

INSTRUCTION MANUAL & PARTS BOOK

TS88 RIDE-ON TROWEL



POWERFUL - EFFICIENT - DEPENDABLE

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SAFETY PRECAUTIONS





DANGER

EXPLOSION HAZARD

Never operate the machine in an explosive atmosphere, near combustible materials or where ventilation does not clear exhaust fumes.





WARNING

BURN HAZARD

Never come into contact with the engine or muffler when engine is operating or shortly after it is turned off. Serious burns may occur.





WARNING

ROTATING HAZARD

Never place hands or feet inside safety guard rings. Serious injury will result from contact with rotating blades.





CAUTION

MOVING PARTS

Before starting the machine ensure that all guards and safety devices are in place and functioning properly.





ATTENTION

READ OWNERS MANUAL

Read and understand operator's manual before using this machine. Failure to follow operating instructions could result in serious injury or death.

TABLE OF CONTENTS

QUALITY ASSURANCE/MACHINE BREAK-IN	4
RIDE-ON POWER TROWEL WARRANTY	
MAINTENANCE RECORD	6
ROUTINE SERVICE INTERVALS	7
FOREWORD	9
SAFETY PRECAUTIONS	9
ASSEMBLY INSTRUCTIONS	9
1. BATTERY	9
2. STEERING HANDLE ASSEMBLY	9
3. PITCH CONTROL ASSEMBLY (FIGURE 1)	
4. SEAT ASSEMBLY	
5. TRANSPORTER ASSEMBLY	
OPERATING INSTRUCTIONS	
1. STARTING PROCEDURES - WARM TEMPERATURES	10
2. STARTING PROCEDURES - COLD TEMPERATURES	10
3. STOPPING PROCEDURES	
4. STEERING (FIGURE 2)	
5. FLOAT/TROWEL PITCH SETTING	
6. BLADE SYNCHRONIZATION (FIGURE 3)	
7. TRANSPORTER USE	
MAINTENANCE INSTRUCTIONS	
1. GENERAL	
2. AIR CLEANER	
3. SPARK PLUG	
4. BELT CHANGE PROCEDURE	
5. BELT TENSIONING SPECIFICATION (FIGURE 4)	
LUBRICATION	
1. ENGINE OIL	
2. SPIDER PLATE	
3. GEARBOX	
4. GEARBOX OIL CHANGE	
5. GREASE FITTINGS	
TROWEL ARM ADJUSTMENT FIXTURE	
ASSEMBLY DRAWINGS AND PARTS LIST	
CHASSIS ASSEMBLY (FIGURE 1)	
CHASSIS PARTS LIST	
POWERPLANT ASSEMBLY (FIGURE 2)	
POWERPANT PARTS LIST	
DRIVE TRAIN ASSEMBLY (FIGURE 3)	
DRIVE TRAIN PARTS LIST	
4. STEERING ASSEMBLY (FIGURE 4)	
STEERING PARTS LIST	
5. GEARBOX ASSEMBLY (FIGURE 5)	
GEARBOX PARTS LIST	
6. PITCH CONTROL ASSEMBLY (FIGURE 6)	
PITCH CONTROL PARTS LIST	20
7. SPIDER PLATE ASSEMBLY (FIGURE 7) / PRESSURE PLATE ASSEMBLY (FIGURE 8)	
SPIDER PLATE ASSEMBLY / PRESSURE PLATE ASSEMBLY PARTS LIST	
8. TROWEL BLADE ASSEMBLY (FIGURE 9)	
TROWEL BLADE PARTS LIST	
9. TRANSPORTER ASSEMBLY (FIGURE 11)	
TRANSPORTER ASSEMBLY (FIGURE 11)	
10.RETARDANT SPRAY SYSTEM (FIGURE 12)	
RETARDANT SPRAY SYSTEM (FIGURE 12)	
TROUBLESHOOTING	
SPECIFICATIONS	
COMPANY INFORMATION	
NOTES	40 41

QUALITY ASSURANCE / MACHINE BREAK IN

The Bartell Ride-on Trowel is the product of extensive engineering development designed to give long life and unmatched performance. Once machines are fully assembled, a runin test is performed to ensure quality standards of the highest level. A series of operational tests are conducted on concrete, incorporating a phase of operations at 1/2 to 3/4 throttle for a minimum of 20 minutes and a final run phase at full throttle for a minimum of 25 minutes.

You can help ensure that your Ride-on will perform at top levels by observing a simple routing on first use. Consider that your new Ride-on Trowel is like a new car. Just as you would break in a new car to the road or any new machine to the job, you should start gradually and build up to full use. Learn what your machine can do and how it will respond. Refer to the engine manufacturer's manual for run-in times. Full throttle and control may be used after this time period, as allowed by material. This will serve to further break in the machine on your specific application, as well as provide you with additional practice using the machine.

We thank you for the confidence you have placed in us by purchasing a Bartell Ride-on Trowel and wish you many years of satisfied use.

/05

RIDE-ON POWER TROWEL WARRANTY

Bartell Morrison Inc. agrees to furnish without charge, F.O.B. our plant, a replacement for any part or portion thereof, comprising the drive train of the Bartell Ride-on Power Trowel, consisting of the drive shaft assembly and the gear case assemblies, save and except drive belts, power units, and/or bearing or electrical controls which prove upon our examination, to be defective in either material or workmanship within a period of twelve (12) months from date of purchase, provided that notice of such defective part or portion thereof is given to Bartell Morrison Inc. within the twelve month warranty period. No further or other guarantee or warranty expressed or implied in connection with the sale of the Rideon Power Trowel is given and our sole liability consists in replacing defective parts or portions thereof. We shall not be responsible for any special, indirect or consequential damages arising in any manner whatsoever.

This guarantee is for the sole benefit of the original purchaser as end user. Our responsibility under this guarantee ends in the case the original purchaser transfers ownership of the Ride-on Power Trowel, makes any changes or adds any parts or devices not of our manufacture to the Ride-On Power Trowel.



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MAINTENANCE RECORD

PREVENTATIVE MAINTENANCE AND ROUTINE SERVICE PLAN

Date Purchased:

Dealer Name:

This Bartell ride-on power trowel has been assembled with care and will provide years of service. Preventative maintenance and routine service are essential to the long life of your Bartell ride-on power trowel. Your dealer is interested in your new trowel and has the desire to help you get the most value from it. After reading through this manual thoroughly you will find that you can do some of the regular maintenance yourself. However, when in need of parts or major service be sure to see your Bartell dealer. For your convenience we have provided this space to record relevant data about your ride-on Trowel. When in need of parts or service be prepared to provide your trowel serial number. Locate the serial number now and record in the space below.

Type of Machine:

Model:

Dealer Pho	one:				Ser	rial Number:	
						Į.	
REPLACEM	ENT	PARTS	USED			MAINTENA	NCE LOG
PART NO.	QUA	NTITY	COST	DATE		DATE	OPERATION

144 Created: 06/05

6

Revised: 06/14

Routine Se	ervice	Each use	After 1.5 months	Each 3 months	Each 6 months	Each 9 months	Each 12 months
Intervals			or 50 hrs	or 100 hrs	or 200 hrs	or 300 hrs	or 400 hrs
General Inspec	ction:						
Operation of lights	Check		0	0	0	0	0
Battery	Clean & Check			0	0	0	0
	Recharge			0	0	0	0
	Replace						2 yrs
Guards	Check	0	0	0	0	0	0
Warning stickers	Check		0	0	0	0	0
Test run:	Check operation		0	0	0	0	0
Controls:							
Dead-man switch operation	Check	0	0	0	0	0	0
Throttle pedal operation	Check	0	0	0	0	0	0
Steering linkages	Check	0	0	0	0	0	0
	Lubricate	-	0	0	0	0	0
	Replace						As req'd
Pitch control levers	Check	0	0	0	0	0	0
	Lubricate		0	0	0	0	0
Joystick controls (N/A)	Check	0					
Hydraulic system (N/A)	Check levels			0	0	0	0
	Check hoses			0	0	0	0
	Replace hoses						2 yrs
Engine:							
Fuel pipes & clamps	Check		0	0	0	0	0
	Replace						2 yrs
Engine oil	Check Level	0	0	0	0	0	O
_	Change		0		0		0
Engine oil filter	Replace				0		0
Oil cooler	Clean			0	0	0	0
Cooling Fins	Clean		0	0	0	0	0
Air cleaner	Check - clean	0	0	0	0	0	0
	Replace						0
Air Intake Line	Check				0		
	Replace						2 yrs
Fan Belt	Check tightness				0		0
	Replace						500 hrs
Valve clearance	Check-adjust				0		0
Fuel filter	Check & Clean			0	0	0	0
	Replace				0		0
Fuel Tank	Clean						500 hrs
Fuel Injection Nozzles	Check pressure						500 hrs
Fuel Injection Timer	Check						500 hrs
Injection Pump	Check						500 hrs
Engine wiring	Check						0

Continued on next page...

		Each	After 1.5	Each 3	Each 6	Each 9	Each 12
Routine Service I	use	months	months	months	months	months	
- Continued	-		or	or	or	or	or
			50 hrs	100 hrs	200 hrs	300 hrs	400 hrs
Drive Train	n:						
Bearings	Lubricate	0	0	0	0	0	0
Universal couplings	Lubricate			0	0	0	0
Belt tension / Condition	Check	0	0	0	0	0	0
Clutch / Pulley operation	Check	0	0	0	0	0	0
LH spider plate assembly	Check	0		0	0	0	0
	Lubricate	0	0	0	0	0	0
RH spider plate assembly	Check	0		0	0	0	0
	Lubricate	0	0	0	0	0	0
Gearboxe	s:						
LH Gearbox oil	Check Level	0	0	0	0	0	0
	Change	0			0		0
RH Gearbox oil	Check Level	0	0	0	0	0	0
	Change	0			0		0
Gearbox breathers Check operation				0	0	0	0
Retardant Spray System:							
Water pump operation	Check	0	0	0	0	0	0
Spray nozzles	Clean	0					
Retardant Fluid	Check levels	0					

Due to the nature and environment of use, power trowels are exposed to severe operating conditions. Some general maintenance guidelines will extend the useful life of your trowel.

- The initial service for your power trowel should be performed after 25 hours of use, at which time your mechanic (or authorized repair shop) should complete all of the recommended checks in the schedule above. The chart on page 6 (six) is handy for keeping a record of the maintenance performed and the parts used for servicing your trowel.
- Regular service according to the schedule above will prolong the life of the power trowel and prevent expensive repairs.
- Keeping your power trowel clean and free from concrete residue is the single most important regular
 maintenance operation, over and above the checks in the service schedule above, that can be performed.
 Components such as oil seals, belts, drive line parts and bearings are prone to premature wear from
 exposure to concrete residue. Using a spray-on non-stick coating on your power trowel before each use will
 make clean-up after use easy and extend the time between replacement of most of the wearing components
 of the machine.
- After each use your power trowel should be cleaned to remove any concrete residue from the undercarriage
 and surrounding components. Use of a power washer will make clean up quick and easy, especially if a
 non-stick coating was applied prior to use.
- In the Service Schedule above, items that should be checked, replaced or adjusted are indicated by "o" in the appropriate column. Not all power trowel models include the same features and options and as such not all service operations may have to be performed. For ease of recording place a checkmark (√) through the "o" when the item is complete. If an item is not required or not completed place an "x" through the "o" in the box.
- For all fuel-line powered trowels the governed speed of the engine is 2000 to 3600 rpm. See engine manufacturer's manual for exact specifications. Care should be used when making any adjustments to the power trowel not to change the governed speed. Increasing the governed speed of the engine may lead to premature failure and void the manufacturer's warranty.
- Failure to have your power trowel regularly serviced and properly maintained in accordance with the manufacturer's instructions will lead to premature failure and void the warranty.

FOREWORD

It is important that the following be read carefully in order that the operational performance of the Bartell RIDE-ON Trowel be fully understood. Proper maintenance procedures will ensure long life and top performance of the unit.

SAFETY PRECAUTIONS

- Always keep unauthorized, inexperienced, untrained people away from this machine.
- Rotating and moving parts will cause injury if contacted. Make sure guards are in place. Keep hands and feet away from moving parts.
- Fuel the machine only when the engine is stopped, using all necessary safety precautions.
- The engine must always be stopped before attempting any repair or adjustments. Ignition key should be off. Danger: Never operate the machine in an explosive atmosphere, near combustible materials or where ventilation does not clear exhaust fumes. Repair fuel leaks immediately. Refer to your engine owner's manual for more safety instructions.
- Be careful not to come in contact with the muffler when the engine is hot, serious burns may result!
- Always operate the machine in a seated position to maintain machine balance.
- The transporter is designed for moving the unit around the job site only. It is not to be used for towing the Ride-On unit off-site.
- When starting the trowel, do not exceed the 1/4 throttle position as recommended. A higher setting could cause the centrifugal clutch to engage, activation the trowel blades.
- Be careful with the trowel around stub pipes or other obstructions on the floor. Should the machine catch, or hit such an obstruction, serious damage may result to the machine, or operator may be thrown from the machine.
- Excess surface water may result in sudden loss of control of steering.
- Disconnect battery before attempting any electrical maintenance.
- Ensure that the electrical dead-man switch, located under the left foot pedal is operating. Placing your left foot flat on the pedal will engage the safety switch. Removing you foot from the pedal will disengage the safety switch and stop the engine. The engine will not start unless the safety switch is depressed. This safety feature must be used as designed.

ASSEMBLY INSTRUCTIONS

Your new Bartell Ride-On Trowel has been shipped to you partially disassembled. To prepare for operation use the following instructions:

1. BATTERY - SHIPPED DRY - NO ACID

Connect and secure the battery cables before attempting starting procedures.

2. STEERING HANDLE ASSEMBLY

The steering handles are shipped ready to connect. Position the handles over the handle sleeves so that the set-screws (2 per handle) are lined up with the tapped holes on the sleeves. Tighten the set-screws and test the mobility of the handles.

3. PITCH CONTROL ASSEMBLY

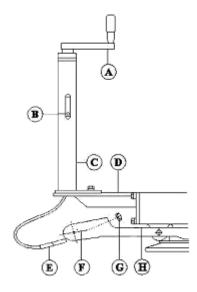


Figure 1a.

Bolt pitch control tube (C) to pitch control bracket (D) with bolts provided. Put cable end (E) through yoke arm (F) and secure with nylon insert locknut (G). For proper cable adjustment, turn crank (A) counter-clockwise to the stop position. Tighten nut (G) until all slack in the cable is removed. If more than 2 or 3 threads show through the nut, it should be turned back and the guide screw (B) moved to the next lower hole. Tension in the cable should then be readjusted. After adjusting tension, turn hand crank full clockwise (ABOUT 24 TURNS) and check for clearance between the yoke arm (F) and the gear box at point (H). There should be enough space to pass a business card through but not more than 1/8 inch.

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4. SEAT ASSEMBLY

Remove protective wrapping from seat. The seat is now ready to secure to the frame using included washers and hex nuts. If the seat adjuster is ordered, the slider bars must be positioned between the seat and the frame using included screws to secure the seat to the sliders, and then securing the sliders to the frame as indicated above.

5. TRANSPORTER ASSEMBLY

The components of the transporter (handle, frame, wheels, and parts bag) are shipped separately, requiring some assembly. Extend the handle outside the frame. Slide the handle along the frame cross-bar to align the hole on the handle with the hole on the "U" frame. Insert the large hitch pin (part #12487) through the hole to secure the handle to the "U" frame. Position one of the wheels on the axle and secure in place by inserting pin (part #10315) into the hole on the end of the axle. Repeat procedure for the other wheel.

CAUTION:

The transporter is designed to be used on the job site only. Do not use the transporter to tow the machine off-site.

OPERATING INSTRUCTIONS

1. STARTING PROCEDURES * WARM TEMPERATURES

- a) Prior to starting the trowel, check the engine and gearbox oil levels. Be sure the fuel tank is full. Fuel is not shipped with the unit. Before attempting to start, fill the fuel tank. Check engine and gearbox oil levels. WARRANTY IS VOID IF RUN WITHOUT OIL. Fill tank with safety approved fuel containers. DO NOT MIX OIL WITH FUEL.
- b) Maintain left foot pressure on the dead-man safety switch. Engine will disengage and stop if safety switch is released. Do not tape, tie-down, or otherwise attempt to bypass safety device.
- Turn ignition key all the way. Allow engine to warm up before proceeding with full trowel operation.

2. STARTING PROCEDURES * COLD TEMPERATURES

Follow same procedure as above but allow for a longer warm up period 3-5 min. (In cold weather oil is much heavier to move. Extra time is required to heat the oil.)

3. TO STOP ENGINE

- a) Bring throttle to low idle, wait a few seconds.
- b) Remove left foot from dead-man safety switch.
- c) Turn off ignition key.

4. STEERING

Guiding the machine on the slab is quite simple but does require some familiarity before actually working with the machine. The controls respond as shown in *figure 2a* below. Test the machine on a finished section of the floor, with the blades in a flat position, and the engine at a low revolution to gain the necessary feel for the steering.

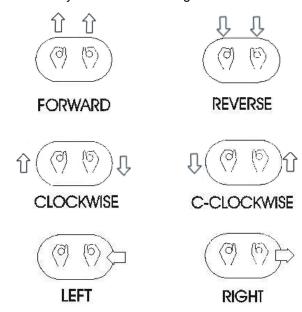


Figure 2a.

For straight line movement, move both handles as one in the direction you wish to travel. Move the handles in opposite directions to produce rotation on the machines axis. Left handle forward, right handle backward for clockwise rotation. Left handle backward, right handle forward, for counter-clockwise rotation. Sideways direction is achieved by sideways movement of the right handle in the required direction of travel.

WARNING:

SERIOUS INJURY OR PROPERTY DAMAGE MAY RESULT DUE TO TEMPORARY LOSS OF CONTROL IF OPERATED WITH FRESH WATER ON THE CONCRETE SURFACE.

5. FLOAT/TROWEL PITCH SETTING

Once you are familiar with the steering functions on a flat floor, you are ready to combine the steering with float/trowel pitch settings to produce the finish you require. The pitch adjustment feature of the BARTELL RIDE-ON TROWEL permits quick and accurate pitch changes of the finishing/float blades, without having to stop the machine. Turning the adjustment crank-handle at the end of the pitch control tubes enables you to change the pitch whenever necessary to allow for varying conditions over the slap surface.

Each spider plate is adjusted independently. The pitch setting will affect the steering of your unit. Experiment with the settings as you test drive so you will know what to expect.

CAUTION:

Do not let the machine stand in one spot on the soft cement; This may place unnecessary strain on the clutch to break it free of the cement. If the unit has been sitting for any length of time, break it free from the concrete before attempting operation.

CAUTION:

When finishing concrete above grade, erect a situation barrier along the edge of the slab as a protective measure. The barrier should be such that it will stop the trowel from riding over the edge of the slab in case of loss of control.

6. BLADE SYNCHRONIZATION (SPECIALLY MODIFIED UNITS ONLY)

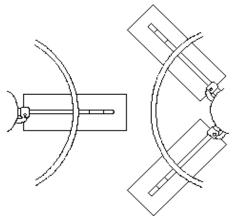


Figure 3a.

To avoid blades hitting, make sure spider plates are positioned as shown with respect to each other after performing any maintenance.

7. TRANSPORTER USE

CAUTION:

The transporter is designed to be used on the job site only. Do not use it to tow the machine off-site.

The transporter has pick-up brackets located on the inside of the wheels which should be positioned under the pick-up points on the frame. Before connection, the handle will be pointing upwards at approximately a 45 degree angle. Pull the handle down, engaging the transporter and secure the bracket and transporter to the frame by locking the handle bracket in the frame lock by means of the hitch pin. Using the handle as a lever, the ride-on may now be moved. To disconnect the transporter, follow the above steps in reverse.

MAINTENANCE INSTRUCTIONS

1. GENERAL

- Keep engine oil clean. Change according to engine manufacturer's specifications.
- Maintain the oil levels in the engine and gearbox assemblies. Change as required.
- · Use only clean fuel in the engine.
- Check for loose nuts and bolts on the trowel and tighten as necessary.
- Check "V" belts for wear, replace if worn.
- · Grease all fittings daily. See diagram.
- Clean the unit after every use to prevent hardening of sludge. Hard concrete is very difficult to remove, greatly increases weight and reduces efficient subsequent operation of unit.
- Check clutch linings regularly for wear. Linings should be changed when 3/4 worn. Do not allow metal to metal contact as this will damage the clutch drum. (New lining is 8mm.)

2. AIR CLEANER

Maintaining a clean engine will extend engine life. Keep air filter clean at all times. Clean air filter using the recommended solvent daily. See engine manual for proper cleaning procedure. Let the filter dry before reinstalling.

3. SPARK PLUG

Check and clean spark plugs regularly. A fouled, dirty spark plug caused hard starting and poor engine performance. Set spark plug gap to recommended clearance. Refer to engine manual.

11

4. BELT CHANGE PROCEDURE

Remove belt cover from the machine to expose the drive components. To remove and change the drive belt, a tool made of a wood or plastic wedge that can be tapped and driven into the center of the driven pulley halves so that it can spread apart and the belt then slipped off the driven pulley and taken off the driver pulley. An alternate method is to squeeze together the belt to put pressure on the sides of the driven pulley (or sheave). While squeezing the belt together, pulling the side of the belt in the direction that will allow the movable side to be pushed down the cam allowing the belt to go down towards the center of the pulley. Work to rotate the belt off the driven pulley.

Install the new drive belt by reverse procedure.

LUBRICATION

1. ENGINE OIL

The long life and successful operation of any piece of machinery is dependent on frequent and thorough

Before using the trowel, always check your engine for oil. Use proper engine oil as recommended in the engine manufacturer's manual. Fill crankcase to levels as recommended.

2. SPIDER PLATE

There are 8 (eight) grease fittings on the spider plates, 4 (four) on each must be greased daily. SPIDER PLATES MUST BE GREASED EVERY TIME MACHINE IS USED.

3. GEARBOX

Check the oil level sight plugs on both gearboxes daily to ensure the oil is half way on the site glass. Top up with Chevron HiPerSYN ISO 320 gear oil only. Gearbox capacity on the TS88 is 27z./767ml.

4. TO CHANGE GEARBOX OIL

Place a pan beneath the drain plug to catch the oil. Remove the drain plug and the filler plug from the gearbox. After the oil has drained completely, replace the drain plug and tighten. Fill the gearbox through the filler plug with 27z./767ml. of Chevron HiPerSYN ISO 320 gear oil. Replace the filler plug and tighten.

5. GREASE FITTINGS

There are 6 bearings in total. Grease all bearings and U-joints to ensure adequate supply of lubricant. They are located above the gearboxes (2 per gearbox) and 2 located in the drive system. The U-joints are located in the drive system as well.

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TROWEL ARM ADJUSTMENT FIXTURE

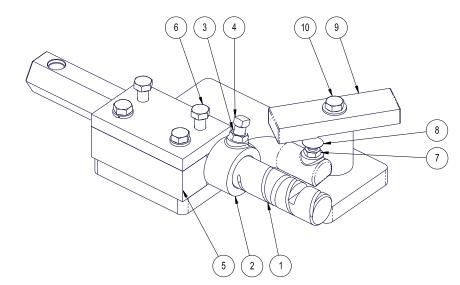


Figure 5a.

The trowel arm adjustment fixture (20801) is reversible. By rotating the arm clamping fixture and the ring bolt, both left hand and right hand trowel arms may be adjusted. Before attempting adjustment, determine whether the trowel arm is right handed or left handed. When adjusting left hand trowel arms use the side of the fixture marked "L". When adjusting right hand trowels arms use the opposite side. The adjustment bar will be 6. Adjust carriage bolt (8) upwards until contact is made set on "36" for the TS88 trowel arm.

ADJUSTMENT PROCEDURE

PART #20801 Unit 36" (TS88) 1) 10411 - Trowel arm 2) 10817 - Lift lever 3) 10808 - Jam nut 4) 10809 - Set screw 5) 10824 - Block top 6) 10507 - Bolt 7) 10816 - Jam nut 8) 10815 - Carriage bolt 9) 10832 - Adjustment bar 10) 10507 - Bolt

- 1. Remove all trowel arm assemblies (1 & 2 arm and attached lift lever) from suspected maladjusted spider plate.
- 2. Remove lift lever (2) from trowel arm (1) by first loosening jam nut (3) then square head screw (4). If upon inspection (method left to discretion of 7. This same procedure is to be followed with ALL arms serviceman) any trowel arm (1) is found to be in a bent condition, it must either be brought back to its original straight condition (method left to the serviceman's discretion) or replaced with new part.
- 3. Replace lift levers (2) on new or straightened arms (1) by reversing procedure as described above.

NOTE: IT IS IMPORTANT THAT WHEN TIGHT-ENING SQUARE HEAD NUT (4), IT SEATS ITSELF SECURELY INTO DIMPLE MACHINED IN ARM.

4. Place trowel arm assembly (1 and 2) in fixture (5) with lift lever (2) butting up against fixture. Secure in place with bolts (6).

- 5. Loosen locknut (7) and screw carriage bold (8) down to full depth allowable. This will provide for ample clearance to swing precision ground adjustment bar (9) over head of carriage bolt. Adjustment bar (9) is stamped for appropriate size of machine. Swing appropriate side directly over carriage bolt (8) and secure in place with bolt (10).
- with adjustment bar (9); holding carriage bolt in position with one wrench, tighten locknut (7) to secure in position with second wrench.

NOTE: IT IS VITALLY IMPORTANT TO ENSURE THAT ONCE THE CARRIAGE BOLT IS ADJUSTED TO THE CORRECT HEIGHT, IT DOES NOT MOVE BEFORE, OR DURING THE TIGHTENING OF LOCKNUT.

from spider plate assembly, and will ensure correct and exact adjustment.

TROWEL ARM ADJUSTMENT SCREW

When assembling trowel blades to trowel arms, the adjustment screw should NEVER protrude below the under-side surface to a trowel arm except when using for emergency on-site adjustment to level trowel blades.

If the adjustment screw is not flush with the underside of the trowel arm, then this will cause the power trowel to bounce and vibrate especially at high speed. This will also cause the trowel blades to leave an uneven finish to the concrete due to the blades not being level to one another.

Make certain that the adjusting screw is held firmly in place while tightening the bolt which secures the blade to the trowel arm.

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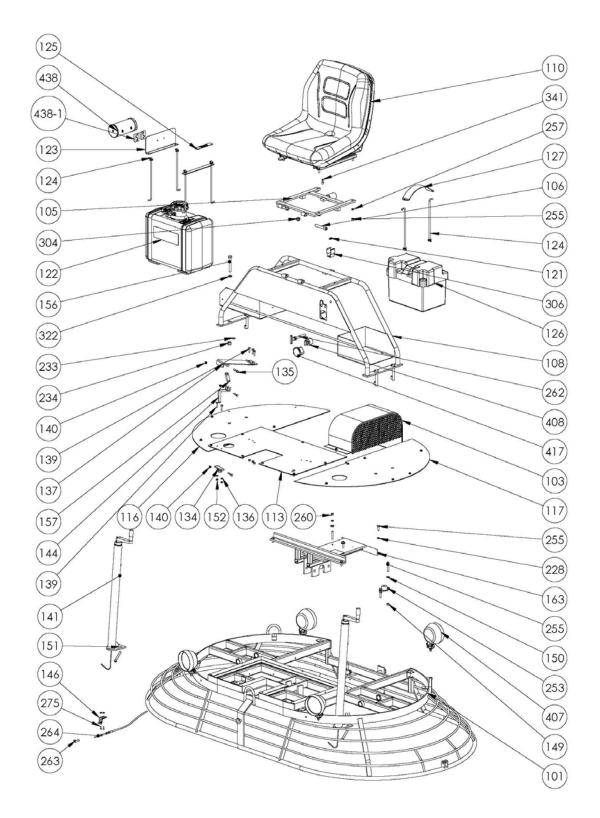
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ASSEMBLY DRAWINGS AND PARTS LIST



CHASSIS ASSEMBLY



Not Shown: Carbon Canister Items 418 to 420 Figure 1 - Complete Chassis

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CHASSIS BOM

Item #	Description	Item #	Description	Item #	Description
101	Chassis Weldment	135	Hex Bolt	234	Hex Nut
103	Belt Guard	136	Hex Nut	253	Anti-vibration Mount
104	Screw	137	Gas Pedal	255	Hex Bolt
105	Hinged Plate	138	Deadman Pedal	257	Hex Nut
106	Socket Screw	139	Hex Screw	260	Flat Washer
108	Seat Frame	140	Locknut	262	Choke Control
109	Seat Adj. Spacer	141	Pitch Control Ass'y	263	Ball Joint
110	Seat	144	Linkage Arm	264	Throttle Cable
113	Floor Plate		Throttle Clip	275	Hex screw
116	Floor Plate - RH	149	Locknut	279	Tension Adj. Screw
117	Floor Plate - LH	150	Flat Washer	295	Engine Mtg. Plate
121	Rivet	151	Hex Screw	304	Lock Nut
122	Tank	152	Lock Washer	306	Seat Clip
123	Tank Bracket	122a	Fuel Cap	156	Hex Screw
322	Flat Washer	123	Hold-Down Bar	157	Throttle Arm Link
341	Engine Kill Switch	124	Hold-Down Bolt	163	Sub-frame
406	Shut-off Switch	125	Hold-Down Bar	215	Lock Washer
407	Lamp 55 Watts	126	Battery Box	216	Hex Nut
408	Starter Key Switch	127	Battery Clamp	228	Lock Washer
414	Switch	134	Throttle Bracket	233	Lock Washer
417	Hour Meter	418	Carbon Canister	438	Carb. Canister
420	Canister Straps	419	Canister Bracket		

17

CUSTOMER PARTS LIST

*	Item #	Part #	Description	Qty	Eff. S/N	Eff. Date
-	101	22627-1	Chassis Weldment	1		10/04/14
	103	22661-1	Belt Guard TS-78/88	1		10/04/14
	104	14596	HWHS 1/4-20 x 1/2"LG Thread Cutting	18		07/10/07
	105	13836	Hinged Plate	1		07/10/07
	106	30012	SHCS 1/2-20UNF x 3"LG	2		07/10/07
	108	13788	Seat Frame TS-78/88	1		07/10/07
	110	13641-1	Seat High Back	1		07/10/07
	113	12887	Floor Plate Checkered	1		07/10/07
	116	22704	Floor Plate – RH	1		07/10/07
	117	22703	Floor Plate – LH	1		07/10/07
-	121	30154	Rivet 3/16" Dia. x 1/2" LG. Button Head	2		07/10/07
	122	18156	Fuel Tank (Complete)	1		04/06/11
	122a	18106	Fuel Cap	1		04/06/11
	123	10192	Gas Tank Hold-Down Bar	2		07/10/07
	124	13839	Hold Down Bolt	3		07/10/07
	125	14480	Label, Fuel	1		07/10/07
	126	13192	Battery Box Black Poly	1		07/10/07
	127	13595	Battery Clamp	1		07/10/07
	134	22548	Throttle Bracket	1		07/10/07
	135	12532	HHCS 1/4 - 20UNC x 1 1/2" LG.	3		07/10/07
-	136	10581	Hex Nut 1/4 – 20 UNC	2		07/10/07
	137	22546	Gas Pedal	1		07/10/07
-	139	50316	HHCS 1/4 - UNC x 1" LG.	7		07/10/07
*	140	30141	Locknut 1/4 -20UNC	8		07/10/07
	141	22551	Pitch Control Ass'y	2		07/10/07
	144	13677	Throttle Linkage Arm	1		07/10/07
	146	13863	Throttle Clip	1		07/10/07
-	149	10108	Locknut 5/16 - 18 UNC	8		07/10/07
-	150	11586	Flat Washer, 5/16 SAE	8		07/10/07
	151	10507	HHCS 3/8-16 UNC x 1" LG.	4		07/10/07
	152	10507	Lockwasher, 1/4" Dia.	2		07/10/07
	156	12742	HHCS 1/2-13 x 3" LG.	4		07/10/07
	157	12742	Throttle Arm Link	1		07/10/07
	163	22710	Sub-frame Weldment, TS88	1		10/04/14
-	215	10902	Lock Washer, 3/8 Med. Split, ZP	6		07/10/07
			Nut, Hex, 3/8 - 16UNC, Grade 5, ZP			
	216	10901	, , ,	6		07/10/07
	228	10402	Lock Washer, 5/16, Medium Split, ZP	16		07/10/07
	233	10009	Lock Washer, 1/2 Dia.	4		07/10/07
	234	12519	Hex Nut 1/2-13UNC	4		07/10/07
	253	14473	Anti-vibration Mount	20		07/10/07
	255	10402				07/10/07
-	257	10915	Hex Nut, 5/16 – 18UNC, Grade 5	4		07/10/07
-	260	10919	Flat Washer, 5/16 Dia. ZP	8		07/10/07
	262	12417	Choke Control	1		07/10/07
	263	11124	Ball Joint	1		07/10/07

Items marked with * are recommended spare parts.

Chassis Assembly continued . . .

*	Item #	Part #	Description	Qty	Eff. S/N	Eff. Date
	264	13862	Throttle Cable, 66" LG.	1		07/10/07
	275	10706	HHMS, #10-24UNC x 1/2" LG. Grade 5	2		07/10/07
*	304	12517	Nylock Nut, 1/2-20 UNF	2		07/10/07
*	306	11592	Bar Clip, Seat Clip	1		07/10/07
*	322	12930	Flat Washer, 7/16" Dia. USS, ZP	4		07/10/07
*	341	13896	Deadman Switch	1		07/10/07
	407	12528	Lamp 55 Watts	4		07/10/07
	408	13365	Starter Key Switch – Honda	1		07/10/07
	414	14377	Switch, ON/OFF, SPSI, Blue	1		07/10/07
	417	12991	Hour Meter	1		07/10/07
	418	18126	Carbon Canister	1		04/06/11
	419	18124	Carbon Canister Mounting Bracket (not shown)	1		04/06/11
	420	18125	Carbon Canister Mounting Strap (set of 2) (not shown)			04/06/11
	438	18124	Carbon Canister	1		04/06/11
	438-1	18124	Carbon Canister Bracket	1		04/06/11

Items marked with * are recommended spare parts.

19

POWERPLANT ASSEMBLY

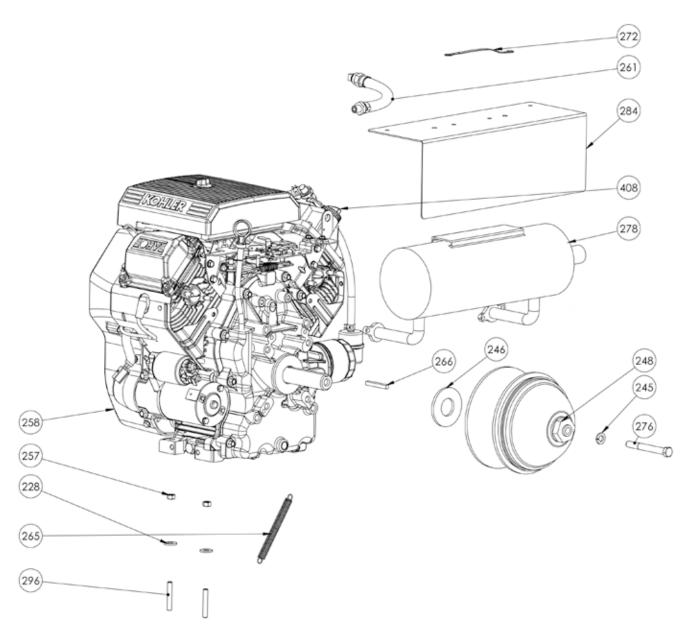


Figure 2 - Complete Powerplant

Item #	Description	Item #	Description	Item #	Description
211	Keystock	257	Hex Nut	278	Exhaust/Guard
228	Lock Washer	258	Engine	284	Clutch Spacer
245	Lock Washer	260	Flat Washer	289	Spring
246	Thick Washer	261	Oil Drain	296	Stud
248	Clutch	276	Hex Bolt		

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CUSTOMER PARTS LIST

*	Item #	Part #	Description	Qty	Eff. S/N	Eff. Date
	228	10402	Lock Washer 5/16"Dia.	4		07/10/07
	245	13491	Lock Washer 7/16"Dia.	1		07/10/07
	246	12708	Thick Washer, 7/16" ID. (Kohler)	1		10/04/14
*	248	14725	CVT Drive Pulley 1-1/8" Bore	1		10/04/14
	257	10915	Hex Nut 5/16-18	4		07/10/07
	258		Engine	1		30/03/11
	260	10919	Flat Washer 5/16"Dia., USS	2		07/10/07
	261	11825	Oil Drain	1		07/10/07
	265	13046	Spring #E11	1		07/10/07
	266	11010	Key, 3/16" x 1/4" x 1"	1		10/04/14
	272	12947	Fuel Line	1		07/10/07
	276	13487	HHCS 7/16-20 x 3-1/2"LG (Kohler)	1		07/10/07
	270	13271	HHCS, 7/16-20 x 4 1/2" LG (Honda)	ı		
	278	13887	Muffler	1		10/04/14
	284	14688	Exhaust Heat Shield	1		10/04/14
	296	10943	5/16-18 UNC x 2"LG. Stud	4		07/10/07
*	408	14648	Starter Switch (Kohler)	1		30/03/11

Items marked with * are recommended spare parts.

21

DRIVETRAIN ASSEMBLY

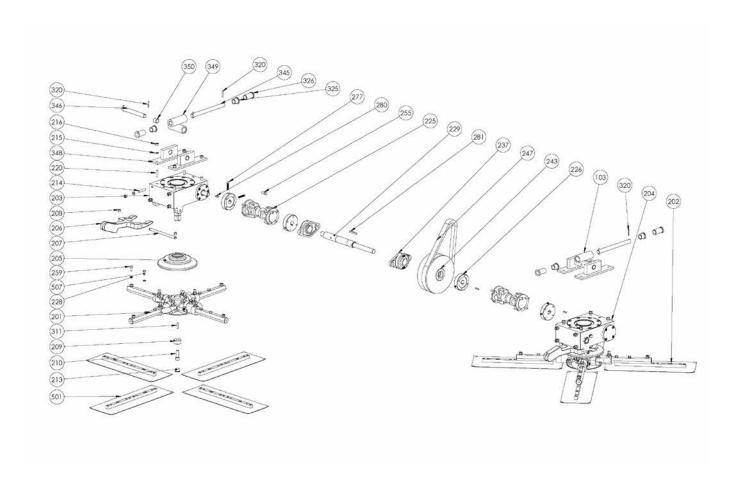


Figure 3 - Complete Drivetrain

Item #	Description	Item #	Description	Item #	Description
103	Left Mounting Bracket	216	Hex Nut	280	Key
201	Spider Assembly	220	Stud	281	Key
202	Spider Assembly	224	U-Joint Drive Flange	311	Keystock
203	Gearbox Assembly-RH	225	Short Coupling	320	Spring Pin
204	Gearbox Assembly-LH	226	U-Joint Drive Flange	325	Flange Bushing
205	Pressure Plate Ass'm	228	Lock Washer	326	Flange Bushing
206	Yoke Arm Large	229	Drive Shaft	345	Gearbox Pin Shaft
207	Yoke Arm Pin	237	Bearing	346	Support Pin
208	Retaining Ring	243	Driven Pulley	348	Bracket Set
209	Retainer	247	Belt	349	Cross Bushing Ass'm
210	Socket Bolt	255	Hex Bolt	501	Finish Blade
213	Cap Plug	259	Hex Bolt	507	Hex Bolt
214	Stud	267	Retaining Ring		
215	Lock Washer	277	Socket Screw		

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6/05

CUSTOMER PARTS LIST

*	Item #	Part #	Description	Qty	Eff. S/N	Eff. Date
	103	22529	Left Mounting Bracket TS88	1		07/10/07
*	201	20840	Spider Assembly, CCW, Right Side	1		07/10/07
*	202	20839	Spider Assembly, CW, Left Side	1		07/10/07
*	203	20968	Gearbox Assembly, CCW, Right Side	1		07/10/07
*	204	20969	Gearbox Assembly, CW, Left Side	1		07/10/07
*	205	20626	Pressure Plate Ass'm LG	2		07/10/07
*	206	10311	Yoke Arm Large	2		07/10/07
*	207	10914	Yoke Arm Pin #3025	2		07/10/07
	208	10913	Retaining Ring 7/16"Dia Shaft	4		07/10/07
	209	10804	Retainer	2		07/10/07
	210	10802	SHCS 1/2-13 x 1-1/2"LG	2		07/10/07
	213	10823	Cap Plug EC-12	2		07/10/07
	214	10910	Stud, 3/8-16UNC x 1-3/4"LG	8		07/10/07
	215	10902	Lock Washer, 3/8 Med. Split, ZP	8		07/10/07
	216	10901	Hex Nut, 3/8" – 16 UNC, Grade 5, ZP	8		07/10/07
	220	11247	Stud, 3/8-16UNC x 1-3/8"LG	8		07/10/07
*	224	13181	U-Joint Drive Flange	2		07/10/07
*	225	13180	Short Coupled U-Joint Coupling	2		07/10/07
*	226	13182	U-Joint Drive Flange	2		07/10/07
*	228	10402	Lock Washer, 5/16" Med. Split, ZP	40		07/10/07
*	229	22711	Drive Shaft, TS88	1		10/04/14
	237	13246	Bearing	2		10/04/14
	243	14726	CVT Driven Pulley	1		07/10/07
*	247	14711	Drive Belt	1		03/07/08
-	255	10441	HHCS 5/16-18 UNC x 1" LG.	16		07/10/07
-	259	10403	HHCS, 5/16-18 UNC x 2" LG	8		07/10/07
	267	14474	Retaining Ring, Internal	2		07/10/07
-	277	13964	SHSS 5/16-18 x 1-1/2" LG. Cup PT	8		07/10/07
	280	12454	KEY 3/16"SQ x 7/8"LG	4		07/10/07
	281	10206	Key 3/16" SQ x 1-7/8" LG.	1		07/10/07
	311	10608	Keystock, 1/4" SQ. 1 5/32" LG.	2		07/10/07
	320	10315	Spring PIN 3/16"DIA x 1-1/4"	6		07/10/07
	325	12593	Flange Bushing	4		07/10/07
*	326	12763	Flange Bushing	4		07/10/07
	345	12918	Gearbox Pin Shaft	2		07/10/07
	346	12497	Cross Bushing Support Pin	1		07/10/07
*	348	22473	Right Pivot Bracket Set	1		07/10/07
*	349	22474	Rear Cross Bushing Ass'y	1		07/10/07
*	501	20410	Finish Blade 6" x 8", Imperial	8		07/10/07
	507	10401	HHCS, 5/16-18 UNC x 1.5 LG.	16		07/10/07

Items marked with * are recommended spare parts.

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Created: 06/05 Revised: 06/14

STEERING ASSEMBLY

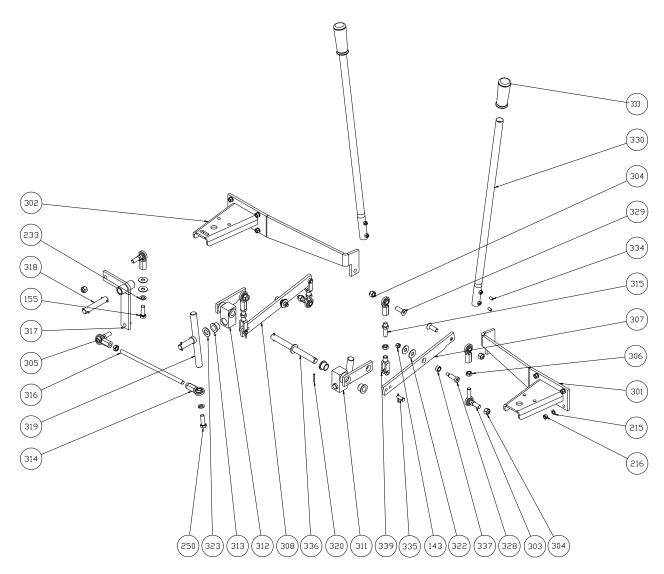


Figure 4 - Complete Steering

Item #	Description	Item #	Description	Item #	Description
143	Locknut	307	Left Pivot Arm	322	Flat Washer
155	Hex Bolt	308	Right Pivot Arm	323	Washer
215	Lock Washer	311	Left Steering Block	328	Shoulder Bolt
216	Hex Nut	312	Right Steering Block	329	Flat Head Screw
233	Lock Washer	313	Flanged Bushing	330	Control Handle
250	Hex Bolt	314	Rod End Pivot	333	Handle Grip
301	Left Control Arm	315	Threaded Rod	334	Socket Screw
302	Right Control Arm	316	Push Rod	335	Clevis Pin & Cotter Pin
303	Rod End	317	Lever	336	Front Steering Pin
304	Nylon Locknut	318	Steering Pin	337	Bushing
305	Rod End Pivot	319	Steering Link	339	Yoke End Clevis
306	Hex Jam Nut	320	Pin		

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CUSTOMER PARTS LIST

*	Item #	Part #	Description	Qty	Eff. S/N	Eff. Date
	143	10317	3/8-16UNC Locknut, Nylon	2		07/10/07
	155	12516	HHCS 1/2-20 UNF x 1-1/2"LG.	1		07/10/07
	215	10902	Lock Washer 1/2", Med. Split ZP	8		07/10/07
	216	10901	Hex Nut, 3/8-16 UNC, Grade 5 ZP	8		07/10/07
*	233	10009	Lock Washer, 1/2 Dia.	2		07/10/07
	250	30019	HHCS 1/2 – 13 x 1-1/2" LG.	1		07/10/07
*	301	14467	LH Control Arm, TS88	1		07/10/07
	302	14468	RH Control Arm, TS88	1		07/10/07
	303	13932	Rod End – Male/Male	2		07/10/07
	304	12517	Nylon Locknut, 1/2-20 UNF	7		07/10/07
	305	12412	Rod End Pivot – Female /Male	2		07/10/07
	306	12592	Hex Jam Nut 1/2 – 20 UNF	8		07/10/07
*	307	13947	Left Pivot Arm, TS88	1		07/10/07
*	308	13944	Right Pivot Arm	1		07/10/07
	311	13943	Steering Block LH	1		07/10/07
	312	13942	Steering Block RH	1		07/10/07
	313	12968	Flanged Bushing	6		07/10/07
	314	12420	Rod End Pivot – Female	4		07/10/07
	315	12969	Threaded Rod 1/2 -20 UNF x 2-1/4" LG.	2		07/10/07
	316	13958	Steering Rod	1		07/10/07
	317	22530	L/R Lever	1		07/10/07
	318	12921	Steering Pin	1		07/10/07
	319	13060	Steering Link RH	1		07/10/07
	320	10315	Pin 3/16" DIA. X 1 – 1/4" LG.	5		07/10/07
*	322	12930	Flat Washer, 7/16"Dia, USS ZP	6		07/10/07
	323	10306	Washer, 3/4" Dia.	2		07/10/07
	328	12985	SHSB 1/2" SHLDR x 3/8-16UNCx1-1/4"LG.	2		07/10/07
*	329	13945	FHSC ½-20 UNF x 1-1/2" LG.	3		07/10/07
	330	13064	Control Handle	2		07/10/07
*	333	13065	Handle Grip 1"	2		07/10/07
*	334	50117	SHSS, 5/16-18 UNC x ½" LG. Cup PT	4		07/10/07
	335	13949	Clevis Pin & Cotter Pin	3		07/10/07
	336	12919	Front Steering Pin	1		07/10/07
	337	12984	Bushing	2		07/10/07
	339	13946	Yoke End Clevis	3		07/10/07

Items marked with * are recommended spare parts.

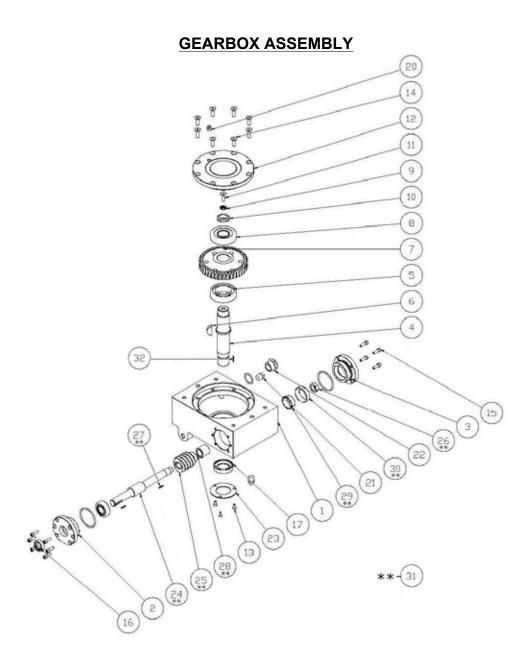


Figure 5 – Gearbox Assembly Note: Right hand gearbox shown.

Item #	Description	Item #	Description	Item #	Description
1	Gear Housing	11	Flat Head Screw	21	Plug
2	Large Flange	12	Gearbox Cover	22	Sight Plug
3	End Cap	13	Flat Head Screw	23	Seal Retainer
4	Main Shaft	14	Flat Head Screw	24	Counter Shaft
5	Bearing Cup	15	Socket Head Screw	25	Worm
6	Woodruff Key	16	Oil Seal	26	Jam Nut
7	Worm Gear	17	Oil Seal	27	Key
8	Taper Bearing	18	O Ring	28	Spacer
9	Lock Washer	19	O Ring	29	Bearing Cone
10	Pressure Washer	20	Relieve Valve	30	Bearing Cup

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Created: 06/05 Revised: 06/14

CUSTOMER PARTS LIST

*	Item #	LH, CW 20969	RH, CCW 20968	Description	Qty	Eff. S/N	Eff. Date
	1	10944	10945	Gear Housing	1		07/10/07
	2	10231	10231	Large Flange	1		07/10/07
	3	10258	10258	End Cap, Ride-on	1		07/10/07
	4	10640	10639	Ride-on Main Shaft	1		07/10/07
*	5	14256	14256	Bearing Cup	1		07/10/07
	6	10638	10638	3/8" Woodruff Key	1		07/10/07
*	7	10642	10641	Worm Gear	1		07/10/07
	8	10603	10603	Taper Bearing, No. 30306	1		07/10/07
	9	10637	10637	3/8"CSK, Lock Washer	1		07/10/07
	10	10613	10613	Pressure Washer	1		07/10/07
	11	10601	10101	FHCS, 3/8-16 UNC x 1" LG.	1		07/10/07
	12	10929	10929	Gearbox Cover, Large	1		07/10/07
*	13	10951	10951	FHCS, 10 - 24 UNC x 1/2" LG.	3		07/10/07
*	14	10903	10903	FHCS, 5/16 – 18 UNC x 1" LG.	8		07/10/07
	15	10213	10213	SHCS, 1/4 – 20 UNC x 3/4" LG.	10		07/10/07
	16	10678	10678	Oil Seal	1		07/10/07
	17	10676	10676	Oil Seal	1		07/10/07
	18	10228	10228	O Ring, No. 227	2		07/10/07
	19	10931	10931	O Ring, No. 213	1		07/10/07
	20	10909	10909	Relieve Valve	1		07/10/07
	21	10911	10911	Plug, 3/8 NPT	2		07/10/07
	22	10930	10930	Sight Plug	1		07/10/07
	23	10950	10950	Seal Retainer	1		07/10/07
	24	10276	10276	Counter Shaft	1		07/10/07
*	25	10274	10273	Worm	1		07/10/07
	26	10202	10202	Jam Nut, 5/8 – 18 UNF	1		07/10/07
	27	10206	10206	Key, 3/16" SQ. x 1 7/8" LG.	1		07/10/07
	28	10223	10223	Spacer	1		07/10/07
	29	10229	10229	Bearing Cone	2		07/10/07
	30	10230	10230	Bearing Cup	2		07/10/07
	**31	20269	20268	Countershaft Assembly	1		07/10/07
	32	10608	10608	Key, ¼" SQ x 1 – 5/32" LG	4		07/10/07
	33	12454	12454	Key, 3/16" SQ x 7/8" LG	1		07/10/07
		10933	10933	Shim (.003"), (For Item 12 – not shown)	A/R		07/10/07
	34	10935	10935	Shim (.005"), (For Item 12 – not shown)	A/R		07/10/07
	35	10209	10209	Shim (.003"), For Item 2 + 3	7 01 0		31710/01
	- 00	10203	10203	Shim (.005"), For Item 2 + 3			
		10212	10212	Shim (.003), For Item 2 + 3			

Items marked with * are recommended spare parts

27

PITCH CONTROL ASSEMBLY

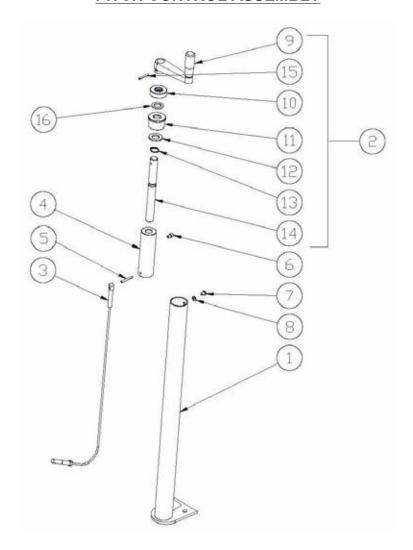


Figure 6 – Steering Assembly

Item #	Description	Item #	Description
1	Tube	9	Crank Handle
2	Crank Handle Assembly	10	Bearing
3	Control Cable	11	Bushing
4	Slide Bushing	12	Flat Washer
5	Spring Pin	13	Retainer
6	Socket Head Screw	14	Screw Shaft
7	Round Head Screw	15	Spring Pin
8	Lock Washer	16	Shim Ring

28

CUSTOMER PARTS LIST

Assembly # 22551

PITCH CONTROL ASS'Y

*	Item #	Part #	Description	Qty	Eff. S/N	Eff. Date
-	1	22538	Tube	1		07/10/07
	2	22573	Crank Handle Assembly	1		07/10/07
	3	22539	Control Cable	1		07/10/07
,	4	10308	Slide Bushing	1		07/10/07
	5	10309	Spring Pin ø3/16" x 1-1/2"	1		07/10/07
	6	10510	SHCS 1/4-20 x 3/8"LG	1		07/10/07
	7	10511	RHMS 1/4-20 x 3/8"LG	1		07/10/07
	8	10521	Lock Washer Ø1/4"	1		07/10/07
	9	12893	Crank Handle	1		07/10/07
	10	10304	Bearing	1		07/10/07
	11	10305	Bushing	1		07/10/07
,	12	10306	Washer	1		07/10/07
	13	10307	Retainer	1		07/10/07
	14	10303	Screw Shaft	1		07/10/07
	15	10315	Spring Pin Ø3/16" x 1-1/4"LG	1		07/10/07
	16	22674	Shim Ring, 3/4" ID x 1 -1/8" OD x .047"	1		07/10/07

29

SPIDER PLATE ASSEMBLY

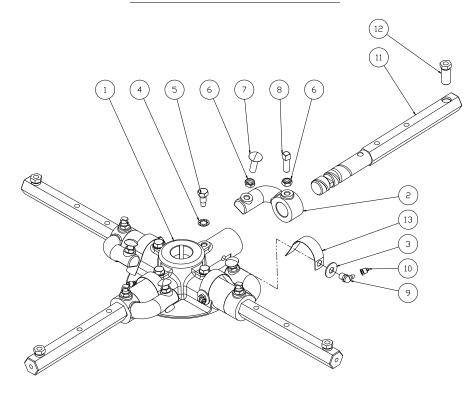


Figure 7 - Greased Spider Assembly

Note: 4 Blade Spider Plate(Part # 20839) Shown.

Item #	Description	Item #	Description
1	Spider Plate	8	Square Head Screw
2	Lift Lever	9	Grease Fitting
3	Flat Washer	10	Cap Plug
4	Lock Washer	11	Trowel Arm
5	Dog Point Bolt	12	Adjusting Screw
6	Jam Nut	13	Trowel Arm Spring
7	Carriage Bolt		

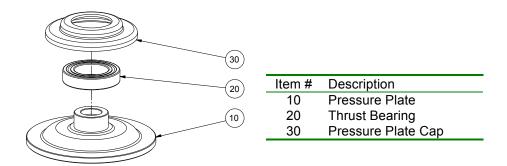


Figure 8 - Pressure Plate Assembly

MORRISON INC. BARTELL MORRISON (USA) LLC 375 ANNAGEM BLVD, MISSISSAUGA, ONTARIO, CANADA, L5T 3A7, 905-364-4200 FAX 905-364-4201 200 COMMERCE DRIVE, FREEHOLD, NEW JERSEY, USA, 07728, 732-566-5400 FAX 732-566-5444

Created: 06/05 Revised: 06/14

CUSTOMER PARTS LIST

Assembly # 20839, 20840

Greased Spider Assembly

Item #	CW, LH 20839	CCW, RH 20840	Description	Qty	Eff. S/N	Eff. Date
1	10820	10840	4 Spoke Spider Plate	1		07/10/07
2	10819	10839	Lift Lever	4		07/10/07
3	10849	10849	Flat Washer, 3/8	4		07/10/07
4	10805	10805	Lock Washer, 3/8	4		07/10/07
 5	10806	10806	3/8-16 UNC Dog Point Bolt	4		07/10/07
 6	10808	10808	Jam Nut, 3/8 - 16 UNC	8		07/10/07
 7	10807	10807	Carriage Bolt, 3/8 - 16 UNC x 1 1/4" LG.	4		07/10/07
 8	10809	10809	SHSS, 3/8 - 16 UNC x 1" LG. Cup Point	4		07/10/07
 9	11096	11096	Grease Fitting, 1/8 NPT	4		07/10/07
10	10822	10822	Cap Plug	4		07/10/07
11	10405	10405	Trowel Arm	4		07/10/07
 12	10404	10404	Adjusting Screw, 1 1/4" LG.	4		07/10/07
13	10848	10848	Trowel Arm Spring	4		07/10/07

Assembly # 20626

Pressure Plate Assembly

Item #	Part #	Description	Qty	EFF. S/N	Eff. Date
10	10659	Large pressure plate	1		07/10/07
20	10663	Large thrust bearing 6010LLU-2A	1		07/10/07
 30	10667	Large pressure plate cap	1		07/10/07

31

TROWEL BLADE ASSEMBLY

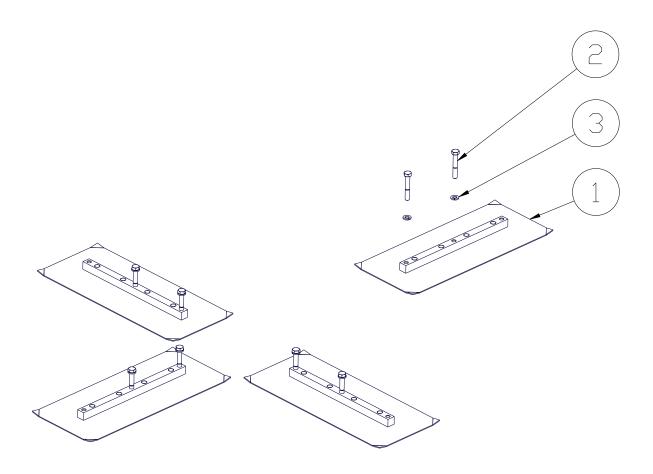


Figure 9 - Trowel Blade Kit

Note: 6 x 18 Model Shown.

Item #	Description
1	Trowel Blade
2, 4	Hex Bolt
3	Lock Washer

CUSTOMER PARTS LIST

6 x 18 Finish Blades (Imperial)

*	Item #	Part #	Description	Qty	Eff. S/N	Eff. Date
*	1	20410	6 x 18 Imperial Trowel Blade	4		07/10/07
	2	10401	HHCS, 5/16-18x1 1/2"LG.	8		07/10/07
	3	10402	Lock Washer, ø5/16"	8		07/10/07
	4	10403	HHCS, 5/16-18x2"LG.	4		07/10/07

6 x 18 Finish Blades (Metric)

*	Item #	Part #	Description	Qty	Eff. S/N	Eff. Date
*	1	20456	6 x 18 Metric Trowel Blade			07/10/07
	2	10452	HHCS, M8x1.25x40mm	8		07/10/07
	3	11614	Lock Washer, Ø8MM	8		07/10/07
	4	10453	HHCS, M8x1.25x50mm	4		07/10/07

Items marked with * are recommended spare parts

33

TRANSPORTER ASSEMBLY

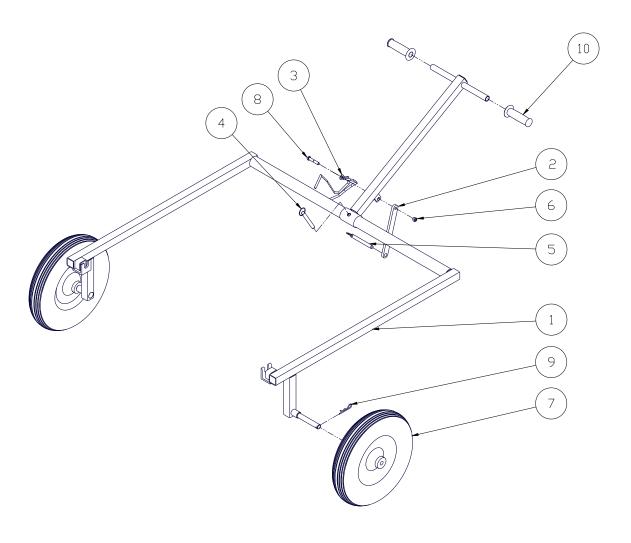


Figure 11 - TS88 Transporter

Item #	Description	Item #	Description
1	Frame Assembly	6	Lock Nut
2	Pickup Bar	7	Wheel
3	Chain	8	Hex Bolt
4	Large Hitch Pin	9	Spring Clip
5	Small Hitch Pin	10	Handle Grips

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CUSTOMER PARTS LIST

Assembly # 22523 TRANSPORTER

*	Item #	Part #	Description	Qty	Eff. S/N	Eff. Date
-	1	22524	Frame Assembly	1		07/10/07
	2	13364	Pickup Bar	1		07/10/07
	3	12860	Chain	1		07/10/07
	4	12487	Large Hitch Pin, 3 1/2" LG.	1		07/10/07
	5	12488	Small Hitch Pin, 2 1/2" LG.	1		07/10/07
	6	10317	Nylon Lock Nut, 3/8 – 16 UNC	1		07/10/07
*	7	13198	Wheel, 16" x 4 " Hub	2		07/10/07
	8	12859	Hex Bolt, 3/8 – 16 UNC x 2" LG.	1		07/10/07
	9	50265	Spring Clip	2		07/10/07
	10	10509	Handle Grips	2		07/10/07

Items marked with * are recommended spare parts.

35

RETARDANT SPRAY SYSTEM

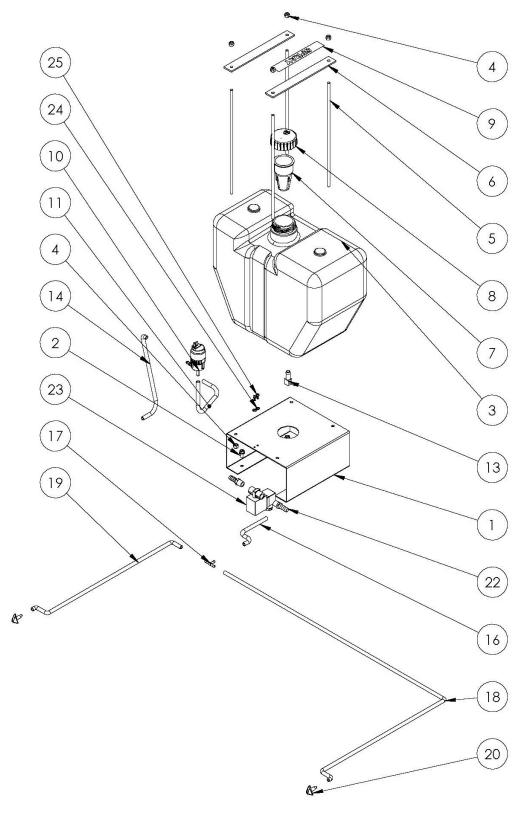


Figure 12 -TS88 Retardant Spray System

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CUSTOMER PARTS LIST

RETARDANT SPRAY SYSTEM

*	Item #	Part #	Description	Qty	Eff. S/N	Eff. Date
	1	18131	Support	1		
	2	14596	HHCS 1/4 - 20 x 5" LG	4		
	3	18136	Water Tank	1		
	4	30141	Locknut 1/4 - 20	8		
	5	11829	1/4 – 20 Threaded Rod	4		
	6	18132	Hold Down Bar	2		
	7	18139	Strainer	1		
	8	18140	Cap	1		
	9	14481	Label	1		
*	10	18138	12V Pump	1		
	11	18141	3/16" Hose	10-1/2"		
	12	18144	Grommet	1		
	13	18145	Elbow	1		
	14	18141	3/16" Hose	8-1/2""		
	15	18137	Check Valve	1		
	16	18141	3/16" Hose	4-1/2"		
	17	18143	3/16" Tee	1		
	18	18141	3/16" Hose	47"		
	19	18141	3/16" Hose	19"		
	20	14179	Nozzles	1		
	21		3/16" Cable Tie	1		

Items marked with * are recommended spare parts.

37

TROUBLESHOOTING

WON'T START

- Throttle fully open
- Hand lever wire broken
- No gas
- Dirty gas
- Gas filter plugged
- · Gas line plugged
- Hole in gas line
- Gas supply valve turned off
- Dead-man safety switch inoperable (foot lever must be depressed)
- Safety switch wire or connectors not making good contact
- Other engine problems (Refer to engine manual)

STARTS BUT NO HIGH SPEED

- Engine problems
- · Throttle cable broken or seized
- Throttle lever and connectors loose or out of adjustment
- Clutch shoes worn

TROWELS TURN, ENGINE AT IDLE

- Idle too fast
- · Belt too tight
- Clutch seized

MACHINE JUMPS ON FLOOR

- Concrete hardened on bottom of spider plate
- · Trowels unevenly worn
- · Spider plate seized
- Spider plate loose
- Trowel arms bent
- Adjusting screws (carriage bolts) incorrectly set use spider plate adjustment jig (pg,13)
- Mainshaft bent
- · Steering handle too far right or left

SPIDER PLATE HARD TO GREASE

- Fittings plugged
- · Cement in grease grooves of arms
- Grease fittings too tight

PITCH CONTROLS WILL NOT OPERATE BLADES

- Cable broken or out of adjustment
- Slot screw missing (under-side of handle)
- Pressure plate and/or yoke arm broken or badly worn
- Hand crank adjuster not working

BELT WEARING RAPIDLY

- · Belt adjusted improperly
- Pulley out of alignment
- Wrong belt/defective belt
- Clutch sticking
- · Gearbox seizing

OIL LEAKS

a) Top of gearbox

- · Engine leaks
- Relief valve broken
- Too much oil in gearbox
- · Set screw missing in cover

b) Between end cap and gearbox (recoil side)

- "O" ring damaged
- · End cap not tight

c) At mainshaft or countershaft

- Relief valve seized
- Shaft and/or seal worn

BLADES HITTING EACH OTHER (MODIFIED MODELS ONLY)

- Blades out of synchrony
- Sheared key in spider plate or gearbox
- · Drive shaft misaligned

WON'T MOVE FORWARD OR REVERSE

- Pins or forward/reverse lever broken
- Rod end seizing on F/R lever
- Connecting rod broken

WON'T STEER LEFT OR RIGHT

- Steering arms broken
- Linkage worn out
- Gearbox stud sheared
- · Rod end connecting shaft loose

DRIVE SHAFT WILL NOT TURN

- Universal joint(s) seized
- Yoke arm broken
- Spline stripped
- Key sheared

6/05

SPECIFICATIONS

RIDE-ON POWER TROWEL

TS88 (GASOLINE)		
Engine	Honda 24 HP	
	Kohler 25 HP OHV	
Length	88" (224 cm)	
Width	48" (122 cm)	
Height (without seat & steering levers)	30" (76 cm)	
Weight	Up to 635 lbs. (289 kg)	
Trowel Coverage	17 sq. ft. (1.7 sq. m)	
Travel Speed	Up to 380 ft/min (116 m/min)	
Dual Rotor Speeds	180 rpm	
Float Blade Size	10" x 18" (25 x 46 cm)	
Finish Blade Size	6"x 18" (15 x 46 cm)	
Combination Blade Size	8"x 18" (20 x 46 cm)	
Pan Float Size	38.5" (98 cm)	
Electric Start	Yes	
Electrical System	12 Volt	
Charging System	15 to 35 Amps	
Battery	12 Volt	
Dead-man Safety Switch	Yes	
Fuel Capacity (approximately)	3 Gal. (12.5 L)	
Running Time (approximately)	2 ½ hours	
Steering Levers	Twin Stick	
"U" Joint Drive Coupling	Yes	
Standard Features	Lifting Hooks	
	Seat Adjuster	
	Hour Meter	
	50W Light Package (4 light kit)	
Options	Transporter	
	Retardant Sprayer	
	Combo Blades	
	Pan Float Discs	

39

COMPANY INFORMATION

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Conforms with the provisions of the "MACHINES" directive, modified (directive 89/392/CEE) and the national codes transposing it.

(Directive 89/392/CEE, modified) and the rules governing its transposition

Mississauga, Ontario, Canada, August 28th, 2012

European Representative

Charles

NOTES

41