Manual for Model PG-541 Parking Gate

Parking Products Inc.
2517 Wyandotte Rd.
Willow Grove PA 19090
December 20, 2005

Table of Contents

1.0 General Description	4
Equipment Description	4
Housing	4
Gear-Motor Assembly	4
Gate Panel and Speed Master Controller	4
2.0 Installation	6
Unpacking	6
Mounting	6
Power and System Connection	6
3.0 Theory of Operation	8
Functional Description	8
Speed Master Controller	8
Motor and Limit Switches	8
Lower Gate	8
Raise Gate	10
Heater Option	10
4.0 Maintenance	11
Gear and Motor Maintenance	11
Controller Maintenance	11
Limit Switch Adjustment	11
Trouble Shooting	11
A. Feeder Wire Size Chart	12
B. Leeson Speedmaster Programming	13
C. PPI Warranty	14

1.0 General Description

Equipment Description:

Parking Products Inc. model 1-541 Power Gate is an industrial barrier gate for use with gate arms up to 20’ in length. This manual has been prepared to assist the user in the installation, operation and maintenance of the Power Gate.

The Power Gate assembly consists of three major components: the housing, the gear-motor assembly and the Gate Controller.

Housing:

The housing is constructed of #14 Ga. steel; all seams are welded and reinforced. The housing is finished with a powder coat paint. The gate door and hood are aluminum in order to prevent rust and corrosion.

Gear -Motor Assembly:

The motor and gearbox are located in the upper compartment as are the gate arm limit switches. To gain access to this compartment, unlock the door on the housing and release the latches located at the top of the housing in order to lift off the gate hood.

Gate Panel and Speed Master Motor Controller:

The Lesson Speed Master controller is a device which consists of the appropriate connectors and solid state logic to perform all necessary functions of the PPI Power gate.

The gate panel and controller contain the following controls:

1. 15A breaker with gate on/off switch
2. Raise\lower switch
3. 3 position terminal block for incoming power
4. 9 position terminal block for control wires
5. 24VDC power supply for low voltage components
6. 2 position convenience outlet

All other electrical parts and components used in the gate, with the exception of the limit switch assembly and the gear-motor assembly are housed inside the gate cabinet. All Speed Master

controllers are identical and are completely interchangeable with any other Series Speed Master controller.

The Power Gate can perform a wide variety of functions by providing the appropriate connections on the gate panel terminal blocks. No change is necessary in the programming of the Speed Master controller to perform the various operations.

Equipment Warranty:

A statement covering the warranty of this equipment is given on page 15. It should be read and understood.

2.0 Installation

Unpacking:

Specifically designed, reinforced packing cartons have been used to provide the best possible protection during transit. A careful visual inspection of the units should be made as soon as they are removed from the cartons for any damage incurred during shipping. In the event the units have been damaged as a result of shipping, the carrier and PPI should be notified as soon as possible.

The gate is shipped as a fully assembled unit. There is no need for field assembly of the equipment. However, some peripheral equipment, specifically plug-in modules such as loop detectors and timers for example, may be packed separately or placed in a smaller box in the bottom of the gate housing. If, after checking all boxes as well as the inside of the gate cabinet, any item listed on the packing slip is missing, please notify PPI as soon as possible.

Remove all shipping tape and padding from the unit before attempting to operate the gate.

Mounting:

To open the gate housing, unlock the door located on the front of the housing and lift it out of its frame exposing the termination panel.

The housing should be held firmly to the mounting surface by four bolts. Refer to the Base Mounting Plan BM-100-000 for bolt configuration. Refer to the appropriate Standard System drawings for recommended equipment placement and separation.

Power and System Connection:

Power is connected to the 3 position terminal block TB1 on the termination panel. Incoming wires should be routed through the opening in the base of the housing to their appropriate termination points.

For system connection details, refer to the appropriate Standard System Drawings or Custom System Drawings supplied by PPI.

Caution: All gates are wired for 120VAC, 60 Hz operation unless labeled otherwise.

Remove the cover over terminal strip TB1 in order to connect the incoming power. All terminals are numbered for easy identification. It is very important to provide adequate voltage to this equipment (120VAC, 60Hz, 15A). Improper wire size will result in an excessive voltage drop which will cause the equipment to malfunction. Under no circumstances should the voltage drop exceed 10 volts under load conditions from the nominal 120VAC input. Prior to pulling the cable for primary power input, refer to the PPI Feeder Wire Size Chart. This chart shows proper cable size for power input to the system gate or gates. The motor draws 8A starting current.

Note: National and local electric codes require proper grounding of all equipment enclosures. In system installations where rigid metal conduits are used, the conduits can be used for grounding if permissible. In systems where plastic conduits or any other type of wire routing is used, a separate ground wire of sufficient size must be provided.

3.0 Operation of the Power Gate

Functional Description:

The Speed Master controller (located at the top of the termination panel) in conjunction with the limit switches and gear-motor assembly provide all functions of the PPI Power Gate. In order for the gate to function with any peripheral equipment such as ticket issuing machines, card readers, loop detectors, etc., the appropriate connections must be made between these devices and the termination panel. All such control wiring is connected to the 9 position terminal block TB2. See the Gate Panel Connection illustration in this manual for a key to this terminal block. The following paragraphs describe the various functions of the gate.

Speed Master Controller:

For specific instructions on the Leeson Speed Master Micro-Controller, see the Speed Master operating manual included with each Power Gate.

Low Voltage Power Supply:

The plug in 24VDC adapter provides power for the gates low voltage circuitry. This adapter must remain on in order for the gate to function.

Motor and Limit Switches:

Motor: The gate motor is connected to terminal block TB2. This connection is made at the factory.

Limit switches: The limit switches are connected to terminal block TB2 through a pre-fabricated cable. This connection is made at the factory.

Lower Gate:

When the gate is in the up position, a pulse or contact closure on pins TB2 1 & 5 will cause the gate to lower. This input should be a “dry contact” of at least 200ms duration. However, as a general rule, these pins should not be shorted for more than 3 seconds. It will not damage the controller if these pins remain shorted, however, it will cause the gate to lower immediately upon reaching the up position. This will prevent any vehicles from passing through the gate or may cause the arm to strike a vehicle if the vehicle has begun moving under the arm.

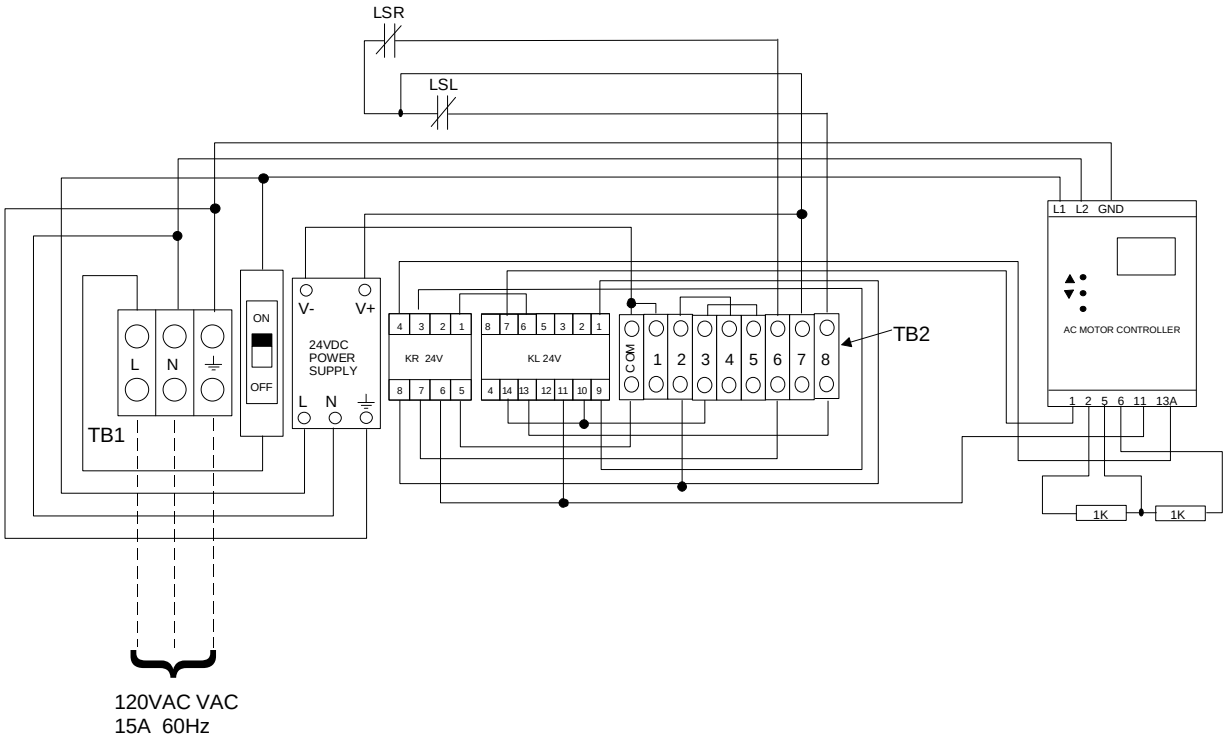
Gate Raise:

When the gate is in the down position, a pulse or contact closure on TB2 pins 1 & 4 will cause the gate to raise. As with the lower input, this should be a “dry contact” of at least 200ms duration but no more than 3 seconds duration. It will not damage the controller if these pins remain shorted, however, it will lock the gate in the up position. This will allow vehicles to pass through the gate at will. If a contact closure is received on these pins while the gate is in the down cycle, the gate will immediately reverse direction and return to the up position.

Heater Option:

A three position switch is placed on the termination panel when a heater and thermostat are installed. This switch can be used to turn the heater on, off or put it on automatic thermostat control.

The diagram below shows the gate termination panel and connections:



4.0 Maintenance

Gear and Motor Maintenance:

The gearbox is designed for a long continuous duty life and needs no routine servicing. The lubricant installed at the factory should be good for the life of the equipment. There is no need to add to or change this lubricant. The lubricant will perform satisfactorily from 0 degrees F to +110 degrees F. Do not attempt a change of lubricant for various climate or temperature extremes.

A higher than normal motor temperature can be expected during the first few weeks of operation. This is normal during the "break-in" period of the gear assembly. The break-in period will vary with the extent of use the gate is subjected to. After the break-in period, a temperature rise of 100 degrees from the ambient temperature is not unusual.

Controller Maintenance:

The Speed Master controller is sealed at the factory at the time of manufacturing and should not be opened in the field for maintenance. If service is required on the controller, contact your local PPI representative or PPI if the unit was purchased from the factory. A replacement unit will be provided from inventory at no cost if the equipment is under warranty or for a flat exchange price after the warranty has expired.

Limit Switch Adjustment:

The travel of the gate arm downward is stopped by the LSL limit switch and the upward travel is stopped by the LSR limit switch. These limit switches are pre-adjusted at the factory. If adjustment to change the stopping point is required, the following steps should be taken:

1. The cam secured to the gear assembly should not be moved.
2. Loosen slightly the two #10 screws holding the limit switch mounting plate to the L shaped bracket.
3. Move the limit switch up or down in the slot provided until the proper stopping point is achieved.
4. Tighten the screws until the mounting plate is secure.

Trouble Shooting:

The Power Gate is designed for minimal maintenance and little or no down time. The function of any parking gate is to raise and lower at the appropriate time. Most problems will manifest

themselves by the failure of the gate to raise or lower when expected. Below is a list of problems and the most probable causes should a failure occur and their possible solutions.

1. Loss of power:

A)Check for proper input voltage at TB1.

B)Make sure all circuit breakers feeding power to the equipment are turned on.

C)Check the 24VDC power supply for proper output voltage.

D)Check the Speed Master controller for any error messages. (See below.)

2. Gate fails to raise or lower:

A)Check the Speed Master Controller for any error messages. (See below.)

B)Check input from any peripheral devices such as loop detectors, card readers, push buttons, etc. Many problems are caused by the failure of such devices to provide the proper signals.

C)The gate is in the locked up state. Make sure TB2 pins 1 & 4 are not shorted.

D)The limit switches are not making contact. Check the limit switches to make sure the NO contacts are open and the NC contacts are closed.

3. Speed Master Error Codes

The table below provides a list of Speed Master error codes and their possible causes:

AF	High temperature fault.
CF	Control fault. Reset the Speed Master.
cF	Incompatibility fault. An incompatible EPM has been installed. Reinstall the original EPM or reset the Speed Master
dF	Breaking fault. The controller has sensed that the braking resistors are overheating and has shut down to protect the resistors.
EF	External fault. One of the TB-13 terminals is set as an external fault input and that terminal is open with respect to TB-11.
GF	Data fault. User data and OEM defaults in the EPM are corrupted.
HF	High DC bus voltage fault. Line voltage is too high or deceleration is too fast.
LF	Low DC bus voltage fault. Line voltage is too low.
OF	Output transistor fault. Phase to phase or phase to ground short on the output, boost settings too high or acceleration is too fast.

PF	Current overload fault. VFD is undersized for the application or mechanical problem with the driven equipment.
UF	Start fault. Start command was present when the drive was powered up. Must wait 2 seconds after power up.
F1	EPM fault. The EPM is damaged or missing.
FC	Internal fault. Consult factory.

A. Feeder Wire Size Chart (FC -101-100-01)

It is very important to provide adequate voltage to the equipment. Improper wire size will result in an excessive voltage drop which can lead to malfunctions, e. g., erratic operation, inaccurate counting etc.

Under no circumstances should the voltage drop exeed 10 volts under load conditions from the nominal 120 volts.

The following chart is a guide to determine the input wire size.

LOAD	DISTANCE IN FEET (2 CONDUCTOR)							BREAKER
UP TO 10A NO GATE	0-196	197-500	501-1000					15A OR 20A
1 GATE	0-128	129-196	197-312	313-500	501-800	801-1120	1121-1500	15A OR 20A
2 GATES		0-98	99-156	157-250	251-400	401-560	561-750	30A
3 GATES			0-117	118-187	188-300	301-420	421-560	40A
4 GATES				0-125	126-200	201-280	281-375	50A
WIRE SIZE	12AWG	10AWG	8AWG	6AWG	4AWG	2AWG	0AWG	

A. The first column is the equipment to be installed.
B. For all standard systems without gates (10 amps or less) use the first row.
C. For all standard systems with gates, use the row indicating the number of gates on that circuit. (Associated equipment is included.)
D. Distances are in feet from power panel to the equipment terminals.

Note:National and local electric codes require proper grounding of all equipment enclosures. In system installations where rigid metal conduits are used, the conduits can be used for grounding if permissible. In systems where plastic conduits or any other type of wire routing is used, a separate ground wire of sufficient size must be provided.

B. Leeson Speedmaster Programming

The following table shows the program settings for the Leeson Speedmaster motor controller. The Speedmaster must be programmed for these settings in order for the Power Gate to operate properly. Note: these settings are made at PPI prior to shipment so in most cases it is not necessary to program the Speedmaster in the field. For additional information on programming the Speedmaster controller, refer to the Leeson Speedmaster Operation Manual section 13.0.

PARAMETER	FUNCTION	SETTING
1	Line Voltage	01
2	Carrier Frequency	02
3	Start Method	01
4	Stop method - ramp with DC brake	04
5	Standard speed source – 0-10VDC	03
6	Relay output – none	01
10	TB-13A function – start reverse	06
11	TB-13B function – none	01
12	TB-13E function – increase frequency	05
14	Control – terminal strip only	01
16	Units ending – tenths of units	02
17	Rotation – forward and reverse	02
19	Acceleration time	1.0
20	Deceleration time	0.3
21	DC brake time	0.3
22	DC brake voltage	15
23	Minimum frequency	0.0
24	Maximum frequency	60
25	Current limit	180
26	Motor overload	100
27	Base frequency	60
28	Fixed boost	1.0
29	Accel boost	0.0
30	Slip compensation	0.0
31-37	Preset speeds	0.0
38	Skip bandwidth	0.0
39	Speed scaling	0.0
42	Accel/Decel #2	20.0
44	Password	000
45	SPD at minimum signal	0.0
46	SPD at maximum signal	60
48	Program selection	01
50-58	Display only, not programmable	-

C. Warranty

PPI warrants to the original buyer that this product is free from defects in workmanship and material. Unless otherwise agreed to in writing, PPIs obligation under this warranty shall be limited to furnishing a replacement for, or at PPIs option, repairing this product or any part or parts thereof which, in PPIs opinion prove to be defective for one year from the date of shipment by PPI provided all Standard Terms and Conditions are complied with. No product or part may be returned without PPIs prior approval. In no event will any claim for labor in removing or replacing a defective product or part or for consequential damages be allowed.

Standard Terms and Conditions:

No warranty is made as to this product or part which has not been sold by PPI or installed or operated or maintained in accordance with instructions conveyed by PPI or the instructions contained in this manual or which have been subject to misuse, abuse, accident, vandalism, alteration or to improper maintenance, storage, transportation or handling.

This warranty is in lieu of all other warrnties, expressed or implied and PPI niether assumes nor authorizes any person or firm to assume for it any other or further obligations or liability in connection with the sale, installation or use of this product.

The following items are excluded from the warranty:

1. Replace fuses or reset circuit breakers.
2. Replace light bulbs or indicator lights.
3. Replace inking ribbons.
4. Replace equipment heaters.
5. Replace gate arms.
6. Change tickets, splice tickets or feed tickets into ticket machine.
7. Remove ticket jams.
8. Set or reset differential or total counters.
9. Set or clean time-heads for ticket mechanisms or time clocks.
10. Remove or install quick-change plug connected components.
12. Set or update computer software or program parameters.
13. Change computer program from original function.
14. Rectify any problems due to wrong connections or faulty installation. (If not installed by PPI.)

BILL OF MATERIAL 101-500-00

POWER GATE MODEL 1-541

ITM	QTY	PART NUMBER	DESCRIPTION
1	1	AS101-101-01	Limit Switch Assembly
2	1	AS101-500-00	Motor & Gear Reducer Assembly
3	1	AS101-500-01	Universal Gate Controller
4	1	AS101-500-08	Termination Panel
5			
6			
7	1	100-100-00	Base
8	1	100-100-00/D	Door
9	2	AS100-100-03	Spring Latch Assembly
10	1	101-100-01	Hood
11	1	101-100-02	Mounting Plate
12			
13	1	100-101-02	Treaded Rod
14A	1	101-500-19	Gate Arm Bracket & Shaft Assembly
14B	1	101-500-20	Gate Arm Bracket - Clamping Plate
15	1	101-104-03	Connecting Plate - Gate Arm Bracket
16	1	101-104-04	Connecting Plate - Motor Shaft
17			
18	1	199-001-24	Standard PPI Name Tag
19	2	101-104-11	1/4" SQ Key
20	1	101-107-01	Limit Switch Cam
21	2	600-000-01	Pillow Block
22	1	500-400-02	Lock Assembly with Cam
23	2	600-001-01	Rod End Bearing
24			
25	2	500-232-03	Retaining Ring
26	4	500-230-01	Pop Rivet
27			
28	2	500-031-01	5/8 - 11 X 2 1/2 Hex Head Bolt
29	2	500-023-08	3/8 - 16 X 1 1/2 Hex Head Bolt
30	4	500-027-01	1/2 - 13 X 1 1/2 Hex Head Bolt
31	4	500-021-02	5/16 - 18 X 1 3/4 Hex Head Bolt
32			
33	2	500-019-17	1/2 - 20 X 1 1/2 Socket Head Screw with Nylok
34	2	500-016-02	#10 - 32 X 1/2 Rd Head Screw
35	2	500-011-30	#6 - 32 X 1/4 Socket Set Screw with Cup
36	1	500-011-01	#6 - 32 X 1/4 Rd Head Screw
37	2	500-010-01	5/8 - 11 Hex Nut
38	12	500-021-04	5/16 - 18 X 3/4 Hex Head Bolt

39	6	500-086-01	#10 - 32 Hex Nut		
40	4	500-211-01	5/8 Flat Washer		
41	4	500-207-01	1/2 Flat Washer		
42	2	500-161-01	5/8 Split Lockwasher		
43	4	500-157-01	1/2 Split Lockwasher		
44	16	500-151-01	5/16 Split Lockwasher		
45					
46	4	500-145-02	#10 Internal Lockwasher		
47	2	500-145-03	#10 External Lockwasher		
48	1	500-225-01	Plastic Bushing		
49	1	199-001-25	Product ID Label		

BILL OF MATERIAL 101-102-01

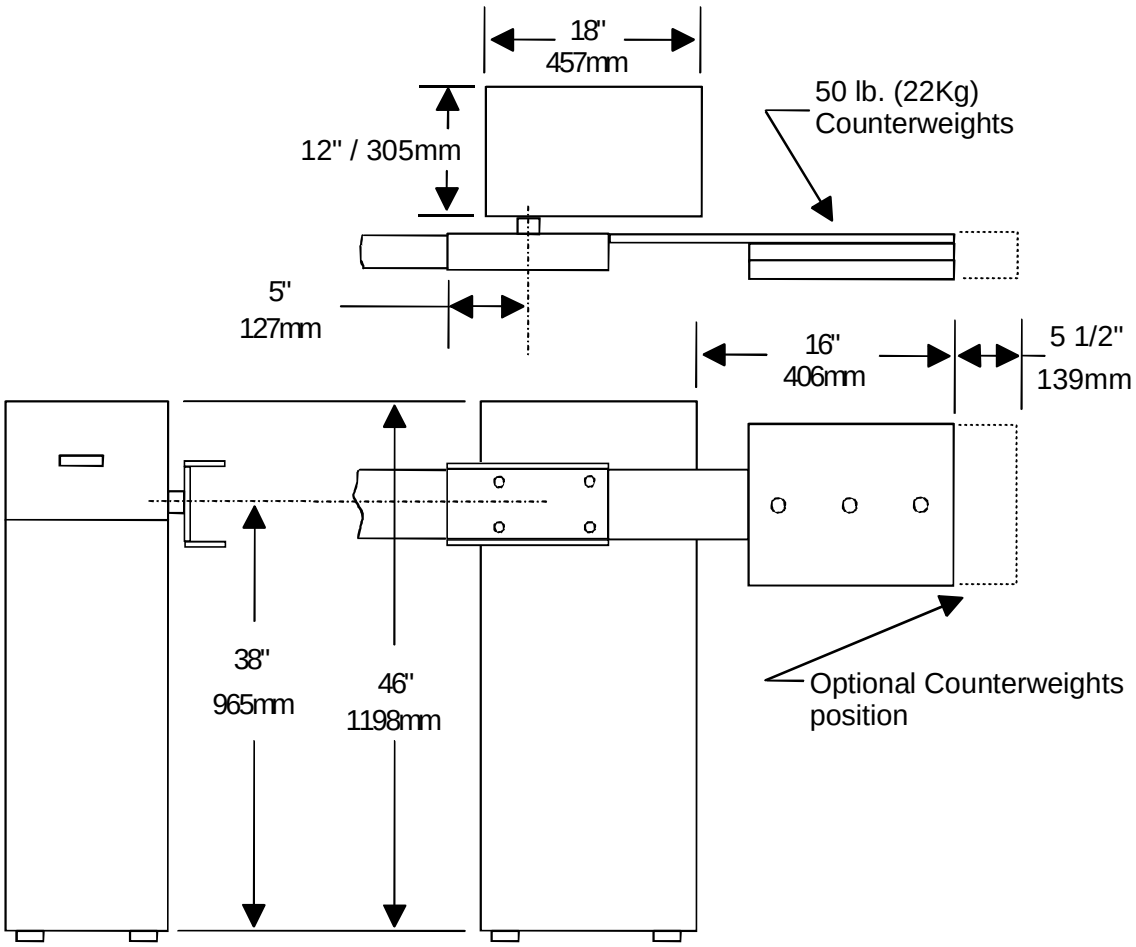
GATE MOTOR ASSEMBLY

ITM	QTY	PART NUMBER	DESCRIPTION		
1	1	800-006-63	8 Position Terminal Block Plug		
2	1	800-000-12	1/3 HP Motor		
3	1	800-000-19	Gear Reducer		
4	1	800-066-09	1.5Ohm 25 Watt Resistor		
5	1	101-199-05	Heat Sink		
6	1	101-199-06	Wire Cover		
7	2	500-230-01	Pop Rivet		
8					
9					
10					
11	1	199-001-25	Product ID Label		
12					

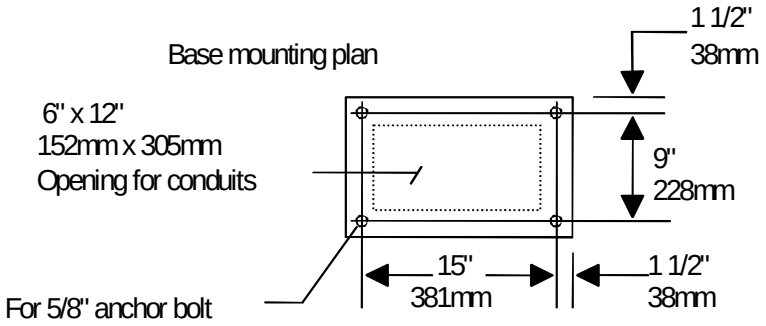
BILL OF MATERIAL 101-101-01

LIMIT SWITCH ASSEMBLY 1-141

ITM	QTY	PART NUMBER	DESCRIPTION		
1	1	101-106-01	Limit Switch Support Bracket		
2	2	101-106-02	Limit Switch Mounting Plate		
3	2	800-005-01	Micro Switch		
4	2	800-005-02	Switch Actuator		
5	3	800-011-05	Tie Wrap Holder		
6	6	800-011-01	Tie Wrap		
7	3	500-016-06	10-32 X 3/8" Pan Hd Screw		
8	4	500-016-04	10-32 X 3/8" Soc Hd Screw		
9					
10					
11	7	500-145-03	#10 External Lockwasher		
12					



Base mounting plan



PPI reserves the right to make technical changes at any time without prior notice.

POWER GATE	**MODEL 1-541**
PARKING PRODUCTS INC.	**SHEET 1OF 1**