**On/Off Control.** Includes mag starter and is pre-wired to ensure proper motor rotation.

**Oil Sight Tube.** Oil should be visible approximately half way up the clear fill tube.

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**DAILY OPERATION**

If your Inject-a-Cure system is equipped with an auxiliary fill pump, gas engine, hydraulic motor or other optional devices, refer to "Optional Equipment Operation and Maintenance" later in this manual for deviations to the following general operating instructions.

1. **Fill the Main Tank with Water**
   a) With irrigation system pressurized, open the fresh water fill valve "A" to begin filling the holding tank with water. As the tank nears full, the internal ball float valve will automatically shut off the flow of incoming water. Valve "A" is shown in the **closed** position in the above photo.

   b) For **constant rate** output, close the fill valve "A" once the tank is full. This will allow the tank to empty, injecting a consistent, non-diluted solution.

   For declining rate application, the fill valve "A" may be left open to maintain a **constant fluid level** in the tank. This will inject the soil amendment on a declining curve rate as the incoming water dilutes the slurry mix.

2. **Turn the System On**

   a) Check that the redirect valve "B" located adjacent to the pump inlet debris screen is in the **CLOSED** position to draw liquid from the tank. (The handle should be facing away from tank (as shown). With handle turned to right, the pump will draw air only.

   b) The discharge outlet valve "C" should be turned to the **CLOSED** position. (Handle should be turned in line with the discharge flow as shown). This allows the pump to start up under no-load conditions to increase motor or engine life.

   c) Turn the machine "ON" at the control box to energize the pump and agitation bar.
d) Check for leaks around all fittings and the agita-
tion shaft front bearing. A leaking front bearing housing
can usually be stopped by turning the machine off, and
simply tightening the packing gland. (See "Maintenance"
later in this manual).

3. Add Amendments

a) For gypsum application, add approximately four
pounds of solution grade gypsum for each gallon of wa-
ter in the mixing tank (i.e. 300 gallon tank=1,200 pounds
of gypsum, 600 gallon tank=2,400 pounds).

CAUTION: This Inject-a-Cure machine was designed
for use with true solution grade gypsum only. Use of
substandard gypsum can cause excessive wear, fre-
quent filter flushing, clogging and may void the fac-
tory warranty. Please refer to "Solution Gypsum Speci-
fications" later in this manual for the minimum speci-
fications of acceptable product, prior to operation.

When adding other amendments with, or instead of
gypsum, be sure to first refer to "Compatible Amend-
ments" in the Owner's Manual, to verify that it is an
approved amendment, and also confirm how and at
what rate to apply it. ALWAYS check with your
amendment supplier as to compatability, when mix-
ing more than one amendment at a time.

If adding gypsum from one ton bulk bags, be careful not
to empty a full bag into the 300 gallon model, as this will
overload the machine.
b) Allow the machine to operate for a few minutes
to insure the slurry is completely and uniformly blended.

4. Adjust Output and Begin Injection

a) If a manual valve has been installed in the irriga-
tion pipe at the point of injection, be sure to check that it
is in the OPEN position.

b) Slowly rotate the Discharge Outlet Valve "C" to
the OPEN position (handle to left), to begin injection.
The diaphragm pump will automatically adjust discharge
pressure to compensate for any irrigation line pressure,
up to 150 psi.

c) Rotate the Fresh Water Bypass Valve "D", coun-
terclockwise to the fully OPEN position. Then, read and
note the total gallons per minute water flow, by reading
the calibration lines on the fresh water sight glass (should
be around 5-6 gpm with a standard pump).

d) Refer to the "Discharge Rate Chart" in this
manual to determine the desired GPM of slurry output
for the desired application rate. Then, subtract this num-
ber from the total GPM flow determined in Step c above.
e) Watch sight glass "E" and slowly rotate the Fresh
Water Bypass Valve "D", clockwise to reduce the flow
of fresh water down to the newly calculated net rate de-
termined in Step d above.

Example: With Fresh Water Bypass Valve "D" turned
all the way open, sight glass indicates 6 GPM total water
flow. Desired injection rate is determined to be 2 gallons
per minute of slurry (6-2=4). Slowly close Fresh Water
Valve "D", until the sight glass reads 4 gallons per minute.
This will cause the diaphragm pump to automatically
draw 4 gallons of fresh water, plus 2 gallons of slurry
from the holding tank.
f) Reload the machine as desired when the water
runs clear, or after refilling the tank in the constant rate
(pump down) mode.

MAINTENANCE

You have selected the most "user-friendly", maintenanc-
free injection system available for gypsum and other pow-
dered amendments. Care in selecting and using only true,
high-grade solution gypsum (and other compatible
amendments) will help keep your injector running
smoothly with minimal attention.

Your SDI machine was designed with common, brand
name components wherever possible, to reduce replace-
ment costs and insure parts availability when maintenance
is necessary.
For parts pricing or orders, call your local SDI Dealer or telephone (559) 734-5555.

The following outlines the steps necessary to service and maintain your SDI injection system, to keep it running at its peak performance.

**Before Each Start-Up:**

1. Check that the oil is visible half way up on the clear sight tube on the diaphragm pump. (Fill with 30W non-detergent motor oil as necessary).

2. Turn the redirect valve to close off the fluid in the main tank and clean the debris filter located on the front of the machine (as well as any other debris screens that may be installed). Remember to turn the valve back on before starting the machine.

3. Check that internal ball float valve(s) are adjusted and working properly.

4. Take time to check over all fittings, clamps and connections to make sure all are secure and not leaking. Check that the belt is tight and the belt guard is in place.

5. If agitation shaft front bearing is leaking, simply tighten the adjusting nuts until the leak stops. **DO NOT OVERTIGHTEN** the Adjusting Nuts. Only about 1/4 to 1/2 turn on each of the adjusting nuts should be required to stop any leak.

Overtightening will lead to rapid wear of the packing material, and possibly the shaft itself. Occasional small adjustments are required to maintain the integrity of the seal. **DO NOT** attempt to avoid the regular interval by overtightening the packing nuts! If one or more turns of the adjusting nuts does not stop the leak, replace the packing material, or severe wear on the agitation shaft may result. (See Replace Packing Material below).

**Every 500 Hours**

1. Change the oil every 500 hours of three months, whichever comes first. To drain the oil, follow these procedures:

   **D30 and D50:** Remove the drain plug and oil sight glass covers, and rotate shaft until the oil stops flowing out. Install the drain plug.

   Slowly pour new oil into sight tube while turning the pump shaft. (Turning the pump shaft purges all the air out of the crank case). Always change oil when replacing diaphragms.

   **Safety Note:** The bypass return outlet on the discharge valve and pressure relief valve must be connected directly to the main tank without any restrictions or valves.

**Annually or As Needed:**

**Replace Packing Material:** The packing gland is located on the front of the machine where the main agitator shaft extends out of the mixing tank. Once or twice a year (or whenever excessive leaking occurs that routine tightening of the adjustments will not stop), the packing material in the packing gland must be replaced as follows:

1. Turn off injector and secure against accidental start-up.

2. Remove fiberglass belt guard. Loosen both adjusting nuts, and slide the backing plate and packing nut out away from the packing gland.
3. Dig out and discard any remaining pieces of the old packing material.

4. Wind new packing material around the shaft, and use a screwdriver to push the packing material firmly down into the packing gland. Continue this process until the packing gland is full, then cut the packing rope off.

5. Slide the packing nut and backing plate back towards the packing gland and tighten the adjusting nuts down *hand tight*.

6. Replace the belt guard and start the injection machine. If the packing is leaking, turn off the machine and tighten the adjustment nuts approximately 1/4 turn each. Continue this procedure until the leaking stops. **DO NOT OVERTIGHTEN!**

**Valve Replacement**

Occasionally, debris can build up and cause improper seating of the valves and/or damage to the o-rings, causing the pump to pulsate. To check for damage, follow these steps:

Remove the pump manifolds (heads). With the manifolds removed, valves can easily be removed and inspected for debris and wear. Replace valves, o-rings and manifolds as necessary.

**Diaphragm Replacement**

If pump oil becomes milky or it comes out the discharge outlet, one or more of the diaphragms have ruptured. The diaphragm material does age and should also be replaced annually, or earlier, under heavy use. To change diaphragms:

1. Drain the oil as instructed previously.

2. Remove the pump manifolds and valves.

3. Remove the pump head retaining nuts and heads.

4. Turn the crankshaft to bring the diaphragm to the top of its stroke. Insert a drift pin into the hole in the retaining stud to hold it in place. Remove the retaining nut, retaining washer and the diaphragm.

5. Turn the crankshaft to bring the piston to the bottom of its stroke and seat the new diaphragm into the sleeve groove. Install the retaining washer and tighten the retaining nut while holding the retaining stud in place with the drift pin.

6. Clean any excess oil from the area and install the heads, valves and manifolds.
### Trouble Shooting Guide

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<thead>
<tr>
<th>SYMPTOM</th>
<th>PROBABLE CAUSE</th>
<th>CORRECTIVE ACTION</th>
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</thead>
<tbody>
<tr>
<td>The pump does not draw fluid.</td>
<td>Pump is drawing air.</td>
<td>Turn redirect valve handle 90°</td>
</tr>
<tr>
<td></td>
<td>One or more pump valves are not seating properly.</td>
<td>Remove valve(s) and check for debris.</td>
</tr>
<tr>
<td></td>
<td>Suction line is plugged or collapsed.</td>
<td>Examine suction hose for blockage.</td>
</tr>
<tr>
<td></td>
<td>Clogged debris filter.</td>
<td>Clean debris filter.</td>
</tr>
<tr>
<td>The liquid flow is erratic.</td>
<td>The charge in the pulsation dampener is incorrect.</td>
<td>Check pressure in pulsation dampener (20-40% working pressure).</td>
</tr>
<tr>
<td></td>
<td>One or more pump valves are not seating properly.</td>
<td>Remove valve(s) and check for debris.</td>
</tr>
<tr>
<td>Output drops and the pump is noisy.</td>
<td>Oil level is too low.</td>
<td>Add 30W motor oil to bring level half way up sight glass.</td>
</tr>
<tr>
<td>Oil comes out the discharge port or oil is a milky color.</td>
<td>One or more diaphragms split.</td>
<td>Replace diaphragsm(s). (Refer to Maintenance section.)</td>
</tr>
<tr>
<td>Pump seems to operate in reverse.</td>
<td>Electric motor wired backwards.</td>
<td>Have a certified electrician check and repair wiring.</td>
</tr>
<tr>
<td>Agitation shaft bearing leaking.</td>
<td>Packing gland loose.</td>
<td>Tighten packing nut on front.</td>
</tr>
<tr>
<td></td>
<td>Worn out packing material.</td>
<td>Replace with 1/4” Teflon packing.</td>
</tr>
<tr>
<td>Irrigation filters plugging or requiring frequent flushing.</td>
<td>Injecting too thick of slurry.</td>
<td>Increase fresh water bypass g.p.m.</td>
</tr>
<tr>
<td></td>
<td>Poor quality gypsum.</td>
<td>Install a screen on the incoming fresh water line.</td>
</tr>
<tr>
<td></td>
<td>Fresh water is contaminated.</td>
<td></td>
</tr>
</tbody>
</table>