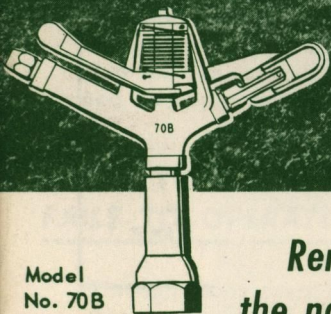


MAINTENANCE MANUAL

RAIN BIRD® **Sprinklers**



Model
No. 70B

*Remember, if it hasn't
the name, it isn't the
same. Specify Rain Bird!*

MAINTENANCE MANUAL



IT PAYS TO KNOW YOUR RAIN BIRDS

Produced by the world's largest, exclusive irrigation sprinkler manufacturer, Rain Bird sprinklers are precision engineered to give you the following advantages:

- Long Life
- Even Distribution with Maximum Coverage
- Trouble Free Operation
- Minimum of Repairs
- Low Cost

To facilitate proper precipitation of moisture in the soil the sprinklers must turn at a low rate of speed. At the same time, they must give maximum coverage (the largest diameter of throw) for the most economical performance. Slow movement of sprinkler parts also is necessary for a long life of trouble-free service. The only positive way of turning irrigation sprinklers slowly is the oscillating arm method used in Rain Bird sprinklers.

Another feature which distinguishes Rain Bird Sprinklers, is their comparatively few parts. From their inception over two decades ago, simplicity as well as efficiency of design ever have been the watchwords.

Extensive factory and field research stands behind each model of Rain Bird sprinklers. In the factory, each process of their manufacture is checked constantly. They are built to exacting standards to give you the fullest measure of service.

HOW RAIN BIRDS OPERATE

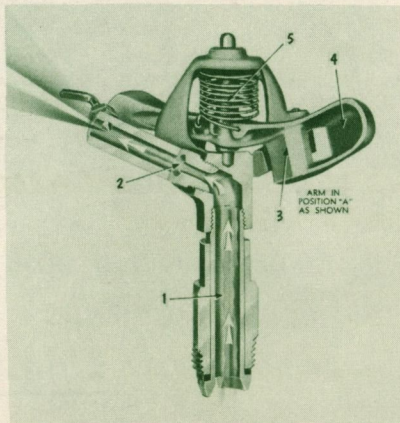


Figure 1

All Rain Bird sprinklers are operated by means of water pressure directed to the spoon-shaped end of the arm.

As indicated by the direction of arrows in Figure 1, the water passes through the body (1), then through the nozzle (2), back of the sloping vane (3) and into the front of the spoon (4). The pressure of the water drives the arm out of the stream and away from the nozzle, to position A; the tension of the arm spring (5) then pulls the arm back into the original position and, at the same time, causes the sprinkler to turn. The impact is accentuated by the thickness and slope of the outer edge of the vane (Figure 2); this causes the stream to exert pressure on the vane.

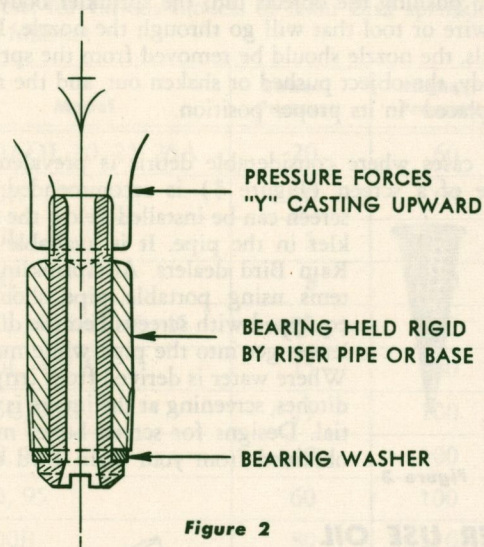


Figure 2

The thickness of this leading edge of the vane should be approximately $1/16$ " with a slope of approximately 30° on the back. The thickness and slope can be maintained with a file as wear becomes apparent.

The impact is only sufficient to cause a small degree of travel so that the rotation of the sprinkler is uniform and slow (one to three minutes per revolution, depending on pressure and size of sprinkler). The slow rotation causes minimum wear on moving parts and thereby prolongs the useful life of the sprinkler.

WHAT TO LOOK FOR IF A SPRINKLER FAILS TO OPERATE PROPERLY

Through many years of experience, we have found that the conditions which interfere with the proper operation of Rain Bird sprinklers are debris, oil, incorrect water pressure and damaged parts.

1. DEBRIS:

Any foreign object that will not go through the nozzle and obstructs the flow will interfere with the operation of the oscillator arm. Small rocks and pipe scale are prevalent in most water systems. If the sprinkler is operating on a hose, small bugs crawl in, and being unobserved, are washed into the nozzle where they often stick and obstruct the flow. Obstructions in the nozzle are the most common cause of a sprinkler's failure to turn. In case of bugs, or other soft material, insert a wire through the opening and by poking, break up the pieces causing the obstruction so that they are small enough to pass through the nozzle. Tougher pieces may be removed by unscrewing the sprinkler from the riser pipe or base, and pushing the objects into the sprinkler body with a wire or tool that will go through the nozzle. If this fails, the nozzle should be removed from the sprinkler body, the object pushed or shaken out, and the nozzle replaced in its proper position.

In cases where considerable debris is prevalent, the use of a screen (Figure 3) is recommended. This screen can be installed below the sprinkler in the pipe. It is available at all Rain Bird dealers. All sprinkling systems using portable pipe should be equipped with screens because dirt and leaves get into the pipe while moving. Where water is derived from irrigation ditches, screening at the intake is essential. Designs for screen boxes may be obtained from your Rain Bird dealer.

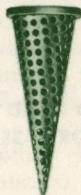
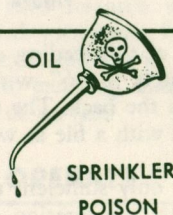


Figure 3

NEVER USE OIL



OIL SOAKED



OIL

SPRINKLER
POISON



2. OIL:

Rain Bird sprinklers are *WATER-LUBRICATED* and must *NOT* be oiled in any manner whatsoever. Oil causes the washer to swell, turn black and soft, which affects the rotation of the sprinkler, frequently bringing it to a complete stop. Pipe dope or thread lubricant contains oil, and if applied to the bearing threads will be carried to the washer, saturating it and causing the sprinkler to stop turning. If oil has been applied to the sprinkler, it will be necessary to wipe the oil off the bearing and replace the washer with a new, clean one. The bearing washer is composed of

material which causes the friction necessary for the successful operation of the sprinkler. As stated previously, Rain Birds are *WATER LUBRICATED* and all materials used in their construction are anti-rust and anti-friction metals, except the bearing washer.

3. PRESSURE:

Rain Birds are designed and adjusted to operate within fairly wide pressure ranges depending on the model. For pressures under twenty pounds models No. 20A, 20L, 25L, 40L and 40LA are recommended. When operating on pressure that is either too high or too low, the performance will be unsatisfactory both as to sprinkler turning and water distribution. Pressure limitations as established by engineering and field tests for various models of Rain Bird sprinklers are as follows:

Model	Lowest Pressure	Highest Pressure
20ADJ, 20, 25, 25A	20	60
20A	10	60
20L	5	30
25L	8	30
30, 35, 40B, 40, 45	25	80
40L, 40LA	15	60
65C, 70B	25	100
80, 80S	40	100
90, 95	60	100
100B	80	120

While the above pressures cover all nozzle sizes in general, it must be borne in mind that a sprinkler with its largest size nozzle will fail to give proper water distribution with the lowest pressure. See our regular catalogue for the proper combinations of nozzles and sprinklers in their relation to water pressure. Note also in the catalogue, the dotted pressure line in the chart for each different sprinkler model.

MEASURING WATER PRESSURE

The nozzle pressure of a sprinkler is measured with a pitot tube while the sprinkler is in operation.

PITOT TUBE AND GAUGE



Figure 4

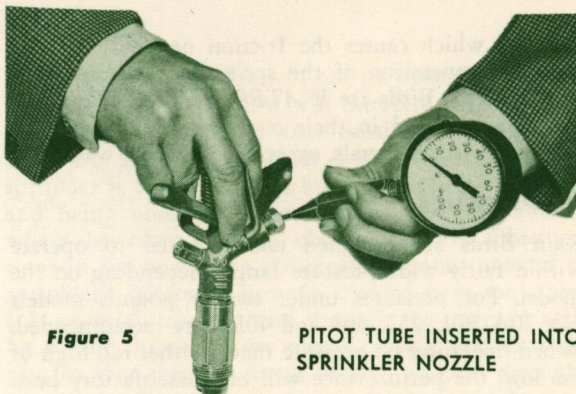


Figure 5

**PITOT TUBE INSERTED INTO
SPRINKLER NOZZLE**

The pitot tube is used with a pressure gauge as shown in Figure 4. When used to measure the operating pressure of a sprinkler, where more than one sprinkler is operating on one pipe line or lateral, the curved end of the tube is inserted into the sprinkler nozzle, as shown in Figure 5.

When measuring the operating pressure of a single sprinkler, on a pipe line or hose, such as a lawn or garden sprinkler, the curved end of the tube must be held approximately 1/8" out from the nozzle opening and in the center of the stream. This is done so that the flow of water from the individual sprinkler will not be retarded, thus building up the pressure.

In either case, move the curved end of the tube back and forth until the highest pressure is recorded.

All people who sell and install either portable sprinkler irrigation equipment or lawn and garden systems should carry and be familiar with the pitot tube and gauge.

Figure 6



All pressures indicated in this manual and our catalogue are pressures at the nozzle, which may differ considerably from pressures at a distant source from which water is supplied. Small diameter pipe or hose will reduce pressure considerably (Figure 6). Failure of a sprinkler to perform properly when pressure is

lower than recommended for a particular size nozzle may be overcome by changing to a smaller size nozzle. To illustrate, sprinkler Model No. 20 failing to operate properly with a 3/16" nozzle may give highly satisfactory performance with a 1/8" nozzle on the same pressure. Also, read instructions under "Adjustment of all models for Low Pressures" in this manual.

When Rain Bird sprinklers No. 20A and No. 25A are equipped with 9/64" or smaller nozzles they are furnished with an aluminum alloy oscillating arm to insure better operation on lower pressures.

On the No. 25 and 20ADJ models, an adjustable pin is used on the nozzle extension—see Figure 7. At pressures from 30 pounds up the pin should not be set into the stream as far as when the sprinkler is operating at lower pressures (20 to 30 pounds). For these low pressures, you can adjust the pin so as to secure the desired break-up of the stream. This pin also can be adjusted to shorten the throw of the stream, where it is desirable to use the sprinkler in a smaller area.

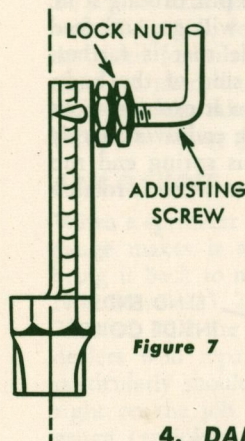


Figure 7

4. DAMAGE TO PARTS:

Parts may be bent by accident or sometimes in shipment. Cast bronze and aluminum alloy, used in our parts, are pliable to certain limits. These parts can usually be bent back into shape if they are not too badly damaged. Also, read "Arm Gauges" on page 9.

REPAIRING RAIN BIRD SPRINKLERS

In replacing the arm and main spring in Model Nos. 20, 20A, 20L, 25, 30, 45 and 65C, do not attempt to save the spring as the ends cannot be rebent.

SPRING

WARNING! If you feed the spring into the body holes, without first pulling the arm away from the nozzle as far as it will go, the tension will be too tight for the arm to operate.

To remove the spring and arm from the sprinkler body, pull the fulcrum pin with a pair of large diagonals or side cutting pliers, as shown in Figure 8. The pin is driven into the lower body hole and will come out when pulled as shown in sketch. Then cut the spring loose, remove parts, and replace with new spring on new arm.

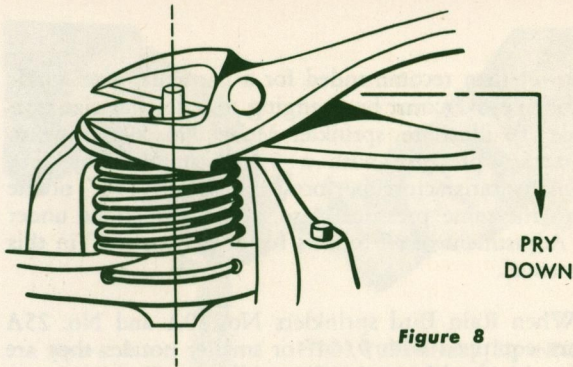


Figure 8

In feeding ends of spring through holes in the arm follow method shown in Figure 9, or observe how it is done on a complete, new sprinkler. Insert arm and spring into body and insert fulcrum pin, driving it in. Pull arm around as far back as it will go, and feed upper end of spring into the hole that is farthest from the nozzle on the opposite side of the body. Then feed through the other hole so it extends about 1/8" and bend this extended spring end over sharply to clinch. Be careful not to let this spring end rub against the center bearing of the arm when it rotates.

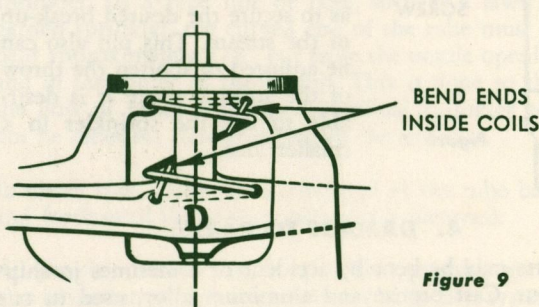


Figure 9

Tighten spring so that the arm has the proper tension, and cut off excess spring material at the center of arm, then bend up sharply inside of coils. Check the tension with that in another sprinkler out of stock; if possible, put sprinkler on test. Try to hold arm in stream to see if it will come out and oscillate of its own accord. If it hangs in stream, the spring needs slightly more tension.

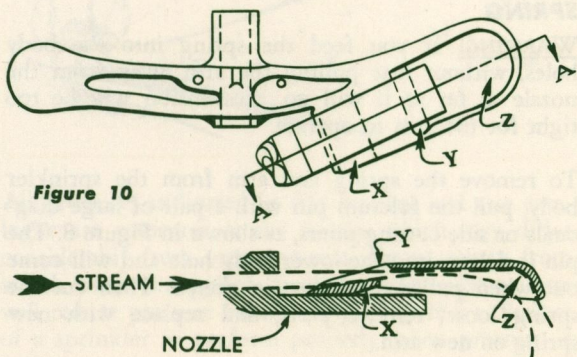


Figure 10

Section "A A"

The tension can be tested on all models this way—see Figure 10. There must be enough tension to pull the vane (x) through the stream, so the stream can enter the window (y) and hit the spoon (z) as shown in Figure 10.

ARM

In the case of bending an arm into shape after it has been damaged, it should be done so the vane (x) fits flat on the nozzle surface and so the stream will enter the window (y) as shown in Figure 10. If the arm oscillates satisfactorily and the sprinkler fails to turn, it needs more drive. To get this, bend the spoon (z) slightly to the left, which will cause the arm to fly out farther and consequently hit harder on the rebound.

To replace arm and spring on Models 40, 70, 70B, 80 and 80 Special, follow about the same procedure as described for other models, except that slight variations are needed to fit the slightly different parts on these models. Always feed the spring into the arm before installing the arm.

ARM GAUGES

When a sprinkler arm is out of alignment the proper gauge makes it apparent how it must be bent to bring it back to normal. Gauges for sprinkler model Nos. 20 and 25, 20A and 25A, 30, 35, 40, 40B, 45, 70, and 70B are available for all distributors and dealers who repair sprinklers. Field representatives particularly should use them to check for bent arms right on the job. It is important to use the correct gauge (sprinkler model number is stamped on each gauge). From the design of the gauge it is readily discernible how it fits on the sprinkler. Some gauges fit against the fulcrum pin on top of the sprinkler while the end of the gauge lies flat against the spoon. Other gauges are centered on the back of the vane and spoon when the arm is in alignment. Some gauges fit on the front side and others on the back side of the spoon.

REPLACING BEARINGS

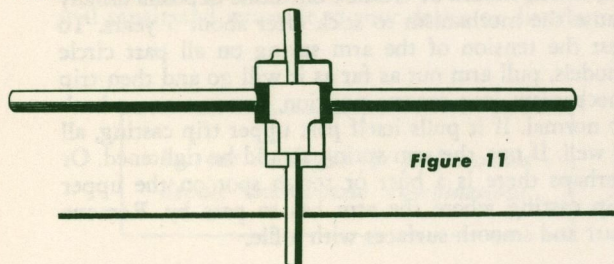


Figure 11

A special wrench (Figure 11) is made to fit all bearing nipples and to unscrew them from the body. This wrench should be available at your Rain Bird dealer; however, if you cannot secure one, a small bar or

large screw driver may be used to unscrew the bearing. Be cautious when placing the sprinkler in a vise, not to squeeze the arm or other extended parts—use the body. Washers that are worn thin from sand and other abrasives in the water should be replaced.

TRIP MECHANISM ON PART CIRCLE MODELS

MODEL NO. 25

The trip spring (Figure 12) is about the only item in this assembly that may need to be replaced after extended use. To reach this spring, remove the whole assembly by pulling the cotter pin. Cut the spring loose from the upper trip casting and replace with a new one in the same position. Observe carefully how

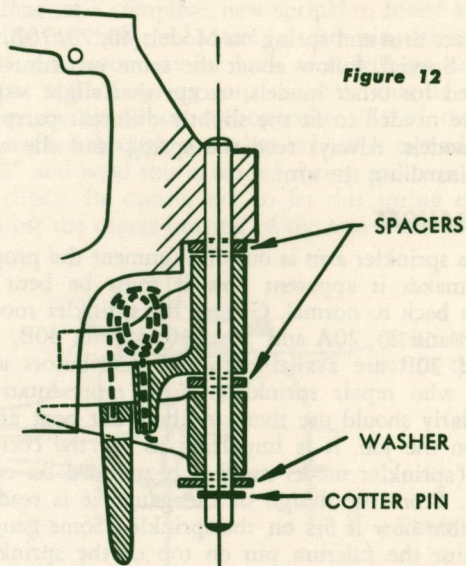


Figure 12

the old one is put in. After bending the spring, be sure there is not too much wire left. If there is, cut the ends off so that it won't rub against the lower trip casting. The assembly must be put together before it goes on the shaft. Be sure spacer washers are in place as shown in Fig. 12. Some water causes lime deposits, which should be cleaned off. Lime deposits usually cause the mechanism to stick after about 5 years. To test the tension of the arm spring on all part circle models, pull arm out as far as it will go and then trip mechanism into reverse position. Let arm come back to normal. If it pulls itself past upper trip casting, all is well. If not, the arm spring should be tightened. Or perhaps there is a burr or rough spot on the upper trip casting where the arm has to pass by. Remove burr and smooth surfaces with a file.

MODEL NO. 45

Follow same instructions as for Model No. 25, except for slight changes due to some different parts. The bearing must be removed to replace parts in the No.

45. A bolt is used through the trip tube. This model should be tested the same way as No. 25 and the arm spring tightened (about 1/16"), if the arm does not return when the trip mechanism is in the reverse position. Remember to put the spacer washer (one) between the two castings.

MODELS NO. 35 and NO. 65C (new type)

Although somewhat different in their parts, basically the operation of these newer models is the same as the No. 25 and No. 45 models.

ADJUSTMENT OF ALL PART CIRCLE MODELS FOR LOW PRESSURES

It is necessary to close the gap where the arm hits the upper trip casting on all models when they are operated on lower pressures than recommended. This is done by bending the upper trip casting toward the arm. When doing this, be sure the spoon goes out far enough so that it will come out of the stream. By this method, the part circle sprinklers will reverse at much lower pressures than indicated.

SETTING PART CIRCLE FRICTION COLLARS

The purpose of the friction collars is to control the arc of the circle of coverage. On the 25 series, 35, 45 and 65C the collars must be moved for setting, only with the pressure of the thumb, never use pliers in setting these collars. Always place the thumb between the two ears or extensions on the collar and press in the direction collar is to move. Use of pliers will cause the collars to lose their tension and, after a few settings, will no longer hold their position.

SPRINKLER REPAIR SERVICE

If, after following the directions in this manual, your Rain Bird does not operate properly, take it to your regular dealer or distributor for servicing. If they do not have the facilities for necessary repairs, they will return it to the factory where expert service personnel will repair and return it to your dealer or distributor.

See our catalogue for performance details and nozzle combinations.

National Rain Bird Sales & Engineering Corp.

P.O. Box 547, Azusa, California

USE NO

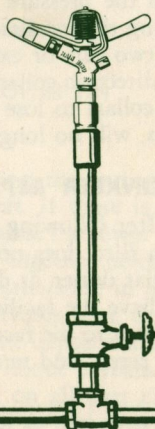
**OIL
GREASE
PIPE DOPE**

RAIN BIRDS are water lubricated



**NATIONAL RAIN BIRD
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