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## EC64-729 Off Season Care of Irrigation Equipment

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# Off Season Care of IRRIGATION EQUIPMENT

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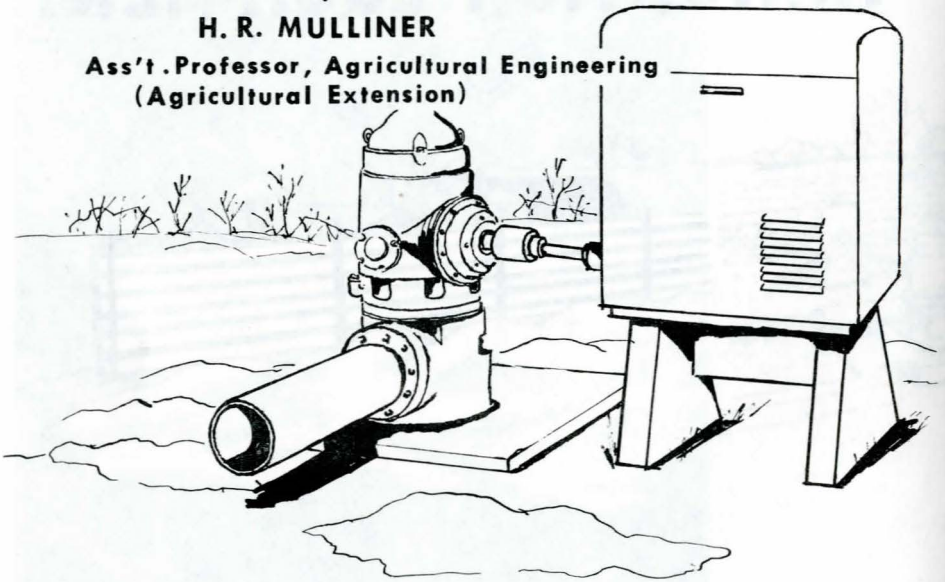
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# Off Season Care of Irrigation Equipment

by

**H. R. MULLINER**

**Ass't. Professor, Agricultural Engineering  
(Agricultural Extension)**



## INTRODUCTION

Idle irrigation equipment should be protected to increase its life and reduce maintenance costs. Care while it is not being used is as important as maintenance during use. This circular discusses how to protect equipment when shutting down in the fall and/or starting up in the spring.

Check your owners manual for more specific recommendations.

## POWER UNITS

### Internal Combustion Engines

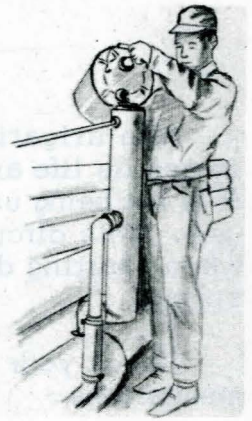
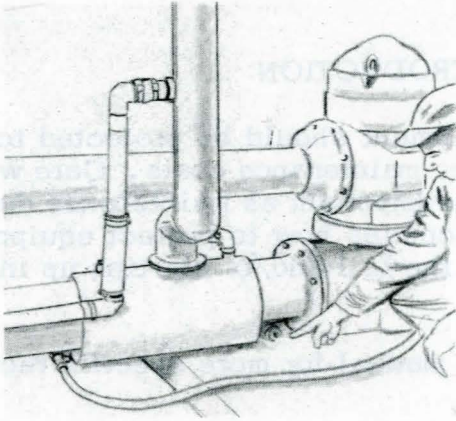
Special attention should be given to:

1. Lubrication
2. Cooling system
3. Ignition
4. Engine openings
5. Fuel system

While the engine is warm drain oil from crankcase, drain and flush the cooling system. Refill crankcase with new oil and replace oil filter. Refill cooling system with water, rust inhibitor and anti-freeze. If the unit will not be used during the winter, a low priced methanol type anti-freeze may be used. If you use your unit during winter months, permanent type anti-freeze is best. Run the engine a few minutes until fresh oil has reached all parts and anti-freeze and water have mixed.

Spark plugs should be pulled, cleaned, regapped, and about two ounces of SAE 50 engine oil poured into each spark plug hole. Replace plugs. Distributor cap should be removed and a small amount of oil placed on governor weights. Replace distributor cap and seal with weather-proof masking tape where cap joins the distributor housing. Remove battery, charge, and store in cool dry place.

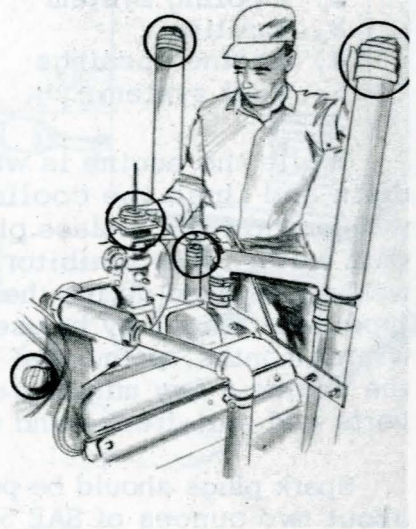
## DRAIN AND REFILL COOLING SYSTEM



Seal all openings with weatherproof masking tape: exhaust, air cleaner inlet, and crankcase breather tube. Clean air cleaner and refill with proper oil. If possible, remove air cleaner and store inside.

Shut off fuel at the tank. Drain all lines and carburetor. If LP gas is used, drain vaporizer-regulator—both fuel and water lines.

For a diesel engine, add the following procedures. Drain fuel tank and filters. Refill with about two gallons of a 50-50 mixture of pure white kerosene and SAE No. 10 engine oil. Start engine and run at a speed of about 1,000 RPM until it stops from lack of fuel.



SEAL ALL OPENINGS

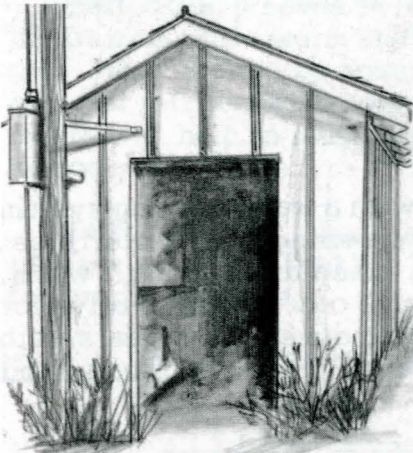
Inspect the condition of seals on engine openings once a month

## Electric Motors

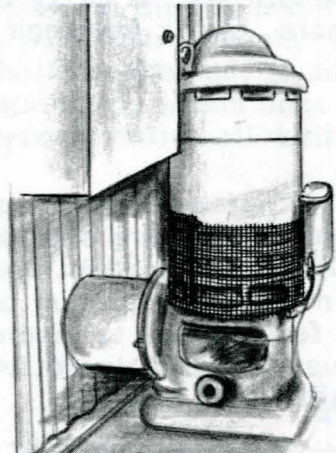
Protect electric motors from water, oil and dirt. Electric irrigation motors are either of weather protected or non-weather protected design. Non-weather protected motors should be in a pump house.

Do not cover motors left out of doors with plastic, canvas, or any material that will shut off air circulation and permit moisture to condense.

Be sure motor is screened from rodents. Check switch boxes for missing knock-out plugs. Mice have entered switch boxes, then followed the conduit into electric motors.



PROTECT MOTORS IN PUMP HOUSE



RODENT SCREEN

For maximum protection, drain oil-lubricated motors just before shut-down. Refill with rust inhibiting oil. Run motor until this oil is distributed over bearings. Next spring drain, flush, and refill with new oil.

Moisture condenses in oil during temperature changes. Turning the motor for a short time once a month during periods of non-use will help redistribute the rust preventative oil. On motors equipped with grease type lubrication, change grease after shut-down. Run motor for a few minutes to relieve bearing of any excess grease.

Before starting the motor next spring, be sure safety switch is in off position. Then clean debris from rodent

screens, dirt from switch boxes, clean non-reverse pins with wire brush, and check windings for moisture. Motors suspected of having moisture in windings should be taken to an electric shop for drying; they can be checked with an electrical resistance meter. If resistance is below 2 megohms, the windings should be dried in an oven or circulated with a safe current. Drying time will depend on size of machine and amount of moisture absorbed.

When cleaning dust from windings, use suction rather than compressed air. If grease or oil is present on motor or windings, wipe with a damp cloth which has been moistened in petroleum solvent.

Shading motor from direct, hot rays of the sun may be beneficial. If motor has been in use for three years or more, check bearings for wear.

## DRIVES

### Gear Heads

Drain gear heads equipped with a water cooling system before they are shut down or freezing weather arrives. Drain oil after last operation, when drive is still warm, and replace with rust preventative oil. Then run drive for a few minutes to insure complete coverage of gears with rust-preventative oil. In spring, drain oil, flush, and refill with new oil.

To avoid possible seizure of the bearings and gears during periods of long shutdown, turn the drive once each month. This helps redistribute the oil to surfaces which may have become exposed and could rust.

Before starting in spring, always turn drive by hand to see that it is operating freely. Clean non-reverse pins with a wire brush.



## Drive Shafts

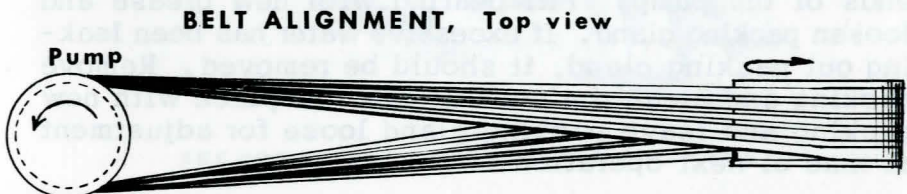
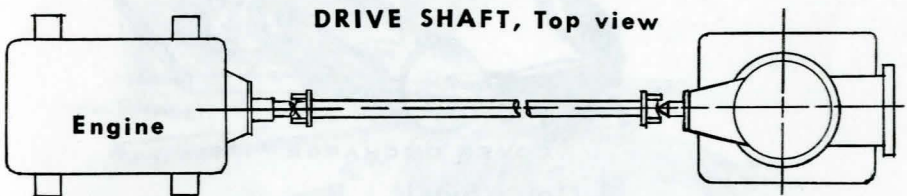
Check nuts for tightness and alignment according to instructions given in Extension Circular 57-701, "Irrigation Turbine Pump Drives." Before operating after shut-down periods, lubricate yokes with grease and the splined slip joint with oil.

## Belt Drives

During periods of extended shut-down, store belts in a dry, cool, dark room. Sun, oil, or grease will cause belts to fail prematurely.

Belted pump heads being shut down in the fall should be drained while warm and refilled with rust-preventative oil. When started up again they should be drained, flushed, and refilled with new oil. Turning the heads once a month will help to redistribute rust-preventative oil during periods of non-use.

In the spring, check sheave and belt alignment and inspect seals for leaks. See Extension Circular 57-701 for proper alignment.



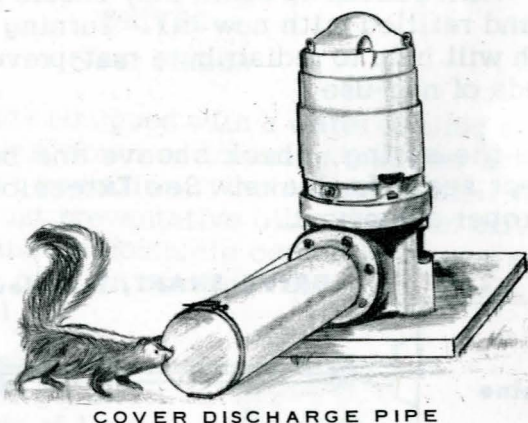


## PUMPS

### Turbine

Cover discharge pipe to prevent animals from getting into pump column. Before starting after periods of long shut-down, oil-lubricated pumps should have the pump shaft lubricated about one week ahead of first pumping operations. One gallon of oil run thru dripper at this time is adequate.

Water-lubricated pumps equipped with prelube tanks must be drained before freezing weather. Before starting again in the spring, water should be injected onto line shaft for about one minute for each 100 feet of pump setting. Packing glands may need cleaning and repacking if excess water is leaking out.



Centrifugal

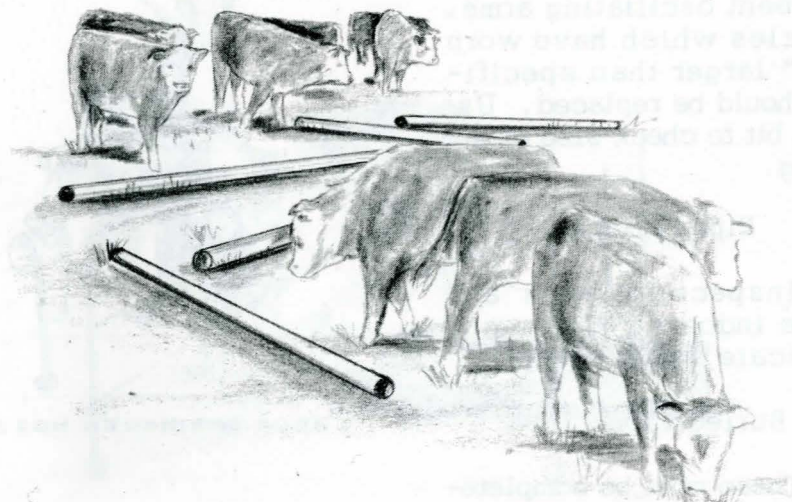
Drain water from pump case and priming pump. Keep rodents out by covering both the discharge and suction ends of the pump. Fill bearing with new grease and loosen packing gland. If excessive water has been leaking out packing gland, it should be removed. Remove packing and clean the stuffing box. Replace with new packing and leave packing gland loose for adjustment at time of next operation.

## PIPES AND OTHER EQUIPMENT

### Aluminum Tubing

Portable aluminum irrigation pipe should be stored on inclined racks above the ground in such a way that they will drain, air can circulate, and they are secure from wind damage. Avoid contact with animal waste, acids, caustic or other chemical fumes or dusts during storage. Mark defective sections and store near top of pile for later repair. Some users store aluminum tubing to form a snow fence in periods of non-use.

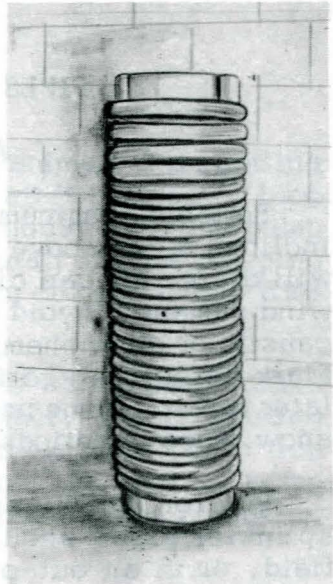
Tractor tow lines and other mechanically moved sprinkler pipes should be placed near the edge of the field, or in an out-of-the-way area. They should be completely drained and made secure from wind damage. Keep ends plugged to keep out rodents. If gaskets are leaking it may be necessary to take pipe apart and clean or replace them.



SECURE PIPE FROM LIVESTOCK DAMAGE

## Pipe Gaskets

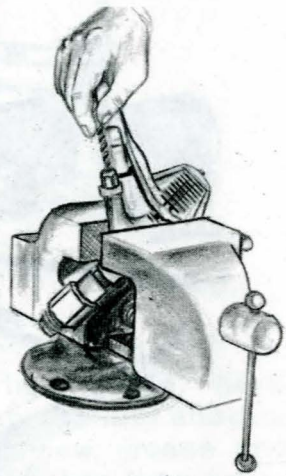
Remove gaskets from pipe. Clean out sand and silt from the pipe seat as well as the gasket. Store in a dry, cool location out of sunlight and away from ozone concentrations. They may be stored in a flat, unstressed position or slipped over a pipe slightly smaller than the inside of the gasket. Do not hang over pegs, nails or small-diameter rods.



STORE GASKETS CAREFULLY

## Sprinkler Heads

Before storing, check sprinkler heads for wear and need for replacements. Especially check the bearing washers, spring tension, and bent oscillating arms. Nozzles which have worn  $1/16$ " larger than specified should be replaced. Use drill bit to check size of opening.



CHECK SPRINKLER NOZZLE

## Pipe Fittings

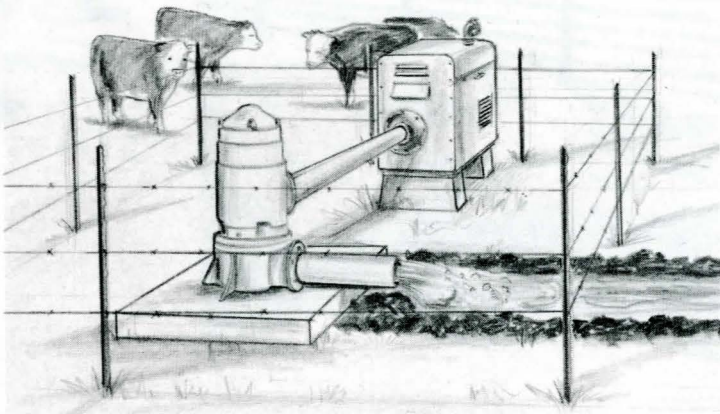
Inspect for wear and store indoors. Clean and lubricate valve shafts.

## Buried Pipe Lines

These must be completely drained unless they are located below the frost line. They should be capped to keep out rodents and debris.

## PUMPING INSTALLATION USE IN FREEZING WEATHER

1. Protect electric motors against moisture from blowing snow. A shed is best for this purpose.
2. Use winter lubricant for electric motors, gear heads, and pumpline shafts.
3. Make sure pipe and fittings are self draining; or drain them immediately after shutdown.
4. Keep belts at proper tension for various temperatures.
5. If water circulates in gear head, make sure it is self draining.
6. Protect from livestock.



PROTECT EQUIPMENT FROM LIVESTOCK

