

Pump Models P435-5100 and P450-5100

Triplex Ceramic Plunger Pump
Operating Instructions
Repair and Service Manual

Corrosion Resistant Pump



GIANT
Performance Under Pressure

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updated 06/23

P435-5100 and P450-3100

1. Performance

U.S. Measurements

	Max. Flow	Pressure	Max. Speed	Power Req'd.	Plunger Diameter	Stroke
Model	GPM	PSI	RPM	BHP	In.	In.
P450-5100	5.5	5075	1450	19.2	0.71	0.79
P435-5100	6.6	3625	1450	16.6	0.71	0.94

Metric Measurements

	Max. Flow	Pressure	Max. Speed	Power Req'd.	Plunger Diameter	Stroke
Model	LPM	Bar	RPM	kW	mm	mm
P450-5100	20.8	350	1450	14.3	18	20
P435-5100	25.0	250	1450	12.4	18	24

Common Specifications

	U.S.	(Metric)
Inlet Pressure	90 PSI.....	(6.2 bar)
Temperature of Pumped Fluids	Up to 160 °F	(70 °C)
Inlet Ports		2 x 3/4" BSP
Discharge Ports		2 x 1/2" BSP
Shaft Rotation		Top of pulley towards manifold
Crankshaft Diameter		(28 mm)
Key Width.....		(8 mm)
Shaft Mounting.....		Either side (specify when ordering)
Weight.....	45.2 lbs	(20.5 kg)
Crankcase Capacity.....	30.4 fl.oz.	(0.9 liters)

Performance data for intermittent operation, data for continuous operation on request.
For information on intermittent operation and calculating of the performance data, see the Giant Pumps assembly instructions.

NPSHR / Inlet pressure

Required NPSH refers to water at 60 °F (20 °C) at max. permissible pump speed.
Maximum inlet pressure: 145 PSI (10 bar)

Level of noise emission

Emission sound pressure level: ≤ 88 dB(A)

SPECIAL NOTE:

P450-5100:

The theoretical gallons per revolution (gal/rev) is 0.00455. To find specific outputs at various RPM, use the formula: $GPM = 0.00455 \times RPM$

P430-5100:

The theoretical gallons per revolution (gal/rev) is 0.00379. To find specific outputs at various RPM, use the formula: $GPM = 0.00379 \times RPM$

P435-5100 and P450-5100

1.3 Horsepower Information

Horsepower ratings shown are the power requirements for the pump. Gas engine power outputs must be approximately twice the pump power requirements shown above.

We recommend that a 1.15 service factor be specified when selecting an electric motor as the power source.

To compute specific pump horsepower requirements, use the following formula: **(GPM X PSI) / 1450 = HP**

P450-5100 HORSEPOWER REQUIREMENTS					
RPM	GPM	2000 PSI	3000 PSI	4000 PSI	5000 PSI
800	3.0	4.1	6.2	8.3	10.3
933	3.5	4.8	7.2	9.7	12.1
1066	4.0	5.5	8.3	11.0	13.8
1200	4.5	6.2	9.3	12.4	15.5
1450	5.5	7.6	11.4	15.2	19.0

P435-5100 HORSEPOWER REQUIREMENTS					
RPM	GPM	2000 PSI	2500 PSI	3000 PSI	3625 PSI
920	4.2	5.8	7.2	8.7	10.5
1050	4.8	6.6	8.3	9.9	12.0
1185	5.4	7.4	9.3	11.2	13.5
1315	6.0	8.3	10.3	12.4	15.0
1450	6.6	9.1	11.4	13.7	16.5

2. Fields of application

The fields of application of these pump types correspond to the specifications in the assembly instructions Giant Pumps.

3. Ambient conditions

Ambient temperature: $41\text{ }^{\circ}\text{F} < T_{\text{Amb.}} < 86\text{ }^{\circ}\text{F}$

Ambient temperature: $5\text{ }^{\circ}\text{C} < T_{\text{Amb.}} < 30\text{ }^{\circ}\text{C}$

4. Oil filling

- Filling quantity: **30.4 fl. oz. (0.9 l)**
- Quality: Industrial gear oil **ISO VG 220** or automotive gear oil **SAE 90 GL4 (Giant's p/n 01154)**
- Intervals: first oil change after **50 operating hours** then every **500 operating hours**, but at the latest after **12 months**

5. Installation/ Putting into Operation

5.1 To Turn Drive Shaft to the Other Side

Remove the valve casing.

Turn the seal adaptors (20) by 180° also so that the leakage holes are underneath.

Remount valve casing rotated by 180°.

Interchange plug (5B) and oil dipstick (2) with each other.

Turn crankcase cover (3) by 180°.

5.2 Direction of pump rotation

When looking at crankshaft with valve casing mounted on left-hand side, counterclockwise direction of rotation.

When looking at crankshaft with valve casing mounted on right-hand side, clockwise direction of rotation.

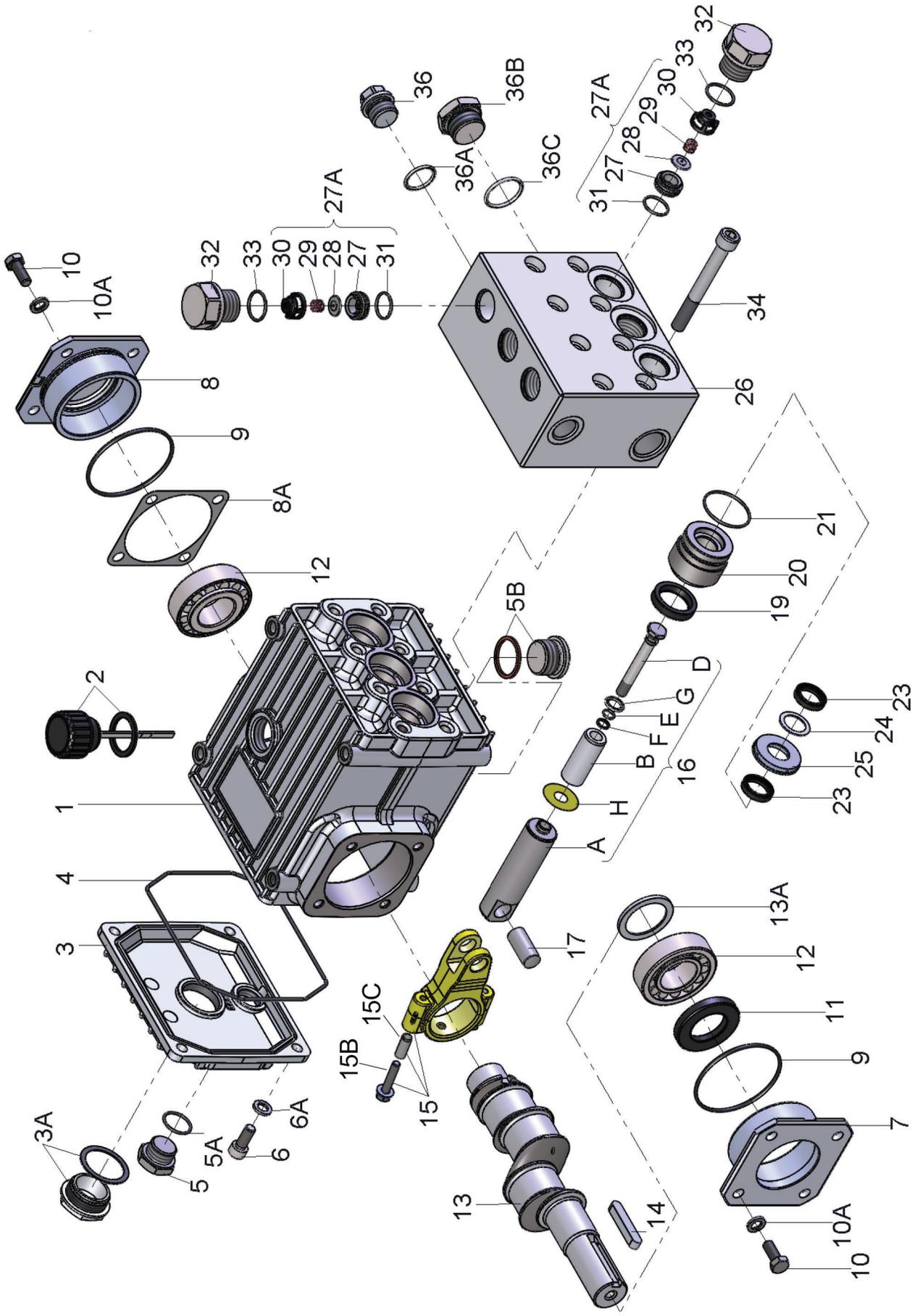
5.3 Suction line filter

Recommended mesh size 150 µm.

6. Operation

For information, see assembly instructions Giant Pumps.

P435-5100 and P450-5100 Exploded View



P435-5100 and P450-5100 Parts List

<u>ITEM</u>	<u>PART</u>	<u>DESCRIPTION</u>	<u>QTY.</u>	<u>ITEM</u>	<u>PART</u>	<u>DESCRIPTION</u>	<u>QTY.</u>
1	08377	Crankcase	1	16B	08397	Plunger Pipe	3
2	08378	Oil Fill Plug with Gasket	1	16D	08399-0100	Tensioning Screw	3
3	06479	Crankcase cover	1	16E	07023-0001	O-Ring	3
3A	07186	Oil Sight Glass w/ Gasket	1	16F	07203	Backup Ring	3
4	08380	O-Ring	1	16G	07161-0100	Copper Washer	3
5	07109-0400	Oil Drain Plug	1	16H	06431	Oil Scraper	3
5A	06015	O-Ring	1	17	06790	Crosshead Pin	3
5B	08092-0100	Plug with Gasket	1	19	05444	Oil Seal	3
6	01010-0100	Screw	4	20	05534-0100	Seal Case	3
6A	01011-0400	Spring Washer	4	21	07266	O-Ring	3
7	04739	Bearing Cover, Open	1	23	08477	V-Sleeve, 18mm	6
8	05291	Bearing Cover, Closed	1	24	07929	Pressure Ring	3
8A	05292	Shim	1-6	25	06804	Weep Return Ring	3
9	01016	O-Ring	2	26	08470-5000	Manifold	1
10	07114-0100	Screw with Washer	8	27A	05578	Valve Assembly (27-31)	6
10A	01011-0400	Spring Washer	8	27	05576	Valve Seat	6
11	07459	Radial Shaft Seal	1	28	05577	Valve Plate	6
12	05350	Bearing	2	29	07906-0100	Valve Spring	6
13	04741	Crankshaft (P435-5100)	1	30	07907	Valve Spring Retainer	6
13	04740	Crankshaft (P450-5100)	1	31	07770-0001	O-Ring	6
13A	04742	Spacer Ring	1	32	08406-0100	Plug	6
14	08091	Fitting Key	1	33	07489	O-Ring	6
15	08390	Connecting Rod Assembly	3	34	08396-0100	Cap Screw	8
15B	05349	Screw	3	36	12250	Plug, 1/2" BSP	1
15C	05348	Washer	3	36A	06807	Steel Ring	1
16	05575	Plunger Assembly (16A-16H)	3	36B	13150-0100	Plug, 3/4", S.S.	1
16A	08384-0600	Plunger Base	3	36C	06808	Steel Seal Ring	1

P435-5100 and P450-5100 Repair Kits

Plunger Packing Kits

09141

<u>Item</u>	<u>Part #</u>	<u>Description</u>	<u>Qty.</u>
21	07266	O-Ring	3
23	08477	V-Sleeve, 18mm	6
24	07929	Pressure Ring	3

Oil Seal Kit

09641

<u>Item</u>	<u>Part #</u>	<u>Description</u>	<u>Qty.</u>
19	05444	Oil Seal	3

Valve Assembly Kit

09646

<u>Item</u>	<u>Part #</u>	<u>Description</u>	<u>Qty.</u>
27A	05578	Valve Ass'y, Complete	6
33	07489	O-Ring	6

REPAIR INSTRUCTIONS - P435-5100 and P450-5100

8. Maintenance and Servicing

For the type of threadlocker used and the required tightening torques, observe the table in the exploded view.

8.1 Special tools required

The following special tools are required for assembly:

- Fitting Sleeve (Tool-11)
- Pull-out tool size 2 (Ø20mm)

8.2 Suction and Discharge Valves

Screw out plugs (32) with a 12-point socket wrench.

Check suction and discharge valves that are under the plugs by taking out the valves with a pair of flat tongs and then taking them apart. Examine valve plate (28) and valve seat (27). Check O-rings (31/33) and replace if necessary. Wet O-rings thinly with silicone grease or mineral oil and insert carefully.

Tighten the plugs to the required torque.

Take care to reassemble in correct sequence.

8.3 Seals and Plunger pipe

Loosen screws (34) and remove valve casing (26) by pulling it off over the plungers.

Remove seal adaptors (20) out of the valve casing (26).

Remove drip-return ring (25), support ring (24), grooved seal (23) and out of valve casing (26).

Remove grooved seal (23) out of seal adaptor (20).

Wet new seals and O-rings thinly with silicone grease or mineral oil and insert carefully.

Pay attention to the installation position of the seals.

Check O-rings (21) and replace if necessary.



The grooved seal (23) or respectively grooved seal pack (23) on the high-pressure side is to be fitted carefully into the valve casing (26) using a fitting sleeve (Tool-11).

Alternatively, the seal can also be carefully fitted into the valve casing using a screwdriver. Under no circumstances must the seal surface in

the valve casing or the seal lip be damaged.

Check plunger surfaces (16).

Damaged surfaces cause hard wear on seals.

Lime deposits or similar on the plunger must be removed.



Plunger surface must not be damaged in the process.

In the case of lime deposits in the pump, care must be taken that the drip-return bores in parts (25) and (26) ensure trouble-free drip-return.

If the plunger pipe (16B) is worn out, loosen tension screw (16D) and remove together with plunger pipe.

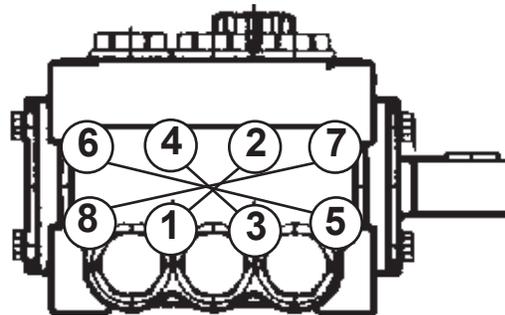
Check and clean contact surface on plunger (16A), check oil scraper(16H), fit new plunger pipe.

Cover thread of tension screw (16D) with a thin coat of thread locker and tighten carefully to the required torque.



Under no circumstances should thread-locker get between the plunger pipe (16B) and the centring neck on the plunger (16A). Tensioning of the plunger pipe due to eccentric tightening of the tensioning screw or due to dirt or damage to the contact surface can lead to breakage of the plunger pipe.

When assembling, tighten the screws (34) to the required torque.



If required, supplementary assembly instructions can be requested from the manufacturer Giant Industries, Inc.

Preventative Maintenance Check List & Recommended Spare Parts List						
Check	Daily	Weekly	50 hrs	Every 500 hrs	Every 1500 hrs	Every 3000 hrs
Oil Level/Quality	X					
Oil Leaks	X					
Water Leaks	X					
Belts, Pulley		X				
Plumbing		X				
Recommended Spare Parts						
Oil Change p/n 01154			X	X		
Seal Spare Parts (1 kit/pump) (see page 5 for kit list)					X	
Oil Seal Kit (1 kit/pump) (see page 5 for kit list)					X	
Valve Spare Parts (1 kit/pump) (see page 5 for kit list)						X

P435-5100 and P450-5100 PUMP TORQUE SPECIFICATIONS					
Position	Item #	Description	Thread Size	Lubrication Info	Torque Amount
3A	07186	Oil Sight Glass w/Gasket	1" BSP	Loctite 5910	106 in.-lbs. (12 Nm)
5	07109-0400	Oil Drain Plug	1/2" BSP		59 ft.-lbs. (80 Nm)
5B	08092-0100	Plug with Gasket	3/4" BSP		59 ft.-lbs. (80 Nm)
6	01010-0100	Screw	M8		110.6 in.-lbs. (12.5 Nm)
10	07114-0100	Screw with Washer	M8		132 in.-lbs. (15 NM)
15	08390	Screw with Washer	M6		97 in.-lbs. (11 Nm)
16D	08399-0100	Tensioning Screw	M8	Loctite 243	199 in.-lbs. (22.5 Nm)
16G	07161-0100	Copper Washer		Loctite 577 (both sides)	
32	08406-0100	Plug	M 24 x 1.5	Loctite 243	110.6 ft.-lbs. (150 Nm)
34	08396-0100	Cap Screw	M10		29.5 ft.-lbs. (40 Nm)

Pump Mounting Selection Guide

Bushings

07175 - 28 mm Tapered H Bushing

Pulley & Sheaves

01055 - 7.75" Cast Iron - 2 gr. - AB Section

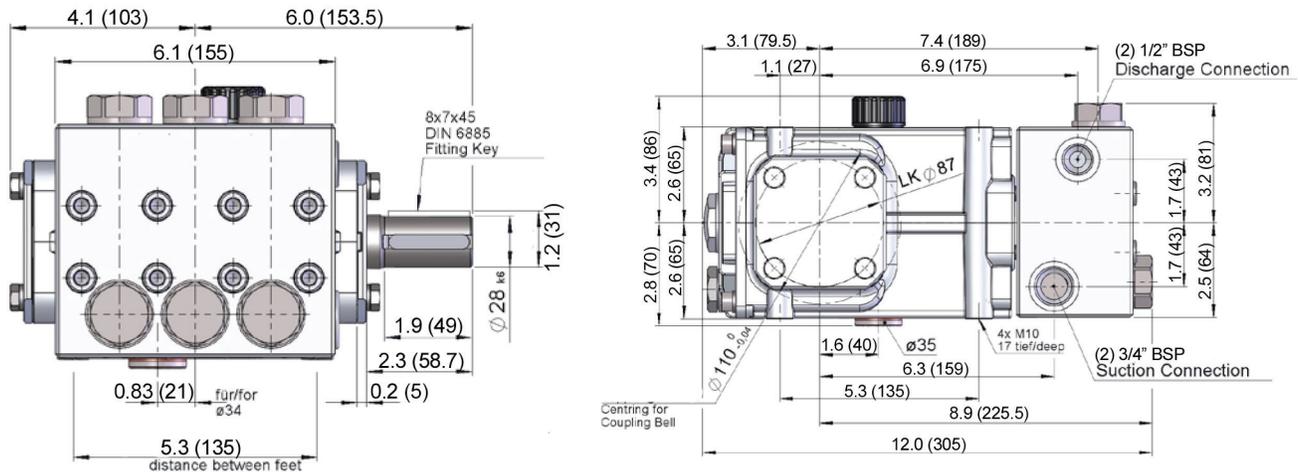
01062 - 7.75" Cast Iron - 2 gr. - AB Section

Rails

07358 - Plated Steel Channel Rails

(L=9.18"x W=1.88"x H=3.00")

P435-5100 and P450-5100 Pump Dimensions - Inches (mm)



GIANT INDUSTRIES LIMITED WARRANTY

Giant Industries, Inc. pumps and accessories are warranted by the manufacturer to be free from defects in workmanship and material as follows:

1. Five (5) years from the date of shipment for all pumps used in portable pressure washers with NON-SALINE, clean water applications.
2. Two (2) years from the date of shipment for Giant pumps used in car wash applications.
3. One (1) year from the date of shipment for all other Giant industrial and consumer pumps.
4. Six (6) months from the date of shipment for all rebuilt pumps
5. Ninety (90) days from the date of shipment for all Giant accessories.

This warranty is limited to repair or replacement of pumps and accessories of which the manufacturer's evaluation shows were defective at the time of shipment by the manufacturer. The following items are NOT covered or will void the warranty:

1. Defects caused by negligence or fault of the buyer or third party.
2. Normal wear and tear to standard wear parts.
3. Use of repair parts other than those manufactured or authorized by Giant.
4. Improper use of the product as a component part.
5. Changes or modifications made by the customer or third party.
6. The operation of pumps and or accessories exceeding the specifications set forth in the Operations Manuals provided by Giant Industries, Inc.

Liability under this warranty is on all non-wear parts and limited to the replacement or repair of those products returned freight prepaid to Giant Industries which are deemed to be defective due to workmanship or failure of material. A Returned Goods Authorization (R.G.A.) number and completed warranty evaluation form is required prior to the return to Giant Industries of all products under warranty consideration. Call (419)-531-4600 or fax (419)-531-6836 to obtain an R.G.A. number.

Repair or replacement of defective products as provided is the sole and exclusive remedy provided hereunder and the MANUFACTURER SHALL NOT BE LIABLE FOR FURTHER LOSS, DAMAGES, OR EXPENSES, INCLUDING INCIDENTAL AND CONSEQUENTIAL DAMAGES DIRECTLY OR INDIRECTLY ARISING FROM THE SALE OR USE OF THIS PRODUCT.

THE LIMITED WARRANTY SET FORTH HEREIN IS IN LIEU OF ALL OTHER WARRANTIES OR REPRESENTATION, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OR MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE AND ALL SUCH WARRANTIES ARE HEREBY DISCLAIMED AND EXCLUDED BY THE MANUFACTURER.



WARNING: This product might contain a chemical known to the State of California to cause cancer, and birth defects or other reproductive harm.
For more information go to www.P65Warnings.ca.gov