WHEEL BEARING PRESS
600-051 MANUAL

FEATURES:
Rugged construction
Low maintenance.
PLC Control System
Air Logic Control System.
Senses Seal, Rotor, Inner bearing and Outer bearing.
Presses in seal and lubricates bearings.
Can not run without all parts correctly in place.
Independent grease volume adjustment.
Easy load drop tooling
Friendly user interface.
Part Stamp if Good Job "OK"
Rotor trapped if faulted job
Grease volume check mode.

OPERATION:
The operator loads the Seal and inner bearing on the pilot. The pilot drops and the rotor can be easily loaded. The pilot rises and the outer bearing is loaded. Having all the parts in place allows the press to run. The operator depresses the two anti-tiedown start buttons and the ram extends an presses the seal into the rotor. The bearing greasers cycle injecting grease into the bearings. When completed the rotor is stamped "OK". Then the Ram and Pilot retract for easy unloading. The rotor is unloaded and the pilot rises for the next cycle.

SPECIFICATIONS:
480 V single phase
¾ NPT Air supply
3/8 NTP material supply

OUTLINE:

IR Assembly Solutions
Johnstone Dispensing Systems

Ingersoll-Rand
1872 Enterprise Drive
Rochester Hills MI 48309

Phone (248) 293-5700
Tech Support (866) 284-5509

OPERATION AND MAINTENANCE MANUAL WHEEL BEARING PRESS

⚠ WARNING This symbol is to alert the user and service personnel to the presence of dangerous voltage or pressure that will cause a personal injury.

⚠ CAUTION This symbol is to alert the user and service personnel to the presence of important operating instructions that must be read and understood to prevent personal injury, electrical shock, excessive air pressure, excessive material pressure or damage to the equipment.

⚠ WARNING

YOU MUST READ THIS MANUAL BEFORE OPERATING THE SYSTEM.

Repairs should be attempted only by authorized trained repairmen. Consult your service center listing for your nearest Ingersoll-Rand authorized service center.

For safe operation the following procedure must be followed.

- **Keep work area Clean.**
  Cluttered areas and benches invite injuries.
- **Consider work area environment.**
  Don't expose the Controller to water or moisture. Keep work area well lit.
- **Guard against electric shock.**
  Prevent bouncy contact with grounded surfaces, such as pipes, metal structures or other electrical products.
- **Keep bystander away.**
  Do not permit unauthorized personnel to operate this press.
- **This apparatus must be earth grounded.**
- **Should the earth fault disconnect the system,** be sure to find the primary reason before you resume operation.
- **Always disconnect the apparatus from the mains by first pulling down the disconnect switch to the off position and locking,** then open up the electrical cabined and turn off the PLC supply circuit breaker.
- **Do not use this product near water** or on other liquids, for example near a washbowl, wet basement or the like.
- **Lag the press down.** Failure to comply can cause the press to tip or fall - Personal injury crush.
- **Excessive Air Pressure.** Always wear Safety Glasses with side shields when operating this equipment.
- **Disconnect power and lockout/tagout machine prior to removal, insertion or servicing any component or module within the system.** Failure to follow instructions can result in contact with high voltage and cause sever injury or death.
- The product should be located so that its location is away from heat sources such a radiators or other products that produce heat.
- For minimum electrical interference, place the instrument as far away as possible from sources of electrical noise, e.q. arc welding equipment, etc.
- **Keep body parts away from the Ram and Pilot when in operation.** Failure to comply can cause personal injury pinch.
- Keep body parts from in-between Front Door, enclosure and Mounting Plate during closing and latching to avoid risk of pinching.
- Install Mounting Plate and Controller on vertical support structure only. Failure to follow installation instructions properly will cause unexpected motion of unlatched Controller and result in personal injury.
- When the press is to be idle for extended periods of time, disable it by turning off the Air and Grease supply.
- Use proper lifting techniques and/or mechanical lifting aids to handle Rotors - personal injury.

SAVE THESE INSTRUCTIONS

NOTICE

The use of other than genuine Ingersoll-Rand replacement parts may result in safety hazards, decreased tool performance, and increased maintenance, and may invalidate all warranties.

Refer All Communications to the Nearest Ingersoll-Rand Office or Distributor.

INSTALLATION AND SET-UP INSTRUCTIONS

Dimensions:

Width 35 inches Depth 40 inches Height 82 inches

Load Height 11 inches Weight 1,800 Lbs.

INSTALLATION:

1. Level and Lag the Wheel bearing press to the floor. When moving the press be careful, it is top heavy and can crush/pinch a person.

2. Connect main electric power to the main door disconnect in the electrical panel. See Electrical drawings for voltage requirements.

3. Connect a earth ground to the press frame to prevent a static shock.

4. Connect the Air Supply to:
   a. The Wheel bearing press at the ¾ inch Safety lockout valve. Minimum line required is ¾ inch. Set the Air Pressure to 80 PSI.
   b. The supply pumps. Minimum line required is ¾ inch. Set the pump Material pressure to deliver approximately 1200 PSI, DO NOT EXCEED 2000 PSI

5. Connect the pump outlet hose to the Wheel Bearing Press 3/8 NPTF.

6. Turn on the main disconnect.

7. Depress the Master Start Button located on the indicator panel

8. Turn the automatic / manual selector switch to the manual position.

9. Turn the Manual Tooling Selector to the UP position. Keep body parts away from Ram – Pilot to prevent personal injury pinch.

10. Turn the Manual Ram to the UP position. Keep body parts away from Ram – Pilot to prevent personal injury pinch.

11. Depress the Manual Grease Check Pushbutton and wait for the grease cycle to complete.
    a. The bearing greasers will shift and dispense material on the grease catch shelf.
    b. After material is dispensed the Grease cycle complete indicator will light and the bearing greaser will shift to the refill position.

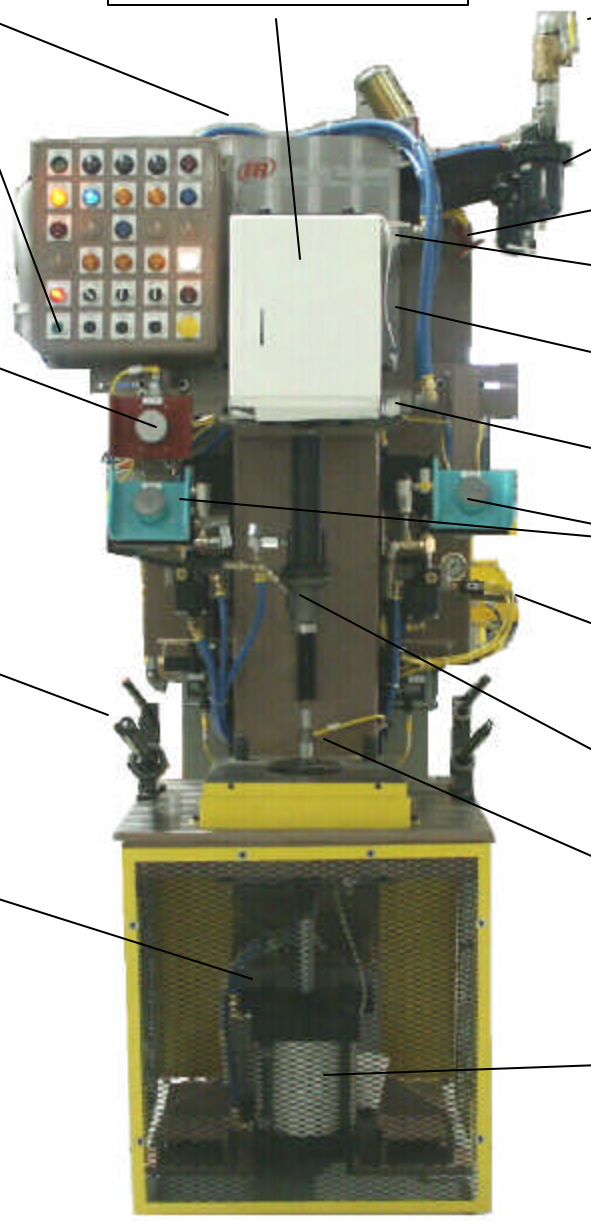
12. Depress the Manual Jet Blowout Pushbutton. Excessive air pressure can cause personal injury. Always wear safety glasses when operating this equipment.

13. Turn the Automatic Manual Selector Switch to the Automatic Position.

14. The press is ready to run.

NOTE: THE GREASE QUANTITY FOR EACH BEARING MUST BE SET

COMPONENTS AND WHAT THEY DO



Electric Control Box
480V AC 1 Phase

Towel Dispenser 360-188

¾ Air Supply Ball Valve
362-666

Master Start Button

FRL 362-286

Air Lockout Valve 360-652

Cylinder Switch 363-194-1

Master Stop Button
363-717

Ram Air Cylinder 364-179

Flow Control 360-163

Cycle Start Pushbuttons
363-718

Seal – Bearing
Holder

3/8 NPTF grease Inlet
350-712

Ram Cap 650-TL93R

RV6 & RV7
Grease dump
valves 360-728

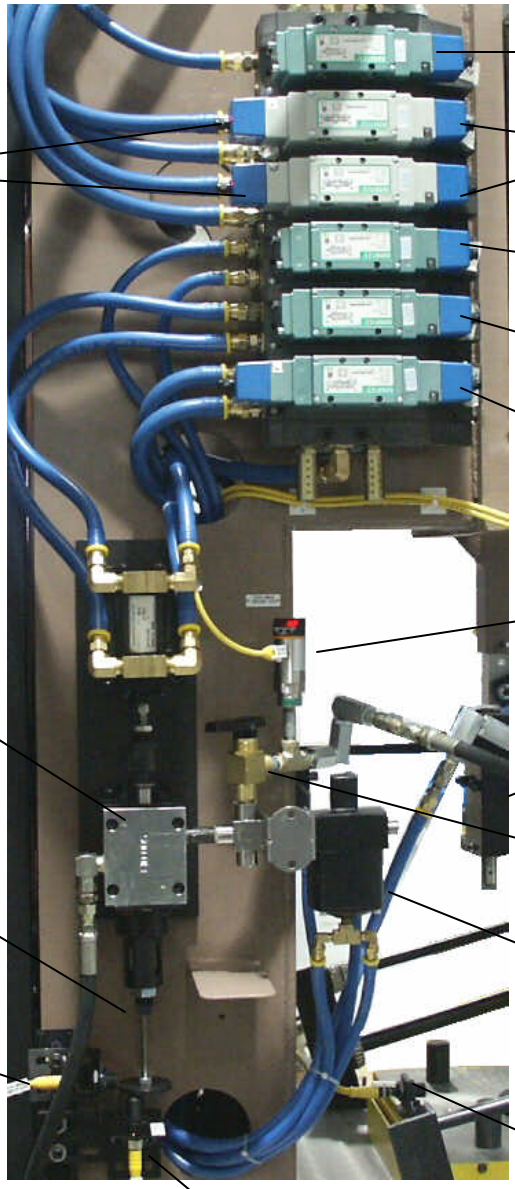
Pilot 650-TL93P

Pilot Air Cylinder 364-178

Electrical Control Box 600-051E

Pneumatic Control Box 360-729DCC

COMPONENTS AND WHAT THEY DO



Ram UP
(2 Valves)

Valve Bank
Assembly 364-325

Bearing Greaser
103-005

Bearing Greaser
Volume Adjusting
Screw

Grease Dispensed
Proximity Switch
364-379

Dispense Ready
Proximity Switch
364-379

Air "OK" Stamp

Ram Down
(2 Valves)

Air Actuated Ball
Valves

Bearing Greaser

Pilot Tooling UP /
Down

Grease Pressure
Switch 364-206

OK Parts Stamper
650-350
OK Insert
360-824-3A

Manual Check Ball
Valve 361-320

Automatic manual
grease check
3-way ball valve
360-641

Hub in Place
Proximity Switch
364-379

CHECKING GREASE QUANTITIES:

MANUAL GREASE CHECK:

1. Place a 3: X 5" card on the grease catch shelf. This card will be used to catch the dispensed grease so that it can be measured.

2. Turn the Automatic / Manual Selector switch to the Manual position.

3. Depress the "Manual Grease Check " Pushbutton.
   a. Both bearing greaser will dispense a shot of grease on the grease catch shelf.
   b. This is the same amount that is being dispensed into the bearings.

4. The Grease can be weighed to meet quality specifications.
   a. The Left side greaser is for the inner bearing
   b. The right side greaser is for the outer bearing.

5. Adjust the Grease Qualities if required.

6. Turn the Automatic / Manual selector switch to the Automatic Position.

7. The press is ready to run.

ADJUSTING GREASE QUANTITIES:

Always lock out air and material sources before performing maintenance on the bearing greasers.

1. The grease quantities are adjusted on the bearing greasers #103-005 (see Drawing)
   The adjustment is made by turning the adjustment screw #500-549. Turning the screw clockwise will decrease the amount of grease and turning the screw counter-clockwise will increase the amount of grease dispensed.

2. Depressurize the grease and air pressure from the valve.

3. Loosen the Lock Nut #350-098

4. Turn the adjusting screw #500-549 clockwise for less material and counter clockwise for more material.

5. Tighten the lock nut #350-098.

6. Turn on the Air and Grease pressure to the valve.

7. The Lower Proximity switch (dispensed) may require adjustment. Pinch point between the Proximity switch and striker plate – Keep fingers away from this area.
   a. Turn the Automatic / Manual Selector switch to the Manual Position.
   b. Hold the Manual Grease check push button.
   c. Adjust the proximity switches until the engaged light is on.
   d. Tighten the proximity switch.

8. Perform a Manual grease check.

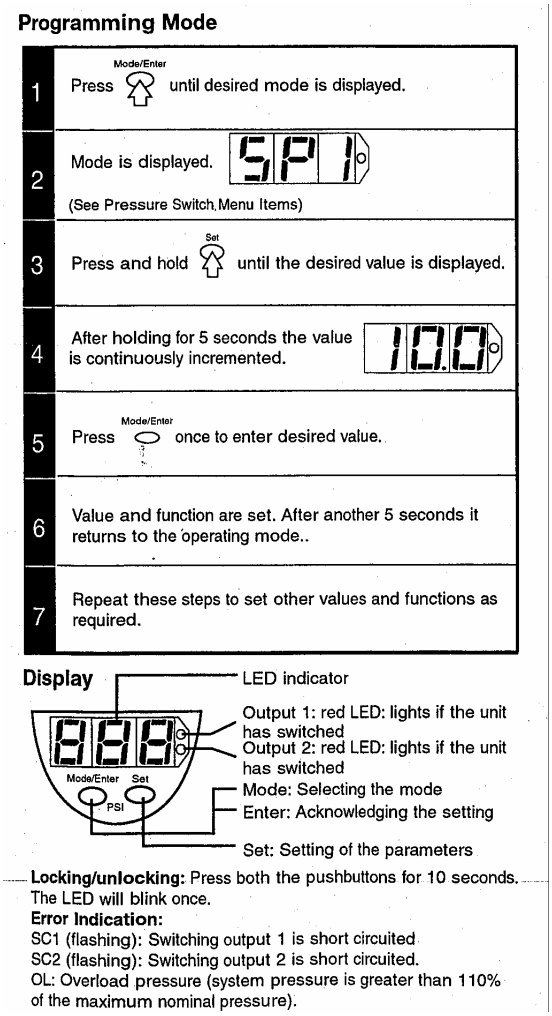
9. Turn the Automatic / Manual Selector switch to the Automatic Position.

10. The Press is ready to run.

ADJUSTING INNER/OUTER BEARING GREASER PRESSURE SWITCH 364-206:

1. The pressure switch is located close to the outlet of the bearing greasers.

2. Adjust pressure



3. Operate the press normally with seal, inner bearing, outer bearing and rotor.

4. During the operation the pressure switch output should be on for 0.75 second. If the light does not illuminate or stays on longer that 1 second the pressure switch need to be adjusted.

5. If the pressure is adjusted to high the press will stop function with the ram in the down direction. The press is operating correctly. The emergency ram return must be depressed to remove the rotor and it will not have the “OK” mark on it.

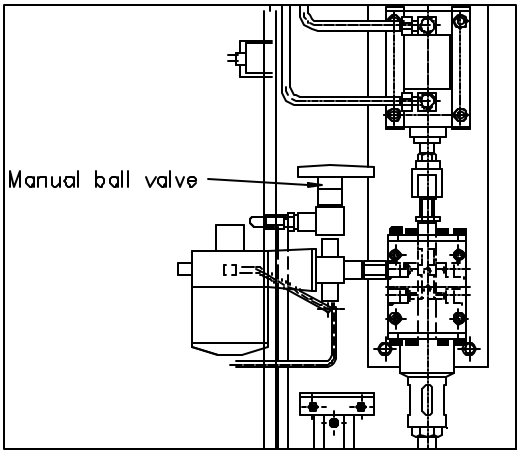
6. Adjust the pressure setting on the switch 25 PSI at a time until the grease pressure light illuminates for about 1 second.

WHEEL BEARING PRESS OPERATIONS CHECK:

1. Performing this will create a defective assembly, the seal will be pressed but NO grease will be in the bearings. The “OK” mark will not be stamped in the assembly.

2. This test checks the function of the bearing greasers and proximity switches.

3. Close the ball valves located after the three-way air actuated ball valve. There are two valves, one for the inner bearing and another for the outer bearing. (see drawing)



4. Load seal, inner bearing, rotor and inner and run the press as a normal job.

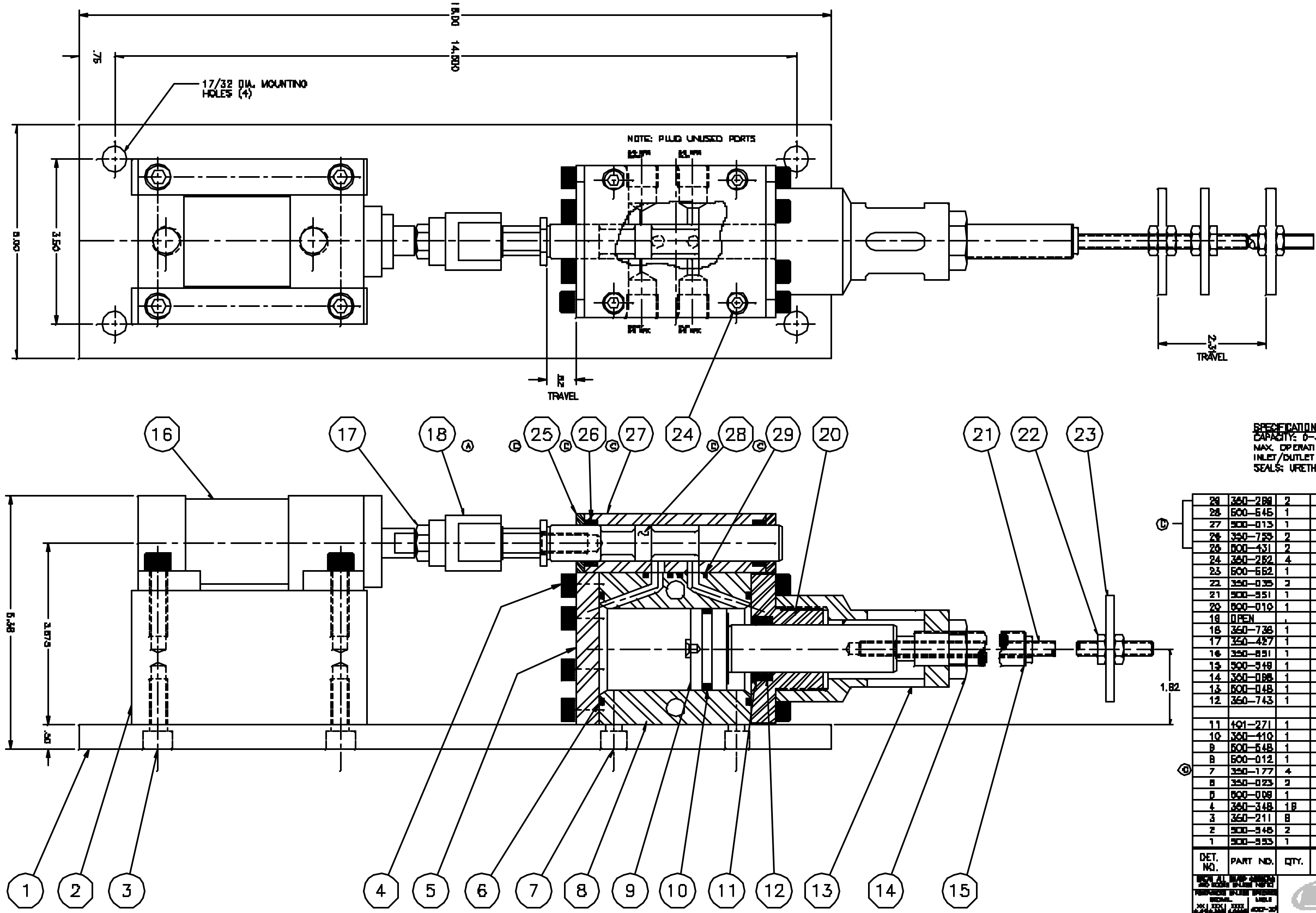
5. The ram will go down pressing in the seal, the bearing greasers will shift, but the material pistons in the bearing greasers will not move. The proximity grease complete proximity switches will not be made.

6. After about 7 seconds the “Parts Not Greased” light will illuminate and the ram will be stopped in the down position. The “OK” mark will not be stamped on the rotor.

7. If the press stopped it is working correctly.

8. To reset it. Open the Manual ball valve and perform a Manual grease check.

9. The press is ready for operation.



REV.	DESCRIPTION	BY	DATE
A	WAS 380-087	MRS	3-17-87
B	DRAWN ON CAD	JFD	1-10-88
C	WAS 350-177	EPF	8-18-87
D	REVISED CAD DWG		
	ADDED/REMOVED PARTS	KDS	12-7-00

SPECIFICATIONS:
CAPACITY: 0-5.56 IN ~3.076 FL. OZ.~90 C.C.
MAX. OPERATING PRESSURE: 3000 P.S.I.
INLET/OUTLET PRESSURE RATIO 1.48–1
SEALS: URETHANE (STD)

DET. NO.	PART NO.	QTY.	DESCRIPTION
29	360-269	2	O RING BUNA 7/16 x 5/8 x 3/32 REF111
28	500-545	1	SPOOL
27	500-013	1	HEAD
26	350-755	2	POLYSEAL LUB 3/4 ID x 1 x 1/8 1/4
25	500-431	2	RETAINER PLATE
24	360-252	4	S.H.C.S. 5/16-18 x 1-1/4"
23	500-552	1	STRIKER PLATE
22	350-035	2	HEX NUT SEMI FINISHED 5/16-18
21	500-551	1	TRIP ROD
20	500-010	1	PACKING GLAND PLATE
19	OPEN		
18	360-736	1	SELF ALIGNING ROD CONNECTOR 7/16-20
17	350-427	1	HEX - JAM NUT 7/16-20
16	350-851	1	AIR CYL. 1 1/2" BORE x 1" STROKE 1/4" NPT
15	500-549	1	ADJUSTING SCREW
14	360-098	1	HEX JAM NUT 3/4-16
13	500-048	1	ADJUSTING SCREW HEAD
12	360-743	1	ROD SEAL LUBRITHANE
			5/16 DEPTH 1 ID x 1 3/8 OD x 3/16 CS
11	401-271	1	SEAL RETAINER
10	360-410	1	O-RING VITON 1-1/2 ID x 1-3/4 OD x 1/8 CS
9	500-548	1	PISTON
8	500-012	1	BODY
7	350-177	4	S.H.C.S. 5/16-18 x 5/8"
6	350-023	2	O-RING BUNA 2-1/8 ID x 2-3/8 OD x 1/8 CS
5	500-009	1	END PLATE
4	360-348	16	S.H.C.S. 5/16-18 x 1"
3	360-211	8	S.H.C.S. 3/8-16 x 1"
2	500-546	2	RISER BLOCK
1	500-553	1	MOUNTING PLATE

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Johnstone DISPENSING SYSTEMS

DRAWN: VOLD
SIZE: D
SCALE: 1:1
DATE: 1/88

AIR OPERATED BEARING GREASER WBP-BG-13AL

103-005
1 1 D
103-005

103-005 BEARING GREASER

SPECIFICATIONS:

Capacity
- 0- 5.5 cubic inches
- 0- 3.078 Fluid OZ
- 0- 90 cc

SIZE:

- Length 26 inches
- Width 5 inches
- Depth 5.38 inches

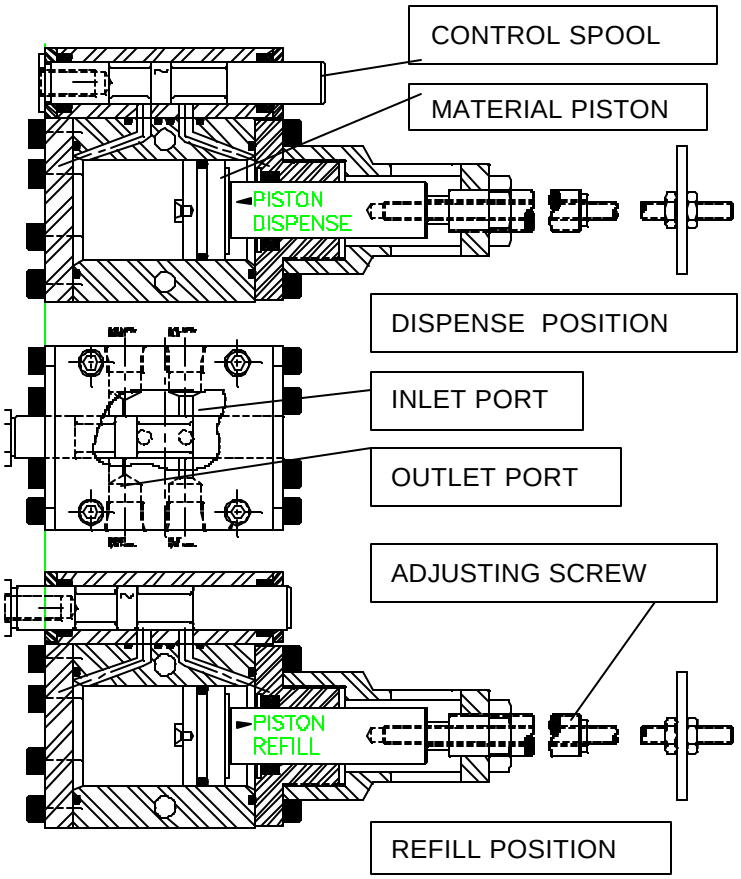
Pressures:

Air Cylinder set to 80 PSI working
Inlet Pressure 100 to 3000 PSI
Inlet Outlet Pressure 1.48 : 1

⚠ WARNING DO NOT EXCEED 3000 PSI.

OPERATION:

1. The Control Spool shifted to the left position To dispense material.
2. The inlet material pressures pushes on The rod end of the Material Piston.
3. The outlet port is open to (tooling) and the Material piston will travel in the left direction Until it hits a hard stop (cylinder cover).
4. All of the material that was in the blind side Of the cylinder will be displaced to the Outlet port (tooling).
5. The Control Spool is shifted to the Right Position to refill the valve.
6. The outlet port is blocked by the center Land of the Control spool (No Material Flow).
7. The inlet port is connected to both sides Of the material piston. Since there is more Surface area on the blind side of the piston Material pressure will force the material to The hard stop of the adjusting screw.



REPAIR KITS:

103-005RK Includes the control valve, seals and O-rings to rebuild the valve.
300-689 Control Valve assembly

Maintenance:

Check Valve for Leakage Monthly. If leaking replace seals.
Check Grease Quantities daily.

103-005 BEARING GREASER DISSASSEMBLY:

⚠ WARNING

1. Remove all air and Material pressure on the valve and lockout.

2. Remove the Air and Grease fitting from the valve.

3. Disconnect the Self Aligning connector 350-736 by unscrewing it from the control spool

4. Remove the 4 SHCS 5/16 x 1 ¼ inch that holds the control valve to the Material piston body.

5. Remove the 4 SHCS 5/16 x 1 inch that hold the seal retainers to the control valve.

6. The Seal retainer , Spool and Polyseals can be removed from the control valve.
   NOTE: Mark the direction that the spool is removed from the body. It can be put in backwards.

7. Remove the Striker plate 500-552 from the trip rod (including the Jam nuts.

8. Remove the (16) SHCS that hold the Packing Gland and end plate to the body.

9. Remove the Packing Gland and Material Piston assembly from The Body. The parts can be separated.

10. Remove the end plate from the body.

11. Clean and inspect all of the parts for damage. Discard all of the soft seals.

ASSEMBLY INSTRUCTIONS:

1. Install a new polyseal in the Packing Gland. The heal Goes into the bore first and install the Snap ring to secure the polyseal. Lubricate the polyseal.

2. Install a new O-ring on the material piston and Lubricate. Insert the Rod end of the material piston through the packing gland.

3. Install New O-rings (2) 350-023 on the Body and insert the Material Piston into the body. Tighten the 8 SHCS that hold the packing gland to the body.

4. Install the end plate and tighten the (8) SHCS that hold it into place.

5. Install the (2) 350-269 O-rings that seal the control Valve to the Body.

6. Install the Polyseals (2) 350-755 into the control valve body. Lips Into The counter bore first and lubricate.

7. Install the Retainer plates onto the control valve body using the (4) SHCS.

8. Install the Spool through the body so that the flange is towards the outlet ports. (see drawing).

9. Install the control valve onto the body so that the spool flange is opposite the rod end of the material piston and tighten with the (4) SHCS.

10. Reconnect the 350-736 self-alignment connector. Adjust the travel of the spool to .625 inch.

11. The valve is ready for operation.

Wheel Bearing Press Preventive Maintenance.

DAILY:

1. Check the grease quantity for the inner and outer bearing. If adjustment is needed see, the manual grease check instructions.

2. The operator should wipe the ram cap and pilot of excessive grease periodically with paper towels supplied.

3. Test for burnt out signal lights.

WEEKLY:

1. Check for worn or damaged sensing pin.

2. Check for worn or damaged spring plunges located on the pilot and ram cap.

3. Check the main air supply system.
   a. Set to 80 PSI
   b. The main air line water filter is drained.
   c. Maintain the proper oil level in the lubricator. Use 10W oil.

4. Check the Bearing Greasers for leakage or stick valve movement.

5. Check for broken or damaged tooling.

6. Clean excess grease from press.

7. Verify the function of the Grease Pressure switches.

DEFAULT PRESSURE SETTINGS:

Grease Supply	1200 PSI	
Air Supply	80 PSI	
Air Logic R1 Regulator	50 PSI	
Air Logic R2 Regulator	5 PSI	Adjust with Seal in place.
Pressure Switch Inner Bearing	100 PSI	
Pressure Switch Outer Bearing	60 PSI	

SEQUENCE OF OPERATION

The press must have air and grease pressure. The Electrical system must have power and the main disconnect must be turned on.

1. Depress the Master Start Switch on the Indicator panel.

2. Move the Manual / Automatic selector switch to the Automatic Position.

3. The Load inner seal and bearing and Bearing Greasers Ready lights are on.

4. The operator correctly positions the Seal on the Pilot.
   a. This starts the jet sensing circuit.
   b. The Seal Present light is on.

5. The operator correctly loads the Inner bearing onto the Pilot.
   a. The load seal & inner Bearing light goes off.
   b. The Pilot tooling will retract after .75 second timer.
   c. The load Hub light will go on.
   d. The Inner Bearing Present light goes on.

6. The operator correctly loads the hub in place.
   a. The Load hub light goes off.
   b. The pilot tooling extends after a .75 second timer.
   c. The Hub Part Present Light goes on.
   d. The load outer bearing Light goes on.

7. The Operator correctly loads the Outer Bearing.
   a. The Outer Bearing / Race Present light goes on.
   b. The Ready light goes on. The system is ready for the dispense cycle.

8. The Operator depresses both Master Cycle Buttons at the same time and holds them.
   a. If the Master Start buttons are released the cycle stops.

9. The Ram presses in the Seal and the Ram is Down Proximity switch is made.
   a. A ram settle in timer of .75 seconds times out. This ensures that the seal is completely pressed in.
   b. The Ram is Down Auto Cycle light goes on and the operator can remove their hands from the Master Cycle pushbuttons.

10. A solenoid valve “Bearing Greasers” is energized.
    a. Both the inner and outer bearing greaser air cylinders are shifted at the same time.
    b. The Bearing greasers start dispensing material and the striker plate deactivates the bearing greaser filled proximity switches.
    c. The grease is being dispensed into the bearing and 2 pressure switches are made. Inner bearing and outer bearing pressure switches. These pressure switches ensure hoses or tubing is connected to the ram and pilot tooling.
    d. The grease pressure light will go on.

11. The Bearing Greasers will fully dispense and the striker plate will trip the dispensed proximity switches.
    a. If the dispensed proximity switches are NOT made after 7 seconds the Greasers did not dispense and Part not Greased light will go on. The press will stay in the down position and can only be retracted b y depressing the Ram retract button.

    NOTE: WHEN THE PRESS FAULTS THE RAM IS IN THE DOWN POSITION.

    b. When both dispensed proximity switches are made a 1 second grease pressure settle timer is started.
    c. The Grease Cycle Complete light will go on.

12. The Part OK stamp circuit will start.
    a. The solenoid valve will be energized for 1 second. This will allow the OK stamp air piston assembly to stamp the hub.

13. The Ram and Pilot air cylinders will retract.
    a. The remove hub light will go on.

14. The operator can remove the hub.

15. If the Press Faulted the Ram Will stay extended locking the rotor so that it can not be removed from the press.
    a. To remove the hub depress the emergency ram retract button. A horn will sound indicating that the ram is moving out of normal sequence.

AIR LOGIC SEQUENCE OF OPERATION

Initial Conditions:
Main air in on – Control air is on – Control air ON indicator is green.
Electricity is on – Solenoid valve ERV1, ERV2 and ERV3 are de-engerized. Pressure actuated Switch PS1 is pressurized (actuated). Pressure actuated switches PS3 and PS4 are exhausted.
Ram is in the up position (raised) and the Pilot is in the up position (raised).
There are no parts in the machine and the Part in Place indicators (seal, inner bearing and outerbearing) are black. (if on they will turn green)
Jet sensing ports are not blocked and RV6 and RV7 are blocking the sensing air.

LOAD SEAL LIGHT IS ON

1. Operator manually loads grease seal on pilot and actuated LV1 (seal in place valve)
   a. The Seal in Place Light indicator turns green (on).
   b. Relays RV6 & RV7 (located at pilot tooling) actuate and connect the sensing air outputs to Jet 1 and Jet 2 (inner & outer bearing jets). Jets start to blow with sensing air 5Psi.
   c. Start time delay TD1.

2. When enough time has elapsed of the pressure in the jet supply tubes to drop to a normal flow jet sensing air the time dely TD1 times out (0.5 seconds normally).
   a. Connect the AMP1 & AMP2 pilot ports to the jet sensing supply tubes. The amplifiers start to read the pressure in the jet sensing feed tubes.
   b. Pressurizes pilot of the pulse drain valve PP1. As PP1 engerizes it opens the coalescer bowl momentarily to atmosphere as it crosses center. This dumps any accumulated liquid to atmosphere.

3. Operator manually loads inner bearing on pilot. As the inner bearing settles into place it blocks Jet1 and amplifier AMP1 energizes.
   a. Inner Bearing in Place visual indicator turns green (on).
   b. Pressurizes pressure actuated switch PS3 and tells the PLC that the Inner Bearing is in Place.

4. When PS1 and PS3 are both actuated.
   a. The Load Seas & Inner Bearing goes off.
   b. The PLC lowers the pilot.

5. When the pilot is fully lowered a Proximity switch be made and the Load Hub light comes on.
   a. The Load Hub indicator light goes on.

6. The operator Loads the Hub.
   a. The Load Hub indicator light goes off.
   b. The Hub present indicator Light comes on.
   c. The PLC raises the Pilot.

7. As the pilot raises the pilot stops just before inner bearing contacts the inner bearing race.
   a. The Load Outer Bearing indicator light comes on.

8. The operator loads the outer bearing on the pilot and it blocks the Jet2 and energizes AMP2.
   a. The Outer Bearing Place visual indicator turns green (on).
   b. Pressurizes pressure actuated switch PS4 and tells the PLC that the Outer Bearing is in Place.

9. When PS1 / PS3 and PS4 are all pressurized and actuated:
   a. The All Parts in Position indicator light goes on.
   b. The PLC arms the start palm button.

AIR LOGIC SEQUENCE OF OPERATION continued:

10. Operator depresses and holds both start buttons.
    a. The ram advances (goes down) and comes into contact with the outer races and presses the seal into the hub.
    b. The PLC energizes ERV1 (momentary).

11. When ERV1 energizes:
    a. The Air logic de-energizes relay RV6 & RV7 (located under pilot tooling) to block the jet sensing lines and vent the downstream jet lines and jets to atmosphere. This prevents grease from backing up in the air logic circuit.
    b. Logic isolates amplifiers from the jet sensing lines and exhausts the amplifier pilots.
    c. Logic exhausts the pilot of the power-pulse drain valve PP1. PP1 resets, as it crosses center it momentarily opens the coalescer bowl to atmosphere. This dumps any accumulated liquids to atmosphere.

12. When amplifier get isolated from jet sensing lines AMP1 & AMP2 de-engerize.
    a. Exhaust pressure actuated switch PS3 and PS3 resets.
    b. The Inner Bearing in Place visual indicator turns black (off).
    c. Exhaust pressure actuated switch PS4 and PS4 resets.
    d. The Outer Bearing in Place visual indicator turns black (off).

13. When the ram gets fully lowered.
    a. A proximity switch is made telling the PLC that the ram is in the down position.
    b. The Grease cycle is started filling the bearing with grease.

14. When the grease cycle is complete the PLC sends a signal to send the ram up and the pilot down.
    a. The ram pulls away from the rotor (up) and it sits on the top of the spring table.
    b. The pilot pulls away from the rotor (down) the Jet ports (Jet1 & Jet2) become unblocked.
    c. The Seal in Place visual indicator turns black (off).

15. When the pilot gets fully lowered it actuates a proximity switch.
    a. The Remove Hub light goes on.
    b. The PLC energizes ERV2 (momentary) and commands the air logic to perform a jet purge cycle.

16. When ERV2 get engerized:
    a. Logic switches jet circuits to high purge air pressure.
    b. Relays RV6 & RV7 open. Admit purge air to the Jets. Blowing the jets clean of any grease.
    c. Starts air purge timer TD2.

17. TD2 will allow the jets to purge high pressure air for 1.5 seconds.
    a. Switches the jet circuits from purge air to sensing (low pressure) air.
    b. Starts sensor settle timer TD3.

18. When the controls have had time to switch to sensing air and the high purge air pressure has had time to dissipate out of the jet sensing port the timer TD3 times out.
    a. Closes relays RV6 & RV7 (located under pilot tooling) and the jets stop blowing.

19. The operator has seen the Remove Hub light and manually unloads the completed hub and the table proximity switch send a signal to the PLC to raise the pilot when the jet purge is complete.
    a. The pilot raises and the Load Inner Bearing Light comes on.

End of cycle.

WHEEL BEARING PRESS TROUBLE SHOOTING

1.	PRESS COMPLETELY INOPERATIVE:	Verify that the Main disconnect is on and the Master Start pushbutton has been depressed. Verify that the press has Air and Grease Pressure. Check for any blown fuses Check the PLC for any fault lights and verify that it is in the RUN position.
	The Press could be out of Sequence	Remove and parts that are on the tooling. Depress the Ram Retract Pushbutton. Put the panel in the Manual Position and test the lights, perform a manual jet blow out and perform a manual grease check.
2.	RAM CYLINDER MALFUNCTION:	The operator must keep both Start palm button depress until “Ram is Down Auto Cycle” light comes on. Failure to do this will cause the press to stop. It is now necessary to depress the Ram Retract button to retract the ram. All of the parts must be taken off the tooling and restart the cycle over again. The Bearing Greaser Proximity Switch are not being made. Check the operation of the bearing greaser and proximity switches. The Ram Cylinder solenoid is sticky or a blown fuse.
3.	PARTS NOT GREASED LIGHT ON.	Check the Main Grease Supply Verify that the Solenoid valve is working correctly. Verify that the bearing greasers are working correctly. Check the operation of the proximity switches. Verify the operation of the grease pressure switches.
4.	NOT SENSING THE SEAL	Check tooling for obstruction. Verify LV1 pin is not bent and is functional. Check Air supply pressure R1 Verify that there are no Kinked air hoses under pilot tooling. Check RV1 for proper operation

WHEEL BEARING PRESS TROUBLE SHOOTING

5.	NOT SENSING THE INNER OR OUTER BEARING	Check Tooling for obstruction Perform a Manual Jet Blowout. Check R2 amplified air regulator setting Verify that there are no kinked air hoses under pilot tooling. Verify RV6 & RV7 valve are working correctly. Check amplifier valve AMP1 & AMP2 proper operation. Check the system for proper air pressure.
6.	BEARING GREASER NOT SHIFTING	Verify that the air cylinder have 80 PSI. Verify that there is grease pressure and that it is Not over 2000 PSI. Check for contamination in the grease supply. The SHCS that secure the control valve could Be over-torqued. Retighten and check for binding.