

MAN 4157308
Rev. A 6-2007



MODEL:
544317
RENOVAIRE



OP / PARTS MANUAL

**CALIFORNIA
Proposition 65 Warning**

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects and other reproductive harm.



WARNING

The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

**Californie Proposition 65
Avertissement**

Les échappements des moteurs diesel et certains de leurs composés sont reconnus par l'Etat de Californie pour être cancérigènes, provoquer des défauts congénitaux et d'autres dangers en matière de reproduction.



AVERTISSEMENT

L'émission du moteur de ce matériel contient des produits chimiques que l'Etat de Californie considère être cancérigènes, provoquer des défauts congénitaux et d'autres dangers en matière de reproduction.

**California Advertencia
de la Proposicion 65**

El estado de California hace saber que los gases de escape de los motores diesel y algunos de sus componentes producen cáncer, defectos de nacimiento y otros daños en el proceso de reproducción humana.



ADVERTENCIA

El estado de California hace saber que los gases de escape de este producto contienen productos químicos que producen cáncer, defectos de nacimiento y otros daños en el proceso de reproducción humana.

**CALIFORNIA
Proposition 65 Warning**

Battery posts, terminals, wiring insulation, and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.
WASH HANDS AFTER HANDLING.

IMPORTANT MESSAGE

Thank you for purchasing this CGC, Inc. product. You have purchased a world class product, one of the best designed and built anywhere.

This machine comes with a Technical Manual containing safety, operation, parts and service information. The useful life and good service you receive from this machine depends to a large extent on how well you read and understand this manual. Treat your machine properly, lubricate and adjust it as instructed, and it will give you many years of reliable service.

Your safe use of this CGC, Inc. product is one of our prime design objectives. Many safety features are built in, but we also rely on your good sense and care to achieve accident-free operation. For best protection, study the manual thoroughly. Learn the proper operation of all controls. Observe all safety precautions. Follow all instructions and warnings completely. Do not remove or defeat any safety features. Make sure those who operate this machine are as well informed and careful in its use as you are.

See a CGC, Inc. dealer for any service or parts needed. CGC, Inc. service ensures that you continue to receive the best results possible from CGC, Inc. products. You can trust CGC, Inc. replacement parts because they are manufactured with the same high precision and quality as the original parts.

CGC, Inc. designs and builds its equipment to serve many years in a safe and productive manner. For longest life, use this machine only as directed in the manual, keep it in good repair and follow safety warnings and instructions. You'll always be glad you did.

**Commercial Grounds Care, Inc.
One Bob Cat Lane
Johnson Creek, WI 53038-0469**

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NOTICE !!!

Unauthorized modifications may present **extreme** safety hazards to operators and bystanders and could also result in product damage.

Commercial Grounds Care, Inc. strongly warns against, rejects and disclaims any modifications, add-on accessories or product alterations that are not designed, developed, tested and approved by CGC, Inc.'s Engineering Department. Any CGC, Inc. product that is altered, modified or changed in any manner not specifically authorized after original manufacture—including the addition of “after-market” accessories or component parts not specifically approved by CGC, Inc.—will result in the CGC, Inc. Warranty being voided.

Any and all liability for personal injury and/or property damage caused by any unauthorized modifications, add-on accessories or products not approved by CGC, Inc. will be considered the responsibility of the individual(s) or company designing and/or making such changes. CGC, Inc. will vigorously pursue full indemnification and costs from any party responsible for such unauthorized post-manufacture modifications and/or accessories should personal injury and/or property damage result.



This symbol means:
ATTENTION!
BECOME ALERT!

Your safety and the safety of others is involved.

Signal word definitions:

The signal words below are used to identify levels of hazard seriousness. These words appear in this manual and on the safety labels attached to CGC, Inc. machines. For your safety and the safety of others, read and follow the information given with these signal words and/or the symbol shown above.

DANGER

DANGER indicates an imminently hazardous situation which, if not avoided, **WILL** result in death or serious injury.

WARNING

WARNING indicates a potentially hazardous situation which, if not avoided, **COULD** result in death or serious injury.

CAUTION

CAUTION indicates a potentially hazardous situation which, if not avoided, **MAY** result in minor or moderate injury. It may also be used to alert against unsafe practices or property damage.

CAUTION

CAUTION used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, **MAY** result in property damage.

GENERAL NOTE: FRONT, REAR, RIGHT HAND AND LEFT HAND REFERENCES BELOW ARE WITH RESPECT TO AN OPERATOR AT THE CONTROLS.

SET-UP

1. Set Frame Assembly on blocks so that hitch end of frame is approximately 18" above ground.

CAUTION

To prevent possible injury use an adequate lifting device or a minimum of two (2) men when placing main frame on blocks.

2. Attach transport tires to wheel yokes and inflate tires to 55 p.s.i.
3. Attach cradle assembly to yokes on frame as shown in frame assembly diagram.
4. Attach hydraulic cylinder to lugs on underside of frame and cradle assembly. Make sure end of cylinder with hose attachment points toward hitch of machine.
5. Assemble aerating wheels as shown in assembly diagram. Do not mount weight trays at this time.
6. Attach aerating wheel to square bar on main frame as shown in **Figure 1**.

NOTE: Attach outside aerating wheel sets as close to clevis pin as possible and the middle sets as close to center clevis pin as possible. Center the middle set of each side.

7. Attach aerating tools on aerating wheels.

CAUTION

knives are sharp. To prevent possible injury use caution when installing these items.

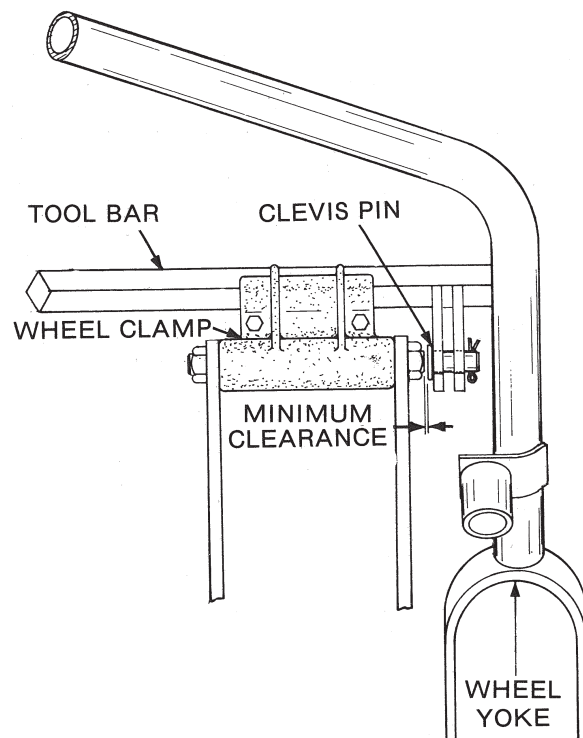


FIGURE 1

8. Attach weight trays as shown in assembly diagram
9. Remove blocks from beneath main frame.
10. Attach machine to tractor at draw bar and attach hydraulic hose from tractor to cylinder.
11. Lubricate aerating wheels until grease can be seen at wheel bushings.

ASSEMBLY

WARNING

To prevent possible injury use an adequate lifting device when placing main frame on blocks.

Use jackstands to provide adequate support. Do not rely on hydraulic or mechanical jacks.

NOTE: Refer to frame assembly parts list on Page 17 to assist with assembly.

1. Set the main frame assembly **5** on jackstands. Frame needs to be at least 18" (457 mm) above the floor.
2. Install transport wheels **13** to the yokes using (4) 1/2-20 X 1-1/2" screws **15** and (4) lockwashers **1**. Tighten and check tires for free rotation.
3. Bolt the tongue **12** to the frame **5** using (4) 1/2-13 X 2" screws **4**, (4) lockwashers **1** and (4) nuts **3**. Tighten all four fasteners at this time.
4. Mount the cradle **27** onto the frame **5** using the (3) clevis pins **14**. Insert the cradle lugs in between the mounting tabs on the frame. See Figure 2. Beginning in the middle of the cradle, install a clevis pin and secure with a cotter pin **2**. Install and secure the remaining cotter pins.
5. Attach the hydraulic cylinder **24** to the lug on the underside of the frame using a clevis pin **26**. Secure clevis pins with hair pins **25**. See note below.

NOTE: The hydraulic cylinder has an opening for a hose attachment. The cylinder must be installed with this opening positioned toward the front of the unit. See Figure 2.

6. Using the clevis pin **26**, attach the other end of the cylinder to the lug on the cradle. Secure the clevis with hair pins **25**. See Figure 2.
7. Mount the aerating wheel assemblies **27**, Figure 2 to the tool bar.

NOTE: The aerating wheel assemblies **27** are mounted to the side rails **24**, Figure 2 and to the clamps **14**, Figure 2.

Beginning in the middle of the frame, clamp a wheel assembly onto the tool bar. Keep a minimum gap of 1/8" (3 mm) between the pivot shaft on the clamp and the clevis pin securing the cradle onto the frame. With the wheel assembly in position, alternate tightening the (2) 1/2-13 X 2-1/4" screws **7** and nuts **6**, Figure 2 clamping the wheel assembly onto the tool bar. Torque each screw to 75 ft-lbss (102 N-m).

8. Attach an aerating wheel assembly **27** toward the outside of the frame keeping a minimum gap of 1/8" (3 mm) between the pivot shaft on the clamp and the clevis pin on the cradle. Secure assemblies as stated in Step 7 and repeat the middle and side assemblies on the other side of the frame. Mount the remaining wheel assemblies onto the tool bar, spacing them evenly between the wheel assemblies already mounted.
9. Using the 3/8-16 X 1-1/2" bolts **3**, Figure 2, mount the weight tray supports **18** to the side rails of the wheel assemblies. Secure with lockwashers **2** and nuts **6**. Mount the weight trays onto these supports securing each tray with (4) 3/8-16 X 1" screws **5**, (4) lockwashers **2** and (4) 3/8-16 nuts **6**.
10. Mount the desired accessories to the aerating wheels (tines or blades). For maximum performance, a double set of tines may be mounted onto the aerating wheels. A longer screw is needed for this application and can be obtained by ordering Part number 311213 from a service representative.
11. Lubricate aerating wheels until grease can be seen at the wheel bushings. Check aerating wheels for free rotation.
12. Remove the jackstands from beneath the main frame. Hitch the Renovaire to the draw bar on the tractor and attach the hydraulic hose from the tractor to the hydraulic cylinder.

NOTE: If using the hydraulic hand pump refer to the instructions for pump installation. The hydraulic hand pump is used with the Renovaire when the hydraulic lifting system on the tractor is not used.

HYDRAULIC HAND PUMP

1. Apply teflon tape to the threads of the hydraulic swivel elbow **12**, Figure 3 and install onto the hydraulic cylinder **10**. Do not tighten at this time.
2. Mount the hydraulic hand pump **9** onto the pump plate **8** using (4) 5/16-18 X 1-1/4" screws **4**, (4) 5/16 lockwashers **3** and (4) 5/16-18 nuts. See Figure 3.
3. For ease of operation (left or right hand operator), the hand pump can be installed on either side of the main frame. Determine which side to mount the pump and using the (2) U-bolts **14**, mount the pump plate **8** onto the frame securing it with 5/16 lockwashers and 5/16-18 nuts.

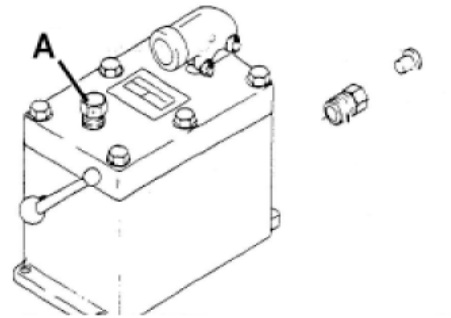
CAUTION

BEFORE INSTALLING THE HYDRAULIC HOSE, REMOVE THE HOSE/CONNECTOR FITTING FROM THE PUMP AND REMOVE THE PLASTIC PLUG.

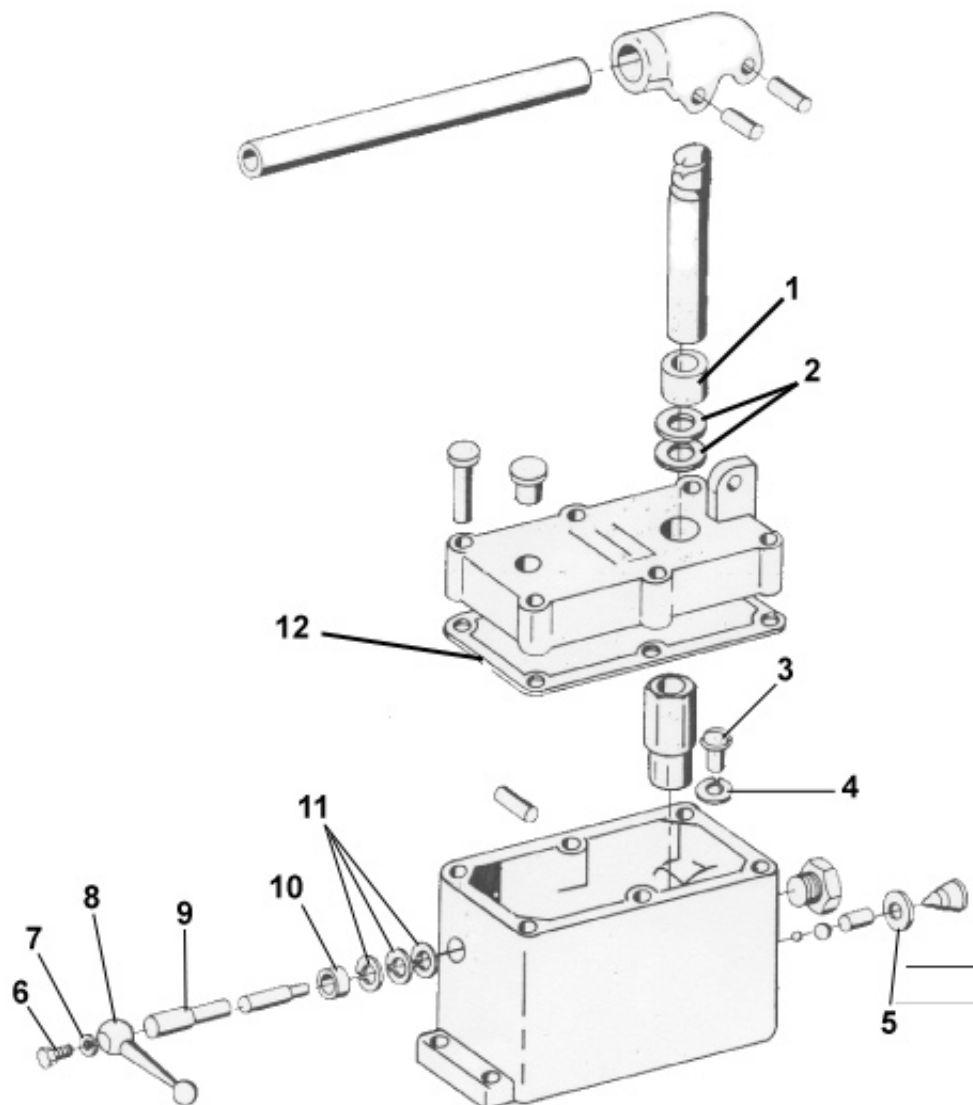
NOTE: Removal of plastic plug, without removing the connector from the pump could cause some of the plug to be forced into the pump.

4. Wrap teflon tape around the threads of the hose connector fitting and reinstall onto the pump.
5. Teflon tape the connector fittings on the hydraulic hose **10** and install the hose onto the pump. Position the hose for installation onto the hydraulic elbow fitting on the cylinder. Make sure the hose does not become kinked or interfere with any moving parts.

6. With the hose properly positioned, adjust the elbow on the cylinder to the approximate position required to connect the hose and elbow fitting. Tighten the elbow into position and tighten the hose onto the elbow. Double check all fittings and hardware for tightness.
7. Remove the vent-filler plug **A** and fill the pump with one quart(.946L) of type "A" or "F" transmission fluid. **DO NOT** substitute with any other type of fluid.



8. Position the pump handle **13** on the top side of the tongue, between the hitch and where the tongue mounts to the frame. Place a handle clip **7** approximately 2" (51 mm) from each end of the handle and mark their locations for drilling.
9. Mark and drill a 9/64" (3.6 mm) hole at each location and install the clips using the #10-5/8" self tapping screws **11**.



546010 - Hydraulic Hand Pump

For use on Renovaire when hydraulic lifting system on tractor is not used. There are three service kits available for gasket and seal replacement on worn pumps.

548812 - Seal and Gasket Kit

Includes one each of items 1, 4, 5 and 12; two each of item 2; and three each of item 11. For use on pumps: HP2503-51-00 P148, HP2503-51-00 P348

548831 - Release Valve Replacement Kit

Includes one each of items 6, 7, 8, 9 and 10; and three each of item 11. For use on all units

548832 - Safety Valve Replacement Kit

Includes one each of item 4; and one assembled safety valve subassembly (substitute for item 3). Specify pressure setting required. For use on all units

TRANSPORTING

CAUTION

This unit is not designed nor meant to be towed at speeds in excess of 10 MPH (16 Km/h).

Towing at excessive speeds will cause damage to frame and/or wheels. This type of damage will not be repaired under the terms of the warranty.

1. Raise the aerating wheels high enough to hook the eye bolts **11**, Figure 1 onto the latch hooks on the side of the cradle assembly.
2. Lower the aerating wheels until the eye bolts are supporting the cradle assembly.

OPERATION

CAUTION

Before operating, check the area to be aerated and remove any objects which may present a safety hazard or which may damage the aerator (rocks, cans, etc.).

Do not leave the tractor unattended without first lowering the aerator and stopping the engine.

To prevent possible injury, do not operate aerator without weight trays in place. Do not make any adjustments or perform any maintenance while tractor is running.

1. Position tractor and equipment where aerating is to begin.
2. Lower aerating wheels and proceed to aerate.

NOTE:

Never cross hard surfaces (sidewalks, driveways, stepping stones etc.) with the tines down.

To prevent turf damage, aerator must be raised completely out of the ground while turning the tractor.

Do Not back up when the tines are in the ground or damage to the tines and clamps may occur.

When aerating soft ground and full penetration is **not** desired, the depth may be controlled by raising the cradle assembly with the hydraulic system.

Failure to lubricate the aerating wheels can cause damage to the axles, bushings and the wheels.

SERVICE

CAUTION

DO NOT use tractor hydraulics to support the aerator while servicing. Hydraulic lines may rupture causing unit to fall suddenly.

When replacement parts are required, use genuine CGC, Inc. parts or parts with equivalent characteristics including type, strength and material. Failure to do so may result in product malfunction and possible injury to the operator and/or bystanders.

Thoroughly clean all tines inside and out when aerating is completed. A light coat of oil will prevent rust and insure proper coring and slicing the next time the unit is put into service.

Lubrication

1. Lubricate aerating wheels after every four hours of use. Use a standard lithium based grease.
2. After lubrication of wheels is complete, lubricate the pivot shafts located on the clamps secured to the tool bar.
3. Wipe off lubrication fittings before and after lubrication of aerating wheels.
4. Transport wheel bearings should be repacked yearly using a good grade wheel bearing lubricant.

Transport Wheels

1. Check daily.
2. Repack with grease yearly.
3. Air pressure: **MINIMUM** 45 p.s.i.
MAXIMUM 65 p.s.i.

Axle Replacement

1. Remove the weight tray from the desired aerating wheel assembly. The weight tray supports can remain attached to the side rail.
2. Remove the aerating wheel assembly from the tool bar.
3. Remove one side rail from the wheel assembly and remove the axle. You may need to tap the axle, using a wood or rubber mallet, to remove it.
4. Install the new axle **19** Figure 2.
5. Attach the side rail onto the wheel assembly and mount the assembly onto the tool bar.
6. Mount the weight tray onto the tray supports.
7. Lubricate the wheel after assembly.

Storage Instructions

1. Thoroughly clean all tines, inside and out, after aerating is completed. A light coat of oil sprayed onto the tines or blades will help prevent rust and ensure proper coring the next time the unit is put into service.
2. Unit should be stored on boards to protect tines or blades from rust and damage. Store in a dry location.
3. Lubrication before long storage periods will help prevent moisture build up in the lubrication cavities.
4. When bringing unit out of storage, check for loose bolts and damaged parts. Tighten and replace as needed.
5. Check hydraulic cylinder for leaks and replace seal kit if needed. If the cylinder end cap has a **RETAINING RING**, order item **25**. If the cylinder cap has a **LOCK WIRE**, order item **30**.
6. If the unit is equipped with a hydraulic hand pump, check the pump for leaks and proper fluid level. Check the hydraulic hose connections for tightness and check the hose for any wear or damage. Refer to the parts list on Page 14 to order replacement seal kits for the pump. The hydraulic hose can be obtained by ordering item **10**.
7. Proper storage and maintenance will extend the usage and performance of the unit.

Specifications

Chassis:..... 2" extra strong pipe

Hitch: Clevis type with 3/4" diameter pin

Axles:..... Aerating: 1-1/4" diameter
Transporting: 3/4" diameter bolted to frame

Wheels:..... Aerating: 12 cast iron wheels w/bushings
Transporting: Pneumatic 4.80 X 4.00-8, 6 ply

Net Weight:..... w/roller bearings
Approximately 1000 lbs.

Dimensions:

Width: 8'

Transport Height:..... 30"

Length: 9'

Operating Speed:..... Up to 10 mph

Transport Speed: Up to 10 mph

Aerating Width:..... 6'

Aerating Depth:..... Up to 5"

Aerating Pattern: Approximately 6" X 6"

Hydraulic Lift: Raise and lower aerating wheels

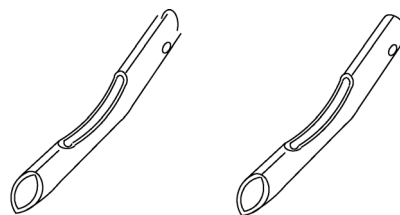
Hydraulic Cylinder..... 2-1/2" bore with 8" stroke
rated @ 3000 p.s.i.

Lubrication Pressure grease fittings

545364 - 1/2" Coring Tine Kit

545365 - 3/4" Coring Tine Kit

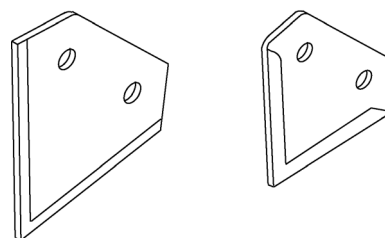
Each kit consisting of 100 #515196 1/2" coring tines or 100 #515197 3/4" coring tines is for thorough aeration programs in the Spring and Fall. Soil cores up to 4" (102mm) in length can be removed with minimal surface disturbance letting in air, moisture and fertilizer to the root zone. The cores on the surface quickly disintegrate forming top dressing for an excellent seed bed. Using this system, rain water run-off is minimized and extra moisture is held down in the root zone.



545363 - Deep Slicing Knife Kit

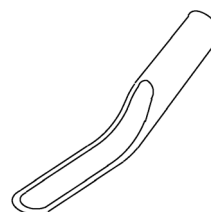
Consists of 100 #521155 slicing knives, this kit is for aeration and renovation programs during all seasons. Slicing knives control thatch by cutting through grass runners and also have the advantage of no surface clean up after aerating. Knives are especially helpful in that they do not place buried seeds of noxious weeds on the surface where they can germinate.

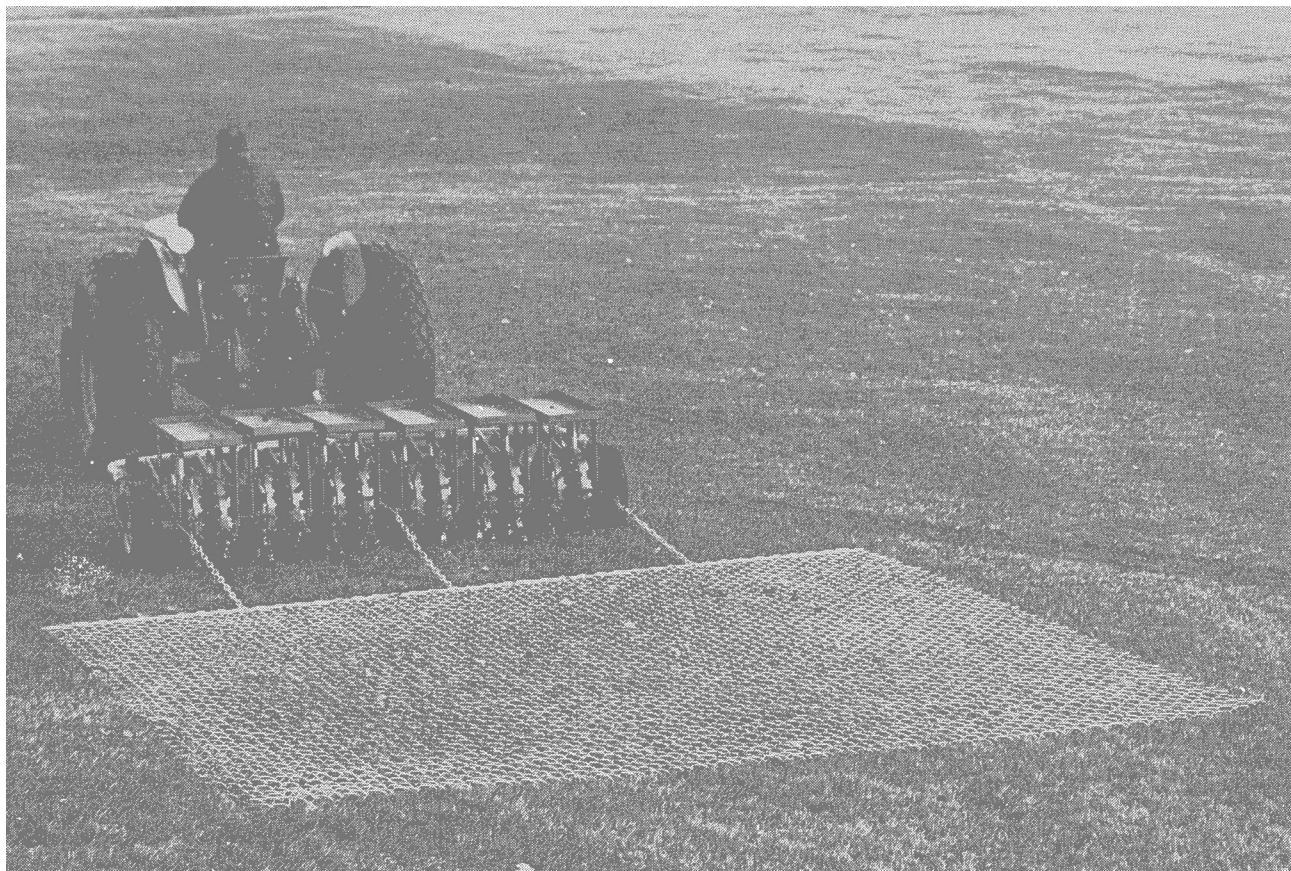
Slicing knives are especially recommended for athletic fields. Due to the "invisible" slices, moisture, air and fertilizer can be trapped while not creating hazardous playing conditions for athletes.



545366 - Aerating Tine Kit

Consists of 100 #520404 tinew, this kit is for turf building and Fall renovation programs. These tines will thoroughly open up the soil by penetrating deep into the ground bringing up large amounts of soil, which then becomes top dressing.



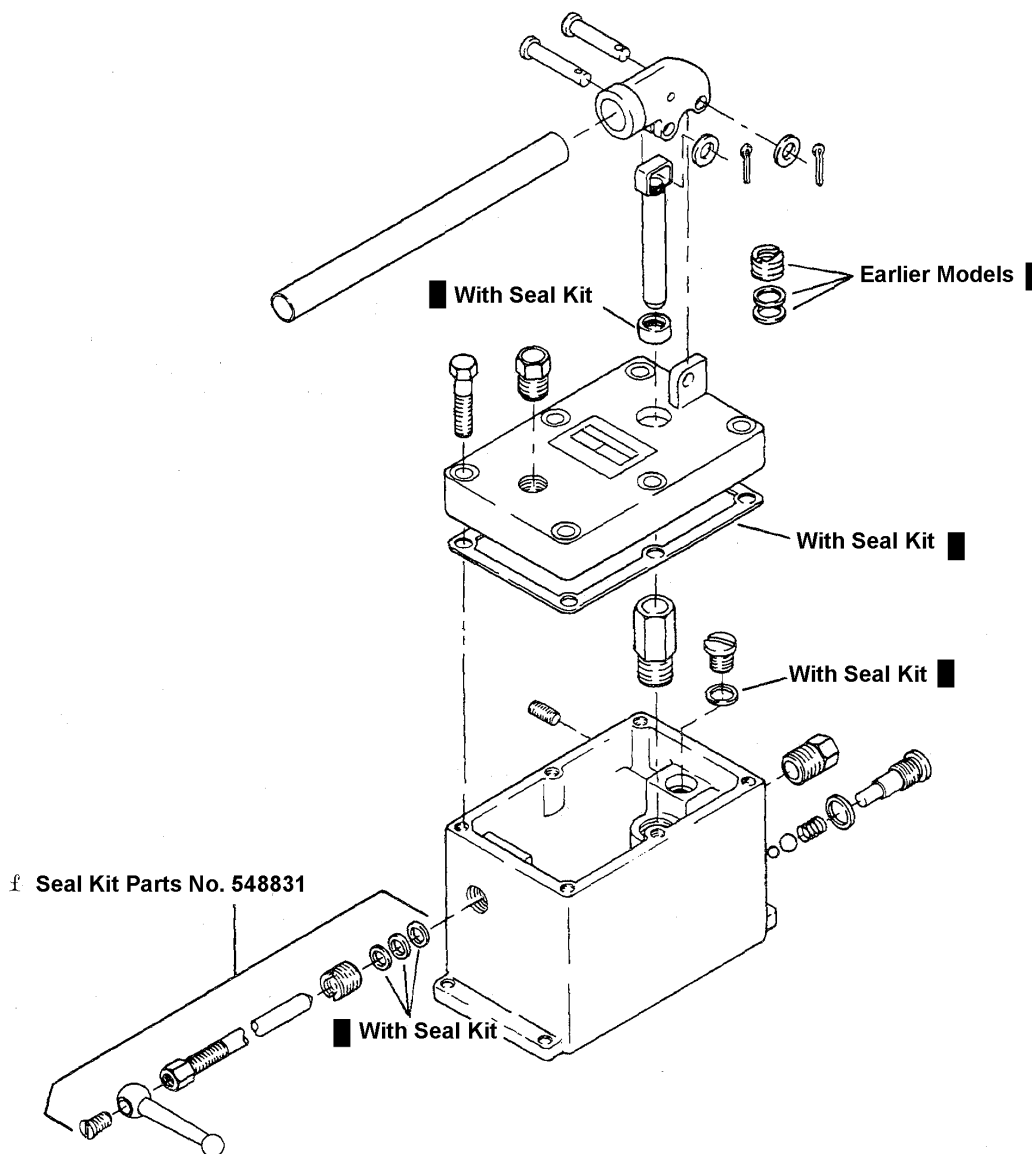


544518 - DRAGMAT

When aerating a fairway, a DRAGMAT can be attached directly behind the Renovaire to break up the cores while aerating all in one quick easy operation.

Mat size: 12' wide x 10' long.

REPLACEMENT PARTS SEAL KITS



SEAL KITS

CGC, Inc. has three service kits available for gasket and seal replacement on worn pumps. Using the illustration shown above and part numbers, determine which Replacement Seal Kit is needed then contact your nearest CGC, Inc. dealer.

f These parts included in Seal Kit Part No. 548831
 These parts included in Seal Kit Part No. 548812

Earlier Models: Some of the earlier models will have these parts to be replaced. Seal kit Part No. 548812 contains these parts, but depending on which model you have, they may not have to be used.

A Relief Valve is also available. The valve is optional and can be obtained by ordering Part No. 548832.

TORQUE SPECIFICATIONS HEX HEAD CAP SCREWS

The torque values shown should be used as a general guideline when specific torque values are not given

U.S. Standard Hardware

Grade	Shank Size (Diameter in inches, fine or coarse thread)													
		1/4	5/16	3/8	7/16	1/2	9/16	5/8	3/4	7/8	1	1-1/8		
SAE grade 5*	ft.-lbs.	9	18	31	50	75	110	150	250	378	583	782		
	N-m	12	24	42	68	102	150	203	339	513	790	1060		
SAE grade 8**	ft.-lbs.	13	28	46	75	115	165	225	370	591	893	1410		
	N-m	18	38	62	108	156	224	305	502	801	1211	1912		
Flangelock Screw w/ Flangelock Nut	ft.-lbs.		24	40										
	N-m		33	54										

* Grade 5 marking -  Minimum commercial quality (Lower quality not recommended).

** Grade 8 marking - 

Metric Standard Hardware

Grade	Shank Size (Diameter in millimeters, fine or coarse thread)														
		M4	M5	M6	M7	M8	M10	M12	M14	M16	M18	M20	M22	M24	M27
Grade 8.8*	ft.-lbs.	2	4	7	11	18	32	58	94	144	190	260	368	470	707
	N-m	1.5	3	5.2	8.2	13.5	24	43.5	70.5	108	142	195	276	353	530
Grade 10.9**	ft.-lbs.	3	6	10	16	25	47	83	133	196	269	366	520	664	996
	N-m	2.2	4.5	7.5	12	18.8	35.2	62.2	100	147	202	275	390	498	747
Grade 12.9***	ft.-lbs.	3.6	7	11	20	29	58	100	159	235	323	440	628	794	1205
	N-m	2.7	5.2	8.2	15	21.8	43.5	75	119	176	242	330	471	596	904

*Grade 8.8 marking -  **Grade 10.9 marking -  ***Grade 12.9 marking - 

PARTS SECTION

FRAME ASSEMBLY

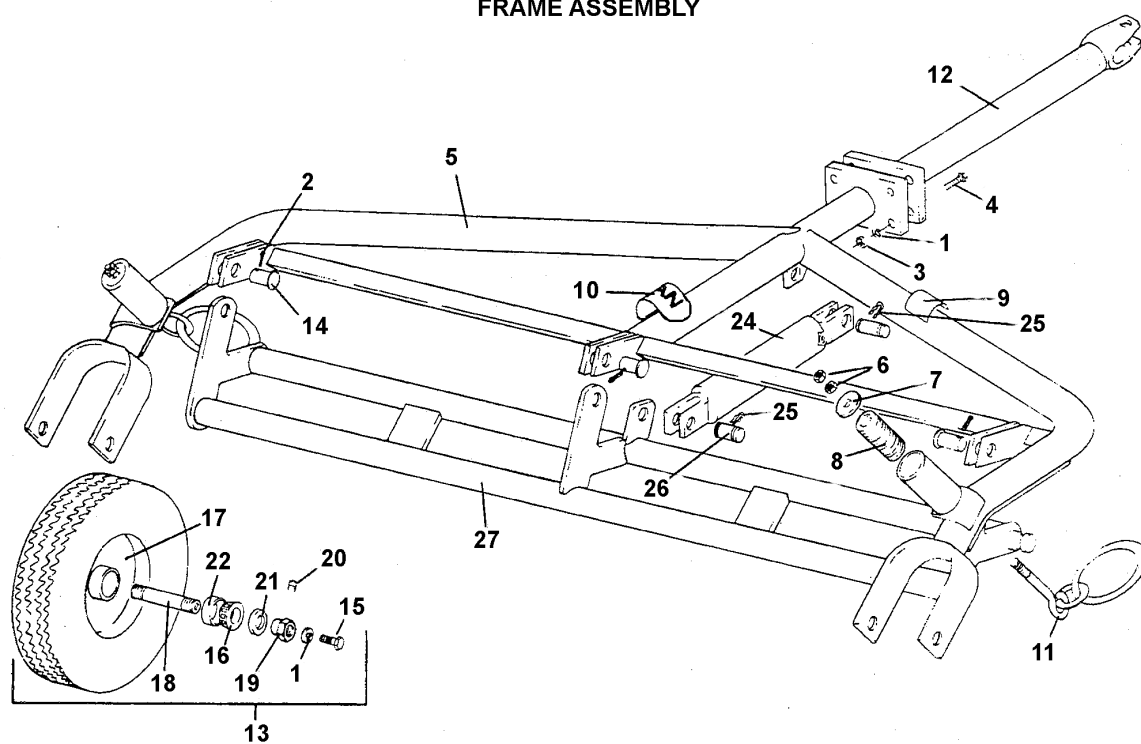


FIGURE 1

ITEM	PART NO.	DESCRIPTION	QTY	ITEM	PART NO.	DESCRIPTION	QTY
1-1	120166	LOCKWASHER-1/2	6				
1-2	120310	PIN-COTTER 1/8 X 1-1/2	3				
1-3	308332	NUT-1/2-13	4				
1-4	311840	BOLT-1/2-13 X 2	4				
1-5	544315	FRAME-MAIN	1				
		(INCLUDES ITEMS 1, 3, 4 & 12)					
1-6	308332	NUT-1/2-13	4				
1-7	515235	WASHER-1/2	2				
1-8	518495	SPRING	2				
1-9	519842	LABEL-INSTRUCTION	1				
1-10	4161125	LABEL-RYAN OVAL SMALL	1				
1-11	546018	EYE BOLT, ASSEMBLY	2				
1-12	545499	TONGUE	1				
1-13	546009	WHEEL	2				
		(INCLUDES ITEMS 1 & 15 - 22)					
1-14	548473	PIN-CRADLE	3				
1-15	306875	BOLT-1/2-20 X 1-1/2	2				
1-16	385174	BEARING-CONE	2				
1-17	515181	HUB	2				
1-18	515182	AXLE	2				
1-19	515183	NUT-3/4-16	2				
1-20	800225	SCREW-SET 10-24 X 1/4	2				
		TIRES-4.80/4.00-8, 4 PLY	2				
		(CAN BE OBTAINED LOCALLY)					
1-21	807630	SEAL-OIL	2				
1-22	808088	CUP-BEARING	2				
1-23*	886735	STEM-VALVE	2				
1-24	546014	CYLINDER-HYD 2-1/2	1				
		(WITH RETAINING RING)					
	545535	KIT-SEAL	1				
	548345	RING-LOCKING	1				
	546014	CYLINDER-HYD 2-1/2	1				
		(WITH LOCK WIRE)					
	545642	KIT-SEAL	1				
1-25	548602	PIN-HAIR	4				
1-26	548603	PIN-CLEVIS	2				
1-27	546017	ASSY-CRADLE	1				

***NOT ILLUSTRATED**

FIGURE 2

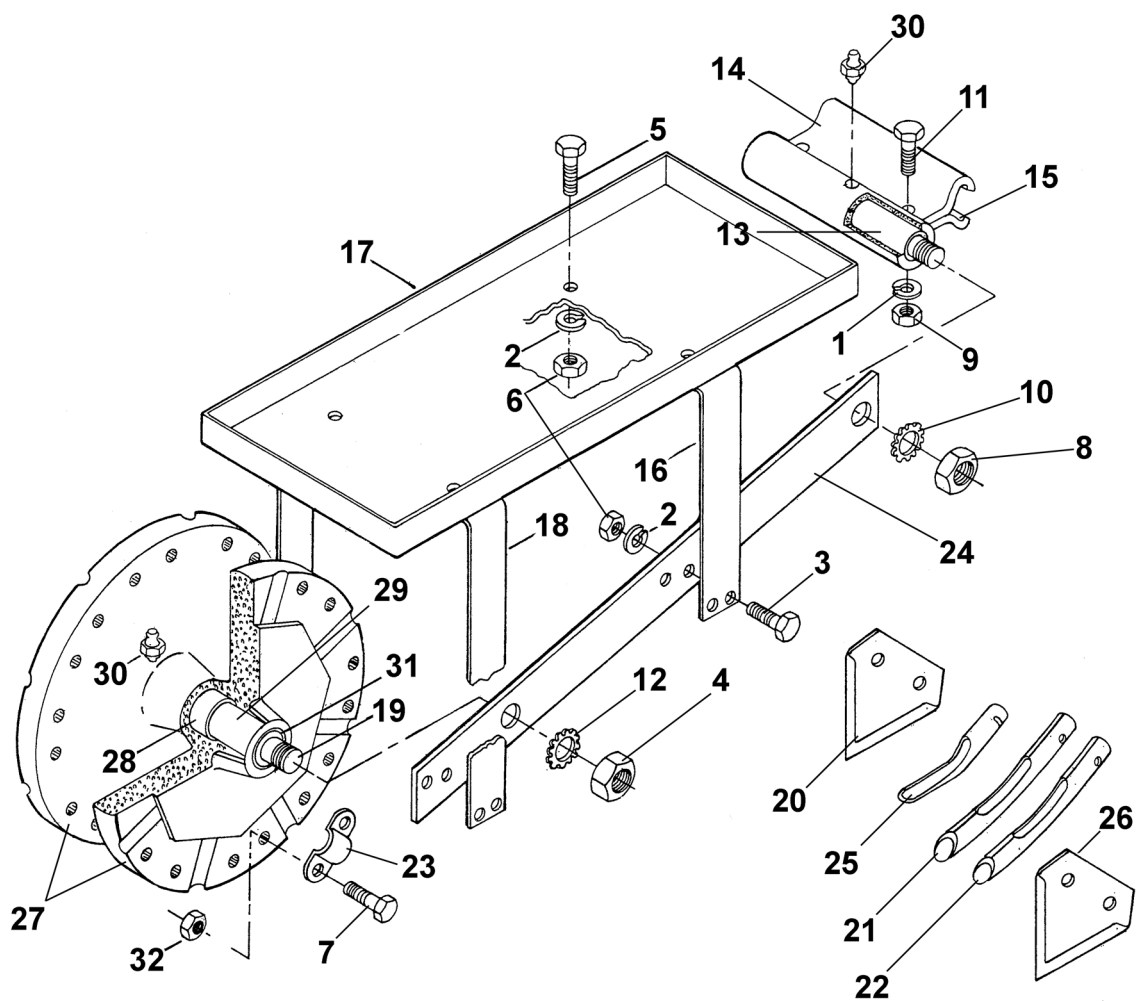


FIGURE 2

ITEM	PART NO.	DESCRIPTION	QTY	ITEM	PART NO.	DESCRIPTION	QTY
2-1	120166	LOCKWASHER-1/2	12				
2-2	120177	LOCKWASHER-3/8	72				
2-3	302600	BOLT-3/8-16 X 1-1/2	48				
2-4	305134	NUT-HEX, JAM, 7/8-14	12				
2-5	306414	BOLT-3/8-16 X 1	24				
2-6	306562	NUT-3/8-16	72				
2-7	306836	SCREW, HEX 3/8-16X2-1/2	192				
2-8	307665	NUT, HEX, JAM, 3/4-16	12				
2-9	308332	NUT, HEX, 1/2-13	12				
2-10	309799	WASHER, SHKPRF, 3/4	12				
2-11	316912	SCREW, HEX 1/2-13X2-1/4	12				
2-12	316954	LOCKWASHER-7/8	12				
2-13	515103	SHAFT	6				
2-14	515109	CLAMP	6				
2-15	515115	CAP	6				
2-16	515118	SUPPORT-WEIGHT TRAY	6				
2-17	515119	TRAY-WEIGHT	6				
2-18	515120	SUPPORT-WEIGHT TRAY	6				
2-19	515185	AXLE	6				
2-20	515193	KNIFE-SHALLOW	96				
2-21	515196	TINE, 1/2" CORING	96				
2-22	515197	TINE, 3/4" CORING	96				
2-23	515198	CLAMP-TINE	96				
2-24	515204	RAIL-SIDE	12				
2-25	520404	TINE, AERATING	96				
2-26	521155	KNIFE, DEEP SLICING	96				
2-27	546048	WHEEL	12				
2-28	515184	BUSHING	12				
2-29	521814	SPACER	12				
2-30	548230	FITTING	18				
2-31	548256	SEAL-OIL	24				
2-32	548804	NUT-3/8-16 FLANGELOCK	192				

FIGURE 3

HYDRAULIC HAND PUMP

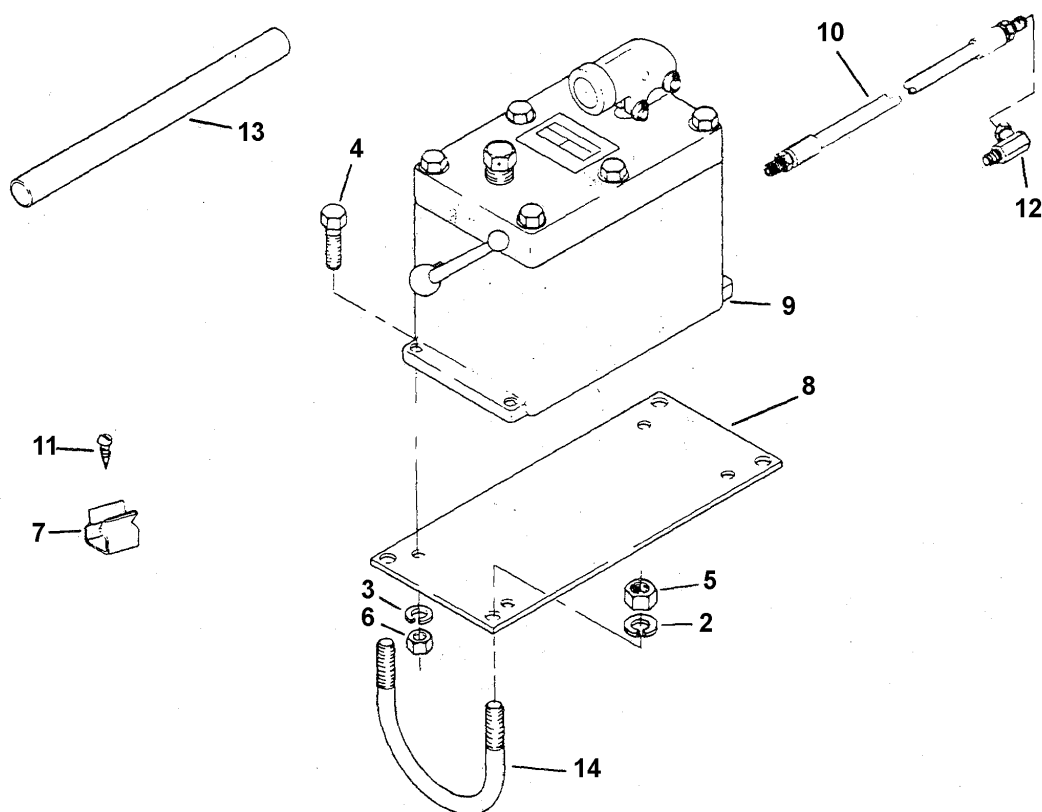


FIGURE 3

ITEM	PART NO.	DESCRIPTION	QTY	ITEM	PART NO.	DESCRIPTION	QTY
3-1	545370	PUMP KIT, COMP	1				
3-2	120177	LOCKWASHER-3/8	4				
3-3	306325	LOCKWASHER-5/16	4				
3-4	306435	BOLT-5/16-18 X 1-1/4	4				
3-5	306562	NUT-3/8-16	4				
3-6	306932	NUT-5/16-18	4				
3-7	518455	CLIP-HANDLE	2				
3-8	521656	PLATE-PUMP	1				
3-9	546010	HOUSING-PUMP	1				
3-10	546012	HOSE-HYD 20" (508 mm)	1				
3-11	548020	SCREW-#10 X 5/8 SLF TP	2				
3-12	548390	FTG-90 SWIVEL, HYD	1				
3-13	548592	HANDLE	1				
3-14	814494	U-BOLT-3/8-16	2				

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