

**RS48**

**ROLL 'n' SLICE**

**GOLF GREEN ROLLER**

**OPERATION, MAINTENANCE  
AND  
PARTS MANUAL**

***TRU-TURF EQUIPMENT  
INTERNATIONAL AGENCIES***

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Congratulations on your investment in the RS48 Roll 'n' Slice Golf Green Roller and your move to smoother, faster, more consistent putting Greens. The following operation and maintenance manual has been prepared for use with the RS48 Roll 'n' Slice Golf Green Roller. It is intended as a guide and supplemental updates to the manual may take place at a future date.

This machine is engineered to be simple to operate and easy to maintain. If you have any questions or concerns that this manual does not address, please feel free to contact your distributor at:

NAME: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

\_\_\_\_\_

TELEPHONE: \_\_\_\_\_

FACSIMILE: \_\_\_\_\_

## **MACHINE INFORMATION**

### **RS48 Roll 'n' Slice Golf Green Roller**

**Serial #** \_\_\_\_\_

**Engine #** \_\_\_\_\_

**Purchase Date:** \_\_\_\_\_

## WARRANTY

THE WARRANTY PROVIDED SHALL BE THAT AS OFFERED BY TRU-TURF EQUIPMENT INTERNATIONAL AGENCIES ALL WARRANTY CLAIMS ARE TO BE DIRECTED TO THE SUPPLIER.

- 10.1 Subject as provided below the Supplier warrants to Buyer that the goods will be free from defects due solely to faulty materials or bad workmanship until after the following periods;
- (a) in respect of whole goods, from date of delivery to the first retail purchaser;-
    - 6 months for federal, state and local government organisations, sporting clubs and agricultural contractors.
    - 3 months for industrial contractors and commercial usage.
  - (b) in respect of spare or replacement parts (whether supplied under the contract or pursuant to a warranty claim) 90 days, or the remainder of the warranty period for the whole goods into which the part is incorporated.
  - (c) In respect to the engine and transmission, the period as offered by that manufacturer through its appointed representative (distributor or agent) in the country in which the machine has been sold.
- 10.2 The Supplier's obligation under 10.1 above shall be to replace - at no charge ex-factory - to the buyer any part of the goods which is defective in materials or workmanship, or (at the Supplier's option) to grant a monetary credit to Buyer equal to then ex-works price to the buyer of such part.
- 10.3 The Supplier's liability under 10.1 above shall be conditional upon:
- (a) every claim being delivered in writing to the Supplier within 50 days of the occurrence of the alleged failure, giving full particulars thereof and stating
    - (1) Date of delivery to first buyer
    - (2) Serial number(s) of the goods
    - (3) Hours of operation
    - (4) Date of failure
  - (b) (where requested by the Supplier) the part which is alleged to have failed being returned to the Supplier or otherwise made available for inspection by Supplier or its appointed representative, the cost of carriage of such part to the Supplier being reimbursed to the Buyer upon acceptance of the claim.
- 10.4 The Supplier's obligations under this Warranty shall not cover or apply to :-
- (a) transportation, installation or labour costs or other charges incurred by the Buyer
  - (b) tyres, engine and transmission/drive and other proprietary articles not manufactured by the Supplier of the product, but the Supplier will pass on to Buyer the benefit of any claim made by the Supplier and accepted by the manufacturer of such articles under a warranty given by that component manufacturer.
  - (c) any goods or parts thereof which in the opinion of the Supplier have been affected adversely by methods of assembly and/or incorporation into another product adopted by Buyer or its sub-contractor or customer, or have altered, repaired, neglected used in such a way as to affect adversely their stability or reliability, or have been used in any product or for any purpose for which they were not designed.
- 10.5 Where directed by the Supplier, the Buyer shall lodge any claims under this warranty directly with the duly appointed Supplier distributor in the territory of use of that product.

## INITIAL ASSEMBLY

When you receive the crate, the machine will be broken down into components ready for assembly. If you run into any problems during assembly, please feel free to call your local distributor or agent.

### *List of Components*

- (1) Operation, Maintenance & Parts Manual
- (2) Machine Frame/Body

#### **Seat Mounting Components**

- (1) Drivers Seat
- (1) Seat Pin
- (1) 12mm External Circlip

#### **Steering Arm Components**

- (1) Steering Joystick
- (1) Woodruff Key
- (1) 3/8" UNF Nyloc Nut
- (1) 3/8" x 1 3/4" UNF Bolt
- (1) 3" (72mm) Spring

#### **Wheel Components**

- (2) Tyres mounted on Wheel Rim
- (2) 1" x 1 3/4" Flat Washers
- (2) 25mm External Circlips

#### **Trailer Arm Components**

- (1) Left-side Trailer Arm
- (1) Right-side Trailer Arm
- (2) 25mm External Circlips

#### **Tow/Latch Components**

- (1) TowballCoupling Assembly
- (2) 2" x 3/8" UNF Hex Head Bolt
- (2) 3/8" UNF Nyloc Nuts

**Step 1: MOUNTING THE SEAT TO THE SEAT FRAME**

- \* Remove the 12mm diameter pin from the seat frame
- \* Place the seat down with the seat back oriented toward the rear of the machine (the front of the machine is the side where the pedals are located)
- \* Replace 12mm diameter seat locating pin through seat frame guides and through the seat guide, replace external circlip on the end of 12mm diameter rod to prevent the seat pin sliding out.

**Step 2: MOUNT THE STEERING ARM TO THE MACHINE**

- \* Find the steering joystick
- \* Place the keyed end of the steering joystick into the hole on top of the steering support cylinder (the cylinder is located directly behind the foot pedals and is approximately 12" high. There is a sealed bearing laying flat in the top and bottom of the cylinder).
- \* Slide the steering joystick into the hole until it rests against the shoulder. If the steering joystick stops before reaching the shoulder, use emery cloth to polish the shaft. You may also use a light oil on the bearing and shaft to allow the shaft to slide in freely.
- \* Lift up the smoothing roller side of the machine so that you can get to the underside of the machine. On the opposite side of the machine from the smoothing rollers, there is a trailer pivot pin (25mm in diameter) welded on the top of the body which will prevent the machine from rolling on its side.

**VERY IMPORTANT:** Brace the machine so that it will not fall over. Secure the machine with a rope or blocks to prevent the machine from falling.

- \* Locate the steering shaft on the underside of the machine (Again, this is toward the front of the machine).
- \* Locate the Woodruff Key. The Woodruff Key is a 3/4" x 3/16" thick piece of steel in the shape of a half circle.
- \* Place the round-side of the Woodruff Key into the rectangular key slot on the

**MOUNTING THE STEERING ARM TO THE MACHINE CONTINUED**

steering rod. Hammer or squeeze with pliers into place. When complete, the flat side of the Woodruff Key should be parallel to the steering rod.

- \* Place the steering linkage assembly onto the steering shaft. The “shiny” arm or rod end should be on the ground-side or lower side of the steering arm assembly. Insert the 1 3/4” x 3/8” bolt through the steering arm, then tighten the 3/8” UNF Nyloc Nut onto the rod end.
- \* Line up the “square groove” on the steering arm assembly with the Woodruff Key with your hand, slide the assembly onto the joystick toward the bearing as far as it will go and tighten the 5/16 Grubscrew up against the steering arm shaft and tighten. Make sure that the steering linkage remains aligned with the Woodruff Key and the Woodruff Key remains parallel to the rod when sliding the steering linkage on the rod.

**Step 3: ATTACHING TRAILER ARMS TO MACHINE BODY**

- \* Locate the trailer arm support rod which extends out on each side of the machine. Slide left side and Right side trailer arms, onto the Rod with the bends facing each other. (The Rod is located between the Transmission and the Engine).
- \* Fasten in position with 25mm external circlip. Ensure circlip is fitted correctly into the groove.
- \* Repeat the same procedure to install the other Trailer Arm Support

**Step 4: ATTACHING WHEELS TO TRAILER ARMS**

- \* Find the two wheels for the left and right side trailer arms
- \* Fill the tyres with the appropriate amount of air (to about 18psi). Do not exceed this pressure.
- \* Onto one trailer arm, slide a wheel onto the shiny axle-rod. Ensure the rubber air filler valve is facing out from the actual trailer arm.

**ATTACHING WHEELS TO TRAILER ARMS CONTINUED**

- \* Place the 25mm External Circlip, 25mm Flat Washer on the end of the wheel axle, ensure the circlip is fitted correctly in the axle groove to prevent the wheel from sliding off the axle.
- \* Repeat the same procedure for the other wheel.

**Step 5: ATTACHING TOW/LATCH BAR TO TRAILER ARMS**

- \* Locate the towball coupling assembly
- \* Gather the ends of the right and left trailer arms. Locate the two holes in the end.
- \* Place the towbar coupling assembly between the trailer arms and align the holes.
- \* Place one 2" x 3/8" Head Bolt through each hole.
- \* Place one 3/8" UNF Nyloc Nut on each bolt and tighten.
- \* Test and ensure trailer latch is correctly locking in the down position. This is important when trailing the machine.

**Step 6: ATTACH DAMPENER STRUT**

- \* Locate dampener strut. Remove wrapping from unattached end.
- \* Slide end of dampener onto the mating pin welded to the trailer arm. Fasten in position with the 'E' clip supplied.
- \* Ensure the nylon bushes are fitted in the eye of the dampener before fitting.
- \* When roller is fully assembled, test the operation of the dampener. When it is operating correctly it should allow the roller to lower to the ground gently and the trailer will move up to its locking position, which will hold the wheels off the ground whilst rolling.
- \* Coupling assembly should raise slowly. This prevents the operator from being injured.



**Step 7: REPLACE ENGINE OIL**

- \* A tag is placed on the engine's On/Off switch indicating you must fill the machine with oil prior to operation. The fluid placed in the machine is designed to keep the inside of the engine from rusting until it is replaced with engine oil.
- \* Replace engine oil as described in the Honda or Briggs & Stratton Manual
- \* Use A SAE Oil only

**Step 8: LUBRICATE ROLLER PIVOT BEARING**

- \* There is a grease fitting covered with a plastic cap located on the smoothing head centre ball joint swivel. Apply grease to lubricate fitting.

**SAFETY INFORMATION**

Safety is of the utmost importance when operating turf equipment. To ensure safe operation of the RS48 Roll 'n' Slice Roller, please follow the following safety guidelines.

- \* Always make a pre-operation inspection before you start the engine. If this procedure is not carried out damage to property or personnel may occur.
- \* Keep children, pets and inexperienced personnel away from the machine. This machine should only be operated by trained and skilled personnel - check with your supervisor if you are unsure.
- \* Know how to stop the engine and stop the aerator when in motion. Read and understand engine manufacturers manual, as supplied.
- \* Never permit inexperienced operators to use the machine. This machine requires certain knowledge and expertise to operate it; you must be a trained person to use this machine. Unskilled persons can harm themselves and others if they operate this machine.
- \* Do not use in enclosed areas unless well ventilated. Carbon monoxide gases are dangerous if inhaled, it can cause death; use the machine outdoors.
- \* When transporting the roller, make sure the trailer lock down mechanism is secure to prevent premature release. This also applies during normal maintenance procedures- make sure the latch is locked in place. If the trailer lock is not correctly engaged and releases prematurely the front of the roller can dig into the ground, causing the machine to move dangerously in any direction and cause bodily injury. When carrying out maintenance ensure the latch is engaged correctly; if it is not the trailer arm could fly up making contact with a person (s) causing serious injury.
- \* When engine is running, always keep hands and loose clothing away from rotating belts and pulleys in transmission area. If hair, clothing or loose objects become entangled on a rotating shaft serious bodily injury could occur. Stop engine before opening safety cover fitted to the transmission area.

**OPERATOR, REMEMBER IT IS YOUR RESPONSIBILITY TO BE AWARE OF YOUR SURROUNDINGS.  
TO AVOID ACCIDENTS, THINK SAFE AND OPERATE SAFE.**

**PRE-OPERATION CHECKS**

- \* Check engine as per Honda or Briggs & Stratton manual
- \* Ensure steering joystick has no looseness
- \* Check that foot pedal does not bottom out on main frame under normal operating foot pressure . If adjustment is needed, see maintenance section.
- \* Ensure that the trailer bar locking catch mechanism is securely locked to the main frame bolt when in the trailering position.
- \* Make sure roller moves freely sideways when hand pushed. Excessive resistance means incorrectly adjusted drive (see Maintenance section for adjustment)
- \* Check and tighten grubscrews fitted to joystick steering arm, and end bearing lock rings on the rubber coated drive roller.
- \* Grease smoothing roller head centre ball-joint swivel lightly. Replace cap.
- \* Oil rod ends sparingly
- \* Check all bearing races for correct function
- \* Check that split pins and washers are in place
- \* Check tyre pressure for proper operating pressure (18psi)
- \* Check for oil leaks - rectify before using machine.

**STANDARD OPERATION PROCEDURES**

- \* Inspect and check that the roller is serviceable prior to departing from workshop.
- \* Use a suitable towing vehicle to move roller from green to green.
- \* Do not speed when towing roller or travel across rough terrain at excessive speeds. If you do, damage may occur to the trailer or rubber drive roller. Maximum recommended speed would be equal to a motorised golf buggy. Approximately 4mph/7kph.
- \* When approaching the green do not tow roller onto the green to set up; put the roller on the fringe of the green. Put trailer in the up position, start up the roller and drive it onto the green.

**STANDARD PROCEDURES CONTINUED**

- \* Greens can be rolled in any direction; take care to ensure there is no crease lines produced on the surface.
- \* It is recommended that you place the smoothing head rollers on the high side of the green when rolling. This puts more weight on the rubber drive roller and helps give more traction, thus less slipping or spinning of the drive roller will occur on the green.
- \* Whilst becoming familiar with the roller, set the throttle at about 1/2 speed. Press the left or right foot pedal down firmly but not suddenly. Be smooth with your action, hold pedal down avoid slipping in the transmission, hold in this position until a few metres from the edge of the green, then take your foot off the pedal. Rest your other foot on the opposite pedal and slowly start applying the pressure on the pedal. This will act as a brake and slows the machine down until it stops. It then starts to move the roller into the opposite direction. Once again be firm with the pedal, but not sudden. By using the left and right pedal in this manner, will ensure there is no damage to the green, less wear and tear on the equipment and operator.
- \* The correct procedure for rolling the green is:
  - (a) Select the correct direction to roll the green
  - (b) Start on one side of the green and work your way across the green in a zigzag fashion, slightly overlapping each lap you roll: this makes sure you miss no part of the green and all of the green is rolled. Avoid coming back across the green to roll missed areas if possible. This takes extra time to do and slows down the rolling time to complete the task in good time. You should be able to complete the rolling of 18 greens in the same time or quicker than mowing using a triplex mower.
- \* When the rolling of the green is completed, move the roller onto the fringe, stop the engine, lock the trailer into the trailing position, connect it to the towing vehicle then move off to the next green to be rolled. Do not put the trailer down into the towing position on the green; damage may occur to the green from the roller tyres and body.

**POINTS TO REMEMBER**

1. Make sure the roller is serviceable before rolling.
2. Start rolling from the fringe of the green.
3. Smooth operation on the foot pedals.
4. Pick a point on the other side of the green to roll to.
5. Do not look at the green close to the roller; it makes it difficult to steer the roller; look well ahead.
6. Use 1/2 throttle until you are proficient at operating the roller.
7. Move the steering joystick a little at a time to change direction; excessive movement of the joystick makes it difficult to maintain a straight line.
8. Roll in straight lines.
9. Do not leave the roller engine running with the roller parked on the green; the engine vibration will leave the ground with roller impressions on the green.
10. Move off the green when rolling is complete before putting the trailer in the down position.
11. When rolling steep greens and the engine stops, check engine oil level. The engine is fitted with a safety switch; when the engine oil level is low the engine will stop.
12. Use only SAE30 grade oil in the engine and transmission.

**SLICER**

**Important** to initially engage the slicing head ensure the roller is in motion, once the slicer is engaged it can be left in this position until the slicing operation is completed on that green. Ensure the cutter is in the raised position before lowering the roller to the ground.

**MAINTENANCE**

- \* Stop engine before performing any maintenance
- \* Service the Honda GX-160 or the Briggs and Stratton Vanguard 6H.P. engine according to their maintenance schedule.

**MAINTENANCE CONTINUED**

- \* Engine oil is SAE Grade as per Honda or Briggs and Stratton's recommendations.
- \* Check and adjust main rubber coated drive roller belt. The belt should be tight, if not slippage will occur.
- \* Check foot pedals for clearance between pedal and frame. If pedal touches the frame under normal operating foot pressure, the transmission bands require adjustment.
- \* *To Adjust:* See Snow-Nabstedt Power TransmissionsParts Manual, inserted in this publication.
- \* Check transmission oil level. The correct oil level is determined by plug situated at the rear side of the transmission approximately half way up. To check oil level, remove this plug and the gear oil should just trickle out of the hole. Recommended oil is SAE30 only.

***IMPORTANT:*** Do not overfill transmission with oil or damage will occur to the oil seals and it will leak out of the breather/fill cap. Make sure the breather is not obstructed at anytime. If this breather is blocked excessive pressure may build up and cause damage to the oil seals and loss of oil.

**STORING**

- \* It is important to store this roller in the towing position. This ensures the shock absorber is in the closed position, protecting the shaft from corrosion, then failure.

**SERVICE OF DRIVE BELT SYSTEM****REPLACEMENT**

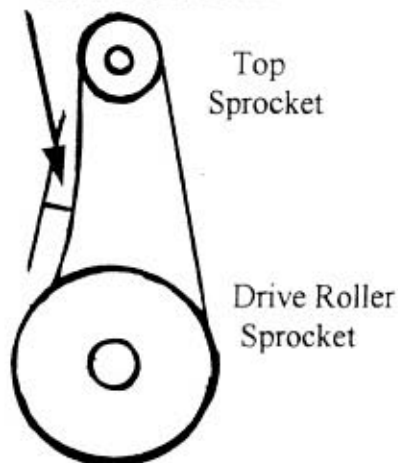
Use only the belt and sprockets recommended. Be sure to use only Poly Chain GT Sprockets and GT Poly Chain GT belts. Poly Chain GT belts and Sprockets make up a specially designed drive system and cannot be interchanged with HTD belts and sprockets or any other curvilinear belt/sprocket systems. Mixing belt and sprocket profiles may result in reduced life and machine performance problems.

**TENSIONING THE DRIVE**

- (a) Be sure it is tensioned to prevent jumping of teeth (ratcheting) under the most severe load conditions which the drive will encounter during operation.
- (b) Avoid extremely high tension which can reduce belt life and possibly damage bearings shafts and other drive components.
- (c) Use shims to adjust the transmission and engine, using the same thickness shim under the engine as the transmission.

**BELT DEFLECTION**

1/16" or 1 mm  
maximum, between  
centres of the belt



## **FAULT FINDING**

### **ROLLER WILL NOT MOVE ONE OR EITHER WAY**

- Check:**
- \* Belt is okay
  - \* For loose belts
  - \* Foot control not operating - check all arms are secure
  - \* Transmission not correctly adjusted
  - \* For Sheared Pulley Keys

### **ROLLER WILL NOT STEER**

- Check:**
- \* Joystick locating grub screw is tight
  - \* Woodruff Key is in place
  - \* Rod ends are connected to smoothing roller head and the steering arm
  - \* Centre swivel bearing on top center of smoothing rollers has not seized

### **ROLLER HAS EXCESSIVE VIBRATION**

- Check:**
- \* Disconnect engine-to- transmission and isolate the drive chain to determine whether the problem is in the engine or into the transmissions
  - \* If engine is at fault contact your nearest Honda or Briggs & Stratton agent for rectification
  - \* If the transmission is at fault, repair or replace as necessary

### **BELTS OVERHEATING**

- Check:**
- \* Check and adjust belt
  - \* Check belt alignment
  - \* For foreign matter

### **SMOOTHING ROLLERS SEIZED**

- Check:**
- \* End float on rollers is sufficient, Minimum 1/16" (1mm)
  - \* Bearing has not seized

### **RUBBER DRIVE ROLLER WILL NOT ROTATE**

- Check:**
- \* Roller shaft end bearings have not seized
  - \* Broken belt
  - \* Slipping belt



**DATE**

**DESCRIPTION OF MAINTENANCE WORK**


**PARTS LIST**

<b>PART NUMBER</b>	<b>PART DESCRIPTION</b>
R39101	Trailer Arm Assembly R.H.
R39102	Trailer Arm Assembly L.H.
R39103	Rubber Pad - Seat
R39104	Chassis Body
R39107	Smoothing Roller Head Assembly R.H.
R39108	Smoothing Roller Head Assembly L.H.
R39109	Transmission Cover
R39110	Pin Cover
R39111	Seat
R39112	Pin Seat
R39113	Circlip Seat
R39114	Base Plate Seat
R39115	Decal - Seat rear
R39116	Catch - Rubber Cover
R39117	Rubber Trim - Cover
R39118 - A	Decal - Cover Top
R39121	Seat Frame
R39120	<i>COVER HINGE</i>
R39123	Engine Base B & S Vanguard
R39124	Engine Base - Honda
R39125	Drawbar - Pin Type
R39125 - 1	Shim 1mm Engine B & S
R39125 - 2	Shim 2mm Engine B & S
R39125 - 5	Shim 5mm Engine B & S
R39126	Drawbar - 50mm coupling
R39127	Catch - Trailer
R39128	Cap Plastic Trailer lock
R39128 - 1	Shim 1 mm Engine Honda
R39128 - 2	Shim 2 mm Engine Honda
R39128 - 5	Shim 5 mm Engine Honda
R39131 - 1	Shim 1 mm SNPT Transmission
R39131 - 2	Shim 2 mm SNPT Transmission
R39131 - 5	Shim 5 mm SNPT Transmission
R39134	Transmission 5101B-3
R39135	Coupling Engine
R39136	Coupling Transmission
R39137	Belt
R39138	Selector Lever
R39139	Sprocket - Roller
R39140	Sprocket Lock - Roller
R39141	Allthread Rod. selector arm.
R39142	Pedal Control Rod
R39143	Pad Rubber (2 of)
R39144	Foot Mat

**PARTS LIST CONTINUED**

R39145	Joystick
R39146	Grip
R39147	Steering Arm
R39148	Key Woodruff (K09)
R39149	Allthread Rod Steering
R39150	Nylon Bush
R39151	Strut (Hydraulic)
R39152	Nylon Bush (Strut) 4 of.
R39153	Circlip - Strut
R39154	Lever - Slicer
R39155	Catch Slicer
R39156	Spring Ext. 3" (75mm)
R39157	Drive Roller (Rubber Coated)
R39158	Sprocket Transmission 25T
R39159	Key - Sprocket - Roller
R39160	Sprocket Lock - Transmission
R39161	Frame Slicer
R39162	Arm
R39163	
R39164	Carrier - Bearing
R39165	Circlip
R39166	Shaft - Hexagon
R39167	Spacer - 55mm x 1
R39168	Spacer - 60mm x 6
R39168-A	Spacer - 80mm x 1
R39169	Spring - Compression x 4
R39170	Blade x 11/set
R39171	Rod Tie End
R39172	Bush Nylon
R39173	Shaft - Swivel
R39174	Arm - Connector
R39175	Spacer
R39176	Bearing Retainer
R39177	Smoothing Roller Assy. Frame
R39178	Roller - Steel
R39179	Spacer
R39180	Shaft
R39181	Cap - Plastic 30mm
R39182	Cap - Plastic 25mm
R39183	Wheel Complete
R39184	Engine B & S Vanguard 6HP
R39185	Engine Honda
R39186	Decal - Rolling Direction
R39187	Mesh Cover - Front
R39188	Mesh Cover - Rear

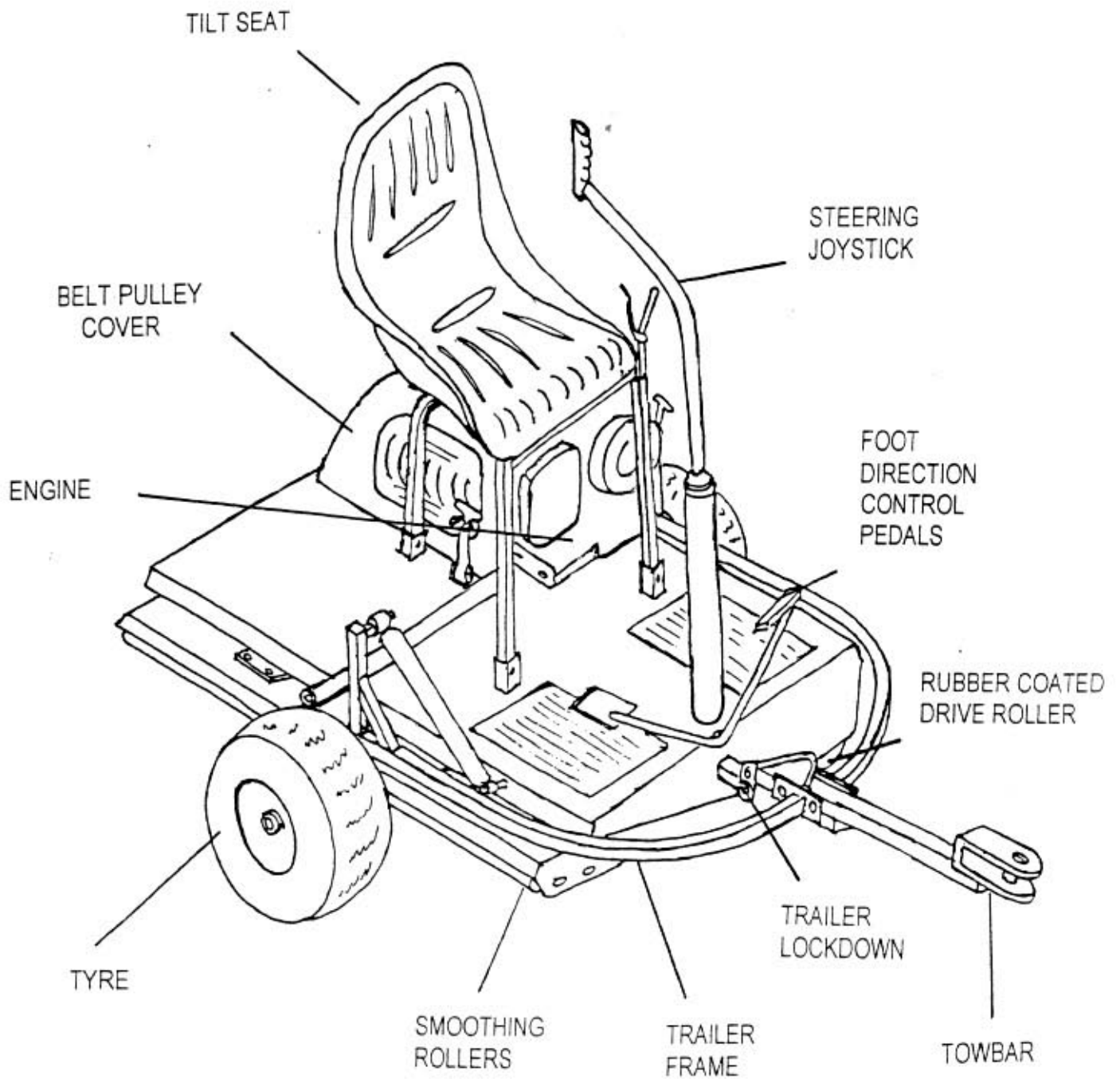
## PARTS LIST CONTINUED

R39189	Coupling - Rubber
R39190	Spring Ext - Slicer
R39191	Decal - Drawbar
R39192	Rubber Pad - Trailer Rest
R39193	Selector Arm - Foot Pedal
R39194	Retainer Shaft
R39195	Brake Pedal
R39196	Brake Drum
R39197	Brake Band
R39198	Bracket, Brake
R39199	Cable Brake
R39200	Clamp Brake
R39201	Bush Nylon
R39202	Pin
R39203	Transmission Cover Mesh
R39205	<i>DECAL - COVER REAR RS48</i>
AM020	Rod End
B0424C	Bolt - Seat Frame
B0432C	Bolt - Seat Frame
B0528F	Bolt - Engine 5/16 x 1 3/4
B0612F	Bolt
B0616F	Bolt - Trailer Axle
B0620F	Bolt
B0624F	Bolt
B0632F	Bolt
B0724F	Bolt
B0820M	Bolt Metric 8 x 20
B4	Bearing - Slicer Shaft
B5/SA5	Bearing Grubscrew Locking Type (confirm when ordering)
B1020M	Bolt- Slicer catch engine
B1280M	Bolt Metric 12 x 120
B6201RS	Bearing & Slicer Arm
B6304RS	Bearing
B6205	Bearing - Slicer - Roller
BB20521N	Bearing Wheel
C16015	Circlip External 1"
C2-240	Circlip - wheel
CSK0616F	Bolt - Smoothing Heads
CP3 - 220	Pin or Circlip - confirm when ordering
CP0632	Clevis Pin, Brake
DP04 - 1	Roll Pin 1/4 x 32 ( To be replaced with 4mm woodruff key)

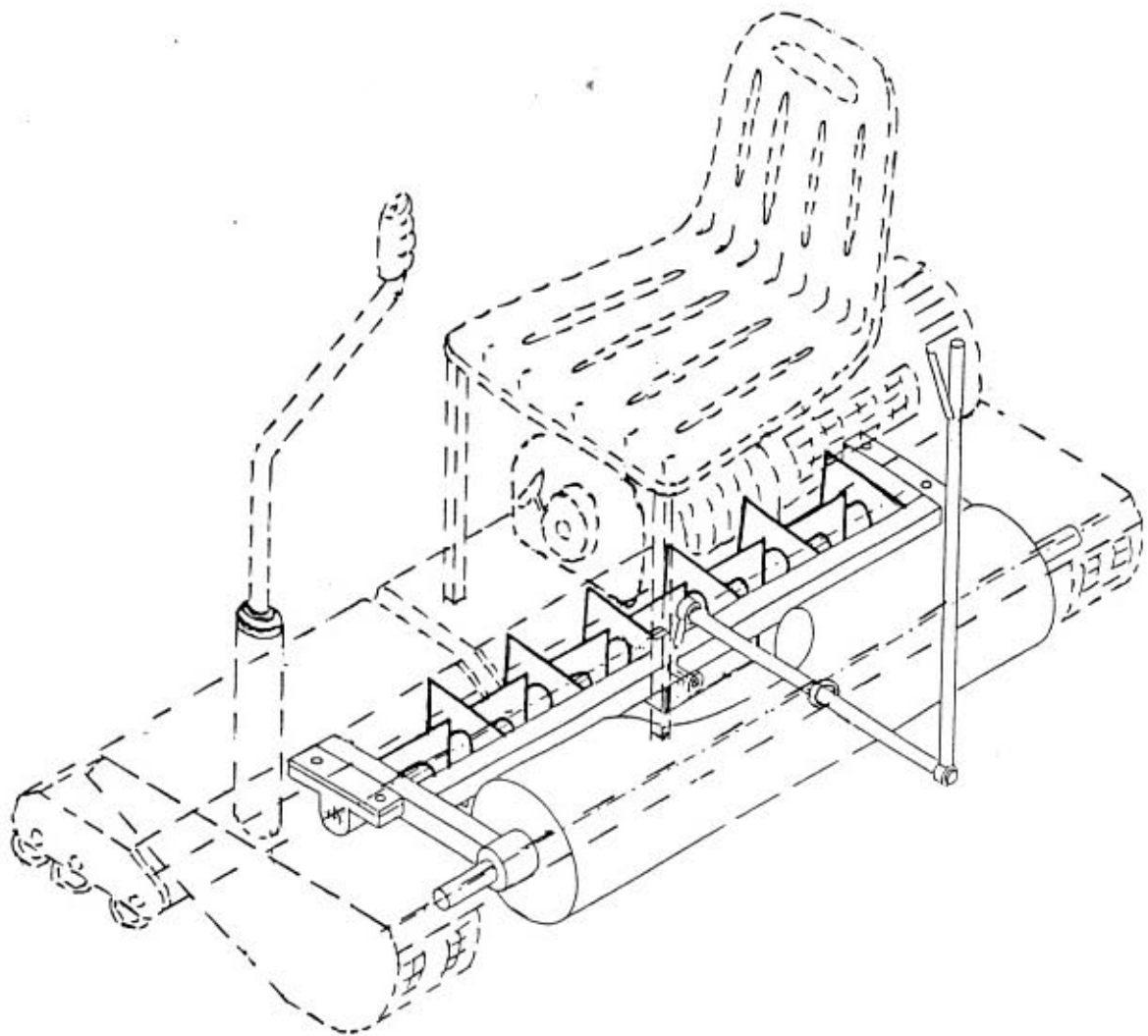
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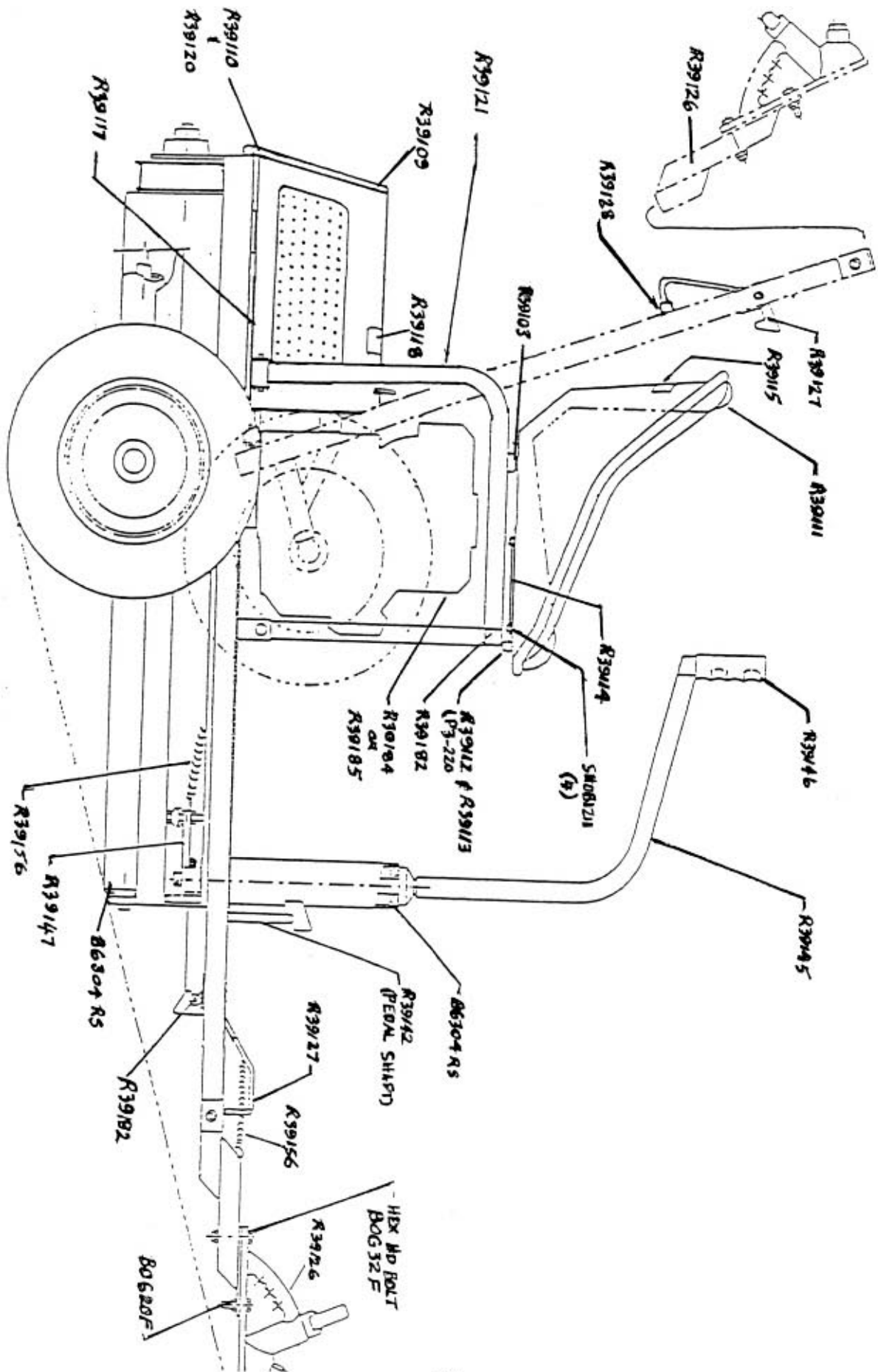
EN205	Bearing - Locking collar style, confirm
F205J	Housing
GS0505W	Grubscrew
LF205	Housing
N04CN	Nut - Seat Frame
N05FN	Nut - Engine
N06FN	Nut
N06F	Nut
N07FN	Nut - 7/16 UNF
N12MN	Nyloc Nut 12mm metric
N16CN	Nut Bearing
P204	Housing
SA5	Bearing Double grubscrew - confirm
SH0612F	Bolt
SH0616F	Bolt
SH0812M	Bolt x 4 Seat
UC204	Bearing
W051216	Washer - Engine
W062016	Washer Flat
W062416	Washer
W08SM	Spring Washer 8 x med.
W101816	Washer Flat
W5060815	Spring Washer 3/8
W254716M	Washer Flat - Wheel
W264702	Washer Flat

**MACHINE COMPONENTS**



SKELETON VIEW SHOWING POSITION OF SLICER

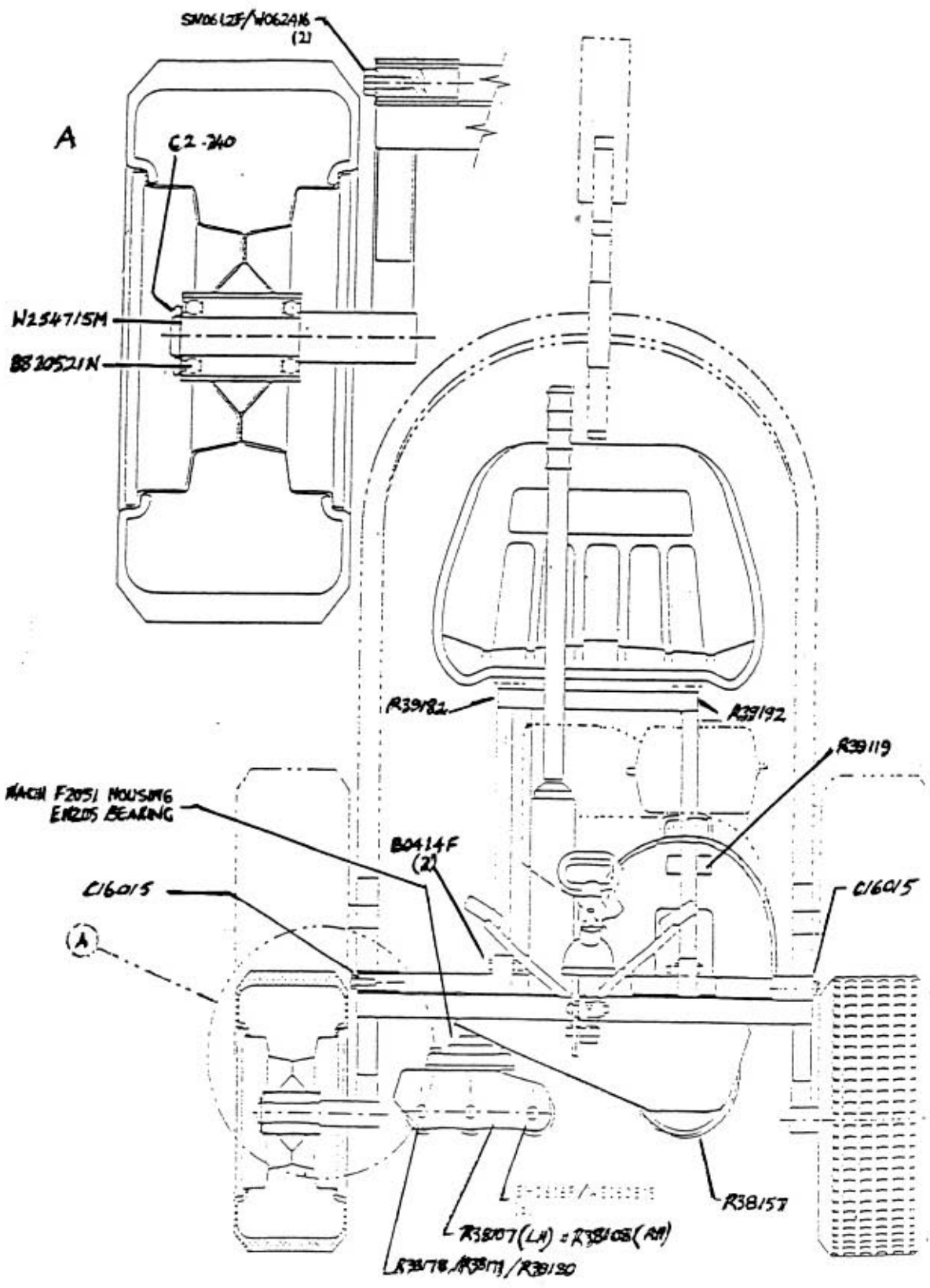


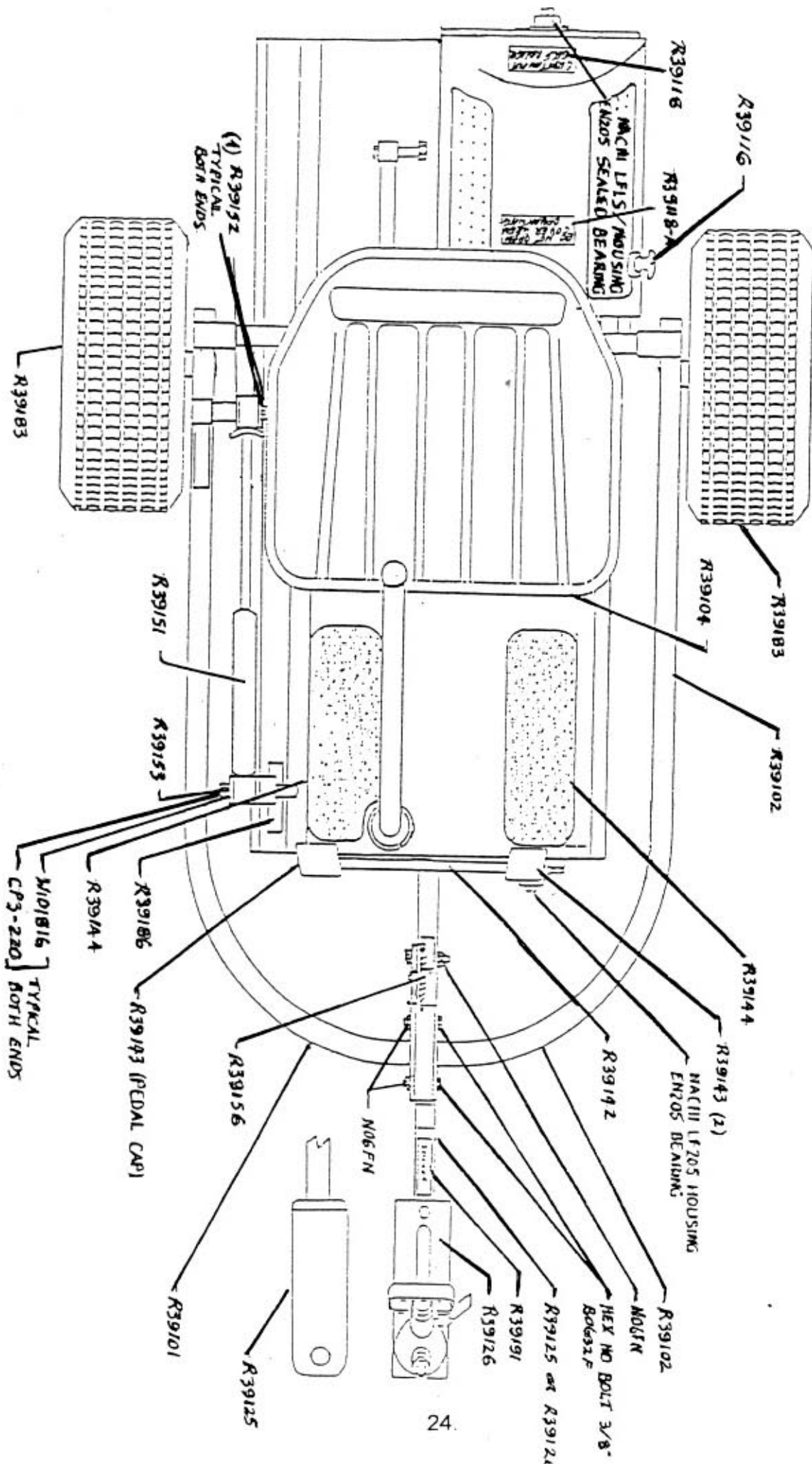


EXTERNAL SIDE ELEVATION



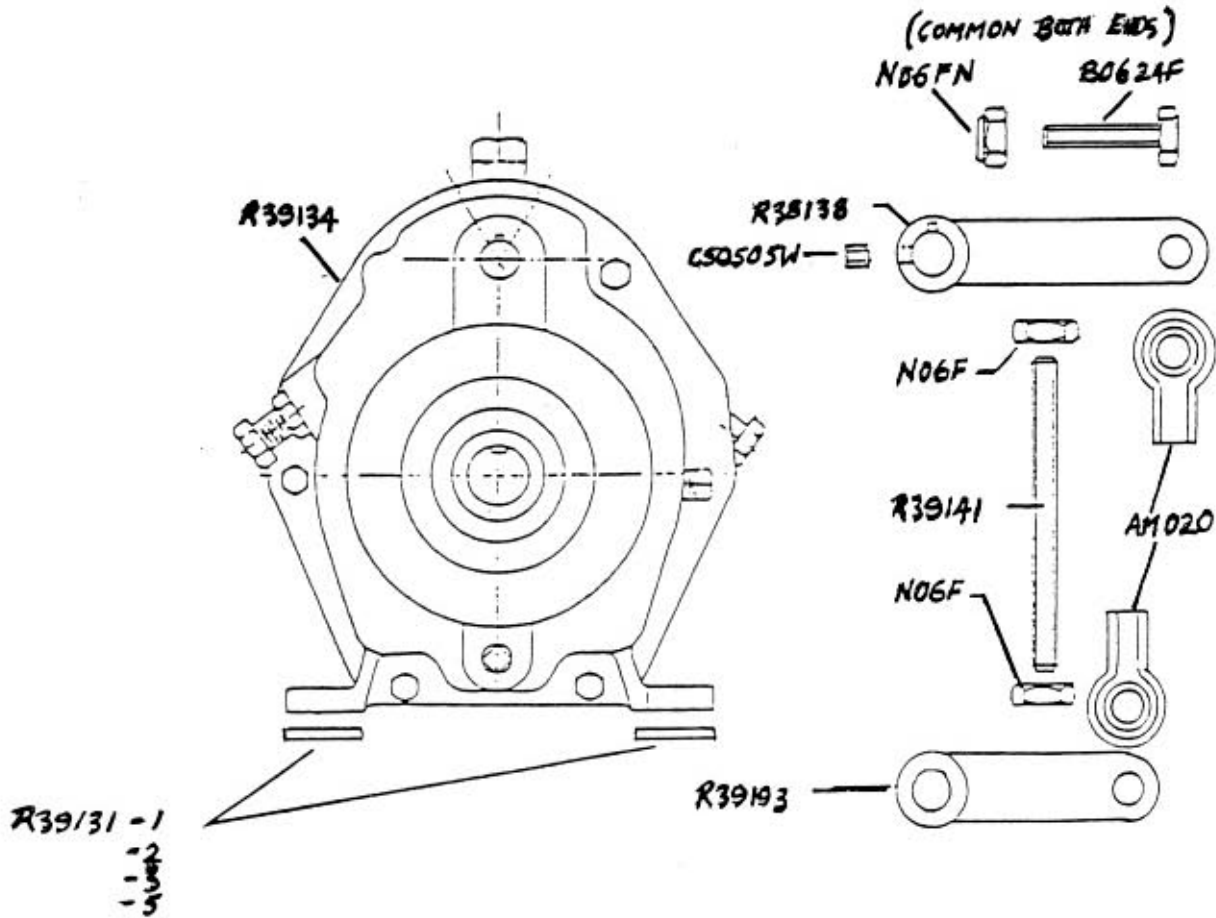
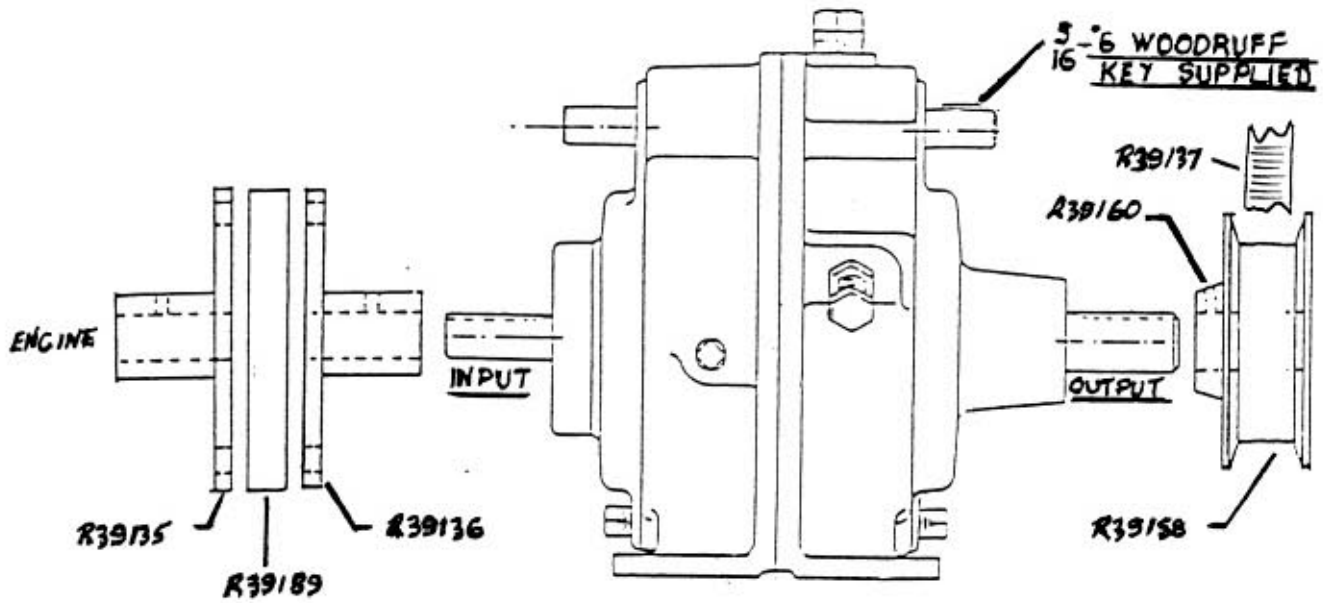
EXTERNAL FRONT ELEVATION

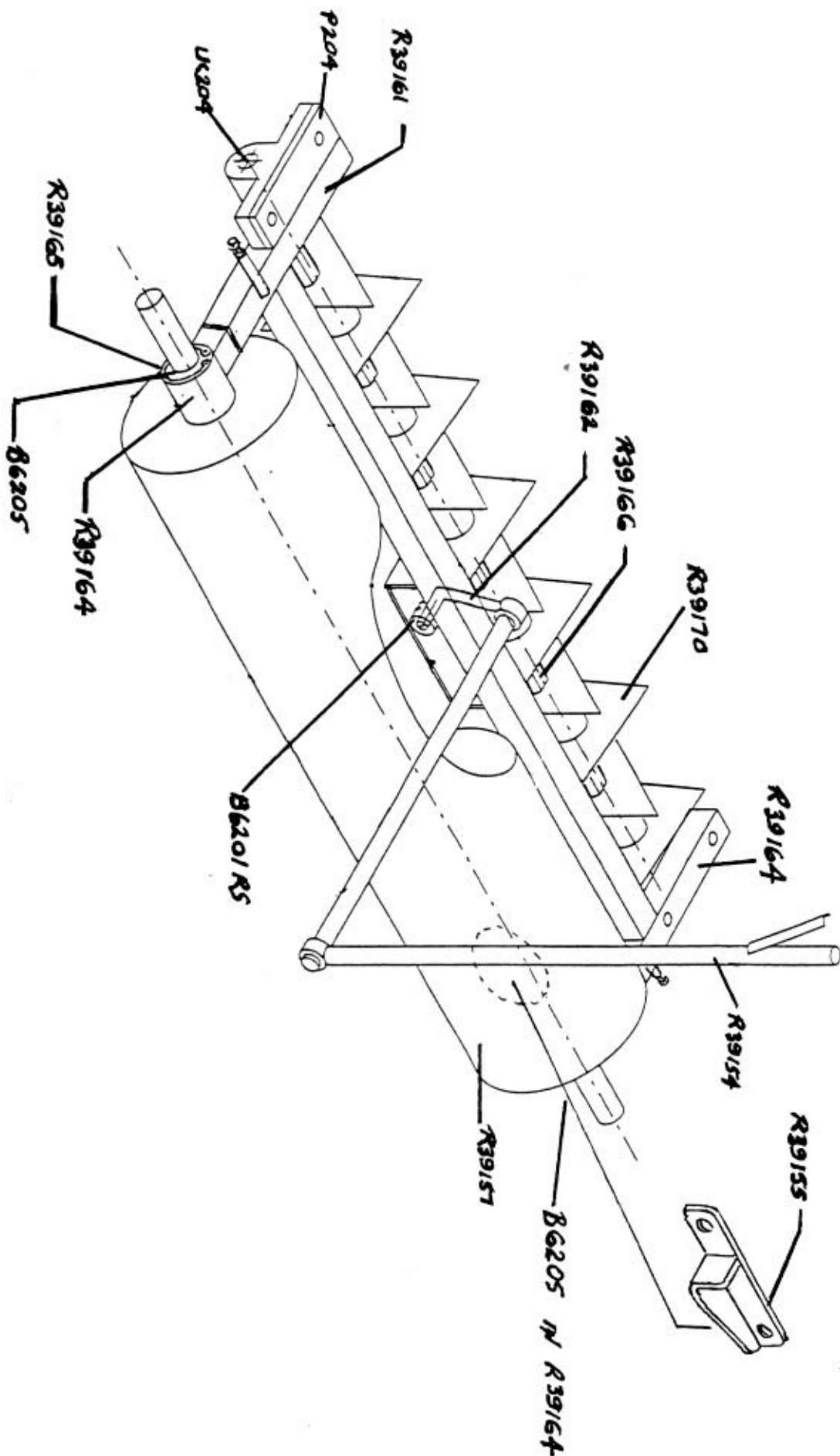




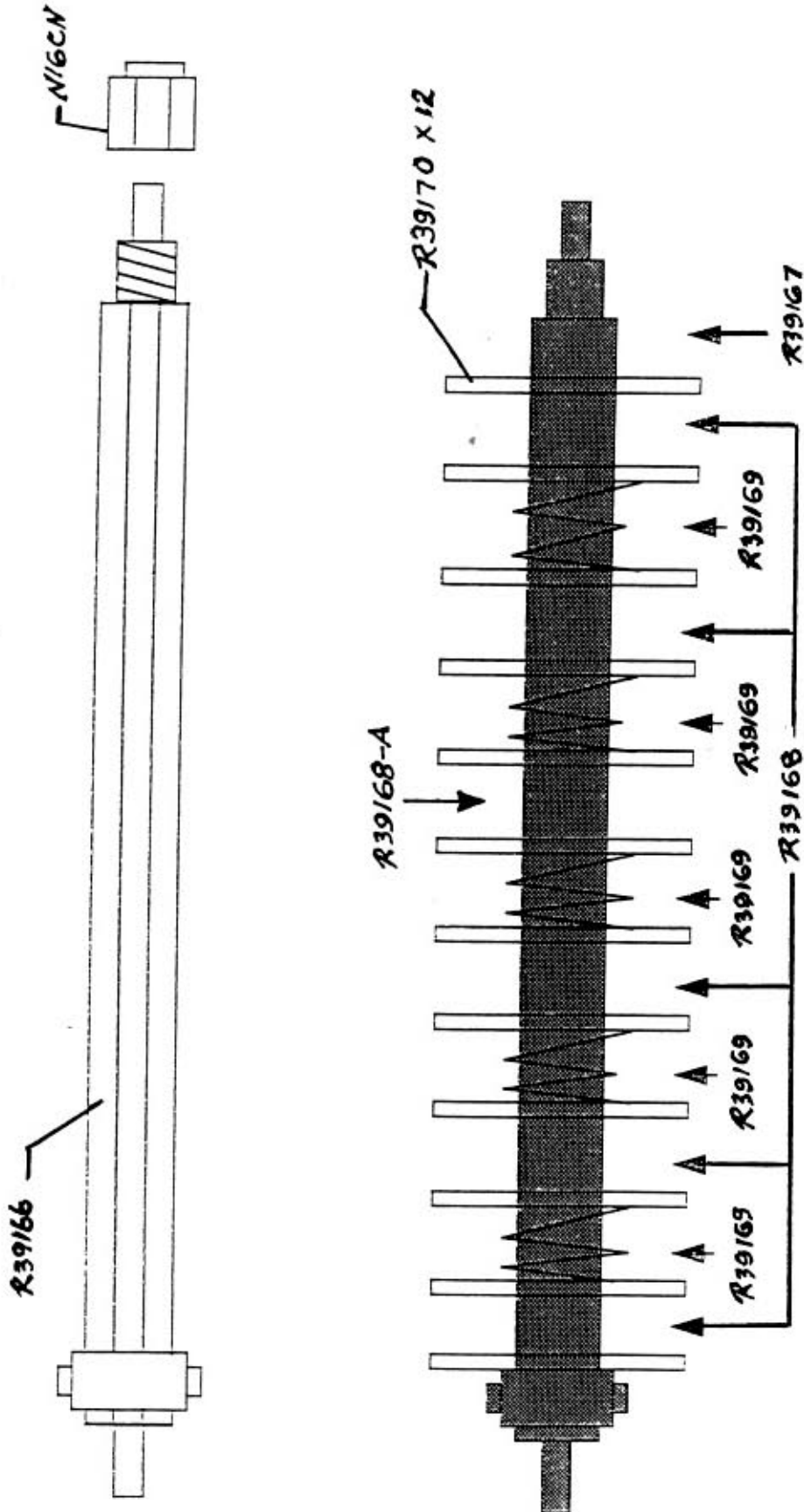
EXTERNAL BACK ELEVATION

TRANSMISSION & SELECTOR COMPONENTS

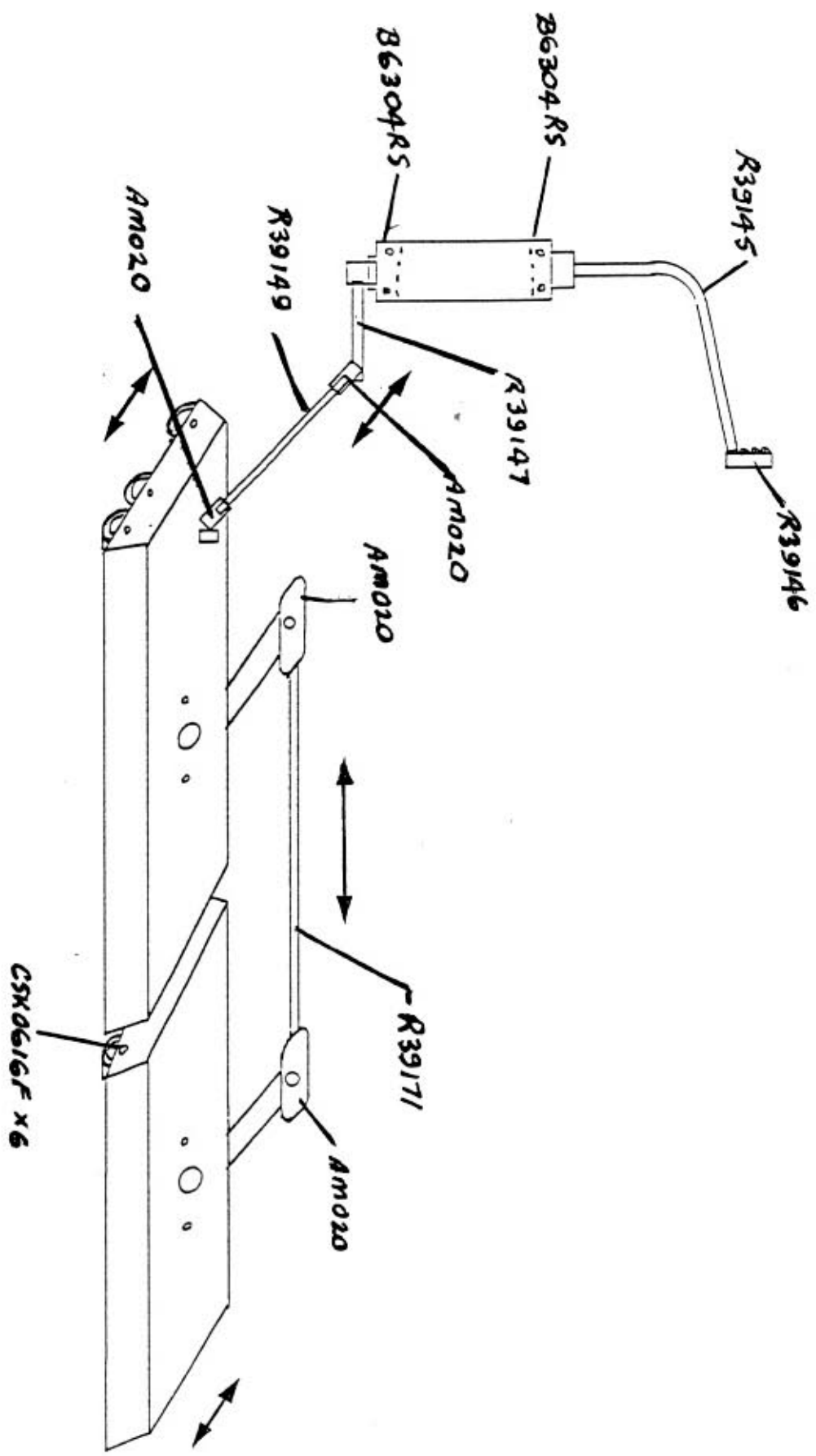




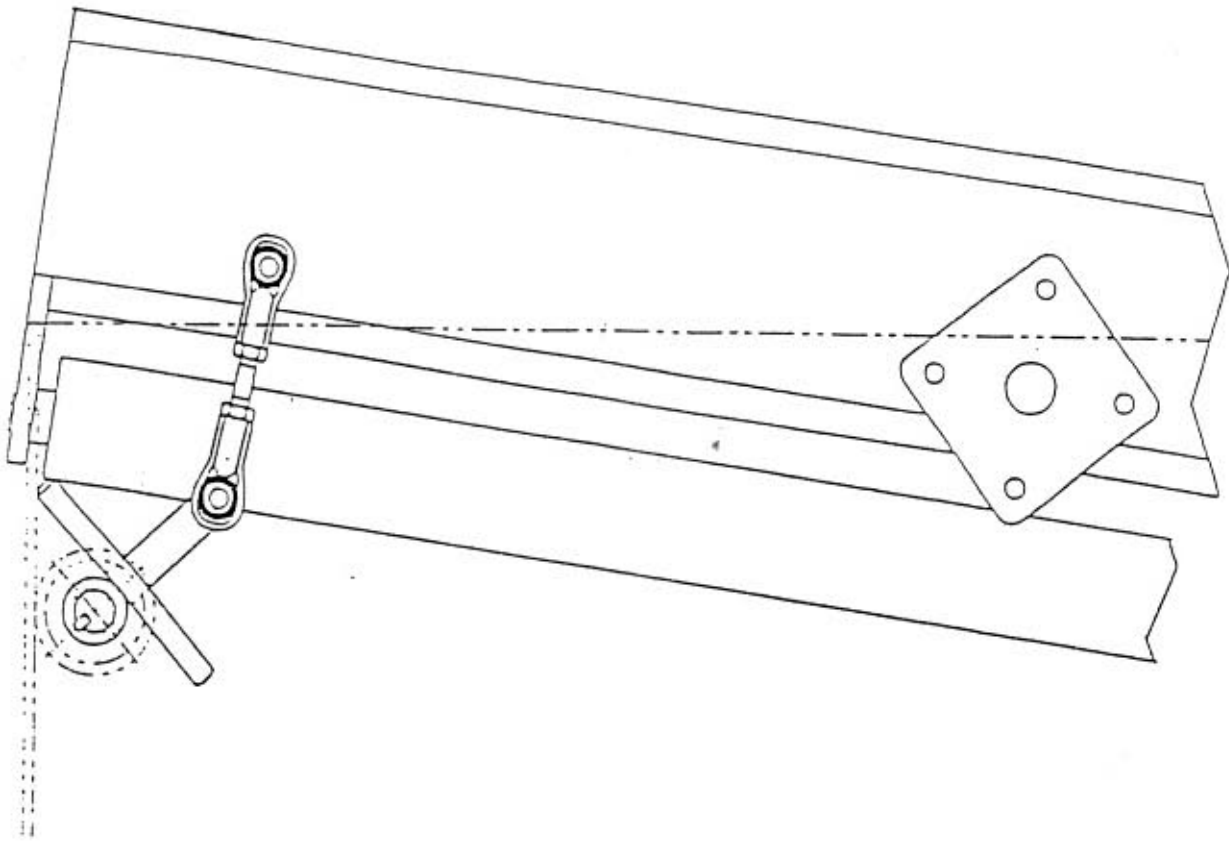
SLICER & COMPONENTS



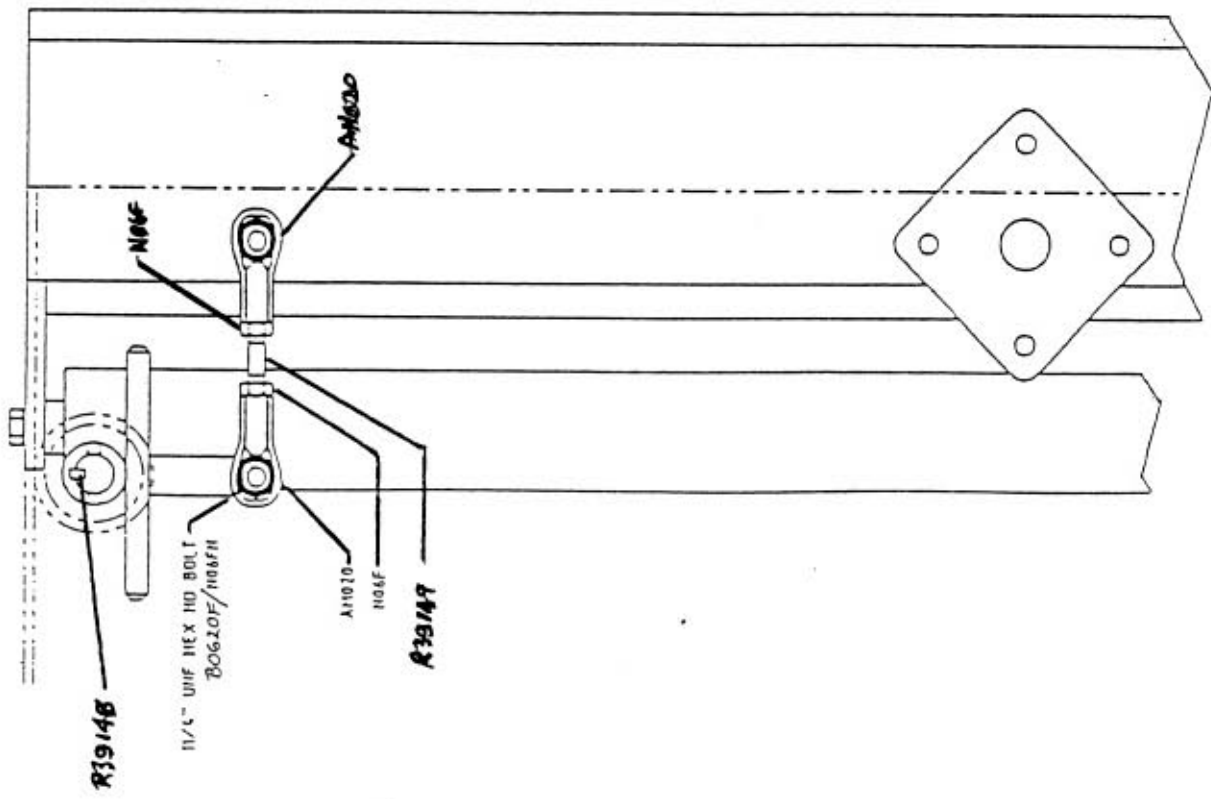
SLICER AXLE

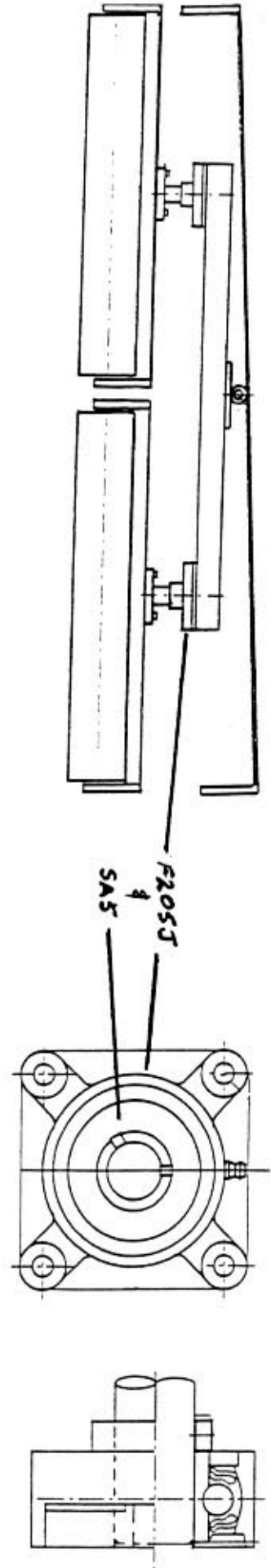
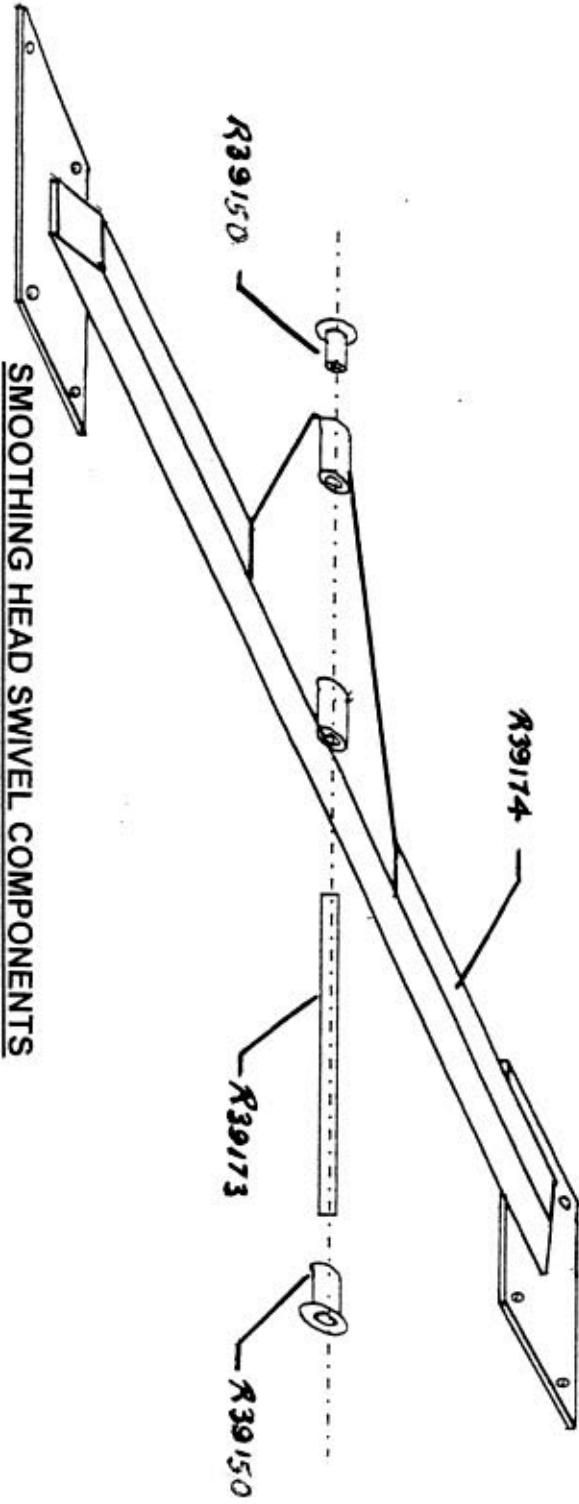


STEERING COMPONENTS

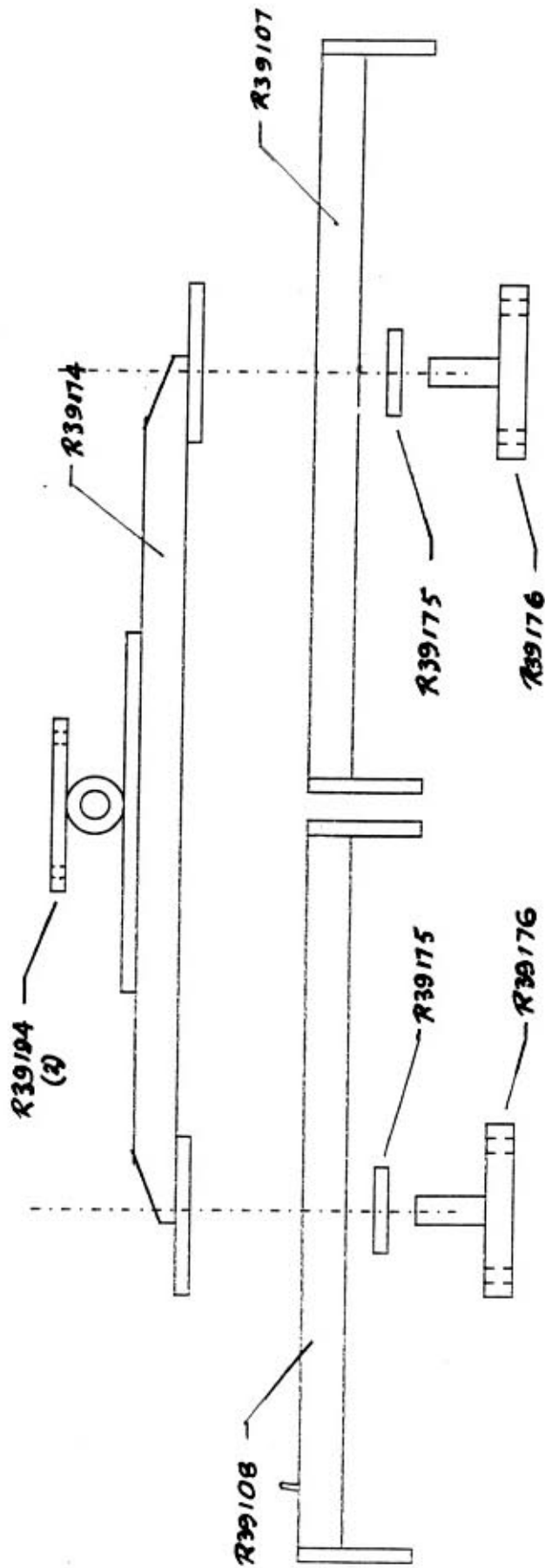


STEERING COMPONENTS



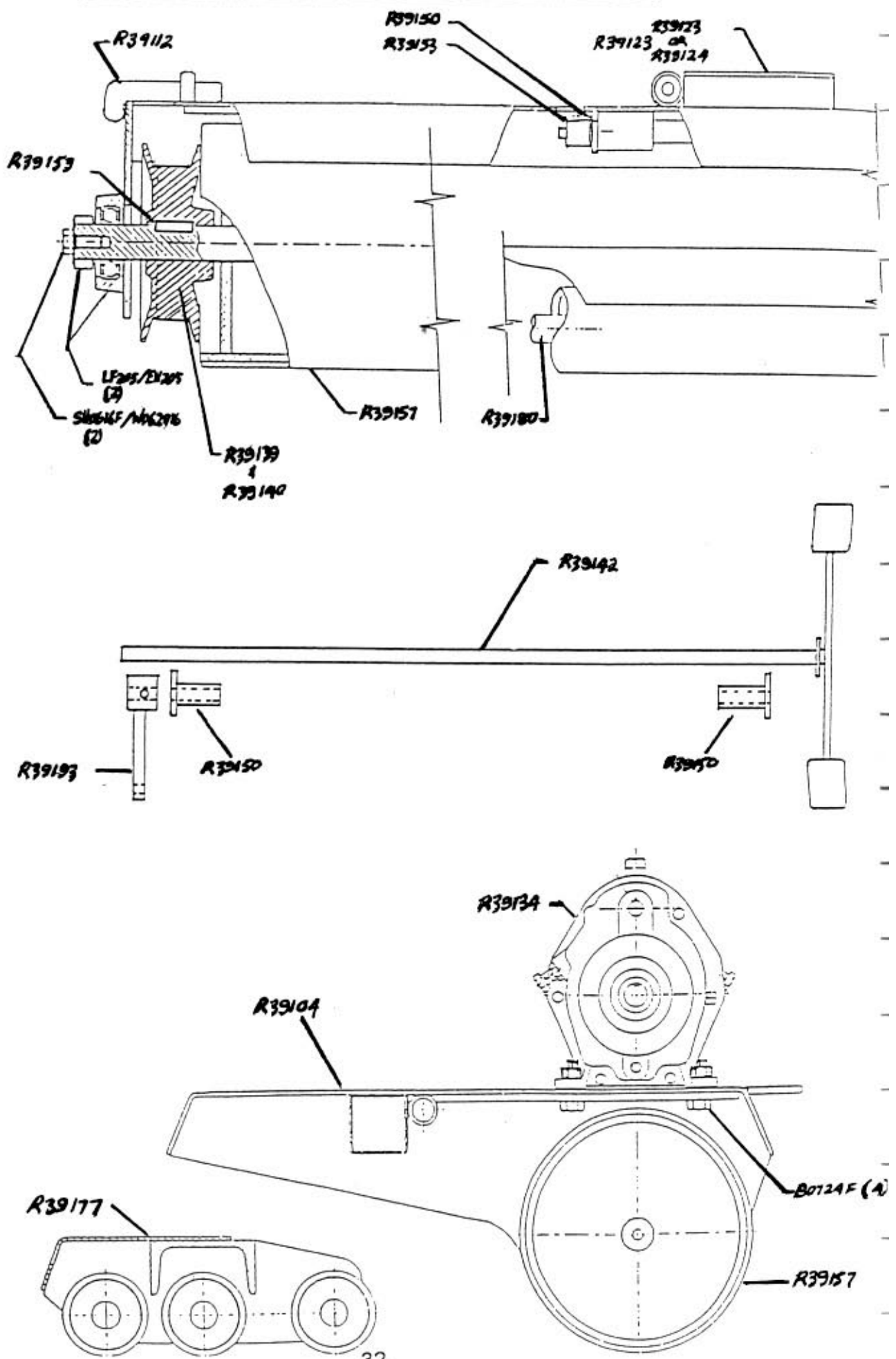


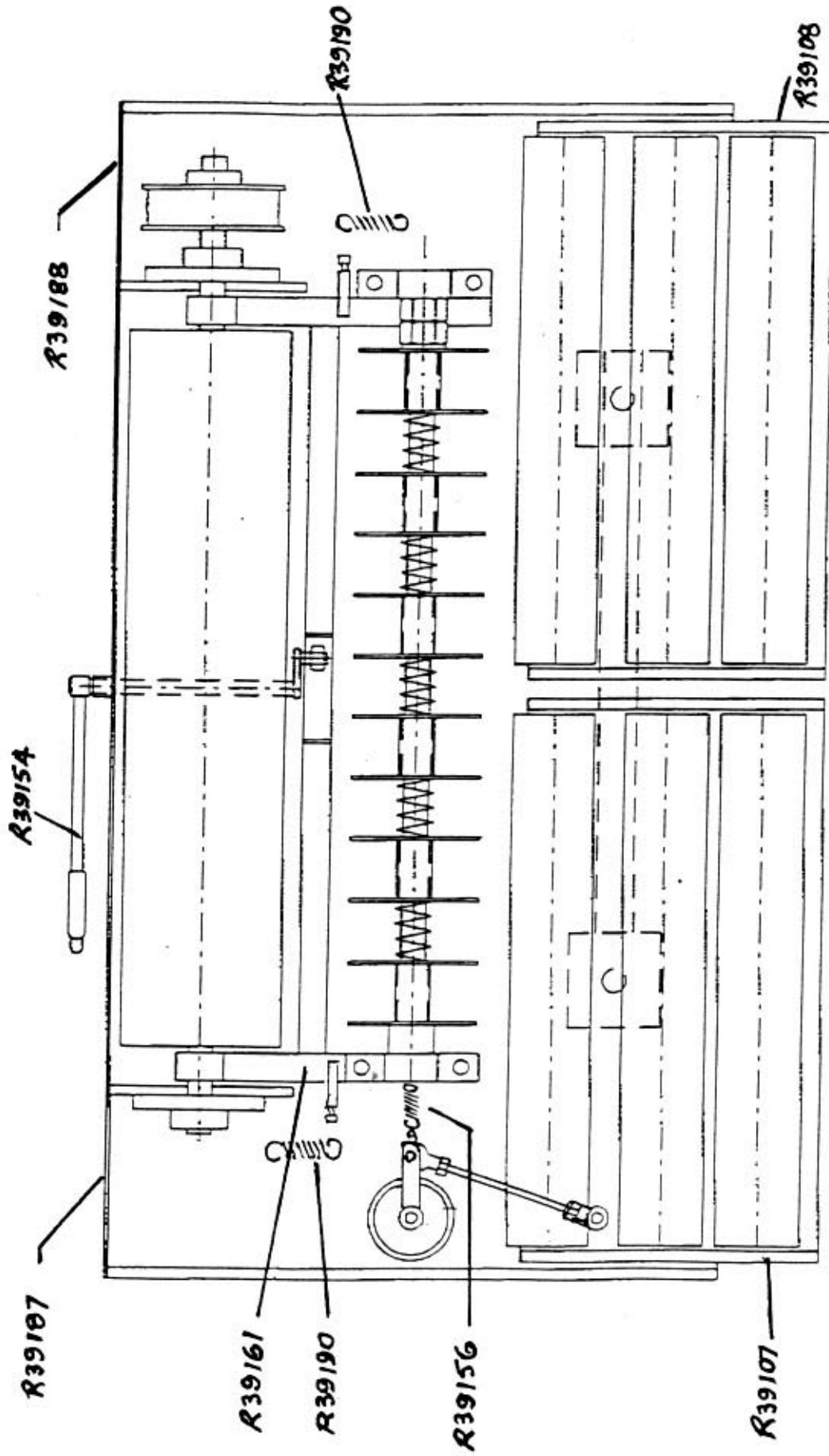




SMOOTHING HEAD SWIVEL

**MAIN FRAME, TRANSMISSION & SMOOTHING HEAD**

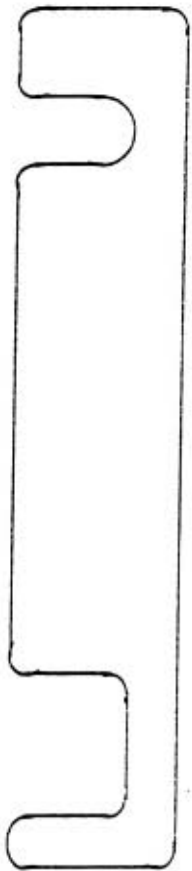




UNDERBODY

Honda Shim (Engine)

- 1 T39018-2
- 3
- 5



Order thickness required: - 2mm  
- 3 mm  
or - 5 mm

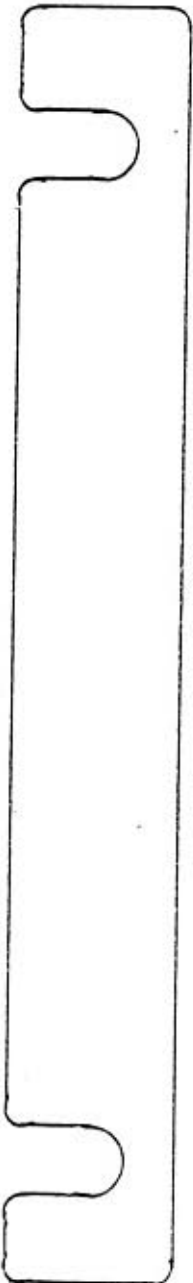
Vanguard Shim (Engine)

- 1 T39019-2
- 3
- 5

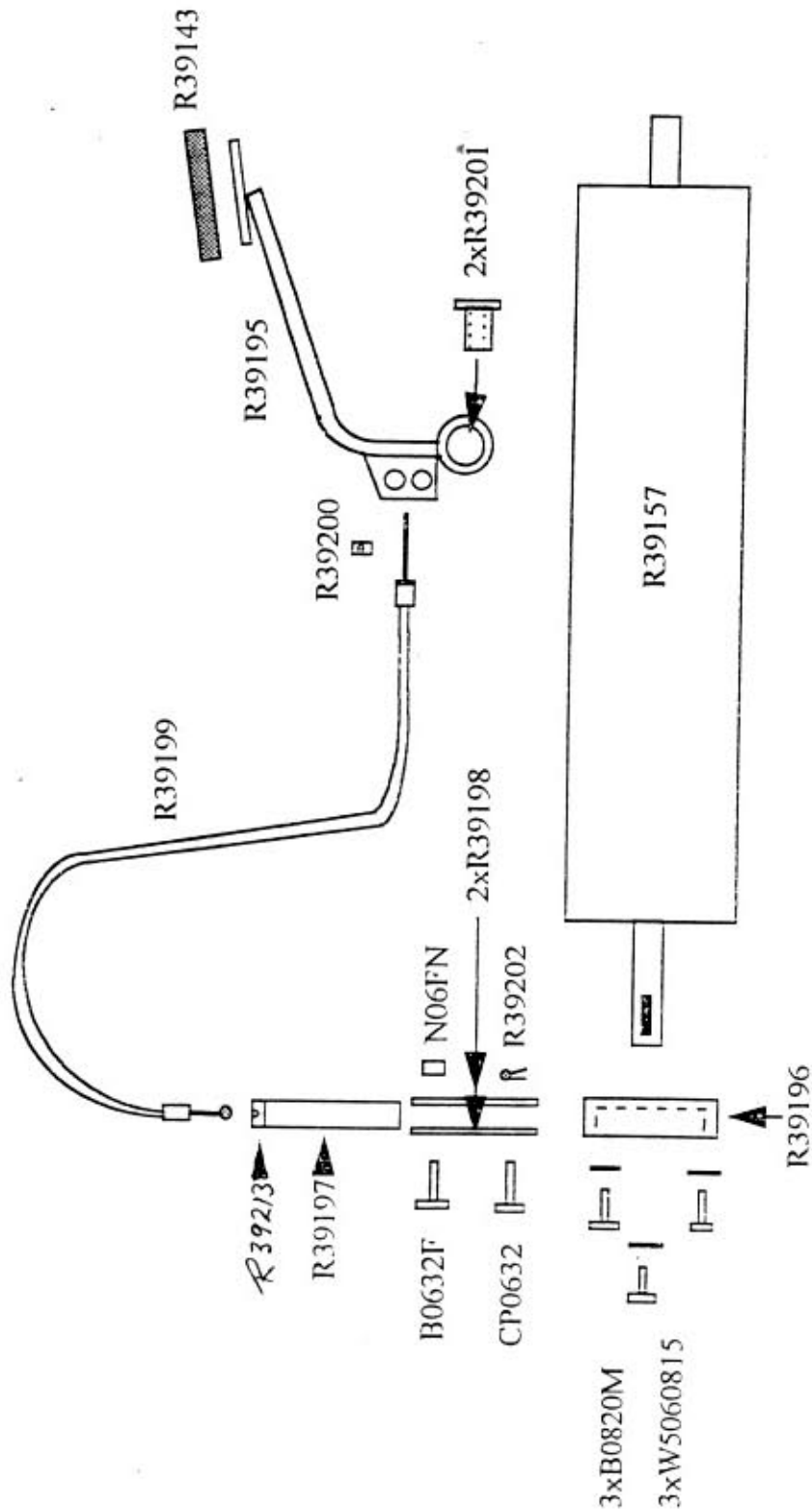


SNP'I Shim (Transmission)

- 1 T39020-2
- 3
- 5



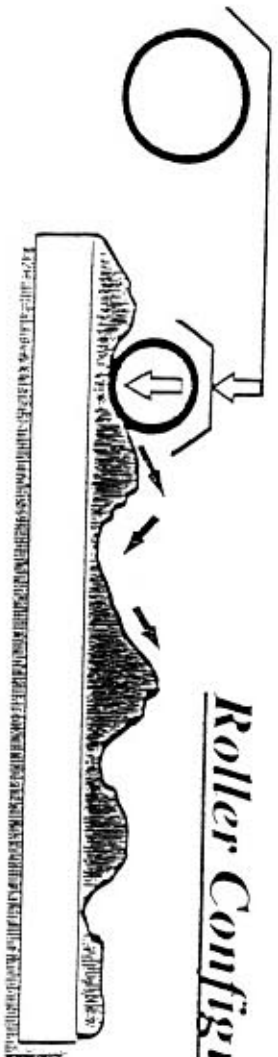
ENGINE & TRANSMISSION ADJUSTMENT SHIMS



BRAKE COMPONENTS

## Roller Configuration Comparison

1 Roller



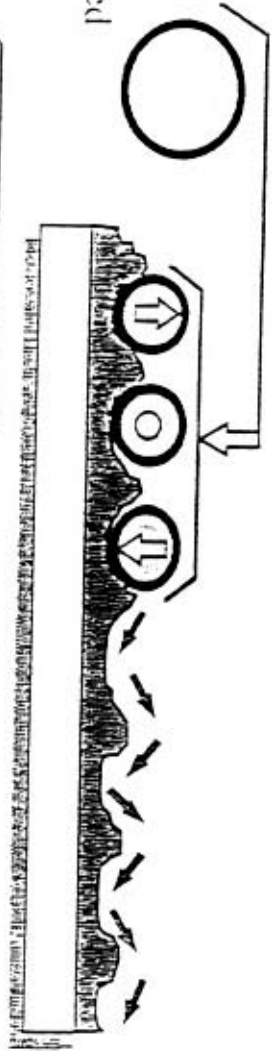
Follows contours,  
lumps & bumps  
**UNDESIRABLE**

2 Rollers



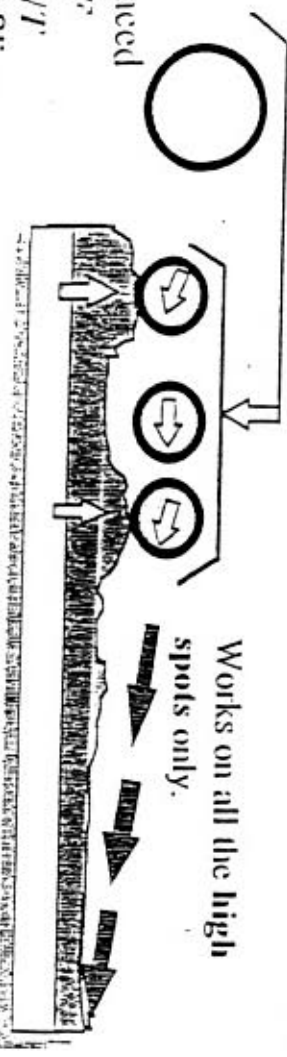
Follows contours,  
lumps & bumps  
**UNDESIRABLE**

3 Rollers  
Evenly spaced



Follows contours,  
lumps, bumps and  
produces a corrugation  
pattern across the  
greens surface.  
**UNDESIRABLE**

3 Rollers  
Unevenly spaced  
*TRU - TURF*  
*EQUIPMENT*  
RS48 Roll 'n' Slice



Works on all the high  
spots only.

More pressure on high spots only

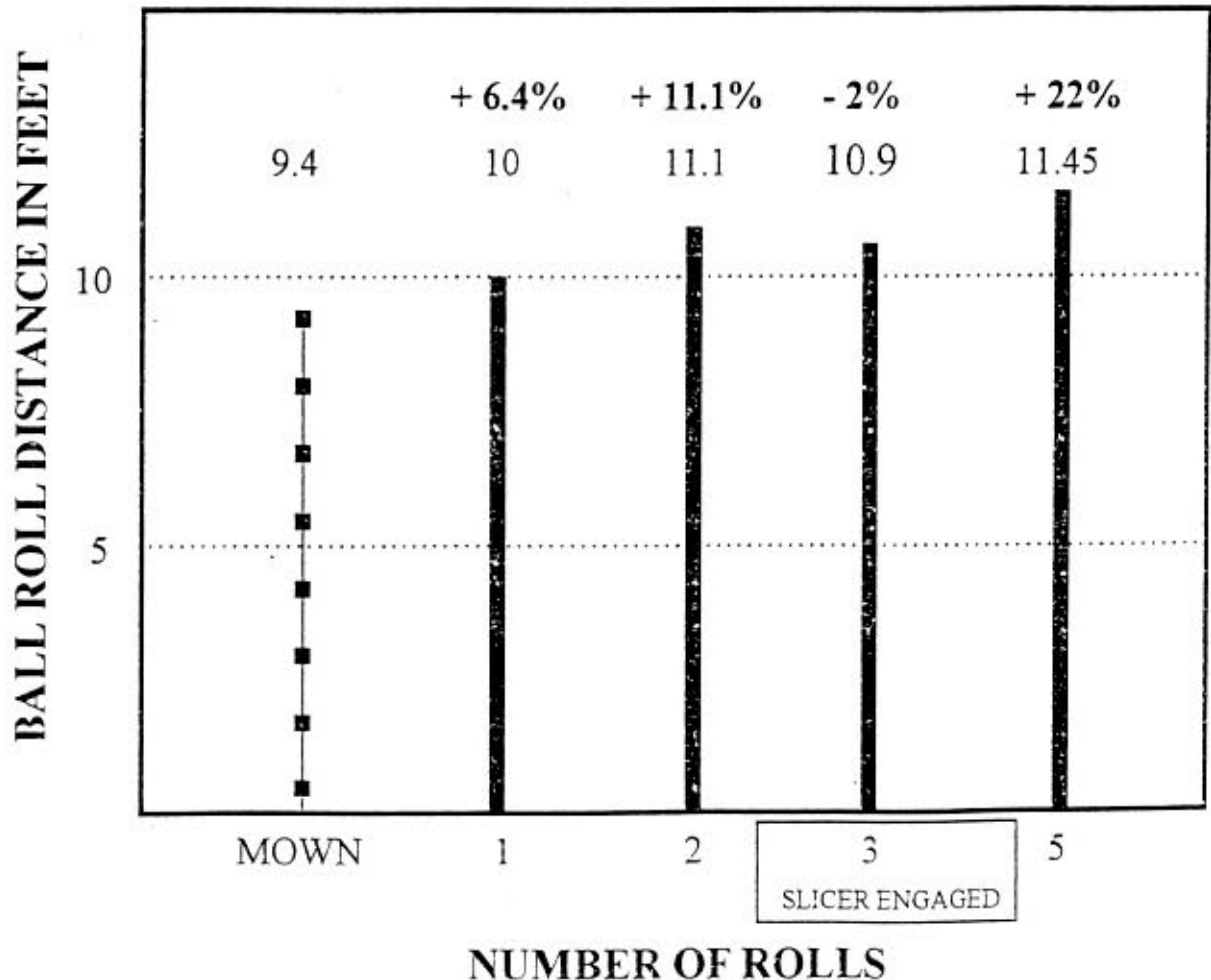
Eliminates bumps  
& lumps, creates a  
true surface trowelling  
away all the imperfections.  
**DESIRABLE**

**TEST RESULTS**

The following results are from a demonstration conducted at Hope Island Resort Golf Club prior to the Johnny Walker Classic by *TRU-TURF EQUIPMENT International Agencies*. The *TRU-TURF* rollers were used to prepare the golf greens for the tournament.

Superintendent - Paul Bevan  
 Date - Nov 1996 (Summer)  
 Grass type - SR 1020 Bent  
 Cut height - 3 mm  
 Time of test - Midday  
 Weather - Fine  
 Roller model - RS48 Roll 'n' Slice / GR39-USA

**STIMP METER READINGS**



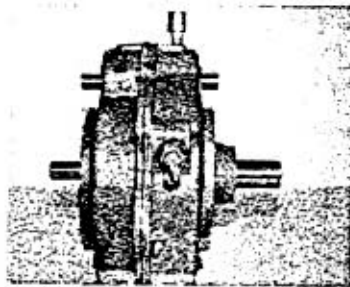
**SNPT**

*Snow-Nabstedt Power Transmissions*

**PARTS MANUAL**

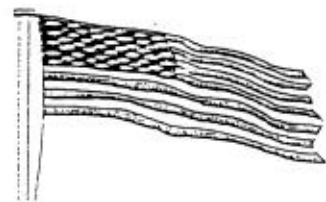
Effective September 1, 1997

U.S. Patent 2,370,484



Model#

***5101B***





## The Customer Commitment

*AS THE PRODUCT MANAGER OF SNOW-NABSTEDT POWER TRANSMISSIONS I OVER SEE ALL THE DAY TO DAY FUNCTIONS AND QUALITY OF EVERY TRANSMISSION SOLD. I CAN GIVE TO YOU MY PERSONAL GUARANTEE TO THE COMMITMENT AND PRIDE TAKEN BY ALL OUR EMPLOYEES IN BUILDING THE SNOW-NABSTEDT PRODUCT AND TO EVERY VALUED CUSTOMER. EVERY PERSON UNDERSTANDS THEIR JOB AND GOES THE EXTRA MILE TO INSURE TO YOU, THE CUSTOMER, A TOP QUALITY PRODUCT EVERY TIME.*

*THERE ARE TIMES WHEN A PART WEARS OUT, A CUSTOMER DOES NOT KNOW WHY THEIR TRANSMISSION IS SLIPPING OR WHAT TYPE OF OIL TO USE. THERE ARE MANY OTHER QUESTIONS YOU MAY HAVE. AS A COMMITMENT TO YOU SNOW-NABSTEDT SET UP A TECHNICAL SUPPORT LINE (1-800-641-5161 PAGER) FOR ALL OF THE SNOW-NABSTEDT PRODUCT USERS. THIS LINE IS AVAILABLE 24 HOURS, SEVEN DAYS A WEEK, 365 DAYS A YEAR TO ISSURE YOUR ABILITY TO PERFORM YOUR JOB PROPERLY. I OR ONE OF OUR HIGHLY EXPERIENCED PERSONEL WILL RETURN YOUR CALL PROMPTLY AND IN A COURTEOUS MANNER.*

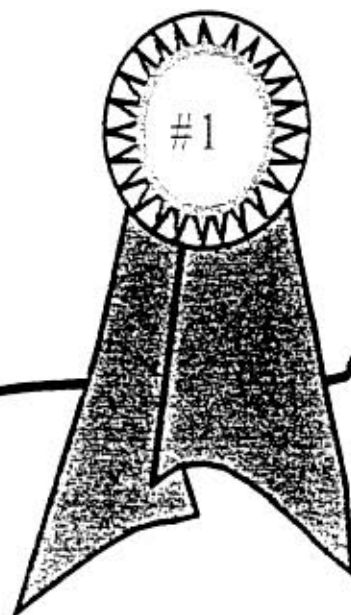
*IF YOU HAVE ANY COMMENTS, QUESTIONS OR PROBLEMS YOU CAN GIVE ME A CALL, LEE TACK, AT ANTYTIME TO DISCUSS WHATEVER YOU NEED. REMEMBER, ALL OF US HERE AT SNOW-NABSTEDT TAKE A GREAT DEAL OF PRIDE IN OUR PRODUCT TO INSURE YOUR CONFIDENCE IN US AND OUR PRODUCT. BECAUSE WE ALL UNDERSTAND THAT WE WOULD NOT BE HERE WITHOUT YOU.*

**"THE CUSTOMER."**

THANK YOU,



LEE A. TACK  
PRODUCT MANAGER



# SNPT

## WARRANTY

*SNOW-NABSTEDT POWER TRANSMISSION* Products are guaranteed to be made of first class material in a skillful and workmanlike manner. All transmissions are in perfect running order when they leave the factory. Every unit shipped must and is tested prior to shipment. They are guaranteed against any defective material or workmanship. Any part proven defective within twelve months from the date of shipment will be replaced free of charge, on return of such defective parts to *SNOW-NABSTEDT POWER TRANSMISSIONS*, transportation charges are the responsibility of the customer. No parts shall be returned without the express authorization of *SNOW-NABSTEDT POWER TRANSMISSIONS*.

There are no warranties, expressed or implied, except such warranties as are definitely set forth within. Any part of, or parts manufactured, altered or repaired by non-authorized personnel without written approval from *SNOW-NABSTEDT POWER TRANSMISSIONS* shall void all warranties set forth herein. Under no circumstances will *SNOW-NABSTEDT* be charged for labor to install parts furnished under warranty unless agreed to in advance by the Product Manager or another authorized personnel of *SNOW-NABSTEDT POWER TRANSMISSIONS*. Shipping charges on warranty parts shall be paid by the customer unless *SNOW-NABSTEDT POWER TRANSMISSIONS* agrees in advance to pay for them.

*SNOW-NABSTEDT POWER TRANSMISSIONS* shall in no event be held liable for any consequential damages or other delay caused by defective material. Equipment and accessories, including bearings, not manufactured by *SNOW-NABSTEDT POWER TRANSMISSIONS* are guaranteed only to the extent of the original manufacturer's guarantee.

*SNOW-NABSTEDT POWER TRANSMISSIONS* reserve the right to improve its products through changes in design or material without being obligated to incorporate such changes in product of prior manufacture.

## ADJUSTMENTS

The forward and reverse clutches are adjusted externally with the screw which projects from both sides of the housing. Adjust one clutch at a time. Loosen the jam nut. Turn in the adjustment bolt a fraction of a turn if more tension is desired. Turn out the adjustment bolt for less tension. Test the adjustment by moving the operations lever towards its respective adjustment bolt. Tighten the jam nut.

Do not tighten clutches excessively since this only increases the operating effort without improving clutch action and may result in damaged clutches. Occasionally, during cold weather operation, the clutches may slip even though correctly adjusted. In such a case the lubricant must be changed to a lighter grade as specified in the lubrication instructions.

**SNOW - NABSTEDT POWER TRANSMISSIONS**

# SNABST

## LUBRICATION



**Important:** All transmissions are shipped dry from our factory. Be sure to add oil before running.

If the transmission requires a shelf life of more than 60 days, completely fill the transmission with oil and allow to stand for 72 hours. Then, drain the transmission to its proper oil level. If practical, to insure long life, allow the transmission to run without load for approximately 60 minutes.

**Quality of Oil:** Use a good grade of non-detergent motor oil - SAE 30 above 32 degrees F, SAE 10 below 32 degrees F.

Fill the transmission to lubricating oil level hole on either side. Sometimes oil will follow the internal parts and flow out of the oil level holes before the transmission is filled to the appropriate level. Always make certain the transmission is completely filled to the oil level holes.

## OIL CHANGE



The transmission should be drained and refilled after the first 30 hours of operation.

After this, a change of oil should be done every 100 hours of operation or every six months, whichever comes first, for transmissions operating under favorable conditions.

Where operating conditions are severe, such as rapid rise and fall in temperature of the gear case with accompanied condensation on the inside walls and resulting formation of sludge, or where operation is in moist or dusty atmospheres, or in the presence of chemical fumes, it may be necessary to change the oil at intervals of one to three months.

## REPLACEMENT OF PARTS



Should it become necessary to replace any gear due to wear or breakage, the mating gears must be carefully examined for wear or cracks. If any doubt exists as to the condition of the mating gears they should be replaced.

The sintered bushings and needle bearings used in this transmission required special assembly and sizing tools as specified by respective manufacturers. Therefore, the replacement of these parts should not be attempted unless proper equipment is available.

- 1.) Anytime the housings are opened, a new gasket should be used when re-assembling the transmission.
- 2.) All replacement parts should be purchased from SNOW-NABSTEDT to insure proper operating function of transmissions.

# SEINFELT

## Snow-Nubstedt Power Transmissions

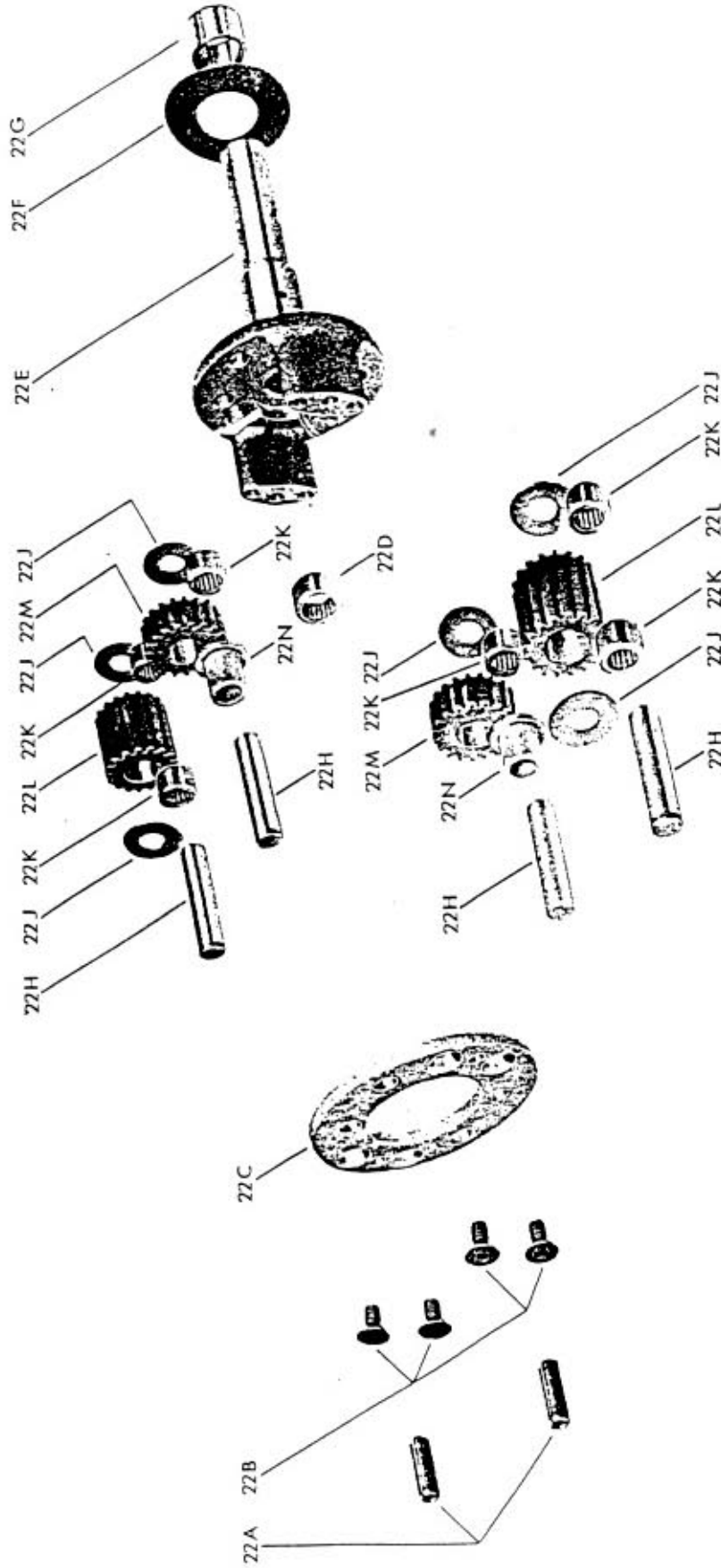


Figure # 2

JX-5104 Gear Cage Assembly

Parts are identified by reference number. See parts list for correct part number



# Snow-Nubstedt Power Transmissions

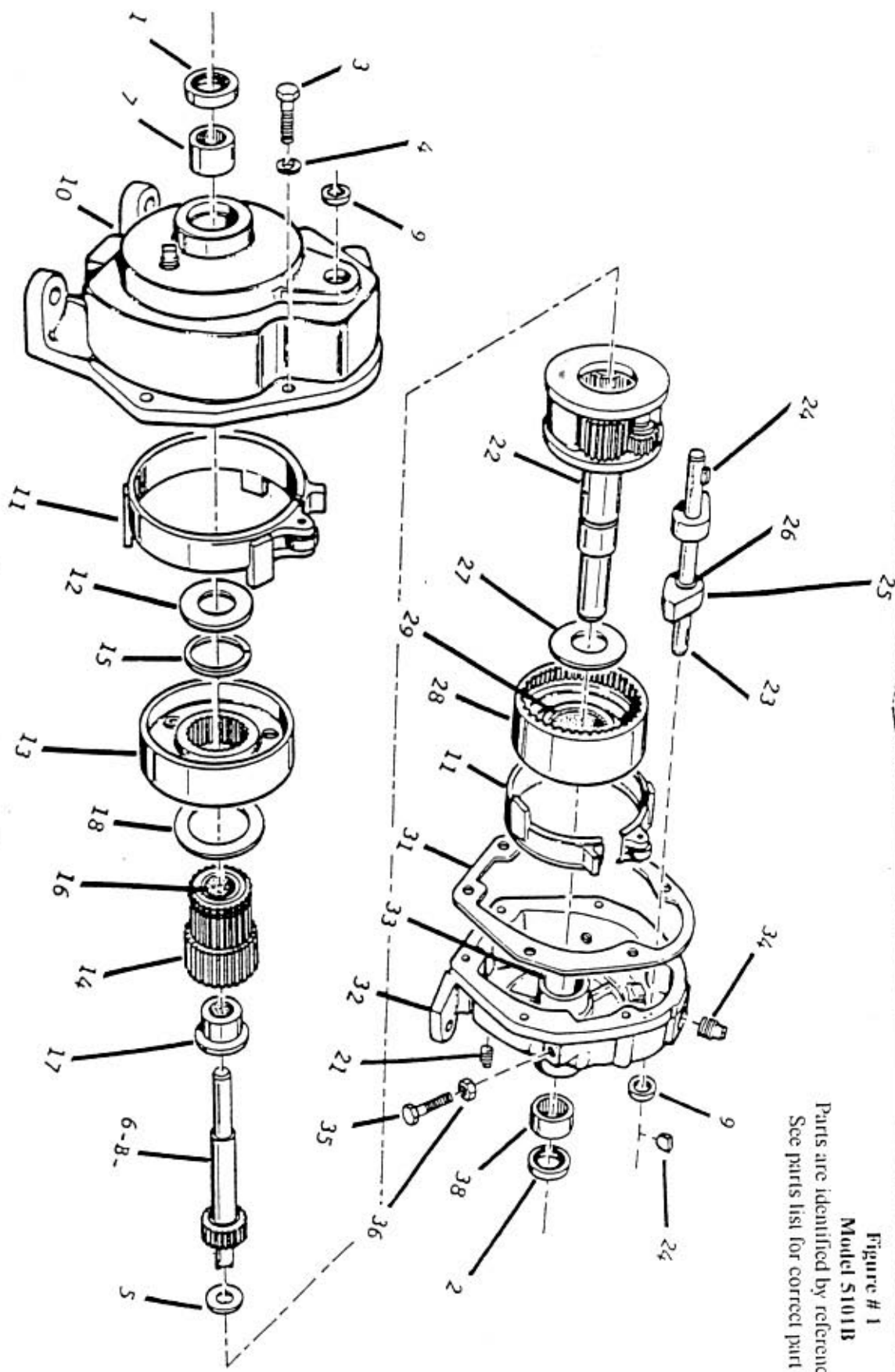


Figure # 1  
Model 5101B  
Parts are identified by reference number.  
See parts list for correct part number.



# Snow-Nubstedt Power Transmissions

MAXIMUM HORSEPOWER	10
MAXIMUM OPERATING SPEED CONTINUOUS	3000 R.P.M.
INTERMITTENT	3600 R.P.M.
MAXIMUM INPUT TORQUE	200 IN.LBS.
REDUCTION RATIO BOTH DIRECTIONS	2.47:1
LUBRICANT	SAE 30

THIS UNIT MAY BE REVERSED FREQUENTLY AND UNDER LOAD AT ANY SPEED.

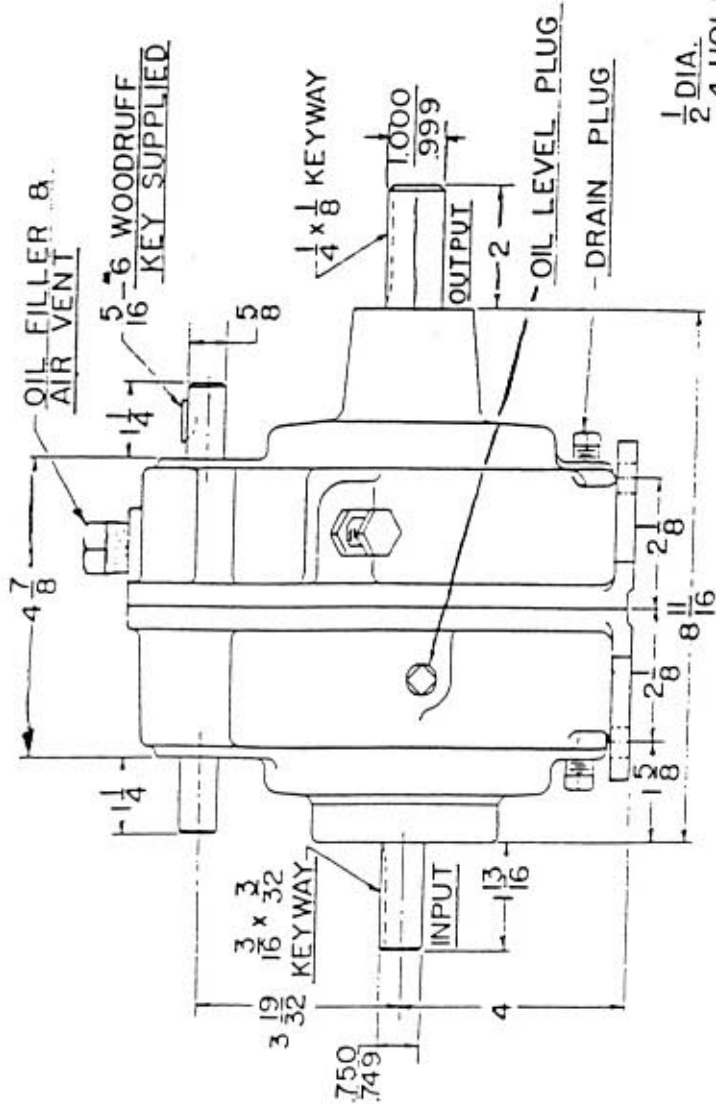
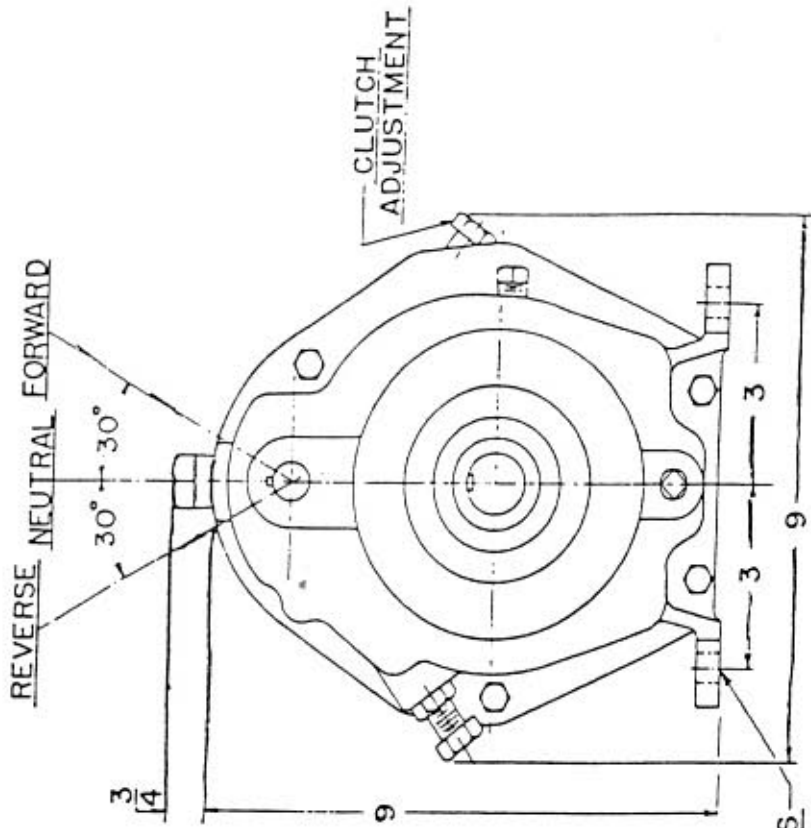


Figure #3  
5101B Installation Drawing

# SNPT

## 5101B PARTS LIST

No.	Part Number	Description	Qty.	No.	Part Number	Description	Qty.
1	2076	Oil Seal	1	Sub-Assembly List for 3X-5104 Gear Cage Assembly Item 22, Figure # 2			
2	20186	Oil Seal	1				
3	2607	Screw	6				
4	1302	Lockwasher	6				
5	6273	Bushing	1				
6	26-5109	Input Shaft	1	22A	7101	Roll Pin	2
7	10736	Bearing	1	22B	9403	Screw	4
9	20187	Oil Seal	2	22C	3-5104	Gear Cover	1
10	30-51027	Input Housing	1	22D	10238	Bearing	1
11	5x-5104	Brake Band Assembly	2	22E	48-5106	Output Shaft	1
12	8TF-5101	Washer	1	22G	10237-2	Bearing	1
13	8A-5102	Flat Drm	1	22H	7938	Dowel Pin	4
14	8-5102	Gear	1	22J	9E-5105	Washer	6
15	50142	Snap Ring	1	22K	10495	Bearing	6
16	6272	Bushing	1	22L	9-5103	Long Pinion	2
17	26A-5101	Spacer	1	22M	9A-5103	Short Pinion	2
18	8TR-5101	Washer	1	22N	6271	Bushing	2
21	2101	Pipe Plug	3				
22	3X-5104	Gear Cage Assmby	1				
23	27A-5106	Cross Shaft	1				
24	1228	Key	3				
25	10-5104	Cam	2				
26	5061	Snap Ring	2				
27	8TR-5134	Washer	1				
28	7A-5106	Gear Drum	1				
29	6268	Bushing	1				
31	31A-5105	Gasket	1				
32	30-5106	Output Housing	1				
33	6267	Bushing	1				
34	30H-5105	Breather (Umbrella)	1				
35	4527	Screw	2				
36	1703	Nut	2				
38	10237-1	Bearing	1				

*Snow-Nabstedt Power Transmissions*

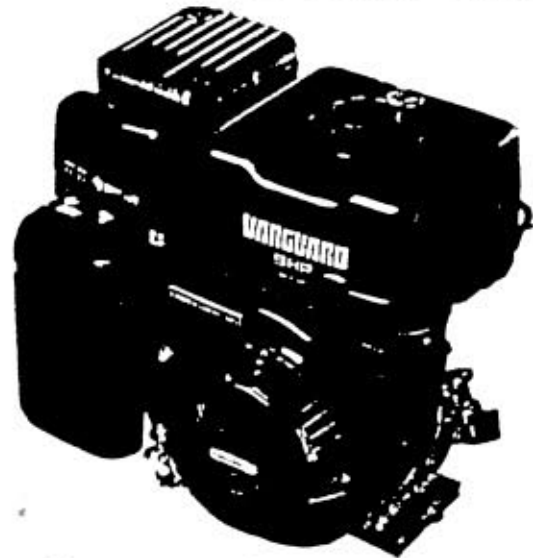
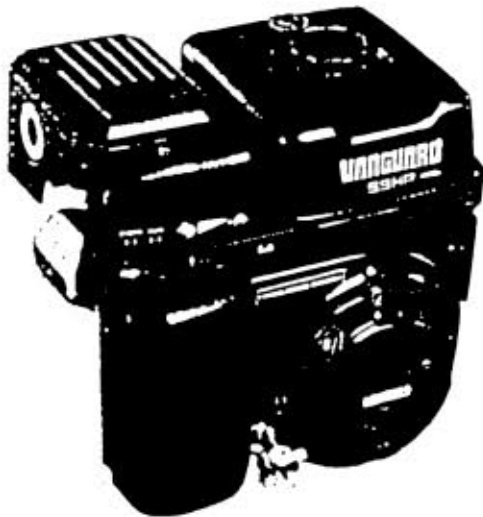
**BRIGGS & STRATTON**

**VANGUARD 6 H.P.**

**ENGINE**

**OWNERS MANUAL**





For future reference, write numbers here. See page 8 for location of your engine Model/Type/Code.

Model \_\_\_\_\_ Type \_\_\_\_\_ Code \_\_\_\_\_


Table of Contents


In the Interest of Safety .....	1	Adjustments .....	5
Oil & Fuel Recommendations .....	2	Maintenance .....	6
Before Starting .....	3	Service & Storage .....	9
Starting and Stopping .....	4	Warranty .....	10

Briggs & Stratton Corporation  
Milwaukee, Wisconsin 53201


FORM NO. 272690-4/93  
PRINTED IN U.S.A.

## In the Interest of Safety

 This symbol means safety alert which indicates that a message involves personal safety. Death, personal injury and/or property damage may occur unless instructions are followed carefully.


-  DO NOT run engine in an enclosed area. (Exhaust gases contain carbon monoxide, an odorless and deadly poison.)  
DO NOT place hands or feet near moving or rotating parts.  
DO NOT store, spill, or use gasoline near an open flame, nor near an appliance like a stove, furnace, or water heater that uses a pilot light or can create a spark.  
DO NOT refuel indoors or in unventilated area.  
DO NOT remove fuel tank cap nor fill fuel tank while engine is hot or running. (Allow engine to cool 2 minutes before refueling.)  
DO NOT operate engine if gasoline is spilled or when smell of gasoline is present or other explosive conditions exist. (Move equipment away from spill and avoid any ignition until gasoline has evaporated.)  
DO NOT transport engine with fuel in tank.  
DO NOT choke carburetor to stop engine. (Whenever possible, gradually reduce engine speed before stopping.)  
DO NOT tamper with governor springs, links or other parts to increase engine speed. (Run engine at speed set for equipment manufacturer.)


Note: The important safety instructions appearing in this manual are not meant to cover all possible conditions and situations that may occur. It must be understood that common sense, caution and care are factors which are not built into an engine, but are supplied by the person(s) maintaining and operating it.

 You are not ready to operate this engine if you have not read and understood the following safety items. Read this entire owner's manual and the operating instructions of the equipment this engine powers.

 **WARNING**












- DO NOT check for spark with spark plug removed. (Use an approved tester.)
- DO NOT crank engine with spark plug removed. (If engine is flooded, place throttle in FAST and crank until engine starts.)
- DO NOT strike flywheel with a hammer or hard object as this may cause flywheel to shatter in operation. (Use correct tools to service engine.)
- DO NOT operate engine without a muffler. (Inspect periodically and replace if worn or leaking. If engine is equipped with muffler deflector, inspect periodically and, if necessary, replace with correct deflector.)
- DO NOT operate engine with an accumulation of grass, leaves or other combustible material in muffler area.
- DO NOT use this engine on any forest covered, brush covered, or grass covered unimproved land unless a spark arrester is installed on muffler. (Spark arrester must be maintained in working order by operator.)
- DO NOT touch hot muffler, cylinder, or fins which can cause burns.
- DO NOT start engine with air cleaner or air cleaner cover removed (or cover over carburetor air intake, if Sno/Gard engine).

-  **PREVENT ACCIDENTAL STARTING** by removing spark plug wire when servicing engine or equipment. Disconnect negative wire from battery terminal if equipped with electric starting system.  
**KEEP** cylinder fins and governor parts free of dirt, grass and other debris which can affect engine speed.  
**PULL** starter cord slowly until resistance is felt. Then pull cord rapidly to avoid kickback and prevent hand or arm injury.

 **WARNING**

- USE** fresh gasoline. Stale fuel can gum carburetor and cause leakage.
- CHECK** fuel lines and fittings frequently for cracks or leaks. Replace if necessary.
- Use only Genuine Briggs & Stratton Parts** or their equivalent. The use of replacement parts which are not of equivalent quality may damage the engine.

INTERNATIONAL SYMBOLS

 Read Owner's Manual	 Fuel	 On/Off	 Stop	 Fuel Shut-off	 Choke	 Slow
 Safety alert Symbol	 Fuel	 Stop	 Primer	 Fast	 Air Cleaner	

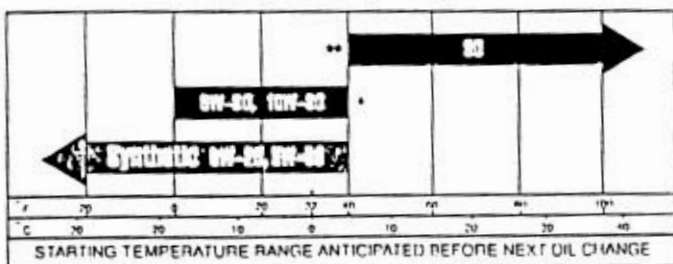
# Oil & Fuel Recommendations

## OIL

Note: Engine is shipped from Briggs & Stratton without oil.  
**Before starting engine**, check oil as shown below.

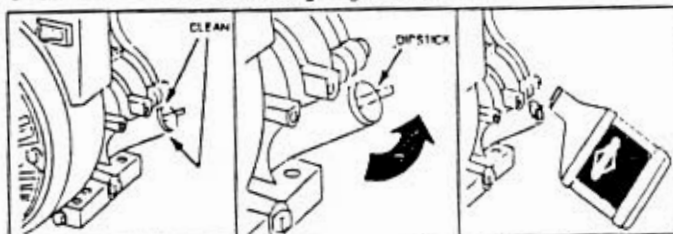
Change and add oil according to chart below. Do not over-fill.  
 Use a high quality detergent oil classified "For Service SD, SE, SF, SG," such as Briggs & Stratton "warrantly certified" SAE 30 oil, part no. 100005 or 100028. Use no special additives with recommended oils.  
 Do not mix oil with gasoline.

### SAE Viscosity Grades



- \* Air cooled engines run hotter than automotive engines. Use of multi-viscosity oils (10W-30, etc.) above 40° F (4° C) will result in high oil consumption and possible engine damage. Check oil level more frequently if using these types of oils.
- \*\* SAE 30 oil, if used below 40° F (4° C), will result in hard starting and possible engine bore damage due to inadequate lubrication.

Check oil level before starting engine. Add oil as shown below:

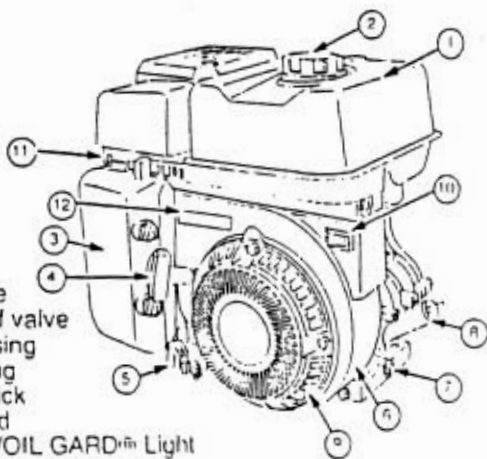


Place engine level  
Clean around oil fill

Remove dipstick

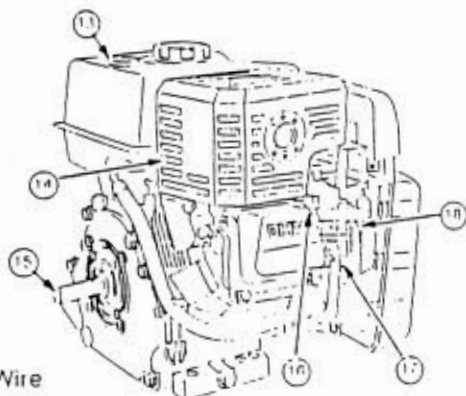
Pour oil slowly

## Before Starting



1. Fuel Tank
2. Fuel Fill
3. Air Cleaner
4. Rope Handle
5. Fuel Shut-off valve
6. Blower Housing
7. Oil Drain Plug
8. Oil Fill/Dipstick
9. Finger Guard
10. Stop Switch/OIL GARD™ Light
11. Throttle and Choke Controls

Engine Model	Type	Code
xxxxx	xxxx xx	xxxxxxxxx



13. Fuel Gage
14. Muffler
15. Crankshaft
16. Spark Plug Wire
17. Fuel drain
18. Carburetor

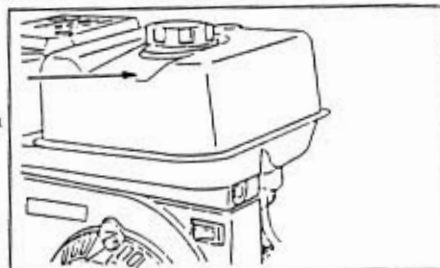
## FUEL

This engine will operate satisfactorily using any automobile gasoline. Use clean, fresh, lead-free gasoline with a minimum of 85 octane. (Leaded gasoline may be used if it is commercially available, and if lead-free is not available.) Purchase fuel in quantity that can be used within 30 days. See **STORAGE INSTRUCTIONS**, page 9.

Do not mix oil with gasoline.

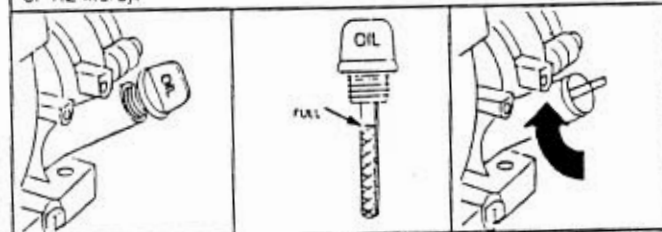
Note: We do not recommend using gasoline which contains alcohol, such as gasohol. If gasoline with alcohol is used (such as oxygenated or MTBE Ethanol fuel additives), it must contain less than 10% Ethanol and must be removed from engine during storage. Do not use gasoline which contains Methanol.

Do not over-fill.  
 Allow space in fuel tank for fuel expansion.



Fuel level

Oil capacity of Model Series 115400 is about 3/4 quart (24 ounces or .7 liter).  
 Oil capacity of Model Series 185400 is about 1-1/4 quarts (41 ounces or 1.2 liters).



Do not screw in dipstick to check oil

Fill to FULL mark on dipstick - recheck

Tighten dipstick firmly before starting

### TIPS TO OBTAIN BEST STARTING RESULTS

Start, store and fuel equipment with engine in level position.



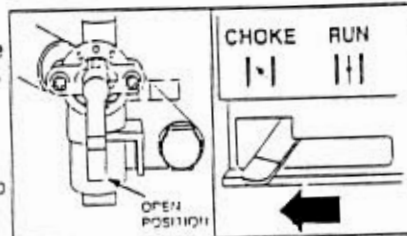
Do not use a pressurized starting fluid. Starting fluid is flammable. Severe engine damage or fire may occur.

A warm engine requires less choking than a cold engine.

Slightly richer fuel mixture usually improves cold starting (below 40° F). See **CARBURETOR ADJUSTMENTS**, page 5.

### Fuel Shut-off Valve

Turn fuel shut-off valve 1/4 turn to OPEN position.



### Choke engine

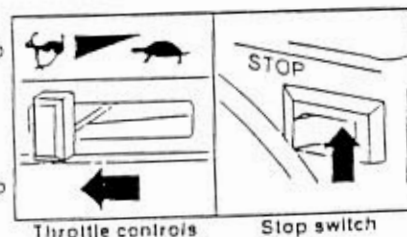
Move choke control to CHOKE position.

### Set throttle control

Move throttle control to FAST position.

### Stop switch

Push rocker stop switch to ON position.



### Oil Gard (optional)

Oil gard light in stop switch warns of low oil level. If light flickers and engine cannot be started, or has stopped and cannot be restarted, oil must be added. Fill to FULL mark on dipstick. Do not over-fill.

# Maintenance Schedule

Follow the hourly or calendar intervals, whichever occur first. More frequent service is required when operating in adverse conditions noted below.

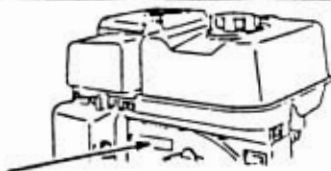
Maintenance Operation	Every 8 Hours or Daily	25 Hours or Every Season	50 Hours or Every Season	100 Hours or Every Season	Yearly
Check Oil Level	•				
Change Oil •			Note 1		
Change Oil (Gear Reduction)				•	
Service Pre-Cleaner		Note 2			
Service Air Cleaner Cartridge (if dual element)				Note 2	
Clean fuel filter			•		
Replace or Clean Spark Plug				•	
Clean Cooling System				Note 2	
Check valve clearance					•
Remove combustion deposits					•

See any Authorized Briggs & Stratton Service Dealer and Insist On Genuine Briggs & Stratton parts! Non-original copies may not perform as well and may void your warranty.

Briggs & Stratton recommends these Genuine Briggs & Stratton maintenance parts

Part	Briggs & Stratton Part No.
Air cleaner cartridge (115400) .....	494511
Air cleaner pre-cleaner (115400) .....	495240
Air cleaner cartridge (185400) .....	710268
Air cleaner pre-cleaner (185400) .....	710268
Resistor spark plug .....	491055
Spark tester .....	19368
Oil .....	100005 or 100028
Gas additive (stabilizer) .....	5041

• Change oil after first 5 hours, then after every 50 hours or every season.  
 Note 1: Change oil every 25 hours when operating under heavy load or in high temperatures.  
 Note 2: Clean more often under dusty conditions or when airborne debris is present. Replace air cleaner parts, if very dirty.



Look here for engine Model/Type/Code. This assures fast service & correct parts.

To obtain a complete Parts List of Genuine Briggs & Stratton Parts for your engine, fill in your engine Model/Type/Code numbers below, and print your name and address on the other side.

Your Engine: Model                      Type                      Code

\_\_\_\_\_

Cut out and send (with \$2) to: Briggs & Stratton Corporation  
 P.O. Box 1144  
 All. Service Division                      Milwaukee, WI 53201-1144

## Service & Storage

### FOR SERVICE

See an Authorized Briggs & Stratton Service Dealer. Each one carries a stock of Genuine Briggs & Stratton Parts and is equipped with special service tools. Trained mechanics assure expert repair service on all Briggs & Stratton engines. Only dealers advertising as "Authorized Briggs & Stratton" are required to meet Briggs & Stratton standards.



You may locate your nearest Authorized Briggs & Stratton Service Dealer in the "Yellow Pages" directory under "Engines, Gasoline" or "Gasoline Engines," or "Lawn Mowers" or similar category. There are over 30,000 Authorized Service Dealers worldwide available to serve you.

Note: Working Engines logo and "Yellow Pages" are registered trademarks in various jurisdictions.

The illustrated shop manual shown here includes "Theories of Operation," common specifications and detailed information covering adjustment, tune-up and repair of Briggs & Stratton, single cylinder, 4 cycle engines. It is available from an Authorized Briggs & Stratton Service Dealer or you can order it from the factory. Write: Briggs & Stratton Corporation, P. O. Box 1144, Milwaukee, WI 53201. Attention: Service Division.



Part No. 272147

### STORAGE INSTRUCTIONS

Engines stored over 30 days need to be protected or drained of fuel to prevent gum from forming in fuel system or on essential carburetor parts.



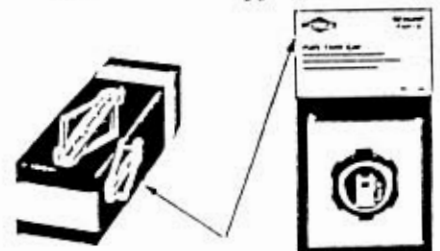
- For engine protection, we recommend use of Briggs & Stratton Gasoline Additive, Part No. 5041, available from any Authorized Briggs & Stratton Service Dealer. Mix Additive with fuel in fuel tank or storage container. Run engine for a short time to circulate Additive through carburetor. Engine and fuel can be stored up to 24 months.

Note: If Additive is not used or if engine is operating on gasoline containing alcohol, such as gasohol, remove all fuel from tank and run engine until it stops from lack of fuel.

- While engine is still warm, drain oil from crankcase (see page 6). Refill with fresh oil of recommended grade (see chart on page 2).
- Remove spark plug and pour about 1/2 oz (15 ml) of engine oil into cylinder. Replace spark plug and crank slowly to distribute oil.
- Clean dirt and chaff from cylinder, cylinder head fins, blower housing, rotating screen and muffler areas (see page 7).
- Store in a clean and dry area, but NOT near a stove, furnace or water heater which uses a pilot light or any device that can create a spark.



Only Genuine Briggs & Stratton Parts have the Briggs & Stratton logo!



Look for Briggs & Stratton logo stamped on part and/or package!

Name \_\_\_\_\_  
 Address \_\_\_\_\_  
 City, State, Zip \_\_\_\_\_

# Maintenance

See *Maintenance Schedule*, page 8. Follow the hourly or calendar intervals, whichever occur first. Note that more frequent service is required when operating in adverse conditions.

## TO PREVENT ACCIDENTAL STARTING



Remove spark plug wire when servicing engine or equipment.

## AIR CLEANER

Note: Service according to *Maintenance Schedule*.

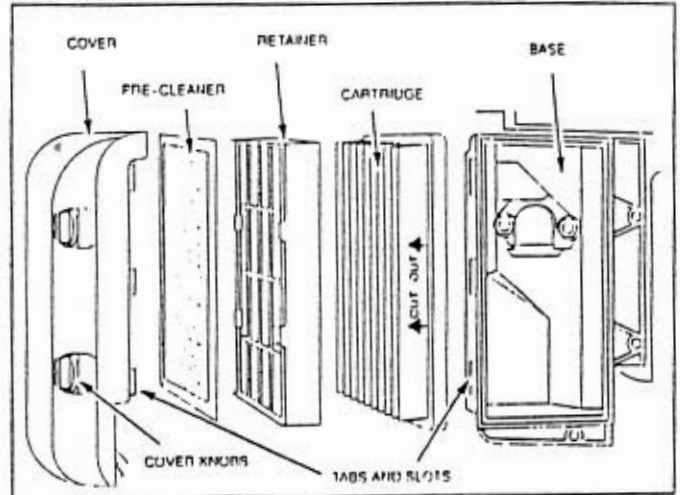
1. Loosen cover knobs and remove cover with air cleaner assembly.
2. Remove cartridge from cover, then retainer and pre-cleaner.

To service pre-cleaner, wash in liquid detergent and water. Squeeze dry in a clean cloth. Saturate in engine oil. Squeeze in clean, absorbent cloth to remove ALL EXCESS oil. If pre-cleaner is very dirty or damaged, replace.

To service cartridge, clean by tapping gently on a flat surface. If very dirty or damaged, replace it. Do not oil cartridge.

Note: Do not use petroleum solvents, e.g., kerosene, nor pressurized air to clean cartridge. They will cause cartridge to deteriorate.

3. Reassemble pre-cleaner on retainer. Place in cover with pre-cleaner mesh side toward cartridge. Place cartridge in retainer in cover.
4. Insert cover tabs into base slots. Tighten knobs securely.



Dual air cleaner

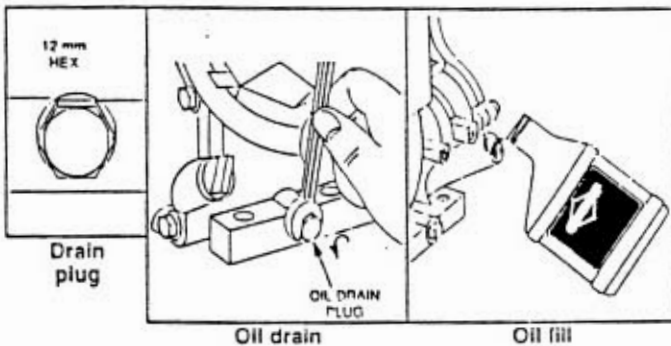
## OIL

Check oil level regularly.

Be sure correct oil level is maintained. Check every 8 hours or daily, before starting engine. See Check oil level on page 2.

Change oil (Follow *Maintenance Schedule*.)

Change oil after first 5 hours of operation. Change oil while engine is warm. Refill with new oil of recommended grade (see chart, page 2).



Oil drain

Oil fill

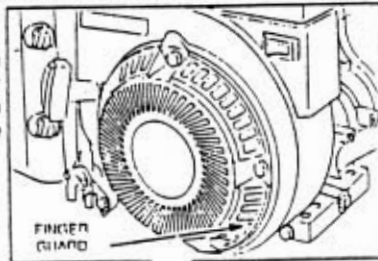
# Maintenance

See *Maintenance Schedule*, page 8. Follow the hourly or calendar intervals, whichever occur first. Note that more frequent service is required when operating in adverse conditions.

## KEEP ENGINE AND PARTS CLEAN

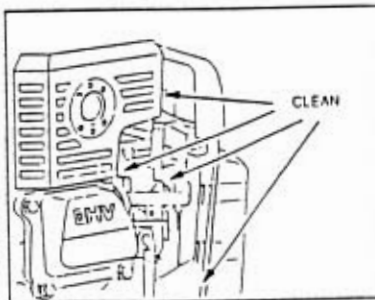
Remove dirt and debris with a cloth or brush. Do not clean with a forceful spray of water because water could contaminate fuel system.

Remove grass and chaff from finger guard every 8 hours or daily (more often if needed) to prevent engine damage caused by overheating.



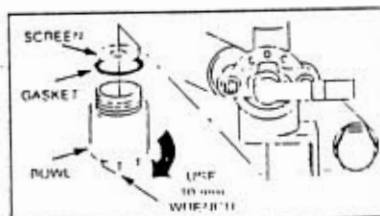
Finger guard

To assure smooth operation, keep governor linkage, springs and controls free of debris.



Linkage, springs & controls

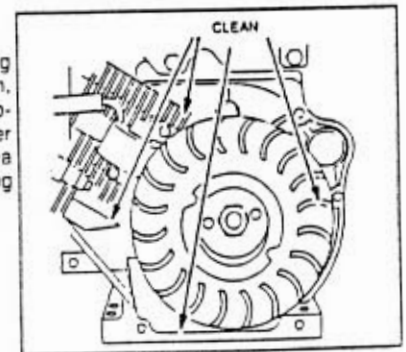
Daily or more often, before running engine, clean muffler area to remove all grass and combustible debris.



Fuel filter

Clean fuel filter every 50 hours.

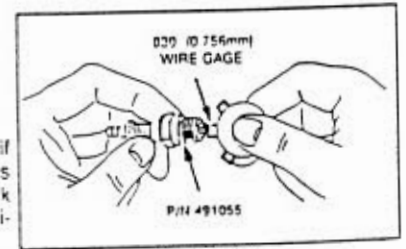
Grass, chaff or dirt may clog engine's air cooling system, especially after prolonged operation. Remove blower housing and clean area shown to prevent overheating and engine damage.



Cooling system

Replace spark plug.

Arcing can occur if wire terminal does not fit firmly on spark plug. Reform terminal if necessary.




Spark plug


Use only Briggs & Stratton Spark Tester, P/N 19368, to check for spark.

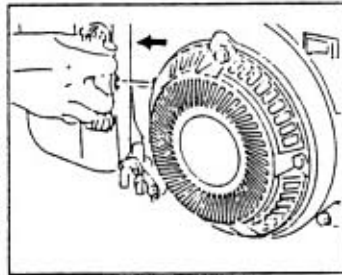
# Starting & Stopping

## START ENGINE

 ALWAYS KEEP HANDS AND FEET CLEAR OF MOWER BLADE OR OTHER ROTATING MACHINERY.

### Rewind starter

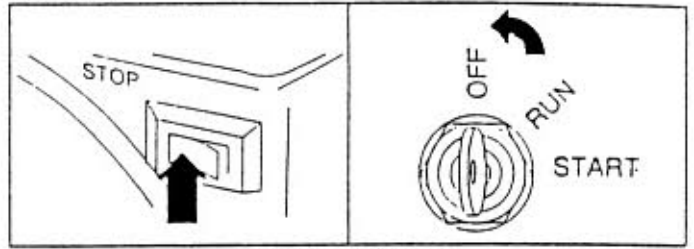
 Grasp rope handle as illustrated and pull slowly until resistance is felt. THEN PULL ROPE RAPIDLY TO OVERCOME COMPRESSION, PREVENT KICKBACK AND START ENGINE. Repeat if necessary with choke in RUN and throttle in FAST positions. When engine starts, operate in FAST position.



Rewind starter

## STOP ENGINE

Do not move choke control to CHOKE to stop engine. Backfire or engine damage may occur. Move throttle control to IDLE or SLOW position. Then push rocker stop switch, or turn key, to STOP or OFF position. Always remove key from switch when equipment is not in use or left unattended.

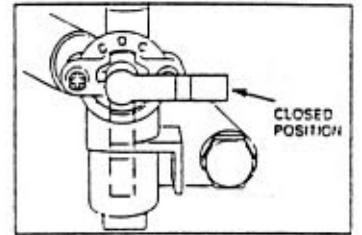


Typical stop controls

### Fuel Shut-off Valve

Turn fuel shut-off valve 1/4 turn to CLOSED position.


Note: Close fuel shut-off valve when transporting or not operating equipment to prevent fuel leakage.



Fuel Shut-off

# Adjustments

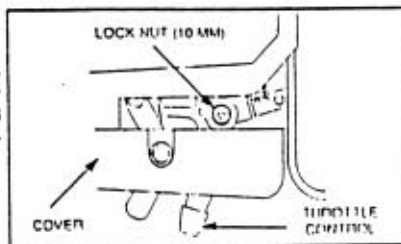
## CONTROL ADJUSTMENTS

 TO PREVENT ACCIDENTAL STARTING Remove spark plug wire, when adjusting controls.



### Manual friction throttle control

If adjustment is required, loosen or lighten lock nut until throttle control moves easily, but stays in set position.



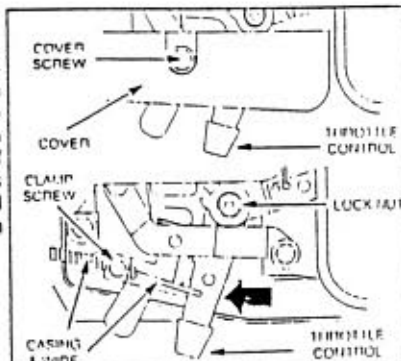
Manual friction throttle control

### Adjustable governor control

Adjustable governor control has been set to permit top no-load RPM specified by equipment manufacturer. If adjustment is required, consult any Briggs & Stratton Authorized Service Dealer or the manufacturer of your equipment.


### Remote throttle control

If adjustment is required, loosen cover screw and remove cover. Then loosen clamp screw. Move throttle control, casing and wire in direction of arrow to end of travel. (Be sure lock nut is loose.) Move throttle control to FAST position. Tighten clamp screw.



Remote throttle control

## CARBURETOR ADJUSTMENTS

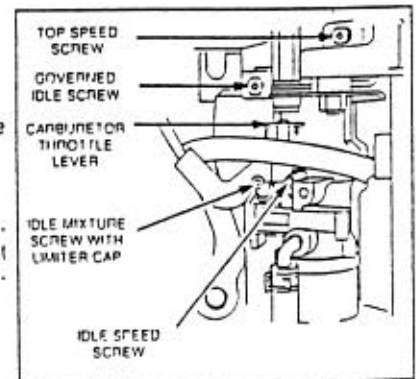
 The manufacturer of the equipment on which this engine is installed specifies the top speed at which the engine will be operated. DO NOT EXCEED this speed.

Differences in fuel, temperature, altitude or load may require minor carburetor adjustment. Air cleaner and air cleaner cover must be assembled to carburetor before starting engine.

### Adjustment screws

Adjust in this order:

1. Idle speed screw.
2. Idle mixture screw, (DO NOT remove limiter cap.)
3. Governed idle screw.
4. Top speed screw, (If adjustment is required, see equipment manufacturer's specifications.)



Carburetor adjustments

### Adjustment

Start and warm up engine (approximately 5 minutes) prior to adjustment. Place throttle control in IDLE or SLOW position. Rotate carburetor throttle lever clockwise and hold against idle speed screw. Turn idle speed screw to obtain 1300 RPM. While still holding carburetor throttle lever against idle speed screw, turn idle mixture with limiter cap screw clockwise (lean) or counterclockwise (rich) until engine runs smoothly. Release carburetor throttle lever.

Adjust governed idle screw to 1400 RPM. Move throttle control to FAST position. Engine should accelerate smoothly. If it does not, readjust carburetor, usually to a slightly richer mixture by turning idle mixture screw 1/8 turn counterclockwise.

Stratton Service Dealer. For prompt attention, your Dealer will need to know the engine model, type and code numbers, the trouble experienced and the total number of hours the engine was run.

**BRIGGS & STRATTON WARRANTY COVERS ONLY DEFECTIVE MATERIAL AND/OR WORKMANSHIP.**

Briggs & Stratton Corporation welcomes the opportunity to make justified warranty repairs by any of its Authorized Service Dealers. In most instances, the requests for warranty repair are handled in a quick and routine manner. However, some requests for warranty are received which appear not justified. In these cases, though engine owners may not be aware of it, the premature failure of their engine was caused by abuse or neglect, or equipment on which it was mounted, rather than the engine.

If you differ with the decision of your Authorized Service Dealer, an investigation will be made to determine the applicability of warranty. Ask the Authorized Service Dealer to submit all supporting facts to the Factory for review. If the Factory decides that your claim is justified, you will be fully reimbursed for those items accepted as defective. To avoid misunderstanding which might occur between engine owners and Authorized Briggs & Stratton Service Dealers, we list below some of the causes of engine failure that Briggs & Stratton warranty does not cover for repair or replacement.

**Normal Wear:** Engines, like all mechanical devices, need periodic parts service and replacement to perform well. Warranty will not cover repair when normal use has exhausted the life of a part or an engine.

**Improper Maintenance:** Remember that the service life of an engine depends upon the conditions under which it operates and the care it receives. Some applications, such as tillers, pumps and rotary mowers, are very often used in dusty or dirty conditions which can cause what appears to be premature wear. Such wear, when caused by dirt, dust, spark plug cleaning grit or other abrasive material that has entered the engine because of improper maintenance, is not covered by warranty.

**Warranty does not apply to engine adjustment or repair required due to:**

1. THE USE OF PARTS THAT ARE NOT ORIGINAL BRIGGS & STRATTON PARTS OR PARTS NOT APPROVED BY BRIGGS & STRATTON.
2. Equipment controls or installations that prevent starting, cause unsatisfactory engine performance, or shorten engine life. (Contact equipment manufacturer.)

3. Damage to engine caused by use of contaminated fuel, or other damage, caused by using contaminated or stale fuel. (Use clean, fresh, lead-free gasoline and Briggs & Stratton gasoline stabilizer.)
4. Parts which are scored or broken because an engine was operated with insufficient or contaminated lubricating oil, or an incorrect grade of lubricating oil. (4 cycle engines: check oil level daily or after every 8 hours of operation. Refill when necessary and change at recommended intervals. (2 cycle engines: use correct mixture of gasoline and BIA/NMMA certified oil.) Read owner's manual.
5. Repair or adjustment of associated parts or assemblies such as clutches, transmissions, remote controls, etc., which are not of Briggs & Stratton manufacture.
6. Damage or wear to parts caused by dirt which entered the engine because of improper air cleaner maintenance, re-assembly or using a non-original air cleaner element. (At recommended intervals, clean and re-oil the oil-foam element or the foam pre-cleaner and replace the cartridge.)
7. Parts damaged by over-speeding or overheating caused by grass, debris or dirt plugging the cooling fins and clogging the flywheel area, or caused by operating the engine in a confined area without sufficient ventilation (Clean fins on the cylinder, cylinder head and flywheel at recommended intervals.)
8. Engine or equipment parts broken by excessive vibration caused by loose engine mounting, loose cutter blades, unbalanced blades or impellers, improperly attaching equipment to engine crankshaft, over-speeding or abuse in operation.
9. A bent or broken crankshaft, caused by striking a solid object with the cutter blade of a rotary lawn mower, or excessive vee belt tightness.
10. Routine tune-up or adjustment needed by an engine but not caused by defective material nor workmanship (Follow the "Owner's Manual" when making any minor adjustments.)
11. Failure of the combustion chamber valves, valve seats, valve guides or burned starter motor windings, which occur when operating an engine with alternate fuels such as, liquified petroleum, natural gas, altered gasolines, etc.

**Warranty is available only through service dealers which have been authorized by the Briggs & Stratton Corporation. Your nearest Authorized Service Dealer is listed in the "yellow pages" of your telephone directory, under "engines, gasoline" or "gasoline engines," "lawn mowers" or similar category.**

Briggs & Stratton Engines Are Made Under One Of Nine Of The Following Patents (Group U 247,177 (Other Patents Pending))												
5 077 343	5 046 373	5 022 495	4 995 357	4 979 916	4 919 593	4 633 556	4 430 984	4 205 522	4 181 206	4 048 788	4 013 105	3 970 913
5 070 851	5 040 614	5 014 897	4 986 278	4 915 060	4 817 577	4 610 498	4 414 903	4 210 509	4 178 874	4 048 787	4 011 513	3 959 854
5 070 829	5 040 503	5 014 605	4 984 543	4 908 218	4 745 895	4 622 935	4 414 934	4 233 534	4 160 808	4 037 309	4 009 818	3 961 724
5 058 514	5 018 127	5 009 208	4 977 819	4 895 159	4 720 618	4 529 090	4 372 433	4 233 043	4 160 298	4 031 872	4 003 180	3 928 906
5 058 542	5 038 064	5 017 573	4 973 877	4 899 069	4 719 622	4 520 298	4 375 253	4 205 737	4 090 345	4 023 550	3 991 152	3 955 904
5 050 371	5 031 587	5 007 398	4 971 219	4 875 418	4 671 792	4 512 499	4 352 235	4 189 040	4 098 636	4 014 302	3 981 289	3 951 273
5 018 502	5 021 204	4 998 956	4 971 001	4 823 752	4 681 917	4 453 597	4 315 885	4 188 930	4 055 898	4 014 195	3 971 353	

**Superseding Warranty  
BRIGGS & STRATTON ENGINE WARRANTY POLICY  
effective September 1, 1992  
Replaces all updated previous Warranties and all Warranties  
dated before September 1, 1992**

When warranty repair is justified, Briggs & Stratton Corporation welcomes such repair by any of its Authorized Service Dealers. In most instances, the requests for warranty brought to the attention of our Service Accounts are handled in a prompt routine manner with no question regarding their validity. However, some requests for warranty are received which appear not justified. In these cases, engine owners may not be aware that the premature failure of their engine was the result of abuse or neglect, or that the difficulty which they experience is caused by the equipment rather than the engine.

**BRIGGS & STRATTON WARRANTY COVERS ONLY DEFECTIVE MATERIAL AND/OR WORKMANSHIP.**

**LIMITED WARRANTY**

"For time period shown below from date of purchase, Briggs & Stratton Corporation will replace for the original purchasers, free of charge, any part, or parts of the engine, found upon examination by any Factory Authorized Service Dealer, or by the Factory at Milwaukee, Wisconsin, to be defective in material or workmanship or both; this is the exclusive remedy. All transportation charges on parts submitted for replacement under this Warranty must be borne by purchaser. For warranty service, contact your nearest Authorized Service Dealer as listed in the "Yellow Pages" under "Engines, Gasoline," or "Gasoline Engines," "Lawn Mower" or similar category. THERE IS NO OTHER EXPRESS WARRANTY, IMPLIED WARRANTIES, INCLUDING THOSE OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE LIMITED TO ONE YEAR FROM PURCHASE, AND TO THE EXTENT PERMITTED BY LAW ANY AND ALL IMPLIED WARRANTIES ARE EXCLUDED. LIABILITY FOR CONSEQUENTIAL DAMAGES UNDER ANY AND ALL WARRANTIES ARE EXCLUDED TO THE EXTENT EXCLUSION IS PERMITTED BY LAW. Some states do not allow limitations on how long an implied warranty lasts, and some states do not allow the exclusion of limitation of incidental or consequential damages, so the above limitation and exclusion may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary from state to state."

Briggs & Stratton Corporation  
F. P. Stratton, Jr.  
Chairman and Chief Executive Officer

**WARRANTY PERIOD**

ENGINES	WITHIN U.S.A. AND CANADA		OUTSIDE U.S.A. AND CANADA
	CONSUMER USE*	COMMERCIAL USE*	ALL USES
All 2 thru 18 HP engines installed on equipment other than lawn mowers, edgers, tillers, and all Sno/Gard engines.	1 year-engine and Magneton® Ignition	1 year-engine and Magneton® Ignition	1 year-engine and Magneton® Ignition
All 2 thru 18 HP engines installed on lawn mowers, edgers, tillers, and all Sno/Gard engines	2 year-engine 5 year-Magneton® Ignition	1 year-engine and Magneton® Ignition	1 year-engine and Magneton® Ignition
All Vanguard™, I/C® and Industrial Plus™ engines.	2 year-engine Lifetime** - Magneton® Ignition	2 year-engine Lifetime** - Magneton® Ignition	2 year-engine Lifetime** - Magneton® Ignition

\* For purposes of this warranty policy, "consumer use" shall mean personal residential household use by the original retail consumer. "Commercial use" shall mean all other uses, including use for commercial, income producing or rental purposes. Once an engine has experienced commercial use, it shall thereafter be considered as a commercial use engine for purposes of this warranty policy.

\*\* Lifetime limited warranty of the Magneton® Ignition shall cover parts and labor for the first five (5) years from the date of purchase; thereafter only parts. "Lifetime" shall mean lifetime of the engine in the hands of the original purchaser.

No registration (warranty) card is necessary to obtain warranty on Briggs & Stratton engines.  
The customer must save the purchase receipt. A proof of purchase date will be required to obtain warranty.