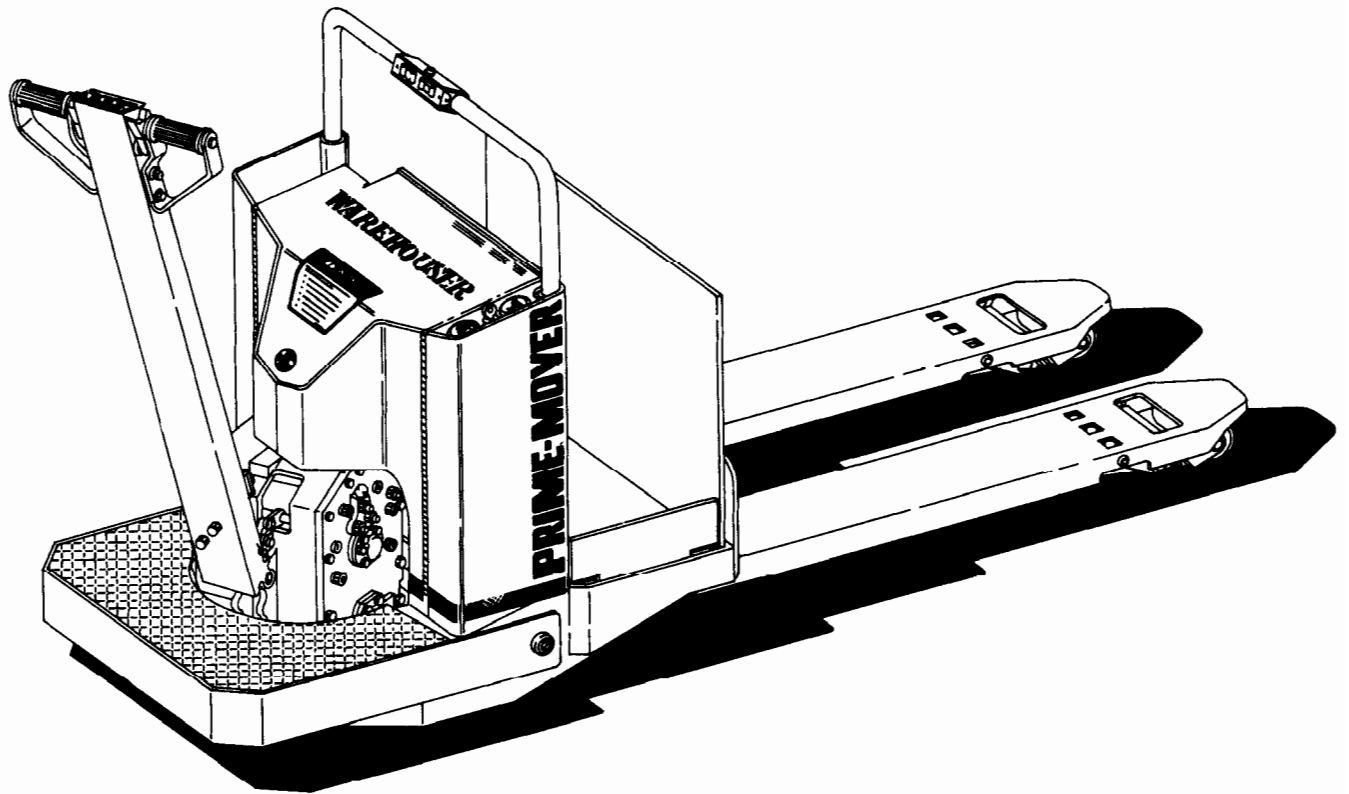


Operating/Maintenance/Parts Manual

HT TRUCK WAREHOUSER

HT-60W



⚠ WARNING Read and observe all warnings on the unit before operating it. Do not operate this equipment unless all factory installed guard and shields are properly secured in place.

Issued August, 1984

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MAINTENANCE INSTRUCTIONS

Maintenance described in this section represents minimum requirements for continuous satisfactory operation of the machine. Because improperly maintained machines are hazardous, **it is extremely important that only qualified mechanics perform maintenance work. It is also imperative that only genuine Prime-Mover parts are used if replacement is needed.**

It is recommended that a regular maintenance schedule be followed for electrical and mechanical adjustments as well as for lubrication. A preventative maintenance program of this type can catch and correct many serious problems before they occur. Because regular maintenance cannot be controlled by the manufacturer or by the distributor, it must ultimately be the responsibility of the owner.

Your Prime-Mover distributor stands ready to assist in the event of operational difficulties. However, most adjustments and/or repair can be readily performed by the user. **The instructions provided in this section will facilitate the maintenance of the Prime-Mover truck to operate at peak efficiency.**

BATTERY

Proper care and servicing of the battery is vital to assure satisfactory operation and life of your Prime-Mover electric truck. Battery acid is, of course, extremely corrosive and should be kept off or washed off the machine as any spillage occurs. The battery should always be kept in a charged stage. An overly discharged battery will cause a number of operational difficulties in any electric truck and the battery charge should be checked first if any electrical difficulties occur.

In cases of a battery not taking a charge, **make sure that the charger is being attached to the battery connector** and not to the connector on the machine. A battery which does not take a proper charge should be referred to the **battery manufacturer's representative for service.**

BATTERY

The Warehouser® uses a 24 volt wet cell Battery.

Adding Water

On a routine basis after every 50 hours of operation, remove the Battery Vent Caps and inspect the Electrolyte level. The water in the Electrolyte Solution evaporates at high temperatures or with excessive charging rates. The level should be to the bottom of the Filler Neck; if NOT, replenish to the proper level with distilled water.

NOTE: DO NOT allow the Electrolyte Solution specific gravity to drop below 1.280 77° F (25° C).

Cleaning Terminals & Cable Connections

The top of the Battery **MUST** be kept clean. Tighten the Vent Caps and clean the Battery with a brush dipped in an alkaline solution (ammonia or baking soda and water). After the foaming has stopped, flush the top of the Battery with clean water. If

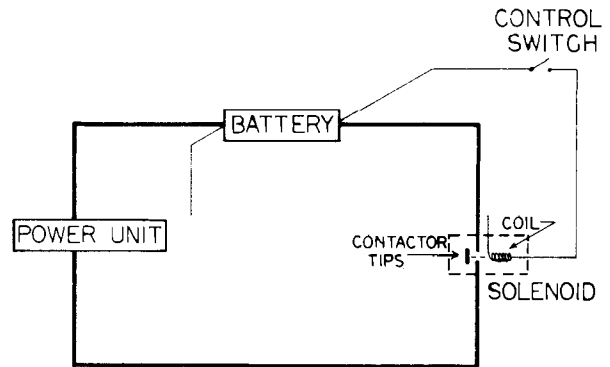
Terminals and Cable Clamps are corroded, disconnect the Cables and clean them with the same alkaline solution.

WARNING Do not allow the alkaline solution to fall in the Battery cell. This will result in a dead or weak cell.

WARNING If acid contacts your skin, eyes or clothing, flush the area immediately with large amounts of water.

WARNING DO NOT attempt to recharge a frozen battery; this may cause it to rupture or explode. DO NOT attempt to recharge the Battery in an area of sparks or near an open flame.

THEORY OF ELECTRICAL OPERATIONS



The electrical system has two basic sections. They are the control system, which determines when and where power is applied, and the power system, which routes energy to components. The control and power systems both derive their energy from the battery but are fused and wired separately.

The control sections consists of the control switches and contactor coils. When a switch is closed, it completes a circuit and supplies voltage to energize the coil and thus close the contactor. The interlock switch and optional key switch are located in the control circuit and prevent the coils from being energized if either switch is opened.

The power circuit handles higher current than the control circuit and therefore uses larger wiring. contactors will withstand the high currents in the power circuit while allowing low current switching to be used. When a coil energizes, power flows through the controlling contactor to the unit which is controlled by that contactor.

CONTROL SWITCHES

Service Ref.: 20700-01

The main control switches are located with the handle shown in the parts section of this book. These switches provide for direction control of the machine and for high speed switching. The switches are not adjustable and if defective, they must be replaced. (See parts breakdown.)

LIFT FRAME

To disassemble the lift frame linkage:

1. Disconnect the battery.
2. Release the tension on the lowering spring(s).
3. Remove the wheel fork pivot pin.
4. Move pull rod away from the lift frame far enough to permit removal of the lower linkage carrier frame pin.
5. At this point any section can be disassembled, so proceed to disassemble required area.

HYDRAULIC PUMP

To remove the hydraulic pump unit, disconnect the hoses and electrical leads and remove the cap screws holding the pump.

RELEASE VALVE AND SOLENOID

Service Reference: 30600-00

When the pump motor operates but the forks fail to lift or won't hold the lift, the release valve may be stuck open. Correcting this malfunction requires removal of the solenoid and plunger. This can be done without removing the pump motor unit from the machine.

Failure of the forks to lower may indicate an inoperative solenoid. To check the solenoid, depress the lower button (or use a hot jumper wire to the solenoid terminal) and feel or listen for a distinct click. If a click is detected, the solenoid is probably not the problem.

Improper adjustment of the solenoid (i.e. improper clearance between solenoid and plunger) can cause the frame to lower too rapidly or too slowly. Adjust as follows:

1. Remove the four screws holding the solenoid and lift it off.
2. Hold the stem, being careful not to damage it.
3. Adjust the threaded hex end $\frac{1}{8}$ turn — clockwise if the frame lowers too fast; counterclockwise if the frame lowers too slowly.
4. Reinstall solenoid.
5. Test and readjust, if necessary.

HYDRAULIC CYLINDERS

Service Ref.: 30600-00

To remove the hydraulic cylinders:

1. Lower the truck.
2. Disconnect and remove the battery.
3. Disconnect hoses and clamps.
4. Remove the pin connecting the cylinder rod to the lift frame.
5. Remove the roll pins in the lift cylinder base by driving them out through the two access holes located on the control side of the battery compartment.
6. Lift out the cylinder through the top of the lift frame.

CONTACTOR ASSEMBLY (Cableform) A-27185 CONTACTORS

The purpose of these instructions is to instruct proper care and maintenance to obtain proper service from contactors.

CONNECTIONS


The proper connections are screws and nuts which should be tightened to 45 to 60 inch/lbs. (5.1 to 6.8 newton meters [N.M]). It is recommended that this be done with a socket on a shaft extension. If a wrench is used, take care the head or body of wrench does not come in contact with the molded base.

MAINTENANCE AND ADJUSTMENT


The following information is intended to assist during periods of normal maintenance and to provide checks to determine if the contactor is in proper operation condition.

POWER CONTACTS

In normal operation, the contacts will become blackened, discolored, and roughened. This will not interfere with proper operation and cleaning is not necessary. The contacts should be replaced before the silver-alloy contact facing is completely eroded through to the backing material.

 **WARNING** Do not file contactor tips.

The silver-alloy may transfer from one contact and cause buildup on the mating contact. This can be expected under certain conditions and does not require contact dressing or filing. When replacing only one contact of a mating pair, remove any high peaks or beads of material on the contact that is not replace.

 **WARNING** When working on this contactor, make sure it is at room temperature or warmer otherwise plastic part may be damaged.

DISASSEMBLY

1. Disconnect the battery.
2. Remove all electrical connections and remove the contactor from the truck for easier servicing.
3. Remove the front contact, nut, and washer.
4. Remove spacer and with your fingers squeeze plastic front and pull to remove from base.
5. Magnet frame with magnet assembled can be removed from base for further disassembly.
6. Remove moving contact with top spring stud by pushing in and twisting until it can be removed.
7. Remove braid from under coil frame.
8. Remove retainer nut. Retainer can be removed with your fingers by squeezing.
9. Remove braid.



FIGURE 14 CONTROL WIRING HARNESS ASSEMBLY

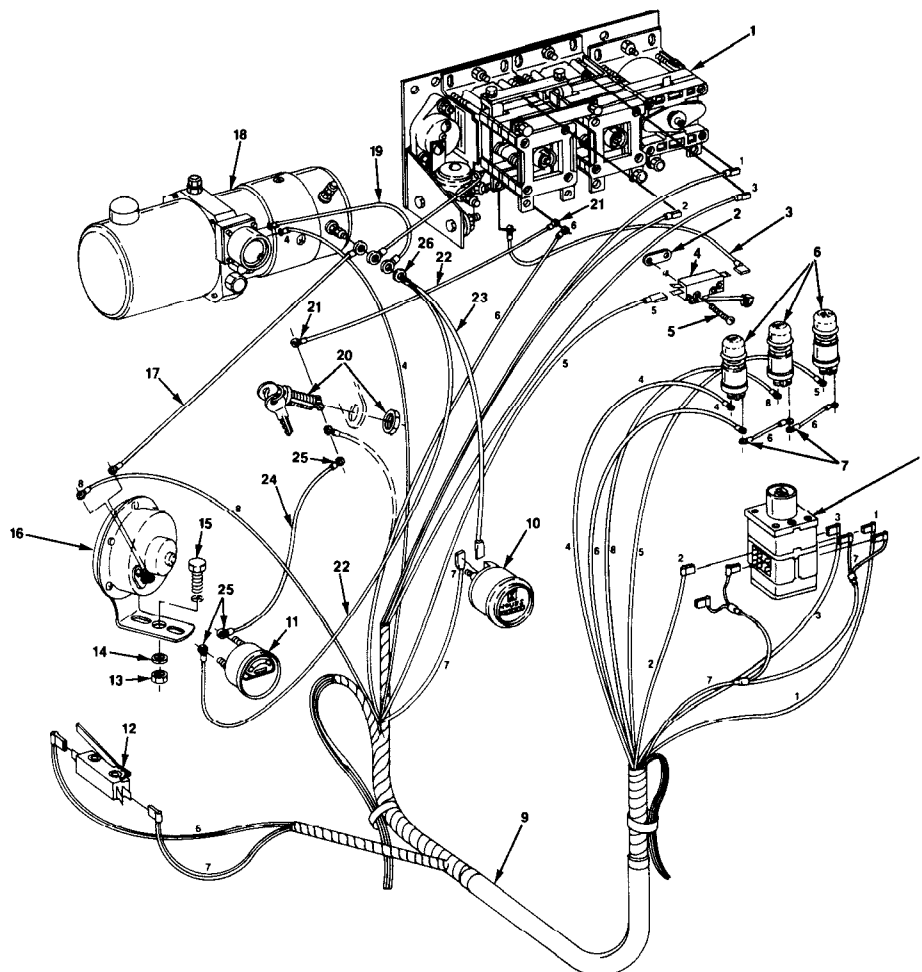


Fig. #	Item #	Part #	Name	# For Assy.
14	1	C-27145-05	Panel assembly (see fig. #17)	1
14	2	P-14986-03	Nut, twin	1
14	3	C-20163-39	Wire assembly	1
14	4	P-20478	Switch, lift limit	1
14	4	P-20479	Switch, lift limit (cold storage)	1
14	5	P-11880-08	Screw, machine	2
14	6	A-14826	Switch, Push button	3
14	7	C-20163-38	Wire assembly	2
14	8	B-24121-01	Switch, master control (see fig. #9)	1
14	9	C-24125	Harness assembly	1
14	10	A-49815	Meter, hour	1
14	11	A-26205-02	Indicator, battery discharge	1
14	12	P-20208	Switch, interlock	1
14	12	P-20323	Switch, interlock	1
14	13	P-11261-08	Nut	1
14	14	P-11009-08	Lockwasher	1
14	15	P-14994-04	Screw, cap	1
14	16	P-25427-01	Horn	1
14	17	C-20163-39	Wire assembly	1
14	18	D-27048-02	Pump motor assembly (see fig. #42)	1
14	19	A-20162-07	Wire assembly	1
14	20	P-20151	Switch, key	1
14	21	P-11823-27	Connector, wire	As Req'd
14	22	52-7901-01	Wire, 16 guage, black	As Req'd
14	23	C-20163-30	Wire assembly	1
14	24	52-7901-03	Wire, 16 guage, red	As Req'd
14	25	P-11823-01	Connector, wire	As Req'd
14	26	B-49771-00	Connector, wire	As Req'd

FIGURE 24 CONTACTOR ASSEMBLY (CABLEFORM) (A-27185-01)

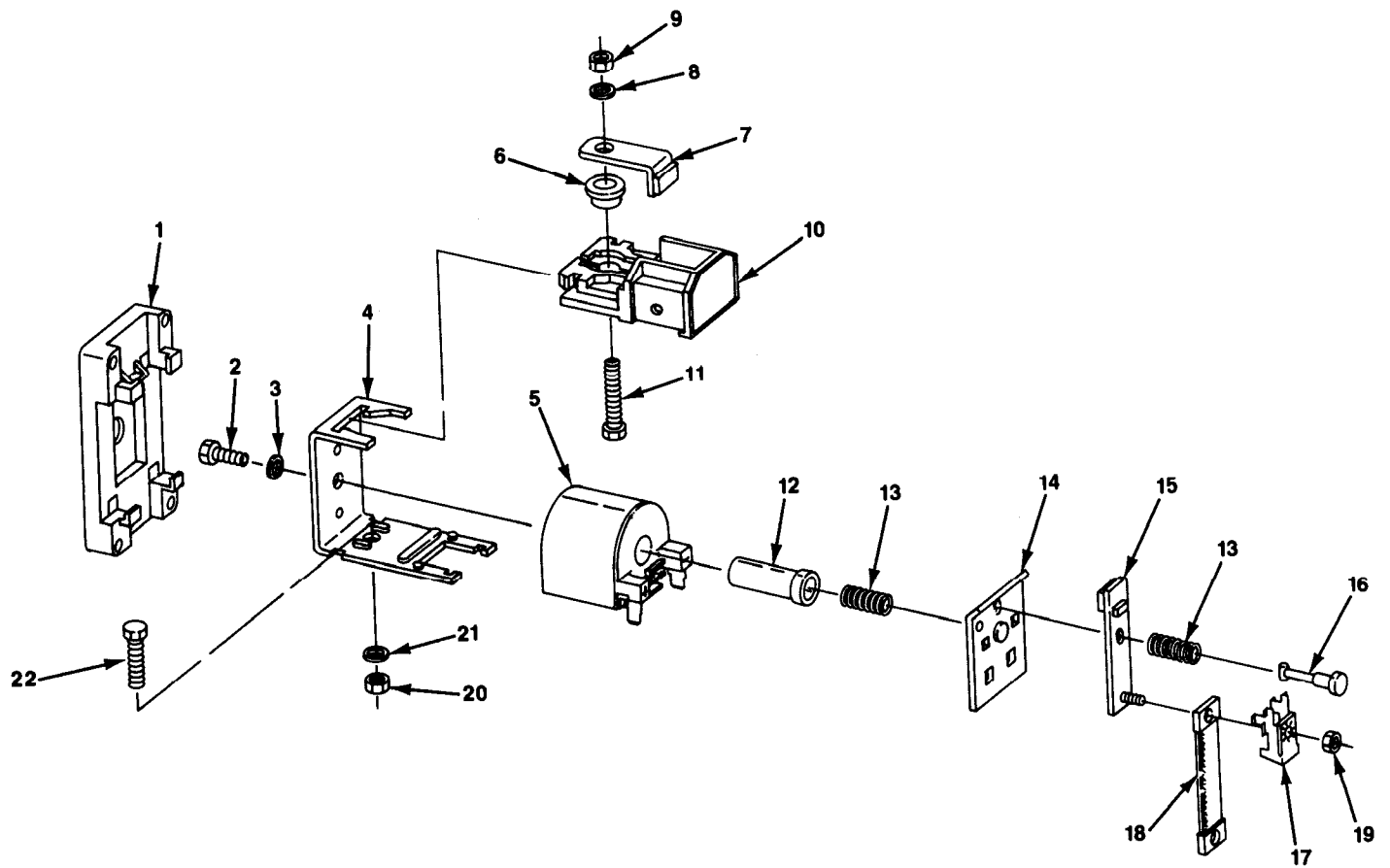
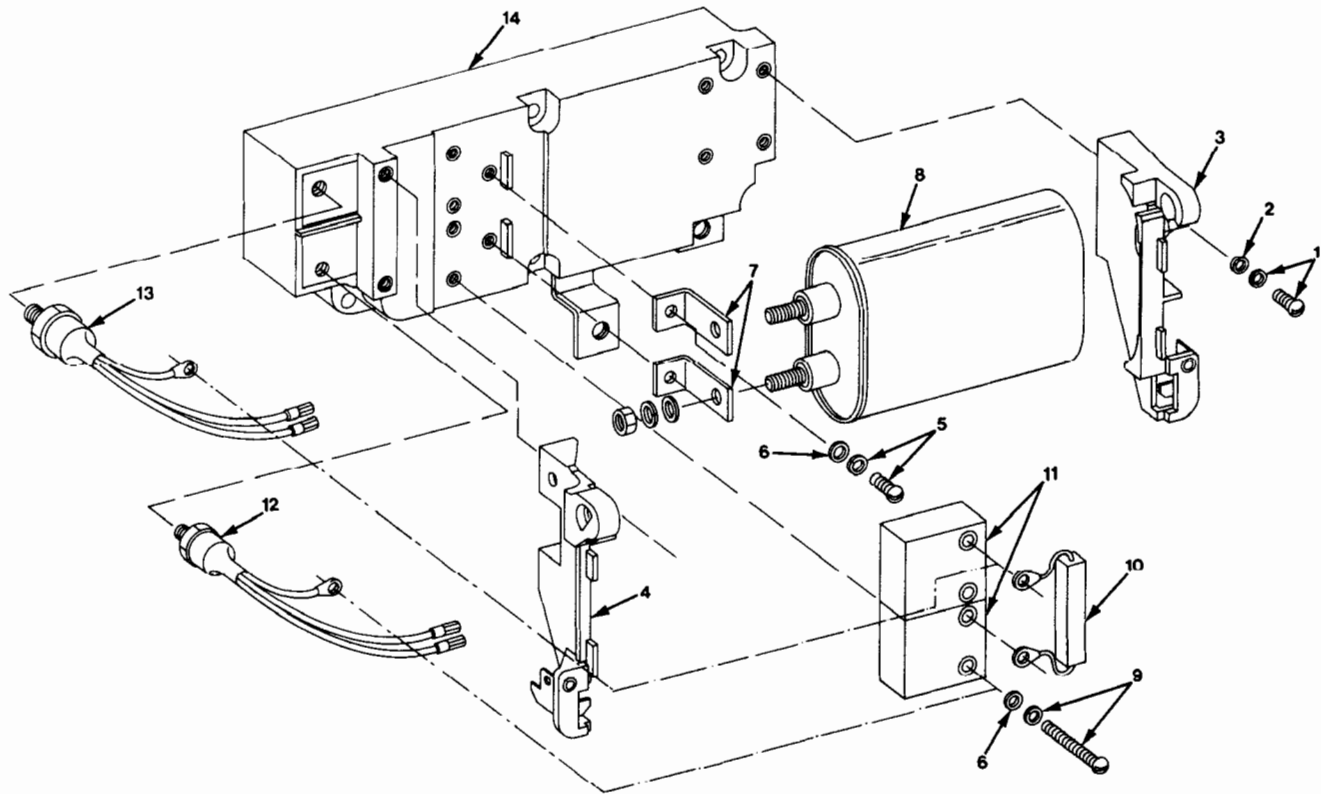


Fig. #	Item #	Part #	Name	# for Assy.
24	1	VN16298	Base	1
24	2	NA	Screw, Cap	1
24	3	NA	Lockwasher	1
24	4	VN16303	Frame, Magnet	1
24	5	VN16297-24	Coil, Magnet	1
24	6	VN16314	Spacer	1
24	7	VN16324	Contact, Front	1
24	8	NA	Lockwasher	1
24	9	NA	Nut	1
24	10	VN16889	Front	1
24	11	NA	Screw, Cap	1
24	12	VN16315	Pole	1
24	13	VN16310	Spring	2
24	14	VN16304	Plate, Armature	1
24	15	VN16326	Contact, Moving	1
24	16	VN16309	Stud, Top Spring	1
24	17	VN16305	Retainer	1
24	18	VN16302	Braid	1
24	19	NA	Nut	1
24	20	NA	Nut	1
24	21	NA	Lockwasher	1
24	22	NA	Screw, Cap	1

FIGURE 34 TRANSFORMER ASSEMBLY



Service Reference 20650-00

Fig. #	Item #	Part #	Name	# for Assy.
34	1	QUN144P15006C6	Screw with lockwasher	5
34	2	QUN402P8B6	Washer, flat	5
34	3	QU245A6998G2	Support, card box (right hand)	1
34	4	QU245A6998G1	Support, card box (left hand)	1
34	5	QUN144P13006C6	Screw with lockwasher	2
34	6	QUN402P7B6	Washer, flat	5
34	7	QU245A6996P1	Bus	2
34	8	QU259A5523P2	Capacitor, 200 Volts	1
34	9	QUN144P13018C6	Screw with lockwasher	4
34	10	QU259A8709G1	Resistor assembly	1
34	11	QU194B5393G1	Snubber assembly	2
34	12	QU259A2138G1	Rectifier assembly	1
34	13	QU259A2135G1	Rectifier assembly (2 REC)	1
34	14	QU136C2306G1	Transformer	1

Fig. #	Item #	Part #	Name	# for Assy
42	15	QWPN-00100	Pump	1
42	16	QWF1-1022-50	Screw, cap	2
42	17	QWT2-5001-00	Elbow, 90°	1
42	18	QWT3-1001-00	Filter	1
42	19	QWG1-1003-48	O ring	1
42	20	QWT4-1002-00	Magnet	1
42	21	QWF4-1010-31	Screw	4
42	22	QWR1-1220-02	Reservoir	1
42	23	QWT3-1002-00	Breather	1
42	24	QWT1-1002-02	Plug, pipe	1
42	25	QWT3-1001-00	Filter	1
42	26	QWE1-1011-02	Solenoid	1
42	27	QWF4-1030-50	Screw	6
42	28	QWS4-1103-00	Stem, release	1
42	29	QWG1-1020-10	O ring	1
42	30	QWS3-1002-04	Cap, release	1
42	31	QWG1-1010-12	O ring	1
42	32	QWS1-1008-00	Spring and ball assembly	1
42	33	QWG1-1000-19	O ring	1
42	34	QWH6-2000-01	Cover	1
42	35	QWS9-6001-06	Bracket, mounting	1
42	36	QWT1-1002-01	Plug, pipe	1
42	37	QWS6-1000-00	Screw, terminal	2
42	38	QWG4-1002-00	Plug, 1/8 plastic	2

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