

POWERTOW™

MODEL 35 / 40 EZ
KEY EZ
THUNDERVOLT

Advanced Assembly
OWNER'S MANUAL



NORTHWEST MANUFACTURING, INC

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REV 2-25-05

POWERTOW

40EZ - Key EZ - 12 Volt DC Cordless

Things to know:

Keep your carton and packing in the event there is any shipping damage to your unit.

Read this instruction manual thoroughly before attempting to move your aircraft.

Your unit will need Oil & Gas - before test running the unit.

Thank you for choosing a Powertow, for your hangaring needs.

Customer Service is # 1 with our company. If you have any questions or comments on your unit, please call us at 800-635-5565

Powertow 35/40/KeyEZ/Thundervolt

ADVANCED ASSEMBLY

Tools Needed For Assembly:

1/2" Wrench
1/2" Socket Wrench
7/16" Wrench
7/16" Socket Wrench
Phillips Screwdriver
Side Cutter (optional) for cutting tie wraps

Assembly Package Includes:

1 - 5/32" Allen Wrench
1 - 1/4" Allen Wrench
1 - 1/4" x 3/4" Hex Cap Screw - Clutch Cable
1 - 1/4" Nylon Lock Nut - Clutch Cable
2 - 1/4" Star Push Nuts - Shift Rod

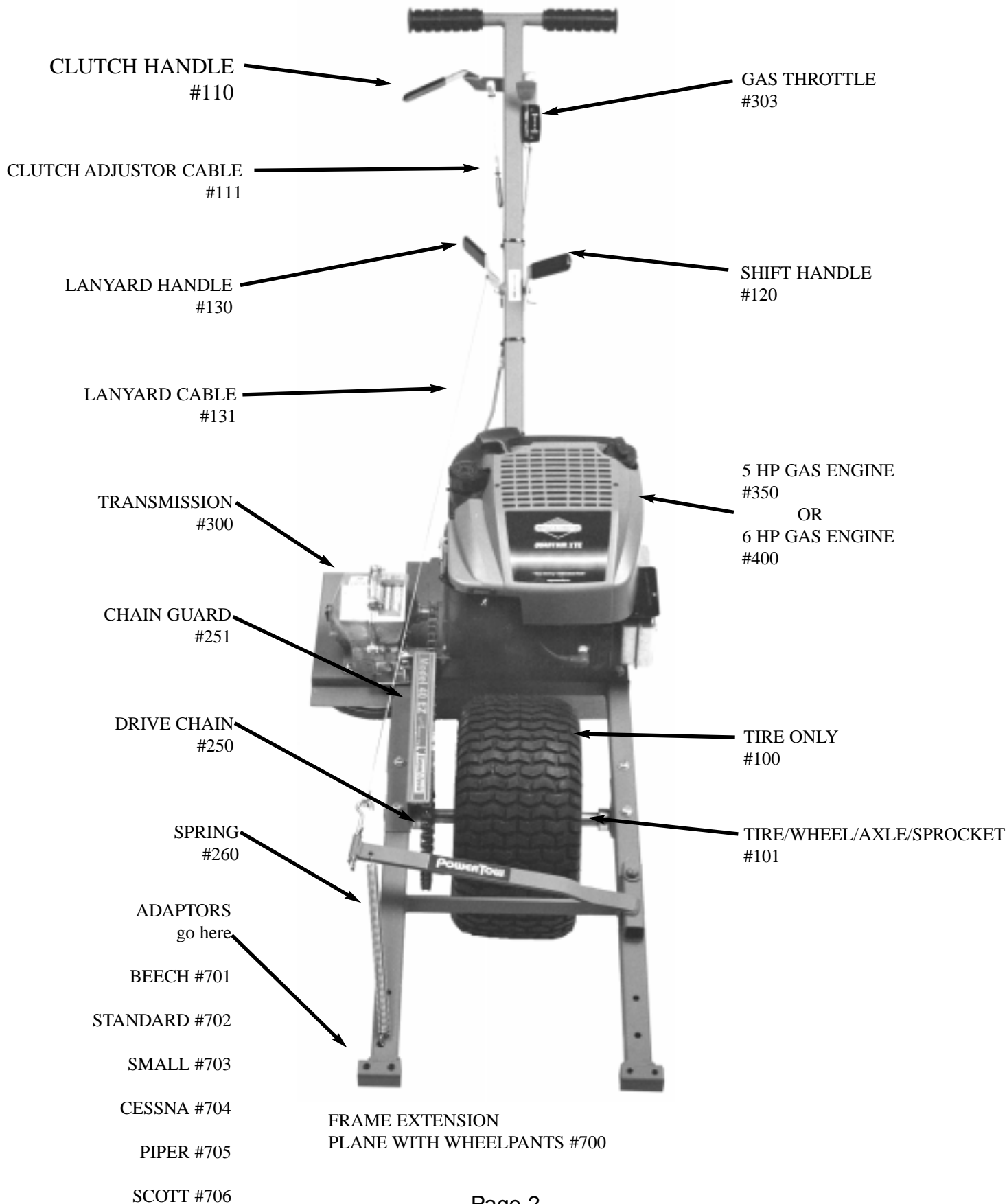
2 - 5/16" x 2 1/4" Hex Cap Screws - Handle
1 - 3/8" x 2" Tapered Head Bolt Handle
2 - 5/16" Flat Washers - Handle
2 - 5/16" Split Lock Washers - Handle

4 - Extra Set Screws - spares

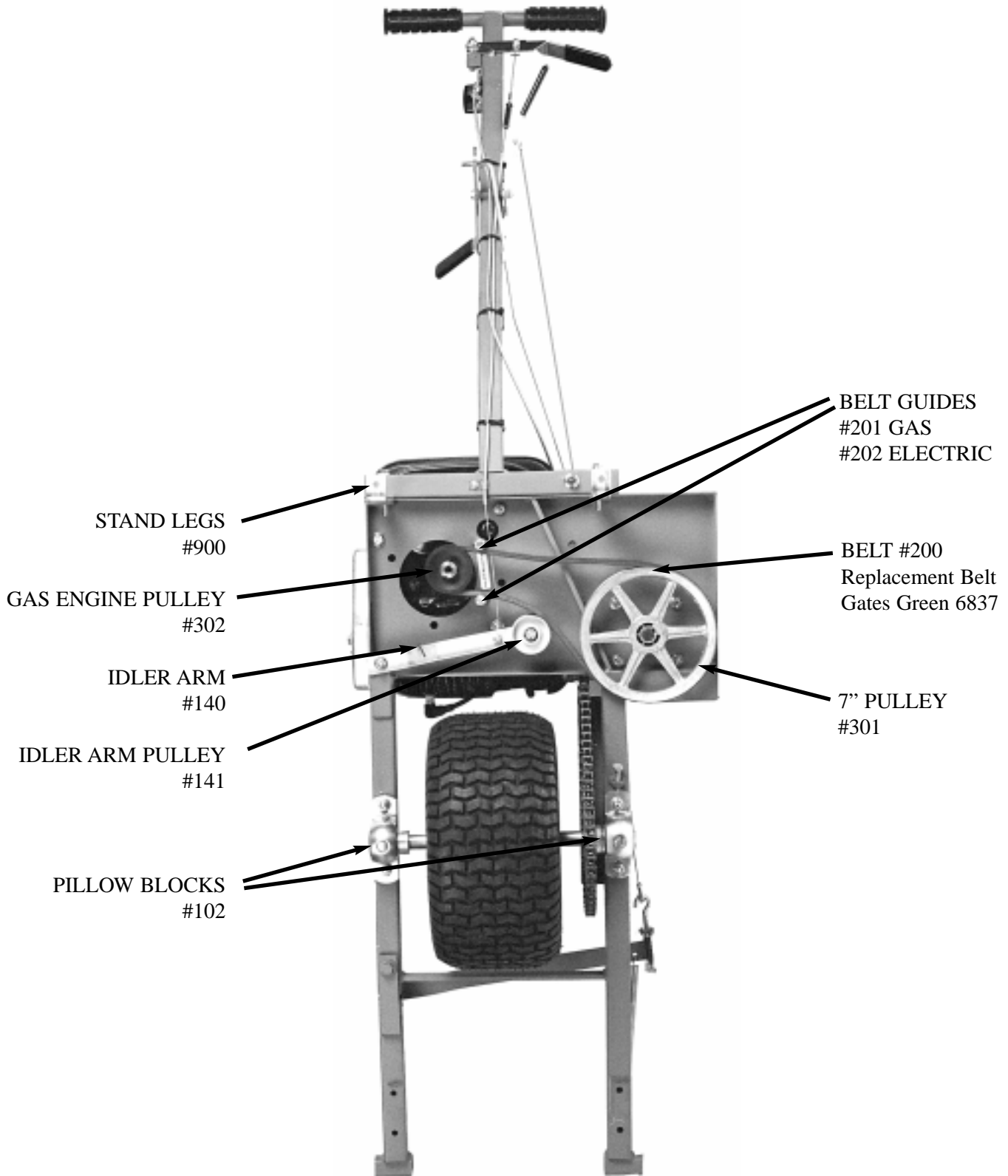
2 - 10/24 x 1/2" Self-Tappers - Gas Units Only

1 - Lanyard Cable
4 - Plastic Tie Wraps
1 - Owners Manual

**POWERTOW MODEL 35/40 EZ / Key EZ
GAS OR ELECTRIC
PARTS LIST**



**POWERTOW MODEL 35/40 EZ / Key EZ
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SNOWCHAINS
FOR DRIVE WHEEL #910

DETAILED ASSEMBLY DIAGRAMS

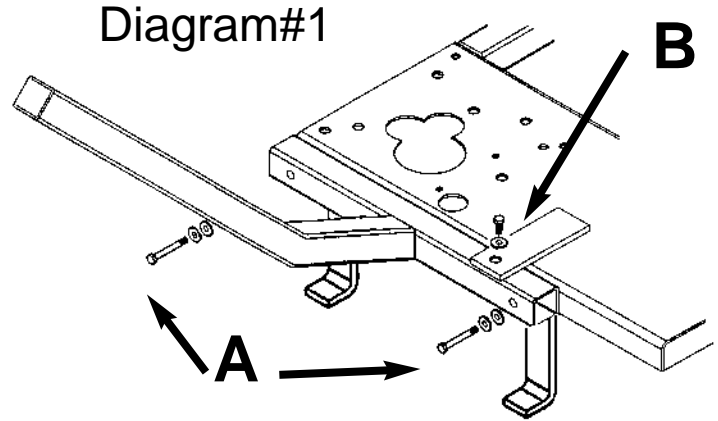
Handle Assembly

Diagram #1

Remove and discard bolts that secure the stand legs for shipment

A - Attach the two 5/16" x 2 1/4" bolts through split lock washer, 5/16" flat washer, frame handle, plate and then into threaded stand legs or frame caster wheels.

B - Top handle bolt - 3/8" x 2" tapered bolt goes directly into threaded hole.



Clutch Cable

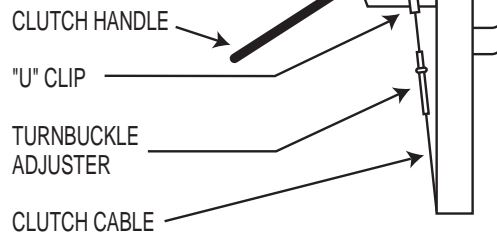
Diagram #2

Bring the clutch cable from under the frame, allowing it to hang freely along the bottom side of the handle. Bolt U-Clip to clutch handle with 1/4" x 3/4" bolt and 1/4" lock nut.

Route all cables under the handle.

Diagram#2

TOP VIEW

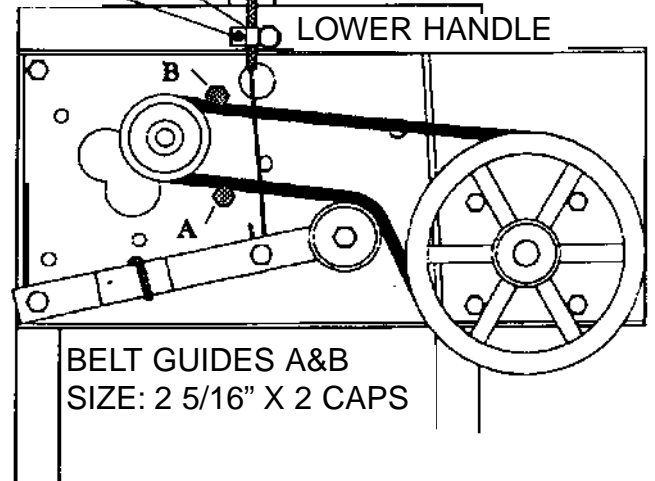


Diagram#3

CLUTCH CABLE CABLE CLAMP

10/24 X 1/2" SELF-TAPPER

BOTTOM VIEW



Clutch Cable

Diagram #3

Secure the clutch cable at lower handle by removing the self-tapper and re-attach through the cable clamp.

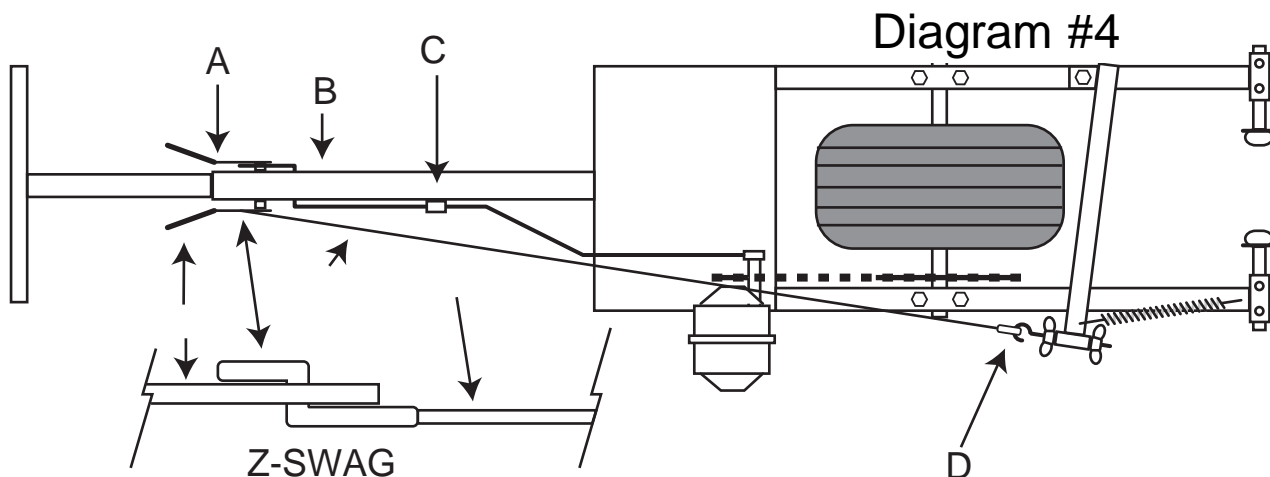
CLUTCH CABLE RUNS UNDERNEATH BELT

DETAILED ASSEMBLY DIAGRAMS

Transmission Shift Rod - Diagram #4

Feed the tagged end of the shift rod down through the plastic keeper (C) on the handle. Keep the plastic keeper in the down position. The top end of the rod goes into the shift handle (A) and bottom into the transmission shifter. Secure with the star push nuts at both ends of the rod. Do not push these star push nuts on too tightly. It's better to have a little play.

A - Shift Handle B - Shift Rod
C - Plastic Keeper D - Eye Bolt



Swing Arm Lanyard Cable - Diagram #4

Place the Z-Swag end of the lanyard cable into the lanyard handle. Hook the other end into the eye bolt.

Plastic Tie Wraps

Place the tie wraps, starting at the bottom of the handle working your way up, so that all the cables are under the handle and out of the way. Do not tighten to the point that the cables will not move freely. Don't worry; we have enclosed extras in case of a mistake.

Powertow (12 Volt Thundervolt)

ThunderVolt Battery Hold-Down Clamp Instructions



Figure A - From Rear Motor View

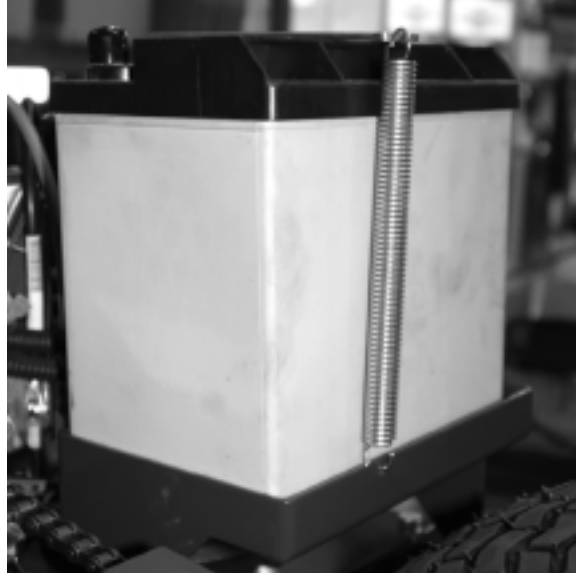


Figure B - From Front Tire View

- Step 1 Before placing battery in the tray connect spring to the battery tray see figure B
- Step 2 Place Battery in the tray. Position hold-down clamp as shown in figure A
- Step 3 Attach spring to hole in top of hold-down clamp by pulling up spring with pliers.

ELECTRICAL CONNECTION - Place black battery cable lug onto negative (-) battery terminal and tighten bolt to secure. Place red battery cable lug onto positive (+) battery terminal and tighten bolt to secure. Route yellow/green wire pair with switch attached along Powertow handle and mount switch in hole provided in upper handle. Connect spade end of wires to spade located on switch. Secure yellow/green wires to handle shaft with nylon tie wraps provided. Keep wire ties clear of moving parts. Securely tighten all battery connections. Charge battery overnight, before first use. Automatic Charger should be left plugged in when not in use.

For Future Reference
and Adjustments

Refer to Diagrams 5 & 6 and instructions on facing page

Powertow Gas Units

Complete the Gasoline Engine Setup - Install throttle quadrant in holes on the left hand side of upper handle using two 10/24" x 1/2" self-tappers.

Oil - The engine is shipped dry. Buy a quart of automotive viscosity 10W-30 motor oil. Don't grab a can of 50W aircraft oil that has been sitting around or this winter you won't get the thing pulled over, let alone started. It will hold 2/3 of a quart when full. Your oil may be supplied with unit.

Fuel - You can run 100 low lead aviation fuel. It burns off the cylinder head quicker and you won't have to store gasoline just for the Powertow.

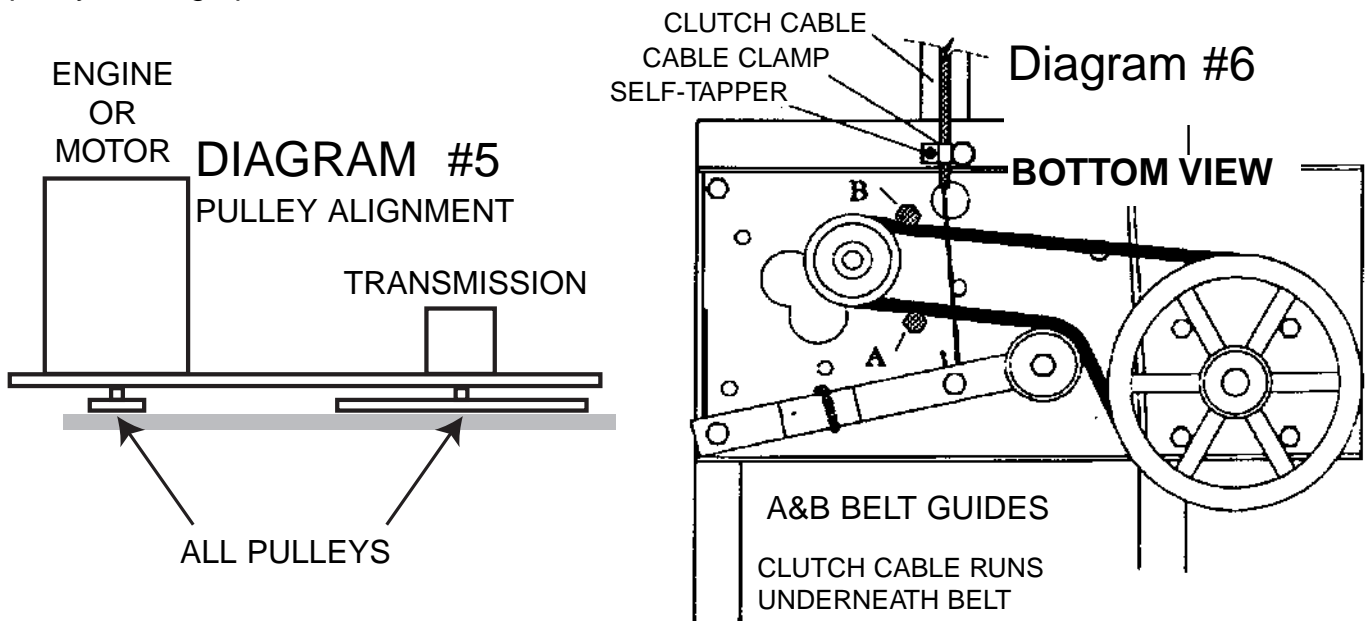
For Future Reference and Adjustments

Pulley - Refer to Diagram #5

Place a straight edge on the bottom surfaces of the motor pulley, transmission and idler pulley, visually check to assure pulleys are aligned/parallel. Refer to Diagram #5.

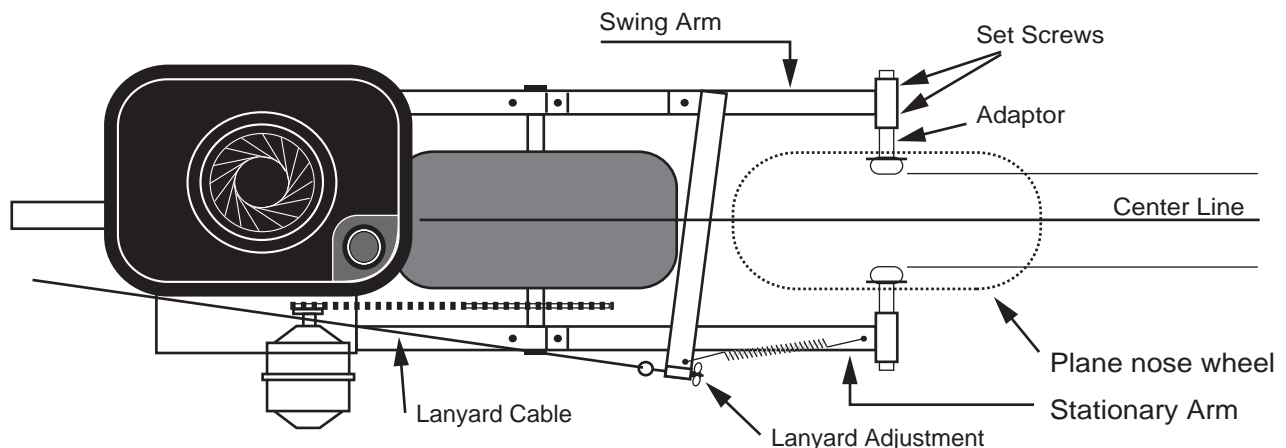
Belt - Refer to Diagram #6

Install belt around the two drive pulleys, between belt guides, exactly as shown in diagram 3. It is important that these pulleys are in exact alignment or the power belt will jump off of the pulleys during operation.



ADAPTER-LANYARD ADJUSTMENT

With the swing arm positioned parallel to the stationary arm, the adaptor set screws loose and the adaptors fully retracted, move the machine up to the aircraft nose wheel so that the Powertow tire and aircraft nose tire are in line. Slide in adaptors evenly on each side snug. Tighten the stationary side adaptor. **Next loosen the swing arm adaptor 1/16" of an inch and tighten down. This will allow the lanyard cable to lock down without undo pressure. Too tight and the adaptors will pop off or the z-swag will break.**



IMPORTANT! - The swing arm and the stationary arm should always be parallel when the lanyard lever is in the locked position. **BEFORE MOVING THE AIRCRAFT, TRY OUT THE POWERTOW UNDER POWER BY ITSELF TO GET USED TO THE CLUTCHING CONTROL.** Note: Without aircraft attached, unit may creep when clutch is released.

EZ HOOK-UP: Open the lanyard handle, move unit up to the aircraft at a slight angle from the right side to engage the stationary adaptor. By using the stationary arm adaptor, as a pivot to lift the wheel, you can swing the machine to your left far enough to engage the hookup, while pulling the lanyard lever into the down and locked position. (It may be necessary to shift the machine left and right and/or up and down to get the lanyard lever completely down and the swing arm adaptor to fully seat.)

IF THE ADAPTORS SLIP OFF OR OUT OF POSITION - Check that the stationary arm and swing arm are parallel and that both adaptor set screws are tight on each of the adaptors.

IF THE SWING ARM OPENS UNDER LOAD - check that the arms are parallel and that the lanyard lever goes past center to the down lock position. Loosen cable at eyebolt slightly. Make smaller turns.

Operating Instructions



Please take a few minutes to read! Maybe even re-read them.

***Five minutes of reading is worth it to avoid damage to your beautiful bird.
Try the Powertow out in the open, before attaching it to your plane.***

TRANSMISSION / Hookup: The transmission has three positions, Forward - Neutral - Reverse. Neutral is the center detent. Roll the machine up to the plane in neutral and hook up to aircraft. (Review EZ Hook-Up on previous page) Always start the unit in neutral.

GAS UNITS: Move throttle control to the chock position to start the engine and return to run after starting. Move throttle control back approximately 2/3 for best torque when running.

ELECTRIC UNITS - Turn on motor.

HANGARING AIRCRAFT: Move the shift rod in the direction you want to go.
IF SHIFT ROD DOES NOT FALL INTO GEAR - ENGAGE CLUTCH HANDLE MOMENTARILY.
To move the airplane, squeeze the clutch handle slowly. A slight down pressure on the Powertow handle, and away you go. Release clutch to stop drive.

Releasing: When you release the clutch handle, the drive belt should disengage completely, there should be no creeping when attached to aircraft. (If there is, refer back to set-up instructions). A slight creep is okay when unit is not hooked to aircraft. Run the unit out in the open for a few minutes to break in a new belt. You can also stop by lifting the Powertow handle up.

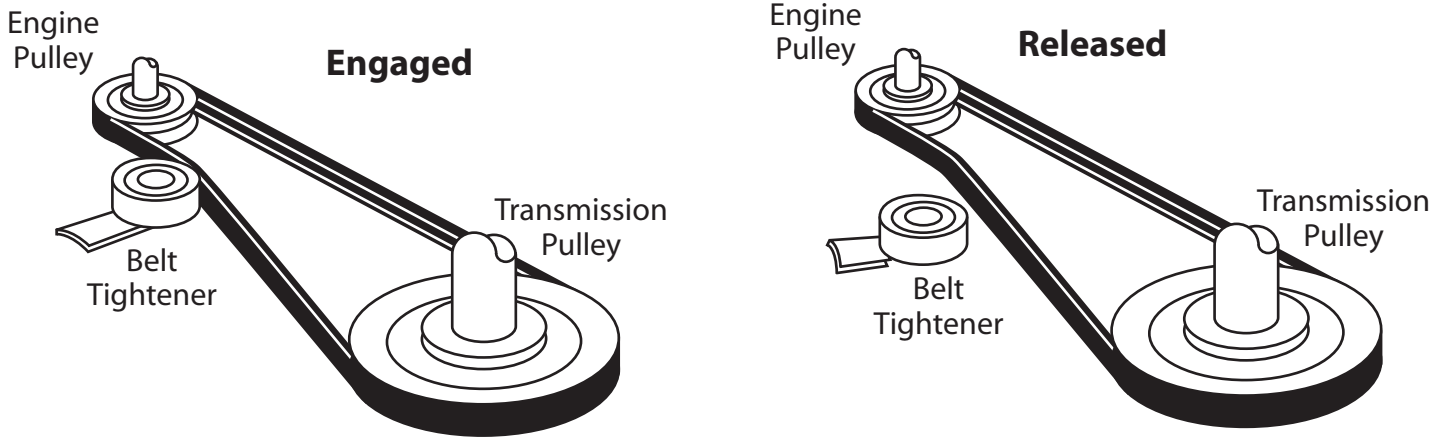
STEERING: Steering is accomplished by **lifting and shifting** the Powertow handle left or right just like a hand towbar. In the case of a heavy plane, especially with cold tires, a rocking technique, with power applied, and using down handle pressure at the right time will get the plane rolling.

TIPS: To get a heavy plane over door rails or ledges, a moderate amount of speed is necessary so that the momentum of aircraft mass will help carry it over the rail. Building up a long tapered ramp in front of a ledge will also help. Icy surfaces are naturally a traction problem. A bit of sand spread around will help, snow chains are available. Wing walk for the Powertow drive tire is great for traction on smooth painted hangar floors.

Now here's a good tip. Get up kind of early on Saturday morning, and get out to the airport before the rest of the hangar bums get there. Pull your plane out of the hangar, by hand for the last time, and get it out on the apron well away from all hard objects. Go through the above procedures until you really have it down. By the time those guys show up, you will have become super proficient and will be able to put on one hell-of-a-show. Always anchor chock blocks at the rear of your main wheel position in the hangar to prevent inadvertent travel through the rear of your hangar.

LAST TIP: If you really want to get smart, re-read this stuff after you have actually used the machine a few times - it will be more meaningful.

Clutch and Transmission Schematic



The Powertow uses a back side idler pulley to control the speed by tightening the pulley against the belt. The clutch handle is located at the top of the Powertow handle. When squeezed, it engages the pulley and movement begins. When handle is released the pulley moves away from the belt and movement stops. Belt guides are installed for proper belt disengagement.

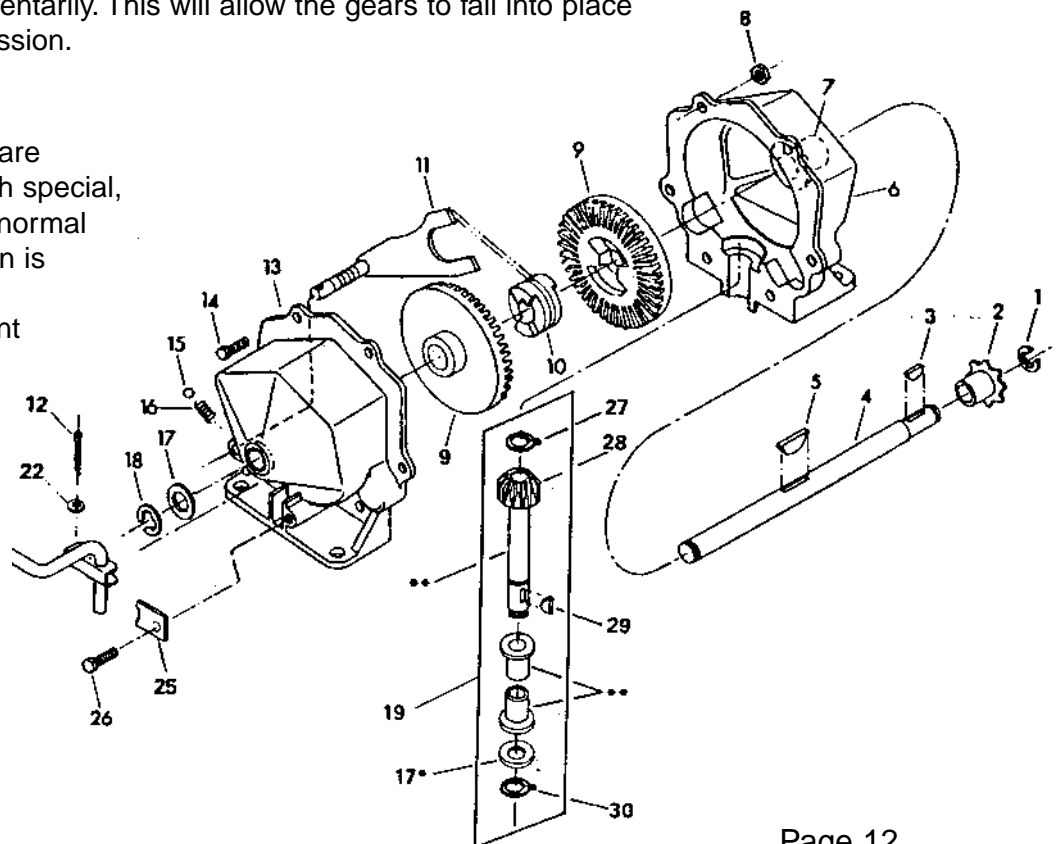
Quicksilver Transmission Model 3500

Under proper operating conditions, the Quick Silver Transmission can be shifted by using only a fingertip pressure on the shift lever. However, when a transmission is subject to even partial load from the engine, the engaging lugs of the clutch collar and gears are forced together. Under this condition, the force required to shift is multiplied. If enough force is applied, it may cause breakage of the shifter mechanism.

ADEQUATE DECLUTCHING - The transmission must be relieved of any load before shifting. The one exception to this is in operating the clutch handle briefly, as a hunting action to permit the clutch collar lugs and gear cavities to line up and mesh fully. If shift rod does not fall into gear easily, engage clutch handle momentarily. This will allow the gears to fall into place without binding the transmission.

LUBRICATION -

Quick Silver transmissions are lubricated at the factory with special, high quality grease. Under normal operation, factory lubrication is adequate for the life of the transmission. Replenishment is not necessary unless the unit is disassembled.



POWERTOW™

GENERAL WARRANTY AND CONDITIONS

All equipment manufactured by **NORTHWEST MFG., INC.** is sold on a satisfaction guaranteed basis. If at any time, within **30 days** of sale, you are not satisfied you can return the unit. The Powertow must be in original shape and in the original packaging only. Ship freight prepaid only and upon receipt of the unit we will immediately issue a refund in the amount of the full purchase price, excluding freight, providing the unit is received in new original condition.

Call for authorization number for return.

Gasoline engines are warranted only by the engine manufacturer. Engine warranty included with unit. Engine parts must be obtained from engine dealers. Refer to "Small Engine Services" in local yellow page directory.

All other parts are warranted by **NORTHWEST MFG., INC.**, on a **PARTS ONLY** basis for a period of **90 days** from date of purchase.

Adding any unauthorized third party attachments or accessories to any Powertow, voids all warranty and claims of responsibility by Powertow, or Northwest Mfg, its parent company. Any damage to tow or aircraft is the responsibility of the aircraft owner and accessory manufacturer.

Thank you for buying POWERTOW™.



NORTHWEST MANUFACTURING, INC

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Powertow 35/40/Key&Z/Thunderbolt

POWERTOW TROUBLESHOOTING

- TRANSMISSION LEAKING GREASE - In hot weather, transmission grease will separate and a slight leakage is normal. It is packed with a solid lubricant. It is not necessary to add grease.
- CHAIN IS TOO LOOSE - - - - - Pillow blocks are slotted. Loosen and pull tire/axle evenly back. This will take up chain slack. Tighten and run adjuster bolt up against pillow block on bottom of frame to hold secure..
- CHAIN BREAKS - - - - - Chain is too loose. Check sprocket alignment.
- BELT SLIPPAGE WHEN CLUTCH IS FULLY ENGAGED - Shorten Clutch Cable by adjusting turnbuckle at handle. Adjust cable so clutch is fully engaged with approximately 1" of space remaining between clutch handle and machine handle grip. Need new belt. See clutch cable this page.
- BELT SLIPS OFF PULLEY
THIS IS VERY IMPORTANT - - - - - Check to make sure motor, transmission and idler pulleys are in line. Belt is inside belt guides. Idler pulley needs to contact belt in the middle of the pulley, not on the edge. Adjust idler pulley handle.
- DRIVES WHEN NOT SQUEEZED - - - - - Lengthen cable at turnbuckle. Check belt guides, make sure belt is inside belt guides.
- UNIT HAS POOR TRACTION - - - - - Check that tire air pressure is within 10-12 PSI range. Make sure key is still in 7" pulley on bottom of machine.
- GAS UNIT: ENGINE SURGES - - - - - See engine manual.
- ENGINE IS HARD TO START - - - - - See engine manual. Check unit for gas. Use choke on engine and on handle.
- ENGINE WILL NOT START IN COLD WEATHER - - - - - Check viscosity of engine oil. See engine manual.

Powertow 35/40/Key&Z/Thundervolt

USE **EXTREME CAUTION** WHEN OPERATING ANY POWER EQUIPMENT!

1. Do not operate this machine until you have read and understand all instructions for proper use.
2. Do not operate unit when not running smoothly.
3. Keep hands and feet out from under towing equipment.
4. Operate in well ventilated area.
5. Do not leave a running machine unattended.
6. Do not operate electric unit in wet conditions or if cords are frayed.
7. Do not start engine when unit is in gear.
8. Hangar storage area should include anchored chocks to control inadvertent movement of planes into hangar walls.
9. Do not change gearing to increase speed.
10. Do not move planes up any inclines...flat surface only.
11. Do not attach any device to activate throttle when both hands - are not on throttle control.
12. Do not run engine without checking oil level.
13. Do not spill gasoline on hot engine.
14. Do not smoke when filling tank with gasoline.
15. Use caution when operating machine on icy / slippery surfaces.
16. Do not move planes in excess of speed that cannot be easily stopped... there is no braking device on the unit.
17. Do routine maintenance to insure proper operation of unit.
18. Do not use unit if the Powertow engine is not running smoothly.

We hope you enjoy this Northwest Manufacturing product.
It was designed and built to give many years of reliable
service with proper use and routine maintenance.

Powertow 35/40/Key&Z/Thundervolt