

The Wash Hand

Caution: No one under the age of 18 should operate this washer.

Caution: This washer is rated for 3000-PSI maximum working pressure.

Caution: Turn off and disconnect the water source before approaching the vehicle while it is in operation.

Caution: Disconnect the battery before servicing the washer.

Caution: Do not remove any guards of sensors. This could cause Damage to the washer and surrounding structures and/or cause erratic operation, which could damage the washer or surrounding structures. Most Importantly it could cause bodily harm.

CAUTION: Do not tilt or turn the washer over with the batteries Inside. This could cause damage to the washer the surrounding or Serious personal injury.

Operational Overview

The wash Hand is a semi- automated washer designed to dispense high pressure water in a repeating elliptical pattern to assist in the cleaning of confined swine barns (other applications may warrant use of the washer).

The washer is semi-automated and should be treated as such. There are no Mechanisms within that will allow it to reason or avoid obstacles that are

impeding the forward motion of the washer. As well, there is o logic that will allow the arm or spray head to avoid obstructions that lie in the path of movement. It is important to treat the washer accordingly and check the path of the washer and the path of the arm before placing the washer into operation.

Operating The Wash Hand

1. Preparatory to set up.

- 1.1 Move The Wash Hand to the appropriate room or barn.
- 1.2 Determine the start and end location of the wash run.
- 1.3 Determine the location of the water supply. It may be necessary to supply additional hose (ensure the hose in properly rated) to complete the run. Standard hose length on the washer is 100'.
- 1.4 Position the washer at the start point with the reel end of the washer pointed in the direction of the end point.
- 1.5 Apply the rear brakes. See Figure 1.1
- 1.6 Turn the main Switch to OFF (located on the upper cabinet at the rear of the washer). See Figure 1.2
- 1.7 Push down the belt release lever (see Figure 1.3) and ensure that it holds in place. The lever is designed as an over center mechanism and should stay in the down position with no other mechanisms needed.
- 1.8 Unreel the hose to the appropriate length.
- 1.9 Slide the orange hose ball with end sensor plate (see Figure 1.4) along the hose to the stop point.

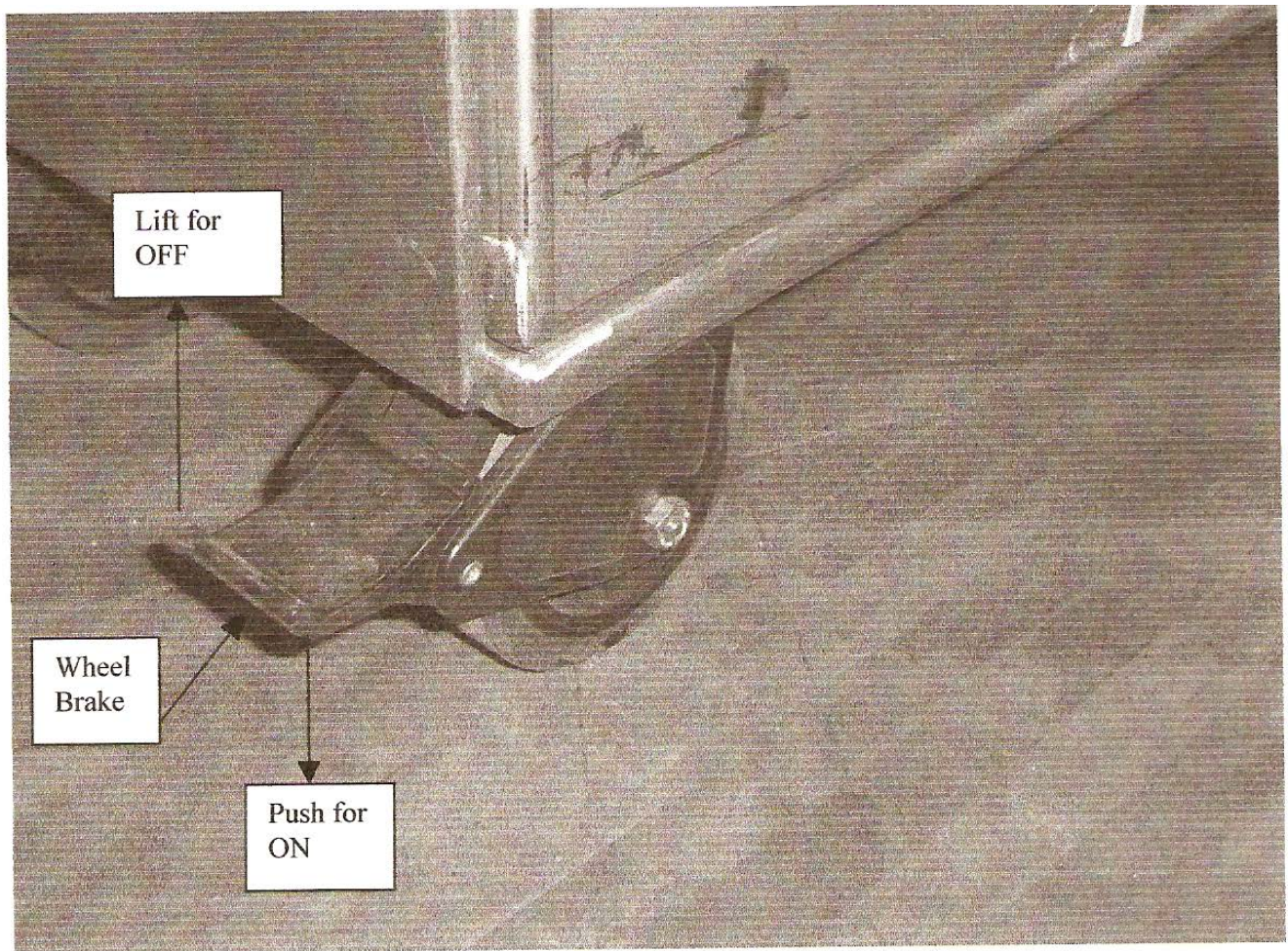


Figure 1.1 Wheel Brake

- 1.10 Determine and anchoring point for the hose. The washer has come from the factory with three anchoring devices. It may be necessary to fabricate an attachment system for you specific application.
- 1.11 Place the anchor at the anchoring point.
- 1.12 Slide the Hose/Cable grip (see Figure 1.4) along the hose to the anchoring point.
- 1.13 Using the D- Ring attached to the Hose/ Cable Grip attach the hose to the anchoring point. (see Figure 1.4)
- 1.14 Attach the hose, supplied with a quick fit couple, to the water supply point. If additional hose was required attach the quick fit disconnect to the additional hose.

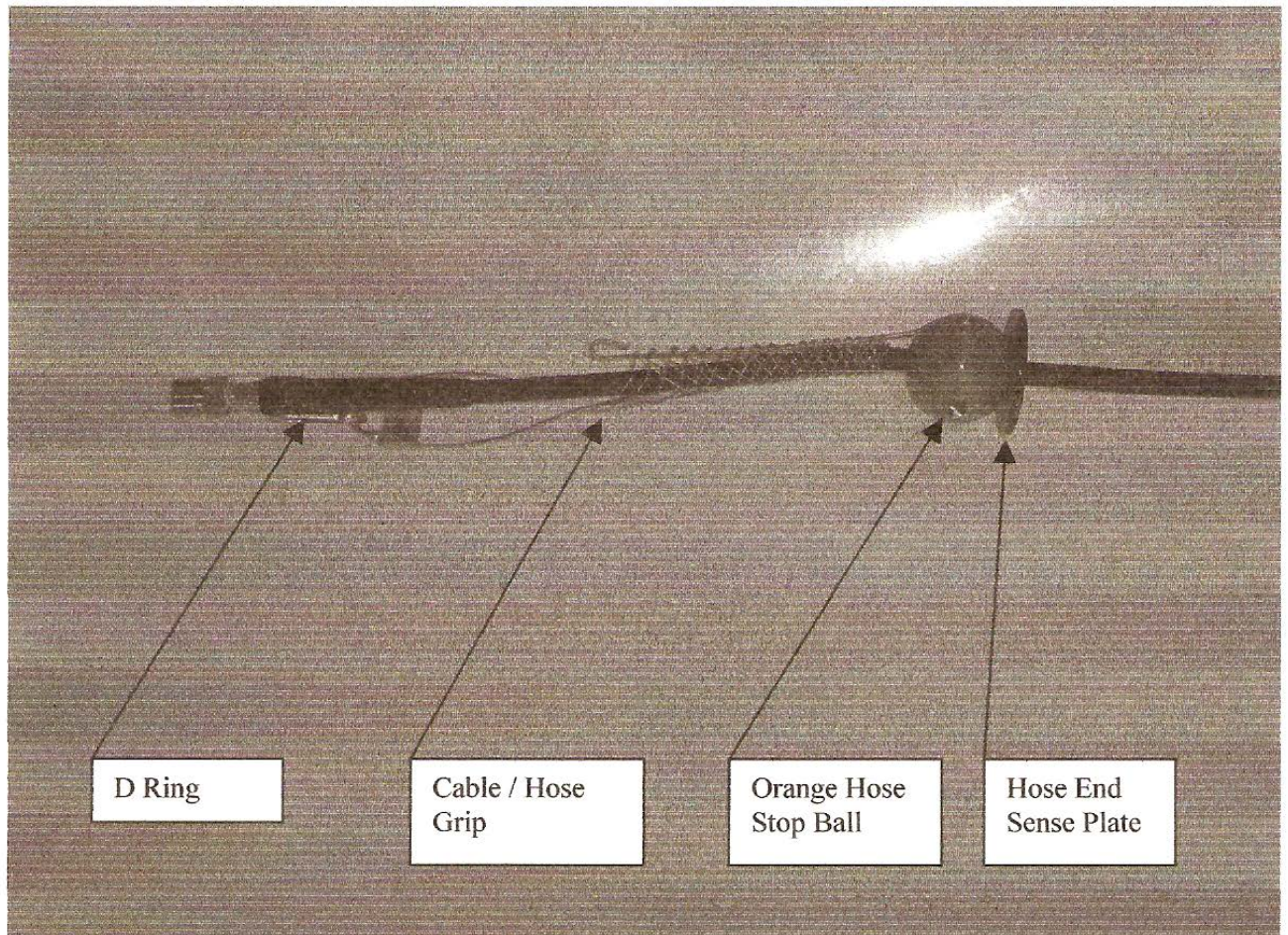


Figure 1.4 End of hose attachments

- 1.15 Return to the washer along the track of the hose. Check the hose for kinks twists or knots, which would impede forward progress of the washer. Remove any twists, knots or kinks. Also survey the area and determine if there are obstacles present that would impede the motion of the arm or the spray head. Make note of any obstacles.
- 1.16 Ensure that the front proximity sensor is in place. It is located below the white plastic hose guide at the very front of the washer. If not properly in place secure. If missing contact the service department and do not operate the washer.

- 1.17 Check the flexible conduit is in place. This should run from the rear of the proximity sensor to the upright cabinet. Verify that the conduit is free and not wrapped with the hose.
- 1.18 Check and verify that the hose is not wrapped or attached to any part of the washer.
- 1.19 Verify the reel belt guard is in place. If missing replace the guard. The guard is attached with 10-24 Phillips Pan Head Machine screws and 10-24- Nylon Insert Lock Nuts.
- 1.20 Visually check the washer to ensure that no part of the washer extrudes past the plane of the sides of the upright housing.
- 1.21 Verify that the upper guards are in place: The splashguard for the rotational arm motor, the upper front (triangular in shape) and upper rear belt guard. If missing replace the guard. The guard is attached with 10-24 Phillips Pan head Machine screws and 10-24 Nylon Inset Lock Nuts.
- 1.22 Verify the proximity sensor is present in the upper front (triangular in shape) belt guard. If not properly in place secure. If missing contact the service department and do not operate the washer.
- 1.23 Check the hose and connections from the reel to the spray head. Ensure that the hose is serviceable (no tears, cuts or other damage) And there are no kinks, twists or knots that will hinder operation of the washer.
- 1.24 Check the upper conduit to ensure that it is in place, secure and serviceable.

- 1.25 Verify that the Clevis pins and associated Hairpin cotter pins are in place and secure. There are eight pins and cotters on the arm of the washer.
- 1.26 Ensure the spray head with nozzle is in place. The washer comes from the factory with three quick fit nozzles with orifice sizes of 04, 06 and 08 (one of each).
- 1.27 Ensure the proximity sensor is in place under the spray head motor.
- 1.28 move the belt release lever to the up, or the activated position.

2 Set up for Washing:

2.1 Spray Head

2.1.1. Turn the main switch to OFF.

2.1.2 Determine the angle that the nozzle will be allowed to operate.

See Figure 2.1

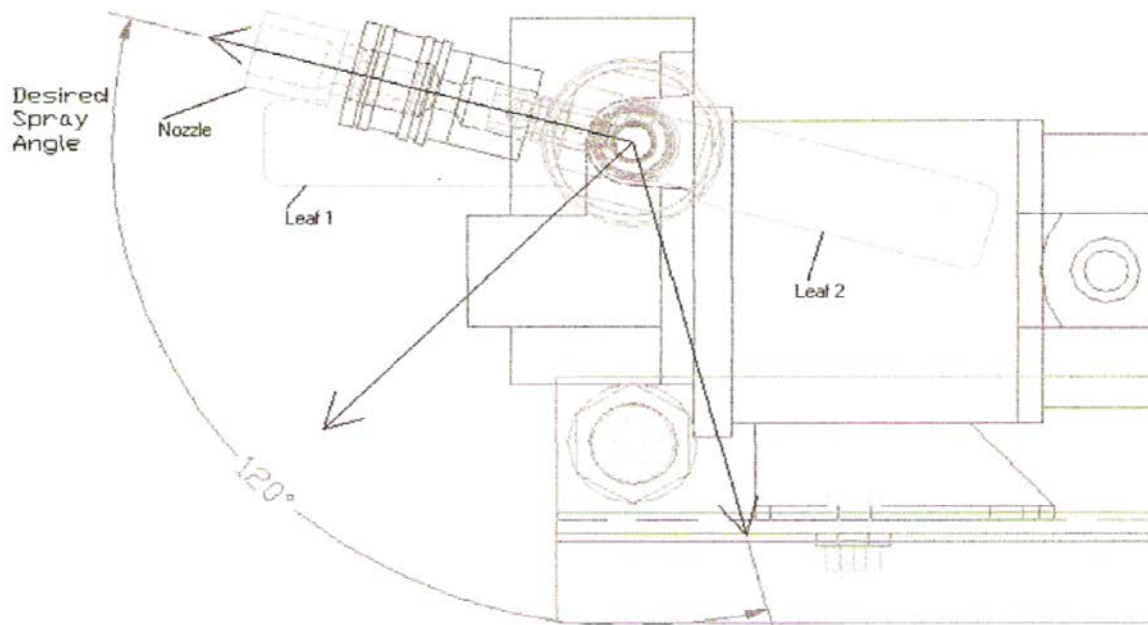


Figure 2.1 Desired spray angle

2.1.3 Open the rear door.

2.1.4 Turn all switches to OFF. The switches are located inside the cabinet on the right as you face the rear of the washer.

2.1.5 Turn the main switch to ON.

2.1.6. Turn the spray head switch to ON Allow the spray head to rotate to the upper extreme of the desired spray angle. See Figure

2.2

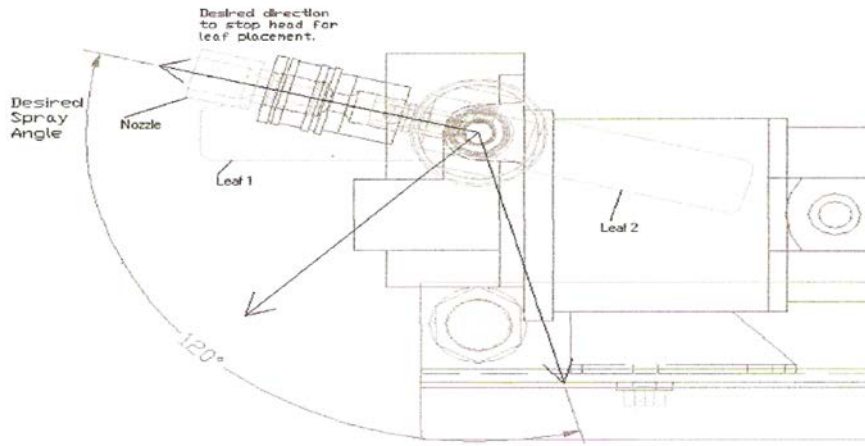


Figure 2.2 Rotated Spray Head

2.1.7 Turn the spray head switch to OFF.

2.1.8 Set the sensor leaves (sensor leaves are shown in Figure 2.6)

2.1.8.1 Set one of the leaves so that it lies along the nozzle. See Figure 2.3

2.1.8.2 Set the second leaf to the desired spray angle. See Figure 2.4

2.1.8.3 Verify that the proximity sensor lies between the two leaves in the direction of the spray. See Figure 2.5 and Figure 2.5 A.

2.1.8.4 If needed, repeat the above steps until the leaves, nozzle and the proximity sensor are all in the correct positions.

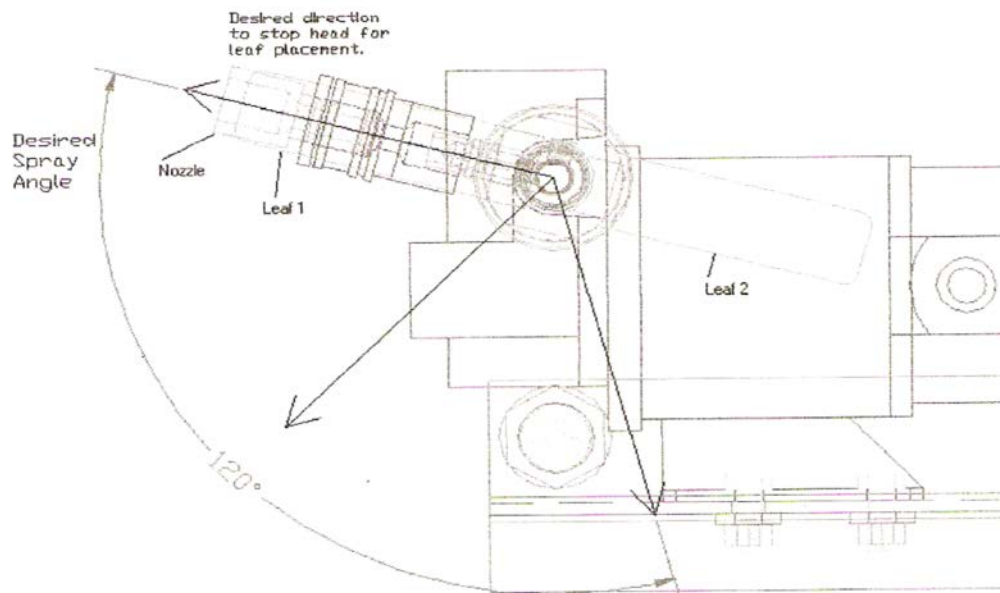


Figure 2.3

Sensor Leaf set inline with spray head

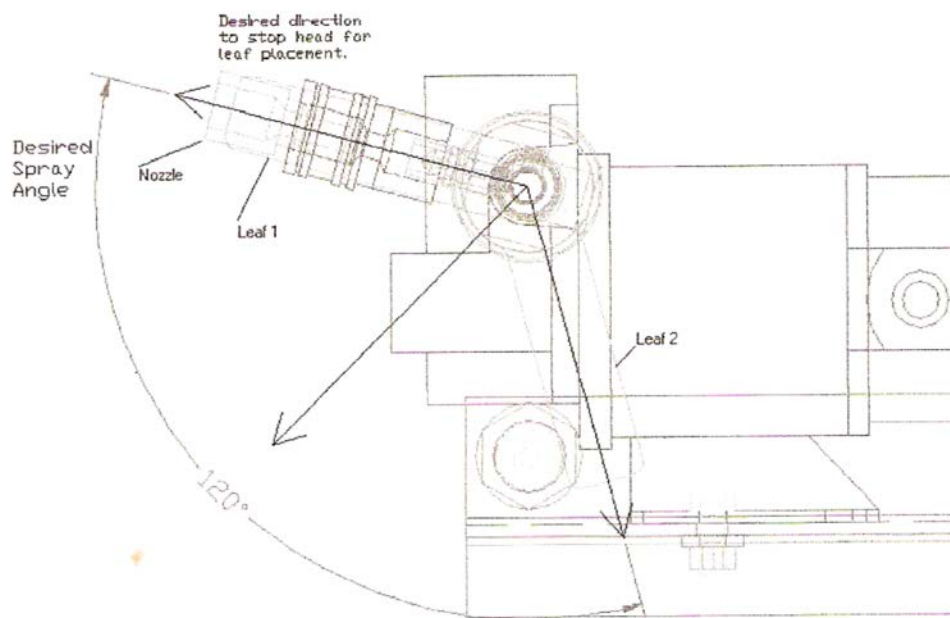


Figure 2.4

Sensor leaf set at desired spray angle

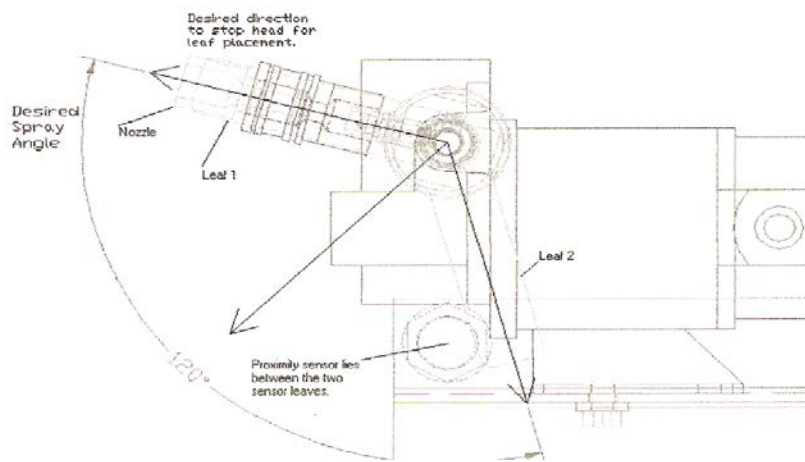


Figure 2.5

Proximity sensor between the two leaves

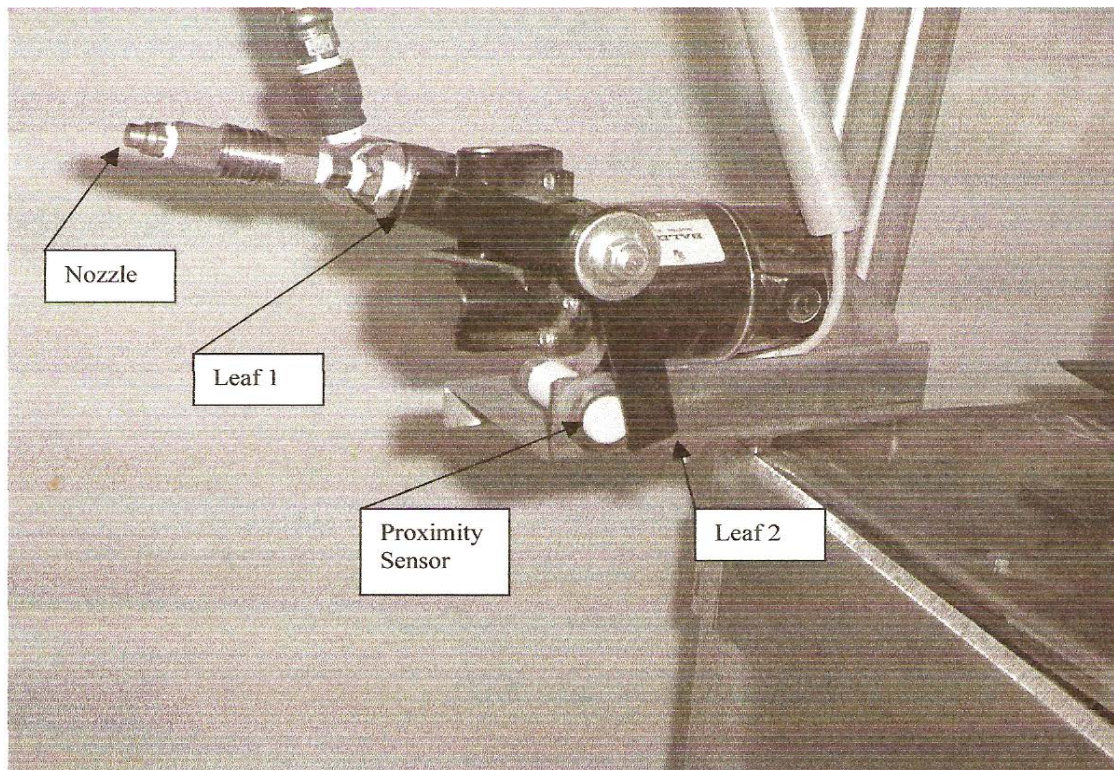


Figure 2.5A

Proximity Sensor Between the two leaves

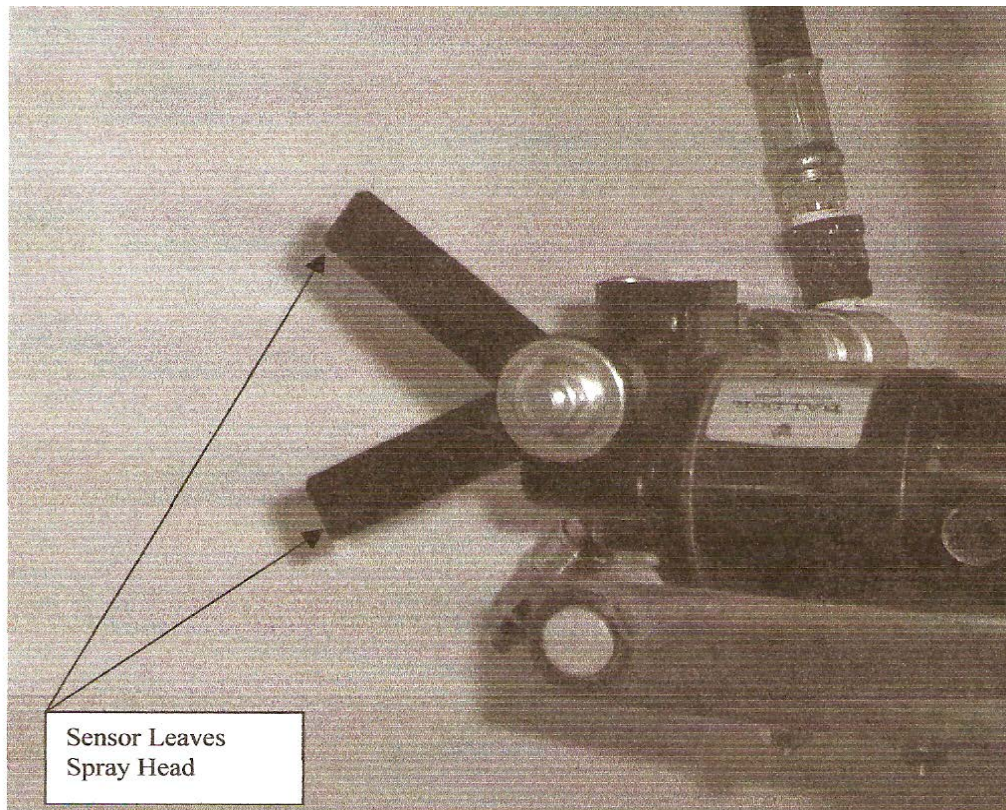


Figure 2.6 Spray Head Sensor Leaves

2.1.9 If desired, one of the preset spray angle leaves may be used.

The set up procedure is the same except the angle will be Predetermined.

2.1.10. Move the spray head switch to the on position and ensure that the spray head nozzles oscillates in the correct angle.

2.1.11. Once verified, move the spray head switch to the OFF position.

2.1.12. Move the Main Switch to the OFF Position.

This is a general procedure for setting the spray angle of the device. This

Procedure is designed to give you the basic set up operation of the spray.

Head. Depending on the desired direction of spray the nozzle may not be

Inline with one of the sensor leaves.

2.2. Spray Head Height and Rotation Diameter:

- 2.2.1 Referring to the preparation for set up, recall any obstacles that would impede the motion of the spray head or the rotational arm.
- 2.2.2 Determine the appropriate spray height and rotation diameter to avoid any and all obstacles.
- 2.2.3 Support the spray head with one hand.
- 2.2.4 Remove the ball detent pin closest to the spray head from the center plate. See Figure 2.7. It is necessary to depress the blue button on the end of the pin to release the locking ball at the end of the pin.
- 2.2.5 Rotate the head until the desired height is reached. The pin must now be inserted back into the center plate. Once again, the blue button must be depressed to release the locking ball at the end of the pin.
- 2.2.6 Still supporting the spray head, remove the other pin (closest to the center rotation point) and adjust the final height of the spray head.
- 2.2.7 It may be necessary to repeat the previous two steps until the final position is reached.

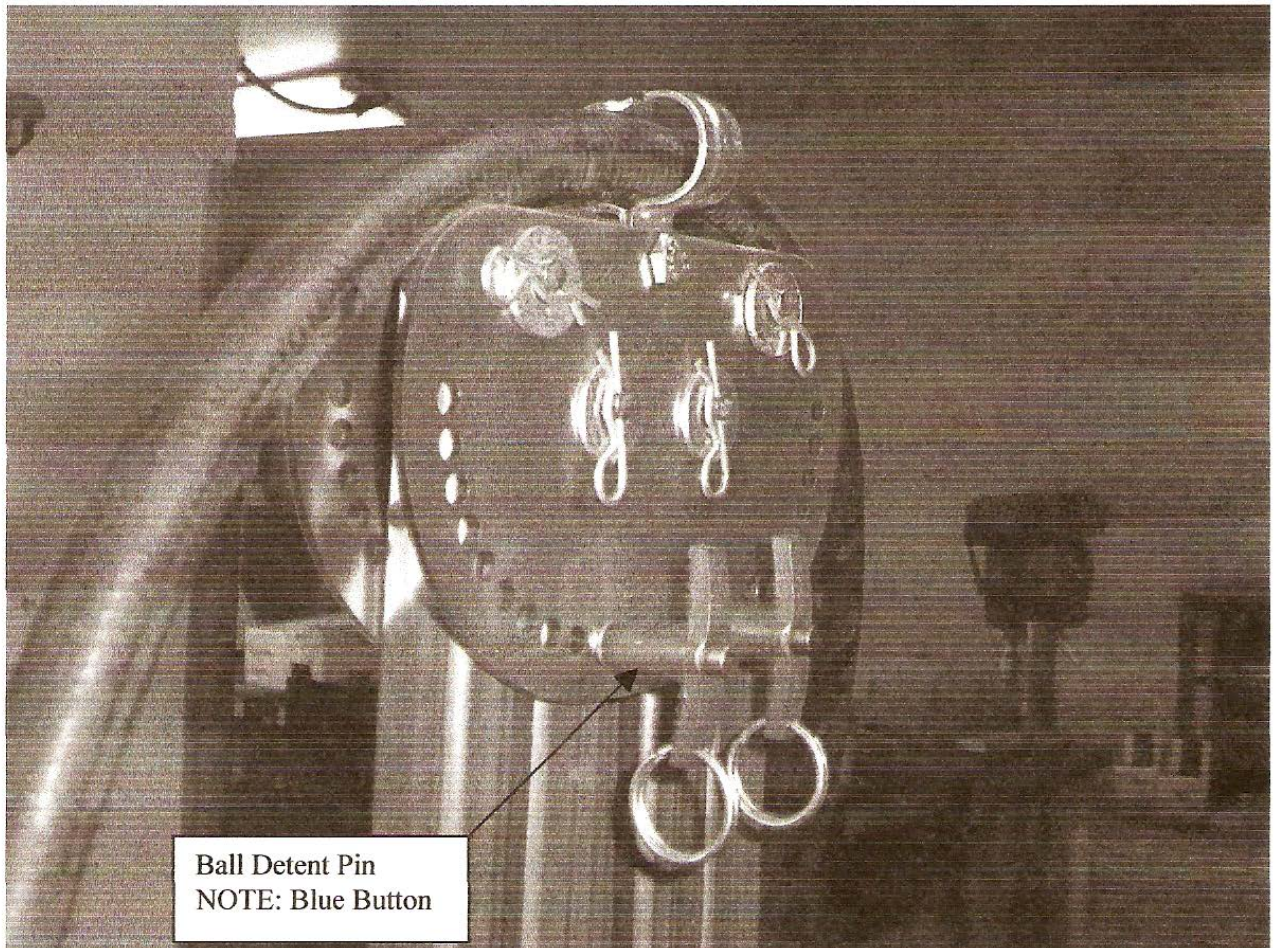


Figure 2.7 Center Plate

2.3. Rotation Angle of the arm:

2.3.1 Determine the angle of rotation of the arm. See Figure 2.8.

2.3.2 Loosen the Wing nuts on the sense arm base plate. See Figure 2.9.

2.3.3 Rotate the sensor plates so that the desired angle is reached

NOTE: This will be opposite the desired angle. See Figure 2.10.

2.3.4 Verify the proximity sensor falls between the two leaves opposite the desired angle. See Figure 2.11 and 2.11 A.

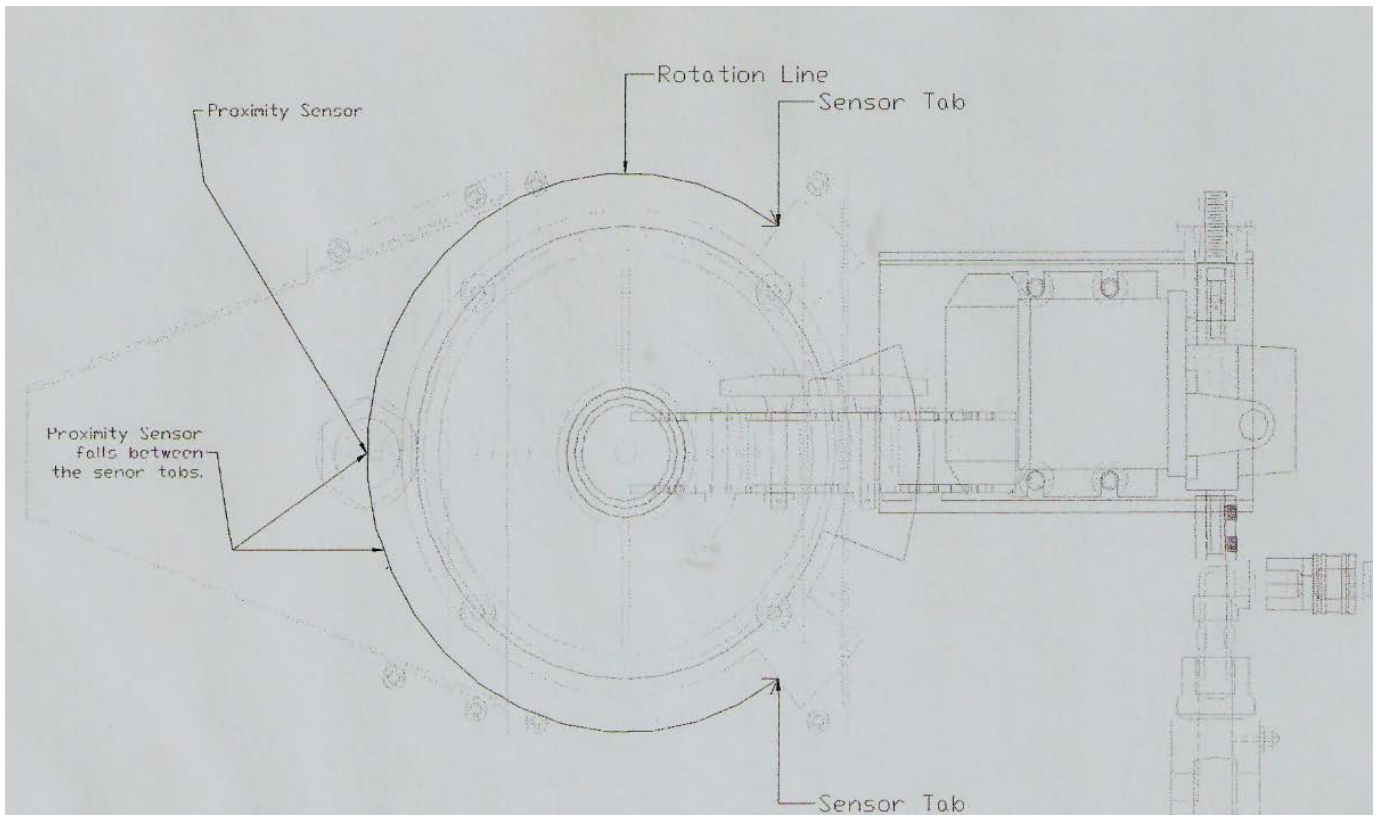


Figure 2.8 Desired Rotation Angle

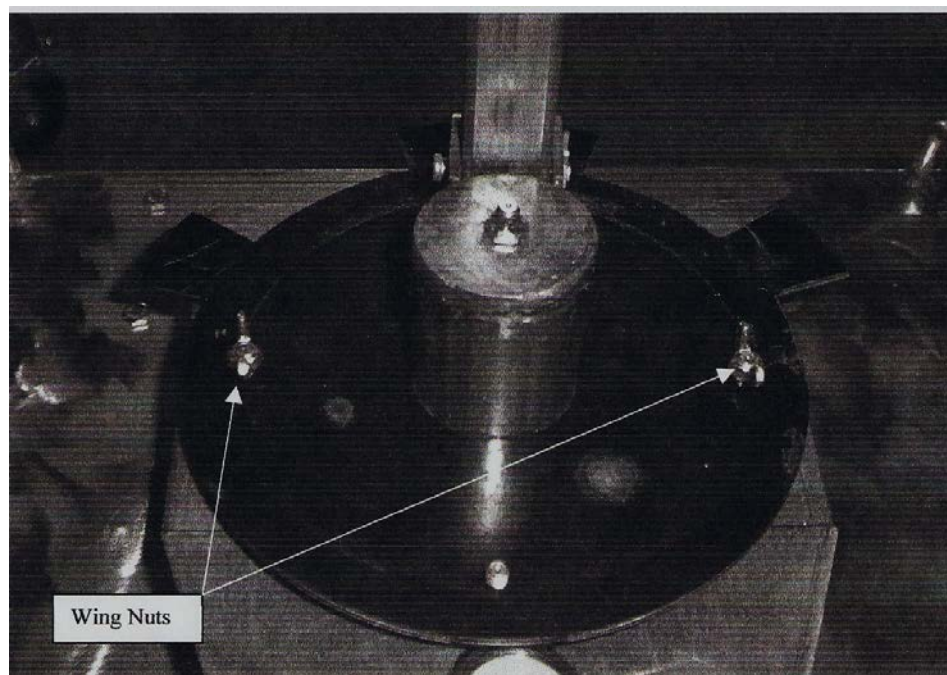


Figure 2.9 Rotational Base

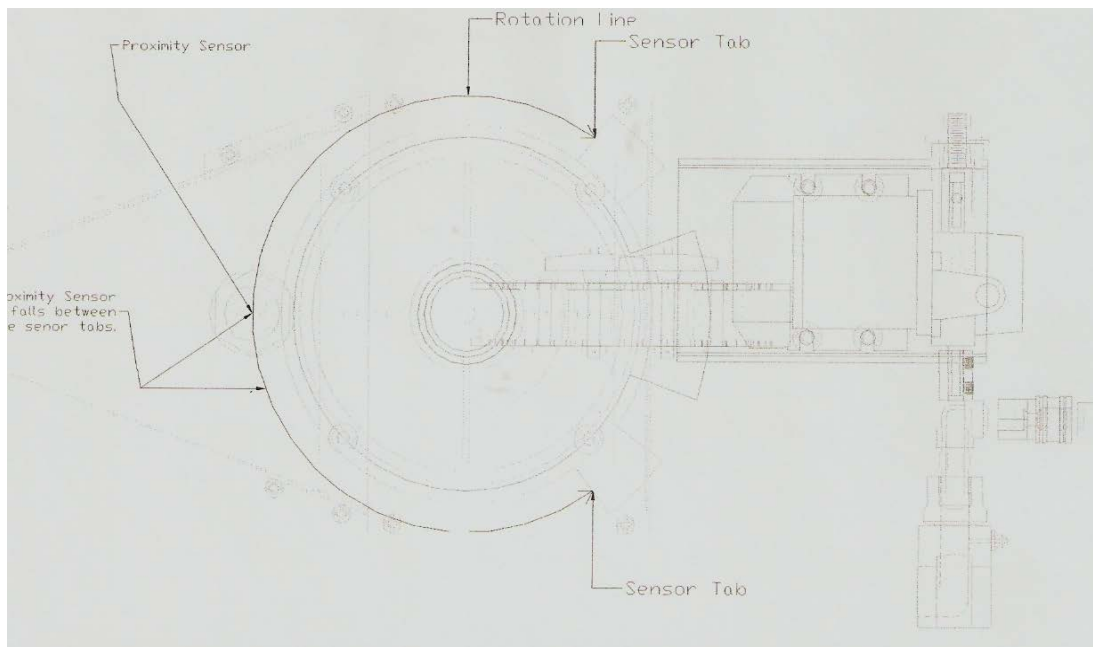


Figure 2.10 Sensor Tab Set opposite the desired spray angle.

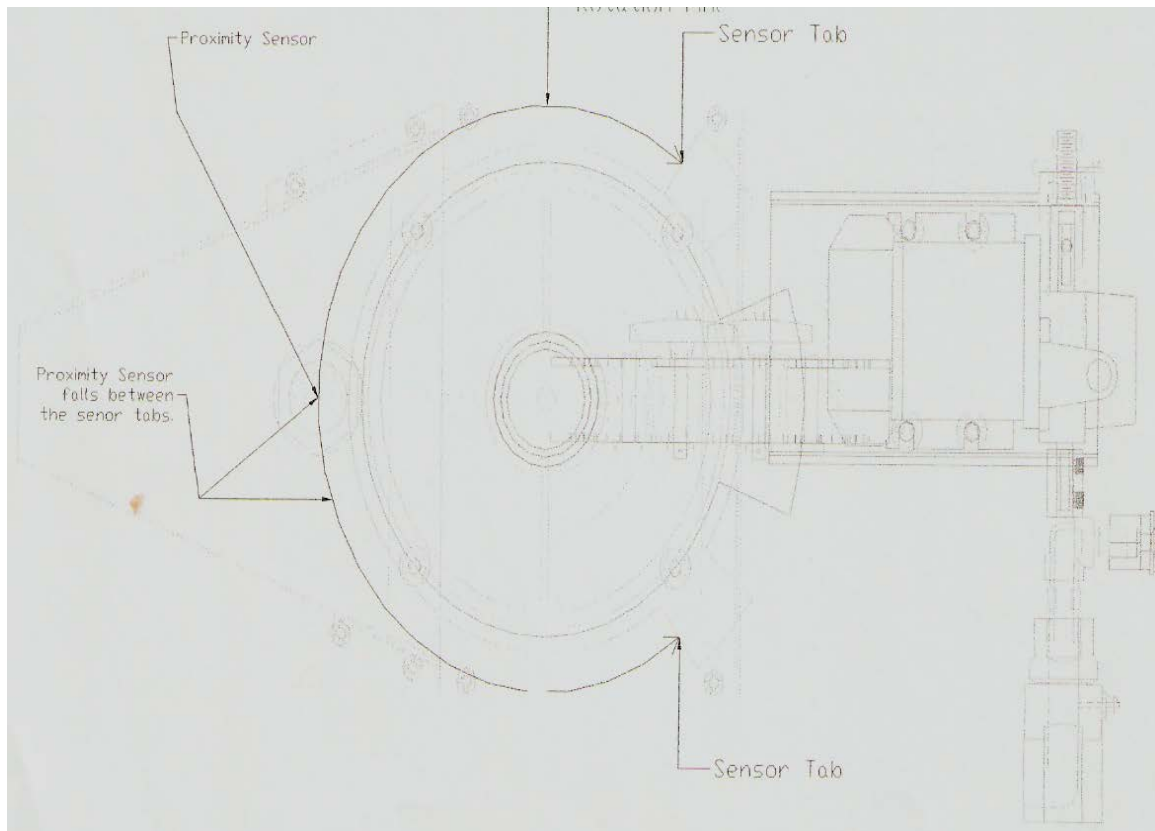


Figure 2.11 Proximity Sensor falls between the sensor tabs.

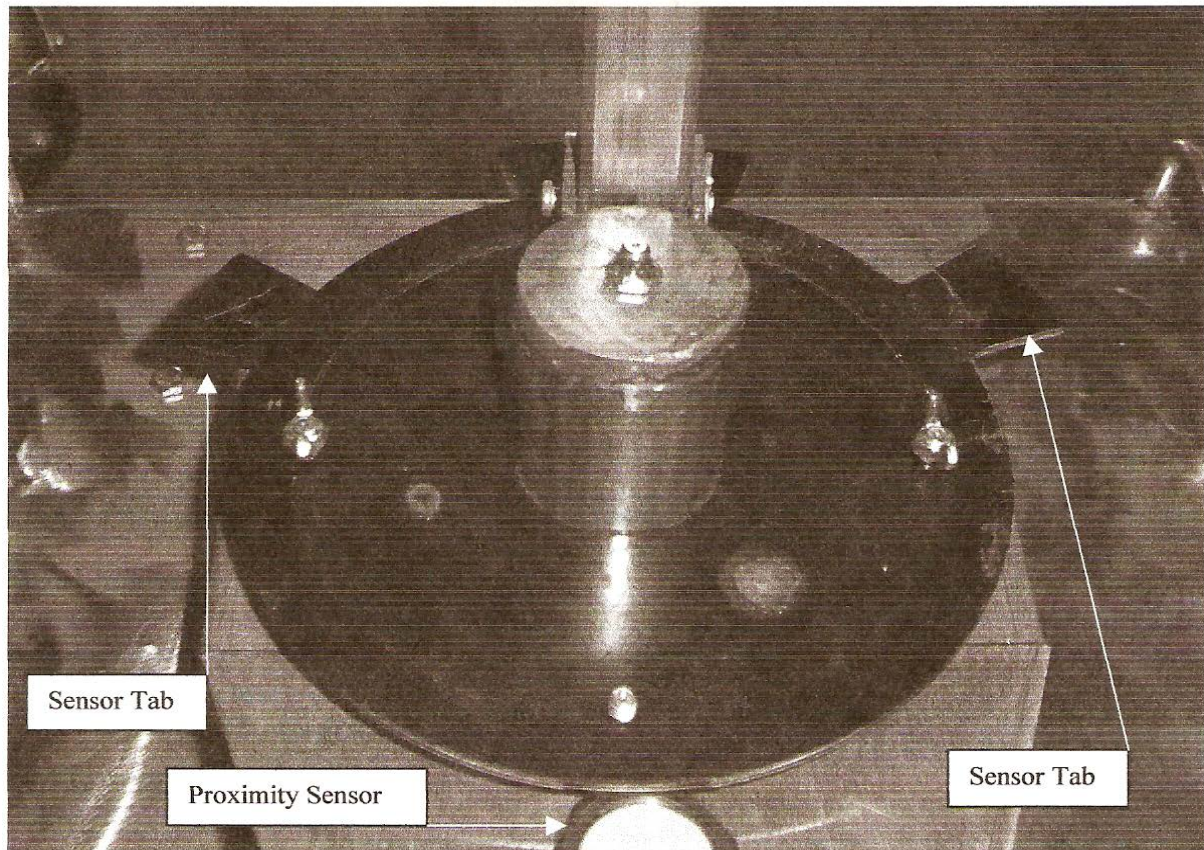


Figure 2.11 Proximity Sensor falls between the sensor tabs.

2.3.5 If it is desired the sensor leaves may be rotated above the tab on the sense arm base plate and the washer will oscillate at the maximum angle possible.

2.3.6 Tighten the wing nuts on the sense arm base plate.

2.3.7 Move the Main Switch to the ON position.

2.3.8 Move the Rotational Arm Switch to the ON position.

2.3.9 Verify the operation of the rotational arm.

2.3.10. If necessary move the Main Switch to the OFF Position and repeat this section until the desire rotation is achieved.

2.3.11. Move the Rotational Arm Switch to the OFF Position.

2.3.12 Move the Main Switch to the OFF Position.

2.4 Reel Speed

2.4.1 First time set up.

2.4.1.1. Test the washer in you application for the appropriate speed.

2.4.1.2 Locate the speed control Dial. It is located on the inside of the cabinet to the right as you face the rear of the washer.

2.4.1.3. The dial is incremented form 0 to 10 in increments of 1.

2.4.1.4 A setting of 10 on the washer will move the washer forward at 2.38 feet per minute with all the hose unreeled and at 4.18 feet per minute with almost all the hose on the reel

The nominal, or average speed, is 3.6 feet per minute.

2.4.1.5. With the washer set up, position the dial to the desired number.

2.4.1.6 Move the Main Switch to the ON position.

2.4.1.7 Move the Reel Motor Switch to the ON position.

2.4.1.8. Monitor the forward movement of the washer.

2.4.1.9. Adjust the dial setting until the desired speed is reached.

2.4.1.10 Move the Main Switch to the OFF position.

2.4.1.11 Move the Reel Motor Switch to the OFF position.

2.4.1.12. Push down the belt release lever until it stays in the down position.

2.4.1.13. Move the washer back to the start point.

2.4.1.14. Move the belt release lever to the up, or activated position.

2.4.2. Normal operation

2.4.2.1 Set the appropriate speed on the dial.

3. Operation of the Washer.

3.1 Move Main Switch to the OFF position.

3.2 Move Spray Head, Rotational Arm and Reel Motor Switches to the ON position.

3.3. Close the rear door.

3.3.1. Ensure the closure handles are engaged to prevent the door from swinging open during operation.

3.4 Perform a quick visual inspection of the area to ensure all obstacles to the movement of the arm and spray head are removed or the washer is set to avoid them i.e. hanging pipes and electrical lines from the ceiling.

3.5 Move the Main Switch to the ON position.

3.6 Move to the water supply point.

3.7 Move to the water supply point.

3.8 Activate the valve or switch to supply water to the washer.

3.9 Verify the washer operates correctly.

3.10 First time users or first use in an area:

3.10.1. Monitor the washer to ensure no obstacles appear and the washer moves along the appropriate path.

3.10.2. Monitor the arm swing and spray head operation to ensure the proper operation.

3.11 In Normal operation, check the washer occasionally to ensure it is operating correctly.

4. End of Operation:

4.1 The washer is factory set to continue operation of the arm and spray head for ten minutes after arrival to the end point to complete the cleaning cycle, this can be interrupted by moving the main switch to the OFF position.

NOTE: TURN OFF THE WATER SUPPLY BEFORE APPROACHING THE WASHER. SERIOUS INJURY CAN OCCUR FROM THE HIGH PRESSURE WATER JET.

- 4.2 Allow the washer to complete the cycle.
- 4.3 Turn off the water supply.
- 4.4 Disconnect the hose from the water supply line.
- 4.5 Move the main switch to the OFF Position.
- 4.6 Disconnect the hose/cable grip from the anchor device.
- 4.7 Remove the anchor device and store,
- 4.8 Slide the hose/cable grip to the end of the hose.
- 4.9 Slide the hose ball and end sense plate to the end of the hose.
- 4.10 Depress the belt release lever.
- 4.11 Reel in the rest of the hose.
- 4.12 Support the Spray head.

- 4.13 Remove the ball detent closest to the center rotation point.
- 4.14 Move the spray head towards the center rotation point.
- 4.15 Once the bars have reached the vertical or near vertical position replace the ball detent pin. It is necessary to depress the blue button on the ball detent pin.
- 4.16 Remove the second ball detent pin (closest to the spray head)
- 4.17 Move the spray head towards the center rotation point.
- 4.18 Once the bars have reached the vertical or near vertical position replace the ball detent pin.
- 4.19 Gather all items used with the washer (anchors, hoses, etc.)
- 4.20 Move the washer to the appropriate storage location.
- 4.21 Store the associated items.
- 4.22 Open the rear door.
- 4.23 Attach the battery charger. (The washer is supplied with an external battery charger)

Mechanical Warranty

Swine Robotics Inc. will replace any part found to be defective in Workmanship for a period of one year from the date of original purchase. This warranty covers the cost of the replacement part, but does not include shipping or labor costs associated with the removal and installation of the part.

Battery Warranty

The factory- installed batteries carry a two-year warranty. Batteries Found to be defective within one year of the original purchase will be Replaced at no charge to you. Batteries found to be defective in the second Year from original purchase will be replaced at a pro-rated cost.

**DO NOT RETURN BATTERIES UNDER WARRANTY TO SWINE ROBOTICS: CONTACT
THE NEAREST EXIDE BATTERY DEALER WITH BATTERY WARRANTY ISSUES.**

Service and Parts

For parts and technical support contact:

**Swine Robotics Inc.
(605) 439-3510**

Please promptly return warranty parts to the following address:

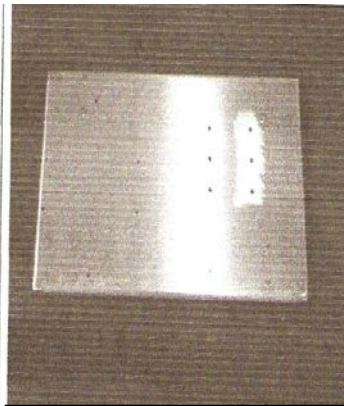
**Swine Robotics Inc.
10858 365th Ave
Leola, SD 57456**

Parts List

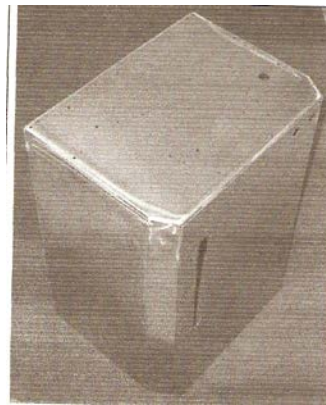
Part Number			Nomenclature				
525H-AH-ASM-01			Fuse Holder	TM	100	27	Hairpin Cotter Pin
BB-525H –AC -01			Battery	TM	100	34	Reduction Fitting 3/8 To ¼"
TM SA 100-03			Arbor base sub assembly	TM	100	35	Quick Fit Disconnect
TM SA 100-06			Electronics Enclosure Sub Assembly	TM	100	36	Nozzle 04
TM	100	1	Base SST	TM	100	36	Nozzle 06
TM	100	2	Side	TM	100	36	Nozzle 08
TM	100	3	Top	TM	100	36	Nozzle Adapter
TM	100	4	4 Bar Linkage Upper Arm	TM	100	37	Reel Base
TM	100	5	4 Bar Linkage Center	TM	100	38	Reel Motor
TM	100	6	4 bar linkage End	TM	100	39	Reel
TM	100	7	Rotational Base Center post	TM	100	40	Rigid Wheel
TM	100	8	Rotational Base Plate	TM	100	41	Brass Bushing
TM	100	9	Rotational Base Support	TM	100	42	Thrust Bearing
TM	100	10	Sleeve	TM	100	43	Small Motor
TM	100	11	Upper Motor Base Plate	TM	100	44	Swivel Wheel
TM	100	12	Upper Motor Prox Sensor Arm	TM	100	45	Venturi Rotational Hose Attachment
TM	100	13	Motor Bracket	TM	100	46	Thrust Washer
TM	100	14	Motor Bracket Adapter	TM	100	47	Rotational Assembly Belt (32" OD)
TM	100	15	Sleeve Top	TM	100	48	Reel Pulley
TM	100	16	Front Guide	TM	100	49	Reel Belt (75" OD)
TM	100	17	Right Arm Guide	TM	100	54	Hose Stop
TM	100	18	Left Arm Guide	TM	100	55	F to F SST 90 Fitting
TM	100	19	4 Bar Linkage Lower Arm	TM	100	57	Upper Connection Hose
TM	100	20	Taper Bearing	TM	100	58	Battery Locator
TM	100	20	Rotational Arm Pulley	TM	100	59	Battery Tie Down
TM	100	21	Reel Motor Pulley/Rotational Assembly Motor Pulley	TM	100	60	All Thread Rod Rotational Arm Sensor Base
TM	100	24	Rotational Base O Ring #27	TM	100	62	Base
TM	100	26	Clevis Pin	TM	100	63	Rotational Arm Position Sensor

TM	100	66	Shaft Couple	TM	100	105	Hose Quick Disconnect
TM	100	67	FF sst 90 Fitting	TM	100	108	Grease Zerk
TM	100	69	MM SST Fitting .375	TM	100	112	Long Tie OFF
TM	100	70	PLC	TM	100	113	1" Gap Tie OFF Base
TM	100	73	Switch	TM	100	114	1" Gap Tie OFF Top
TM	100	74	DC Variable Speed Controller	TM	100	115	3/8" Gap Tie OFF Base
TM	100	75	½ F to 3/8 M	TM	100	116	3/8" Gap Tie OFF Leaf handle
TM	100	76	SST Hinge	TM	100	117	3/8" Gap Tie Off Leaf Stop
TM	100	78	Battery Charger	TM	100	123	120 Degree Spray Limitor
TM	100	79	Ball Detent Pin	TM	100	124	105 Degree Spray Limitor
TM	100	80	Pressure Gauge	TM	100	125	135 Degree Spray Limitor
TM	100	81	Pressure Gauge tee	TM	100	126	150 Degree Spray Limitor
TM	100	82	Bushing ½ to 3/8	TM	100	128	Handle
TM	100	83	Bushing 3/8'to 1/4	TM	100	129	Small Down Rod
TM	100	84	Circuit Relay	TM	100	130	Long Down Rod
TM	100	85	MM Close Nipple ¼"	TM	100	131	Reel Guard Cover
TM	100	87	Front Plastic	TM	100	133	Switch Enclosure
TM	100	92	Rot Arm Rear Guard	TM	100	134	M M Close Nipple ½"
TM	100	92	Rot Arm Front Guard	TM	100	135	Cable Grip
TM	100	94	Rear Door	TM	100	136	Potentiometer
TM	100	95	Reel Guard	TM	100	137	Dial for Potentiometer
TM	100	96	Reel Guard Bracket	TM	100	138	Wheel Brake
TM	100	97	Hose End Sense Plate	TM	100	139	Proximity Sensor ¾"
TM	100	98	Rotational Motor	TM	100	140	Flexible conduit Upper
TM	100	100	Proximity Sensor 1#	TM	100	141	Flexible conduit Lower
TM	100	101	Rotational Base O Ring #28	TM	100	142	U-Bolt (Tie OFF)
TM	100	102	T Handle Closure	TM	100	143	Switch Box
TM	100	104	Hose	TM	100	143	Rot Motor Splash guard

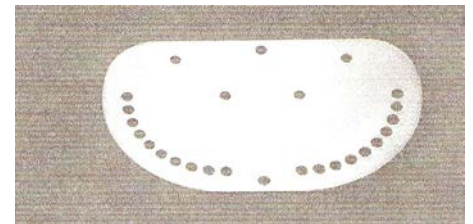
TM	143		Rot Motor Splash Guard
TM	144		Lever Arm
TM	145		Push Arm
TM	146		Lever Pivot
TM	147		Bushing Reel
TM	148		Clamp Reel
TM	149		Foam Tape
TM	150		Pipe hanger
TM	151		Water tight conduit Adaptors
TM	152		Tensioner
TM	153		Tensior Shaft
TM	154		Idler Pulley
TM	155		Fuse 1 Amp
TM	156		Fuse 3 Amp



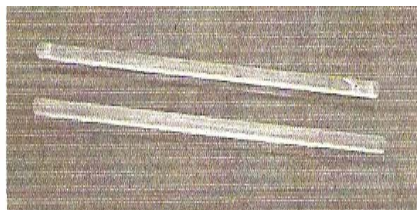
TM 100-01 Base



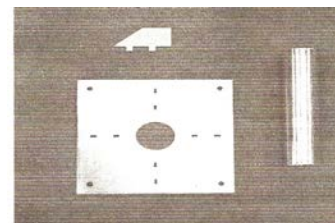
TM 100-02 Side and TM 100-03 Top



TM 100-05 4 Bar Center



TM 100-04 Upper Arm And TM 100-19 Lower Arm (Lower has Two holes on one end)

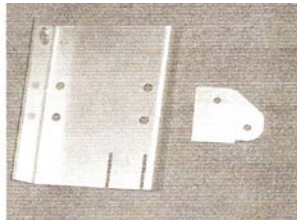


Right TM 100-07 Center Post
Bottom TM 100-08 Rotational Base Plate

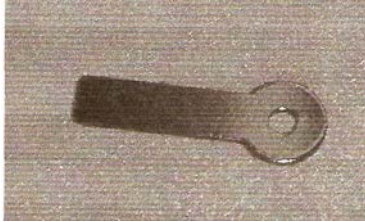
TM 100-06 See Picture TM 100-11



Left TM 100-10 Sleeve
Right TM 100-15 Sleeve Top



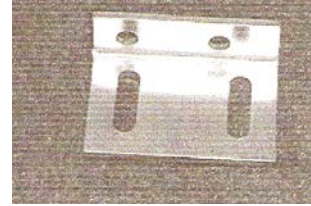
Left TM 100-11 Upper Motor
Base plate
Right TM 100-06 4 Bar End



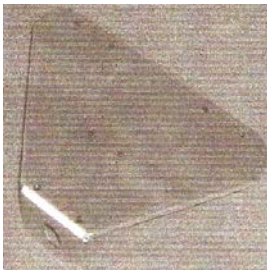
TM 100-12 Upper Arm
Prox Sensor Arm/ Leaf



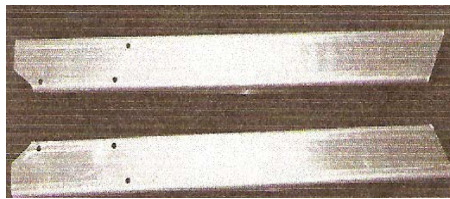
TM 100-13 Motor Bracket



TM 100-14 Motor Bracket
Adapter TM 100-15 See
TM 100-10



TM 100-16 Front Guide



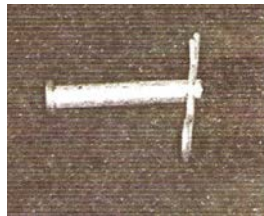
TM 100-17 Right Guide Arm
100-18 Left Guide Arm
TM 100-19 See TM 100-04



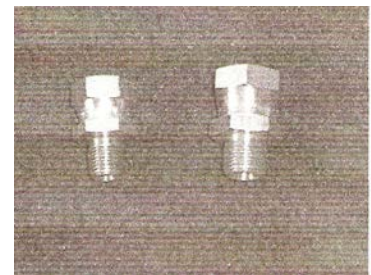
TM 100-20 Rotational Arm
Pulley with taper bearing



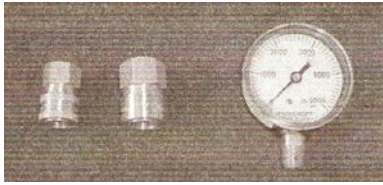
TM 100-21 Motor Pulleys



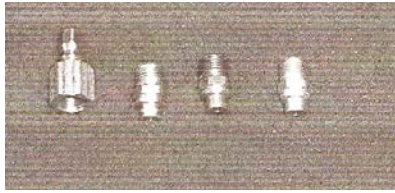
TM 100-26 Clevis Pin
TM 100-27 Hairpin Cotter Pin



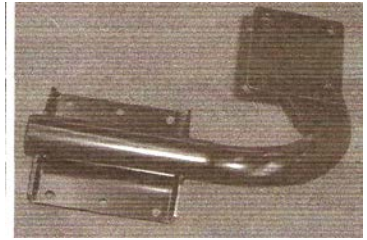
Left TM 100-34 Reduction Fitting
3/8" to 1/4"
Right TM 100-75 Reduction Fitting
1/2" to 3/8"



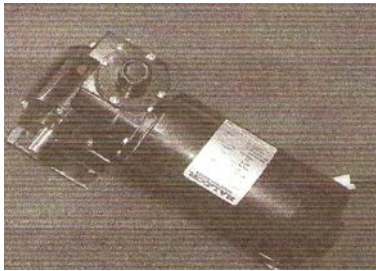
*Left TM 100-24 Quick Fit
Disconnect Nozzle
*Middle Tm100-105 Quick Fit
Disconnect Hose
*Right Tm 100-80 Pressure Gauge



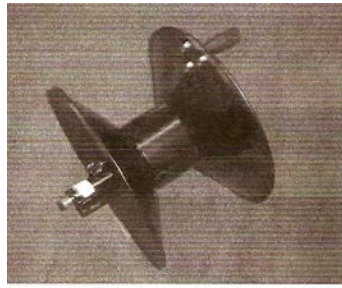
*TM 100-36 Nozzle
*Left Nozzle Adapter
*Middle Left 04 Nozzle
*Middle Right 06 Nozzle
*Right 08 Nozzle



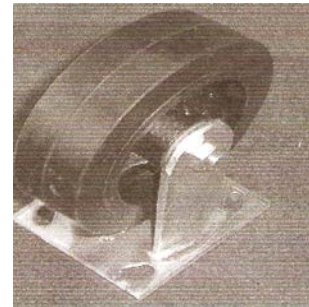
TM 100-37 Reel Base



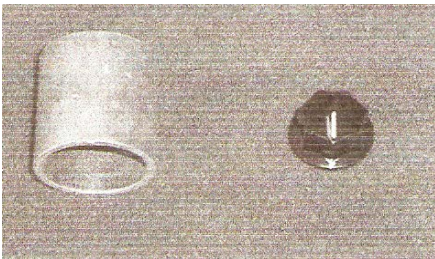
TM-100-38 Reel Motor



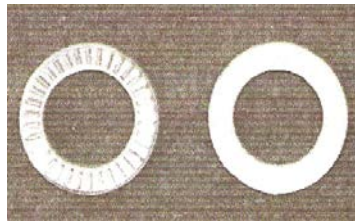
TM 100-39 Reel



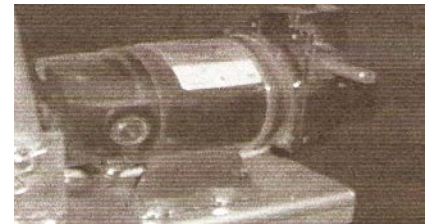
TM 100-40 Ridge Wheel



Left TM 100-41 Brush Bushing
Right TM 100-137 Dial for
Potentiometer



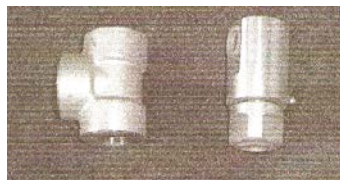
TM 100-42 Thrust Bearing
TM 100-46 Thrust Washer



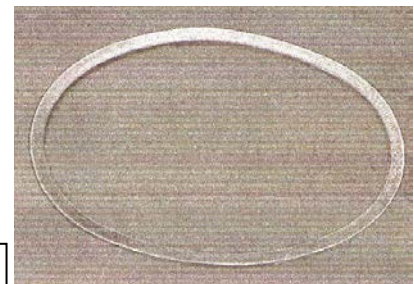
TM 100-43 Spray Head
Motor (small motor)



TM 100-44 Swivel Wheel
TM 100-46 Thrust Washer
See TM 100-42



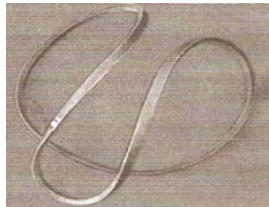
Right TM 100-45 Venturi Rotational
Hose Attachment
Left TM 100-42 Pressure Gauge tee



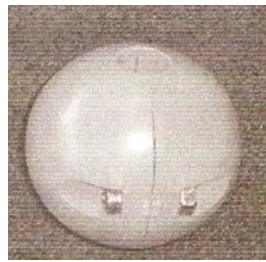
TM 100-47 Rotational Belt



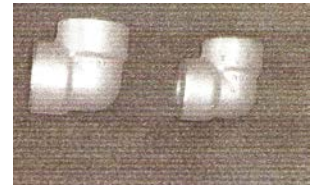
TM 100-48 Reel
Pulley before cut



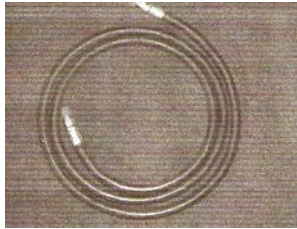
TM 100-49 Reel
Belt



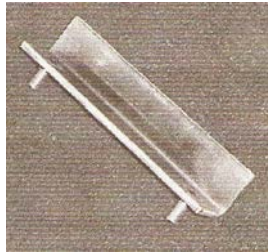
TM 100-54 Hose Stop



Left TM 100-55 F to F
90 1/2"
Right TM 100-67 F to
F 90 3/8"



TM100-57 Upper
Connection Hose



TM 100-58 Battery
Locator



TM 100-59
Battery
Locator



TM 100-60 All
Thread Rod



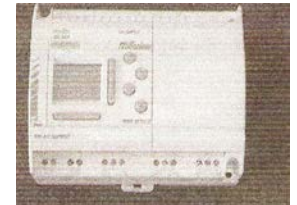
Left TM 100-62 Rotational
Arm Sensor Base
Right Tm 100-63 Rotational
Arm Position Sensor or
Sensor tab
TM 100-67 See Tm 100-55



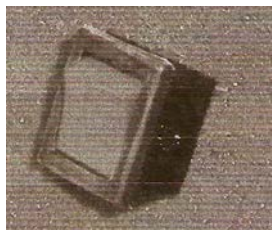
TM 100-66 Shaft Couple



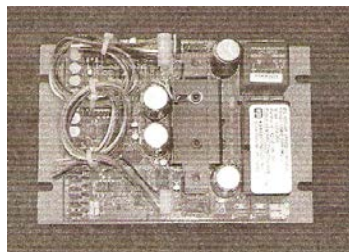
TM -69 3/8" Close
Nipple Alternate



TM 100-70PLC



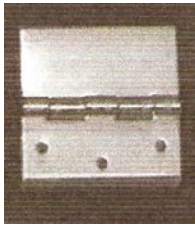
TM 100-73 Switch
TM 100-75 See TM 100-34



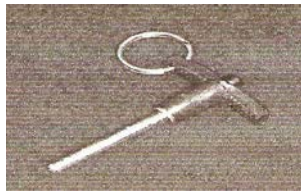
TM 100-74 Variable Speed
Controller



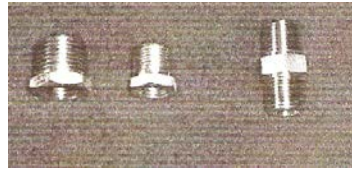
TM 100-78 Battery Charger



TM 100-76 SST
Hinge



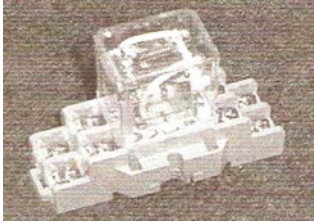
TM 100-79 Ball
Detent Pin



*Left TM 100-82 Bushing 1/2
*Middle TM 100-83 Bushing 3/8"
*Right TM 100-69 M to M Fitting 3/8"



TM 100-85 1/4"
Close Nipple



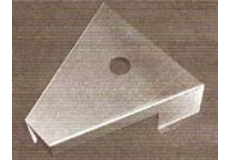
TM 100-84 Circuit Relay



TM 100-87 Front Plastic



TM 100-92 Rear
Gear



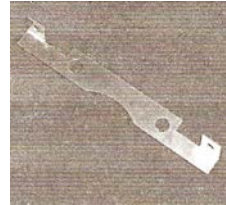
TM-100-93
Front Guard



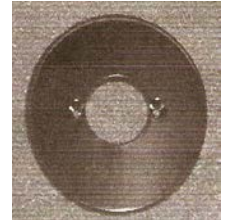
TM 100-94 Rear Door



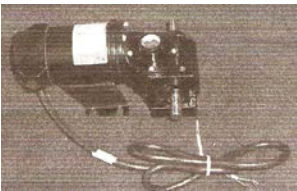
TM 100-95 Reel Guard



TM 100-96 Reel
Guard Bracket



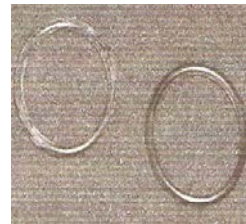
TM 100-97 Hose
end Senses Plate



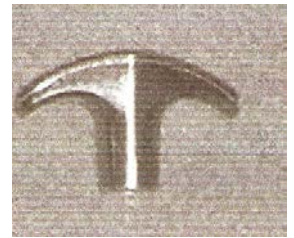
TM 100-98 Rotational
Motor



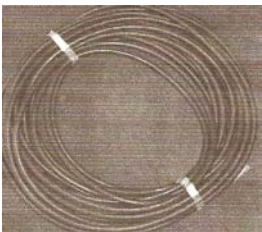
TM 100-100 Proximity
Sensor 3/4"



TM 100-101 Rotational
Base O Ring

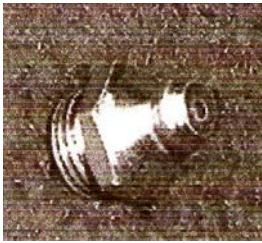


TM 100-102
Closure Handle

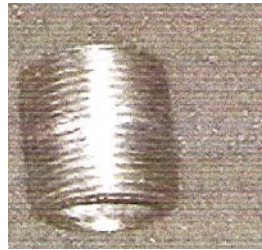


TM 100-104 Hose

TM100-105 see TM 100-



TM 100-108 Grease Zurk

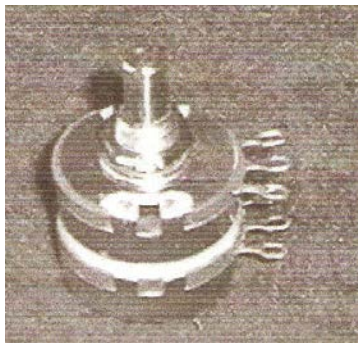


TM 100-134 MM Close 1/2" Nipple

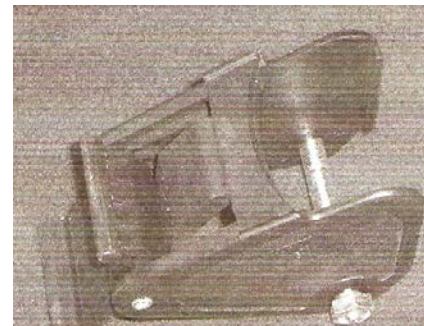
TM 100-112 Long Tie off
TM 100-113 1" Gap Tie off Base
TM 100-115 3/8" Gap Tie Off Base
TM 100-117 3/8" Gap Tie off leaf Stop
TM 100-124 105 Spray Limitor
TM 100-126 150 Spray Limitor
TM 100-129 Small Down Rod
TM 100-131 Reel Guard Cover
TM 100-114 1" Tie Off Top
TM-116 3/8" Gap Tie Off Leaf Handle
TM 100-123 120 Spray Limitor
TM 100-125 135 Spray Limitor
TM 100-128 Handle
TM 100-130 Long Down Rod
TM 100-134 MM Close 1/2" Nipple
TM 100-137 see TM 100-41



TM 100-135 Cable Grip



TM 100-136 Potentiometer



TM 100-138 Wheel Brake



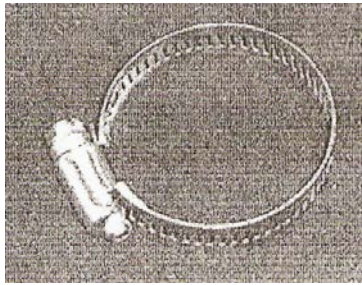
TM 100-139 Proximity



TM 100-140 And TM 100-141
TM 100-145 Push Arm
TM 100-144 Lever Arm
TM 100-143 Rotational Motor Splash Guard



TM 100-147 Bushing Reel



TM 100-148 Clamp Reel



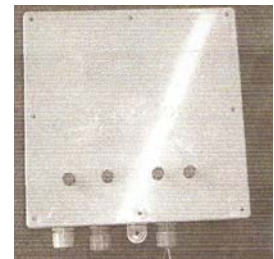
TM 100-149 Foam Tape



TM 100-150 Pipe Hanger



TM SA 100-03 Arbor Base Sub Assembly



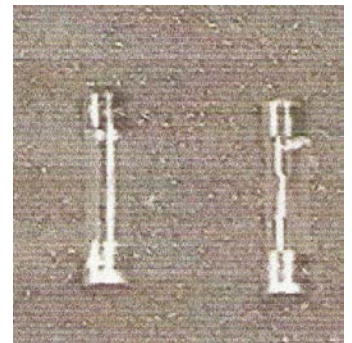
TM 100-SA 100-06 Electronics Enclosure



TM 100-151 Water Tight Connectors



TM 100-152 Tensioner
TM 100-153 Tensioner Shaft
TM 100-154 Idler Pulley



TM 100-155 1 Amp Fuse
TM 100-156 3 Amp Fuse



TM 100-160 Switch Box

Maintenance

Monthly Maintenance

The Wash Hand has been designed to give you many hours of trouble free service with minimal maintenance. To help extend the life of you machine and keep it operating smoothly the following maintenance should be performed.

1. Lubrication

1. All Lubrication can be accomplished with a standard grease gun.

1.1 Wheels

- 1.1.1 Grease the rigid rear wheels.

- 1.1.1.1 The zurk is located on the outside of the wheel at the hub.

1.1.2 Grease the swivel Wheels

- 1.1.2.1 A grease zurk is located on the outside of the wheel at the hub.

- 1.1.2.2 A second grease zurk is located at the base of the wheel
(the base will be defined as where the wheel attaches to the washer).

CAUTION: Do not tilt or turn the washer over with the batteries inside.

This could cause damage to the washer the surroundings or could cause serious injury.

1.2. Idler

- 1.2.1 A grease zurk is located on the end of the idler shaft facing the inside
of the washer.

1.3 Rotational Arm

- 1.3.1 A grease zurk is located on the top of the rotational sleeve.

2 Check battery water level

CAUTION: Avoid skin or clothing contact with battery acid. If contact occurs, Flush with water immediately!

- 2.1 It will be necessary to remove one of the batteries to perform this service.
- 2.2 Verify that all switches are in OFF position.
- 2.3 Remove the positive and negative wires from the right battery.
- 2.4 Remove the nylon insert lock not on the all thread rod to the right of the batteries.
- 2.5 Lift the end battery hold down and rotate out of the way.
- 2.6 Check the right battery.
 - 2.6.1 Lift and remove the right battery out of the washer.
 - 2.6.2 Carefully pry the caps off and check the water level.
 - 2.6.3 If the battery cells are not full, fill using only distilled water.
 - 2.6.4 Firmly push battery caps back into position.
- 2.7 Check the left battery.
 - 2.7.1 Slide the battery to the right so that access to the battery is not hindered.
 - 2.7.2 Carefully pry the caps off and check the water level.
 - 2.7.3 If the battery cells are not full, fill using only distilled water.
 - 2.7.4 Firmly push battery caps back into position.
- 2.8 Reinstall the batteries.
 - 2.8.1 Slide the left battery back to its original position.
 - 2.8.2 Replace the right battery.

- 2.8.3 Rotate the battery hold down back into position.
- 2.8.4 Place the battery hold down over the all thread rod.
- 2.8.5 Replace the nylon insert lock nut.
- 2.8.6 Reattach the negative and positive wires to the appropriate terminals on the right battery.
- 3. Cleaning battery connections.
 - 3.1 Check to see that the power switch is in the “OFF” position.
 - 3.2 Remove the terminal connections from the batteries.
 - 3.3 Remove any corrosion from the battery terminals using emery Cloth or fine sandpaper.
 - 3.4 Reconnect wire terminals and apply anti-grease or spray.
- 4 Check Belt Tension
 - 4.1 Rotational Arm Belt
 - 4.2 Remove Front Guard
 - 4.3 Remove the four 10-24 Pan Head Phillips Screws and the 10-24 Nylon inset lock nuts.
 - 4.4 Lift and move the guard off to the side. Do not damage the proximity sensor wires.
 - 4.5 Check the belt tension.
 - 4.6 Adjust the tension if necessary.
 - 4.6.1 Loosen the 1/4”-20 Hex Head Bolts on the Rotational Motor bracket.
 - 4.6.2 Move the motor in or out as needed to correctly tension the belt.

- 4.6.3 Tighten the 1/4"-20 Hex Head Bolts.
- 4.7 Place the front guard back into position taking care not to bind the proximity sensor wires under the guard or fouling the wires on the belt.
- 4.8 Replace the four 10-24 Pan Head Phillips Screws and the 10-24 Nylon insert lock nuts
- 5 Reel Belt Tension.
 - 5.1 The tensioning device should automatically apply tension. If tension is not present or correct, contact the service department.

Yearly Maintenance

- 1 Move the Main Switch to the OFF Position.
- 2 Remove the negative lead from the left battery.
- 3 Belt replacement
- 4 Replace the reel belt
 - 4.1 Remove the reel guard.
 - 4.1.1 Remove the 1/4-20 Hex head bolt from the reel guard and reel guard bracket.
 - 4.1.2 Remove the 1/4-20 nylon inset hex nuts from the inside of the reel guard.
 - 4.1.3 Remove the inside panel of the reel guard.
 - 4.1.4 Remove the 10-24 Pan Head Phillips screws from the reel guard.
 - 4.1.5 Remove the reel guard.
 - 4.1.6 Move the belt release lever to the down position.

- 4.1.7 Remove one of the screws from the front plastic guide.
- 4.1.8 Rotate the front plastic guide 90 the front.
- 4.1.9 Remove the hose from the guide.
- 4.1.10 Reel the hose onto the reel
- 4.2 Remove the belt from the drive pulley.
- 4.2.2 Remove the belt from the peel pulley.
- 4.2.3 The belt must be removed from the washer by passing it completely over the reel.
- 4.3 Replace the belt
 - 4.3.1 Place the belt onto the reel pulley
 - 4.3.2 Place the belt onto the drive pulley
- 4.4 Replace the reel guard
 - 4.4.1 Unreel a portion of the hose.
 - 4.4.2 Place the hose into the guide.
 - 4.4.3 Rotate the plastic guide back into the original position.
 - 4.4.4 Replace the removed screw in the plastic guide.
 - 4.4.5 Move the belt release lever to the up position.
 - 4.4.6 Replace the reel guard.
 - 4.4.7 Replace the 10-24 Pan Head Screws.
 - 4.4.8 Replace the inside panel of the reel guard.
 - 4.4.9 Replace the 1/2-20 nylon hex nuts.
 - 4.4.10 Replace the 1/4-20 Hex Head bolt on the reel guard and reel guard bracket.

- 5 Replace the Rotational Arm Belt
 - 5.1 Remove the front guard.
 - 5.1.1 Remove the 10-24 Pan Head Phillips screws
 - 5.1.2 Remove the plastic nut from the top of the proximity sensor.
 - 5.1.3 Remove the proximity sensor from the guard.
 - 5.1.4 Place the guard to the side
 - 5.2 Remove the rear guard
 - 5.2.1 Remove the 10-24 Pan Head Phillips Screws.
 - 5.2.2 Slide the rear guard to the rear and place to the side.
 - 5.3 Remove the Rotational head Assembly.
 - 5.3.1 Supporting the arms and spray head.
 - 5.3.2 Remove the hairpin cotter pins from the clevis pins on the rotational sleeve.
 - 5.3.3 Remove the clevis pins.
 - 5.3.4 Lay the Rotational Head assembly to the side
 - 5.4 Remove the Rotational motor splashguard.
 - 5.4.1 Remove the 10-24 Pan Head Phillips screws.
 - 5.4.2 Lay the splashguard to the side,
 - 5.5 Loosen the ½-40 Hex Head bolts on the rotational head motor bracket.
 - 5.6 Slide the motor towards the rotational sleeve.
 - 5.7 Remove the belt.
 - 5.7.1 Remove the belt from the motor pulley
 - 5.7.2 Remove the belt from the rotational assembly pulley.

- 5.8 Replace the belt.
 - 5.8.1 Place the belt on the rotational assembly pulley.
 - 5.8.2 Place the belt on the motor pulley.
- 5.9 Slide the motor away from the rotational assembly until proper belt tension is achieved.
- 5.10 Tighten the 1/4-20 Hex Head Bolts.
- 5.11 Replace the Rotational motor splashguard.
 - 5.11.1 Place the splashguard into its original position.
- 5.12 Replace the arms and spray head assembly.
 - 5.12.1 Place the arms and spray head assembly into its original position.
 - 5.12.2 Replace the clevis pins.
 - 5.13.3 Replace the hairpin cotter pins.
- 5.13 Replace the rear guard.
 - 5.13.1 Place the rear guard into its original position.
 - 5.13.2 Replace the 10-24 Pan Head Phillips screws.
- 5.14 Replace the front guard
 - 5.14.1 Place the proximity sensor into the front guard.
 - 5.14.2 Replace the proximity sensor plastic nut.
 - 5.14.3 Place the front guard into its original position.
 - 5.14.3.1 Ensure not to pinch the proximity sensor wires under the guard or bind the wires in the belt.
 - 5.14.4 Replace the 10-24 Pan Head Phillips screws.
- 6 Replace the negative wire on the negative terminal of the battery.

Trouble Shooting

This section is for general trouble shooting of the washer. It is not intended to be a comprehensive guide to repair.

1 Reel does no turn:

Possible Cause	Possible Solution
Proximity sensor on front of washer is activated	Hose ball is up against sensor, move hose ball away
	Remove any steel object from in front of sensor (approximately ½” sense range)
Main Switch not completely tripped	Cycle switch to OFF and then ON
Reel Motor Switch no Completely tripped	Cycle switch to OFF and then ON
Low voltage condition	Check voltage, should be 24 volts. Charge or replace batteries as necessary.
Belt is loose	Move the belt release lever to the up position.
	Verify the tensioning arm is operating (located inside the cabinet).

Reel brake is engaged	On the reel under the reel guard, there is a spring loaded pin with a ring attached. Verify; that the pin is in not engaged. If engaged, pull ring and rotate approximately 90 ,there is a slot that will engage the ring.
Motor does not turn	Contact customer support

2 Arm does not turn

Proximity sensor on front of washer is activated.	Hose ball is up against sensor, move hose ball away.
	Remove any steel objects from in front of sensor (approximately1/2")
Proximity sensor on front guard is activated.	Move sensor plates
Main Switch not completely tripped	Cycle switch to OFF and then ON
Rotational Arm Switch not completely tripped	Cycle switch to OFF and then ON
Belt is loose	Verify belt tension (see Maintenance section) tighten as necessary.
The arm is obstructed	Remove obstructions
Low voltage conditions	Check voltage, should be 24 Volts charge.
	Or replace batteries as necessary
Motor does not turn	Contact customer support

3 Spray Head does not turn

Proximity sensor on front of washer is activated	Hose ball is up against sensor, move hose ball away
	Remove any steel objects from in front of sensor (approximately 1/2")
Proximity sensor is activated	Move sensor leaves
Main Switch not completely tripped	Cycle switch to OFF and then ON
Rotational Arm Switch not completely tripped	Cycle switch to OFF and then ON
Spray head is obstructed	Remove obstructions
Low Voltage condition	Check voltage, should be 24 volts. Charge or replace batteries as necessary
Motor does not turn	Contact customer support

4 Rotational Arm turns beyond sensor plate tabs

Proximity Sensor inoperable	Verify operation, main switch on, rotational arm switch on, place a steel object over sensor, look for light on bottom (rear) of sensor, it may be necessary to remove the front guard.
Low voltage in batteries	Check voltage, should be 24 volts. Charge or replace batteries as necessary

5. Spray head turns beyond sensor leaves

Proximity sensor inoperable	Verify operation, main switch on, spray head switch on, place a steel object over sensor, look for light on bottom (rear) of sensor.
Sensor leaves are beyond the sense range	Move leaves closer to proximity sensor

6 Reel does not stop

Proximity sensor inoperable	Verify operation, main switch on , reel motor switch on, place a steel object over sensor, look for light on bottom (rear) of sensor
Switch engagement incorrect	Cycle all switches

7 Rotational Arm does not stop

Switch engagement incorrect	Cycle all switches
Low voltage condition	Check voltage, should be 24 volts. Charge or replace batteries as necessary
Proximity sensor inoperable	Verify operation, main switch on, reel motor switch on, place a steel object over sensor, look for light on bottom (rear) of sensor

8 Spray head does not stop

Switch engagement incorrect	Cycle all switches
Low voltage condition	Check voltage, should be 24 volts. Charge or replace batteries as necessary
Proximity Sensor inoperable	Verify operation, main switch on, reel motor switch on, place a steel object over sensor, look for light on bottom (rear) of sensor

9 Device does not move forward

Hose not secured	Correctly anchor hose
See Reel does not turn in this section	

10 Hose will not reel by hand

Reel brake is engaged	On the reel, under the reel guard, there is a spring-loaded pin with a ring attached. Verify that the pin is in not engaged. If engaged, pull ring and rotate approximately 90, there is a slot that will engage the ring.
Belt is tight	Move the belt release lever to down position
Hose still anchored and brakes engaged	Release hose

11 Hose will not reel by power

See reel does not turn in this section	
--	--

12 Belt release lever will not stay in the up position

Connection is loose	Check the connections of the lever
---------------------	------------------------------------

	Tighten or reconnect if needed
Tensioning arm is inoperable	Replace tensioning device

13 Belt Release lever will not stay in the down position

Connection is loose	Check the connections of the lever. Tighten or reconnect if needed
Tensioning arm is inoperable	Replace tensioning device

14 Wheels will not roll

Rear wheel brake engaged	Release brake
Wheels are obstructed	Remove obstruction
Bushings are corroded	Clean or replace as necessary

15 Wheels will not swivel

Wheels are obstructed	Remove obstructions
Bearing are corroded	Clean or replace as necessary

16 Water does not flow

Water supply valve is closed	Open supply valve
Pump is not operating	Turn on pump or repair pump
Nozzle is clogged	Turn on pump or repair pump
Obstruction in hose or fixture	Remove and clean

17 Sprays in the wrong direction

Refer to spray head set up in the operation section of this manual	
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18 Batteries do not charge or maintain charge

Low battery water lever	Check water lever as outlined in the “monthly maintenance” Section
Corroded battery connections	Clean connections as outlined in the “monthly maintenance” section
Battery Charger not correctly attached to batteries	Verify charger connections at the batteries
Faulty battery charger	Check that battery charger is working replace as necessary
Faulty batteries	Have battery condition checked at local battery dealer. Replace as necessary

Service

1 Replacing spray head motor.

1.1 Disconnect the negative battery cable from the rear of the batteries. (See Figure Service 1.1)

1.2 Remove the arbor base assembly.

1.2.1 Loosen the Allen Hex set screw. (See Figure Service 1.2)

1.2.2 Slide assembly off of motor shaft

1.3 remove the Nozzle Assembly

1.3.1 Loosen the Allen Hex set screw in the shaft couple.

(See Figure Service 1.2)

1.3.2 Slide the Assembly off of the motor shaft

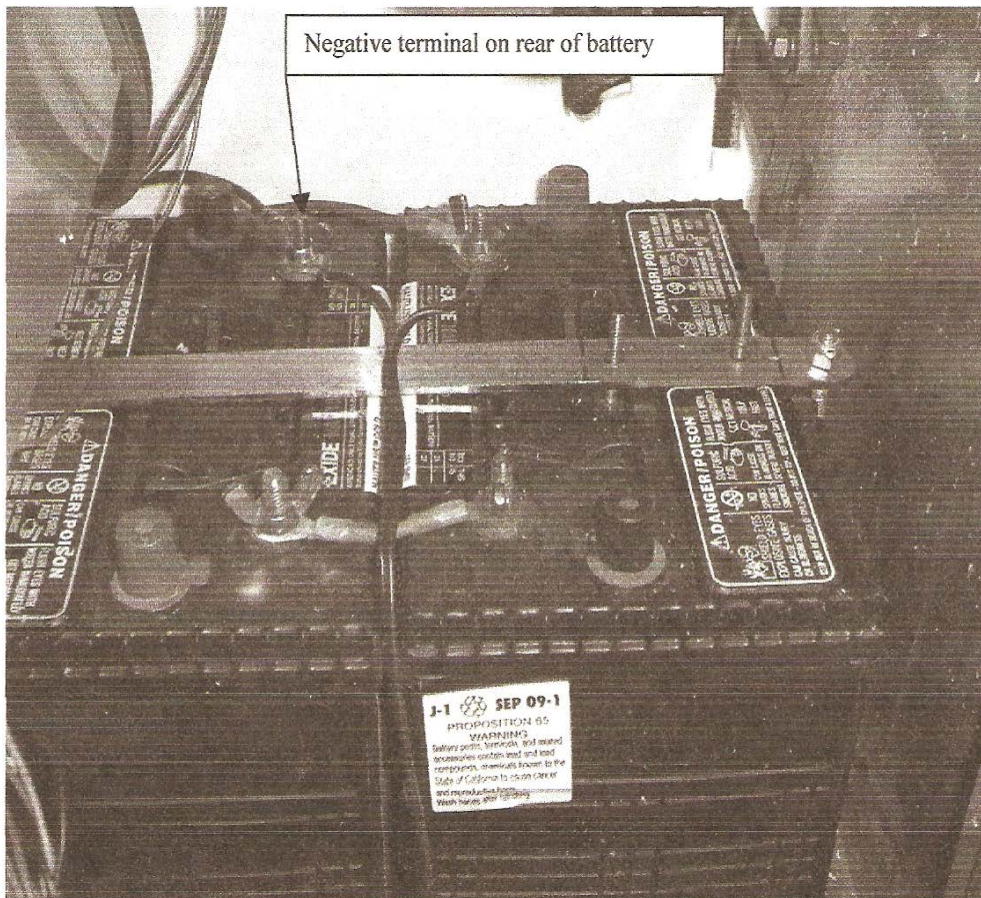


Figure Service 1.1 Battery connections

- 1.4 Disconnect the motor from the electrical system. The Motor is equipped with a quick fit coupling.
- 1.5 Remove the four ¼"-20 hex head bolts.
- 1.6 Remove the motor
- 1.7 To place the new motor, accomplish the above steps in reverse.

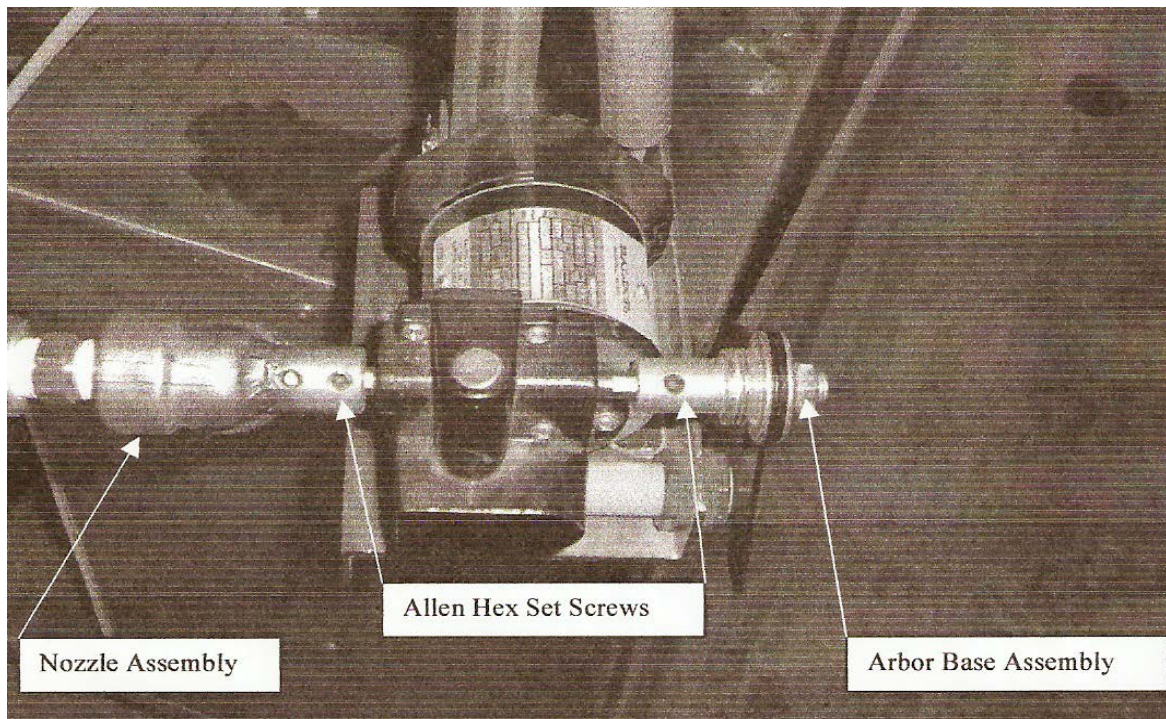


Figure Service 1.2 Spray Head

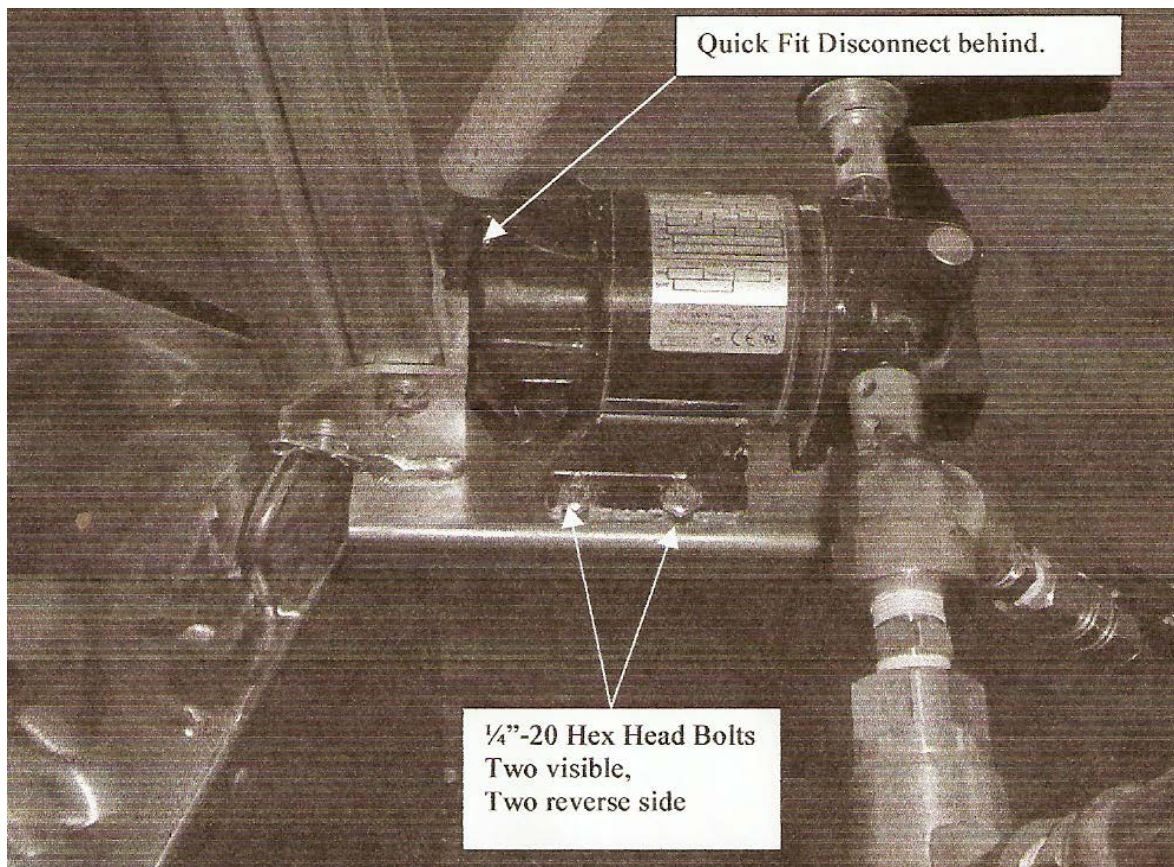


Figure Service 1.2A Spray Head

2 Replacing the Rotational Arm Motor.

2.1 Disconnect the negative battery cable from the rear or the batteries. (see Figure Service 1.1)

2.2 Remove the rotational motor splashguard. (see Figure service 2.1)

2.2.1 Remove the two # 10-24 Pan head Phillips screws.

2.2.2 Remove the splashguard.

2.3 Remove the front guard. (see Figure Service 2.1)

2.3.1 Remove the four # 10-24 pan head Phillips screws.

2.3.2 Lift and move the front guard to the side, careful not to damage the proximity sensor wires.

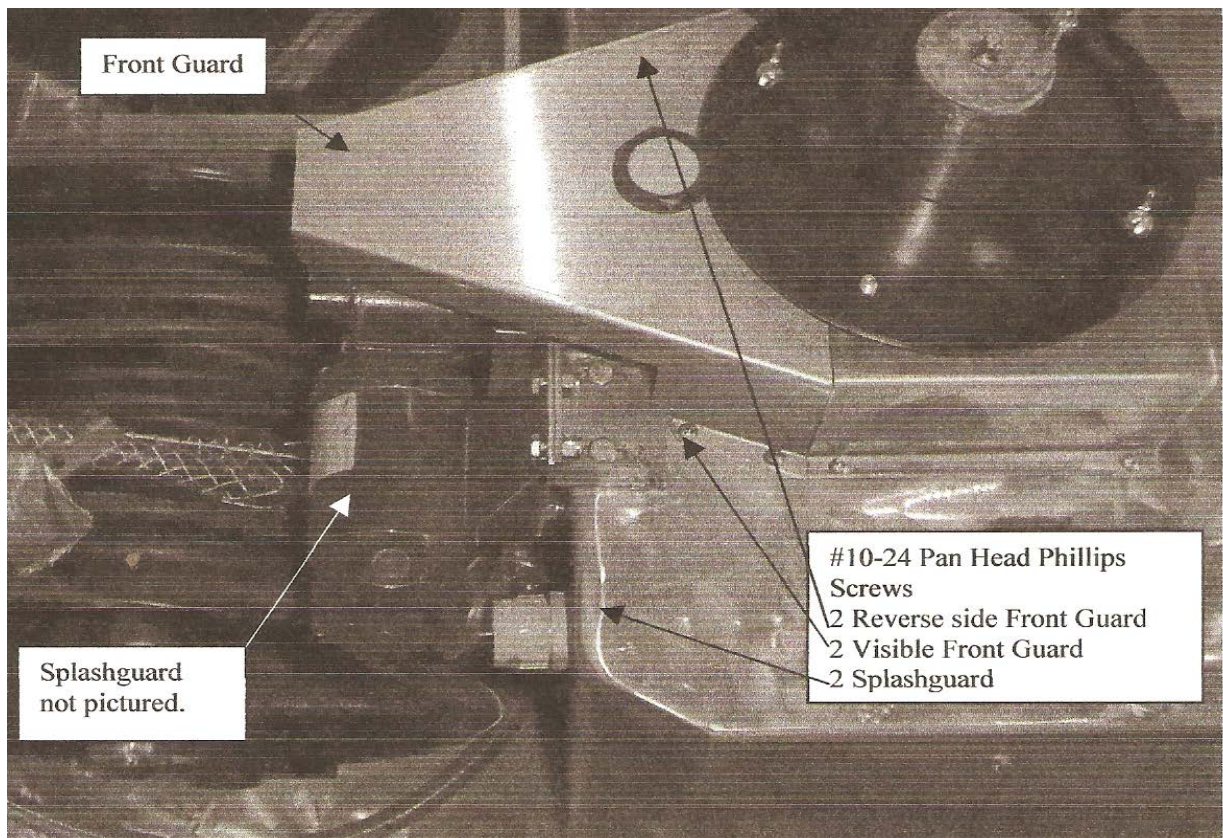


Figure Service 2.1 Rotational Arm Motor Replacement

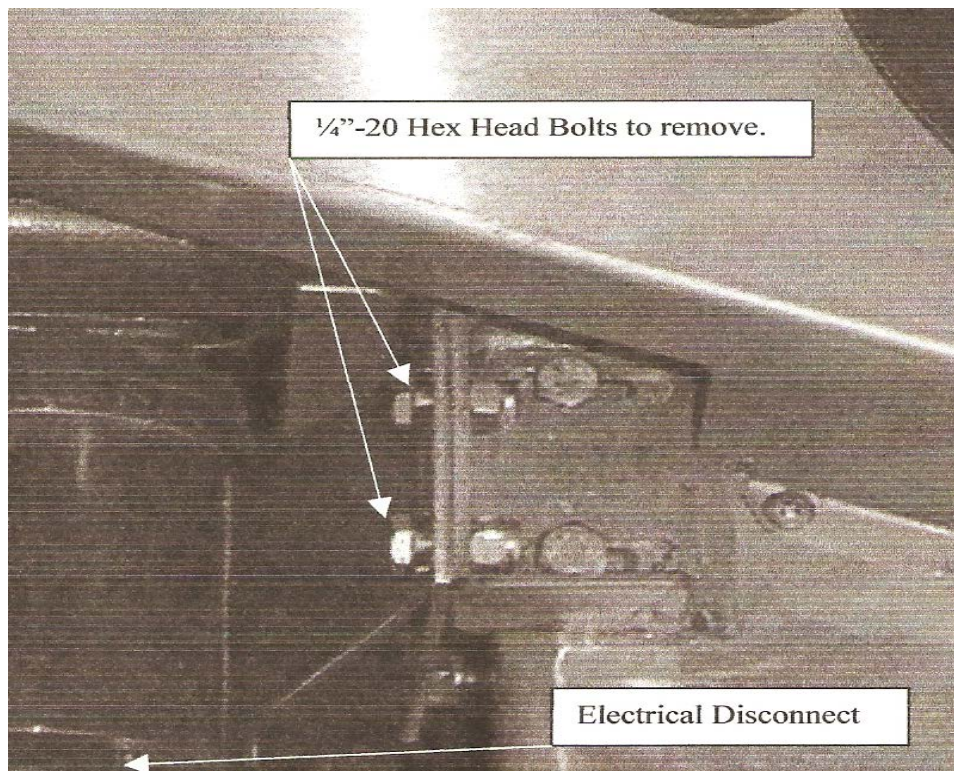


Figure Service 2.3 Rotational Motor Service

- 3 Replacing the Reel Motor.
 - 3.1 Disconnect the negative battery cable from the rear of the batteries. (see Figure Service 1.1)
 - 3.2 Move the belt release lever to the down position.
(see Figure Service 3.1)
 - 3.3 Remove the belt from the motor pulley. (see Figure Service 3.2)
 - 3.4 Remove the four 1/4\"-20 hex head bolts. (see Figure service 3.2)
 - 3.5 Lay the motor down behind the washer.
 - 3.6 Open the electrical box.
 - 3.6.1 There are eight screws in the electrical box cover

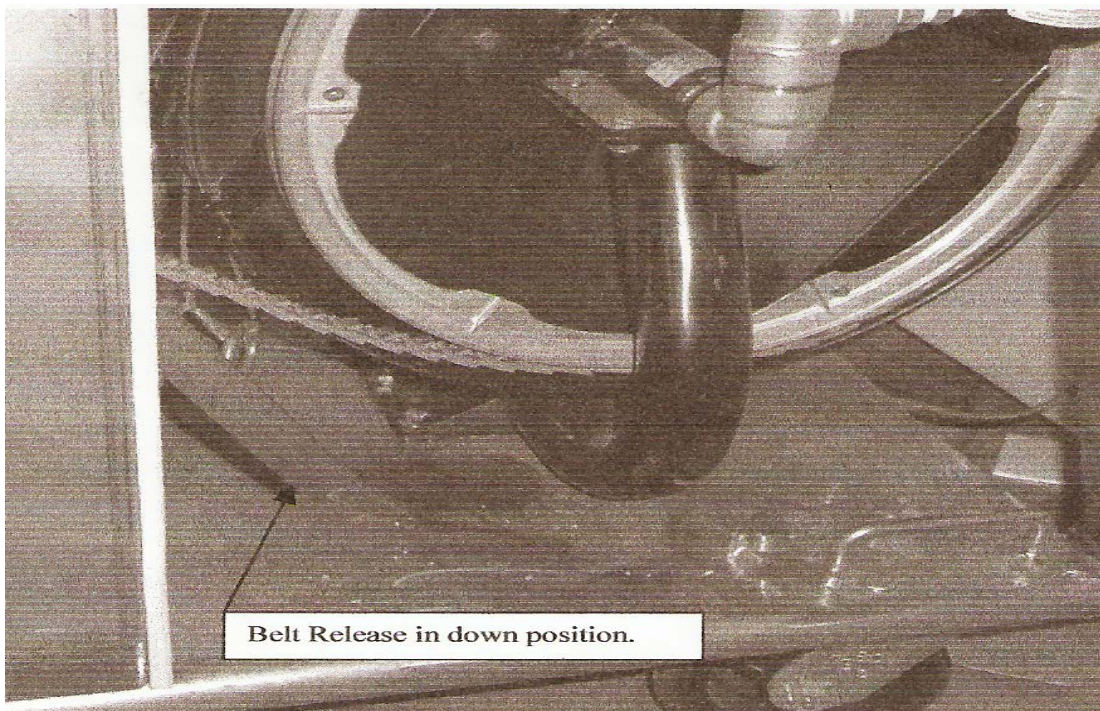


Figure Service 3.1 Belt Release Lever in Down Position

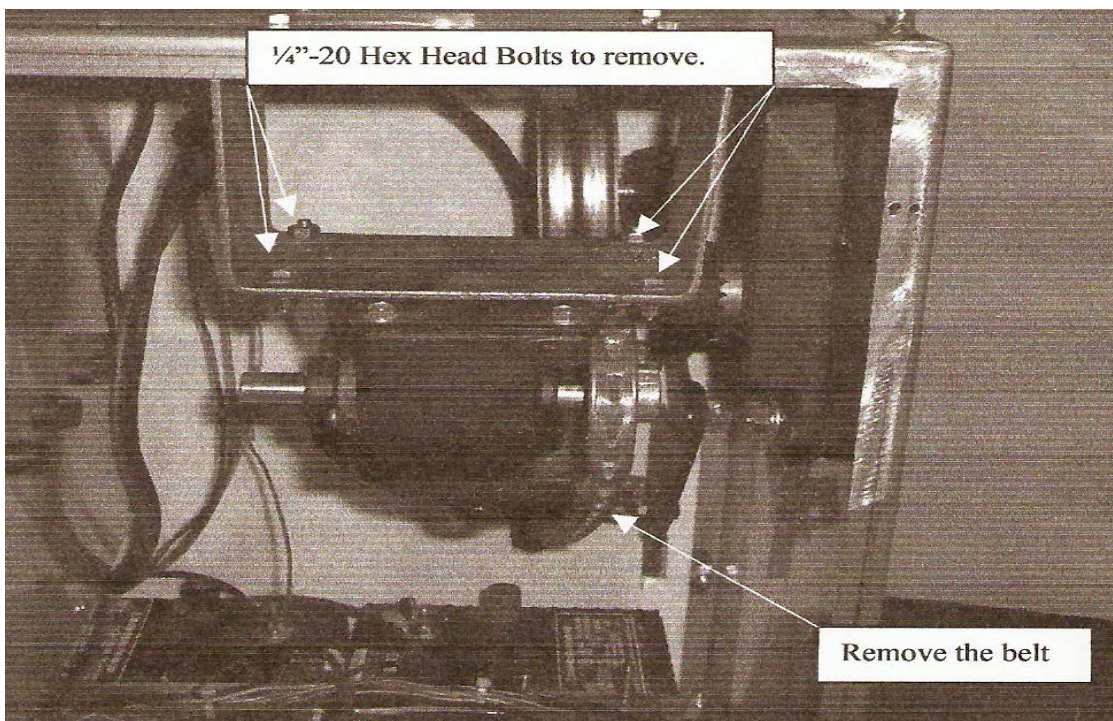


Figure Service 3.2 Belt and 1/4"-Hex Head Bolts

3.6.2 Locate the variable speed controller. (Upper right in the electrical box, (see Figure Service 3.3)

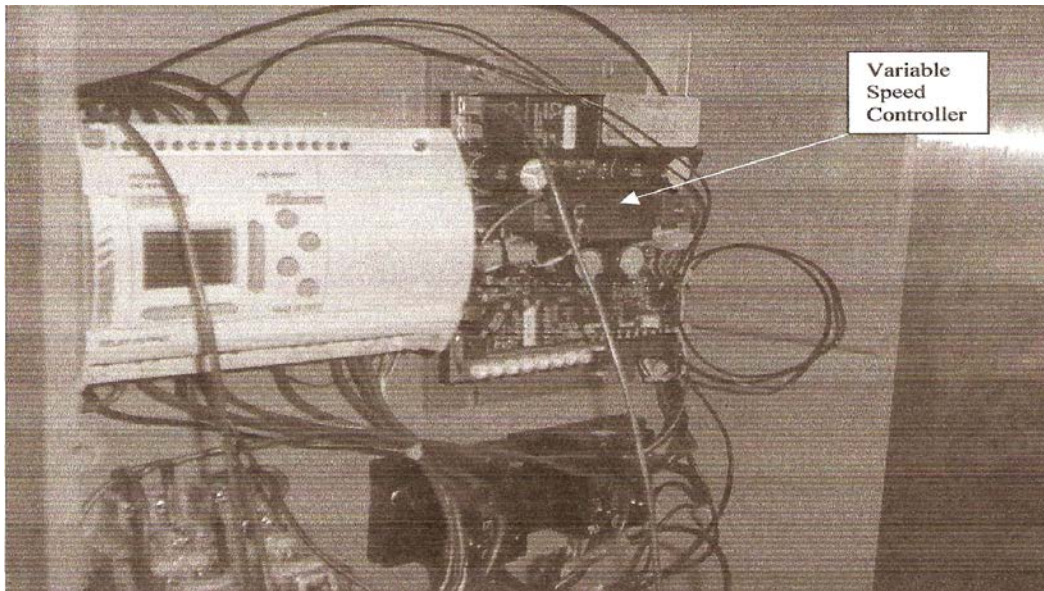


Figure Service 3.3 Electrical Box

- 3.7 Remove the wire attached to the M1 connector on the Controller.
(see Figure Service 3.4)
- 3.8 Remove the wire attached to the reel motor fuse (the wire will be one wire that goes to the motor, (see Figure Service 3.5).
- 3.9 Loosen the water tight connector that the motor leads go through.
- 3.10 Remove the motor leads from the box.
- 3.11 Replace the motor using the above steps in reverse order. Ensuring that the motor leads are attached with the brown wire to the M1 Block and the blue wire to the fuse holder.

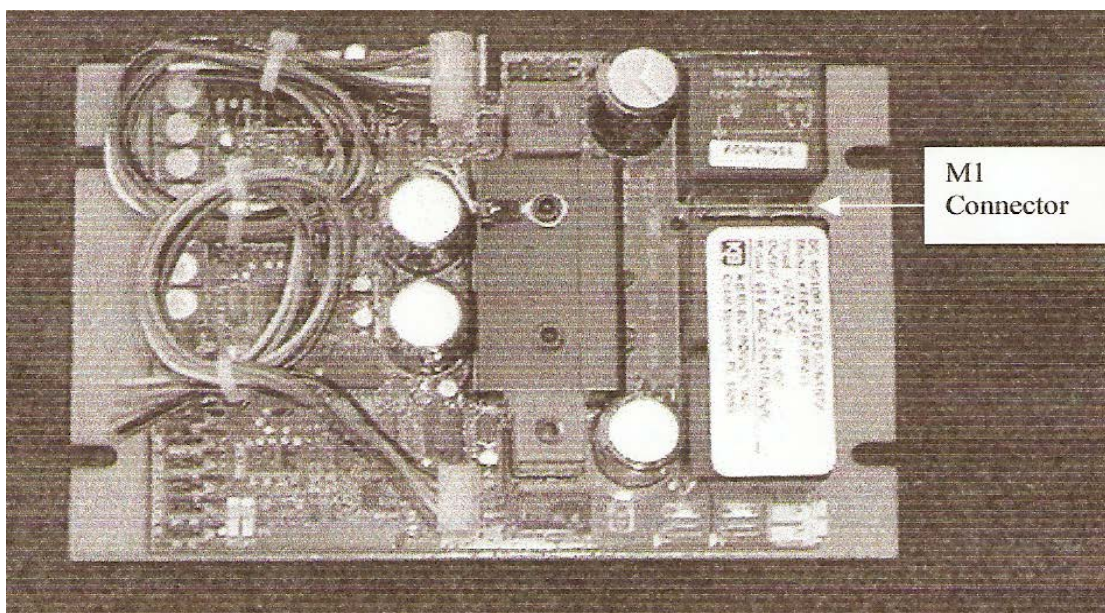


Figure Service 3.4 Variable Speed Controller M1 Connection

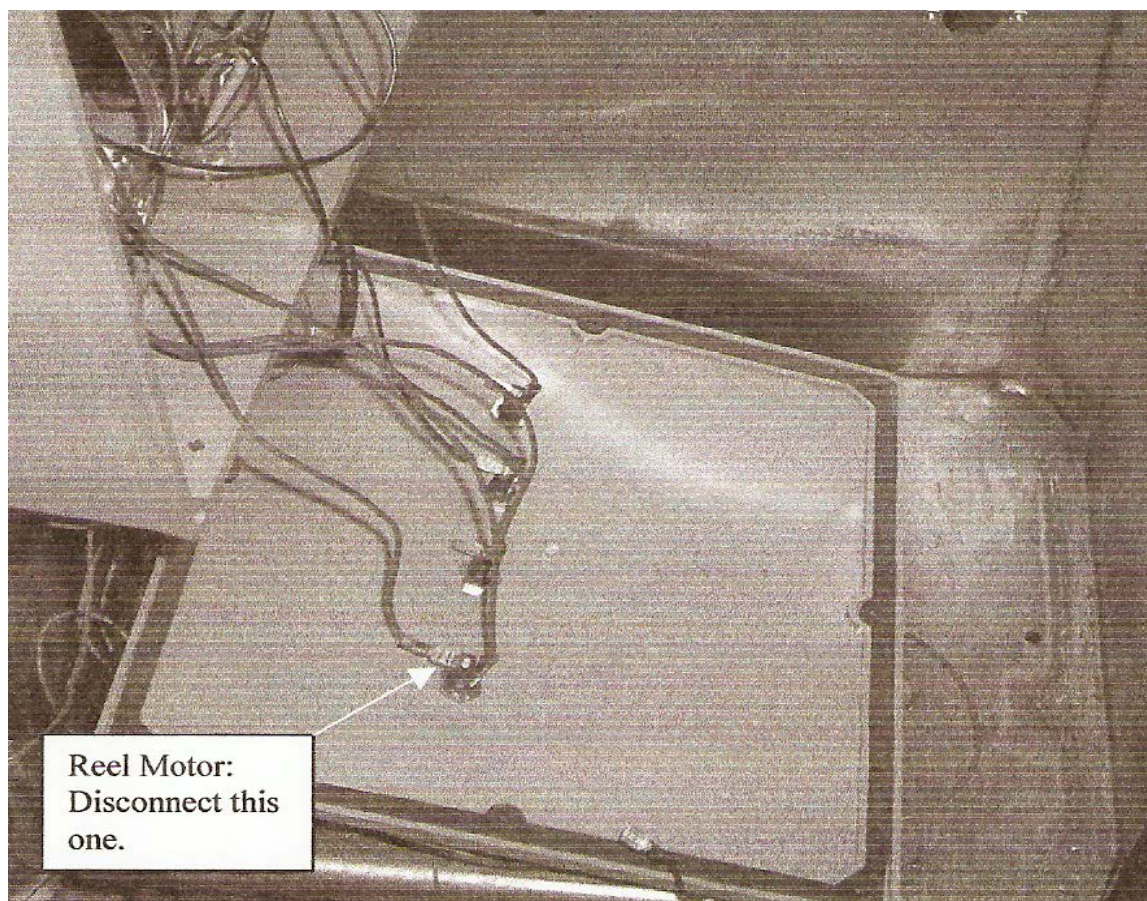


Figure Service 3.5 Reel Motor Fuse Disconnect

- 4 Replace a Bushing or Bearing in Rotational Arm
 - 4.1 Disconnect the negative battery cable from the rear of the batteries (see Figure Service 1.1).
 - 4.2 Remove the Rotational Arm.
 - 4.2.1 Remove the Hairpin Cotter Pins.
 - 4.2.2 Remove the Clevis Pins.
 - 4.2.3 Lay rotational arm to the side.

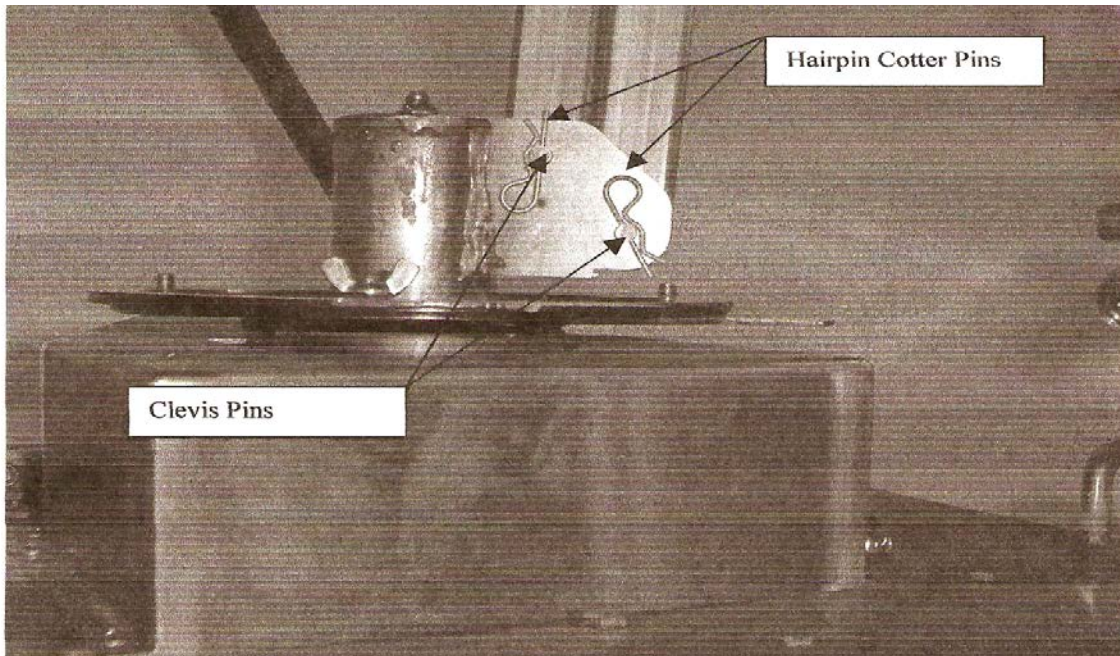


Figure Service 4.1 Clevis and Cotter Pins

- 4.3 Remove front and rear guards.
 - 4.3.1 Remove the eight # 10-24 Pan Head Phillips Screws.
 - 4.3.2 Slide rear guard to rear and set aside.
 - 4.3.3 Lift and set front guard to the side (careful not to damage the proximity sensor wires).

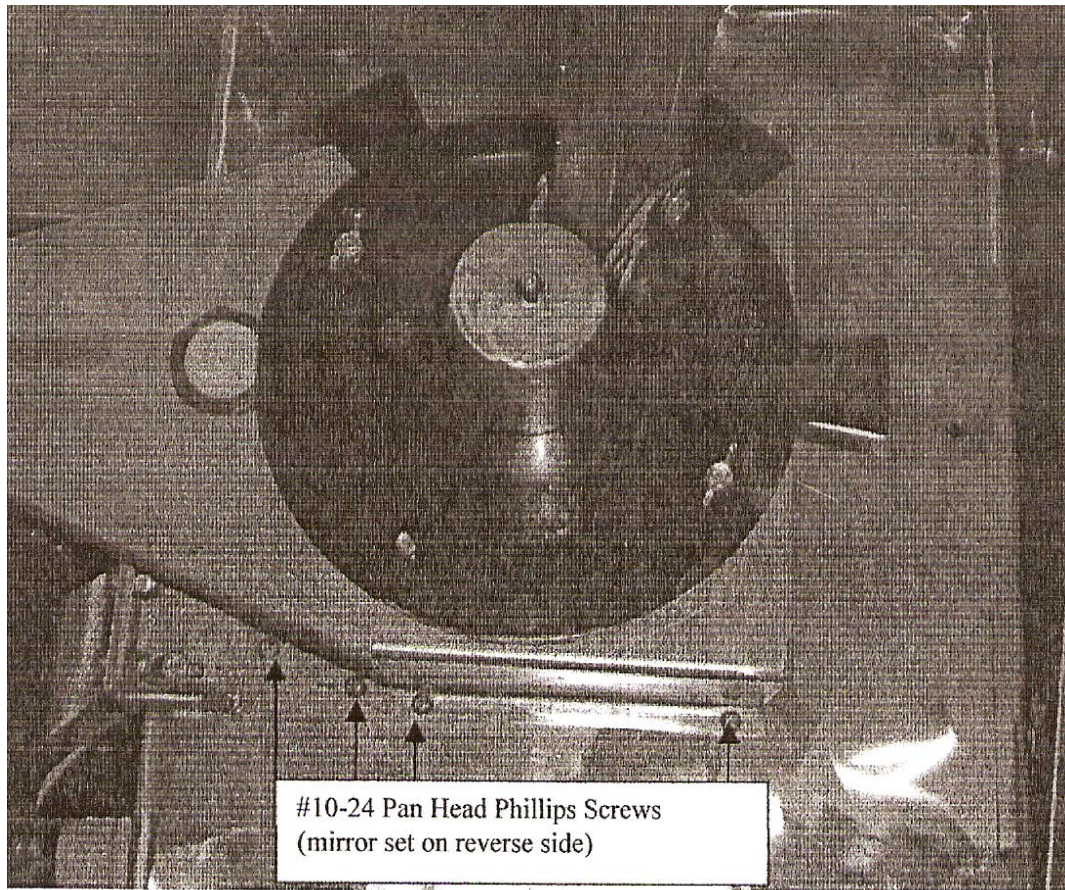


Figure Service 4.2 Front and Rear Guard

- 4.4 Remove the rotational arm belt from the pulley (it may be necessary to loosen the belt to remove (refer to replace rotational arm motor).
- 4.5 Lift off rotational center Assembly to expose the Bushings and Bearings.
- 4.6 replace Bearings, Bushings or O Rings as needed.
- 4.7 perform these steps in reverse order to return washer to original configuration.

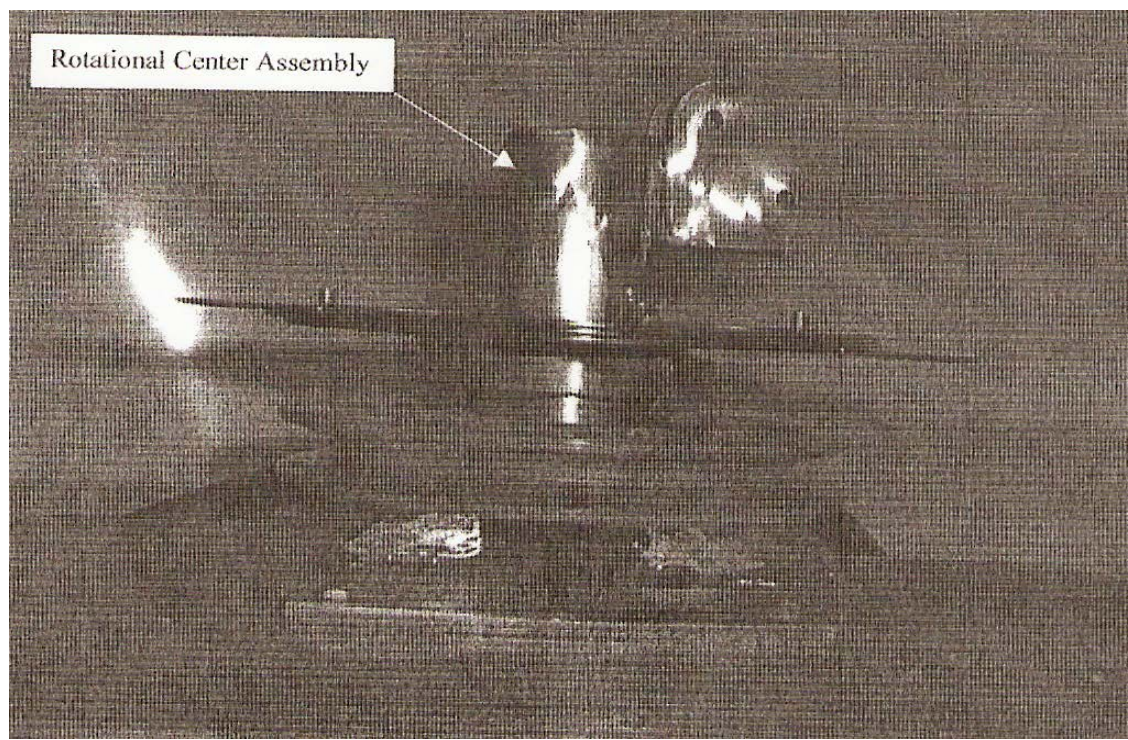


Figure Service 4.3 Rotational Center Assembly

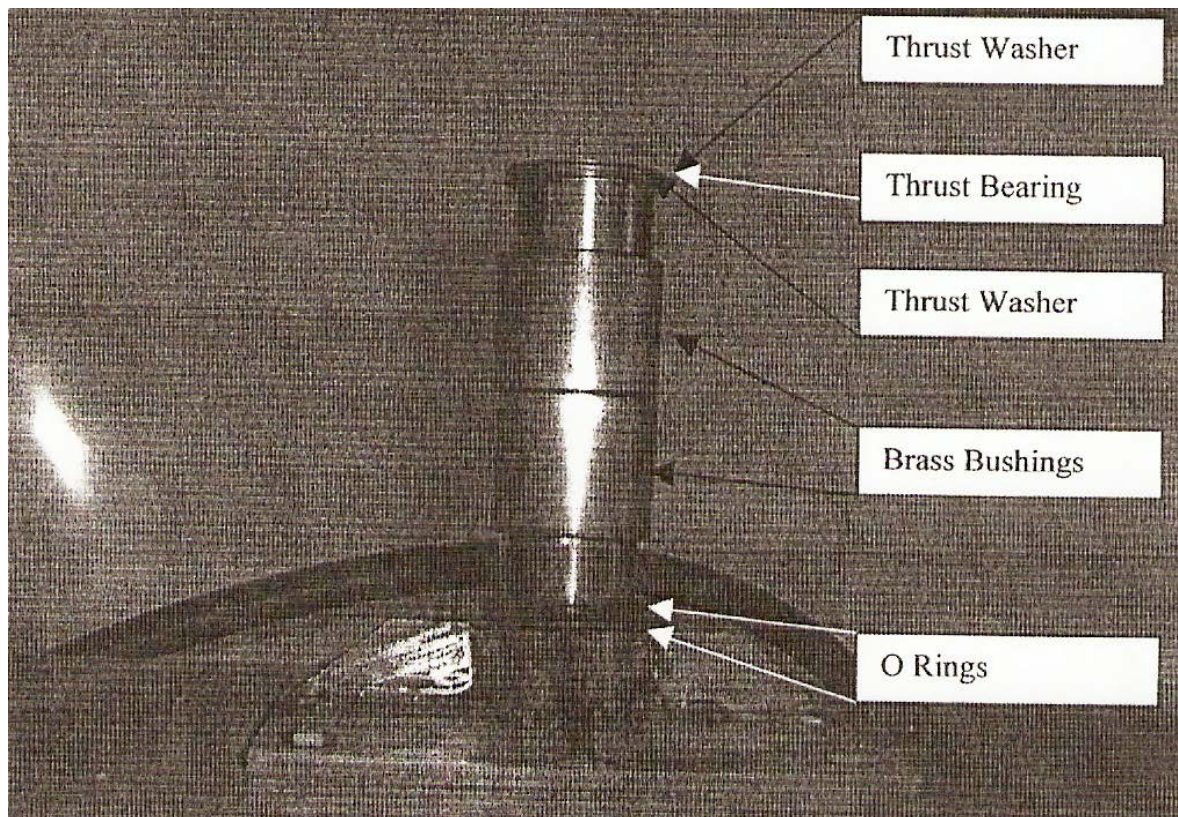


Figure Service 4.4 Bushing, Bearings and o Rings.

Wire Diagram

This wiring diagram is included for the possible use in troubleshooting the washer. At no time should an attempt be made to rewire the washer.

Swing Robotics Inc.

10858 365th Ave

Leola, SD 57456

(605) 439-3510 Shop

(605) 439-5312 Fax

WashHand Spec

The WashHand Is:

- 1 As Semi. Automated washer designed to dispense high pressure water.
- 2 Rated for 3000 PSI Maximum working pressure
- 3 24 volt power systems (2-12 volt batteries)
- 4 One Year warranty on parts
- 5 Weight 340LBS
- 6 Dimension 32" L 18"W 41"H
- 7 Operated By 3-24 Volt Motor
- 8 Stainless Steel

