Hydraulic Power Pack

Owner's Manual

Sonny's Enterprises, Inc.
5605 Hiatus Road
Tamarac, Florida 33321
21v1

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WARNING *SAFETY REQUIREMENTS* WARNING

1. All employees must be thoroughly trained in safe operation and standard maintenance practices. All employees must review this entire manual monthly.
2. Do not enter the wash tunnel when the equipment is operating. Death or dismemberment may occur.
3. Do not wear loose fitting clothing or jewelry around moving equipment. Do not allow any part of your body or other objects (including ladders, hoses or tools) to come in contact with moving equipment. Entanglement may result causing death or dismemberment.
4. Do not leave a ladder or any other items such as wash down hoses or tools in the wash tunnel while equipment is running. Vehicle damage and injury, including death, can occur.
5. Always exercise caution when walking (never run) through the wash tunnel as there may be slippery conditions. Be careful so you do not bump into or trip over equipment.
6. Only those employees specifically instructed and trained by the location management are permitted to enter the wash tunnel to perform inspections or maintenance. At least two qualified maintenance people must be present when performing equipment repairs or preventive maintenance.
7. Do not perform any maintenance or work on equipment unless you first perform LockOut Safety Precautions. All electrically powered equipment must have manually operated

disconnects capable of being locked in the “OFF” position. Equipment that has been “locked out” for any reason must be restarted only by the person who performed the “lock out” operation.

8. When working on any equipment that is higher than your shoulders, always use a fiberglass ladder that is in good condition.
9. Do not attempt to repair or adjust any pressurized liquid or pneumatic part, hose, pipe or fitting while that equipment is in operation.
10. Electrical connections and repairs must be performed by a Licensed Electrician Only. 11. Emergency “STOP” buttons must be well marked and their location and proper use reviewed with all personnel. Any activated “STOP” button must be reset only by the person who activated it. Clear the wash tunnel of any people, ladders, hoses, tools and other loose items before restarting the equipment. An audible device must sound to warn people that the equipment is starting.
12. Do not operate any piece of equipment that requires safety covers with those covers removed or improperly installed. Do not operate any piece of equipment if any component of that piece is suspected to be defective or malfunctioning.
13. Store all cleaning and washing solutions and oils in a well-ventilated area. Clean up fluid spills immediately to prevent hazardous safety conditions. Be certain to follow all safety procedures on SDS Sheets for each chemical product used.
14. All hydraulic and electric systems in the wash tunnel equipped with a torque relief or overload should be checked and set at the minimum amount that will allow for proper functionality under normal washing conditions.
15. No unauthorized people should ever be permitted in the wash tunnel or near the equipment at any time.

* * *

! ! CAUTION ! !

When a piece of equipment must be in operation during inspection or maintenance, one qualified technician must stay at the power disconnect switch while another qualified technician performs the inspection or maintenance.

INTRODUCTION

This Manual contains information that is vital to the successful installation, operation and maintenance of your SONNY'S vehicle washing equipment.

Please read, and understand, the full contents of this manual before installation and operation of the equipment. Keep this booklet in a location where it may be used for ongoing reference.

Should you have any questions on the operation or servicing of this equipment please contact

TECHNICAL SERVICES DEPT.

SONNY'S ENTERPRISES INC.

5605 Hiatus Road

TAMARAC, FLORIDA 33321

TELEPHONE: 800-327-8723 FAX: 800-495-4049

THANK YOU FOR YOUR CONFIDENCE IN SONNY'S !!!!!

PRODUCT SPECIFICATIONS

- Sight glass & temperature gauge
- Return line filter
- Filler breather
- Clean-out cover(s)
- Suction strainer
- System relief
- Pressure-compensated flow control
- Pressure gauge
- Low level switch
- Vickers gear pump on 3HP
- Vickers vane pump available on 5, 7.5, 10, 15, 20 HP
- Vickers piston pump available on 7.5,10,15, 20 HP

SONNY'S Power Packs with Vickers® Vane Pumps

All Power Packs come complete with:

- Sight glass & temperature gauge
- Return line filter
- Filter breather
- Clean-out cover(s)
- Suction strainer
- System relief
- Pressure-compensated flow control
- Pressure gauge
- Low level switch
- Vickers Vane pump on 5HP through 20HP packs
- Vickers Gear pump on 3HP packs

INSTALLATION
Utilities Requirements

Utilities interconnection and the materials required for interconnection to Sonny's equipment are the responsibility of the customer!

Perform all trades work to all applicable local and national codes!

Hydraulic

- The installer is to provide materials and install pressure and return lines to and from the hydraulic power pack flow control valves and the equipment to be operated. These lines may be Schedule 80 BIP or hose rated at least 2200PSI. Minimum 18 inch long flexible hose should be used at each termination. It is recommended that the return line from the last hydraulic motor in a circuit to the power pack return filter be one size larger than the pressure line (example; pressure line is ½ inch … return line should be ¾ inch). This practice extends the life of the hydraulic motors and pump by reducing line friction and oil temperature.

Electrical

- The Customer's Electrician is to provide materials and install 208VAC or 230VAC or 460VAC, 3-phase, 60Hz power to the electric motor on the hydraulic power pack from a properly sized three pole circuit breaker and motor starter with three thermal overloads.
- The Customer's Electrician is to provide materials and install single phase power (24VAC or 110VAC) from the Customer supplied start/stop system through the low oil level switch on the hydraulic power pack to the motor starter coil for the hydraulic power pack.

???? QUESTIONS ????

CALL

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Hydraulic Power Pack Capabilities

Hydraulic Motor Chart

Model	HP	GPM	Capacity

HY345	3	4.5	11
HY575	5	7.5	25
HY7510	7.5	10.5	25
HY10124	10	12.3	25
HY151840	15	19.5	40
HY202440	20	33	80
HY7VAR	7.5	10.5	25
HY10VAR	10	12.3	25
HY15VAR	15	19.5	60
HY20VAR	20	33	60

One 5HP Power Pack with 7.5GPM pump can operate

One pair of tire brushes plumbed in series, running at 300RPM with 4.5 cu in/rev motors (5.9GPM fluid requirement)

OR

Four side washers plumbed in parallel with separate speed control valves running at 80RPM, each using 5.9 cu in/rev motors (6.13GPM total fluid requirement)

One 7.5HP Power Pack with 10.5GPM pump can operate

A surface mount or over-under conveyor 100 ft. long or shorter at 120CPH (assumes 15RPM drive sprocket with 5.2:1 speed reducer) using a high torque / low speed hydraulic motor 24.0 cu in/rev (8.1GPM fluid requirement)

OR

One pair of wraps or high side washers plumbed in parallel with separate speed control valves running at 80RPM, each using 9.7 cu in/rev motors (6.72GPM total fluid requirement)

OR

One pair of low side washers plumbed in series running at 80RPM with 5.9 cu in/rev motors, one pair of high side washers plumbed in series running at 80RPM with 11.3 cu in/rev motors, and one pair of tire washers plumbed in series running at 200RPM with 4.5 cu in/rev motors using a flow divider and 3 speed control valves (total fluid requirement of 8.37GPM)

One 10HP Power Pack with 12.3GPM pump can operate

A surface mount or over-under conveyor longer than 100 ft. at 150CPH (assumes 15RPM drive sprocket with 5.2:1 speed reducer) using a high torque / low speed hydraulic motor 24 cu in/rev (10.12GPM fluid requirement)

OR

A surface mount or over-under conveyor longer than 100 ft. at 150CPH (assumes 15RPM drive sprocket with 5.2:1 speed reducer) using a medium torque / medium speed hydraulic motor 14.9 cu in/rev (6.3GPM fluid requirement)

OR

One pair of low side washers plumbed in series running at 80RPM with 5.9 cu in/rev motors, one pair of wraparound washers plumbed in parallel running at 80RPM with 11.3 cu in/rev motors, and one pair of high side washers plumbed in series running at 80RPM with 11.3 cu in/rev motors using 4 speed control valves (total fluid requirement of 10.35GPM)

NOTE

Recommended shaft speed for Tire Brushes with plastic bristles is 300-400RPM.

Recommended shaft speed for Washers with cloth is 60-70RPM.

Recommended shaft speed for Washers with NeoGlide is 80-90RPM.

Hydraulic Power Pack Selection

The correct power pack selection is important to your operation for long term reliability and maintenance cost control. Reliability and less maintenance can be achieved partly by sizing a hydraulic power pack so that it's full running load, in gallons per minute, is approximately 80% of the maximum rating of the power pack pump.

Additionally, an operating back-up power pack for key equipment will be most appreciated during an unexpected breakdown. For example, if your conveyor power pack is a 7.5HP, 10.5GPM unit, you could select the same size power pack for your tire brush equipment. By placing these two power packs side by side you can easily switch the hydraulic lines should there be a problem with the conveyor power pack. Your cash register won't ring if the conveyor is not operating but you can still process vehicles without the tire brushes turning.

Sizing a hydraulic power pack is not difficult. One simple formula and a few minutes of your time to calculate hydraulic motor loads is well worth the effort. Multiple outputs from one power pack

(not to exceed the maximum gpm delivery of the power pack pump) can be achieved by plumbing pressure compensated speed control valves in a “daisy chain” method.

The formula for determining hydraulic motor demand in gallons per minute (GPM) is;

$$\frac{\text{equipment shaft rotation rpm X cu in/rev rating of the hydraulic motor}}{231}$$

= required GPM of pumped hydraulic fluid

SPECIAL NOTE: Series, or parallel, plumbing of hydraulic drive motors must be taken into consideration when sizing a power pack.

Series plumbed motors may be calculated as one motor provided they are the same cu in/rev displacement.

Parallel plumbed motors must be calculated as separate fluid loads and their total usage in GPM added for a total gpm power pack requirement.

A few examples using the selection formula are:

* Example #1: A pair of cloth equipped wraparound washers using 11.3 cu in/rev motors plumbed in parallel needs a new power pack.

$$\frac{\text{90 rpm X 11.3 cu in/rev}}{231}$$

= 4.40 GPM per motor
= 8.80 GPM for two #1005 motors in parallel

Therefore, a 7.5HP power pack with a 10.5GPM pump with two pressure compensated speed control valves will meet the needs of this equipment fluid demand.

* Example #2: You want to run a pair of low side washers using 5.9 cu in/rev motors plumbed in series, a pair of van side washers using 11.3 cu in/rev motors plumbed in series, and a pair of tire brushes using 4.5 cu in/rev motors plumbed in series all on using one power pack;

$$\text{Side Washers} \quad \frac{80 \text{ RPM} \times 5.9 \text{ cu in/rev}}{231} = 2.04 \text{ GPM}$$

$$\text{Van Washers} \quad \frac{80 \text{ RPM} \times 11.3 \text{ cu in/rev}}{231} = 3.91 \text{ GPM}$$

$$\text{Tire Washers} \quad \frac{350 \text{ RPM} \times 4.5 \text{ cu in/rev}}{231} = 6.82 \text{ GPM}$$

Total GPM required 12.77 GPM

Therefore, a 15HP power pack with a 19.5GPM pump with three pressure compensated speed control valves will meet the needs of this equipment fluid demand.

* Example #3: A power pack is needed for a 100 ft. long over and under conveyor that will generally run at 120CPH (Cars Per Hour) using a 14.9 cu. in./rev. motor coupled to a 5.2:1 ratio speed reducer. In this application there is 32 inches of conveyor chain travel per drive sprocket revolution. 120 cars per hour equals one pusher roller traveling approximately 40 ft. per minute.

$$\frac{480 \text{ inches pusher roller travel per minute}}{32 \text{ in. conveyor chain travel per drive sprocket revolution}}$$

= 15 RPM for drive sprocket X 5.2 speed reduction

= 78 RPM of hydraulic drive motor shaft

$$\frac{78 \text{ RPM} \times 14.9 \text{ cu in/rev}}{231}$$

= 5.03 GPM hydraulic fluid required for 120 CPH

Allowing for conveyor chain speed increases above 120CPH for this 100 ft. long conveyor a 7.5HP, 10.5GPM hydraulic power pack would be chosen.

NOTE

Hydraulic fluid requirements, in gallons per minute, from the power pack pump will vary with a change in the size of the conveyor hydraulic drive motor as well as a change in the speed of the conveyor chain movement. Always calculate conveyor power pack requirements using the highest conveyor chain speed and the largest (in cu in/rev) hydraulic drive motor that your location would run.

Refer to the conveyor hydraulic motor speed and torque notes in the Motor Chart in this section to determine your motor needs as they relate to high and low speed and high and low torque.

Some high speed, low torque hydraulic drive motors will stall if the conveyor chain is adjusted to a very slow speed. Also, some low speed, high torque hydraulic motors will “top out” at chain speeds that may not be fast enough for high production.

A method to handle the slow conveyor speeds of off-season washing and the high conveyor speeds of the peak washing season is to have both high torque / low speed and low torque / high speed hydraulic motors on hand. This helps to cure the very slow conveyor speed problem by mounting the high torque / low speed motor in that slower season as well as providing an onthe-shelf spare hydraulic motor at all times.

Equipment Installation

Hydraulic Power Pack Installation

Tools

1. Safety Glasses
2. ½" Drive Ratchet Set
3. Standard Combo Wrenches
4. Standard Screwdriver
5. 1” Hammer Drill

Consumables

1. Stainless Shims

6. Sledge Hammer
7. Tape Measure

Work Force Time (assuming no problems) Two (2) persons 1.00 - 2.00 hours

Installation Steps 1.

Determine where the Power Packs are to be installed.

2. Sweep any debris from where the pack will sit.
3. Bring the Power Pack into the building set it in place.
4. Lag the Power Pack down, shim as needed.
5. If a second Power Pack will be mounted above this one install the 4 stacking legs to the pack and lift the second pack into place and bolt it to the stacking legs.
6. Thread the 90 into the output port of the flow control valve of the top pack. Tighten the fitting.
7. Thread the 90 into the input on the return filter and tighten.
8. Repeat steps 6 & 7 on the top pack if present.
9. Install the gauges on both Power Packs
10. Fill the reservoirs with oil.
11. Connect feed and return lines before operation.

Adjustments and Testing

Initial Start-Up

AFTER WASHING THE FIRST 200 CARS WITH A NEW HYDRAULIC SYSTEM CHANGE THE RETURN LINE FILTER. THEN CHANGE THE

RETURN LINE FILTER EVERY 6 MONTHS.

1. Check all fittings for tightness.
2. Fill the hydraulic system with non-detergent, non-foaming, **ISO 32 10W** grade hydraulic fluid. With the power on fill the unit until there is enough oil to make the low level switch then add only a slight bit more.

3. Adjust the relief pressure on each flow control valve on the hydraulic power pack
   a. Install caps on the output of each flow control valve (FCV)
   b. Pressure must be equal on each FCV. To achieve this turn all FCV's off (zero flow).
   c. Advance the adjustment handle on the FCV closest to the pump to the full flow position (the FCV closet to the pump should have the highest GPM placed on it and go down accordingly).
   d. Adjust the set screw under the hex cap on this FCV to the minimum relief setting required for operation on each individual piece of equipment.
   e. Turn this first FCV to zero flow.
   f. Repeat Steps b - d for each FCV, in order, on this power pack. Be certain that all FCV's are off except the one that is being adjusted for the pressure relief setting.
4. Check that rotation is correct for each hydraulic motor in each circuit. Reverse the hydraulic lines at the hydraulic motors to reverse rotation.
5. Adjust for proper hydraulic motor speeds with the appropriate flow control valves on the hydraulic power pack.
6. Repair any hydraulic fluid leaks.

Speed and Torque Adjustment (where applicable)

1. Hydraulic
   a. The speed can be adjusted on the flow control for the power pack.
   b. To increase the speed move the handle on the flow control closer to the number 10.
   c. To decrease the speed move the handle on the flow control closer to the number 1.
   d. The torque must be set prior to operation and should be set between 600 and 900 PSI. For information on how to set the torque please refer to the Hydraulic Power Pack Manual.
2. Electric
   a. The speed can be adjusted on the Variable Frequency Drive (VFD).
   b. To increase the speed adjust the Hertz on the VFD to a higher number.
   c. To decrease the speed adjust the Hertz on the VFD to a lower number.
   d. The Overload on the Motor Starter protector(s) must be set at the lowest level to allow for operation. Adjust the amps in accordance with motor(s) name plate.

Instructions for Setting the Relief Valve

1. Remove the pressure hose going to the hydraulic motor. This is the “C” port on the flow control valve.
2. Plug the “C” port with a pipe plug.
3. Remove the relief valve cap nut located directly across from the incoming pressure pipe or hose from the pump.
4. Startup power unit and read the gauge pressure
5. Adjust the relief valve pressure by turning the adjustment screw clockwise to increase, counter clockwise to decrease.
6. Adjust to the lowest possible level to archive desired use.
7. Turn off the power unit and replace cap nut on the relief valve and replace the pressure hose on the flow control valve.

For Multi-Flow Units

1. Remove both pressure hoses & plug both pressure (C) ports.
2. Set flow valve closest to pump to full flow & second flow valve to zero (0) flow.
3. Turn on power unit and adjust relief valve to desired setting on first valve.
4. Set flow on first valve to 0 flow and flow on second valve to full flow.
5. Adjust the relief valve on the second flow valve to the desired setting.
6. Turn off power unit and reconnect the pressure hoses.

GENERAL OPERATION

POWER PACK OPERATION

Starting and stopping of the electric motor is controlled by the motor starter coil for the function the power pack is designated.

The speed of the rotation of the motor(s) being driven may be changed by the flow control valve on the hydraulic power pack. See Adjustments and Testing Section.

Flow dividers are used to divide the hydraulic fluid supplied by a power pack between several pieces of tunnel equipment to reduce the number of power packs required for a given tunnel layout.

WARRANTY INFORMATION

- Fill the hydraulic system with non-detergent, non-foaming, ISO 32 10W grade hydraulic fluid.
- You can contact Suncoast Hydraulics @ 904-693-3318 for any technical questions.
- Motors are manufactured by Baldor and are OEM. They can be purchased through Sonny's and will be Drop Shipped from Suncoast Hydraulics.
- All Power Pack Motors carry an (18) month Baldor warranty and will need to be brought to a local Baldor Service center for a warranty evaluation. If a replacement motor is purchased prior to the motor being evaluated and the service center & Baldor decides to repair the motor under warranty the motor will be returned to the customer @ no charge for the repairs and the customer will be responsible for payment of the new motor. If the motor is a warranty failure customer will be issued credit for the motor. Freight is not covered.
- All Pumps carry a (1) year warranty through Suncoast/Vickers and will need to be returned back to Suncoast for any warranty evaluations. If a replacement pump is purchased prior to the bad pump being evaluated and the pump is repaired under warranty it will be returned to the customer @ no charge for the repairs and the customer will be responsible for payment of the new pump. The repaired pump is now a spare. If the pump is a warranty failure customer will be issued credit for the pump. Freight is not covered.
- Warranty on other items such as low level switches, filters and flow controls carry a (1) year warranty period.
- Warranty is voided on all pumps when using a water based fluid.

PREVENTIVE MAINTENANCE

DAILY

1. Opening Checks
   a. Check for leaks around hoses and fittings, repair any hydraulic leaks immediately.
   b. Check hydraulic fluid level in the power pack reservoir. Refill, as necessary, with a non-detergent non-foaming ISO 32 10W grade hydraulic fluid.
2. Operational Checks
   a. Check fluid temperature on tank sight gauge at mid-day. Oil temperature should not exceed 180 degree Fahrenheit.

b. General examination of general operation, listening for any unusual noises. Visually check each piece of equipment in each hydraulic circuit for proper operation.

WEEKLY

1. Clean the entire assembly thoroughly.

FOR THE FIRST MONTH OF OPERATION CHECK ALL FITTINGS FOR TIGHTNESS EACH WEEK. PERFORM THIS INSPECTION TO THE SCHEDULE SHOWN BELOW AFTER THE FIRST MONTH OF OPERATION.

MONTHLY

1. Inspecting all hardware and fittings for tightness.

SEMI-ANNUALLY

1. Measure and Record Full Load Amp Readings.
   a. Measure and record, full load current readings from each of the three legs of each of the three phase electric motors.
   b. If the differential of current load exceeds 10% between the legs, or the balanced load current of all three legs has increased over 10% since the most recent measurements, order a replacement motor.
   c. Record readings in the semi-annual log.
2. Change return line fiberglass filter.

ANNUALLY

1. Drain, flush and refill the hydraulic power pack with new, non-foaming, non-detergent hydraulic fluid (ISO 32 10W).

WARRANTY

SONNY'S ENTERPRISES, INC.

FACTORY LIMITED

LIFETIME WARRANTY

Equipment manufactured by SONNY'S ENTERPRISES, INC. is warranted to be free from defect in material and workmanship. Welded metal framework and other non-moving, non-wearable fabricated metal components manufactured by SONNY'S are warranted for the life of the equipment

to the original purchaser. Fabricated metal wearable surface and moving components manufactured by SONNY'S are warranted for a period of one (1) year to the original purchaser of the equipment. All components assembled to SONNY'S equipment that are manufactured by others are warranted by the appropriate manufacturer and subject to that manufacturer's limited warranty. Contact SONNY'S for the specific information on other component manufacturer's warranty terms. All new cloth shipped with new SONNY'S equipment is warranted for a period of one (1) year or 80,000, whichever occurs first.

This warranty is not assignable or transferable. The warranty period begins the first day following installation or 30 days from the original invoice date, whichever occurs first. The Seller's liability shall be limited to repair or replacement of materials found to be defective within the warranty period. In the event of repair or replacement this limited warranty is noncumulative. The Purchaser must supply the Seller with immediate written notice when any defects are found. The Seller shall have the option of requiring the return of defective material to establish the Purchaser's claim. Neither labor nor transportation charges are included in this warranty. Transportation damage claims are to be submitted to the carrier of the damaged materials.

This warranty is based upon the Purchaser's reasonable care and maintenance of the warranted equipment. It does not apply to any equipment which has been subject to misuse, including neglect, accident or exposure to harsh chemicals or chemicals that react violently with: water, organic acids (e.g. acetic acid), inorganic acids (e.g. hydrofluoric acid), oxidizing agents (e.g. peroxides), and metals (e.g. aluminum). Chemicals corrosive to: aluminum alloys, carbon steel, and other metals. Nor does it apply to any equipment which has been repaired or altered by anyone not so authorized by SONNY'S. Further, the equipment must be properly installed with proper accuracy of all specified plumbing, electrical, and mechanical requirements. This warranty does not apply to normal wear and tear or routine maintenance components.

EXCEPT AS EXPRESSLY STATED HEREIN, SONNY'S SHALL NOT BE LIABLE FOR DAMAGES OF ANY KIND IN CONNECTION WITH THE PURCHASE, MAINTENANCE, OR USE OF THIS EQUIPMENT INCLUDING LOSS OF PROFITS AND ALL CLAIMS FOR CONSEQUENTIAL DAMAGES. THE LIMITED WARRANTY EXPRESSED HEREIN IS IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED. SONNY'S NEITHER ASSUMES NOR AUTHORIZES ANY PERSON TO ASSUME FOR IT ANY OTHER OBLIGATION OR LIABILITY IN CONNECTION HEREWITH.

CUSTOMER SERVICE

Please contact SONNY'S Equipment Department for installation and/or operational questions regarding this piece of equipment.

Please refer to the Parts Catalog and contact SONNY'S Customer Service Order Entry Department for any replacement parts for this piece of equipment.

You can also visit the web at www.SonnysDirect.com.

DEPARTMENT	PHONE NUMBERS	FAX NUMBERS
Toll Free Main Line	800-327-8723	800-495-4049
Equipment Department	954-720-4100	954-720-9292

Or you can email Sales at sales@SonnysDirect.com

Thank you for being a SONNY'S car wash equipment owner!

From all of us here at