PRODUCT MANUAL
PARK BRAKE WARNING SYSTEM
12/24 VOLTS

Part No. 11377 | 11386 | 11387

www.rct.net.au
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GENERAL SAFETY WARNINGS

PERSONAL SAFETY

■ Everyone is responsible for safety.
■ The installer/service personnel should be trained and authorized to complete the required work.
■ Ensure that the machine is safely isolated during installation and testing to protect all personnel.
■ Complete all required risk assessments and job safety analysis (JSA) before commencing work.
■ Observe all site specific and machine OEM procedures regarding the following:
  – working at heights
  – working in heat
  – working in confined spaces
  – all other site specific occupational health and safety (OH&S) procedures

MACHINE

■ Carry out all prestart operations as per site and machine OEM procedures.
■ Ensure the machine is safely isolated during installation and testing to protect the machine and other equipment in the area.
■ Do not operate any machine with a known fault and report all findings to the supervisor in writing.
■ Test and operate machine as per machine OEM and site procedures.
■ Read and understand machine and site specific operational and testing instructions.

PRODUCT

Before applying power to the equipment, the user/repairer/installer must read all product instructions. If in doubt, seek assistance.

■ Ensure electrical connections are made as per RCT’s recommendations. Test circuits prior to connecting power to any component.
■ The equipment contains no user serviceable parts inside. Return the unit to RCT for repairs.
■ Retain product and installation instructions for future use.
■ Ensure that RCT’s recommended service procedures are included in the machine’s service routine.
■ Observe all machine, site and RCT product warnings.
■ Follow all machine, site and RCT product operating procedures at all time.

The application of safety should not be limited to the above recommendations.
PRODUCT OVERVIEW

The Muirhead® Park Brake Warning systems, part numbers 11386 and 11387, are preventative action systems that not only alert the operator that the machine’s park brake is not applied, but also alert any personnel within the vicinity of the machine.

The control unit senses when a door is opened or closed via proximity switches. The 11386 kit has two door proximity switches whilst the 11387 kit has only one. If a machine’s door is open, the system alerts the operator and personnel by means of an audible horn and a instrument panel-mounted LED that the machine’s park brake has not been applied. When the machine's battery isolator is turned on, the system runs through a test cycle.

FEATURES AND FUNCTIONS

- Increases operator and workplace safety
- Multi-voltage 12 to 24 volts
- Environmentally sealed – IP66
- Door sensing
- Self-test mode
- Override switch
- Protects personnel working on and near machine
- Helps prevent unattended machine run away accidents
- Enforces safe operating practices
- Compact and robust design
- Audio and visual indicators
- Park brake sensing
- Customised circuitry

OPERATION AND USE

When the park brake warning system is first powered up, the alarms will self test for approximately one to two seconds. When the two doors are closed and the park brake is applied, the park brake warning system is in its armed state.

When the park brake is released and a door is opened, a flashing LED will operate and the OEM horn will operate repeatedly until the park brake is reset.

When the park brake is applied and a door is opened, this has no effect on the park brake warning system until the park brake is released.

The park brake warning system has a keyed override (11386 kit only) incorporated in the external circuitry, so that when the override is turned to the off position, the system becomes inactive to allow for maintenance.
CONTROL UNIT STATUS INDICATOR OPERATION

<table>
<thead>
<tr>
<th>STATE</th>
<th>INDICATOR SEQUENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Battery Power-up</td>
<td>■ All indicators will turn on.</td>
</tr>
<tr>
<td></td>
<td>■ All indicators will turn off.</td>
</tr>
<tr>
<td></td>
<td>■ After power-up, the control unit will revert to normal operation.</td>
</tr>
<tr>
<td>Status Indicator in Operation</td>
<td><strong>RED</strong> – Fault.</td>
</tr>
<tr>
<td></td>
<td>■ If outputs have problems, this will turn on.</td>
</tr>
<tr>
<td></td>
<td>■ Outputs 1 &amp; 2 – high current outputs: checked for over current.</td>
</tr>
<tr>
<td></td>
<td>■ Output 3 – not checked as it is a low side driver.</td>
</tr>
<tr>
<td></td>
<td>■ Output 4 – checked for correct output voltage.</td>
</tr>
<tr>
<td></td>
<td>■ Temperature – checked for board temperature exceeding 80 °C.</td>
</tr>
<tr>
<td></td>
<td><strong>YELLOW</strong> – Pulses during normal operation, indicates system OK.</td>
</tr>
<tr>
<td></td>
<td>■ Flashes on and off at one-second intervals (on for one second, off for one second).</td>
</tr>
<tr>
<td></td>
<td><strong>GREEN</strong> – On for normal operation.</td>
</tr>
<tr>
<td></td>
<td>■ Flashes when valid input goes active (number of flashes = input number).</td>
</tr>
<tr>
<td></td>
<td>■ Allows checking that inputs are correctly wired and that the hardware is seeing the input toggle.</td>
</tr>
</tbody>
</table>

INSTALLATION INSTRUCTIONS

1. Mount the control unit in suitable location.
2. Refer to the wiring table below and the wiring diagram in this manual to connect the control unit. It is recommended that the wiring is installed alongside the OEM wiring ensuring that it is secured at regular intervals; this will provide protection from heat and abrasion, and any other excess damage that may occur with extended vehicle operation. When securing the wiring to the OEM wiring, ensure that the loom is away from moving vehicle parts which could lead to loom damage.
3. Mount the LED on the instrument panel in the cab in clear view of the operator.

WIRING CONNECTIONS

<table>
<thead>
<tr>
<th>NO.</th>
<th>COLOUR</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Red</td>
<td>Keyed override switch (11386 kit only). To battery supply at key switch (ensure it is circuit breaker protected)</td>
</tr>
<tr>
<td>2</td>
<td>Black</td>
<td>Earth</td>
</tr>
<tr>
<td>3</td>
<td>Green</td>
<td>Flashing LED +ve (13 A)</td>
</tr>
<tr>
<td>4</td>
<td>-</td>
<td>Not used</td>
</tr>
<tr>
<td>5</td>
<td>-</td>
<td>Not used</td>
</tr>
<tr>
<td>6</td>
<td>Blue</td>
<td>Left door switch input</td>
</tr>
<tr>
<td>7</td>
<td>Blue</td>
<td>Right door switch input (11387 kit join BU wire to BK wire - earth)</td>
</tr>
<tr>
<td>8</td>
<td>Grey</td>
<td>Park brake switch input</td>
</tr>
<tr>
<td>9</td>
<td>-</td>
<td>Not used</td>
</tr>
<tr>
<td>10</td>
<td>White</td>
<td>OEM horn +ve (13 A)</td>
</tr>
<tr>
<td>11</td>
<td>-</td>
<td>Not used</td>
</tr>
<tr>
<td>12</td>
<td>-</td>
<td>Not used</td>
</tr>
</tbody>
</table>
Note: Manufacturer recommends that the Pin 10 Output - (white) be connected to the OEM horn circuit via a relay if the current draw is greater than 13 amps.

Please refer to the following table if you are upgrading from a 0230 or 10886 device:

**Upgrading From 0230 or 10886 – Equivalent Pin Outs**

<table>
<thead>
<tr>
<th>8-PIN PLUG</th>
<th>12-PIN PLUG</th>
<th>WIRE COLOUR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pin 1</td>
<td>Pin 1</td>
<td>Red</td>
</tr>
<tr>
<td>Pin 2</td>
<td>Pin 2</td>
<td>Black</td>
</tr>
<tr>
<td>Pin 3</td>
<td>Pin 10</td>
<td>White</td>
</tr>
<tr>
<td>Pin 4</td>
<td>Pin 3</td>
<td>Green</td>
</tr>
<tr>
<td>Pin 5</td>
<td>Pin 6</td>
<td>Blue</td>
</tr>
<tr>
<td>Pin 6</td>
<td>Pin 7</td>
<td>Blue</td>
</tr>
<tr>
<td>Pin 7</td>
<td>Pin 8</td>
<td>Grey</td>
</tr>
<tr>
<td>Pin 8 (Not connected)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

All other pins on the 12 pin connector are not connected and should be sealed using the blocking contacts.

The following parts are required when upgrading the old control unit:

<table>
<thead>
<tr>
<th>PART NO.</th>
<th>DESCRIPTION</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>2022</td>
<td>12-socket connector (supplied separately)</td>
<td>1</td>
</tr>
<tr>
<td>1959</td>
<td>Lock wedge 12 socket (supplied separately)</td>
<td>1</td>
</tr>
<tr>
<td>2118</td>
<td>Blocking contact #16 (supplied separately)</td>
<td>5</td>
</tr>
</tbody>
</table>
EXTERNAL WIRING DIAGRAM

Loom Diagram (474s)

WIRE LEGEND

RD - RED
BK - BLACK
GN - GREEN
BU - BLUE
WH - WHITE
GY - YELLOW
OR - ORANGE
TQ - TURQUOISE
DN - DARK
PK - PINK
PU - PURPLE
BR - BROWN

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NOTE:

A) ALL SWITCHES ARE SHOWN AS THEY WOULD BE WITH THE PARK BRAKE APPLIED AND THE DOORS CLOSED.

B) IF ONLY ONE DOOR SWITCH IS USED THE OTHER DOOR SWITCH WIRING MUST BE LINKED TOGETHER.

WIRE LEGEND

BK - BLACK
PK - PINK
BU - BLUE
PN - PURPLE
GN - GREEN
Y - YELLOW
OR - ORANGE
GR - GREY

PARK BRAKE WARNING SYSTEM

EXTERNAL WIRING

OPTIONAL SUPPLIED KEYED OVERRIDE SWITCH

OPTIONAL DOOR SWITCH (11386 KIT ONLY)

OPTIONAL DOOR SWITCH (11387 KIT REQUIRES PIN 6 TO BE BRIDGED TO PIN 11)

[Diagram of wiring connections with labels for various switches and symbols for horn, earth, etc.]
SERVICE INFORMATION

SERVICE SCHEDULE

The manufacturer recommends that the following service procedure should be performed at each machine’s scheduled service interval.

SERVICE PROCEDURE

1. Perform a visual inspection; include the following:
   a) Control unit
   b) Wiring connections and looms
   c) Park brake switch
   d) Door proximity switches

2. Perform a system test as per the following:
   a) Refer to the Operation and Use section of this manual for instructions on the operation of each function, and checking the controller for maintenance or repairs that may be required to keep it functional and operational.
   b) For any problems found when testing, refer to the Troubleshooting section of this manual.

PARTS LIST

PARTS SUPPLIED FOR THE 11386 AND 11387 KITS

<table>
<thead>
<tr>
<th>PART NO.</th>
<th>DESCRIPTION</th>
<th>QTY (11386 KIT)</th>
<th>QTY (11387 KIT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6812</td>
<td>Proximity Switches</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>0658</td>
<td>Door Open Warning Label</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>5054</td>
<td>Park Brake Switch</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>0821</td>
<td>Terminal F/Spade Blue</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>0825</td>
<td>Terminal Blue 5.3 mm Hole</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>0826</td>
<td>Terminal Blue 6.6 mm Hole</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>9393</td>
<td>LED M/V Red 2T Flashing</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>11378</td>
<td>Loom To Suit 11386/11387</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>11377</td>
<td>Control unit to suit 11386/11387</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>5343</td>
<td>System Override Label</td>
<td>1</td>
<td>–</td>
</tr>
<tr>
<td>3543</td>
<td>Key Switch Head Stay Put L/H</td>
<td>1</td>
<td>–</td>
</tr>
<tr>
<td>5510</td>
<td>Switch Body with 1 x N/C Contact</td>
<td>1</td>
<td>–</td>
</tr>
</tbody>
</table>
TECHNICAL SPECIFICATIONS

<table>
<thead>
<tr>
<th><strong>Dimensions, control unit only</strong></th>
<th>Length: 119 mm</th>
<th>Width: 80 mm</th>
<th>Height/Depth: 65 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dimensions, boxed for freight</strong></td>
<td>Length: 300 mm</td>
<td>Width: 200 mm</td>
<td>Height/Depth: 180 mm</td>
</tr>
<tr>
<td><strong>Weight, control unit only</strong></td>
<td>255 g</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Weight, including harness / packaging for freight</strong></td>
<td>2 kg</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Input nominal voltage</strong></td>
<td>12 to 24 V DC</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Min &amp; Max Input Voltage</strong></td>
<td>8 to 35 V DC</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>System current rating:</strong></td>
<td>10 A continuous</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Operating temperature:</strong></td>
<td>-10 to +65 °C</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Connection types</strong></td>
<td>12-pin Deutsch receptacle</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Inputs</strong></td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Environmental rating:</strong></td>
<td>IP66</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Circuit protection</strong></td>
<td>External control, reverse polarity protection</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Enclosure material</strong></td>
<td>Polycarbonate</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

COMPLIANCE AND STANDARDS

Remote Control Technologies Pty Ltd has an obligation as a manufacturer to comply with the regulations as required by the relevant regulatory bodies, depending on the market and location.

This product currently complies with the following:

**ACMA**

**EU**
- RoHS 2 Directive 2011/65/EU.

**FCC**
This device is exempt from FCC regulations under 47 CFR 15.103 Exempted devices.

**IC**
This device is exempt from IC regulations under ICES-003 — Information Technology Equipment (ITE) — Limits and Methods of Measurement.

TROUBLESHOOTING

<table>
<thead>
<tr>
<th><strong>FAULT</strong></th>
<th><strong>POSSIBLE CAUSE</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Device not working.</td>
<td>Check wiring and connections.</td>
</tr>
<tr>
<td>Intermittent fault.</td>
<td>Check wiring, connections, and proximity switch adjustment.</td>
</tr>
</tbody>
</table>
GLOSSARY

Amp (Ampere) mW Milli Watts
Alternating Current N/A Not Applicable
Advanced Management System N/C Normally Closed
Auxiliary Output N/O Normally Open
Advanced Management System OEM Original Equipment Manufacturer
AC N/C Normally Closed
Controller Area Network O/P Outputs
AMN N/C Normally Open
Control Master Input Output PCB Out Output
Auxiliary Output PB Push Button
Control Master Transmitter PC Personal Computer
CM2200 Control Master 2200 Remote Set PCB Printed Circuit Board
Control Master Receiver PIN Personal Identification Number
Control Master Transmitter PLC Programmable Logic Controller
Control Master 2200 Remote Set PWR Power
COMMS Communications RCT Remote Control Technologies Pty Ltd
Central Processor Unit Rev Revision
AC N/C Normally Open
DC N/C Normally Open
E.G. For example PPM Pulses Per Metre
Energised To Run POT Potentiometer
Energised To Stop PPM Pulses Per Metre
End Engine Shutdown PWM Pulse Width Modulation
Field Effect Transistor RCT Remote Control Technologies Pty Ltd
Field Effect Transistor Rev Revision
Hexidecimal Numbering System RF Radio Frequency
Hexidecimal Numbering System RH Relative Humidity
Identity RPM Revolutions per minute
Input RX Receiver
In SYS System
Input RS232 Recommended Standard (number 232) for serial data transfer
IP Source The output can supply/drive current out
Kilogram SYS System
Kilogram TOV Text On Video
Kilogram Source The output can supply/drive current out
Km/h TOV Text On Video
Km/h SYS System
Km/h V Volts
Km/h °C Degrees Centigrade
Light Emitting Diode # Number
Link # Number
Link °C Degrees Centigrade
Light Emitting Diode < Less Than
Light Emitting Diode > Greater Than
Light Emitting Diode % Percentage
Link % Percentage
Link

WARRANTY

Please see the RCT standard warranty, available on our website - www.rct.net.au.
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