

# **AERATORS**

## **OPERATION AND PARTS MANUAL**

**Aerator Models:**

**AE20-48, 60, & 72**

# *Manufacturer's Warranty*

The Manufacturer, warrants each new implement to be free from defects in material and workmanship under normal use and service for a period of six (6) months from the date of original sale.

This warranty is expressly in lieu of all other warranties and representations, expressed or implied, and all other obligations or liabilities on the part of the Manufacturer.

Manufacturer's liability and obligation is limited to repair or replacement of the product or a refund of purchase price, at Manufacturer's option, provided the purchaser returns the claimed defective product to the Manufacturer, or authorized distributor, with transportation charges prepaid, and an examination by Manufacturer discloses the product is defective.

This warranty does not cover said product which has been repaired or altered outside of the factory of Manufacturer in any way as to, in the judgment of the Manufacturer affect the stability, reliability or performance of the product. This warranty does not cover damage or product failure caused by accident, misuse, negligence, tampering, improper attachment or improper maintenance.

This warranty is null and void unless "Warranty Registration Form and Inspection Report" is completed and returned to Manufacturer.

This warranty excludes any and all liability for consequential or incidental damages.

This warranty gives you specific legal rights providing said product is put to its proper designed use.

## THIS CHECKLIST TO REMAIN IN OWNER'S MANUAL

### Dealer Preparation Check List

- 1. Assembly Completed
- 2. All fasteners torqued to specifications given in Torque Chart
- 3. All decals in place and readable
- 4. All guards in place and in good operating order
- 5. Overall condition good (paint, welds)
- 6. Operator's Manual has been delivered to owner
- 7. Owner has been instructed on the safe and proper use of the implement

Dealer Signature: \_\_\_\_\_

*It is the dealer's responsibility to complete the procedures listed above before delivery of this implement to the customer.*

## IMPORTANT SAFETY PRECAUTIONS

In addition to the design and configuration of equipment, hazard control and accident prevention are dependent upon the awareness, concern, prudence and proper training of personnel in the operation, transport, maintenance and storage of equipment. Lack of attention to safety can result in accident, personal injury, reduction of efficiency and worst of all—loss of life. Watch for safety hazards and correct deficiencies promptly. Use the following safety precautions as a general guide to safe operations when using this machine. Additional safety precautions are used throughout this manual for specific operating and maintenance procedures. Read this manual and review the safety precautions often until you know the limitations.

1. Read the Operator's Manual. Failure to read the Operator's Manual is considered a misuse of this equipment.
2. Become familiar with all the machine's controls and all the caution, warning and danger decals affixed to the machine before attempting to start or operate.
3. Before starting or operating the machine, make a walk around inspection and check for obvious defects such as loose mounting bolts and damaged components. Correct any deficiency before starting.
4. Do not allow children to operate the implement. Do not allow adults to operate it without proper instruction.
5. Do not carry passengers.
6. Keep the area of operation clear of all persons, particularly small children and pets. The operator should cease operation whenever anyone comes within the area.
7. Lower implement to ground, stop tractor engine and apply parking brake before leaving the tractor.
8. Keep hands and feet away from implement.
9. Wear personal protective equipment such as, but not limited to, protection for eyes, ears, feet, hands and head when operating or repairing the equipment. Do not wear loose clothing or jewelry that may catch on equipment moving parts.
10. When performing adjustments or maintenance on the implement, first lower it to the ground or block it securely at a workable height.
11. Never stand between tractor and implement while tractor is being backed to the hitch.
12. Reduce speed when transporting implement to avoid bouncing and momentary loss of steering.
13. Use tractor flashing warning lights, day or night, when transporting implement on road or highways unless prohibited by law.
14. It is recommended that tractor be equipped with Rollover Protective System (ROPS) and seat belt be used in all implement operations.

## **IMPORTANT FEDERAL LAWS AND REGULATIONS\* CONCERNING EMPLOYERS, EMPLOYEES AND OPERATIONS.**

\*(This section is intended to explain in broad terms the concept and effect of the following federal laws and regulations. It is not intended as a legal interpretation of the laws and should not be considered as such).

U.S. Public Law 91-596 (The Williams-Steiger Occupational and Health Act of 1970) OSHA

### **This Act Seeks:**

“...to assure so far as possible every working man and woman in the nation safe and healthful working conditions and to preserve our human resources...”

### **DUTIES**

Sec. 5 (a) Each employer—

- (1) shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees;
- (2) shall comply with occupational safety and health standards promulgated under this Act.
- (b) Each employee shall comply with occupational safety and health standards and all rules, regulations and orders issued pursuant to this Act which are applicable to his own actions and conduct.

### **OSHA Regulations**

Current OSHA regulations state in part: “At the time of initial assignment and at least annually thereafter, the employer shall instruct every employee in the safe operation and servicing of all equipment with which the employee is, or will be involved.” These will include (but are not limited to) instructions to:

- Keep all guards in place when the machine is in operation;
- Permit no riders on equipment;
- Stop engine, disconnect the power source, and wait for all machine movement to stop before servicing, adjusting, cleaning or unclogging the equipment, except where the machine must be running to be properly serviced or maintained, in which case the employer shall instruct employees as to all steps and procedures which are necessary to safely service or maintain the equipment.
- Make sure everyone is clear of machinery before starting the engine, engaging power, or operating the machine.

### **Child Labor Under 16 Years Old**

Some regulations specify that no one under the age of 16 may operate power machinery. It is your responsibility to know what these regulations are in your own area or situation. (Refer to U.S. Dept. of Labor, Employment Standard Administration, Wage & Home Division, Child Labor Bulletin #102.)

## **EMPLOYEE TRACTOR OPERATING INSTRUCTIONS:**

1. Securely fasten your seat belt if the tractor has a ROPS.
2. Where possible, avoid operating the tractor near ditches, embankments, and holes.
3. Reduce speed when turning, crossing slopes, and on rough, slick, or muddy surfaces.
4. Stay off slopes too steep for safe operation.
5. Watch where you are going, especially at row ends, on roads, and around trees.
6. Do not permit others to ride.
7. Operate the tractor smoothly - no jerky turns, starts, or stops.
8. Hitch only to the drawbar and hitch points recommended by tractor manufacturers.
9. When tractor is stopped, set brakes securely and use park lock if available.



## OPERATION

***DURING AERATOR ADJUSTMENT KEEP BODY, HANDS AND FEET CLEAR OF IMPLEMENT.***

### ATTACHMENT TO TRACTOR

The aerator should be placed on level ground. Place the tractor 3 point lift arm control in "position control" (non-floating) for attaching and detaching the rear mounted blade. "Draft control" or "position control" can be used while operating. Attach the top link to the top hitch mount and adjust so that the aerator frame will be level in the operating position.

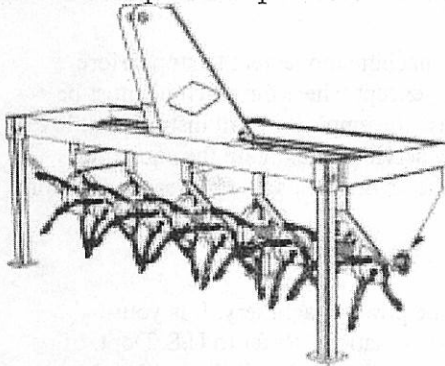
Back the tractor until the ends of the lift arms can be attached to the bottom clevis pins on the implement. Secure the lift arms to the clevis pins.

Slowly lift aerator 3 inches from the ground. Remove the pin from the legs and remove legs. The legs may be reversed and stored inverted in the sockets by replacing the pins or unit may be used without legs.

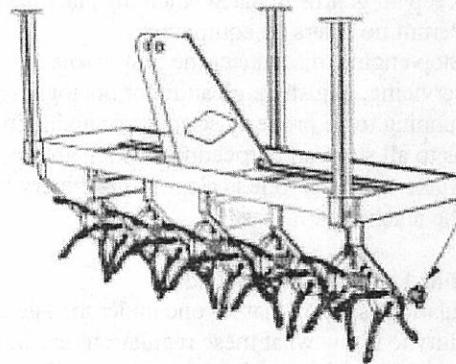
Slowly move aerator throughout the lift cycle of the tractor watching for interference between aerator and tractor. Adjust top link, if necessary to provide additional clearance.

### DETACHING FROM TRACTOR

Replace the legs in the standing position. Lower the aerator to the ground with 3 point lift arm control in position control. Remove top link from top hitch mount, disconnect hitch arms from bottom clevis pins and pull tractor away from blade.



Storage Position



Working Position

### OPERATION

***LOWER THE AERATOR AS MUCH AS POSSIBLE AND SECURELY SUPPORT BEFORE MAKING ANY ADJUSTMENT.***

Level the aerator from side to side and front to rear using adjustments on the tractor's 3-point lift.

With tractor stopped, lower 3 point of tractor down until all weight is off tractor. Pull ahead slowly to start tine spools rotating. Increase speed up to a maximum of 5 mph.

Care should be exercised during use of the aerator to prevent hanging the tine points on impenetrable objects or otherwise use the implement under conditions beyond its designed capacity.

## ADDING WEIGHT

Weight may be added to the aerator by installing bricks, sand bags, blocks, etc if securely fastened to frame. ***Do not allow riders for extra weight!!***

## TRANSPORTATION

***WHEN EQUIPMENT IS TRANSPORTED, USE NECESSARY DEVICES REQUIRED BY LOCAL REGULATIONS FOR ADEQUATE WARNING TO OPERATORS OF OTHER VEHICLES.***

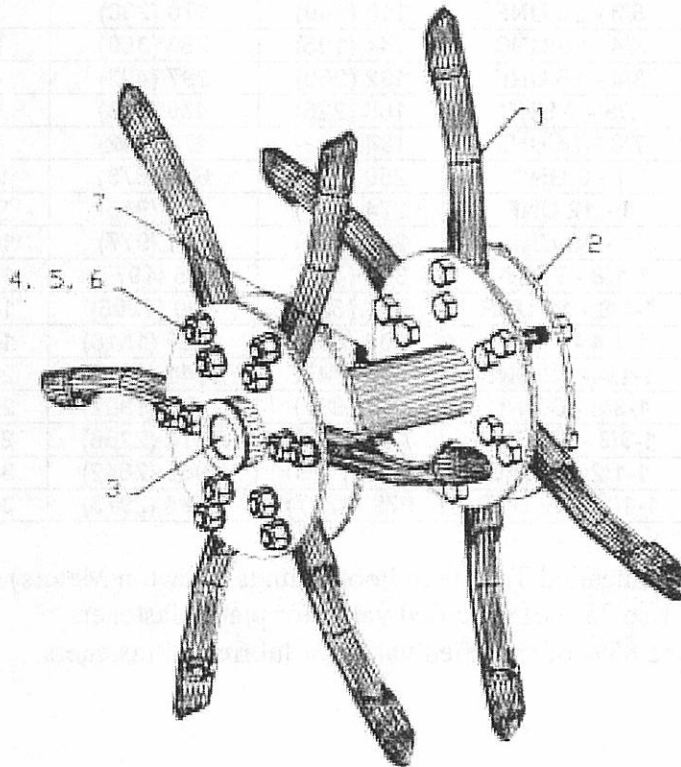
## MAINTENANCE

Inspect your aerator periodically and replace any worn or broken parts in order to have it ready for use when needed.

Store the aerator out of the weather when it is not in use. This helps prevent rusting of the blades and other components.

Spools should be greased before every use with multi-purpose grease lube at point 7 on each spool.

Tines should be cleaned immediately after use for easier cleaning. Tines can become clogged with debris. This can be removed with the use of a tool such as a screwdriver or hard pointed object.



# TORQUE SPECIFICATIONS

Proper torque for American fasteners used on Equipment

WRENCH SIZE	BOLT AND THREAD SIZE	SAE GRADE 2	SAE GRADE 5	SAE GRADE 8
7/16	1/4 - 20 UNC	6 (7)	8 (11)	12 (16)
7/16	1/4 - 28 UNF	6 (8)	10 (13)	14 (18)
1/2	5/16 - 18 UNC	11 (15)	17 (23)	25 (33)
1/2	5/16 - 24 UNF	13 (17)	19 (26)	27 (37)
9/16	3/8 - 16 UNC	20 (27)	31 (42)	44 (60)
9/16	3/8 - 24 UNF	23 (31)	35 (47)	49 (66)
5/8	7/16 - 14 UNC	32 (43)	49 (66)	70 (95)
5/8	7/16 - 20 UNF	36 (49)	55 (75)	78 (106)
3/4	1/2 - 13 UNC	49 (66)	76 (103)	106 (144)
3/4	1/2 - 20 UNF	55 (75)	85 (115)	120 (163)
7/8	9/16 - 12 UNC	70 (95)	109 (148)	153 (207)
7/8	9/16 - 18 UNF	79 (107)	122 (165)	172 (233)
15/16	5/8 - 11 UNC	97 (131)	150 (203)	212 (287)
15/16	5/8 - 18 UNF	110 (149)	170 (230)	240 (325)
1-1/8	3/4 - 10 UNC	144 (195)	266 (360)	376 (509)
1-1/8	3/4 - 16 UNF	192 (260)	297 (402)	420 (569)
1-5/16	7/8 - 9 UNC	166 (225)	430 (583)	606 (821)
1-5/16	7/8 - 14 UNF	184 (249)	474 (642)	668 (905)
1-1/2	1 - 8 UNC	250 (339)	644 (873)	909 (1232)
1-1/2	1 - 12 UNF	274 (371)	705 (955)	995 (1348)
1-1/2	1 - 14 UNF	280 (379)	721 (977)	1019 (1381)
1-11/16	1-1/8 - 7 UNC	354 (480)	795 (1077)	1288 (1745)
1-11/16	1-1/8 - 12 UNF	397 (538)	890 (1206)	1444 (1957)
1-7/8	1-1/4 - 7 UNC	500 (678)	1120 (1518)	1817 (2462)
1-7/8	1-1/4 - 12 UNF	553 (749)	1241 (1682)	2013 (2728)
2-1/16	1-3/8 - 6 UNC	655 (887)	1470 (1992)	2382 (3228)
2-1/16	1-3/8 - 12 UNF	746 (1011)	1672 (2266)	2712 (3675)
2-1/4	1-1/2 - 6 UNC	870 (1179)	1950 (2642)	3161 (4283)
2-1/4	1-1/2 - 12 UNF	979 (1327)	2194 (2973)	3557 (4820)

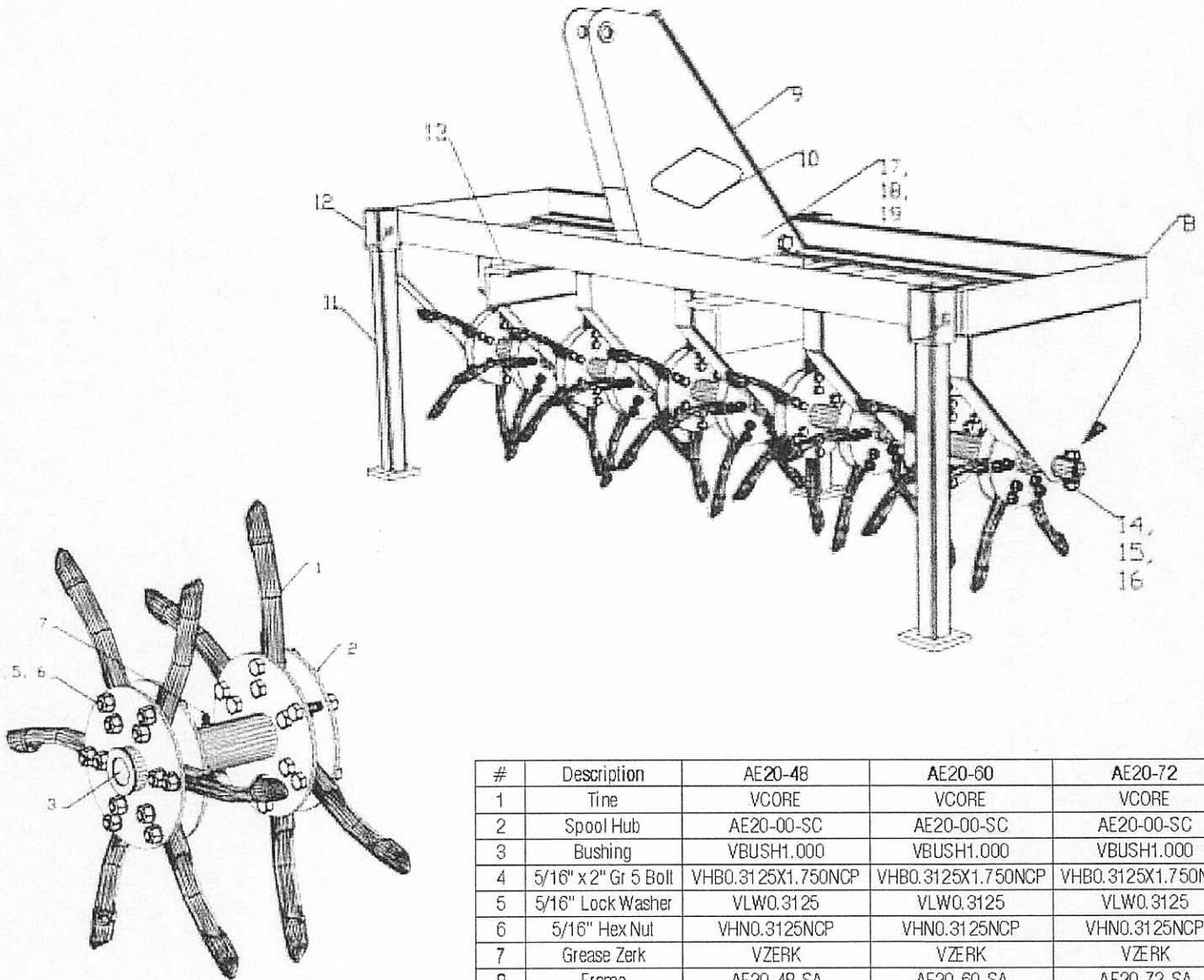
Recommended Torque in Foot Pounds (Newton Meters)

Use 75% of specified value for plated fasteners

Use 85% of specified value for lubricated fasteners



# Aerator Parts



#	Description	AE20-48	AE20-60	AE20-72
1	Tine	VCORE	VCORE	VCORE
2	Spool Hub	AE20-00-SC	AE20-00-SC	AE20-00-SC
3	Bushing	VBUSH1.000	VBUSH1.000	VBUSH1.000
4	5/16" x 2" Gr 5 Bolt	VHBO.3125X1.750NCP	VHBO.3125X1.750NCP	VHBO.3125X1.750NCP
5	5/16" Lock Washer	VLW0.3125	VLW0.3125	VLW0.3125
6	5/16" Hex Nut	VHNO.3125NCP	VHNO.3125NCP	VHNO.3125NCP
7	Grease Zerk	VZERK	VZERK	VZERK
8	Frame	AE20-48-SA	AE20-60-SA	AE20-72-SA
9	Top Link Mount	AE20-00-SB	AE20-00-SB	AE20-00-SB
10	Brand Label	VLBLMIDWEST	VLBLMIDWEST	VLBLMIDWEST
11	Leg	AE20-00-SD	AE20-00-SD	AE20-00-SD
12	Leg Pin Clip	VPINO.3125X3.00	VPINO.3125X3.00	VPINO.3125X3.00
13	Lift Pin	VLIFTPIN1	VLIFTPIN1	VLIFTPIN1
14	3/8" x 2" Gr 5 Bolt	VHBO.3750X2.000NCP	VHBO.3750X2.000NCP	VHBO.3750X2.000NCP
15	3/8" Lock Nut	VLNO.3750NCP	VLNO.3750NCP	VLNO.3750NCP
16	Axle	AE20-48-14	AE20-60-14	AE20-72-14
17	9/16" x 4" Gr 5 Bolt	VHBO.5625X4.000NCP	VHBO.5625X4.000NCP	VHBO.5625X4.000NCP
18	9/16" Lock Washer	VLW0.5625	VLW0.5625	VLW0.5625
19	9/16" Hex Nut	VHNO.5625NCP	VHNO.5625NCP	VHNO.5625NCP





**P.O. Box 168  
Yakima, WA 98907-0168**

**Phone: 509.453.8271  
Fax: 509.457.2456**

**[www.rankinequipment.com](http://www.rankinequipment.com)**

**P.O. Box 1937  
Yakima, WA 98907-1937**

**Phone: 509.452.1651  
Fax: 509.457-6601**

**[www.northstarattachments.com](http://www.northstarattachments.com)**

**3205 Bay Street, Union Gap, WA 98903**