



AE401 Owner's Manual

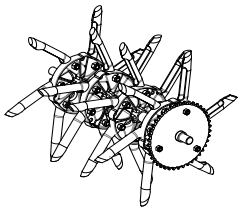
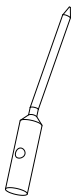


AERATOR Owner's Manual

AE401H, AE401V

Beginning Serial #: 100515001

Replacement Parts and Accessories

TINE REEL KIT	SOLID SPIKE TINE	TINE KIT
Replacement reel with tines for your aerator.	Complete set of spike tines for the AE's reel.	Individual coring tine for replacement of worn or broken tines.
		
P/N 360352	P/N 360394-S	P/N 360100

Original Instructions

IMPORTANT- READ CAREFULLY BEFORE USE AND KEEP FOR FUTURE REFERENCE.



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Go to <http://www.billygoat.com> for translations of the product manuals.

Visitez <http://www.billygoat.com> pour la version canadienne-française des manuels de produits



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SPECIFICATIONS

	AE401H	AE401V
Engine: HP	4.0 (2.98 kW)	5.5HP (4.1 Kw)
Engine: Model	GX120U1HX2	13L1520311F8
Engine: Type	HONDA OHV	B&S VANGUARD
Engine: Fuel Capacity	2.1 qt. (2.0 L)	3.0 qt. (2.84 L)
Engine: Oil Capacity	0.63 qt. (0.6 L)	0.66 qt. (0.62 L)
Total Unit Weight:	242# (109.8 Kg)	244# (109.8 Kg)
Max. operating slope	20°	20°
Sound test in accordance with 2000/14/EC	99 dB(a)	99 dB(a)
Sound at operators ear	79 dB(a)	79 dB(a)
Vibration at operator position	0.3g (2.97 m/s ²)	0.3g (2.97 m/s ²)

SAFETY



WARNING



This product can expose you to chemicals including gasoline engine exhaust, which is known to the State of California to cause cancer, and carbon monoxide, which is known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

Read the safety rules and follow them closely. Failure to obey these rules could result in loss of control of the unit, severe personal injury or death to you, or bystanders, or damage to property or equipment.



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INSTRUCTION LABELS

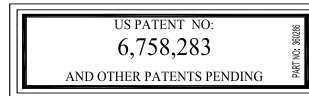
The labels shown below were installed on your BILLY GOAT® Aerator. If any labels are damaged or missing, replace them before operating this equipment. Part numbers from the Illustrated Parts List are provided for convenience in ordering replacement labels. The correct position for each label may be determined by referring to the part numbers shown.



LABEL WARNING GUARDS
P/N 900327



LABEL EXPLOSIVE FUEL
P/N 400268



LABEL PATENT
P/N 360286

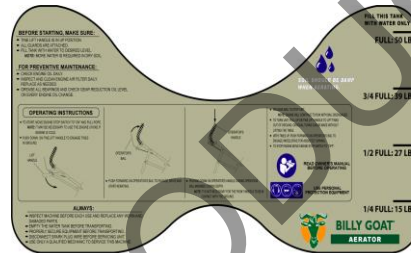


LABEL WARNING UNIT WEIGHT
P/N 360188



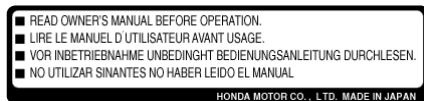
LABEL LIFT HERE
P/N 360187

LABEL INSTRUCTIONS AE
P/N 360025



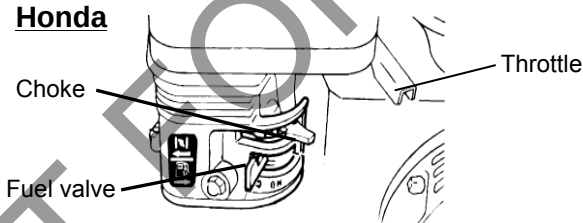
ENGINE LABELS

HONDA



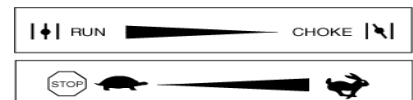
THROTTLE CONTROLS

Honda



Briggs

Set lever to choke when starting cold



Set lever to desired engine speed.
Move lever completely to the left to stop engine



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PACKING CHECKLIST

Your Billy Goat is shipped from the factory in one carton, completely assembled.



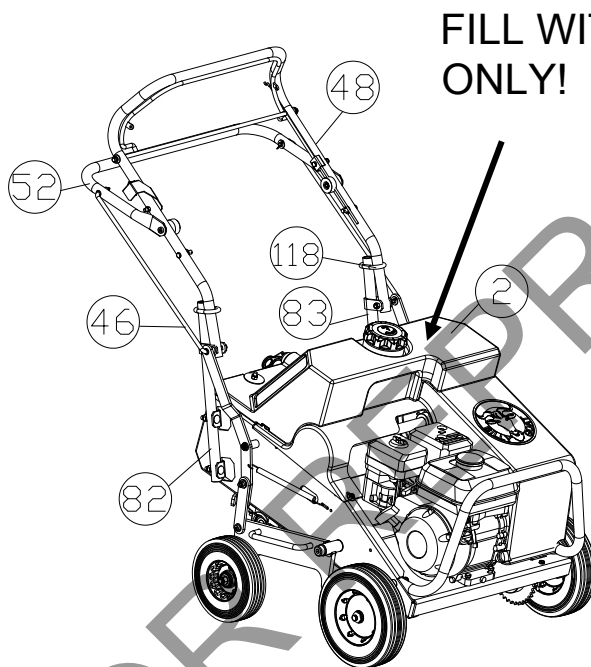
READ all safety instructions before assembling unit.
TAKE CAUTION when removing the unit from the box.



PUT OIL IN ENGINE BEFORE STARTING

PARTS BAG & LITERATURE ASSY

Warranty card P/N- 400972, Owner's Manual P/N-360390, General Safety and Warnings Manual Renovation-100295, Declaration of Conformity P/N-360194.



Boxing Parts Checklist

☐ Owner's Manual
AE 360390

Engine Manual Per Model

☐ Honda 4.0 HP
☐ Vanguard 5.5 HP

ASSEMBLY

NOTE: Items in () can be referenced in the Parts Illustrations and Parts Lists on pages 10-13.

1. **UNFOLD** the upper handle (item 48) and slide handle lock loops (item 118) into place to secure the upper handle to the lower handle (item 82 & 83).
2. **ASSEMBLE** the water tank to the unit and secure with the two carriage bolts, two locknuts and washers (items 137, 105 and 111) that can be found in the parts bag.
3. **FILL** the water tank (item 2) to desired weight with water **ONLY**.
4. **CHECK** engine oil level and fill to proper level. Also check oil in gear reduction reservoir and fill if necessary. See engine owner's manual for type and amount of oil to use. Move the tine engagement lever to the down position, to level engine during checking.
5. **CONNECT** spark plug wire. Set the engine stop switch to the **ON** position. You will use the stop switch on the handle during operation.



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OPERATION

AERATING OPERATION

NOTE: NEVER PARK THIS UNIT ON A SLOPE OF ANY KIND. Always keep tines in the up position when parking the unit.

TINES RAISING/LOWERING: The tines are raised or lowered into the ground by operating the tine engagement lever on the upper handle. Tine penetration is very dependent on surface preparation. READ the entire operation section before aerating. (See Fig. 1)

SET SPEED: The ground speed of your aerator varies with the engine speed. Set the engine at approximately half throttle to start. Speed may be increased based on the turf conditions (i.e. large flat areas) and operator experience. Speed should be lowered when operating under adverse turf conditions (i.e. fenced areas, hills, or slopes).

ENGAGE TINES: With the aerator in the work area, release the clutch bail and push forward on the tine engagement lever, lowering the tines into the dirt.

AERATE: Engage the operators clutch bail by pulling it backwards from the handle, and start aerating.

MOVE: Be sure the tine engagement control is in the up position (tines out of the ground) and engage the wheel drive by squeezing the operators clutch bail against the handle. Transport the aerator to the work area.

NOTE: For maximum tine penetration apply downward pressure on the handle.

TURNING: At the end of an aerating run, release the clutch bail and lift up on the tine engagement control to lift the tines out of the ground. Using the handle lift the front of the unit to pivot it around and line up for the next pass.

TRANSPORT: Be sure to lift the tine engagement lever (tines out of the ground) before transporting away from the work area. (See Fig. 2)

FOLDING HANDLE

This unit is equipped with a folding upper handle for easier storage. TO FOLD THE HANDLE (See Fig. 3 and Fig. 4):

1. Slide handle lock loops (item 118) up on both sides.
2. Fold the upper handle (item 48).

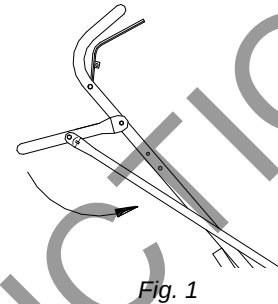
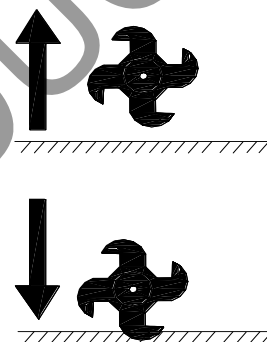


Fig. 1



Tines up
transport

Tines down
aerating

Fig. 2



Fig 3



Fig 4

*****TIPS*****

MOW

Mow the lawn to its normal cut height.

WATER

For the best performance and maximum tine penetration the lawn should be thoroughly watered the day before aeration.

INSPECT

Check the lawn before beginning work. Remove all rocks, wire, string, or other objects that can present a hazard during work prior to starting.

IDENTIFY

Mark all fixed objects to be avoided during work, such as sprinkler heads, water valves, buried cables, or clothes line anchors, etc.

SLOPES

Do not operate the aerator on steep slopes. Use extreme caution when operating on any sloped surface. For lesser sloped areas operate the unit, traversing up and down at a 45 degree angle to the slope rather than straight across. Extended operation on steep slopes can cause engine damage. **NOTE: DO NOT** release the operators clutch bail when operating on a slope. This will allow the unit to free wheel and allow the unit to roll down the slope. **NOTE:** Honda engines are equipped with a low oil sensor to prevent engine damage. When it senses a low oil condition (i.e. unit is operating or sitting on a steep slope) the engine shuts down. The maximum operating slope for the engine is 20°. The low oil condition must be corrected before the engine can be restarted. See the engine owner's manual for more information.



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MAINTENANCE

PERIODIC MAINTENANCE

Periodic maintenance should be performed at the following intervals:

Maintenance Operation	Every Use (daily)	Every 25 hrs	Every 50 Hours
Inspect for loose, worn or damaged parts.		•	
Check engine oil.	•		
Inspect belt for wear.			•
Engine (See Engine Manual)			
Oil chains (see lubrication).		•	
Thoroughly clean all debris from unit and tine reel	•		
Check tine reel nut torque. Torque to min. 100 ft.lbs.			•
Check gear reduction oil level		•	
Grease bearings (see lubrication).			•

ENGINE MUST BE LEVEL WHEN CHECKING OR FILLING OIL

NOTE: Items in () can be referenced in the Parts Illustrations and Parts Lists on pages 10-13.

TINE REEL REMOVAL (See pages 12 and 13 for Parts Illustration and Parts List)

NOTE: Tine reel removal is only necessary to replace an entire tine row or for other major unit maintenance. Individual tines can be replaced by following the INDIVIDUAL TINE REPLACEMENT instructions.

1. Wait for engine to cool and disconnect spark plug.
2. Remove the top guard by removing the four nuts, two on each side that secures it to the frame.
3. Release the tension on the chain. See CHAIN TENSION ADJUSTMENT in this manual.
4. Remove the four bolts and nuts, two on each side, holding the tine reel bearings in place. BE CAREFUL the tine reel is heavy and sharp. Take precautions to not allow it to fall when the bearing bolts are removed.
5. Lift the reel up and to the side to remove it from the drive chain.
6. Replace the reel with a new one.
7. To reinstall the reel follow the above steps in reverse. Make sure all hardware is tightened securely
8. Replace the guard and reinstall the four nuts that secure it in place.

INDIVIDUAL TINES REPLACEMENT (See pages 12 and 13 for Parts Illustration and Parts List)

1. Wait for engine to cool and disconnect spark plug.
2. Remove the bolt and nut holding the tine to the plate.
3. Replace the tine with a new one along with a new bolt and nut.

NOTE: Tines are a normal wear item and should be inspected regularly for signs of wear or damage.

BELT AND CHAIN TENSION ADJUSTMENT

ADJUSTING BELT TENSION (See pages 12 and 13 for Parts Illustration and Parts List)

1. Remove the top guard (item 3) by removing the four nuts (item 87), two on each side, that secure it to the frame.
2. Locate the top of the belt idler assembly where the clutch cable (item 55) is secured in place. A properly tensioned belt should stretch the idler spring (located next to the idler pulley) between 1/4" - 3/8" when the clutch bail (item 54) is held in the drive position.
3. Using a 1/2" wrench loosen the two nuts that secure the cable (item 55) in place.

Continued next page.



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4. TO INCREASE belt tension adjust these two nuts so that the cable (item 55) is secured in place with an additional 1/4" of the threaded adjuster at the top of the assembly.

TO DECREASE belt tension, adjust these two nuts so that the cable (item 55) is secured in place with 1/4" less of the threaded adjuster at the top of the assembly.

5. Replace the guard (item 3) and reinstall the four nuts (item 87) that secure it in place.
6. Run the unit to test your adjustment. Repeat as necessary to achieve proper adjustment. A properly adjusted belt will pull the unit up a 15 degree slope when clutched without any belt slip, and will declutch and stop the unit completely when the clutch is released.

NOTE: Never release the clutch on a slope. The unit is heavy and will free wheel downhill.

NOTE: A worn belt will not allow for proper adjustment and must be replaced.

ADJUSTING CHAIN TENSION (See pages 12 and 13 for Parts Illustration and Parts List)

1. Remove the top guard (item 3) by removing the four nuts (item 87), two on each side, that secure it to the frame.
2. Locate the bolt (item 31, 33) and nut (item 80) that hold each idler sprocket to the frame of the unit. One idler sprocket sets tension on the wheel drive chain and one sets tension on the tine drive chain.
3. Loosen the bolt and nut and slide the idler sprocket (item 29) in the desired direction.

INCREASED TENSION: Slide the sprocket to the rear.

DECREASED TENSION: Slide the idler sprocket to the front.

4. Tighten the bolt and nut to secure the sprocket in place.
5. Replace the guard and reinstall the four nuts that secure it in place.

NOTE: Over tensioning the chain will cause premature chain and sprocket wear. DO NOT OVER TENSION THE CHAIN. A properly tensioned chain will have slack of 1/4"-3/8" when moved by hand.

DRIVE BELT REPLACEMENT (See pages 12 and 13 for Parts Illustration and Parts List)

1. Wait for engine to cool and disconnect spark plug.
2. Remove the top guard by removing the four nuts, two on each side, that secure it to the frame.
3. Slide the belt off of the engine drive pulley, and off of the jackshaft drive pulley.
4. Continue sliding the belt along the jackshaft to the right jackshaft bearing away from the pulley and sprockets.
5. Using a 9/16" wrench, remove the two bolts and nuts that hold the jackshaft bearing in place.
6. Carefully lift the jackshaft up until the belt can be slid out underneath the bearing.
7. Slide the new belt in place over the jackshaft.
8. Replace and tighten the bolts and nuts holding the jackshaft bearing in place. Be sure that the jackshaft is aligned straight across between both bearings.
9. Slide the belt along the jackshaft and over both engine and jackshaft pulleys. Be sure the idler pulley is positioned on the flat side of the belt.
10. Check proper belt tension. See BELT TENSION ADJUSTMENT in this manual.

CHAIN REPLACEMENT (See pages 12 and 13 for Parts Illustration and Parts List)

NOTE: This procedure will work to change the wheel drive chain or the tine drive chain.

1. Wait for engine to cool and disconnect spark plug.
2. Remove the top guard by removing the four nuts, two on each side, that secure it to the frame.
3. Roll the unit until the master link of the chain that you want to replace is exposed near the jackshaft sprocket.
4. Release the tension on the chain. See CHAIN TENSION ADJUSTMENT in this manual.
5. Using a screwdriver or similar device, remove the spring clip that secures the master link in the chain.
6. With the master link removed unwind the chain from the two sprockets that it connects.
7. Carefully string the replacement chain around the same two sprockets and reconnect it with the new master link provided with your replacement chain.
8. Reset the tension on the chain.
9. Replace the guard and reinstall the four nuts that secure it in place.



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LUBRICATION

BEARINGS (See pages 12 and 13 for Parts Illustration and Parts List)

1. Remove the top guard by removing the four nuts, two on each side that secures it to the frame. *NOTE:* Guard must be removed to lubricate the jackshaft bearings only. All other bearings can be lubed without removing the guard.
2. Lubricate all 6 bearings using a pressurized grease gun with standard lithium based grease.
3. Wipe any excess grease off of all bearings and fittings after each lubrication.
4. Replace the guard and reinstall the four screws that secure it in place.

CHAINS (See pages 12 and 13 for Parts Illustration and Parts List)

1. Remove the top guard by removing the four nuts, two on each side that secures it to the frame.
2. Apply a light coat of No. 30 Oil or a penetrating chain lubricant to keep the chain clean and in good running order.
3. Replace the guard and reinstall the four screws that secure it in place.

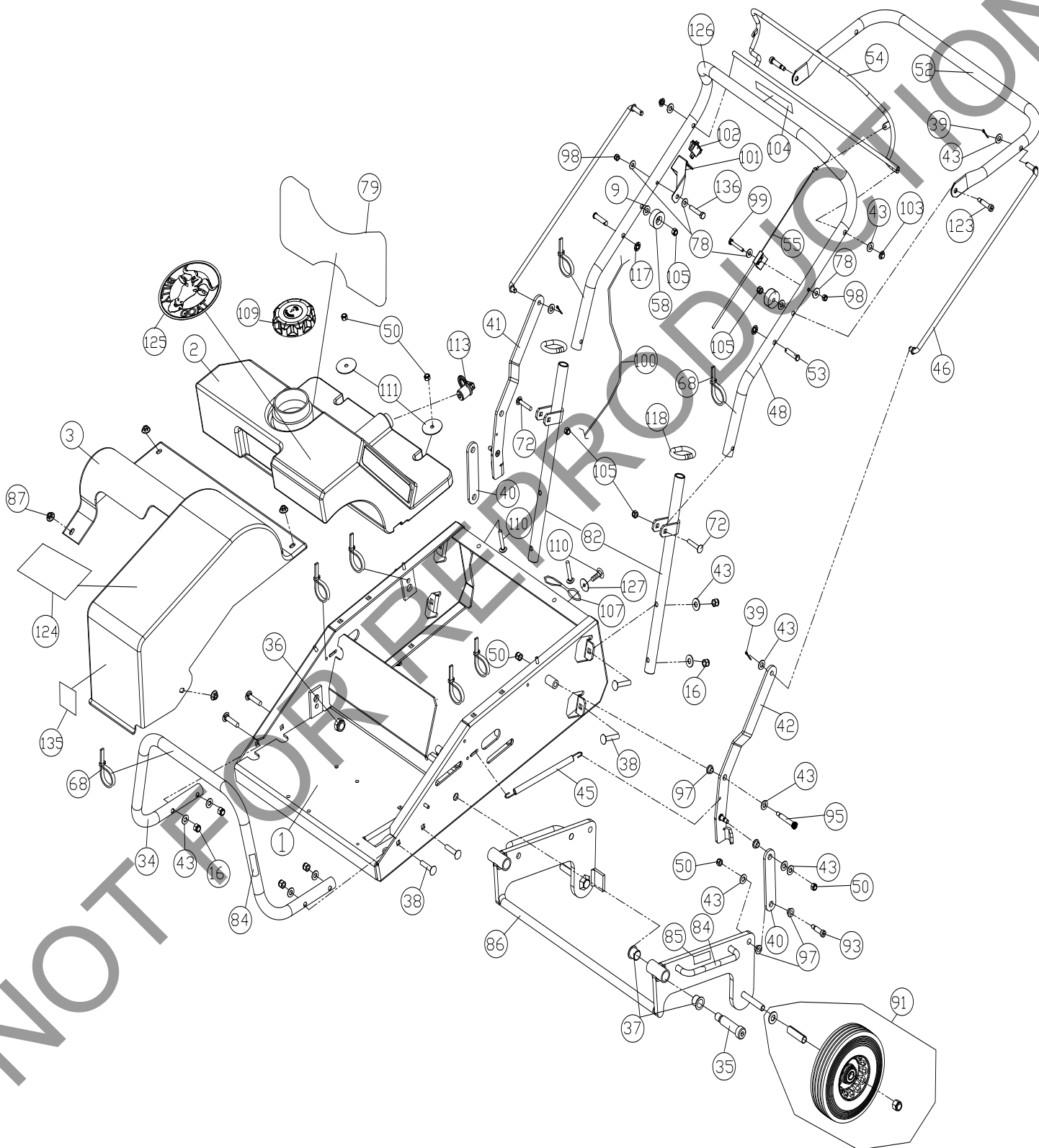
NOTE: If machine is cleaned with a pressure washer the chains and bearings should be lubricated after each cleaning.

TROUBLESHOOTING

Problem	Possible Cause	Solution
Engine will not start	Stop switch off (Honda only). Throttle in off position. Engine not in full choke position. Out of gasoline. Bad or old gasoline. Spark plug wire disconnected. Dirty air cleaner. Engine oil level too low (Honda only).	Check stop switches, throttle, choke position and gasoline. Connect spark plug wire. Clean or replace air cleaner. Or contact a qualified service person. Check and fill engine oil.
Abnormal vibration	Damaged or missing tines. Loose handle bolts. Loose engine bolts.	Stop work immediately. Replace any damaged or missing tines. Tighten all loose bolts and nuts.
Engine is making loud noise or squealing	Gear reduction oil level is low	Check and add oil according to engine owner's manual
Engine stalls or labors when aerating	Working on too steep of a slope. Not enough oil in the engine.	Work at 45 degrees to the slope moving up and down instead of across. Check and add engine oil.
Engine is locked, will not pull over	Debris locked against reel, or drive pulleys. Engine problem.	Pull spark plug wire and remove debris. Contact an engine servicing dealer for engine problems.
Unit does not move when clutch is engaged	Belt drive out of adjustment. Worn drive belt. Loose or damaged chain or sprockets. Loose or damaged pulleys. Damaged or broken clutch cable.	See maintenance on pg. 7 of this manual. Contact a qualified servicing dealer.



AE401 HANDLE PARTS DRAWING





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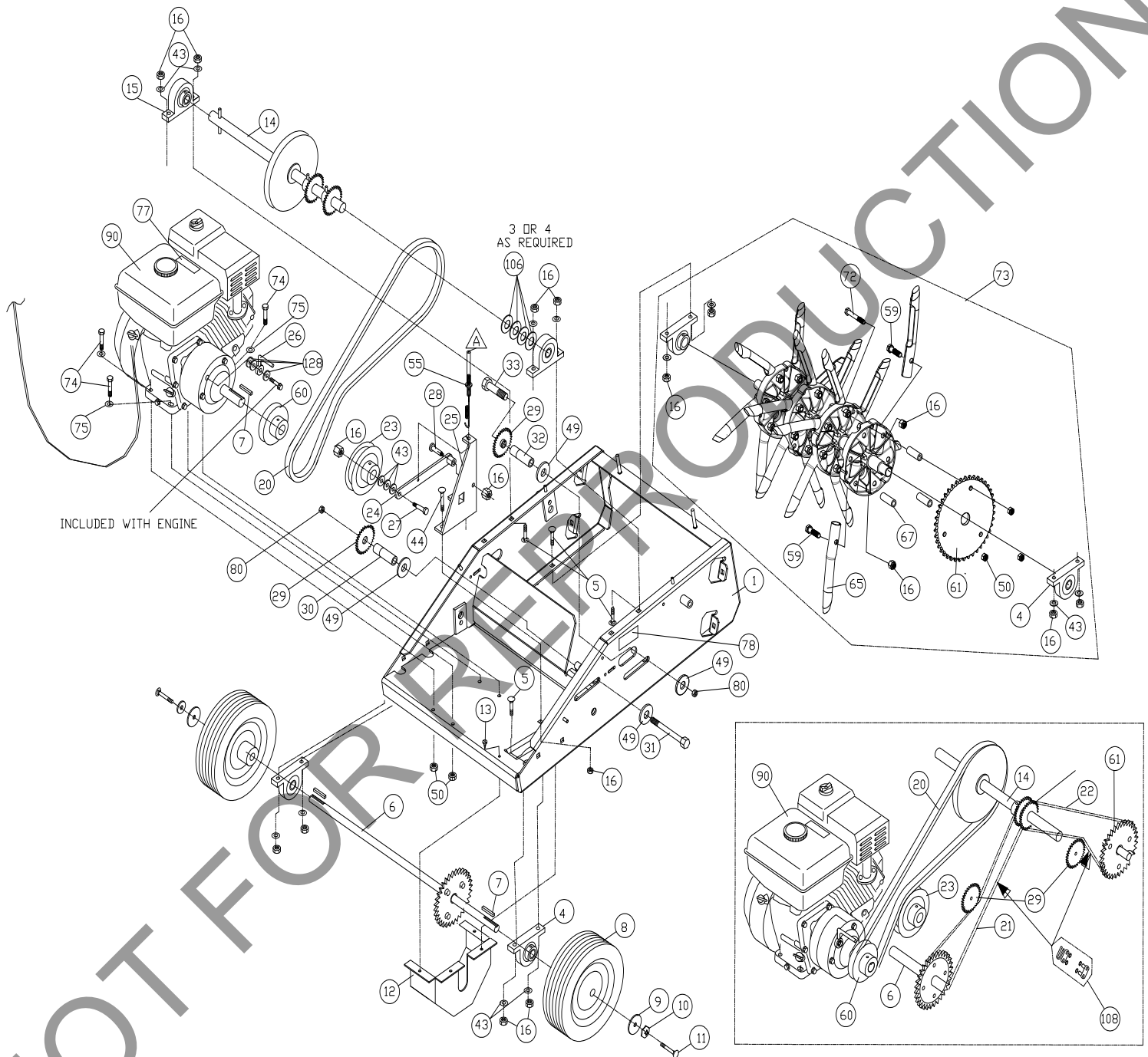
AE401 HANDLE PARTS LIST

ITEM NO.	DESCRIPTION	AE401H Part No.	QTY	AE401V Part No.	QTY
1	FRAME ASSEMBLY WA AE402	360324	1	360324	1
2	WATER TANK 5.5 GAL	360238	1	360238	1
3	GUARD DRIVE COVER	360280	1	360201	1
9	WASHER 5/16 FENDER	8172020	2	8172020	2
16	NUT LOCK 3/8-16	8160003	8	8160003	8
34	TUBE FRONT BUMPER	360329	1	360329	1
35	BOLT SHOULDER 3/4 x 2.5	360146	2	360146	2
36	NUT LOCK 5/8-11 THIN	8161046	2	8161046	2
37	BUSHING PIVOT	360183	4	360183	4
38	BOLT CARRIAGE 3/8-16 x 1.75"	8024061	8	8024061	8
39	COTTER PIN	8197031	4	8197031	4
40	BRACKET LIFT LINK	360246	2	360246	2
41	PLATE LINKAGE RH LONG WAAE	360328	1	360328	1
42	PLATE LINKAGE LH LONG WAAE	360327	1	360327	1
43	WASHER FLAT 3/8 SAE	8172009	22	8172009	22
45	SPRING EXTENSION	360154	2	360154	2
46	ROD LIFT	360330	2	360330	2
48	HANDLE UPPER AE	350375	1	350375	1
50	NUT LOCK 5/16-18	8160002	8	8160002	8
52	HANDLE LIFT	360296	1	360296	1
53	CLEVIS PIN 3/8" X 1.625	520119	2	520119	2
54	BAIL CLUTCH	350374	1	350374	1
55	CABLE CLUTCH ASSY	360313	1	360313	1
58	BUMPER RECESS	360298	2	360298	2
68	TY-WRAP	900407	8	900407	8
72	CARRIAGE BOLT 5/16-18X1.75	8024043	2	8024043	2
78	WASHER 1/4 SAE	8172007	4	8172007	4
79	LABEL TANK INSTRUCTIONS AE	360025	1	360025	1
82	HANDLE LOWER WA	360321	2	360321	2
84	LABEL LIFT HERE	360187	4	360187	4
85	LABEL WARNING WEIGHT	360188	2	360188	2
86	FRAME REAR WA	360267	1	360267	1
87	NUT FLANGE 1/4-20	900453	4	900453	4
91	TIRE & WHEEL 8" ASSY	360334	2	360334	2
93	BOLT SHOULDER 3/8 x 1"	360152	2	360152	2
95	BOLT SHOULDER 3/8 x 2"	360153	2	360153	2
97	BUSHING SHOULDER NYLON 3/8 ID	360175	8	360175	8
98	NUT LOCK 1/4x20 THIN	8160001	2	8160001	2
99	SCREW CAP 1/4 - 20 x 1 1/2"	8041009	1	8041009	1
100	HARNESS WIRE AE	360316	1	360316	1
101	BRACKET MOUNT SWITCH	430141	1	430141	1
102	SWITCH ON-OFF	500281	1	500281	1
103	NUT - PAL 3/8	360218	2	360218	2
104	CLUTCH LABEL	830503	1	830503	1
105	NUT LOCK 5/16 - 18 THIN	8161041	4	8161041	4
107	PLASTIC LANYARD	360243	2	360243	2
109	CAP WATER TANK	360256	1	360256	1
110	SCREW SELF TAP 1/4-20 x 5/8"	890359	1	890359	1
111	WASHER - EXTENSION	810652	2	810652	2
113	PLUG DRAIN 1"	360293	1	360293	1
117	RETAINER 3/8"	360279	2	360279	2
118	LOOP FOLDING HANDLE	350138	2	350138	2
123	BOLT SHOULDER 3/8 x 1 1/4"	360284	2	360284	2
124	LABEL AE BADGING	360395	1	360395	1
125	LABEL LOGO CIRCLE 3.5"	100387	1	100387	1
126	GRIP	400570	2	400570	2
127	1/4 WASHER FLAT FENDER	8172019	1	8172019	1
135	LABEL MADE IN U.S.A	520116	1	520116	1
136	SCREWCAP 1/4"-20 X 1 1/2" HCS ZP	8041008	1	8041008	1
137	BOLT CARRIAGE 5/16"-18 X 2" ZP	8024044	2	8024044	2



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AE401 ENGINE PARTS DRAWING





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AE401 ENGINE PARTS LIST

ITEM NO.	DESCRIPTION	AE401H	QTY	AE401V	QTY
		Part No.		Part No.	
1	FRAME ASSEMBLY WA AE402	360324	1	360324	1
4	BEARING 3/4" PILLOW BLOCK	350133	4	350133	4
5	CARRIAGE BOLT 3/8-16 x 1 1/2	8024060	12	8024060	12
6	FRONT AXLE ASSY	360332	1	360332	1
7	KEY SQUARE 3/16 x 3/16 x 1.25	9201080	3	9201080	3
8	WHEEL 10.5" SEMI PN. W3/4" KEYED HUB	360388	2	360388	2
9	FENDER WASHER 5/16"	8172020	2	8172020	2
10	WASHER LOCK 5/16 TWISTED TOOTH	430298	2	430298	2
11	SCREWCAP 5/16-18 x 1"	8041028	2	8041028	2
12	GUARD DIFFERENTIAL AE	360248	1	360248	1
13	SCREW SELF TAP 1/4 x 1/2"	890359	2	890359	2
14	JACKSHAFT AERATOR ASSY	360331	1	360331	1
15	BEARING 1" PILLOW BLOCK	810700	2	810700	2
16	NUT LOCK 3/8-16	8160003	28	8160003	28
20	BELT 4L x 43" POWER RATED	360120	1	360120	1
21	CHAIN #40 x 94 PITCH O-RING (WHEEL)	360115	1	360115	1
22	CHAIN #40 x 76 PITCH O-RING (TINE)	360114	1	360114	1
23	PULLEY IDLER 4.5"	500270	1	500270	1
24	ARM IDLER WA	510199	1	510199	1
25	BRACKET MOUNT IDLER	360121	1	360121	1
26	BELT FINGER FRONT AE	360219	1	360219	1
27	SCREWCAP 3/8"-16 X 2" HCS ZP	8041054	1	8041054	1
28	BOLT SHOULDER 1/2 x 1	500114	1	500114	1
29	SPROCKET IDLER 17T x 5/8" BORE	360116	2	360116	2
30	SPACER SPROCKET IDLER 2.5"	360123	1	360123	1
31	SCREW CAP 1/2 - 13 x 4	8041106	1	8041106	1
32	SPACER SPROCKET IDLER 1.175"	360124	1	360124	1
33	SCREW CAP 1/2 - 13 x 3"	8041102	1	8041102	1
43	WASHER FLAT 3/8 SAE	8172009	17	8172009	17
44	CARRIAGE BOLT 3/8"-16 X 1"	8024058	2	8024058	2
49	FLAT WASHER 1/2"	8171006	4	8171006	4
50	NUT LOCK 5/16-18	8160002	7	8160002	7
55	CABLE CLUTCH ASSY	360313	1	360313	1
59	SCREWCAP 3/8 - 16 X 1/2"	8041052	1	8041052	24
60	PULLEY ENGINE	610417	1	610417	1
61	SPROCKET 42 T 1" CENTER HOLE	360350	1	360350	1
65	TINE	360100	24	360100	24
67	SPACER SPROCKET A E REEL	360351	3	360351	3
72	SCREWCAP 5/16"-18 X 2 1/2" GR 5	8041034	3	8041034	3
73	TINER ASSY AE401	360352	1	360352	1
74	SCREW CAP 5/16 - 18 x 1.5"	8041030	4	8041030	4
75	WASHER FLAT CUT 5/16	8171003	4	8171003	4
77	LABEL WARNING FUEL EN/SP	-	-	100261	1
78	LABEL DANGER GUARD	900327	2	900327	2
80	NUT LOCK 1/2 -13 THIN	8161044	2	8161044	2
90	ENGINE	360278	1	360355	1
106	WASHER 1.062" ID X 1.75 OD	8172021	3 OR 4	8172021	3 OR 4
108	CHAIN MASTER LINK	360205	2	360205	2
128	WASHER 1/4" FC	8171002	3	8171002	3