MTD
For A Growing World.™

White OUTDOOR®

Y2K MTD/White
Technical Seminar

FOREWORD

This Service Update Book is intended for Authorized Dealers who are familiar with outdoor power equipment. It is necessary, and good shop practice, that your service area be equipped with proper tools and the mechanics be supplied with the latest information available. The information in this handbook and a properly equipped shop will aid in making necessary repairs as simple as possible in a complete and satisfactory manner.

The Technical Service Handbook Form Number 770-8640M, again will suggest methods of repair on current products. It is intended to supplement the Technical Service Update Book.

All repair procedures illustrated in this update book are suggested methods of repair. With the aid of the information in this handbook, the technician should be able to repair or replace parts as necessary to correct most service problems. The service technician can also diagnose a problem more easily with a better knowledge of potential problems. Alternate methods of repair are acceptable but not encouraged. Alternate methods, in come cases, may be more time consuming and may result in a dealer performing unnecessary steps to repair a unit. The more you familiarize yourself with potential service problems, the more efficient your operation will become.

We recommend you keep this Service Update Book in your shop for future reference.

Acknowledgements
We would like to thank Briggs and Stratton for continuing (Partnership In Training and Education).

MTD Y2K Table of Contents

MTD Y2K Table of Contents (continued)

SERVICE PUBLICATIONS AVAILABLE

Please Order By Description (Include Year) and Part Number.

MICROFICHE

Description	Form No.	Unit Price
2000 MTD Microfiche - Spring/Summer	770-9442	$ 6.95
2000 MTD Microfiche - Fall/Winter	770-9441	$ 3.25
1999 MTD Microfiche - Spring/Summer	770-9438	$ 6.95
1999 MTD Microfiche - Fall/Winter	770-9435	$ 3.25
1998 MTD Microfiche - Spring/Summer	770-9432	$ 6.95
1998 MTD Microfiche - Fall/Winter	770-9427	$ 3.25
1997 MTD Microfiche - Spring/Summer	770-9496	$ 6.95
1997 MTD Microfiche - Fall/Winter	770-9497	$ 3.25
1996 MTD Microfiche - Spring/Summer	770-9482	$ 6.95
1996 MTD Microfiche - Fall/Winter	770-9481	$ 3.25
1995 MTD Microfiche - Spring/Summer	770-9471	$ 6.95
1995 MTD Microfiche - Fall/Winter	770-9470	$ 3.25
1994 MTD Microfiche - Spring/Summer	770-9466	$ 6.95
1994 MTD Microfiche - Fall/Winter	770-9465	$ 3.25
1993 MTD Microfiche - Spring/Summer	770-8291	$ 6.95
1993 MTD Microfiche - Fall/Winter	770-8290	$ 3.25
1992 MTD Microfiche - Spring/Summer	770-7981	$ 6.95
1992 MTD Microfiche - Fall/Winter	770-7980	$ 3.25
1991 MTD Microfiche - Spring/Summer	770-7606	$ 6.95
1991 MTD Microfiche - Fall/Winter	770-7607	$ 3.25
1990 MTD Microfiche	770-7228	$ 8.95
1989 MTD Microfiche	770-6811	$ 8.95
1988 MTD Microfiche	770-6503	$ 8.95
1987 MTD Microfiche	770-6083	$ 8.95
1986 MTD Microfiche	770-5170	$ 8.95
1985 MTD Microfiche	770-4106	$ 8.95
1984 MTD Microfiche	770-3357	$ 8.95
1983 MTD Microfiche	770-2662	$ 8.95
1982 MTD Microfiche	770-2200	$ 8.95
1981 MTD Microfiche	770-1155	$ 8.95
1980 MTD Microfiche	770-0273	$ 7.50
1979 MTD Microfiche	770-8912	$ 7.50
1978 MTD Microfiche	770-8122	$ 7.50
1977 MTD Microfiche	770-9104	$ 6.00
1976 MTD Microfiche	770-9103	$ 6.00
1975 MTD Microfiche	770-9102	$ 6.00
1974 MTD Microfiche	770-9101	$ 5.00
MTD Microfiche Set—Current 10 Years	770-9407	$58.95
MTD Microfiche Set—1991 thru 1995	770-9404	$29.95
MTD Microfiche Set—1986 thru 1990	770-9403	$29.95
MTD Microfiche Set—1981 thru 1985	770-9402	$29.95
MTD Microfiche Set—1975 thru 1980	770-9401	$29.95
MTD Microfiche Set—1964 thru 1974	770-7014	$30.00
AIRCAP Microfiche Set—thru 1990	706-15271	$20.00
General Power Microfiche Set—thru 1995	770-9412	$89.95
General Power Microfiche—1995 Only	770-9485	$ 9.95
1992 Yard-Man Microfiche - Spring/Summer	770-7985	$ 4.25
1992 Yard-Man Microfiche - Fall/Winter	770-7984	$ 2.25
1991 Yard-Man Microfiche - Spring/Summer	770-7613	$ 4.25
1991 Yard-Man Microfiche - Fall/Winter	770-7612	$ 2.25
1990 Yard-Man Microfiche	770-7231	$ 6.25
1989 Yard-Man Microfiche	770-6814	$ 6.25
1988 Yard-Man Microfiche	770-6505	$ 6.25
1987 Yard-Man Microfiche	770-6087	$ 6.25
1986 Yard-Man Microfiche	770-5175	$ 6.25
1985 Yard-Man Microfiche	770-4107	$ 6.25
1984 Yard-Man Microfiche	770-3356	$ 6.25
1983 Yard-Man Microfiche	770-2663	$ 6.25
1982 Yard-Man Microfiche	770-2203	$ 6.00
1981 Yard-Man Microfiche	770-1158	$ 6.00
1980 Yard-Man Microfiche	770-0272	$ 5.00
1979 Yard-Man Microfiche	770-8913	$ 5.00
1978 Yard-Man Microfiche	770-8199	$ 5.00
1977 Yard-Man Microfiche	770-7391	$ 3.50
1976 Yard-Man Microfiche	770-9105	$ 3.50
1975 & Prior Yard-Man Microfiche	770-9106	$14.00
Yard-Man Microfiche Set - 1983 thru 1992	770-9405	$29.95
Yard-Man Microfiche Set - 1982 and Prior	770-9406	$29.95

SETS AVAILABLE BELOW

SETS AVAILABLE BELOW

MASTER BOOKS

Description	Form No.	Unit Price
1999 MTD Master Book	770-99	$19.95
1998 MTD Master Book	770-98	$19.95
1997 MTD Master Book	770-97	$19.95
1996 MTD Master Book	770-96	$19.95
1995 MTD Master Book	770-95	$19.95
1994 MTD Master Book	770-94	$19.95
1993 MTD Master Book	770-8294	$17.50
1992 MTD Master Book	770-7986	$17.50
1991 MTD Master Book	770-7610	$17.50
1990 MTD Master Book	770-7232	$17.50
1989 MTD Master Book	770-6815	$17.50
1988 MTD Master Book	770-6506	$16.50
1987 MTD Master Book	770-6084	$16.50
1986 MTD Master Book	770-5171	$16.50
AIRCAP Master Book (thru 1990)	706-15272	$34.50
General Power Master Book (1995)	770-0265K	$19.95
1992 Yard-Man Master Book	770-7988	$16.50
1991 Yard-Man Master Book	770-7620	$16.50
1990 Yard-Man Master Book	770-7234	$15.50
1989 Yard-Man Master Book	770-6818	$15.50
1988 Yard-Man Master Book	770-6508	$15.50
1987 Yard-Man Master Book	770-6088	$15.50
1986 Yard-Man Master Book	770-5174	$15.50
1985 Yard-Man Master Book	770-4102	$15.50
1984 Yard-Man Master Book	770-3358	$15.00
1983 Yard-Man Master Book	770-2665	$15.00
1982 Yard-Man Master Book	770-2204	$15.00
1981 Yard-Man Master Book	770-1159	$15.00
1980 Yard-Man Master Book	770-0270	$10.50
1979 Yard-Man Master Book	770-8915	$10.50

MISCELLANEOUS

Description	Form No.	Unit Price
2000 MTD Parts Price Book	770-8855Q	$15.00
MUST HAVE SERVICE MANUAL	770-8640M	$29.95
2000 Service Update Seminar Book	770-8877Q	$19.50
1999 Service Update Seminar Book	770-8877P	$12.50
Warranty Claim Forms	770-7601H	$5 per 100
Job Estimating Guide	770-7738P	$ 3.00
Service Publications Order Forms	770-8633	N/C
Video Tapes:		
1996 Single Speed Transmission	770-9479	$14.95
1996 Two Speed Transmission	770-9480	$14.95
Special “Five-in-One”*	770-9475	$14.95
1997 Two Speed	770-0413M	$14.95
Z Series Tractor Transmission and Adjustment	770-0414M	$14.95

*Contains: Trouble shooting: batteries & charging systems, electrical (riders & tractors), hydrostatic transaxles plus neutral adjustment, 410/420 tiller chain cases, and log splitter test procedures.

NOTE: Ohio Residents—When Ordering, Add 5.5% Sales Tax or Provide a Valid Sales Tax Exemption Certificate.
Price subject to change without notice.

SERVICE PUBLICATIONS AVAILABLE

Please Order By Description (Include Year) and Part Number.

MICROFICHE

Description	Form No.	Unit Price
White Microfiche Set—Current 10 Years (Included in New Dealer Kits)	770-9409	$ 34.95
White Microfiche Set—1991 to 1995	770-9413	$ 21.95
White Microfiche Set—1986 to 1990	770-9411	$ 14.95
White Microfiche Set—1980 to 1985	770-9410	$ 6.25
White Microfiche Set—1979 and Prior	770-8659	$ 8.00
2000 White Spring/Summer Microfiche	770-9444	$ 4.50
2000 White Fall/Winter Microfiche	770-9443	$ 2.25
1999 White Spring/Summer Microfiche	770-9440	$ 4.50
1999 White Fall/Winter Microfiche	770-9437	$ 2.25
1998 White Fall/Winter Microfiche	770-9429	$ 2.25
1998 White Spring/Summer Microfiche	770-9433	$ 4.50
1997 White Microfiche Spring/Summer Microfiche	770-9498	$ 4.50
1997 White Microfiche Fall/Winter Microfiche	770-9499	$ 2.25
1996 White Microfiche Spring/Summer Microfiche	770-9484	$ 4.50
1996 White Microfiche Fall/Winter Microfiche	770-9483	$ 2.25
1995 White Microfiche Spring/Summer Microfiche	770-9473	$ 4.50
1995 White Microfiche Fall/Winter Microfiche	770-9472	$ 2.25
1994 White Microfiche Spring/Summer Microfiche	770-9468	$ 4.50
1994 White Microfiche Fall/Winter Microfiche	770-9467	$ 2.25
1993 White Microfiche Spring/Summer Microfiche	770-8293	$ 4.50
1993 White Microfiche Fall/Winter Microfiche	770-8292	$ 2.25
1992 White Microfiche Spring/Summer Microfiche	770-7983	$ 4.50
1992 White Microfiche Fall/Winter Microfiche	770-7982	$ 2.25
1991 White Microfiche Spring/Summer Microfiche	770-7608	$ 4.50
1991 White Microfiche Fall/Winter Microfiche	770-7609	$ 2.25
1990 White Microfiche Spring/Summer Microfiche	770-7230	$ 4.50
1990 White Microfiche Fall/Winter Microfiche	770-7229	$ 2.25
1989 White Microfiche Spring/Summer Microfiche	770-6813	$ 4.50
1989 White Microfiche Fall/Winter Microfiche	770-6812	$ 2.00
1988 White Microfiche Microfiche	770-6504	$ 2.50
1987 White Microfiche Microfiche	770-6085	$ 2.50
1986 White Microfiche Microfiche	770-5173	$ 1.50
1985 White Microfiche Microfiche	770-4108	$ 1.50
1984 White Microfiche Microfiche	770-3493	$ 1.50
1983 White Microfiche Microfiche	770-3061	$ 1.00
1982 White Microfiche Microfiche	770-3060	$ 1.00
1981 White Microfiche Microfiche	770-3059	$ 1.00
1980 White Microfiche Microfiche	770-3058	$ 1.00

SERVICE HANDBOOKS

Description	Form No.	Unit Price
MUST HAVE SERVICE MANUAL	770-8640M	$29.95
1999 Service Update Seminar Book	770-8877P	$12.50
2000 Service Update Seminar Book	770-8877Q	$19.50

SERVICE VIDEO TAPES

Description	Form No.	Unit Price
Video Tapes:		
Single Speed Transmission	770-9479	$14.95
1996 Two Speed Transmission	770-9480	$14.95
Special “Five-in-One”*	770-9475	$14.95
1997 Two Speed	770-0413M	$14.95
Z Series Tractor Transmission and Adjustment	770-0414M	$14.95

*Contains: Trouble shooting: batteries & charging systems, electrical (riders & tractors), hydrostatic transaxles plus neutral adjustment, 410/420 tiller chain cases, and log splitter test procedures.

MASTER BOOKS

Description	Form No.	Unit Price
1999 White Master Books	770-99W	$ 16.50
1998 White Master Books	770-98W	$ 16.50
1997 White Master Books	770-97W	$ 16.50
1996 White Master Books	770-96W	$ 16.50
1995 White Master Books	770-95W	$ 16.50
1994 White Master Books	770-94W	$ 16.50
1993 White Master Books	770-8295	$ 16.50
1992 White Master Books	770-7987	$ 16.50
1991 White Master Books	770-7611	$ 16.50
1990 White Master Books	770-7233	$ 14.50
1989 White Master Books	770-6817	$ 12.95
1988 White Master Books	770-6554	$ 12.50
1987 White Master Books	770-6086	$ 12.50
1986 White Master Books	770-5172	$ 9.00
1985 White Master Books	770-4103	$ 8.50
1984 White Master Books	770-3930A	$ 8.50
White Binder (4"-6" Expandable)	785-0570	$ 6.00

MISCELLANEOUS

Description	Form No.	Unit Price
Repair Parts Cross Reference	770-3064/ 770-3174	$ 2.50
Warranty Claim Forms	770-7601H	$ 5.00 per 100
Service Parts Order Form	770-6016	N/C
Job Estimating Guide	770-7738P	$ 3.00

NOTE: Ohio Residents—When Ordering, Add 5.5% Sales Tax or Provide a Valid Sales Tax Exemption Certificate.
Price subject to change without notice.

WARRANTY AND SERVICE POLICY
MTD SERVICE CENTERS

PURPOSE

The purpose of warranty is to protect the customer from defects in materials and workmanship, defects which are not detected at the time of manufacture. Warranty does not imply, state or provide for the unlimited and unrestricted replacement of parts. The customer is responsible for their use and maintenance of the unit, and is responsible for providing adequate proof of purchase to substantiate any warranty claim. The manufacturer cannot and will not assume responsibility for conditions over which it has no control.

MTD MANUFACTURER'S LIMITED WARRANTY

For TWO YEARS from the date of retail purchase within the United States of America, its possessions and territories, MTD PRODUCTS INC will, at its option, repair or replace, for the original purchaser, free of charge, any part or parts found to be defective in material or workmanship. This warranty covers units which have been operated in accordance with the operating instructions furnished with the unit, and which have not been subject to misuse, abuse, commercial use, neglect, accident, improper maintenance or alteration.

Normal wear parts or components thereof are subject to separate terms as noted below in the "No Fault ninety Day Consumer Warranty" clause.

All normal wear part failures will be covered on this product for a period of 90 days regardless of cause. After 90 days, but within the two year period, normal wear parts failures will be covered ONLY IF caused by defects in material or workmanship of OTHER component parts. Normal wear parts are defined as batteries*, belts, blades, blade adapters, grass bags, rider deck wheels, seats, snow thrower skid shoes, rubber auger spirals, shave plates and tires.

How to obtain service: Warranty service is available, with proof of purchase, through your local authorized service dealer. To locate the dealer in your area, please check the yellow pages or contact the Customer Service Department of MTD PRODUCTS INC, P.O. Box 368022, Cleveland, Ohio 44136-9722. Phone 1-800-800-7310. The return of a complete unit will not be accepted by the factory unless prior written permission has been extended by the Customer Service Department of MTD PRODUCTS INC.

Transportation charges: Transportation charges for the movement of any power equipment unit or attachment are the responsibility of the purchaser.

Units exported out of the United States: MTD PRODUCTS INC does not extend any warranty for products sold or exported outside of the United States of America, its possessions and territories, except those sold through MTD PRODUCTS INC's authorized channels of export distribution

Other Warranties:

1. The engine or component parts thereof carry separate warranties from their manufacturers. Please refer to the applicable manufacturer's warranty on these items.
2. *Batteries are covered by a 90 day replacement warranty.
3. Log splitter pumps, valves and cylinders, or component parts thereof are covered by a one year warranty.
4. All other warranties, express or implied, including any implied warranty of merchantability or fitness for a particular purpose, are hereby expressly disclaimed in their entirety.
5. The provisions as set forth in this warranty provide the sole and exclusive remedy of MTD PRODUCTS INC's obligations arising from the sales of its products. MTD PRODUCTS INC will not be liable for incidental or consequential loss or damage.

How state law relates to this warranty: This limited warranty gives you specific legal rights, and you may also have other rights which vary from state to state. Certain disclaimers are not allowed in some states and therefore they may not apply to you under all circumstances.

NOTE: This warranty does not cover routine maintenance items such as lubricants, filters, blade sharpening and tune-ups, or adjustments such as brake adjustments, clutch adjustments or deck adjustments. Nor does this warranty cover normal deterioration of the exterior finish due to use or exposure.

OTHER WARRANTIES

The ENGINE is covered by a warranty extended by the engine manufacturer, which may include Briggs & Stratton Corporation, Tecumseh Products Company, Kohler Company or Onan Corporation. Any and all claims for engine or engine related components must be handled through the respective manufacturer's authorized service representative.

HYDROSTATIC TRANSMISSIONS manufactured by Hydro-Gear carry a two year limited warranty and are to be handled by authorized Hydro-Gear service representatives. Replacement parts and technical assistance can be obtained from the Hydro-Gear Central Distributor. MTD PRODUCTS INC is not responsible for processing these warranty claims nor processing returned units.

PEERLESS COMPONENTS are covered by Tecumseh Products Company. Any claims against this warranty will be handled directly by an authorized service center for Tecumseh Products.

CLAIMS

Claims against MTD's warranty may consist of any of the following:

1. Replacement of missing parts on new equipment by an authorized servicing dealer.
2. Replacement of defective parts during the warranty period by an authorized servicing dealer.
3. Repair of defects during the warranty period by an authorized servicing dealer.

Claims against MTD's warranty may include:

1. Reasonable labor charges which are guided by posted MTD policy.
2. Parts necessary to complete repairs at the servicing firm's cost plus a percentage of dealer cost.
3. "NO FAULT" NINETY DAY CONSUMER WARRANTY**. All normal wear part failures will be covered on MTD products for a period of 90 days regardless of cause. After 90 days but within the two year period, normal wear part failures will be covered if caused by defects in material or workmanship of other component parts. Normal wear parts are defined as batteries, belts, blades, blade adapters, grass bags, rider deck wheels, seats, snow thrower skid shoes, rubber auger spirals, shave plates and tires. ***PLEASE NOTE: This is not a "blank check" repair clause. This particular policy covers normal wear parts only!***
4. Batteries on riding equipment are covered by a ninety (90) day replacement warranty. Batteries on walk behind mowers are covered for one year.

Claims against MTD's warranty will not include:

1. Repairs which become necessary because of:
   - Misuse or abuse
   - Accident
   - Neglect
   - Lack of correct maintenance
   - Damage in transit
   - Normal wear
   - Incorrect set up of complete units or attachments by a dealer or consumer
   - Damage from stale gas or gas that contains water or other debris
2. Units used commercially
3. Transportation charges
4. Normal maintenance such as tune-ups, carburetor and mechanical adjustments, oil changes, etc.
5. Service call or travel time charges
6. Telephone calls
7. Installation of attachments or accessories
8. Customer set up of a unit or attachment

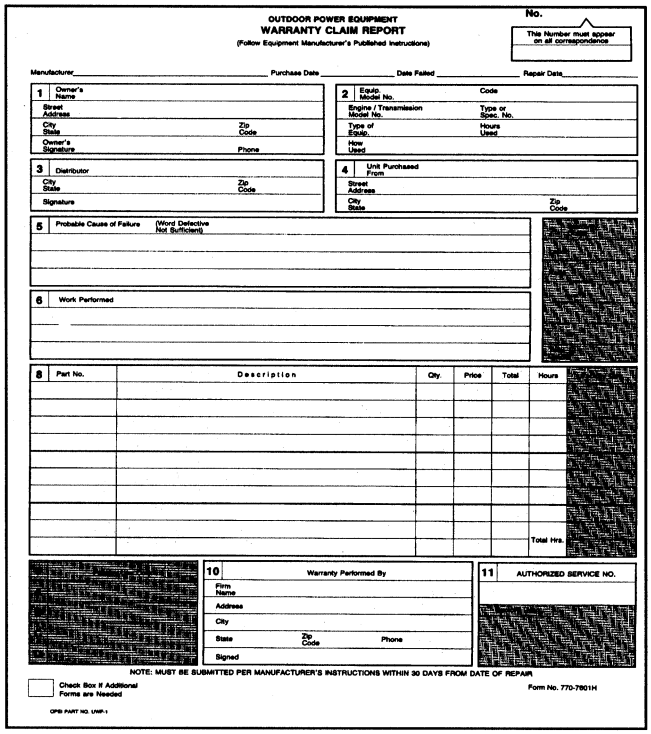
The following information will be required on ALL warranty claims:

1. Authorized service dealer number
2. Model number and manufacturing code/serial number of unit
3. Date of purchase
4. Date of failure and repair
5. Description of failure and work performed
6. Parts and labor time required to complete repair, including type of part and quantity used
7. Owners name and address

- Each warranty claim must at minimum include the above information to be processed.
- If the serial number indicates the unit is out of warranty, attach a copy of the owner's original proof of purchase to the warranty claim.

WARRANTY CLAIM SUBMISSION:

MTD Products uses the Outdoor Power Equipment Warranty Claim Report:



OUTDOOR POWER EQUIPMENT
WARRANTY CLAIM REPORT
(Follow Equipment Manufacturer's Published Instructions)

No.
This Number must appear on all correspondence

Manufacturer _____ Purchase Date _____ Date Failed _____ Repair Date _____

1 Owner's Name
Street Address
City State Zip Code
Owner's Signature Phone

2 Equip. Model No. Code
Engine / Transmission Model No. Type or Spec. No.
Type of Equip. Hours Used
How Used

3 Distributor
City State Zip Code
Signature

4 Unit Purchased From
Street Address
City State Zip Code

5 Probable Cause of Failure (Word Defective Not Sufficient)

6 Work Performed

8 Part No.	Description	Qty.	Price	Total	Hours
					Total Hrs.

10 Warranty Performed By
Firm Name
Address
City
State Zip Code Phone
Signed

11 AUTHORIZED SERVICE NO.

NOTE: MUST BE SUBMITTED PER MANUFACTURER'S INSTRUCTIONS WITHIN 30 DAYS FROM DATE OF REPAIR

Check Box if Additional Forms are Needed

Form No. 770-7601H

OPE PART NO. UWP-1

Completing the Claim Report:

Top of Claim Report:

MANUFACTURER: MTD, Yard-Man, etc
PURCHASE DATE: When purchased
DATE FAILED: When unit failed
REPAIR DATE: When unit repaired

Box No. 1:

OWNER'S NAME: Doe, John
STREET ADDRESS: 1 Any Street
CITY/STATE: Any town, Ohio ZIP CODE:11111
OWNER'S SIGNATURE: _____ PHONE: (000) 000-0000

Box No. 2:

EQUIPMENT MODEL NUMBER:
11 digit alpha-numeric number
CODE: 11 digit serial number or manufacturing date code
ENGINE/TRANS MODEL NO.: Only if component being repaired
TYPE OR SPEC. NO.: See previous
TYPE OF EQUIPMENT: Rider, push, tiller, etc.
HOURS USED: How many
HOW USED: Residential, commercial, etc.

Box No. 3:

DISTRIBUTOR: Where parts for repair were obtained
CITY/STATE: Of distributor ZIP CODE: Of distributor
SIGNATURE: Not needed

Box No. 4:

UNIT PURCHASED FROM: Where was unit purchased
STREET ADDRESS: Of retailer selling unit
CITY/STATE: Of retailer selling unit
ZIP CODE: Of retailer selling unit

Box No. 5:

PROBABLE CAUSE OF FAILURE: What specifically happened to cause the damage to the unit. Be specific here ("defective" is not sufficient). E.G. The shift bracket in the transmission was bent, causing the gears to strip and break the casting.

Box No. 6:

WORK PERFORMED: What was necessary for the repair.
E.G. Open casing, replace shift bracket and gears, replace casing.

Box No. 7:

WARRANTY CREDIT: For factory use only

Box No. 8:

PART NUMBER: Must be an OEM Part number
DESCRIPTION: Of part
QTY: Number of part used
PRICE: What was paid for the part
TOTAL: Total amount used for the specific part (e.g. 2 parts @ $1.00 per = $2.00)
HOURS: How much time to fix that specific part
FACTORY USE: For factory use only

Box No. 9:

A,B,C,D: For factory use only

Box No. 10:

WARRANTY PERFORMED BY: Dealer performing the repair
FIRM NAME:
ADDRESS:
CITY:
STATE: ZIP CODE: PHONE:
SIGNED:

Box No. 11:

AUTHORIZED SERVICE NO.: This is your designated six-digit "S" number supplied by MTD for authorized service dealers

SMALL CHECK BOX IN LOWER LEFT HAND CORNER: Check if more claim forms are needed

PROCESSING:

- Most warranty claims are processed directly by the factory.
- Claims received which are missing information will be returned to the repairing service center.
- All claims must be filed within thirty (30) days after service is completed.
- MTD reserves the right to review any major repairs BEFORE work is performed. A major repair is considered any repair where the cost of repair is excessive in relation to the value of the unit. Authorization for major repairs is extended by the MTD Service Department or the authorized Central Service Distributor.
- Any claim judged to be excessive may be adjusted by MTD. The MTD "Job Estimating Guide" provides a rule of thumb time allowance for most standard repairs. PLEASE NOTE that upon receipt of an adequate explanation MTD WILL consider any and all extenuating circumstances which may apply on a warranty claim.
- Any claims not in compliance with the above will not be accepted.
- All parts sold or used for MTD warranty repairs MUST be genuine MTD original equipment parts.
- PLEASE MAIL ALL CLAIMS NOT INVOLVING RETURN PARTS TO:

MTD PRODUCTS INC
P.O. Box 368022
Cleveland, Ohio 44136-9722
ATTENTION: WARRANTY

WARRANTY PARTS RETURN POLICY

Parts replaced under warranty must be held by the servicing firm for a period of thirty (30) days after the claim is paid. MTD reserves the right to request the return of any part replaced under warranty for inspection. If inspection is required a letter will be sent to the dealer explaining return shipping procedures.

1. Differentials
2. Clutches
3. Transaxles (upon request)
4. PTO Assemblies
5. Chain and Gear case assemblies (current production year only)
6. Hydrostatic valves
7. Hydrostatic pumps
8. Hydraulic cylinders (ONLY when non-repairable)
9. Electric motors (warranty period units only)

When returning a part for warranty credit and/or inspection, a COPY of the original WARRANTY CLAIM should be placed in a plastic bag and included with the parts. If more than one part is being returned, attach each claim copy to the appropriate part. Any part returned to MTD should be shipped via the most cost effective method. Freight charges for these parts are reimbursed to the repairing dealer. Documentation of these freight charges should be included with your warranty claim.

Each component that is returned is disassembled and inspected for failure mode. This information is crucial in the process of continuous improvement.

Transmission Warranty Process
MTD Service Centers

1
Dealer inspects unit
Determines unit should be replaced
under warranty

↓

2
Dealer calls parts distributor for
like-kind exchange after providing necessary information

↓

3
Replacement unit sent

↓

4
Dealer submits copy of warranty claim form to distributor
which includes ALL necessary information*

↓

5
Dealer submits properly completed original warranty claim
to MTD Warranty Department for processing and
normal reimbursement

↓

6
Dealer returns defective unit to MTD upon
receipt of a return letter

EXPLANATION OF PROCESS STEPS:

1. The dealer must make a thorough inspection using specific diagnostic techniques to determine whether unit must be replaced.
2. The Central Distributor will gather the claim number from the dealer and attach it to the replacement order. Each Central is responsible for maintaining an available supply of units to be used for warranty repairs.
3. Units will be shipped immediately to maintain service levels.
4. The dealer MUST submit a copy of the properly completed warranty claim form to the Central Distributor. Each Central will need this information so that Wegman Service can create a replenishment order. Any copy of a claim form received without COMPLETE information will be returned to the Central without a re-order placed.
5. The dealer will submit the properly completed warranty claim form to MTD per the standard warranty procedure. Claims received with incomplete information will be returned unpaid.
6. Upon receipt of a return letter, the defective unit must be returned to MTD. Shipping charges are reimbursed to the repairing dealer. Defective parts must be retained for a period of 30 days from the receipt of payment for the claim.

It is extremely important to file these claims accurately and immediately. Warranty service should not be an expense to your Service Center. It should be just another means of payment for a normal repair.

MANUFACTURER'S LIMITED WARRANTY

The limited warranty set forth below is given by MTD PRODUCTS INC ("MTD") with respect to new merchandise purchased and used in the United States, its possessions and territories.

MTD warrants this product against defects in material and workmanship for a period of two (2) years commencing on the date of original purchase and will, at its option, repair or replace, free of charge, any part found to be defective in material or workmanship. This limited warranty shall only apply if this product has been operated and maintained in accordance with the Operator's Manual furnished with the product, and has not been subject to misuse, abuse, commercial use, neglect, accident, improper maintenance, alteration, vandalism, theft, fire, water or damage because of other peril or natural disaster. Damage resulting from the installation or use of any accessory or attachment not approved by MTD Products Inc. for use with the product(s) covered by this manual will void your warranty as to any resulting damages.

Normal wear parts or components thereof are subject to separate terms as follows: All normal wear part or component failures will be covered on the product for a period of 90 days regardless of cause. After 90 days, but within the two year period, normal wear part failures will be covered ONLY IF caused by defects in material or workmanship of OTHER component parts. Normal wear parts and components include, but are not limited to, belts, blades, blade adapters, grass bags, rider deck wheels, seats, snow thrower skid shoes, shave plates and tires. Batteries are covered by a 90-day limited replacement warranty.

HOW TO OBTAIN SERVICE: Warranty service is available, WITH PROOF OF PURCHASE THROUGH YOUR LOCAL AUTHORIZED SERVICE DEALER. To locate the dealer in your area, please check for a listing in the Yellow Pages or contact the Customer Service Department of MTD PRODUCTS INC by calling 1-800-800-7310 or writing to P.O. Box 368022, Cleveland, Ohio 44136-9722.

This limited warranty does not provide coverage in the following cases:

a. The engine or component parts thereof. These items carry a separate manufacturer's warranty. Please refer to the applicable manufacturer's warranty on these items.
b. Log splitter pumps, valves and cylinders have a separate one year warranty.
c. Routine maintenance items such as lubricants, filters, blade sharpening and tune-ups, or adjustments such as brake adjustments, clutch adjustments or deck adjustments; and normal deterioration of the exterior finish due to use or exposure.
d. MTD does not extend any warranty for products sold or exported outside of the United States of America, its possessions and territories, except those sold through MTD's authorized channels of export distribution.

No implied warranty, including any implied warranty of merchantability or fitness for a particular purpose, applies after the applicable period of express written warranty above as to the parts as identified. No other express warranty or guaranty, whether written or oral, except as mentioned above, given by any person or entity, including a dealer or retailer, with respect to any product shall bind MTD. During the period of the Warranty, the exclusive remedy is repair or replacement of the product as set forth above. (Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.)

The provisions as set forth in this Warranty provide the sole and exclusive remedy arising from the sales. MTD shall not be liable for incidental or consequential loss or damages including, without limitation, expenses incurred for substitute or replacement lawn care services, for transportation or for related expenses, or for rental expenses to temporarily replace a warranted product. (Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above exclusion or limitation may not apply to you.)

In no event shall recovery of any kind be greater than the amount of the purchase price of the product sold. Alteration of the safety features of the product shall void this Warranty. You assume the risk and liability for loss, damage, or injury to you and your property and/or to others and their property arising out of the use or misuse or inability to use the product.

This limited warranty shall not extend to anyone other than the original purchaser, original lessee or the person for whom it was purchased as a gift.

How State Law Relates to this Warranty: This limited warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

MANUFACTURER'S LIMITED WARRANTY FOR:

White OUTDOOR®

For TWO YEARS from the date of retail purchase within the United States of America, its possessions and territories, MTD PRODUCTS INC will, at its option, repair or replace, for the original purchaser, free of charge, any part or parts found to be defective in material or workmanship. This warranty covers units which have been operated and maintained in accordance with the operating instructions furnished with the unit, and which have not been subject to misuse, abuse, neglect, accident, improper maintenance or alteration.

NORMAL WEAR PARTS or components thereof are subject to separate terms as noted below in the "No Fault Ninety Day Consumer Warranty" clause. Commercial use is subject to the terms listed above, and is covered for a period of 90 days from the date of purchase.

TWO YEAR CONSUMER WARRANTY ON NORMAL WEAR PARTS WITH NINETY DAY NO FAULT PROTECTION: All normal wear parts failures will be covered on this product for a period of 90 days regardless of cause. After 90 days, but within the two year period, normal wear parts failures will be covered if caused by defects in material or workmanship. Normal wear parts are defined as belts, blades, blade adapters, grass bags, rider deck wheels, seats, snow thrower skid shoes, shave plates and tires.

HOW TO OBTAIN SERVICE: Warranty service is available, with proof of purchase, through your local authorized service dealer. To locate the dealer in your area, please check the yellow pages or contact the Customer Service Department of MTD PRODUCTS INC, P O Box 361131, Cleveland, Ohio 44136-0019. Phone (330) 225-8883. The return of a complete unit will not be accepted by the factory unless prior written permission has been extended by the Service Department of MTD PRODUCTS INC.

TRANSPORTATION CHARGES: Transportation charges for the movement of any power equipment unit or attachment are the responsibility of the purchaser. Transportation charges for any parts submitted for replacement under this warranty must be paid by the purchaser unless such return is requested by MTD PRODUCTS INC.

UNITS EXPORTED OUT OF THE UNITED STATES: MTD PRODUCTS INC does not extend any warranty for products sold or exported outside of the United States of America, its possessions and territories, except those sold through MTD PRODUCTS INC's authorized channels of export distribution.

OTHER WARRANTIES:

1. The engine or component parts thereof carry separate warranties from their manufacturers. Please refer to the applicable manufacturer's warranty on these items.
2. Batteries are covered by a 90-day replacement warranty.
3. Log splitter pumps, valves and cylinders or component parts thereof are covered by a one year warranty.
4. All other warranties, express or implied, including any implied warranty of merchantability or fitness for a particular purpose, are hereby expressly disclaimed in their entirety.
5. The provisions as set forth in this warranty provide the sole and exclusive remedy of MTD PRODUCTS INC's obligations arising from the sales of its products. MTD PRODUCTS INC will not be liable for incidental or consequential loss or damage.

HOW STATE LAW RELATES TO THIS WARRANTY: This limited warranty gives you specific legal rights, and you may also have other rights which vary from state to state. Certain disclaimers are not allowed in some states and therefore they may not apply to you under all circumstances.

NOTE: This warranty does not cover set-up, routine maintenance items such as lubricants, filters, blade sharpening and tune-ups, or adjustments such as brake adjustments. Nor does this warranty cover normal deterioration of the exterior finish due to use or exposure.

Lubrication Chart for Yard Machines and Yard-Man

**NOTE:	**Whenever Never Seez is mentioned in the following, use it ONLY upon complete DISASSEMBLY / REASSEMBLY of transmissions, chain cases, etc.**			
	Never Seez is ONLY applied to EXTERNAL moving parts.			
SNOWTHROWERS	**GEAR CASE**	**GREASE/OIL**	**PART NO.**	**AMOUNT**
24" (E)	618-0120	Alvania Grease (Lead Free)	737-0168	1.5 OZ.
26" (F)	618-0121	Alvania Grease (Lead Free)	737-0168	1.5 OZ.
28" (G)	618-0122	Alvania Grease (Lead Free)	737-0168	1.5 OZ.
22" (D)	618-0152	Alvania Grease (Lead Free)	737-0168	1.5 OZ.
30" (H)	618-0160	Alvania Grease (Lead Free)	737-0168	1.5 OZ.
33" (I)	618-0257	Alvania Grease (Lead Free)	737-0168	3.0 OZ.
TILLERS	**CHAIN CASE**	**GREASE/OIL**	**PART NO.**	**AMOUNT**
***340-390**	686-0091			
	***NOTE: CAN'T BE SERVICED!**			
O35	686-0093A	Never Seez Grease	737-0288	**SEE NOTE!**
		Benalene Grease 920	737-0300	.625 LB.(10 OZ.)
410-420	686-0094	Shell Grease	737-0148	40 OZ.
		Benalene Grease 920	737-0300	2.5 LB. or 40 OZ.
430 & 448	686-0098	Never Seez Grease	737-0288	**SEE NOTE!**
		Benalene Grease 920	737-0300	1.875 LB. or 30 OZ.
450	686-0107	Never Seez Grease	737-0288	**SEE NOTE!**
		Benalene Grease 920	737-0300	1.875 LB. or 30 OZ.
MOWERS	**TRANSMISSION**	**GREASE/OIL**	**PART NO.**	**AMOUNT**
370-389, 970-979, & 999	618-0263A	Benalene Grease 920	737-0300	.063 LB. (1 OZ.)
440-459, 460, 559K, 560, & 580	618-0298	Benalene Grease 920	737-0300	.044 LB. (1 OZ.)
230 & 520	717-0417B	Benalene Grease 372	737-0223	1 OZ.
		Benalene Grease 920	737-0300	.063 LB. (1 OZ.)
HYDROSTATICS	**TRANSMISSION**	**GREASE/OIL**	**PART NO.**	**AMOUNT**
600 SERIES	718-0255A	SAE 20W-50	SAE	80 OZ.
	HG 310-0500	SAE 20W-50	SAE	80 OZ.
	HG 310-0750	SAE 20W-50	SAE	80 OZ.
	NOTE: Fill to 1.50" to 1.75" from top of case.			
800 SERIES	618-0249	SAE 20W-50	SAE	80 OZ.
	HG 311-3000	SAE 20W-50	SAE	80 OZ.
900 SERIES	Peerless 717-0395	20W	See Manual	5 QT. DRY
HYDRO-GEAR: (217) 728-2581 or 1-800-367-6820				
TECUMSEH (Peerless): 1-800-558-5402				

Lubrication Chart for Yard Machines and Yard-Man (continued)

SINGLE/2 SPEED	TRANSMISSION	GREASE/OIL	PART NO.	AMOUNT
Yard Bug	618-0251A	Shell Grease	737-0148	15 OZ.
Single (660-679)	618-0163B	Shell Grease	737-0148	15 OZ.
AutoDrive (600)	618-0307	Shell Grease	737-0148	20 OZ.
AutoDrive (2 Sp.)	618-0376	Shell Grease	737-0148	32 OZ.
2 SPEED (800)	618-0301A	Shell Grease	737-0148	32 OZ.
2 SPEED (800)	618-0312	Shell Oil - 85W140	737-0353	32 F.O.
ATTACHMENTS	**GEAR CASE**	**GREASE/OIL**	**PART NO.**	**AMOUNT**
190-623	684-0097	Benalene Grease 920	737-0300	.315 LB. (5 OZ.)
	618-0244	Benalene Grease 920	737-0300	.160 LB. (3 OZ.)
190-621	618-0161A	Alvania Grease (Lead Free)	737-0168	1.5 OZ.
	618-0244	Benalene Grease 920	737-0300	.160 LB. (3 OZ.)
190-624	684-0113	Benalene Grease 920	737-0300	.315 LB. (5 OZ.)
	618-0244	Benalene Grease 920	737-0300	.160 LB. (3 OZ.)
190-831 & 190-990	717-0870	Sunaplex 990 EP Grease	737-0120	8 OZ.
		Alvania Grease (Lead Free)	737-0168	4 OZ.
190-756	884-0061-5	Plastilube Grease #0 - Drop	737-0133	20 OZ.
190-823 (AutoDrive)	618-0407	Alvania Grease (Lead Free)	737-0168	1.5 OZ.
	NOTE:	**The BACK gear case on the snowthrower attachments takes 5 OZ. of grease.**		

Quick Reference Guide

1999 MTD Quick Reference Guide	300 SERIES 320/325/328	600 AUTODRIVE SERIES 604/608/609	600 TRANSMATIC 660/661/665/674/675	800 AUTODRIVE SERIES 804/809	800 TRANSMATIC 820-829/840-849
DRIVE TRAIN					
BELT, ENGINE TO V/S	754-0453	754-0467	754-0280A	754-0467	754-0280A
BELT, V/S TO TRANS	754-0453	754-0468	754-0370	754-0468	754-0446
BRAKE PAD	717-0678	717-0678	717-0678 (2)	717-0678 (2)	717-0678 (2)
PULLEY, ENGINE	756-0658	756-0639	756-0982A	756-0639	756-0989
PULLEY, TRANS	756-0650	656-0051	656-0004	656-0051	656-0046
PULLEY, V/S	717-0884	656-0048	717-0800A	656-0050	717-1578
PULLEY, IDLER	756-0116 V 3.06 dia, 756-0627 flat 3.05 od, 756-0981 flat 2.75 od	756-0627(PTO)-1 756-0981(DRIVE)-3	756-0643	756-0627 (PTO)-1 756-0981 (DRIVE)-3	756-0487 V, 756-0627 3.5 flat, 756-0981 2.75 flat
ELECTRICAL					
BATTERY	725-1633	725-1707C	725-1707C	725-1707B	725-1707C
SOLENOID	725-1426	725-1426	725-1426	725-1426	725-1426
SWITCH, IGNITION	725-0267	725-1741	725-0267, 725-1396 (OHV)	725-1741	725-1717
SWITCH, LIGHT	N/A	N/A	725-0634 (Optional)	N/A	725-0634 (Optional)
SWITCH, SAFETY (DECK)	725-1657A	725-1752 (EL PTO)	725-1657A	725-1752 (EL PTO)	725-1657A
SWITCH, SAFETY (REV)	725-1643	725-1644	725-1643	725-1713	725-1713
SWITCH, SAFETY (SEAT)	725-1461	725-1747	725-1303 & 725-1439	725-1747	725-1303 & 725-1439
SWITCH, SAFETY (CLUTCH)	725-1657A	725-1657A	725-1657A	725-1657A	725-1657A
STEERING					
BALL JOINT	723-0156	723-0448A	723-0448A	723-0448A	723-0448A
STEERING DRAG LINK	747-0955	711-1408 (RH) 711-1409 (LH)	683-0055	711-1408 (RH) 711-1409 (LH)	747-1106A
STEERING GEAR SEGMENT	783-0411	717-1550A	717-0622A	717-1550A	717-0943C
STEERING SHAFT	650-0007	738-1001	738-0919	738-1001	738-0963
STEERING WHEEL	731-1869	731-1869	731-1687	731-1869 (804) 631-0027 (809)	631-0027
FLANGE BRG, FRONT AXLE	741-0225(4)	741-0659(.632ID) 741-0660(.760 ID)	741-0659 (4)	N/A	741-0660 (4)
MISCELLANEOUS					
CHOKE CABLE	746-0964	746-1085(INTEK Twin) 746-1088(KOH)	746-0616A	746-1085	746-0614A
THROTTLE CABLE	746-0964	746-1084 (INTEK Sgl) 746-1086 (Twin)746-1087 (KOH)	746-0776	746-1086	746-0634
THROTTLE LEVER	N/A	731-1857	831-0823A	731-1857	831-0823A
FUEL CAP	751-3124B	751-0649(3GAL) 751-0603(2 GAL)	751-0603	751-0649(3GAL) 751-0603(2 GAL)	751-0531B
MUFFLER	See Engine Parts List	751-0616(Twin) 751-0617(Sgl)	751-0617 Single 751-0616 Twin 751-0302 B&S 12.5h, 13h	751-0616 (INTEK Twin) 751-0805 (KOHLER Twin))	751-0616 Twin 751-0617 Single

	1999	600 HYDROSTATIC 690 THRU 699	800 HYDROSTATIC 830 SERIES	900 HYDROSTATIC 999
DRIVE TRAIN	BELT, ENG to HYDRO	754-0441	754-0461	N/A
	BELT, ENGINE TO V/S	N/A	N/A	N/A
	BELT, V/S TO TRANS	N/A	N/A	N/A
	BRAKE PAD	N/A	HG-44132	HU-24-13772 (2)
	PULLEY, ENGINE	756-0983A	756-0636, 756-0637 (EL PTO)	756-0601
	PULLEY, TRANS	756-0975	HG-50818	N/A
	PULLEY, V/S	N/A	N/A	N/A
	PULLEY, IDLER	756-0116 V, 756-0981 flat	756-0116 V 3.06, 756-0487 V 4.0, 756-0515 flat 3.25, 756-0627 flat 3.5	711-0306
ELECTRICAL	BATTERY	725-1707C	725-1707B	725-0453F
	SOLENOID	725-1426	725-1426	See Engine Parts List
	SWITCH, IGNITION	725-1396	725-1717	725-0267
	SWITCH, LIGHT	725-0634 (Optional)	725-0634 (optional)	725-0634
	SWITCH, SAFETY (DECK)	725-1657A	725-1657A	725-1657A
	SWITCH, SAFETY (REV)	725-1643	725-1713	725-1644
	SWITCH, SAFETY (SEAT)	725-1303 & 725-1439	725-1303 & 725-1439	725-1303 & 725-1439
	SWITCH, SAFETY (CLUTCH)	725-1657A	725-1657A	725-1657A
STEERING	BALL JOINT	723-3018	723-0448A 723-3018	723-0179
	STEERING DRAG LINK	747-1107	747-1106	747-0294
	STEERING GEAR SEGMENT	717-0622A	717-0943C	748-0238
	STEERING SHAFT	738-0919	738-0963	13515-0637
	STEERING WHEEL	731-1687	631-0027	731-0806A
	FLANGE BRG, FRONT AXLE	741-0659 (4)	741-0660 (4)	731-0374
MISCELLANEOUS	CHOKE CABLE	746-0616A	746-0614A	746-0914
	THROTTLE CABLE	746-0638	746-0630A	746-0915
	THROTTLE LEVER	831-0823A	831-0823A	746-0915
	FUEL CAP	751-0603	751-0531B	751-0226
	MUFFLER	751-0616 Twin 751-0617 Single	751-0616 Twin 751-0661 Koh	751-0611 Koh

Quick Reference Guide

	MOWER DECK									ACCESSORIES	
1999	**27.5"**	**F 38"**	**G 42"**	**H 46"**	**P 50"**	**50" OEM-190-993**	**G 42" AutoDrives**	**H 46" AutoDrives**	**P 50" AutoDrives**		
BELT, BLADE DRIVE	N/A	N/A	N/A	754-0440 (600) 754-0349 (800)	754-0291A	754-0197	N/A	754-0349 (600 & 800)	754-0291A		
BELT, ENG TO DECK	754-0754	754-0329A	754-0371A	754-0439 (600) 754-0350 (800)	754-0364	754-0234 PTO	754-0472	754-0476 (600 & 800)	754-0475		
BLADE ADAPTER	N/A	N/A	N/A	N/A	N/A	748-0283 (3)	N/A	N/A	N/A		
BLADE	742-0651 (3-in-1)	742-0610 (3-in-1)	742-0616 (3-in-1)	742-0644 (2) 742-0645 (1)	742-0171B (3)	742-0171B (3)	742-0616 3-in-1	742-0611 (2) 742-0612 (1) 3-in-1	742-0623 (3)		
BLADE BRAKE	683-0159	761-0168B	761-0168A	17116 (600 & 800) Not used with electric clutches	17116 Not used with electric clutches	17116 Not used with electric clutches	N/A	N/A	N/A		
DISC, BRAKE	N/A	783-0342	783-0342	N/A	N/A	N/A	N/A	N/A	N/A		
DISCHARGE CHUTE	731-1744	731-1032	731-1032	731-1032	12649	12649	731-1032A	731-1032A	12649		
PULLEY, FLAT IDLER	756-0627	N/A	N/A	756-0627 (600 & 800)	756-0627	711-0306 (2)	N/A	756-0627 (600 & 800)	756-0627		
PULLEY, BLADE SHAFT	618-0250	756-0969	756-0980	756-0969 (3) 600 756-0969 (2) 756-0603 (1) 800	756-0969 (2) 756-1041 (1) Dbl	756-0519	756-1151	756-0603 (Dbl) 756-0969 (Sgl) (600 & 800)	756-1041 (Dbl)- 2 756-0969 (Sgl)- 1		
PULLEY, MAIN DRIVE	756-0658	756-0982 (Engine)	756-0982 (TRans) 756-0983 (Hydro) (Engine)	756-0638 (600) 756-0603 (800) (Deck)	756-1041 (Deck)	756-0632	756-0639	756-0639	756-0639		
SPINDLE ASSY	618-0250	618-0138 (2)	618-0142	618-0240 (3) 600 618-0240 (2) 618-0241 (1) 800	618-0269 (1) 618-0268 (2)	14199A (3)	618-0324	618-0241 (2) 618-0240 (1) (600 & 800)	618-0268 (1) 618-0269 (2)		
WHEEL, DECK	N/A	734-0973 (2)	734-0973 (2)	734-0973	731-0335 (3)	731-0335 (3)	734-0973	734-0973 (600) 734-3058B (800)	731-0335		
PTO GEARBOX	N/A	N/A	N/A	N/A	N/A	PE-794111	N/A	N/A	N/A		
MULCHING KIT	731-1745A Plug (1) 712-0397 Wing Nut (2) 710-0564 Bolt (1) 710-0825(1)	OEM-190-112	OEM-190-112	OEM-190-118	N/A	N/A	Oem-190-112	OEM-190-118	N/A		
MULCHING BLADE	N/A	742-0610 (2)	742-0616	742-0611 (2) 742-0612 (1)	N/A	N/A	742-0616 3-in-1	742-0611 (2) 742-0612 (1) 3-in-1	N/A		
GRASS CATCHER KIT	813-03023	OEM-190-063 OEM-190-064	OEM-190-063 OEM-190-064	OEM-190-103 600 OEM-190-083 800	N/A	N/A	OEM-190-601	OEM-190-602	N/A		
GRASS BAG	631-0080	764-0221 (2)	764-0221 (2)	764-0221 (2) 600 764-0251 (3) 800	N/A	N/A	764-0221	764-0221	N/A		

	1999	300 SERIES 13A-320-401	600 AUTODRIVE SERIES 604/608/609	600 660 THRU 679 690 THRU 699	800 AUTODRIVE SERIES 804/809	800 820-829 / 840-849 830 SERIES	900 HYDROSTATIC 999
FRONT WHEELS	WHEEL ASSEMBLY	634-0169	634-0056A (Round Shoulder) 634-0105A (Square Shoulder)	634-0056A (Round Shoulder) 634-0105 (Square Shoulder)	634-0183	734-1500A 16" x 6.5" (Round Shoulder) 634-0084 16" x 6.5" (Square Shoulder)	734-1221 18" x 6.5"
	TIRE	734-1382 11x4x4 (Square Shoulder)	734-0864 (Round Shoulder) 734-1731 (Square Shoulder)	734-0864 (Round Shoulder) 734-1731 (Square Shoulder)	734-1727 (Square Shoulder)	734-0275 (Round Shoulder) 734-1727 (Square Shoulder)	734-0294 18" x 6.5"
	RIM	734-1455A	634-0172	634-0024	634-0182	634-0067 16" x 6.5"	734-0787A
	FLANGE BEARING	741-0353	741-0487A (w/o fitting) 741-0706 (w/fitting)	Without rim grease fitting: 741-0487A (2) With rim grease fitting: inner 741-0706 outer 741-0478	741-0516 (w/o fitting) 741-0990 (w/fitting)	741-0516	731-0374 (4)
	BALL BEARING (Optional)	N/A	N/A	N/A	N/A	N/A	N/A
	AIR VALVE	734-0255	734-0255	734-0255	734-0255	734-0255	734-0255
	GREASE FITTING	737-0211A	737-3000 (Optional)	737-0211A (Optional)	737-3000 (Optional)	737-0280 (Optional)	737-0280 (Optional)
	GREASE PLUG	N/A	N/A	737-0212A	N/A	737-0212A	737-0212A
REAR WHEELS	WHEEL ASSEMBLY	634-0139	634-0177 (Sq) 22x10x8 634-0144 (Sq) 20x8x8 734-1675 (Rd) 20x8x8	734-1675 (Round Shoulder) 634-0104 (Square Shoulder)	634-0132 23x9.5x12	634-0133 (Round Shoulder) 634-0132 (Square Shoulder)	734-0934 27" x 9.5"
	TIRE, REAR	734-1727	734-1873 (Sq) 20x10x8 734-1730 (Sq) 20x8x8 734-1596 (Rd) 20x8x8	734-1596 (Round Shoulder) 734-1730 (Square Shoulder)	734-1728 (Square Shoulder)	734-1596	734-0397 27" x 9.5"
	RIM	634-0138	634-0077	634-0070 20" X 8.0"	634-0194	634-3178 23" X 9.5"	734-0935
	AIR VALVE	734-0255	734-0255	734-0255	734-0255	734-0255	734-0255

Yardman Specifications

Walk-Behind Mowers

Model	E999M	999L	979L	559K	519C	106C
Engine	6.5 HP B&S Intek OHV	6.5 HP B&S Intek OHV	6.5 HP B&S Intek OHV	6.5 HP B&S Intek OHV	6.0 HP B&S Quantum I/C	5.0 HP B&S Quantum
Drive	Self-prop; 6-spd.; Elec. strt.	Self-prop; 6-speed.	Self-prop; 6-speed.	Self-prop; single speed.	Push	Push
Deck	21"	21"	21"	21"	21"	20"
Height Control	6-Pos./Single-lever	6-Pos./Single-lever	6-Pos./Single-lever	9-Position	9-Position	9-Position
Wheel Size/Type	7"x2"/Caster Front 9"x2" Rear	7"x2"/Caster Front 9"x2" Rear	8"x2"/Ball brg. Front 9"x2" Rear	8"x2"/Front 14"x2"/Ball brg. Rear	8"x2"/Ball brg. Front 14"x2"/Ball brg. Rear	8"x2"/Ball brg. Front 8"x2" Rear
Hubcaps	Yes	Yes	Yes	Yes	Yes	Yes
Mulching Kit	Included	Included	Included	Included	Included	Included
Grass Catcher	Included	Included	Included	Included	Included	Optional OEM-190-106
Side Discharge Deflector	Included	Included	Included	N/A	N/A	Included
Approx. Shipping Weight	112 lb	105 lb	105 lb	105 lb	93 lb	80 lb
Carton Dimensions	12.15 cu ft	12.15 cu ft	12.15 cu ft	12.15 cu ft	10.12 cu ft	6.68 cu ft

Specifications subject to change without notice.

Lawn Tractors

Model	A604F	D604G	X604G	U604H	D674G	X694G	Yard Bug™ 325
Engine	13 HP OHV Briggs & Stratton Intek	16 HP OHV Briggs & Stratton Intek	15 HP OHV Kohler	20 HP OHV Briggs & Stratton Intek	16 HP OHV Briggs & Stratton Intek	16 HP OHV Kohler Command	8.5 HP I/C
Pressure Lube & Filter	Yes/Spin-on oil filter	Yes/Spin-on oil filter	Yes/Spin-on oil filter	Yes/Spin-on oil filter	Yes/Spin-on oil filter	Yes/Spin-on oil filter	No
Transmission/Speed Selection	AutoDrive™	AutoDrive™	AutoDrive™	AutoDrive™	7-Speed "Shift-on-the-Go"	Hydro/Infinite	Automatic
Deck Width/ Blades	38"/Twin	42"/Twin	42"/Twin	46"/Triple	42"/Twin	42"/Twin	27.5"/Single
Front Pneumatic Tires w/Hub Caps	15" x 6"	15" x 6"	15" x 6"	15" x 6"	15" x 6"	15" x 6"	11" x 4"
Rear Pneumatic Tires w/Hub Caps	20" x 8"	20" x 8"	20" x 8"	20" x 10"	20" x 8"	20" x 8"	16" x 6.5"
Wheel Base/Turn Radius	45.5"/16"	45.5"/16"	45.5"/16"	45.5"/16"	45.5"/24"	45.5"/24"	–
Mulching Kit	Installed	Installed	Installed	Optional OEM-190-118	Installed	Installed	Installed
Front Grease Fittings-Wheels/Axles	Yes	Yes	Yes	Yes/Cast-Iron Front Axle	Yes	Yes	No
Headlights	Yes	Yes	Yes	Yes	Yes	Yes	No
Fuel Capacity	3-Gallon	3-Gallon	3-Gallon	3-Gallon	3-Gallon	1.5-Gallon	1-Gallon
Approx. Shipping Weight	485 lb	490 lb	490 lb	500 lb	490 lb	478 lb	–

Specifications subject to change without notice.

Garden Tractors

Model	U804H	W804H	V804P	Z804P	U844H	999
Engine	20 HP OHV Briggs & Stratton Intek	20 HP OHV Kohler Twin Cylinder	22 HP OHV Briggs & Stratton Intek	22 HP Twin OHV Kohler Command	20 HP OHV Briggs & Stratton Intek	22 HP Twin OHV Kohler Command
Pressure Lube & Filter	Yes/Spin-on oil filter	Yes/Spin-on oil filter	Yes/Spin-on oil filter	Yes/Spin-on oil filter	Yes/Spin-on oil filter	Yes
Transmission/Speed Selection	AutoDrive™ Hi/Lo	AutoDrive™ Hi/Lo	AutoDrive™ Hi/Lo	AutoDrive™ Hi/Lo	Transmatic®/14-Speed	Hydro/Infinite w/ Hi-Lo Range
Deck Width/ Blades	46"/Triple	46"/Triple	50"/Triple	50"/Triple	46"/Triple	50"/Triple (Optional)
Front Pneumatic Tires w/Hub Caps	16" x 6.5"	16" x 6.5"	16" x 6.5"	16" x 6.5"	16" x 6.5"	18" x 6.5" no caps
Rear Pneumatic Tires w/Hub Caps	23" x 9.5"	23" x 9.5"	23" x 9.5"	23" x 9.5"	23" x 9.5"	27" x 9.5" no caps
Wheel Base/Turn Radius	45.5"/16"	45.5"/16"	45.5"/16"	45.5"/16"	47.5"/26"	52.8"/48"
Mulching Kit	Optional OEM-190-118	Optional OEM-190-118	N/A	N/A	Optional OEM-190-118	N/A
Front Grease Fittings-Wheels/Axles	Yes	Yes/Cast-Iron Front Axle	Yes/Cast-Iron Front Axle	Yes/Cast-Iron Front Axle	Yes	Yes
Headlights	Yes	Yes	Yes	Yes	Yes	Yes
Fuel Capacity	3-Gallon	3-Gallon	3-Gallon	3-Gallon	2.5-Gallon	3.5-Gallon
Ground Engaging Capability	Yes	Yes	Yes	Yes	Yes	Yes
Approx. Shipping Weight	485 lb	490 lb	490 lb	500 lb	625 lb	980 lb

Specifications subject to change without notice.

Yardman Specifications

TILLER

Model	458B
Type	Rear tine/Dual direction
Engine	6.5 HP Intek OHV
Drive	Self-propelled; Fwd/Rev
Tines	12" Dual Dir. / Self Adj.
Wheels	16"x 4.8" Pneumatic
Handles	Plow type/Swinging
Depth Control	8"
Approx. Shipping Weight	265 lb
Carton Dimensions	23 cu ft

Specifications subject to change without notice.

EDGER

MODEL	564A
Blade	9" Triple-Edge
Engine	4 HP Quattro
Fuel Capacity	2-Quart
Edging Depth	2"
Bevel Position	5
Edging Depth Position	5
Wheels	7" x 2"/Ball Brg. Front 8" x 2"/Rear Wheel
Curb Hop Feature	Yes/17-Position
Approx. Shipping Wt.	68 lb
Carton Dimensions	6.75 cu ft

Specifications subject to change without notice.

CHIPPER/SHREDDER/VACS

Model	103A	203B
Engine	5 HP Tecumseh OHV	5.5 HP Tecumseh OHV
Transmission	Push	Chain Drive
Extended Oil Fill	Yes	Yes
Fuel Capacity (approximate)	3-Quart	3-Quart
Chipper Capacity	2" Diameter	2" Diameter
Vacuum Capacity	24"	24"
Chipper Knives	2 Hardened Steel	2 Hardened Steel
Flail Knives	9 Hardened Cast Steel	9 Hardened Cast Steel
Stationary Knives	10 Hardened Steel	10 Hardened Steel
Self-Cleaning Screen	Hardened Cast Steel	Hardened Cast Steel
Bag Capacity	3-Bushel	3-Bushel
Goggles	Included	Included
Vacuum Height Adjustment	.25" to 4.75"	.25" to 4.75"
Speeds	N/A	Single Speed
Front Wheels	6" Lockable Caster	6" Lockable Caster
Rear Wheels	10" x 4" Pneumatic	10" x 4" Pneumatic
Vacuum Hose Kit	Optional (OEM 290-005)	Optional (OEM 290-005)
Reduction	10:1	10:1
Warranty	2-Year Limited	2-Year Limited
Carton Size	44" x 27" x 43" 29.56 cu ft	44.25" x 27" x 43.25" 29.90 cu ft
Shipping Weight	186 lb	186 lb

Specifications subject to change without notice.

Model	A60ME	D60MC	X60MC	U60MH	D67MC	X60MC	YARD BUG™ 325
Engine	13 HP OHV Briggs & Stratton Intek	16 HP OHV Briggs & Stratton Intek	15 HP OHV Kohler	20 HP OHV Briggs & Stratton Intek	16 HP OHV Briggs & Stratton Intek	16 HP OHV Kohler Command	8.5 HP I/C
Pressure Lube & Filter	Yes/Spin-on oil filter	Yes/Spin-on oil filter	Yes/Spin-on oil filter	Yes/Spin-on oil filter	Yes/Spin-on oil filter	Yes/Spin-on oil filter	No
Transmission/Speed Selection	AutoDrive™	AutoDrive™	AutoDrive™	AutoDrive™	7-Speed "Shift-on-the-Go"	Hydro/Infinite	Automatic
Deck Width/ Blades	38"/Twin	42"/Twin	42"/Twin	46"/Triple	42"/Twin	42"/Twin	27.5"/Single
Front Pneumatic Tires w/Hub Caps	15" x 6"	15" x 6"	15" x 6"	15" x 6"	15" x 6"	15" x 6"	11" x 4"
Rear Pneumatic Tires w/Hub Caps	20" x 8"	20" x 8"	20" x 8"	20" x 10"	20" x 8"	20" x 8"	16" x 6.5"
Wheel Base/Turn Radius	45.5"/16"	45.5"/16"	45.5"/16"	45.5"/16"	45.5"/24"	45.5"/24"	–
Mulching Kit	Installed	Installed	Installed	Optional OEM-190-118	Installed	Installed	Installed
Front Grease Fittings-Wheels/Axles	Yes	Yes	Yes	Yes/Cast-Iron Front Axle	Yes	Yes	No
Headlights	Yes	Yes	Yes	Yes	Yes	Yes	No
Fuel Capacity	3-Gallon	3-Gallon	3-Gallon	3-Gallon	3-Gallon	1.5-Gallon	1-Gallon
Oil	Included in Engine	Included in Engine	Included in Engine	Included in Engine	Included in Engine	Included in Engine	Included in Engine
Approx. Shipping Weight	485 lb	490 lb	490 lb	500 lb	490 lb	478 lb	–
UPC Codes (043033)	496242	496143	496167	496150	489480	490813	495627

Specifications subject to change without notice.

White Outdooor Specifications

Garden Tractors	GT 2055	GT 2150	GT 2550
Engine	20 HP Briggs & Stratton Vanguard V-Twin OHV	21 HP Briggs & Stratton V-Twin Industrial Plus OHV	25 HP Briggs & Stratton V-Twin Industrial Plus OHV
Lubrication	Full-pressure lubrication	Full-pressure lubrication	Full-pressure lubrication
Transmission	Hydrostatic	Hydrostatic with rocker pedal	Hydrostatic with rocker pedal
PTO	Manual	Electric	Electric
Cutting Deck	Optional 50"/60" side discharge	46" w/Gr. Fit.	50" w/Gr. Fit.
Mulcher	N/A	OPT 190-118	N/A
Fuel Capacity	3.5 gal.	3 gal.	3 gal.
Key Start	Standard	Standard	Standard
Ammeter	Standard	Standard	Standard
Headlights	Standard	Standard	Standard
Speed Selection	Infinite	Infinite	Infinite
MPH	0-6.8	0-5.5	0-5.5
Disc Brakes	Standard	Standard	Standard
Parking Brake	Standard	Standard	Standard
Cast-Iron Front Axle	N/A	Yes	Yes
Turning Radius	27"	18"	18"
Front Tires	18" x 6.5"	16" x 6.50"	16" x 6.50"
Rear Tires	27" x 9.5"	23" x 9.50"	23" x 9.50"
Wheelbase	53"	45.5"	45.5"
Weight (Shipping)	916 lb (tractor only) 1156 lb (w/60" mowing deck)	715 lb	730 lb

Specifications subject to change without notice.

ZT Series	ZT 1850	ZT 2150	ZT 2250
Engine	18 HP Briggs & Stratton Industrial Plus V-Twin OHV	21 HP Briggs & Stratton Industrial Plus V-Twin OHV	22 HP Briggs & Stratton Industrial Plus V-Twin OHV
Lubrication	Full-pressure lubrication with spin-on oil filter	Full-pressure lubrication with spin-on oil filter	Full-pressure lubrication with spin-on oil filter
Transmission	Dual bi-directional hydrostats	Dual bi-directional hydrostats	Dual bi-directional hydrostats
PTO (Power Take-Off)	Electric	Electric	Electric
Cutting Deck	44" standard mulch baffle	48"	54"
Cutting Height	1.5"-4.5"	1.5"-4.5"	1.5"-4.5"
Number of Blades	3	3	3
Fuel Capacity	5 gal	5 gal	5 gal
Key Start	Standard	Standard	Standard
Hourmeter	Standard	Standard	Standard
Headlights	Standard	Standard	Standard
Speeds	Forward: 0-7 mph Reverse: 0-2.5 mph	Forward: 0-7 mph Reverse: 0-2.5 mph	Forward: 0-7 mph Reverse: 0-2.5 mph
Seat	Adjustable high back	Adjustable high back with armrests	Adjustable high back with armrests
Steering Control	Twin-lever with speed control bar	Twin-lever with speed control bar	Twin-lever with speed control bar
Front Wheels	11" x 4" pneumatic caster	11" x 4" pneumatic caster	11" x 4" pneumatic caster
Rear Wheels	20" x 8" turf tread	22" x 11" chevron tread	22" x 11" chevron tread
Weight (Shipping)	852 lb	925 lb	935 lb
Optional Accessories	590-506-190 48" Mulch Baffle	590-507-190 54" Mulch Baffle	190-515-101 Bagger - Fits 44" deck only

Specifications subject to change without notice.

Self-Propelled Mowers	LC 210	LC 215	LC 215E	HW 656	Push Mowers LC 40	LC 106	LC 436	HW 615
Engine	6.5 HP Briggs & Stratton Industrial Plus OHV	6.5 HP Briggs & Stratton Industrial Plus OHV	6.5 HP Briggs & Stratton Industrial Plus OHV	6.5 HP Briggs & Stratton Industrial Plus OHV	4.0 HP Briggs & Stratton Quattro	6.0 HP Briggs & Stratton Quantum	6.0 HP Briggs & Stratton Quantum	6.5 HP Briggs & Stratton Industrial Plus OHV
Drive	6-Speed	6-Speed	6-Speed	Single Speed	Push	Push	Push	Push
Mulching	Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard
Side Discharge	Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard
Bagging	Rear Bag Optional	Rear Bag Standard	Rear Bag Standard	Rear Bag Standard	Side Bag Optional	Side Bag Optional	Rear Bag Standard	Rear Bag Optional
Deck	21"	21"	21"	21"	18"	20"	21"	21"
Height Adjuster	Single Lever 6-Position	6-Position	6-Position	Single Lever 6-Position	9-Position	9-Position	9-Position	6-Position
Cutting Height	1" - 3.5"	1" - 3.5"	1" - 3.5"	1" - 3.5"	1" - 3.5"	1" - 3.5"	1" - 3.5"	1" - 3.5"
Safety Start	Extended Rope Start	Extended Rope Start	Electric Start	Extended Rope Start	Extended Rope Start	Extended Rope Start	Extended Rope Start	Extended Rope Start
Front Wheels	8" x 2" BB	7" Caster, BB	7" Caster, BB	8" x 2" BB	8" x 2"	8" x 2" BB	8" x 2" BB	7" Caster, BB
Rear Wheels	9" x 2" BB	9" x 2" BB	9" x 2" BB	14" x 2" BB	8" x 2"	8" x 2" BB	8" x 2" BB	14" x 2" BB
Fuel	1.6 qt.	1.6 qt.	1.6 qt.	1.6 qt.	1.6 qt.	1.6 qt.	1.6 qt.	1.6 qt.

Specifications subject to change without notice.

Wide-Cut Mowers	833R	833E	Trimmer/ Mowers	HWT 4	HWT 5E
Engine	8.5 HP Briggs & Stratton Diamond I/C	8.5 HP Briggs & Stratton Diamond I/C	Engine	4 HP Briggs & Stratton	5 HP Briggs & Stratton
Starting	Recoil Start	Electric Start	Starting	Recoil Start	Electric
Cutting Width	33"	33"	Cutting Diameter	22" to 25"	22" to 25"
Drive	Rear	Rear	Cutting Cords	Extra Heavy-Duty 155 mil. Heavy-Duty 130 mil.	Extra Heavy-Duty 155 mil. Heavy-Duty 130 mil.
Speeds	4 Forward/ 1 Reverse	4 Forward/ 1 Reverse	Cutting Height	1.5" to 4.5"	1.5" to 4.5"
Cutting Height	1" to 4"	1" to 4"	Wheels	16" x 1.75" BB	16" x 1.75" BB
Front Wheels	6" x 2" Caster	6" x 2" Caster	Brake/Clutch	Spindle Safety Brake	Spindle Safety Brake
Rear Wheels	16" x 4.8"	16" x 4.8"	Parallel Trim Adjustment	Yes	Yes

Tillers	RB 500	RB 530	RB 650
Type	Front tine	Rear tine-CRT	Rear tine dual-direction
Engine	5.5 HP Briggs & Stratton Industrial Plus OHV	5.5 HP Briggs & Stratton Industrial Plus OHV	6.5 HP Briggs & Stratton Industrial Plus OHV
Tine Diameter	12"	12"	12"
Tilling Width	13", 22", 24"	18"	18"
Fwd. Tine Speed	140 rpm	N/A	257 rpm
Rev. Tine Speed	N/A	177 rpm	177 rpm
Self-Sharpening	Yes	Yes	Yes
Heat-Treated	Yes	Yes	Yes
Adj. Side Panels	N/A	Yes	Yes
Wheel Size/Tires	8" x 1.75" Steel	16" x 4.8" Pneumatic/ ag tread	16" x 4.8" Pneumatic/ ag tread
Adjustable Handle	Yes	Yes	Yes

Specifications subject to change without notice.

White Outdoor Specifications

Chipper/Shredder/ Vacuums	YB 50	YB 550	YB 950	Edger	598
Engine	5 HP	5.5 HP OHV	9 HP XL	Engine	3.5 HP Briggs & Stratton
Drive	Push	Self-Propelled Single-Speed	6 Forward/ 2 Reverse	Blade	9" Steel
Width	22"	24"	26"	Blade Control	7-Pos. Blade Angle
Chip Diameter	1.5"	2"	3"	Height Adjustment	5 Edging Depth Positions
Bag Capacity	2-Bushel	3-Bushel	4-Bushel	Curb Wheel	5 Positions
Chipper Knives	1	2	2	Wheels	Front 7" x 1.75" BB Rear 8" x 1.75" BB
Flails	6	9	9	Handle	Loop
Stationary Shredding Knives	N/A	10	10		
Fuel Tank	1 qt.	3 qt.	1 gal.		

Specifications subject to change without notice.

SECTION 2
FRONT WHEEL DRIVE SELF-PROPELLED LAWN MOWERS

Removal and Replacement of the Drive Belt

1. Remove both of the transmission cover screws with a 1/4" socket. See figure 1.
2. Push the sides of the transmission cover in, releasing the locking tabs from the height adjusters.

   NOTE: You may need to use a flat head screw driver to apply pressure inward during cover removal.

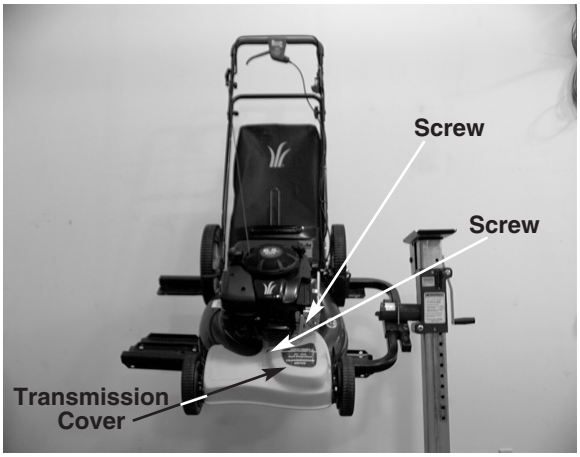


FIGURE 1.

3. Using a 7/16 socket and a 7/16 wrench, remove the idler and belt keeper from the unit. See figure 2.

   NOTE: The belt is free from the transmission at this point.

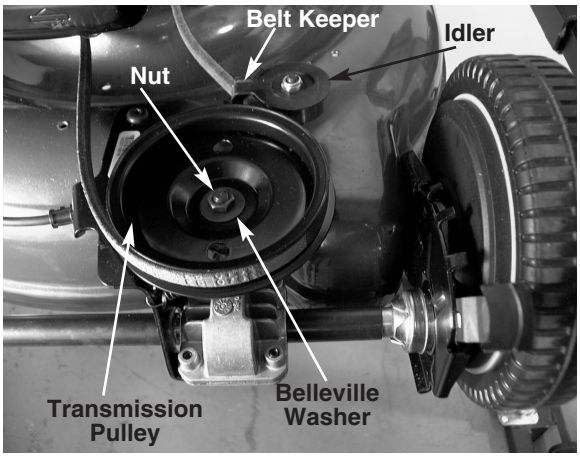


FIGURE 2.

4. Lift up on the front of the unit and tilt the machine towards the handlebars.
5. Remove the blade bolt and bell washer from the blade assembly using a 5/8 socket. See figure 3.

   NOTE: The blade, blade adapter, and the drive pulley will come off of the crank shaft as one assembly.

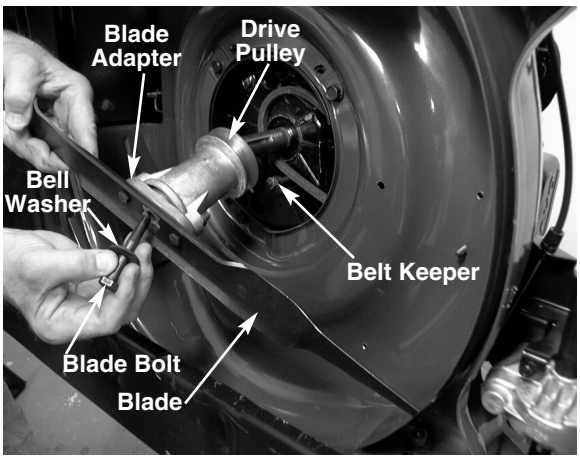


FIGURE 3.

6. Remove the belt from the unit.

REINSTALL THE BELT IN THE REVERSE ORDER.

Removal of the Front Wheel Drive Assembly

1. Lift up on the front of the unit and tilt the machine towards the handlebars. Secure the unit in this position.

   NOTE: A 2x4 on end works well for this.

2. Remove the hubcaps, hairpins and washers. See figure 1.

   NOTE: The washers on this unit are on the outside of the wheels.

3. Remove the wheels, drive gears marked with "R" or "L" for right and left, the dowel pins and dust covers. See figure 1.

   NOTE: The dust covers are being held on by the wheel hubs. There are no washers on the inside of the wheels.

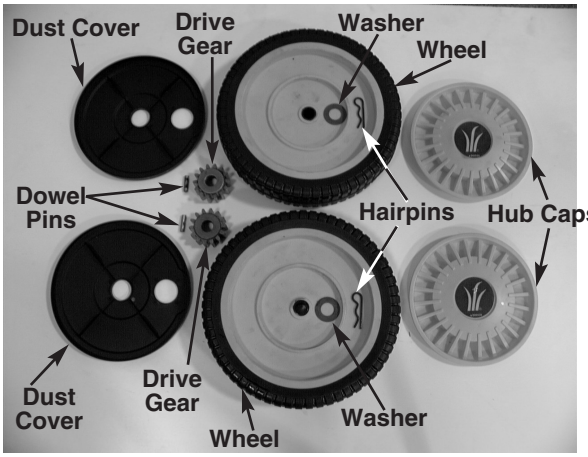


FIGURE 1.

4. Remove the drive cable from the cable idler bracket by squeezing the cable lock tabs in and pulling the "Z" fitting from the idler arm. See figure 2.

5. Remove the cable bracket screw with a T-27 torx. This will allow the transmission to pivot freely.

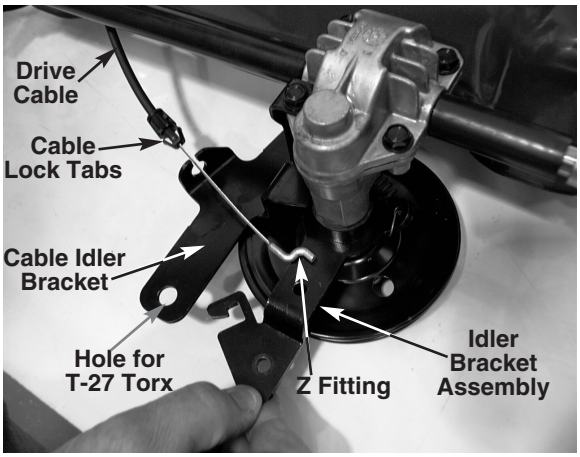


FIGURE 2.

6. Remove both hex cap screws and hex nuts from the left height adjuster using a 9/16 socket and wrench. Take note of which way the bell washers face. The cup side faces the deck. See figure 3.

   NOTE: As you pull the right height adjustment away, the transmission assembly will come with it.

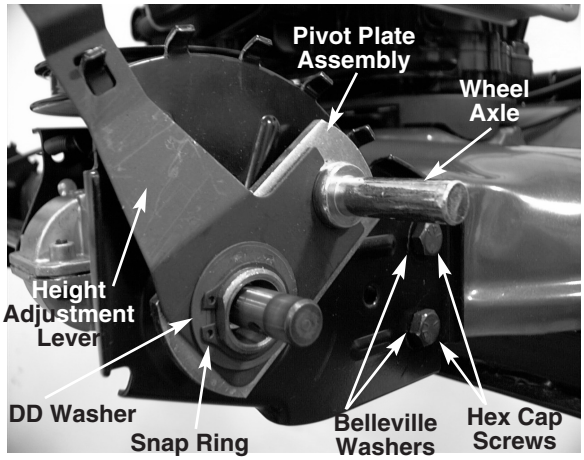


FIGURE 3.

REINSTALL THE TRANSMISSION ASSEMBLY IN THE REVERSE ORDER.

FRONT DRIVE ASSEMBLY

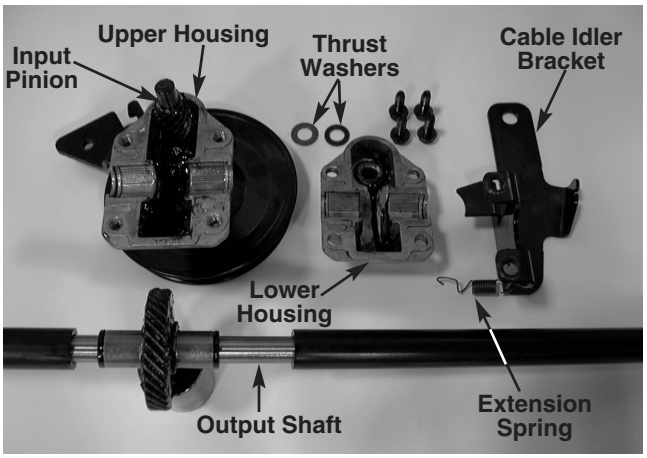


FIGURE 4.

Front Height Adjustment Disassembly

CAUTION: The height adjustment assembly is spring loaded with a wave washer!!!

1. Remove the snap ring, DD washer, height adjustment lever and pivot plate. See figure 1.

   NOTE: The wheel axle is mounted to the pivot plate, not to the adjustment lever.

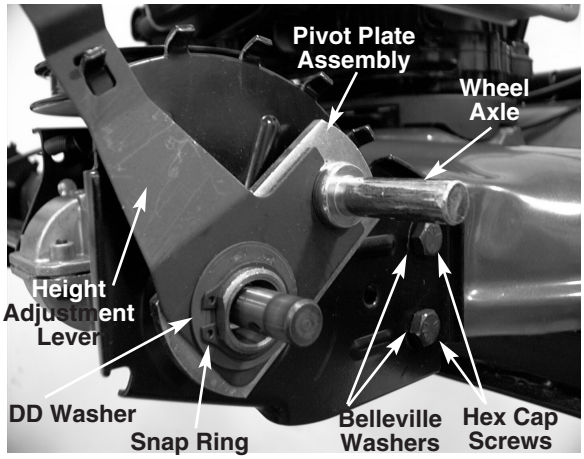


FIGURE 1.

2. Remove the bearing retainer, bearing sleeve, bearing support, and wave washer from the height adjustment plate. See figure 2.

   NOTE: These are all pressed together at this time.

3. Remove the wave washer from the bearing support.
4. The bearing assembly (retainer, sleeve, and support) can now be disassembled.

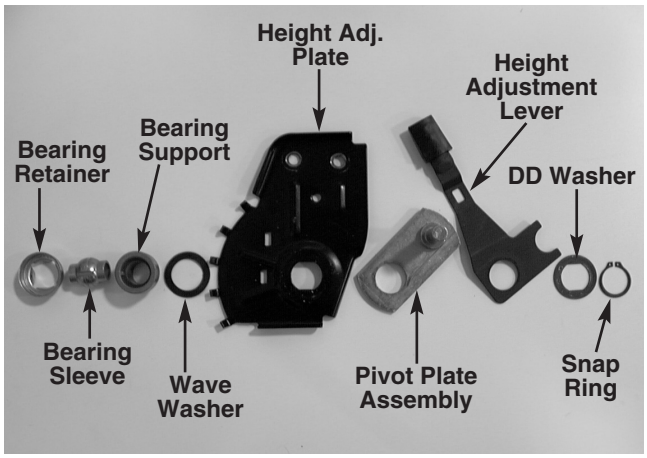


FIGURE 2.

Bearing Sleeve Removal and Assembly

1. Open the jaws of a vice to allow the bearing support to fall into the center, stopping the retainer lip on the top surface of the jaws.
2. Tap the bearing sleeve face with a brass hammer, and the assembly will come apart.

   NOTE: The bearing sleeve has an indicator pin on it that locks the bearing in place. This ensures that the bearing does not spin on the axle shaft.

3. Replace the bearing sleeve.

   NOTE: Make sure the indicator pin is in the detent of the bearing support.

4. Put the bearing support, new bearing sleeve, and the bearing retainer in the correct sequence.
5. Find a socket that will fit over the center raised bearing retainer area, yet fit flush on the outer perimeter of the bearing retainer. See figure 1.
6. Open the jaws of a vice to allow the bearing support to fall into the center, stopping at the bearing support lip on the top surface of the jaws.
7. Place the socket over the bearing retainer perimeter and tap the bearing assembly until the bearing sleeve is firmly in place. See figure 1.

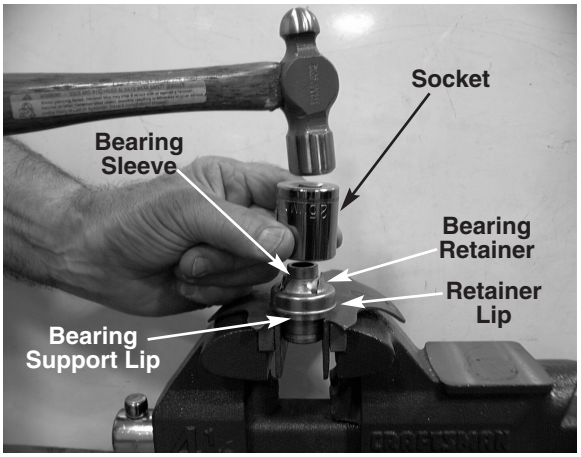


FIGURE 1.

Front Height Adjustment Reassembly

1. Place the wave washer on the bearing support.
2. Place the bearing support and the wave washer into the height adjustment plate.

   NOTE: The wave washer goes between the bearing support and the height adjustment plate on the inside.
3. Place the pivot plate, lever, and the DD washer on next.
4. With a pair of retainer ring pliers, place the retaining ring on the bearing support.

   NOTE: The retaining ring will not be in the grove at this time. The retaining ring needs to be installed with the squared edge facing the wheel.
5. Using two 1" sockets, one on the bearing retainer side and one on the retaining ring side, put the assembly into a vice. See figure 1.

   NOTE: If you have a 1" ID washer, use it on the retaining ring side for support and remove it when finished.

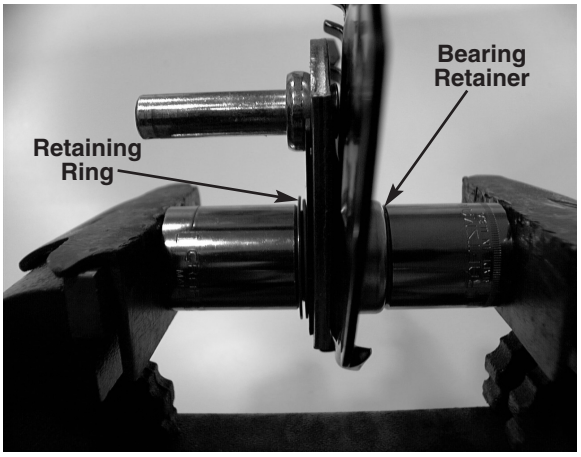


FIGURE 1.

6. Compress the assembly until the retaining ring snaps itself into place.

SECTION 3
YARD BUG

Deck Leveling

INITIAL PREPARATION:

IMPORTANT: Prior to leveling the mowing deck, perform the following steps:

1). Check the tire pressure. All tires will be approximately 12 PSI.

2). Place the rider on a level surface.

3). Depress and lock the parking brake.

4). Raise the hood and remove the grass bag assembly and discharge chute.

5). Remove the spark plug wire from the spark plug and lower the hood.

6). Raise the cutting height adjustment lever to the highest position.

7). Locate both lower "T" links and extension springs that secure the rear deck hangers to the pivot link assemblies.

8). Make certain the lower "T" links are mounted to the rider correctly. See figure 1.

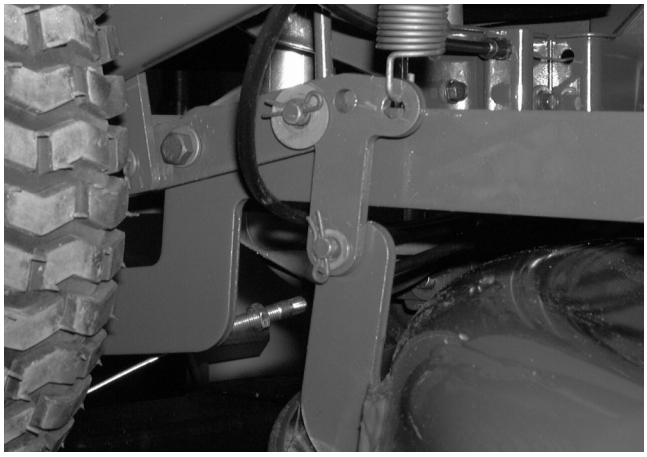


FIGURE 1.

FRONT TO REAR LEVELING ADJUSTMENT:

IMPORTANT: The front of the mowing deck will be between 1/4 and 3/8" lower in the front than the rear of the deck.

1). Using a work glove or rag, rotate the mowing blade until it is parallel with the rider frame. See figure 2.

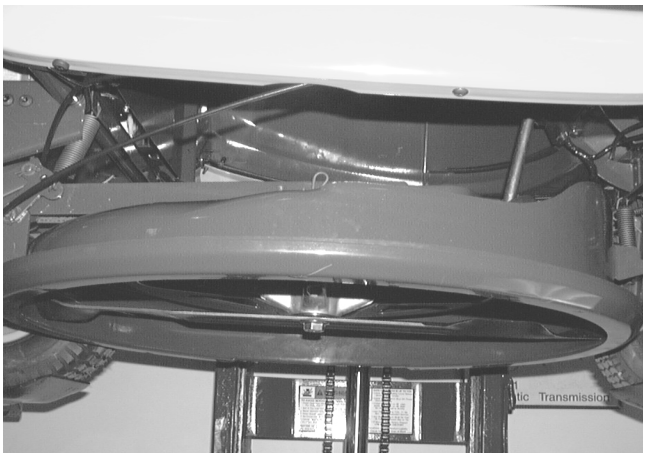


FIGURE 2.

2). Depress and lock the deck pedal assembly.

3). Measure the front blade tip to ground.

4). Measure the rear blade tip to ground.

5). The front blade tip will be 1/4 to 3/8" lower than the rear blade tip. If not, perform the following adjustments:

6). Loosen both jam nuts that are directly on top of the center deck ferrules using a 3/4" wrench. See figure 3.

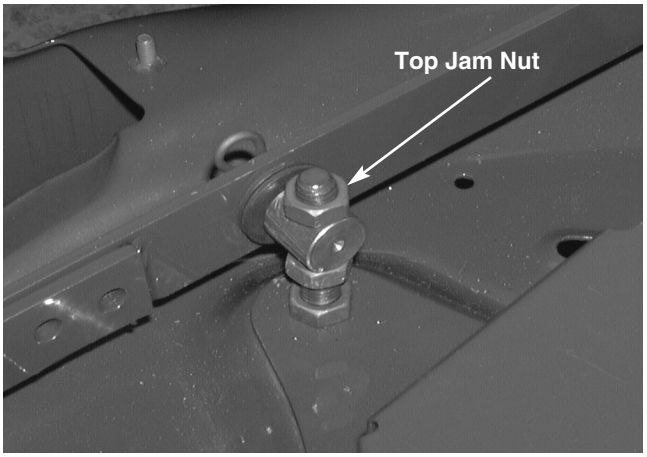


FIGURE 3.

7). Loosen the middle jam nuts that are directly below the center deck ferrules until they bottom out on top of the mowing deck jam nuts using a 3/4" wrench. See figure 4.

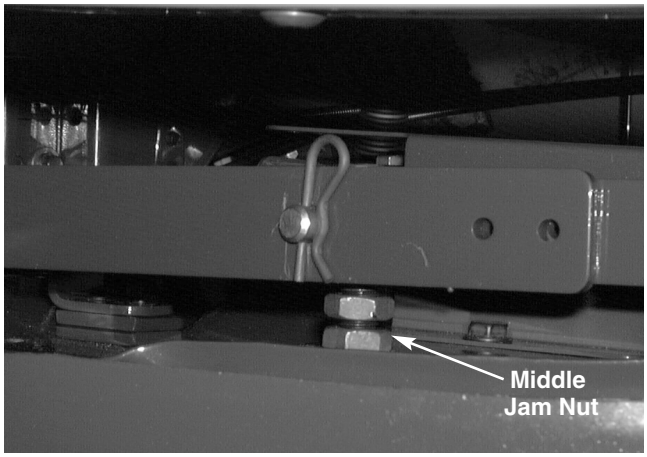


FIGURE 4.

8). Raise or lower the mowing deck assembly by tightening or loosening the jam nuts that are directly on top of the center deck ferrules, until the proper measurement (front to back) has been achieved. Refer to figure 3.

9). Tighten both middle jam nuts that are directly below the center deck ferrules using a 3/4" wrench.

10). Release the deck pedal assembly

SIDE TO SIDE LEVELING ADJUSTMENT:

1). Using a work glove or rag, rotate the mowing blade until it is perpendicular to the rider frame. See figure 5.

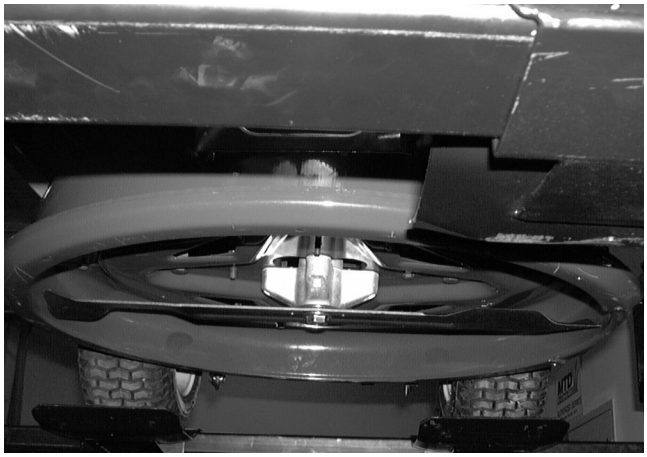


FIGURE 5.

2). Depress and lock the deck pedal assembly.

3). Measure the right blade tip to ground.

4). Measure the left blade tip to ground.

5). The right blade tip will be equal to the left blade tip. If not, perform the following steps:

6). Loosen both jam nuts that are directly on top of the center deck ferrules using a 3/4" wrench. Refer to figure 3.

7). Loosen the middle jam nuts that are directly below the center deck ferrules until they bottom out on top of the mowing deck jam nuts using a 3/4" wrench. Refer to figure 4.

8). Identify which side of the mowing deck needs to be raised or lowered to achieve the correct measurements.

9). Locate and adjust the jam nuts that are directly on top of the center ferrules until the deck is leveled out. Refer to figure 3.

REMEMBER: The front to back adjustment will be altered if both jam nuts are altered.

10). Tighten both middle jam nuts that are directly below the center deck ferrules using a 3/4" wrench.

11). Release the deck pedal assembly.

12). Reconnect the spark plug wire to the spark plug.

13). Reinstall the discharge chute and grass bag assembly.

14). Lower the hood and test for a level cut.

Brake Adjustment

TESTING THE BRAKES:

1). Release the parking brake and place the rider in neutral.

2). Depress the brake pedal and try to roll the rider.

NOTE: If the tractor moves, perform the following steps:

BRAKE ADJUSTMENT AT THE TRANSMISSION:

1). Standing on the right side of the rider, locate the brake cable under the front housing.

2). Follow the brake cable forward to the front channel assembly. See figure 1.

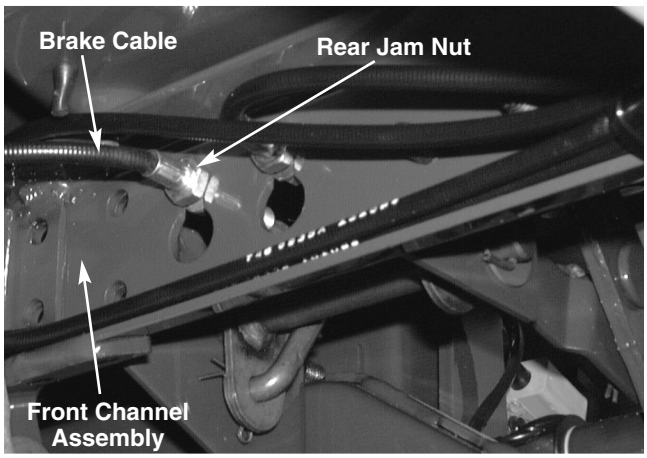


FIGURE 1.

3). Locate and loosen the brake cable adjustment jam nuts using two 1/2" wrenches.

4). By hand, loosen the rear jam nut (closest to the deck) until it bottoms out on the threaded cable end.

5). Slide the brake cable forward until the rear jam nut is flush with the back side of the front channel assembly.

6). By hand, tighten the front jam nut to the front of the front channel assembly. See figure 2.

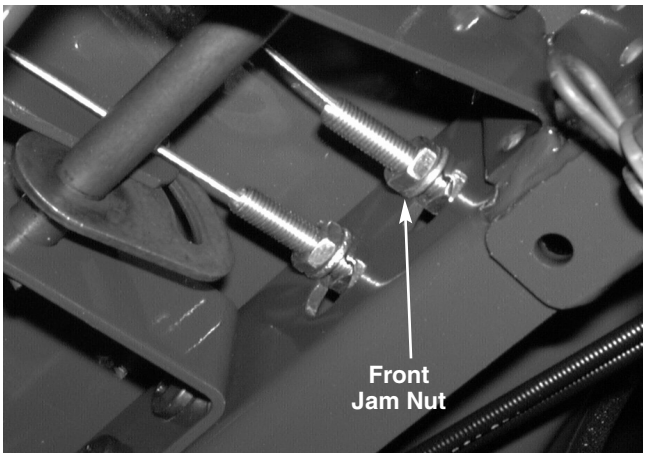


FIGURE 2.

7). Tighten both jam nuts using two 1/2" wrenches.

8). Locate the locking hex nut that secures the brake actuation arm to the brake assembly on the transmission. See figure 3.

9). Loosen **(DO NOT REMOVE)** the locking hex nut using a 1/2" wrench. See figure 3.

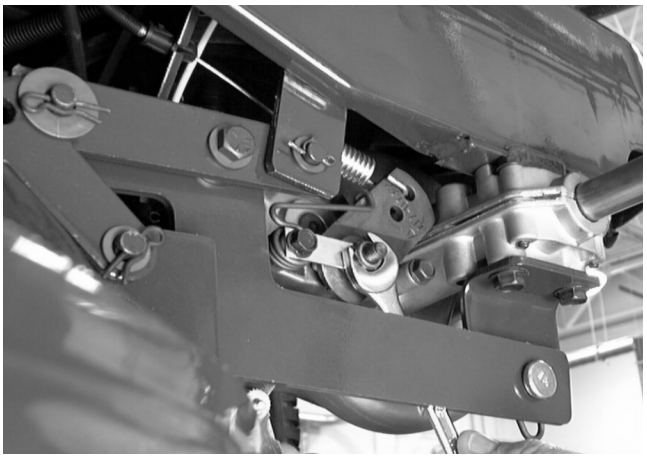


FIGURE 3.

10). Slide an .011" feeler gauge between the brake disc and the brake puck. See figure 4.

11). Tighten the locking hex nut until the .011" feeler gauge is snug. See figure 4.

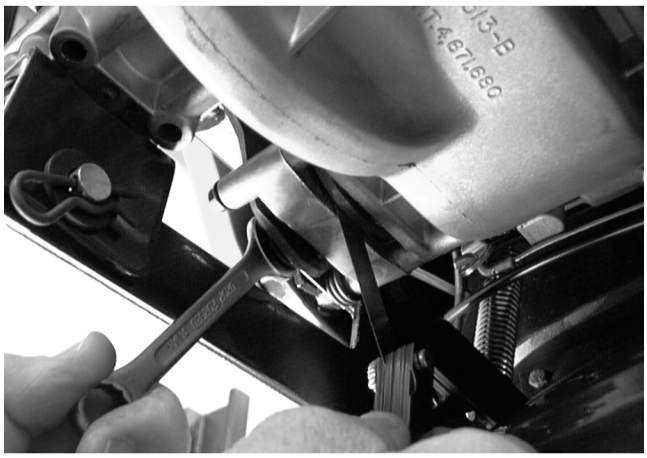


FIGURE 4.

12). Remove the .011" feeler gauge.

13). Test for proper brake adjustment using the TESTING THE BRAKES section.

PERIODIC BRAKE ADJUSTMENT:

1). Lock the parking brake and turn the ignition key off.

2). Pivot the hood up and remove the spark plug wire from the spark plug.

3). Lower the hood.

4). From the right side of the rider, locate the brake cable under the front housing.

5). Follow the brake cable forward to the front channel assembly.

6). Locate and loosen the brake cable adjustment jam nuts using two 1/2" wrenches. Refer to figures 1 and 2.

7). Loosen the front jam nut several turns.

8). Grasp the brake cable with your left hand from the rear of the front channel assembly and gently pull rearward.

9). Tighten the rear jam nut (clockwise) one complete rotation at a time using a 1/2" wrench. Between rotation, try to roll the rider. Refer to figure 1.

10). When the rider no longer rolls, hand tighten the front jam nut to the front of the front channel assembly. Refer to figure 2.

11). Tighten both jam nuts using two 1/2" wrenches.

12). Unlock the parking brake and roll the rider several feet on flat ground to make certain the brakes are not too tight.

13). Repeat the TESTING THE BRAKES section and make certain all hardware is secure.

14). Pivot the hood up, reconnect the spark plug wire, and pivot the hood down.

Blade Brake/ PTO Adjustment

IMPORTANT: The deck belt will begin to engage when the blade engagement pedal is depressed 3/4" from the original starting position.

1). Lower the mowing deck to the lowest cutting position.

2). Raise the hood and remove the grass bag assembly. See figure 1.

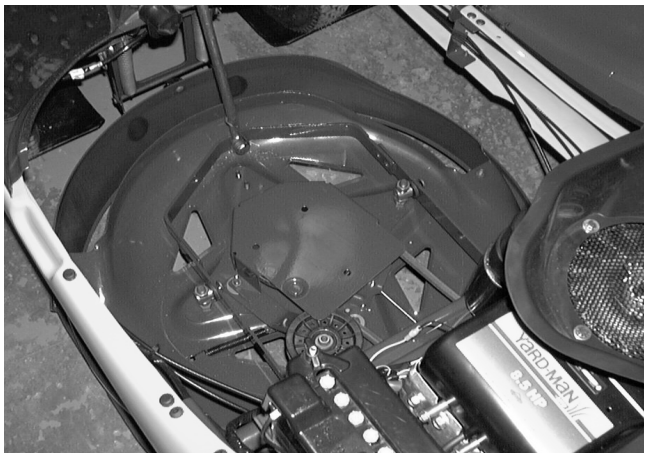


FIGURE 1.

3). Remove the spark plug wire from the spark plug.

4). Depress the blade engagement pedal 3/4" from the starting position. See figure 2.

NOTE: Use a tape measure from the original starting point of the engagement pedal.

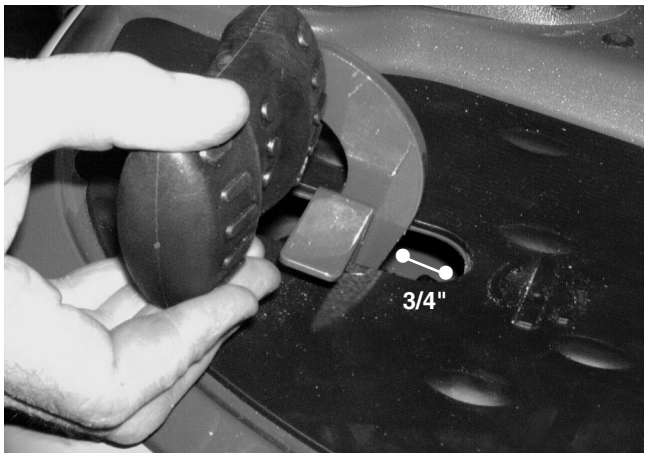


FIGURE 2.

5). Take hold of the deck engagement belt and try to pull it forward or backward. See figure 3.

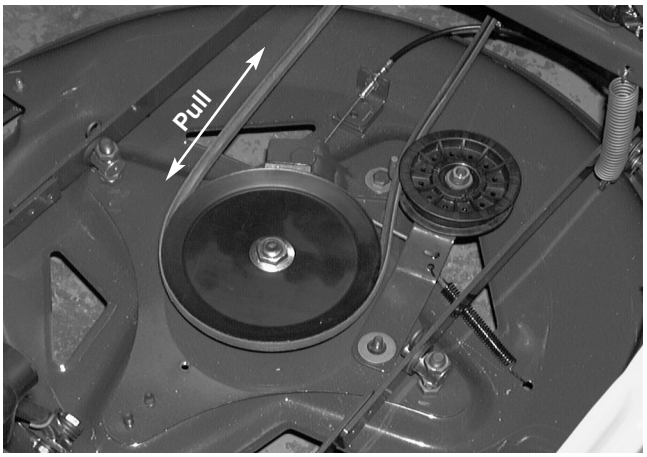


FIGURE 3.

NOTE: If the belt is slipping through the deck pulley and engagement flat idler, perform the following steps:

6). Release the blade engagement pedal.

7). Locate and loosen the hex jam nuts that secure the threaded end of the deck cable to the deck cable bracket using two 1/2" wrenches. See figure 4.

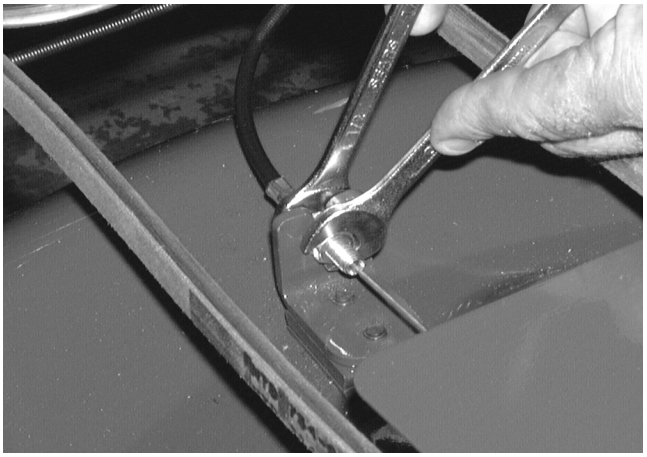


FIGURE 4.

8). Adjust the deck cable to the proper specifications and secure the hex jam nuts using two 1/2" wrenches.

9). Test the blade engagement pedal for proper adjustment by performing steps 4 and 5.

NOTE: Make certain the deck belt has a maximum deflection of 1/2" off center when the blade engagement pedal is fully depress.

Speed Control Pedal Adjustment

INITIAL SPEED CONTROL PEDAL ADJUSTMENT WITH NEW BELTS:

NOTE: This section is performed with new belts **ONLY**.

1). Lock the parking brake and turn the ignition key **"OFF"**.

2). Pivot the hood up and remove the spark plug wire from the spark plug.

3). Lower the hood.

4). From the right side of the rider, locate the variable drive cable under the front housing.

5). Follow the variable drive cable forward to the front channel assembly.

6). Locate and loosen the variable drive cable adjustment jam nuts using two 1/2" wrenches. See figures 1 and 2.

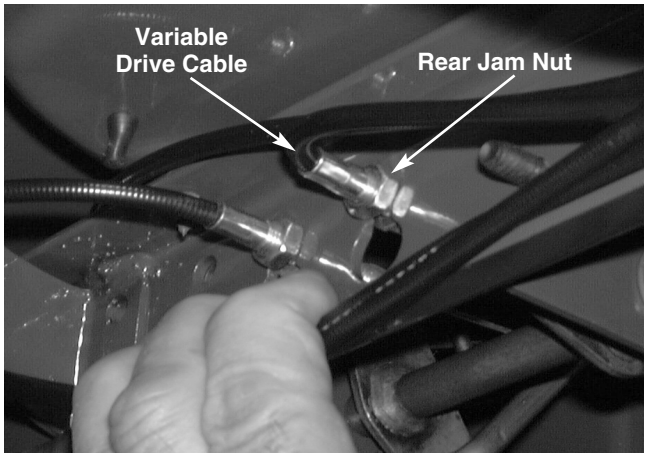


FIGURE 1.

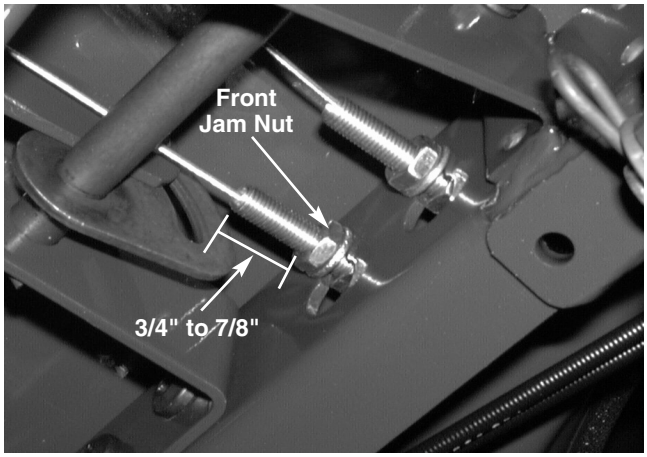


FIGURE 2.

7). By hand, loosen the rear jam nut (closest to the deck) until it bottoms out on the threaded cable end. See figure 1.

8). By hand, tighten the front jam nut until the threaded cable end is exposed 3/4 to 7/8" past the front face of the front jam nut. See figure 2.

9). By hand, tighten the rear jam nut (clockwise) until it is snug up against the rear of the front channel assembly. See figure 1.

10). Tighten both jam nuts using two 1/2" wrenches.

11). Release the parking brake.

12). Apply 10 pounds of force to the variable pedal assembly with a fish scale. See figure 3.

FIGURE 3.

13). From the back of the rider, locate the oval frame extrusion directly behind the engine.

14). Looking down through the oval extrusion, locate the head of the weld pin (belt keeper) on the idler bracket assembly.

15). With a partner applying 10 pounds of force to the variable pedal assembly, measure the distance between the edge of the weld pin head and the right inside edge of the oval extrusion.
–The measurement will be between 1.60" and 1.65". See figure 4.

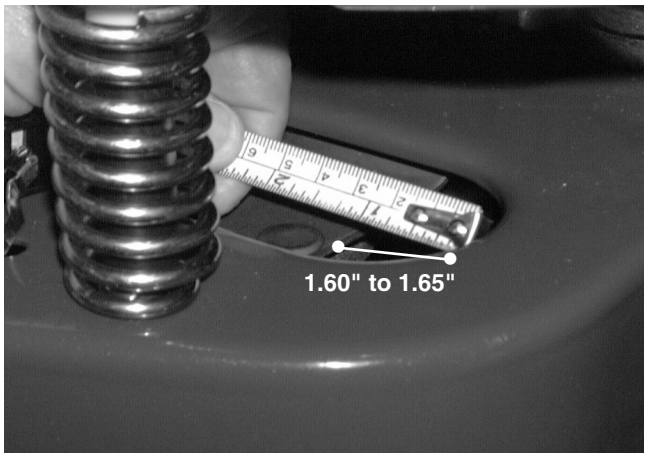


FIGURE 4.

IF ADDITIONAL SPEED CONTROL ADJUSTMENT IS NEEDED, PERFORM THE FOLLOWING STEPS:

IMPORTANT: DO NOT perform adjustment while the rider is running.

NOTE: Inspect both variable drive belts before performing this adjustment.

1). Place the rider on level ground and make certain the parking brake is **NOT** applied.

2). Raise the hood, remove one of the wiring harness female connectors from the seat switch, and lower the hood. See figure 5.

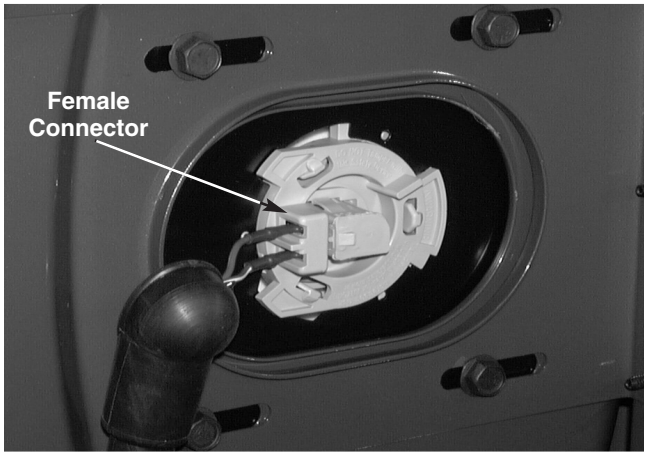


FIGURE 5.

3). Raise the rear wheels of the rider off the ground.

4). From the right side of the rider, locate the variable drive cable under the front housing.

5). Follow the variable drive cable forward to the front channel assembly.

6). Locate and loosen the variable drive cable adjustment jam nuts using two 1/2" wrenches. Refer to figures 1 and 2.

7). By hand, loosen the front jam nut several full turns. See figure 6.

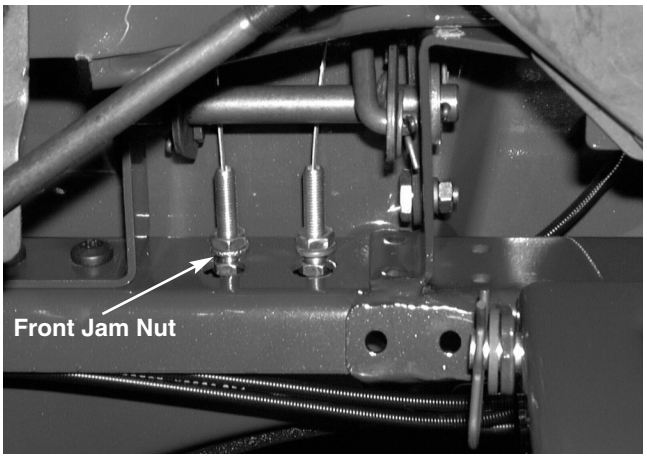


FIGURE 6.

8). Mark a line at any point on the back face of the rear jam nut. See figure 7.

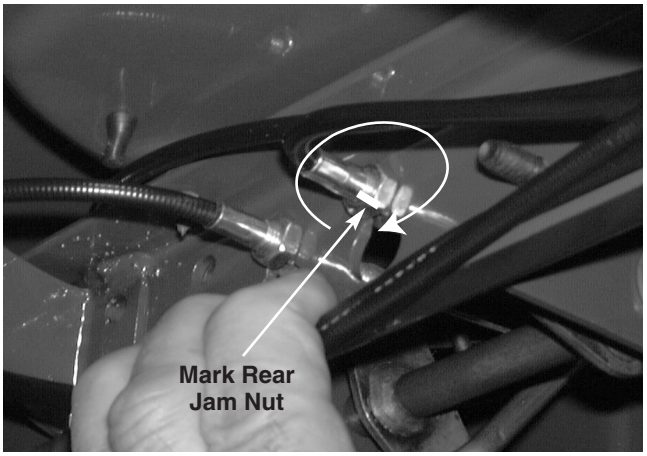


FIGURE 7.

9). Grasp the variable drive cable with your left hand from the rear of the front channel assembly and gently pull rearward.

10). Looking at the line that was marked on the rear jam nut, tighten the rear jam nut 1 complete rotation (clockwise) using a 1/2" wrench.

11). **"START"** the rider.

12). Place the shift lever in the forward position.

13). Make certain the variable drive pedal is fully released.

14). Look at the rear tire assemblies and check for motion.

NOTE: If any motion is present, shut **"OFF"** the rider and proceed to step 15.

NOTE: If there is NO motion, shut **"OFF"** the rider and repeat steps 9 through 14.

15). Looking at the line that was marked on the rear jam nut, loosen the rear jam nut 2 complete rotations using a 1/2" wrench. See figure 8.

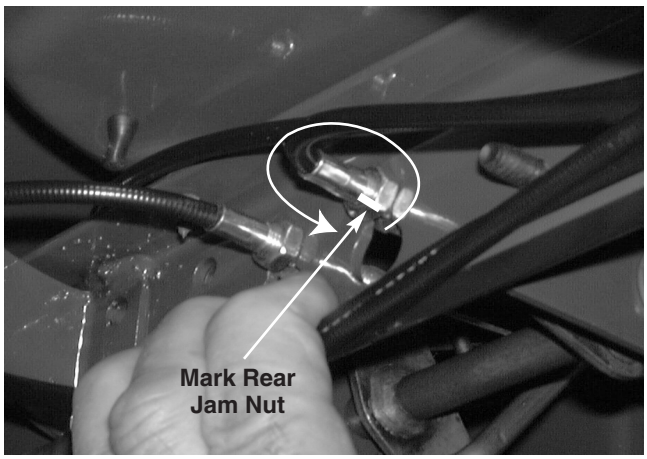


FIGURE 8.

16). By hand, tighten the front jam nut to the front of the front channel assembly. See figure 9.

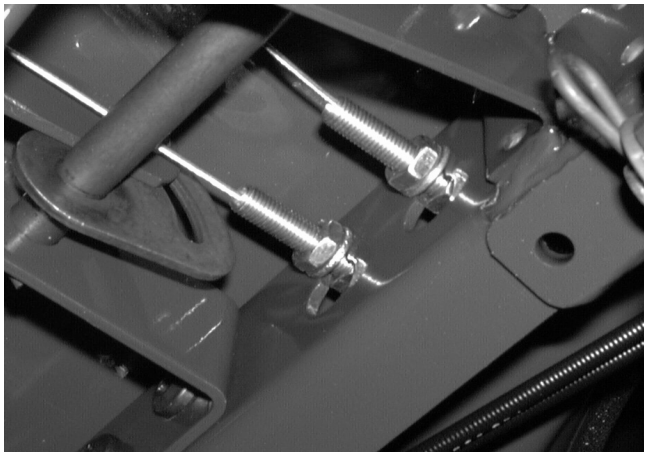


FIGURE 9.

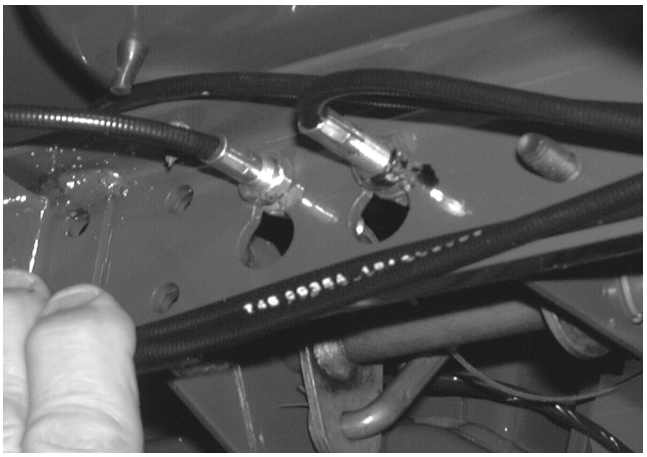


FIGURE 10.

17). Tighten both jam nuts using two 1/2" wrenches.

18). **"START"** the rider.

19). Depress and release the variable pedal assembly several times.

20). Fully release the variable pedal assembly and make certain the rear wheels are not trying to rotate.

NOTE: If the rear wheels try to move at all, shut the rider **"OFF"** and back the rear jam nut off 1 full rotation.

21). **IMPORTANT:** Raise the hood, connect the wiring harness female connector (removed earlier) to the seat switch, and lower the hood.

TEST RUN AND ADJUST IF NECESSARY.

Steering Adjustment

IMPORTANT: The front tires should have a "TOE-IN" between 1/16" and 5/16" to allow the unit to track properly.

1). Check the tire pressure in the front tires and make certain that they are at approximately 12 PSI.

2). Place the unit on level ground.

3). Place the steering wheel in the straight forward position. See figure 1.

NOTE: Make certain the tires are running parallel with the frame.

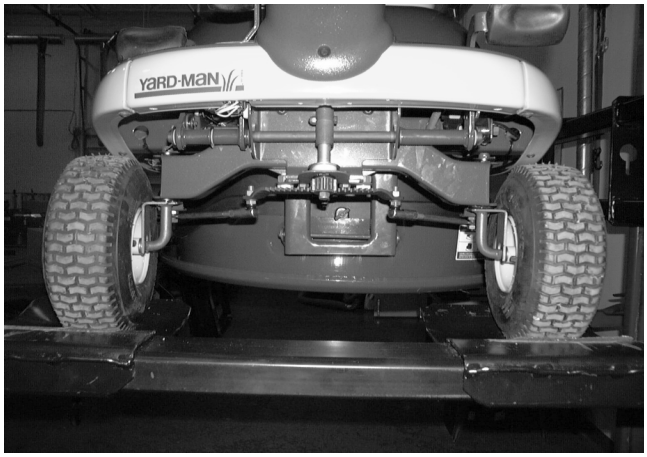


FIGURE 1.

4). In front of the axle, measure the distance horizontally from the inside of the left rim, to the inside of the right rim. See figure 2.

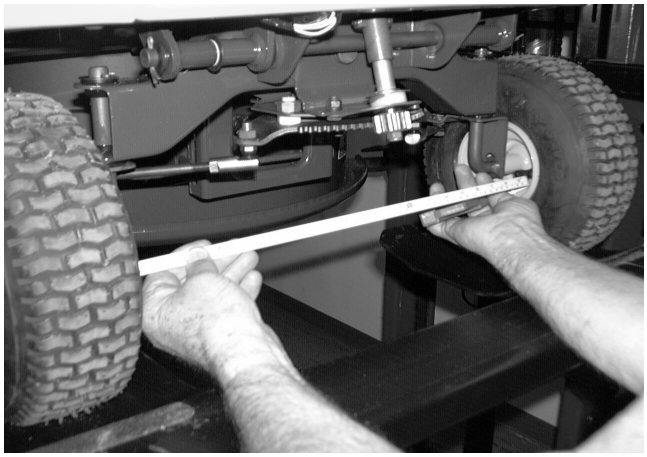


FIGURE 2.

5). From behind the axle, measure the distance horizontally from the inside of the left rim, to the inside of the right rim.

6). The measurement taken in front of the axle should be between 1/16" and 5/16" less than the measurement taken behind the axle. If not, perform the following steps:

7). Remove the hex nut securing the right ball joint to the steering segment gear using a 1/2" and a 9/16 wrench.

NOTE: Do not lose the lock washer. See figure 3.

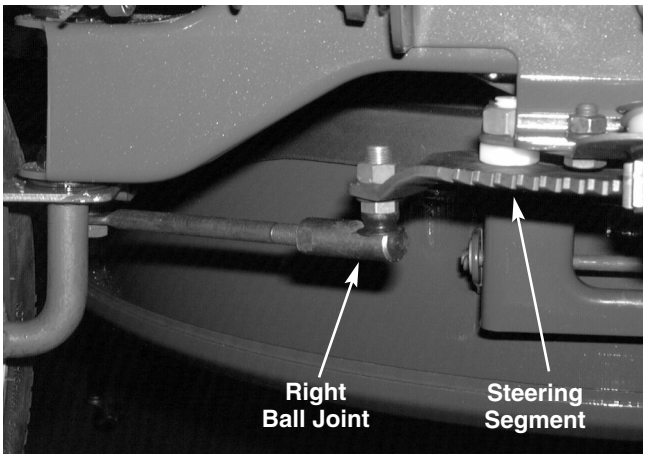


FIGURE 3.

8). Remove the hex nut securing the left ball joint to the steering segment gear using a 1/2" and a 9/16 wrench.

NOTE: Do not lose the lock washer.

9). Remove both ball joints from both tie rods using a 1/2" wrench.

10). Place the left and right tire assemblies in the straight forward position.

11). Set the toe-in for the rim assemblies to the proper measurements as described in steps 4, 5, and 6.

12). Thread the right hand ball joint onto the right hand tie rod until the mounting hole in the steering segment gear lines up with the ball joint stud.

NOTE: Count the number of turns the ball joint rotates onto the tie rod. The number of rotations will be equal to the left side.

13). Secure the right hand ball joint to the steering segment gear with the hex nut removed earlier using a 1/2" and a 9/16 wrench.

NOTE: Make certain the lock washer is between the ball joint and the steering segment gear.

14). Install the left hand ball joint to the tie rod and steering segment gear performing steps 12 and 13.

NOTE: Make certain the same number of rotations are used for the left ball joint as the right ball joint.

IMPORTANT: Test the steering assembly for excessive tolerances. Make certain all the hardware is secure.

Removal and Installation of the Deck Belt

1). Lower the deck to the lowest cutting position.

2). Raise the hood and remove the grass bag assembly and discharge chute. See figure 1.

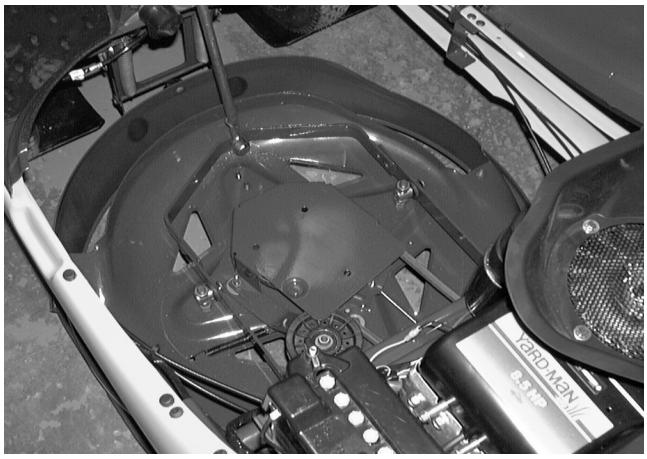


FIGURE 1.

3). Fully depress the deck pedal assembly and lock it down.

4). Remove both hex washer self tapping screws from the deck belt cover using a 1/2" socket.

5). Remove the top hex nut and lock washer from the idler bracket pivot screw using a 1/2" socket.

6). Remove the deck belt cover from the deck assembly. See figure 2.

NOTE: The deck belt must be engaged during deck belt cover installation. The belt keeper pin must not interfere with the deck belt.

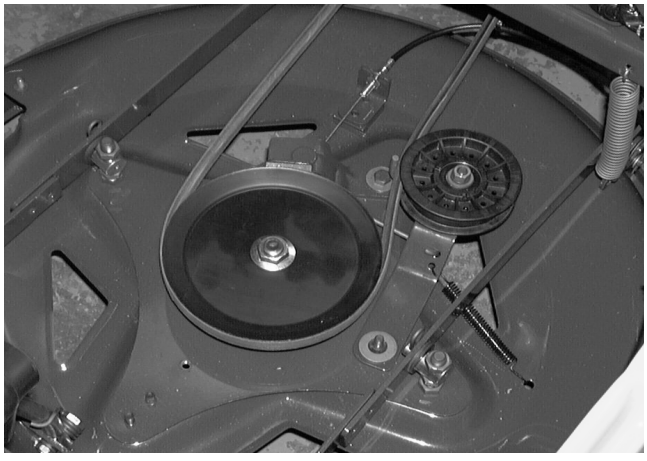


FIGURE 2.

7). Release the deck pedal assembly.

8). Loosen the hex nut that secures the flat idler pulley to the idler bracket using a 9/16 wrench and a 9/16 socket. See figure 3.

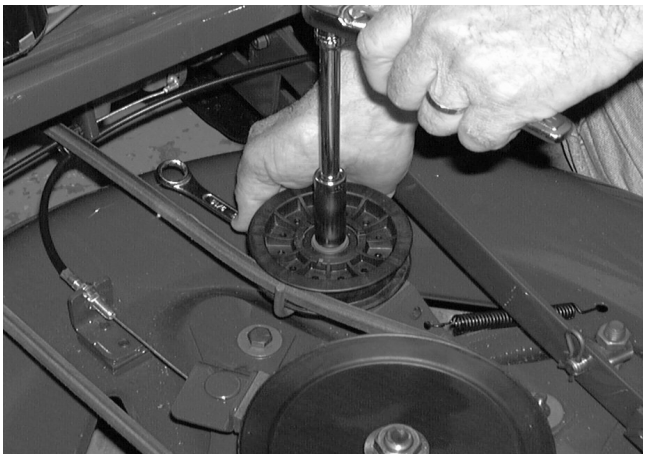


FIGURE 3.

9). Raise the cutting deck to the highest cutting position.

10). Remove the deck belt from the flat idler pulley and the deck spindle pulley. See figure 4.

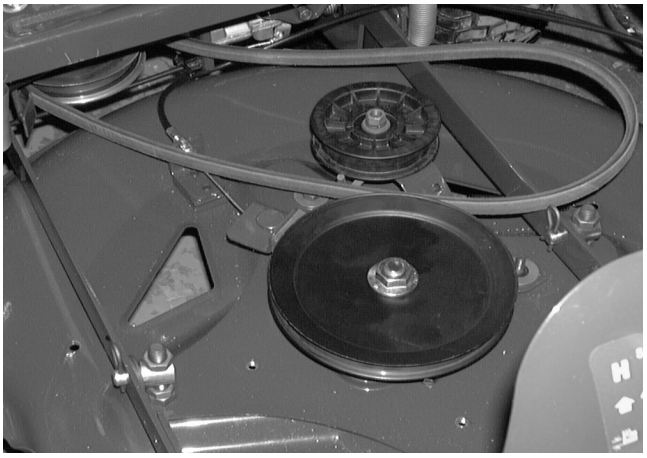


FIGURE 4.

11). Remove the self tapping washer head hex screw that secures the left side of the half circle belt keeper to the frame using a 3/8 socket. See figure 5.

NOTE: The self tapping washer head hex screw is directly to the right of the front transmission support bracket.

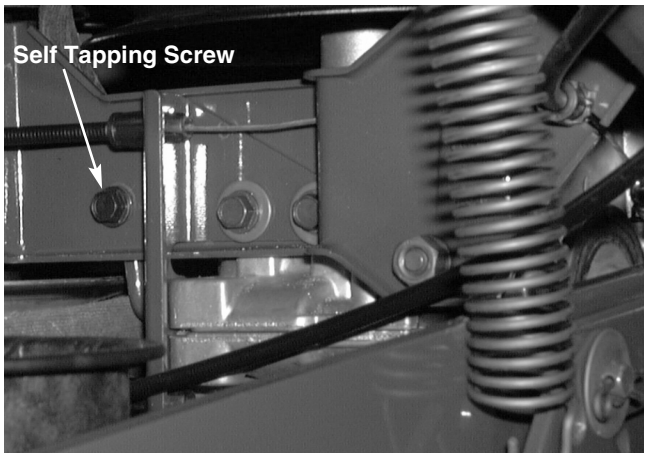


FIGURE 5.

12). Loosen the hex nut and lock washer that secures the right side of the half circle belt keeper to the frame using a 7/16 socket and a 6" extension. See figure 6.

NOTE: You must come in from the rear of the rider to access the hex nut and lock washer.

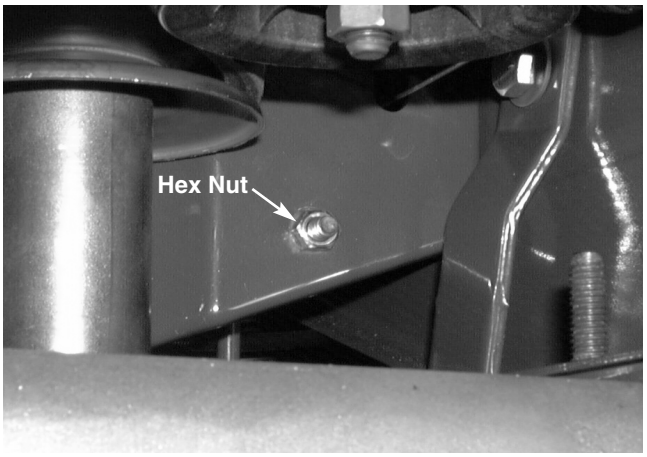


FIGURE 6.

13). Remove the deck belt from the rider.

REINSTALL THE NEW DECK BELT IN THE REVERSE ORDER.

Removal and Installation of the Mowing Deck Assembly

NOTE: Prior to deck removal, perform deck belt removal.

1). Locate and loosen the hex jam nuts that secure the threaded end of the deck cable to the deck cable bracket using two 1/2" wrenches. See figure 1.

FIGURE 1.

2). Remove the cotter pin and flat washer that secures the deck cable eyelit to the brake bracket pin.

3). Remove the deck cable eyelit from the brake bracket pin. See figure 2.

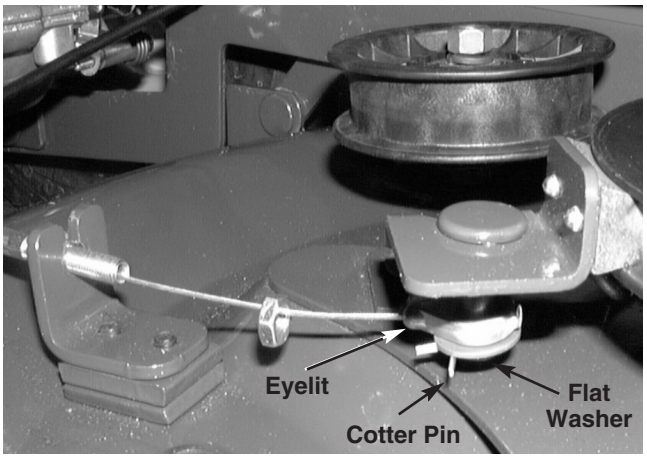


FIGURE 2.

4). Remove both front deck extension springs from the front channel assembly. See figure 3.

NOTE: The use of a 2 foot piece of recoil rope can be used for spring removal.

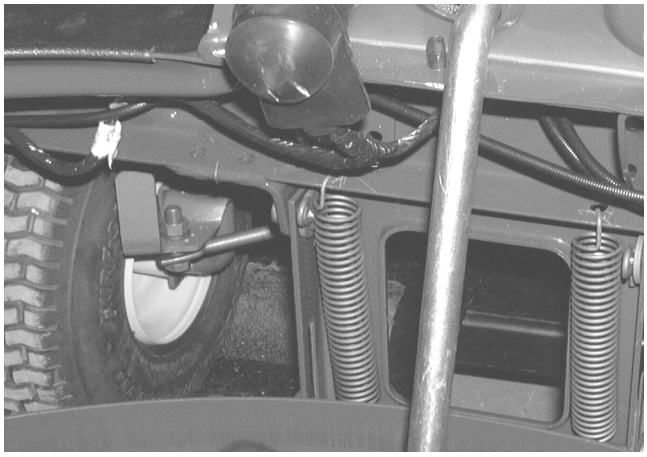


FIGURE 3.

5). Remove both of the clevis pins, flat washers, and hairpin clips that secure the deck stabilizer bracket to the front channel assembly. See figure 4.

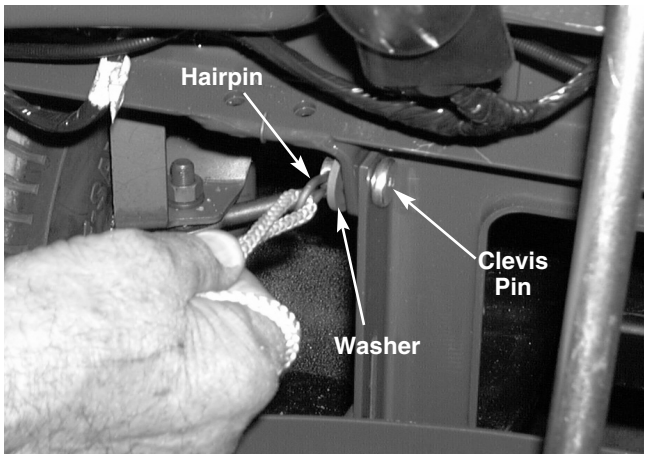


FIGURE 4.

6). Remove both hairpin clips that secure the center deck ferrules to the lift link assembly. See figure 5.

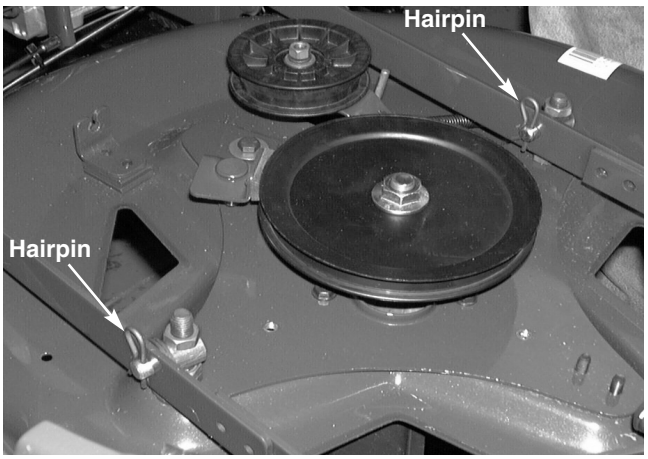


FIGURE 5.

NOTE: Both center deck ferrules are secured to the lift link assembly from the left. Also, there are two flat washers between the ferrules and the lift link assembly. See figure 6.

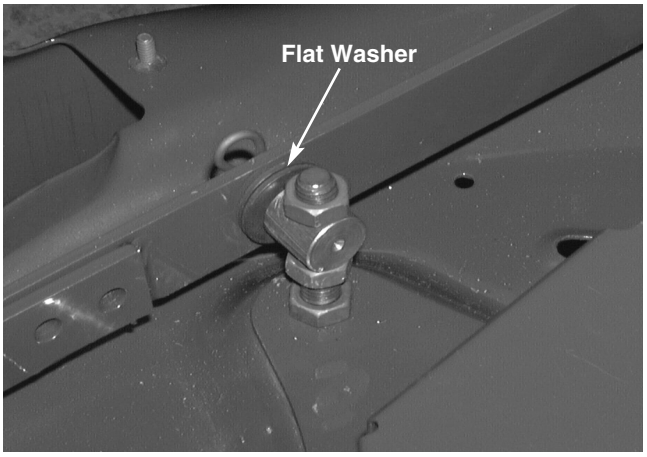


FIGURE 6.

7). Remove both small hairpin clips and flat washers that secure the rear deck support pins to the lower "T" links. See figure 7.

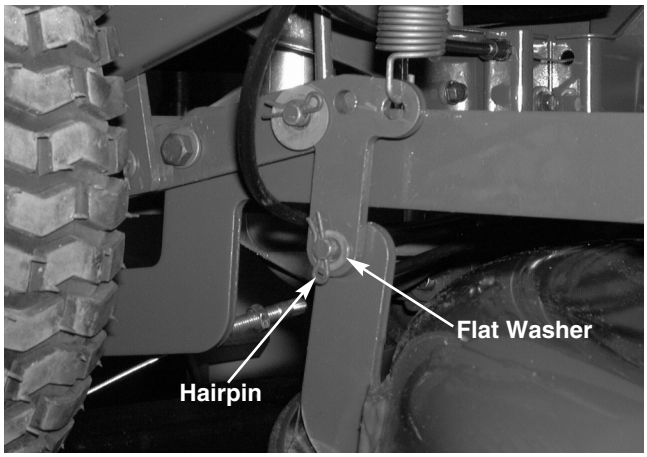


FIGURE 7.

8). Remove the mowing deck assembly.

INSTALL THE MOWING DECK ASSEMBLY IN THE REVERSE ORDER ABOVE.

Removal and Replacement of the Drive Belts

NOTE: The upper and lower drive belts are identical.

LOWER DRIVE BELT:

1). From behind the rider, pull the spring loaded "V" idler towards the right frame rail and release the lower drive belt downward. See figure 1.

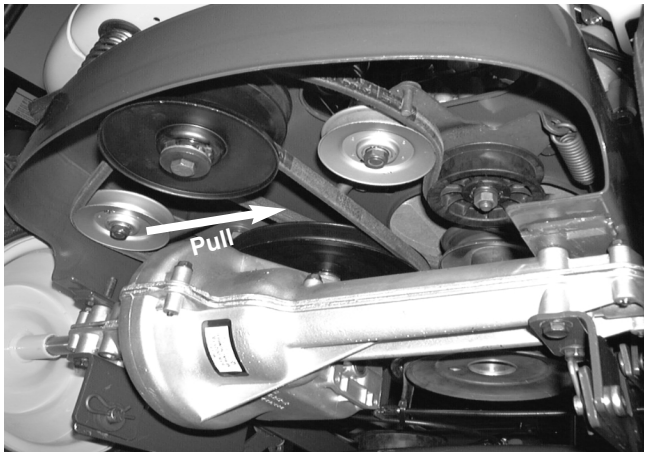


FIGURE 1.

2). Slowly release the "V" idler to the left frame rail.

3). Roll the lower drive belt down and off of the variable-speed pulley assembly. See figure 2.

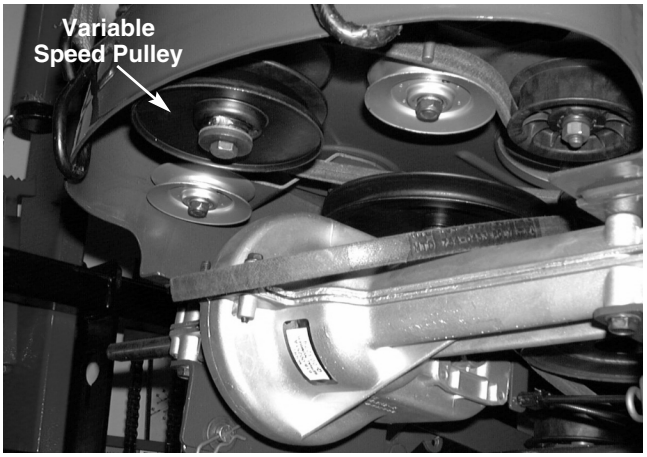


FIGURE 2.

4). Take hold of the lower drive belt and push it forward, up, and off of the transmission pulley. Pull it back towards the rear of the rider.

INSTALL THE LOWER DRIVE BELT IN THE REVERSE ORDER ABOVE.

UPPER DRIVE BELT:

NOTE: Prior to removing the upper drive belt, it is necessary to remove the lower drive belt. See figure 3.

FIGURE 3.

1). Remove the hex screw and lock washer that secures the engine pulley to the engine crankshaft using a 5/8 socket. See figure 4.

FIGURE 4.

2). Slowly lower the engine pulley until the lower pulley is clear of the half circle belt keeper. See figure 5.

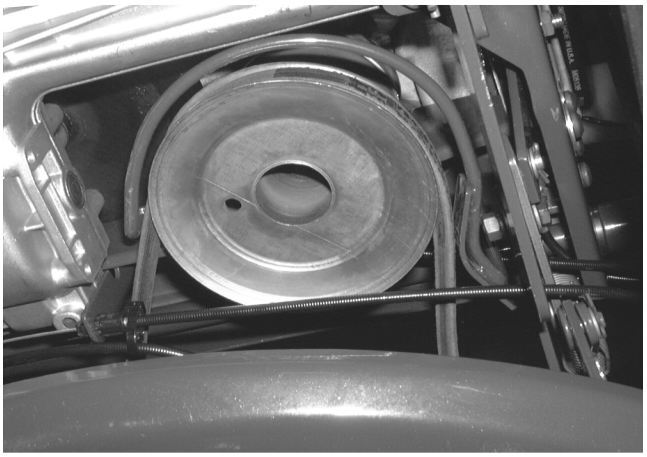


FIGURE 5.

NOTE: The drive belt must be moved to the right to keep it from catching the top of the transmission pulley.

3). Remove the deck belt from the lower engine pulley.

4). Push up on the upper drive belt and roll it off of the upper engine pulley.

5). Lower the engine pulley from the rider. See figure 6.

NOTE: Make certain that the square key is in the crankshaft during reassembly.

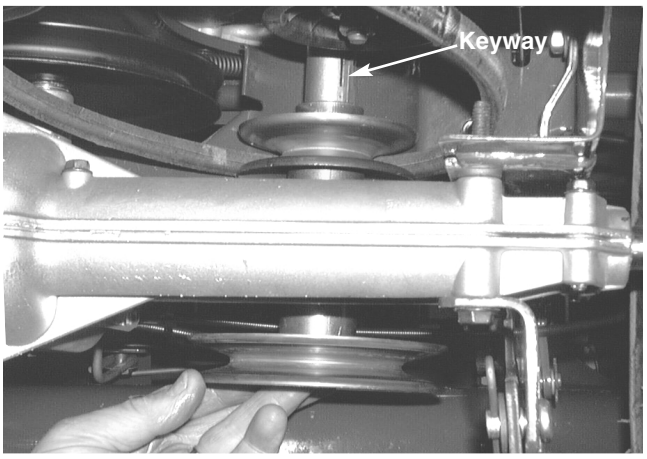


FIGURE 6.

6). Remove the upper drive belt from idler pulleys on the idler bracket and the crankshaft.

7). Roll the upper drive belt down and out of the variable-speed pulley assembly.

INSTALL THE UPPER DRIVE BELT IN THE REVERSE ORDER ABOVE.

Transmission Removal and Installation

NOTE: Prior to transmission removal, perform lower drive belt removal.

1). Raise the hood up and remove the grass bag assembly.

2). Lower the cutting height adjustment lever to the lowest position. See figure 1.

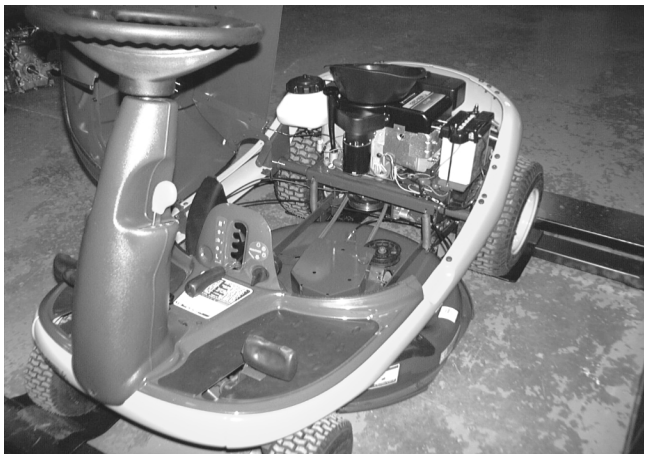


FIGURE 1.

3). Raise the rear wheels off the ground. See figure 2.

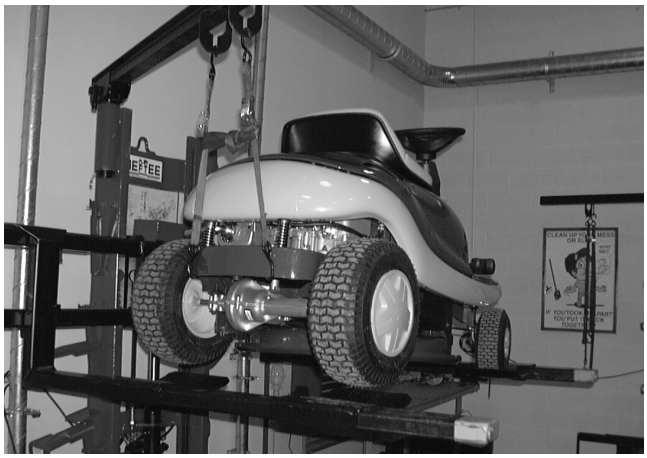


FIGURE 2.

4). Remove both hub caps from the rear wheel assemblies using a flat blade screw driver.

5). Remove the hex screws and bell washers that secure the rear wheel assemblies to the transmission axles using a 1/2" socket and a 6" extension.

6). Remove the rear wheel assemblies from the rider.

NOTE: Make certain the rear axles are greased during reassembly. See figure 3.

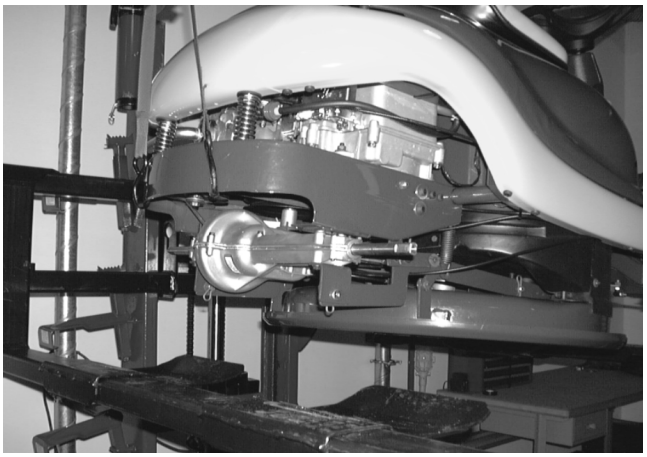


FIGURE 3.

7). Remove both hex washer head self tapping screws that secure the transmission support bracket to the transmission using a 3/8 socket. See figure 4.

NOTE: Torque the hex washer head self tapping screws between 90 and110 in-lbs. during installation.

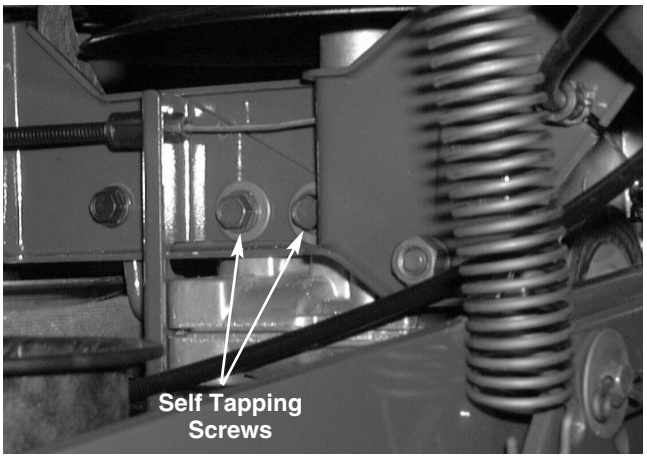


FIGURE 4.

8). Remove the hex nut and lock washer from the shift lever cap screw using two 1/2" wrenches. See figure 5.

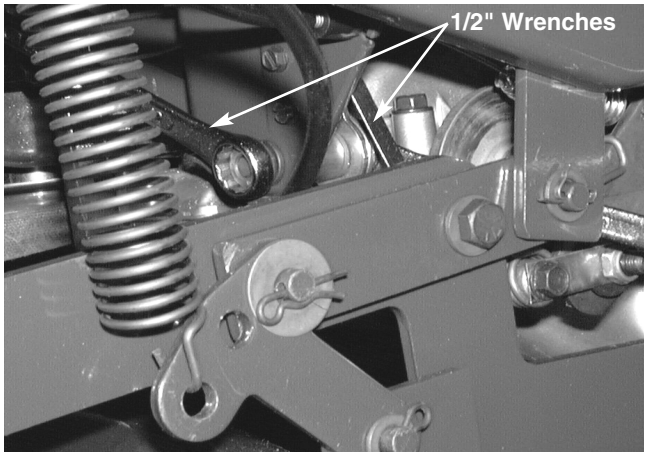


FIGURE 5.

NOTE: During reinstallation remove the cotter pin securing the shift lever assembly to the transmission. Secure the shift lever assembly to the frame before reinstalling the transmission. See figure 6.

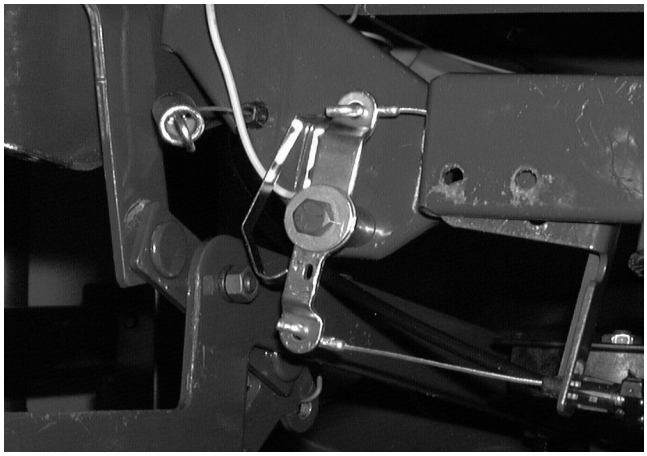


FIGURE 6.

9). Loosen (DO NOT REMOVE) the locking hex nut that secures the brake actuation arm to the brake assembly using a 1/2" wrench. See figure 7.

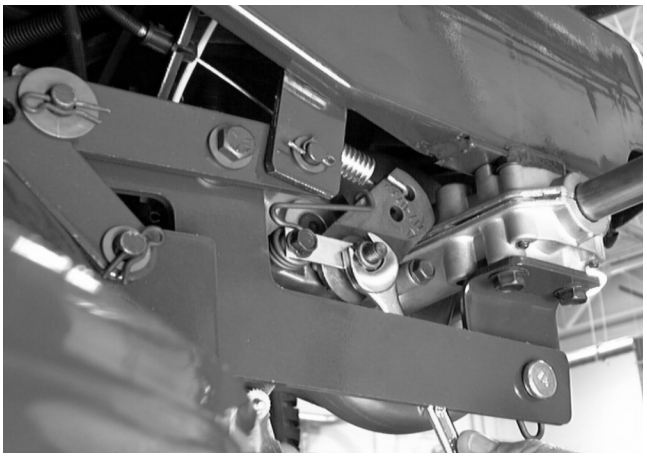


FIGURE 7.

NOTE: Perform the BRAKE ADJUSTMENT section during reassembly.

10). Pull the brake actuation arm forward and remove the brake cable spring from the brake actuation arm. See figure 8.

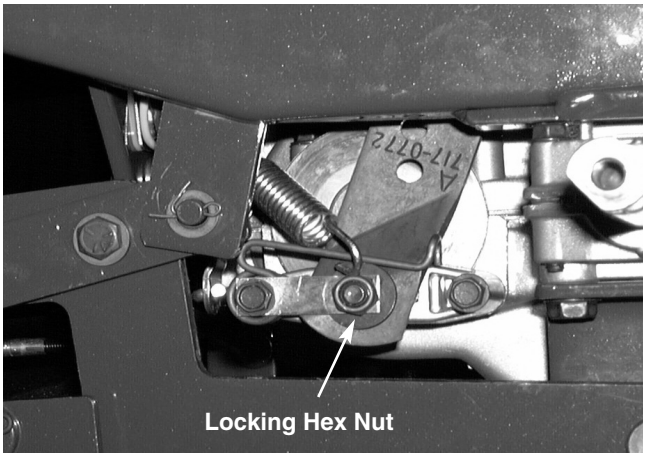


FIGURE 8.

11). Remove all four self tapping hex screws that secure the transmission to the frame using a 1/2" socket.

12). Slide the transmission slowly to the rear and remove the shift cable "Z" fittings from the shift lever. See figure 9.

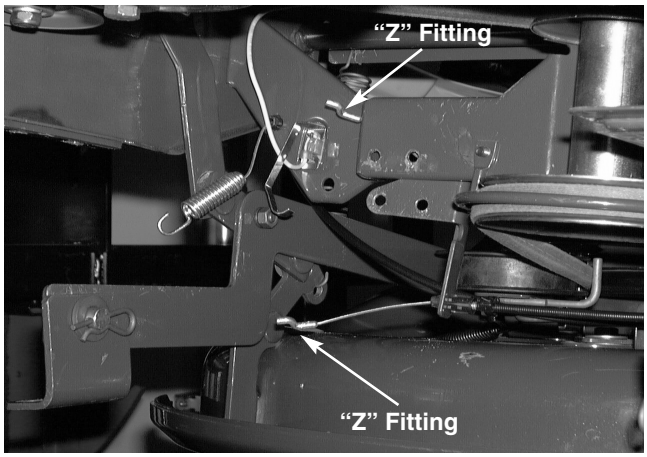


FIGURE 9.

13). Remove the transmission from the rider.

INSTALL THE TRANSMISSION IN THE REVERSE ORDER ABOVE.

Transmission Disassembly

1). Set the transmission on a work bench with the transmission pulley facing up.

2). Remove the cotter pin securing the shift lever to the shift fork assembly using needle nose pliers. See figure 1.

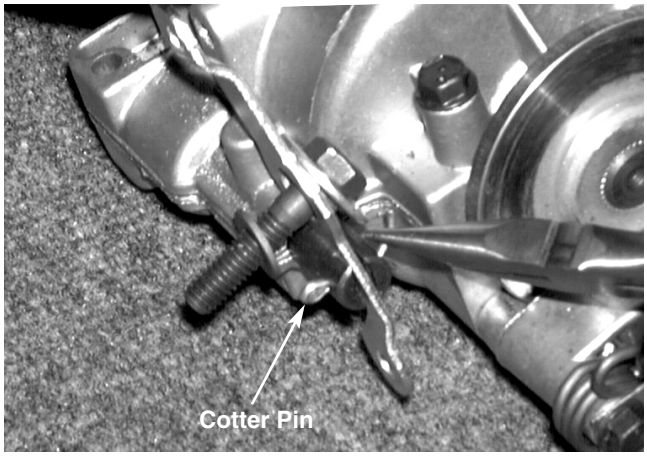


FIGURE 1.

3). Place a "C" clamp over the transmission pulley and tighten it down on the flat area of the pulley.

4). Rotate the "C" clamp until it rests up against the upper transmission housing.

5). Loosen the hex jam nut securing the transmission pulley to the input shaft using a 7/8 socket.

6). Remove the hex jam nut, belleville washer, and transmission pulley from the input shaft. See figure 2.

FIGURE 2.

7). Loosen and remove all of the hex washer head self tapping screws that secure the upper and lower transmission housings together using a 3/8 socket.

NOTE: The two longest hex washer head self tapping screws secure the brake area.

8). Remove the upper transmission housing. See figure 3.

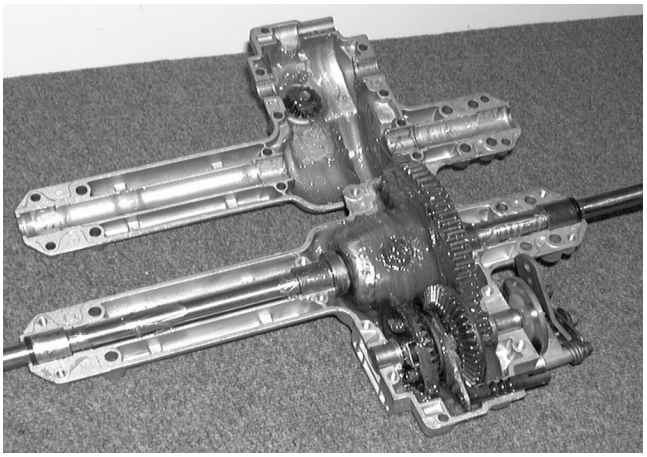


FIGURE 3.

NOTE: The transmission assembly has been cleaned out for clarity. See figure 4.

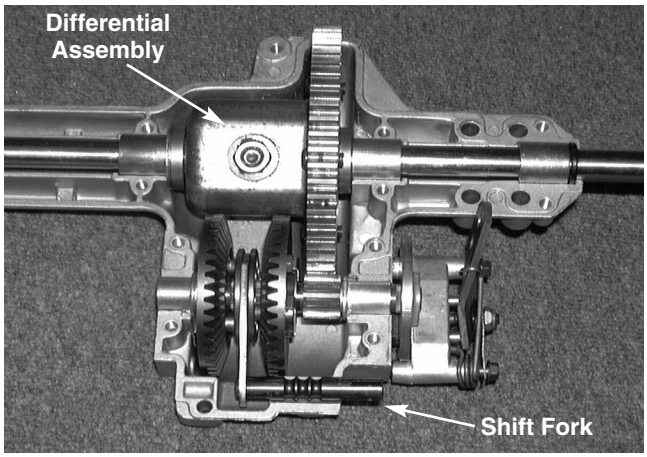


FIGURE 4.

9). Remove the differential assembly. See figure 5.

10). Remove the shift fork, detent ball, and spring. See figure 5.

11). Remove the upper drive shaft assembly. See figure 5.

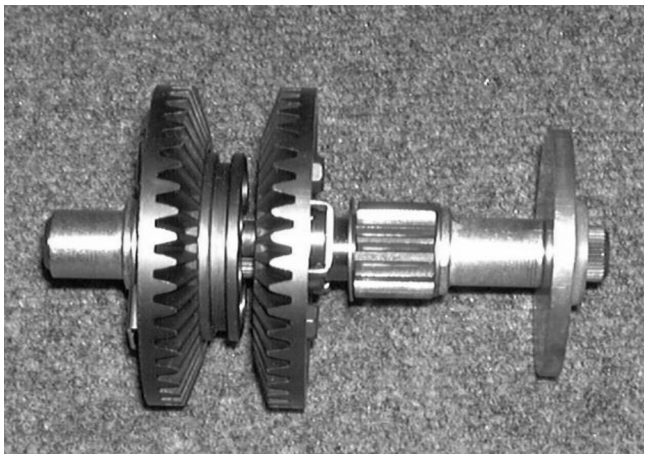


FIGURE 5.

12). Disassemble and inspect all components of the upper drive shaft assembly. See figure 6.

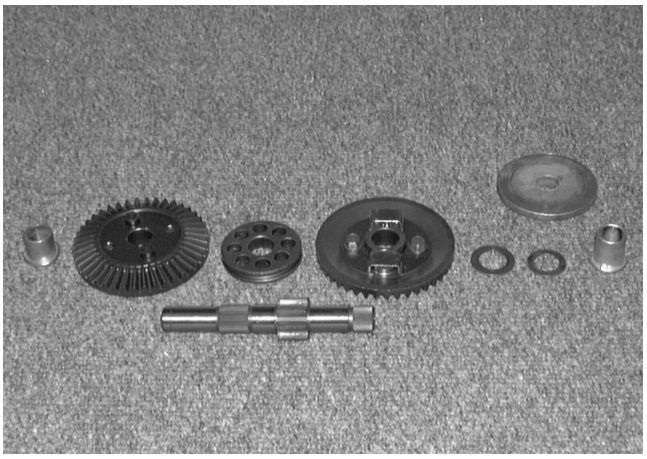


FIGURE 6.

13). Place the upper transmission housing flat on the bench with the input shaft facing up.

14). Remove the wire ring, "E"-clip, and flat washer from the input shaft.

NOTE: There may be an additional shim washer on the input shaft to alleviate excessive tolerances.

15). Lift the upper transmission housing and remove the input shaft.

16). Remove the thrust washer from the input shaft.

17). The input pinion can be separated from the input shaft by removing the retaining ring. See figure 7.

FIGURE 7.

18). Clean all components of the transmission assembly.

Transmission Reassembly

1). Inspect the needle bearings in the upper transmission housing.

2). Inspect the input shaft and pinion.

3). Apply never seez to the input shaft.

4). Slide the thrust washer over the input shaft.

5). Slide the input shaft up through the needle bearings in the upper transmission housing.

6). Slide the flat washer over the input shaft.

7). Install the "E" ring and wire ring on to the input shaft.

8). Make certain the input shaft does not have excessive tolerance by placing two feeler gauges between the flat washer and the upper transmission housing. See figure 1.

NOTE: The tolerance will be between .006" and .015". If not, place shim washers between the flat washer and the upper transmission housing.

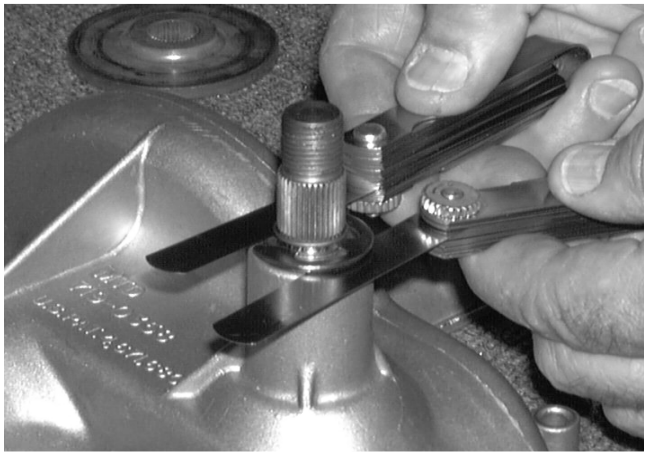


FIGURE 1.

9). Rotate the upper transmission housing 180 degrees and set it on the bench with the input pinion facing up.

10). Inspect all components of the upper drive shaft assembly.

11). Apply never seez to the drive shaft.

12). Grasp the short end of the drive shaft with your right hand.

13). Slide the thrust washer, bevel gear with large inner diameter hole, clutch collar, bevel gear with small inner diameter hole, flat washer, and short flange bearing over the long end of the drive shaft. See figure 2.

FIGURE 2.

14). Holding the assembly in your left hand, slide the flat washer, long flange bearing, and brake disc over the short end of the drive shaft.

NOTE: There may be additional shim washers on the shaft assembly to alleviate excessive tolerances.

15). Set the upper drive shaft assembly into the upper transmission housing. See figure 3.

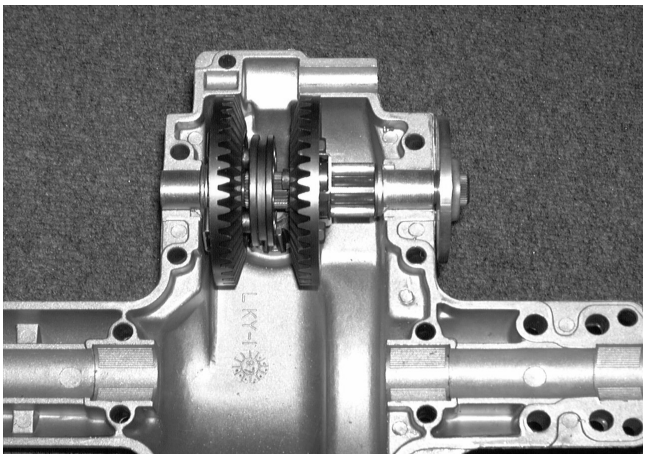


FIGURE 3.

16). Make certain both bushings are seated correctly in the upper housing and the bevel gears have meshed properly with the input pinion.

17). Make certain the upper drive shaft assembly is within tolerance by placing two feeler gauges between the flat washer and the bushing behind each bevel gear. See figures 4 and 5.

NOTE: The tolerance will be between .006" and .015" on both sides. If not, place a shim washer between the flat washer and the bushing on the side that is out of tolerance.

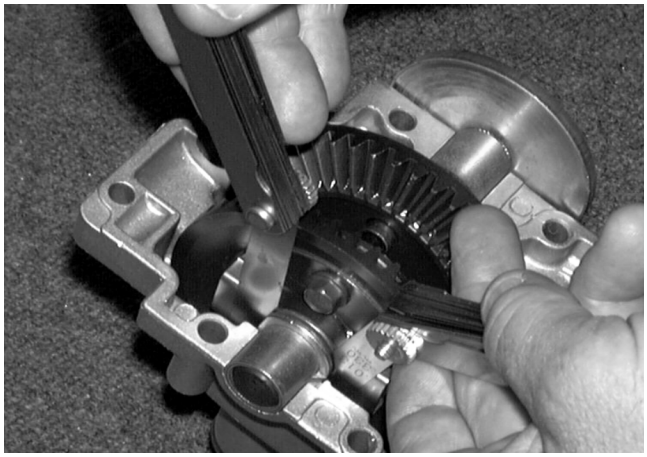


FIGURE 4.

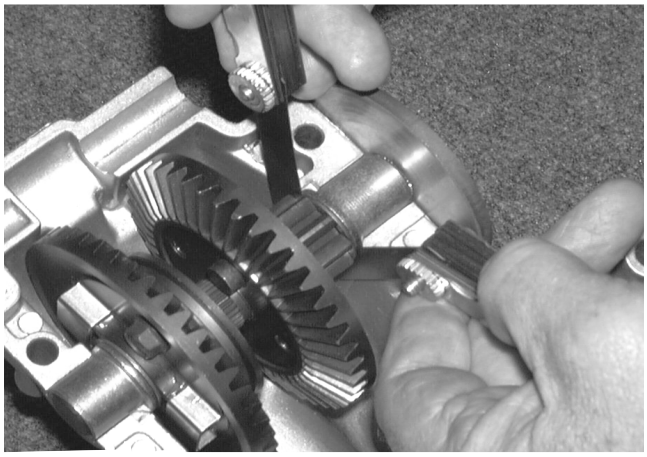


FIGURE 5.

18). Place a dab of grease on the puck plate and brake puck before installing it into the brake yoke assembly.

19). Install the puck plate and brake puck into the brake yoke assembly.

20). Secure the brake yoke assembly to the lower transmission housing using a 3/8 socket.

NOTE: Torque both hex washer head self tapping screws between 90 and 110 in.-lbs.

21). Set the upper drive shaft assembly into the lower transmission housing.

22). Make certain both bushings are seated correctly in the lower housing.

23). Inspect the oil seals and sleeve bearings on the differential assembly.

24). Grease both axle shafts of the differential assembly.

25). Place the differential assembly into the lower transmission housing. See figure 6.

NOTE: Make certain the oil seals and sleeve bearings are seated properly in the lower housing.

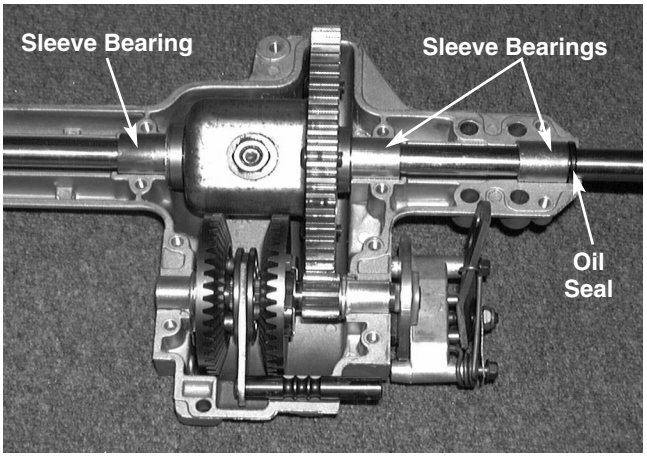


FIGURE 6.

26). Fully grease the transmission. See figure 7.

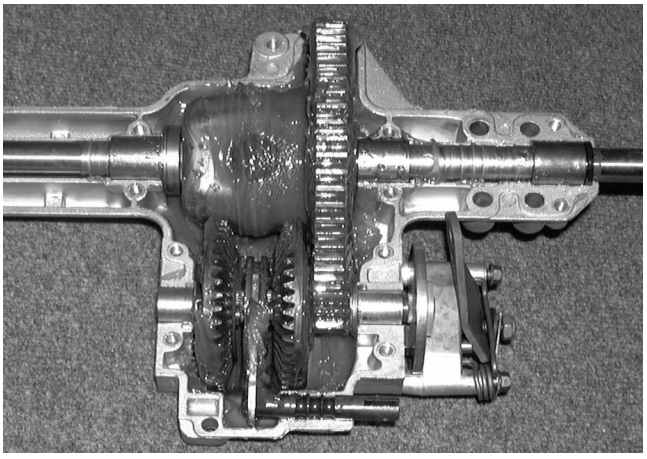


FIGURE 7.

27). Place the detent spring and ball into the lower transmission housing.

28). Never seez the shift fork assembly and install it into the shift collar.

29). Place the upper transmission housing over the lower housing and rotate the input shaft, making certain the bevel gears mesh correctly with the input pinion. See figure 8.

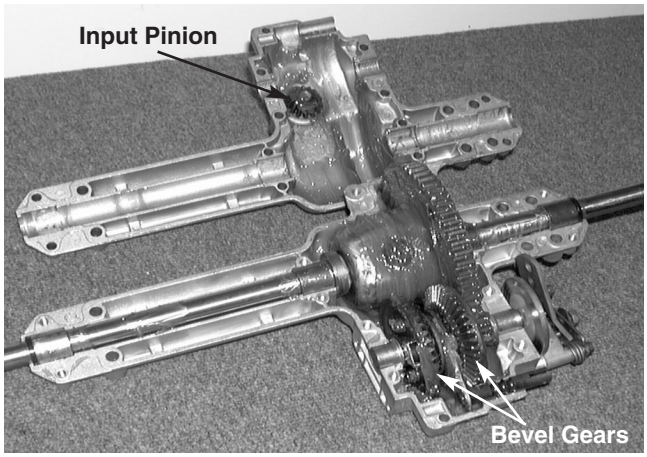


FIGURE 8.

30). Install and hand tighten all of the hex washer head self tapping screws that secure the upper and lower transmission housings together.

NOTE: Make certain the two longest self tapping screws are securing the brake area.

31). Torque all hex washer head self tapping screws between 90 and 110 in.-lbs.

32). Install the transmission pulley, belleville washer, and hex jam nut onto the input shaft.

33). Place a "C" clamp over the transmission pulley and tighten it down on the flat area of the pulley.

34). Rotate the "C" clamp until it rests up against the upper transmission housing.

35). Torque the hex jam nut on the input shaft between 300-400 in.-lbs.

36). Secure the shift lever to the shift fork assembly using the cotter pin removed in disassembly.

37). Test operations.

Electrical (Start Circuit)

IMPORTANT: This section is used for electrical training. Even though some of the subsections are called out, this section is meant to be performed inclusively. If you are working on a specific section, make certain all devices are in the proper modes (switches, relays, and etc...)

NOTE: A multimeter is a must for this section. If any of the following tests do not match, repair that portion of the system.

GENERAL CONTINUITY:

1). Turn the ignition key to the **"OFF"** position.

2). Place the multimeter in the **OHM'S** mode until instructed to change modes. See figure 1.

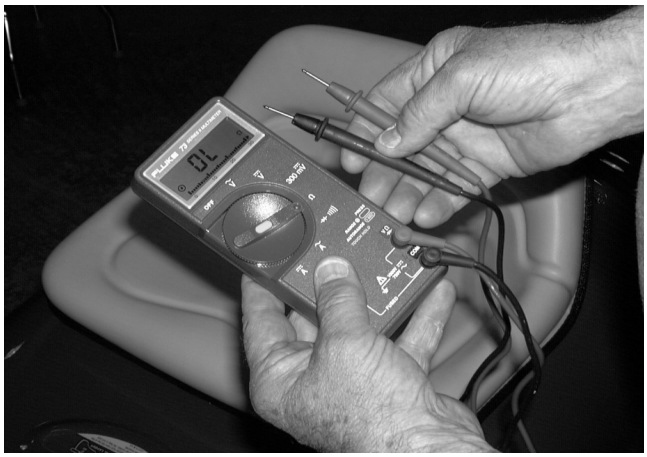


FIGURE 1.

3). Place one probe on the negative battery terminal. Place the second probe on the frame bolt.
–There will be **CONTINUITY**. See figure 2.

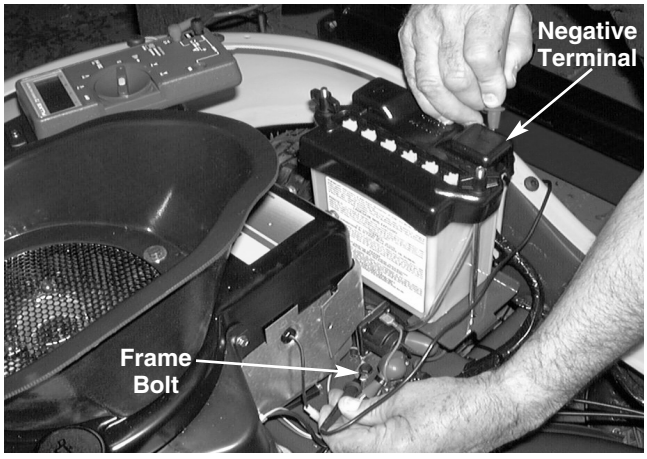


FIGURE 2.

4). Place one probe on the positive battery terminal. Place the second probe on the inlet post of the solenoid.
–There will be **CONTINUITY**. See figure 3.

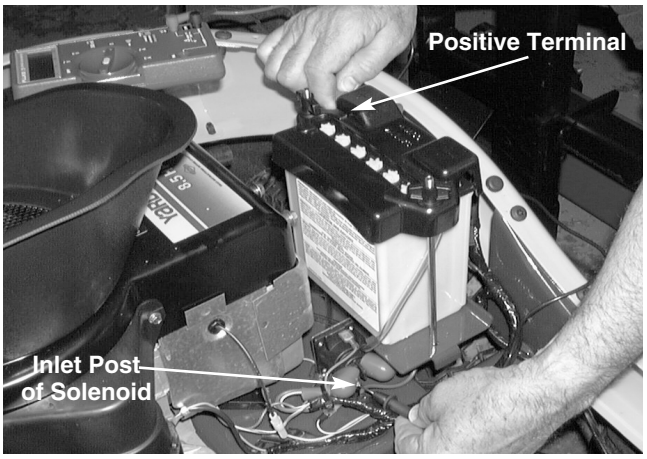


FIGURE 3.

5). Place one probe on the negative battery terminal. Place the second probe on the engine block.
–There will be **CONTINUITY**.

6). Place one probe on the outlet post of the solenoid. Place the second probe on the starter post.
–There will be **CONTINUITY**. See figure 4.

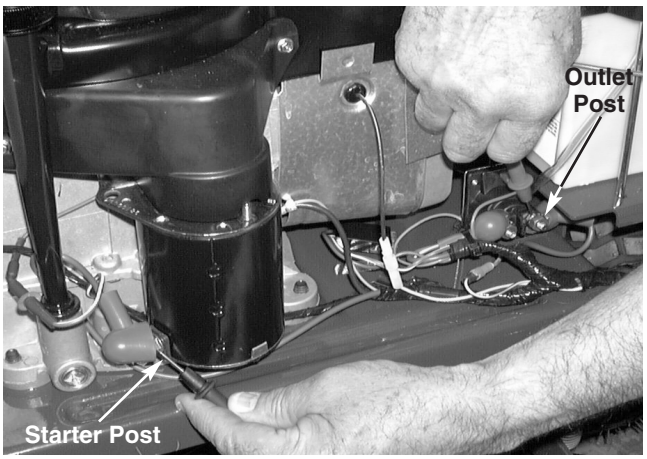


FIGURE 4.

7). Place one probe on the negative battery terminal. Place the second probe on the solenoid base.
–There will be **CONTINUITY**.

IGNITION SWITCH:

8). Locate the ignition switch and remove the wiring harness connector. See figure 5.

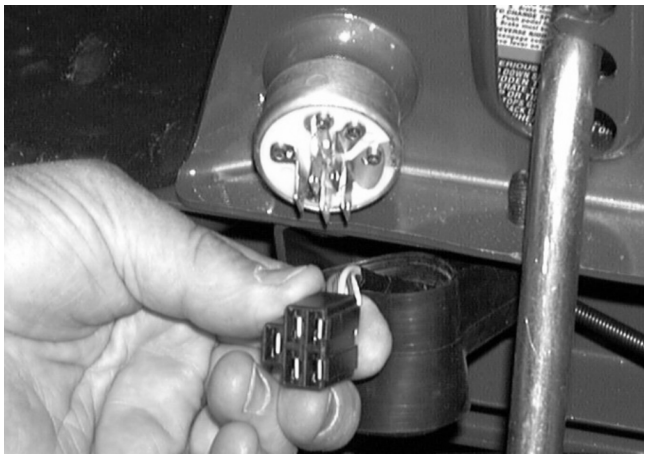


FIGURE 5.

9). Locate and identify all ignition switch terminals. **L**–Alternator, **S**–Start, **M**–Magneto, **G**–Ground, **B**–Battery.

10). Locate and identify all wires coming into the wiring harness connector at the ignition switch. **Green**–Ground, **Red**–Battery, **Yellow**–Magneto, **Red/White**–Alternator, **Orange/Black**–Start.

11). Place one probe on any frame bolt. Place the second probe on the ground (green) wire of the ignition switch connector.
–There will be **CONTINUITY**. See figure 6.

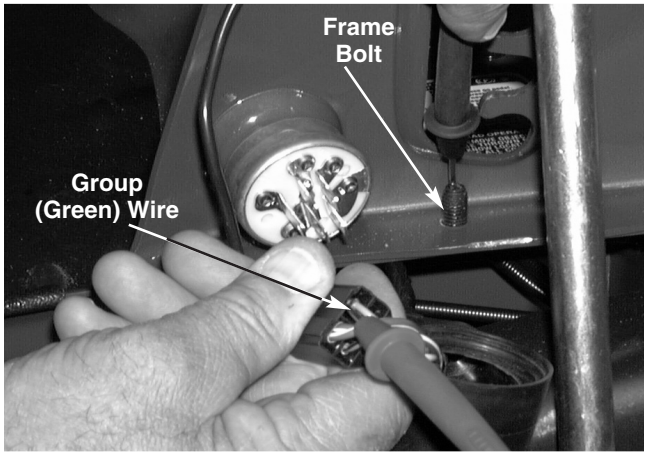


FIGURE 6.

FUSE:

12). Locate and remove the fuse from the fuse connector. See figure 7.

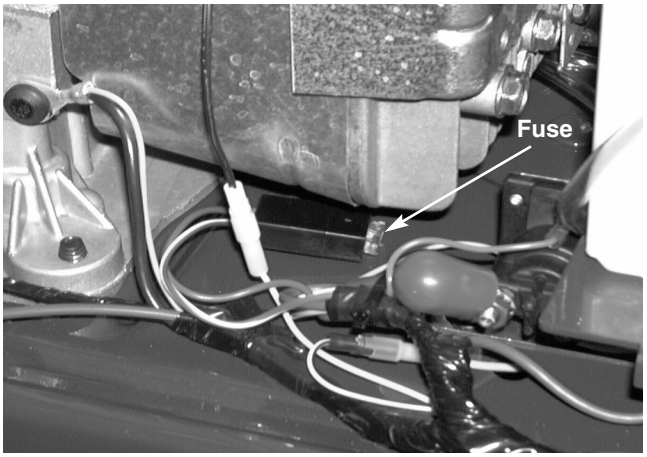


FIGURE 7.

13). Place one probe on one male terminal of the fuse. Place the second probe on the second male terminal of the fuse.
–There will be **CONTINUITY**.

14). Place the fuse back into the fuse holder.

15). Place one probe on the inlet post of the solenoid. Place the second probe on the battery (red) wire of the ignition switch connector.
–There will be **CONTINUITY**. See figure 8.

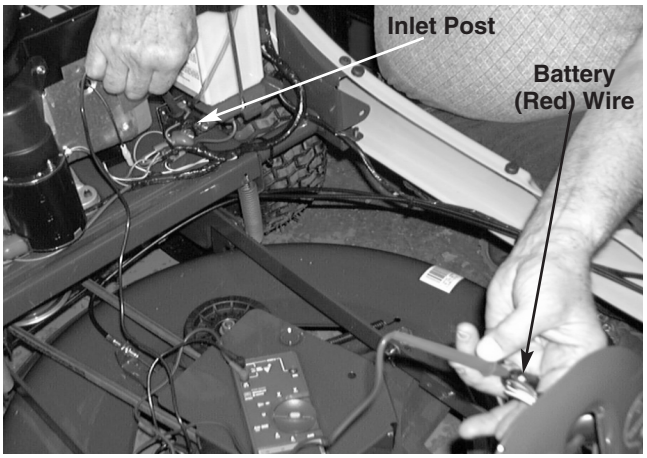


FIGURE 8.

16). Place the multimeter in the **D.C. VOLTS** mode.

17). Place the red probe on the positive battery (red) wire and the black probe on the ground (green) wire of the ignition switch connector.
–There will be **12 VOLTS**. See figure 9.

FIGURE 9.

18). Place the multimeter in the **OHM's** mode.

19). Place one probe on the **"B"** terminal and the second probe on the **"S"** terminal of the ignition switch.
–There will be **NO CONTINUITY**.

20). Turn the ignition key to the **"START"** (spring loaded) position.
–There will be **CONTINUITY**.

NOTE: Turn the ignition key back to the **"OFF"** position after completion.

21). **DO NOT** reconnect the wiring harness to the ignition switch.

BRAKE SWITCH:

22). Locate the brake switch. See figure 10.

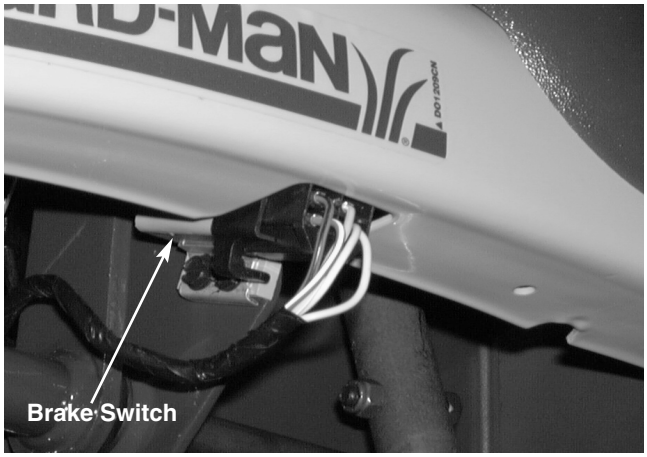


FIGURE 10.

23). Identify the **NC** (normally closed) terminals of the brake switch.

24). Place one probe on one **NC** (yellow) terminal and the second probe on the second **NC** (yellow) terminal of the brake switch.
–There will be **CONTINUITY**. See figure 11.

25). Depress the plunger on the brake switch.
–There will be **NO CONTINUITY**. See figure 11.

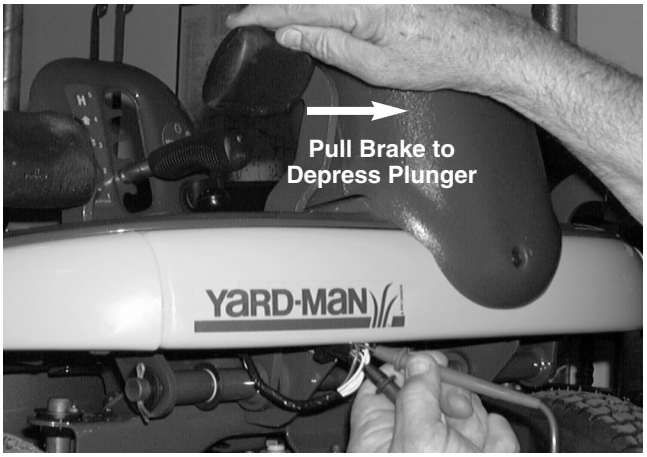


FIGURE 11.

26). Release the plunger and place the probes on the NO (normally open– orange) terminals.
–There will be **NO CONTINUITY**.

27). Depress the plunger on the brake switch.
–There will be **CONTINUITY**.

PTO SWITCH:

28). Locate the PTO switch.

29). Identify the **NC** (normally closed) terminals of the PTO switch. See figure 12.

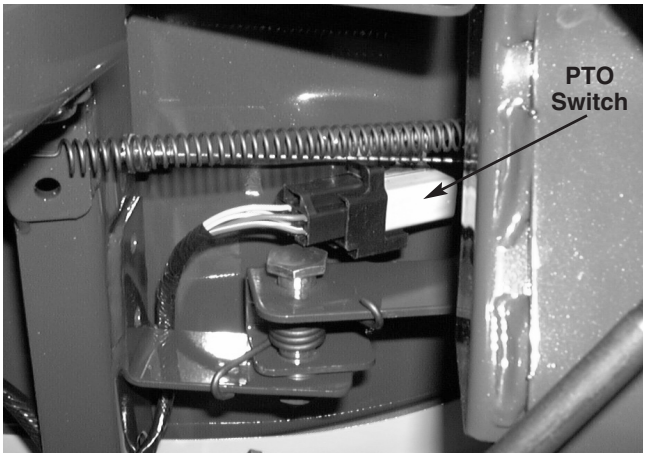


FIGURE 12.

30). Place one probe on one **NC** (yellow) terminal and the second probe on the second **NC** (yellow) terminal of the PTO switch.
–There will be **CONTINUITY**.

31). Depress the plunger on the PTO switch.
–There will be **NO CONTINUITY**.

32). Release the plunger and place the probes on the **NO** (normally open– orange) terminals.
–There will be **NO CONTINUITY**.

33). Depress the plunger on the PTO switch.
–There will be **CONTINUITY**.

SOLENOID:

34). Locate and remove the orange– female connector wire that is connected to the male actuation terminal of the solenoid.

35). Lock the parking brake down.

36). Make certain the deck engagement pedal is fully disengaged (UP) and depressing the plunger on the PTO switch all the way.

37). Place one probe of the multimeter on the orange/black wire of the wiring harness ignition connector. Place the second probe on the female connector of the orange wire that was disconnected from the male actuation terminal of the solenoid.
–There will be **CONTINUITY**.

38). Place one probe on the base (steel portion) and the second probe on the male actuation terminal of the solenoid.
–There will be approximately 5 OHM'S at room temperature.

NOTE: The OHM's reading will rise or fall slightly depending on the current temperature.

39). Reconnect the orange wire– female connector to the male actuation terminal of the solenoid.

40). Reconnect the wiring harness ignition connector to the ignition switch.

41). Disconnect the thick red wire (solenoid to starter) from the outlet post of the solenoid using a 7/16" wrench.

42). Place one probe on the inlet post and one probe on the outlet post of the solenoid.
–There will be **NO CONTINUITY**.

43). Turn the ignition key to the "START" (spring loaded) position.
–There will be **CONTINUITY**.

NOTE: Turn the ignition key to the **"OFF"** position after completion.

44). Reconnect the thick red wire (solenoid to starter) to the outlet post of the solenoid using a 7/16" wrench.

45). Make certain all connections are secure and test the starting circuit.

Electrical (Off / Safety Circuit)

IMPORTANT: This section is used for electrical training. Even though some of the subsections are called out, this section is meant to be performed inclusively. If you are working on a specific section, make certain all devices are in the proper modes (switches, relays, and etc...)

NOTE: A multimeter is a must for this section. If any of the following tests do not match, repair that portion of the system.

IGNITION SWITCH:

1). Turn the ignition key to the **"OFF"** position.

2). Locate the ignition switch and remove the wiring harness connector. See figure 1.

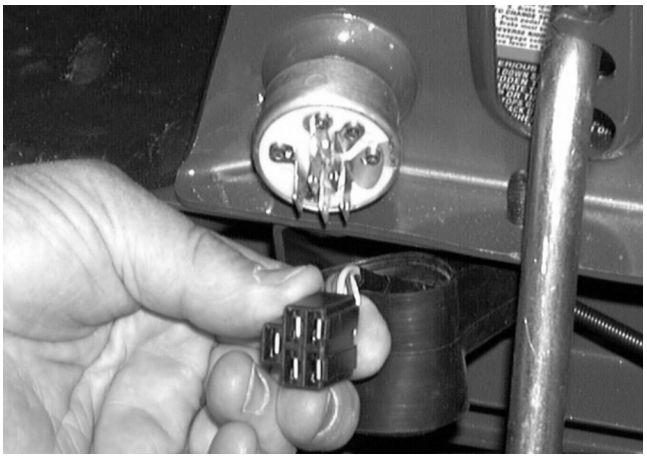


FIGURE 1.

3). Locate and identify all ignition switch terminals.

L—Alternator, **S**–Start, **M**–Magneto, **G**–Ground, **B**–Battery.

4). Locate and identify all wires coming into the wiring harness connector at the ignition switch.

Green–Ground, **Red**–Battery, **Yellow**–Magneto, **Red/White**–Alternator, **Orange/Black**–Start.

5). Place the multimeter in the OHM's mode until instructed to change modes. See figure 2.

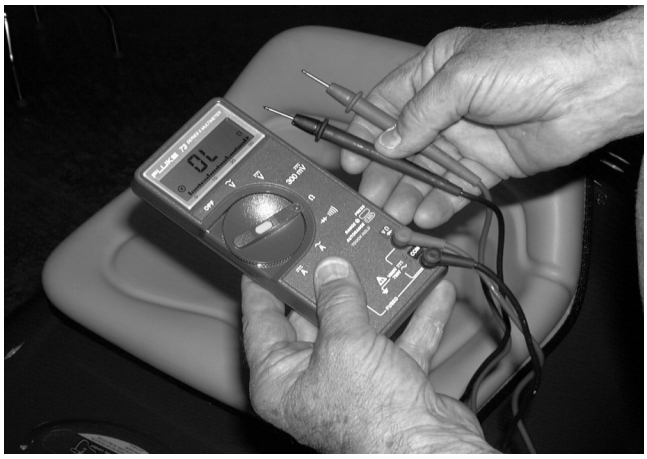


FIGURE 2.

6). Place one probe on any frame bolt. Place the second probe on the ground (green) wire of the ignition switch connector.
–There will be **CONTINUITY**. See figure 3.

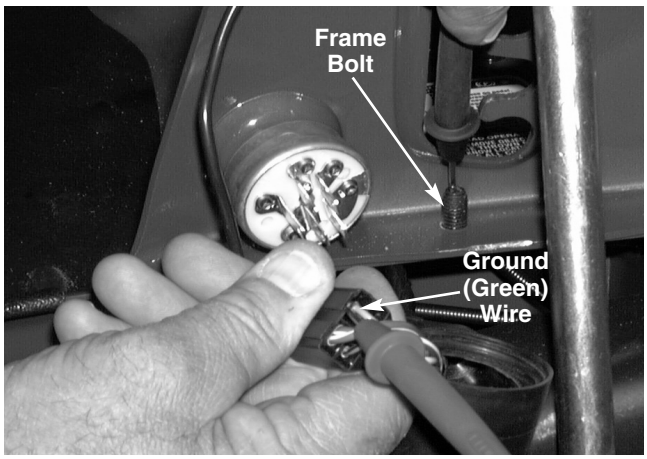


FIGURE 3.

7). Place one probe on the **"G"** terminal and one probe on the **"M"** terminal of the ignition switch.
–There will be **CONTINUITY**.

MAGNETO:

8). Locate the magneto (yellow) wire coming off of the engine.

9). Disconnect the magneto (yellow) wire from the magneto harness wire at the connector.

10). Place one probe of the multimeter into the wiring harness magneto (yellow) wire connector. Place the second probe on the magneto (yellow) wire of the ignition switch connector.
–There will be **CONTINUITY**. See figure 4.

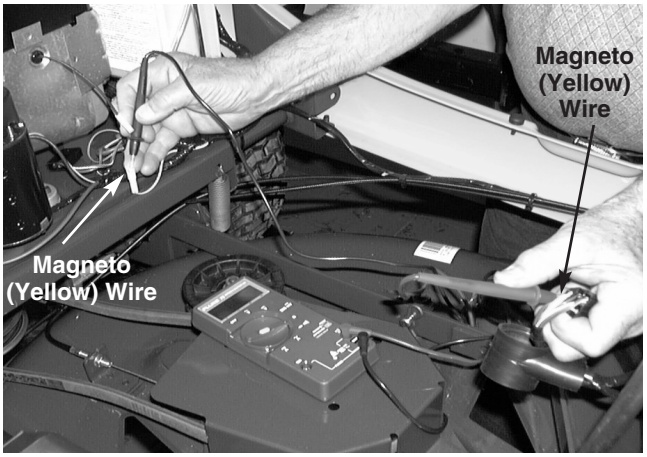


FIGURE 4.

11). Reconnect the magneto (yellow) wire to the magneto harness wire.

12). **DO NOT** reconnect the wiring harness connector to the ignition switch.

PTO SWITCH:

13). Locate the PTO switch and remove the wiring harness connector. See figure 5.

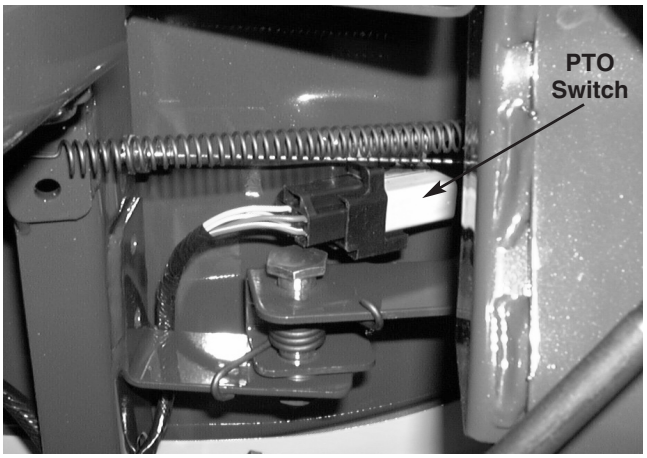


FIGURE 5.

14). Identify the **NC** (normally closed) terminals of the PTO switch.

15). Place one probe on one **NC** terminal and the second probe on the second NC terminal of the PTO switch.
–There will be **CONTINUITY**.

16). Depress the plunger on the PTO switch.
–There will be **NO CONTINUITY**.

17). Release the plunger and place the probes on the NO (normally open) terminals.
–There will be **NO CONTINUITY**.

18). Depress the plunger on the PTO switch.
–There will be **CONTINUITY**.

19). Reconnect the wiring harness connector to the PTO switch.

REVERSE SWITCH:

20). Locate the reverse switch and disconnect the yellow/black wire and connector. See figure 6.

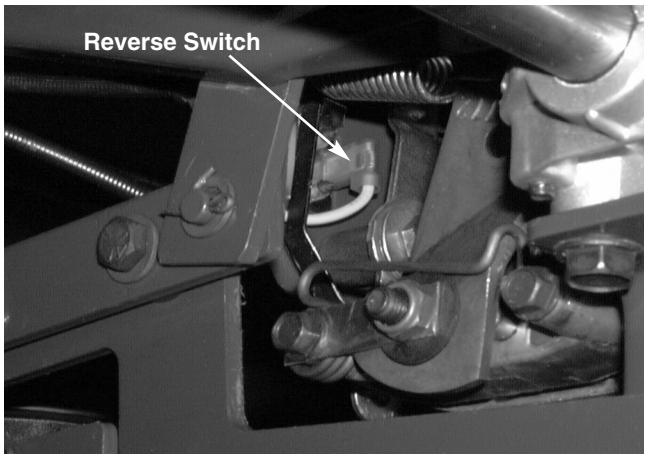


FIGURE 6.

21). Make certain the unit is off. Engage and lock down the cutting deck engagement pedal.

22). Place one probe of the multimeter into the yellow/black wire connector off of the reverse switch. Place the second probe on the magneto (yellow) wire of the ignition switch connector.
–There will be **CONTINUITY**. See figure 7.

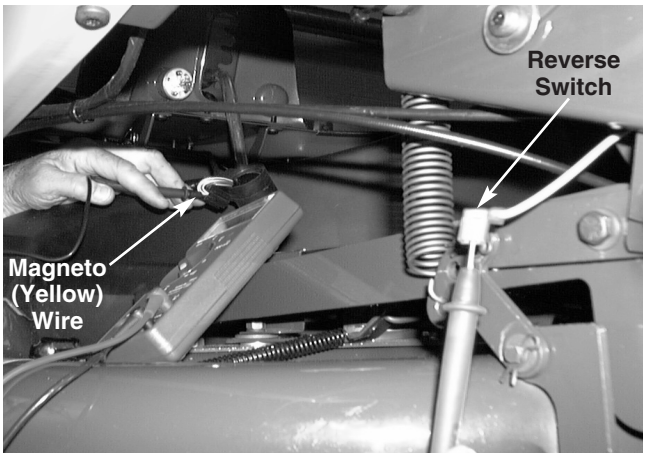


FIGURE 7.

RELAY CONNECTOR–(PTO switch):

23). Locate the relay connector with the yellow/black wire running into it. See figure 8.

FIGURE 8.

24). Place one probe on the yellow/black wire going into the relay connector. Place the second probe on the magneto (yellow) wire of the ignition switch connector.
–There will be **CONTINUITY**.

BRAKE SWITCH:

25). Locate the brake switch and remove the wiring harness connector. See figure 9.

FIGURE 9.

26). Identify the **NC** (normally closed) terminals of the brake switch.

27). Place one probe on one **NC** terminal. Place the second probe on the second **NC** terminal of the brake switch.
–There will be **CONTINUITY**.

28). Depress the plunger on the brake switch.
–There will be **NO CONTINUITY**. See figure 10.

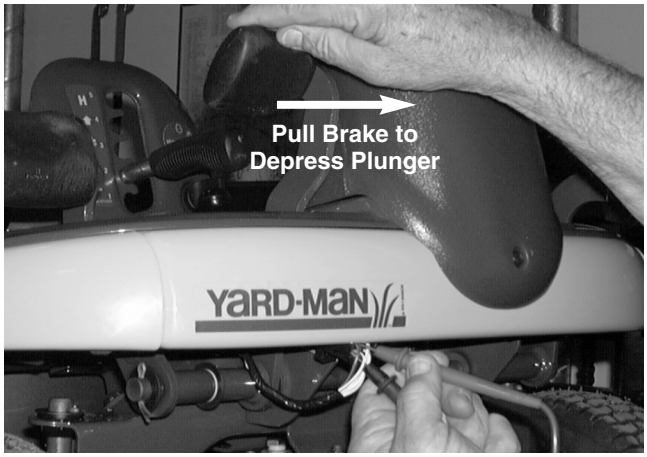


FIGURE 10.

29). Release the plunger and place the probes on the NO (normally open) terminals.
–There will be **NO CONTINUITY**.

30). Depress the plunger on the brake switch.
–There will be **CONTINUITY**.

31). Reconnect the wiring harness connector on the he brake switch.

32). Make certain the brake pedal is fully released (up).

RELAY CONNECTOR– (brake switch):

33). Locate the relay connector with the yellow/white wire running into it. See figure 11.

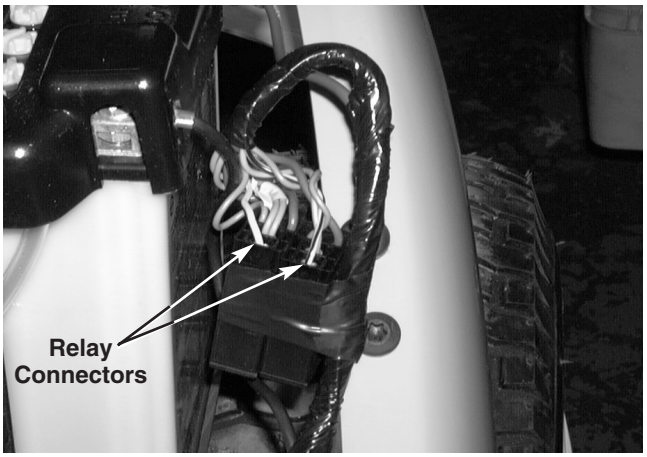


FIGURE 11.

34). Place one probe on the yellow/white wire going into the relay connector. Place the second probe on the magneto (yellow) wire of the ignition switch connector.
–There will be **CONTINUITY**.

35). Place one probe on any frame bolt. Touch the second probe to the ground (green) wires coming into both relays (all four positions).
–There will be **CONTINUITY**. See figure 12.

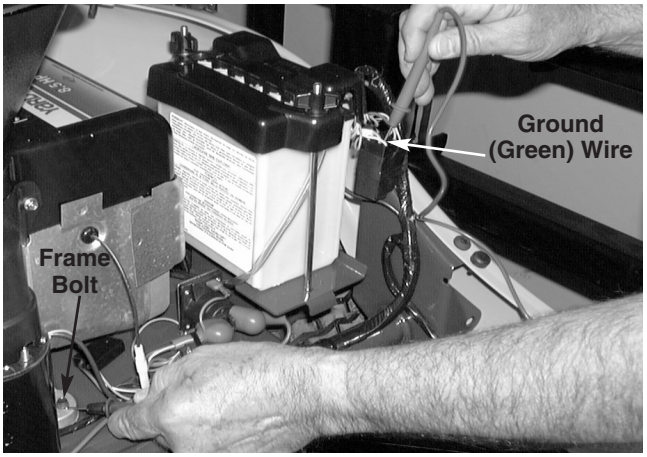


FIGURE 12.

36). Turn the ignition key to the **"ON"** position.

37). Place one probe on the **"B"** terminal and one probe on the **"L"** terminal of the ignition switch.
–There will be **CONTINUITY**.

SEAT SWITCH:

38). Locate the seat switch and remove both female harness connectors. See figure 13.

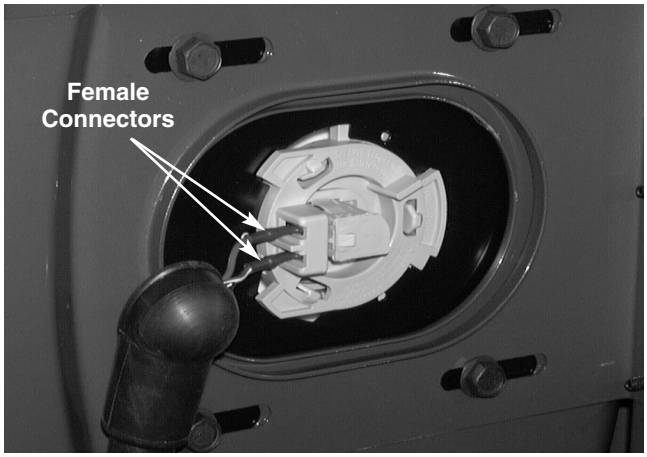


FIGURE 13.

39). Place one probe on one male terminal and the second probe on the second male terminal of the seat switch.
–There will be **CONTINUITY**.

40). Push the seat cushion in and activate the seat switch.
–There will be **NO CONTINUITY**.

41). Reconnect both female harness connectors to the seat switch.

42). Locate the red wires coming into both relay connectors.

43). Place one probe on the alternator (red/white) wire of the ignition switch connector. Touch the second probe on the red wires coming into both relay connectors.
–There will be **CONTINUITY**.

ALTERNATOR:

44). Locate and disconnect the alternator (red) wire from the harness (red/white) wire connector at the engine.

45). Place one probe in the round (red/white) alternator connector on the harness. Place the second probe on the alternator (red/white) wire of the ignition switch connector.
–There will be **CONTINUITY**.

46). Reconnect the alternator (red) wire to the harness (red/white) wire connector at the engine.

47). Reconnect the ignition switch wiring harness connector to the ignition switch.

RELAYS:

48). Remove both relays from the wiring harness relay connectors.

49). Locate and identify all terminals on the relays using the wiring diagram on the side of the relays.

50). Place one probe on terminal 3. Place the second probe on terminal 4.
–There will be **CONTINUITY**.

51). Place one probe on terminal 3. Place the second probe on terminal 5.
–There will be **NO CONTINUITY**.

52). Place on e probe on terminal 1. Place the second probe on terminal 2.
–There will be app. **82 OHM's** at room temperature.

NOTE: The OHM's reading will rise or fall depending on the temperature of the relay.

53). Place a red jumper wire on the positive terminal of a battery. Place a black jumper wire on the negative terminal of a battery.

54). Attach the red jumper wire to terminal 2 of the relay. Attach the black jumper wire to terminal 1 of the relay.
–There will be one **CLICK**.

55). Leave the relay attached to the battery. Place one probe on terminal 3. Place the second probe on terminal 4.
–There will be **NO CONTINUITY**.

56). Leave the relay attached to the battery. Place one probe on terminal 3. Place the second probe on terminal 5.
–There will be **CONTINUITY**.

57). Disconnect the relay from the battery. Repeat steps 50 through 56 for the second relay.

58). Place the multimeter into the **D.C. VOLTS** mode.

59). Locate and identify the red and green wires that come into the relay connectors at relay terminal positions **1** and **2**.

60). Make certain the ignition key is **"ON"**

61). Place the red probe on the red wire and the black probe on the green wire of the relay connector.
–There will be **12 VOLTS**.

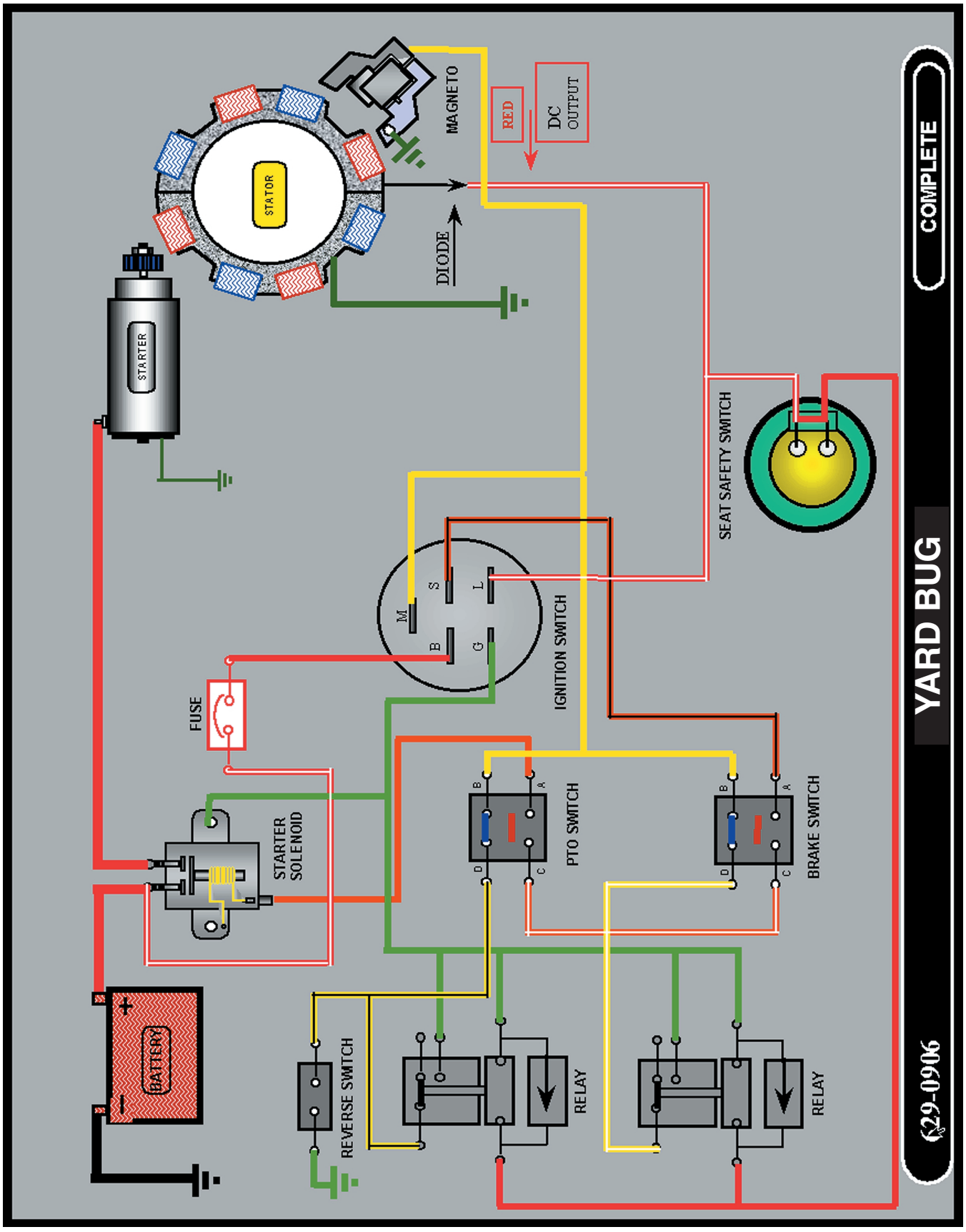
NOTE: Repeat this step for the second relay connector.

62). Turn the ignition key to the **"OFF"** position.

63). Reconnect the relays to the wiring harness relay connectors.

64). Make certain all wiring harness connections are secure and test the **OFF/SAFETY CIRCUIT**.

Electrical Drawing



SECTION 4
VARIABLE SPEED DRIVE

Steering Adjustments

IMPORTANT: The front tires will have a "TOE-IN" between 1/16" and 5/16" to allow the unit to track properly.

1). Check the tire pressure in the front tires and make certain that they are at approximately 14 PSI.

2). Place the unit on level ground.

3). Place the steering wheel in the straight forward position.

4). Lower the deck lift lever to the lowest position.

5). Line up the centering hole in the steering gear with the centering hole in the support plate, and insert a 1/4" Phillips screw driver up through both. See figure 1.

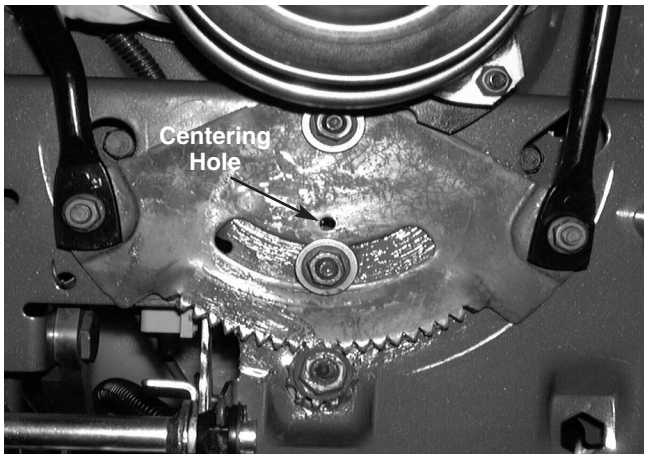


FIGURE 1.

6). In front of the axle, measure the distance horizontally from the inside of the left rim to the inside of the right rim. See figure 2.

FIGURE 2.

7). From behind the axle, measure the distance horizontally from the inside of the left rim to the inside of the right rim.

8). The measurement taken in front of the axle should be between 1/16" and 5/16" less than the measurement taken behind the axle. If not, perform the following steps:

9). Loosen the jam nut at the rear of the right ball joint that secures the ball joint to the drag link using a 1/2" wrench and an 11/16" wrench. See figure 3.

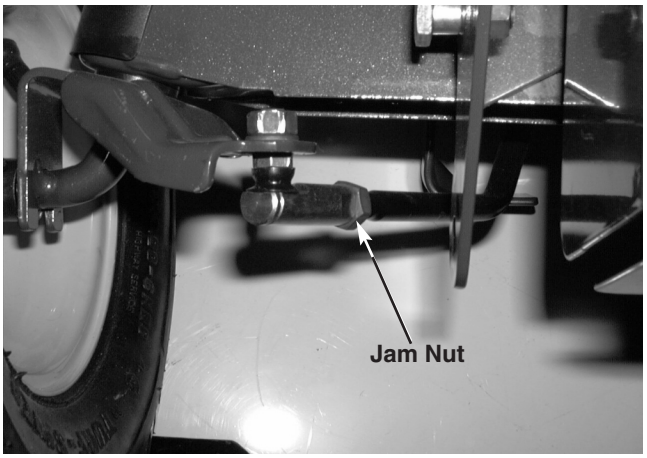


FIGURE 3.

10). Remove the hex nut and lock washer that secures the right ball joint to the right axle assembly using a 1/2" wrench and a 9/16 wrench.

11). Remove the right hand ball joint from the right hand drag link.

12). Remove the left hand ball joint performing steps 9, 10, and 11 above.

13). Place the left and right tire assemblies in the straight forward position.

14). Set the toe-in for the rim assemblies to the proper measurements as described in steps 6, 7, and 8 above.

15). Thread the right hand ball joint onto the right hand drag link until the mounting hole in the right hand axle assembly lines up with the ball joint.

NOTE: Count the number of turns the ball joint was rotated onto the drag link. This number should be equal for the left side as well.

16). Secure the right hand ball joint to the right hand axle assembly with the lock washer and nut removed earlier, using a 1/2" wrench and a 9/16 socket.

17). Secure the right hand ball joint jam nut to the right hand drag link using a 1/2" wrench and an 11/16 wrench.

18). Install the left hand ball joint using steps 15, 16, and 17.

NOTE: Make certain the same amount of rotations are used on the left ball joint as the right ball joint.

Autodrive Pedal Adjustment

IMPORTANT: The AutoDrive pedal is properly adjusted when the hole found in the double-idler bracket has approximately 1-3/8" of travel with ten pounds of pressure applied to the AutoDrive pedal. See figures 1 and 2.

FIGURE 1.

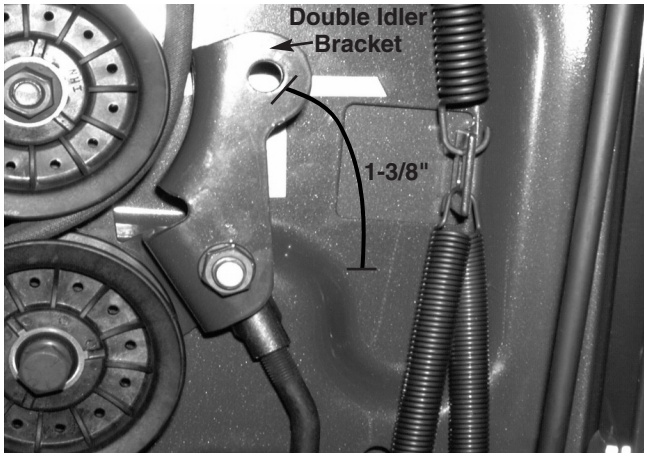


FIGURE 2.

1). Locate the speed control assembly on the underside of the steering support bracket.

2). Remove both hairpin clips from the main pin on the speed control assembly. See figure 3.

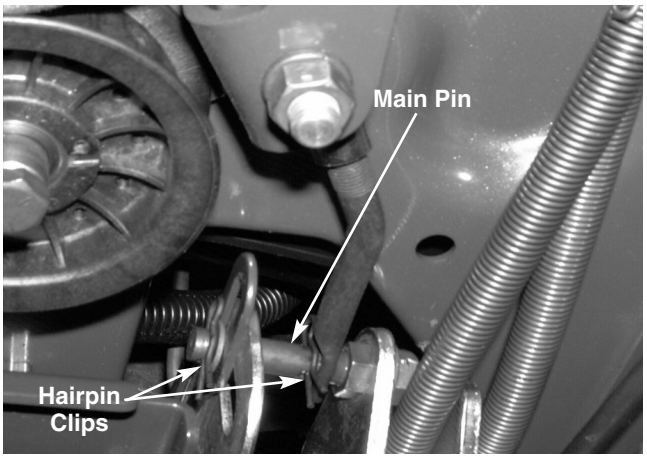


FIGURE 3.

NOTE: Be careful not to lose the small flat washers found on the main pin.

NOTE: Make certain both hairpins are put back in from the top of the main pin during reassembly.

3). Remove the AutoDrive pedal return spring.

4). Using two 9/16" wrenches, remove the main pin from the speed control assembly.

5). Thread the idler adjustment rod inward or outward until the proper adjustment has been achieved.

REASSEMBLE THE AUTODRIVE PEDAL IN THE REVERSE ORDER ABOVE.

Brake Adjustments

IMPORTANT: Make certain the tractor comes to a complete stop when the brake pedal is depressed. Also, make certain the rear wheels do not roll when the parking brake has been applied. If motion continues, perform the following steps:

1). Locate the hex nut that secures the brake assembly.

2). Loosen (DO NOT REMOVE) the hex nut using a 1/2" wrench.

3). Slide an .011" feeler gauge between the brake disc and the brake puck. See figure 1.

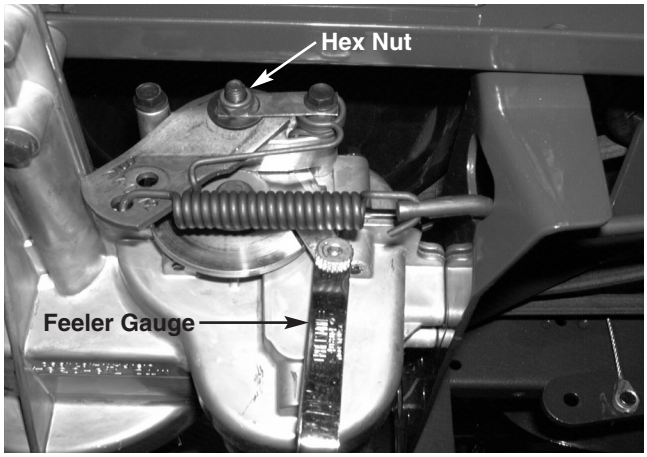


FIGURE 1.

4). Tighten the hex nut that secures the brake assembly.

5). Remove the .011" feeler gauge from the brake assembly.

6). Test for proper adjustments.

Leveling the Cutting Deck

NOTE: Prior to leveling the mowing deck, perform the following steps:

1). Check the tire pressure. The front tires will be approximately 14 PSI, and the rear tires will be approximately 10 PSI.

2). Place the tractor on a level surface.

3). Depress and lock the parking brake.

4). Raise the deck lift lever to the highest position.

FRONT TO REAR ADJUSTMENT:

IMPORTANT: The front of the deck will be between 1/4" to 3/8" lower in the front than the rear of the deck.

1). Using a work glove or rag, rotate the blades until they are parallel with the tractor frame. See figures 1 and 2.

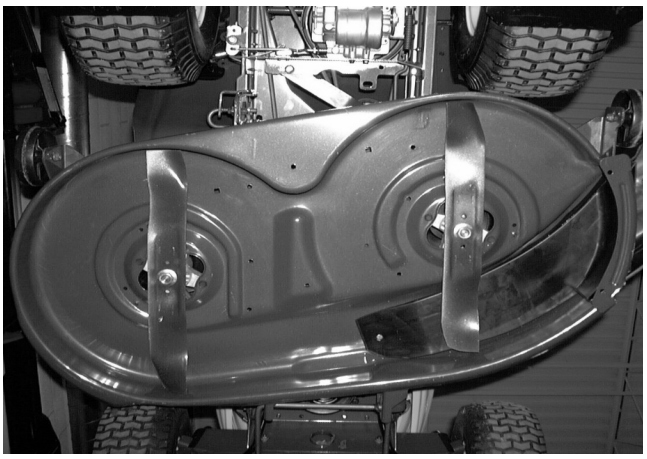


FIGURE 1.

2). Measure the front blade tips to ground.

3). Measure the rear blade tips to ground.

4). Make certain the front blade tips are 1/4" to 3/8" lower in the front than the rear blade tips.

FIGURE 2.

NOTE: If an adjustment is needed, perform the following steps:

5). Loosen both two jam nuts on the rear side of the deck stabilizer bracket using a 3/4" wrench. See figure 3.

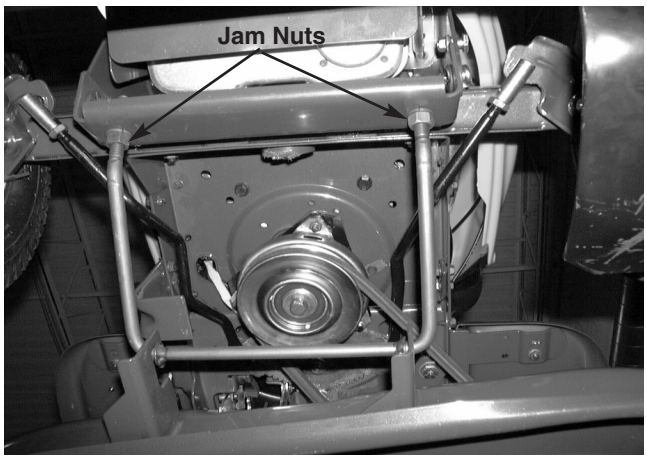


FIGURE 3.

6). Locate both lock hex nuts on the front side of the deck stabilizer bracket. See figure 4.

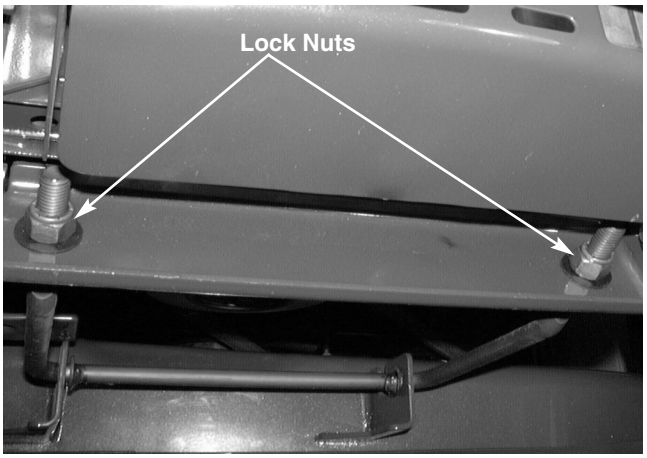


FIGURE 4.

7). Tighten both lock hex nuts to raise the front of the deck or loosen both lock hex nuts to lower the front of the deck using a 3/4" wrench.

8). Retighten both jam nuts on the rear side of the deck stabilizer when the proper adjustment has been achieved.

SIDE TO SIDE ADJUSTMENT:

IMPORTANT: The cutting deck must be even side to side.

1). Using a work glove or rag, rotate the blades until they are cutting edge tip to cutting edge tip (perpendicular) to the tractor. See figure 5.

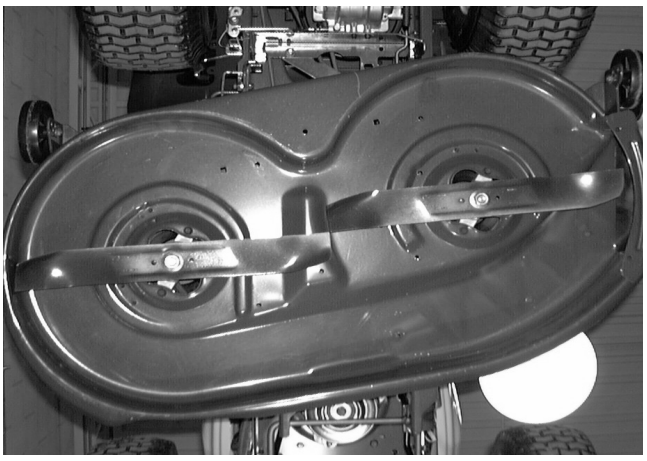


FIGURE 5.

2). Measure the outer blade tips to ground. Both measurements taken should be equal. See figure 6.

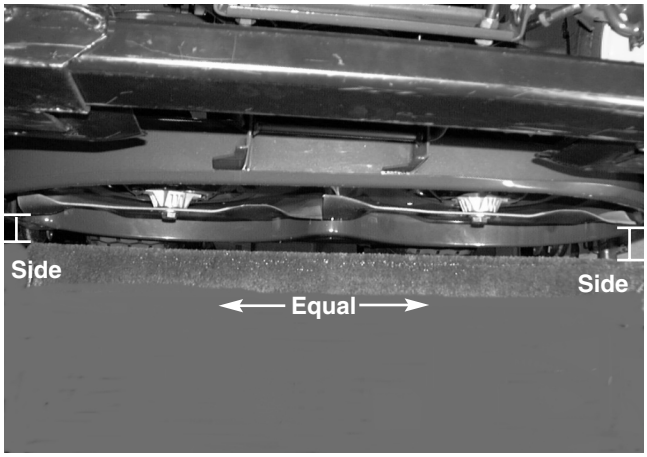


FIGURE 6.

NOTE: If an adjustment is needed, perform the following steps:

3). Loosen (DO NOT REMOVE) the hex cap screw on the left deck hanger bracket using a 1/2" and a 3/4" wrench. See figure 7.

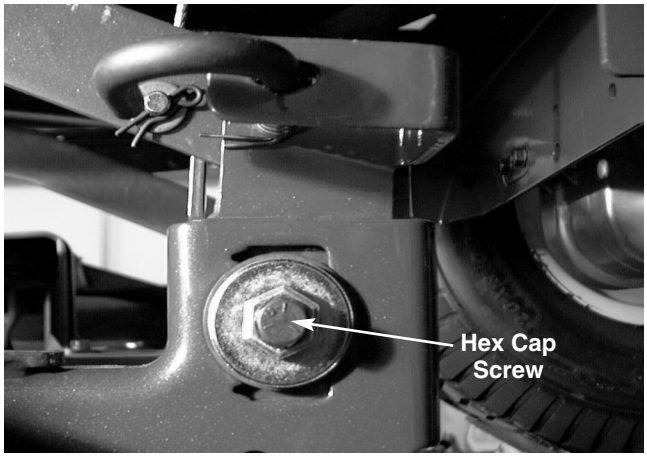


FIGURE 7.

4). Rotate the 3/4" deck adjustment gear right or left until the deck is level side to side and both blade tips to ground are equal in measurement.

5). Retighten the hex cap screw on the left deck hanger using a 1/2" and 3/4" wrench when the proper adjustment has been achieved.

NEW ADJUSTMENT DESIGN

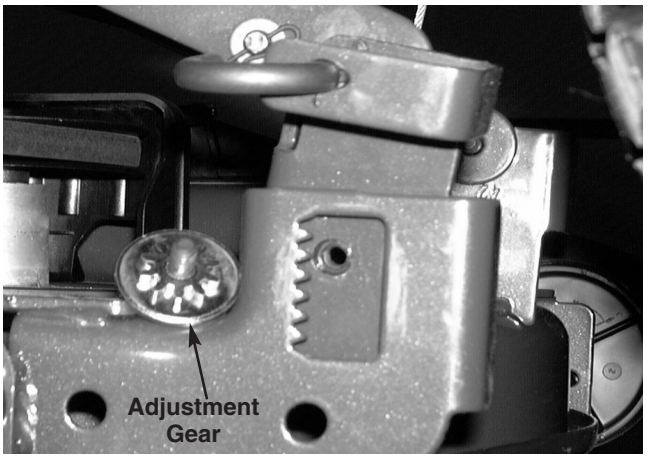


FIGURE 8.

Deck Belt Removal and Installation

42" CUTTING DECK:

1). Lower the deck to the lowest position.

2). Pull the PTO idler pulley and bracket towards the discharge chute, relieving belt tension. See figure 1.

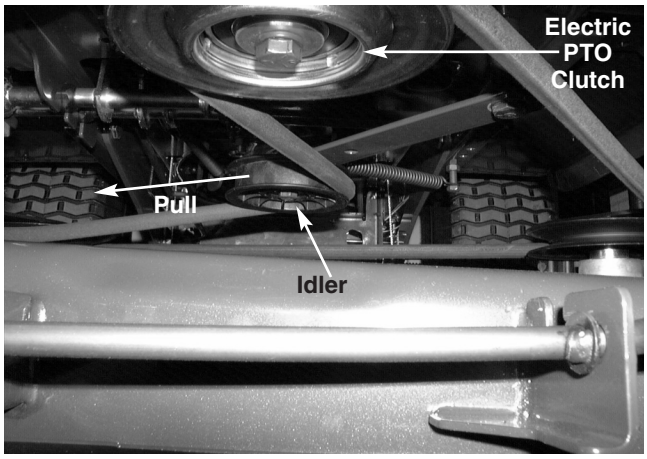


FIGURE 1.

3). Remove the deck belt from the electric PTO clutch on the engine.

4). Remove the self tapping screws securing the spindle belt covers. See figure 2.

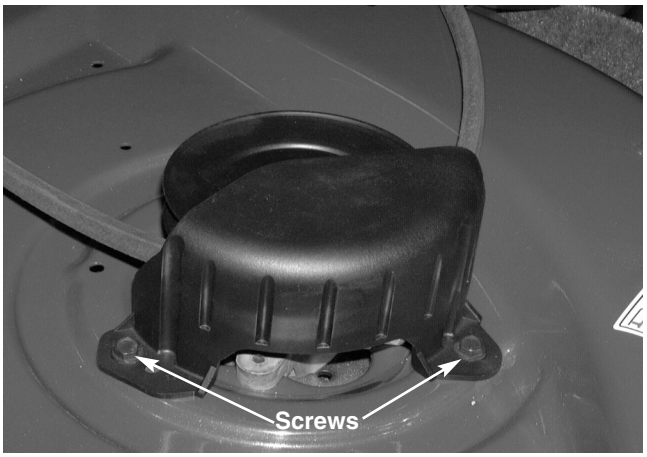


FIGURE 2.

5). Remove the spindle belt covers.

6). Remove the PTO deck belt.

REINSTALL THE NEW BELT IN THE REVERSE ORDER ABOVE.

46" CUTTING DECK:
LOWER BELT:

1). Pull the lower deck belt flat idler and idler bracket towards the left side of the tractor, relieving the belt tension. See figure 1.

2). Remove the lower deck belt.

REINSTALL THE NEW BELT IN THE REVERSE ORDER ABOVE.

Cutting Deck Removal

1). Lower the lift lever to the lowest setting.

2). Pull the PTO idler pulley and bracket towards the side discharge chute. See figure 1.

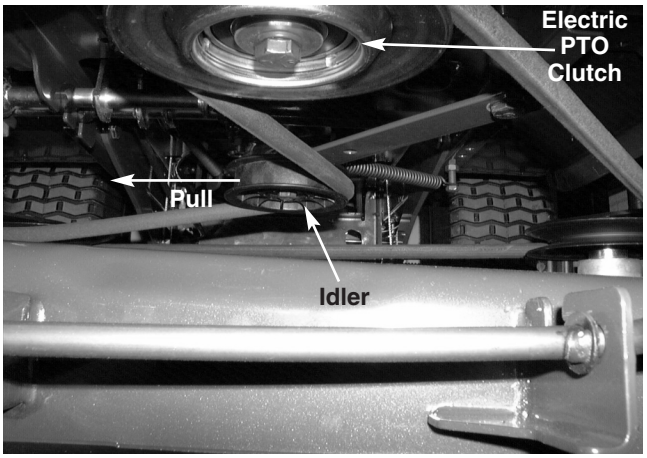


FIGURE 1.

3). Remove the deck belt from the lower pulley on the engine.

NOTE: The 46" decks have an upper and a lower belt. The upper belt is removed for cutting deck removal.

4). Pull the rear deck support pins outward from the deck lift arms. See figure 2.

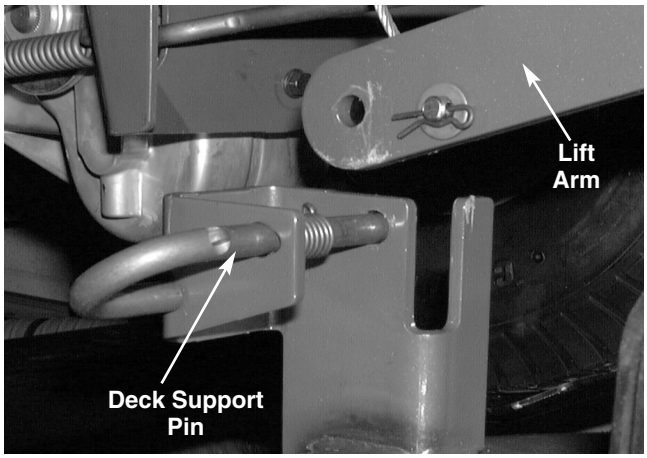


FIGURE 2.

5). Pivot the deck support pins to the rear.

6). Raise the lift lever to the highest setting. This will raise the lift arms up and out of the way of the deck assembly.

7). Slide the cutting deck forward and release the front deck hangers off of the front stabilizer rod. DO NOT DROP the deck to the ground. See figure 3.

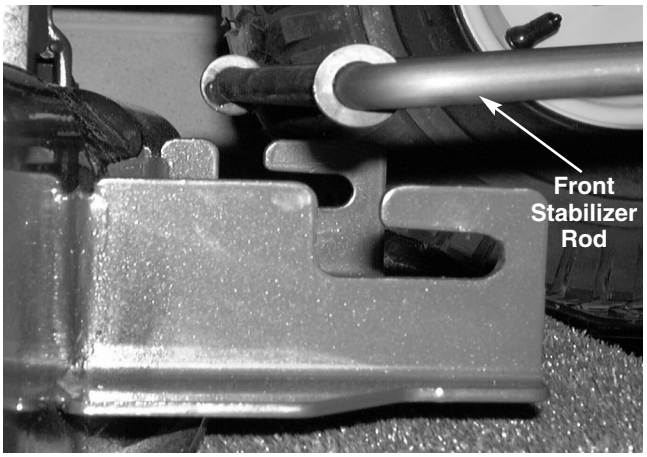


FIGURE 3.

8). Slide the deck towards the side discharge chute and remove it from the tractor.

CAUTION: Remove the deck stabilizer assembly from the tractor prior to moving the unit.

Drive Belt Removal and Reinstallation

TRANSMISSION BELT REMOVAL AND INSTALLATION:
UPPER BELT:

1). Raise the seat of the tractor and disconnect the battery cables from the battery. Remove the negative cable first. See figure 1.

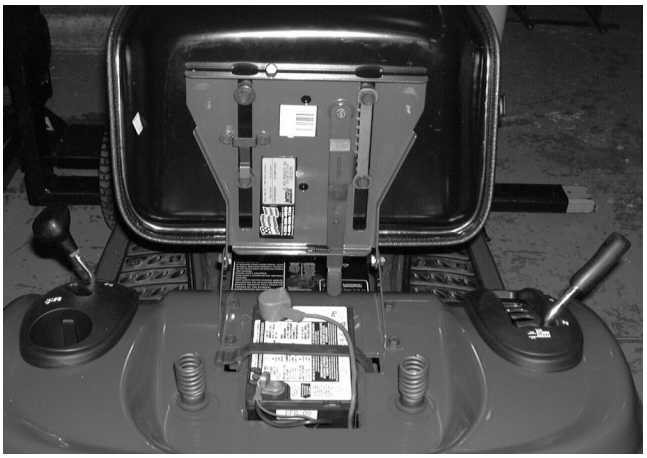


FIGURE 1.

2). Remove the battery strap, battery, and the battery tray from the tractor. See figure 2.

FIGURE 2.

3). Raise the deck lift lever to the highest position.

4). Pull the transmission idler pulley towards the transmission and release the upper drive belt. See figure 3.

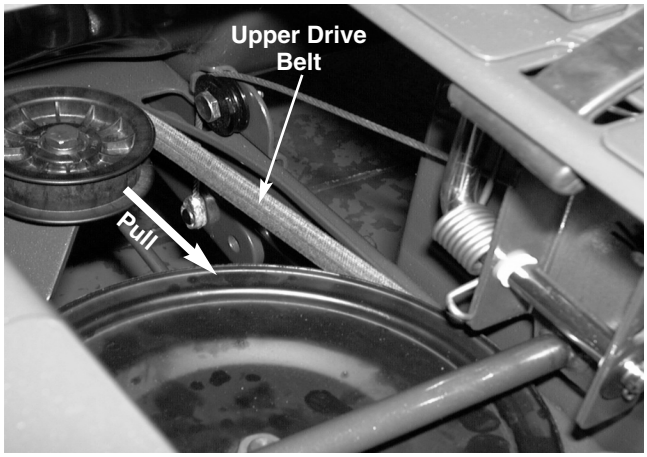


FIGURE 3.

5). Slowly release the idler pulley.

6). Remove the upper drive belt from the transmission pulley and the variable-speed pulley. See figure 4.

NOTE: Slowly roll the drive belt off of the variable-speed pulley.

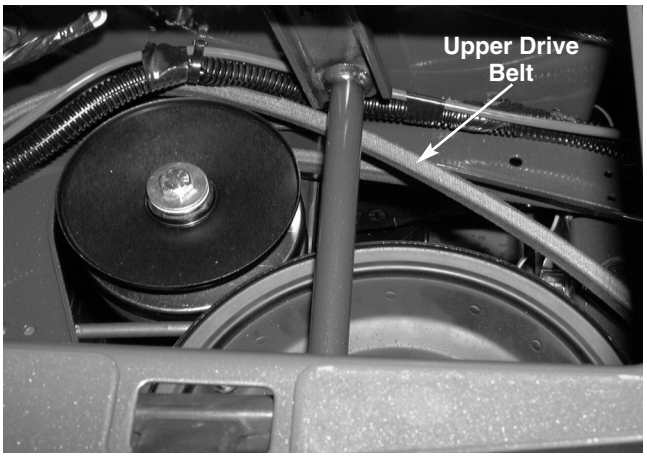


FIGURE 4.

VARIABLE-SPEED BELT REMOVAL AND REINSTALLATION:

LOWER BELT:

IMPORTANT: Prior to lower variable speed belt removal, perform cutting deck removal and upper drive belt removal.

1). Remove the hex bolt and lock nut securing the variable-speed pulley to the transmission using a 9/16 socket and a 9/16 wrench. See figure 5.

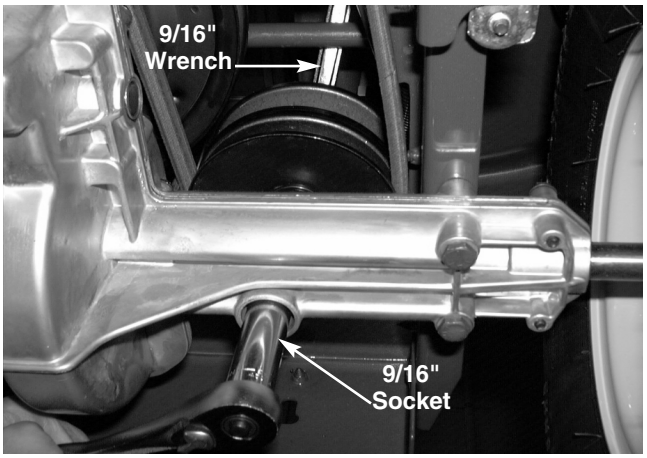


FIGURE 5.

2). Raise the variable speed pulley and roll the lower drive belt off.

3). Remove the variable-speed pulley from the tractor through the battery box opening.

4). Disconnect the wiring harness female connector from the reverse safety switch.

5). Loosen (DO NOT REMOVE) the flat moving idler on the double-idler bracket. See figure 6.

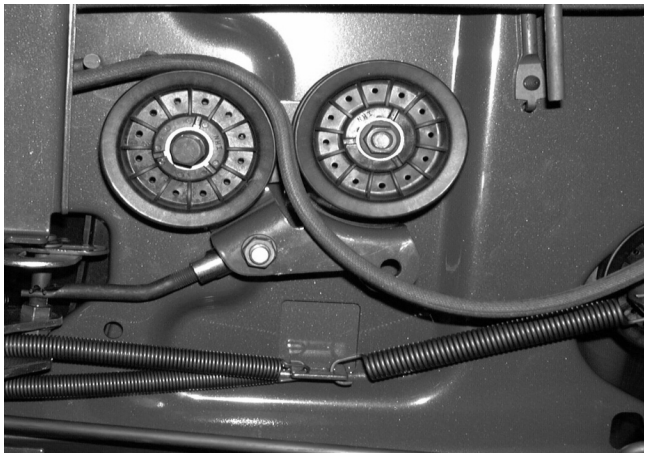


FIGURE 6.

6). Remove the variable-speed belt from the double idler pulley assembly.

7). Cut and remove the zip tie securing the PTO clutch wires to the wiring harness.

NOTE: Make certain a new zip tie is reinstalled during reassembly.

8). Carefully disconnect the wiring harness connector from the electric PTO clutch assembly. See figure 7.

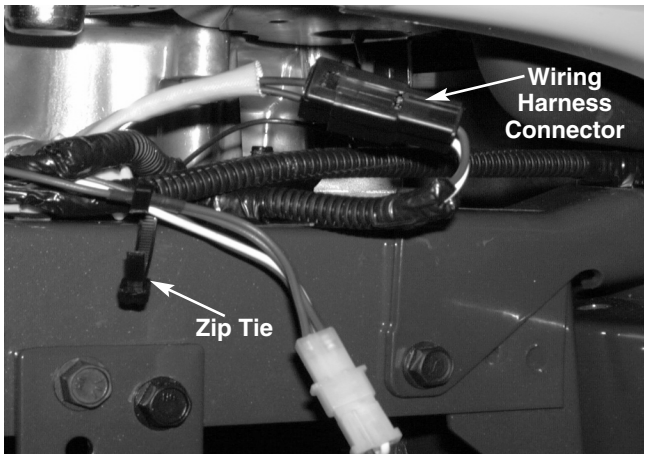


FIGURE 7.

NOTE: During reassembly, make certain the PTO clutch wires are routed inside the right hand drag link.

9). Remove the hex bolt that secures the electric PTO clutch to the engine crank shaft using a 5/8 socket.

NOTE 1: Some units have a washer that rests on top of the electric PTO clutch, make certain it is in place during reassembly.

NOTE 2: Torque the hex bolt to 38 to 50 foot-pounds during reassembly.

NOTE 3: Make certain that the clutch retaining pin is in the electric PTO clutch bracket during reassembly.

10). Slowly lower the engine drive pulley and remove the variable-speed belt. See figure 8.

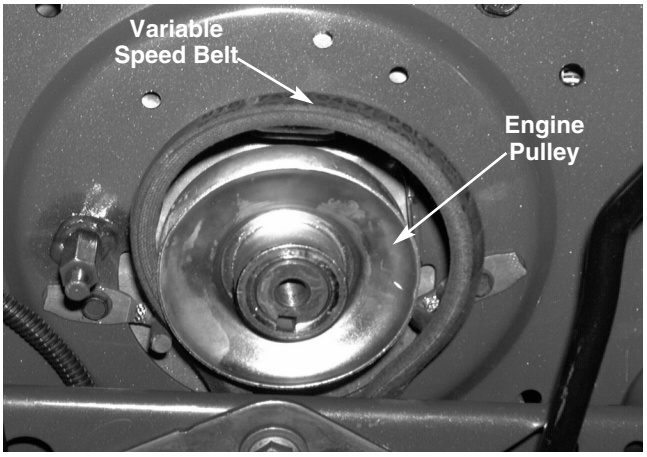


FIGURE 8.

NOTE: Carefully set the engine drive pulley aside, making certain the 1/4" squared key remains in place.

11). Remove the variable-speed belt from the tractor.

REINSTALL THE VARIABLE-SPEED BELT IN THE REVERSE ORDER ABOVE.

Transmission Removal and Installation

NOTE: Prior to performing transmission removal and installation, it is necessary to remove the upper drive belt.

1). Remove both rear hub caps from the rear wheel assemblies.

2). Loosen both hex cap screws securing the rear wheel assemblies to the axles.

3). Raise the rear of the tractor off the ground.

4). Remove both center hex cap screws and bell washers from the rear wheel assemblies.

5). Remove both rear wheel assemblies from the tractor.

6). Disconnect the reverse safety switch. See figure 1.

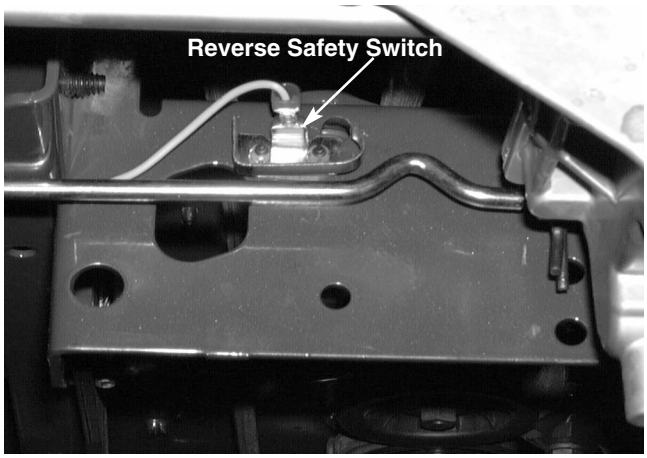


FIGURE 1.

7). Remove the hair pin that secures the shift linkage to the shift fork and set the shift linkage aside. See figure 2.

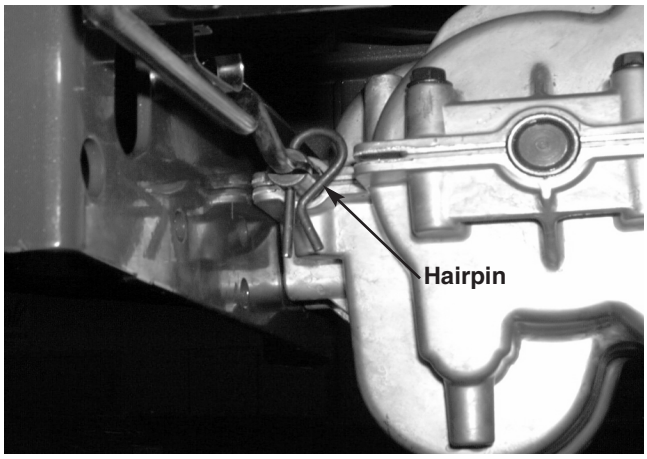


FIGURE 2.

8). Remove both of the self tapping screws that secure the transmission to the front torque bracket using a 3/8 socket. See figure 3.

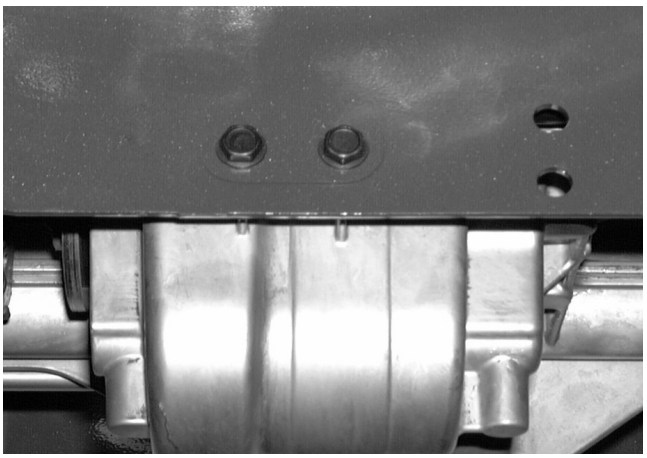


FIGURE 3.

9). Support the bottom of the transaxle.

10). Remove all four hex bolts and lock nuts securing the transmission to the frame using a 1/2" socket and a 1/2" wrench. See figure 4.

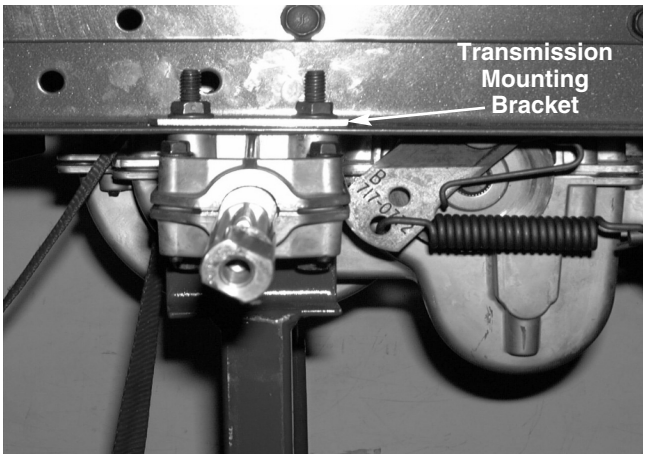


FIGURE 4.

11). Remove both transmission mounting brackets from the top of the frame.

12). Remove the hex bolt and lock nut securing the variable-speed pulley to the transmission using a 9/16 socket and a 9/16 wrench.

13). Remove the locking hex nut from the brake actuation arm on the transmission. See figure 5.

NOTE: During reassembly, perform the brake adjustment section.

14). Loosen (DO NOT REMOVE) the hex washer head self-tapping screw that secures the anti-rotation bracket to the brake assembly using 3/8 wrench. See figure 5.

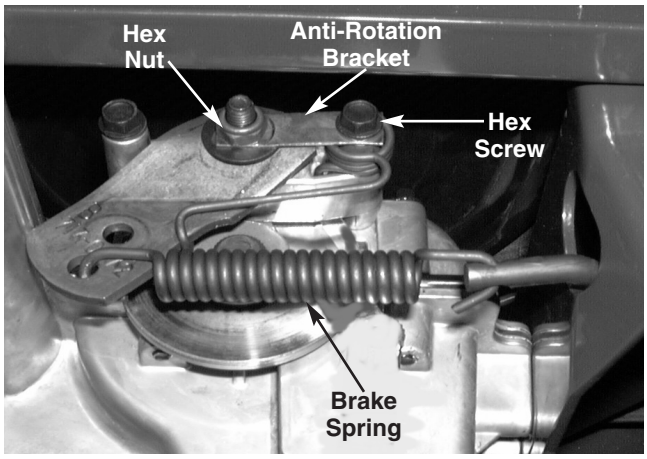


FIGURE 5.

15). Pivot the anti-rotation bracket down and relieve the spring tension on the brake actuation arm.

16). Remove the flat washer from the actuation arm stud of the brake assembly.

17). Remove the brake spring from the brake actuation arm. See figure 5.

18). Slowly lower the transmission from the tractor. See figure 6.

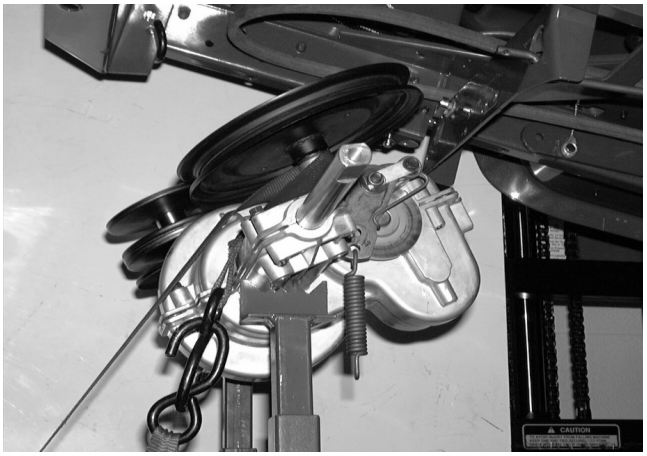


FIGURE 6.

NOTE: The variable-speed pulley will be hanging by the drive belt at this time. Set it aside after removal of the transmission.

INSTALL THE TRANSMISSION IN THE REVERSE ORDER ABOVE.

4

Transmission Disassembly and Reassembly

1). Remove the hex nut and bell washer that secures the transmission pulley to the input shaft using an 11/16 socket.

2). Remove the transmission pulley from the input shaft.

3). Remove all the self tapping screws that secure the two transmission case halves together using a 3/8 socket. See figure 1.

NOTE: The two long self tapping screws secure the brake area.

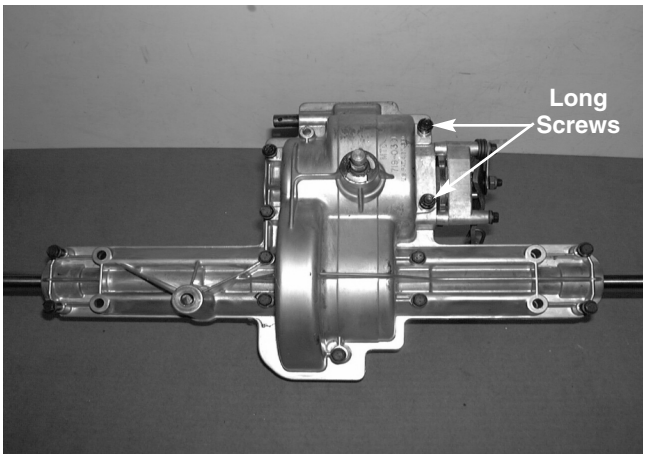


FIGURE 1.

4). Separate the upper transmission housing from the lower transmission housing and set it aside.

5). Remove the differential axle assembly from the lower housing.

6). Remove the shift fork assembly, detent ball and spring.

7). Remove both self tapping screws securing the lower drive shaft to the lower transmission housing using a 3/8 socket and a 6" extension.

8). Remove the upper and lower drive shaft assemblies as one unit from the lower transmission housing.

9). Remove and inspect all components of the upper and lower drive shafts. See figure 2.

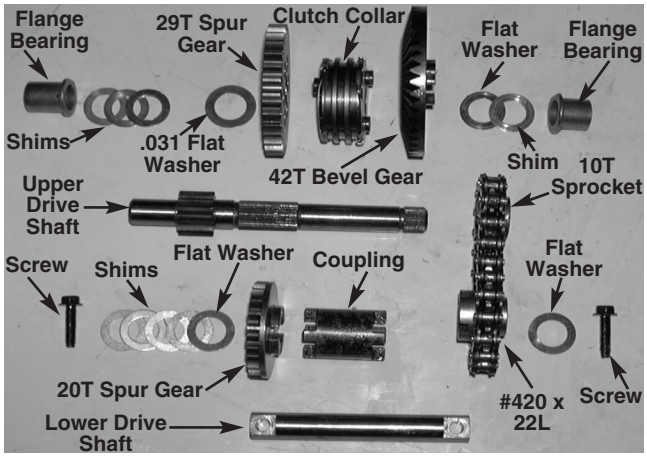


FIGURE 2.

10). Reassemble the lower drive shaft assembly (ONLY) and place it into the lower transmission housing. Secure the lower drive shaft in place with both self tapping screws using a 3/8 socket and a 6" extension.

11). Place two feeler gauges between the reverse spur gear and the flat washer shim. See figure 3.

NOTE: Make certain the tolerance is between .007" and .015".

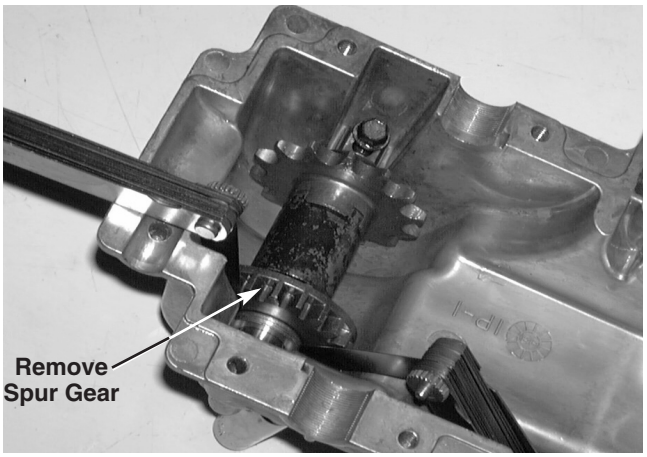


FIGURE 3.

12). Remove the lower shaft assembly from the lower transmission housing using a 3/8 socket and a 6" extension.

13). Reassemble the upper drive shaft assembly (ONLY) and place it into the lower transmission housing. Make certain the bushing detents are sitting firmly into the housing.

14). Place two feeler gauges between the chain sprocket and the flat washer shim. See figure 4.

NOTE: Make certain the tolerance is between .007" and .015".

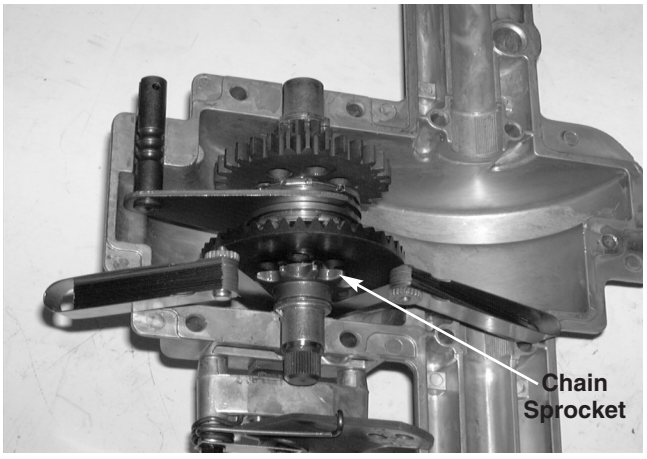


FIGURE 4.

15). Place two feeler gauges between the gear on the upper drive shaft and the flat washer shim. See figure 5.

NOTE: Make certain the tolerance is between .007" and .015".

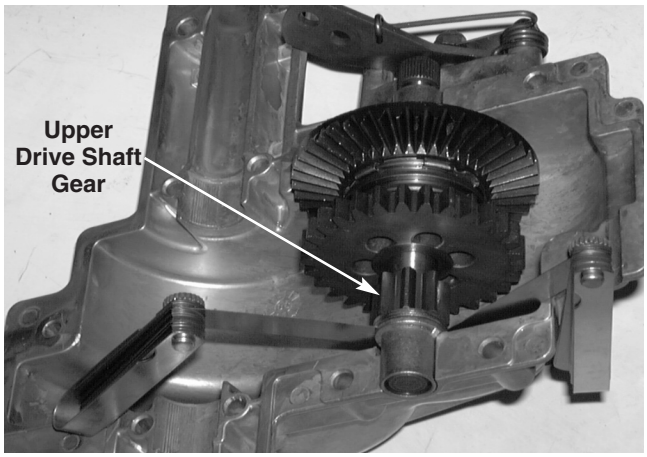


FIGURE 5.

16). Place two feeler gauges between the top of the upper housing and the flat washer on the input shaft. See figure 6.

NOTE: Make certain the tolerance is between .007" and .015".

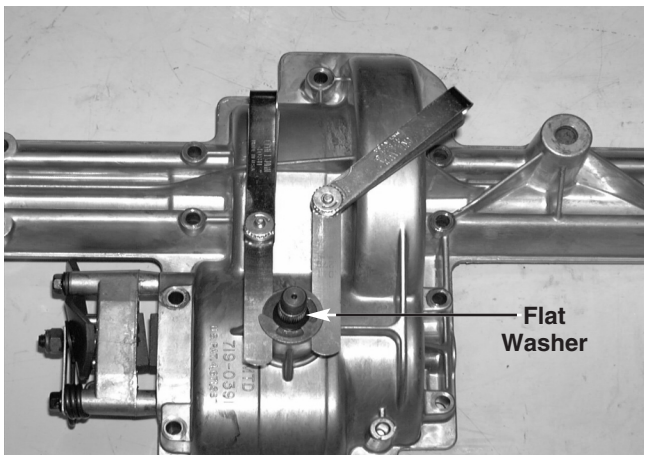


FIGURE 6.

17). Lubricate all shafts with Never Seez and reassemble the components of the transmission in the lower housing.

18). Fill the transmission with 20 ounces of grease, part #737-0148.

19). Place the upper transmission housing over the lower housing and secure them together with the self tapping screws removed earlier, using a 3/8 socket. See figure 7.

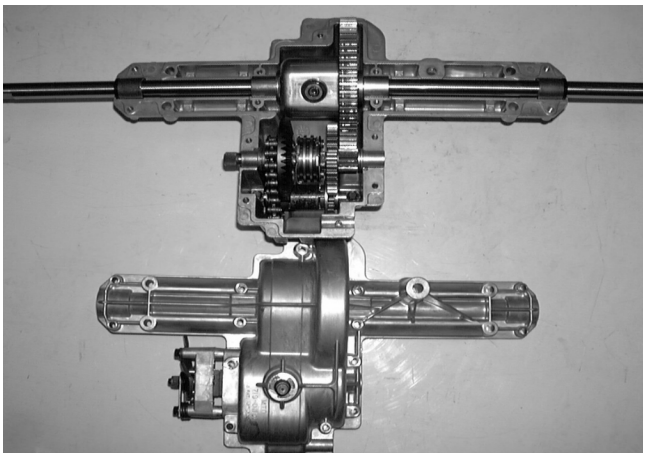


FIGURE 7.

IMPORTANT: Remember to install the two longest self tapping screws in the brake assembly area.

20). Torque all perimeter case halve self tapping screws between 90 and 110 inch-pounds using a 3/8 socket and a torque wrench. See figure 8.

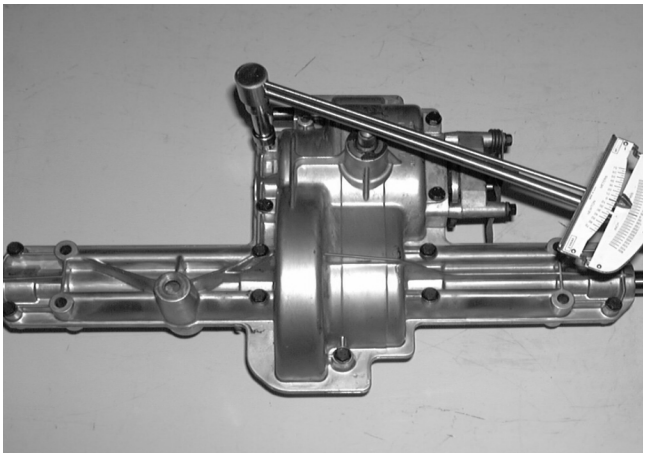


FIGURE 8.

REASSEMBLE ALL COMPONENTS IN THE REVERSE ORDER ABOVE.

Electrical Section

NOTE: A multimeter is a must for this section. If any of the following tests do not match, repair that portion of the system.

BRAKE SWITCH:

IMPORTANT: The fuel tank has been removed for clarity.

1). Locate and remove the brake safety interlock switch from the metal frame tab. See figure 1.

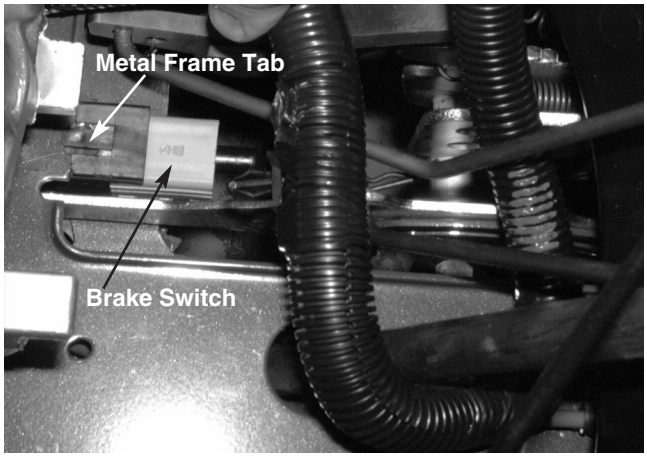


FIGURE 1.

NOTE: The brake switch has a center locking tab that must be dislodged from the metal frame tab.

2). Pull the wiring harness connector and brake switch forward and slide it toward the right frame rail. See figures 2 and 3.

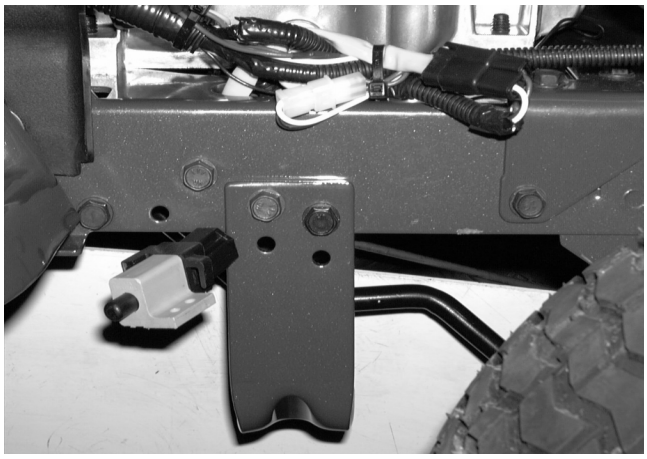


FIGURE 2.

3). Remove the brake safety switch from the wiring harness connector. See figure 3.

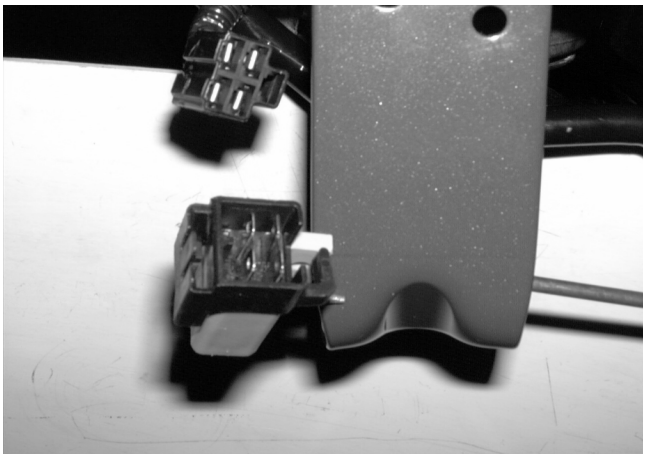


FIGURE 3.

4). Place the multimeter in the **OHM's** mode.

5). Place both probes of the multimeter on the NC (normally closed) terminals and test for continuity.
–There will be **CONTINUITY**. See figure 4.

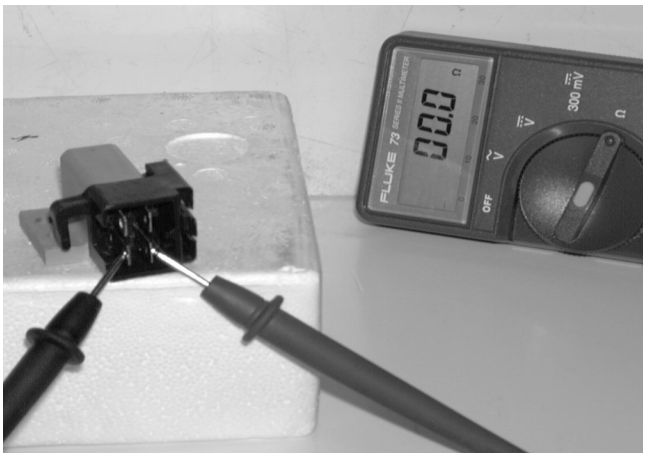


FIGURE 4.

6). Place both probes on the NO (normally open) terminals and test for continuity.
–There will be **NO CONTINUITY**. See figure 5.

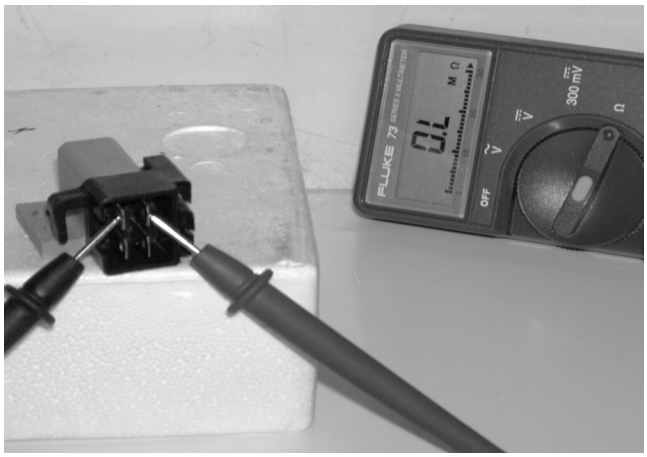


FIGURE 5.

7). Depress the plunger and perform steps 5 and 6.

NOTE: The **NC** (normally closed) terminals will not have continuity. The **NO** (normally open) terminals will have continuity.

SEAT SAFETY SWITCH:

NOTE: The seat safety switch is mounted directly below the left seat compression spring assembly.

1). Raise the seat.

2). Remove the negative and positive battery cables from the battery.

NOTE: For safety, remove the negative terminal first.

3). Remove the battery strap, battery, and battery tray from the tractor.

4). Reach in through the battery opening and squeeze the locking clips together on the seat switch. See figure 8.

5). Remove the seat switch from the frame holding bracket. See figure 6.

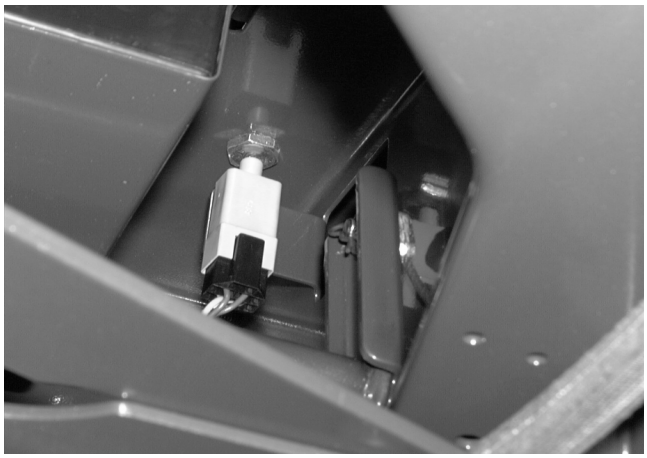


FIGURE 6.

6). Disconnect the wiring harness connector from the seat switch. See figure 7.

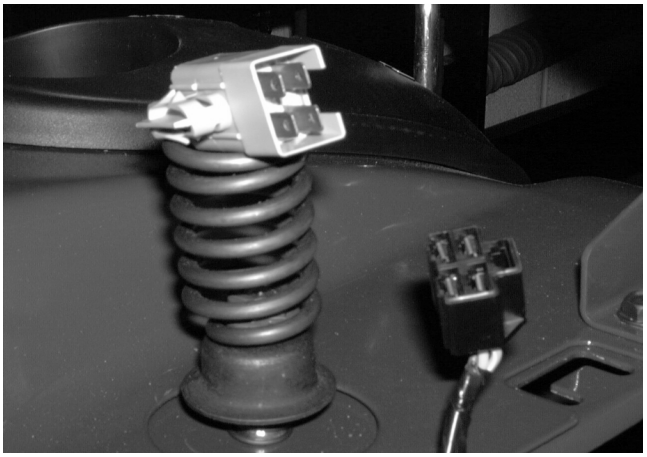


FIGURE 7.

7). Set the seat safety switch on a flat surface. This is the at rest position. See figure 8.

FIGURE 8.

8). Place the multimeter in the **OHM's** mode.

9). Place both probes of the multimeter on the lower NC (normally closed) terminals and test for continuity.
–There will be **CONTINUITY**. See figure 9.

FIGURE 9.

10). Place both probes on the second set of upper NC (normally closed) terminals.
–There will be **CONTINUITY**. See figure 10.

FIGURE 10.

11). Depress the plunger and perform steps 9 and 10.

NOTE: Both sets of NC terminals will not have continuity.

ELECTRIC PTO SWITCH:

IMPORTANT: The electric PTO switch is three small switches bundled into one. The PTO switch consists of nine total terminal positions (three sets of three terminals) on the back side. Seven of these terminals have male spades. Two terminals do not have male spades because they are not used in our applications.

NOTE: Remove all four self tapping screws securing the fuel tank to the dash panel using a 1/2" socket. Lower the fuel tank out of the way.

1). Locate and remove the PTO switch and wiring harness connector. See figure 11.

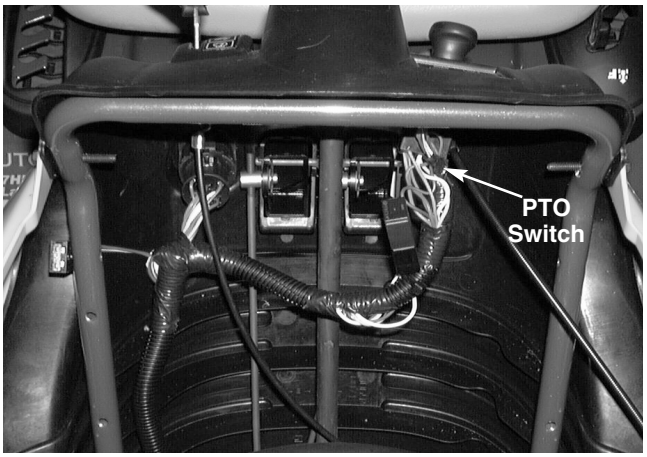


FIGURE 11.

2). Remove the wiring harness connector from the PTO switch.

3). Make certain the PTO switch is in the **OFF** (closed) position.

4). Looking at the back side of the PTO switch, find the male terminals that are nearest the steering column. There will be a terminal on each side and no terminal in the center... **XOX**.

5). Using an ohm meter, place the test probes on the outer two terminals. This is the start circuit.
–There will be **CONTINUITY**. See figure 12.

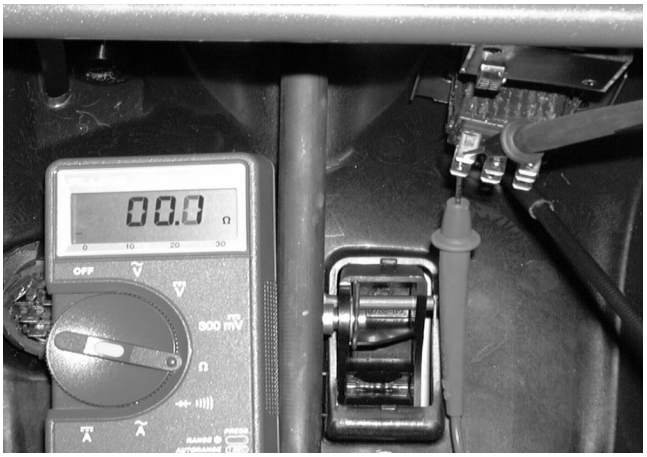


FIGURE 12.

6). Pull the PTO switch to the ON position.
–There will be **NO CONTINUITY**. See figure 13.

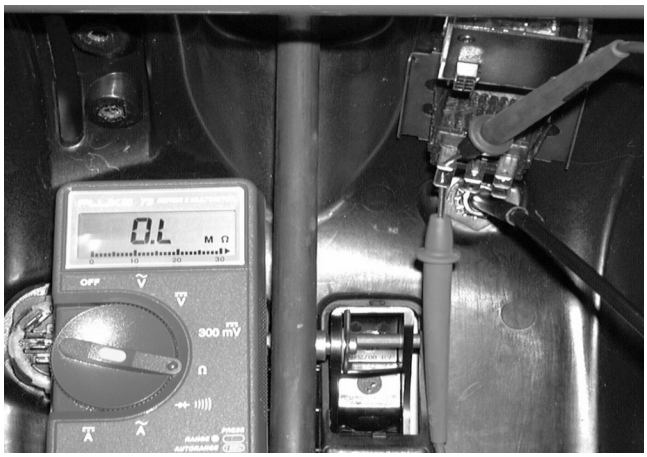


FIGURE 13.

7). Push the PTO switch back to the OFF position and check the two right terminals...**OXX** in the middle.
–There will be **NO CONTINUITY**. See figure 14.

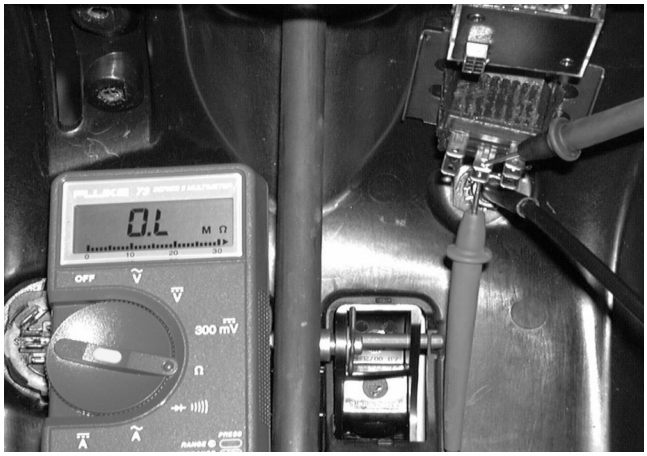


FIGURE 14.

8). Pull the PTO switch to the ON position.
–There will be **CONTINUITY**. See figure 15.

FIGURE 15.

9). Push the PTO switch back to the **OFF** position and check the outer two terminals in the last set of three...XXX.
–There will be **CONTINUITY**. See figure 16.

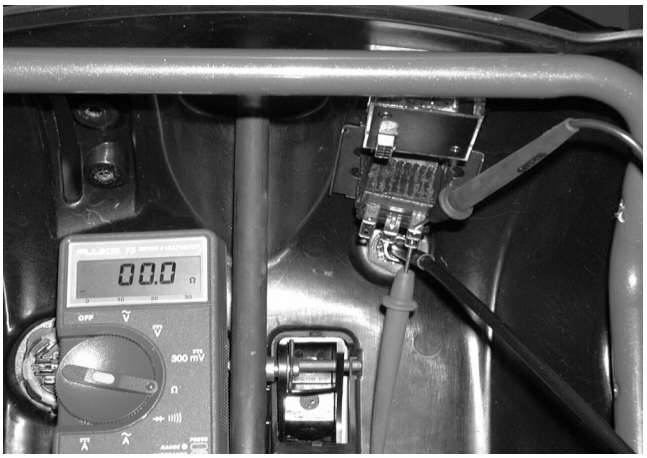


FIGURE 16.

10). Pull the PTO switch to the ON position.
–There will be **NO CONTINUITY**.

11). Push the PTO switch back to the OFF position and check the two right terminals for continuity...**XXX**.
–There will be **NO CONTINUITY**.

12). Pull the PTO switch to the **ON** position.
–There will be **CONTINUITY**. See figure 17.

FIGURE 17.

NOTE: If any of the above tests do not match, the electric PTO switch is defective. Recheck the PTO switch to make certain that it is defective.

IGNITION SWITCH:

NOTE: Remove all four self tapping screws securing the fuel tank to the dash panel using a 1/2" socket. Lower the fuel tank out of the way.

Terminal Codes:

G= Ground S=Start M=Magneto L=Lights B=Battery
A1=Alternator A2=Alternator–Lights

NOTE: A multimeter is a must for this section. If any of the following tests do not match, repair that portion of the system.

1). From behind the dash panel, locate the ignition switch and wiring harness connector. See figure 18.

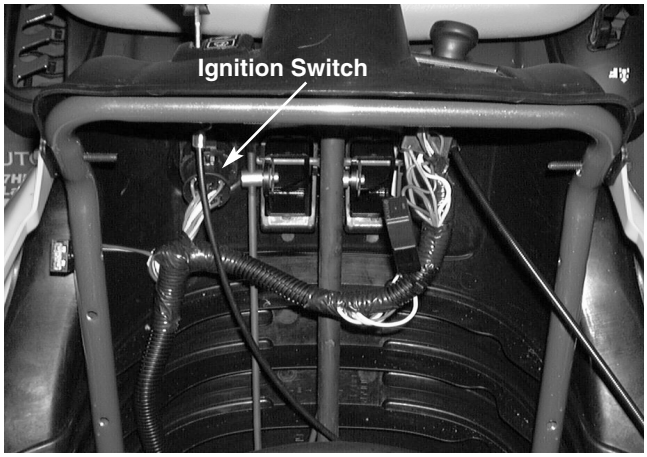


FIGURE 18.

2). Remove the wiring harness connector from the ignition switch. See figure 19.

3). Make certain the multimeter is working properly. Hold both test probes apart and check the meter display.
–There will be an **O.L.** (open line) reading. See figure 19.

FIGURE 19

4). Turn the key to the **ON** position. Place the test probes on the B and A1 terminals.
–There will be **CONTINUITY**. See figure 20.

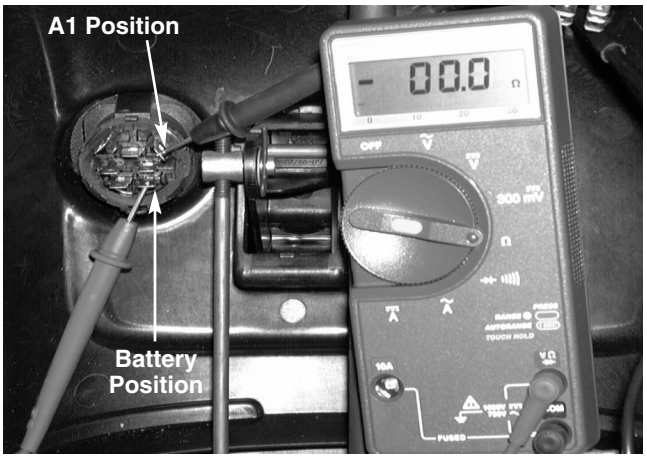


FIGURE 20.

5). Turn the key to the **OFF** position.
–There will be **NO CONTINUITY**.

6). Leave the key in the **OFF** position. Place the test probes on the M and G terminals.
–There will be **CONTINUITY**. See figure 21.

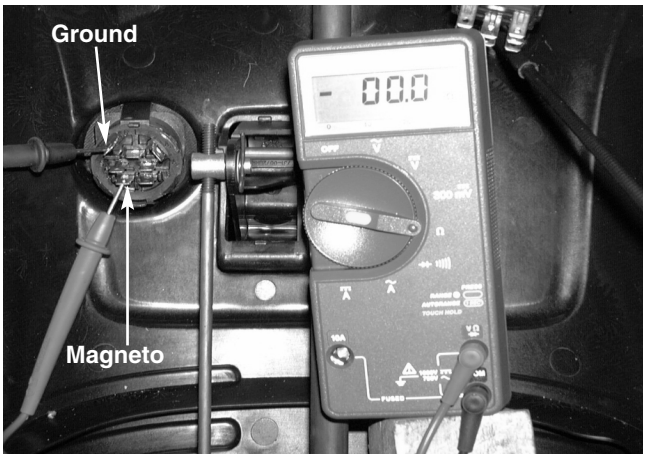


FIGURE 21.

7). Turn the key to the **ON** position.
–There will be **NO CONTINUITY**.

8). Leave the key in the **ON** position. Place the test probes on the B and S terminals.
–There will be **NO CONTINUITY**.

9). Turn the key to the **START** (spring loaded) position.
–There will be **CONTINUITY**. See figure 22.

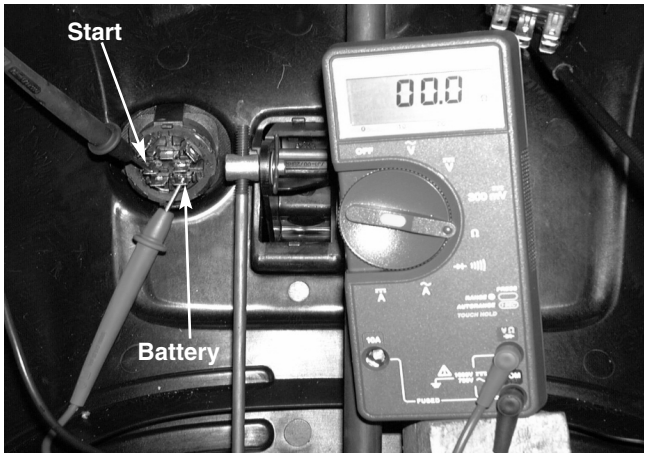


FIGURE 22.

10). Leave the key in the **ON** position. Place the test probes on the B and A1 terminals.
–There will be **CONTINUITY**. See figure 23.

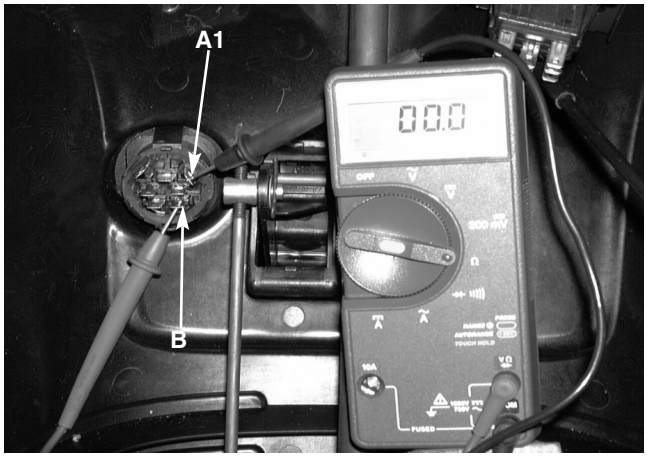


FIGURE 23.

11). Turn the key to the (spring loaded) **START** position.
–There will be **CONTINUITY**.

12). Turn the key to the **LIGHTS** position. Place the test probes on the L and A2 terminals.
–There will be **CONTINUITY**. See figure 24.

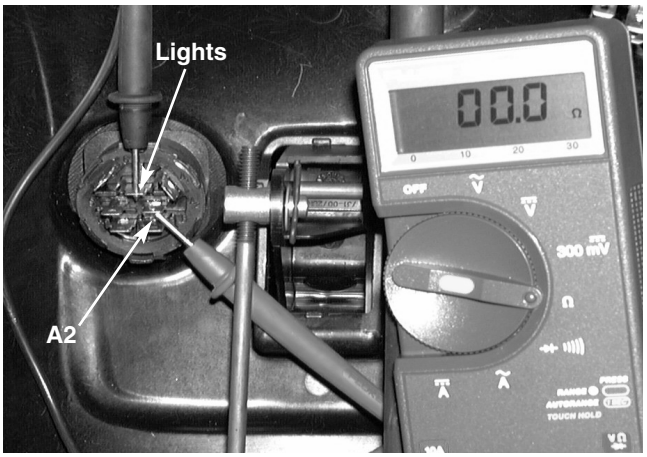


FIGURE 24.

13). Turn the key to the **OFF** position.
–There will be **NO CONTINUITY**.

NOTE: The ignition switch can be removed by depressing the upper and lower tabs.

ELECTRIC PTO RELAY:

NOTE: Remove all four self tapping screws securing the fuel tank to the dash panel using a 1/2" socket. Lower the fuel tank out of the way.

1). Locate the electric PTO relay and wiring harness. See figure 25.

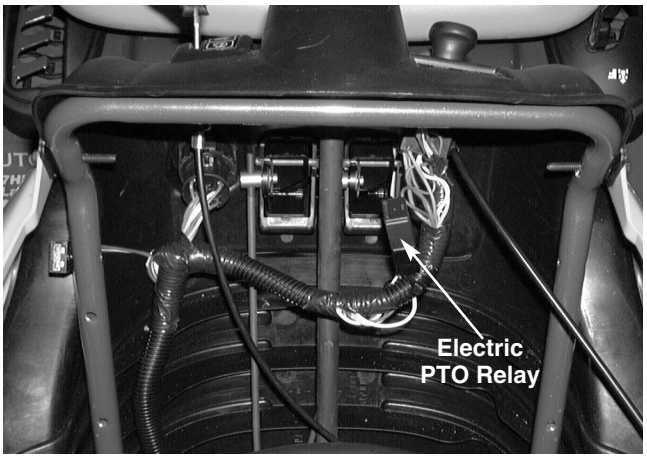


FIGURE 25.

2). Remove the PTO relay from the wiring harness connector. See figure 26.

NOTE: The relay circuitry is on the front of the relay.

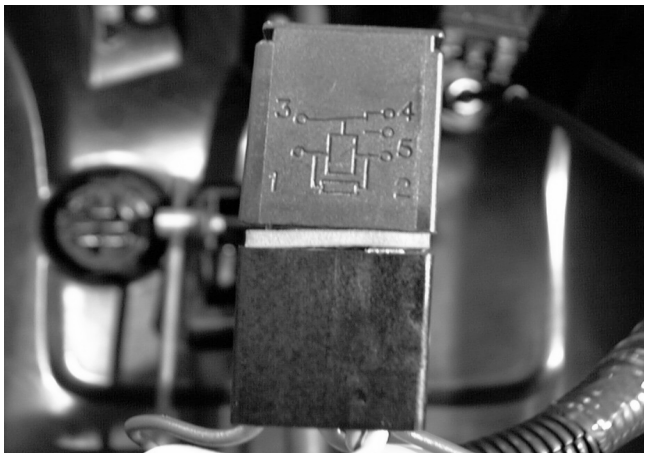


FIGURE 26.

3). Place the relay on a flat surface and identify the corresponding male terminals. See figure 27.

NOTE: The male terminals are labeled at the base of the relay.

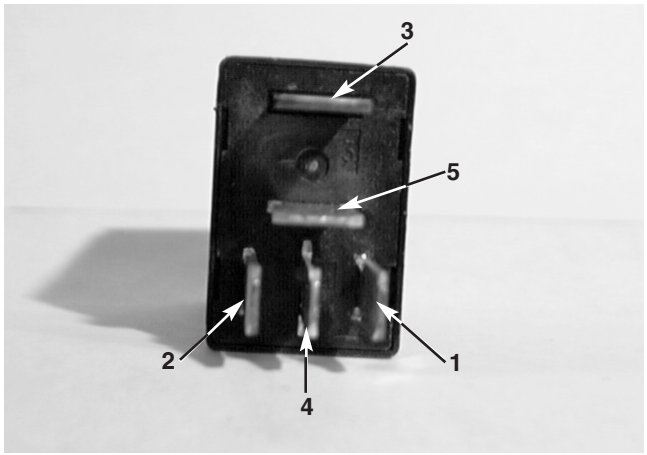


FIGURE 27.

4). Using an ohm meter, place the test probes on terminals 1 and 2.
–Depending on the temperature, the ohms reading should be approximately 82 ohms. See figure 28.

FIGURE 28.

5). Place the test probes on terminals 3 and 4.
–There will be **CONTINUITY**. See figure 29.

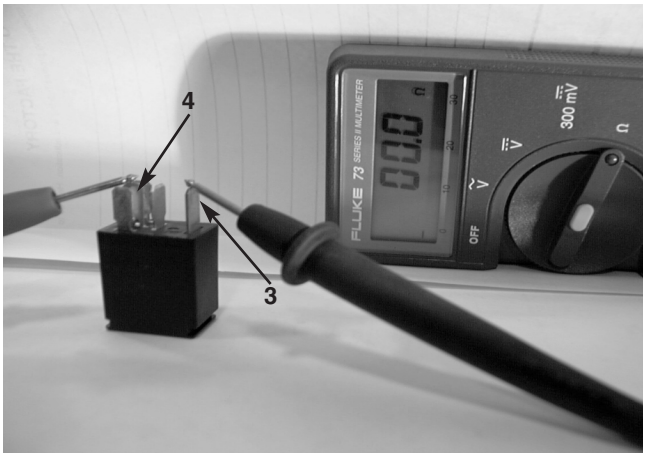


FIGURE 29.

6). Locate a 12 volt battery and hook up a positive and negative jumper wire.

7). Place the positive jumper wire on terminal 1 and a negative jumper wire on terminal 2 of the relay. The relay will activate.
–There will be **NO CONTINUITY** on terminals 3 and 4.

9). Leave the battery hooked up to terminals 1 and 2.

10). Place the test probes on terminals 3 and 5.
–There will be **CONTINUITY**.

11). Remove the positive and negative jumper wires from the relay.
–There will be **NO CONTINUITY** on terminals 3 and 5. See figure 30.

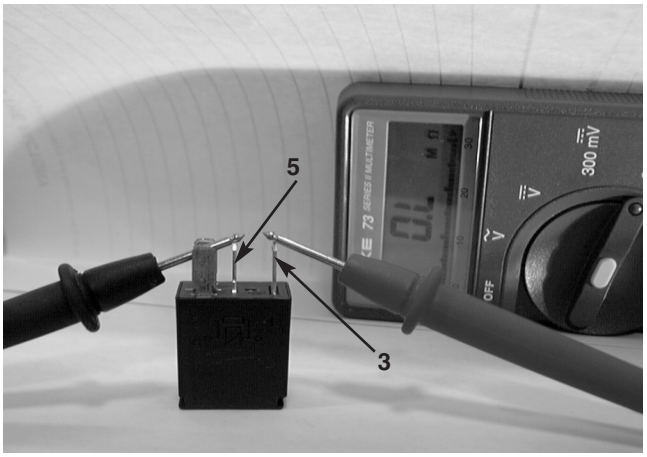
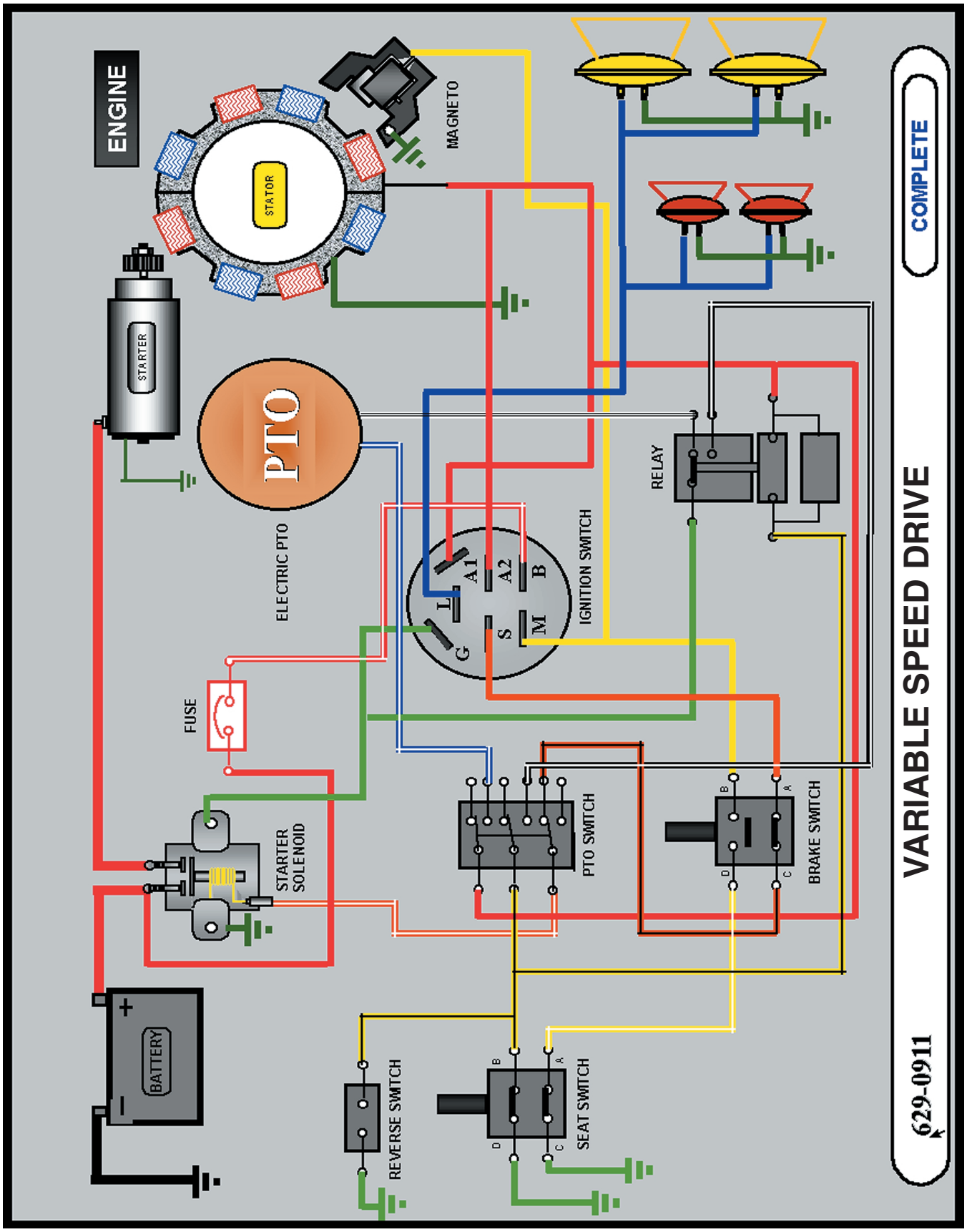


FIGURE 30.

NOTE: If any of the above tests do not match, the relay is defective. Recheck the relay to make certain that it is defective.

Electrical Drawing



NOTE

SECTION 5
HYDROSTATIC LT FOOT CONTROL

Drive Belt Removal

1. Coming in from below the left foot board, locate the stationary “V” idler.
2. Grasp the left frame rail and “V” belt on both sides of the “V” idler.
3. Squeeze both hands and release the “V” belt from the “V” idler.
4. Release the “V” belt slowly. See figure 1.

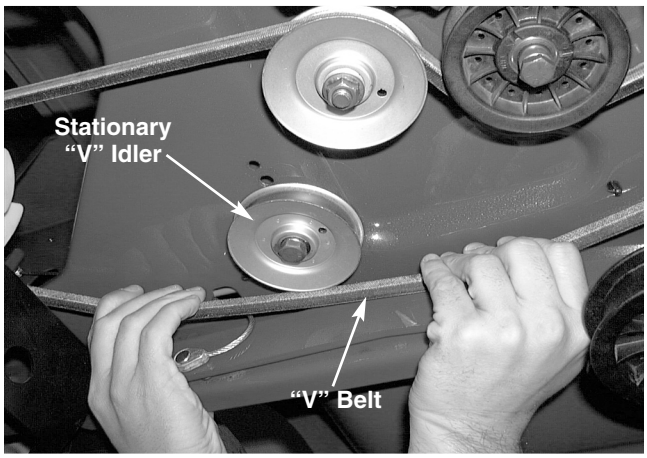


FIGURE 1.

5. Push forward lightly on the double idler bracket assembly and remove the extension spring from the fixed frame bolt.
6. Remove the extension spring from the double idler bracket assembly and set it aside. See figure 2.

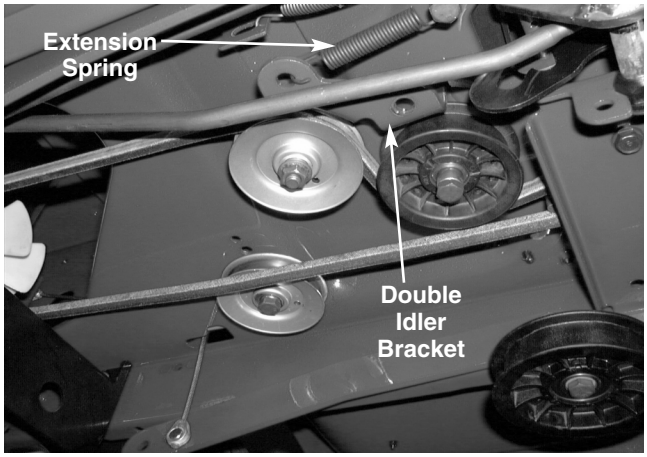


FIGURE 2.

7. Roll the “V” belt out of both the “V” idler and the flat idler on the double idler bracket assembly. See figure 3.

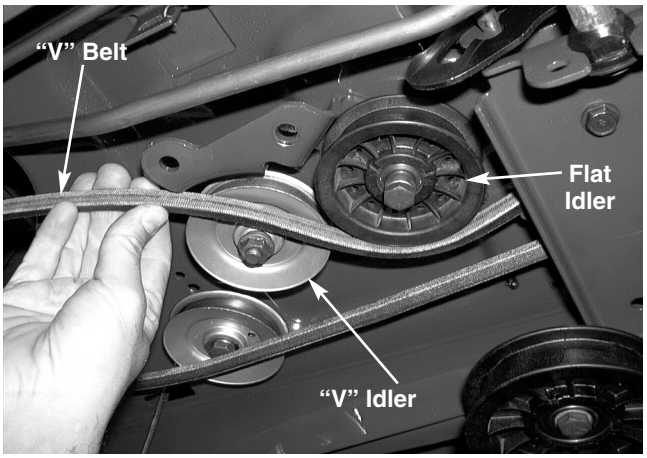


FIGURE 3.

8. Grasp the electric PTO clutch and remove the hex bolt securing it to the crank shaft using a 5/8 socket. See figure 4.

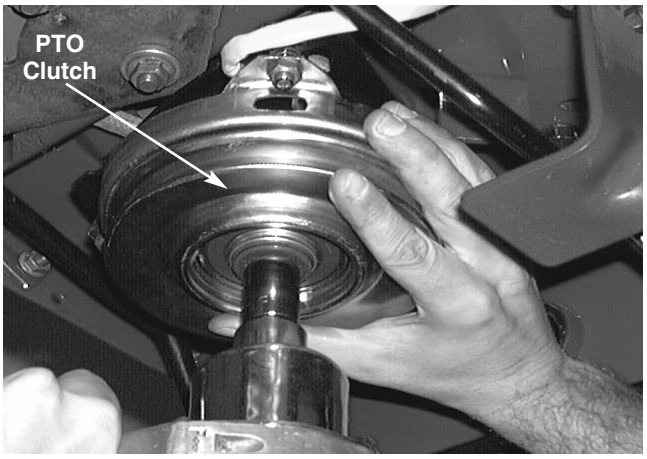


FIGURE 4.

9. Set the hex bolt and hardware aside.

   NOTE: The order of the hardware is as follows: hex bolt, lock washer, spacer, and stepped spacer. See figure 5.

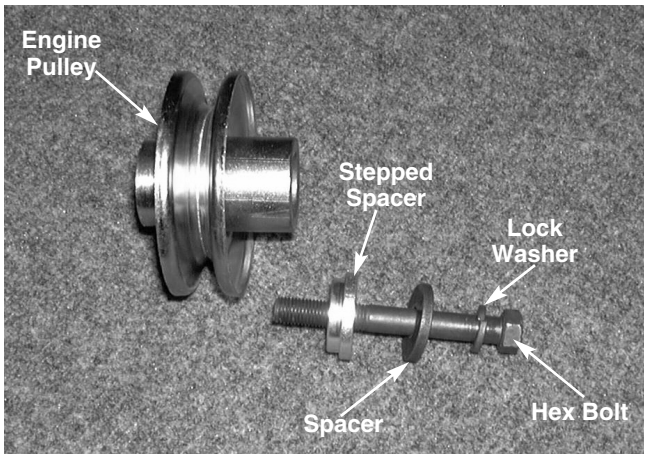


FIGURE 5.

10. Slowly lower the electric PTO and secure it.

    NOTE: Make certain the electric PTO is NOT hanging on the harness wires.

11. Grasp the drive pulley and pull downward until the "V" belt is clear of the belt keepers at the engine. See figure 6.

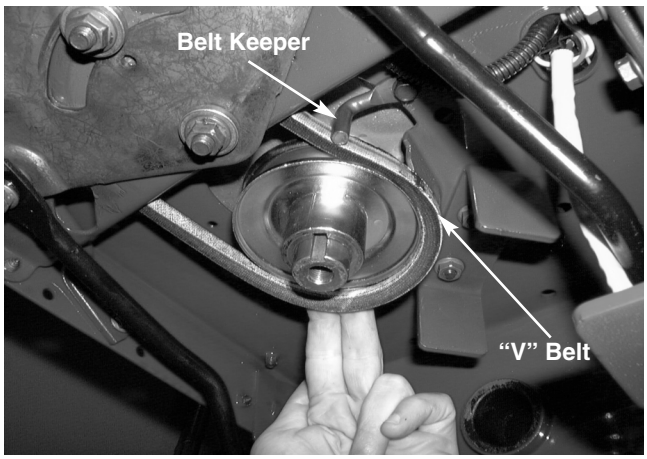


FIGURE 6.

12. Roll the drive belt off of the drive pulley at the engine and set the drive pulley aside.

    NOTE: The drive pulley goes on the crankshaft thin side up, and has a separate key.

13. Pull the "V" belt down and to the back side of the crankshaft.

14. Pull the "V" belt rearward towards the hydrostatic transmission.

15. Remove the "V" belt from around the hydrostatic drive pulley. See figure 7.

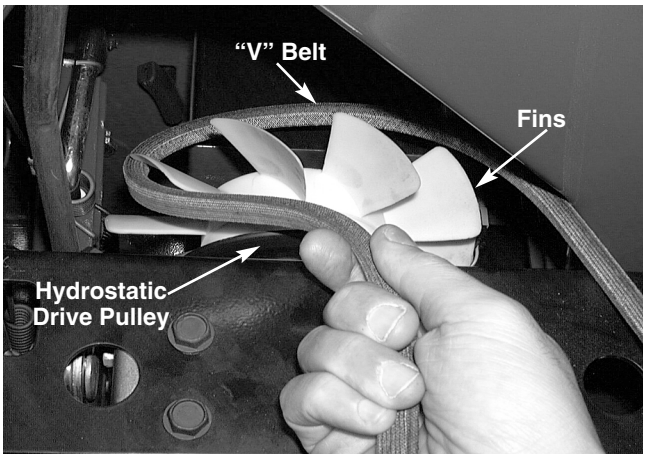


FIGURE 7.

NOTE: The fins on the hydrostatic fan are slightly flexible and can be bent down cautiously to remove the "V" belt.

INSTALL THE DRIVE BELT IN THE REVERSE ORDER ABOVE.

Hydrostatic Transmission Removal

1. Raise the rear wheels off the ground.
2. Support the hydrostatic transmission from below.
3. Remove both hex bolts and belleville washers securing the rear wheel assemblies to the rear axles using a 1/2" socket and extension. See figure 1.

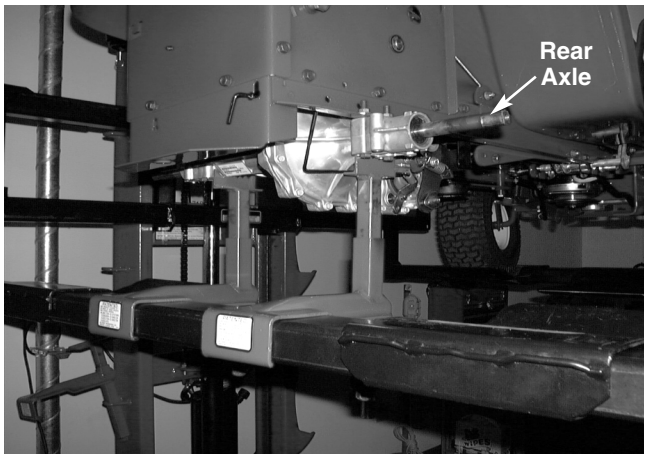


FIGURE 1.

4. Remove the rear wheel assemblies.
5. Raise the seat.
6. Remove the battery cables from the battery terminals using a 7/16 wrench.
7. Remove the battery and battery tray from the tractor. See figure 2.

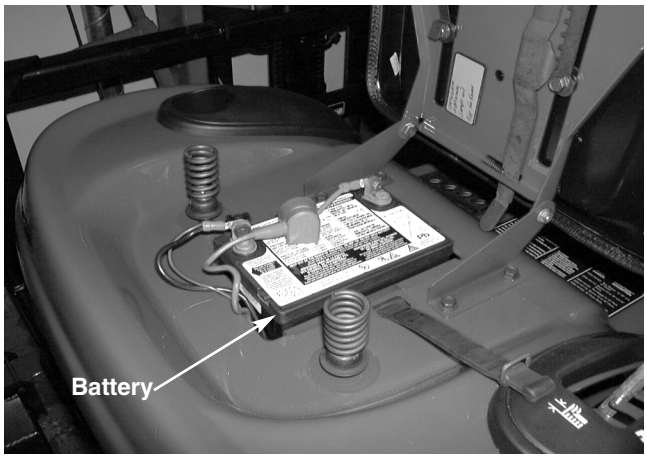


FIGURE 2.

8. Remove all three self tapping screws securing the hydrostatic fan to the hydrostatic drive pulley using a 5/16 socket.
9. Remove the hydrostatic fan. See figure 3.

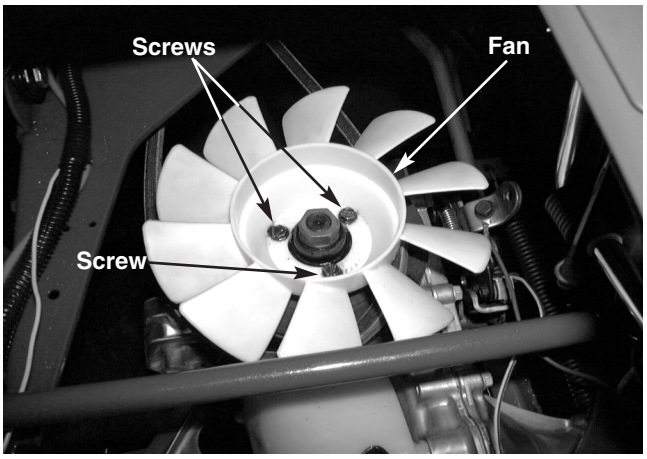


FIGURE 3.

10. Coming in from below the left foot board, locate the stationary "V" idler.
11. Grasp the left frame rail and "V" belt on both sides of the "V" idler. See figure 4.

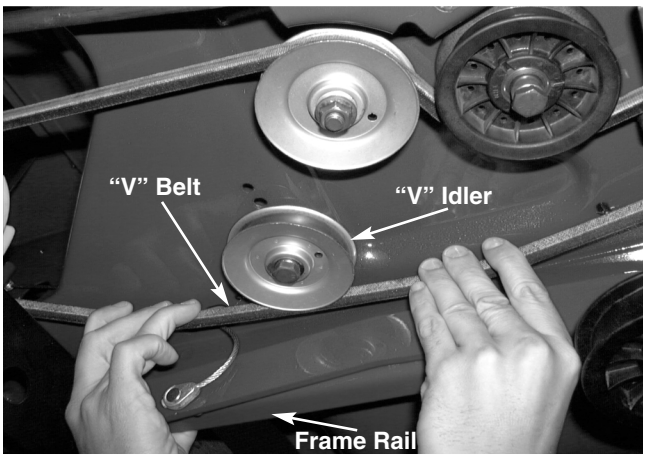


FIGURE 4.

5

12. Squeeze both hands and release the "V" belt from the "V" idler. See figure 5.

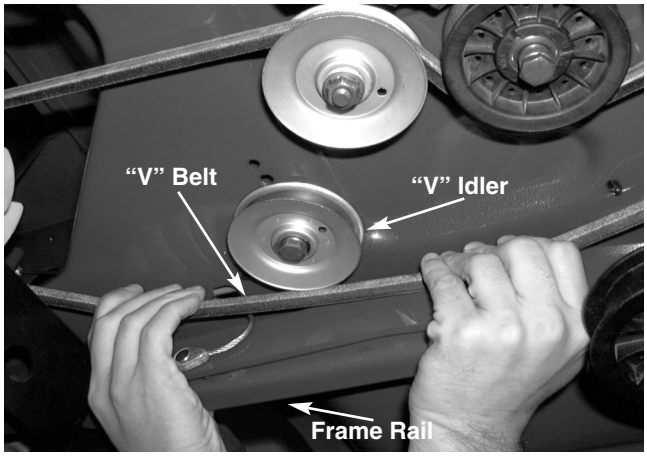


FIGURE 5.

13. Release the "V" belt slowly. See figure 6.

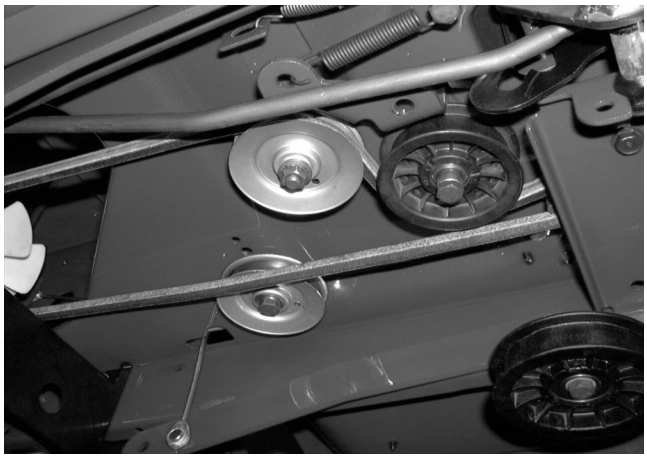


FIGURE 6.

14. Roll the "V" belt off of the hydrostatic drive pulley. See figure 7.

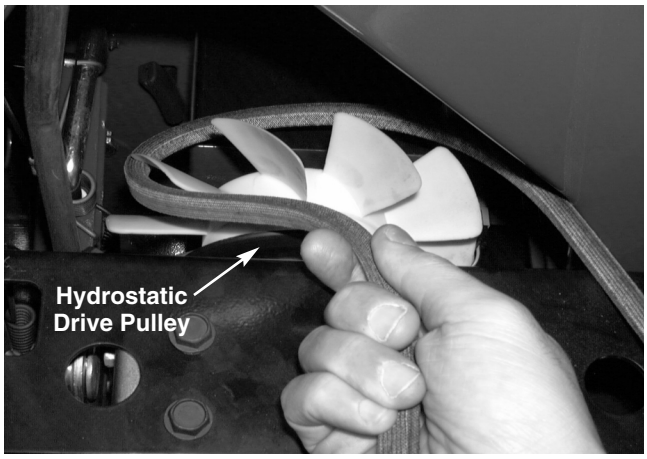


FIGURE 7.

15. Remove the hairpin securing the hydrostatic foot control rod ferrule and reverse safety bracket to the neutral return plate. See figure 8.

    NOTE: Make certain the small extension spring is properly installed during reinstallation.

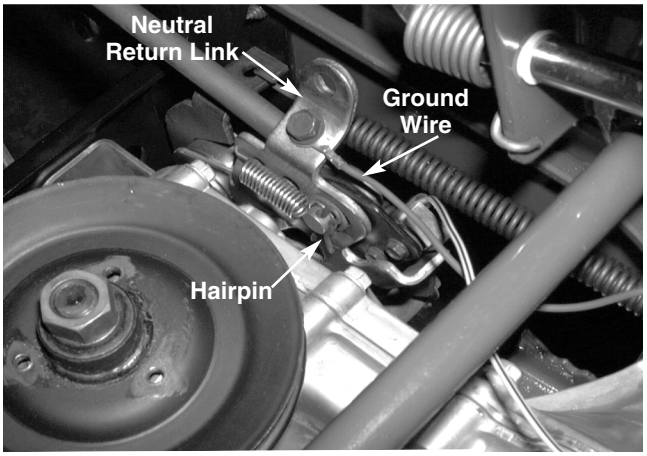


FIGURE 8.

16. Remove the self tapping screw securing the ground wire to the neutral return link. See figure 9.

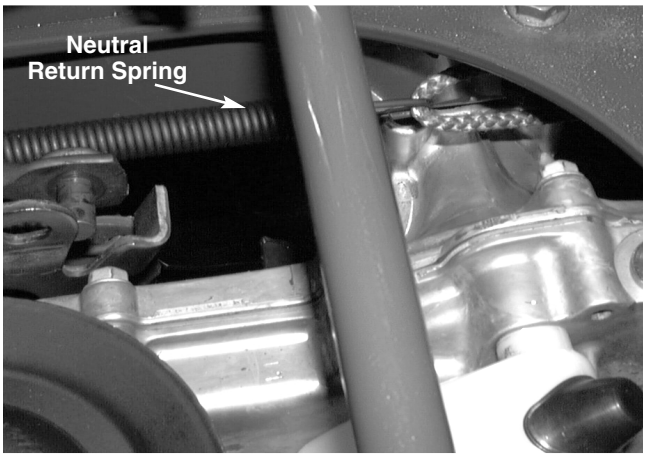


FIGURE 9.

17. Remove the neutral return spring from the frame bolt using a piece of recoil rope. See figure 10.

    NOTE: An assistant may be necessary during reinstallation to guide the extension spring back onto the frame bolt. See figure 9 and 10.

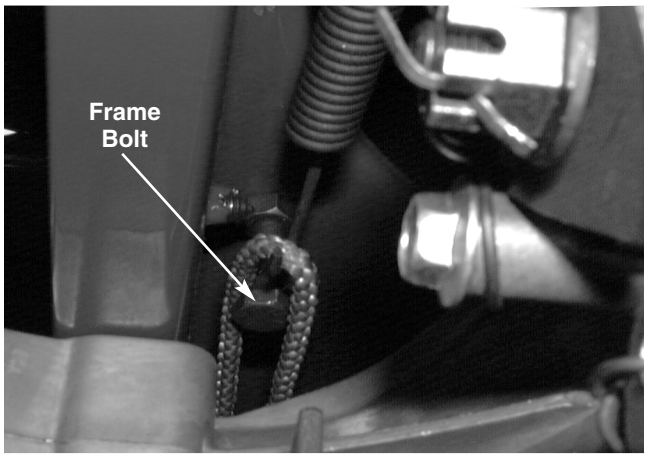


FIGURE 10.

18. Remove the hydrostatic relief spring from the hydrostatic bypass linkage and set it aside. See figure 11.

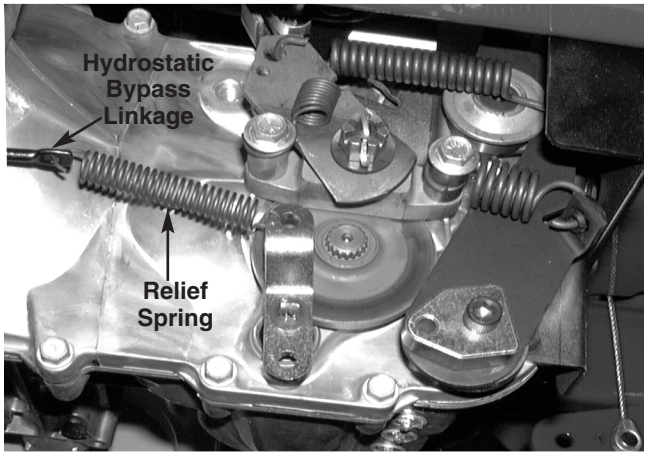


FIGURE 11.

19. Remove the brake extension spring from the brake rod using a pair of vice grips. See figure 12.

    NOTE: Insert the brake extension spring into the brake rod before installing the hydrostatic transmission.

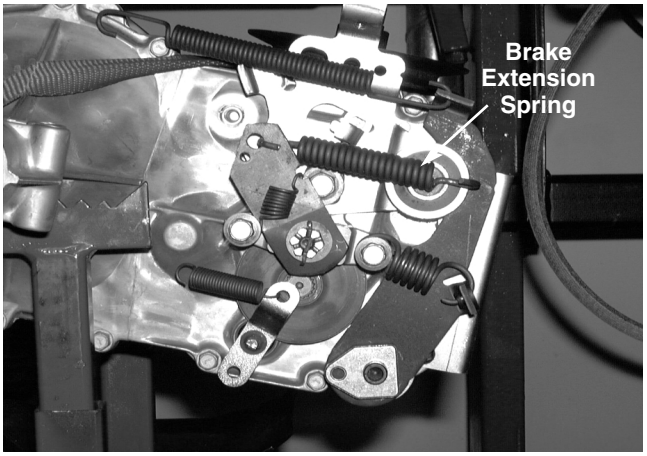


FIGURE 12.

20. Remove both self tapping screws securing the front of the hydrostatic transmission to the front hydrostatic support bracket using 1/2" socket. See figure 13.

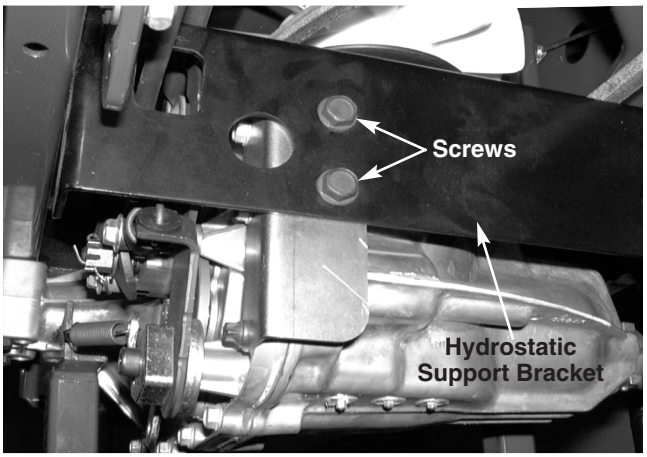


FIGURE 13.

21. Secure the front of the hydrostatic transmission to make certain it does not tip forward during lowering.

22. Remove all four hex bolts and lock nuts securing the hydrostatic transmission to the frame rails using a 1/2" socket and a 1/2" wrench. See figure 14.

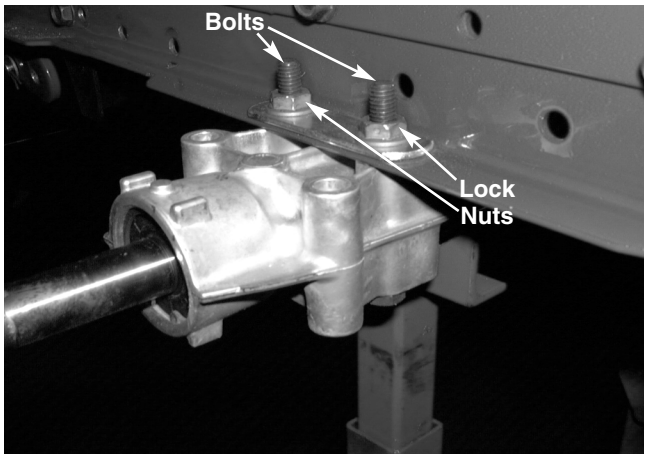


FIGURE 14.

23. Secure the tractor frame. See figure 15.

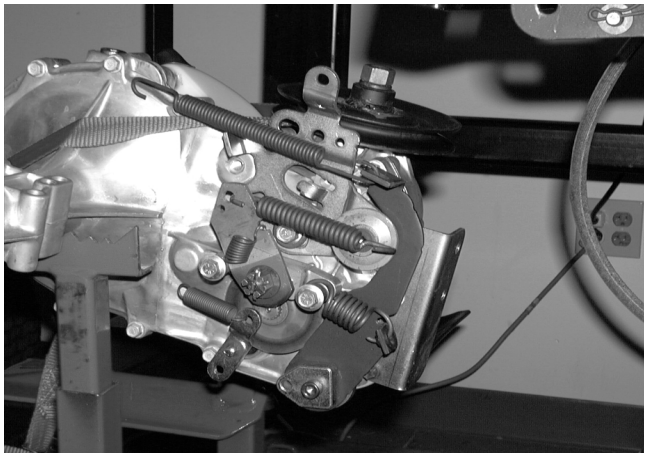


FIGURE 15.

24. Slowly lower the hydrostatic transmission from the tractor. See figure 16.

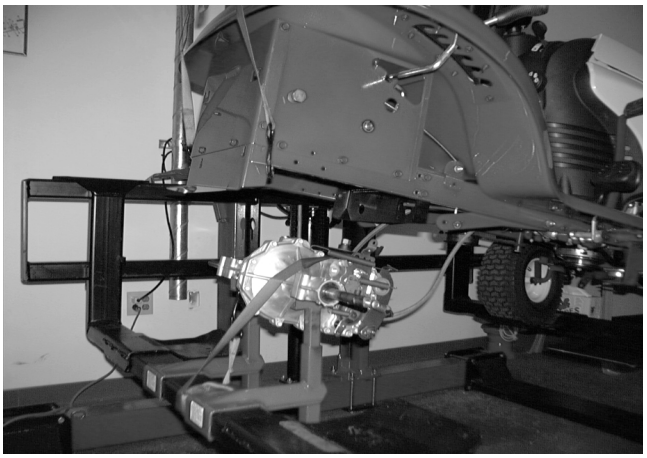


FIGURE 16.

REINSTALL THE HYDROSTATIC TRANSMISSION IN THE REVERSE ORDER ABOVE.

SECTION 6
HYDROSTATIC GT FOOT CONTROL

Hydrostatic Transmission Removal and Installation

1. Raise the rear wheels off the ground
2. Support the bottom of the hydrostatic transmission.
3. Remove the center hub caps
4. Remove the lug nuts securing the rear wheel assemblies to the rear axle hubs using a 3/4" socket and extension.
5. Remove the rear wheel assemblies.
6. Raise the seat.
7. Remove the battery cables from the battery terminals using a 7/16 wrench.
8. Remove the battery and battery tray from the tractor.
9. Remove all three self tapping screws securing the hydrostatic fan to the hydrostatic drive pulley using a 5/16 socket. See figure 1.

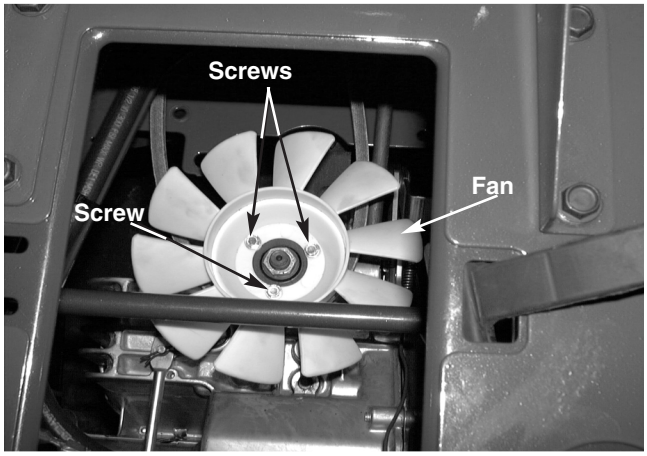


FIGURE 1.

10. Remove the hydrostatic fan.
11. Coming in from below the left foot board, locate the stationary "V" idler.
12. Grasp the left frame rail and "V" belt on both sides of the "V" idler.
13. Squeeze both hands and release the "V" belt from the "V" idler.
14. Release the "V" belt slowly.
15. Roll the "V" belt off of the hydrostatic drive pulley.
16. Remove the self tapping screw securing the ground wire to the neutral return plate using a 3/8 socket.
17. Remove the hairpin securing the hydrostatic foot control rod ferrule and reverse safety bracket to the neutral return plate.

    NOTE: Make certain the small extension spring is properly installed during reinstallation. See figure 2 and 3.

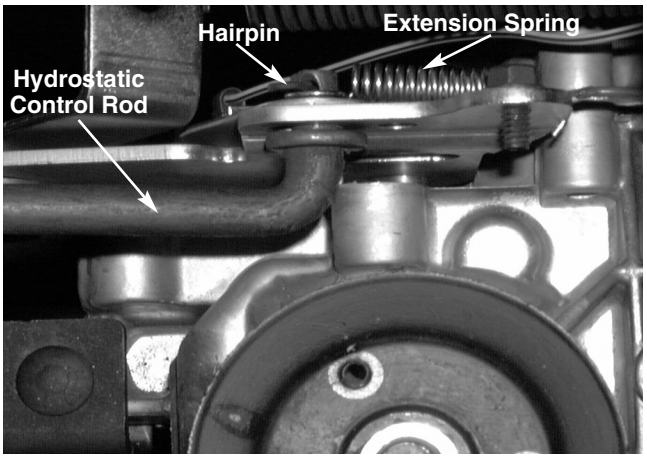


FIGURE 2.

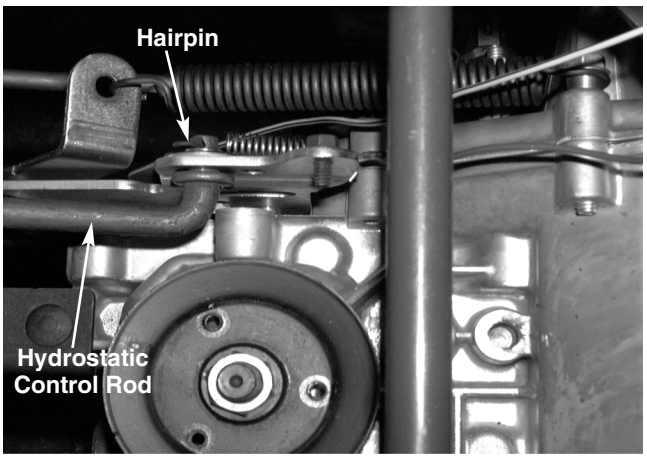


FIGURE 3.

18. Set the reverse safety bracket aside.

Hydrostatic GT Foot Control

19. Remove the hairpin securing the hydrostatic relief lever to the hydrostatic transmission. See figures 4 and 5.
20. Set the hydrostatic relief lever aside. See figures 4 and 5.

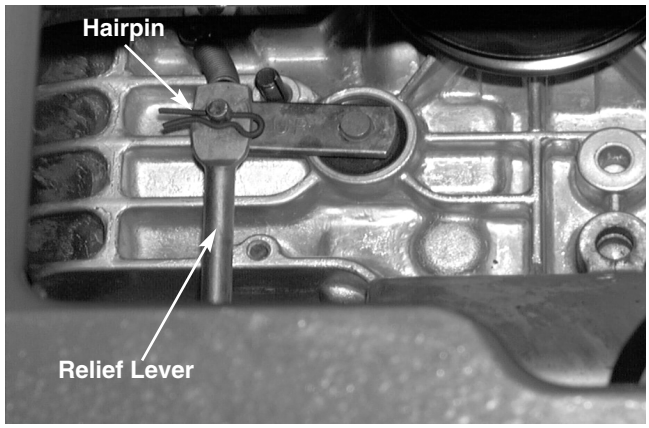


FIGURE 4.

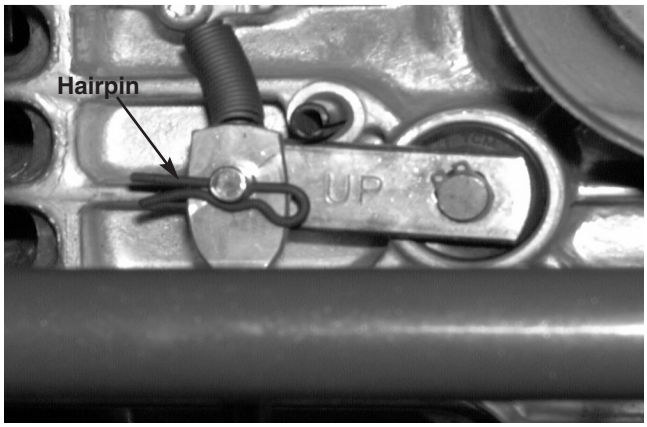


FIGURE 5.

21. Snip the zip tie that secures the hydrostatic vent tube to the frame. See figure 6.

    NOTE: Make certain the hydrostatic vent tube is zip tied back into place during reinstallation. See figure 6.

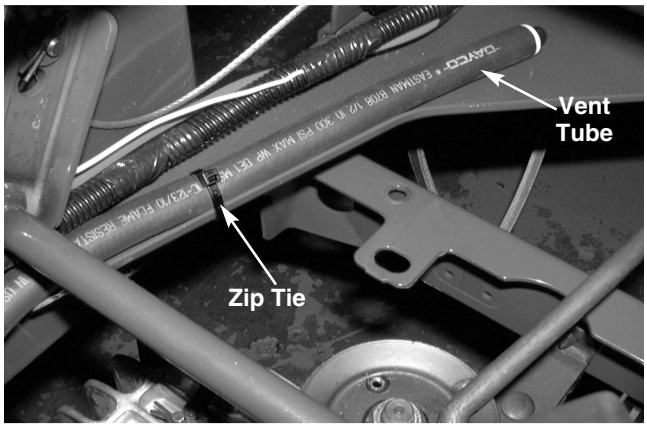


FIGURE 6.

22. Remove both self tapping screws securing the front of the hydrostatic transmission to the front hydrostatic support bracket using 1/2" socket. See figure 7.

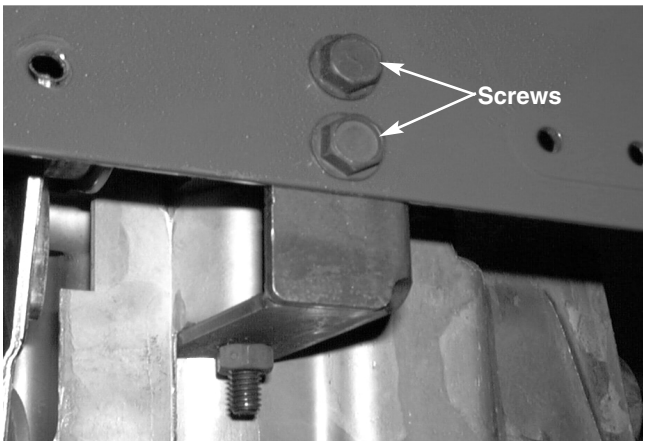


FIGURE 7.

23. Secure the front of the hydrostatic transmission to make certain it does not tip forward during lowering.
24. Remove all four of the hex bolts and lock nuts securing the hydrostatic transmission to the side transmission support brackets using a 1/2" socket and a 1/2" wrench. See figure 8.

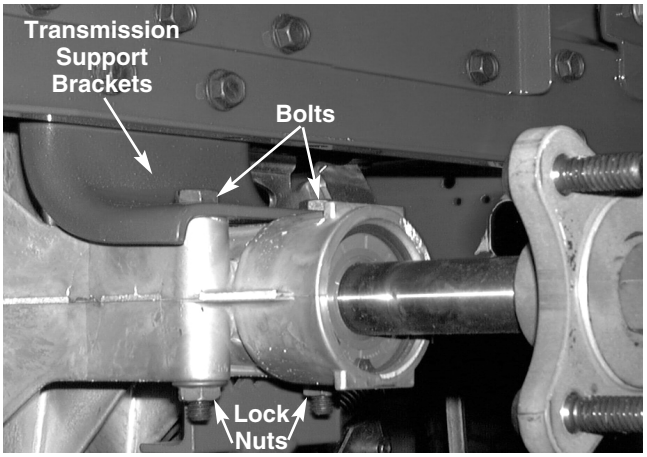


FIGURE 8.

25. Remove the brake extension spring from the brake rod using a pair of vice grips.

    NOTE: The hydrostatic transmission can be tilted to assist brake spring removal. See figure 9.

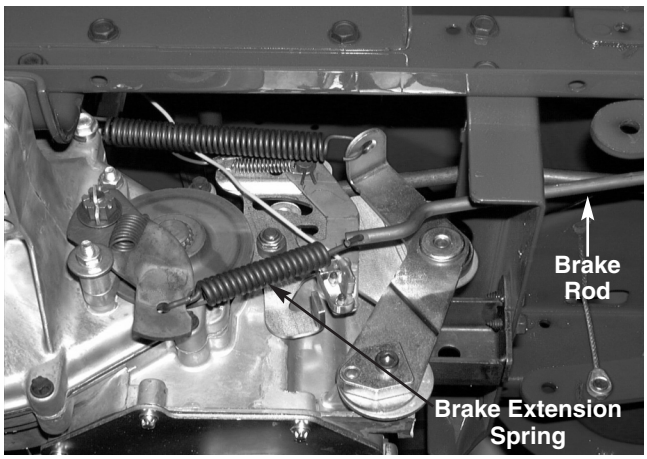


FIGURE 9.

26. Secure the tractor frame.
27. Slowly lower the hydrostatic transmission from the tractor. See figure 10.

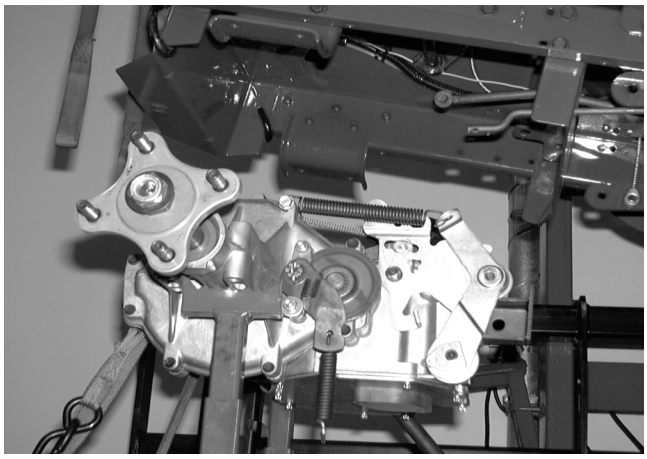


FIGURE 10.

REINSTALL THE HYDROSTATIC IN THE REVERSE ORDER ABOVE.

NOTES

SECTION 7
Z SERIES TRACTOR

Z Series Neutral / Steering Adjustment

1. Park the unit on flat, level ground.
2. Remove the ignition key.
3. Pull outward and detach the base of the control bellow from the bellow retaining bracket.
4. Slide the control bellow upward (towards the drive control handles. See figure 1.

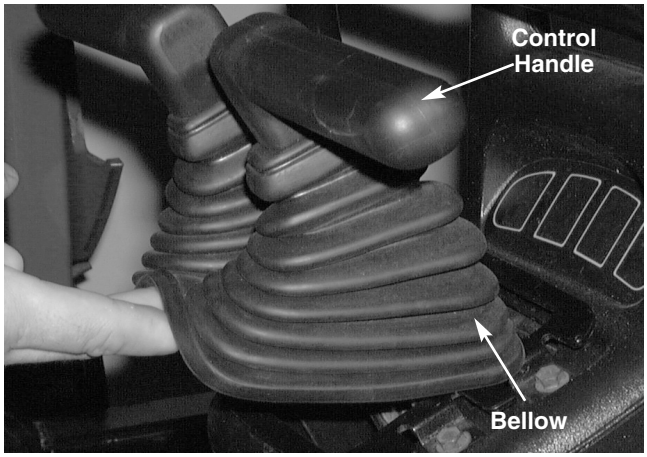


FIGURE 1.

5. Remove the carriage bolt and flange lock nut securing each drive control handle to the upper left and right bellcrank assemblies using a 1/2" socket. See figure 2.

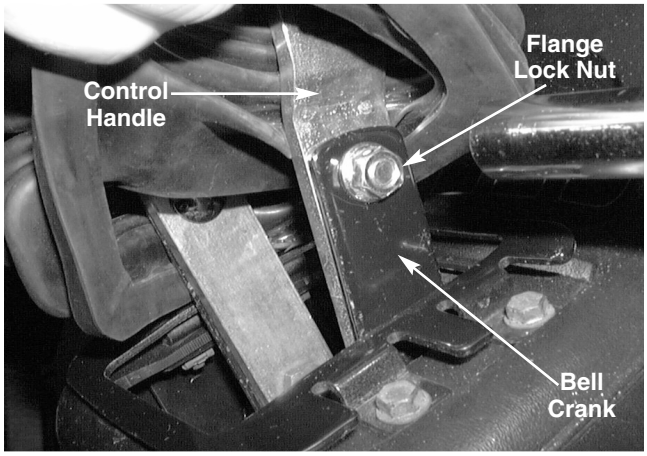


FIGURE 2.

6. Remove both of the drive control handles and the control bellow, and set them aside.
7. Remove all four hex washer head screws securing the bellow retainer bracket to the top of the support tower using a 3/8 socket. See figure 3.

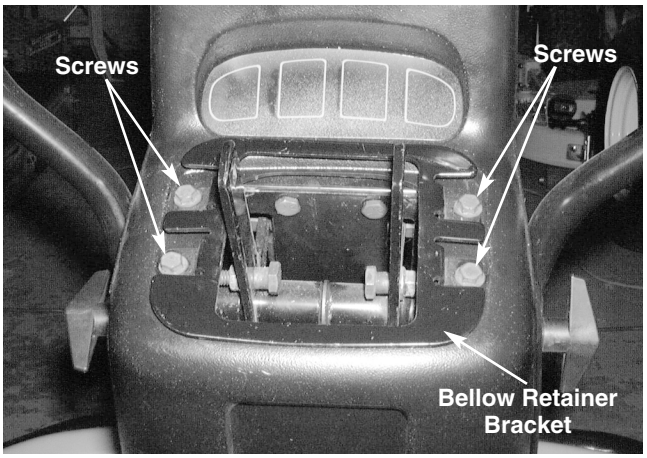


FIGURE 3.

8. Pull straight up on the console assembly and remove it from the rider.
9. Remove both safety switches from their respective holders by squeezing the retaining clips in and pushing upward until they are clear of the securing brackets. See figure 4.

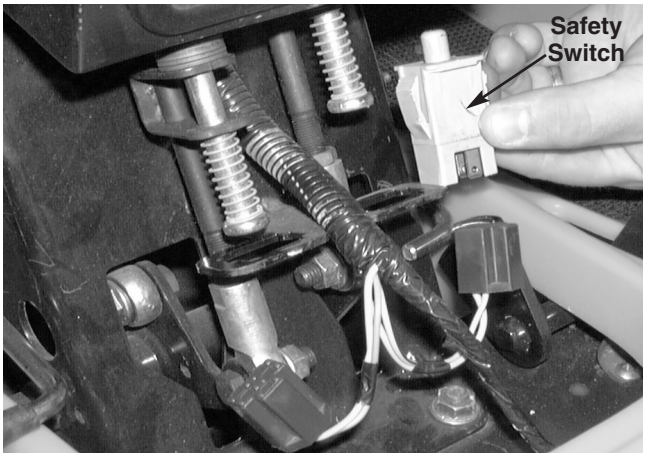


FIGURE 4.

NOTE: Pivot both upper bellcrank assemblies rearward to allow full clearance between the safety switches and the push pins.

10. Remove the hex cap screw and flange lock nut securing each control rod assembly to the upper left and right bellcrank assemblies using a 9/16 socket and 9/16 wrench. See figure 5.

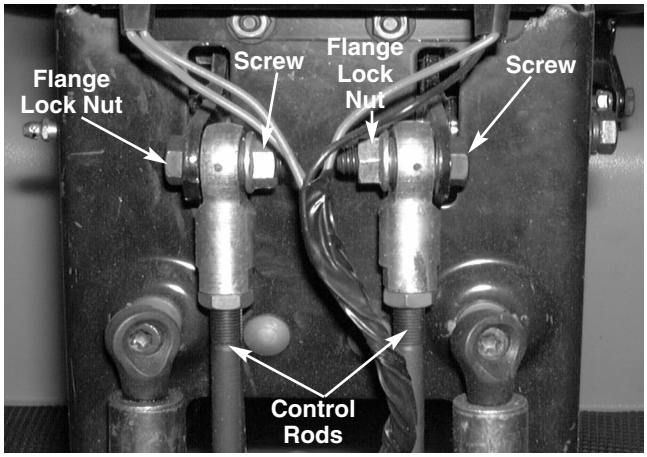


FIGURE 5.

NOTE: The damper cylinders will remain secured to the support tower assembly.

11. Remove the hex cap screw and flange lock nut securing each control rod assembly to the lower left and right bellcrank assemblies using a 9/16 socket and a 9/16 wrench. See figure 6.

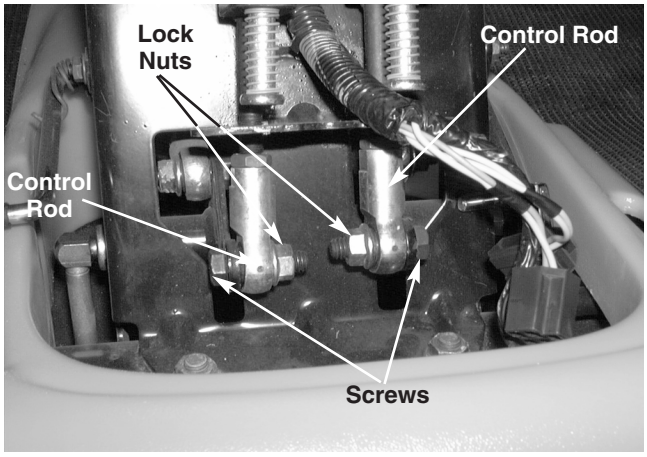


FIGURE 6.

NOTE: The damper cylinders will remain secured to the control rod assemblies.

12. Raise the seat.
13. Disconnect the wiring harness connector from the seat switch and push it down through the seat platform.
14. Remove all four hex bolts securing the seat platform to the upper frame rails using a 9/16 socket. See figure 7.

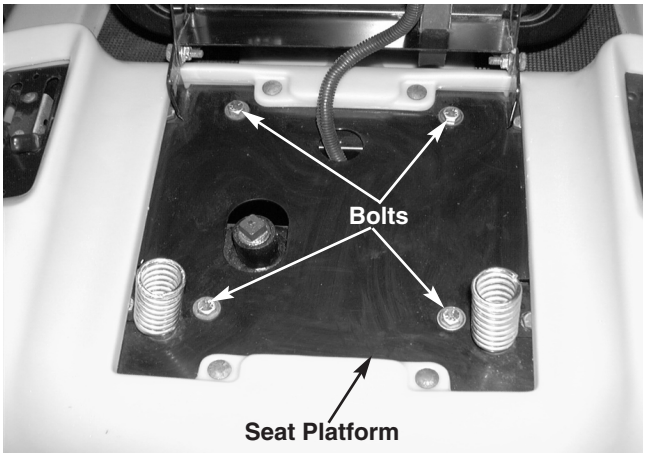


FIGURE 7.

15. Remove the rear fender assembly and set it aside.
16. Remove all four hex bolts securing the rear of the foot board body to the center frame rails using a 1/2" socket. See figure 8.

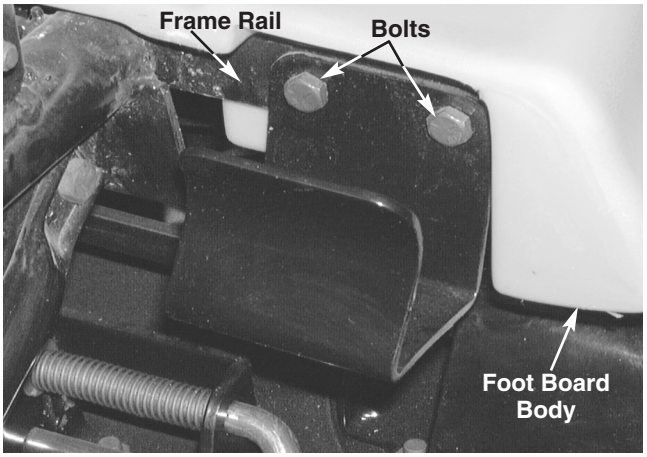


FIGURE 8.

17. Remove both front shoulder bolts securing the front of the foot board body to the front frame assembly using a 15/16 socket. See figure 9.

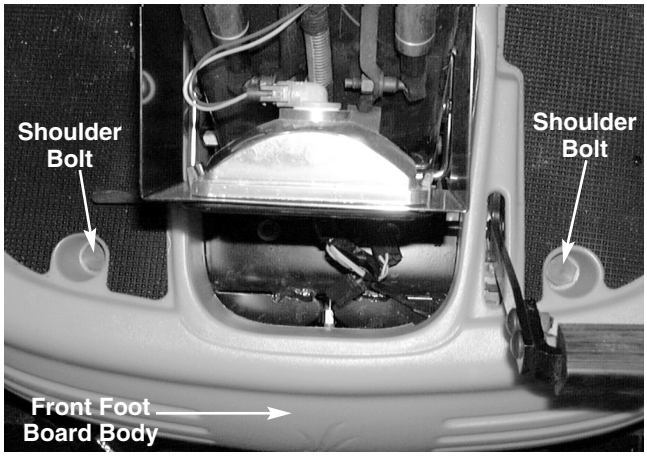


FIGURE 9.

18. Remove the hex flange lock nut and carriage bolt securing the parking brake retaining rod bracket to the support tower assembly using a 7/16 socket. See figure 10.

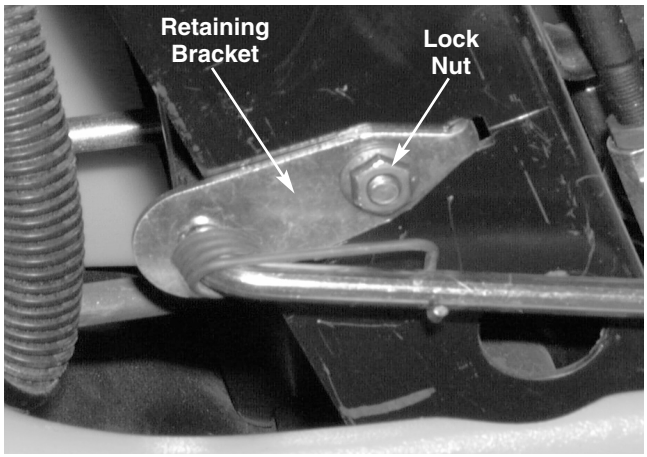


FIGURE 10.

19. Remove both hex flange lock nuts and carriage bolts securing the brake pedal to the brake arm assembly using a 9/16 socket. See figure 11.

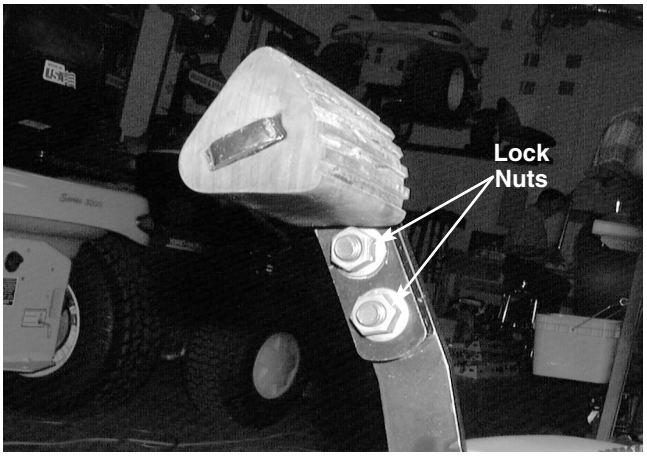


FIGURE 11.

20. Insert a 1/4" by 7" dowel pin or equivalent through the upper alignment hole of the support tower, through the upper left and right bellcrank assemblies, and out the opposite side of the support tower. See figure 12.

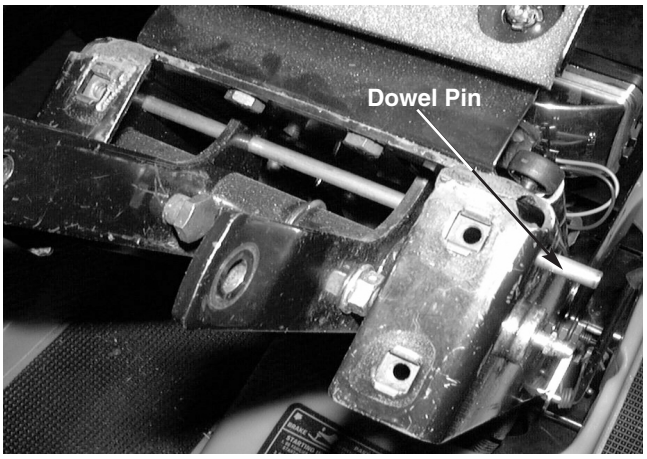


FIGURE 12.

NOTE: This is the set position for neutral.

21. Raise the front of the foot board body high enough to insert a 1/4" by 7" dowel pin or equivalent through the lower alignment hole of the support tower, through the lower left and right bellcrank assemblies, and out the opposite side of the support tower. See figure 13.

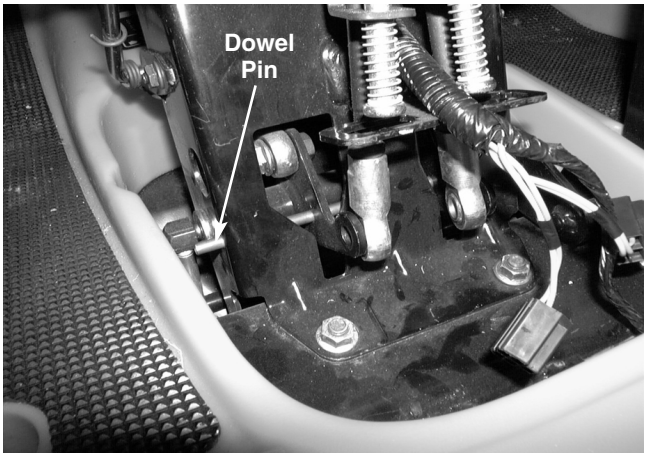


FIGURE 13.

NOTE: This is the set position for neutral.

22. With the damper cylinders secured, loosen all four hex jam nuts that maintain the alignaball positions on the control rod assemblies using a 9/16 wrench. See figure 14.

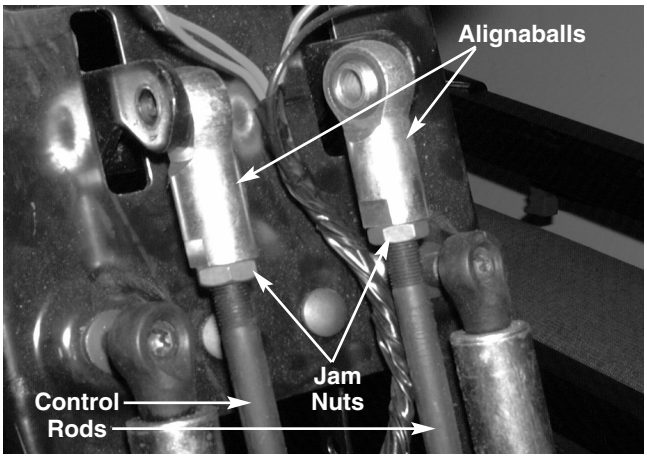


FIGURE 14.

23. With the damper cylinders secured, adjust all four alignaballs until the hex cap screws (removed earlier) slip into the upper and lower bellcrank assemblies with little effort.

24. Secure the alignaballs and hex cap screws to the bellcrank assemblies with the flange lock nuts removed earlier using a 9/16 socket and a 9/16 wrench. See figure 15.

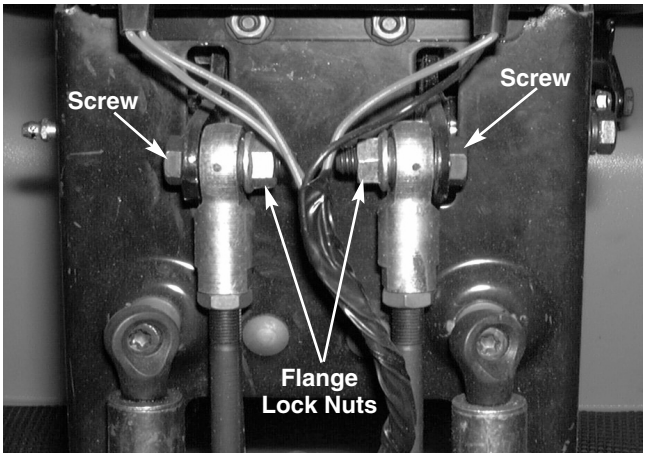


FIGURE 15.

25. Tighten all four hex jam nuts that maintain all the alignaball positions on the control rod assemblies using two 9/16 wrenches.

26. Raise the rear of the rider until the rear wheel assemblies are off the ground, and secure it with jack stands. See figure 16.

FIGURE 16.

27. Locate the hydrostatic control rods that run from the lower bellcrank assemblies to the hydrostatics. See figure 17.

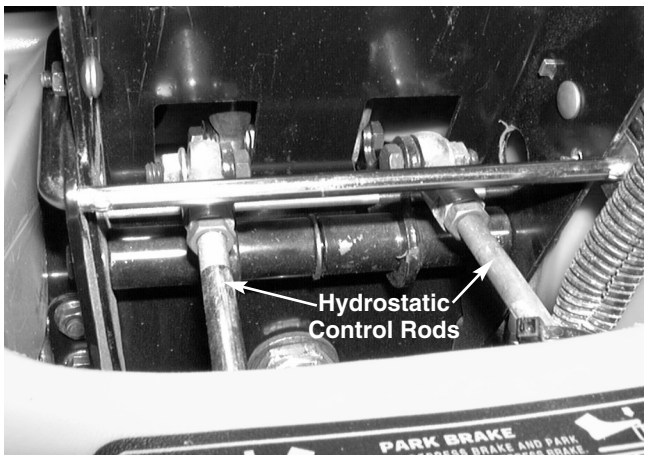


FIGURE 17.

28. Loosen all four hex jam nuts that maintain the alignaball positions on the hydrostatic control rods using two 9/16 wrenches. See figure 18.

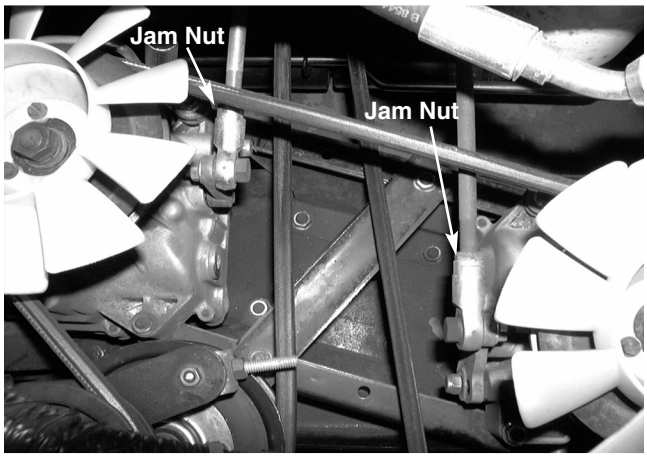


FIGURE 18.

29. Make certain the PTO is in the OFF position.
30. Depress the brake pedal, start the rider, and adjust the throttle to full.
31. Release the brake.
32. Rotate the hydrostatic control rods clockwise or counter-clockwise until the rear wheel assemblies come to a complete stop. See figure 19.

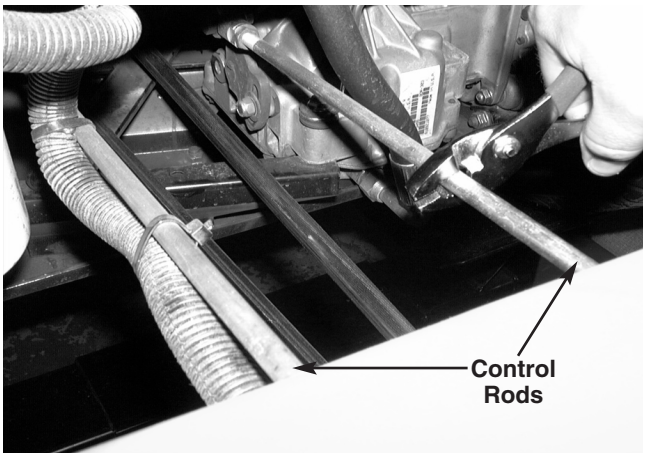


FIGURE 19.

NOTE: The rotation of the hydrostatic control rod will increase or decrease the length between the alignaballs on each hydrostatic control rod. The pump end is left handed, and the tower end is right handed.

33. Tighten all four hex jam nuts that maintain all the alignaball positions on the hydrostatic control rods using a 9/16 wrench. See figures 17 and 18.

    NOTE: Make certain the hydrostatic control rods do not rotate while securing the jam nuts.

34. Shut the rider off and remove the 1/4" by 7" dowel pins from the upper and lower alignment holes in the support tower.
35. Depress the brake pedal, start the rider, and adjust the throttle to full.
36. Release the brake pedal and check the rear wheel assemblies for motion.

    NOTE: If there is motion, insert the 1/4" by 7" dowel pin and repeat steps 27 through 35.

37. If a state of no motion has been achieved, shut the rider off.
38. Raise the rear of the rider and remove the jack stands.
39. Lower the rear of the rider to the ground.

REASSEMBLE THE RIDER IN THE REVERSE ORDER ABOVE.

NOTES

Removal of the ZTT Transmission From the Tractor

This section will show you how to remove the two hydrostatic transaxles from the ZTT tractor. We will also show you how to disassemble, inspect, and reassemble the gearbox. Finally we will show you how to adjust the neutral position for each transaxle to assure proper steering.

Although you may be working on only one of the transaxles, the easiest method of repair is to remove both transaxles at the same time, leaving them attached to the lower side pan.

Before beginning, disconnect the negative cable from the negative terminal on the battery. See figure 1. This will assure that no current can flow through the electrical system.

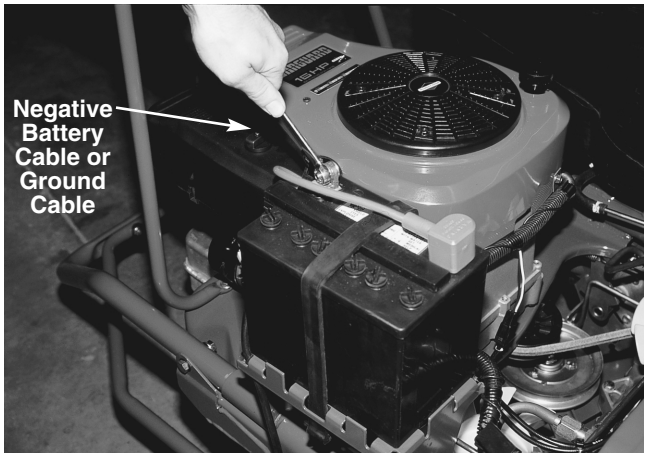


FIGURE 1.

Using a jack and blocks of wood, jack the unit up using the rear bumper for jack placement. See figure 2.

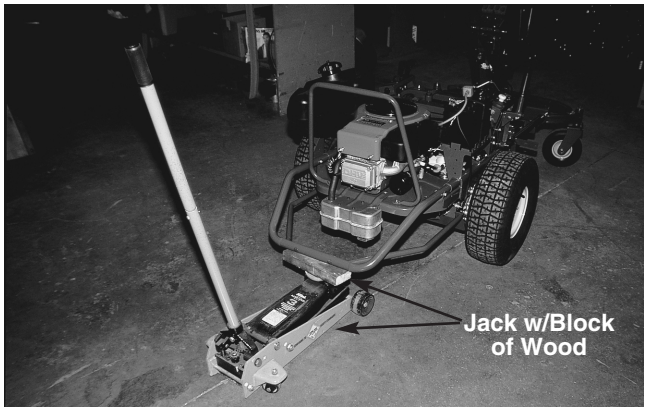


FIGURE 2.

Remove both wheels to allow easy access to the remainder of the components. See figure 3.

FIGURE 3.

Place wooden blocks under the skid pan and lower the unit onto the blocks while at the same time keeping some of the weight on the bumper jack. See figure 4.

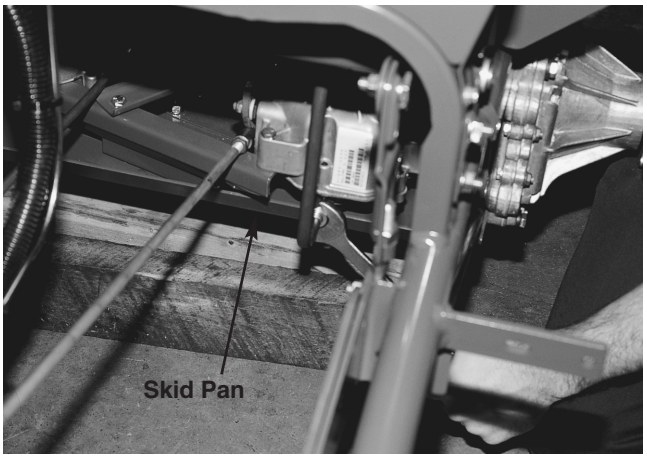


FIGURE 4.

Turn the fuel valve to the off position. It is located below the fuel tank. See figure 5.

Place a rag below the fuel line to catch any spilled fuel and disconnect the fuel line.

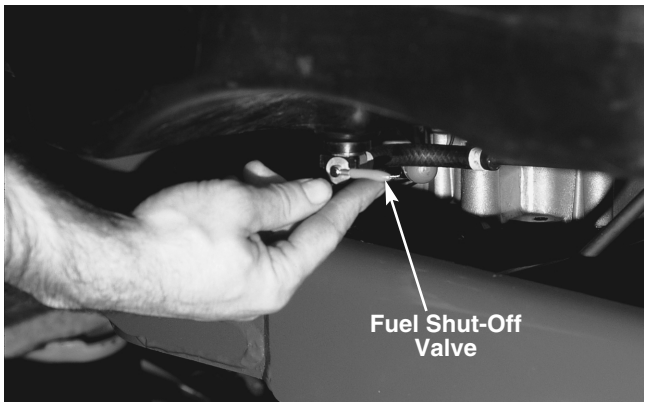


FIGURE 5.

Using a 9/16 socket, remove the four bolts attaching the fuel tank to the mounting brackets.

Remove the fuel tank from the tractor and set it aside. See figure 6.

Set the parking brake to relieve tension on the idler pulley to ease removal of the drive belt.

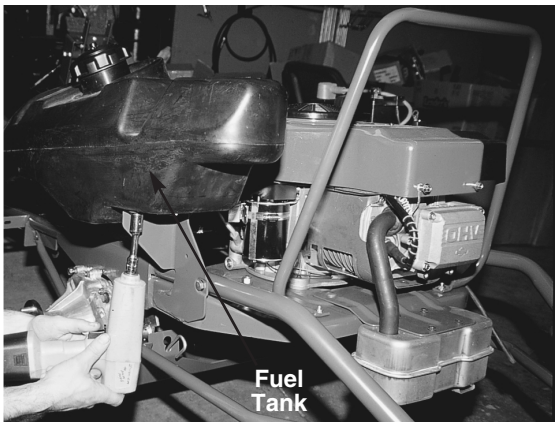


FIGURE 6.

Remove the belt from the drive pulleys.

FIGURE 7.

Place a catch pan under the transmission, remove the drain plug, and drain all of the oil from transmission. See figure 8. Do this for both transmissions. This procedure will also drain the oil from the oil reservoir. Total oil loss approximately three gallons.

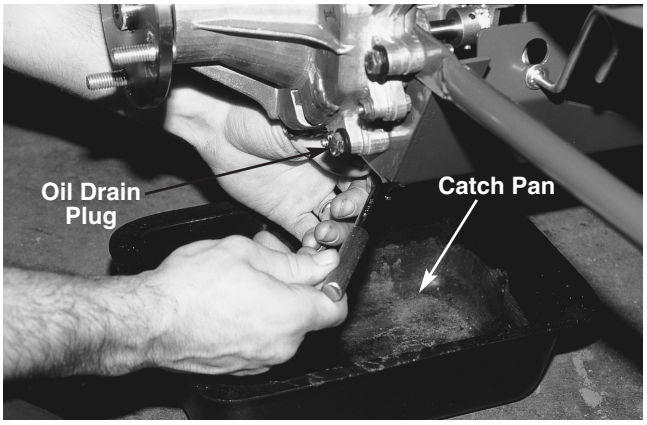


FIGURE 8.

Disconnect the four hydraulic lines where they connect to the oil reservoir. See figure 9.

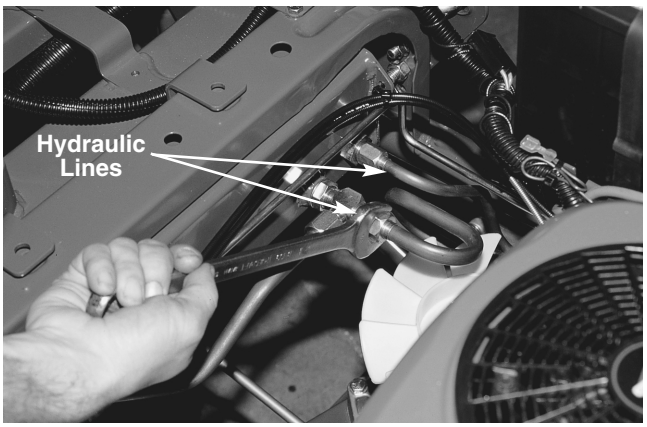


FIGURE 9.

Remove the cooling fan and pulley from each hydraulic pump. This will allow easy access to the remaining parts and ease removal of the pumps from the tractor. See figure 10.

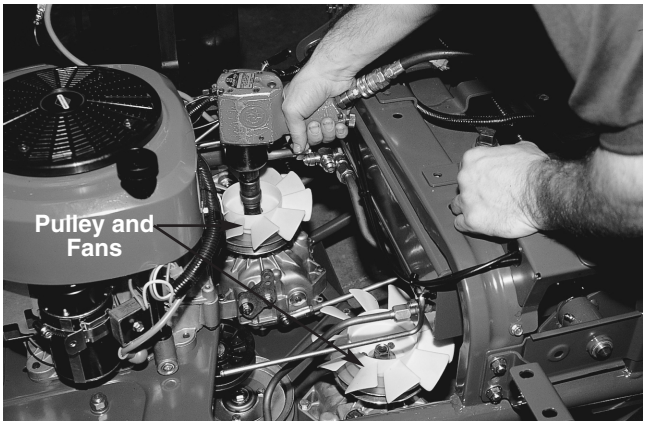


FIGURE 10.

Remove the control arm bolts where they connect to the hydrostatic pumps and lower each arm out of the way. See figure 11.

FIGURE 11.

Remove both parking brake rods from near the front of the tractor by unbolting them and separating them from the bracket. See figure 12.

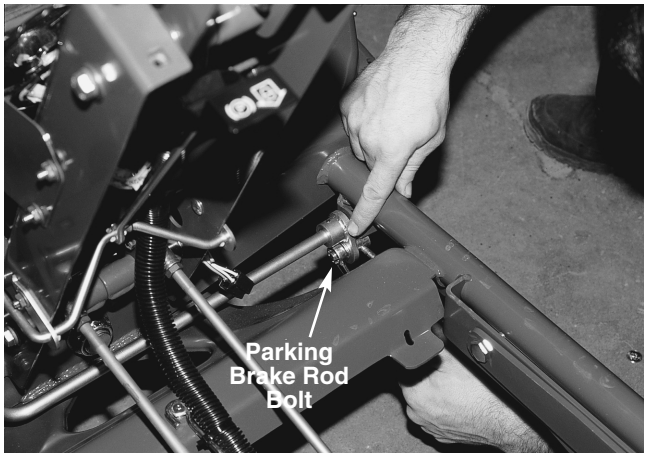


FIGURE 12.

Remove the threaded adjustment ferrules from each rod and slide the rods to the rear of the tractor, removing them from the back of the unit. See figure 13.

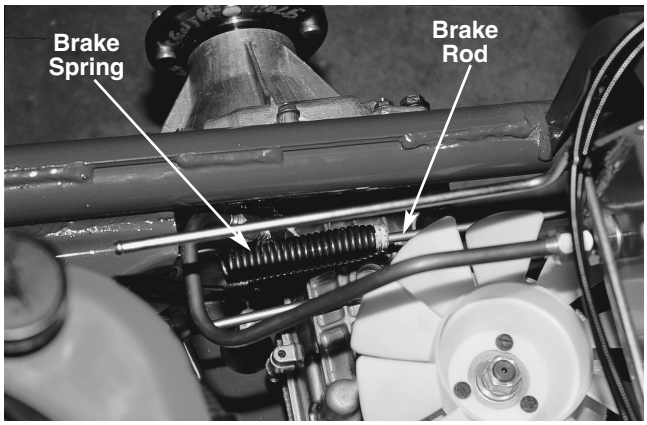


FIGURE 13.

Remove both torsion bars supporting the front of the transmission to the frame.

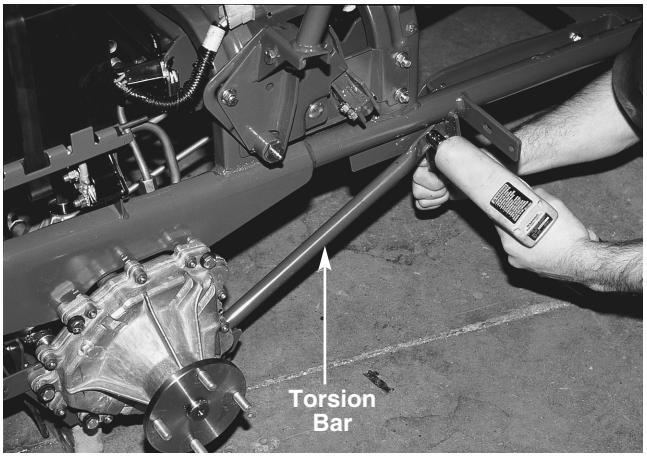


FIGURE 14.

Remove the bolts attaching the transmission to the frame. See figure 15. Do this for both transmissions. The blocks of wood under the pan should support the pan and keep it from dropping as you remove the bolts.

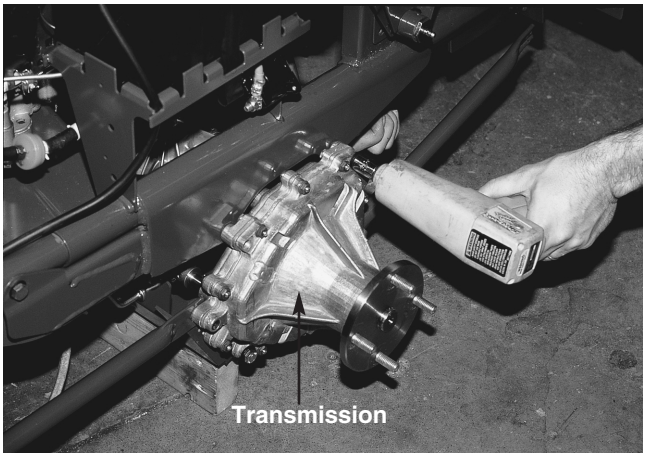


FIGURE 15.

Jack the unit up to raise the frame above the transmissions.

FIGURE 16.

Loosen the lower bumper, see figure 17 and strap it up out of the way to ease removal of the transaxle skid pan.

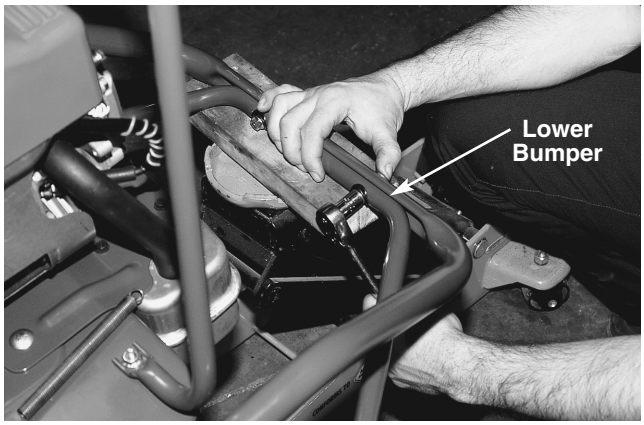


FIGURE 17.

Slide the transaxle assembly from under the tractor.

If you are only repairing one transmission, follow the remaining steps to remove only the transmission you will be working on.

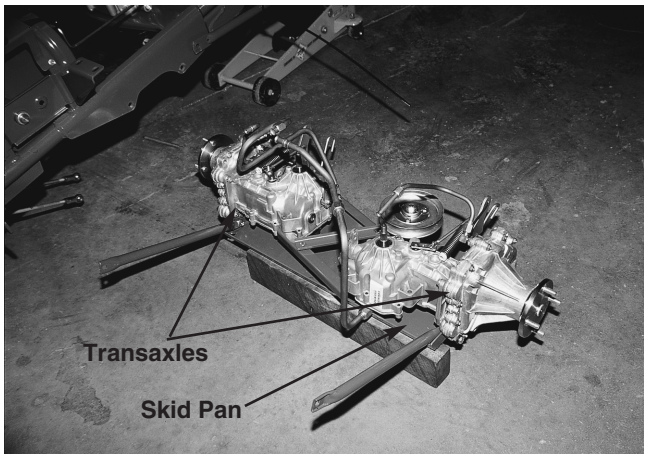


FIGURE 18.

Remove the hydraulic lines from the transaxle.

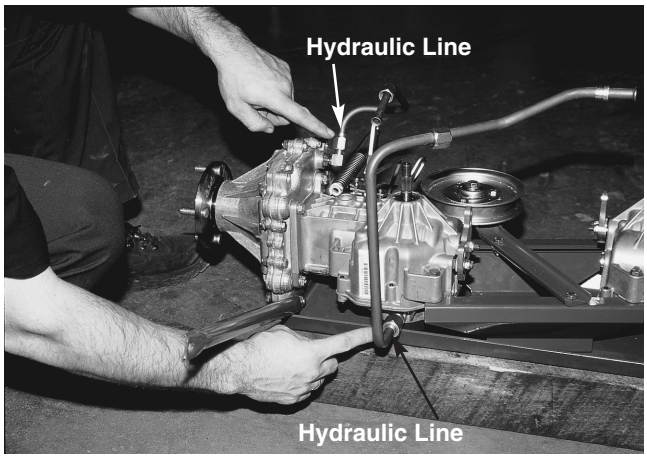


FIGURE 19.

Remove the brake spring. See figure 20.

Remove the hydro release rod by disconnecting the hairpin and setting the rod aside. See figure 20

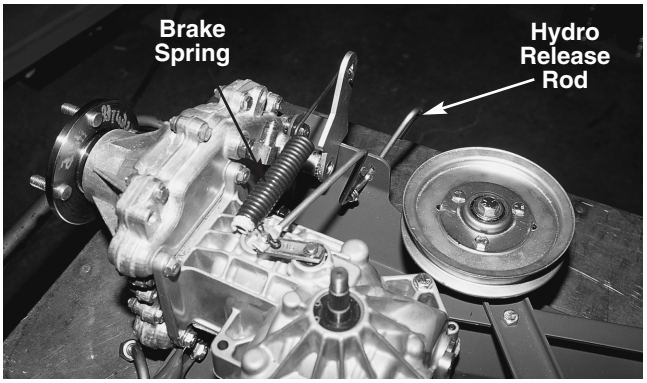


FIGURE 20.

Remove the two hydrostatic transmission support bolts.

Then remove the transmission support bolts.

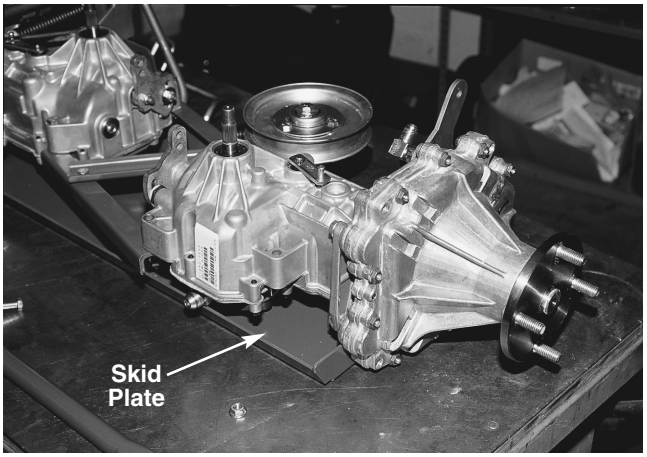


FIGURE 21.

Remove the transaxle from the skid pan and place it on your work bench.

Follow the same procedures to remove the other transaxle from the skid plate.

This completes removal of the transmissions from the tractor.

REINSTALLING THE TRANSAXLES

To ease reassembly, place the skid pan on a work-bench.

We will start by installing the right side transaxle first by placing the transaxle onto the skid pan.

Next install the 5/16 inch hydro pump bolts. Do not tighten until after you have installed the 3/8 inch trans-mission bolts.

Attach the front support strut to the skid plate and transmission with a 3/8 inch bolt.

Use the remaining two bolts to attach the transaxle to the frame.

Tighten all bolts holding the transaxle to the skid pan.

Attach the hydro release rod to the transaxle with the hairpin.

Install the top hydraulic fluid line first, followed by the lower line. Graphic “REVERSE ANGLE”

Finally, attach the parking brake tension spring.

Install the left side transmission in a similar fashion.

Attach the hydro bolts.

Attaching the front support strut and remaining trans-mission bolts.

Tighten all bolts.

Attach the hydro release rod.

Followed by the parking brake spring.

Then attach both hydraulic lines.

Using a helper, place the assembled transmissions and skid on wooden support blocks and slide the assembly into place under the tractor. ALign the pan with the tractor frame and place the control rods onto the pan for later assembly.

Lower the frame onto the transmission assembly and align the mounting bolt holes.

Maker sure that the hydro lines are clear and install the mounting bolts.

Attach the front support bars on both sides of the unit.

Remove the rear mounting bolt, and attach the lower bumper tube.

Repeat this procedure for the other side.

Tighten all bolts attaching the transaxle and skid plate to the tractor frame. Torque all bolts to proper specifications.

Install the right hand hydraulic line. Hand tighten each pair of fittings.

Before installing the remaining lines, install both hydraulic pulleys. Then torque to spec.

Once you have finished installing the pulleys you can finish installing the hydraulic lines. Torque all fittings to spec. The lower fitting on the right hydro pump is hard to get to. We are showing this being done with a crows foot wrench.

Next we will install the parking brake rods. Slide the rod through the tension spring, through the holes in the frame brackets and forward to the parking brake bracket.

Install the ferrules on each brake rod, shorten or lengthen to line up with the brake lever. Bolt the ferrule to the brake lever.

Before connecting the control rods, check that the hydro control lever is straight up in a vertical position. This is a rough estimate for the neutral position.

You can then proceed to connect the two control rods. Attach the control rod by loosening the jam nut and adjusting the ferrule until it lines up with the hydro control lever. Insert the retaining bolt and secure with the self locking flange nut. Finally, tighten the jam nut. Do this for each transaxle.

Install the drive belt by placing it over the engine pulley, slipping it over the hydro cooling fans and around the pulleys. When you release the parking brake the idler pulley should engage the drive belt.

Place the fuel tank over the two mounting brackets. Fasten with the four mounting bolts. Make sure you are using the proper bolts. Using bolts that are longer than the originals can strip the threads or puncture the fuel tank.

Connect the fuel tank hose to the fuel line and secure with a hose clamp.

Install both wheels and torque to specifications.

Lower the unit to the ground and remove the jack. Tighten the lower rear bumper support where it connects to the main bumper.

Attach the negative battery cable to the negative terminal, tighten, protect the terminal with the rubber cover.

Perform a neutral test to make sure the unit remains in neutral when stopped and does not creep or turn in either direction.

Transmission Disassembly

1. REMOVE TRANSMISSION FROM TRACTOR. See figure 1.

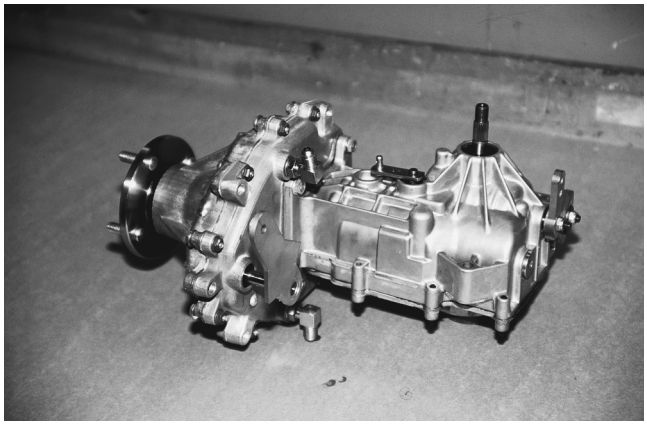


FIGURE 1.

2. Using an 11/16 wrench, remove the hydraulic fittings. This will allow easy removal of the nuts attaching the hydrostatic pump. See figure 2.

   NOTE: The fittings have “O” ring seals up against the washer. It is important not to damage it during removal. Also notice that the housing has a machined surface to accommodate the “O” ring that should not be scratched or damaged during disassembly. This assures a good mating surfaced between the “O” ring and housing.

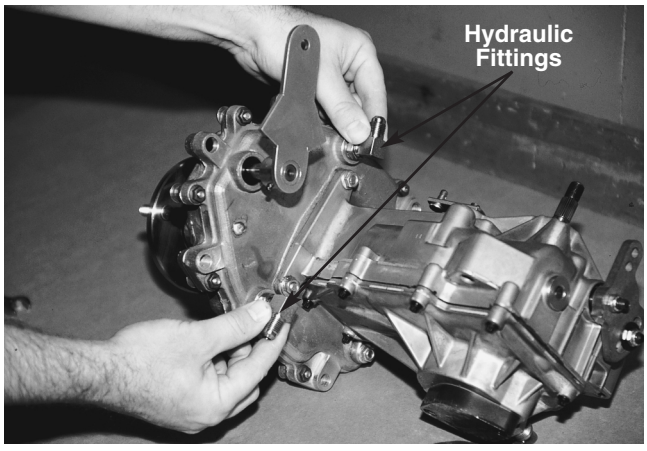


FIGURE 2.

3. Separate the hydrostatic pump from the housing by using a 9/16 wrench and removing the four nuts securing the pump. See figure 3.

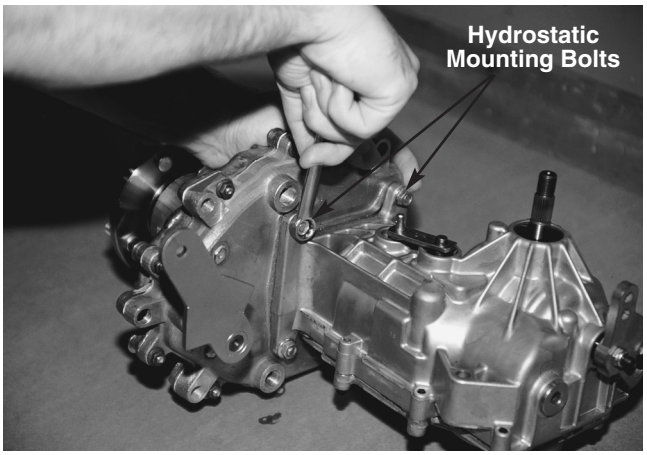


FIGURE 3.

4. While separating the pump from the housing notice that the input pinion gear slides easily on and off the shaft. Make sure that the gear does not fall into the transmission housing during removal. Also notice that the four studs that stick out of the housing are pressed into the housing. When you remove the pump, do not jar these studs or allow them to fall into the housing. See figure 4.

   NOTE: There is an “O” ring on the pump housing that should be inspected and replaced if necessary.

   Also make sure that the sealing surface is clean and not scratched or damaged in any way.

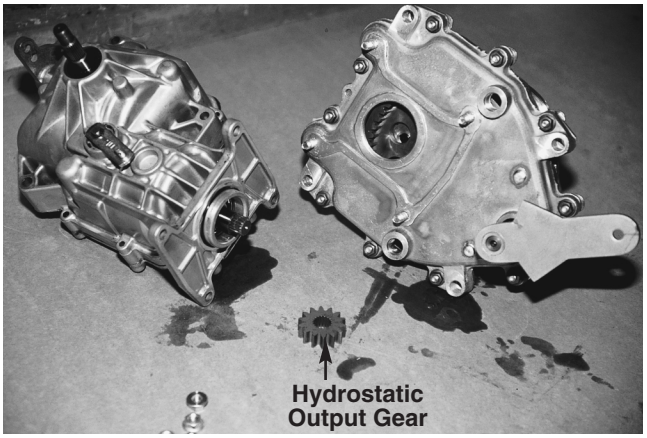


FIGURE 4.

5. Remove the brake actuating arm from the shaft by supporting the shaft and housing with some blocks of wood so that you do not damage the shaft and components during disassembly. See figure 5.

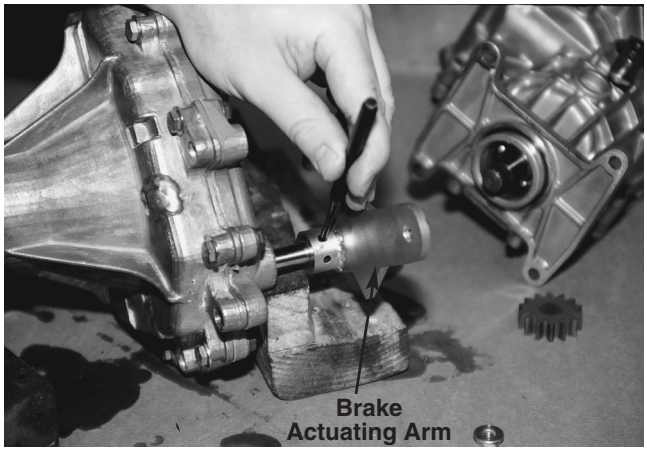


FIGURE 5.

NOTE: Using a punch, tap out the roll pin to allow removal of the arm from the shaft.

6. To disassemble the housing halves remove the housing bolts with a 7/16 inch wrench and socket. See figure 6.

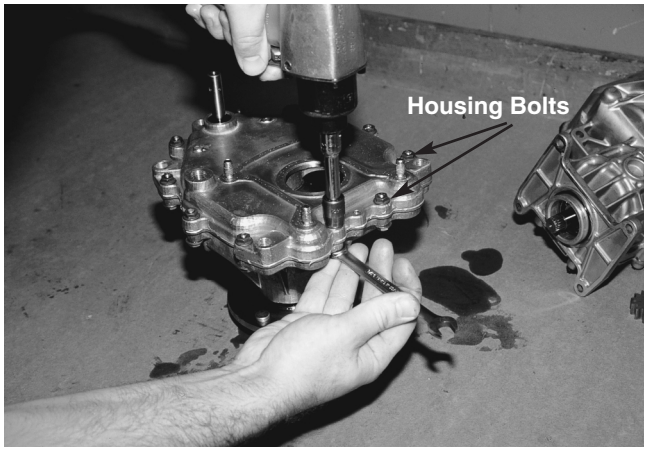


FIGURE 6.

NOTE: On production models of this transmission we will not be using washers on these bolts. During reassembly, it is important to remember not to overtighten these bolts and stretch them.

7. To separate the housing halves, use a paint scraper or similar tool to pry the halves apart. Work around the housing to evenly release the housing halves. See figure 7.

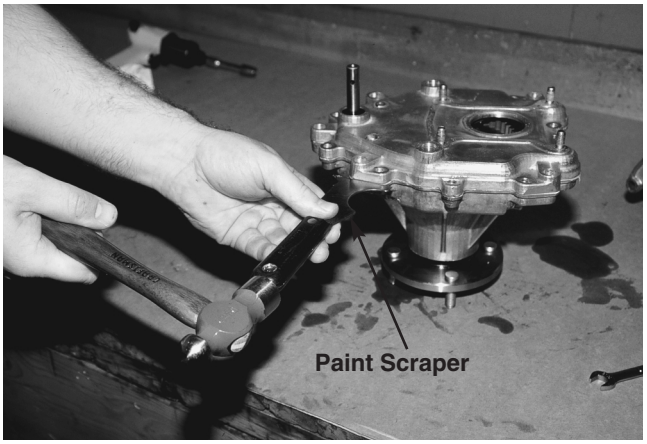


FIGURE 7.

NOTE: The needle bearing inside the housing half. Protect this bearing during repairs to keep dirt or foreign matter from damaging it. This is a press fit bearing. If it is damaged, it will have to be removed by prying or cutting it out without damaging the housing and pressing in a new bearing. Be sure that the face of the bearing seats below the surface of the housing.

8. Visually inspect the parts in the housing. Check that the shim is in place and inspect the gear teeth for any obvious damage. Remove the shin and make sure it is not waved like a potato chip, an indication of heat or excessive wear. See figure 8.

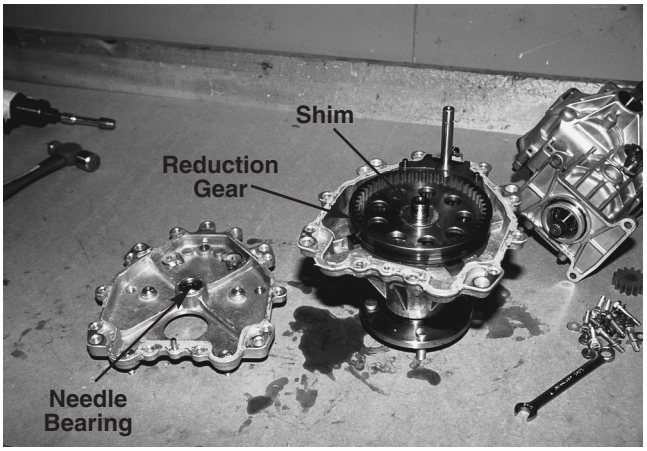


FIGURE 8.

Transmission Disassembly

9. Remove the reduction gear and inspect for missing teeth or irregular wear patterns. See figure 9.

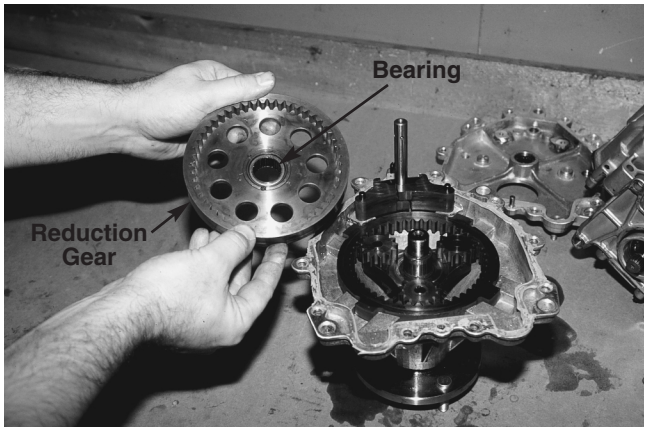


FIGURE 9.

NOTE: Inspect the bearing for any visible wear or damage and make sure that the bearing face is below the surface of the gear and centered within the gear.

Flip the gear over and inspect the teeth on the reduction gear for damage.

Production gears will not have the pins and screws and will be a one piece assembly.

10. Remove the brake assembly by first removing the brake spring, then remove the brake shoes, shaft and two pins. See figure 10.

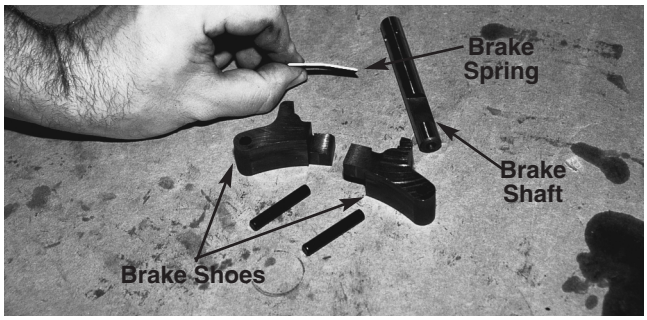


FIGURE 10.

NOTE: The parts then easily come apart. The shoes are symmetrical, are the same part and part number, and can be reassembled on either side.

The brake spring is slightly bent and should not be flat. Make sure it is not deformed or showing any signs of fatigue.

Inspect the brake shaft making sure that there is no excessive wear on the corners of the shaft and that the area where the seal rides is smooth and clean and not worn by the seal. This shaft has two holes. There will only be one hole in production units.

11. Remove the internals from the housing and inspect them for damage. See figures 11 and 12.

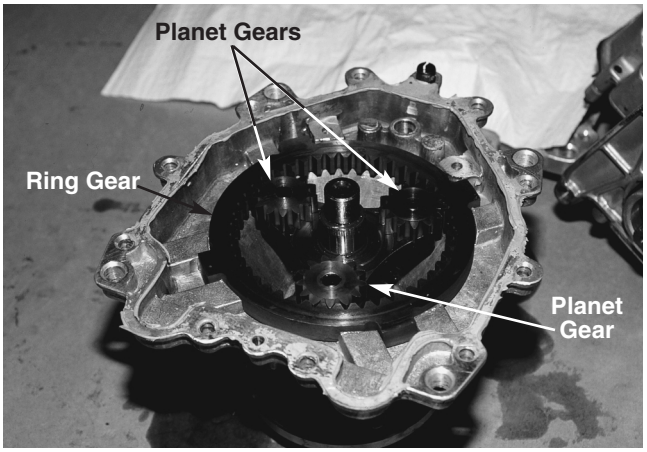


FIGURE 11.

12. Remove the ring gear, three planetary gears which come off the carrier, and the carrier which is splined to the shaft. All of these parts should be a slip fit and come off easily. See figures 11 and 12.

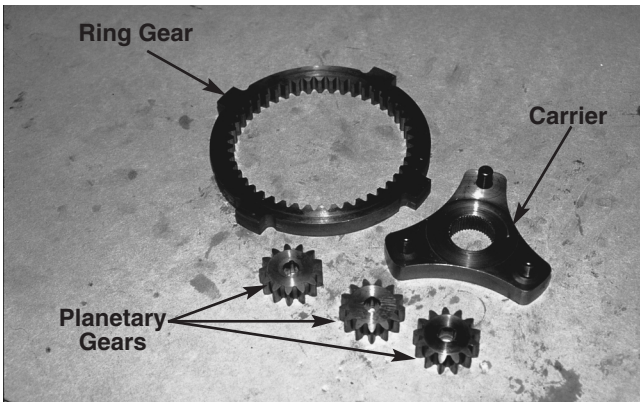


FIGURE 12.

13. The axle bearing is placed into the housing and is held by a snap ring that is used to keep the bearing in place under load. The axle is pressed through the bearing and is held in place by a smaller snap ring. See figure 13.

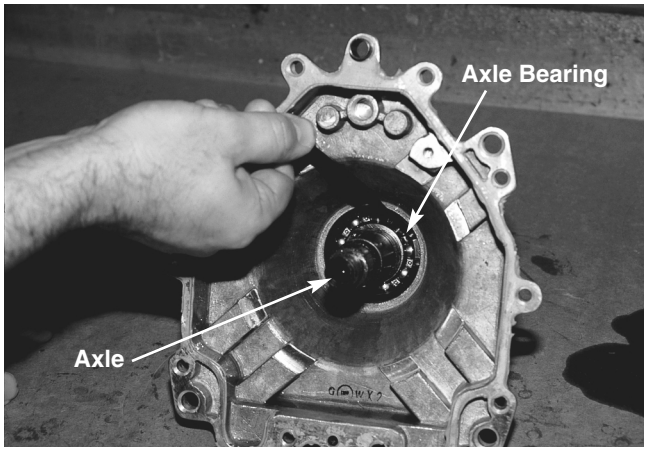


FIGURE 13.

14. Remove the axle from the housing, first remove the snap ring from the axle. See figure 14.

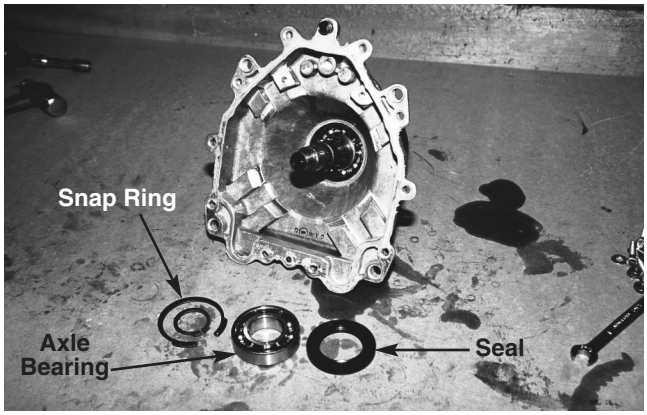


FIGURE 14.

NOTE: Support the housing using pieces of tubing. You want to support the housing on its body and not the ears which may break off. Leave enough travel for the axle to fall out and press on the end of the axle to remove it.

15. When you press the axle out of the bearing, you will need to replace the bearing because it will be damaged during removal. See figure 15.

FIGURE 15.

16. To remove the bearing from the housing you must first remove the snap ring. See figure 16.

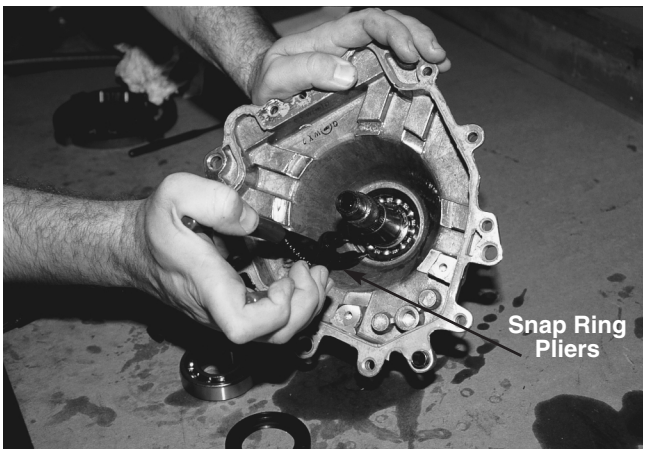


FIGURE 16.

NOTE: Remove the bearing and discard. Remember, you must replace the bearing once the axle shaft has been pressed out.

17. Reassemble the axle, inspect the seal area of the housing for burrs or damage. The housing is chamfered so the seal starts easy and locates well. Using a piece of material close to the outside diameter of the seal so you are supporting it properly as you press it in. You will feel the seal bottom out against the shoulder of the inside of the housing. Inspect it to make sure it is seated properly. See figure 17.

FIGURE 17.

18. Install the bearing. Set it into the housing so it goes down below the snap ring groove. See figure 18.

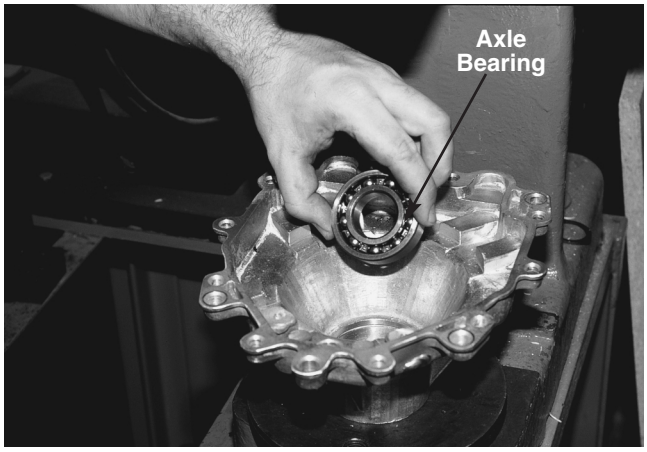


FIGURE 18.

NOTE: Install the large snap ring and seat it into the groove in the housing to retain the bearing.

NOTE: To install the axle shaft and press it into the bearing, first support the shaft with a block so that pressure is not applied to the studs. Place the housing over the axle, and using a sleeve or some tubing that is close in size to the inner race of the bearing, press the bearing and housing down over the axle.

19. Install the snap ring on the axle shaft to retain the bearing on the shaft, making sure that the snap ring is in the groove on the axle. See figure 19.

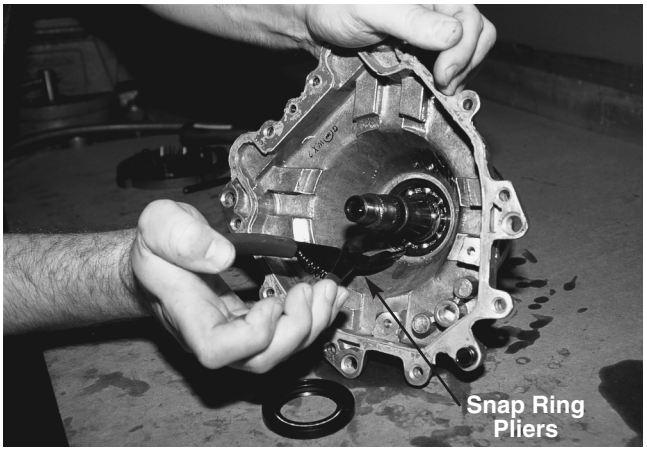


FIGURE 19.

20. If a stud becomes loose or broken and needs to be replaced, it is important to properly support the axle during this procedure in order not to put undue stress on the bearing. See figure 20.

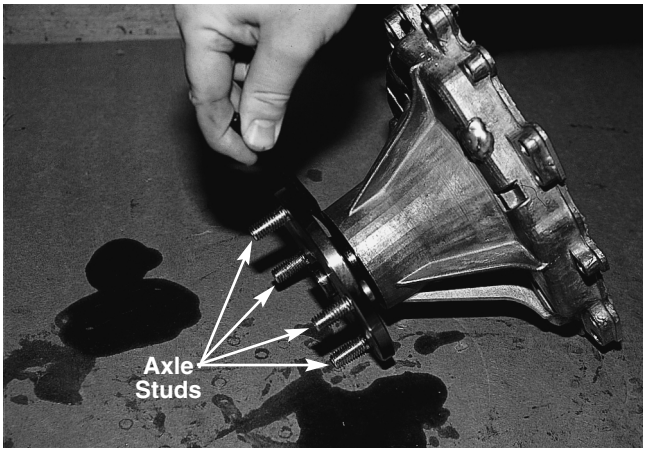


FIGURE 20.

NOTE: To make replacing a stud easier, line up the serration's of the stud with the axle plate and press the stud through the plate. Using a spacer and the nut, or the tire rim itself, tighten the nut to draw the bolt through the plate, seating it completely.

21. Before reassembly, clean the housing and remove old gasket material. Use a rag to protect the bearing before cleaning to avoid damage. Take a paint scraper or other tool and remove all gasket material. Do this to both housing halves and then wipe down the mating surfaces to remove any grease or oil from them. See figure 21.

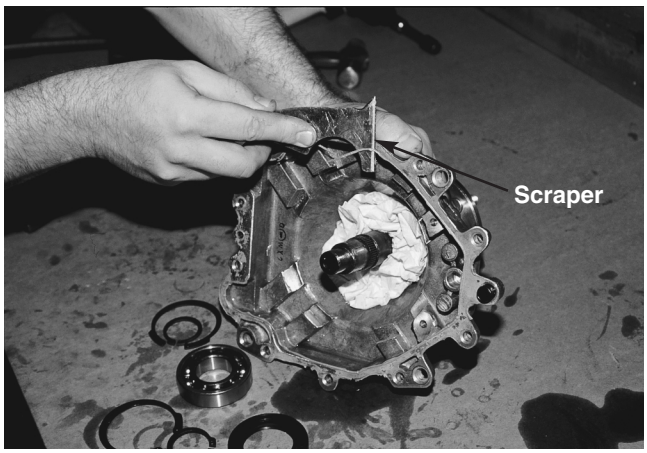


FIGURE 21.

22. Install the brake components by installing the brake actuating shaft into the housing, then installing the brake shoes next, one inverted next to the other. Insert the two dowel pins through the brake shoes into the housing, then insert the brake spring with the bend around the shaft. See figure 22.

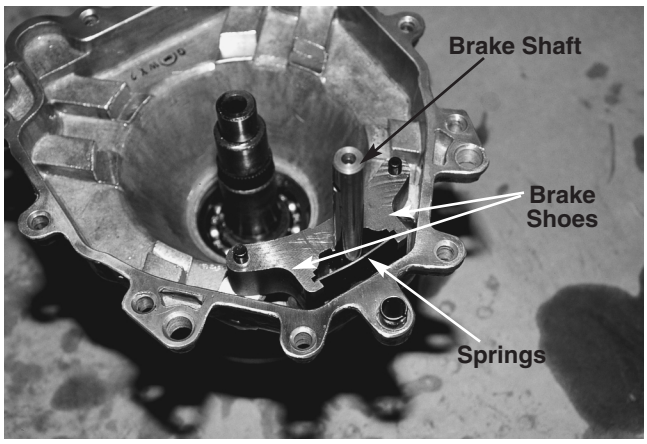


FIGURE 22.

23. Install the ring gear into the housing. It has four tabs and should rest in the housing and be loose. See figure 23.

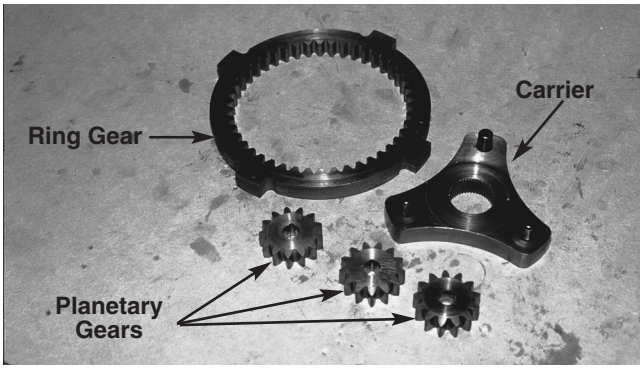


FIGURE 23.

NOTE: Install the carrier onto the splines by lining up the splines and sliding it down onto the shaft.

Install the three planetary gears. They have lubrication grooves on one slide and should be installed with these grooves down.

Make sure everything turns smoothly.

Then install the reduction gear with the small gear down, inserting it through the planetary gears and sliding it down the shaft, making sure that the whole assembly turns smoothly as well.

24. Prior to assembling the two housings together, make sure that there is proper clearance between the gear and inner housing by measuring the distance from the mating surface of the housing to the boss on the center of the housing. See figure 24.

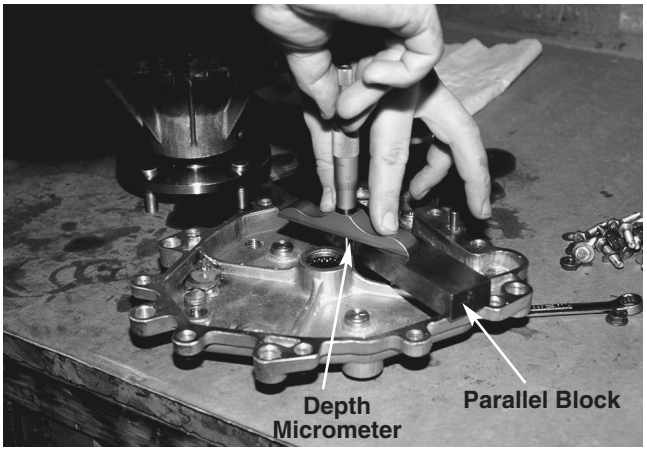


FIGURE 24.

NOTE: Using a parallel and a depth micrometer, measure the distance to the boss and subtract the height of the parallel to arrive at the distance from the housing mating surface to the center boss. Write that number down for reference.

25. Using parallels, measure the distance from the mating surface of the large housing down to the first shoulder on the axle shaft. Subtract the height of the parallels to arrive at the distance between the mating surface and shoulder. This measurement should be greater than the number for the smaller housing. See figure 25.

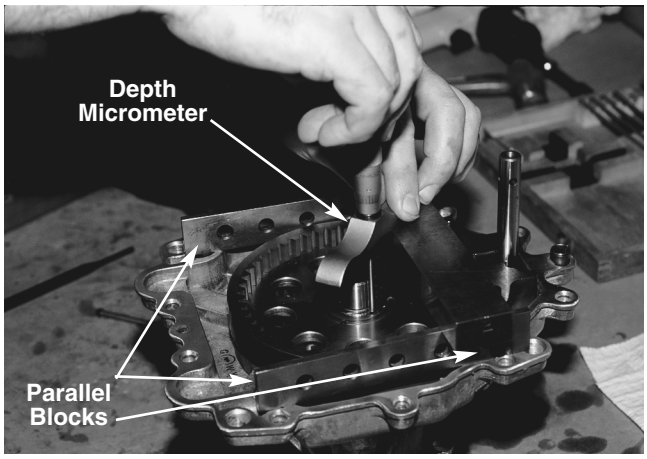


FIGURE 25.

26. Shim the axle with hardened washers to achieve five to 20 thousandths clearance. This provides play without binding. See figure 26.

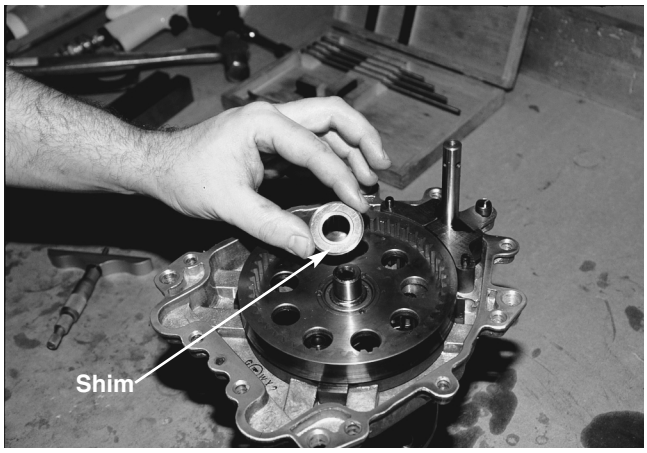


FIGURE 26.

27. Prior to installing the two housing halves, inspect the seal to make sure the spring is in place and the lip has not been damaged during disassembly. If it needs to be replaced, pry the seal from the housing, making sure not to mar the surface the seal gets pressed in to. Press a new seal into place making sure that the top surface of the seal is below the housing surface. See figure 27.

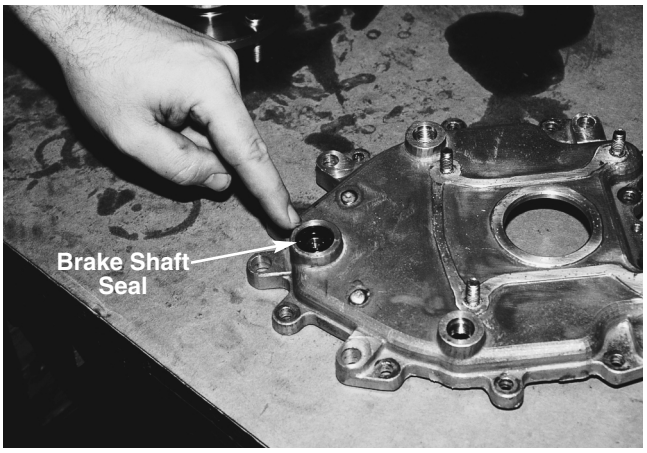


FIGURE 27.

28. Before installing the smaller housing is to inspect the four studs and make sure they are in place and not loose in the housing. See figure 28.

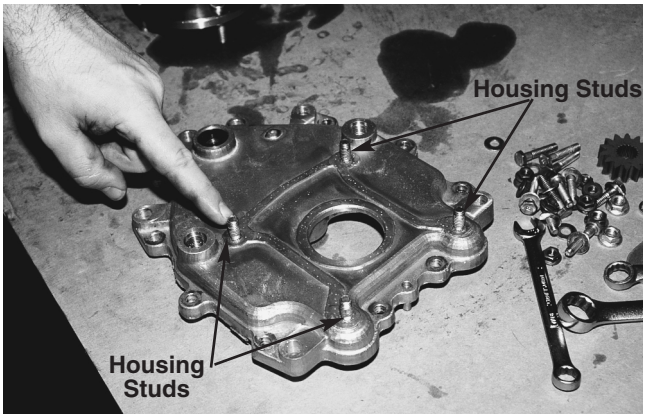


FIGURE 28.

29. There is an “O” ring on the stud and a sealing surface cut into the housing on the opposite side. If the studs are loose, but still in the housing, they can be used but cannot be allowed to fall into the housing during assembly. If the housing will not retain the studs you will need to replace the housing. See figure 29.

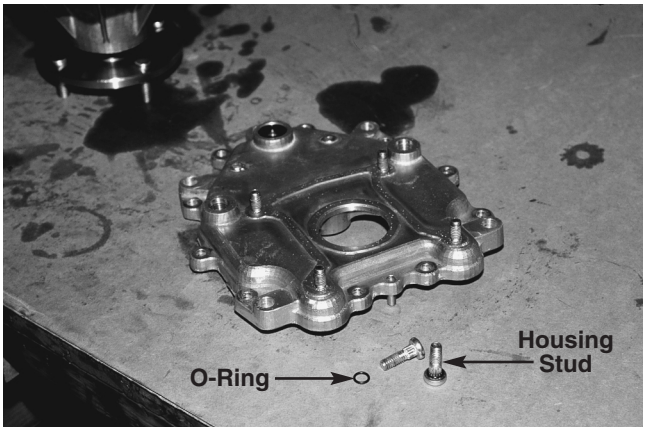


FIGURE 29.

30. Prior to applying Loctite sealer, make sure the mating surfaces are clean and free from dirt and oil. Apply a 1/16 inch bead of sealer around the inner surface of the housing. Applying too much sealer and allowing it to get inside the transmission can hinder the performance of the transmission. See figure 30.

FIGURE 30.

31. Before installing the smaller housing place a light coating of oil on the brake shaft and check to be sure the needle bearing is lubricated. See figure 31.

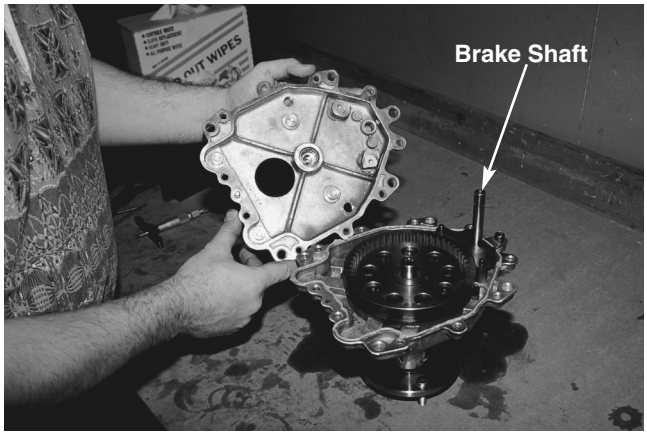


FIGURE 31.

32. Install the housing over the brake shaft, being careful with the seal, align the axle shaft with the bearing and press the two halves together. See figure 32.

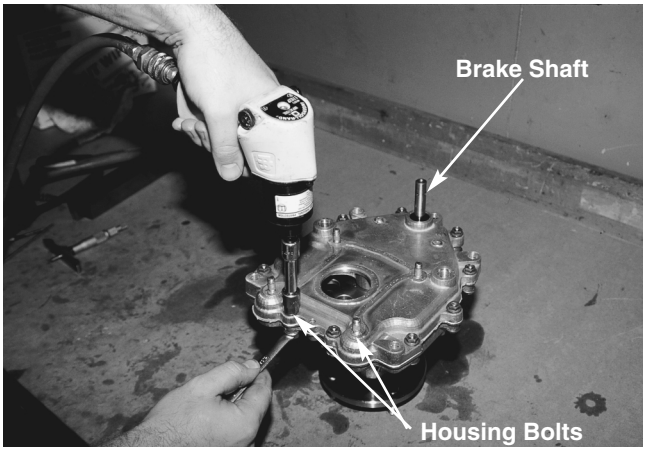


FIGURE 32.

NOTE: Install the ten perimeter bolts with the head of the bolt on the underside and the lock nut on top. These bolts have washers, the production models will not.

If using an air tool, use caution not to overtighten the bolts. Torque between 60 and 85 inch pounds.

33. Prior to installing the pump onto the housing be sure that the “O” ring is in place on the pump. Set the pump up on its end and install the input pinion gear on the pump shaft. See figure 33.

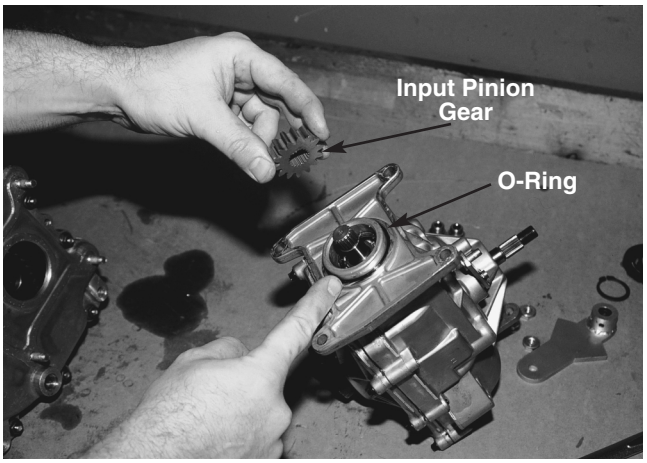


FIGURE 33.

Transmission Disassembly

34. Align the studs with the transmission, and be careful not to push the studs into the transmission, mate the two halves together. See figure 34.

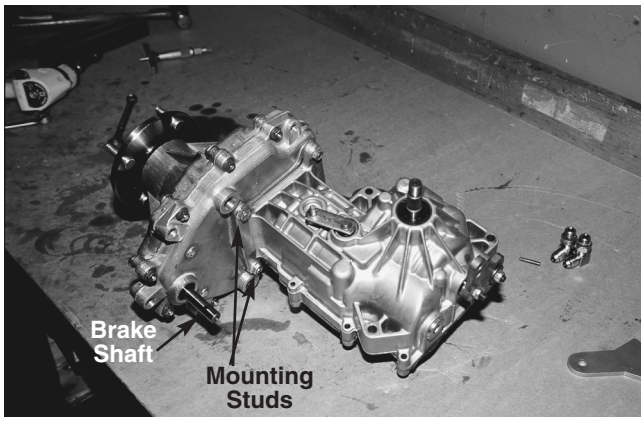


FIGURE 34.

NOTE: The ZT tractor transmissions and pumps are the same for each wheel but the pump is reversed on one side. Make sure you orient the pump properly.

Install the four nuts retaining the pump to the transmission using a 1/2 inch wrench. Make sure the “O” ring is compressed and the four ears of the pump are flush with the housing.

Torque to specifications.

35. Install the hydro fitting by backing off the nut so the washer is loose. Screw the fitting into the housing part way, leaving it loose so that you can align the fitting with the frame and other parts installed on the tractor. During installation make sure the seats are clean and the “O” rings are in good condition. See figure 35.

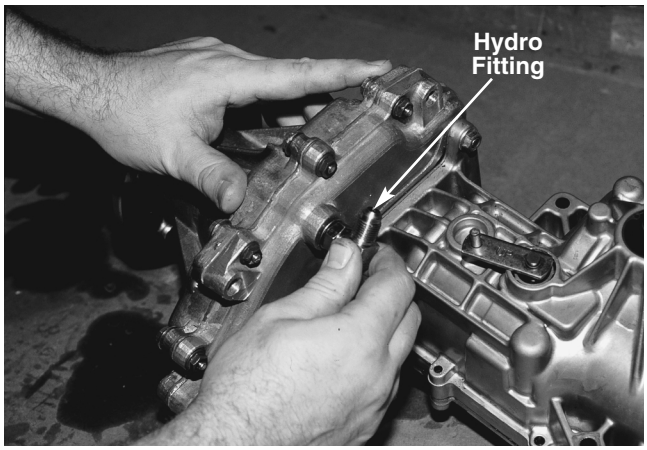


FIGURE 35.

36. Reinstall the brake actuating arm by properly bracing the shaft and driving the pin into the hole and through the shaft. See figure 36.

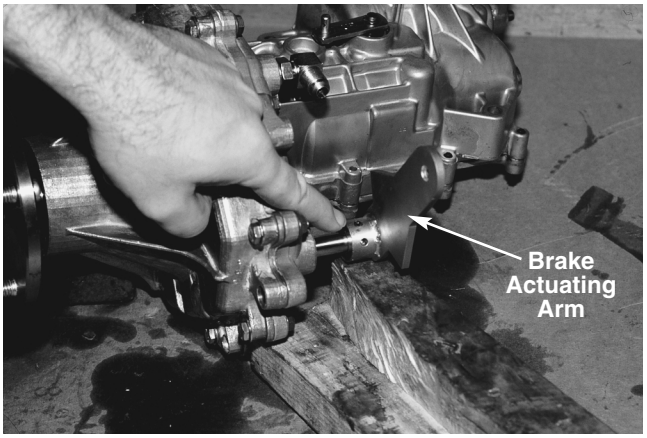


FIGURE 36.

SECTION 8
CHORE PERFORMER

Lawn Vacuum

REPLACING THE CHIPPER BLADE/ REMOVAL AND REINSTALLATION OF THE IMPELLER ASSEMBLY:

FIGURE 1.

NOTE: Prior to performing impeller removal, remove the vacuum bag or blower chute from the unit.

1. Remove the front hub caps.
2. Remove the shoulder screws securing the front wheels using a 3/4" socket.

   NOTE: There is a wave washer located on the outside of the wheel and a bell washer on the inside of the wheel. The cupped side of the bell washer rests against the pivot arm.
3. Remove the shoulder screws securing the pivot arms and height bracket adjusters (not shown) to the front support brace using a 3/8" socket. See figure 2.

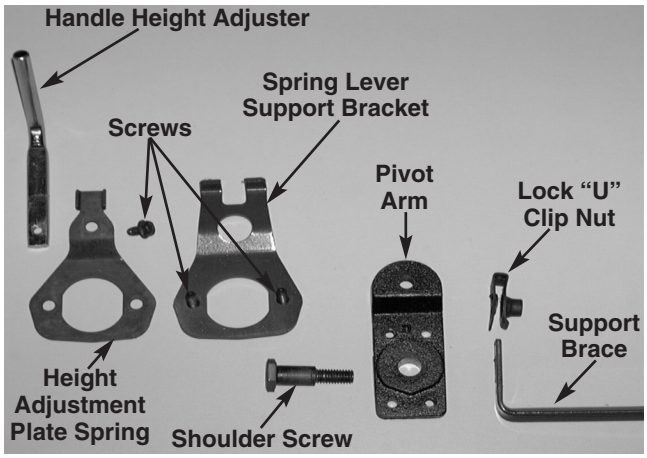


FIGURE 2.

4. Remove the three screws on the upper housing that secure the nozzle cover to the upper housing, using a phillips screwdriver. See figure 3.

FIGURE 3.

NOTE: It is not necessary to remove the three hex cap screws and lock nuts securing the nozzle cover to the lower housing. See figure 4.

FIGURE 4.

5. Remove the nine screws securing the lower housing to the upper housing using a 1/2" wrench and a 1/2" socket.
6. Remove the lock nut that secures the flail screen to the lower housing using two 1/2" wrenches.

   NOTE: It is not necessary to remove the flail screen from the unit.

7. Remove the nozzle cover and lower housing from the upper housing.
8. Remove the hex bolt and lock washer securing the impeller assembly to the crankshaft using a 9/16" socket. See figure 5 and 6.

   NOTE: There is a flat washer between the lock nut and impeller assembly.

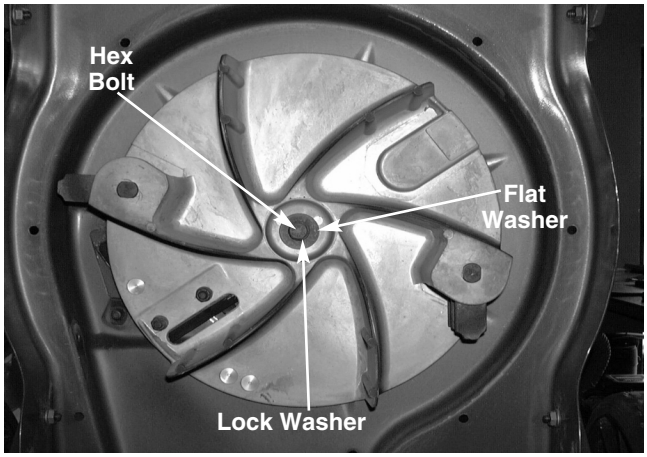


FIGURE 5.

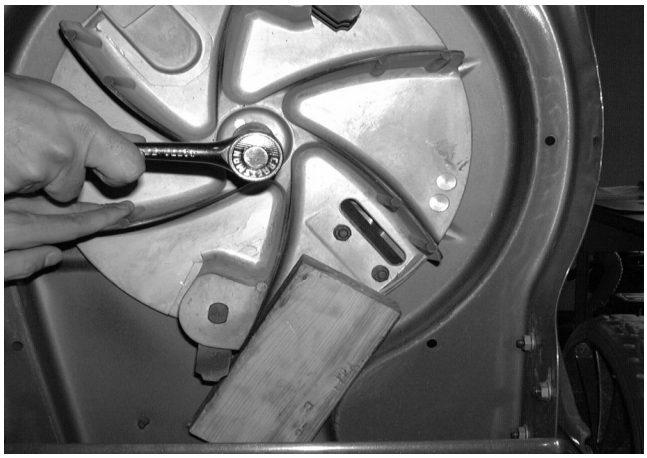


FIGURE 6.

9. Apply lubricant to the threads of the impeller removal tool (part number 753-0638). Thread the tool into the crankshaft until the impeller assembly can move on the crankshaft.
10. Remove the impeller assembly from the crankshaft. Unthread the impeller removal tool from the impeller assembly.

    NOTE: The impeller assembly is made of aluminum.
11. Remove the chipper blade using a 3/16" allen wrench and a 1/2" open end wrench.
12. Replace chipper blade.

    NOTE: Torque chipper blade screw to 210 to 250 inch pounds.

    NOTE: Make certain the chipper blade is installed with the sharp edge facing upward.
13. Reassemble in reverse order above.

    NOTE: Torque the impeller bolt to 375 to 425 inch pounds.

REMOVAL AND REINSTALLATION OF THE FLAIL SCREEN

NOTE: Prior to performing flail screen removal, remove the vacuum bag or blower chute from the unit.

1. Remove the hex screw, flat washer, and lock nut securing the flail screen to the top of the rear housing using a 1/2" wrench.
2. Remove the flail screen.

SAFETY SWITCH

The safety switch is located at the rear of the unit. It is mounted to the upper impeller housing assembly. A ground magneto wire runs from the engine to the left side terminal of the safety switch. The right side terminal of the safety switch has a wire running to frame ground. The safety switch is a normally closed switch. This means that at rest, plunger up, the switch will be closed.

Anytime the vacuum bag or blower chute is attached to the unit, the safety switch plunger will be depressed. Anytime neither the bag or chute is present, the switch will be up and the magneto will have a path to frame ground. This would prevent the engine from running.

If the safety switch is operating properly, the engine will not run without the bag or blower chute attached.

TESTING THE SAFETY SWITCH:

NOTE: A multimeter is a must for this section. If any of the following tests do not match, replace the safety switch.

1. Remove the vacuum bag or blower chute from the unit.
2. Set the multimeter to the Ohms position.
3. Make certain the multimeter is working properly. Hold both test probes apart and check the meter display. There will be an O.L. (open line) reading. Touch the probes together. There should be a 0.00.
4. Disconnect the ground magneto wire connector. See figure 7.

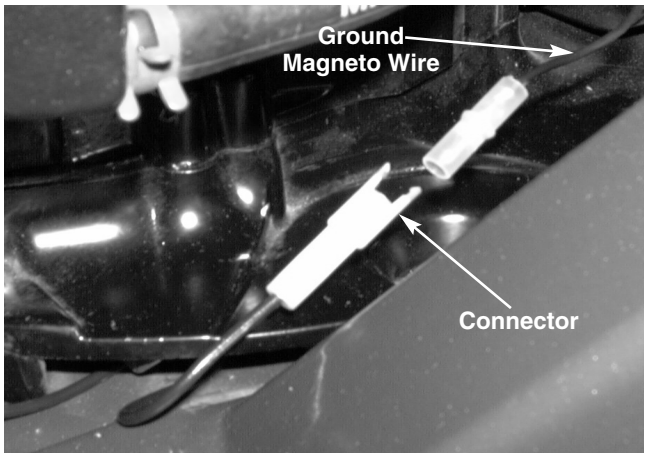


FIGURE 7.

5. With the safety switch plunger up, place one probe into the end of the connector with the wire running to the safety switch. Place the other probe on the connector at the end of the frame ground wire. There will be continuity. See figure 8.

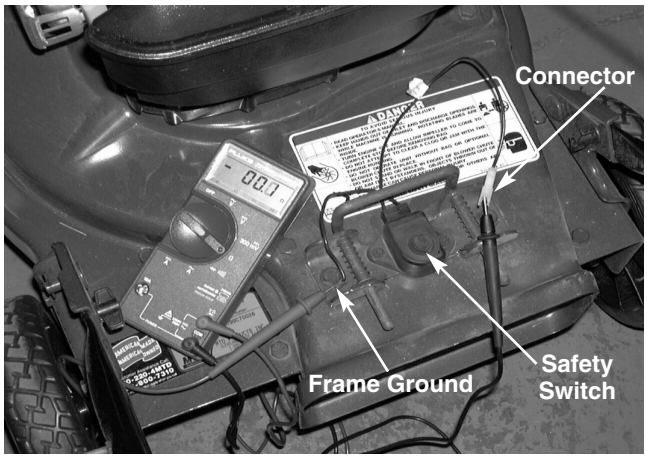


FIGURE 8.

6. With the safety switch plunger depressed, place one probe into the end of the connector with the wire running to the safety switch. Place the other probe on the connector at the end of the frame ground wire. There will be no continuity. See figure 9.

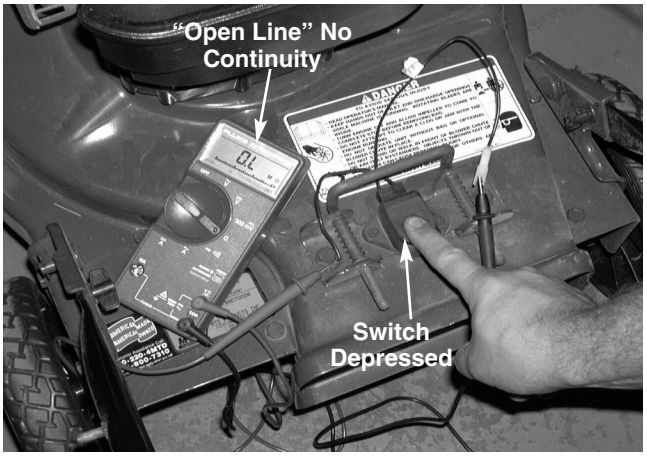
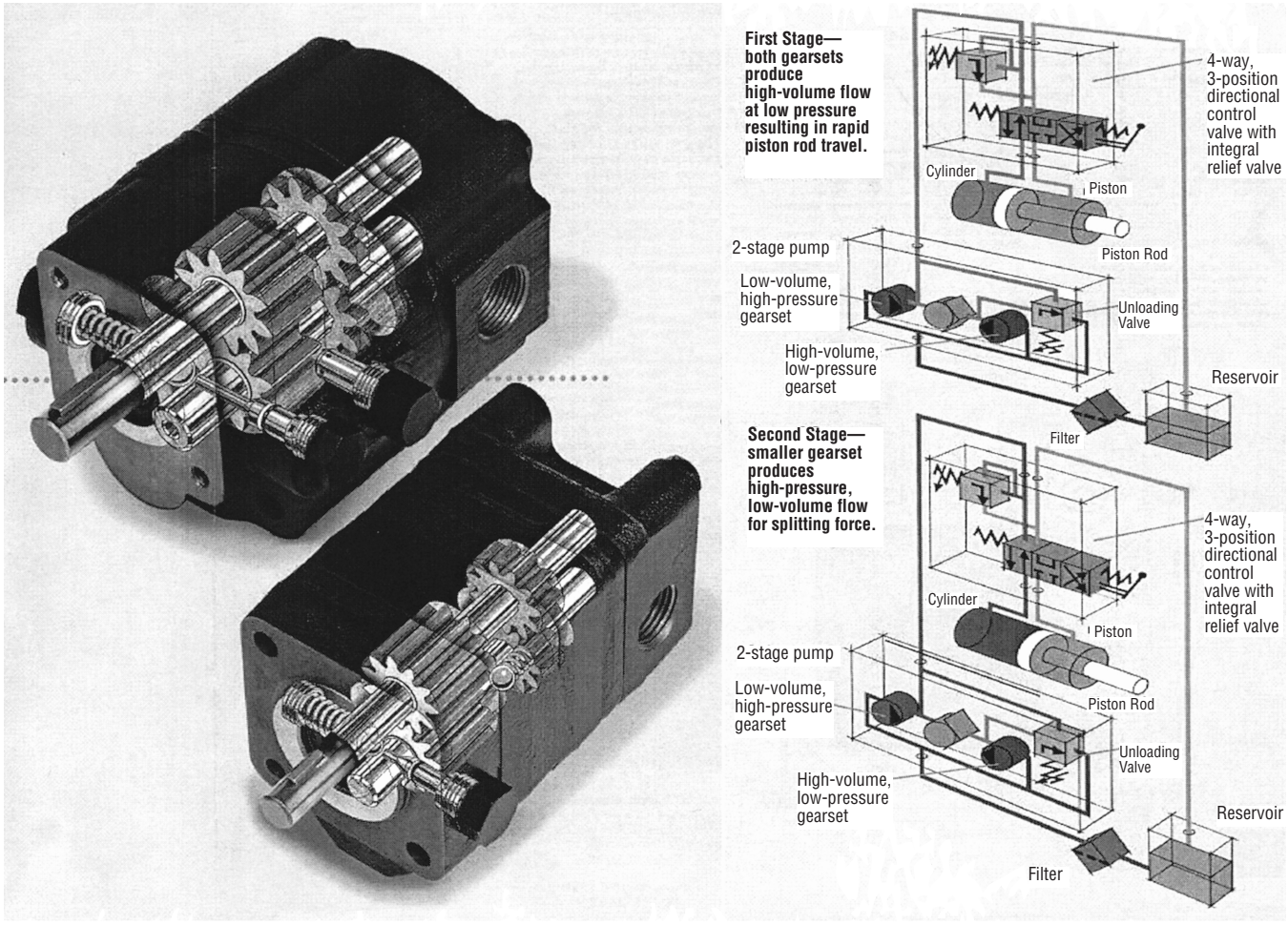


FIGURE 9.

NOTE: If any of the above tests do not match, the safety switch is defective. Recheck the switch to make certain that it is defective. Replace if defective.

Two Stage Pump



Log Splitter Pump User's Guide

DO

- Use clean oil.
- Use an oil filter (preferable at the pump inlet).
- Mount the pump properly (check alignment).
- Use flexible "spider-type" coupling with clearance between pump and engine driveshafts.
- Only split wood lengthwise (with the grain).
- Check tank oil level regularly.
- Make sure hoses are not pinched or blocked.
- Bleed hoses of air before using.
- Flush and clean system before startup after any malfunction or servicing.
- Use liquid/paste pipe dope on hydraulic fittings.
- Let system warm up before splitting wood.
- Use multi-viscosity oil to allow for temperature extremes.
- Use a breather cap on the reservoir.
- Return flow to tank with tube below oil level.
- "Jog" engine with spark plug disconnected to prime pump before startup.

DON'T

- Use extremely cold oil (20° F min.).
- Use dirty oil.
- Use clogged filter.
- Let oil level in tank drop.
- Use solid pump-to-engine coupling.
- Force pump when mounting.
- Cut wood across the grain.
- Run over relief valve for more than a few seconds at a time.
- Tamper with sequence or relief valve settings.
- Let oil get too hot (150° F max.).
- Run with air in system.
- Use teflon tape on hydraulic fittings.
- Warm up engine before connecting to pump in cold weather.

All two-stage log splitter pumps have the same basic hydraulic circuit. Two gearsets (one large and one small) use a common inlet and outlet. A sequence valve bypasses the flow of the larger pump gearset at a preset pressure. A check valve at the discharge between the two gearsets allows both flows to combine at low pressure, and isolates the larger gearset from discharge above sequence pressure. The sequence valve responds to a pilot pressure from the smaller gearset, which is close to the actual pressure at the cylinder. The flow from the large Gearset is bypassed internally back to the pump inlet.

The two gearsets together put out a large flow which results in fast cylinder cycle time at no load. After sequence pressure is reached, the small gearset alone can reach several times greater pressure to do the actual splitting. But because the discharge flow is correspondingly less, this increase in splitting force doesn't require any more engine horsepower.

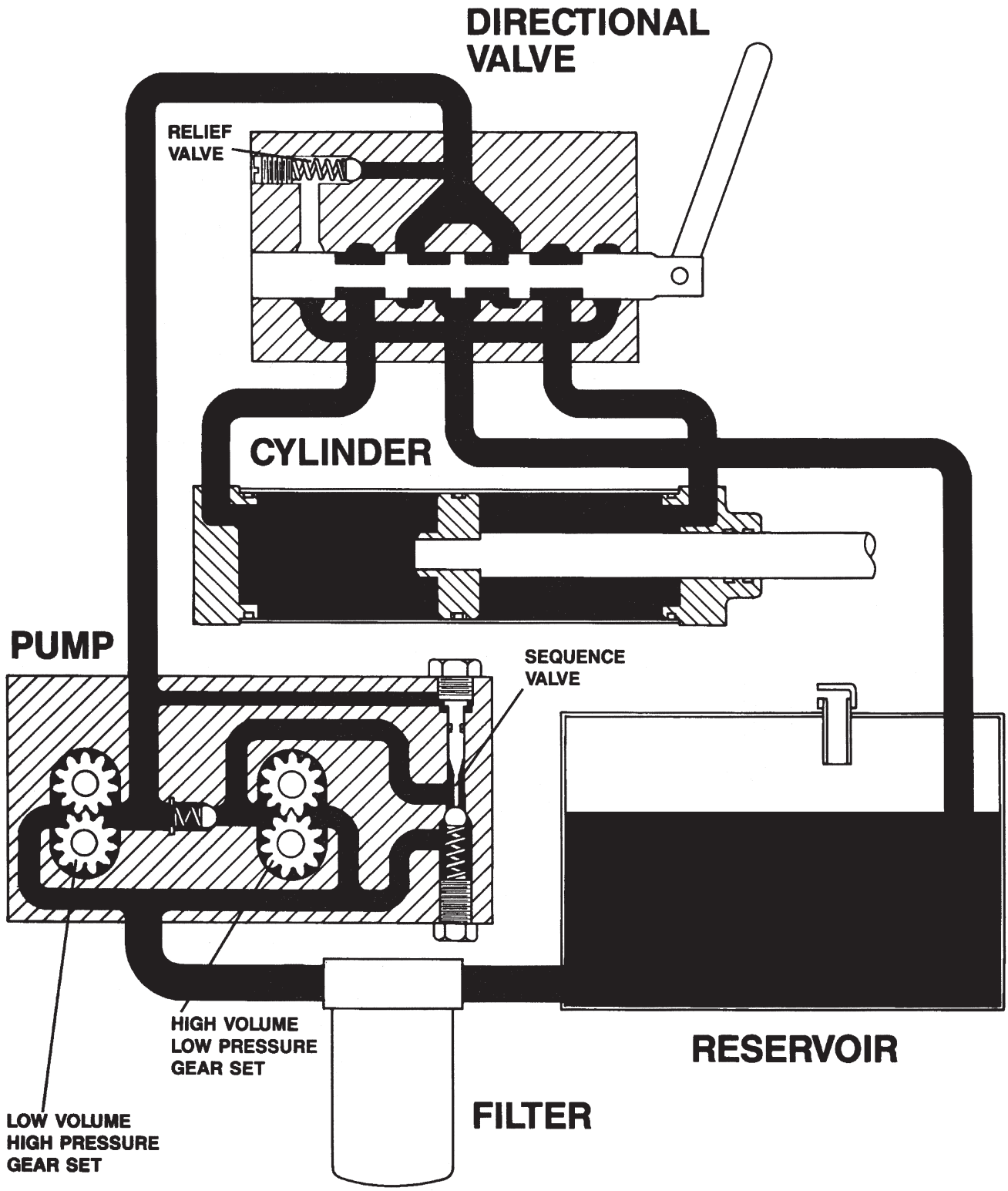
The sequence valve is set at the factory and should not be reset. The setting is calculated to give maximum flow until the discharge pressure is near motor stalling load. This valve does not affect splitting capability.

The pump discharge goes through a four-way, three-position flow control valve. In neutral (center) position, the flow returns to the tank without doing any work. Directing the flow to the rear of the cylinder causes it to extend. The cylinder will extend quickly until it meets resistance. When the pressure required to overcome the resistance exceeds the sequence setting, the cylinder will slow down but keep moving forward. A relief valve in the pressure line will bypass all pump discharge if the pressure reaches a preset maximum. This can happen at the end of the extend or retract stroke, when the cylinder can go no farther, or if the cylinder meets excessive resistance during its stroke.

Directing the flow to the front of the cylinder causes it to retract. Retracting is always at high speed, since there is nothing to resist the cylinder. Again, the relief valve will bypass all flow at the end of the return stroke. The flow control valve should be self-centering, so that it automatically bypasses the pump flow to the tank rather than remaining at relief valve pressure. This prevents overloading the pump, which should not be subjected to relief valve pressure for more than a few seconds.

All systems should have relief valves to protect components from damage due to overpressurizing. Like the sequence valve, the relief valve should be preset by the manufacturer, and cannot be adjusted without gauges. Increasing this setting is not recommended. If a log won't split at the factory setting, something else may be wrong in the system. Increasing pressure might still not split the log, and might damage the pump.

The troubleshooting page (8-7) lists possible log splitter problems. Each problem has a number of possible causes, for which are listed possible fixes and hints. Failure analysis is very difficult, especially in the field where special tools or pressure/vacuum gauges are not available. If there is **any** doubt about the cause of a malfunction, it's best to return the suspected component to your shop for evaluation. In case of the **pump**, please note that **valve readjustment or pump disassembly VOIDS ALL WARRANTIES.**



Log Splitter Troubleshooting

SYMPTOM	POSSIBLE CAUSES	FIXES & HINTS
Won't split wood or slow splitting, engine still runs. (See CAUSES 1, 2, 3, 6, 8, 12, 16, 19 & 20)	1. Insufficient oil to pump (See A) 2. Foaming-air in oil (See A, D) 3. Excess pump inlet vacuum (See B, C) 4. Tank breather plugged (See E) 5. Shaft seal improperly vented (See M)	A. Keep oil reservoir full and clean. B. Check pump inlet hose for kinks.
Engine stalls while splitting (See CAUSES 7, 17, 19 & 21)	6. Leakage through pump check valve (See M) 7. Sequence valve setting too high (See F, M) 8. Pump high-pressure gearset damaged (See M) 9. Pump gearsets damaged (See M)	C. Use as short and as large a diameter inlet hose as possible. D. Return tube to tank should be below oil level.
Slow cylinder travel extending and retracting (See CAUSES 1, 2, 3, 9, 12, 18, 20 & 22)	10. Pump seized-frozen up (See M) 11. Driveshaft broken (See M) 12. Internal leakage in directional valve (See M) 13. Directional valve damaged (See M)	E. Tank must be vented to atmospheric pressure. F. Do not adjust valves without the proper equipment (pressure gauges).
Cylinder won't move (See CAUSES 1, 9, 11, 13, 14, 15, 18 & 24)	14. Obstruction in directional valve (See G, M) 15. Obstruction in hydraulic lines (See G) 16. Relief valve setting too low (See F)	G. Flush and clean hydraulic system.
Engine won't turn or stalls at no load (See CAUSES 10, 14, 15, 21 & 23)	17. Relief valve setting too high (See F) 18. Relief valve damaged (See F, M) 19. Cylinder overloaded (See H) 20. Internal leakage in cylinder (See M) 21. Weak engine-low horsepower (See M)	H. Do not split logs against the grain. L. Precise alignment of engine and pump is necessary (do not force).
Pump shaft seal leaks (See CAUSES 4, 5, 9, 11 & 23)	22. Engine speed too slow (See M) 23. Improper engine/pump alignment (See L) 24. Shaft coupling loose (See L)	M. Return component for necessary repair.

NOTES

SECTION 9
ATTACHMENTS

Grass Collectors

OEM-190-601, OEM-190-602, OEM-190-821

ASSEMBLY AND INSTALLATION:

NOTE: The 601 twin bagger for 38" and 42" decks does not come with blades. Use the blades that came with the tractor.

1. Identify the pieces included in the carton. See figure 1.

FIGURE 1.

2. Tilt the seat forward.
3. Position the hooked ends of the bracket assembly over the shoulder bolts located at the rear of the rider.
4. Insert the clevis pin through the bracket assembly and hitch plate and secure with hairpin clip. See figure 2.

FIGURE 2.

5. Place the cover assembly's support tube through the outer set of holes in the left side of the bracket assembly.

   NOTE: The inside holes are for units equipped with 46" decks.

   NOTE: The support tube needs to rest on the right side of the bracket assembly. Keep cover open while attaching the bags. See figure 3.

FIGURE 3.

6. Hook grass bags into slots on cover assembly and close the cover.

   NOTE: The 821 bagger will come with three bags. See figure 4.

FIGURE 4.

7. Raise the deck to the highest cutting position and lift up the chute deflector. Place the top edge of the discharge chute over the opening on the deck. Push down on the discharge chute so that the front edge fits snuggly around the deck opening. See figure 5.

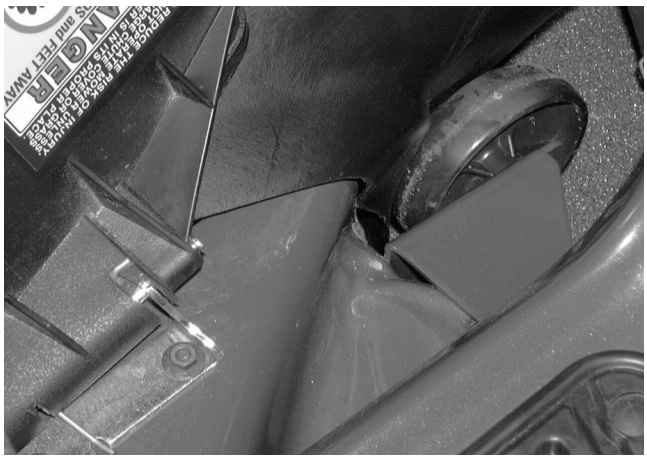


FIGURE 5.

8. Secure the discharge chute by hooking the retainer strap over the clip on the deck. See figure 6.

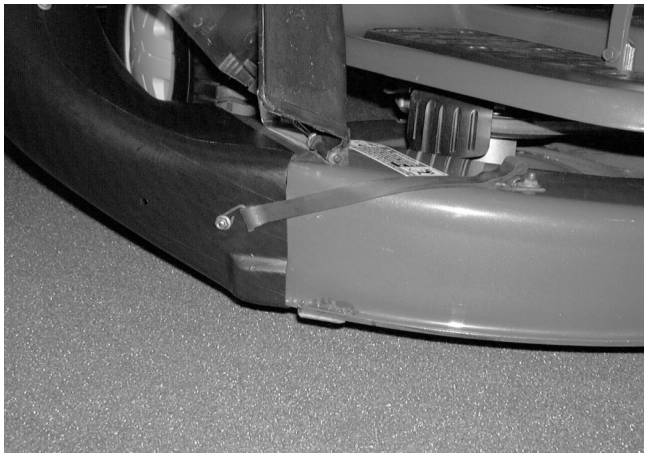


FIGURE 6.

9. Insert the upper end of the chute tube into the hole in the cover assembly, then place the lower end of the chute tube over the discharge tube. Secure by placing the ends of the retaining straps on the discharge chute over the clips on the chute tube. See figure 7.

FIGURE 7.

Front Bumper

OEM-190-603

1. Identify the different components.
2. Hook the notched ends of the bumper onto the shoulder bolts on the front of the tractor frame. See figure 1.

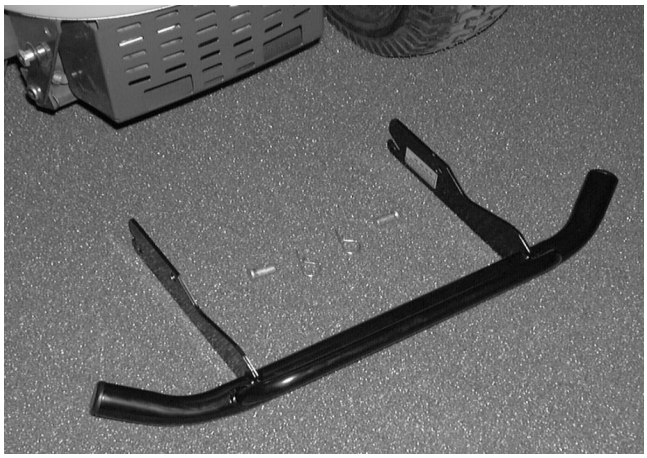


FIGURE 1.

3. Align the holes in the bumper with the holes in the tractor frame and insert the clevis pins. Secure with hairpin clips. See figure 2.

FIGURE 2.

FIGURE 3.

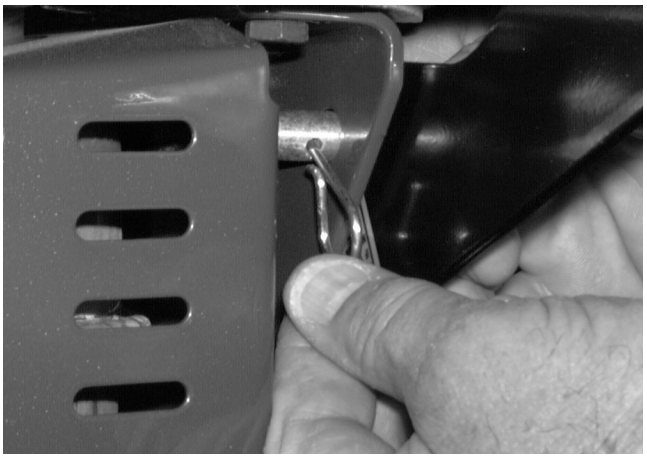


FIGURE 4.

TRACPAC

OEM-190-604

1. Identify the different components.
2. Position the hooked ends of the bracket assembly over the shoulder bolts.
3. Insert the clevis pin through the holes in the bracket assembly and hitch plate. Secure the bracket assembly with the hairpin clip.
4. Pivot the seat forward. See figure 1.

FIGURE 1.

5. Slide the tool box onto the bracket assembly. See figure 2.

FIGURE 2.

42" Dozer Blade

OEM-190-620

ASSEMBLY, INSTALLATION AND TROUBLESHOOTING

NOTE: Prior to performing blade assembly and installation, it is recommended to remove the deck assembly.

NOTE: These instructions are meant to be used along with those in the owners guide. Some steps have been modified to help simplify the process. Refer to the owners guide for hardware descriptions and locations.

NOTE: Install hardware finger tight until instructed to tighten.

FIGURE 1.

1. Place the wear plate against the front edge of the blade and insert one carriage bolt in each end, head towards front of blade, and secure with hex lock nuts.

   NOTE: The wear plate is not reversible or adjustable. The skid shoes are adjustable (see adjustments section).

2. Place the reinforcement plate in position and insert four carriage bolts, head towards front of blade, through the blade and reinforcement plate. Secure with hex lock nuts.
3. Place the skid shoes against either side of the blade and insert the carriage bolts through the top holes of the blade and skid. Secure with flat washers and hex lock nuts.
4. Insert carriage bolts through wear plate, blade, and skid. Secure with flat washer and hex lock nuts. See figure 2.
5. Insert hex bolts through blade, reinforcement plate, and front support bracket. Tighten carriage bolts and hex bolts securing wear plate and reinforcement plate using a 1/2" socket. See figure 2.

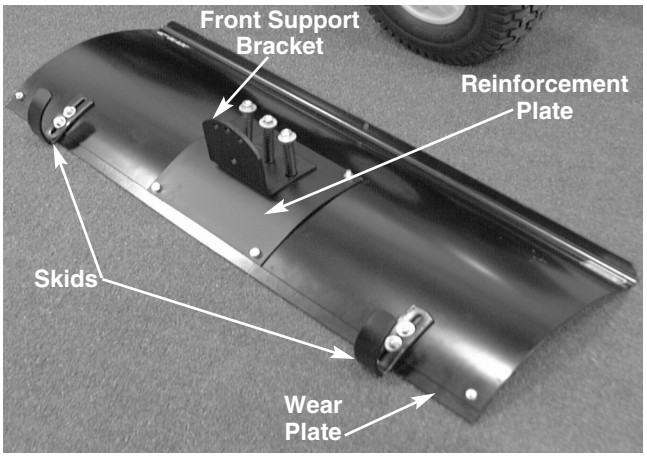


FIGURE 2.

6. Place compression springs over hex bolts and secure with flat washers and hex lock nuts. See figure 3.

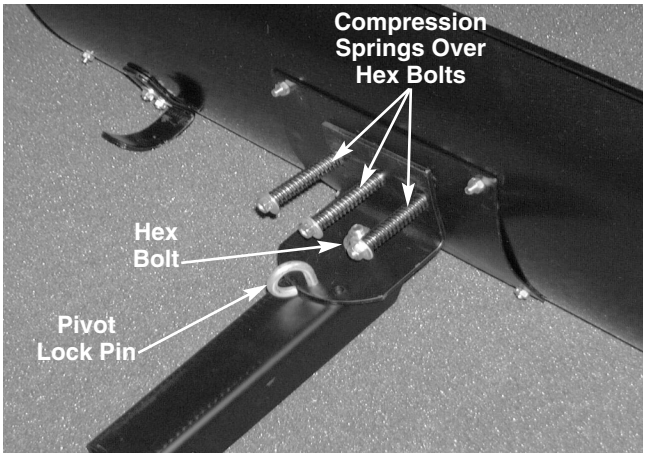


FIGURE 3.

7. Insert hex bolt through push bar channel and front support bracket. Secure with flat washer and hex lock nut. Tighten using a 3/4" flat wrench on top and a 3/4" socket and 6" extension on the bottom. See figure 3.

   NOTE: Do not overtighten the hex bolt because the push bar channel needs to pivot.

8. Insert the pivot lock pin through one of the holes in the front support bracket and push bar channel. Secure it with a hairpin clip. See figure 3.

9. Place the lift link inside the pivot support bracket. Insert the long pin through the slot in the support bracket and the short pin through the hole just above the slot.
10. Secure with lift link to the pivot support bracket with a cotter pin.

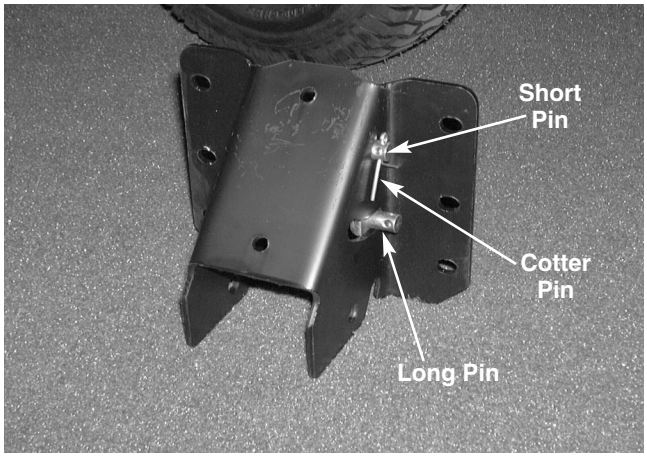


FIGURE 4.

11. Secure the support brackets to the frame in the rear holes with two .75" long hex bolts, lock washers, and hex nuts. Secure in the center and front holes with the 1" long hex bolts, lock washers, and hex nuts. Use a 1/2" socket to tighten the rear bolts and a 9/16" socket to tighten the middle and front hex bolts. See figure 5.

    NOTE: The right and left hand support brackets are secured to the frame with four bolts behind the pivot bar and one in front of the pivot bar. The support brackets angle inward.

    NOTE: The tractor tie rod will run between the two support brackets. When removing the attachment from the tractor it will be necessary to either lift the front of the tractor over the frame support brackets or remove the four hex bolts securing the upper and lower support brackets to the frame support brackets. See figure 5.

FIGURE 5.

12. Secure the upper and lower support brackets to the pivot support bracket with four hex bolts, lock washers, and hex nuts. Tighten using a 9/16" socket. See figure 6.

    NOTE: If the upper and lower support brackets contact the muffler heat shield, replace the brackets with kit number 753-0839. The brackets included in this kit will extend the attach hole distance from 1.25" to 2.25".

13. Secure the upper and lower support brackets to the frame support brackets with four hex bolts, lock washers, and hex nuts using a 9/16" socket. See figure 6.

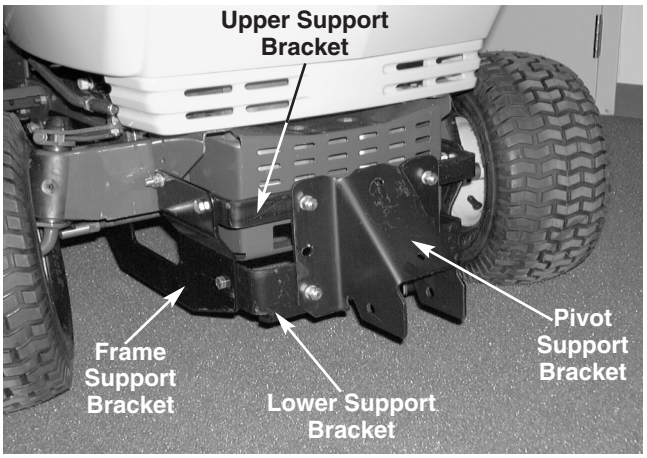


FIGURE 6.

14. Slide flat washer onto channel pivot shaft and insert the shaft through the holes in the pivot support bracket and push bar channel. See figure 7.
15. Secure the channel pivot shaft with a hairpin clip. See figure 7.

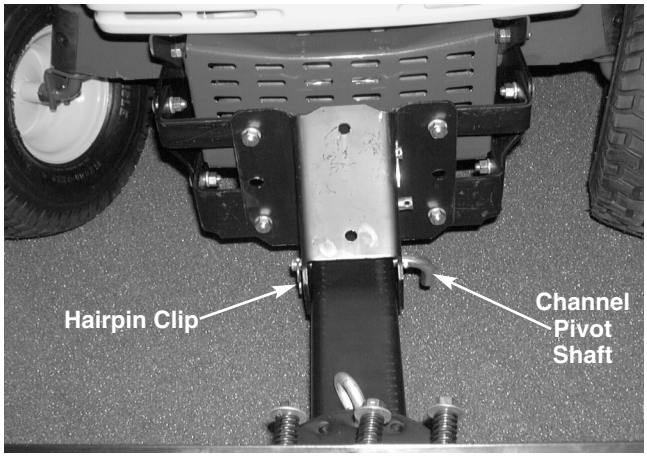


FIGURE 7.

16. Insert the end of the lower lift handle through the slot in the pivot support bracket and the hole in the push bar channel. The hole in the link on the end of the handle goes over the long pin on the lift link. See figure 8.
17. Secure the lower handle with a hairpin clip. See figure 8.

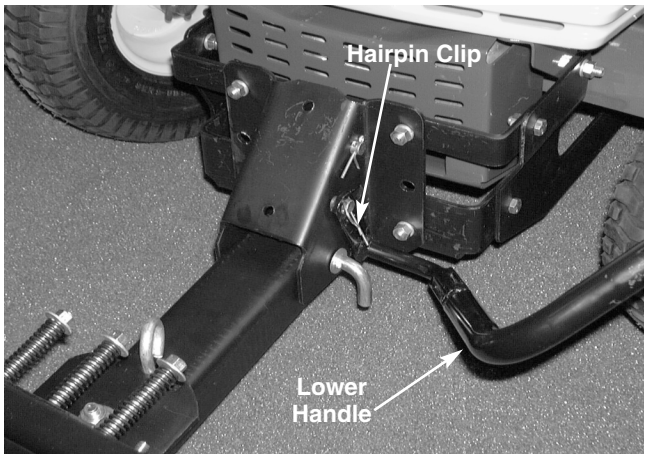


FIGURE 8.

18. Slide the grip onto the upper lift handle then secure it to the lower lift handle with the hex screw.

Adjustments

1. Adjust the skid shoes so the wear plate is approximately 1/8" to 1/4" above the ground when the blade is fully lowered. Tighten the hex lock nuts securing the skid shoes to the blade using a 1/2" socket. See figure 1.

FIGURE 1.

2. The normal adjustment for the spring tension is for the top of the hex nuts to be flush with the end of the hex bolts. To tighten the blade trip action, tighten the hex nuts using a 9/16" socket. See figure 2.

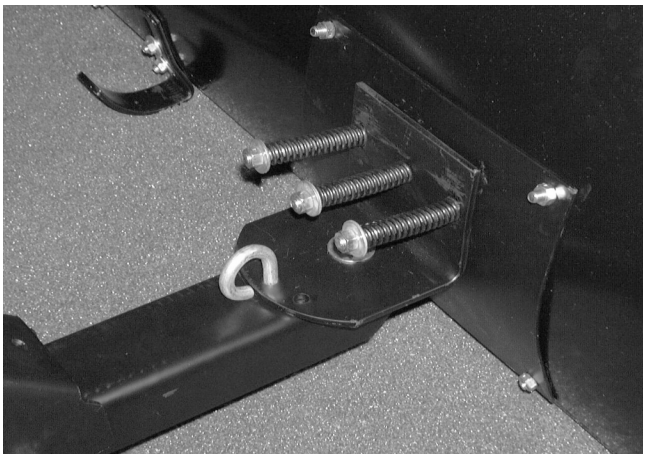


FIGURE 2.

3. For the best blade performance, use with 62 lb. rear wheel weights, part number OEM 190-215, and tire chains (see chart below for correct chains for each tire size).

Part Number	Tire Size
OEM-190-657	18" x 9.5"
OEM-190-325	20" x 8.0"
OEM-190-664	18" x 6.5"
OEM-190-754	18" x 8.5"
OEM-190-915	20" x 10"

40" Snow Thrower

OEM-190-621

ASSEMBLY, INSTALLATION, AND TROUBLESHOOTING

NOTE: Prior to installing the snow thrower, it is necessary to remove the deck assembly and engine belt keepers.

NOTE: These instructions are meant to be used along with those in the owners guide. Some steps have been modified to help simplify the process. Refer to the owners guide for hardware descriptions and locations.

FIGURE 1.

1. Secure the front of the support carriage to the frame using a 3/4" wrench and 3/4" socket.

   NOTE: Using a partner, lift the front of the tractor over the carriage assembly.

2. Secure the rear of the support carriage to the frame using a 1/2" wrench and 1/2" socket. See figure 2.

FIGURE 2.

3. Insert hex bolt part way into the bottom hole of the grill mounting bracket (either side). Lift carriage assembly until it is against the bolt then tighten using a 1/2" wrench and 1/2" socket.
4. On top of the rear idler bracket assembly, loosen the left hex nut and remove the right hex nut using a 7/16" deep well socket.
5. Secure side plates to the rear idler bracket assembly using a 9/16" wrench and 9/16" socket.
6. Secure front idler bracket assembly to side plates using a 9/16" socket.
7. Attach extension spring between hex nuts on the flat idler, leaving slightly loose, and hole on right side plate. See figure 3.

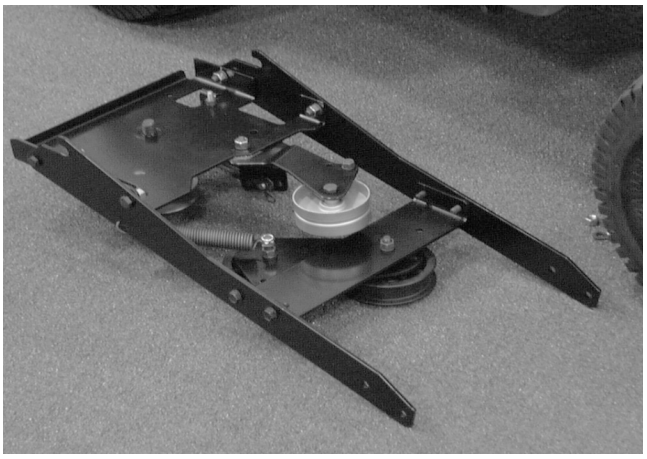


FIGURE 3.

8. Slide slots of side plates onto rod under tractor.

   NOTE: The front deck links must come through the slots of the rear idler bracket assembly. The ends of the side plates go inside the support carriage.

9. Secure the front of the side plates to the support carriage using a 9/16" socket.
10. Remove the control rod from the idler bracket by removing the hairpin clip. Lower the engagement lever to the lowest position.
11. Thread the adjustable lift link all the way up and insert the adjustable lift link into the hole in the idler engagement bracket. Secure with the hairpin clip from the deck assembly. See figure 4.

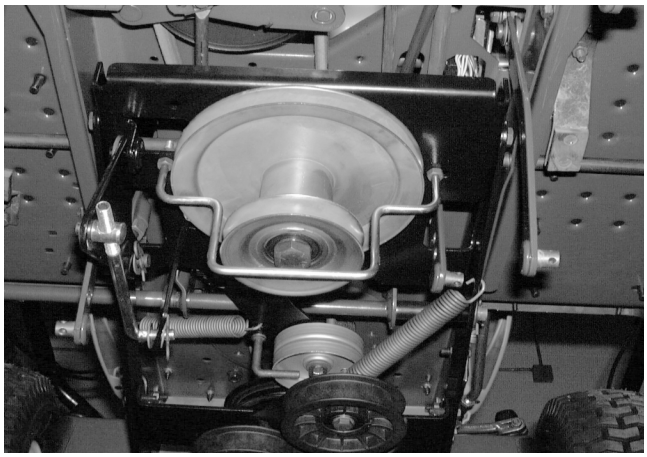


FIGURE 4.

12. Insert the control rod into the idler bracket and secure with hairpin removed in step 10.
13. Tilt auger housing forward and roll the tractor up to the housing. Line up the hole in the small lift link on the support carriage with the hole in the bottom lift link. Insert lift pin through both holes and secure with cotter pin.
14. Line up the hole in the bottom lift link with the bottom rear hole in the support carriage. Place flat washer over hex bolt and insert into hole. Place other flat washer on hex bolt. Secure with slotted nut. Using a 1/2" wrench, tighten slotted nut until snug, then back off approximately 1/3 turn or until one of the slots in the slotted nut lines up with the hole in the bolt.
15. Insert the cotter pin through the slot in nut and hole in bolt. Secure with cotter pin.
16. Place hex bolt through hole in top link and hole in support carriage. Secure with hex lock nut using a 1/2" socket and 1/2" wrench. NOTE: Make certain the hex nut is loose enough to allow the top link to pivot.
17. Lubricate the snow thrower chute opening.
18. Loosen the two hex nuts on the chute crank spiral bracket using a 1/2" wench.
19. Place discharge chute over chute opening of snow thrower housing with the opening in the discharge chute facing forward. Line up the spirals of the chute crank with the notches in the discharge chute. Place the chute flange keepers beneath flange discharge chute, and insert hex bolts up through chute flange keepers and discharge chute flange. Secure all three flange keepers finger tight with lock nuts, then tighten using a 7/16" socket and 7/16" wrench.

    NOTE: Leave lock nuts loose enough to allow easy turning of discharge chute.

    NOTE: Make sure the hex lock nuts securing the upper chute to the lower chute are not over-tightened. This could cause the plastic tab within the cable guide, for the chute tilt control, to break where the barrel on the end of the cable fits into the plastic retainer.
20. Install chute crank support tube and rod on left top link of snow thrower support tube and secure with carriage bolts, washers, and nuts using a 1/2" socket and 1/2" wrench.
21. Remove chute crank rod.
22. Place chute tilt handle assembly on support tube and secure with carriage bolts, washers, and flange lock nuts using a 1/2" socket.
23. Secure cables of chute tilt handle assembly to support tube using cable tie.
24. Insert end of chute crank rod into universal joint and secure with cotter pin.

    NOTE: It may be necessary to pull back on chute rod to line up end of chute rod with the universal joint.
25. Line up chute crank spirals with notches in chute and tighten nuts on chute crank spiral bracket using 1/2" wrench.
26. Place lift handle into lift handle mounting bracket on the right side of snow thrower support. Line up holes on lift handle and mounting bracket and secure with hex bolts and lock nuts using a 1/2" socket.
27. Place "Z" end of pivot release cable into hole of lift latch. Loosen nuts on cable and place cable into slot of mounting bracket with one hex nut above the slot and one lock washer and hex nut below. Tighten finger tight. See figure 5.

FIGURE 5.

NOTE: To release the latch when raising or lowering the snow thrower, push down on the lift handle before squeezing the trigger assembly. This will take the pressure off of the pivot release cable and prevent any damage to the cable or trigger assembly. See figure 6.

FIGURE 6.

28. Thread the release cable through the trigger assembly.
29. Slide the flat weld nut into the trigger housing.
30. Hold flat weld nut in position, place the trigger assembly against the lift handle, secure with truss machine screw.
31. Secure pivot release cable to lift handle using two cable ties.

INSTALLING THE BELTS:

32. Pivot the belt guard to the left. See figure 7.

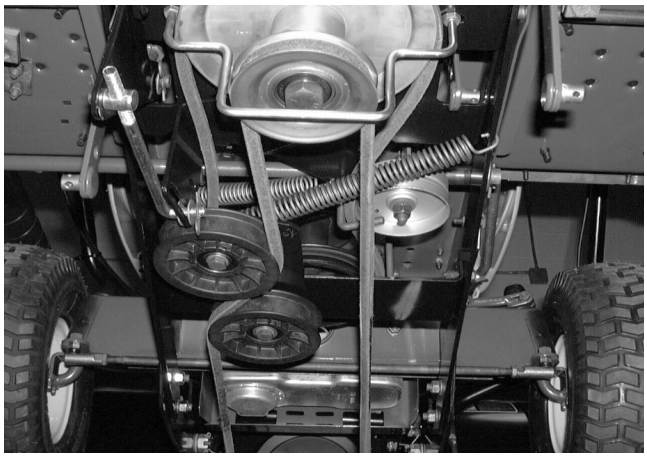


FIGURE 7.

33. Loosen the belt keeper and work the belt past the keeper and onto the engine pulley, idler pulley, and top pulley on the idler bracket assembly.

    NOTE: The flat side of the belt goes against the idler pulley. See figure 8.

FIGURE 8.

34. Lower the snow thrower to the ground.
35. Route the long belt, or auger belt, around the auger pulley.
36. Loosen the nuts that secure the belt guards to the front idler bracket using a 1/2" wrench.
37. Route the belt around idler pulleys and bottom pulley on rear idler bracket assembly. See figure 9.

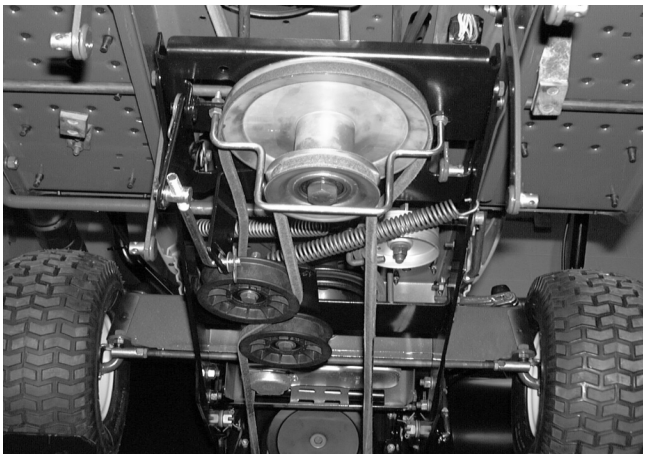


FIGURE 9.

NOTE: The auger belt may "whip", come free, or wear prematurely from rubbing on the edge of the "v" idler. To correct this, replace the v idler with plastic flat idler part # 756-0627. As of 1999 both idlers are flat idlers. This keeps the belt from rubbing and allows for better alignment of the auger belt between the double pulley and the two front "v" idler pulleys. The routing of the belt stays the same with the narrow "v" side of the belt traveling on the left of the rear flat idler and the wider flat side of the belt traveling on the right side of the front flat idler.

NOTE: The auger belt might "whip" or come free. The belt originally used in production in 1996 was part number 754-3039 and was 103" long. The belt currently being used is part # 754-0455 and is 102" long. In 1996, tension was kept on the auger belt with an extension spring that ran from the frame to a "v" idler arm assembly on the front left side of the attachment. In October of 1997 this extension spring was eliminated (reference service kit 753-0716) and tension was changed to the current production design. When installing the kit, also use belt number 754-0455, 102" long.

NOTE: During 1997 and 1998 production, three spacers, part number 711-0242, where installed between the idler support bracket and the idler pivot arm. This was to allow for movement of the belt as the snow thrower was raised and lowered. The spacers attempted to even the plane between the double pulley and two front "v" idlers. With current production now using two flat idlers on the pivot arm, only one spacer should be used instead of three.

38. Place extension spring into hole in idler bracket and, using a short piece of rope, into hole in left frame (just behind left support carriage bracket).
39. Reinstall all belt keepers and belt guard. See figure 10.

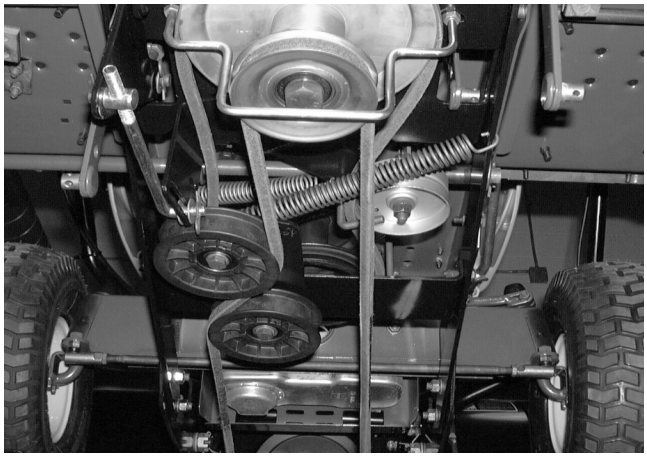


FIGURE 10.

ADJUSTMENTS:

Pivot Release Cable:
Squeeze trigger on trigger assembly. If lift latch does not latch securely, loosen upper hex nut several turns and tighten lower hex nut using two 1/2" wrenches. If pivot release cable has slack in it, loosen lower hex nut several turns and tighten upper hex nut. If lift latch is already latched securely, tighten the lower hex nut. See figure 11.

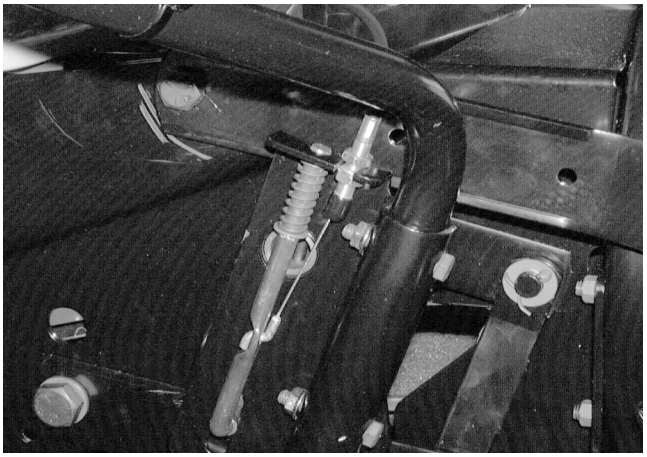


FIGURE 11.

Skid Shoes:
Raise auger housing off the ground and loosen the six hex nuts securing the skid shoes to the housing using a 9/16" wrench. Lower the housing onto a piece of cardboard and tighten skid shoes so they are touching the ground. See figure 12.

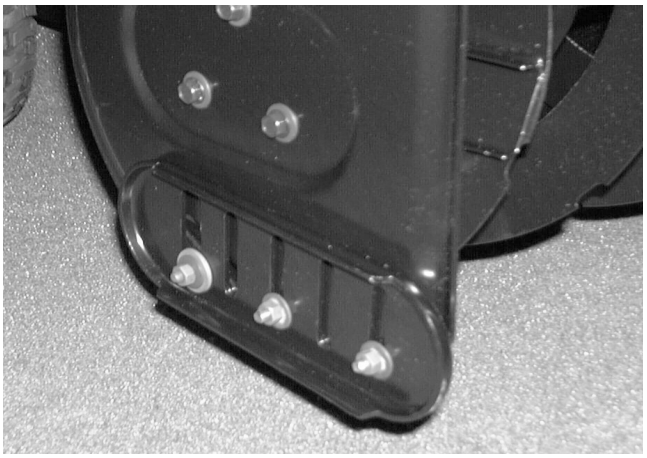


FIGURE 12.

Disengagement (manual pto):
remove the control rod from the idler bracket assembly by removing hairpin clip and washer. Thread control rod out of ferrule a few turns. Reinstall control rod and test engagement. See figure 13.

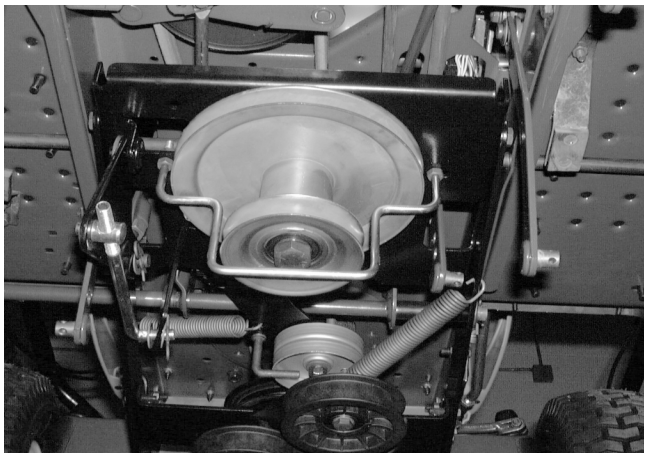


FIGURE 13.

NOTES

46" Dozer Blade

OEM-190-822

1. Identify the different components. See figure 1.

FIGURE 1.

2. Hooked the notched ends of the hitch assembly onto the shoulder bolts on the front of the tractor frame. Secure with the attachment pins. See figure 2.

FIGURE 2.

3. Remove the pivot shaft from the welded brackets on the back of the blade by removing the hairpin clips. See figure 3.

FIGURE 3.

4. Align the holes in the pivot plate with the holes in the welded brackets. Insert the pivot shaft through the holes and secure with hairpin clips. See figure 4.

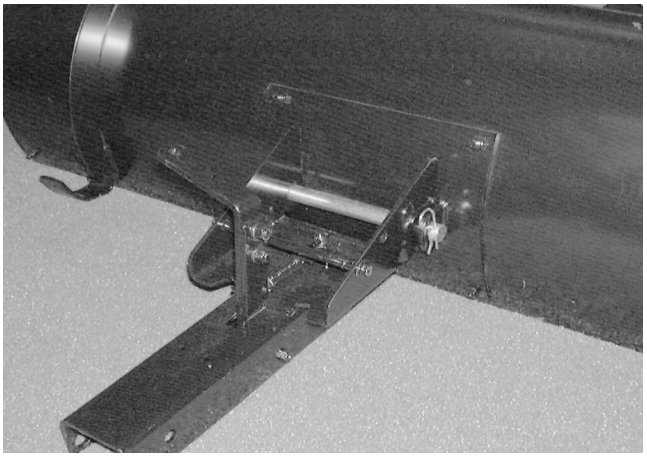


FIGURE 4.

5. Remove the plastic cap, knob, and washer from the blade adjusting spring bolt. Adjust the hex nut on the bolt so that it is threaded approximately 1" onto the bolt. Hook the spring over the spring mount rod. See figures 5 and 6.

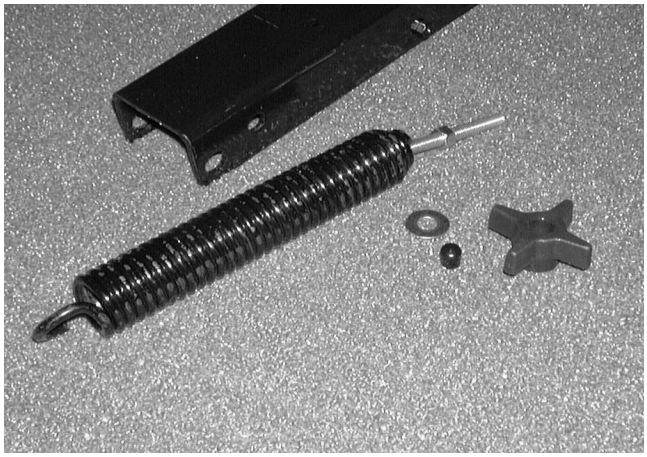


FIGURE 5.

6. Insert the bolt through the hole in the top of the blade and reassemble the washer and the knob onto the bolt. See figure 6.

FIGURE 6.

7. Tighten the knob until it is secure against the blade and hex nut.
8. Place the plastic cap over the end of the bolt.
9. Remove the channel pivot pin, washer, and hair-pin clip from the pivot support bracket. See figure 7.

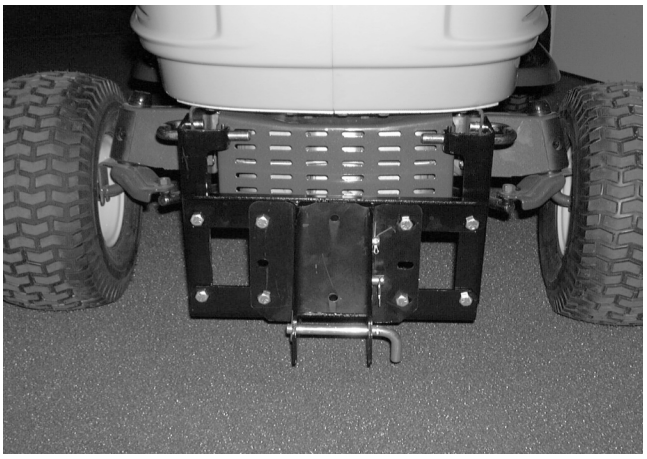


FIGURE 7.

10. Attach the channel assembly to the tractor by placing the end of the channel into the pivot support bracket. Insert the channel pivot pin through the holes in the pivot support bracket and channel. Secure with the hairpin clip. See figure 8.

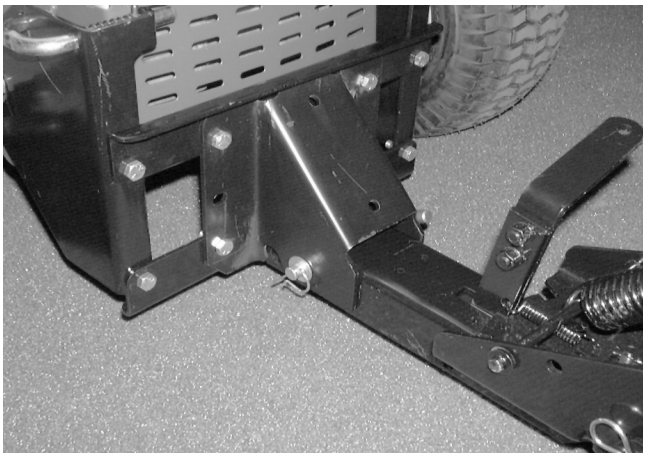


FIGURE 8.

11. Remove the hairpin clip from the lift link pin which is assembled to the pivot support bracket. Insert the end of the lower lift handle assembly through the notch in the pivot support bracket and through the holes in the channel. Align the lift link pin with the hole in the welded bracket on the lower lift handle assembly. Insert the lift link pin through the hole in the bracket and secure with the hairpin clip. See figure 9.

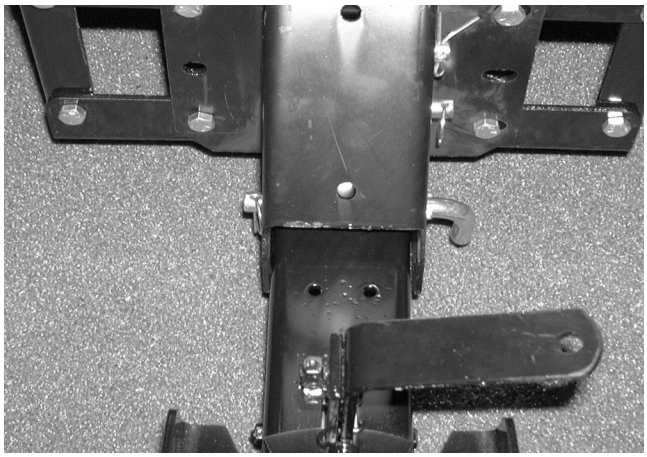


FIGURE 9.

12. Remove the clevis pin and hairpin clip from the upper lift handle. Place the upper lift handle over the lower lift handle assembly. Align the holes and secure with the clevis pin and hairpin clip. See figure 10.

FIGURE 10.

ADJUSTMENTS:

Skid Shoes:

1. Loosen the two nuts securing the skid shoes to the blade.
2. Set the shoes to the desired position and re-tighten. See figure 11.

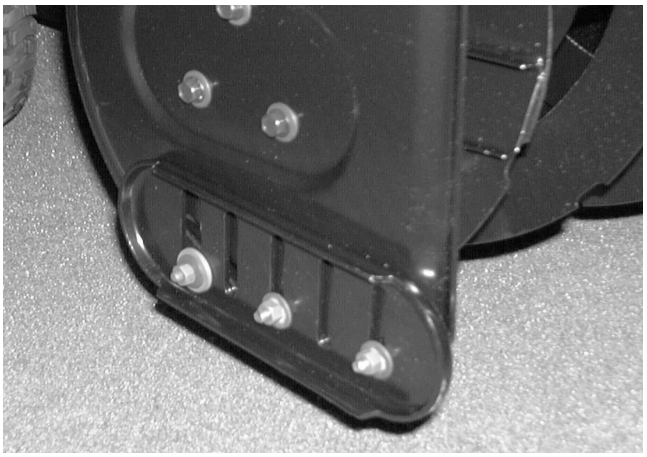


FIGURE 11.

To stiffen the blade trip action:

1. Loosen the hex nut on the spring bolt.
2. Tighten the knob. See figure 12.

FIGURE 12.

The normal adjustment of the spring tension is for the spring bolt to extend 1" through the hex nut.

NOTES

SECTION 10
SNOW THROWER

1999-2000 Snow Thrower Overview

The following report lists previous issues, concerns and the improvements that will be found on the 2000 model year snow throwers.

500 SERIES

1. Service Advisory sent to the field advising dealers to remove the left and right drive shaft retainers part number **784-5730** (same number for both) and then thoroughly lubricate the left and right drive shaft actuators with an automotive style wheel bearing grease.

   CAUTION: Use of aerosol or liquid based lubricants other than the above mentioned automotive grade wheel bearing grease is not recommended.

2. For 1999-2000 the drive axles will be heat treated. The part number will be going to an **"A"** level as **738-0994A**.

800 SERIES

1. The drive shaft has gone to a **"B"** level part number **618-0294B**. This updated shaft contains the following modified components. Ring gear part number **717-1211A** and carrier part number **718-0188A**. Both of these parts have new oil impregnated bushings pressed into them from the supplier. These new bushings significantly improve the durability of the drive shaft.
2. The hex bushing used in the sides of the frame, part number **741-0597** has been changed to **741-1111**. This new part is oil impregnated. This new bushing will also be used on the smaller 500 series units. However, it will only be a running change as the smaller 500 series units do not show the same amount of wear as the larger 800 & 900 series models.
3. The auger idler bracket **784-0385** has gone to an **"A"** level. The bracket has been re-tooled so the auger idler pulley is .250" further from the impeller housing, improving belt alignment.
4. The auger brake assembly part number **618-0281** has gone to an **"A"** level. The new assembly has a lower coefficient of friction and also higher strength resulting in less aggressive braking of the drive system.

900 SERIES

1. The drive shaft has gone to a **"B"** level part number **618-0282B**. This updated shaft contains the following modified components. Two ring gears part number **717-1211A** and 2 carriers part number **718-0188A**. Both of these parts have new oil impregnated bushings pressed into them from the supplier. These new bushings significantly improve the durability of the drive shaft.
2. The hex bushing used in the sides of the frame, part number **741-0597** has been changed to **741-1111**. This new part is oil impregnated. This new bushing will also be used on the smaller 500 series units. This will only be a running change on the smaller 500 series units as they do not show the same amount of wear as the larger 800 & 900 series models.
3. The auger idler bracket **784-0385** has gone to an **"A"** level. The bracket has been re-tooled so the auger idler pulley is .250" further from the impeller housing, improving belt alignment.
4. The auger brake assembly part number **618-0281** has gone to an **"A"** level. The new assembly has a lower coefficient of friction and also higher strength resulting in less aggressive braking of the drive system.

4 Wheel Drive Snow Thrower

LUBRICATION:

WHEEL CHAIN CASE

1. The wheel chain case is equipped with a grease fitting. A cold weather multi-purpose grease should be pumped into chain case after every 25 hours of operation. See figure 1.

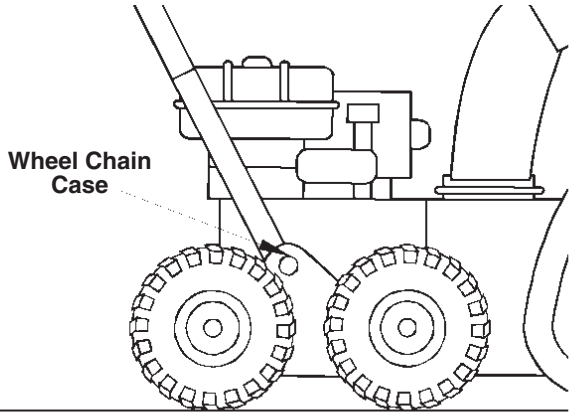


FIGURE 1.

CAUTION: Two pumps is sufficient, exceeding this may cause grease to leak out of the chain case when warm.

WHEELS

1. Oil or spray lubricant into bearings at wheels at least once a season. Remove wheels, clean and coat axles with a multi-purpose automotive grease.

DRIVE AND SHIFTING MECHANISM

1. Remove rear cover. Oil any chains, spockets, gears, bearings, shafts, and shifting mechanism at least once a season. Use engine oil or a spray lubricant. **Avoid getting oil on rubber friction wheel and aluminum drive plate.** See figure 2.

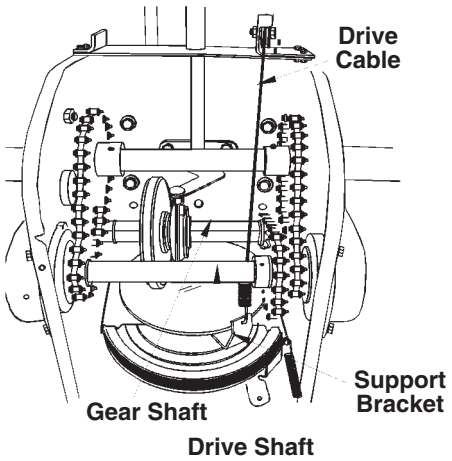


FIGURE 2.

GEAR BOX

1. The worm gear box has been filled with grease at the factory. If disassembled for any reason, lubricate with 1.5 ounces of Shell Alvania grease EPR00, part number 737-0168. Before reassembling remove old sealant and apply “Loctite 5699” or equivalent.

   CAUTION: Do not overfill the gear box, damage to the seals could result. Be sure the vent plug is free of grease in order to relieve pressure.

WORM GEAR

1. The worm gear on the chute direction crank should be greased with multi-purpose automotive grease.

MAINTENANCE AND LUBRICATION CHECK LIST

	After First 2 Hours	After 5 Hours	Frequently	Beginning Each Season	Before Storage
Check engine oil level					
Change engine oil					
Tighten all screws and nuts					
Check spark plug					
Lubricate chute opening					
Lubricate wheel axle					
Lubricate wheel bearings					
lubricate chains, bearings, shafts and shifting mechanism					
Check wear on friction wheel rubber					

GEAR SHAFT

1. Lubricate the gear (hex) shaft with a light weight cold weather lubricant at least once a season or after every 25 hours of operation.

   IMPORTANT: Keep all grease and oil off of the rubber friction wheel and aluminum drive plate.

2. If for any reason your transmission was disassembled and the drive cable disconnected, make sure when reassembling to pass the cable between the drive shaft and the gear shaft before reconnecting to support bracket. See figure 2.

MAINTENANCE:

WARNING: Disconnect the spark plug wire and ground against the engine before performing any repairs or maintenance.

AUGERS

1. The augers are secured to the spiral shaft with two shear bolts and hex locknuts. See figure 3. A direct impact of an object will usually cause the shear bolts to shear however, if you ingest an object between the augers/impellers and housing you may cause damage without shearing bolts. Keep clear of foreign objects.

   NOTE: Locknuts cannot be threaded onto a bolt by hand. This type of nut is used where vibration occurs.

2. If the augers will not turn, check to see if the hex bolts have sheared. Two replacement hex bolts (F) and hex lock nuts (H) have been provided with the snow thrower. When replacing bolts, spray an oil lubricant into shaft before inserting new bolts.

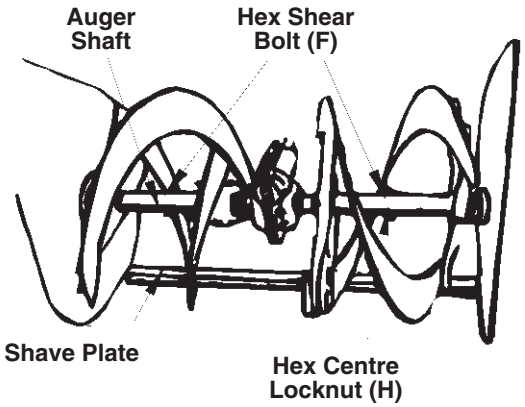


FIGURE 3.

SHAVE PLATE AND SLIDE SHOES

1. The shave plate and slide shoes on the bottom of the snow thrower are subject to wear. They should be checked periodically and replaced when necessary.
2. To remove slide shoes, remove the four carriage bolts, Belleville washers and hex nuts which attach them to the snow thrower. Reassemble new slide shoes with the four carriage bolts, Belleville washers (cupped side goes against slide shoes) and hex nuts.
3. To remove shave plate, remove the carriage bolts, Belleville washers and hex nuts which attach it and the slide shoes to the snow thrower housing. Reassemble new shave plate, making sure heads of the carriage bolts are to the inside of the housing. Tighten securely.

BELT REMOVAL AND REPLACEMENT

WARNING: Remove the spark plug wire from the spark plug and ground. Drain gasoline from the fuel tank, or place a piece of plastic film underneath the gas cap to prevent gasoline from leaking.

1. Disconnect electric chute crank motor at the discharge chute by removing the hex bolt, Belleville washer and hex nut as shown in figure 4. Loosen the remaining hex bolt, Belleville washer and hex nut.
2. Remove the two lockwashers and hex nuts which attach the bracket to the frame. See figure 4.

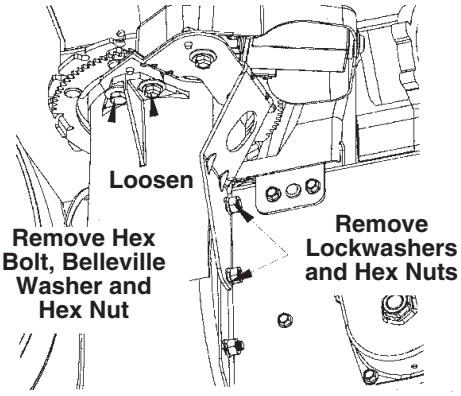


FIGURE 4. (Viewed from underside of chute)

3. Remove the plastic belt cover on the front of the engine by removing two self-tapping screws. See figure 5.

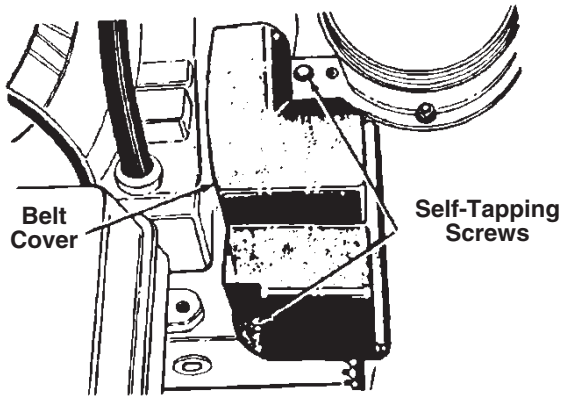


FIGURE 5. (Chute removed for clarity.)

Maintenance

AUGER DRIVE BELT

1. Unthread the bottom of the auger cable from the "Z" fitting, leaving the hex nut in place.
2. Remove the four remaining lockwashers and hex nuts which attach the auger housing assembly to the frame. See figure 6.

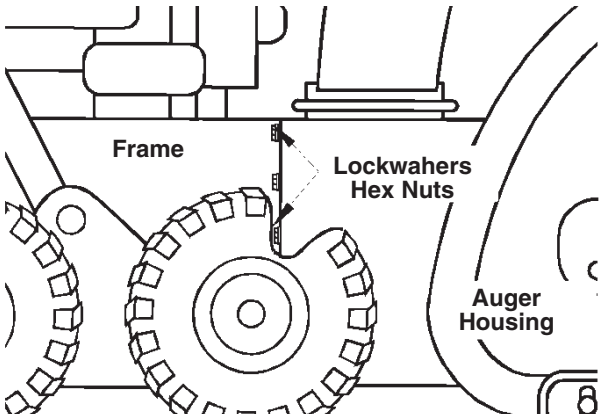


FIGURE 6.

3. Separate the housing from the frame assembly by standing in the operating position and lifting up on the handles. The frame and housing will separate, and the rear auger drive belt will come off the pulleys. See figure 7.

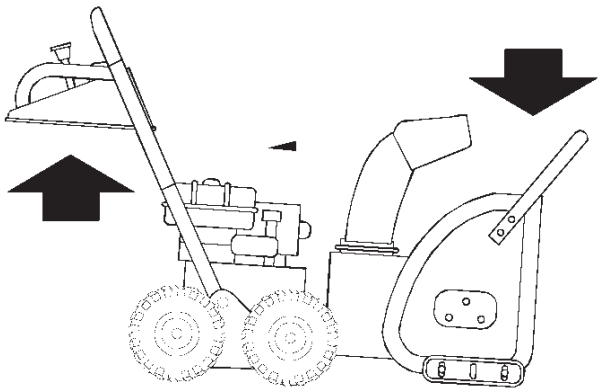


FIGURE 7.

NOTE: Your unit may be equipped with one or two auger belts.

4. To remove the front auger drive belt, push the idler pulley to the left, and lift front auger drive belt from the front auger pulley. See figure 8.

REPLACE BOTH AUGER DRIVE BELTS BY FOLLOWING INSTRUCTIONS IN REVERSE ORDER.

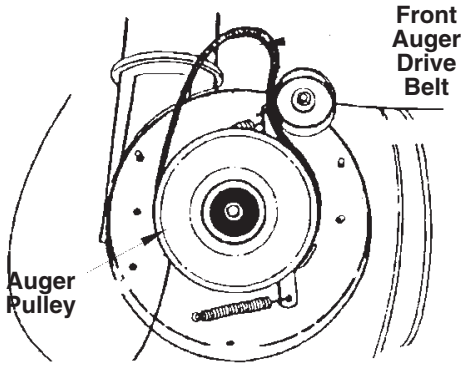


FIGURE 8.

NOTE: When reassembling the two halves of the unit, the auger drive cable must be routed through the cable roller guides as shown in figure 9.

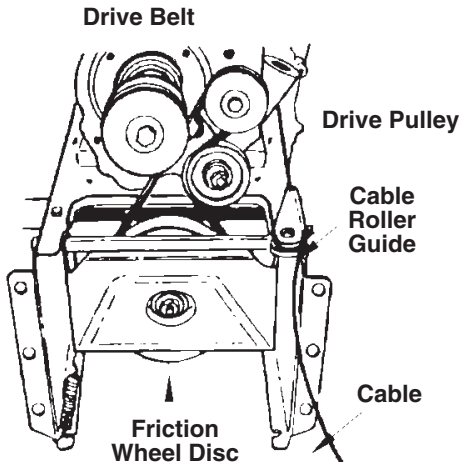


FIGURE 9.

DRIVE BELT

NOTE: Separating the housing from the frame is not required when removing and replacing the drive belt.

1. Tip the snow thrower up and forward, so that it rests on the housing.
2. Remove six self-tapping screws from the frame cover underneath the snow thrower.

3. Pull the idler pulley towards you and remove the drive belt from the pulley. You will find the idler pulley in front of the engine and under the belt cover that you removed earlier. See figure 10.

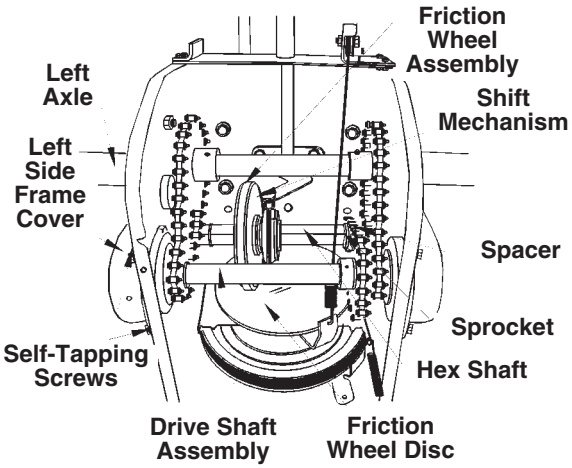


FIGURE 10.

4. Slip belt between friction wheel and friction wheel disc. See figure 11. You may have to twist the belt flat in order to slide it through the clearance between the friction wheel and the friction wheel disc. Remove the belt completely.
5. Replace new belt. Reassemble in reverse order.

FRICTION WHEEL

1. Check wear on friction wheel at least once a season. Replace rubber ring (friction wheel) before clamping plates damage aluminum drive plate. See figure 11.

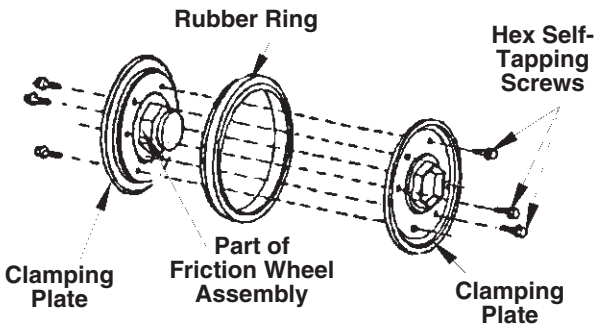


FIGURE 11.

CHANGING THE FRICTION WHEEL RUBBER

1. The rubber on the friction wheel is subject to wear and should be checked after 25 hours of operation, and periodically thereafter. Replace the friction wheel rubber if any signs of wear or cracking are found.
2. Drain the gasoline from the snow thrower, or place a piece of plastic under the gas cap.
3. Tip the snow thrower up and forward, so that it rests on the housing.
4. Remove six self-tapping screws from the frame cover underneath the snow thrower.
5. Remove the klick pin which secures the left wheel, and remove the left wheel from the axle.
6. Remove four self-tapping screws from the left side frame cover and remove the cover off the drive shaft assembly. Refer to figure 11.
7. Holding the friction wheel assembly, slide the hex shaft out the left side of the unit. The spacer on the right side of the hex shaft will fall and the sprocket should remain hanging lose in the chain.

   NOTE: If the sprocket fell from the snow thrower while removing the hex shaft, place the sprocket on the hex shaft. Position the hex hub of the sprocket toward the friction wheel when sliding the sprocket onto the hex shaft.
8. Lift the friction wheel assembly out between axle shaft and drive shaft assembly.
9. Remove the six screws from the friction wheel assembly (three from each side). Remove the friction wheel rubber from between the clamping plates.
10. Reassemble new friction wheel rubber to the friction wheel assembly, tighten approximately 2 turns on each screw until tight. It is important for the rubber to be assembled symmetrically.
11. Slide the friction wheel assembly up onto the shift mechanism as shown in figure 11 and slide the hex (gear) shaft back into the unit.

REASSEMBLE IN REVERSE ORDER USING THE FOLLOWING TIPS.

NOTE: When reassembling make sure the spacer is aligned between the sprocket and the right side bearing on the hex shaft.

NOTES

SECTION 11
SERVICE KITS

Service Kit 753-0714

CODE: R-401

DATE: July 6, 1999

SUBJ: Transmission housing replacement

This kit replaces housing part numbers 717-0541, 719-0303, 717-0761, and 717-0761A.

RE-ASSEMBLY INSTRUCTIONS:

For proper assembly of the transmission it is recommended that the procedure found in the Technical Service Handbook (Form No. 770-8640L) be used.

!NOTE!

Hex head screws (Part No. 710-1206) have been provided to replace the original self-tapping screws used to mount the brake yoke. The new housing already has the mounting holes threaded in the casting for this purpose.

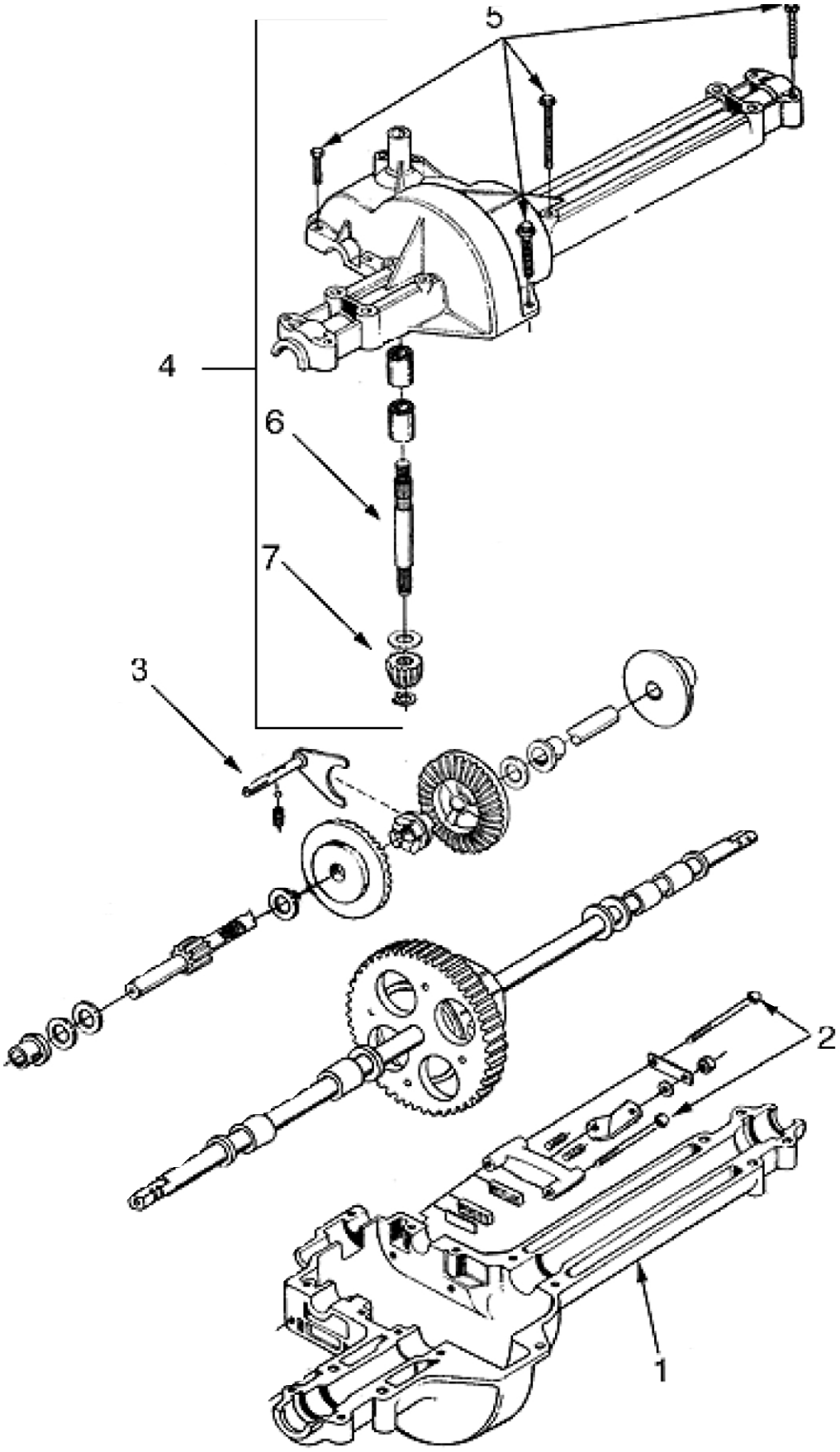
In addition to the brake mounting change it is also necessary to discard the original hardware used to fasten both transmission housings together. The 13 tap screws provided in this kit will be used for this purpose.

Finally, the shift fork on later model units was modified with a larger diameter detent shaft. The original shift fork will be discarded and replaced with the shift fork supplied in the kit. It will be necessary to retain the spring and detent ball from the original transmission. The spring and detent ball on the replacement housing will be positioned on the lower housing as opposed to earlier models where the ball and spring were mounted in the upper housing.

Service Kit 753-0714 consists of:

Ref. No.	Part No.	Description	Qty.
1	719-0313B	Lower housing	1
2	710-1206	Hex head screw	2
3	611-0011	Shift fork assembly	1
4	618-0072B	Upper housing ass'y (Incl. Refs 5, 6 & 7)	1
5	710-1325	Tap screw	13
6	711-1109	Input Shaft	1
7	717-1464	Input Pin, 14 T	1

Over



Service Kit 753-0867

CODE: R-433

DATE: June 28, 1999

SUBJECT: Yard Bug Wiring Harness & Seat Switch Revision

Use this Service Kit when replacing Wire Harness (629-0902) and/or Seat Switch (725-3234) on units manufactured prior to those with serial numbers beginning 5B269.

It has been found in some instances that units fail to start due to an insufficient charge being produced by the tractor's battery. This may be the result of the operator failing to follow proper stopping procedure as instructed in the Operator's Manual under the heading Stopping Mower. The final instruction beneath this heading reads:

- Turn the ignition key to OFF position and remove the key.

If the operator continually leaves the ignition key in the ON position, the result will be a dead battery and the installation of this kit is suggested. Following proper operating instructions eliminates the need for this service kit.

IMPORTANT: This is NOT a warranty repair situation.

Service Kit 753-0867 consists of:

PART NO.	QTY.	DESCRIPTION
725-1461	1	Seat Safety Switch
629-0925	1	Wiring Harness
725-0157	5	Cable Tie

1. Disconnect and remove battery.

IMPORTANT: Note the routing of the harness and placement of cable ties. Pay specific attention to the routing of the wires going to the brake safety switch.

NOTE: *It is helpful to remove the bagging chute to gain access to the harness in the front of the unit.*

2. Disconnect and remove original wire harness.
3. In order to remove the seat switch assembly, remove the rubber boot covering the seat switch. Disconnect the wires from the switch. Use a narrow punch to depress the three locking pins in the mounting holes. See Figure 1, while applying pressure to the assembly. Turn the switch assembly counterclockwise and remove.
4. Install replacement wire harness and seat switch. Insure correct routing of wires. Test operation of the safety system.

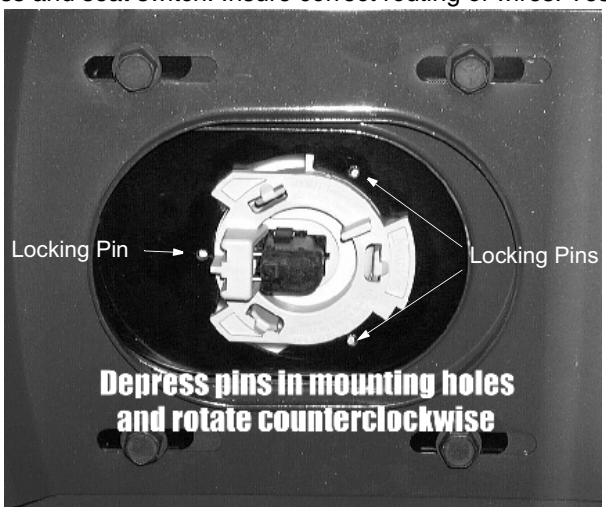


Figure 1

Form No. 770-10272
(6/99)

5. Use Figure 2 below for reference when installing this service kit.

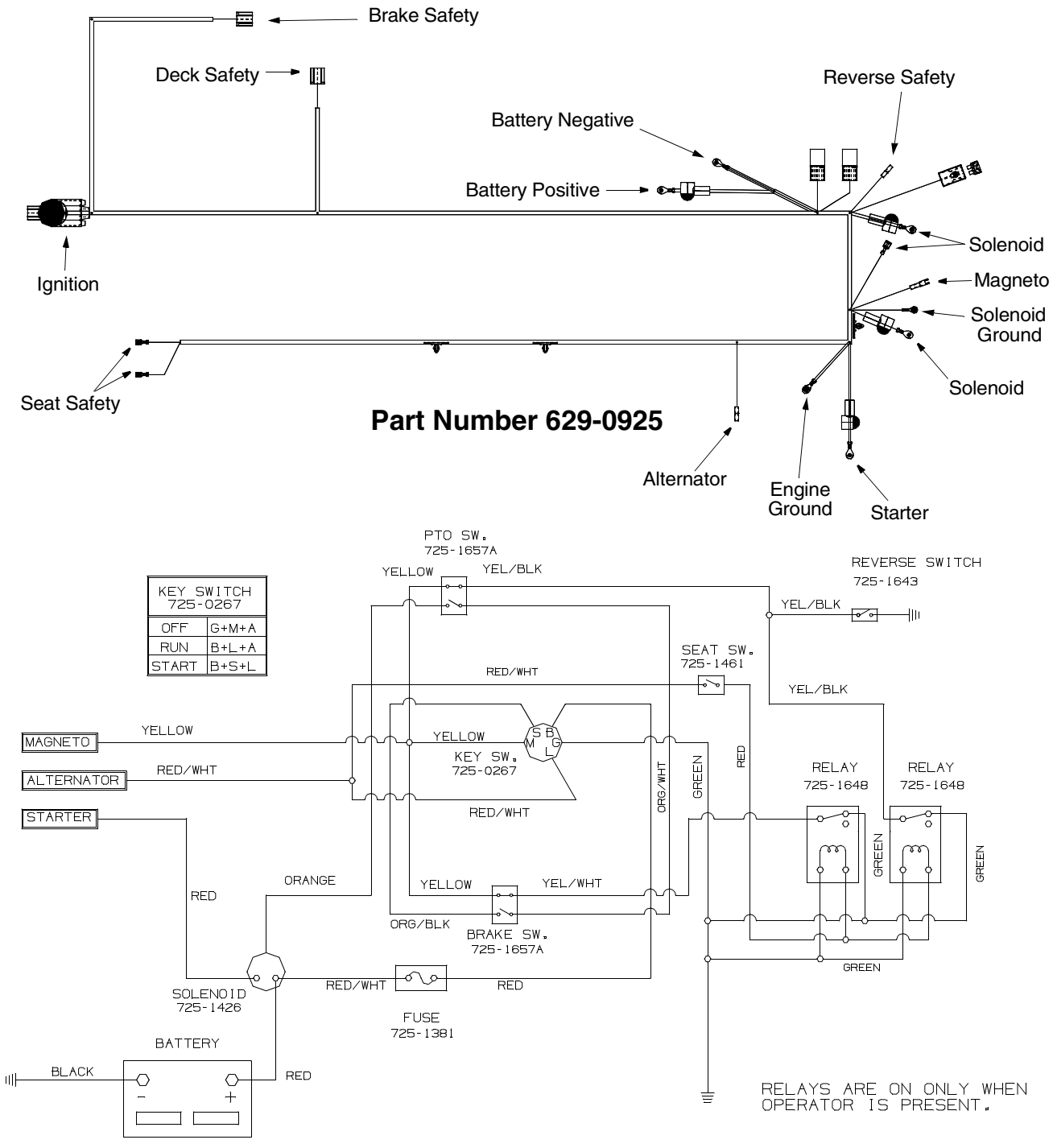


Figure 2

Service Kit 753-0868

CODE: R-434
DATE: June 8, 1999
SUBJECT: Shift Linkage Replacement
MODELS AFFECTED: 604, 608 & 609

Service Kit 753-0868 applies to AutoDrive™, Pedal Drive, Automatic Transmission & Automatic Lawn Tractors having serial numbers whose first five digits fall between 1B019H10001 and 1E209H10190. If you are unsure of your tractor's serial number, locate your tractor's Model Plate found beneath the seat.

This kit is a recommended remedy for various shifting problems and should be applied before replacing the transmission in the event the operator experiences any of the following difficulties:

- Moving the shift lever either into or out of the Forward position or Reverse position.
- Tractor moves in either direction when depressing the drive pedal with the Shift Lever in the Neutral position.
- Shift Lever remains in either the Forward or Reverse position while depressing the drive pedal, yet the tractor fails to move.

PART NO.	QTY.	DESCRIPTION
17840	1	Transaxle Mounting Bracket
647-0045	1	Shift Lever
647-0047	1	Shift Rod
711-0736	1	Adjustment Ferrule, 1/4-20
714-0104	1	Internal Cotter Pin
714-0111	1	Cotter Pin
714-0149B	1	Internal Cotter Pin
732-0525	1	Compression Spring Clip
736-0275	1	Flat Washer, .344 x .688 x .065
736-0272	1	Flat Washer, .51 x 1 x .060
726-0320	1	Insulator Nut Plate
783-1015	1	Shift Lever Support Bracket
783-1016	1	Speed Control Rod Bracket

Installation Instructions: Remove the existing shift linkage and replace with the contents of this kit. Refer to Figure 1 and Figure 2 for the location of parts included in the kit.

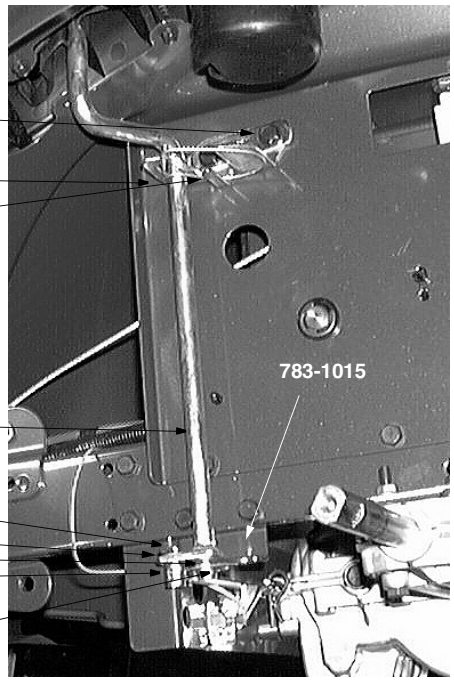
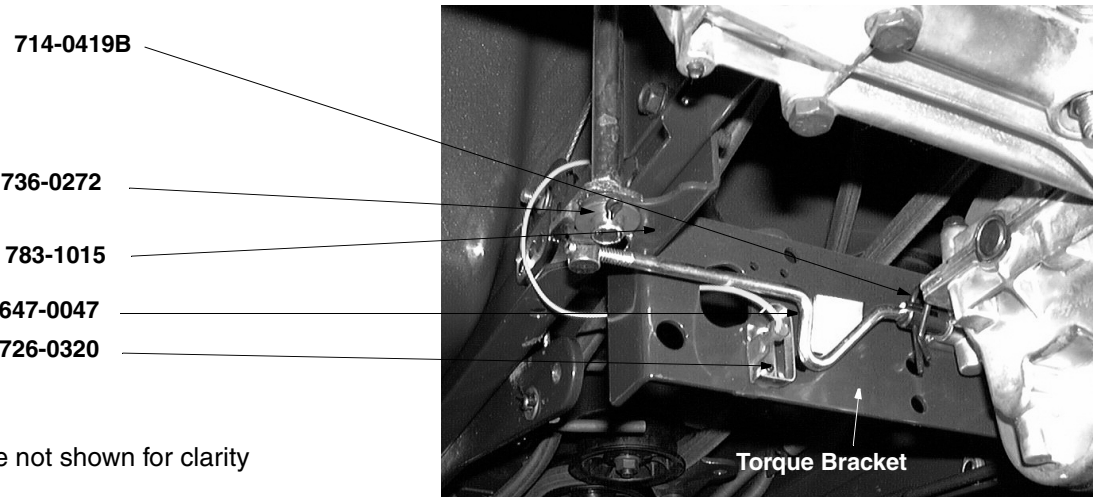


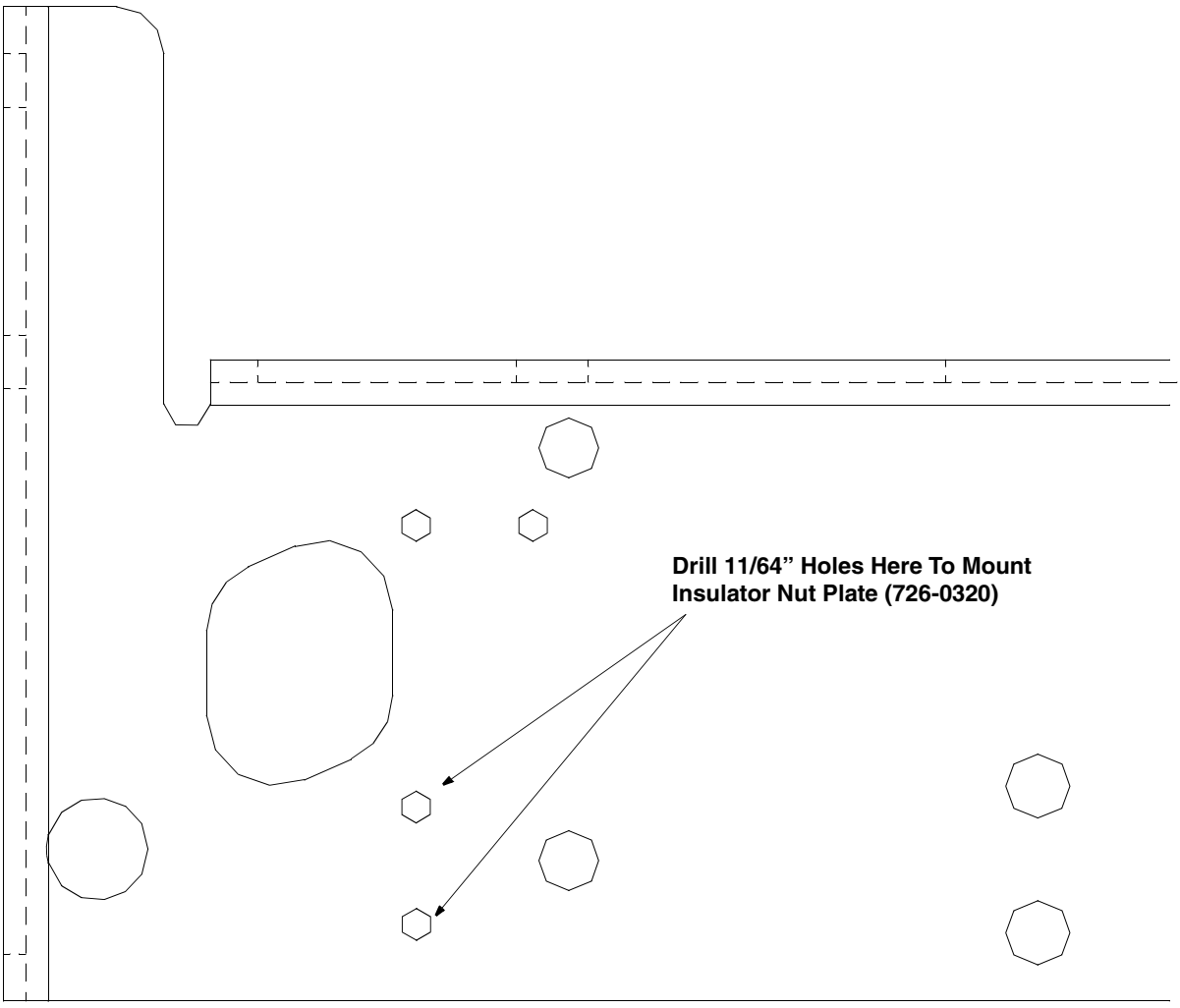
Figure 1



Note: Rear left tire not shown for clarity

Figure 2

NOTE: If the reverse switch is NOT in the position show in Figure 2, remove the switch, and using the template provided below, drill new mounting holes. Reinstall the reverse switch using the insulator nut plate included in this kit.



Service Kit 753-0869

CODE: RT-132

DATE: July 30, 1999

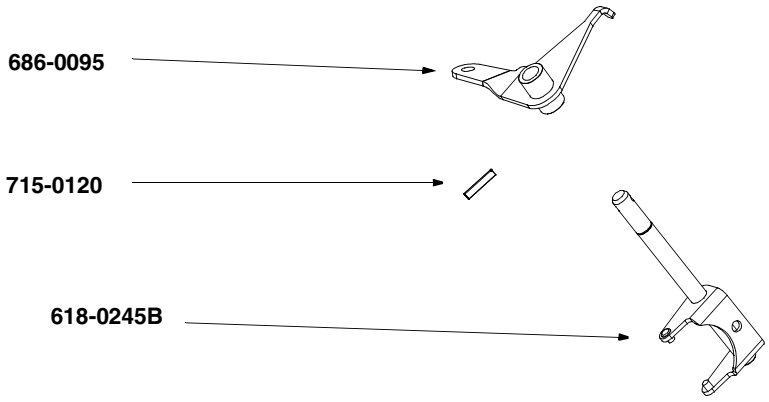
SUBJECT: Shifter Assembly for 1995 Model 410 Rear-tine Tiller

Service Kit 753-0869 is for use on Rear-tine Tiller Models 410-417. If you are unsure of your tiller's Model Number, refer to the Model Plate found on the rear right portion of the tiller's tine shield.

- Use this kit when replacing shifter assembly part number 618-0105.

Service Kit 753-0869 consists of:

PART NO.	QTY.	DESCRIPTION
715-0120	1	Spiral Pin, 3/16 x 1.0
686-0095	1	Shift Crank Assembly
618-0245B	1	Shift Assembly



Service Kit 753-0861

CODE: R-428

DATE: April 14, 1999

SUBJECT: Electric PTO Clutch Anti-rotation Bracket Installation

Service Kit 753-0861 is for use on AutoDrive™, Pedal Drive, Automatic Transmission & Automatic Lawn Tractors and Garden Tractors having serial numbers whose first five digits fall between 1B019H and 1C139H. If you are unsure of your tractor's serial number, refer to Section 2 of your tractor's Operator's Manual or locate your tractor's Model Plate found beneath the seat.

Use this kit in the event the original electric PTO clutch anti-rotation pin (if so equipped) fails.

Service Kit 753-0861 consists of:

PART NO.	QTY.	DESCRIPTION
710-0604A	2	Self Tapping Screw, 5/16-18 x .625
683-0300-0637	1	PTO Clutch Anti-rotation Bracket

1. Place the Bracket on a flat surface and thread the Self Tapping Screws into it using a 1/2" wrench. See Figure 1.
2. Remove the Self Tapping Screws from the Bracket.

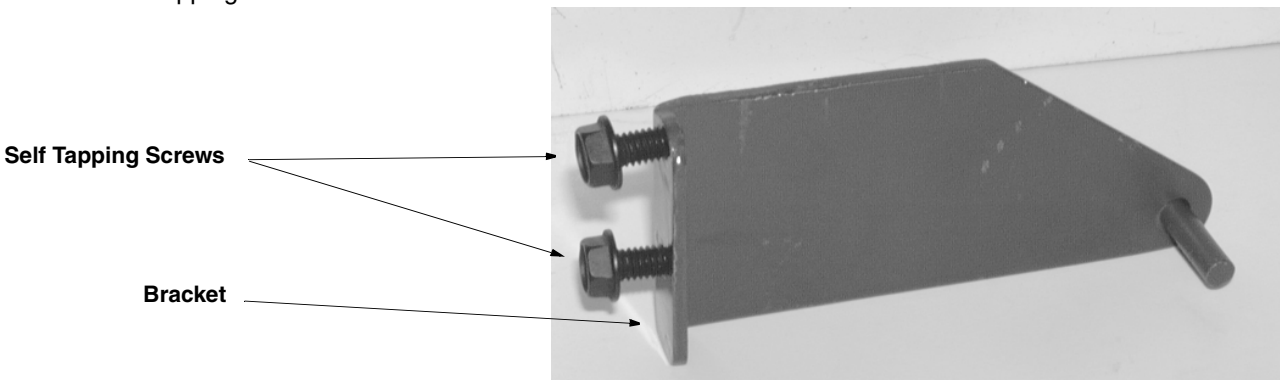


Figure 1

3. The Bracket will mount to the left frame rail directly across from the electric PTO clutch. See Figure 2

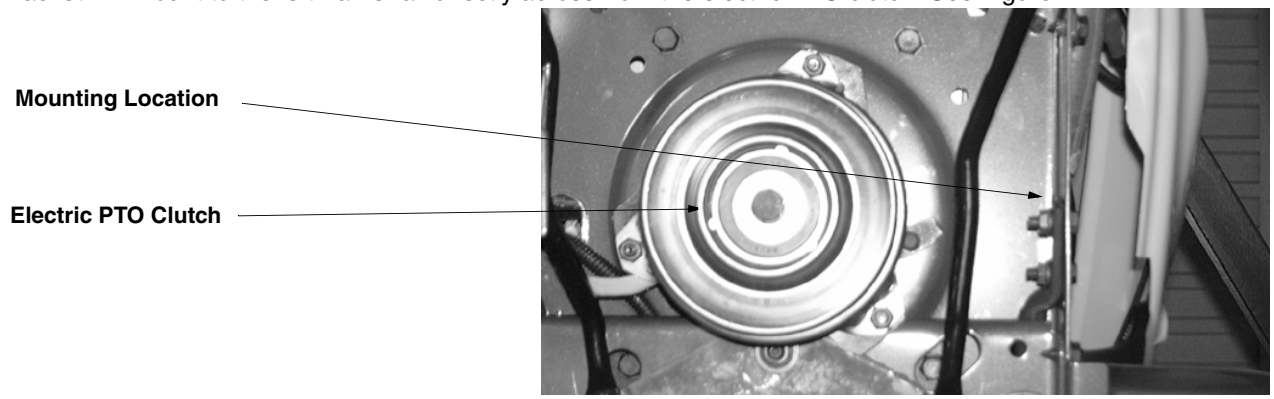


Figure 2

Form No. 770-1646A
(4/99)

4. Place the Bracket in place and make sure the clutch stop pin locks into the electric PTO clutch hole. See Figure 3.
5. Locate the open hole in the left frame rail that is directly in front of the Self Tapping Screws that secure the dash support tube to the frame.

   NOTE: Screw driver shown through the open hole of the frame rail in Figure 3.

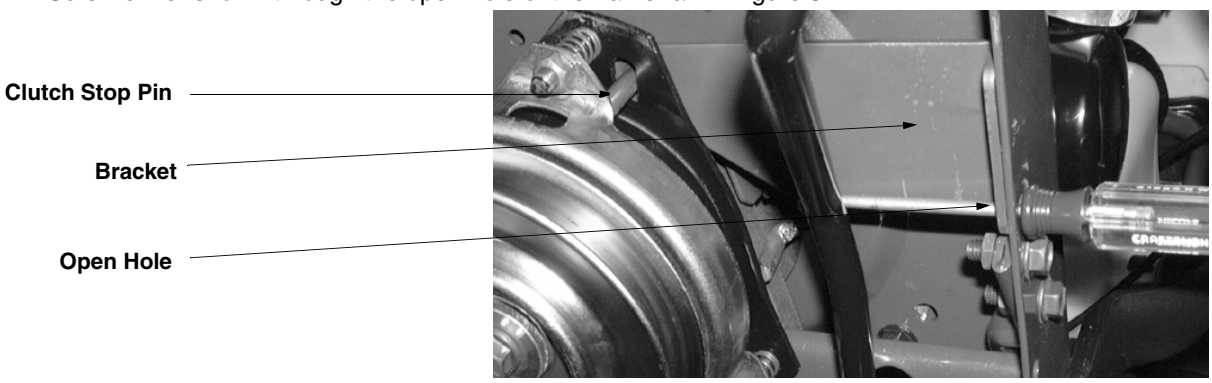


Figure 3

6. Rotate the Bracket upside down until the stop pin points straight up. Place the Bracket up to the outside of the frame and mark the second hole location using a center punch. See Figure 4.

   NOTE: Securing the Bracket to the frame with one Self Tapping Screw (from the inside) is the best method for correct hole location. Make certain the holes are parallel to the frame rail.

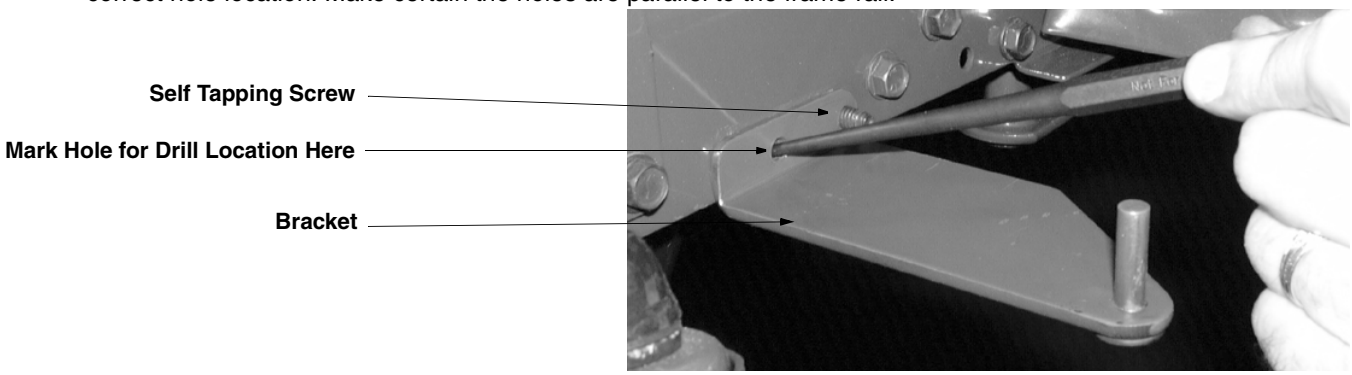


Figure 4

7. Remove the Bracket and drill out the punch marked hole in the frame using a 5/16” drill bit.

   NOTE: Predrilling this hole with a smaller sized bit will ease this procedure.

8. Place the stop pin of the Bracket into the electric clutch and rotate the bracket into place.
9. Secure the Bracket to the frame using both Self Tapping Screws from the outside. Use a 1/2" wrench to tighten them down securely. See Figure 5.

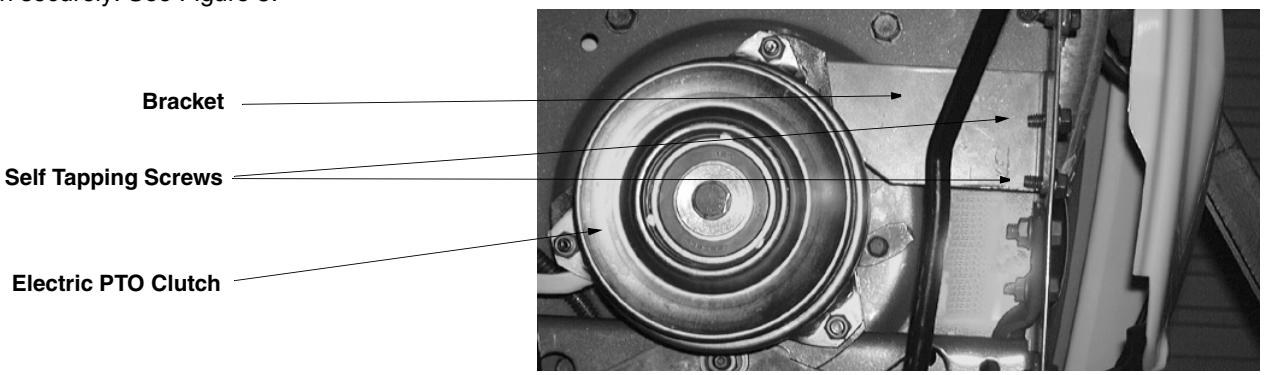


Figure 5

Service Kit
753-0857

CODE: R-420
DATE: March 4, 1999
SUBJ: 42” Deck Skirt

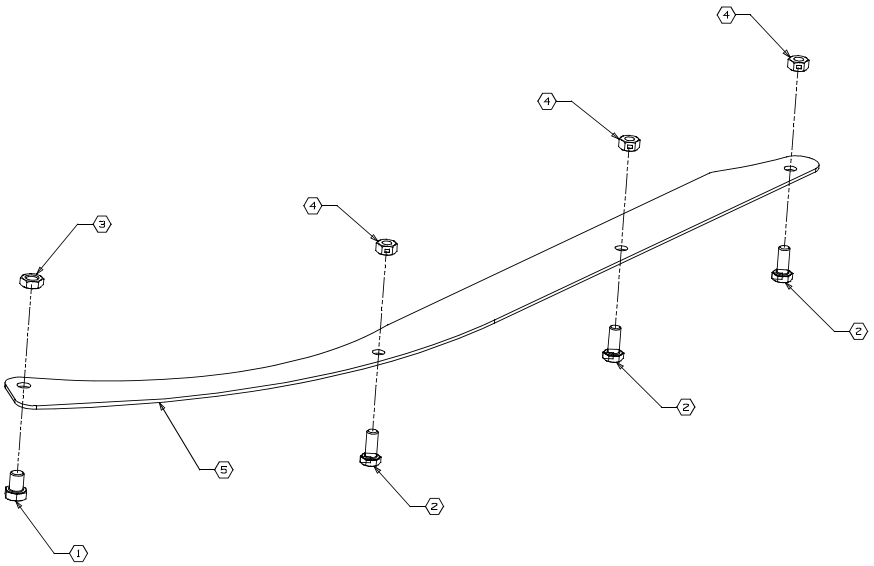
Service Kit designed to help reduce grass cuttings from blowing out the front and right side of 42” decks on MTD 600 series and RT-99 series riders during mulching.

INSTALLATION INSTRUCTIONS

1. Remove the deck and/or place it in a stable position to work with the underside.
2. Remove the mulching plug
3. Align the 3/8” diameter hole in the Deck Skirt (p/n783-0874) to the 3/8” diameter hole in the Discharge Bracket. Fasten using the 3/8” screw (p/n 710-0168) and 3/8” jam nut (p/n 712-3008).
4. Use two clamps to secure the deck skirt in position along the edge of the deck, such that all of the remaining holes line up with the center of the deck flange.

NOTE: It is important that the holes line up with the center of the deck flange as well as possible so that there is room for the screws and nuts.

5. Using an 11/32” bit, drill holes through the deck using the holes in the deck skirt as locators. You may first need to drill 1/8” pilot holes all the way through before using the 11/32” drill bit since the material is fairly thick. Be sure to center 1/8” pilot holes.
6. Fasten the deck skirt to the deck with remaining 5/16” screws (p/n 710-3008) and nuts (p/n 712-3009). Remove clamps and tighten all screws.
7. Fully rotate the blades around several times to make certain the blades do not come in contact with the deck skirt.
8. Reassemble the mulch plug.



Service Kit 753-0857 consists of:

Ref. No.	Part. No.	Description	Qty.
1	710-0168	HHCS:3/8-16:.500:GR5:STD	1
2	710-3008	HHCS:5/16-18:.75:GR5:STD	3
3	712-3008	NUT:JAM:3/8-16:GR5	1
4	712-3009	NUT:HEXLK:5/16-18:GR8:CTRLK	3
5	783-0874	SKIRT:DECK	1

Service Kit

Steering Gear Cover Kit
753-0846

CODE: R - 413

DATE: November 23, 1998

SUBJECT: Instruction Sheet

The steering gear cover kit consists of the parts listed below. Compare and make sure that all the parts are included in your kit. If any part is missing, contact the local dealer or the manufacturer.

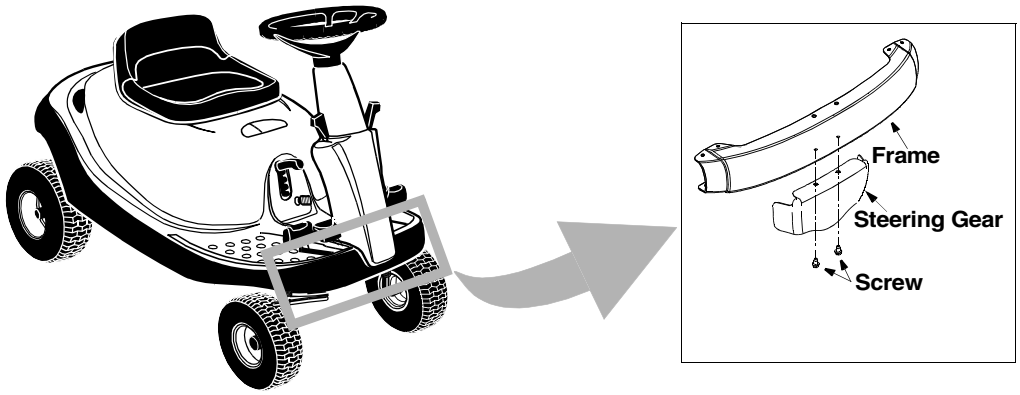
Parts List

Please note that this list covers the parts mentioned in this supplement sheet only, and is in addition to the Illustrated parts list already in the manual.

Part No.	Description
783-0811	Steering Gear Cover
710-0599	Hex Screw (Included in hardware pack only)
710-1621A	Instruction Sheet

Attaching Steering Gear Cover:

- Align the two holes on the **Steering Gear Cover** with the two corresponding holes on the front frame of the rider. See figure below.
- Insert two self-tapping screws from the hardware pack through these two holes of the gear cover and the frame as shown below. Secure tightly.



Service Kit 753-0865

CODE: PE-119

DATE: June 3, 1999

SUBJECT: 46-inch Deck Bagger Hooks & Extension Tube

Service Kit 753-0865 is for use on Twin Rear Bagger Model OEM-190-602 & Triple Rear Bagger Model OEM-190-821 for AutoDrive™, Pedal Drive, Automatic Transmission & Automatic Lawn Tractors & Garden Tractors. If you are unsure of your bagger's Model Number, refer to the Model Plate found on the front left portion of the bagger's plastic cover.

- Use this kit in the event that the discharge chute fails to remain in place when the operator raises and lowers the cutting deck while bagging.

Service Kit 753-0865 consists of:

PART NO.	QTY.	DESCRIPTION
16606	1	Retainer Hook Bracket
710-0751	1	Hex Cap Screw, 1/4-20 x .62
712-3027	1	Hex Flange Lock Nut, 1/4-20
731-2299	1	Extension tube
723-0476	2	Retainer Straps
N/A	1	Template For Drilling Location

1. Crease the template included in this kit and place it over the front of the cutting deck near the discharge chute as illustrated in Figure 1. Mark the hole location on the cutting deck with a center punch.
2. Remove the template and with a 1/4" bit, drill a hole on the mark made with the center punch.

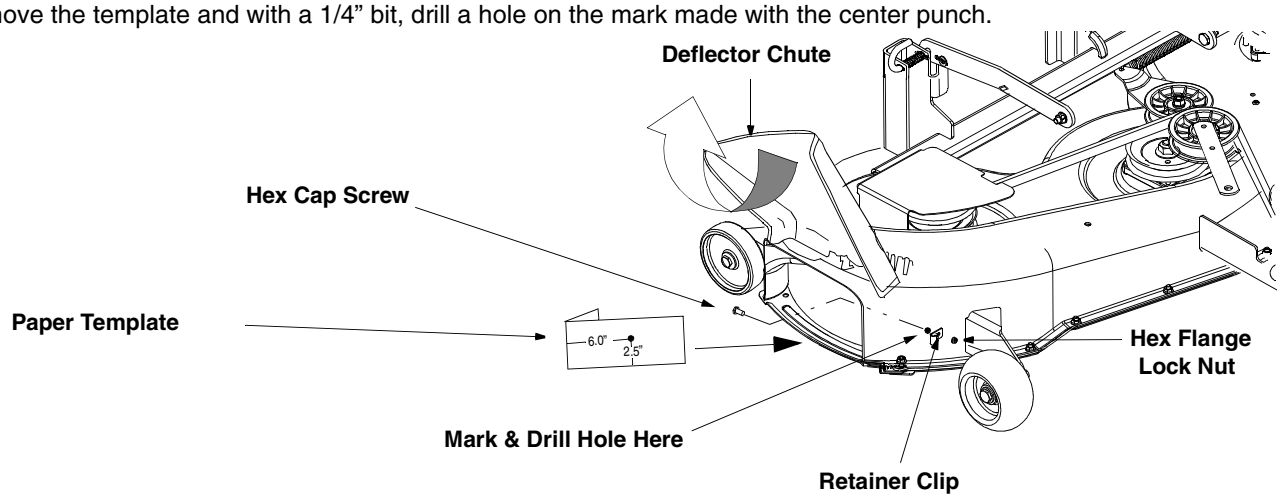


Figure 1

3. Attach the retainer hook bracket to the cutting deck using the hex cap screw and hex flange lock nut included in this kit. See Figure 1.
4. Attach the extension tube included in this kit to the top of the bagger discharge tube. Secure it in place by attaching the retainer straps to the retainer clips found on the chute tube. See Figure 2.

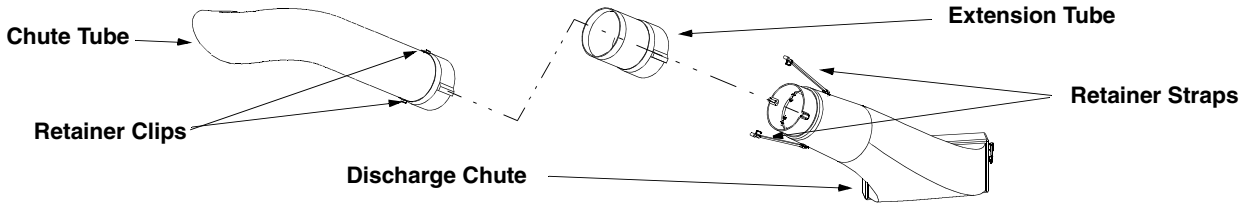


Figure 2

Service Kit 753-0862

CODE: R-427
DATE: April 12, 1999
SUBJECT: Shift Lever Screw Replacement
MODELS AFFECTED: 604, 608 & 609

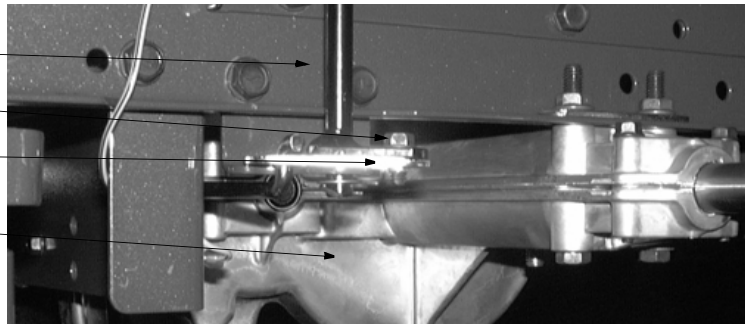
Service Kit 753-0862 is a recommended repair on AutoDrive™, Pedal Drive, Automatic Transmission & Automatic Lawn Tractors having serial numbers whose first five digits fall between 1B019H and 1D089H. If you are unsure of your tractor's serial number, locate your tractor's Model Plate found beneath the seat.

This kit is a recommended remedy for various shifting problems and should be applied before replacing the transmission in the event the operator experiences any of the following difficulties:

- Moving the shift lever either into or out of the Forward position or Reverse position.
- Tractor moves in either direction when depressing the drive pedal with the Shift Lever in the Neutral position.
- Shift Lever remains in either the Forward or Reverse position while depressing the drive pedal, yet the tractor fails to move.

Service Kit 753-0862 consists of:

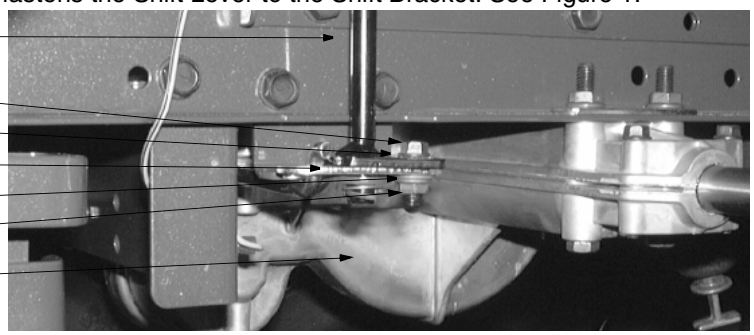
PART NO.	QTY.	DESCRIPTION
710-0642	1	Self Tapping Screw, 1/4-20 x .75
712-3027	1	Flange Lock Nut, 1/4-20
736-0275	1	Flat Washer, .344 x .688 x .065
736-0222	1	Star Washer, 1/4



Note: Rear left tire not shown for clarity

Figure 1

1. Place the Shift Lever in Neutral and roll the tractor forward and rearward slightly to make sure the transmission has found a true Neutral as well. Apply the parking brake for safety.
2. Remove and discard the Self Tapping Screw which fastens the Shift Lever to the Shift Bracket. See Figure 1.



Note: Rear left tire not shown for clarity

Figure 2

3. While holding the Shift Lever in place (the Neutral position), replace the discarded Self Tapping Screw with the Self Tapping Screw and Star Washer included in this kit.
4. Secure the Self Tapping Screw installed in Step 3 firmly in place by fastening it to the Shift Bracket with the Flat Washer and Flange Lock Nut included in this kit as shown in Figure 2.

Service Bulletin

CODE: R-430
DATE: May 5, 1999
SUBJECT: FastAttach™ Shoulder Bolts
MODELS AFFECTED: 13AG608H022 & 13AR608G022

Service Bulletin R-430 is the recommended procedure for installing the FastAttach™ shoulder bolts and accompanying hardware (found in the baggers' hardware pack) necessary to mount rear attachments (i.e. Twin Rear Bagger OEM-190-601 and OEM-190-602) to Automatic Lawn Tractors.

1. Tilt the tractor's seat forward as shown in Figure 1 and allow it to remain in this position throughout the following steps.
2. Unhook the hold-down strap which secures the battery in place.
3. Disconnect the battery by first unfastening the wing nut found on the Negative (-) battery terminal and removing the bolt found on the opposite side. Refer to Figure 1. Position the thick, Black wire away from the negative terminal.
4. Carefully lift the protective rubber boot off of the positive terminal. Follow by disconnecting the hex nut found on the Positive (+) battery terminal and removing the bolt found on the opposite side. Refer to Figure 1. Position the thick, Red wire away from the positive terminal.
5. Lift the battery up and out of the tray it rests in and set it aside in a safe place.
6. Remove the tray by lifting it up and out of the tractor's fender.

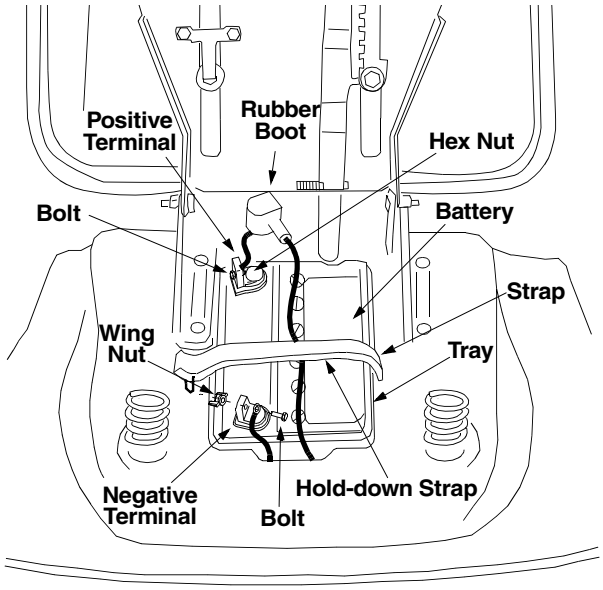


Figure 1

7. Attach the shoulder bolt and bell washer to the left side of hitch plate as shown in Figure 2 by positioning a wrench over the hex flange nut on the inside of the hitch plate (accessed through the battery tray opening) while tightening the shoulder bolt with a second wrench. Fasten securely. Repeat this on the right side of the hitch plate.
8. Reinstall the battery following steps 6 through 2 in reverse order. Connect the positive (Red) wire to its terminal first, followed by the negative (Black) wire. Be CERTAIN that the wires are connected to the correct terminals.

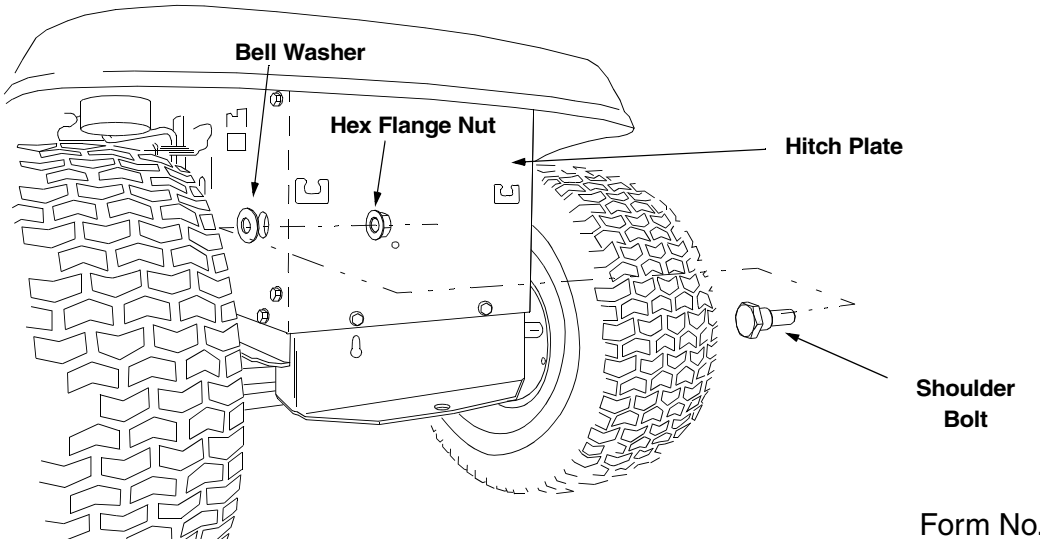


Figure 2

Form No. 770-1651A
(5/99)

Service Kit 753-0864

CODE: PE-118

DATE: May 3, 1999

SUBJECT: 42-inch Deck Bagger Hooks & Extension Tube

Service Kit 753-0864 is for use on Twin Rear Bagger Model OEM-190-601 for AutoDrive™, Pedal Drive, Automatic Transmission & Automatic Lawn Tractors. If you are unsure of your bagger's Model Number, refer to the Model Plate found on the front left portion of the bagger's plastic cover.

- Use this kit in the event that the discharge chute fails to remain in place when the operator raises and lowers the cutting deck while bagging or in the event that the cover assembly fails to remain in the open (up) position while the operator attempts to remove and empty the grass bags.

Service Kit 753-0864 consists of:

PART NO.	QTY.	DESCRIPTION
16606	1	Retainer Hook Bracket
710-0751	1	Hex Cap Screw, 1/4-20 x .62
712-3027	1	Hex Flange Lock Nut, 1/4-20
731-3272	1	Extension Tube
723-0476	2	Retainer Straps
N/A	1	Template For Drilling Location

1. Crease the template included in this kit and place it over the front of the cutting deck near the discharge area as illustrated in Figure 1. Mark the hole location on the cutting deck with a center punch.
2. Remove the template and with a 1/4" bit, drill a hole on the mark made with the center punch.

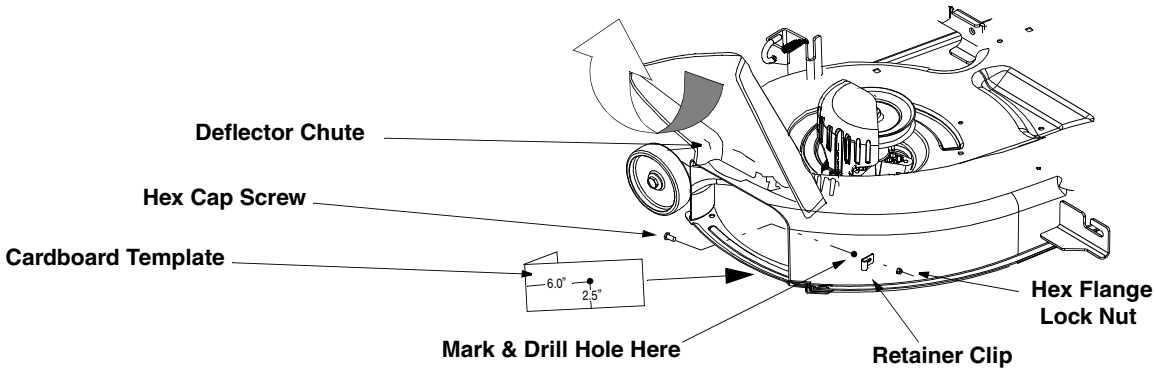


Figure 1

3. Attach the retainer hook bracket to the cutting deck using the hex cap screw and hex flange lock nut included in this kit. See Figure 1.
4. Attach the extension tube included in this kit to the top of the bagger discharge chute. Secure it in place by attaching the retainer straps to the retainer clips found on the chute tube. See Figure 2.

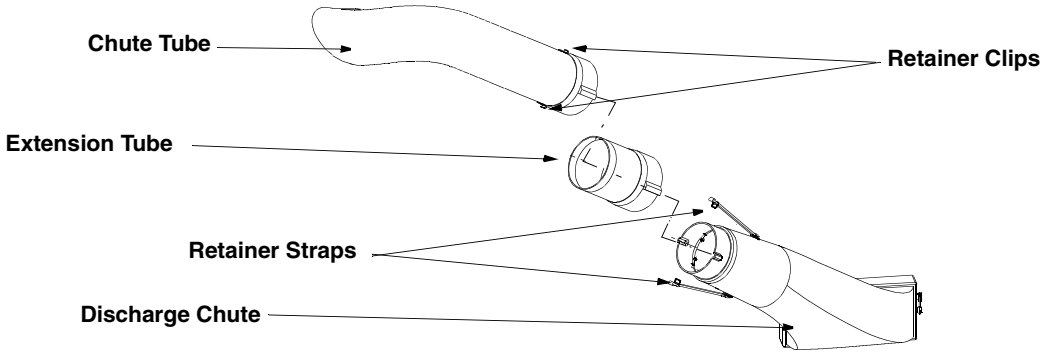


Figure 2

Form No. 770-1648A
(5/99)