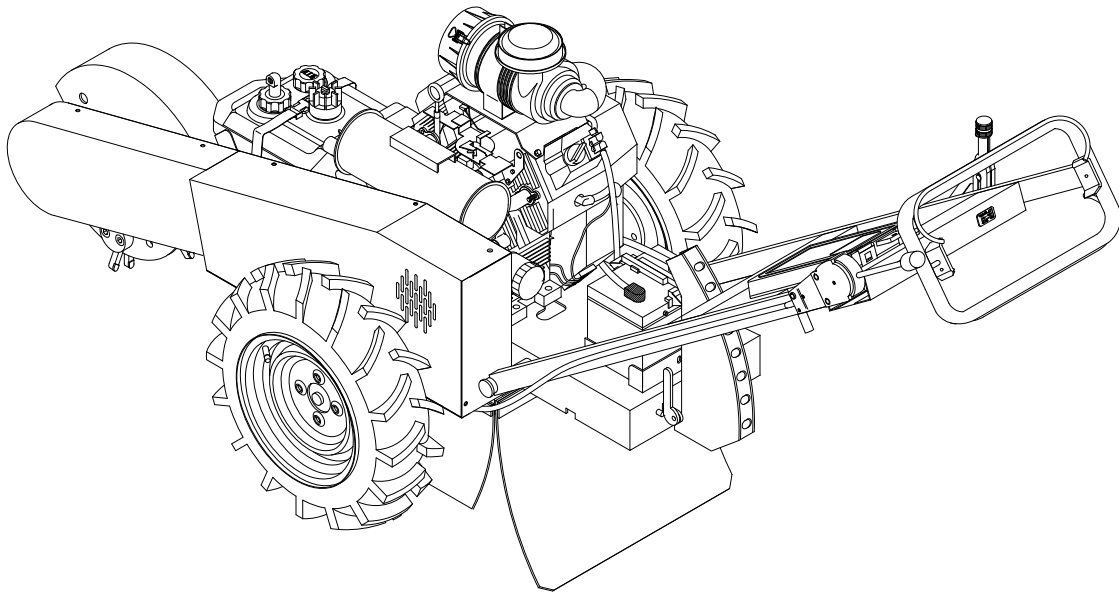


**Model 16-20 P/16-24 P/16-20 SP/16-31SP
Stump Grinders
Operation & Maintenance Manual**



**PowerTek Inc.
P.O. Box 3
Lebanon, In. 46052
1-877-769-7835**

2-23-09

TABLE OF CONTENTS

WARNINGS SAFETY.....	2-3
HOW TO USE YOUR STUMPER.....	4
WORK ZONE.....	5
INITIAL INSPECTION.....	6
TRANSPORTATION & SET-UP.....	6-7
OPERATION.....	7-10
STARTING.....	7
GRINDING STUMPS.....	8
ADJUSTABLE HANDLE FREIGHT.....	8
DIRECTIONAL CONTROL.....	9
STOPPING.....	10
MAINTENANCE.....	11-14
ENGINE.....	11
FUEL.....	11
BATTERY.....	11
BELTS.....	11
CUTTER BELT REPLACEMENT.....	11
HYDROSTATIC DRIVE BELT REPLACEMENT.....	11
HOUR METER.....	11
SHARPENING CUTTERS.....	12
REPLACING CUTTERS.....	13
TOOTH GAUGE.....	13
CUTTER WHEEL BEARINGS.....	13
HYDRAULIC OIL.....	14
MAINTENANCE SCHEDULE.....	14
EXPLODED VIEW 16/20 SP & 16/24 SP.....	15
PARTS LIST 16/20 SP & 16/24 SP.....	16
EXPLODED VIEW 16/20 P & 16/24 P.....	17
PARTS LIST 16/20 P & 16/24 P.....	18
ELECTRICAL SCHEMATICS.....	19
WARRANTY INFORMATION.....	20-21



WARNING

WARNING TO PURCHASERS OF INTERNAL COMBUSTION ENGINE EQUIPPED MACHINERY OR DEVICES IN THE STATE OF CALIFORNIA:

The equipment that you have purchased does not have a spark arrester muffler. If this equipment is to be used on any forest or brush covered land or grass covered un-improved land in the State of California, the law requires that a spark arrester muffler be installed and be in effective working order. The spark arrester must be attached to the exhaust system and comply with Section 4442 of the California Public Resource Code.

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



WARNING

This manual contains vital information for the safe use and efficient operation of this equipment. Carefully read this operation maintenance manual before using this equipment, as failure to adhere to the instructions could result in death, serious bodily injury and/or property damage.

The Stump Grinder is to be used only for grinding tree stumps. Using this machinery for any other purpose may cause injury and or property damage. Improper use of the grinder will void the warranty.

1. ***Read the entire owner's manual carefully before operating the stump grinder. Also, read the entire Engine Operator's Handbook.*** Familiarize yourself with the, proper use of the Stumper. Know the controls and how to stop quickly.
2. Do not allow children to operate the stump grinder. Do not allow adults to operate the stump grinder without proper instruction- Do, not allow anyone to operate the stump grinder who is not acquainted with the Safety Instructions.
3. Be especially watchful of children and pets darting into the operating area and/or danger zone.
4. Wear protective clothing-long pants and heavy work boots as well as ear and eye protection while operating the Stumper.
5. Keep your mind and eyes on the machine while operating it. Do not let others distract you.
6. Check the stump grinder for any loose parts before operating.
7. *Never* place hands or feet anywhere near the cutter blade. The blade is larger than it appears when it is operating.
8. Make sure you are aware of the location of any pipes (water, gas, electrical, etc.) above or below the ground.
9. Clear the work area of all foreign objects such as sticks stones wires, etc.
10. Turn off clutch before moving
11. Never operate the unit without the safety guards in place and operating properly. Keep equipment in good working condition.
12. Take all possible precautions when leaving unit unattended. Stop engine and remove ignition key to prevent unauthorized use.
13. When refueling machine: shut off engine, do not smoke or allow any hot or burning material near.
14. Before removing or replacing teeth or belts, or before performing any maintenance: shut off engine and wait for all moving parts to stop, disconnect spark plug wire' and remove key.
15. **Stability:** The stump grinder has a narrow wheelbase and can become unstable under adverse conditions. Always go straight up or down on steep hills. Avoid steep side angles. When grinding avoid dropping one wheel into a hole to avoid a side tip of the unit.
16. When stump grinder is being transported on a trailer or in a truck make sure the machine is securely fastened to prevent property damage.

BEFORE YOU CUT:

Before you start to grind the stump, remove all debris-dirt, rocks, metal, and loose wood from around the area of the stump before the first cut. Be sure to remove any debris that may also be embedded in the tree stump itself. Debris can wear or damage the cutting teeth and can be a safety hazard. If the teeth meet these foreign objects, the stump cutter can propel these objects great distances.

Before you start the machine, become familiar with all of the controls on the stump grinder. Locate the key switch, throttle, choke, presence handle, brake and forward or reverse lever. Check to see if the debris curtains and guarding are in place to help reduce flying objects. Take time to read all the decals and warnings that are on the machine. Read the operation and maintenance manual, it will give you information that can save you time as well as prevent serious injury.

Make sure the teeth on the cutter wheel are in good shape. Inspect them for sharpness, freedom from nicks, and damage. Teeth can wear down quickly causing performance problems as well as lost productivity.

When you are finished, lift the cutter wheel from the stump before shutting the engine off.

OPERATION:

The type of wood will determine how much to cut at one time. Softer woods such as pines or firs are easier to remove than harder woods such as elm, oak, ash or maple. For harder wood, take shallow cuts. Cutting harder woods will dull teeth faster, therefore, be prepared by having an extra set of teeth available.

If the stump is on a hill, level the area where the stump grinder will be setting. If grinding is attempted without leveling, the stumper could tip over. Also, engage the cutter wheel before allowing the cutter wheel to touch the stump.

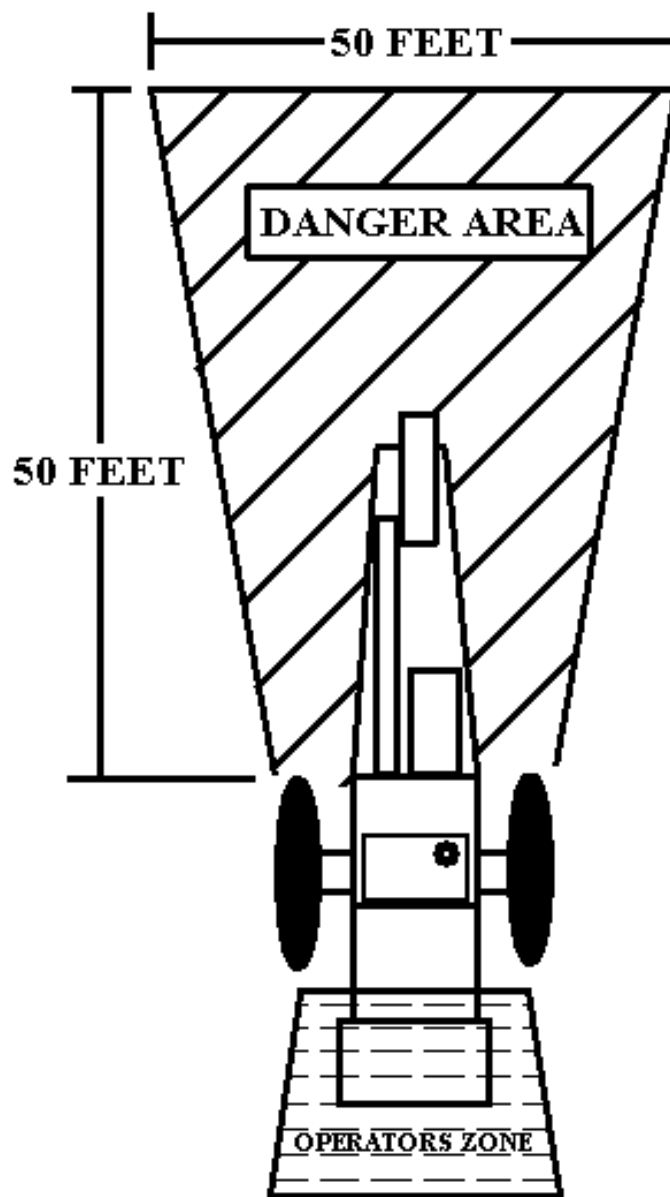
Do not take large cuts. The recommendation is to take 1-inch deep cuts and then sweep side to side. Cuts deeper will not only slow productivity but could cause damage to the machine as well as personnel injury. Also, start at the front of the stump and work toward the center. If the stump is very large, it may be necessary to work from more than one side.

When grinding you may go as low as 12 inches below ground level. Make sure to clear away all dirt, rocks, and debris before you continue to grind.

SAFETY TIPS:

The stump grinder is a powerful machine and can throw debris. Be prepared by wearing protective clothing such as gloves, ear protection, eye protection, long pants, and heavy boots. Never leave the operating position while the machine is engaged in a stump.

Make sure there is no one near the machine while it is in use. Use signs and/or barricades to restrict pedestrian traffic around the danger zone. Keep all children away from the stump grinder and the work area.



WARNING

When operating grinder do not allow anyone to be in the danger zone while stump grinder is running or serious injury or death may occur.

INSPECTION

Upon receiving your stump grinder, inspect and report any shipping damage to the carrier immediately. PowerTek is not responsible for damage during transportation.

TIRES

Inflation pressure may change with temperature and or altitude. Check and adjust tire pressure to the tire manufacturer's recommended tire pressure as marked on the tire of the stump grinder.

BATTERY

As a safety precaution, the positive cable has been disconnected from the battery. Remove the unit from the shipping pallet, reconnect the cable to the terminal, and charge the battery.

ENGINE

The stump grinder engine was shipped from PowerTek with the proper amount of oil. However, you should double-check the level and add to or change the oil if conditions warrant. (see Engine Operators Handbook for full details).

HYDRAULIC DRIVE

The hydraulic transmission and gear reducer are shipped with the proper amount of oil. Again, double check the levels and add to the level if needed.

PRE-USE INSPECTION

Check for any loose bolts or parts before starting or first use.

PREPARATION:

Unit should not be operated until the owner's manual is read, all safety decals are noted and the user has complete knowledge of all controls.

TRANSPORTATION

It is the responsibility of the owner and/or operator to be aware of and abide by all applicable state and local regulations regarding transport of equipment and trailers (i.e. lights, tags, registration, etc.). Pick-up truck or similar vehicle may be used to transport the machine. The stump grinder may also be transported on any suitable trailer. Make sure it is properly secured.

SET-UP

The following procedures should be performed before each use of the stump grinder.

Check the unit for any loose parts. Tighten nuts and bolts and make sure all safety guards and devices (Belt Guard, Brakes, Kill Switch and Clutch Switch) are securely in place and working. Please check all cutters to make sure they are tight.

Check the cutters for dulling. It is important to keep cutters sharpened by grinding or replacing them. Dull cutters will cause excessive engine wear and poor performance. See the Maintenance Instructions for details.

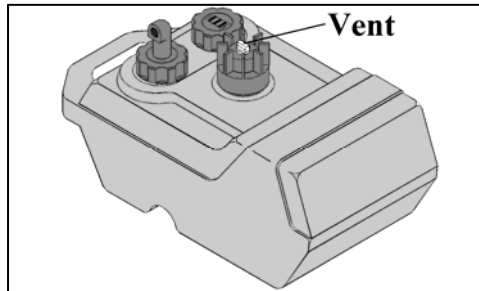
Check the oil and fuel level in the engine. Follow the Engine Operators Handbook if fluid needs to be added or changed.

Check the air filter. The air filter should be cleaned of dust regularly. See the Engine Operators Handbook for details.

Check the tension of the engine belts. The cutter wheel belts should have a deflection at the center of 3/8", under 15-lbs. deflection. Recheck belt tension after every use.

Check the hydraulic oil level. See the Maintenance Instructions for checking the hydraulic oil level.

Gas Tank Vent. When operating the stump grinder, make sure the gas tank vent is open. (It is threaded vent.) If the vent is not open the stump grinder will not run properly. Close Vent when transporting the stump grinder or re-fueling the gas tank (Fig. 1).

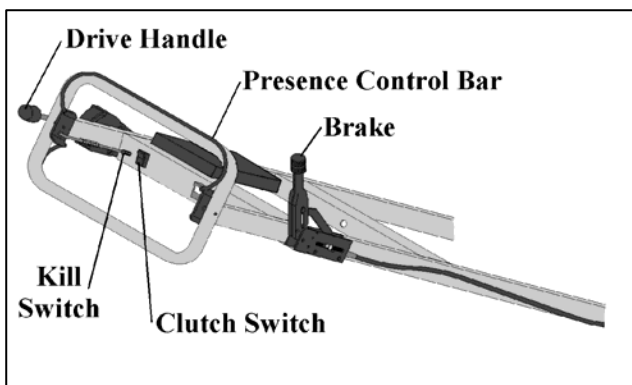


(Fig. 1)

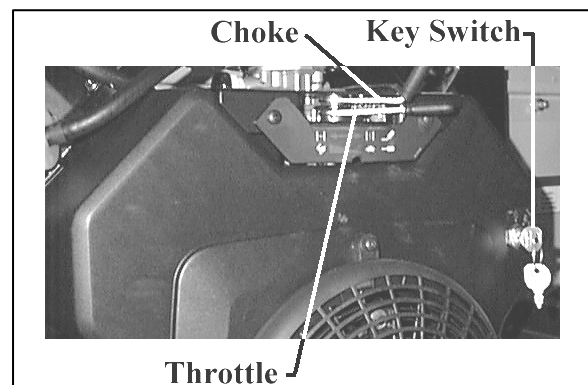
STARTING (Fig. 2 & 3)

1. Turn the electric clutch switch off. **The engine will not start if the clutch switch is on.**
2. Pull the choke all the way out.
3. Slide the throttle to about 1/4 throttle.
4. Depress the operator presence control bar and turn the ignition switch until you hear the engine start.
5. Keep the control bar depressed and push the choke back in.

Important Note: The control bar is designed as a safety feature. The engine will not start or operate without depressing the presence control bar.



(Fig. 2)



(Fig. 3)

GRINDING STUMPS

1. Start the engine according to instructions
2. Use the throttle to gradually bring the RPM's up to full speed.
3. To move the stump grinder, gradually push the drive handle forward. Full handle forward is walking speed. Pull back on the drive handle to travel in reverse.
4. Position the cutter wheel over the front edge of the stump and set the brake. You may need to adjust the handle position for better leverage depending on the height of the stump.
5. Once you have maneuvered the stump grinder near a stump, turn the clutch switch on to engage the cutter wheel. When the engine is cold, you may have to flip clutch switch off and on quickly to keep the engine running.
6. Slowly lower the stump grinder until the wheel comes in contact with the stump. Move the stump grinder back and forth in a long slow sweeping motion. Maintain the same elevation until a section has been removed, then lower stump grinder to take out the next section and continue until the front part of the stump is removed.
7. When the front part of the stump has been removed, release the brake and move the grinder forward to the new edge, and reset the brake.
8. Repeat Steps 6 and 7 until the stump is completely removed. Do not exceed 12" below ground level or 18" above the ground.
9. Turn the clutch switch off and wait for the cutter wheel to stop spinning before moving.

Important Note: For better performance and to avoid excessive clutch wear, run the engine at full throttle during operation.

ADJUSTABLE HANDLE HEIGHT

The handle can be raised or lowered to provide different leverages to better handle different stump heights. (Maximum stump height 18" above ground. Maximum below ground cut is 12")



CAUTION

Shut off engine and wait for all moving parts to stop before adjusting handle.

TO ADJUST THE HEIGHT:

Holding the handle firmly, pull the handle lock pin to unlock the handle. Raise or lower the handle as needed and let the lock pin slip back into one of the holes in the bracket.

To lock the handle in the towing position:

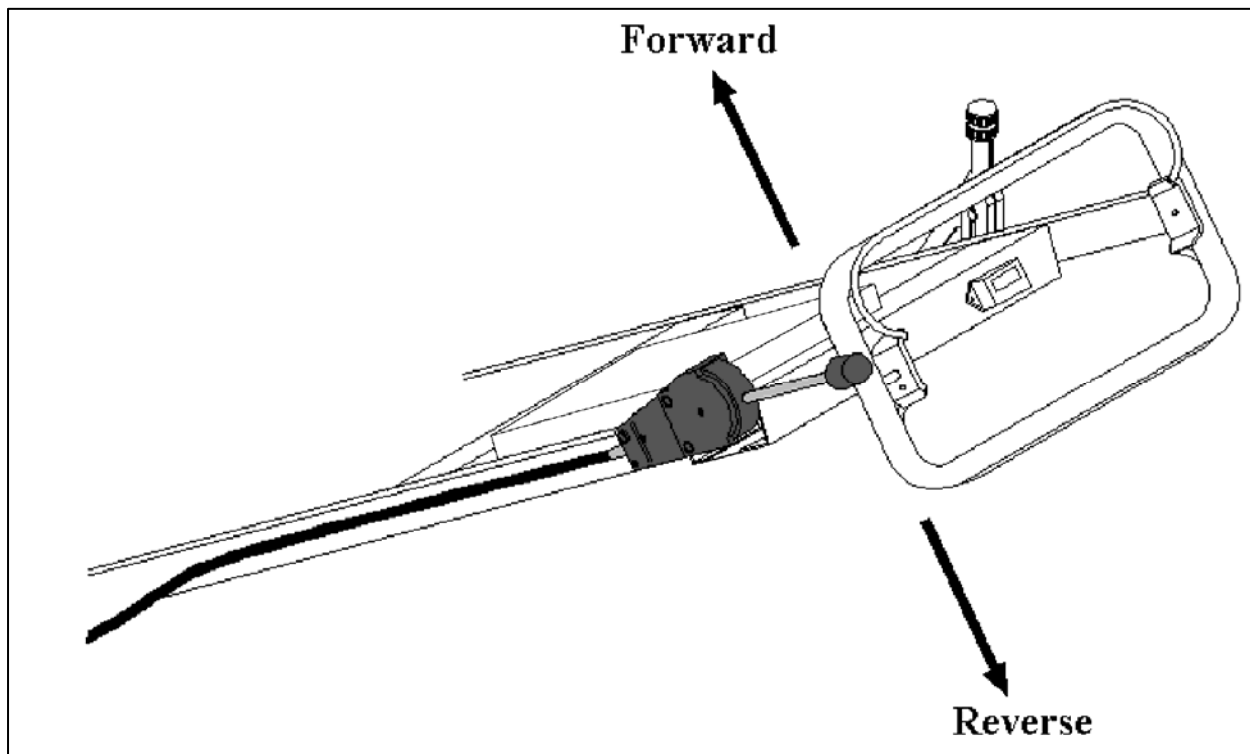
1. Remove the handle fold-up link from the info tube.
2. Push the handle all the way forward and hold it firmly in its upright position.
3. Slide the link (hole end) onto the handle lock pin and slide the other end (peg end) into the topmost hole of the bracket.
4. Replace the hairpin cotters in the lock pin and link.

DIRECTIONAL CONTROL (SP)

The drive system consists of a hydrostatic transmission and differential axle assembly. The hydrostatic control lever at the handle bar, controls forward and reverse, and automatically returns to neutral or stop when released. Always 'feather' the finger control lever-easing it into the direction desired. Pushing the control lever forward propels the grinder forward, pulling the control lever back reverses the grinder (Fig. 4).

! CAUTION

Pushing the hydrostatic lever full forward may cause stump grinder to jump forward, injury or property damage may occur. Use light pressure on hydrostatic lever to maintain proper control of stumper.



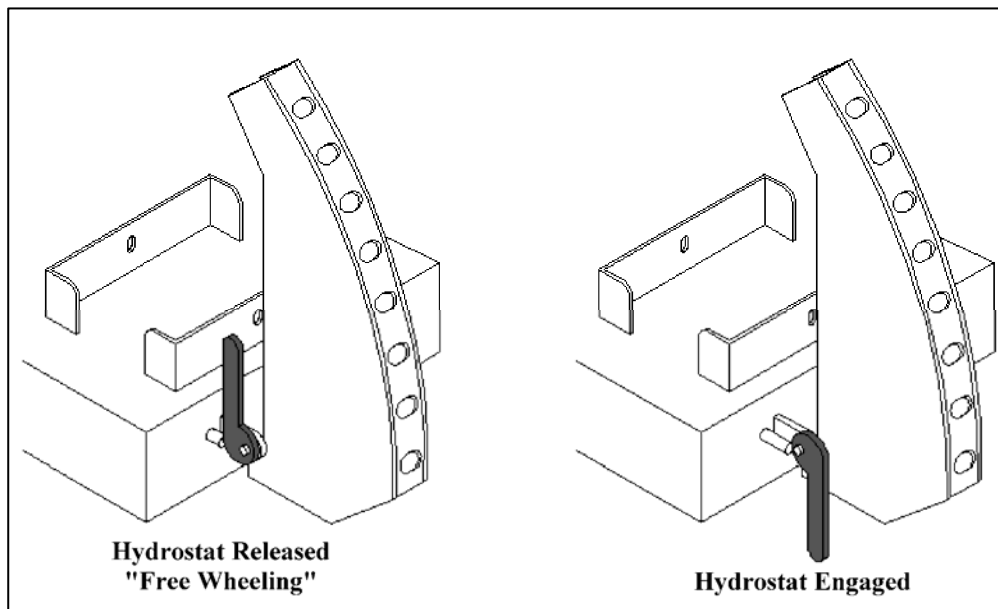
(Fig. 4)

BY PASS CONTROL (SP)

The hydrostatic also has a 'by-pass' control which enables the operator to manually move the machine when desired. This control is located at the rear of the main frame-lower left-hand side and is clearly identified. To put the grinder in a "free-wheeling mode" rotate the bypass handle up until it locks in place. To return it to powered travel, lower the bypass handle to original position. See Fig. 5.

CAUTION

DO NOT start or run the engine with the "by-pass" lever in the "up" or the "free-wheeling" position! DAMAGE will occur to the hydrostatic transmission. Use the "up" position ONLY when you wish to move the unit manually without the engine running.



(Fig. 5)

STOPPING (SP)

1. Turn the clutch switch off.
2. Gradually reduce the throttle down idle.
3. Turn the ignition switch off.
4. Release presence control bar remember the stump grinder will not restart until clutch switch is turned off. Releasing the presence control bar will stop the stumper at anytime.

Important Note: Make sure to allow the cutter wheel to stop spinning before lowering the stump grinder nose to the ground.

ENGINE

Follow the instructions in the Engine Operators Manual for all maintenance of the engine such as checking the oil, cleaning air filters, etc.

FUEL

Use standard unleaded gasoline in the stump grinder engine.

BELTS

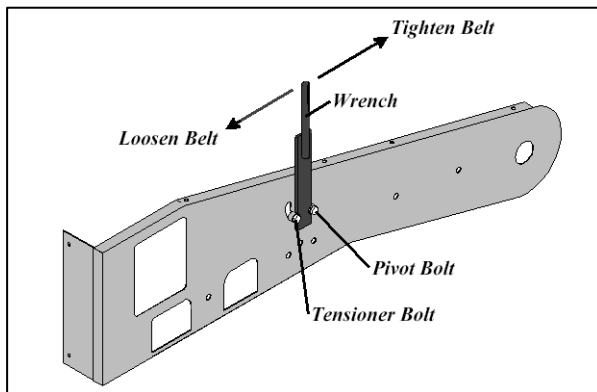
Check the condition and tension of the drive belts before each operation. When properly tensioned, the belts should give a 3/8" deflection at the center span under approx. 15 lbs. of pressure.

CUTTER BELT REPLACEMENT

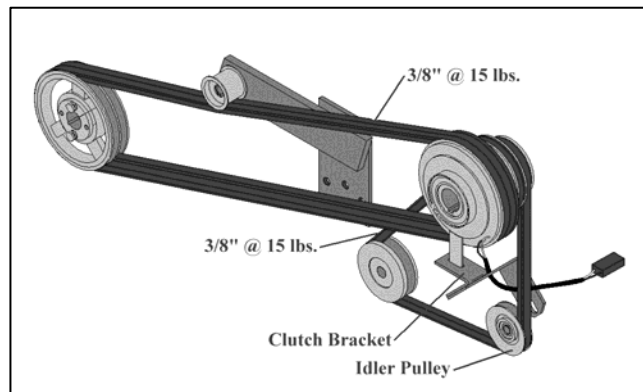
If the belts are excessively worn or can no longer be properly tensioned, they must be replaced. Use a 2A94 size belt when replacing the belt. To remove cutter belt, lightly loosen the tensioner bolt and the pivot bolt on the backside of the belt cover in front of the engine. Place tensioner wrench between the two tension bolts. Push the wrench handle away from the cutter wheel. Remove belt. Replace with new belt. Pull wrench handle toward cutter wheel until proper tension of 3/8" at 15 lbs. is attained. Hold wrench as you tighten the tensioner bolt and pivot bolt. Replace belt cover. See fig. 6 & 7.

HYDROSTATIC DRIVE BELT REPLACEMENT

To remove hydrostatic drive belt, remove cutter belt as described above. Loosen the clutch bracket and remove. Loosen idler pulley and slide forward. Remove belt. Replace with a new AX-35 belt. Replace belt over clutch pulley, hydro pulley, and idler pulley. Slide idler pulley until belt is tensioned to 3/8" at 15lbs. Tighten idler pulley. Replace clutch bracket and re-tighten. Replace cutter drive belt as above. Replace belt cover. **See fig. 7.**



(Fig. 6)



(Fig. 7)

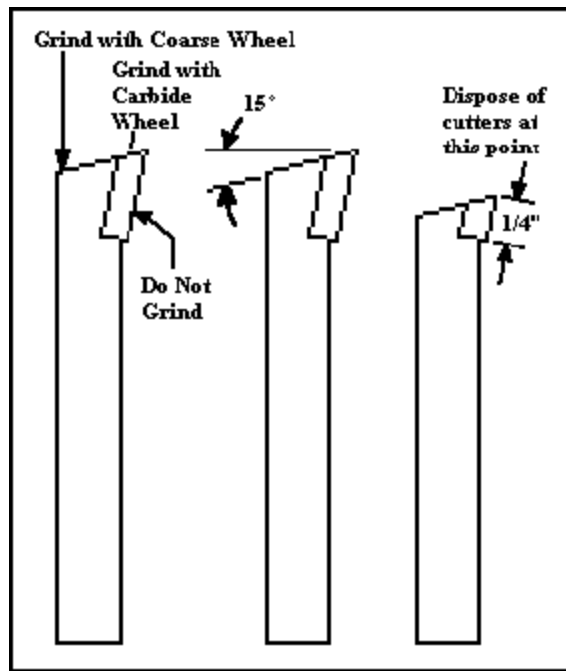
HOUR METER

The meter is fully automatic with a display that may be read at all times, whether the engine is on or off. During running times, engine RPM is shown; after shut down, Accumulated Running Time is shown. After 25 hour of running time, the meter will automatically blink as a signal for oil change. It will continue to blink for a (2) hour period of accumulated running time (ie., 25 to 27 hours). The next alert will automatically appear in 25 hours. No re-set is required.

SHARPENING CUTTERS

The cutters should be sharpened frequently for higher performance and a longer life. It is also easier to grind them if they are ground often.

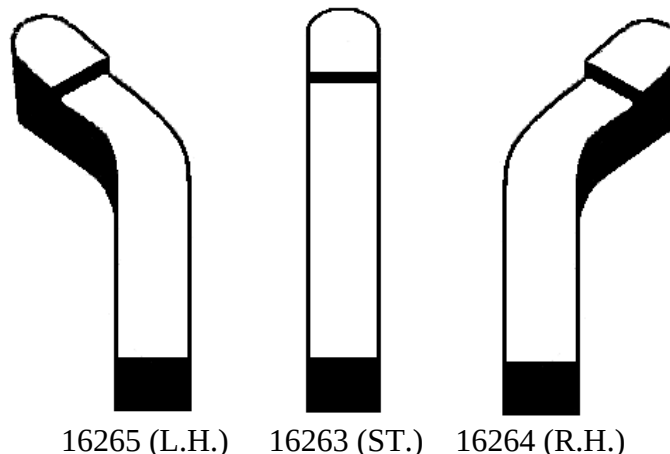
*You will need a carbide-grinding wheel (green wheel) to sharpen them. Use a coarse grinding wheel to grind the steel shank. Be sure to maintain the back grind of 15 degrees (approximately). The cutters must be replaced when the tooth has been sharpened so that 1/4" (approximately) of the carbide is left.



(Fig. 8)

TOOTH SELECTION

WHEN ORDERING TEETH USE THIS GUIDE TO ORDER SINGLE TEETH.



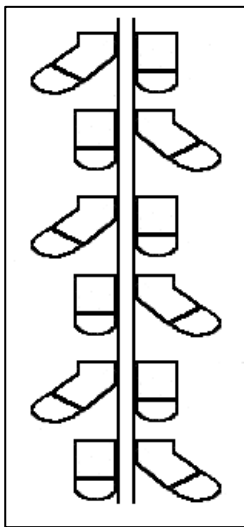
16265 (L.H.) 16263 (ST.) 16264 (R.H.)

REPLACING CUTTERS (Fig. 9)

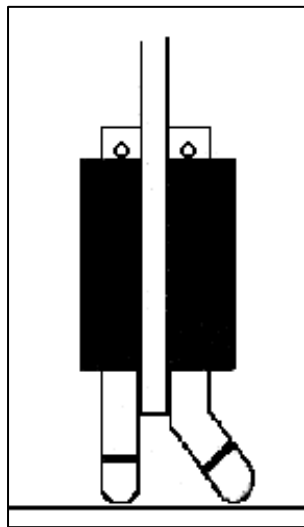
Remember before you replace any cutters you must turn the engine off, wait for moving parts to stop, remove the key from the ignition and remove wires from spark plugs.

1. Put the handle in the transport position and tilt the Stumper all the way back until it rests firmly on the ground.
2. To make cutter replacement easier, you can slide tensioner wrench handle through the hole in the cutter guard and cutter wheel. This will prevent the wheel from turning during blade replacement.
3. Loosen the allen head bolts (16262) from each of the cutter pockets and remove the cutters.
4. Install the new cutters in pairs alternating the cutters as shown.
5. Tighten the allen head bolts only tight enough to hold the cutters in the pockets, make sure all of the cutters are extended past the cutter wheel equally. **(Fig. 10)**
6. Torque each allen head bolt to 175 ft. lbs. (alternating as you tighten) to lock the cutters in the pockets.
7. Once you have installed all of the cutters, double check to make sure all the allen head bolts have been tightened securely and make sure all the cutters are equally extended. **NOTE:** cutter wheel viewed from bottom of stumper. **(Fig. 9)**

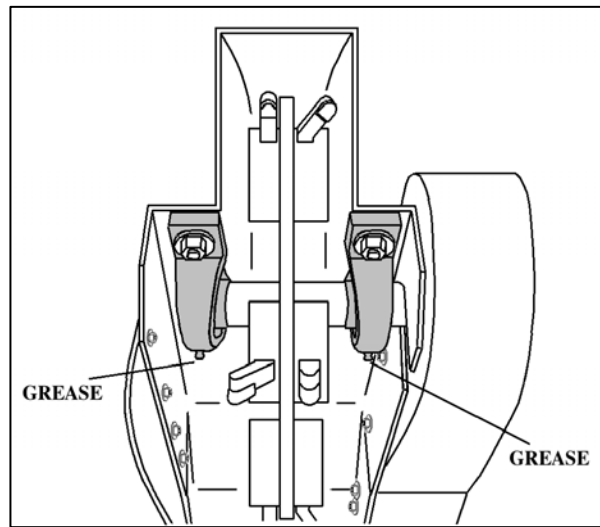
Important Note: Do not operate the Stumper if any of the cutters are missing. This will cause the cutter wheel to be out of balance. Also, make sure all of the pockets are the same kind.



(Fig. 9)



(Fig. 10)



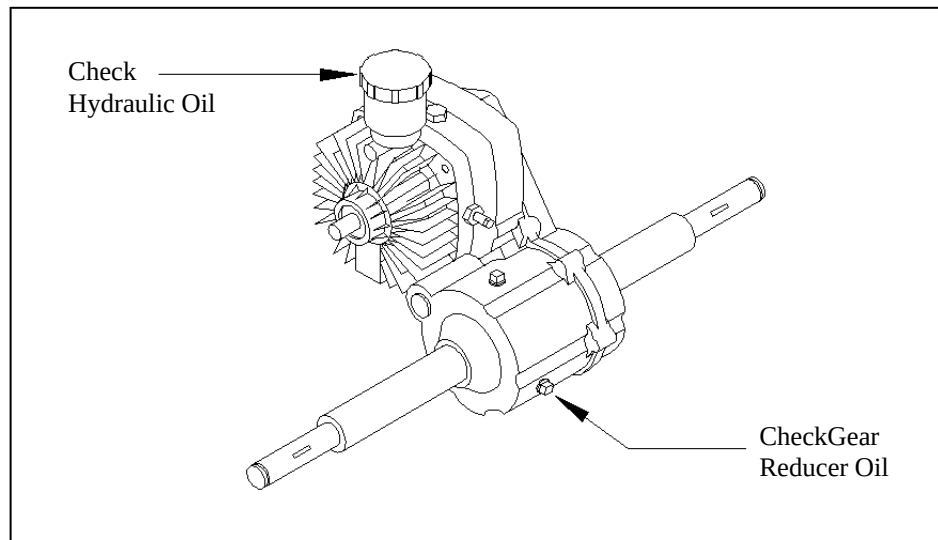
(Fig. 11)

CUTTER WHEEL BEARINGS (Fig. 11)

Grease -cutter wheel bearing every 40 hours of operation **NOTE: DO NOT OVERGREASE.**

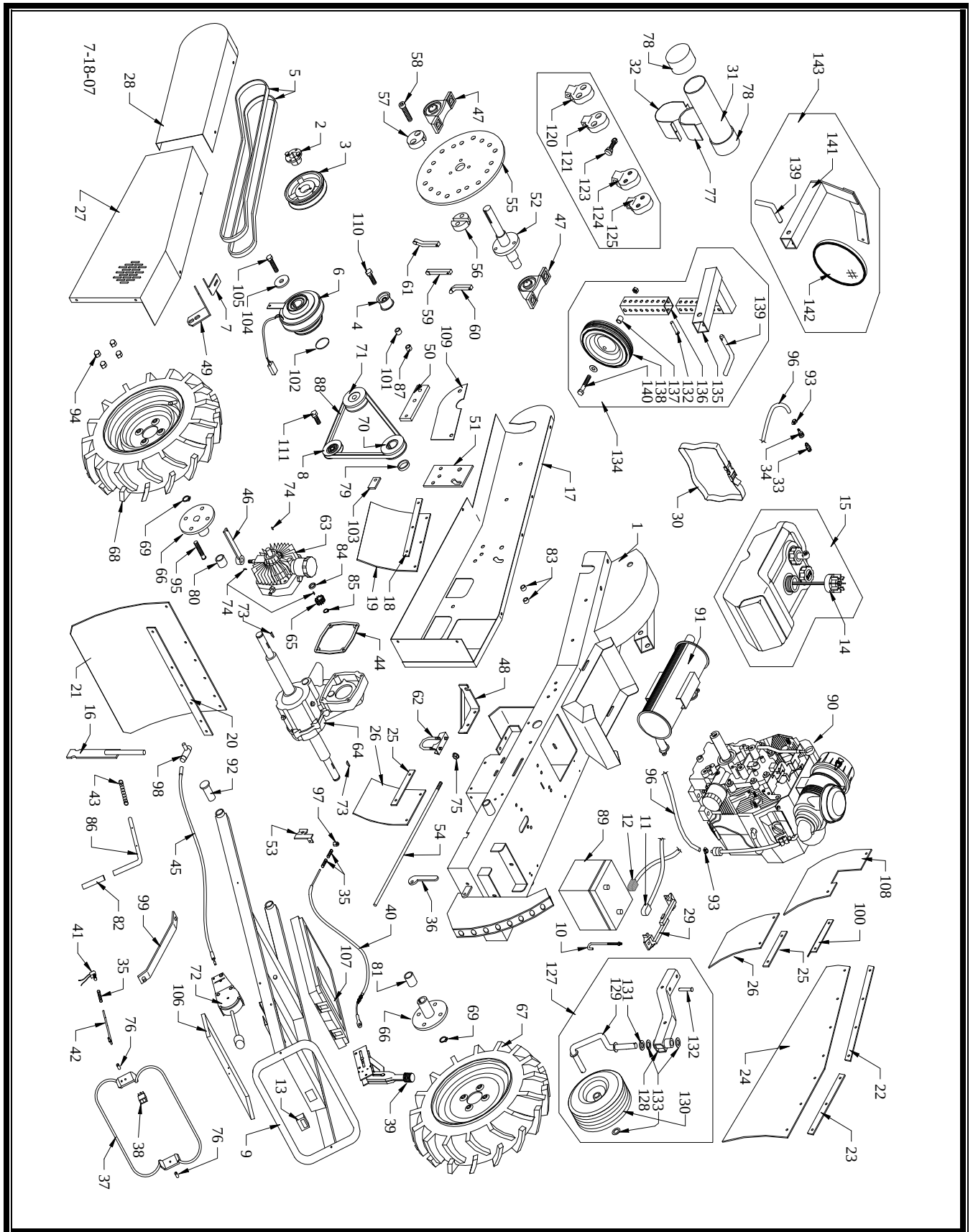
HYDRAULIC OIL

Use- SAE 20W Hydraulic Oil - In hydraulic Pump (16267) only. You will need to check the hydraulic oil level in both the transmission and the gear reducer. To check the transmission read the level mark located on the bottom of the fill cup. Use SAE 20W hydraulic oil to fill the hydrostatic transmission. To check the gear reducer (16268) you will need to get, underneath the stump grinder. After removing the orange plug, you can check the level with your fingertip or use a squeeze container to fill the reducer until some oil drips out of the hole. Then re-plug the hole. Use SAE 90 weight gear lube in gear reducer, (See fig 12).



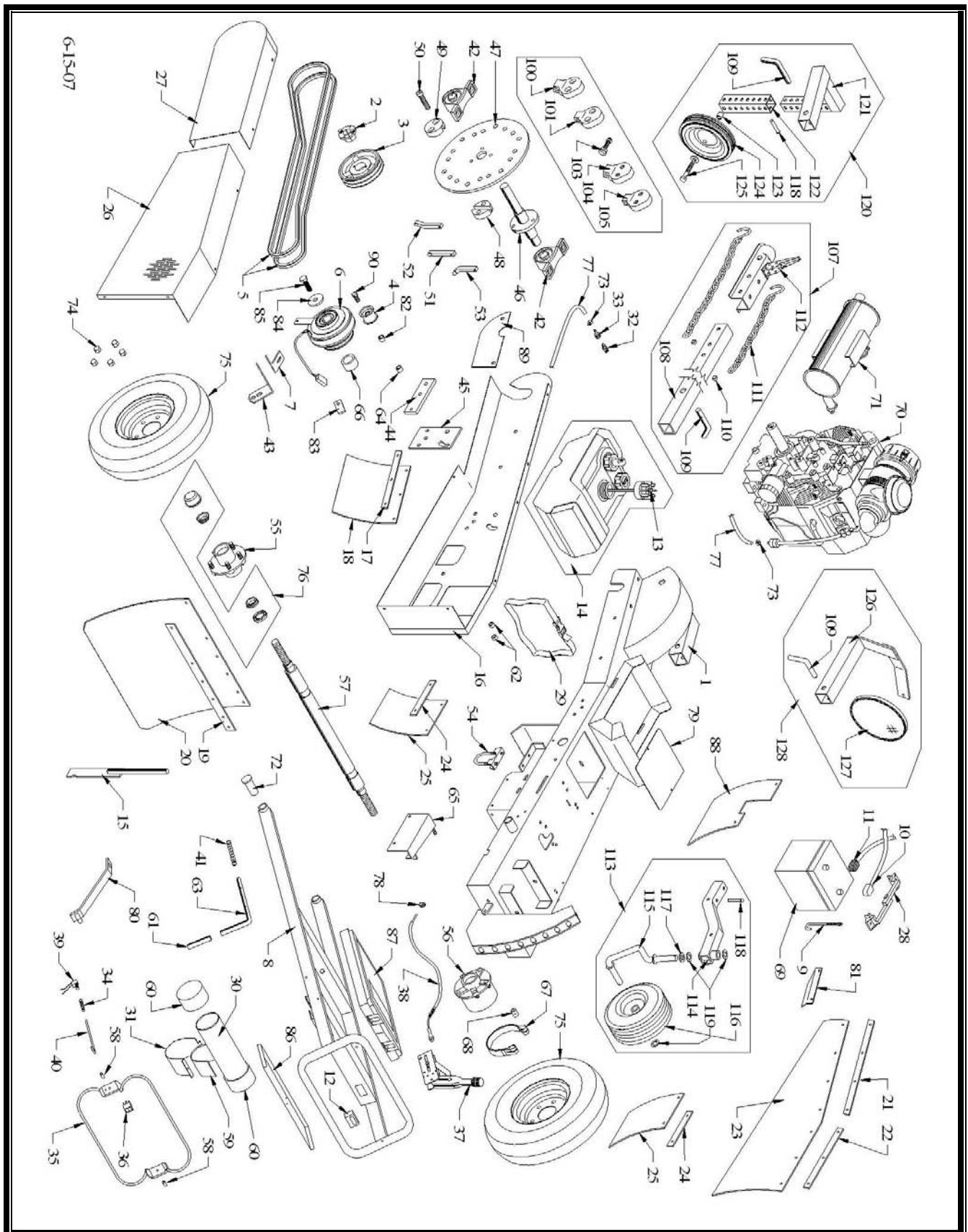
(Fig. 12)

MAINTENANCE SCHEDULE				
	Daily	Weekly	Monthly	Yearly/as Required
Check engine oil			X	
Check Machine Tire Pressure	X			
Inspect/Check Engine Cooling Fins	X			
Check for Loose Bolts	X			
Check Hitch and Safety Chains (PT only)	X			
Check Stump Grinder Teeth	X			
Check Air Cleaner	X			
Grease Bearings			X	
Check Belts for Proper Tension		X		
Check Hyd. Transmission Oil Level (SPH)			X	
Check that Clutch is Working Properly			X	
Check Rubber Guards			X	
Check and Gap Spark Plugs				X
Change Engine Oil as Indicated in Engine Manufacturers Owners Manual				



Key	Part No.	Qty	Description	Key	Part No.	Qty	Description
1	16200	1	Main Frame. 1620	75	16286	1	Dump Valve Knob
2	16201	1	Taper Bushing, 1.18	76	16287	2	Presence Handle Spacer
3	16202	1	Cutting Wheel Pulley	77	16288	1	Info Tube Pad thru S/N 61496 only
4	16203	1	Idler, Main Drive	78	16289	2	Info Tube End Caps thru S/N 61496 only
5	16209	2	Main drive Belt, Single	79	16291	1	3/8" Clutch Bushing
6	16205	1	Electric Clutch, 1.437	80	16292	1	LH Wheel Spacer, Short
7	16207	1	Clutch Bracket	81	16293	1	RH Wheel Spacer, Long
8	16208	1	Idler Pulley, 3"	82	16294	1	Adj. Pin Handle Grip
9	16353	1	Frame Control Handle	83	16295	2	Tension Adj. Spacers
10	16211	2	J-Bolt, Battery Hold Down	84	16296	1	Transmission Gear Spacer
11	16212	1	Red, Positive Cable	85	16297	1	Retaining Ring, M17
12	16213	1	Black, Negative Cable	86	16298	1	Pin, Handle Lock
13	16215	1	Tach/Hour Meter thru S/N	87	16299	1	Idler Spacer
	72646	1	Tach/Hour Meter S/N 61497/up	88	18105	1	Belt, AX-35
14	16216	1	Gas Cap	89	18123	1	Battery
15	16217	1	Gas Tank, Includes Cap	90	20118	1	Engine, 20HP Kohler (1620 SP)
16	16219	1	Adjustment Tool		16336	1	Engine, 24HP Honda (1624 SP)
17	16220	1	Inner Belt Guard		72673	1	Engine 31HP Briggs Van. (1631 SP)
18	16221	1	Curtain Mount, Left	91	20119	1	Muffler Kit, 20HP Kohler (1620 SP)
19	16222	1	Curtain, Left		16337	1	Muffler Kit, 24HP Honda (1624 SP)
20	16223	1	Curtain Mount, Rear		16359	1	Muffler w/Shield 31HP Va. (1631 SP)
21	16224	1	Curtain, Rear		28801	2	1" x 4" Clevis Pin
22	16225	1	Rt. Curtain Mnt, Long	92	28839	2	Fuel Line Clamp
23	16226	1	Rt. Curtain Mnt, Short	93	5001002	8	1/2" Lug Nuts
24	16227	1	Right Curtain	94	5001225	8	1/2" Wheel Hub Stud
25	16228	2	Rear Side Curt. Mount	95	16310	1	Fuel Line, 48"
26	16229	2	Rear Side Curtain	96	16313	2	Wire Stop
27	16230	1	Outer Rear Belt Guard	97	16314	1	Ball Joint
28	16231	1	Outer Front belt Guard	98	16316	1	Handle Fold-Up Link
29	16232	1	Battery Hold Down (2)	99	16318	1	Shield, Right Curtain
30	16233	1	Gas Tank Strap	100	16320	1	Main Idler Bushing
31	16234	1	Info Tube thru S/N 61496 only	101	16325	1	1/8" Clutch Bushing
32	16235	1	Tube Strap thru S/N 61496 only	102	16326	1	Guard Lock Tab
33	16236	1	Male Fuel Coupling	103	72522	1	Clutch Retainer
34	16237	1	Female Fuel Coupling	104	72523	1	Retainer Bolt
35	16238	3	Spring, Kill Switch	105	16338	1	Cover Plate S/N 61497/up only
36	16239	1	Dump Valve Handle	106	16339	1	Manual Pack S/N 61497/up only
37	16240	1	Presence Handle	107	16355	1	Axle curtain, RH
38	16241	1	Clutch Switch	108	16357	1	Wheel Slot Cover
39	16242	1	Brake Handle	109	5000408	1	1/2-12 x 1" Shoulder Bolt
40	16243	1	Brake Cable	110	5000406	1	1/2-12 x 3/4 Shoulder Bolt
41	16244	1	Kill Switch	111	16290		Complete Decal Set
42	16245	1	Shut Off Rod		16290A		Decal, Clutch Switch
43	16246	1	Spring, Handle Lock		16290B		Decal, Transmission Valve
44	16247	1	Transmission Gasket		16290C		Decal, Caution Stumps Only
45	16249	1	Forward/Reverse Cable		16290D		Decal, Warning Don't Move
46	16250	1	Hydro Control Arm		16290E		Decal, Belt Tension
47	16251	2	Pillow Block Bearing		16290F		Decal, Danger Cutter Wheel
48	16252	1	Cable Support		799021		Brake Pad
49	16253	1	Clutch Stabilizer		162171		Float Assembly, 3&6 gal. tank
	16365	1	Clutch Stabilizer (1624 only)		162172		Pick-Up Assembly, 3&6 gal. tank
50	16354	1	Idler Arm		Optional Accessories		
51	16255	1	Belt Tensioner Bracket	120	16300		Counter Bore Mnt., Std Angle
52	16256	1	Cutter Shaft	121	16301		Counter Bore Mnt., Straight
53	16257	1	Hydro Brake Bracket	123	16303		Tooth, Deep Dish, Hard Carbide
54	16258	1	Shut Off Rod	124	16304		Threaded Mnt., Std. Angle
55	16356	1	Cutter Wheel	125	16305		Threaded Mnt., Straight
56	16260	6	Threaded Tooth Pocket	127	16327		Transport Wheel Assembly
57	16261	6	Counter Bore Tooth Pocket	128	16327A		Caster Tube, Transport Wheel
58	16262	12	Pocket Bolt	129	45060A		Caster Yoke
59	16263	6	Straight Tooth	130	68050		Pneumatic Wheel
60	16265	3	Left Hand Tooth	131	45061		Nylon Washer
61	16264	3	Right Hand Tooth	132	16218		Clevis Pin, 3/8" s 2 1/4"
62	16266	1	1 1/2" Muffler Clamp	133	7500802		3/4" Flat Washer
63	16267	1	Eaton Hydro Transmission	134	16328		Gauge Wheel Assembly
64	16268	1	Peerless Transaxle	135	16328A		Mount Arm, Gauge Wheel
65	16269	1	12 Tooth Gear	136	16328B		Adjustment arm, Gauge Wheel
66	16270	2	Wheel Hub	137	16328C		Wheel Spacer, Gauge Wheel
67	16271	1	Wheel Assembly, RH	138	32104		Wheel
68	16272	1	Wheel Assembly, LH	139	85226		Bent Pin
69	16273	2	Snap Ring	140	500126		Bolt, 1/2" -13 x 3 1/4"
70	16275	1	Pulley, 3" x 1.437 Bore	141	16352A		Mirror Mount Arm
71	16276	1	Pulley, 3" x 17MM Bore	142	16352B		Mirror, Convex
72	16281	1	Hydro Valve Control Lever	143	16352		Sight Mirror Assembly
73	16284	2	Woodruff Key, Axle				
74	16285	3	Woodruff Key, Transmission				

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PARTS LIST 16/20 P

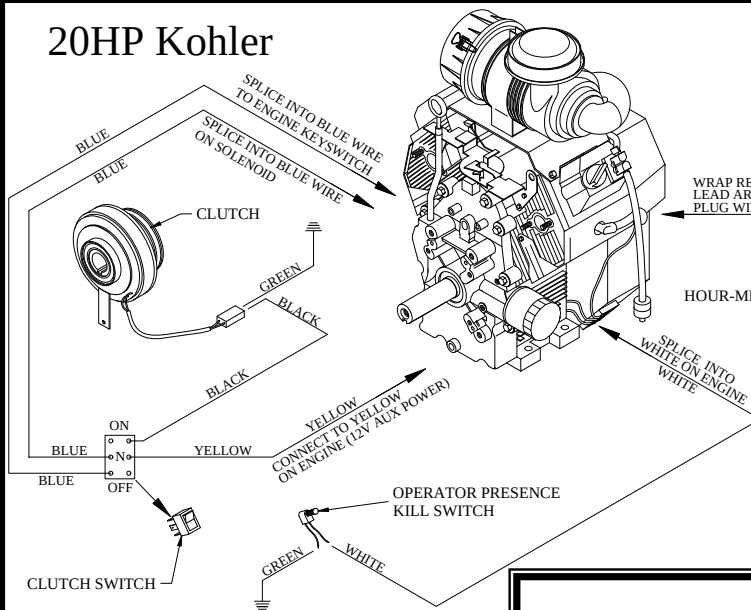
POWERTEK

Key	Part No.	Qty	Description	Key	Part No.	Qty	Description
1	16200	1	Main Frame	67	16308	1	Brake Band
2	16201	1	Taper Bushing, 1.187	68	16311	1	Brake Band Lock Pin
3	16202	1	Cutting Wheel Pulley	69	18123	1	Battery
4	16203	1	Idler, Main Drive	70	20118	1	Engine, 20HP Kohler (1620 P)
5	16209	2	Main Drive Belt, Single		16336	1	Engine, 24HP Honda (1624 P)
6	16205	1	Electric Clutch, 1.437	71	20119	1	Muffler Kit, 20HP Kohler (1620 P)
7	16207	1	Clutch Bracket		16337	1	Muffler Kit, 24HP Honda (1624 P)
8	16353	1	Frame Control Handle	72	28801	2	1" x 4" Clevis Pin
9	16211	2	J-Bolt, Battery Hold Down	73	28839	2	Fuel Line Clamps
10	16212	1	Red, Positive Cable	74	5001002	10	Lug Nut, 1/2"
11	16213	1	Black, Negative Cable	75	51611	2	Wheel/Tire
12	16215	1	Tach/Hour Meter thru S/N 61496	76	51667	2	Wheel Bearing Kit
	72646	1	Tach/Hour Meter S/N 61497/up	77	16310	1	Fuel Line, 48"
13	16216	1	Gas Cap	78	16313	1	Wire Stop
14	16217	1	Gas Tank, Includes Cap	79	16315	1	Cover Plate
15	16219	1	Adjustment Tool	80	16316	1	Handle Fold-Up Link
16	16220	1	Inner Belt Guard	81	16318	1	Shield, Right Curtain
17	16221	1	Curtain Mount, Left	82	16320	1	Main Idler Bushing
18	16222	1	Curtain, Left	83	16326	1	Guard Lock Tab
19	16223	1	Curtain Mount, Rear	84	72522	1	Clutch Retainer
20	16224	1	Curtain, Rear	85	72523	1	Retainer Bolt
21	16225	1	Rt. Curtain Mnt, Long	86	16338	1	Cover Plate S/N 61497/up only
22	16226	1	Rt. Curtain Mnt, Short	87	16339	1	Manual Pack S/N 61497/up only
23	16227	1	Right Curtain	88	16355	1	Axle Curtain, RH
24	16228	2	Rear Side Curt. Mount	89	16357	1	Wheel Slot Cover
25	16229	2	Rear Side Curtain		16290		Complete Decal Set 1620
26	16230	1	Outter Rear Belt Guard		16290A		Decal, Clutch Switch
27	16231	1	Outter Front Belt Guard		16290B		Decal, Transmission Valve
28	16232	1	Batter Hold Down (2)		16290C		Decal, Caution Stumps Only
29	16233	1	Gas Tank Strap		16290D		Decal, Warning Don't Move
30	16234	1	Info Tube thru S/N 61496 only		16290E		Decal, Belt Tension
31	16235	1	Tube Strap thru S/N 61496 only		16290F		Decal, Danger Cutter Wheel
32	16236	1	Male Fuel Coupling		162171		Float Assembly, 3 & 6 gal. tank
33	16237	1	Female Fuel Coupling		162172		Pick-Up Assembly, 3 & 6gal. tank
34	16238	1	Spring Kill Switch				
35	16240	1	Presence Handle	100	16300		Optional Accessories
36	16241	1	Clutch Switch	101	16301		Counter Bore Mnt., Std Angle
37	16242	1	Brake Handle	103	16303		Counter Bore Mnt., Straight
38	16243	1	Brake Cable	104	16304		Tooth, Deep Dish, Hard Carbide
39	16244	1	Kill Switch	105	16305		Threaded Mnt., Std. Angle
40	16245	1	Shut Off Rod	107	16-20PTB		Threaded Mnt., Straight
41	16246	1	Spring, Handle Lock	108	162801		Tow Bar Assembly, P1621
42	16251	2	Pillow Block Bearing	109	85226		Tow Bar, P1621
43	16253	1	Clutch Stabilizer	110	51625		Bent Pin
44	16354	1	Idler Arm	111	51624		Safety Chain Spacer
45	16255	1	Belt Tensioner Bracket	112	51601		Safety Chain
46	16256	1	Cutter Shaft	113	16327		2" Coupler
47	16356	1	Cutter Wheel	114	16327A		Transport Wheel Ass'y
48	16260	6	Threaded Tooth Pocket	115	45060A		Caster Tube, Transport Wheel
49	16261	6	Counter Bore Tooth Pocket	116	68050		Caster Yoke
50	16262	12	Pocket Bolt	117	45061		Pneumatic Wheel
51	16263	6	Straight Tooth	118	46218		Nylon Washer
52	16264	3	Right Hand Tooth	119	7500802		Clevis Pin, 3/8" x 2 1/4"
53	16265	3	Left Hand Tooth	120	16328		3/4" Flatwasher
54	16266	1	1 1/2" Muffler Clamp	121	16328A		Gauge Wheel Assembly
55	16321	1	Wheel Hub, PT	122	16328B		Mount Arm, Gauge Wheel
56	16279	1	Wheel Hub w/ Brake Drum	123	16328C		Adjustment Arm, Gauge Wheel
57	16282	1	Axle Assembly	124	32104		Wheel Spacer, Gauge Wheel
58	16287	2	Presence Handle Spacer	125	5000126		Wheel
59	16288	1	Info Tube Pad thru S/N 61496 only	126	16352A		Bolt, 1/2"-13 x 3 1/4"
60	16289	2	Tube End Caps thru S/N 61496 only	127	16352B		Mirror Mount Arm
61	16294	1	Adj. Pin Handle Grip	128	16352		Mirror, Convex
62	16295	2	Tension Adj. Spacers				Sight Mirror Assembly
63	16298	1	Pin, Handle Lock				
64	16299	1	Idler Spacers				
65	16307	1	Brake Bracket Ass'y				
66	16309	1	Clutch Spacer				

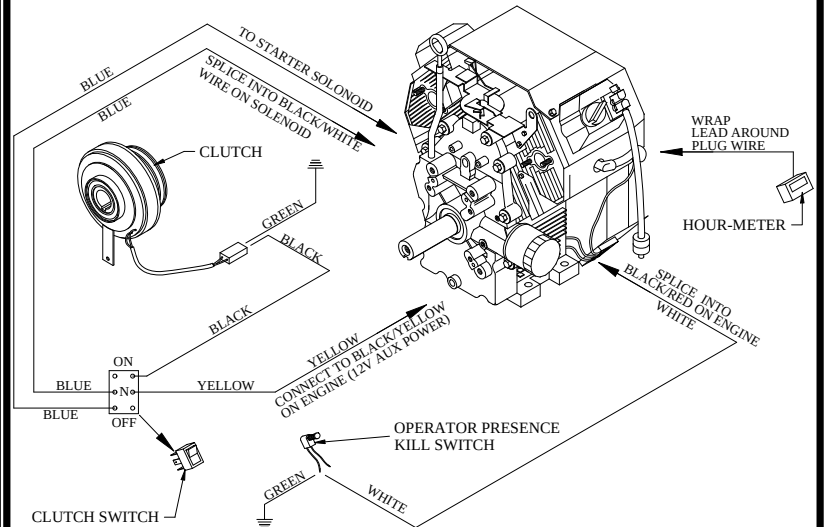
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ELECTRICAL SCHEMATICS POWERTEK

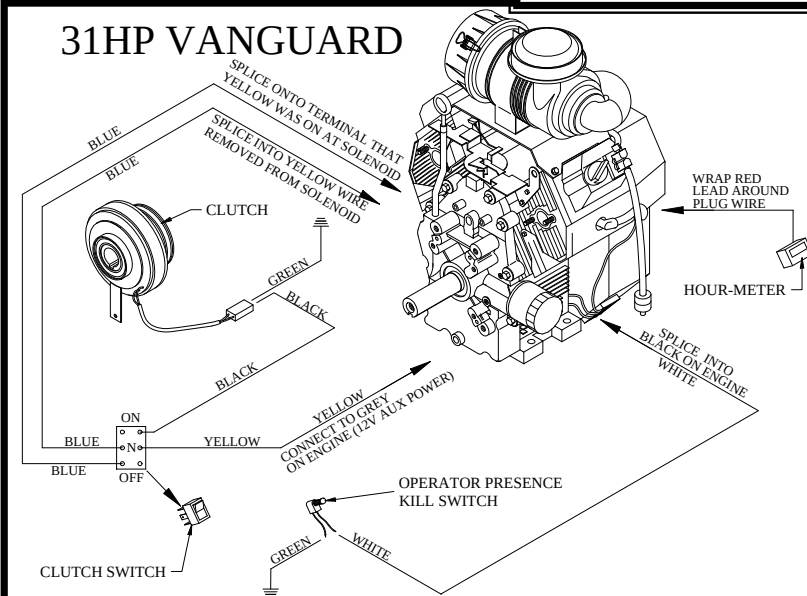
20HP Kohler



24HP Honda



31HP VANGUARD



WARRANTY INFORMATION

Each new product is warranted against manufacturing defects in workmanship and/or materials under normal use and service for a period of 12 months from the date of delivery of the product to the original purchaser. PowerTek, Inc.'s obligation under this warranty shall be limited to the replacement to the original purchaser of any part which, as delivered to the original purchaser, and upon PowerTek, Inc.'s examination, is shown to PowerTek, Inc.'s satisfaction, to be defective due to faulty workmanship or materials at the factory.

This warranty does not apply to damage in transit, damage caused by user misuse, negligence, accident, normal wear, or alterations or repairs done outside the factory and/or authorized service stations as determined by PowerTek, Inc. This warranty does not apply to any labor charges in connection with the replacement parts claimed to be defective.

All parts claimed to be defective must be returned to PowerTek, Inc.'s factory for inspection, repair or replacement, with all transportation or mailing charges prepaid. It is the exclusive responsibility of the purchaser to bear the transportation or mailing charges in any warranty claim.

This warranty specifically excludes engines or batteries, which are warranted separately by their respective manufacturers, all claims for defective batteries; engines or engine parts must be made in accordance with the battery and/or engine manufacturers warranty. This warranty also specifically excludes costs of regular maintenance and replacement of service items such as belts, hoses, blades, and similar items.

PowerTek, Inc. reserves the right to make changes upon PowerTek, Inc., products without imposing any obligation upon PowerTek, Inc. to install the same on a product manufactured prior to the change. PowerTek, Inc. makes no other warranties, representations or promises other than those set forth herein. **POWERTEK, INC. SPECIFICALLY DISCLAIMS ANY AND ALL IMPLIED WARRANTIES OF FITNESS FOR PARTICULAR PURPOSE AND MERCHANTABILITY.**

The remedies available to a distributor, dealer, and/or purchaser in connection with PowerTek, Inc.'s warranty set forth above. In no event will PowerTek, Inc. be liable for special, incidental or consequential damages.

POWERTEK, INC. WARRANTY PROCEDURE

- A. All requests for warranty must have approval from PowerTek, Inc. before work starts, or the warranty claim will be denied.
- B. All requests for warranty must be made on an **O.P.E.** warranty claim form. This is available from an authorized distributor or dealer on a no charge basis.
- C. It is the responsibility of the distributor; dealer and/or purchaser to complete the form warranty claim and submit it to PowerTek, Inc.
 1. The form must be filled out completely. It is the sole responsibility of the purchaser to obtain the proper and correct information for the warranty claim. Claims received without serial numbers, model numbers, replacement part numbers, purchase dates, repair dates, purchasers correct address, signature or other information requested by PowerTek, Inc. shall be returned without service.
 2. Warranty claims that are illegible will be returned without service. Please type or print in black ink.
 3. PowerTek, Inc. warranty makes no allowance for the time spent to fill out the warranty claim, any such claim will be denied.

WARRANTY INFORMATION

POWERTEK

4. All parts shall be retained and tagged for a period of sixty (60) days or until credit is issued.
 5. The factory may request parts to be returned for examination or analysis. These parts shall be sent by prepaid freight to the PowerTek, Inc. Returns sent freight collect, without the express, written permission of PowerTek, Inc, shall not be accepted by PowerTek, Inc.
 6. It is the responsibility of the dealer to review the claim and to comply fully with all procedures set forth herein. Failure to do so shall result in the denial of the warranty claims.
- A. Any warranty payments by PowerTek, Inc. will be -paid by credit memo to the distributor, dealer, rental store or purchaser.
- B. All warranty claims, which are denied, will be returned with a reason for denial.
- C. Labor Allowance.
1. The warranty labor rate is \$40.00 per hour.
 2. The actual time is divided into tenths of an hour. The warranty form should show the time to the nearest tenth of an hour.
 3. Labor credit is based on the actual time required only to make the repair.

Items not covered by warranty.

1. Mileage and transportation costs of any kind. All warranty is "Bench Work" only. The warranty specifically states that any transportation charges in connection with a warranty repair is the exclusive responsibility of the purchaser.
2. Postage, delivery, telephone calls or similar communication.
3. Normal maintenance or adjustments. This includes set up and service.
4. Battery, engines or engine parts. Warranty on batteries, engines, engine parts or other vendor parts that are covered by the component manufacturers warranty and must be handled by that component manufacturers representative.
5. Failure caused by neglect, normal wear, or abuse. PowerTek, Inc. depends on its dealer network to accurately determine when such conditions occur.
6. Any alteration of the original design of the unit, or the use of unauthorized or non-PowerTek, Inc. parts. Any claim submitted containing such unauthorized alteration repairs shall be rejected.
7. Freight or transportation -damage. All such damage is the responsibility of the carrier and any claim for damages must be made with the carrier.
8. Parts or labor supplied by unauthorized repair facility.
9. Compound or repeat warranties caused by negligent/improper repair.
10. Any claim for warranty where the date of repair -exceeds thirty (30) days from the submission of the warranty claim.
11. Any claim for warranty on the entire unit.
12. Warranty claim involving oils or fluids of any kind.
13. Any warranty claims for leaking, punctured, blown, flat, or otherwise damaged tires on units that have been placed in service.
14. Lost time, lost rental, lost profits, or other economic loss due to warranty work.

Voluntary cooperation with the entire warranty procedure will make the program work better for both the purchaser and PowerTek, Inc.