SERVICE BULLETIN SB3001
Rev. E 11/04

Balcrank®

Director Jr.

Model: 3110-005

⚠ CAUTION

It is strongly recommended that shielded wiring be used for ALL impulse meter connections. The use of unshielded wiring could results in erroneous dispense volumes. The Director batch register and the totaling register will read the correct amounts requested, but the actual dispense volume will be less. This condition is a result of the unshielded wiring picking up stray signals from adjoining electrical wires and/or electrical equipment. If unshielded wiring is used, the condition described above will not be covered under Balcrank's Product Warranty.

Thoroughly read and understand this manual before installing, operating or servicing this equipment.

OPERATION, INSTALLATION, MAINTENANCE AND REPAIR GUIDE

GENERAL SAFETY

Thoroughly read and understand this manual before installing, operating or servicing this equipment.

Guide to Safety Comments:

NOTE: Gives more explanation of a procedure, or a helpful hint.

CAUTION: Alerts user to avoid or correct conditions which could cause damage and/or destroy the equipment.

WARNING: Alerts user to avoid or correct conditions which could cause bodily injury.

The following precautions should be observed to lessen the risk of equipment damage and/or personal injury.

- Check equipment regularly and repair or replace worn and damaged parts.
- Never alter or modify any parts of this unit; doing so may cause damage to the unit and/ or personal injury.
- Always read and follow the fluid manufacturer's recommendations regarding proper use, handling and disposal.

WARNING: Before servicing or maintaining any pressurized component on the system (e.g. filters), relieve the pressure on the component

WARNING: A pressure relief valve at the fluid supply point is mandatory for protection of the sytem and personnel, and to maintain the warranty in effect. Relief Kit 3120-014 (1/2" NPT) or 3120-015 (3/4" NPT) will protect the system from possible overpressure damage. Excess fluid pressure above 850 psi (56 bar) is relieved. Relief over low is directed back into the supply container to reduce the risk of equipment damage or serious bodily injury.

WARNING: High voltage may be present when servicing this equipment. This equipment should only be serviced by authorized persons. **Remove power from the console before attempting to replace the fuse.**

TABLE OF CONTENTS

INTRODUCTION

General Description

Controlled dispensing of motor oil, ATF, gear oil and antifreeze is available with the economical DIRECTOR JR. The unit allows the selection of one of up to ten (10) stations. One Director Jr. is required for each fluid type dispensed. The console size is very small allowing for easy placement of as many units as may be required for the number of fluids to be dispensed. Each unit is completely self-contained. The units of measure are normally quarts or pints, depending on the selection of the in-line meter used. Gallon and liter meters are also available. The voltage controlling the solenoid valves and the impluse meter voltage is 24 VAC.

System Specifications

Power Required . . . . . 120 VAC, 60/50 Hz, 20 Watts

Control Capacity . . . . . 1 Product, 10 Stations

Operating Temperature . . . . . .0° - 140° F (-17° - 60° C)

Maximum Amount Dispensed . . . . . 99,999.9 Units of Volume

Impulse Meter Rating . . . . . Maximum of 35 VAC, 0.01 amp

Resolution . . . . . .0.1 Unit of Volume

Control Output Rating . . . . . 24 VAC, 1/2 amp max.

Dimensions . . . . . 5.7" H x 6.7" W x 5.7" D

Maximum Flow Rate . . . . . 20 Units per Minute

Cable Length . . . . . .6 feet

Console Features

The Director Jr. controls include switches for entering the desired amount of delivery, a station selector switch, reset buttons (4+6) to start flow, a power switch and a "Ready" light. One console provides complete control over the dispensing of one type of fluid for up to ten (10) stations.

PRODUCT SPECIFICATIONS

Figure 1 shows a simplified, pictorial schematic of one product controlled to 5 stations and referenced extension of a sixth station addition.

Typically, the following items are necessary:

1. **Director Jr. (3110-005)** - The Director Jr. allows centralized control and monitoring of individual deliveries as well as a running total.

2. **Isolation Air Valve (3230-004)** - This valve will isolate the pump, air regulator and air solenoid valve for any servicing requirements, etc.

3. **Air Regulator (3260-009)** - To regulate air pressure to the pump, so not to exceed 80 psi and/or limit pump output pressure to 850 psi (59 bar) if normal air supply would make it higher than recommended.

4. **Air Solenoid Vlave (3120-011)** - This valve opens and closes air line to start the pump when activated by the Director Jr. (Balcrank recommends this feature to help prevent accidental spills.)

5. **Pumps** - 1.3:1, 4:1, 5:1 and 10:1 ratios can provide nad maintain sufficient line pressures and fluid volumes for most systems (system plumbing length will dictate pump ratio required).

6. **Impulse Meters** - Electric impulse metermeasures the amount of fluid that is being dispensed. There are four types of impulse meters available; quart, liter, pint and gallon.

7. **Relief Kit (MANDATORY IN EACH SYSTEM)** - **3120-014** FOR 1/2" NPT or **3120-015** for 3/4" NPT systems. The Relief Kit limits fluid pressure buildup in lines due to thermal expansion, by relieving fluid pressure over 850 psi (59 bar).

8. **Gate Valve** - Isolates the pump and fluid meter from fluid flow-back when servicing, etc.

9. **Fluid Shut-off Valve (3230-002)** - Isolates solenoid valve and dispensing station for servicing, etc.

10. **Fluid Line Y-Strainer (3120-010)** - Protects system against foriegn contaminants.

11. **Fluid Solenoid Valve (3120-012)** - This valve opens fluid line to dispensing station when activated by the Director Jr.

12. **Ready Light (3120-009)** - Alerts the operator when the fluid at his station has been enabled for dispensing.

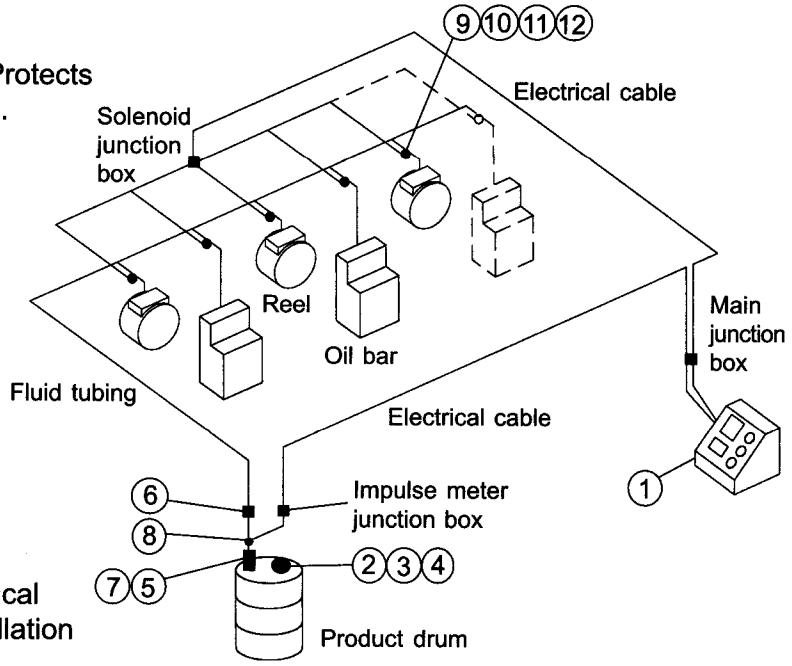

Figure 1
Pictorial of a typical Director Jr. installation

Interconnection Box

There is no interconnection box or junction box provided with the Director Jr. because all of the electronics are contained in the console. A multiwire cable is provided to connect in any convenient wiring box.

Impulse Meter

An impulse meter is used in the system to measure the amount of fluid dispensed. This meter is actually a simplle flow meter that is installed in the fluid line. Inside the impulse meter is a rotating cam that actuates a small microswitch that sends electrical impulses to the console. One impulse is generated for every tenth of a unit volume of fluid that flows through the meter. This meter will measure in quarts or pints.

INSTALLATION

General

To determine the installation requirements for a Director Jr. system(s), certain factors need to be established. In general, these factors will determine how much material such as cable, wire, fluid lines, pumps and etc. will be needed. Answers to these questions below will help determine your material requirements.

1. Determine how many fluid types are to be dispensed. This will determine how many Director Jr. systems will be needed.

2. The number of reels or oil bars and solenoid valves needed will be determined by the number of stations to be serviced.

3. Decide where to locate the console(s), the reels and oil bars, and the fluid supply tanks. Once these locations are established, the lengths of wire, cable and fluid lines can be determined.

WARNING: A pressure relief valve at the fluid supply point is mandatory for protection of the sytem and personnel, and to maintain the warranty in effect. Relief Kit 3120-014 (1/2" NPT) or 3120-015 (3/4" NPT) will protect the system from possible overpressure damage. Excess fluid pressure above 850 psi (56 bar) is relieved. Relief over low is directed back into the supply container to reduce the risk of equipment damage or serious bodily injury.

Plumbing

The Director Jr. system is a custom assembly tailored to specific needs depending on the relative position of equipment, the number of products controlled and the number stations for each product. To control a product which will be monitored, an electric impulse meter will be installed in the main hydaulic line coming from the pump or source of fluid supply, (Figure 1, Item 6). The meter has 1/2" female pipe threads at both inlet and outlet. It is recommended that the meter be installed on a rigid line which will give it support. It is suggested that a flexible hose be attached between the pump and the meter. This will allow for slight movement or flexing of the inlet line.

To make sure the system is as tamperproof and inconspicuous as possible, the impulse meter can be installed at any point in the hydaulic line between the fluid source and the first branch of the system. In this case a short length of hose at one end is suggested to simplify the piping hook-up. A careful study of the floor plan of the building where the system is to be installed should be made to determine

the best location for this meter, considering ease of installation and length of wiring to the console.

The electric solenoid valve (3120-012) is installed in the hydraulic line as near to the point of dispensing as possible (Figure 1, Item 11). One valve must be installed in the line of each outlet to be controlled. It is suggested that a manual by-pass valve be installed around the solenoid valve as shown in the diagram (Figure 1, Item 9). This allows the solenoid valve to be by-passed in case of electric power line failure. The by-pass valve should allow for locking in either the open or closed position by means of a padlock or sealing wire to avoid tampering.

ELECTRICAL

Refer to Figures 2 and 3 for electrical installation.

Installation should be made in accordance with the National Electrical Code (NFPA 70) and the Flammable and Combustible Liquids Code (NFPA 30).

Power input to the Director Jr. is 115 VAC. All control circuits are 24 VAC which are not normally restricted by electrical codes, however, local codes should be checked for applicability, and all electrical installations should comply with codes.

Place the console(s) where it will normally be used. All electrical connections are made through the multi-wire cable supplied with the unit. Some kind of pull box should be mounted within 5 feet of the console. A suitable place might be behind a desk or in the ceiling where the existing electrical system is likely located. Connect the supplied cable to a screw type terminal strip with 14 terminals that is mounted iinside the box as indicated in Figure 2.

No. 18 AWG wire is recommended for all runs less than 400 feet. For runs from 400 to 625 feet, use wire no. 16 AWG or larger. Normally the 24 VAC wiring can be run around the overhead structure of the building without using conduit. This wire should be clamped or secured to the structure in such a way that it is not subject to any mechanical stress. Use a strain relieving clamp any time a cable enters a junction box. The cables from all the consoles in the system can be run to one junction box with conduit running to the 115 VAC circuit breakers and then using multi-wire cable for the control circuit runs.

Another junction box should be installed within a few feet of the impulse meter (less than 10 feet). A control cable can then be used to run between this box and the console junction box. Solderless connections (wire nuts) can be used for the connections in this box.

Another junction box or group of boxes should be mounted near the solenoid valves. In the case of a reel bank, one junction box may suffice for several valves. In the event that a number of reel banks or oil bars or other dispensing points are used, it may be necessary to locate seperate junction boxes at each dispensing location. The two wires from each electrical solenoid valve should be run inside of plastic or metal sheathing for mechanical protection. In the event that the junction box is located at a distance from the valve greater than the length of the valve wires, it may be necessary to splice on another length of wire. If this is necessary, it is suggested that the splice be made by twisting the two ends of the wires together, soldering them and then covering the connection with heat shrinking tubing.

An optional extra to the system is a "Ready" light (3120-009). This light is installed within sight of the dispensing mechanic. It may be attached to the side of the reel bank, oil bar or an adjacent wall. The wires of the "Ready" light are run to the solenoid valve junction box and are wired in parallel with the valve.

CAUTION: Before attempting to operate the system a careful check should be made of all wiring to assure that all connections are secure and that no frayed leads cause an unwanted connection between terminals or leads.

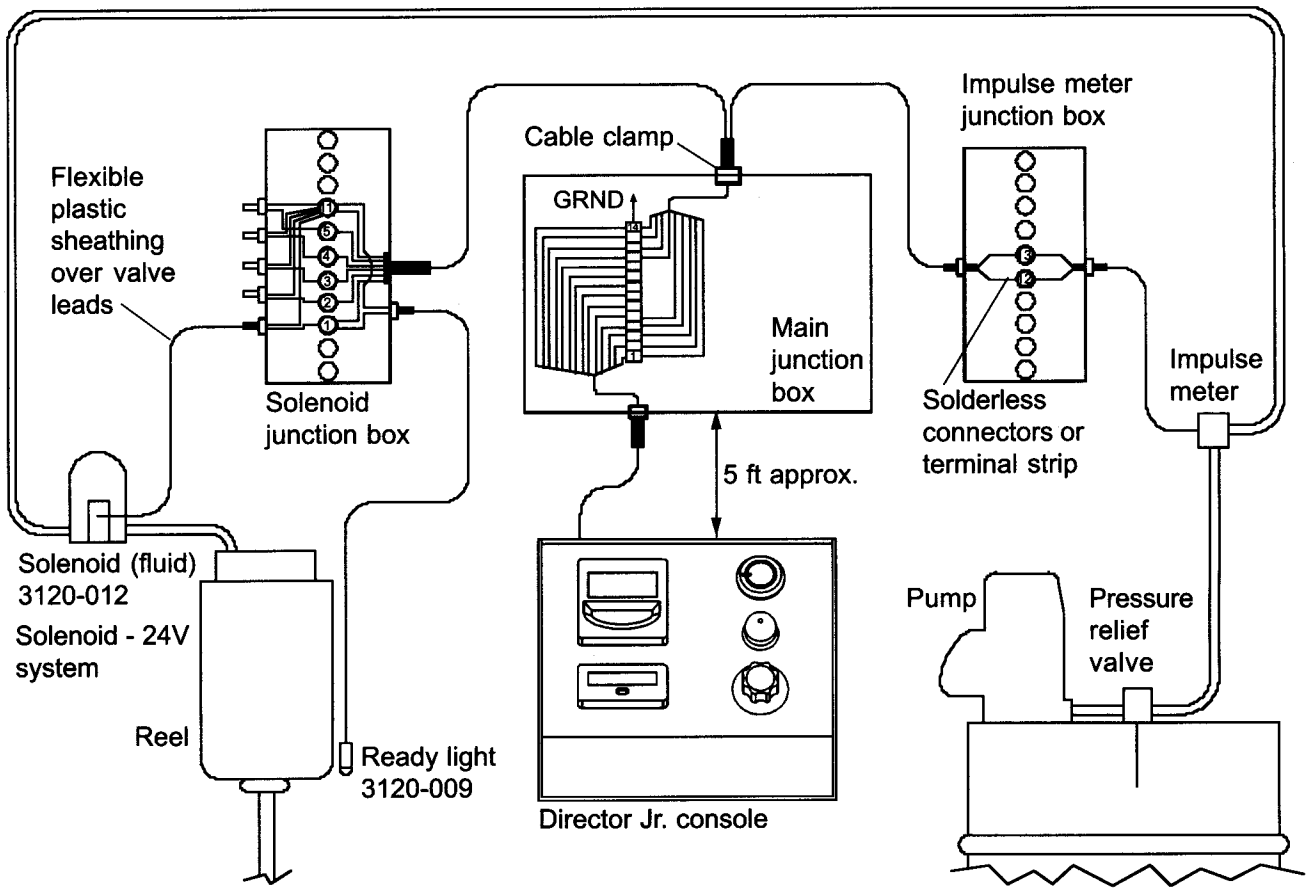

Figure 2 - Electrical System Installation Schematic

Terminal Strip & Conductor No.	Color	Use
1	Black	Numbers 1-10 individual conductors for solenoid valves
2	White	
3	Red	
4	Green	
5	Orange	
6	Blue	
7	White/Black Tracer	
8	Red/Black Tracer	
9	Green/Black Tracer	
10	Orange/Black Tracer	
11	Blue/Black Tracer	Common for solenoid
12	Black/White Tracer	Impulse meter
13	Red/White Tracer	Impulse meter
14	Green/White Tracer	Pump air solenoid
15	Blue/White Tracer	Unused

Figure 3 - Cable Color Code Chart

POST INSTALLATION CHECK

If manual by-pass valves have been installed at the solenoid valves (Figure 1, Item 9), they should be opened to allow checking the system for leakage before the electrical check out. The pumps should be set to operate at normal pressure (500 psi maximum), and oil drawn from each dispensing point. When it is certain that all air and foreign materials have been purged from all lines, the piping system should be checked for leaks. The by-pass valves should be closed before proceeding with the electrical check out.

Operational Check

1. Double check all electrical connections for correctness and possible shorts and opens.

2. Turn on the circuit breaker for the console to be checked (it is suggested that only one system be checked at a time).

3. Follow the Normal Operation procedure below, being sure to enter a large amount for this trial run.

4. With the "Ready" light on, rotate the Station Selector switch to each position. Stop at each position and make sure the solenoid valve and the remote "Ready" light for the station selected is on. Check to make sure no station is enabled other than the one selected. Also make sure the air pump is activated for the product associated with the unit being checked out. As each station is enabled and the lines pressurized, check for leaks. NOTE: Leakage not only causes a mess and a loss of product but it will also cause erroneous control of the amount of the amount delivered.

5. As each station is checked out, draw some fluid from each line to make sure that the lines are free of air pockets. Also make sure it is the correct fluid.

6. Now that the lines are clear of air, dial in an appropriate amount of fluid and check the accuracy of delivery of each type of fluid.

It is suggested that when the check out is complete, that the consoles and their associated circuit breakers be labeled by fluid type.

OPERATION INSTRUCTIONS

CAUTION: It is strongly recommended that this system not be considered fully operational until the "POST INSTALLATION CHECK" has been completed. Once the circuit breakers controlling the power to the system are turned on, all operations are controlled from the console.

Normal Operation

1. Push in and turn the power keylock switch to ON.
2. Set Station Selector dial to desired station.
3. Press E and 1 buttons simultaneously.
4. Press on one of the digit select buttons until it reads the desired value.
5. Repeat step 4 until the display reads the desired dispense amount.
6. Press the E key to accept the amount.
7. Press the Reset keys (4+6). The "Ready" light should turn on and stay on during delivery.
8. If entire amount is not dispensed, press button on top of Director Jr. to zero count.

Totalizer Operation

The Totalizer will accumulate and display the pulses recieved on the count input terminals. The Totalizer is factory preprogrammed with a decimal value of 0.1, but it displays only the whole number accumulations that are also indicated on the dispense counter (e.g. 120.3 on the dispense counter = 120 on the Totalizer). Count capacity is 8 digits. The reset button on the Totalizer has been disabled at the factory.

Keylock Operation

The Director Jr. is equipped with a security key lock to enable the system. The key must be inserted and turned to the ON position (12 o'clock position) to enable dispensing. The Director Jr. should have power applied prioir to turning on the key lock switch to assure that the controller is initialized.

Ready Light Operation

The Director Jr. is equipped with a large red lamp to indicate when the dispensing system is armed and ready for dispensing. If the light is not illuminated then the system is not operational. The only exception to this is if the light bulb is inoperative. The lamp is a 28 volt T2 size (type 28PSB) relampable.

Station Rotary Switch Operation

The Station Rotary Switch controls the station which is authorized to dispense the preset amount. Stations are numbered 1 through 10.

Example

Assume that the operator of station 3 wants to add 4 quarts of oil to a car. He contacts his supervisor who will enable the Director Jr. to meter the required oil. The supervisor would perform the following steps:

1. Assure that the Director Jr. has power.
2. Push in and turn the key lock switch to the ON position.
3. Turn the station rotary switch to the number 3 position.
4. Press the "E" and "1" keys simultaneously. If this is the first use, the main display will read 00001.0, with PRG in the status display.
5. Press the "2" key and the main display will read 00001.0, with PRG in the status display.
6. Press the "2" key three more times and the main display will read 00004.0, with PSC in the status display.
7. Press the "E" key to accept the new preset value. Disregard the main display reading.
8. Press the "6" and "4" simultaneously to reset the counter. The main display will read 4.0.
9. The ready light will illuminate and the operator in station 3 is enabled.
10. The operator in station 3 dispenses the fluid. The counter decreases in tenths and the totalizer increases in whole numbers.
11. When the counter reaches 0.0, then the ready light turns off and dispensing is complete. F1 appears in the status display.
12. Turn off the key lock switch to prevent further unauthorized dispensing.

Emergency Stop

In the event that the fluid flow must be stopped immediately due to leakage or other emergency situation, **TURN OFF THE KEY LOCK SWITCH**. This action shuts off the solenoid valve which stops the flow of fluid. *Simply unplugging the Director Jr. will not provide emergency shutoff.*

Reset

If the amount of delivery needs to be changed or corrected after reset ("6" and "4") has been pressed or after flow of fluid has already started, turn off the key lock switch and start over. If some fluid has already been dispensed, that amount should be subtracted from the new setting.

SERVICE AND MAINTENANCE

General

No attempt should be made to repair the Director Jr. console unit. A certain amount of information about servicing and troubleshooting is provided in this manual but if questions arise, contact your Balcrank Service Representative or the Balcrank factory Service Department. Customer repairs that are beyond the scope of this manual become the sole responsibility of the customer.

Periodic Inspection

Inspection of the Director Jr. system should be conducted at regular intervals by qualified personnel. The frequency of these inspections should be based on operating rate and environmental conditions. While the system is built for excellent reliability, the complete system, including the electronic, electro-mechanical and mechanical parts need periodic inspection for optimum life. Here is a suggested list of areas to check:

1. Inspect the wiring, cable and electrical connections.
2. Make sure all components of the system are still secured properly on their mounting surfaces.
3. Check all screws, nuts and bolts to make sure they have not worked loose.
4. Carefully clean the console with a lint free cloth dampened with a mild detergent. Do not pour or spray cleaner directly on the console. DO NOT LET LIQUID ENTER THE CONSOLE.
5. Check all switches and lamps for proper operation.
6. Refer to POST INSTALLATION CHECK to verify for proper operation.

WARNING: Make sure that the power is turned off before removing any components or disconnecting any connectors or wiring.

Troubleshooting

In order to properly troubleshoot the system and perform proper replacement or repair of parts, it is necessary that the technician performing the work be thoroughly familiar with the equipment. Attempted repair by unqualified personnel could void the warranty. It is suggested that this manual be studied thoroughly before any troubleshooting is attempted.

It is suggested that whenever there is a problem with the system that a visual inspection first be made of the overall condition of the equipment. Here is a list of things to look for:

1. Inspect for corrosion of components or wiring.
2. Check for frayed or broken insulation of wires and cables, and make sure their connections are secure.
3. Make sure all components are mounted securely.
4. Check front panel components to make sure none are cracked or broken.
5. All deficiencies should be corrected before proceding with troubleshooting.

TROUBLESHOOTING CHART

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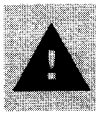

WARNING: Make sure that the power is turned off before removing any components or disconnecting any connectors or wiring.

Symptom	Cause	Solution
1. No power at console.	Blown fuse.	Replace fuse.
	Circuit breaker tripped.	Reset breaker at main panel.
	Unit not plugged in.	Plug unit in.
	Damaged line cord.	Replace line cord.
	Cable not connected or properly seated.	Plug in cable connector.
	Key lock switch off.	Turn on key lock.
2. System power is on but the preset counter will not accept any inputs.	Counter is defective.	Return the unit for repair.
	Cable is not connected or properly seated.	Plug in cable connector.
3. Preset counter display not illuminated, or digit elements incomplete.	Counter is defective.	Return the unit for repair.
4. System powers up but will not go into "Ready" mode when the "R" (reset) button is pressed.	Defective preset counter.	Return the unit for repair.
5. Console controls the wrong fluid.	Control wires to the solenoid valves are improperly connected.	Rewire as specified.

Symptom	Cause	Solution
6. System has power and goes into ready mode when reset button is pressed but no fluid can be dispensed.	Pump is not operating.	Check the air supply to the pump and the pump air solenoid valve.
	Out of fluid.	Check the fluid level in the storage container.
	Control solenoid valve not operating.	Check valve for energized position.
	Outlet of pump is blocked.	Check impulse meter and control solenoid valve for blockage.
	Defective station selector switch.	Return the unit for repair.
	System not properly wired.	Recheck electrical connections and rewire as specified.
	Cable not connected or properly seated.	Plug in cable connector.
7. Fluid does not cut off at the correct preset amount.	Impulse meter set up for the wrong units.	Check the impulse meter for the correct volume per pulse.
	Impulse meter cam plate not actuating pulse switch at each cam lobe. The pulse switch is out of position.	Check the position of the pulse switch in relation to the cam lobes. Also check for broken cam lobe. Adjust or replace as required per meter instructions.
	Defective preset counter.	Return the unit for repair.
8. Remote "Ready" light will not come on, but the console "Ready" light does.	Remote "Ready" light bulb burned out.	Replace bulb.
	Remote "Ready" light improperly wired or faulty wiring.	Correct or replace remote wiring.
9. System operates properly but the console light never comes on.	Console light is burned out.	Replace the console light bulb.

Symptom	Cause	Solution
10. Counter counts “up” not “down”.	Incorrect programing.	1. Unplug unit and turn key to the on position. Hold down the “E” & “5” keys at the same time and plug in the unit. 2. Using the “E” key to move from one parameter to the next and the “1” key to change the parameter if needed: F0 - 0 F1 - 0 F3 - 1 F4 - 2 F6 - On F7 - 0 F9 - 0 F10 - 1 F11 - 0 F12 - 1 F14 - 1 F15 - 0 F20 - 0 3. Hold down the “E” key for 5 seconds to return to operation mode.
11. Counter is counting negative.	Dispensing with a “0.0” preset value.	1. Disconnect signal cable. 2. Press “E” & “1” keys at the same time. 3. Reset the counter to “0.0”. 4. Press the “E” key. 5. Press “6” & “4” keys at the same time. You should see “0.0”. 6. Press “E” & “1” keys at the same time. 7. Enter 4.0 quarts. 8. Press the “E” key. 9. Press the “6” & “4” keys at the same time. 10. Return the counter to “0.0” by pressing the button on top of the Director Jr. 11. Replug the signal cable.

FACTORY SERVICE

Repair

No attempt to repair the Director Jr. should be made beyond the scope of this manual. The modular design of the unit, made possible by the use of integrated circuits, makes it necessary to have access to special test equipment if serious damage to the system is to be avoided. The unit should be returned to a Balcrank authorized Service Center for repair or adjustment.

Parts List

	Part No.
Light bulb (type 28PSB)	821690
Key	819437
Fuse (1 amp, 250V)	
Director Jr. Console, less cable	828871
Cable only	828872

Associated Components

	Model No.
Pressure Relief Kit (1/2 NPT)	3120-014
Pressure Relief Kit (1/4 NPT)	3120-015
Isolation Air Valve	3230-004
Air Regulator	3260-009
Air Solenoid Valve	3120-011
Impulse Meter (liter)	3120-005
Impulse Meter (pint)	3120-006
Impulse Meter (quart)	3120-007
Impulse Meter (gallon)	3120-008
Impulse Meter (quart,coolant)	3120-016
Fluid Shut-off Valve	3230-002
Fluid Line Y-Strainer	3120-010
Fluid Solenoid Valve	3120-012
Ready Light	3120-009

Balcrank Lubrication Equipment Warranty Statement

All Balcrank equipment sold by authorized Balcrank distributors is warranted to their original customer to be free from defects in materials and workmanship for a period of one year from the date of sale to that customer. Selected Balcrank equipment carries warranty terms for a more extended period as defined in the Balcrank Lubrication Equipment & Accessories User Price List, wherein a "lifetime" warranty represents a warranty period of thirty years. Within the initial one-year warranty period, Balcrank will repair or replace all Balcrank equipment determined by Balcrank to have defective materials or workmanship. For equipment carrying more extended warranties, Balcrank will repair or replace the product including parts and labor during the first full year and will provide parts only for the remainder of the warranty period.

This warranty applies only to equipment installed and operated according to applicable Balcrank Service Bulletins and Installation Instructions.

Any equipment claimed to be defective must be returned, freight prepaid, to an Authorized Balcrank Service Center (ASC). Upon receiving candidate warranty equipment from a customer, ASC will: 1) diagnose to determine the warrantable condition of the equipment, 2) submit, prior to repair or replacement, a request to Balcrank for warranty authorization, then 3) in cooperation with Balcrank, proceed with repair locally or forward the equipment to Balcrank and obtain replacement. If the part(s) or equipment items are found defective upon inspection by Balcrank, they will be repaired or replaced, and then will be returned to the ASC. If Balcrank finds the claimed part(s) or equipment not to be defective, the ASC will receive written authorization from the original customer, and then repair them for a reasonable charge to the customer, which will include all applicable parts, labor, and return transportation costs.

Optionally, the customer may submit certain eligible products directly to Balcrank for warranty return by using Balcrank Lubrication Equipment Direct Service Warranty Procedure. Eligible products are defined in the Balcrank Lubrication Equipment & Accessories User Price List. Refer to the Balcrank web site www.balcrank.com for a copy.

Any equipment returned to Balcrank must have the Warranty Service Claim number (WSC#) clearly marked on the outside of the carton. Balcrank's sole responsibility is for defects in material and workmanship, and Buyer's sole and exclusive remedy hereunder, shall be limited to repair or replacement of the defective part or equipment.

This warranty does not cover, nor shall Balcrank be liable for repair or replacement of parts or equipment resulting from general wear and tear through use, or damage or failure caused by improper installation, abuse, misapplication, abrasion, corrosion, insufficient or improper maintenance, negligence, accident, alteration, or substitution of non-Balcrank parts.

Furthermore, the Warranty for Lubrication Equipment and Accessories does not cover the following specific conditions:

- Failure or damage to equipment caused by dirt or debris in compressed air lines and fluid lines. This includes, but is not limited to, clogged inlet filters, strainers, or regulators; fluid meters; control handles; fluid tips; and valves.
- Failure of normal wear parts including but not limited to: o-rings, packings, seals and valves unless originally improperly installed by the factory.
- Products placed in applications for which their use was not intended. Examples include but are not limited to Lubricant pump being used to pump solvents, or placing equipment intended strictly for indoor use outdoors
- Damage to equipment resulting from operation above and beyond Balcrank's recommendations.
- Leaks at air and fluid fittings and connections.
- Damage caused by thermal expansion whenever adequate pressure relief was not included in the system.
- Loose suction tubes on pumps.
- Incorrect hose reel spring tension, requiring adjustment.

THERE ARE NO OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL BALCRANK BE LIABLE FOR ANY SPECIAL, CONSEQUENTIAL, OR OTHER DAMAGES OF SIMILAR NATURE, INCLUDING BUT NOT LIMITED TO LOST PROFITS, LOST PRODUCTION, PROPERTY DAMAGE, PERSONAL INJURY, WHETHER SUFFERED BY BUYER OR ANY THIRD PARTY, IRRESPECTIVE OF WHETHER CLAIMS OR ACTIONS, LEGAL OR EQUITABLE, FOR SUCH DAMAGES ARE BASED UPON CONTRACTS, WARRANTY, NEGLIGENCE, STRICT LIABILITY, OR OTHERWISE. ANY CLAIM OR ACTION FOR BREACH OF WARRANTY MUST BE BROUGHT WITHIN TWO (2) YEARS FROM THE DATE OF SALE TO THE ORIGINAL CUSTOMER.

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