. 22. Remove and clean check valve. 23. See 3 (k). 24. Beplace packing (contact factory for replacement parts). 25. Elevating is worn or damaged. 26. Correct per diagram (p. 13 (DC) or 16 (AC)). 27. If. Lightly tap down the solenoid coil body to seat it properly. DO NOT if coil hord as it will permanently damage the internal system. DO NOT remove the solenoid valve from the block because the carriage will descend dangerously quickly. 27. Remove and clean check valve. 28. Pivot arm sies then slowly lowering solenoid valve wiring. 29. Pivot arm elevates but does not lowering solenoid valve wiring. 20. See 2 (c). 21. Cercuit Diagram on p. 17. 22. Remove and clean check valve. 23. See 2 (c). 24. Replace packing (contact factory for replacement parts). 24. Elevation Circuit Diagram on p. 17. 25. Remove and clean check valve. 26. See 2 (c). 27. Align cylinders. 28. Pivot ar		·	<u>18</u> .
w. Foreign material in flow control valve. x. Binding cylinders. y. Foreign material in velocity fuse. 7. Pivot arm lowers too quickly. 8. Pivot arm rises then slowly lowers on its own. 8. Pivot arm elevates but does not lower. 9. Pivot arm elevates but does not lower. 1. Each property lowering solenoid valve is stuck. 1. Each property lowering solenoid coil. 1. Each property lowering solenoid valve wiring. fil. Lowering solenoid valve is stuck. 2. Remove and clean flow control valve. Refer to Hydraulic Circuit Diagram on p. 17. 2. Remove flow control valve from the valve block and clean. Refer to Hydraulic Circuit Diagram on p. 17. 2. Remove and clean clean clean clean clean valve is stuck. 3. Remove and clean flow control valve from the valve lower. 4. Align cylinders. 1. Align cylinders valve. In this case, carriage initially lowers at a normal rate but accelerates as the carriage descends). 4. Remove and clean flow control valve. Refer to Hydraulic Circuit Diagram on p. 17. 5. Remove and clean clean clean clean valve block and clean. Refer to Hydraulic Circuit Diagram on p. 17. 2. Remove and clean clean valve block and clean clea	6. Pivot arm lowers too slowly	·	18. U. Remove lowering solenoid valve and clean filter
Hydraulic Circuit Diagram on p. 17. x. Align cylinders correctly. y. Foreign material in velocity fuse. Hydraulic Circuit Diagram on p. 17. x. Align cylinders correctly. y. Remove and clean velocity fuse. Refer to Hydraulic Circuit Diagram on p. 17. z. Remove flow control valve from the valve block and clean. Refer to Hydraulic Circuit Diagram on p. 17. z. Remove flow control valve from the valve block and clean. Refer to Hydraulic Circuit Diagram on p. 17. z. Remove flow control valve from the valve block and clean. Refer to Hydraulic Circuit Diagram on p. 17. z. Remove flow control valve from the valve block and clean. Refer to Hydraulic Circuit Diagram on p. 17. z. Remove flow control valve from the valve block and clean. Refer to Hydraulic Circuit Diagram on p. 17. z. Remove flow control valve from the valve block and clean. Refer to Hydraulic Circuit Diagram on p. 17. z. Remove flow control valve from the valve block and clean. Refer to Hydraulic Circuit Diagram on p. 17. z. Remove flow control valve from the valve block and clean. Refer to Hydraulic Circuit Diagram on p. 17. z. Align cylinders carriage descends. z. Remove flow control valve from the valve block and clean. Refer to Hydraulic Circuit Diagram on p. 17. z. Remove flow control valve from the valve block and clean. Refer to Hydraulic Circuit Diagram on p. 17. z. Remove flow control valve from the valve block and clean. Refer to Hydraulic Circuit Diagram on p. 17. z. Remove flow control valve from the valve block and clean. Refer to Hydraulic Circuit Diagram on p. 17. z. Remove and clean. Refer to Hydraulic Securit Diagram on p. 17. z. Remove and clean. Refer to Hydraulic Securit Diagram on p. 17. z. Remove and clean. Refer to Hydraulic Securit Diagram on p. 17. z. Remove and clean. Refer to Hydraulic Securit Diagram on p. 17. z. Remove and clean. Refer to Hydraulic Securit Diagram on p. 17. z. Remove and clean. Refer to Hydraulic Securit Diagram on p. 17. z. Remove and clean. Refer to Hydrauli		u. Lowering solenoid valve filter screen clogged.	18. u. Remove lowering solenoid valve and clean filter screen.
x. Binding cylinders. y. Foreign material in velocity fuse. y. Foreign material in velocity fuse. y. Remove and clean velocity fuse. Refer to Hydraulic Circuit Diagram on p. 17. z. Foreign material stuck in flow control valve. (In this case, carriage initially lowers at a normal rate but accelerates as the carriage descends). s. Pivot arm rises then slowly lowers on its own. 8. Pivot arm rises then slowly lowers on its own. 8. Pivot arm rises then slowly lowers on its own. 9. Pivot arm elevates but does not lower. 10. Lowering solenoid valve is stuck. 11. Lightly tap down the solenoid coil body to seat it properly. DO NOT it coil hard as it will permanently damage the internal system. DO NOT remove the solenoid valve from the block because the carriage will lower in an uncontrolled manner. hh. Binding cylinders. 11. Lightly resource to Properly. Do Not remove the lowering solenoid valve from the block because the carriage will lower in an uncontrolled manner. hh. See 4 (r). 12. Remove and clean check valve and clean. Refer to Hydraulic Circuit Diagram on p. 17. 2. Remove flow control valve from the valve block and clean. Refer to Hydraulic Circuit Diagram on p. 17. 2. Remove and clean check valve and see and clean check valve. 2. Remove and clean check valve and see a (k). 3. Remove and clean check valve and See 3 (k). 4. Replace packing (contact factory for replacement parts). 4. Replace packing (contact factory for replacement parts). 4. Replace packing is warm or damaged. 5. Remove and clean check valve. 6. Corect per diagram (p. 13 (DC) or 16 (AC))	6. Pivot arm lowers too slowly	U. Lowering solenoid valve filter screen clogged. v. Pinched tube or hose.	U. Remove lowering solenoid valve and clean filter screen. V. Correct as appropriate.
y. Foreign material in velocity fuse. y. Remove and clean velocity fuse. Refer to Hydraulic Circuit Diagram on p. 17. z. Remove flow control valve for the valve block and clean. Refer to Hydraulic Circuit Diagram on p. 17. z. Remove flow control valve from the valve block and clean. Refer to Hydraulic Circuit Diagram on p. 17. z. Remove flow control valve from the valve block and clean. Refer to Hydraulic Circuit Diagram on p. 17. a. Lowering solenoid valve may be incorrectly wired or is stuck open bb. Check valve stuck open. cc. Leaking hoses, fittings, pipes. dd. Cylinder packing is worn or damaged. 9. Pivot arm elevates but does not lower. ee. Incorrect lowering solenoid valve wiring. ff. Lowering solenoid valve is stuck. ee. Incorrect per diagram (p. 13 (DC) or 16 (AC)). ff. Lightly tap down the solenoid coil body to seat it properly. DO NOT hit coil hard as it will permanently damage the internal system. DO NOT remove the solenoid valve from the block because the carriage will descend dangerously quickly. gg. Remove and replace. DO NOT remove the lowering solenoid valve from the block because the carriage will lower in an uncontrolled manner. hh. Binding cylinders. ii. Air present in the hydraulic system causing	6. Pivot arm lowers too slowly	U. Lowering solenoid valve filter screen clogged. v. Pinched tube or hose.	U. Remove lowering solenoid valve and clean filter screen. V. Correct as appropriate. W. Remove and clean flow control valve. Refer to
7. Pivot arm lowers too quickly. 2. Foreign material stuck in flow control valve. (In this case, carriage initially lowers at a normal rate but accelerates as the carriage descends). 8. Pivot arm rises then slowly lowers on its own. 8. Pivot arm rises then slowly lowers on its own. 9. Pivot arm elevates but does not lower. 10. Can Lowering solenoid valve may be incorrectly wired or is stuck open. 11. Can Lowering solenoid valve may be incorrectly wired or is stuck open. 12. Can Lowering solenoid valve may be incorrectly wired or is stuck open. 13. Can Lowering solenoid valve may be incorrectly wired or is stuck open. 14. Can Lowering solenoid valve may be incorrectly wired or is stuck open. 15. Can See 3 (k). 16. Remove and clean check valve. 17. Can Lower to Hydraulic See 2 (c). 18. Can Lower to Hydraulic Circuit Diagram on p. 17. 28. Remove flow control valve from the valve block and clean. Refer to Hydraulic Circuit Diagram on p. 17. 29. Remove and clean check valve. 20. See 2 (c). 20. Remove and clean check valve. 21. Can Lower to Hydraulic See 2 (c). 22. Remove and clean check valve. 23. See 3 (k). 24. Replace packing (contact factory for replacement parts). 25. End Hydraulic See 3 (k). 26. See 2 (c). 27. Can Lower to Hydraulic See 3 (k). 27. Can Lower to Hydraulic See 3 (k). 28. Remove and clean check valve. 29. Can Lower to Hydraulic See 3 (k). 20. See 3 (k). 20. See 3 (k). 21. Can Lower to Hydraulic Circuit Diagram on p. 17. 27. Remove and clean check valve. 28. Can See 3 (k). 29. Remove and clean check valve. 29. Can Lower to Hydraulic See 3 (k). 20. See 3 (k). 20. See 3 (k). 20. See 3 (k). 21. Can Lower to Hydraulic Circuit Diagram on p. 17. 20. Lower to Hydraulic Circuit Diagram on p. 17. 20. Lower to Hydraulic Circuit Diagram on p. 17. 21. Can Lower to Hydraulic Circuit Diagram on p. 17. 21. Can Lower to Hydraulic Circuit Diagram o	6. Pivot arm lowers too slowly	u. Lowering solenoid valve filter screen clogged. v. Pinched tube or hose. w. Foreign material in flow control valve.	U. Remove lowering solenoid valve and clean filter screen. V. Correct as appropriate. W. Remove and clean flow control valve. Refer to Hydraulic Circuit Diagram on p. 17.
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gg. Faulty lowering solenoid coil. gg. Remove and replace. DO NOT remove the lowering solenoid valve from the block because the carriage will lower in an uncontrolled manner. hh. See 4 (r). ii. Air present in the hydraulic system causing	6. Pivot arm lowers too slowly when loaded. 7. Pivot arm lowers too quickly. 8. Pivot arm rises then slowly lowers on its own. 9. Pivot arm elevates but does	u. Lowering solenoid valve filter screen clogged. v. Pinched tube or hose. w. Foreign material in flow control valve. x. Binding cylinders. y. Foreign material in velocity fuse. z. Foreign material stuck in flow control valve. (In this case, carriage initially lowers at a normal rate but accelerates as the carriage descends). aa. Lowering solenoid valve may be incorrectly wired or is stuck open bb. Check valve stuck open. cc. Leaking hoses, fittings, pipes. dd. Cylinder packing is worn or damaged. ee. Incorrect lowering solenoid valve wiring.	18. U. Remove lowering solenoid valve and clean filter screen. v. Correct as appropriate. w. Remove and clean flow control valve. Refer to Hydraulic Circuit Diagram on p. 17. x. Align cylinders correctly. y. Remove and clean velocity fuse. Refer to Hydraulic Circuit Diagram on p. 17. z. Remove flow control valve from the valve block and clean. Refer to Hydraulic Circuit Diagram on p. 17. aa. See 3 (k). bb. Remove and clean check valve. cc. See 2 (c). dd. Replace packing (contact factory for replacement parts). ee. Correct per diagram (p. 13 (DC) or 16 (AC)). ff. Lightly tap down the solenoid coil body to seat it properly. DO NOT hit coil hard as it will permanently damage the internal system. DO NOT remove the
lowering solenoid valve from the block because the carriage will lower in an uncontrolled manner. hh. See 4 (r). ii. Air present in the hydraulic system causing	6. Pivot arm lowers too slowly when loaded. 7. Pivot arm lowers too quickly. 8. Pivot arm rises then slowly lowers on its own. 9. Pivot arm elevates but does	u. Lowering solenoid valve filter screen clogged. v. Pinched tube or hose. w. Foreign material in flow control valve. x. Binding cylinders. y. Foreign material in velocity fuse. z. Foreign material stuck in flow control valve. (In this case, carriage initially lowers at a normal rate but accelerates as the carriage descends). aa. Lowering solenoid valve may be incorrectly wired or is stuck open bb. Check valve stuck open. cc. Leaking hoses, fittings, pipes. dd. Cylinder packing is worn or damaged. ee. Incorrect lowering solenoid valve wiring.	18. U. Remove lowering solenoid valve and clean filter screen. V. Correct as appropriate. W. Remove and clean flow control valve. Refer to Hydraulic Circuit Diagram on p. 17. X. Align cylinders correctly. Y. Remove and clean velocity fuse. Refer to Hydraulic Circuit Diagram on p. 17. Z. Remove flow control valve from the valve block and clean. Refer to Hydraulic Circuit Diagram on p. 17. aa. See 3 (k). bb. Remove and clean check valve. cc. See 2 (c). dd. Replace packing (contact factory for replacement parts). ee. Correct per diagram (p. 13 (DC) or 16 (AC)). ff. Lightly tap down the solenoid coil body to seat it properly. DO NOT hit coil hard as it will permanently damage the internal system. DO NOT remove the solenoid valve from the block because the
the carriage will lower in an uncontrolled manner. hh. Binding cylinders. ii. Air present in the hydraulic system causing the carriage will lower in an uncontrolled manner. hh. See 4 (r). ii. To unlock, pressurize the hydraulic system.	6. Pivot arm lowers too slowly when loaded. 7. Pivot arm lowers too quickly. 8. Pivot arm rises then slowly lowers on its own. 9. Pivot arm elevates but does	U. Lowering solenoid valve filter screen clogged. V. Pinched tube or hose. W. Foreign material in flow control valve. X. Binding cylinders. Y. Foreign material stuck in flow control valve. (In this case, carriage initially lowers at a normal rate but accelerates as the carriage descends). a. Lowering solenoid valve may be incorrectly wired or is stuck open bb. Check valve stuck open. cc. Leaking hoses, fittings, pipes. dd. Cylinder packing is worn or damaged. ee. Incorrect lowering solenoid valve wiring. ff. Lowering solenoid valve is stuck.	18. U. Remove lowering solenoid valve and clean filter screen. V. Correct as appropriate. W. Remove and clean flow control valve. Refer to Hydraulic Circuit Diagram on p. 17. X. Align cylinders correctly. Y. Remove and clean velocity fuse. Refer to Hydraulic Circuit Diagram on p. 17. Z. Remove flow control valve from the valve block and clean. Refer to Hydraulic Circuit Diagram on p. 17. aa. See 3 (k). bb. Remove and clean check valve. cc. See 2 (c). dd. Replace packing (contact factory for replacement parts). ee. Correct per diagram (p. 13 (DC) or 16 (AC)). ff. Lightly tap down the solenoid coil body to seat it properly. DO NOT hit coil hard as it will permanently damage the internal system. DO NOT remove the solenoid valve from the block because the carriage will descend dangerously quickly.
hh. Binding cylinders. ii. Air present in the hydraulic system causing hh. See 4 (r). ii. To unlock, pressurize the hydraulic system.	6. Pivot arm lowers too slowly when loaded. 7. Pivot arm lowers too quickly. 8. Pivot arm rises then slowly lowers on its own. 9. Pivot arm elevates but does	U. Lowering solenoid valve filter screen clogged. V. Pinched tube or hose. W. Foreign material in flow control valve. X. Binding cylinders. Y. Foreign material stuck in flow control valve. (In this case, carriage initially lowers at a normal rate but accelerates as the carriage descends). a. Lowering solenoid valve may be incorrectly wired or is stuck open bb. Check valve stuck open. cc. Leaking hoses, fittings, pipes. dd. Cylinder packing is worn or damaged. ee. Incorrect lowering solenoid valve wiring. ff. Lowering solenoid valve is stuck.	18. U. Remove lowering solenoid valve and clean filter screen. V. Correct as appropriate. W. Remove and clean flow control valve. Refer to Hydraulic Circuit Diagram on p. 17. X. Align cylinders correctly. Y. Remove and clean velocity fuse. Refer to Hydraulic Circuit Diagram on p. 17. Z. Remove flow control valve from the valve block and clean. Refer to Hydraulic Circuit Diagram on p. 17. aa. See 3 (k). bb. Remove and clean check valve. cc. See 2 (c). dd. Replace packing (contact factory for replacement parts). ee. Correct per diagram (p. 13 (DC) or 16 (AC)). ff. Lightly tap down the solenoid coil body to seat it properly. DO NOT hit coil hard as it will permanently damage the internal system. DO NOT remove the solenoid valve from the block because the carriage will descend dangerously quickly. gg. Remove and replace. DO NOT remove the
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the velocity fuse to activate	6. Pivot arm lowers too slowly when loaded. 7. Pivot arm lowers too quickly. 8. Pivot arm rises then slowly lowers on its own. 9. Pivot arm elevates but does	U. Lowering solenoid valve filter screen clogged. V. Pinched tube or hose. W. Foreign material in flow control valve. X. Binding cylinders. Y. Foreign material in velocity fuse. Z. Foreign material stuck in flow control valve. (In this case, carriage initially lowers at a normal rate but accelerates as the carriage descends). Ga. Lowering solenoid valve may be incorrectly wired or is stuck open bb. Check valve stuck open. Cc. Leaking hoses, fittings, pipes. dd. Cylinder packing is worn or damaged. Ge. Incorrect lowering solenoid valve wiring. If. Lowering solenoid valve is stuck. gg. Faulty lowering solenoid coil. hh. Binding cylinders.	18. U. Remove lowering solenoid valve and clean filter screen. V. Correct as appropriate. W. Remove and clean flow control valve. Refer to Hydraulic Circuit Diagram on p. 17. X. Align cylinders correctly. Y. Remove and clean velocity fuse. Refer to Hydraulic Circuit Diagram on p. 17. Z. Remove flow control valve from the valve block and clean. Refer to Hydraulic Circuit Diagram on p. 17. aa. See 3 (k). bb. Remove and clean check valve. cc. See 2 (c). dd. Replace packing (contact factory for replacement parts). ee. Correct per diagram (p. 13 (DC) or 16 (AC)). ff. Lightly tap down the solenoid coil body to seat it properly. DO NOT hit coil hard as it will permanently damage the internal system. DO NOT remove the solenoid valve from the block because the carriage will descend dangerously quickly. gg. Remove and replace. DO NOT remove the lowering solenoid valve from the block because the carriage will lower in an uncontrolled manner. hh. See 4 (r).

LABELING DIAGRAM

Each unit should be labeled as shown in the diagram. However, label content and location are subject to change so your product might not be labeled exactly as shown. Compare this diagram to your <u>Record of Satisfactory Condition</u>. If there are differences between actual labeling and this diagram, adapt the diagram to reflect actual labeling. Replace all labels that are damaged, missing, or not easily readable (e.g. faded). To order replacement labels or to inquire whether your unit is properly labeled, contact the <u>technical service and parts department</u> online at http://www.vestilmfg.com/parts_info.htm or by calling (260) 665-7586 and asking for the Parts Department.



A: Label 220 (applied to side of pivot arm)

Labor 220 (applied to side of pivot diff)		
AWARNING	NG ADVERTENCIA AVERTISSEMENT	
KEEP CLEAR	MANTENGASE ALEJADO	SE TENIR À DISTANCE
WHEN IN USE	CUANDO SE ESTA OPERANDO	LORS DU FONCTIONNEMENT 220

B: Label 232 (applied to side of pivot arm)

▲ CAUTION	▲ ATENCIÓN	A ATTENTION
DRUM MUST BE IN	EL TAMBOR DEBE DE ESTAR	LE BIDON DOIT ÊTRE EN
VERTICAL POSITION	EN LA POSICIÓN VERTICAL	POSITION VERTICALE
WHEN MOVING	CUANDO EN MOVIMIENTO	LORS D'UN DÉPLACEMENT
VESTIL MANUFACTURING	CORPORATION • Phone (260) 665-7586 • Fax (260) 665	1339 • sales@vestil.com • www.vestil.com 233

C: Label 1153 (applied to frame by foot pump)

MODEL / MODÉLO / MODÈLE	
WEIGHT / PESO / MASS	
CAPACITY / CAPACIDAD / CAPACITÉ	
SERIAL / SERIE / SÉRIE	
UNITS: 2.2 lb. = 1kg 1" (or 1in.) = 2.54cm	1153

D: Label 206 (on base frame by oil reservoir or inside MPU on oil tank)

1		
	ISO 32 / 150 SUS	
	HYDRAULIC OIL OR NON-SYNTHETIC TRANSMISSION FLUID	
l	ACEITE HIDRAULICO O LIQUIDOS DE TRANSMISION NO SINTE	TICOS
l	HUILE OU LIQUIDE HYDRAULIQUE NON-SYNTHÉTIQUE	206 Rev. 1003
١	VESTIL MANUFACTURING CORPORATION • Phone (260) 665-7586 • www.	vestil.com

Electric powered units also have the following labels applied to the modular power unit:

HDC-DC

D: label 206 applied inside MPU cover

B: 19801 200 applied it 19190 1411 0 004
ISO 32 / 150 SUS
HYDRAULIC OIL OR NON-SYNTHETIC TRANSMISSION FLUID
ACEITE HIDRAULICO O LIQUIDOS DE TRANSMISION NO SINTETICOS
HUILE OU LIQUIDE HYDRAULIQUE NON-SYNTHÉTIQUE
VESTIL MANUFACTURING CORPORATION • Phone (260) 665-7586 • www.vestil.com

Label 295 (on MPU cover)

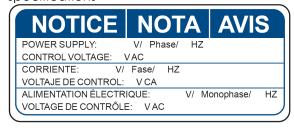


HDC-AC

D: label 206 is applied to metal frame inside MPU cover



Label 248; 249; 250; or 251 electrical system specifications





LIMITED WARRANTY

Vestil Manufacturing Company ("Vestil") warrants this product to be free of defects in material and workmanship during the warranty period. Our warranty obligation is to provide a replacement for a defective, original part covered by the warranty after we receive a proper request from the Warrantee (you) for warranty service.

Who may request service?

Only a warrantee may request service. You are a warrantee if you purchased the product from Vestil or from an authorized distributor AND Vestil has been fully paid.

Definition of "original part"?

An original part is a part used to make the product as shipped to the Warrantee.

What is a "proper request"?

A request for warranty service is proper if Vestil receives: 1) a photocopy of the <u>Customer Invoice</u> that displays the shipping date; AND 2) a <u>written request</u> for warranty service including your name and phone number. Send requests by one of the following methods:

US Mail
Vestil Manufacturing Company
2999 North Wayne Street, PO Box 507
Angola, IN 46703

Fax
(260) 665-1339
Phone
Enter "Warranty service request"
in the subject field.

In the written request, list the parts believed to be defective and include the address where replacements should be delivered. After Vestil receives your request for warranty service, an authorized representative will contact you to determine whether your claim is covered by the warranty. Before providing warranty service, Vestil will require you to send the entire product, or just the defective part (or parts), to its facility in Angola, IN.

What is covered under the warranty?

The warranty covers defects in the following original, dynamic parts: motors, hydraulic pumps, motor controllers, and cylinders. It also covers defects in original parts that wear under normal usage conditions ("wearing parts"), such as bearings, hoses, wheels, seals, brushes, and batteries.

How long is the warranty period?

The warranty period for original dynamic components is <u>90 days</u>. For wearing parts, the warranty period is <u>90 days</u>. Both warranty periods begin on the date Vestil ships the product to the Warrantee. If the product was purchased from an authorized distributor, the periods begin when the distributor ships the product. Vestil may, at its sole discretion, extend a warranty period for products shipped from authorized distributors by up to 30 days to account for shipping time.

If a defective part is covered by the warranty, what will Vestil do to correct the problem?

Vestil will provide an appropriate replacement for any covered part. An authorized representative of Vestil will contact you to discuss your claim.

What is <u>not</u> covered by the warranty?

The Warrantee (you) is responsible for paying labor costs and freight costs to return the product to Vestil for warranty service.

Events that automatically void this Limited Warranty.

- Misuse:
- Negligent assembly, installation, operation or repair;
- Installation/use in corrosive environments;
- Inadequate or improper maintenance;
- Damage sustained during shipping;
- Collisions or other accidents that damage the product;
- <u>Unauthorized modifications</u>: Do not modify the product IN ANY WAY without first receiving written authorization from Vestil.

Do any other warranties apply to the product?

Vestil Manufacturing Co. makes no other express warranties. All implied warranties are disclaimed to the extent allowed by law. Any implied warranty not disclaimed is limited in scope to the terms of this Limited Warranty. Vestil makes no warranty or representation that this product complies with any state or local design, performance, or safety code or standard. Noncompliance with any such code or standard is not a defect in material or workmanship.