

BARTELL

CONCRETE EQUIPMENT

INSTRUCTION MANUAL & PARTS BOOK

TS78 RIDE-ON TROWEL



POWERFUL - EFFICIENT - DEPENDABLE

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TS78 RIDE-ON TROWEL INSTRUCTION MANUAL

SAFETY PRECAUTIONS	
	<p style="text-align: center;"> DANGER</p> <p>EXPLOSION HAZARD Never operate the machine in an explosive atmosphere, near combustible materials or where ventilation does not clear exhaust fumes.</p>
	<p style="text-align: center;"> WARNING</p> <p>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.</p>
	<p style="text-align: center;"> WARNING</p> <p>ROTATING HAZARD Never place hands or feet inside safety guard rings. Serious injury will result from contact with rotating blades.</p>
	<p style="text-align: center;"> CAUTION</p> <p>MOVING PARTS Before starting the machine ensure that all guards and safety devices are in place and functioning properly.</p>
	<p style="text-align: center;"> ATTENTION</p> <p>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.</p>

TS78 RIDE-ON TROWEL INSTRUCTION MANUAL

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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 run-in 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 and a final phase at full throttle for a minimum of 20 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.

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MAINTENANCE RECORD

PREVENTATIVE MAINTENANCE AND ROUTINE SERVICE PLAN

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.

Date Purchased:		Type of Machine:	
Dealer Name:		Model:	
Dealer Phone:		Serial Number:	

REPLACEMENT PARTS USED				MAINTENANCE LOG	
PART NO.	QUANTITY	COST	DATE	DATE	OPERATION

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

+ Continued on next page...

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

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 release agent 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 release agent 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.

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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, turning 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 your 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

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

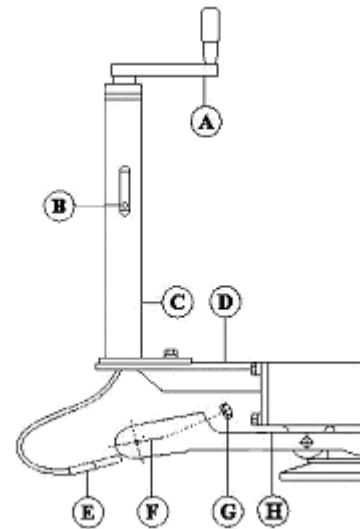


Figure 1a.

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

- 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.**
- 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

- Bring throttle to low idle, wait a few seconds.
- Remove left foot from dead-man safety switch.
- 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.

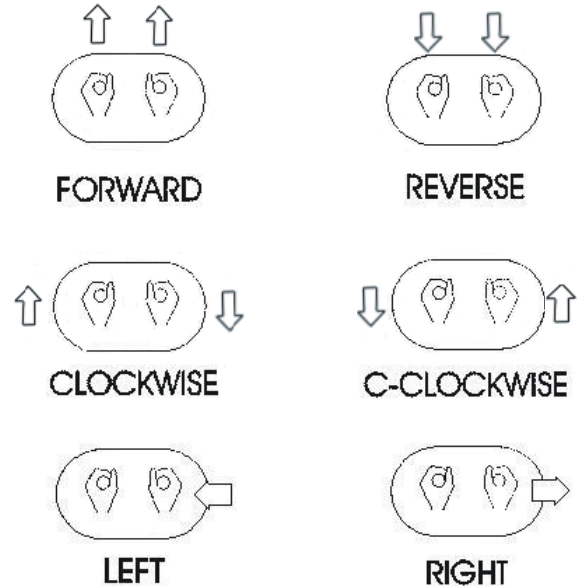


Figure 2a.

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 EXCESS LIQUID ON THE CONCRETE SURFACE.

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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 concrete; This may place unnecessary strain on the clutch to break it free of the concrete. 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 must follow all applicable codes and 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)

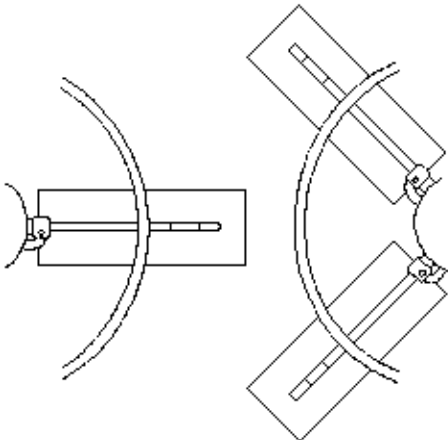


Figure 3a.

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 concrete residue. 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. 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 causes hard starting and poor engine performance. Set spark plug gap to recommended clearance. Refer to engine manual.

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4. BELT CHANGE PROCEDURE

Remove belt cover from the machine to expose the drive components. To remove the drive belt, a tool made of a wood or plastic wedge can be tapped and driven into the center of the driven pulley halves so that it can spread apart 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 moveable 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 lubrication.

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 sight glass. Top up with Agma 8 compounded gear oil only. Gearbox capacity on the TS78 is 27 oz./767ml.

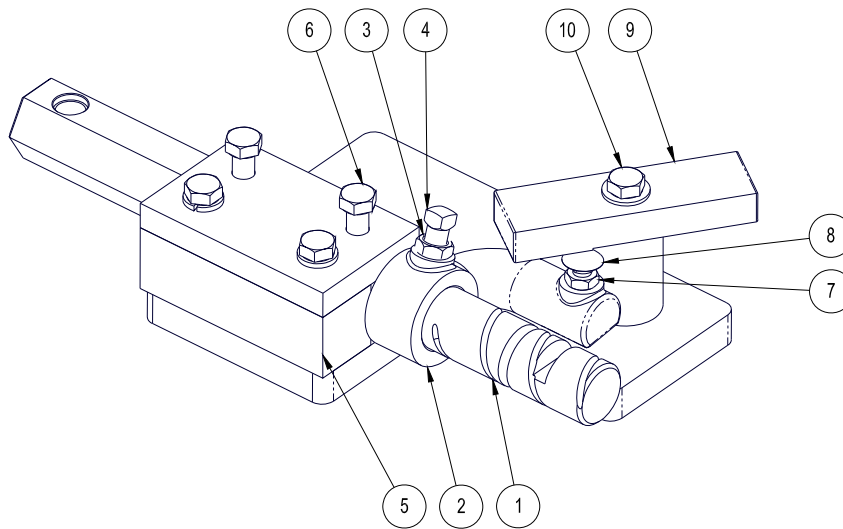
4. TO CHANGE GEARBOX OIL

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 27oz./767ml. of Chevron HiPerSYN ISO 320 gear oil or equivalent. 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.

TROWEL ARM ADJUSTMENT FIXTURE



PART #20801

Unit 36" (TS78)

- 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

Figure 4a.

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 set on "36" for the TS78 trowel arm.

ADJUSTMENT PROCEDURE

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 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 described above.

NOTE: IT IS IMPORTANT THAT WHEN TIGHTENING SQUARE HEAD SETSCREW (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 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).
6. Adjust carriage bolt (8) upwards until contact is made with adjustment bar (9); holding carriage bolt in position with one wrench, tighten locknut (7) to secure in position with second wrench.
7. This same procedure is to be followed with ALL arms from spider plate assembly, and will ensure correct and exact adjustment.

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.

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 on 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.

ASSEMBLY DRAWINGS AND PARTS LIST



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CHASSIS ASSEMBLY

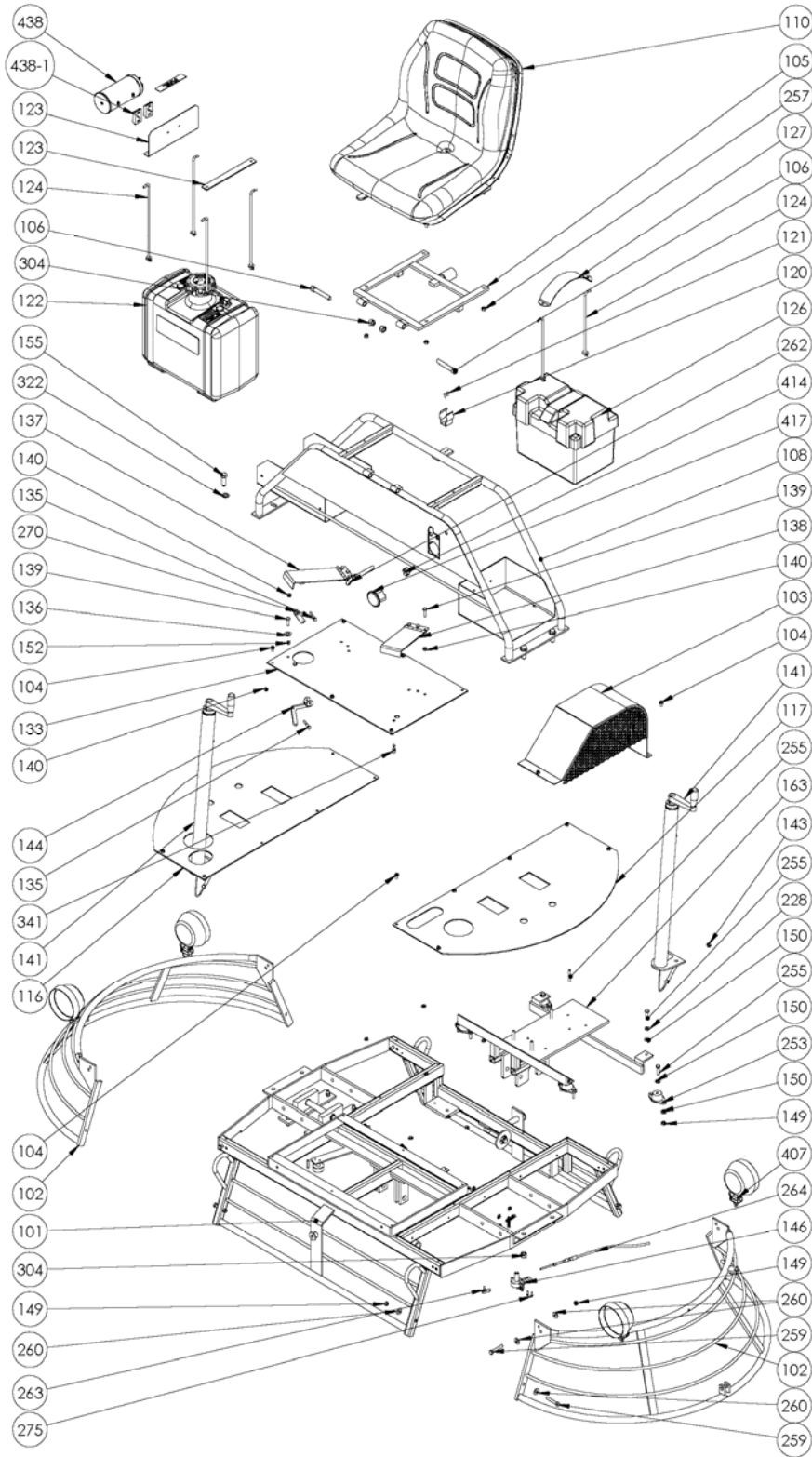


Figure 1 - Complete Chassis

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CHASSIS BOM

Item #	Description	Item #	Description	Item #	Description
101	Chassis Weldment	134	Throttle Bracket	257	Hex Nut
102	Guard Ring	135	Hex Bolt	259	Hex Bolt
103	Belt Guard	136	Hex Nut	260	Flat Washer
104	Screw	137	Gas Pedal	262	Choke Control
105	Hinge Plate	138	Dead-man Pedal	263	Ball Joint
106	Socket Screw	139	Hex Bolt	264	Throttle Cable
108	Seat Frame	140	Lock Nut	270	Throttle Pivot
109	Spacer	141	Pitch Control	275	Screw
110	Seat	143	Lock Nut	279	Tension Screw
111	Seat Adjuster	144	Throttle Link	295	Engine Mount Plate
116	Floor Plate - RH	146	Cable Clamp	304	Lock Nut
117	Floor Plate - LH	149	Lock Nut	322	Fender Washer
120	Bar Clip	150	Flat Washer	341	Deadman Switch
121	Rivet	152	Lock Washer	406	Shut-off Switch
122	Fuel Tank	155	Hex Bolt	407	Lamp 55 Watts
123	Tank Bracket	163	Sub-frame Weldment	414	Switch
124	Hold-Down Bolt	215	Lock Washer	417	Hour Meter
125	Label Tank Bar	216	Hex Nut	437	Wiring Clamp
126	Battery Box	228	Lock Washer	438	Carb. Air Filter
127	Battery Clamp	253	Anti-vibration Mount		
133	Centre Floor Plate	255	Hex Bolt		

TS78 RIDE-ON TROWEL INSTRUCTION MANUAL

CUSTOMER PARTS LIST

Chassis Assembly

*	Item #	Part #	Description	Qty	Eff. S/N	Eff. Date
	101	22633	Chassis	1		07/10/07
	102	13805	Ring	2		07/10/07
	103	22660	Belt Guard	1		07/10/07
	104	14596	HWHS #14 x 1/2"LG	20		07/10/07
	105	13836	Hinged Plate	1		07/10/07
		14836	Hinged Plate, Central Steering	1		07/10/07
	106	30012	SHCS 1/2-20 x 3"LG	2		07/10/07
	108	14569	Seat Frame	1		01/28/11
	109	10139	Spacer	4		07/10/07
	110	13641	Seat	1		03/15/12
	111	12896	Seat Adjuster	1		07/10/07
	112	13986	Floor Plate Cover, Central Steering	1		07/10/07
	116	13787	RH Floor Plate	1		07/10/07
	117	13786	LH Floor Plate	1		07/10/07
	120	11592	Bar Clip	1		07/10/07
	121	11042	Rivet ø3/16" x 1/2"LG	2		07/10/07
	122	18156	Fuel Tank (complete)	1		04/06/11
	122a	18106	Fuel Cap	1		04/06/11
	122b	18126	Carbon Canister (not shown)	1		04/06/11
	122c	18124	Canister Bracket (not shown)	1		04/06/11
	122d	18125	Canister Strap (set of 2) (not shown)	1		04/06/11
	123	10192	Tank Bracket	2		04/06/11
	124	13839	Hold Down Bolt Kit	3		07/10/07
	125	14480	Label Tank Bar – FUEL	1		07/10/07
	126	13192	Battery Box	1		07/10/07
	127	13595	Battery Clamp	1		07/10/07
	133	13785	Centre Floor Plate	1		07/10/07
		13985	Centre Floor Plate, Central Steering	1		07/10/07
	134	22548	Throttle Bracket	1		07/10/07
	135	12532	HHCS 1/4-20 x 1-1/2"LG	3		07/10/07
	136	10581	Hex Nut 1/4-20	2		07/10/07
	137	22546	Gas Pedal	1		07/10/07
	138	22547	Dead-man Pedal	1		07/10/07
	139	50316	HHCS 1/4-20 x 1"LG	8		07/10/07
	140	30141	Nylock Nut 1/4-20	9		07/10/07
*	141	22551	Pitch Control Assembly	2		07/10/07
	143	10317	Nylock Nut 3/8-16UNC	6		07/10/07
	144	13677	Throttle Link	1		07/10/07
	146	13863	Cable Clamp	1		07/10/07
	149	10108	Nylock Nut 5/16-18	8		07/10/07
	150	11586	Washer ø5/16	20		07/10/07
	152	10521	Lock Washer ø1/4"	2		07/10/07
	155	12516	HHCS 1/2-20 x 1-1/2"LG	4		07/10/07
	163	22708	Sub-Frame Weldment	1		07/10/07
	215	10902	Lockwasher 3/8	3		07/10/07
	216	10901	Hex Nut 3/8-16 UNC	3		07/10/07
	228	10402	Lock Washer ø5/16"	16		07/10/07
	253	14473	Anti-Vibration Mount	4		07/10/07
	255	10441	HHCS 5/16-18 x 1"LG	20		07/10/07
	257	10915	Hex Nut 5/16-18	4		07/10/07

TS78 RIDE-ON TROWEL INSTRUCTION MANUAL

*	Item #	Part #	Description	Qty	Eff. S/N	Eff. Date
	259	10403	HHCS 5/16-18 x 2"LG	8		07/10/07
	260	10919	Washer ø5/16"	12		07/10/07
	262	12417	Choke Control (for Kohler, B&S)	1		07/10/07
	263	11124	Ball Joint	1		07/10/07
*	264	18165	Throttle Cable 42"LG GX690	1		08/10/11
	270	12970	Throttle Pivot	1		07/10/07
	275	10706	HHMS #10-24 x 1/2" LG.	2		07/10/07
	279	14999	Tension Screw 3/8-16 x 4"LG	3		07/10/07
	295	14492	Engine Mount Plate	1		07/10/07
	304	12517	Nylock Nut 1/2-20	6		07/10/07
	322	12930	Fender Washer ø1/2"	4		07/10/07
	341	13896	Dead-man Switch	1		07/10/07
*		14397	Dead-man Switch, Central Steering (located under seat)	1		07/10/07
*	407	12528	Lamp 55 Watts (for Kohler, B&S)	4		07/10/07
*	414	14377	Switch (for Kohler, B&S)	1		07/10/07
*	417	12991	Hour Meter	1		07/10/07
	437	13591	Wiring Clamp 5/8"	21		07/10/07
	438	18124	Carbon Canister	1		04/06/11
	438-1	18124	Carbon Bracket	1		04/06/11

Items marked with * are recommended spare parts

POWERPLANT ASSEMBLY

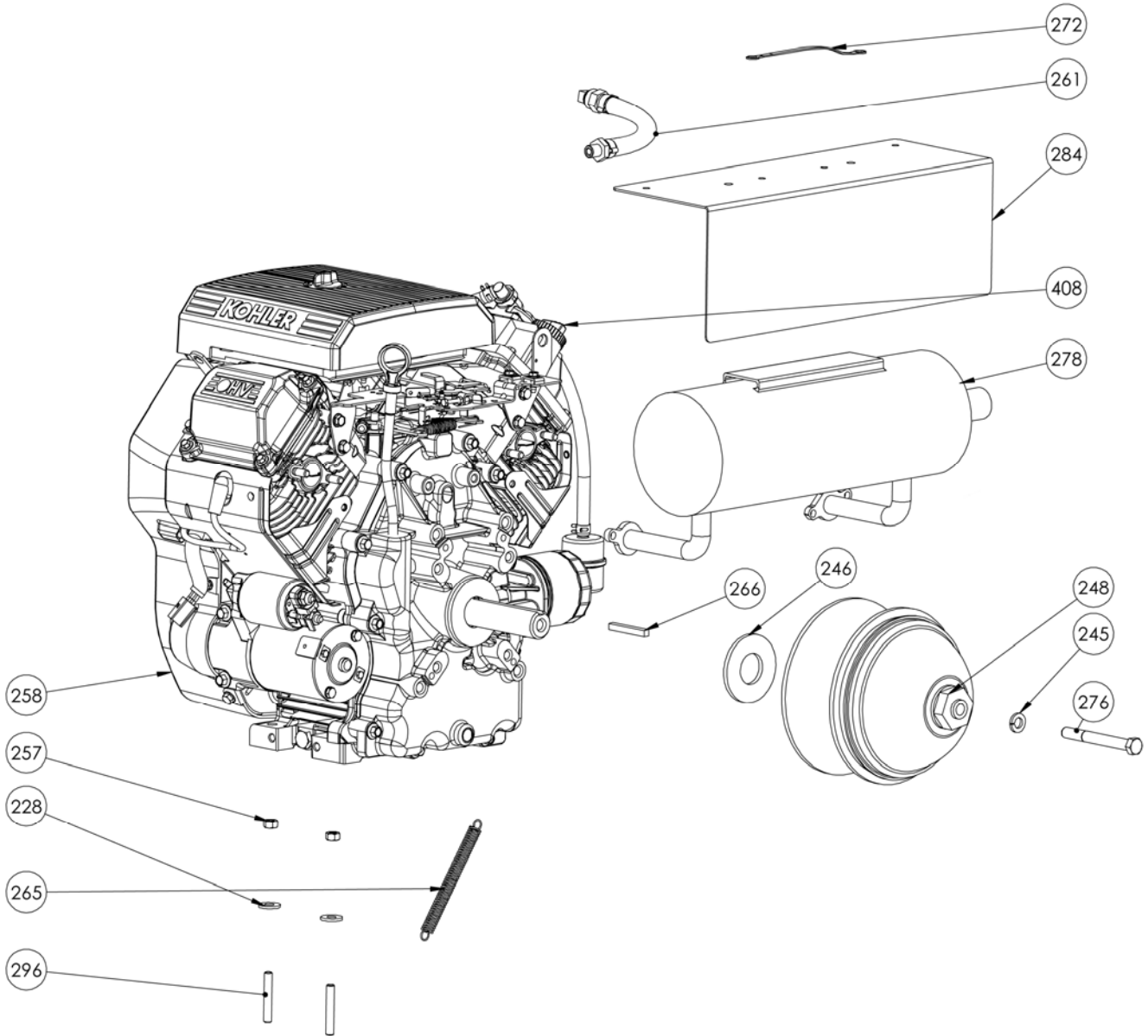


Figure 2 - Complete Powerplant

Item #	Description	Item #	Description	Item #	Description
228	Lock Washer	260	Flat Washer	278	Exhaust/Guard
245	Lock Washer	261	Oil Drain	284	Exhaust Heat Shield
246	Thick Washer	265	Spring	296	Stud
248	Clutch Pulley	266	Key	408	Starter Switch
257	Hex Nut	272	Fuel Line		
258	Engine	276	Hex Bolt		

TS78 RIDE-ON TROWEL INSTRUCTION MANUAL

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	11003	Key, 1/4" x 2" (incl. with engine)	1		07/10/07
	272	12947	Fuel Line	1		07/10/07
	276	13487	HHCS 7/16-20 x 1-1/2"LG	1		07/10/07
	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

DRIVETRAIN ASSEMBLY

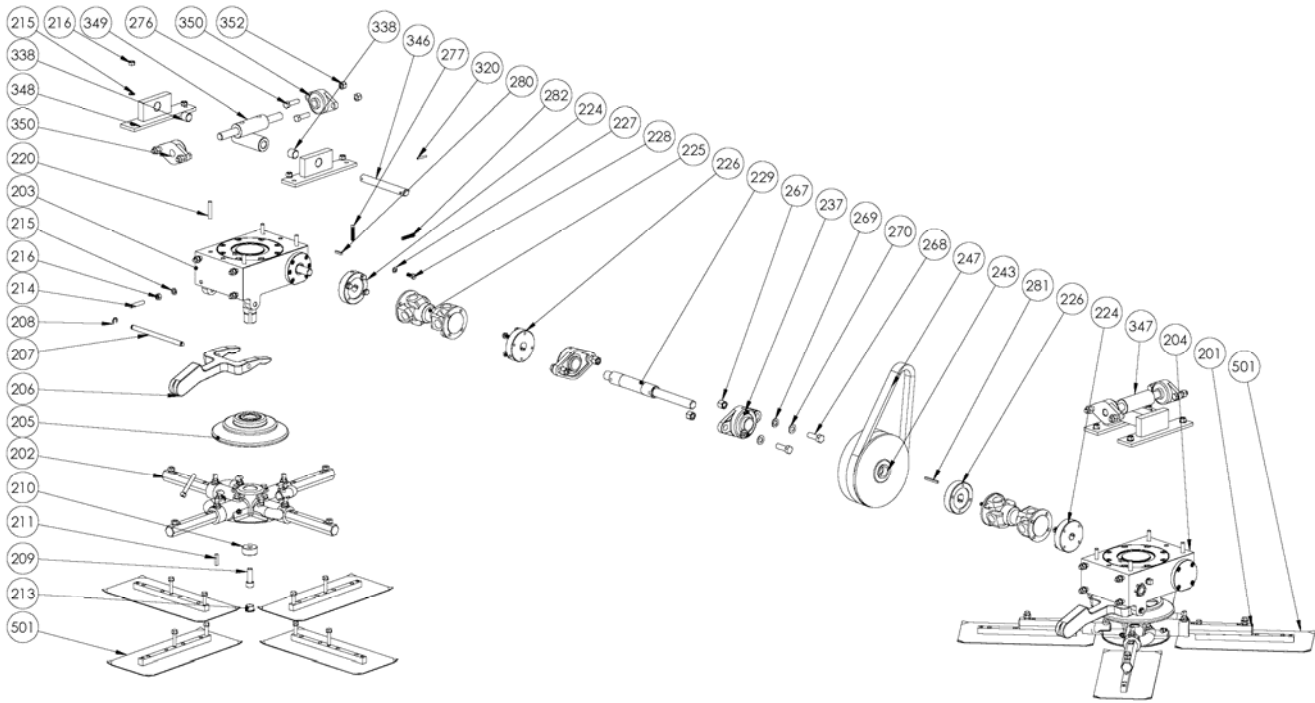


Figure 3 - Complete Drivetrain

Item #	Description	Item #	Description	Item #	Description
150	Flat Washer	216	Hex Nut	276	Hex Bolt
201	Spider Assembly	220	Stud	277	Square Head Screw
202	Spider Assembly	224	Drive Flange	280	Key
203	Gearbox Assembly	225	U-Joint Coupling	281	Key
204	Gearbox Assembly	226	Drive Flange	282	Set Screw
205	Pressure Plate Ass'm	227	Hex Bolt	320	Pin
206	Yoke Arm Large	228	Lock Washer	338	Bushing
207	Yoke Arm Pin	229	Drive Shaft	346	Support Pint
208	Retaining Ring	237	Ball Bearing	347	Pivot Bracket
209	Retainer	243	Pulley	348	Bracket Set
210	Socket Bolt	247	V-Belt	349	Cross Bracket
211	Key	267	Hex Nut	350	Flange Bearing
213	Cap Plug	268	Hex Bolt	352	Lock Nut
214	Stud	269	Washer	501	Trowel Blade
215	Lock Washer	270	Lock Washer		

TS78 RIDE-ON TROWEL INSTRUCTION MANUAL

CUSTOMER PARTS LIST DRIVE TRAIN ASSEMBLY

*	Item #	Part #	Description	Qty	Eff. S/N	Eff. Date
	150	11586	Washer 5/16"	16		07/10/07
	201	20843	Spider Assembly TS78 – CW Rot.	1		07/10/07
	202	20844	Spider Assembly TS78 – CCW Rot.	1		07/10/07
	203	20968	Gearbox Assembly – Right Side	1		07/10/07
	204	20969	Gearbox Assembly – 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
*	211	10608	Key	2		07/10/07
	213	10823	Cap Plug Ec-12	2		07/10/07
	214	11339	Stud, 3/8-16UNC X 1-1/2"LG	8		07/10/07
	215	10902	Lock Washer 3/8"	16		07/10/07
	216	10901	Hex Nut 3/8-16 UNC	17		07/10/07
	220	11247	Stud 3/8-16UNC X 1-1/4"LG PLT	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
	227	30142	HHCS 5/16-18 UNC x 3/4"LG	16		07/10/07
	228	10402	Lock Washer 5/16"Dia	16		07/10/07
	229	22709	Driveshaft, Ts78	1		07/10/07
	237	13246	Bearing, Ball, Setscrew Type	2		07/10/07
	243	14726	Pulley	1		03/10/12
	247	14711	Drive Belt	1		03/10/12
	267	12519	Hex Nut	1		07/10/07
	276	10269	HHCS 7/16-20 X 1-1/2"LG	8		07/10/07
	277	13964	SHSS 5/16-18 X 1-1/2"LG Cup Point	4		07/10/07
	280	12454	Key 3/16" Sq. x 7/8"Lg	2		07/10/07
	281	10206	Key 3/16"SQ X 1-7/8"LG	1		07/10/07
	282	12931	SHSS 5/16-18 X 1-1/4"LG Cup Point	6		07/10/07
	320	10315	Pin 3/16" Dia x 1 1/4" LG.	2		07/10/07
	338	12586	Bushing	4		07/10/07
	346	12497	Cross Bushing Support Pin	1		07/10/07
	347	22625	Left Hand Pivot Bracket	1		07/10/07
	348	22473	Right Pivot Bracket Set	1		07/10/07
	349	13802	Cross Bracket TS78	1		07/10/07
	350	13570	Flange Bearing 20 MM ID.	4		07/10/07
	352	13488	Hex Locknut 7/16-20, Nylon	8		07/10/07
		20414	Trowel Blade 6 x 14 Imperial	8		07/10/07
		20457	Trowel Blade 6 x 14 Metric	8		07/10/07
	501	20480	Combo Blade 8 x 18 Imperial	8		07/10/07

Items marked with * are recommended spare parts

TS78 RIDE-ON TROWEL INSTRUCTION MANUAL

STEERING ASSEMBLY (OUTER POSITION)

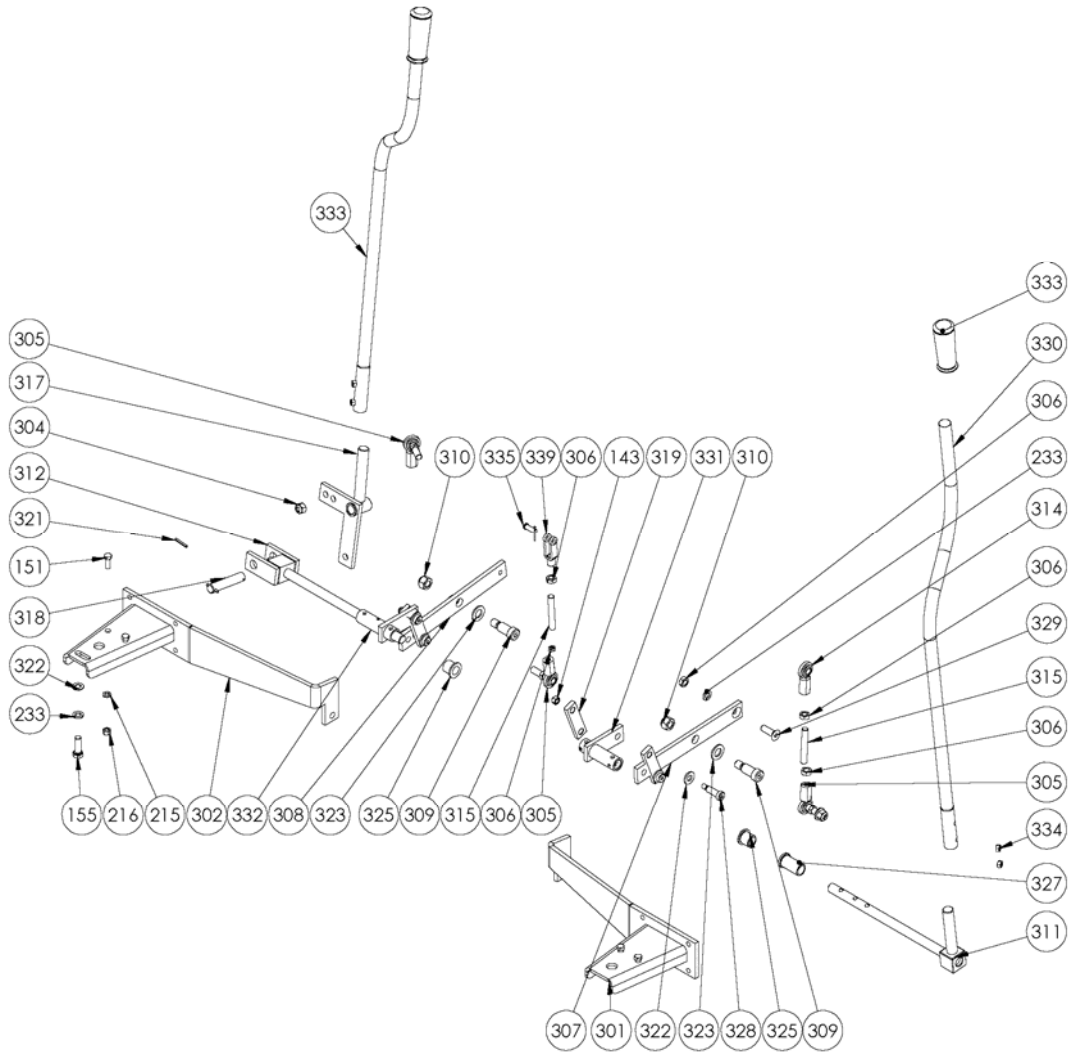


Figure 4 – Complete Steering

Item #	Description	Item #	Description	Item #	Description
143	Lock Nut	309	Socket Bolt	326	Bushing
151	Hex Bolt	310	Lock Nut	327	Pin
155	Hex Bolt	311	Steering Bracket	328	Shoulder Bolt
215	Lock Washer	312	Steering Bracket	329	Flat Head Screw
216	Hex Nut	314	Rod End	330	Control Handle
233	Lock Washer	315	Thread Rod	331	Steering Lever
301	Steering Arm Ass'y	317	Handle Lever	332	Steering Lever
302	Steering Arm Ass'y	318	Steering Pin	333	Hand Grip
304	Lock Nut	319	Pivot Link	334	Setscrew
305	Rod End	320	Pin	335	Clevis Pin
306	Hex Jam Nut	322	Fender Washer	339	Yoke End Clevis
307	Pivot Plate, LH	323	Washer		
308	Pivot Plate, RH	325	Bushing		

TS78 RIDE-ON TROWEL INSTRUCTION MANUAL

CUSTOMER PARTS LIST **Steering Assembly (Outer Position)**

*	Item #	Part #	Description	Qty	Eff. S/N	Eff. Date
	143	10317	Nylock Nut 3/8-16	4		07/10/07
	151	10507	HHCS, 3/8-16 x 1"LG	4		07/10/07
	155	12516	HHCS, 1/2-20 x 1-1/2"LG	1		07/10/07
	215	10902	Lock Washer ø3/8"	4		07/10/07
	216	10901	Hex Nut 3/8-16	4		07/10/07
	233	10009	Lock Washer ø1/2"	1		07/10/07
	301	14465	Steering Arm Assembly, LH	1		07/10/07
	302	14466	Steering Arm Assembly, RH	1		07/10/07
	304	12517	Nylock Nut 1/2-20	3		07/10/07
*	305	12412	Rod End	4		07/10/07
	306	12592	Hex Jam Nut 1/2-20	5		07/10/07
	307	13976	Pivot Plate, LH	1		07/10/07
	308	13956	Pivot Plate, RH	1		07/10/07
	309	13481	SHSB, 3/4"	2		07/10/07
	310	13578	Lock Nut, 5/8-11 UNC	2		07/10/07
	311	13795	Steering Bracket, LH	1		07/10/07
	312	13792	Steering Bracket, RH	1		07/10/07
*	314	12420	Rod End 1/2-20 x ø.500" Eye, Female	1		07/10/07
	315	12659	Threaded Rod, 1/2-20 x 3-1/4"LG	2		07/10/07
	317	13798	Handle Lever	1		07/10/07
	318	13741	Steering Pin	1		07/10/07
	319	13571	Pivot Link	4		07/10/07
	321	10315	Pin 3/16" x 1-1/4"	2		07/10/07
	322	12930	Fender Washer, ø1/2"	1		07/10/07
	323	10306	Washer	2		07/10/07
*	325	12593	Bushing 1" x 3/4" x 7/8", 1/8 Head	2		07/10/07
*	326	12763	Bushing 1" x 3/4" x 2" c/w Head	2		07/10/07
	327	12627	Spiral Pin ø5/16"	4		07/10/07
	328	12985	SHSB 3/8-16 x 1/2" Shoulder x 1-1/4"	4		07/10/07
	329	13945	FHSC 1/2-20 x 1-1/2"LG	1		07/10/07
*	330	13821	Handle	2		07/10/07
	331	13789	Steering Lever, LH	1		07/10/07
	332	13790	Steering Lever, RH	1		07/10/07
	333	13065	Handle Grip ø1"	2		07/10/07
	334	50117	SHSS 5/16-18 X 1/2"LG, Cup Point, Nylock	4		07/10/07
*	335	13949	Clevis Pin	1		07/10/07
*	339	13946	Yoke End Clevis & Cotter Pin	1		07/10/07

Items marked with * are recommended spare parts

TS78 RIDE-ON TROWEL INSTRUCTION MANUAL

STEERING ASSEMBLY (CENTRAL STEERING)

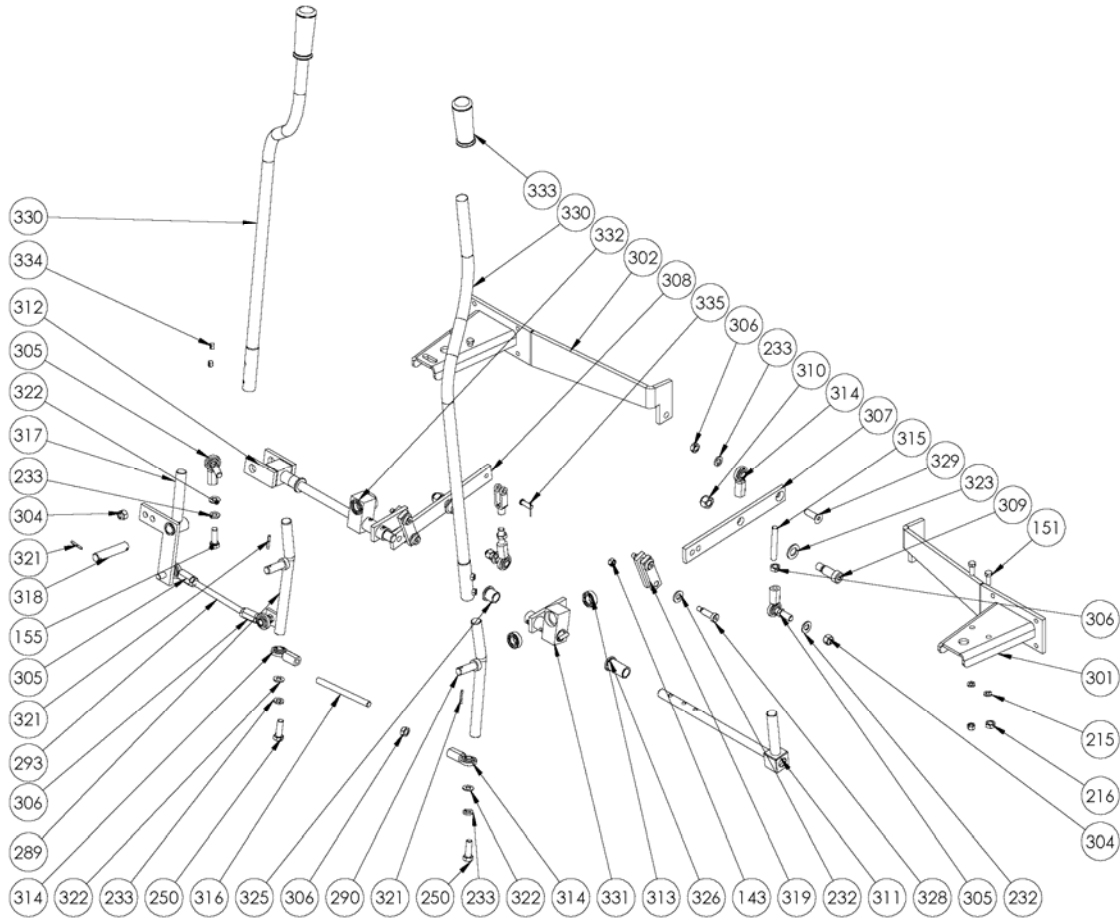


Figure 5 – Complete Steering

Item #	Description	Item #	Description	Item #	Description
143	Lock Nut	306	Hex Jam Nut	322	Fender Washer
151	Hex Bolt	307	Pivot Plate, LH	323	Washer
155	Hex Bolt	308	Pivot Plate, RH	325	Bushing
215	Lock Washer	309	Socket Bolt	326	Bushing
216	Hex Nut	310	Lock Nut	327	Pin
232	Flat Washer	311	Steering Bracket	328	Shoulder Bolt
233	Lock Washer	312	Steering Bracket	329	Flat Head Screw
250	Hex Bolt	313	Bearing	330	Control Handle
289	Steering Link, RH	314	Rod End	331	Steering Lever
290	Steering Link, LH	315	Thread Rod	332	Steering Lever
293	L/R Push Rod	316	Push Rod	333	Hand Grip
301	Steering Arm Ass'y	317	Handle Lever	334	Setscrew
302	Steering Arm Ass'y	318	Steering Pin	335	Clevis Pin
304	Lock Nut	319	Pivot Link	339	Yoke End Clevis
305	Rod End	321	Pin	340	Spray Switch/Deadman (not shown)

TS78 RIDE-ON TROWEL INSTRUCTION MANUAL

CUSTOMER PARTS LIST Central Steering

*	Item #	Part #	Description	Qty	Eff. S/N	Eff. Date
	143	10317	Nylock Nut 3/8-16	4		07/10/07
	151	10507	HHCS, 3/8-16 x 1"LG	4		07/10/07
	155	12516	HHCS, 1/2-20 x 1-1/2"LG	1		07/10/07
	215	10902	Lock Washer ø3/8"	4		07/10/07
	216	10901	Hex Nut 3/8-16	4		07/10/07
	232	50026	Flat Washer, ø1/2"	8		07/10/07
	233	10009	Lock Washer ø1/2"	1		07/10/07
	250	30019	HHCS, 1/2-13x1 1/2" LG.	2		07/10/07
	289	13983	Steering Link, RH	1		07/10/07
	290	13984	Steering Link, LH	1		07/10/07
	293	13987	L/R Push Rod	1		07/10/07
	301	14465	Steering Arm Assembly, LH	1		07/10/07
	302	14466	Steering Arm Assembly, RH	1		07/10/07
	304	12517	Nylock Nut 1/2-20	5		07/10/07
*	305	12412	Rod End	5		07/10/07
	306	12592	Hex Jam Nut 1/2-20	9		07/10/07
	307	13976	Pivot Plate, LH	1		07/10/07
	308	13956	Pivot Plate, RH	1		07/10/07
	309	13481	SHSB, 3/4"	2		07/10/07
	310	13578	Lock Nut, 5/8-11 UNC	2		07/10/07
	311	13795	Steering Bracket, LH	1		07/10/07
	312	13792	Steering Bracket, RH	1		07/10/07
	313	13883	Bearing	4		07/10/07
*	314	12420	Rod End 1/2-20 x ø.500" Eye, Female	3		07/10/07
	315	12659	Threaded Rod, 1/2-20 x 3-1/4"LG	2		07/10/07
	316	13478	Push Rod	1		07/10/07
	317	13980	Handle Lever	1		07/10/07
	318	13480	Steering Pin	1		07/10/07
	319	13571	Pivot Link	4		07/10/07
	321	10315	Pin 3/16" x 1-1/4"	4		07/10/07
	322	12930	Fender Washer, ø1/2"	4		07/10/07
	323	10306	Washer	2		07/10/07
*	325	12593	Bushing 1" x 3/4" x 7/8", 1/8 Head	2		07/10/07
*	326	12763	Bushing 1" x 3/4" x 2" c/w Head	2		07/10/07
	327	12627	Spiral Pin ø5/16"	4		07/10/07
	328	12985	SHSB 3/8-16 x 1/2" Shoulder x 1-1/4"	4		07/10/07
	329	13945	FHSC 1/2-20 x 1-1/2"LG	1		07/10/07
*	330	13821	Handle	2		07/10/07
	331	13982	Steering Lever, LH	1		07/10/07
	332	13981	Steering Lever, RH	1		07/10/07
	333	13065	Handle Grip ø1"	2		07/10/07
	334	50117	SHSS 5/16-18 X 1/2"LG, Cup Point	4		07/10/07
*	335	13949	Clevis Pin	1		07/10/07
*	339	13946	Yoke End Clevis & Cotter Pin	1		07/10/07
	340	13896	Spray Switch (Spray Option)	1		07/10/07

Items marked with * are recommended spare parts

GEARBOX ASSEMBLY

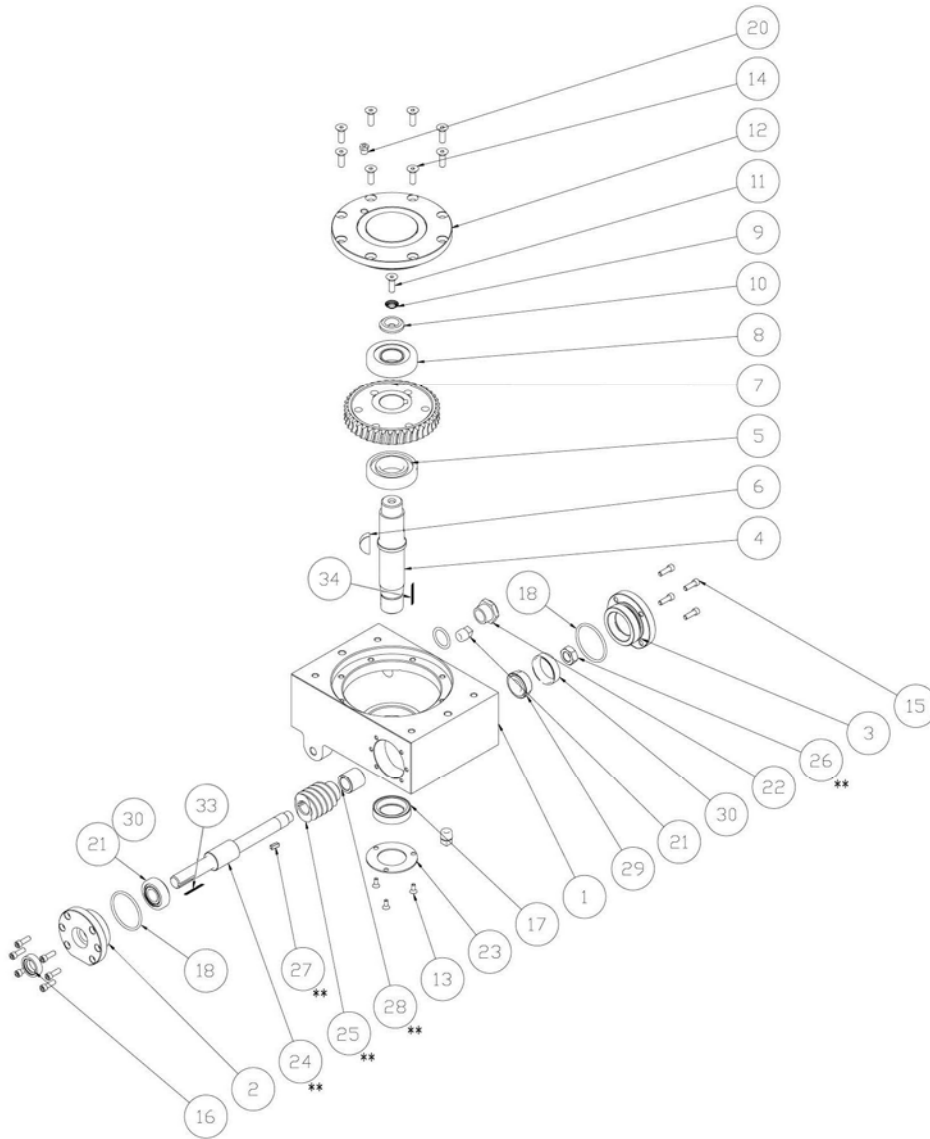


Figure 6 – Gearbox Assembly

Note: Right hand gearbox shown.

Item #	Description	Item #	Description	Item #	Description
1	Gear Housing	12	Gearbox Cover	23	Seal Retainer
2	Large Flange	13	Flat Head Screw	24	Counter Shaft
3	End Cap	14	Flat Head Screw	25	Worm
4	Main Shaft	15	Socket Head Screw	26	Jam Nut
5	Bearing Cup	16	Oil Seal	27	Key
6	Woodruff Key	17	Oil Seal	28	Spacer
7	Worm Gear	18	O Ring	29	Bearing Cone
8	Taper Bearing	19	O Ring	30	Bearing Cup
9	Lock Washer	20	Relieve Valve	32	Cover Shim
10	Pressure Washer	21	Plug	33	Key
11	Flat Head Screw	22	Sight Plug	34	Key

TS78 RIDE-ON TROWEL INSTRUCTION MANUAL

CUSTOMER PARTS LIST

Gearbox Assembly

*	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	1		07/10/07
	6	10638	10638	3/8" Woodruff Key	1		07/10/07
*	7	10642	10641	Bronze Main Gear	1		07/10/07
	8	10603	10603	Taper Bearing, Cup and Cone	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 ½" LG.	3		07/10/07
*	14	10903	10903	FHCS, 5/16 – 18 UNC x 1" LG.	8		07/10/07
	15	10213	10213	SHCS, ¼ – 20 UNC x ¾" 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 (must buy 10230)	2		07/10/07
	30	10230	10230	Bearing Cup (must buy 10229)	2		07/10/07
	**31	20269	20268	Countershaft Assembly	1		07/10/07
	32	10933	10933	Shim (.003"), (For Item 12 – not shown)	A/R		07/10/07
		10935	10935	Shim (.005"), (For Item 12 – not shown)	A/R		07/10/07
	33	12454	12454	Key, 3/16" SQ x 7/6" LG	1		07/10/07
	34	10608	10608	Key, 1/4" SQ x 1 5/32" LG	1		07/10/07

Items marked with * are recommended spare parts

PITCH CONTROL ASSEMBLY

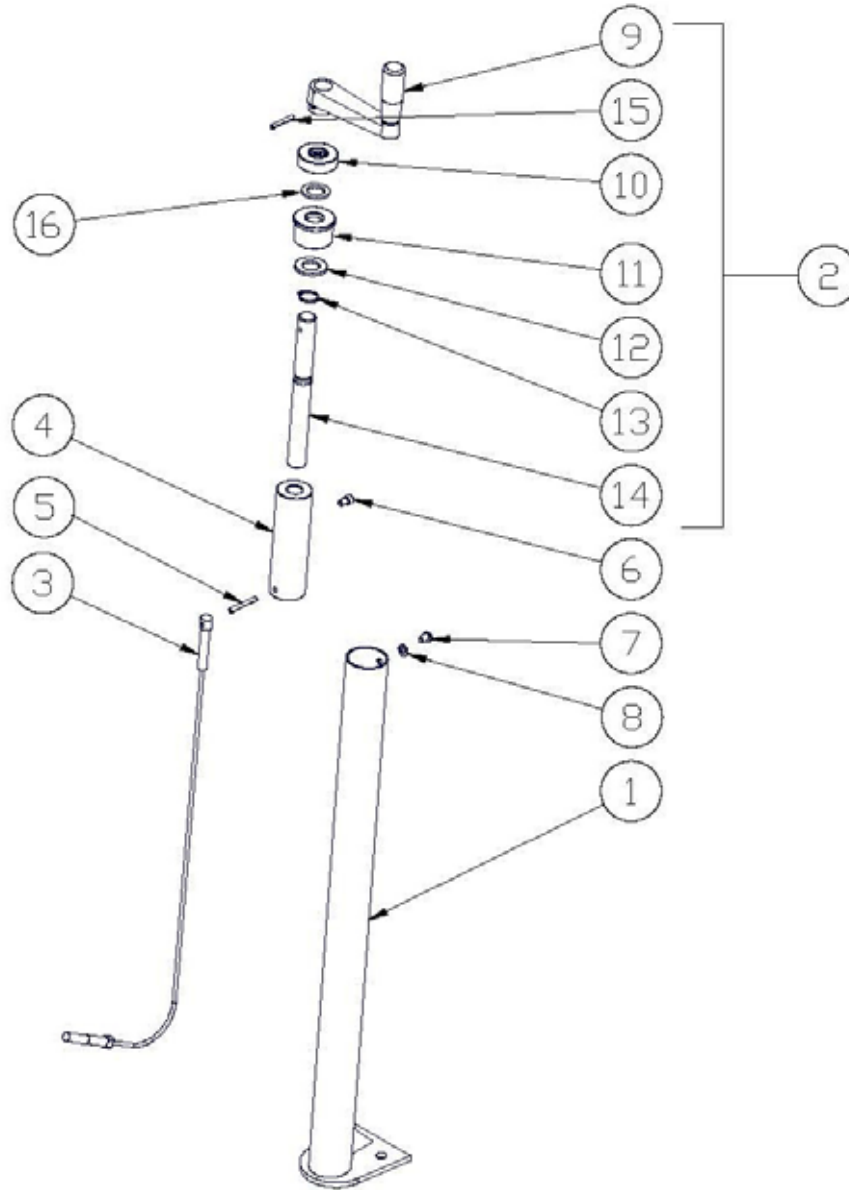


Figure 7 – Steering Assembly

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

TS78 RIDE-ON TROWEL INSTRUCTION MANUAL

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 $\varnothing 3/16$ " 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 $\varnothing 1/4$ "	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	10309	Spring Pin $\varnothing 3/16$ " x 1-1/4"LG	1		07/10/07
	16	22674	Shim Ring $3/4$ " ID x 1 1/8" ODx047	1		07/10/07

Items marked with * are recommended spare parts

SPIDER PLATE ASSEMBLY

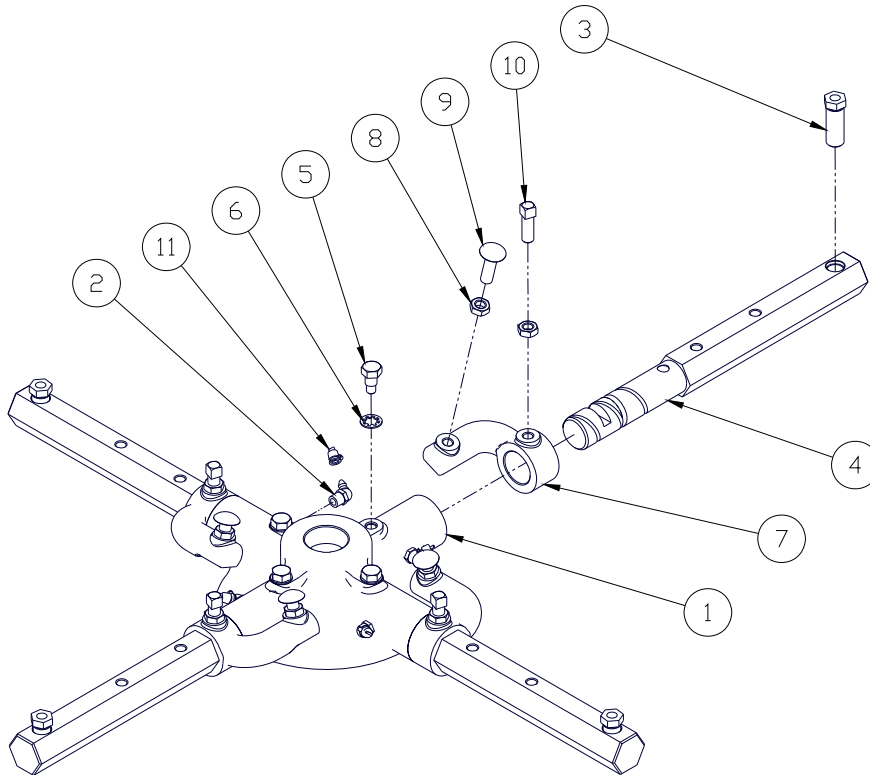


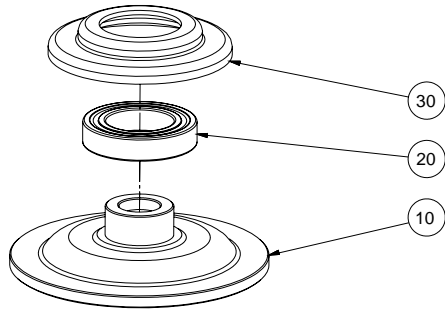
Figure 8 – Greased Spider Assembly (LH Shown)
Spider Plate Assembly, Grease

Item #	RH, CCW Rotation 20844	LH, CW Rotation 20843	Description	Qty	Eff. S/N	Eff. Date
1	10840	10820	4 Spoke Spider Plate	1		07/10/07
2	10801	10801	Grease Fitting 1/8 NPT x 658	4		07/10/07
3	10404	10404	Adjusting Screw 1 1/4" LG.	4		07/10/07
4	10470	10470	Trowel Arm 72/78 Hex	4		07/10/07
5	10806	10806	HHCS 3/8-16 x 7/8" LG.	4		07/10/07
6	10805	10805	Lock Washer ø3/8" External Tooth	4		07/10/07
7	10839	10819	Lift Lever	4		07/10/07
8	10808	10808	Jam Nut 3/8-16	8		07/10/07
9	10807	10807	Carriage Bolt 3/8-16 x 1 1/4" LG.	4		07/10/07
10	10809	10809	SHSS 3/8-16 x 1" Cup Point	4		07/10/07
11	10822	10822	Cap Plug	4		07/10/07

Items marked with * are recommended spare parts

TS78 RIDE-ON TROWEL INSTRUCTION MANUAL

CUSTOMER PARTS LIST



Item #	Description
10	Pressure Plate
20	Thrust Bearing
30	Pressure Plate Cap

Figure 9 – Pressure Plate Assembly

Assembly # **20626**
Pressure Plate Assembly

Item #	Part #	Description	Qty	EFF. S/N	Eff. Date
10	10659	Large pressure plate	1		10/20/04
20	10663	Large thrust bearing 6010LLU-2A	1		10/20/04
30	10667	Large pressure plate cap	1		10/20/04

TS78 RIDE-ON TROWEL INSTRUCTION MANUAL

TROWEL BLADE ASSEMBLY

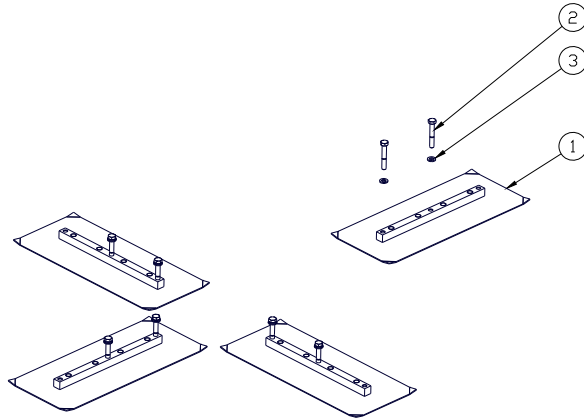


Figure 10 – Trowel Blades

Note: 6 x 14 Model Shown.

CUSTOMER PARTS LIST

6 x 14 Finish – 4 Blades, Imperial

* Item #	Part #	Description	Qty	Eff. S/N	Eff. Date
* 1	20414	6 x 14 Imperial Trowel Blade	4		07/10/07
2	10401	HHCS 5/16-18 x 1-1/2"LG, Grade 5	8		07/10/07
3	10402	Lock Washer ø5/16"	8		07/10/07

6 x 14 Finish – 4 Blades, Metric

* Item #	Part #	Description	Qty	Eff. S/N	Eff. Date
* 1	20457	6 x 14 Metric Trowel Blade	4		07/10/07
2	10453	HHCS M8-1.25 x 50mm	8		07/10/07
3	11614	Lock Washer 8mm	8		07/10/07

8 x 18 Combo – 4 Blades

* Item #	Part #	Description	Qty	Eff. S/N	Eff. Date
* 1	20408	8 x 18 Imperial Combo Blade	4		07/10/07
2	10401	HHCS 5/16-18 x 1-1/2"LG, Grade 5	8		07/10/07
3	10402	Lock Washer ø5/16"	8		07/10/07

Items marked with * are recommended spare parts

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TS78 RIDE-ON TROWEL INSTRUCTION MANUAL

RETARDANT SPRAY SYSTEM

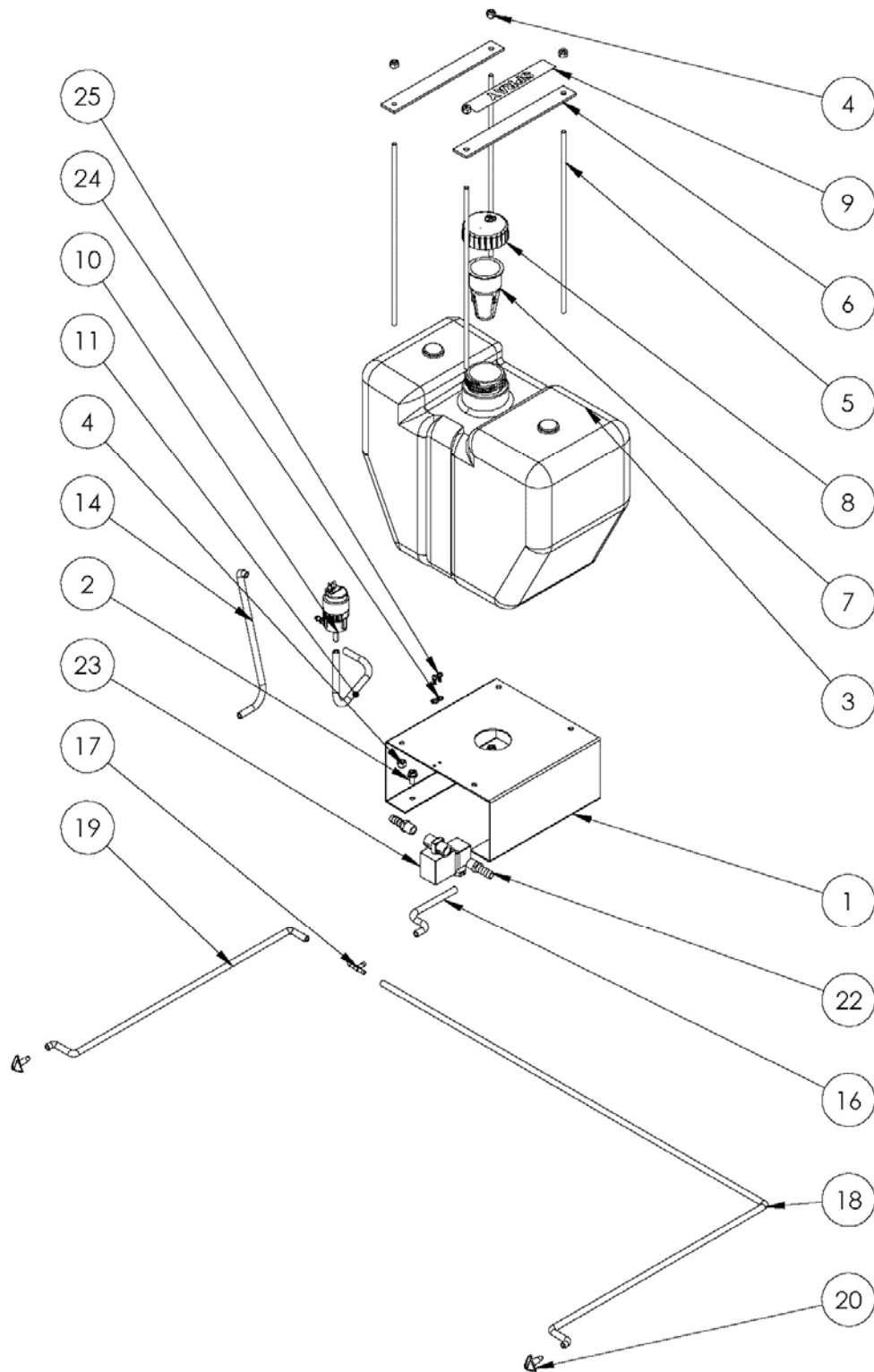


Figure 11 – TS78 Water Spray System

TS78 RIDE-ON TROWEL INSTRUCTION MANUAL

CUSTOMER PARTS LIST

Assembly: 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		
	4	30141	Locknut 1/4 - 20	8		
	5	11829	1/4 - 20 Threaded Rod	4		
	6	18132	Hold Down Bar	2		
	9	14481	Label	1		
	20		Nozzles	1		
	21	---	3/16" Cable Tie	1		
	22	14696	3/16" Tube	2		
	23	14234	12V Valve	1		
	24	10703	Lockwasher	2		
	25	11035	PHMS, M4-0.7 x 10mm LG	2		

Assembly #18133: WATER SPRAY SYSTEM

*	Item #	Part #	Description	Qty	Eff. S/N	Eff. Date
	1	18136	Water Tank	1		
	10	18138	12V Pump	1		
	7	18139	Strainer	1		
	8	18140	Cap	1		
	11	18141	3/16" Hose	10.5"		
	14	18141	3/16" Hose	26"		
	16	18141	3/16" Hose	8.5"		
	17	18143	3/16" Tee	1		
	18	18141	3/16" Hose	26"		

TS78 RIDE-ON TROWEL INSTRUCTION MANUAL

TRANSPORTER ASSEMBLY - 22593

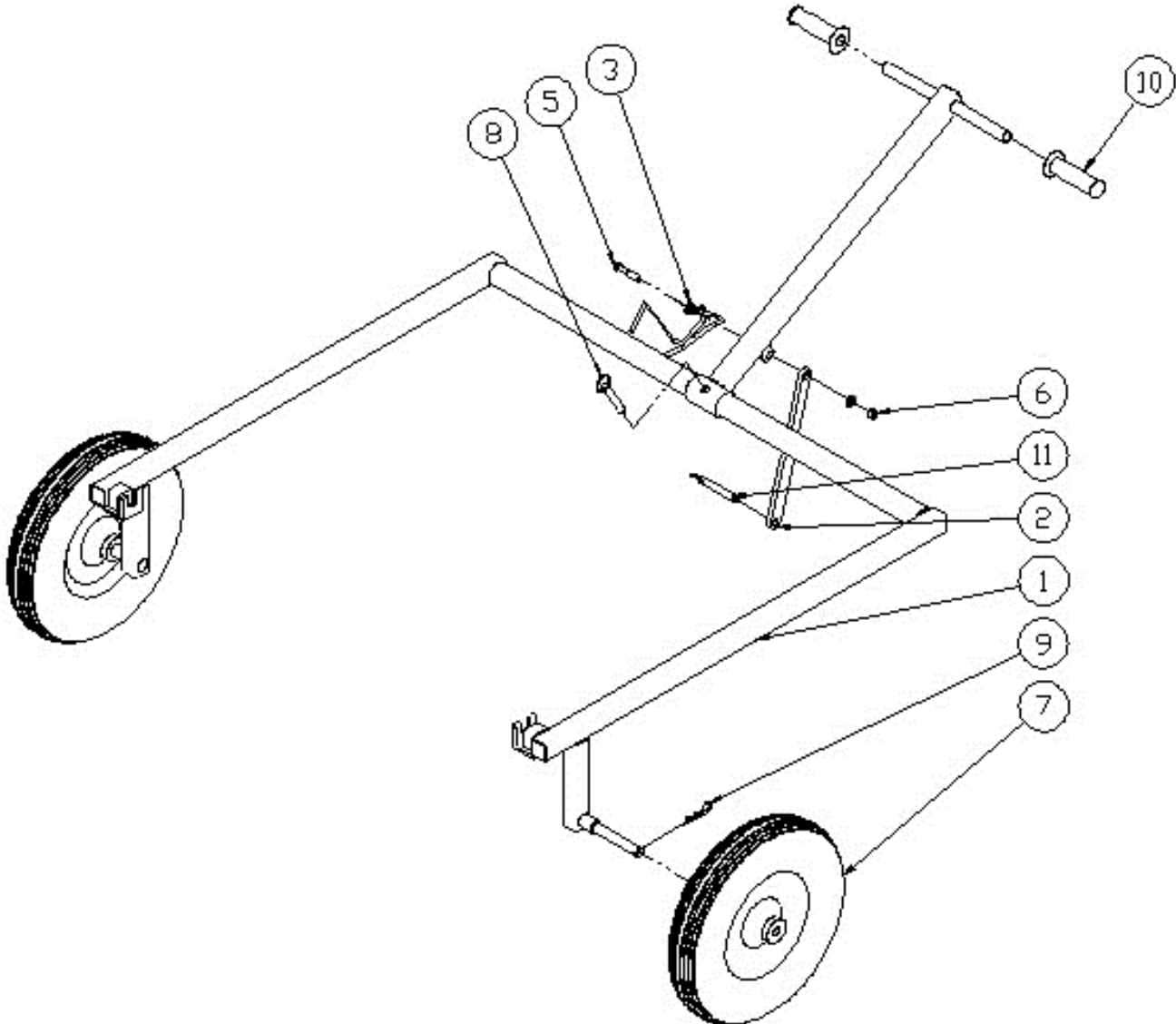


Figure 12 – TS78 Transporter

Item #	Description	Item #	Description
1	Frame Assembly	7	Wheel
2	Linkage Arm	8	Hitch Pin Lg
3	Chain	9	Cotter Pin
4	Flat Washer	10	Handle Grips
5	Hex Bolt	11	Hitch Pin Sm
6	Lock Nut		

TS78 RIDE-ON TROWEL INSTRUCTION MANUAL

CUSTOMER PARTS LIST

Assembly # 22593
TRANSPORTER

Item #	Part #	Description	Qty	Eff. S/N	Eff. Date
1	22594	Transporter Frame Assembly	1		07/10/07
2	13364	Transporter Linkage Arm	1		07/10/07
3	12860	Chain Link With 3/8" Washer	1		07/10/07
5	12859	HHCS 3/8-16 UNC x 2"LG.	1		07/10/07
6	10317	Nylon Locknut, 3/8-16UNC	1		07/10/07
7	13198	Wheel 16"Dia. x 4" Hub	2		07/10/07
8	12487	Large Hitch Pin 3-1/2"LG.	1		07/10/07
9	50265	Cotter Pin, 1/8" Dia.	2		07/10/07
10	10509	Handle Grip	2		07/10/07
11	12488	Hitch Pin Sm 2 1/2"	1		07/10/07

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

TS78 RIDE-ON TROWEL INSTRUCTION MANUAL

SPECIFICATIONS

RIDE-ON POWER TROWEL

TS78 (GASOLINE)	
Engine	Honda 20 <i>HP</i> Honda 24 <i>HP</i> Kohler 20 <i>HP OHV</i> Kohler 25 <i>HP OHV</i>
Length	78" (198 cm)
Width	40" (102 cm)
Height (without seat & steering levers)	30" (76 cm)
Weight	Up to 740 lbs. (336 kg)
Trowel Coverage	17 sq. ft. (1.7 sq. m)
Travel Speed	Up to 400 ft/min (122 m/min)
Dual Rotor Speeds	150-155 rpm
Float Blade Size	10" x 14" (25 x 35.6 cm)
Finish Blade Size	6" x 14" (15 x 35.6 cm)
Combination Blade Size	8" x 14" (20 x 35.6 cm)
Pan Float Size	36.5" (92.7 cm)
Electric Start	Yes
Electrical System	12 Volt
Charging System	25 Amps
Battery	12 Volt
Dead-man Safety Switch	Yes
Fuel Capacity (approximately)	3 Gal. (12.5 L)
Running Time (approximately)	3 hours
Steering Levers	Twin Stick
Variable Speed Clutch	Yes
"U" Joint Drive Coupling	Yes
Standard Features	Seat Adjuster Hour Meter 50W Light Package (4 light kit)
Options	Transporter Water Sprayer Combo Blades Pan Float Discs

TS78 RIDE-ON TROWEL INSTRUCTION MANUAL

COMPANY INFORMATION

Worldwide Distribution	International Marketing
Distributed By:	Bartell Morrison Inc. 375 Annagem Blvd Mississauga, ON, Canada L5T 3A7 Tel: (905) 364-4200 Fax: (905) 364-4201 http://www.bartellmorrison.com

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, May 15th, 2007

European Representative

Steve Adam

ATTACHED

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 Ride-on 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.

TS78 RIDE-ON TROWEL INSTRUCTION MANUAL

- All ride-on trowels sold by Bartell Morrison Inc. are warranted against defects in materials and/or workmanship; excluding normal wear on wearing components and components covered by a separate original manufacturers warranty, for a period of 24 months from the date of sale to the original end user purchaser provided that certain conditions have been met.

Conditions:

1. The equipment serial number has been registered with Bartell Morrison Inc. or its approved dealers, distributors, representatives or agents.
2. The equipment has been operated in an appropriate manner by qualified individuals.
3. The equipment has been properly maintained as per the instructions included in the Owner's Manual.
4. All claims for warranty must be filed on proper forms and include the serial number of the equipment along with proof of purchase.

Any evidence of failure to meet these conditions may result in a denial of the warranty claim.

- Consideration of warranty claims will be at the sole discretion of Bartell Morrison Inc., or its authorized dealers, distributors, representatives or agents.
- Bartell Morrison Inc. may, at its discretion, request that the equipment to be considered for warranty be returned at the owner's expense to an authorized repair facility for inspection.
- Under this warranty we may, at our discretion, repair or replace a part or the whole of the defective component or equipment.
- Our Warranty coverage is limited to the cost to repair or replace the defective portion of the equipment and a reasonable (as determined by Bartell Morrison Inc.) amount of labour to conduct the repair or replacement. Under no circumstances shall Bartell Morrison Inc. be liable for any additional or exceptional costs beyond the cost to repair or replace the defective portion of the equipment. Bartell Morrison Inc. shall not be held accountable for; costs associated with travel to inspect or repair defective equipment, costs for transporting defective equipment to or from an authorized repair facility, costs incurred to repair or replace the defective equipment at any facility other than one authorized by Bartell Morrison Inc., or ancillary damage caused by or as a result of the defective equipment.
- Under no circumstances shall equipment be returned to Bartell Morrison Inc. or its authorized dealers, distributors, representatives or agents without the approval of Bartell Morrison Inc. as evidenced by a Returned Goods Number. To obtain a Returned Goods Number contact the factory or your authorized dealer, distributor, representative or agent.
 - This warranty is for the sole benefit of the original end user purchaser and is not transferable to any other company or person.

SAMPLE OF CE CERTIFICATE

Declaration of Conformity / Certificat de conformité / Gelijkvormigheids certificaat Declaración de Conformidad/Declaração de Conformidade/Dichiarazione Di Conformita

We: Bartell Morrison Inc.
375 Annagem Blvd
Mississauga, Ontario, Canada
L5T 3A7
Tel: 905-364-4200 Fax: 905-364-4201

Declare under our sole responsibility that the product to which this declaration relates is in conformity with the following standard(s) or other normative documents.

Déclarons sous notre responsabilité que le produit cette déclaration est conforme aux normes suivantes ou d'autres documents habituels.

Verklaren onder onze verantwoordelijkheid dat het product naar welke de verklaring verwijst conform de volgende standaards of anders gebruikelijke documenten is.

Declaramos bajo nuestra única responsabilidad que el producto en lo que esta declaración concierne, es conforme con la siguiente normativa u otros documentos.

Declara sob sua responsabilidade que o produto a quem esta declaração interessar, está em conformidade com os seguintes documentos legais ou normas directivas.

Dichiariamo sotto la ns. unica responsabilità che il prodotto al quale questa dichiarazione si riferisce, è fabbricato in conformità ai seguenti standard e documenti di normative.

EN 349:1993	Safety of Machinery - Minimum gaps to avoid crushing of parts of the human body.
EN 418:1993	Safety of Machinery - Emergency stop equipment, functional aspects - Principles for design
EN 12100-1:2003	Safety of Machinery - Basic Concepts, general principles for design - Part 1: Basic Terminology, methodology
EN 12100-2:2003	Safety of Machinery - Basic Concepts, general principles for design - Part 2: Technical Principles
EN ISO 4872:1978	Acoustics - Measurement of Airborne noise emitted by construction equipment intended for outdoor use - Method for determining compliance with noise limits.
EN ISO 5349-1:2001	Mechanical vibration. Measurement and evaluation of human exposure to hand-transmitted vibration. General requirements
EN ISO 5349-2:2001	Mechanical vibration. Measurement and assessment of human exposure to hand-transmitted vibration. Practical guidance for measurement at the workplace.

Following the provisions of Directive(s):

Suivant les directive(s) déterminées:

Volgens de vastgestelde richtlijnen:

Siguiendo las directiva(s):

No seguimento das clausulas da Directiva(s):

Seguendo quanto indicato dalla Direttiva(s):

98/37/EC	Machinery Directive
2000/14/EC	Noise Directive
2001/95/EC	General Product Safety Directive
2002/95/EC	Reduction of Hazardous Waste Directive

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

Doc. # OI – B09003
PB – B09003
Orig. Rel. – 05/2008
Curr. Rev. – 16
Rev. Date – 06/2014

Technical Characteristics:
 Caractéristiques techniques:
 Technisch gegevens:
 Características Técnicas:
 Características Técnicas:
 Qualitàs di tecnico:

Model Modèle Type Modelo Modelo Modello	Machine Serial Number Numéro de Série machine Serienummer machine Máquina número de série Numero de serie da maquina Numero di seria la macchina	Engine Serial Number Numéro de Série moteur Serienummer motor Motor número de série Numero de serie do motor Numero di seria la motore	Weight Masse Gewicht Masa Massa Massa
			Lbs (kg)
TS78 Ride-on Power Trowel			620 (282)

Noise Level Puissance acoustique Geluidniveau Nivel Sonoro Nivel del Ruido Potenza Acustica	Pressure level Pression acoustique Geluidsdrumniveau Nivel Acustico Pressão Acústica Pressione Acustica	Vibration level Niveau de vibration Vibratieniveau Nivel de Vibracion Nivel de Vibração Livello di Vibrazione
Lwa (dB)	Lpa (Db)	a _{hv} (m/s ²)
98	113	2.2

The Technical Construction file is maintained at:
 Les fiches techniques de construction sont gardées à:
 Het technische constructie document wordt bewaard te:
 El archivo técnico de construcción se mantiene en:
 O arquivo técnico de construção é mantido no (a):
 L'originale dossier tecnico di costruzione è conservato presso:

Bartell Morrison Inc.
 375 Annagem Blvd.
 Mississauga, Ontario, Canada
 L5T 3A7
 Telephone: 905-364-4200
 Facsimile: 905-364-4201

The authorized representative is:
 Le représentant autorisé est:
 Gemachtigd vertegenwoordiger is:
 La representación autorizada es:
 O representante autorizado é:
 Il rappresentate autorizzato:

Mr. Steve Adam
 International Sales Manager
 C/o Bartell Morrison Europe
 Nijverheidsstraat 11
 1840 Londerzeel
 Belgium
 Telephone: +1 514 463 4838
 Facsimile: +1 514 697 4239

Signature of Authorized Person:
 Signature de la personne autorisée:
 Handtekening van gemachtigd persoon:
 Firma de la persona autorizada:
 Assinatura de pessoa autorizada:
 Firma della persona autorizzata:



Typed name of Authorized Person:
 Nom dactyographié de la personne autorisée:
 Getypte naam van gemachtigd persoon:
 Nombre de la persona autorizada:
 Nome datilografado da pessoa autorizada:
 Nome della persona autorizzata:

Richard Stanley

Title of Authorized Person:
 Titre de la personne autorisée:
 Functie van gemachtigd persoon:
 Cargo de la persona autorizada:
 Título da pessoa autorizada:
 Posizione della persona autorizzata:

V.P. of Operations

Date and place of issue:
 Date et place d'émission:
 Datum en plaats van afgifte:
 Fecha y lugar de emision:
 Data e lugar de emissão:
 Data e luogo di emissione:

7.14.2014

Mississauga, Ontario, Canada