RIDING TRIPLTROWEL

RF3

OPERATION, MAINTENANCE and PARTS MANUAL

Publication M32748
(Revised 01/015)

MODEL NUMBER: _____

SERIAL NUMBER: _____

SOLD & SERVICED BY: _____

_____

MASTER EQUIPMENT
850 State Hwy 55 ● Brooten MN 56316

TABLE OF CONTENTS

RF3 Transporter Installation and Operation Instructions Publication No. M48326 4/96

Figure i
Removing Trowel Components from Skid

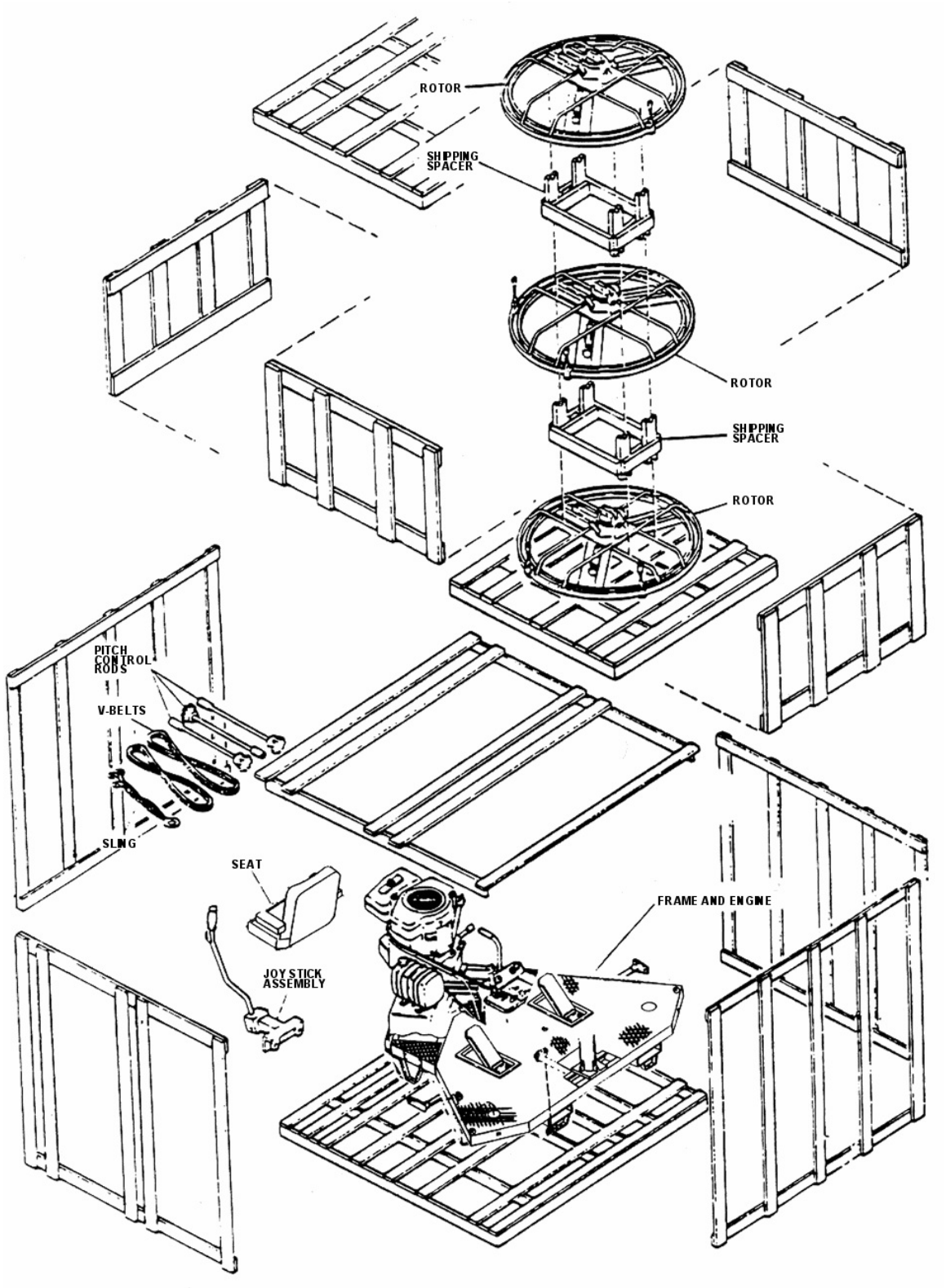
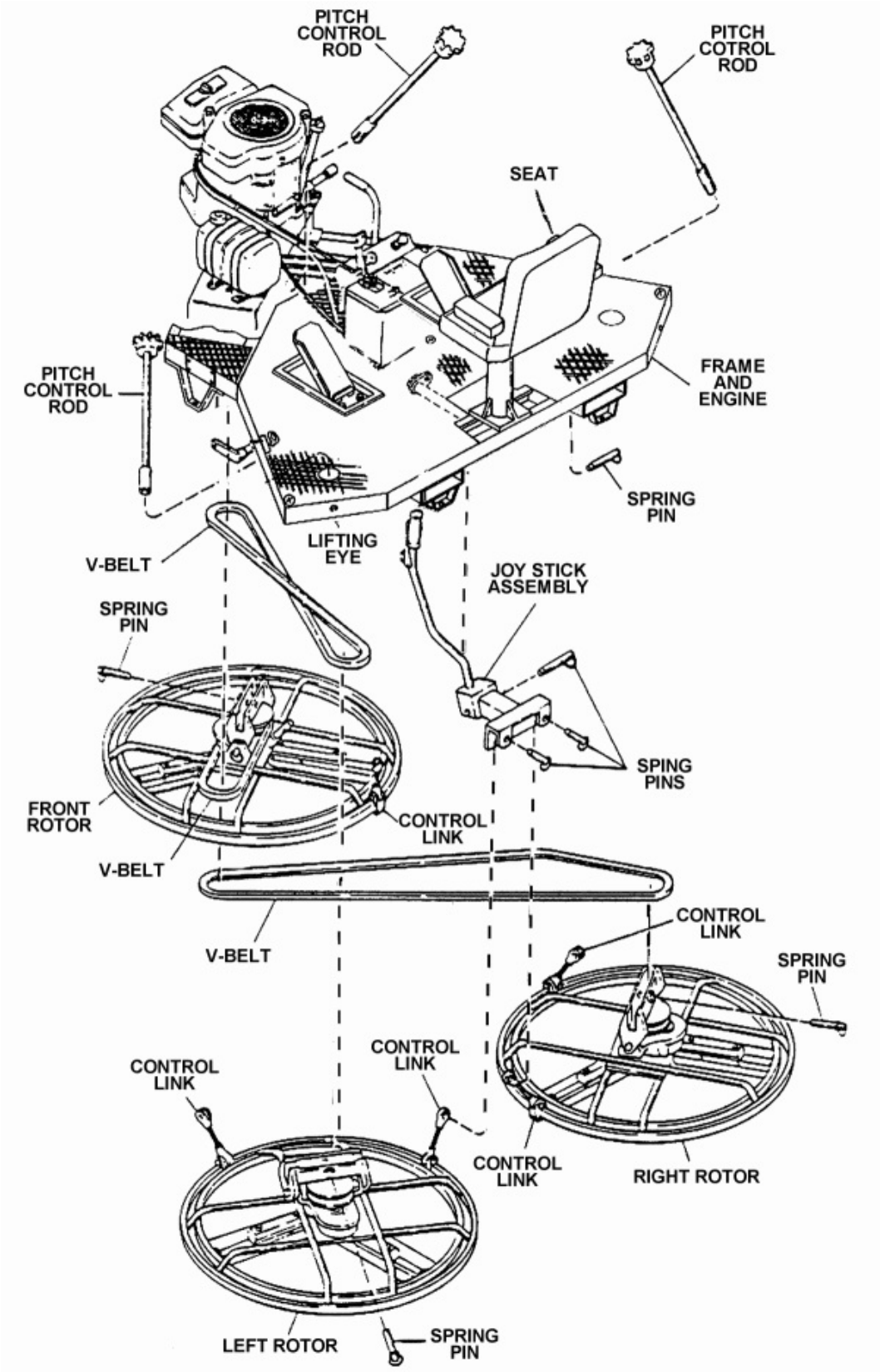


Figure ii
Assembling Trowel



INTRODUCTION AND DESCRIPTION

INTRODUCTION

The Model RF3 TriplTrowel is a surface working machine designed to permit the operator to ride the machine while troweling large areas of concrete and will produce the most level surface possible. After concrete has set up sufficiently, the troweling machine is used to grout, level and finish the slab.

DESCRIPTION

Each unit is comprised of a triangular frame, an engine and three rotors. The triangular frame provides the platform upon which the engine, controls and operator's seat are mounted. This group in turn is supported by each of three rotors which are attached to the frame with a tilt yoke and locking pin. Each rotor contains a pitch control which is accessible to the operator and enables him to adjust the blade angle to accommodate various concrete conditions. Trowel blades may be set from flat to a tilt angle of 15 degrees.

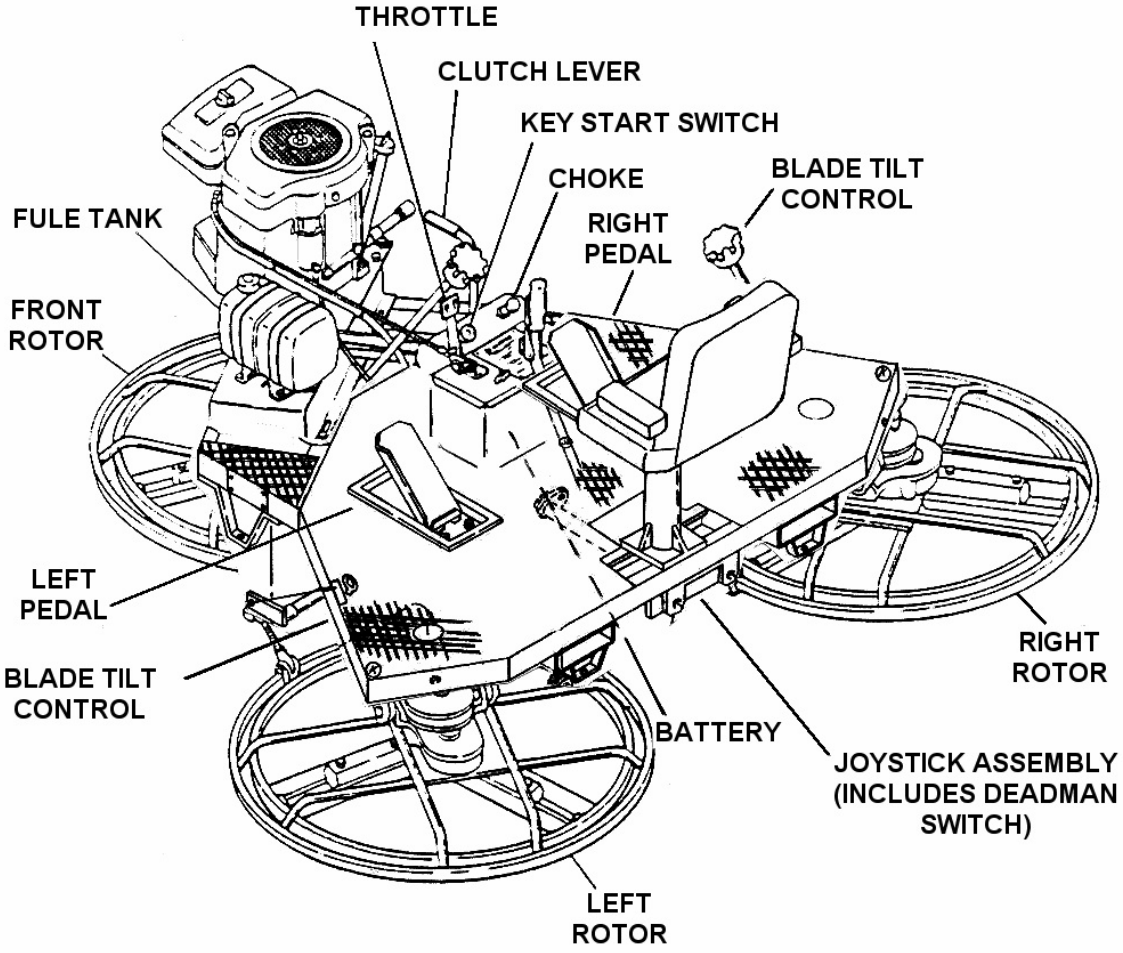


Figure 1
TriplTrowel General View

The operator steers the troweling machine by moving the joy stick assembly which swings universally. Forward or rearward movement of the stick for forward or rearward movement of the machine. Swinging the stick to the right or left will cause the machine to turn right or left. The machine can be made to "crab" right or left with right or left movement of the control stick in conjunction with a simultaneous movement of the respective foot pedal.

A manual, heavy duty, rotary cam actuated mechanical clutch with detent lock-in transmits the engine power to the rotors through V-belts.

A deadman lever is provided on the joy stick as a safety device to stop the engine should the operator become disabled or lose control of the machine. A throttle control attached to the battery box cover permits the machine to be operated at varying speeds.

The front and right trowel rotors (see Figure 1) turn clockwise while the left trowel rotor turns counterclockwise. The rotors engage the concrete solely with the trowel blades which orbit about the axis of the rotor. The leading edge of all but the finishing trowel blades are curved upward and the pitch can be controlled during rotation by raising the leading edge. Float or finish type blades may be substituted for the standard combination blades.

The direction the machine moves and its turning to face in a chosen direction are controlled by selectively applying a tilting pressure to one or more of the rotors. The tilting pressure applied to a chosen side of the rotor increases the pressure of the orbiting rotors on the concrete so that reaction to the increased friction along one side of the orbit exerts a moving force. Most of the time, control may be exerted only through the stick which the operator can swing forward and rearward about one axis and left to right about another axis. This movement is universal so that any combination of the two swinging movements may be used. Thus, the operator can move the stick straight forward for forward movement, straight rearward for rearward movement, and with either of these movements can also move the joy stick sidewise for turning in one direction or the other as the machine moves forward or rearward. If the operator chooses to turn the machine with little or no forward or rearward movement he can move the stick to one side or the other from the neutral position. The stick applies pressure to the front rotor in a manner which will produce lateral movements by that rotor and simultaneously influence one of the rear rotors for forward movement and the other for rearward movement. If crab-like or direct sideward movement is desired, this can be accomplished by applying a pressure to all three rotors at a selected point to induce movement in a single lateral direction. Foot pedals are used in conjunction with the stick to apply pressure to the rotors to provide lateral movement.

TABLE I - TROWEL SPECIFICATIONS

Unit Dimensions (L x W x H), in. (cm)	95 x 107 x 46.5 (241 x 272 x 118)
Path Width, in. (cm)	102 (259)
Trowel Travel Speed Max., ft/min (m/min)	500 (152.4)
Trowel Blade Speed, rpm	variable to 120
Operating Weight, lbs. (kg)	900 - 1000 (409 - 454)
Shipping Weight, lbs. (kg)	1100 - 1200 (499 - 544)
Noise Levels at Operator's Seat:	L_{wA} = 107 dB(A) L_{pA} = 90 dB(A)

TABLE II - ENGINE SPECIFICATIONS

Make	**Briggs & Stratton**	**Kohler**	**Onan**	**Onan**
Model	351777	M20S	LXV790	LX990
Type	1036E1	49544	10893	11257
Power @ Maximum Governor Speed, hp (kW)	20 (14.9)	20 (14.9)	20 (14.9)	24 (17.9)
Starting System (electrical)	12V	12V	12V	12V
Cooling System	Air	Air	Air	Air
Governor Speed Max. (no load), rpm	3600	3600	3600	3600
Fuel Tank Capacity, gal. (L)	4.0 (15.2)	4.0 (15.2)	4.0 (15.2)	4.0 (15.2)
Crankcase Oil Capacity, qts. (L)	1.5 (1.4)	1.8 (1.7)	2.1 (2.0)	3.0 (2.9)

SET-UP & OPERATION

UNPACKING AND ASSEMBLY

The TriplTrowel is shipped in a knocked down condition in (2) crates with the components strapped to the wooden skids and covered with a protective plastic cover. As it is unpacked, inspect each component for damage sustained in transit. If damage is found, notify the carrier immediately and submit a claim for the damage. Each rotor is identified by a stamped RIGHT or LEFT on the cover casting. To unpack and assemble the TriplTrowel proceed as follows:

1. Remove the sides and top of the shipping container from the skids.

2. Remove the steel bands to free the rotor assemblies, pitch control rods, spring, seat, V-belts and joy stick. (See Fig. i)

3. Lift off the rotor assemblies and set them on the floor so that they are in the correct location with respect to each other (See Fig. ii).

4. Remove the three bolts securing the trowel frame to the skid.

5. Use a forklift, hoist, or sling to lift the frame assembly from the skid. Be sure to attach the sling to the three lifting eyes. Move the frame over the three rotors. The pitch control screw of each rotor should be positioned so that it points toward the center of the frame. Lower the frame slowly and align each of the three rotor yokes with the holes in the frame. When all three yokes are in position on the frame, insert a locking pin through the yoke and frame to lock the rotor in position.

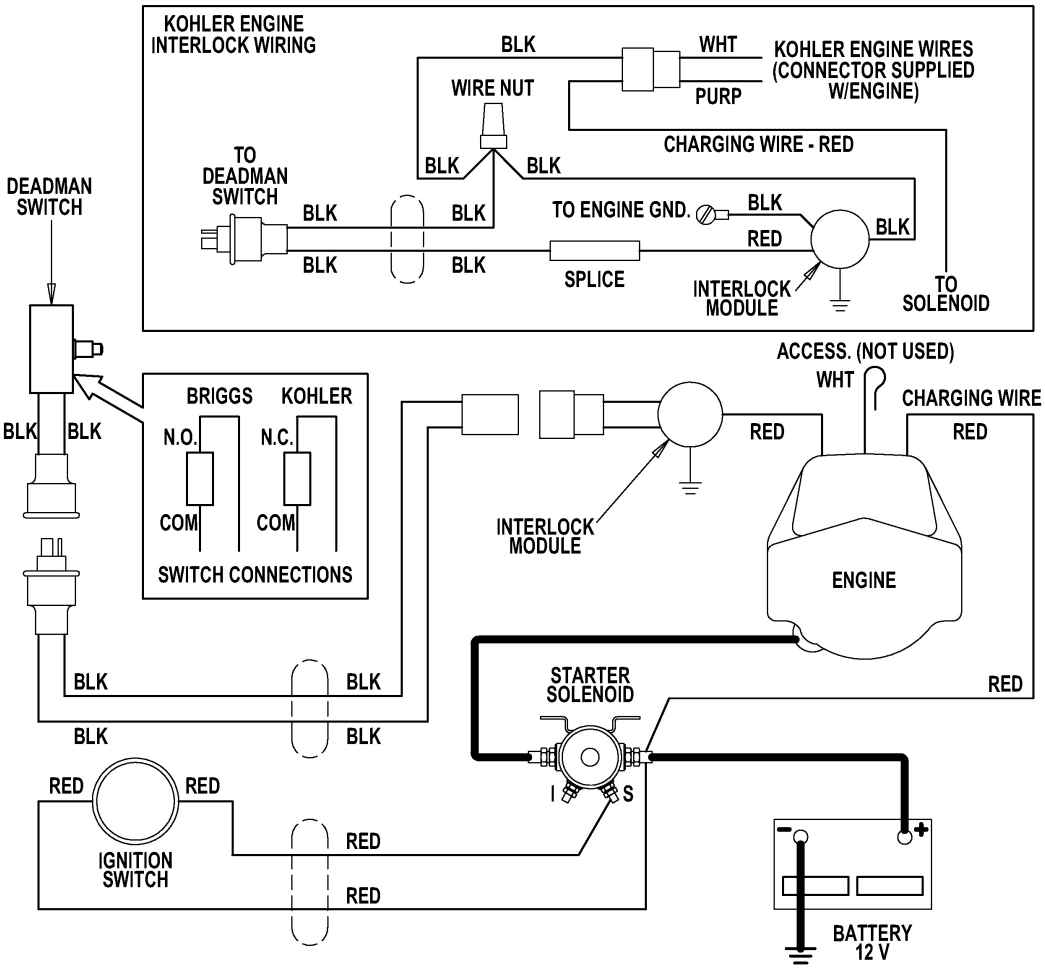


Figure 2
Wiring Diagram

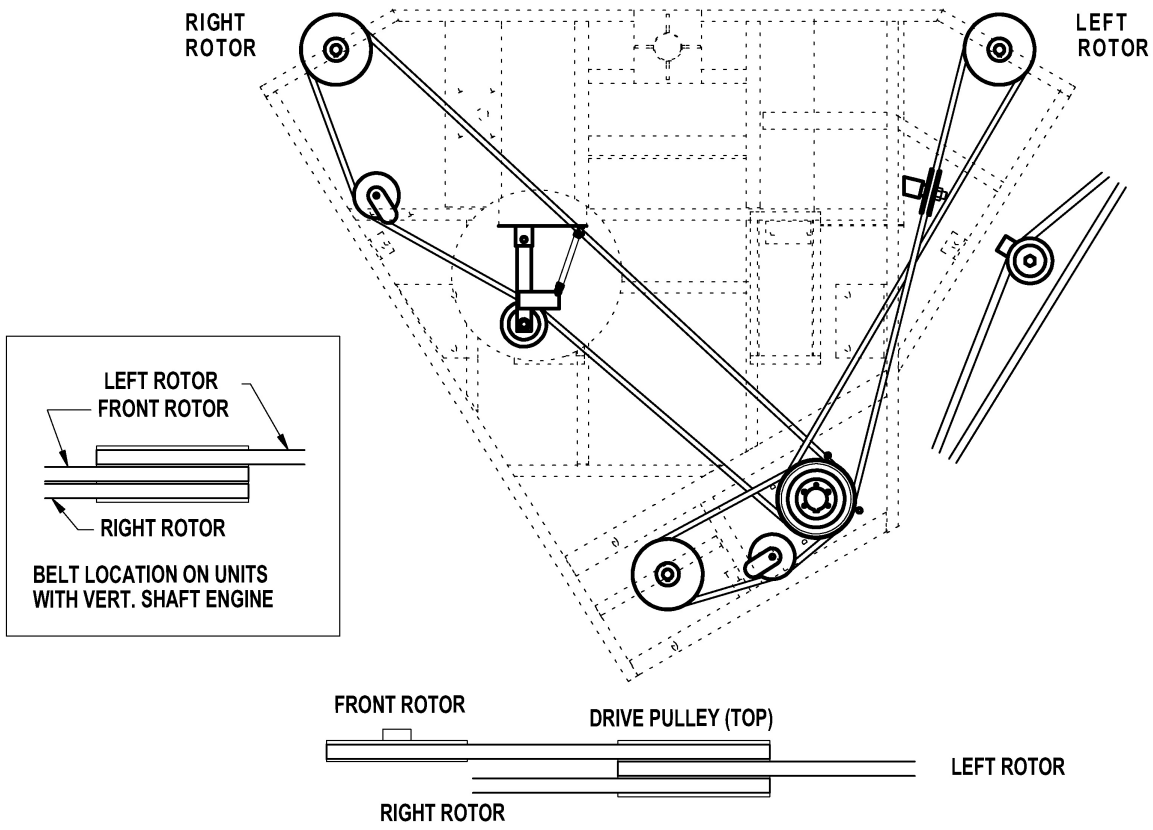


Figure 3
Drive Belt Installation

6. Place the joy stick assembly into position from underneath the frame and secure it with a spring pin. Plug in the wiring connector. Make sure that the wiring conforms to Figure 2. Check the level, and add water to the battery if necessary.

7. See Figure 3. Install the V-belts as follows:

   Install the captured belt of the **front rotor** into the **top groove** of the drive pulley. Run the belt around the idler and drive sheave of the **front rotor**.

   Cross the shorter V-belt into a figure "8" pattern and install it in the **middle groove** of the drive pulley. Install the belt onto the **left rotor** drive sheave and idler as shown in Figure 3.

   Position the long belt in the **bottom groove** of the drive pulley. Install the belt onto the drive sheave of the **right rotor**. Route the belt around the two idlers as shown in Figure 3.

   NOTE: Check the tension of the belts at the mid point of the longest span. Refer to Table V for recommended tension. After running in the belts, they may require adjustment due to normal stretching. Check belts frequently during the first few hours of operation for evidence of slipping.

8. Attach the spring to the joy stick assembly. The opposite end of the spring hooks into a hole in the frame which will keep the joy stick assembly in a vertical position.

9. Install the seat to the desired height and lock it in position with spring pin.

10. Connect the five controls links using the spring pins.

    NOTE: Control links were adjusted at the factory and should need no further adjusting.

11. Install the pitch control rods, through the grating, into the pitch control screws. Push the control rod down until groove bottoms out on the roll pin.

12. When assembly is complete, and the trowel is sitting on a flat level surface, the joy stick assembly should assume a straight up position. If not, adjust the control links as outlined:

    a. To adjust the control links it is important to understand that the TriplTrowel is controlled by shifting weight at the ends of the blades. This is accomplished by the five links connected to the foot control shaft and joy stick.

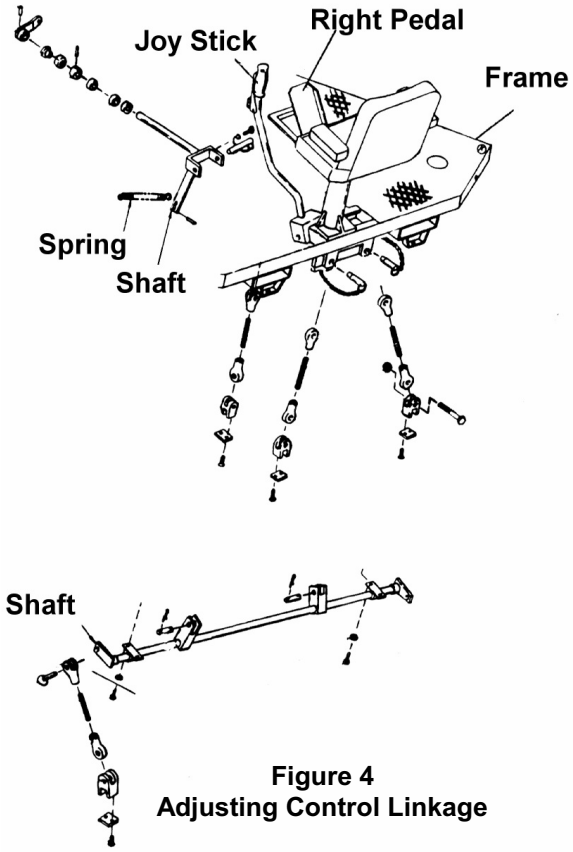


Figure 4
Adjusting Control Linkage

b. The rotor assemblies must be set true and level. All blades on the three rotors must be flat. Make sure the blade bars are all the same distance from the floor. If not, simply lift the guard ring on the low side, or run the machine for a few seconds on a flat surface with no force on the pedals or joy stick. Disconnect all the links and the spring on the joy stick.

c. The first step is to "bias" the controls to give the machine stability. This allows the machine to remain still with the engine at full throttle and no force on the pedals or joy stick. STOP the engine and perform the following:

   Connect the link on the front guard ring and adjust it until the joy stick cross bar is parallel with the top of the angle iron under the seat.

   Connect the spring between the joy stick and the frame. Use the first hole in the frame to minimize spring tension as a starting point.

   Hold the joy stick in the vertical position so the dimension is 2-3/32" (cross bar parallel to the frame) adjust the links to align the holes so the pins slide through easily.

d. Connect the links between the foot control shaft and the right and left guard rings. These links should be adjusted so the pedals are at the same angle and the lower ball joints align with the mounting brackets when the quick pins are installed. In short, there should be no tension, either up or down, on the guard rings.

e. It is very important that the control links do not exert excessive force when the joy stick and pedals are in their neutral position. Excessive force will not produce as smooth a finish as a properly adjusted machine.

f. If the machine still does not respond properly to the controls, refer to Figure 5 for corrective procedures.

CAUTION

Do not get on or off machine when trowel blades are turning.

13. To start the engine and check steering, proceed as follows:

    a. Check that joy stick and foot pedals are free.

    b. Open throttle slightly. Choke engine if cold.

    c. Squeeze deadman lever on joy stick.

    d. Turn key to crank engine until it starts.

    e. Maintain grip on deadman lever or latch it to keep running.

    f. Open the throttle slowly until the clutch engages. Adjust throttle to full speed.

    g. Keep controls in neutral position. Trowel should not move in any direction or revolve any appreciable amount.

14. When the steering control system has been equalized, the machine will move straight forward without veering off to the side when the joy stick is moved straight forward. The same applies when the steering stick is moved straight back.

CAUTION

Do not stand in the path of the blades when engine is idling and the clutch is disengaged.

15. If the machine is not in balance, shut off the engine by releasing the deadman lever on the joy stick assembly, and turn the ignition key to "OFF". Adjust the front and both rear joy stick links as required until the steering is equalized. Balancing the forces on the trowel is a matter of adjustment, and may necessitate several attempts before an equalized steering system is achieved.

CAUTION

Always stop engine before adjusting or servicing control link.

16. Remove the ignition key when leaving the equipment unattended.

TROUBLE SHOOTING CHART

Problem	Correction (Use 4 Turns Initially)
Nose won't turn right	Lengthen at #1 and #3, Shorten #2
Nose won't turn left	Shorten at #1 and #3, Lengthen #2
Rear crabs left	Shorten #5, Lengthen #4
Rear crabs right	Shorten #4, Lengthen #5
Won't go forward	Shorten #2 and #3
Won't go backward	Lengthen #2 and #3

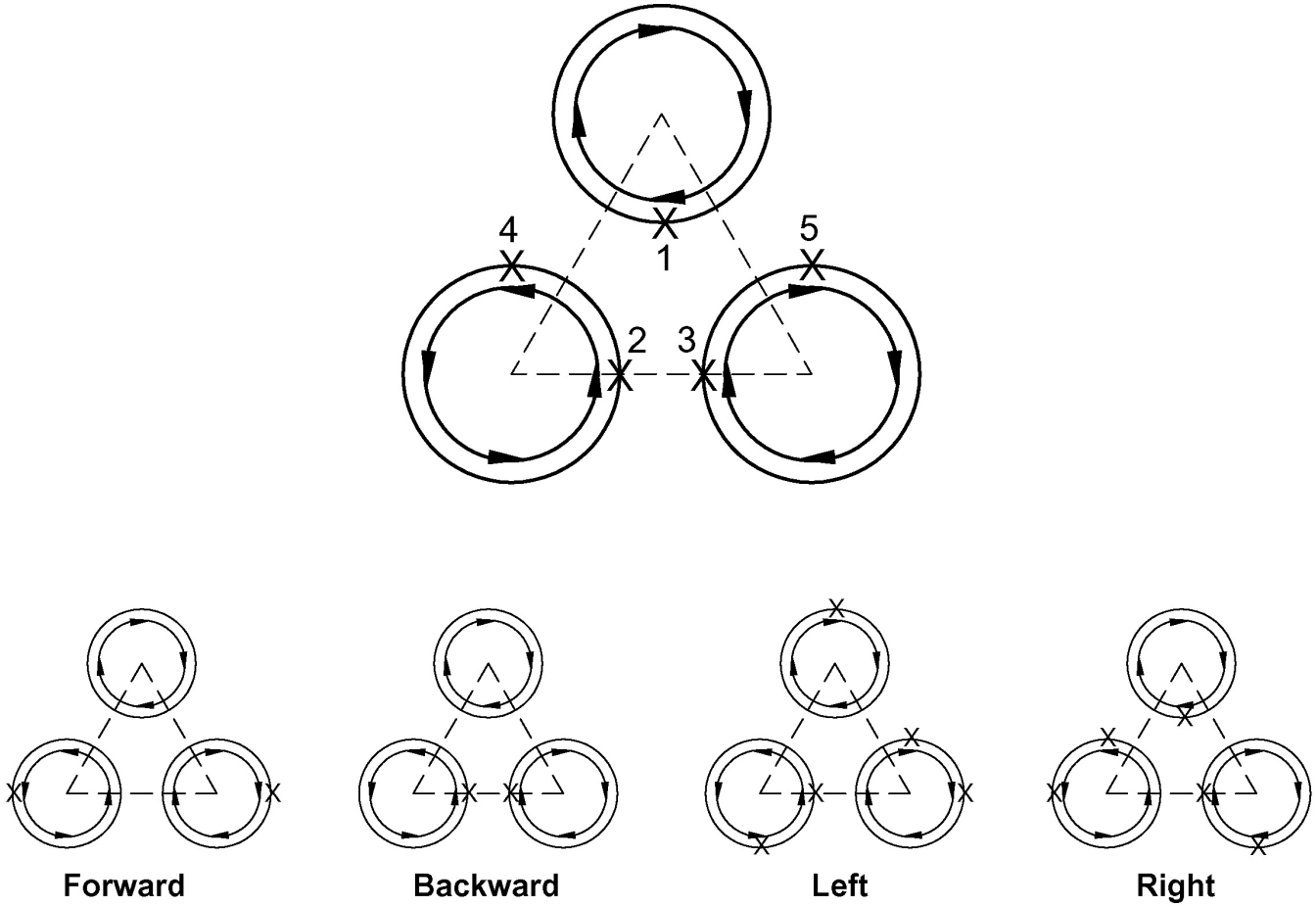


Figure 5
Direction Control: Downward Force at "X" Produces Indicated Motion

OPERATING CONTROLS

GENERAL - Before operating the TriplTrowel for the first time, become familiar with its controls and their function by studying the pictorial index in front of this section.

The operator's seat may be adjusted up and down by removing the pin and raising or lowering the seat and reinserting the pin. After setting the height of the seat, adjust the seat forward or backward to make yourself comfortable. Adjust the seat so that all controls are within easy reach. This is important to prevent fatigue.

THROTTLE CONTROL - The throttle control is the short lever mounted on the left side of the battery box cover. Moving the throttle control backward will increase the engine speed (RPM); moving it forward will decrease engine speed.

While operating the trowel, maintain a throttle setting at which you can best control the machine and achieve the surface finished desired. Keep the operating speed down until you get the feel of the controls, and learn the reaction of the trowel of each of the controls.

JOY STICK ASSEMBLY - The joy stick assembly controls the forward and reverse direction. Move the joy stick slowly but steadily. Avoid sudden or jerky movements which may cause you to lose control of the trowel. It also contains the deadman lever, which must be held in the depressed position to keep the engine running.

FOOT PEDALS - The coordinated movement of either the left or right foot pedal in conjunction with the joy stick assembly will cause the machine to move directly to the left or right respectively.

STARTING SWITCH - The key start switch is mounted on the left side of the battery box and is used for cranking the engine and maintain the ignition circuit to allow the engine to run once it is started. After you have become familiar with the controls, place the throttle control in the mid position and turn the key to crank the engine. Be sure to keep the lever on the joy stick depressed. When the engine starts, release the starting key, but keep lever on the joy stick depressed. It may be necessary to choke engine when cold.

DEADMAN LEVER - The joy stick has a normally open switch which is held closed by the deadman lever when the operator grasps the joy stick. This lever must be squeezed against the hand grip on the joy stick to start and run the engine. A latch is provided to hold the lever against switch, thereby permitting the operator to adjust the blade pitch or warm up a cold engine without constant hand pressure.

To set the latch proceed as follows:

1. Depress the deadman lever with one hand.

2. Rotate the upper end of the latch toward the joy stick and hold it there with the other hand.

3. Release the deadman lever to set the latch.

4. Release the latch. The blocked lever will hold the safety switch closed permitting the engine to be started and run.

CAUTION

Do not get on or off machine while blades are turning.

OPERATING THE TRIPLTROWEL

1. Close throttle (Lever Forward).

2. Turn the IGN switch to crank the engine. Depress the deadman lever. Release the key switch as soon as the engine starts.

3. Pull the throttle Rearward slowly and engage the mechanical clutch to start the trowel blades rotating.

CAUTION

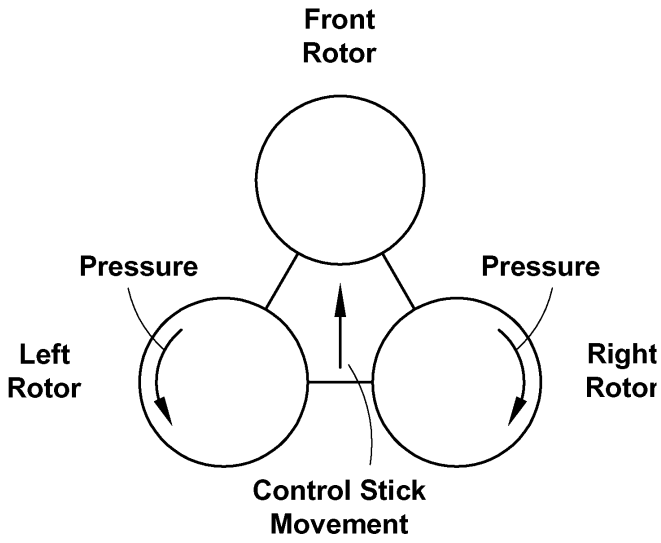
Do not get on or off machine while blades are turning.

4. With the operator seated in the seat and the controls in a neutral position, the machine should not move in any direction or revolve on its own axis any appreciable amount.

CAUTION

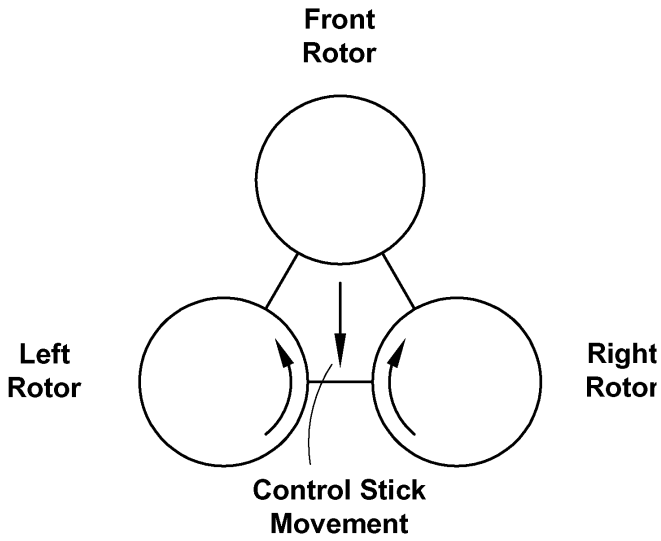
If you become confused while operating the trowel, release the deadman lever on the joy stick to stop the engine. The trowel will stop when the engine stops and you will be able to start over.

FORWARD MOVEMENT - Push control stick forward. Return control stick to center position to stop movement.



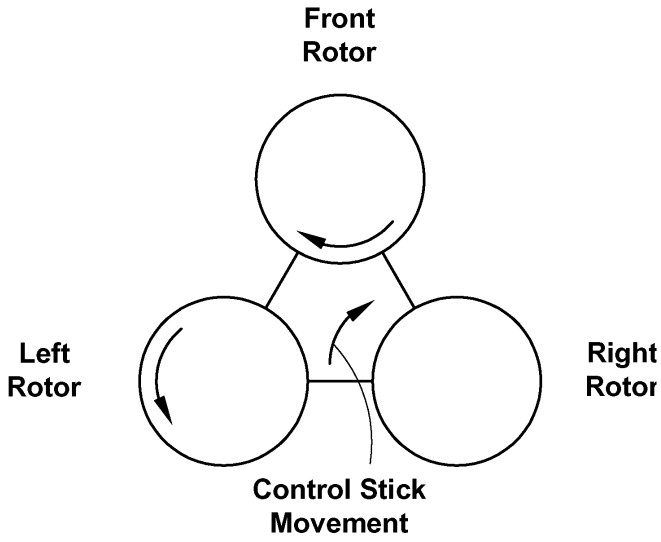
FORWARD MOVEMENT

REARWARD MOVEMENT - Pull control stick backward to move backward. Return control stick to center position to stop movement.



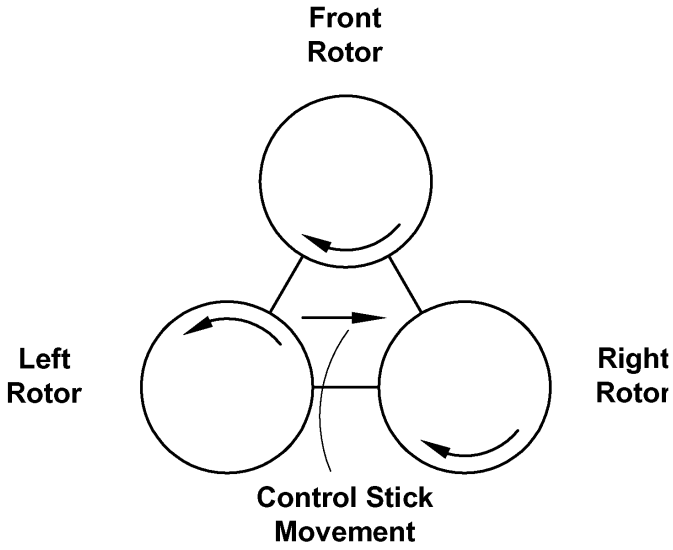
REARWARD MOVEMENT

RIGHT TURN - To turn the machine to the right, swing the control stick in the direction shown in the adjacent illustration and simultaneously press down on the left pedal. The front of the machine will swing to the right. Return the control stick to the center position and release foot pressure to stop movement.

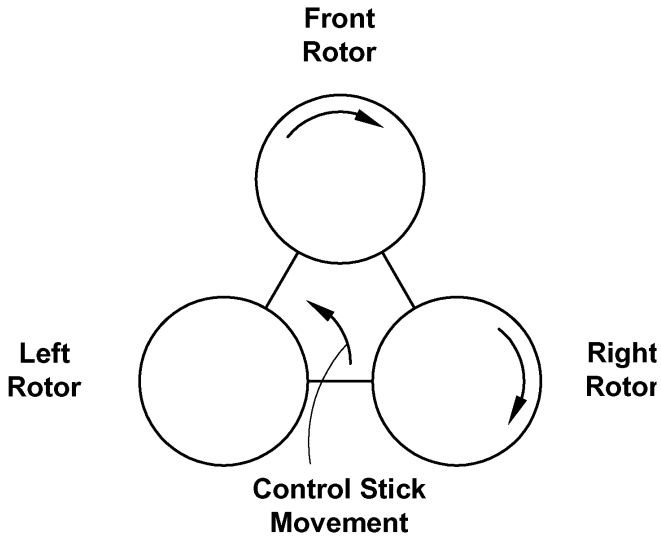


RIGHT TURN

CRABBING TO THE RIGHT - To make the machine "crab" to the right, swing the control stick to the right as shown and simultaneously press down on the right foot pedal. Return the control stick and foot pedal to the center position to stop movement.

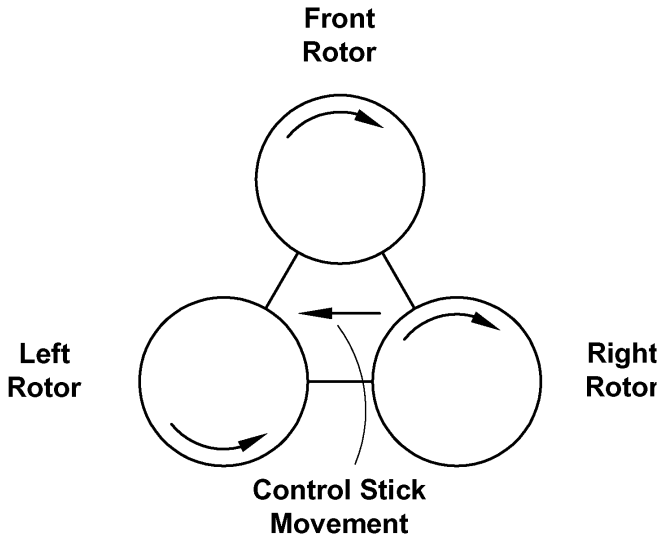


CRABBING TO THE RIGHT



LEFT TURN

LEFT TURN - To turn the machine to the left, swing the control stick in the direction shown in the adjacent illustration and simultaneously press down on the right pedal. The front of the machine will swing to the left. Return the control stick to the center position and release foot pressure to shop.



CRABBING TO THE LEFT

CRABBING TO THE LEFT - To make the machine "crab" to the left, swing the control stick to the left as shown and simultaneously press down on the pedal. Return the control stick and foot pedal to the center position to stop movement.

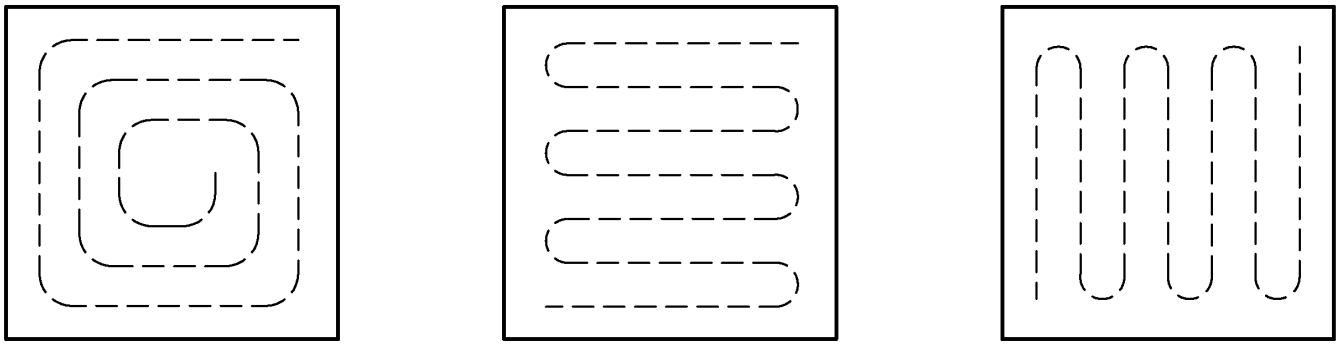


Figure 6
Typical Patterns for Troweling

HOISTING THE TROWEL

To lift the trowel, attach the sling to the three lifting eyes. The short leg of the sling attaches to the front (forward) lifting eye. Attach the sling to a hoist and take up the weight of the trowel slowly.

TRANSPORTING THE TROWEL

NOTE: Be sure to remove float pans if present, before hoisting or transporting the trowel.
It is not necessary to disassemble the trowel to transport it from one site to another. Unless the machine must be moved through a narrow doorway, the machine may be left assembled. The width of the trowel fully assembled is approximately 9 feet. If you pick it up and cock it slightly, the machine can be placed in a pickup truck and moved about the construction site. To move the unit through a narrow doorway, the rotor assemblies may be removed. In most cases, removing the three rotor drive belts, rotors, battery and draining the engine fuel tank will be required to move the trowel through a doorway by tilting the assembly.

FINISHING CONCRETE WITH THE RIDE-ON TROWEL

Finishing concrete becomes a pleasure rather than a chore with the new ride-on TriplTrowel. These procedures have been developed by experienced finishers to assist you in getting the most from your machine. If you follow them carefully you will get a smooth even finish, minimize the time on the slab, and reduce wear and tear on the trowel.

The tendency is to get on the slab too soon and trowel too long. Let the slab cure until you barely make a depression when walking on the slab. On the first pass keep the trowel moving. Do not sit in one place long. Before making the first pass decide what pattern you are going to use. Some suggestions are shown in Figure 6. The blade pitch is independently adjustable on all three rotors. Set the pitch the same on all three rotors; low pitch for soft surface and high pitch for hard surface.

. . . . . .

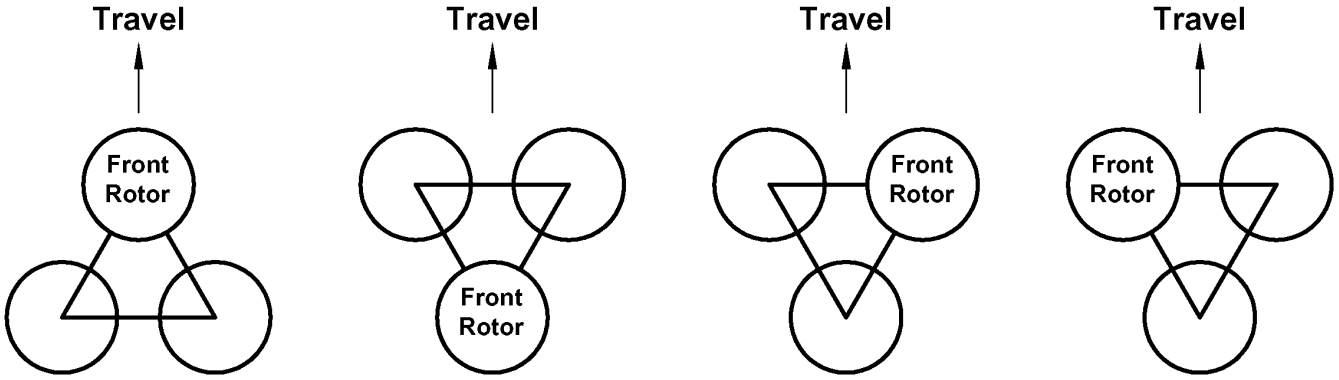
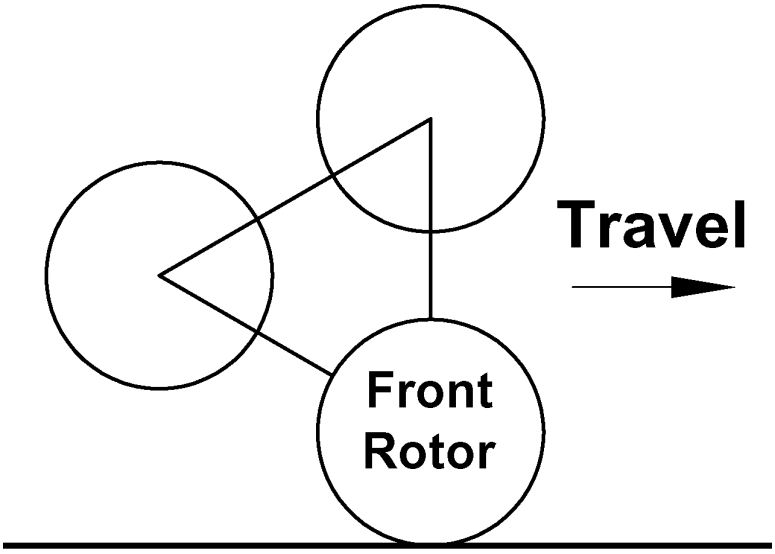


Figure 7
Orientation with Respect to Direction of Travel



NOTE: When finishing concrete with the TriplTrowel above grade, erect a suitable 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.

⚠WARNING

WHEN USING THE TRIPLTROWEL ABOVE GRADE, PROPER BARRIERS SHOULD BE INSTALLED ACCORDING TO APPLICABLE CODES.

Figure 8
Finishing Along Edge of Slab

After making one pass, stop and let the slab cure a little more. Some finishers prefer to vary their pattern from one pass to the other to achieve maximum flatness. For instance, run pattern view "B" one pass, then pattern view "C", Figure 6, the next pass. Continue making passes until the desired finish is obtained. The direction of travel (forward, backward, sideways or diagonally) is not important. However, there is slightly more weight on the front trowel which makes it most useful along edges and around columns where the concrete tends to cure faster. Preferred orientation relative to the direction of travel is shown in Figure 7. When finishing the edge of a slab, position the TriplTrowel as shown in Figure 8. Straight, sideways or diagonally left or right will miss a strip during troweling. If care is taken to avoid this, coming back to trowel a missed spot will be avoided. See Figure 9 for troweling patterns to be avoided.

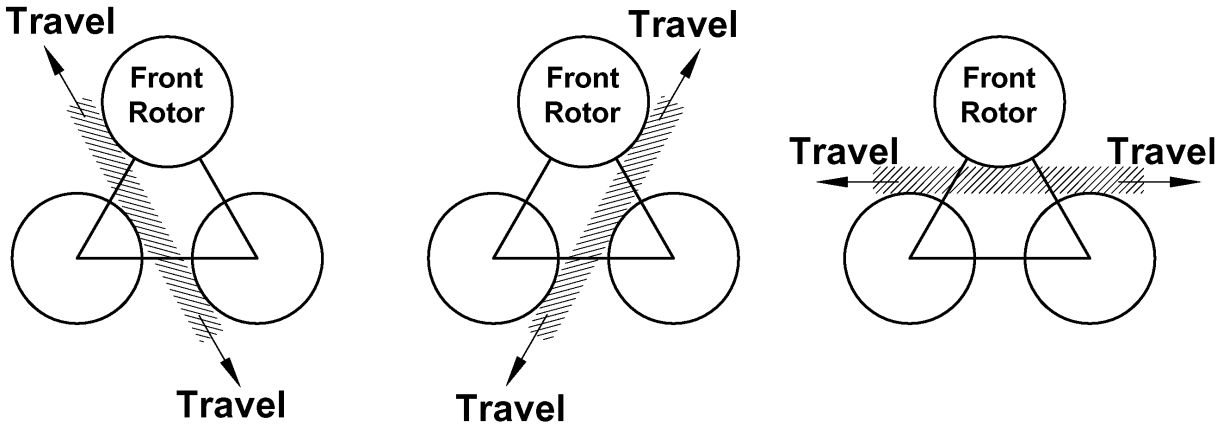


Figure 9
Patterns to be Avoided to Prevent Missing a Strip

USING FLOAT PANS

Float pans (troweling disks) may be used with the RF3 Tripltrowel to achieve flatter floors (F_F). Using float pans is only recommended for units having at least a 24 hp engine. Since finishing conditions vary widely (concrete wetness, air temperature, relative humidity, etc.), using float pans may not be practical or possible in every application. Trowel operation, steering, and finishing patterns are similar to using blades.

Float Pan Installation - Before installing the float pans, be sure the blades are in the flat position. Lift the trowel and slide the pan under the rotor blades. Be sure the blades are positioned between the mounting clips and centered in the pan. Start the engine and **SLOWLY** open the throttle until the blades begin to turn and engage the mounting clips.

NOTE: When using float pans, DO NOT pitch the blades. Trowel blades must be left flat. Pitching the blades will deflect the pans and substantially reduce their service life.

MAINTENANCE

LUBRICATION

TABLE III - RECOMMENDED LUBRICANTS

Lubricant	Company
Sohiotran EP1 Grease	Standard Oil of Ohio
Alvania® EP1 Grease	Shell Oil Company
Aeroshell® 22 Grease	Shell Oil Company
Mobilgear 630 Gear Lubricant	Mobil Oil Company
Omala® 220 Gear Lubricant	Shell Oil Company

TABLE IV - LUBRICATION SCHEDULE

Component	Service Interval	Procedure
Engine	Lubricate the engine according to schedules & instructions in the engine manufacturer's manual.	
Gearcase	12 months or 1600 hours* or after disassembly	Fill gearcase even with the bottom of the first stage reduction gear with an EP1 grease specified in TABLE III. DO NOT overfill. Using more grease than necessary will result in leakage.
Upper Needle Bearing	12 months or 1600 hours* or after disassembly	Remove seal (65, Figure 19) and repack upper needle bearing (37, Figure 19) with Aeroshell® 22 grease. NO SUBSTITUTION PERMITTED!
Drive Shaft Bearings	12 months or 1600 hours* or after disassembly	The cavity between the top and bottom drive shaft bearings (48, Figure 19) will not need grease if double sealed bearings are used on the trowel. Early production units used single sealed bearings which require this cavity be 1/2 filled with an EP1 grease listed in TABLE III.
Rotor Assembly Cam Plate	12 months or 1600 hours or after disassembly	Apply a film of grease to the cam plate and thrust bearing before reassembly. Use an EP1 grease listed in TABLE III.
Blade Arms	Every 50 hours	Lubricate blade arm grease fittings (19, Figure 19).
Tilt Yoke Pins	As needed	Lubricate rotor and gearcase hinge pins (17 & 19, Figure 15).
Jackshaft Bearings	12 months or 1600 hours	Grease the jackshaft bearings (16, Figure 16) with an EP1 grease listed in TABLE III. Wipe off grease fittings before greasing.
Steering arm Bearings	12 months or 1600 hours	Grease the steering arm bearings (49, Figure 18) with an EP1 grease listed in TABLE III. Wipe off grease fittings before greasing.
Throttle Cable, Steering Linkage, & Clutch Linkage	Every 50 hours	Lubricate the throttle cable, steering linkage, and clutch links with a non-oil type lubricant (WD-40 or equivalent). *NOTE: The drive clutch bearings are sealed for life and need no lubrication.*
Right-angle Drive	Check oil every 90 days. Change oil after first 100 hours, then after every 6 months or 2500 hours**	Remove the breather plug and drain the lubricant from the right -angle drive. Flush out the gearcase with an approved non-flammable, non-toxic solvent. Refill the right-angle drive using a gear lubricant listed in TABLE III.

* For units operating under severe conditions, such as the use of float pans, heavy-duty high-volume service, extremely dirty or high/low temperature environments the recommended lubrication service intervals are every 6 months or 800 hours. Lubricate the gearcase each time it is disassembled and the old grease has been removed. Do not add grease if the unit has been partially disassembled.

** For units operating in extremely dirty or high/low temperature environments, change oil more often.

DEADMAN SAFETY SWITCH REPLACEMENT

1. Remove clevis pins (5, 6, and 12, Figure 10).
2. Remove rubber boot (2) with knurled insert.
3. Remove switch cover plate (10).
4. Carefully remove switch (11) and wiring from joystick.
5. Install new switch in reverse order noting the following:

   a. Be certain the wires are connected to the "COM" and "NO" terminals if the switch has 3 terminals.

   b. Be sure to install the lever spring as shown in Figure 11 (leg of the long hook toward the joystick). If the spring is installed upside down, the leg on the long hook will hit clevis pin (5).

   c. If the engine fails to start or stops unexpectedly, even though the deadman lever is being held properly, check the following:

      1. Make sure all electrical connectors in the deadman circuit are secure.

      2. Make sure a wire in the deadman circuit has not been cut or broken.

      3. Make sure a wire in the deadman circuit is not grounded.

BLADE REPLACEMENT

Each blade is attached to its blade bar by means of two spring clips which pass horizontally through the blade and blade bar. (See Figure 11) This method provides for quicker and easier blade changes.

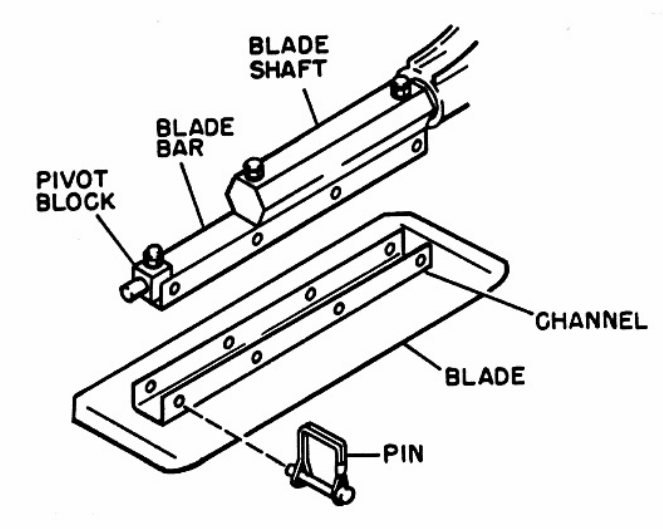


Figure 11
Blade Attachment

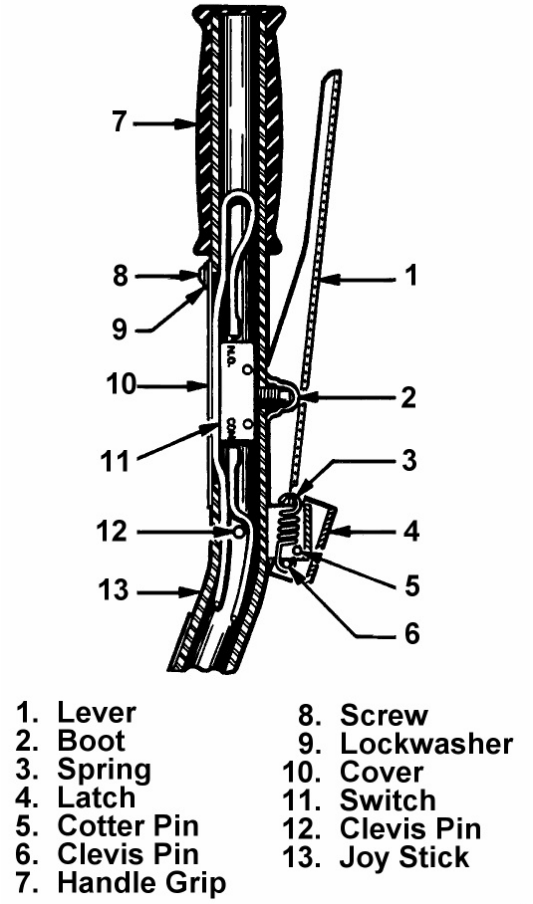


Figure 10
Lever Type Deadman Joy Stick

DRIVE BELT REPLACEMENT

1. The rotor drive belts are replaced as follows:

   NOTE: The rotor drive belts are installed on the gear box drive pulley as shown in Figure 3.

   a. Replacing the two rear rotor drive belts does not require disassembling the unit.

   b. Install the replacement belt(s). Make sure the belt is in the drive and driven pulley grooves, and idler before tightening the belt (see Figure 3).

   c. To replace the front rotor drive belt, pull the locking pin to disconnect the control link from the guard ring. Raise the front end slightly and pull locking pin to release the front rotor from the frame. Raise and block the frame when it is clear of the yoke. Remove the drive belt at the main pulley (both rear rotor belts must be removed first). Remove the two cotter pins and clevis pins to detach the tilting yoke from the rotor assembly. Remove the defective drive belt.

   d. Place the new belt in the front rotor pulley. Reposition the tilting yoke so one leg of the tilting yoke rides inside the belt loop. Reinstall the two clevis pins and cotter pins.

e. Lower the frame into the yoke. Making sure that the belt is riding in the drive and driven pulleys, and idlers. Secure the rotor assembly to the frame with the locking pin and attach the control link to the guard ring. Adjust the belt tension with the idler mounted under the engine (see Table V). Measure belt tension at the midpoint of the longest span. Reinstall the rear rotor belts.

NOTE: New belts stretch during the first hours of operation. Check frequently for signs of new belt slippage and readjust belt tension as necessary.

TABLE V - RECOMMENDED BELT DEFLECTION

Belt	Deflection	Side Load
Main Drive	1/4 inch	12-1/2 - 16-1/2 lbs.
Front Rotor	3/16 inch	4 - 5-1/2 lbs.
Rear Rotors	11/16 inch	4 - 5-1/2 lbs.

f. Adjust the left rotor belt tension by loosening the engine frame mounting bolts and sliding the engine frame to the left or right. Any time you adjust the left rotor belt tension, you must also re-adjust the right and front rotor belt tension. Adjust the right and front rotor belt tension with the idlers mounted underneath the frame.

2. The main drive belt set (9) is replaced as follows: Refer to Figure 24.

   a. Remove belt guard (16). Loosen the front rotor belt idler and remove the rear rotor belts from the idlers. All three belts should be slack.

   b. Loosen the two drive-adjustment screws (35). Remove the four gearbox mounting bolts (19) and remove the old belts.

   c. Install the new drive belt set on the clutch and reinstall the gearbox. Tighten the two drive-adjustment screws and adjust the belt tension to 14-1/2 pounds at 1/4" deflection at the center of the span.

   d. Reinstall the belt guard and the three rotor drive belts (see Figure 3).

BATTERY MAINTENANCE

1. Proper care of the battery will ensure satisfactory starting under most severe conditions. At least once each week check the electrolyte level in the battery. **Do not over fill - Do not under fill**. Add only enough soft water to each cell to bring the electrolyte level up to the marker in the fill opening.

2. Diluting the electrolyte too much will weaken the battery or if the plates are allowed to "dry" because of a low electrolyte level, loss of ampere hour capacity and service life result.

3. When servicing the battery keep the following points in mind.

   a. Never add acid to the batteries. Add only approved water.

   b. Add water after taking the hydrometer reading and before putting the batteries on charge. A hydrometer reading taken immediately after water has been added will be completely false.

   c. Excessive use of water indicates overcharging, or charging at excessively high charging rates.

   d. Keep battery vent caps in position when charging.

   e. Keep batteries dry and clean to avoid electrical leakage over the top of the batteries and through the hold-down frame.

   f. Use a brush to clean battery tops and hold-downs with a solution of baking soda and water. Be sure battery filler caps are on tight before cleaning. After brushing with solution of baking soda, flush clean with water.

   g. Clean battery terminals and connectors in the same manner as described above. If baking soda solution is not adequate to get terminals and connectors clean, use wire brush terminal and battery post cleaner to remove corrosion.

   h. After cleaning, drying, and tightening terminals, coat with petroleum jelly to retard and prevent corrosion. Keep connections tight.

   i. Battery failure is due to improper maintenance or normal wear. More often the cause is lack of maintenance. However, when failure occurs, one cell fails and affects the entire circuit.

   j. Batteries discharge slowly even if not used. Check it once each month with a hydrometer, and recharge when necessary. When charging the battery, do not exceed a charging rate of 5 amperes.

CAUTION

Adequate ventilation must be provided when batteries are being charged. Sparks, open flame and smoking must be avoided during charging, since hydrogen gas is produced in the charging process. This gas may collect in poorly ventilated areas and present an explosion hazard.

OVERHAUL INSTRUCTIONS

GENERAL

1. The TriplTrowel is designed to permit all service procedures to be accomplished with readily available common tools.

2. Refer to the engine manual for overhaul instructions pertaining to the engine.

DISASSEMBLY

1. Complete disassembly of the TriplTrowel is seldom required to accomplish most repairs. Disassemble the machine only to the extent required to perform the required repair.

2. Refer to Figure 15 and disassemble the trowel as required.

REASSEMBLY

Reassemble the trowel in reverse sequence of disassembly and according to the following additional instructions.

1. <u>Gear Case and Drive Shaft Assembly</u>.

a. Press needle bearing (56, Figure 19) into the gear case (57). Press from stamped end of bearing.

b. Apply pressure to the outer race only, press the top bearing (48) into the gear case.

c. Insert a steel tube, as shown in Figure 12, to support the bearing inner race and press the drive shaft and secondary gear (50, Figure 19) into the bearing until seated.

d. Place the gearcase assembly on a flat block with gear shaft upward. See Figure 13.

e. Slide bottom bearing (43, Figure 19) over the drive shaft and secondary gear (50) and, using a steel tube as shown in Figure 12, press the bottom bearing into the gearcase until seated against the snap ring.

f. Install sufficient shims (47, Figure 19) to provide shaft end play of 0.003 to 0.008 inch. Secure with retaining ring (46).

g. Use shims (39) and thrust washer (40) to maintain 0.015 to 0.025 inch end play on gear (41).

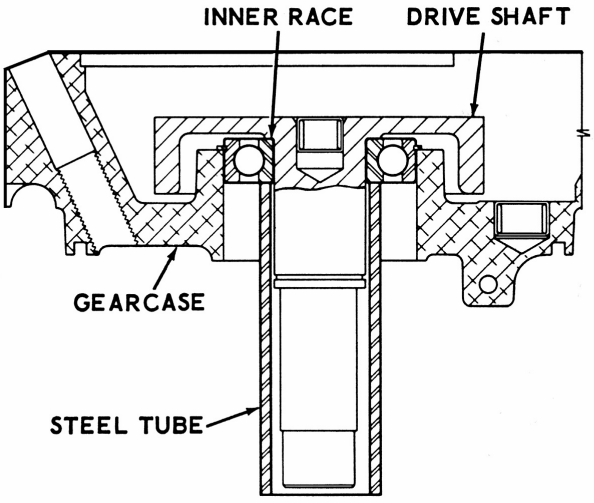


Figure 12
Top Bearing Installation

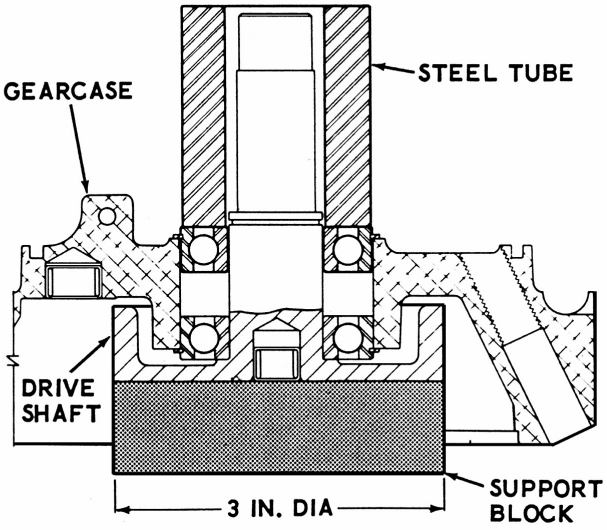


Figure 13
Bottom Bearing Installation

2. Spider and Shaft Assembly.

Disassemble the spider and shaft assembly only if parts replacement is required.

a. Slide one vibration washer (18, Figure 19) onto each shaft arm (14 or 17).

b. Position tilting arm curved end upward, in the blade spider (20).

c. Insert the blade shaft into the spider and through the tilting arm.

d. Secure the tilting arm to the blade shaft with taper pin. The shaft arms must be kept with their respective spider assemblies. The tilting arms are not interchangeable between the left and right hand spider assemblies.

ENGINE REPLACEMENT

1. Remove the belt guard, then disconnect the fuel line, electrical harness, leads, and throttle and choke cables from the engine. Remove the two clutch control links and clutch lever support assembly (45, Figure 16).

2. Remove the four sets of hardware securing the engine mounting plate to the engine frame. Slide the engine toward the jackshaft and work the belt off the clutch pulley.

3. Two people may now lift off the engine and engine mounting plate.

4. Remove clutch retaining nut (25A) and loosen two set screws (29) above the clutch pulley with a long 1/8" hex "TEE" wrench. The clutch can now be slid off the crankshaft. If a bearing puller is used, be careful not to damage the clutch cams or pulley groove

5. Remove the engine mounting plate from the engine.

6. Remove interlock module and install it on the replacement engine. (See Figure 14 for locating interlock module.) Tighten module mounting screw and red grounding wire lock nut securely.

7. Reassemble the engine mounting plate on the engine. Apply a light coating of an anti-seize grease to the clutch bore to keep it from seizing on the crankshaft.

8. Install the replacement engine onto the engine frame, tilting the engine to work the drive belt onto the clutch pulley. Position the engine so that the belt tracks properly. Secure the engine to the engine frame with four sets of hardware. Tension belt properly.

9. Connect the fuel line, throttle cable, electrical harness, and leads to the engine. Refer to the wiring diagram, Figure 2 for wiring connections.

CLUTCH OVERHAUL

1. Remove the clutch as noted in Step 4 of Engine Replacement.

2. Install clutch rebuild kit, Part No. M32227 as follows. (See Figure 14A.)

DISASSEMBLY

1. Loosen two set screws (15) and remove collar (16).

2. Compress separator springs by pressing on upper pressure plate.

3. Remove snap ring (14) and shims (13).

4. Remove upper pressure plate and separator springs, pulley and bearing, lower separator springs and pressure plate from hub.

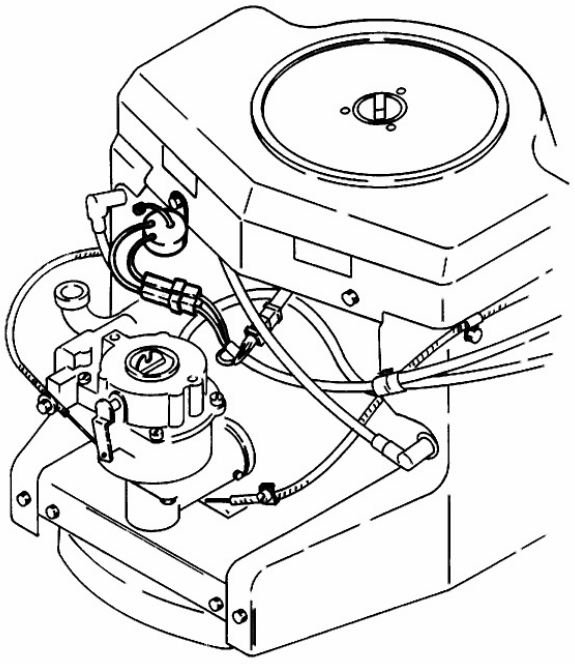


Figure 14
Location of Interlock Module

ASSEMBLY

1. Install new lower pressure plate on hub. Be sure pressure plate can slide freely on hub splines.

2. Install two pairs of new separator springs, tip-to-tip, between pressure plate and pulley bearing, as shown. (See View B and C.)

3. Install pulley and bearing on hub. Be sure bearing inner race can slide freely on the hub.

4. Install second set of two pairs of new separator springs, tip-to-tip, as shown (See View B).

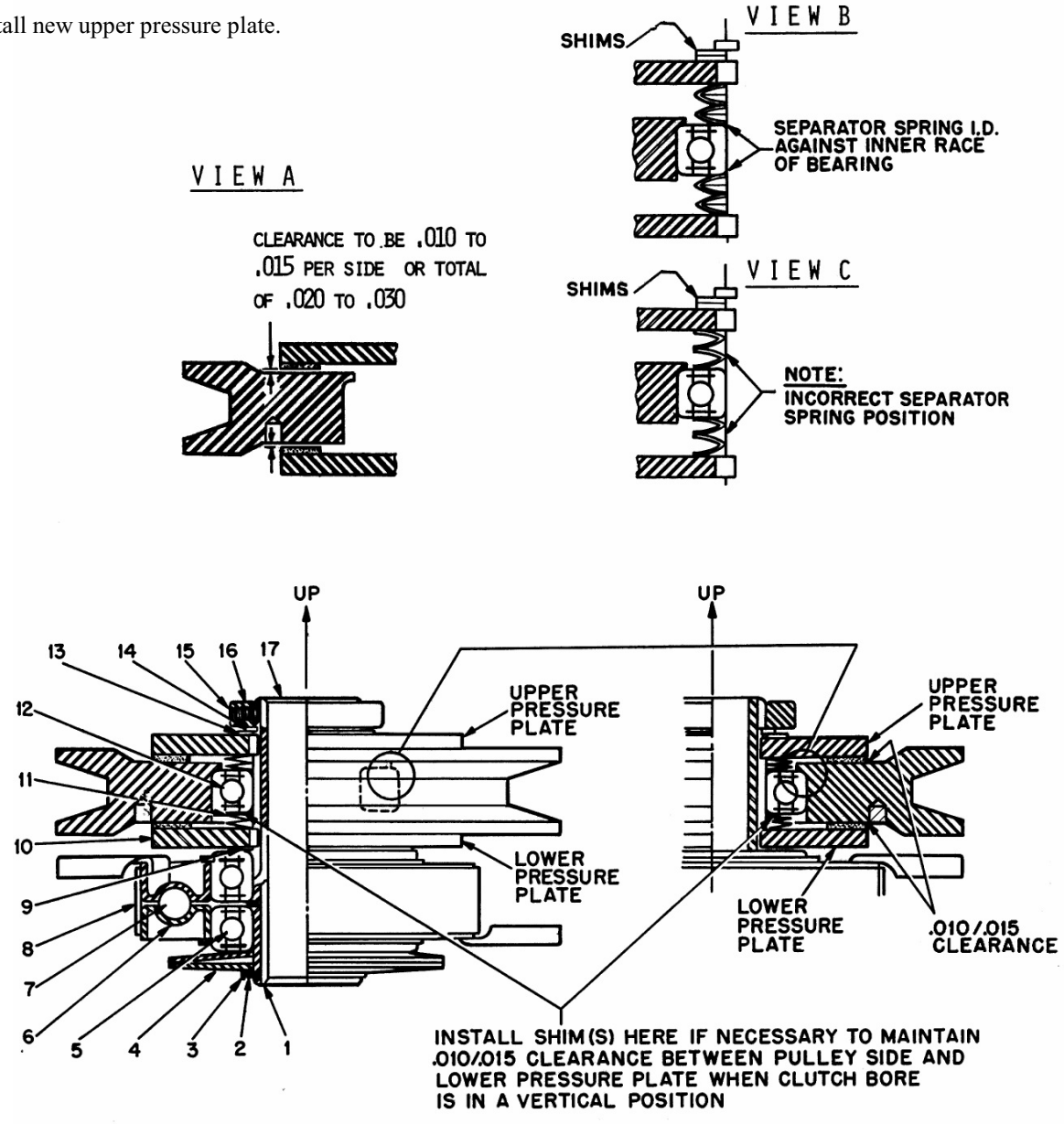
5. Install new upper pressure plate.

6. Install original shims.

7. Install snap ring and check clearance between pressure plates and pulley sides with clutch disengaged and hub vertical with pulley on top. Proper clearance is .020 to .030 total.

8. Install collar, locate clutch on shaft and tighten set screws. Replace flat washer (26) and lock nut (25A).

NOTE: The bearing shoulder in the pulley must be next to the upper pressure plate to support the weight of the pulley. If installed up-side down, the pulley will drag on the lower pressure plate and cause the clutch to overheat.



Install shim(s) here if necessary to maintain .010/.015 clearance between pulley side and lower pressure plate when clutch bore is in a vertical position.

Figure 14A
Clutch Rebuild Kit

JACKSHAFT BEARINGS

1. Remove belt guard.
2. Loosen engine plate bolts to release belt tension.
3. Remove belt from top pulley on jackshaft.
4. Remove (3) lower belts.
5. Remove the lower (3 groove) pulley and hub from jackshaft.
6. Loosen locking collars on both bearings and pull pulley and jackshaft out of bearings
7. Replace old bearings and reassemble in reverse.
    a. Place locking collar on top bearing up and the locking collar on lower bearing, down.
    b. Install the pulley (3 groove) on the jackshaft so that the middle belt to the front rotor is in line with the pulley on the front rotor.

PARTS LIST

This section lists all the items which make up this equipment. Standard hardware items should be procured locally. Parts indicated NA in the Quantity required column are listed for convenience and to maintain parts relationship and are not available as a service part.

When ordering parts, check the model decal for the correct model of the equipment. In addition to the model number, include the specification and serial numbers when ordering parts. Order parts by part name and part number only. Do not use index numbers from the illustrations when ordering parts.

Figure 15
TriplTrowel Exploded View

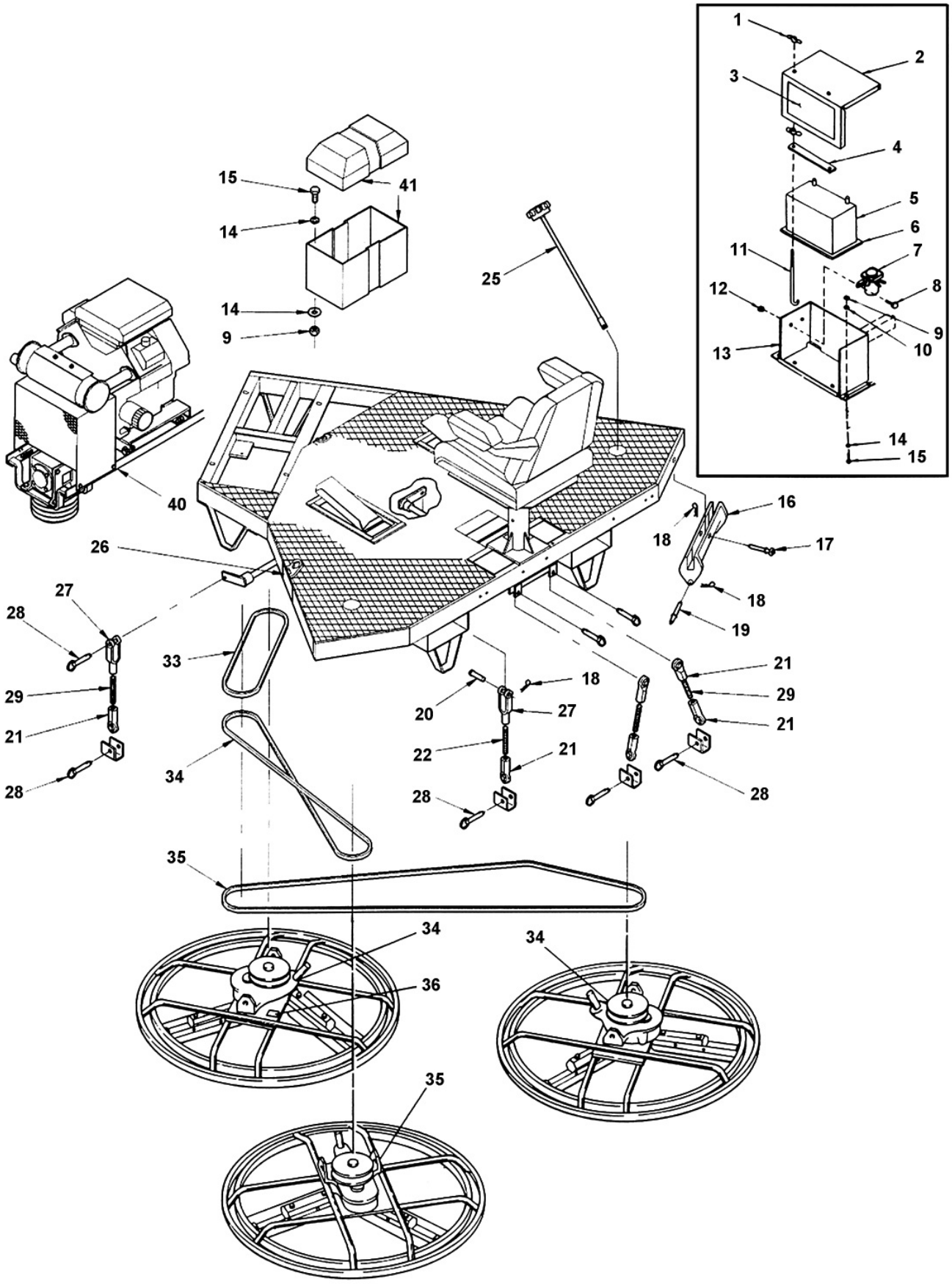


Figure 15
TriplTrowel Exploded View

Key No.	Part No.	Description	Qty.
1	M15166	Wing Nut, 1/4"-20	4
2	M46899	Battery Box Cover	1
3	M46289-01	Decal, Caution - Stay Clear	1
4	M20393	Battery Strap	1
5	M21783	Battery	1
	M48617	Battery (24 hp & 25 hp)	1
6	M22752	Battery Pad	2
7	M27706	Solenoid	1
8	H5C4-4C	Hex Head Cap Screw, 1/4"-20 x 1/2"	2
9	NTC-5C	Torque Lock Nut, 5/16"-18	4
10	WP-5C	Flatwasher, 5/16"	4
11	M29863	Battery Bolt	2
12	NTC-4C	Torque Lock Nut, 1/4"-20	2
13	M46902	Battery Box Weldment	1
14	805433-2	Engine Support Washer, 15/32" ID x 1-3/8" OD	8
15	H5C5-12C	Hex Head Cap Screw, 5/16"-18 x 1-1/2"	4
16	M48740	Yoke w/Bearings	3
	M6857-88	Needle Bearing, 3/4" O.D.	12
17	M48731	Rotor Hinge Pin	3
18	C4-8C	Cotter Pin	10
19	M48727	Gearbox Hinge Pin	6
	56981	Grease Fitting	6
20	M27261-2	1/2" x 1-3/8" Clevis Pin	1
21	M27205	Ball Joint	7
22	M27074-04	Threaded Rod, 1/2"-20 x 2-7/8"	1
23			
24			
25	M48434	Control Pitch Assembly	3
	ROP8-12	Roll Pin	1
	M8805	Knob	1
	M48435	Rod	1
26	M28469	Decal, Caution - Lift Here	3
27	M31601	1/2-20" Clevis	3
28	M23019-9	Fast Pin	7
29	M27074-03	Threaded Rod, 1/2"-20 x 3-5/8"	4
30			
31			
32			
33	M27209-3	V-Belt, (A105)	1
34	M27209-5	V-Belt, (A48)	1
	M48629	V-Belt, (A50 - Kohler 25 hp only)	1
35	M27209-4	V-Belt, (A136)	1
36			
37	. . . . .	Rotor Assembly, R.H. (See Figure 19)	2
38	M32118	Decal, Caution	6
39	. . . . .	Rotor Assembly, L.H. (See Figure 19)	1
40	. . . . .	Engine Group (See Figure 16)	-
	. . . . .	Engine and Drive Group (See Figure 24)	-
41	M48619	Battery Box & Strap	1
42	M32684	Decal, Rotation	3

Figure 16
Engine Group

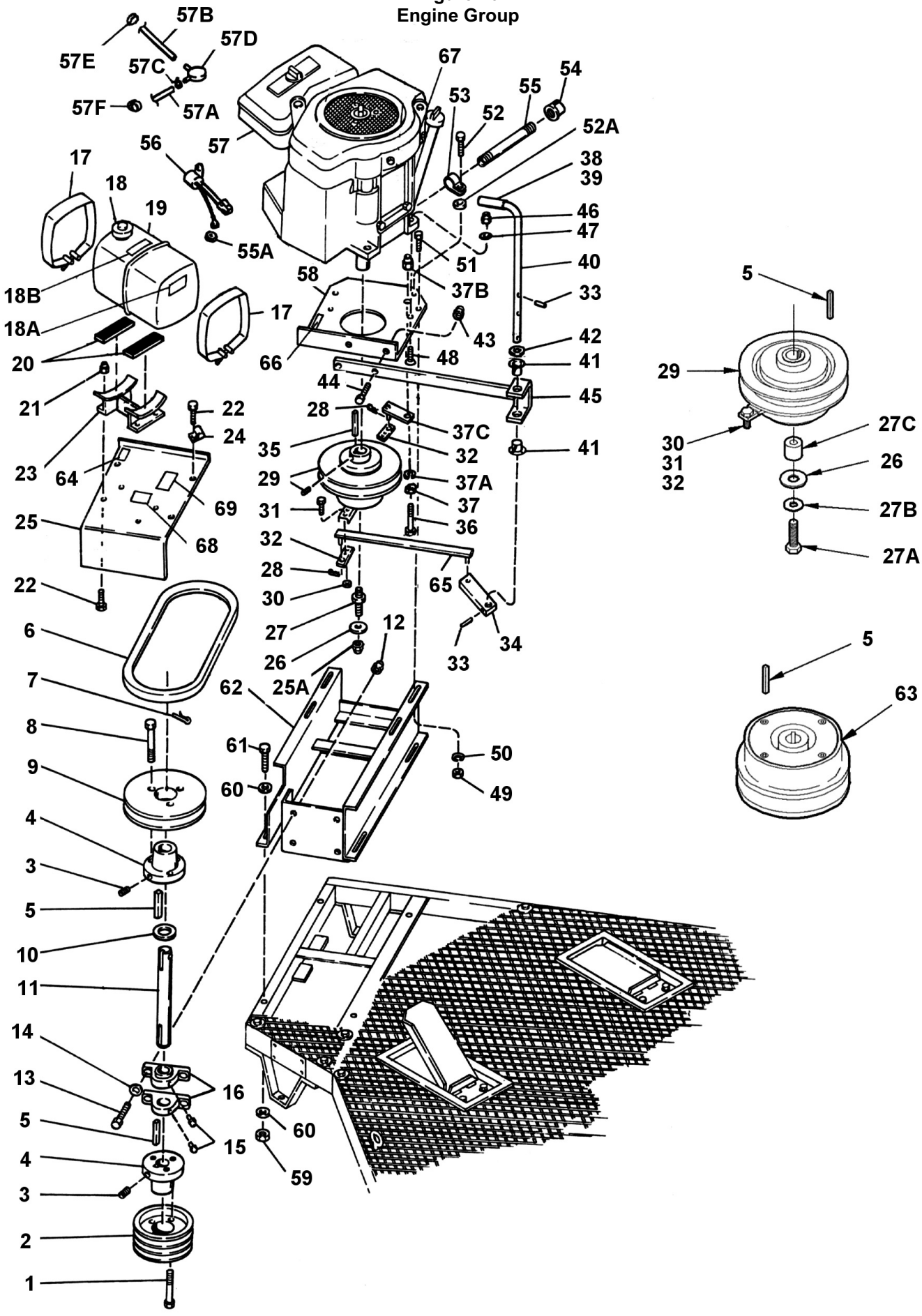


Figure 16
Engine Group

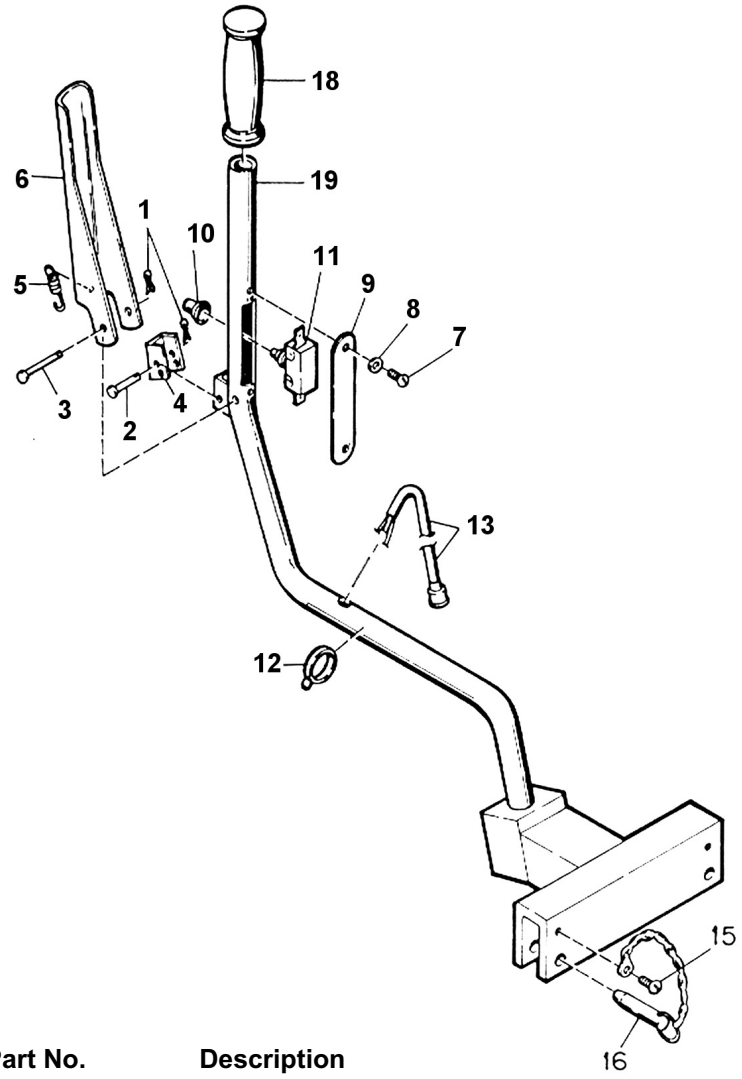
Key No.	Part No.	Description	Qty.
1	. . . . .	Hex Head Cap Screw, 1/4"-20 x 1-7/8"	3
2	M32156	Sheave	1
3	SC4-6	Set Screw, 1/4"-20 x 3/4"	2
4	M27165	Bushing	2
5	K4-14	Square Key, 1/4" x 1-3/4"	2
6	M32127	V-Belt (C51)	1
7	C4-12	Cotter Pin, 1/8" x 1-1/2"	1
8	. . . . .	Hex Head Cap Screw, 1/4"-20 x 1-7/8"	3
9	M32126	Sheave, Jackshaft	1
10	M27147	Spacer	A/R
11	M32148	Jackshaft	1
12	NTC-6C	Torque Lock Nut, 3/8"-16	4
13	H5C6-12C	Hex Head Cap Screw, 3/8"-16 x 1-1/2"	4
14	WP-6C	Flat Washer, 3/8"	4
15	R4981026	Grease Fitting	2
16	M32128	Pillow Block	2
17	M22653	Clamp	2
18	M11151	Cap, Fuel Tank	1
18A	M32166	Decal, Directional Control	1
18B	M32117	Decal, Caution	1
19	M32352	Fuel Tank	1
20	M22752	Pad	4
21	NTC-4C	Torque Lock Nut, 1/4"-20	4
22	H5C4-4C	Hex Head Screw, 1/4"-20 x 1/2"	7
23	M22652-1	Tank Support Assembly	1
24	M48465	Insulated Clamp	4
25	M32129	Belt Guard	1
25A	NEF-7C	Lock Nut, 7/16"-20 (Disc.)	1
26	805433-02	Washer	1
27	M32161-01	Stud Assembly, Clutch (Disc.)	1
27A	H5F7-14C	Hex Hd. Screw, 7/16"-20 x 1-3/4"	1
27B	WLM-7C	Split Lockwasher, 7/16"	1
27C	M48479	Spacer (Kohler)	1
	M48480	Spacer (Briggs)	1
28	M32162	#3 Hitch Pin	3
29	M32124-01	Clutch & Sheave Assy., (incls. 30-32) Briggs	1
	M32124-03	Clutch & Sheave Assy., (incls. 30-32) Kohler	1
	M32125	Sheave only	1
	M32630-2	Shim, 0.005"	1
	M32631-2	Shim, 0.010"	1
30	NEC-4C	Lock Nut, 1/4"-20	4
31	H5C4-6C	Hex Head Cap Screw, 1/4"-20 x 3/4"	4
32	M32157	Clutch Lever	2
33	ROP12-20	Roll Pin, 3/16" x 1-1/4"	3
34	M32158	Deadman Link	1
35	K4-28	Square Key	1
36	H5C8-24C	Hex Head Cap Screw, 1/2"-13 x 3"	1
37	NPC-8	Hex Nut, 1/2"-13	1
37A	WLM-8C	Split Lockwasher, 1/2"	1
37B	NTC-8C	Torque Lock Nut, 1/2"-13	1
37C	M32146-01	Link Assembly, Anchor	1
38	M31769	Decal, Clutch (Disc.)	1
39	M31768	Handle Grip	1
40	M32150	Clutch Lever	1

Figure 16
Engine Group (Continued)

Key No.	Part No.	Description	Qty.
41	M31689-02	Nylon Bushing	2
42	WP-10C	Flatwasher, 5/8"	1
43	NTC-6C	Torque Lock Nut, 3/8"-16	2
44	H5C6-10C	Hex Head Cap Screw, 3/8"-16 x 1-1/4"	2
45	M32141-01	Lever Support Assembly	1
46	NTC-5C	Torque Lock Nut, 5/16"-18	5
47	WP-5C	Flatwasher, 5/16"	2
48	FSC5-12	Flat Head Screw, 5/16"-18 x 1-1/2"	2
49	NTC-6C	Torque Lock Nut, 3/8"-16	8
50	WP-6C	Flatwasher, 3/8"	8
51	H5C6-8C	Hex Head Cap Screw, 3/8"-16 x 1"	4
52	H5C5-10C	Hex Head Cap Screw, 5/16"-18 x 1-1/4"	1
53	M22388	Clamp	1
54	M32164	Pipe Cap	1
55	M32163	Pipe Nipple	1
55A	NEC-2C	Hex Nut, #8-32	1
56	M32768	Interlock Module	1
57	M46551	Engine, 18 hp Briggs	1
	M48350	Engine, 20 hp Kohler	1
	M48648	Engine, 20 hp Onan	1
57A	M3335-21	Fuel Hose	1
57B	M3335-22	Fuel Hose	1
57C	M22355-3	Hose Clamp	3
57D	M32373	Fuel Filter	1
57E	M40909	Wire Tie	A/R
57F	M45182	Clamp	2
58	M32138	Plate, Engine Mounting	1
59	NTC-6C	Torque Lock Nut, 3/8"-16	4
60	WP-6C	Flatwasher, 3/8"	8
61	H5C6-10	Hex Head Cap Screw, 3/8"-16 x 1-1/4"	4
62	M32155-01	Frame Assembly, Engine	1
63	M48650	Centrifugal Clutch (Onan 20 hp)	1
64	M32167	Decal, Caution (Disc.)	1
65	M32145-01	Clutch Link Weldment	1
66	M32063	Decal, Hot Muffler	2
67	M32345	Decal, RF3	2
68	M5621	Plate, Weight	1
69	M32168	Decal, Instruction	1

Spark arresters are available for this engine from Briggs & Stratton Authorized Service Centers. The Briggs & Stratton service part number is 392390. It must be used with deflector part number 222573.

Figure 17
Lever Type Joy Stick Assembly



Key No.	Part No.	Description	Qty.
	M30922-01	Joy Stick Assembly	
1	C2-4C	Pin, Cotter, 1/16 x 1/2 in.	3
2	M29910-01	Pin, Clevis	2
3	M29910-02	Pin, Clevis	1
4	M29907	Latch, Deadman	1
5	M29909	Spring, Latch	1
6	M29908	Lever, Deadman	1
7	RC2-2C	Screw, Rd., Hd.	2
8	WLI-2C	Lock Washer	2
9	M29913A	Cover, Deadman Switch	1
10	M30909	Boot, Switch	1
11	M30908	Switch, Push Button	1
12	M40909	Tie, Wire	1
13	M28321-02	Harness, Wiring	1
14	. . . . .		
15	M10908-2	Screw, Rd., Hd.	2
16	M23019-4	Pin, Locking	2
17	. . . . .		
18	M32706	Grip, Handle	1
19	M26881-02A	Joy Stick Assembly	1

Figure 18
Frame Group

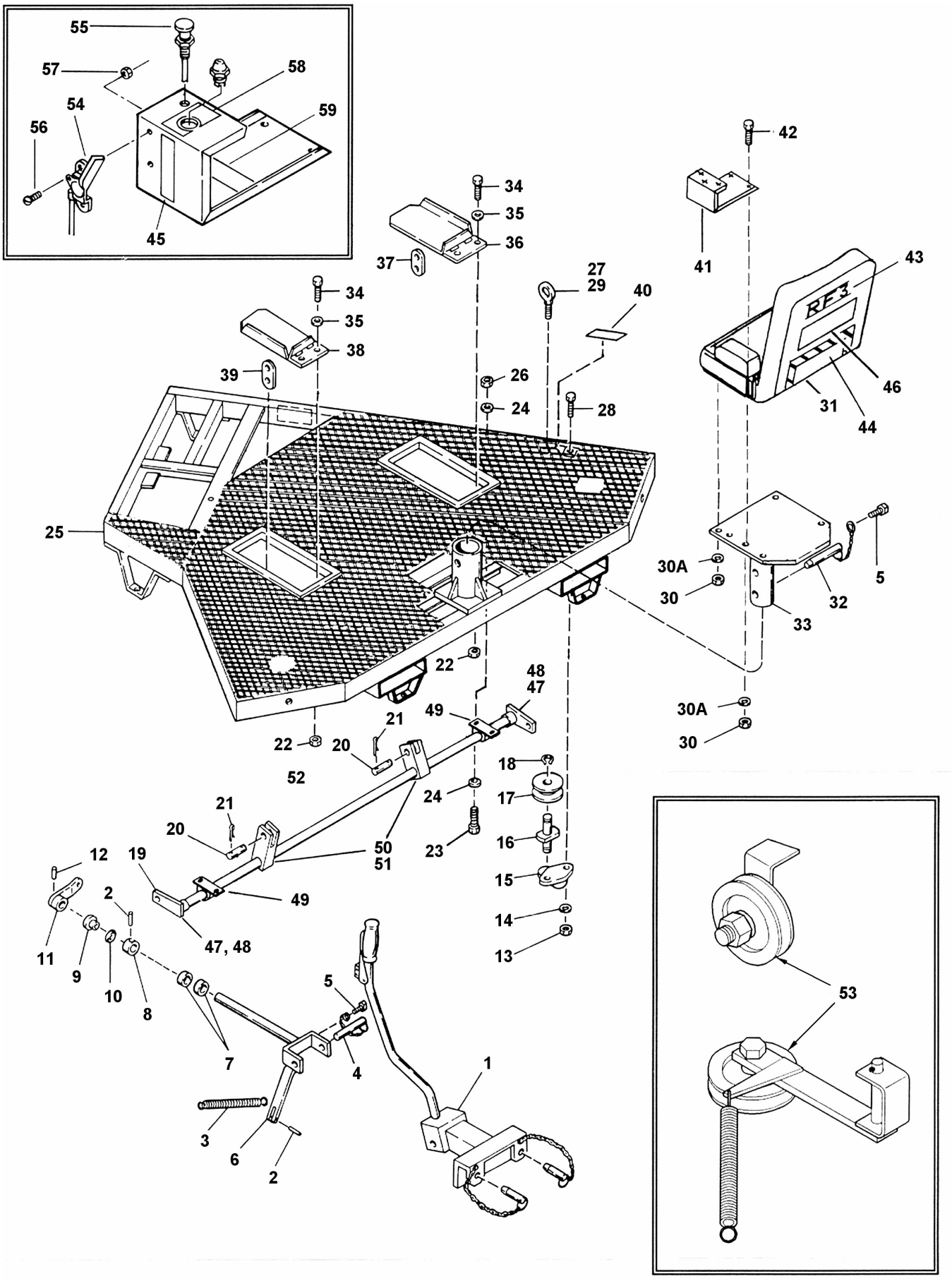


Figure 18
Frame Group

Key No.	Part No.	Description	Qty.
1	M30922-01	Joy Stick Assembly (See Figure 17)	1
2	ROP8-20	Roll Pin	2
3	M27322	Spring	1
4	M23019-3	Locking Pin	1
5	M10908-2	Self Tapping Screw, #6-32 x 3/8"	6
6	M26896-2	Front Rotor Shaft Assembly	1
7	M27199	Bearing, Plain	2
8	M27223	Shaft Collar	1
9	M27200	Flanged Bearing	1
10	M27198	Thrust Bearing	1
11	M48021	Arm Assembly	1
12	ROP16-24	Roll Pin	1
13	NTC-6C	Torque Lock Nut, 3/8"-16	4
14	WP-6C	Flatwasher, 3/8"	4
15	M27206	Drive Tightener	2
16	M26921	Idler Stud	2
17	M27208	Idler Pulley	2
18	M8733	Retainer Ring	2
19	M29356-01	Foot Control Shaft, (Includes Items 47-52)	1
20	M27477	Straight Pin	4
21	C2-6	Cotter Pin	8
22	NTC-4C	Lock Nut, 1/4"-20	4
23	H5C8-16C	Hex Head Cap Screw, 1/2"-13 x 2"	4
24	WP-8C	Flatwasher, 1/2"	8
25	M26849-1	Frame Assembly	1
26	NTC-8C	Torque Lock Nut, 1/2"-13	4
27	NTC-7C	Torque Lock Nut, 7/16"-14	3
28	H5C6-26C	Hex Head Cap Screw, 3/8"-16 x 3-1/4"	2
29	M27207	Eye Bolt	3
30	NTC-5C	Torque Lock Nut, 5/16"-18	6
30A	WP-5C	Flatwasher, 5/16"	6
31	M46692	Seat Assembly	1
32	M23019-5	Locking Pin	1
33	M27245-1	Seat Support	1
34	H5C4-6C	Hex Head Cap Screw, 1/4"-20 x 3/4"	4
35	WP-4C	Flatwasher, 1/4"	4
36	M29203-1	Pedal Assembly, Right	1
37	M29202	Pedal Link, Right	1
38	M28515-1	Pedal Assembly, Left	1
39	M27473	Pedal Link, Left	1
40	M28469	Decal, Caution - Lift Here	3
41	M48042	Control Bracket	1
42	H5C5-8C	Hex Head Cap Screw, 5/16"-18 x 1"	2
43	M32345	Decal, RF3	2
44	M46289-01	Decal, Caution - Stay Clear	1
45	76946	Decal, Throttle	1
46	M48722	Decal, TriplTrowel Logo	1
47	M27031-1	Arm Assembly	2
48	ROP16-24	Roll Pin	2
49	M46443	Bearing, Pillow Block	2
50	M28267	Pivot Arm	2
51	ROP16-22	Roll Pin	2
52	M27025	Tube, Foot Pedal	1
53	. . . . .	Tensioner & Idler Assembly (See Figure 23)	-
54	M46341-01	Throttle Control Assembly	1
	56741W	Throttle Lever	1
	1000417-34	Throttle Wire	1
	1000417-37	Throttle Wire Housing	1
55	M26944-07	Choke Control Cable	1
56	RF3-4C	Round Head Screw, #10-32 x 1/2"	2
57	NTF-3C	Locknut, #10-32	2
58	M48673	Decal, Start	1
59	M29938	Decal, Read Instructions	1

Figure 19
Rotor Assembly

NOTE 1: Shim to provide 0.015 to 0.025 inch end play on gear 41.

NOTE 2: Shim to provide 0.040 inch minimum clearance between gears 41 & 50.

NOTE 3: Use only M10593 washer. NO SUBSTITUTION PERMITTED.

NOTE 4: Apply Loctite® 242 (M15219-1) then torque to 75-85 ft./lb.

NOTE 5: Cannot be intermixed with old style shaft arm kits in same spider. Retrofitting will require all new shafts, arms, and cam plate.

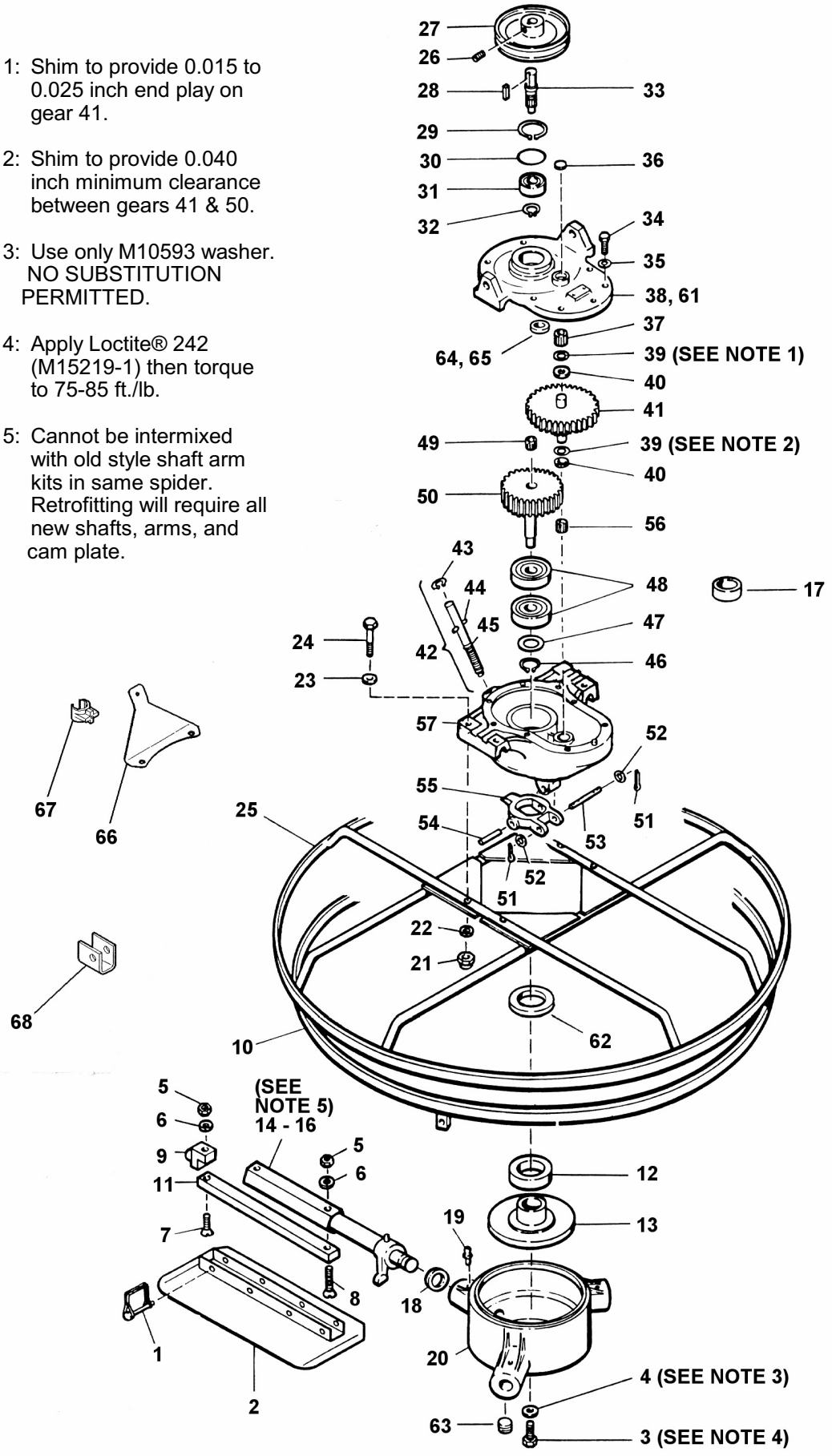
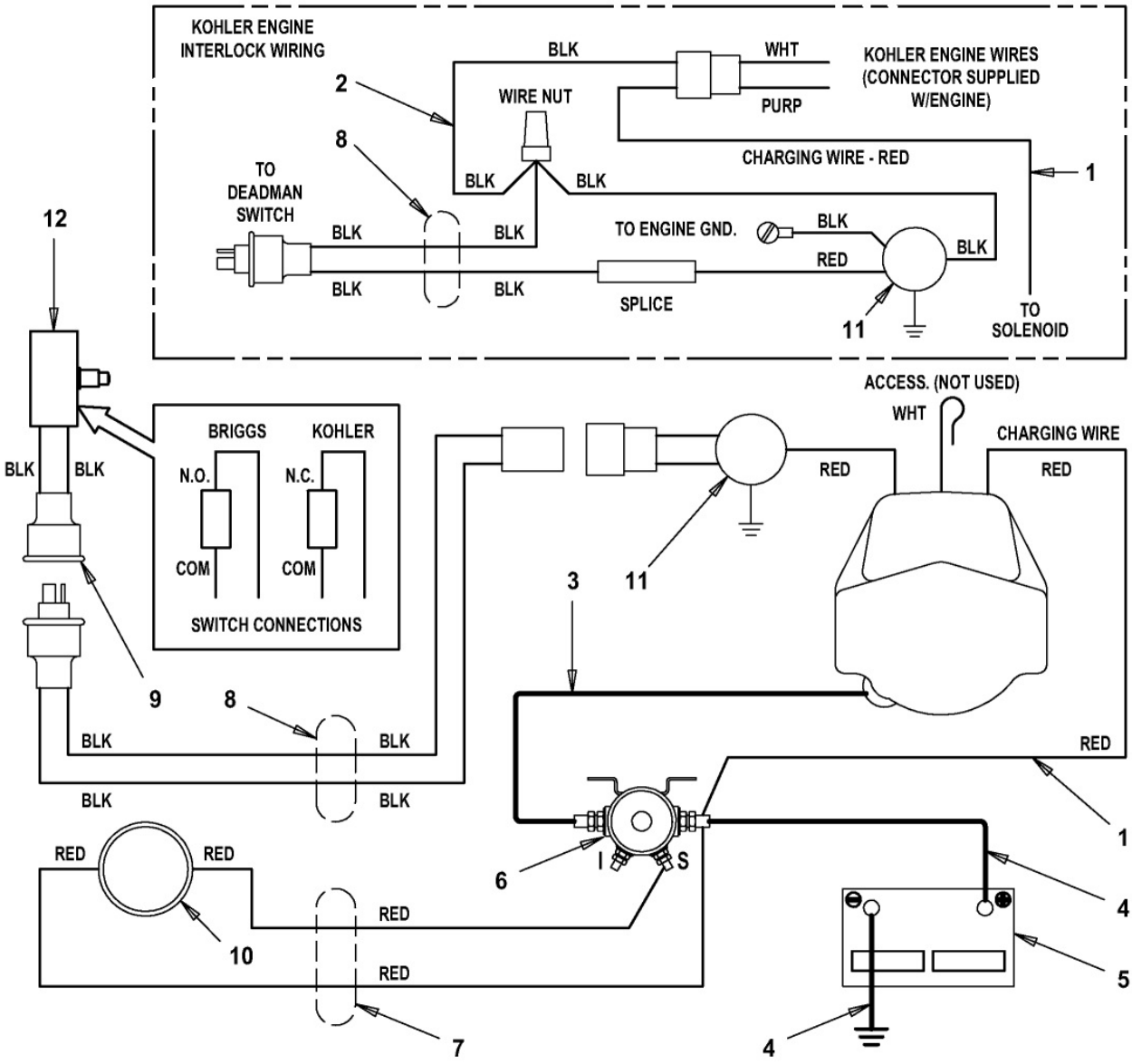


Figure 19
Rotor Assembly

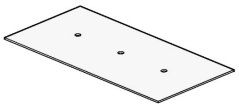
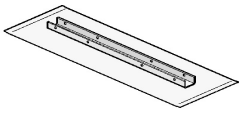
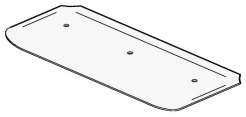
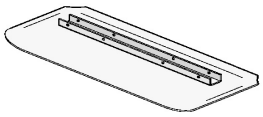
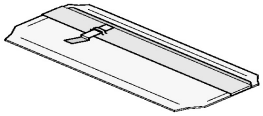
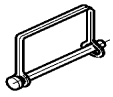
Key No.	Part No.	Description	Qty.
1	M27514	Pin Assembly	18
2	. . . . .	Blade Assembly (See Figure 21)	9
3	H5F8-8C	Hex Head Cap Screw, 1/2"-20 x 1" UNF (13 Tooth Hub)	1
	M23506-111	Hex Head Cap Screw, 1/2-13 x 1-1/4" UNC (10 Tooth Hub)	1
4	M10593	Flatwasher, 1/2"	1
5	NPC-5C	Hex Nut, 5/16"-18	9
6	WLM-5C	Split Lockwasher, 5/16"	9
7	F5C5-12C	Flat Head Screw, 5/16"-18 x 1-1/2"	3
8	F5C5-18C	Flat Head Screw, 5/16"-18 x 2-1/4"	6
9	M29262-1	Pivot Block	3
10	M32739-03	Stabilizer Ring	1
11	M10577	Blade Bar	3
12	M8142	Thrust Bearing	1
13	M32627	Cam Plate	1
14	M45688-2	Tilting Arm, RH; Includes #16 (See Note 5)	3
15	M45688-3	Tilting Arm, LH; Includes #16 (See Note 5)	3
16	M32364-2	Drive Lock Pin, Grooved (See Note 5)	3
17	M46830	Bearing Spacer (13-Tooth Gearbox Only)	1
18	M8200-2	Vibration Washer	3
19	56981	Grease Fitting	3
20	M48118	Spider, 13-Tooth Spline	1
21	NTC-5C	Torque Lock Nut, 5/16"-18	4
22	WLM-5C	Split Lockwasher, 5/16"	4
23	WP-5C	Flatwasher, 5/16"	4
24	H5C5-20C	Hex Head Cap Screw, 5/16"-18 x 2-1/2"	4
25	M31602-01	Guard Ring	1
26	SC5-4K	Set Screw	1
27	M19532	Sheave, Driven	1
28	K3-8C	Key	1
29	M27204	Retaining Ring	1
30	M25694	O-Ring	1
31	M25696	Ball Bearing	1
32	M27201	Retaining Ring	1
33	M32196	Primary Pinion	1
34	HC5-8C	Hex Head Cap Screw, 5/16"-18 x 1"	6
35	WLM-5	Split Lockwasher, 5/16"	6
36	WEP-14	Welch Plug	1
37	M6857-108	Needle Bearing	1
38	M26739	Cover	1
39	M2710	Shim	A/R
40	M6119	Thrust Washer	1
41	M32195	Primary & Secondry Gear	1
42	M32976-01	Tilt Screw Assembly, (Items 43,44, & 45)	1
43	M31086	Retaining Ring	1
44	ROP12-16	Roll Pin	1
45	M32965	Tilt Screw	1
46	M6889	Retaining Ring	1
47	M8972-1	Shim	A/R
48	M6855-07	Ball Bearing	2
49	M6857-88	Needle Bearing	1
50	M48069	Output Shaft Gear, 13 Spline	
51	C3-5C	Cotter Pin	2
52	WP-4C	Flatwasher, 1/4"	2
53	M27736	Straight Pin	1
54	ROP16-18	Roll Pin	2
55	M6846	Tilting Yoke	1
56	M6857-108	Needle Bearing	1
57	M30919	Gearcase Casting	1
58	M48109-1	Gearcase Assembly, 13-Tooth Spline (Items 29-57)	1
59	M48120-5	Spider Assy., 3/46 R.H., 13 Spline (Items 5-20)	2
60	M48120-7	Spider Assy., 3/46 L.H., 13 Spline (Items 5-20)	1
61	M27226-1	Cover Assy., Gearcase, (Items 36, 37, & 38)	1
62	M46839	Upper Spider Washer (13-Tooth Gearbox Only)	1
63	M46393-01	Pipe Plug	3
64	60160	Oil Seal	1
65	M48571Q	Grease, Aeroshell® 22	A/R
66	M48720	Tilt Screw Bracket	1
67	M48721	Tilt Screw Hanger	1
68	M31585	Ball Joint Bracket	1

Figure 20
TriplTrowel Wiring Diagram
(Briggs 18 hp & Kohler 20 hp)



Key No.	Part No.	Description	Qty.
1	M46568-02	Harness, Charging Wire (Briggs)	1
	M48487	Harness, Charging Wire (Kohler)	1
2	M48489	Harness, Kill Wire	1
3	M28324-2	Cable, Battery	1
4	M28325-4	Cable, Battery	1
5	M21783	Battery, 12V	Ref.
6	M27706	Solenoid	Ref.
7	M46569	Harness, Switch Wire	1
8	M46567-02	Harness, Deadman Wire (Briggs)	1
	M48488	Harness, Deadman Wire (Kohler)	1
9	M28258-2	Connector, Female	1
10	M46524	Ignition Switch	1
11	M32768	Module, Interlock (Briggs)	1
	M48445	Module, Interlock (Kohler)	1
12	M30908	Pushbutton Switch	1

Figure 21
Trowel Blades & Accessories

Blade Number	Blade Size	Trowel Diameter	Blade Type
FT36 FT46	6" x 13-1/4" 6" x 18"	36" 46"	FINISHING BLADE Screw Mounted (Refer to Figure 6-5) 
RT36 RT46	6" x 13-1/4" 6" x 18"	36" 46"	FINISHING BLADE Channel Mounted (Refer to Figure 6-20) 
FC36 FC46	8" x 14" 8" x 18"	36" 46"	COMBINATION BLADE Screw Mounted (Refer to Figure 6-5) 
RC36 RC46	8" x 14" 8" x 18"	36" 46"	COMBINATION BLADE Channel Mounted (Refer to Figure 6-5) 
FF36 FF46	10" x 13-1/4" 10" x 18-1/8"	36" 46"	FLOAT BLADE ASSEMBLY Clip-On Mount 
24TP	Set of 24		Lock Pin for mounting channel blades (replaces bolts). Two Lock Pins per blade. 

Mounting Hardware is not included with these Blades.

ACCESSORIES

Part Number	Description
M8197	Weights, (2 Required) - Walk behind units only
M11624-1	Grinding Head Hardware Kit, (1 Kit for 4 Blades) - Walk-behind units only,
56982	Coarse stone, 1" x 2" x 3", (3 per Blade Required) - Walk-behind units only.
57295	Fine Stone, 1" x 2" x 3", (3 per Blade Required) - Walk-behind units only.
M48578	Floating/Troweling Disc Pans 38-1/2" - Model RO2 & RB3 only
M48579	Floating/Troweling Disc Pans 48-1/2" - Model RF2o4-20 & RF3o3-24 only

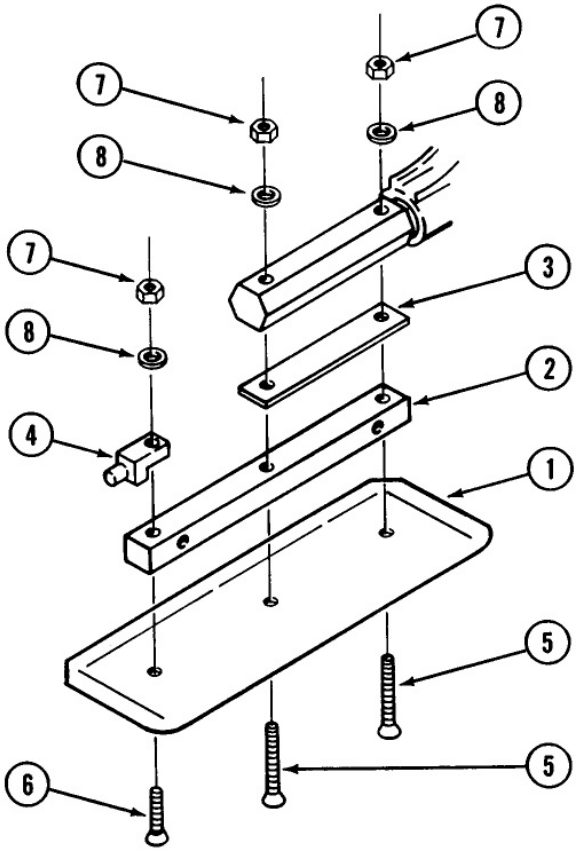


Figure 22a
Screw Mounted Blade Installation

Key No.	Part No.	Qty.	Description
1	- - -	1	Blade, Screw Mounted (See figure 6-19)
2	M10576	1	Blade Bar, 36" Diameter
	M10577	1	Blade Bar, 46" Diameter
3	M46717	1	Blade Bar Spacer, F30 only
4	M29262-1	1	Pivot Block
5	M12372-4	2	Flat Hd Screw, 5/16-18 x 2-1/2"
6	FSC5-12C	1	Flat Hd Screw, 5/16-18 x 1-1/2"
7	NPC-5C	3	Hex Nut, 5/16-18
8	WLM-5C	3	Lockwasher, 5/16"
9	FH12	- -	Hardware Kit (Includes Items 5 - 8)

Note: Quantities given are per blade.

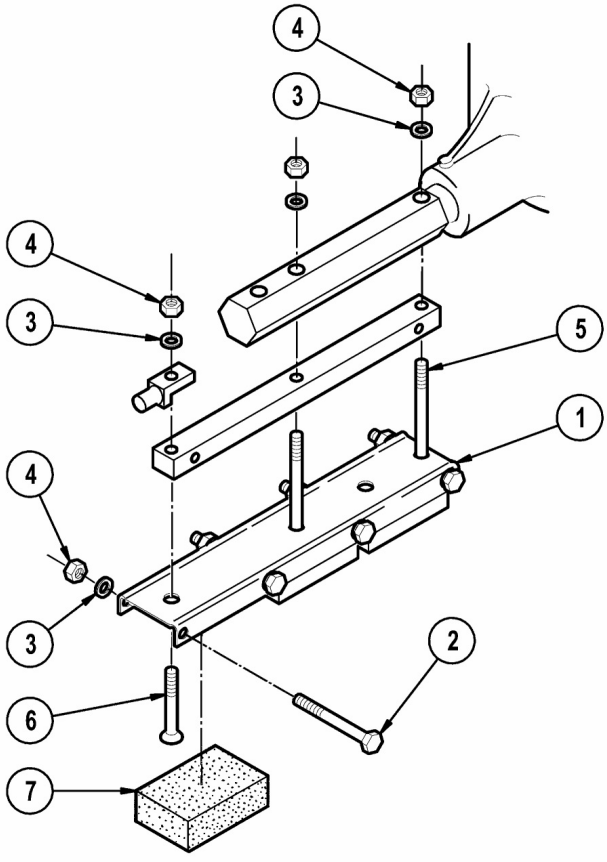
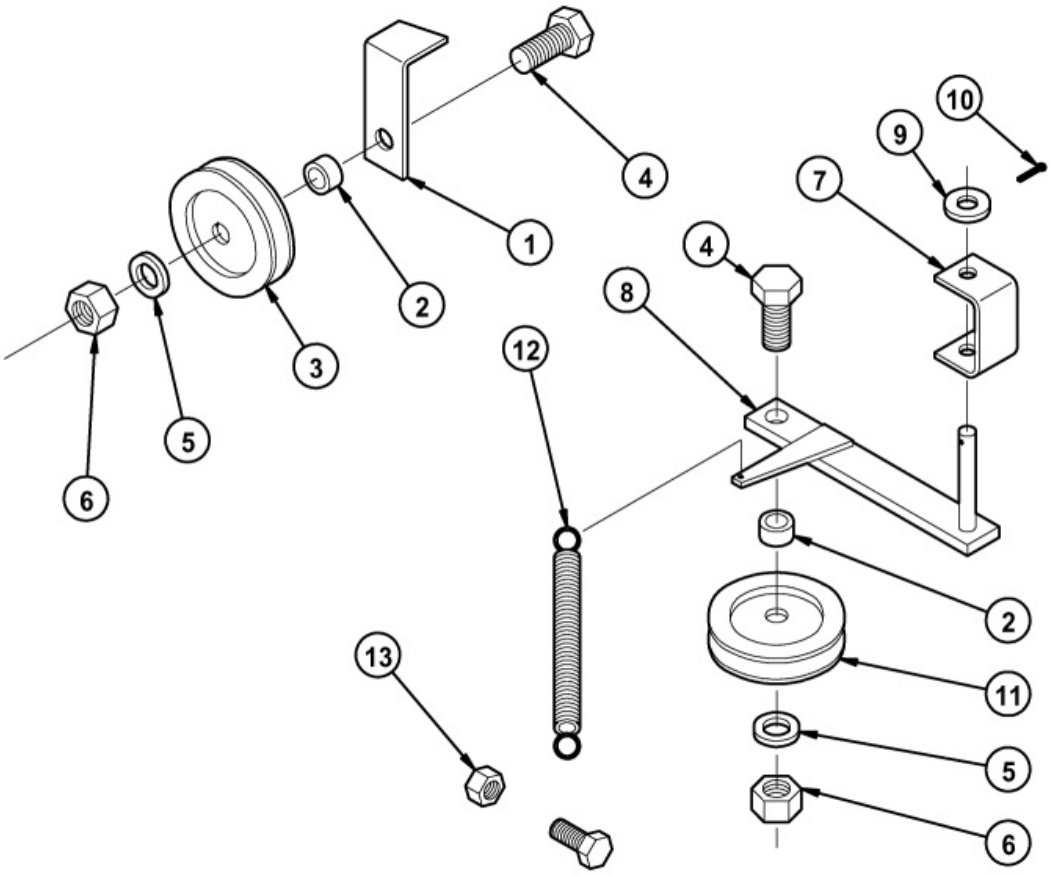


Figure 22b
GRINDING STONE INSTALLATION

Key No.	Part No.	Qty.	Description
1	M11086	1	Stone Clip
2	H5C5-22C	4	Hex Hd Screw, 5/16-18 x 2-3/4"
3	WLM-5C	7	Split Lockwasher, 5/16"
4	NPC-5C	7	Hex Nut, 5/16-18
5	FSC5-18C	2	Flat Hd Screw, 5/16-18 x 2-1/4"
6	FSC5-12C	1	Flat Hd Screw, 5/16-18 x 1-1/2"
7	56982	3	Course Stone
	57295	3	Fine Stone

Note: Quantities given are per blade.

Figure 23
Belt Tensioner & Idler Assemblies



Key No.	Part No.	Description	Qty.
1	M48605	Angle	1
2	M31538	Idler Spacer	2
3	M27208	Idler Pulley	1
4	H5C10-20C	5/8"-11 x 2-1/2" Hex Head Cap Screw	2
5	WP-10C	5/8" Flatwasher	2
6	NTC-10C	5/8" Torque Lock Nut	2
7	M31539	Bracket, Belt Tensioner	1
8	M48610	Bar Weldment, Belt Tensioner	1
9	WP-8C	1/2" Flatwasher	1
10	C4-8	1/8" x 1" Cotter Pin	1
11	M46553	Idler Pulley	1
12	M31691	Spring	1
13	NTC-5C	5/16" Torque Lock Nut	1

Figure 24
Engine and Drive Group (Horizontal Shaft Drive)

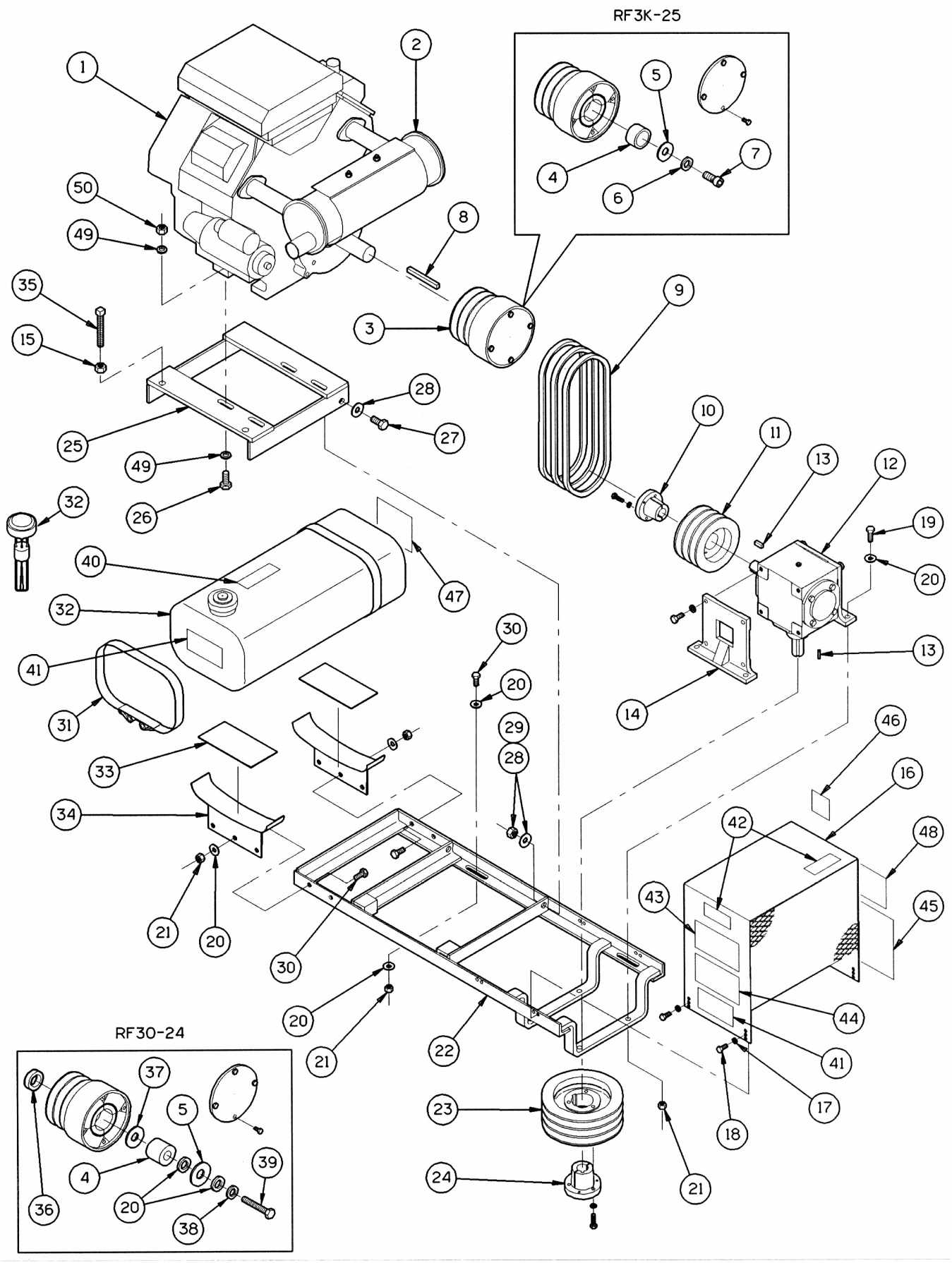
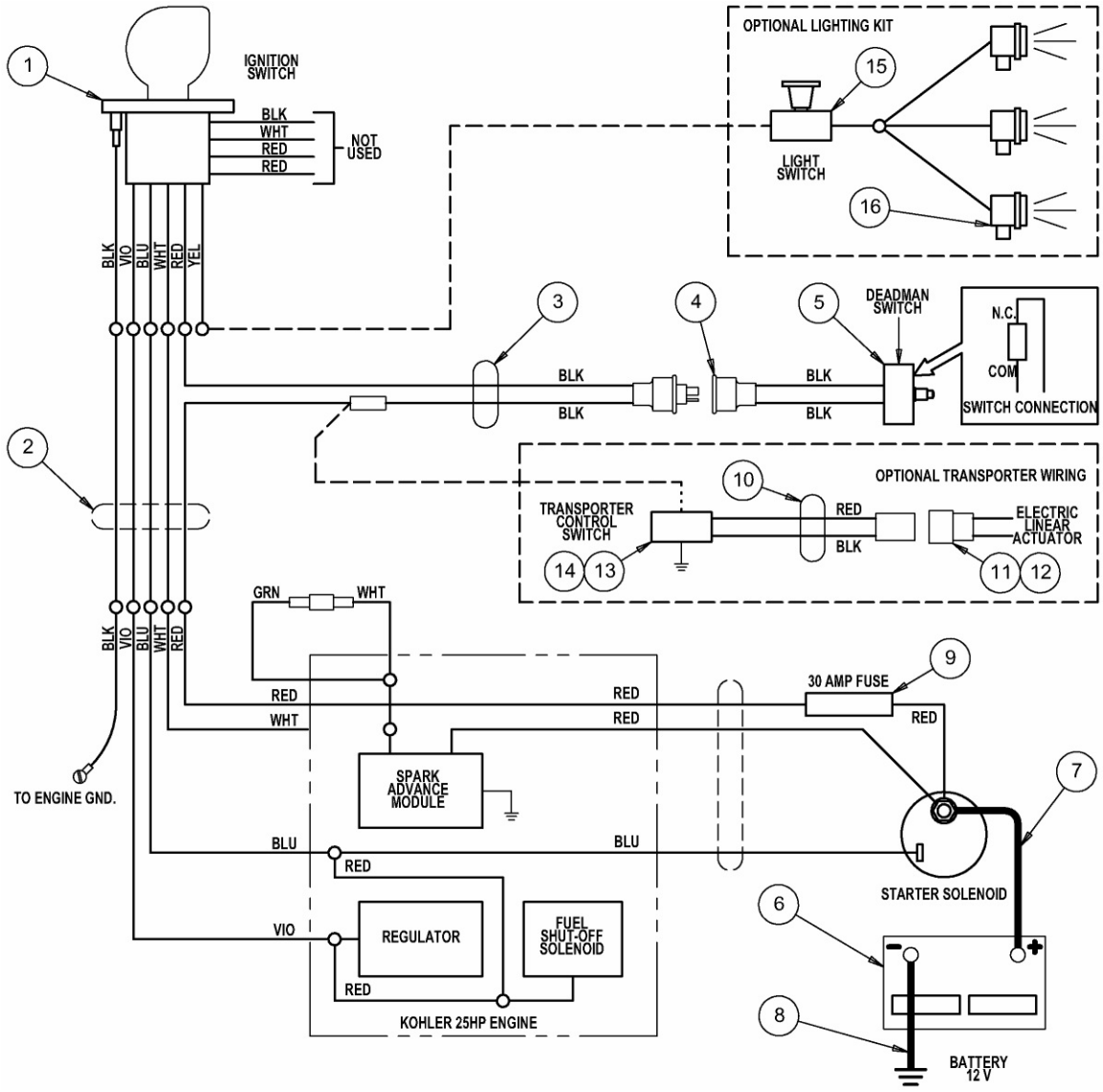


Figure 24
Engine and Drive Group (Horizontal Shaft Drive)

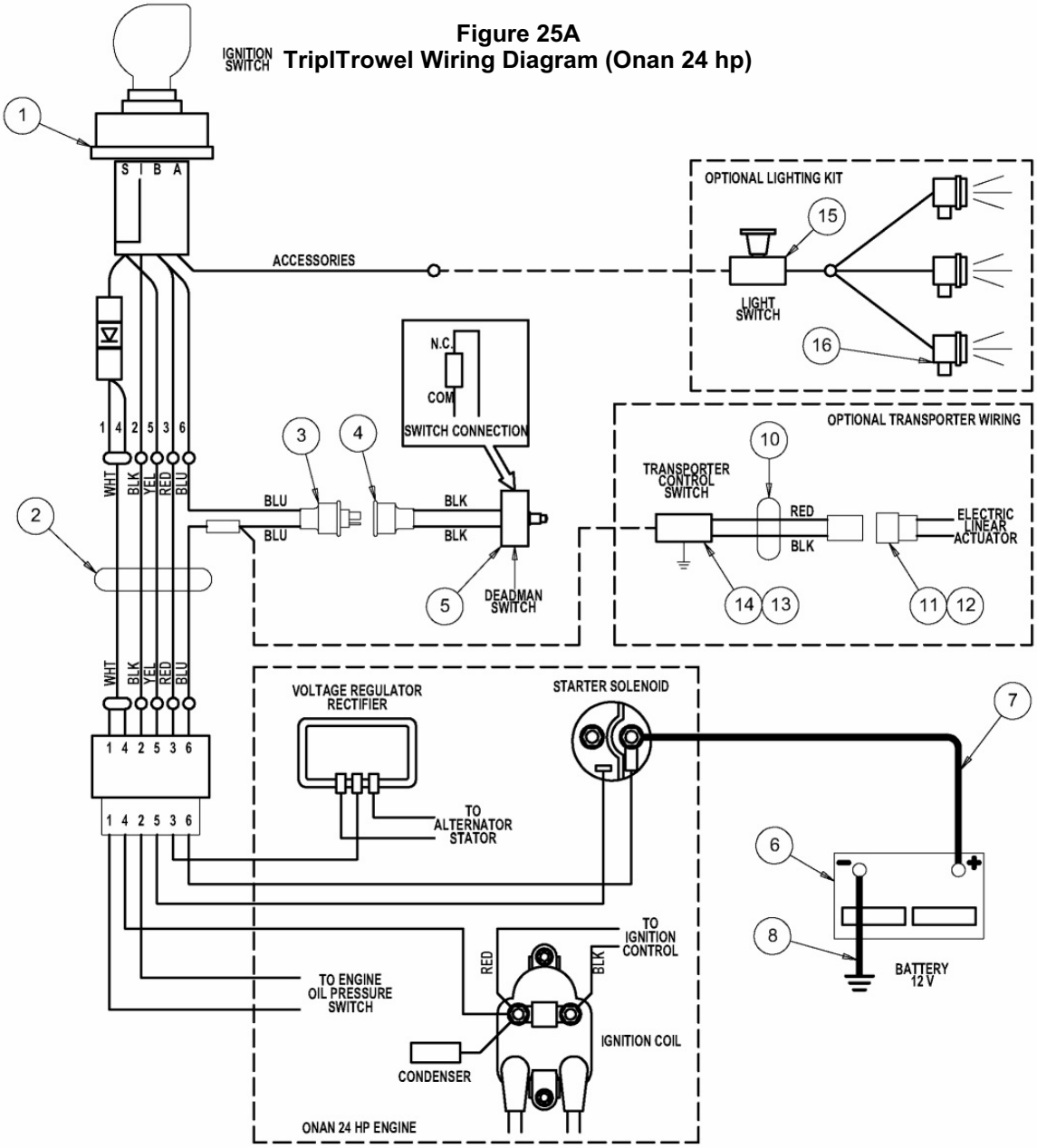
Key No.	Part No.	Description	Qty.
1	M48576	Kohler Engine, 25 hp	1
	. . . . .	Onan Engine, 24 hp (RF3 S/N: RO684 - RO704)	1
	M48645	Onan Engine, 24 hp	1
2	M48634	Muffler, L.H. (RF3-K25 only)	1
3	M48618	Centrifugal Clutch	1
	M48647	Centrifugal Clutch (RF3 S/N: RO684 - RO704)	1
4	M48623	Clutch Spacer	1
	M45753	Clutch Spacer RF3O24	1
5	WP-10C	5/8" Flatwasher	1
6	WLM-10C	5/8" Split Lockwasher	1
7	SHF10-14	5/8"-18 x 1-3/4" Soc Hd. Cap Screw	1
8	KR5-6-27	Key, 5/16" x 3/8" x 3-3/8"	1
	K4-16	Key, 1/4" x 1/4" x 2" (RF3 S/N: RO684 - RO704)	1
	KR5-6-22	Key, 5/16" x 3/8" x 2-3/4"	1
9	M48628A	Belt Set (RF3-K25)	1
	M48680A	Belt Set (RF3-O24)	1
10	M19614	Hub	1
11	M48631	Sheave	1
12	M27160-02	Right Angle Gear Box	1
13	K4-12	Key	2
14	M48638	Mounting Bracket	2
15	NJC-8C	1/2"-13 Hex Jam Nut	2
16	M48588	Belt Guard (RF3-K25)	1
	M48667	Belt Guard (RF3-O24)	1
17	WLM-4C	1/4" Split Lockwasher	4
18	H5C4-6C	1/4"-20 x 3/4" Hex Head Cap Screw	4
19	H5C6-10C	3/8"-16 x 1-1/4" Hex Head Cap Screw	4
20	WP-6C	3/8" Flatwasher	16
21	NTC-6C	3/8"-16 Torque Lock Nut	12
22	M48602	Engine Mounting Base (RF3-K25)	1
	M48663	Engine Mounting Base (RF3-O24)	1
23	M48626	Sheave	1
24	M48627	Hub	1
25	M48603	Engine Plate (RF3-K25)	1
	M48664	Engine Plate (RF3-O24)	1
26	H5F7-14C	7/16"-20 x 1-3/4" Hex Head Cap Screw	4
27	H5C8-12C	1/2"-13 x 1-1/2" Hex Head Cap Screw	2
28	WP-8C	1/2" Flatwasher	4
29	NTC-8C	1/2"-13 Torque Lock Nut	2
30	H5C6-8C	3/8"-16 x 1" Hex Head Cap Screw	8
31	M48615	Gas Tank Clamp	2
32	M48616	Gas Tank w/ Gas Cap	1
	M48736	Gas Cap w/ Gauge	1
33	M22752	Tank Pad	4
34	M48585	Fuel Tank Mount	2
35	SQSS8-24CU	1/2"-13 x 3" Square Head Cap Screw	2
36	M48670	Clutch Spacer (RF3 S/N: RO684 - RO704)	1
	M46830	Clutch Spacer (RF3O-24)	1
37	WF-8C	1/2" Flatwasher	1
	WF-6C	3/8" Flatwasher (RF3 S/N: RO684 - RO704)	1
38	WLM-6C	3/8" Lockwasher (RF3O24)	1
39	H5F6-20C	3/8"-24 x 2-1/2" Hex Head Cap Screw (RF3O-24)	1
40	M32117	Decal, Caution - Do Not Refuel	1
41	M45010	Decal, Arrow-Master	2
42	M32063	Decal, Caution - Hot Muffler	2
43	M32168	Decal, Knockdown Instructions	1
44	M48027	Decal, Caution - Moving Belts	1
45	M32151	Decal, Operator's Warning	1
46	M46461	Decal, Ear Protection Required	1
47	M32166	Decal, RF3 Steering Instructions	1
48	M31873	Decal, Water Warning	1
49	WS-6C	Structural Washer, 3/8"	8
50	NTF-7C	Torque Lock Nut, 7/16"-20	4

Figure 25
TriplTrowel Wiring Diagram (Kohler 25 hp)



Key No.	Part No.	Description	Qty.
1	M48640	Ignition Switch (Kohler 25 hp)	1
2	M48641	Harness, Engine Wiring (Kohler 25 hp)	1
3	M48488	Harness, Deadman Wire (Kohler)	1
4	M28258-2	Connector, Female	1
5	M30908	Pushbutton Switch	1
6	M48617	Battery (Kohler 25 hp)	Ref.
7	M48642	Battery Cable - Pos. (Kohler 25 hp)	1
8	M48682	Battery Cable - Neg. (Kohler 25 hp)	1
9	M48423	Fuse, 30 Amp, 32 volt	1
10	M48420	Harness, Transporter Control	Ref.
11	M48424	Connector, 2-Way Male	Ref.
12	M48426-13	Terminal, Male	Ref.
13	M48393	Toggle Switch	Ref.
14	M48422	Jumper Wire	Ref.
15	M46843	Switch, Push-Pull	Ref.
16	M48081	Driving Light	Ref.

Figure 25A
TriplTrowel Wiring Diagram (Onan 24 hp)



Key No.	Part No.	Description	Qty.
1	. . . . .	Ignition Switch (Onan 24 hp)	1
2	M48671	Harness, Engine Wiring (Onan 24 hp) 1995 - 1999	1
	M48962	Harness, Engine Wiring (Onan 24 hp) 2000 - . . .	
3	M28258-1	Connector, Male	1
4	M28258-2	Connector, Female	1
5	M30908	Pushbutton Switch	1
6	M48617	Battery	Ref.
7	M48642	Battery Cable - Pos.	1
8	M48682	Battery Cable - Neg.	1
9	. . .		
10	M48420	Harness, Transporter Control	Ref.
11	M48424	Connector, 2-Way Male	Ref.
12	M48426-13	Terminal, Male	Ref.
13	M48393	Toggle Switch	Ref.
14	M48422	Jumper Wire	Ref.
15	M46843	Switch, Push-Pull	Ref.
16	M48081	Driving Light	Ref.

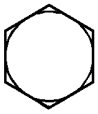
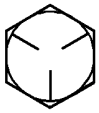
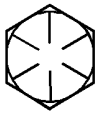
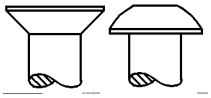
Decal & Warning Plate List for RF3

Part No.	Description	Qty
76946	Throttle Decal	1
M28469	Caution - Lift Here Decal	3
M29938	Read Instructions Decal	1
M30911	Lever Must Be Latched Decal	1
M31769	Clutch ON / OFF Decal - Vertical Shaft (Manual Clutch)	1
M31873	Water Warning Decal	1
M32063	Caution - Hot Muffler Decal	2
M32117	Caution - Do Not Refuel Decal	1
M32118	Caution - Moving Blade Decal	6
M32151	Warning Decal	1
M32166	RF3 Steering Instruction Decal	1
M32168	Knockdown Instructions - Vertical Shaft (Manual Clutch)	1
M32169	Operating Instructions Decal (Manual Clutch)	1
M32345	RF3 Model Decal	2
M32684	Rotation Decal	3
M45010	Arrow-Master Decal (2 x 4)	3
M46289-01	Caution - Stay Clear Decal	1
M46461	Ear Protection Required Decal	1
M46795	Choke/Start/Lights Decal	1
M48027	Caution - Moving Belts Decal	1
M48057	Grease Fitting Decal	11
M48673	Key Switch Start Decal	1
M48699	Knockdown Instructions - Horizontal Shaft	1
M48722	TriplTrowel Logo Decal	1

Accessories

Part No.	Description
RF3T	Transporter - Electric
RF3TC	Transporter - Crank
M46793	Light Kit
M28611	Lifting Sling (Standard with Machine)

Bolt and Cap Screw Torque Specifications

MATERIAL SPEC AND MARKING	Hex Head Bolts & Hex Head Cap Screws			Socket Head Cap Screws	
	SAE Grade 2 ASTM A307 (No Mark) 	Grade 5* ASTM A449 	Grade 8* ASTM A354 	Grade 8 	** 

*** Manufacturer's marks may vary**

**** For Flat and Button Head Socket Cap Screws, use Grade 5 minimum recommended torque values.**

Size (inches)	Grade 2 Recommended Torque ***				Grade 5 Recommended Torque ***				Grade 8 Recommended Torque ***			
	lb-ft		N•m		lb-ft		N•m		lb-ft		N•m	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
1/4	5	6	6.8	8.1	9	11	12.3	14.9	12	15	16.3	20.3
5/16	10	12	13.6	16.3	17	21	23.1	28.5	24	29	32.5	39.3
3/8	20	23	27	31	35	42	48	57	45	54	61	73
7/16	30	35	41	47	54	64	73	87	70	85	95	115
1/2	45	52	61	70	80	96	108	130	110	125	149	170
9/16	65	75	88	102	110	125	149	170	160	175	217	237
5/8	95	105	129	142	150	175	203	237	220	245	298	332
3/4	150	185	203	251	270	300	366	407	380	425	515	576
7/8	160	200	217	271	400	450	542	610	600	660	814	895
1	250	300	339	406	580	680	786	922	900	990	1220	1342
1-1/8					800	880	1085	1193	1280	1440	1736	1953
1-1/4					1120	1240	1519	1681	1820	2000	2468	2712
1-3/8					1460	1635	1980	2217	2380	2720	3227	3688
1-1/2					1940	2180	2631	2956	3160	3560	4285	4827

***** Use minimum recommended torque value when threads are coated with lubricant, such as engine oil, or fasteners with phosphate and oil coatings. Use maximum recommended torque value for dry fasteners or zinc plated fasteners without any lubricant.**

NOTES:

1. **This specification is intended to be a general guideline for coarse threaded hardware in ferrous materials (steel, Cast-iron).**
2. **Thread engagements in non-ferrous materials (aluminum, brass, plastic, etc.) may not be adequate to allow torque specified above.**
3. **Where a particular application gives specific torque values, use them in lieu of those given above.**