TORO®

Residential Products

# Garden Tractor GT Series

## Service Manual

# ABOUT THIS MANUAL

This service manual was written expressly for Toro service technicians. The Toro company has made every effort to make the information in this manual complete and correct.

Basic shop safety knowledge and mechanical/electrical skills are assumed. The Table of Contents lists the systems and the related topics covered in this manual.

For service information on the Hydro-Gear hydrostatic transaxle, please refer to the Hydro-Gear 310-3000 Transaxle service manual (form no. 492-0682). For electrical service, please refer to the Riding Products Demystification Guide, 2006-2007 (form no. 492-9173), or the Electrical Troubleshooting DVD (form no. 492-9193).

Units covered in this manual are:  GT2000 Series Lawn & Garden Tractors

The manual may also be specified for use on later model products.

The hydraulic power system is precision machinery. Maintain strict cleanliness control during all stages of service and repair. Cover or cap all hose ends and fittings whenever they are exposed. Even a small amount of dirt or other contamination can severely damage the system.

We are hopeful that you will find this manual a valuable addition to your service shop. If you have any questions or comments regarding this manual, please contact us at the following address:

The Toro Company
Residential and Landscape Contractor Technical Services
8111 Lyndale Avenue South
Bloomington, MN 55420

The Toro Company reserves the right to change product specifications or this manual without notice.

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## MOWER DECK



## Electrical

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## General Information

This symbol means WARNING or PERSONAL SAFETY INSTRUCTION - read the instruction because it has to do with your safety. Failure to comply with the instruction may result in personal injury or even death.

This manual is intended as a service and repair manual only. The safety instructions provided herein are for troubleshooting, service, and repair of the GT2000 Series Lawn & Garden Tractors.

The GT2000 Series tractor operator's manual contains safety information and operating tips for safe operating practices. Operator's manuals are available online at www.toro.com or:

**The Toro Company**
**Publications Department**
**8111 Lyndale Avenue South**
**Bloomington, MN 55420**

## Think Safety First

**Avoid unexpected starting of engine...**

Always turn off the engine and disconnect the spark plug wire(s) before cleaning, adjusting, or repair.

**Avoid lacerations and amputations...**

Stay clear of all moving parts whenever the engine is running. Treat all normally moving parts as if they were moving whenever the engine is running or has the potential to start.

**Avoid burns...**

Do not touch the engine, muffler, or other components which may increase in temperature during operation, while the unit is running or shortly after it has been running.

**Avoid fires and explosions...**

Avoid spilling fuel and never smoke while working with any type of fuel or lubricant. Wipe up any spilled fuel or oil immediately. Never remove the fuel cap or add fuel when the engine is running. Always use approved, labeled containers for storing or transporting fuel and lubricants.

**Avoid asphyxiation...**

Never operate an engine in a confined area without proper ventilation.

**Avoid injury from batteries...**

Battery acid is poisonous and can cause burns. Avoid contact with skin, eyes, and clothing. Battery gases can explode. Keep cigarettes, sparks, and flames away from the battery.

**Avoid injury due to inferior parts...**

Use only original equipment parts to ensure that important safety criteria are met.

**Avoid injury to bystanders...**

Always clear the area of bystanders before starting or testing powered equipment.

**Avoid injury due to projectiles...**

Always clear the area of sticks, rocks, or any other debris that could be picked up and thrown by the powered equipment.

**Avoid modifications...**

Never alter or modify any part unless it is a factory approved procedure.

**Avoid unsafe operation...**

Always test the safety interlock system after making adjustments or repairs on the machine. Refer to the Electrical section in this manual for more information.

**Hydraulics Safety**

• Inspect all hydraulic line connectors and fittings. Make sure all hydraulic hoses and lines are in good condition before applying pressure to the system.

• Keep body and hands away from pin hole leaks or nozzles that eject high pressure hydraulic fluid. Use cardboard or paper to find hydraulic leaks. Hydraulic fluid escaping under pressure can penetrate the skin and cause injury. Fluid accidentally injected into the skin must be surgically removed within a few hours by a doctor or gangrene may occur.

• Before disconnecting or performing any work on the hydraulic system, lower the loader arm/attachment to the ground and stop the engine so all pressure is relieved.

• Be sure you understand a service procedure before working on the machine.

## Torque Specifications

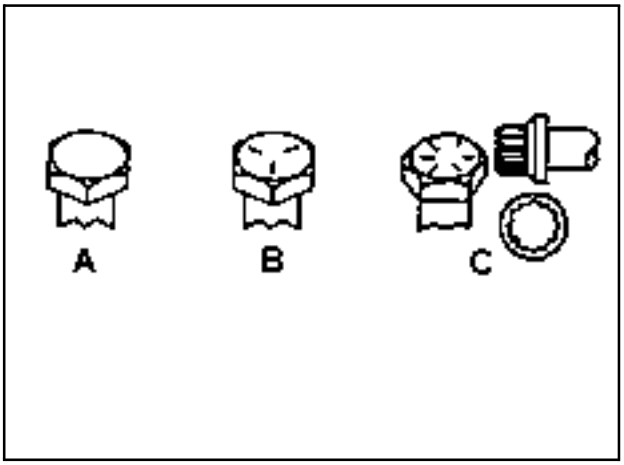
Recommended fastener torque values are listed in the following tables. For critical applications, as determined by Toro, either the recommended torque or a torque that is unique to the application is clearly identified and specified in the service manual.

These torque specifications for the installation and tightening of fasteners shall apply to all fasteners which do not have a specific requirement identified in the service manual. The following factors shall be considered when applying torque: cleanliness of the fastener, use of a thread sealant (Loctite), degree of lubrication on the fastener, presence of a prevailing torque feature, hardness of the surface underneath of the fastener's head, or similar condition which affects the installation.

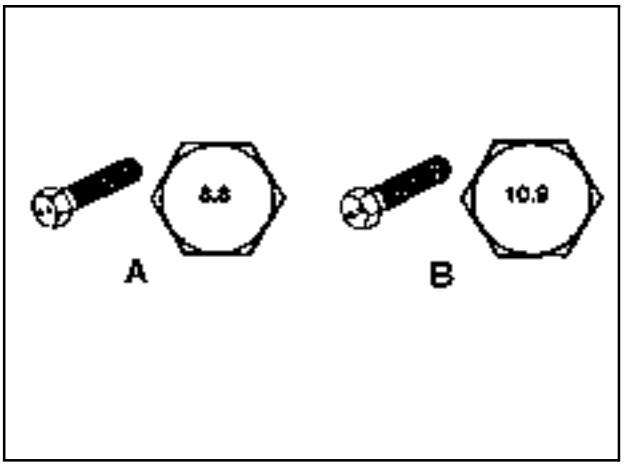
As noted in the following tables, torque values should be **reduced by 25% for lubricated fasteners** to achieve the similar stress as a dry fastener. Torque values may also have to be reduced when the fastener is threaded into aluminum or brass. The specific torque value should be determined based on the aluminum or brass material strength, fastener size, length of thread engagement, etc.

The standard method of verifying torque shall be performed by marking a line on the fastener (head or nut) and mating part, then back off fastener 1/4 of a turn. Measure the torque required to tighten the fastener until the lines match up.

**Fastener Identification**




| Inch Series Bolts and Screws | |
|---|---|
| (A) Grade 1<br>(B) Grade 5 | (C) Grade 8 |




| Metric Bolts and Screws | |
|---|---|
| (A) Class 8.8 | (B) Class 10.9 |

# SPECIFICATIONS



## Standard Torque for Dry, Zinc Plated, and Steel Fasteners (Inch Series)

| Thread Size | Grade 1, 5, & 8 with Thin Height Nuts | SAE Grade 1 Bolts, Screws, Studs, & Sems with Regular Height Nuts (SAE J995 Grade 2 or Stronger Nuts) | | SAE Grade 5 Bolts, Screws, Studs, & Sems with Regular Height Nuts (SAE J995 Grade 2 or Stronger Nuts) | | SAE Grade 8 Bolts, Screws, Studs, & Sems with Regular Height Nuts (SAE J995 Grade 2 or Stronger Nuts) | |
|---|---|---|---|---|---|---|---|
| | In-lb | In-lb | N-cm | In-lb | N-cm | In-lb | N-cm |
| # 6 - 32 UNC | 10 ± 2 | 13 ± 2 | 147 ± 23 | 15 ± 2 | 170 ± 20 | 23 ± 2 | 260 ± 20 |
| # 6 - 40 UNF | | | | 17 ± 2 | 190 ± 20 | 25 ± 2 | 280 ± 20 |
| # 8 - 32 UNC | 13 ± 2 | 25 ± 5 | 282 ± 30 | 29 ± 3 | 330 ± 30 | 41 ± 4 | 460 ± 45 |
| # 8 - 36 UNF | | | | 31 ± 3 | 350 ± 30 | 43 ± 4 | 31 ± 3 |
| # 10 - 24 UNC | 18 ± 2 | 30 ± 5 | 339 ± 56 | 42 ± 4 | 475 ± 45 | 60 ± 6 | 674 ± 70 |
| #10 - 32 UNF | | | | 48 ± 4 | 540 ± 45 | 68 ± 6 | 765 ± 70 |
| 1/4 - 20 UNC | 48 ± 7 | 53 ± 7 | 599 ± 79 | 100 ± 10 | 1125 ± 100 | 140 ± 15 | 1580 ± 170 |
| 1/4 - 28 UNF | 53 ± 7 | 65 ± 10 | 734 ± 113 | 115 ± 10 | 1300 ± 100 | 160 ± 15 | 1800 ± 170 |
| 5/16 - 18 UNC | 115 ± 15 | 105 ± 17 | 1186 ± 169 | 200 ± 25 | 2250 ± 280 | 300 ± 30 | 3390 ± 340 |
| 5/16 - 24 UNF | 138 ± 17 | 128 ± 17 | 1446 ± 192 | 225 ± 25 | 2540 ± 280 | 325 ± 30 | 3670 ± 340 |
| | ft-lb | ft-lb | N-m | ft-lb | N-m | ft-lb | N-m |
| 3/8 - 16 UNC | 16 ± 2 | 16 ± 2 | 22 ± 3 | 30 ± 3 | 41 ± 4 | 43 ± 4 | 58 ± 5 |
| 3/8 - 24 UNF | 17 ± 2 | 18 ± 2 | 24 ± 3 | 35 ± 3 | 47 ± 4 | 50 ± 4 | 68 ± 5 |
| 7/16 - 14 UNC | 27 ± 3 | 27 ± 3 | 37 ± 4 | 50 ± 5 | 68 ± 7 | 70 ± 7 | 68 ± 9 |
| 7/16 - 20 UNF | 29 ± 3 | 29 ± 3 | 39 ± 4 | 55 ± 5 | 75 ± 7 | 77 ± 7 | 104 ± 9 |
| 1/2 - 13 UNC | 30 ± 3 | 48 ± 7 | 65 ± 9 | 75 ± 8 | 102 ± 11 | 105 ± 10 | 142 ± 14 |
| 1/2 - 20 UNF | 32 ± 3 | 53 ± 7 | 72 ± 9 | 85 ± 8 | 115 ± 11 | 120 ± 10 | 163 ± 14 |
| 5/8 - 11 UNC | 65 ± 10 | 88 ± 12 | 119 ± 16 | 150 ± 15 | 203 ± 20 | 210 ± 20 | 285 ± 27 |
| 5/8 - 18 UNF | 75 ± 10 | 95 ± 15 | 129 ± 20 | 170 ± 15 | 230 ± 20 | 240 ± 20 | 325 ± 27 |
| 3/4 - 10 UNC | 93 ± 12 | 140 ± 20 | 190 ± 27 | 265 ± 25 | 359 ± 34 | 374 ± 35 | 508 ± 47 |
| 3/4 - 16 UNF | 115 ± 15 | 165 ± 25 | 224 ± 34 | 300 ± 25 | 407 ± 34 | 420 ± 35 | 569 ± 47 |
| 7/8 - 9 UNC | 140 ± 20 | 225 ± 25 | 305 ± 34 | 430 ± 45 | 583 ± 61 | 600 ± 60 | 813 ± 81 |
| 7/8 - 14 UNF | 155 ± 25 | 260 ± 30 | 353 ± 41 | 475 ± 45 | 644 ± 61 | 660 ± 60 | 895 ± 81 |

**Note:** Reduce torque values listed in the table above by 25% for lubricated fasteners. Lubricated fasteners are defined as threads coated with a lubricant such as oil, graphite, or thread sealant such as Loctite.

**Note:** Torque values may have to be reduced when installing fasteners into threaded aluminum or brass. The specific torque value should be determined based on the fastener size, the aluminum or base material strength, length of thread engagement, etc.

**Note:** The nominal torque values listed above for Grade 5 and 8 fasteners are based on 75% of the minimum proof load specified in SAE J429. The tolerance is approximately ± 10% of the nominal torque value. Thin height nuts include jam nuts.

## Standard Torque for Dry, Zinc and Steel Fasteners (Metric Series)

| Thread Size | Class 8.8 Bolts, Screws, and Studs with Regular Height Nuts (Class 8 or Strong Nuts) | | Class 10.9 Bolts, Screws, and Studs with Regular Height Nuts ( Class 10 or Strong Nuts) | |
|---|---|---|---|---|
| **M5 X 0.8** | 57 ± 5 in-lb | 640 ± 60 N-cm | 78 ± 7 in-lb | 885 ± 80 N-cm |
| **M6 X 1.0** | 96 ± 9 in-lb | 1018 ± 100 N-cm | 133 ± 13 in-lb | 1500 ± 150 N-cm |
| **M8 X 1.25** | 19 ± 2 ft-lb | 26 ± 3 N-m | 27 ± 2 ft-lb | 36 ± 3 N-m |
| **M10 X 1.5** | 38 ± 4 ft-lb | 52 ± 5 N-m | 53 ± 5 ft-lb | 72 ± 7 N-m |
| **M12 X 1.75** | 66 ± 7 ft-lb | 90 ± 10 N-m | 92 ± 9 ft-lb | 125 ± 12 N-m |
| **M16 X 2.0** | 166 ± 15 ft-lb | 225 ± 20 N-m | 229 ± 22 ft-lb | 310 ± 30 N-m |
| **M20 X 2.5** | 325 ± 33 ft-lb | 440 ± 45 N-m | 450 ± 37 ft-lb | 610 ± 50 N-m |

**Note:** Reduce torque values listed in the table above by 25% for lubricated fasteners. Lubricated fasteners are defined as threads coated with a lubricant such as oil, graphite, or thread sealant such as Loctite.

**Note:** Torque values may have to be reduced when installing fasteners into threaded aluminum or brass. The specific torque value should be determined based on the fastener size, the aluminum or base material strength, length of thread engagement, etc.

**Note:** The nominal torque values listed above are based on 75% of the minimum proof load specified in SAE J1199. The tolerance is approximately ± 10% of the nominal torque value. Thin height nuts include jam nuts.

# SPECIFICATIONS

## Other Torque Specifications

**SAE Grade 8 Steel Set Screws**

| Thread Size | Recommended Torque | |
|---|---|---|
| | Square Head | Hex Socket |
| 1/4 - 20 UNC | 140 ± 20 in-lb | 73 ± 12 in-lb |
| 5/16 - 18 UNC | 215 ± 35 in-lb | 145 ± 20 in-lb |
| 3/8 - 16 UNC | 35 ± 10 ft-lb | 18 ± 3 ft-lb |
| 1/2 - 13 UNC | 75 ± 15 ft-lb | 50 ± 10 ft-lb |

**Wheel Bolts and Lug Nuts**

| Thread Size | Recommended Torque** | |
|---|---|---|
| **7/16 - 20 UNF Grade 5** | 65 ± 10 ft-lb | 88 ± 14 N-m |
| **1/2 - 20 UNF Grade 5** | 80 ± 10 ft-lb | 108 ± 14 N-m |
| **M12 X 1.25 Class 8.8** | 80 ± 10 ft-lb | 108 ± 14 N-m |
| **M12 X 1.5 Class 8.8** | 80 ± 10 ft-lb | 108 ± 14 N-m |

** For steel wheels and non-lubricated fasteners.

**Thread Cutting Screws (Zinc Plated Steel)**

| Type 1, Type 23, or Type F | |
|---|---|
| **Thread Size** | **Baseline Torque*** |
| **No. 6 - 32 UNC** | 20 ± 5 in-lb |
| **No. 8 - 32 UNC** | 30 ± 5 in-lb |
| **No.10 - 24 UNC** | 38 ± 7 in-lb |
| **1/4 - 20 UNC** | 85 ± 15 in-lb |
| **5/16 - 18 UNC** | 110 ± 20 in-lb |
| **3/8 - 16 UNC** | 200 ± 100 in-lb |

**Thread Cutting Screws (Zinc Plated Steel)**

| Thread Size | Threads per Inch | | Baseline Torque* |
|---|---|---|---|
| | Type A | Type B | |
| **No. 6** | 18 | 20 | 20 ± 5 in-lb |
| **No. 8** | 15 | 18 | 30 ± 5 in-lb |
| **No. 10** | 12 | 16 | 38 ± 7 in-lb |
| **No. 12** | 11 | 14 | 85 ± 15 in-lb |

* Hole size, material strength, material thickness and finish must be considered when determining specific torque values. All torque values are based on non-lubricated fasteners.

**Conversion Factors**

***in-lb X 11.2985 - N-cm***
***ft-lb X 1.3558 = N-m***

***N-cm X - 0.08851 = in-lb***
***N-cm X 0.73776 - ft-lb***

## Equivalents and Conversions

### Decimal and Millimeter Equivalents

| Fractions | Decimals | mm | Fractions | Decimals | mm |
|---|---|---|---|---|---|
| 1/64 | 0.015625 | 0.397 | 33/64 | 0.515625 | 13.097 |
| 1/32 | 0.03125 | 0.794 | 16/32 | 0.53125 | 13.484 |
| 3/64 | 0.046875 | 1.191 | 35/64 | 0.546875 | 13.891 |
| 1/16 | 0.0625 | 1.588 | 9/16 | 0.5625 | 14.288 |
| 5/64 | 0.078125 | 1.984 | 37/64 | 0.578125 | 14.684 |
| 3/32 | 0.9375 | 2.381 | 19/32 | 0.59375 | 15.081 |
| 1/8 | 0.1250 | 3.175 | 5/8 | 0.6250 | 15.875 |
| 9/64 | 0.140625 | 3.572 | 41/64 | 0.640625 | 16.272 |
| 5/32 | 0.15625 | 3.969 | 21/32 | 0.65625 | 16.669 |
| 11/64 | 0.171875 | 4.366 | 43/64 | 0.671875 | 17.066 |
| 3/16 | 0.1875 | 4.762 | 11/16 | 0.6875 | 17.462 |
| 13/64 | 0.203125 | 5.159 | 45/64 | 0.703125 | 17.859 |
| 7/32 | 0.21875 | 5.556 | 23/32 | 0.71875 | 18.256 |
| 15/64 | 0.234375 | 5.953 | 47/64 | 0.734375 | 18.653 |
| 1/4 | 0.2500 | 6.350 | 3/4 | 0.7500 | 19.050 |
| 17/64 | 0.265625 | 6.747 | 49/64 | 0.765625 | 19.447 |
| 9/32 | 0.28125 | 7.144 | 25/32 | 0.78125 | 19.844 |
| 19/64 | 0.296875 | 7.541 | 51/64 | 0.796875 | 20.241 |
| 5/16 | 0.3125 | 7.541 | 13/16 | 0.8125 | 20.638 |
| 21/64 | 0.328125 | 8.334 | 53/64 | 0.828125 | 21.034 |
| 11/32 | 0.34375 | 8.731 | 27/32 | 0.84375 | 21.431 |
| 23/64 | 0.359375 | 9.128 | 55/64 | 0.859375 | 21.828 |
| 3/8 | 0.3750 | 9.525 | 7/8 | 0.8750 | 22.225 |
| 25/64 | 0.390625 | 9.922 | 57/64 | 0.890625 | 22.622 |
| 13/32 | 0.40625 | 10.319 | 29/32 | 0.90625 | 23.019 |
| 27/64 | 0.421875 | 10.716 | 59/64 | 0.921875 | 23.416 |
| 7/16 | 0.4375 | 11.112 | 15/16 | 0.9375 | 23.812 |
| 29/64 | 0.453125 | 11.509 | 61/64 | 0.953125 | 24.209 |
| 15/32 | 0.46875 | 11.906 | 31/32 | 0.96875 | 24.606 |
| 31/64 | 0.484375 | 12.303 | 63/64 | 0.984375 | 25.003 |
| 1/2 | 0.5000 | 12.700 | 1 | 1.000 | 25.400 |
| 1 mm = 0.03937 in. | | | 0.001 in. = 0.0254 mm | | |

## U.S. to Metric Conversions

| | To Convert | Into | Multiply By |
|---|---|---|---|
| **Linear Measurement** | Miles | Kilometers | 1.609 |
| | Yards | Meters | 0.9144 |
| | Feet | Meters | 0.3048 |
| | Feet | Centimeters | 30.48 |
| | Inches | Meters | 0.0254 |
| | Inches | Centimeters | 2.54 |
| | Inches | Millimeters | 25.4 |
| **Area** | Square Miles | Square Kilometers | 2.59 |
| | Square Feet | Square Meters | 0.0929 |
| | Square Inches | Square Centimeters | 6.452 |
| | Acre | Hectare | 0.4047 |
| **Volume** | Cubic Yards | Cubic Meters | 0.7646 |
| | Cubic Feet | Cubic Meters | 0.02832 |
| | Cubic Inches | Cubic Centimeters | 16.39 |
| **Weight** | Tons (Short) | Metric Tons | 0.9078 |
| | Pounds | Kilograms | 0.4536 |
| | Ounces | Grams | 28.3495 |
| **Pressure** | Pounds/Sq. In. | Kilopascal | 6.895 |
| **Work** | Foot-pounds | Newton-Meters | 1.356 |
| | Foot-pounds | Kilogram-Meters | 0.1383 |
| | Inch-pounds | Kilogram-Centimeters | 1.152144 |
| **Liquid Volume** | Quarts | Liters | 0.9463 |
| | Gallons | Liters | 3.785 |
| **Liquid Flows** | Gallons/Minute | Liters/Minute | 3.785 |
| **Temperature** | Fahrenheit | Celsius | 1. Subtract 32°<br>2. Multiply by 5/9 |

## Product Specifications

| Name | GT2100 | GT2200 | GT2300 |
|---|---|---|---|
| **Engine** | 23HP Twin Cylinder Kohler Courage | 25HP Twin Cylinder Kohler Courage | 26HP Twin Cylinder Kohler Courage |
| **High RPM Setting** | 3375 | | |
| **Low RPM Setting** | 1200 ± 75 | | |
| **Construction** | 12 Gauge Steel Frame | | |
| **Fuel Capacity** | 3.0 gallons (11.4 liters) | | |
| **Wheel Base** | 46.0” (116.8cm) | | |
| **Overall Length** | 68.0” (172.7cm) | | |
| **Overall Width** | 54.0” (137.2cm) | 54.0” (137.2cm) | 60.0” (152.4cm) |
| **Overall Height** | 43.0” (109.2cm) | | |
| **Weight (approx.)** | 575 lbs. (261kg) | 575 lbs. (261kg) | 675 lbs. (306kg) |
| **Traction System** | CVT 2-Speed Transaxle | Hydro-Gear 3000 Series Transaxle | Hydro-Gear 3000 Series Transaxle |
| **Forward Ground Speed** | 0 – 5.2 mph (8.2 km/h) | | |
| **Reverse Ground Speed** | 0 – 2.3 mph (3.7 km/h) | | |
| **Front Tires** | 16 x 7.5 x 8 | | |
| **Rear Tires** | 23 x 10.5 x 12 | | |
| **Tire Pressure (Front/Rear)** | 14 psi/10 psi (97kPa/68kPa) | | |
| **Turning Radius** | 21” (53.3cm) | | |
| **Electrical System** | Voltage: 12 volt negative ground<br>Battery: 245CCA (sealed)<br>Alternator: 15 amp regulated<br>Fuse: 20 amp | | |
| **Mower Deck** | 50” (127cm) Three Blade 12 Gauge Steel (2.7mm) | 50” (127cm) Three Blade 12 Gauge Steel (2.7mm) | 54” (138cm) Three Blade 12 Gauge Steel (2.7mm) |
| **Height-of-Cut** | 1.5” to 4” (3.8 to 10cm) | | |

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## Front Pivot Axle Replacement

### Front Pivot Axle Removal

1. Disconnect the negative and then the positive battery cable.

2. Remove the mower deck. Refer to:
   - “50” Mower Deck Removal” on page 7-6
   - “54” Mower Deck Removal” on page 7-29

3. Remove the 2 hairpin cotters and clevis pins securing the deck hanger bracket to the frame (Fig. 001).

**Fig 001** PICT-7204a

4. Remove the deck hanger bracket and rod assembly from the frame (Fig. 002).

**Fig 002** PICT-7206

5. Raise the hood (Fig. 003).


**Fig 003** PICT-7207

6. Unplug the headlights from the wire harness (Fig. 004).

**Fig 004** PICT-7210

7. Remove the hood from the frame (Fig. 005).


**Fig 005** PICT-7212

8. Apply the parking brake.

9. Lift and secure the front end of the machine so the front axle can be accessed.

10. Remove the hubcaps from both front wheels (Fig. 006).

**Fig 006** PICT-7214

11. Remove and discard the cotter pin from the 2 axles (Fig. 007).

**Fig 007** PICT-7216a

12. Remove the washers from the 2 axles (Fig. 008).

**Fig 008** PICT-7217a

13. Remove the wheels from the axles (Fig. 009).

**Fig 009** PICT-7218

**Note: There is an inner and an outer bushing included with the wheel assembly:**

Inner bushing (Fig. 010):

**Fig 010** PICT-7219a

Outer bushing (Fig. 011):

**Fig 011** PICT-7220a

14. Remove the nut securing the ball joint to the axle assembly (Fig. 012).

**Fig 012** PICT-7222

15. Remove the ball joint from the axle assembly (Fig. 013).

**Fig 013** PICT-7225

16. Remove the cap from the axle assembly (Fig. 014).

**Fig 014** PICT-7226

17. Remove the push nut from the axle assembly (Fig. 015).

**Fig 015** PICT-7228

18. Remove the axle assembly from the front pivot axle (Fig. 016).

**Fig 016** PICT-7230

19. Repeat steps 13 - 18 to remove the axle assembly from the opposite side of the pivot axle.

20. Remove the harness clip from the frame (Fig. 017).

**Fig 017** PICT-7236

21. Support the front pivot axle with jackstands.

22. Remove the 2 screws securing the bumper to the frame (1 bolt on the left and 1 on the right) (Fig. 018).

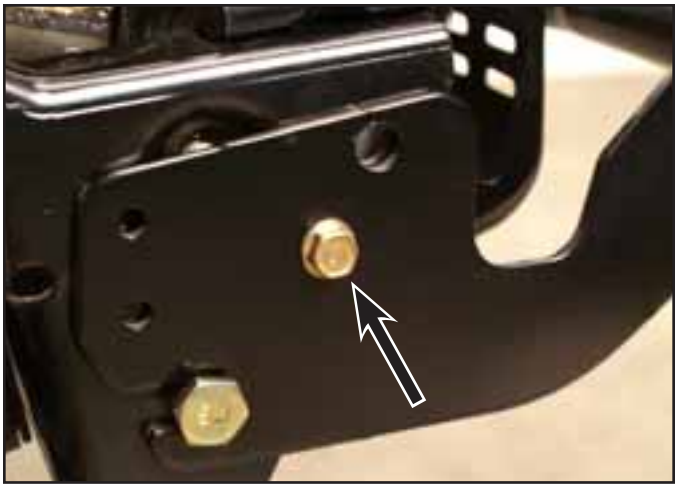

**Fig 018** PICT-7245

23. Remove the bumper (Fig. 019).

**Fig 019** PICT-7249

24. Remove the 4 screws securing the left and right side bumper brackets to the muffler bracket (2 on the left and 2 on the right (Fig. 020).

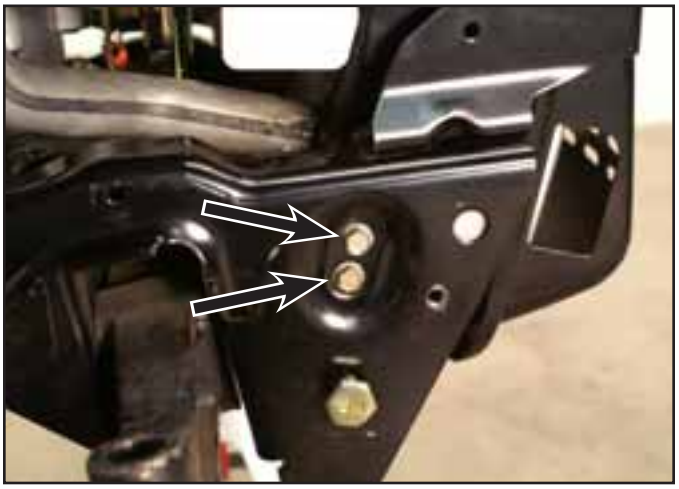

**Fig 020** PICT-7250

25. Slide the muffler and heat shield assembly off the manifold pipes (Fig. 021).

**Fig 021** PICT-7252

26. Remove the 4 bolts (2 on the right, 2 on the left) securing the left and right pivot supports to the frame (Fig. 022).

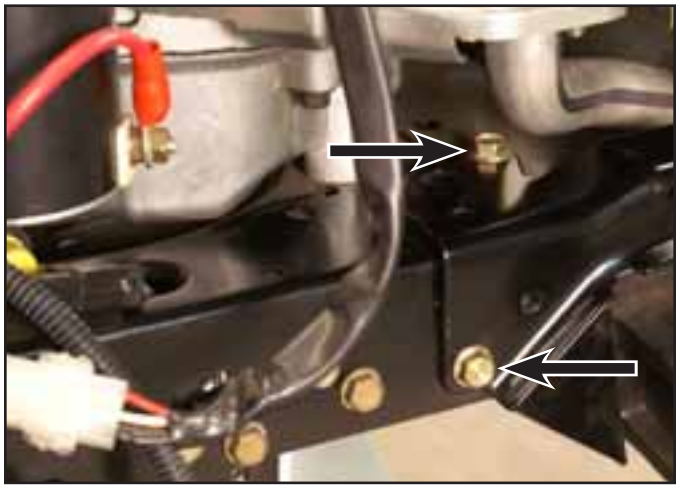

**Fig 022** PICT-7243

27. Remove the nuts from the bolts securing the pivot bar and pivot support brackets to the frame (Fig. 023).

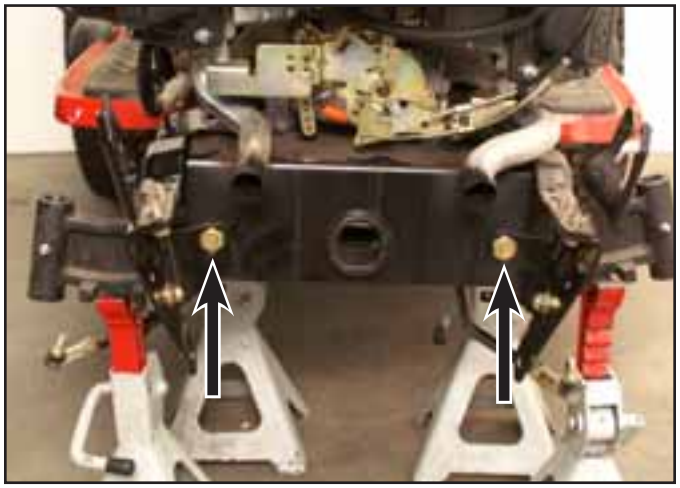

**Fig 023** PICT-7258

28. Unthread and remove one of the bolts and pivot supports from the pivot axle and frame (Fig. 024).

**Fig 024** PICT-7262

29. Unthread and remove the other bolt and pivot support from the pivot axle and frame (Fig. 025).

**Fig 025** PICT-7264

30. Remove the pivot bar bracket from the frame (Fig. 026).

**Fig 026** PICT-7265

31. Remove the front pivot axle (Fig. 027).

**Fig 027** PICT-7266

## Front Pivot Axle Installation

1. Position and support the front pivot axle to the frame.

**Note: The grease fittings should face forward (Fig. 028).**

**Fig 028** PICT-7266

2. Position the pivot bar bracket onto the frame (Fig. 029).

**Fig 029** PICT-7265

3. Position the pivot support to the frame and loosely install a bolt through the pivot support, pivot bracket and pivot axle (Fig. 030).

**Fig 030** PICT-7268

4. Position the other pivot support bracket to the frame and loosely install the other bolt through the pivot support, pivot bracket and pivot axle (Fig. 031).

**Fig 031** PICT-7270

5. Loosely install a nut onto each of the bolts securing the pivot support bracket and pivot bar bracket to the frame (Fig. 032).

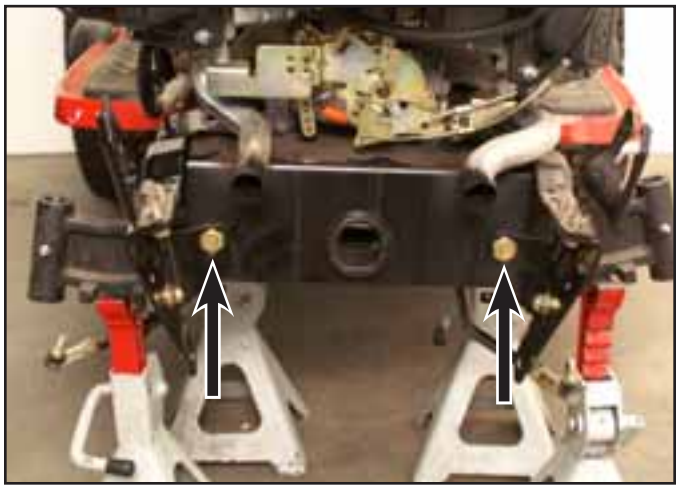

**Fig 032** PICT-7258

6. Install 4 bolts securing the left and right pivot supports to the frame (2 on the right, 2 on the left) (Fig. 033).

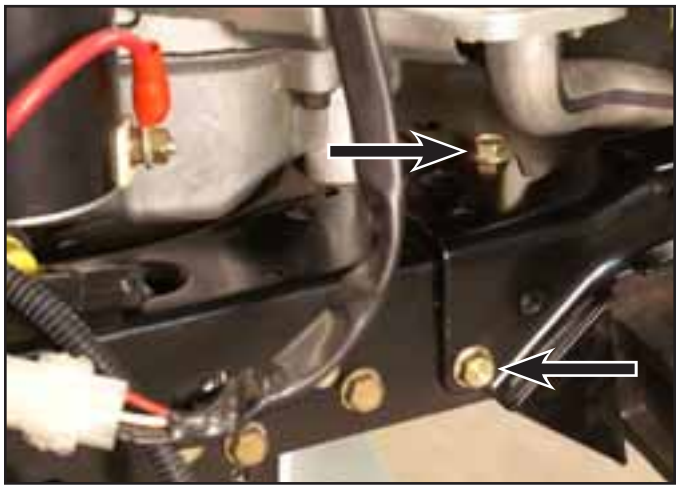

**Fig 033** PICT-7243

7. Tighten the 2 nuts and bolts securing the pivot support bracket and axle pivot bar to the frame (Fig. 034).

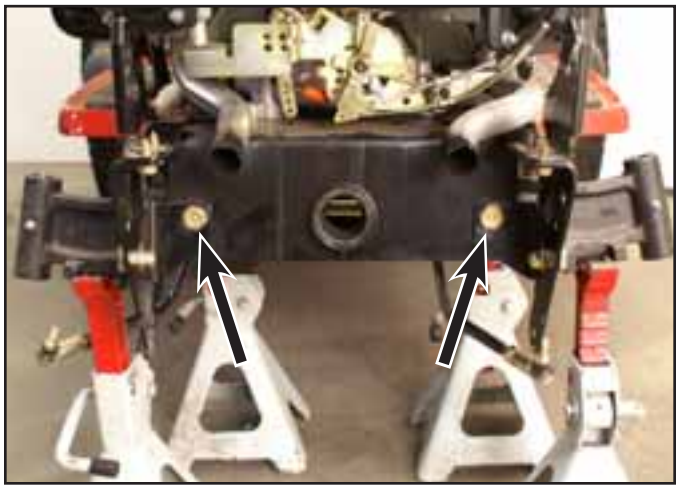

**Fig 034** PICT-7271

8. Slide the muffler and heat shield assembly onto the manifold pipes and position it to the frame (Fig. 035).

**Fig 035** PICT-7273

9. Install 4 screws securing the left and right side pivot support brackets to the muffler/heat shield assembly (2 on the left and 2 on the right) (Fig. 036).

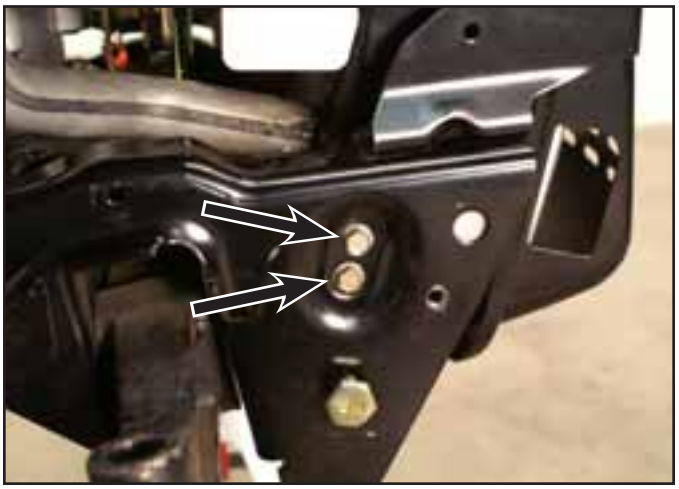

**Fig 036** PICT-7250

10. Position the bumper (Fig. 037).

**Fig 037** PICT-7249

11. Install 2 screws securing the bumper to the frame (1 bolt on the left and 1 on the right) (Fig. 038).

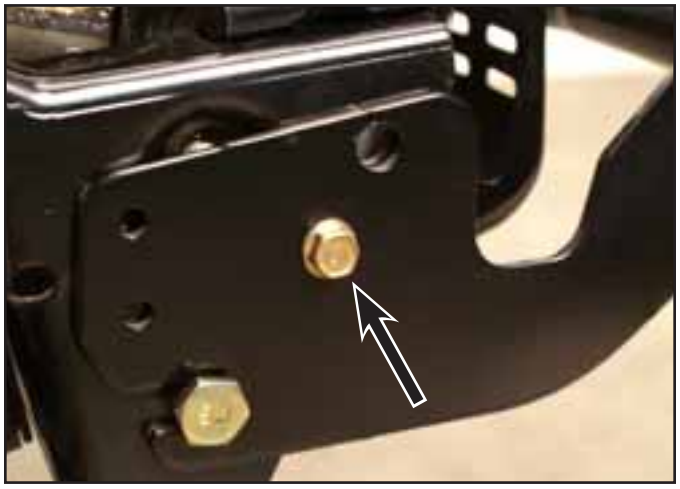

**Fig 038** PICT-7245

12. Install the harness clip into the frame (Fig. 039).

**Fig 039** PICT-7236

13. Slide the axle assemblies into the front pivot axle (Fig. 040).

**Fig 040** PICT-7230

14. Position the ball joints into the axle assembly (Fig. 041).

**Fig 041** PICT-7225

15. Install a nut onto each ball joint securing the ball joints to the axle assembly (Fig. 042).

**Fig 042** PICT-7276

16. Slide the wheel assemblies onto the axles (Fig. 043).

**Fig 043** PICT-7277

**Note: There is an inner and an outer bushing included with the wheel assembly:**

Inner bushing (Fig. 044):

**Fig 044** PICT-7219a

Outer bushing (Fig. 045):

**Fig 045** PICT-7220a

17. Install a washer onto each axle (Fig. 046).

**Fig 046** PICT-7217a

18. Install a new cotter pin into each axle to secure the wheel (Fig. 047).

**Fig 047** PICT-7280a

19. Install a hubcap onto the 2 wheel assemblies (Fig. 048).

**Fig 048** PICT-7214

20. Lower the front end of the machine to the ground.

21. Install push nut caps onto each of the axle assemblies (Fig. 049).

**Fig 049** PICT-7282

22. Position the hood onto the hood support brackets (Fig. 050).


**Fig 050** PICT-7212

23. Plug the headlights into the wire harness (Fig. 051).

**Fig 051** PICT-7210

24. Lower the hood (Fig. 052).


**Fig 052** PICT-7207

25. Apply grease to the axle pivot bar grease fittings and to the bushings on the inside of the wheel assembly (Fig. 053 and Fig. 054).

**Fig 053** PICT-7286

**Fig 054** PICT-7288a

26. Position the deck hanger bracket and rod assembly to the frame (Fig. 055).

**Fig 055** PICT-7206

27. Install 2 clevis pins and hairpins to secure the deck hanger bracket to the frame (Fig. 056).

**Fig 056** PICT-7204

28. Install the mower deck. Refer to:
    - “50” Mower Deck Installation” on page 7-8
    - “54” Mower Deck Installation” on page 7-31

29. Connect the negative and the positive battery cable.

## Axle Assembly Replacement

**Note: The following procedure is the same for right side and left side axle assembly replacement.**

**Note: The following procedures were done with the mower deck removed. It is not required that the mower deck be removed.**

### Axle Assembly Removal

1. Disconnect the negative and then the positive battery cable.

2. Raise the hood (Fig. 057).


**Fig 057** PICT-7207

3. Unplug the headlights from the wire harness (Fig. 058).

**Fig 058** PICT-7210

4. Remove the hood from the frame (Fig. 059).


**Fig 059** PICT-7212

5. Apply the parking brake.

6. Lift and secure the front end of the machine so the front axle can be accessed.

7. Remove the hubcap from the front wheel (Fig. 060).

**Fig 060** PICT-7214

8. Remove and discard the cotter pin from the axle (Fig. 061).

**Fig 061** PICT-7216a

9. Remove the washer from the axle (Fig. 062).

**Fig 062** PICT-7217a

10. Remove the wheel assembly from the axle (Fig. 063).

**Fig 063** PICT-7218

**Note: There is an inner and an outer bushing included with the wheel assembly:**

Inner bushing (Fig. 064):

**Fig 064** PICT-7219a

Outer bushing (Fig. 065):

**Fig 065** PICT-7220a

11. Remove the nut securing the ball joint to the axle assembly (Fig. 066).

**Fig 066** PICT-7222

12. Remove the ball joint from the axle assembly (Fig. 067).

**Fig 067** PICT-7225

13. Remove the cap from the axle assembly (Fig. 068).

**Fig 068** PICT-7226

14. Remove the push nut from the axle assembly (Fig. 069).

**Fig 069** PICT-7228

15. Remove the axle assembly from the front pivot axle (Fig. 070).

**Fig 070** PICT-7230

## Axle Assembly Installation

1. Slide the axle assembly into the front pivot axle (Fig. 071).

**Fig 071** PICT-7230

2. Position the ball joint into the axle assembly (Fig. 072).

**Fig 072** PICT-7225

3. Install a nut onto the ball joint securing it to the axle assembly (Fig. 073).

**Fig 073** PICT-7276

4. Slide the wheel assembly onto the axle (Fig. 074).

**Fig 074** PICT-7277

**Note: There is an inner and an outer bushing included with the wheel assembly:**

Inner bushing (Fig. 075):

**Fig 075** PICT-7219a

Outer bushing (Fig. 076):

**Fig 076** PICT-7220

5. Install a washer onto the axle (Fig. 077).

**Fig 077** PICT-7217a

6. Install a new cotter pin into the axle to secure the wheel (Fig. 078).

**Fig 078** PICT-7280a

7. Install a hubcap onto the wheel assembly (Fig. 079).

**Fig 079** PICT-7214

8. Lower the front end of the machine to the ground.

9. Install a push nut cap onto the axle assembly (Fig. 080).

**Fig 080** PICT-7282

10. Position the hood onto the hood support brackets (Fig. 081).


**Fig 081** PICT-7212

11. Plug the headlights into the wire harness (Fig. 082).

**Fig 082** PICT-7210

12. Lower the hood (Fig. 083).


**Fig 083** PICT-7207

13. Apply grease to the axle pivot bar grease fittings and to the bushings on the inside of the wheel assembly (Fig. 084 and Fig. 085).

**Fig 084** PICT-7286

**Fig 085** PICT-7288a

## Steering Wheel Replacement

### Steering Wheel Removal

1. Remove the steering wheel cover (Fig. 086).

**Fig 086** PICT-7290

2. Remove the screw securing the steering wheel to the steering shaft (Fig. 087).

**Fig 087** PICT-7323a

3. Remove the washer from the steering wheel (Fig. 088).

**Fig 088** PICT-7292

4. Remove the steering wheel from the steering shaft (Fig. 089).

**Fig 089** PICT-7295a

## Steering Wheel Installation

1. Slide the steering wheel onto the steering shaft (Fig. 090).

**Fig 090** PICT-7295a

2. Place a washer into the steering wheel (Fig. 091).

**Fig 091** PICT-7296

3. Install a screw to secure the steering wheel to the steering shaft (Fig. 092).

**Fig 092** PICT-7323a

4. Install the steering wheel cover (Fig. 093).

**Fig 093** PICT-7290

## Steering Shaft Replacement

### Steering Shaft Removal

1. Remove the steering wheel. Refer to “Steering Wheel Removal” on page 3-23.

2. Raise the hood (Fig. 094).


**Fig 094** PICT-7298

3. Remove the mower deck. Refer to:
   - “50” Mower Deck Removal” on page 7-6
   - “54” Mower Deck Removal” on page 7-29

4. Remove the fuel cap. Slide the hose clamp down the fuel line. Remove the fuel line from the fuel filter and drain the fuel into a suitable container. Slide the fuel line back onto the fuel filter and position the hose clamp to secure. Replace the fuel cap onto the fuel tank (Fig. 095).

**Fig 095** PICT-7300

5. Loosen the 2 screws securing the fuel tank support rods to the dash supports. Lay the support rods to the side (Fig. 096).

**Fig 096** PICT-7303

6. Lift the fuel tank out of the tower (Fig. 097).

**Fig 097** PICT-7304a

7. Raise and support the machine to access the steering gear assembly.

8. Secure the steering gear in place with a punch and remove the nut from the end of the steering shaft (Fig. 098).

**Fig 098** PICT-7306

9. Remove the pinion from the steering shaft (Fig. 099).

**Fig 099** PICT-7308

10. Push up on the steering shaft and remove the washer from the end of the steering shaft (Fig. 100).

**Fig 100** PICT-7319

11. Lower the machine.

12. Pull the steering shaft up and out of the hex flange bearing. Angle the steering shaft between the pedal levelers and lower it out of the tower (Fig. 101).

**Fig 101** PICT-7310

13. Remove the hex flange bushing from the steering shaft support bracket (Fig. 102).

**Note: Inspect the hex flange bushing and replace it if worn or damaged.**

**Fig 102** PICT-7312

## Steering Shaft Installation

1. Install the hex flange bushing into the steering support bracket ensuring the hex is seated in the bracket (Fig. 103).

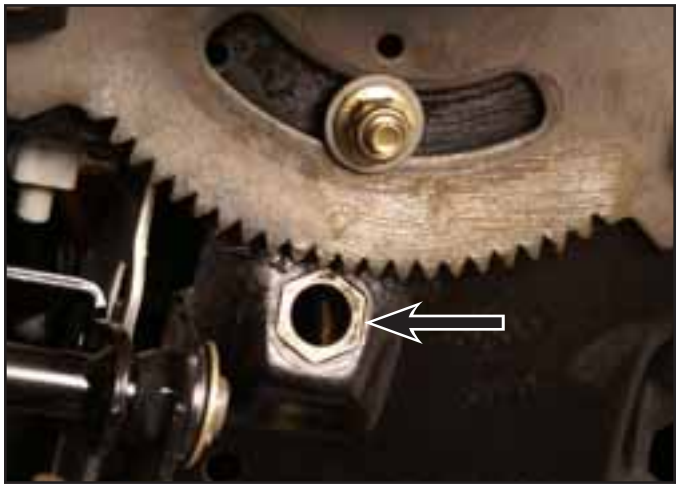

**Fig 103** PICT-7315

2. Slide the steering shaft up into the tower from below. Insert the lower end of the steering shaft into the hex flange bushing (Fig. 104).

**Fig 104** PICT-7310

3. Raise the machine to access the steering gear assembly.

4. Push up on the steering shaft to install a washer onto the steering shaft (Fig. 105).

**Note: The washer is installed above the steering gear.**

**Fig 105** PICT-7319

5. Slide the pinion onto the steering shaft (Fig. 106).

**Fig 106** PICT-7308

6. Loosely install a nut onto the steering shaft. Secure the steering gear in place with a punch and tighten the nut (Fig. 107).

**Fig 107** PICT-7306

7. Grease the pinion gear with #2 general purpose grease (Fig. 108).

**Fig 108** PICT-7321

8. Lower the machine.

9. Position the fuel tank into the tower (Fig. 109).

**Fig 109** PICT-7304a

10. Position the 2 fuel tank support rods and install a screw securing each support rod to the dash supports (Fig. 110).

**Fig 110** PICT-7303

11. Install the steering wheel. Refer to “Steering Wheel Installation” on page 3-24.

## Electric PTO Clutch Replacement

### Electric PTO Clutch Removal

1. Remove the mower deck. Refer to:
   - “50” Mower Deck Removal” on page 7-6
   - “54” Mower Deck Removal” on page 7-29

2. Unplug the clutch from the wire harness (Fig. 111).

**Fig 111** PICT-7329

3. Raise the machine so the electric PTO clutch can be accessed.

4. Route the clutch connector out through the slot in the frame.

5. Remove the bolt and lock washer securing the clutch to the crankshaft (Fig. 112).

**Fig 112** PICT-7331

6. Remove the clutch and spacer(s) from the crankshaft (Fig. 113).

**Fig 113** PICT-7335a

## Electric PTO Clutch Installation

1. Apply anti-seize compound to the crankshaft (Fig. 114).

**Fig 114** PICT-7343

2. Position the spacer(s) on the top side of the clutch (Fig. 115).

**Fig 115** PICT-7345a

3. Align the clutch keyway with the key on the crankshaft and slide the clutch and spacer assembly onto the crankshaft (Fig. 116).

**Fig 116** PICT-7335a

4. Install a bolt and lock washer securing the clutch to the crankshaft. Torque the bolt to 37.5 to 50 ft-lbs. (50.84 to 67.79 Nm) (Fig. 117).

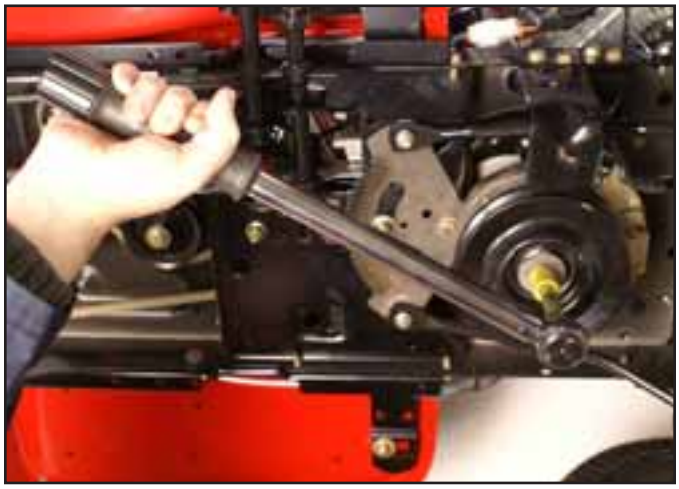

**Fig 117** PICT-7346

5. Route the clutch connector through the slot in the frame.

6. Lower the machine.

7. Plug the clutch into the wire harness (Fig. 118).

**Fig 118** PICT-7329

8. Install the mower deck. Refer to:
   - “50” Mower Deck Installation” on page 7-8
   - “54” Mower Deck Installation” on page 7-31

## Fuel Tank Replacement

### Fuel Tank Removal

1. Raise the hood (Fig. 119).


**Fig 119** PICT-7298

2. Remove the fuel cap. Slide the hose clamp down the fuel line. Remove the fuel line from the fuel filter and drain the fuel into a suitable container. Replace the fuel cap onto the fuel tank (Fig. 120).

**Fig 120** PICT-7300

3. Loosen the 2 screws securing the fuel tank support rods to the dash supports. Lay the support rods to the side (Fig. 121).

**Fig 121** PICT-7303

4. Lift the fuel tank out of the tower (Fig. 122).

**Fig 122** PICT-7304a

## Fuel Tank Installation

1. Position the fuel tank into the tower (Fig. 123).

**Fig 123** PICT-7304a

2. Position the 2 fuel tank support rods and install a screw securing each support rod to the dash supports (Fig. 124).

**Fig 124** PICT-7303

3. Slide the fuel line back onto the fuel filter and position the hose clamp to secure (Fig. 125).

**Fig 125** PICT-7300

4. Lower the hood (Fig. 126).


**Fig 126** PICT-7207

## Hood Replacement

### Hood Removal

1. Raise the hood (Fig. 127).


**Fig 127** PICT-7207

2. Unplug the headlights from the wire harness (Fig. 128).

**Fig 128** PICT-7210

3. Remove the hood from the frame (Fig. 129).


**Fig 129** PICT-7212

### Hood Installation

1. Position the hood onto the hood support brackets (Fig. 130).


**Fig 130** PICT-7212

2. Plug the headlights into the wire harness (Fig. 131).

**Fig 131** PICT-7210

3. Lower the hood (Fig. 132).


**Fig 132** PICT-7207

## Fender Replacement

### Fender Removal

1. Lift the seat to access the battery compartment.
2. Disconnect the battery cable from the negative battery terminal (Fig. 133).

**Fig 133** PICT-7349

3. Disconnect the battery cable from the positive battery terminal (Fig. 134).

**Fig 134** PICT-7351a

4. Remove the battery hold down rod (Fig. 135).

**Fig 135** PICT-7352

5. Remove the battery from the battery tray (Fig. 136).

**Fig 136** PICT-7353

6. Remove the battery tray (Fig. 137).

**Fig 137** PICT-7354

7. Unplug the 2 seat switch wires (Fig. 138).

**Fig 138** PICT-7357

8. Loosen the bolt and nut securing the left seat mount bracket to the seat bracket (Fig. 139).

**Fig 139** PICT-7358

9. Using a spring tool (Toro part no. 92-5771), release the extension spring from the seat mount bracket (Fig. 140).

**Fig 140** PICT-7359

10. Remove the 4 bolts securing the seat mount brackets to the fender (Fig. 141).

**Fig 141** PICT-7363

11. Remove the seat (Fig. 142).

**Fig 142** PICT-7364

12. Remove the height-of-cut grip from the height-of-cut lever (Fig. 143).

**Fig 143** PICT-7391

13. Pry up the front portion of the left hand foot pad (Fig. 144).

**Fig 144** PICT-7367

14. Remove the carriage bolt, washer and nut securing the fender to the frame (Fig. 145).

**Fig 145** PICT-7369

15. Pry up the front portion of the right hand foot pad (Fig. 146).

**Fig 146** PICT-7372

16. Remove the carriage bolt, washer and nut securing the fender to the frame (Fig. 147).

**Fig 147** PICT-7373

17. Locate the 2 screws under the danger decal on the fender. Cut the decal to expose the screw heads (Fig. 148).


**Fig 148** PICT-7375

18. Remove the 2 screws (Fig. 149).


**Fig 149** PICT-7376

19. Remove the fasteners securing the brake pedal lever to the brake control assembly (Fig. 150):

**Note: The foot pad has been removed for photo purposes.**

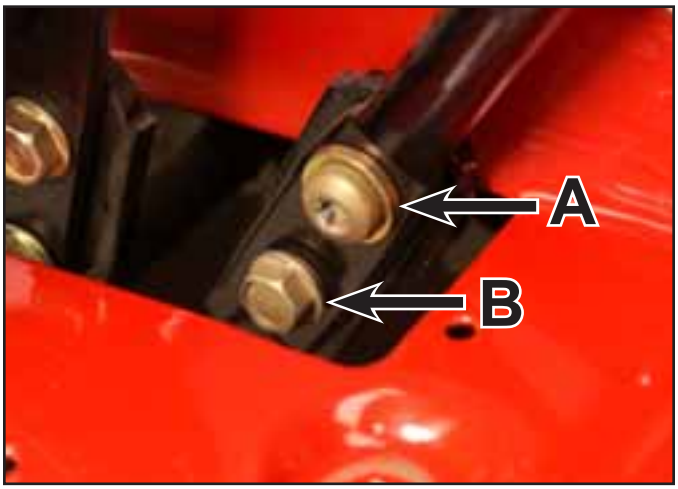


**Fig 150** PICT-7378

A. TORX screw and washer
B. Hex head bolt and lock washer

20. Remove the brake pedal (Fig. 151).


**Fig 151** PICT-7379

21. Remove the 2 bolts securing the speed control lever to the speed control assembly (Fig. 152).

**Fig 152** PICT-7381

22. Remove the speed control pedal (Fig. 153).

**Fig 153** PICT-7383

23. Remove the fender (Fig. 154).

**Fig 154** PICT-7386

## Fender Installation

1. Position the fender onto the frame (Fig. 155).

**Fig 155** PICT-7386

2. Position the speed control pedal to the speed control assembly (Fig. 156).

**Fig 156** PICT-7383

3. Install 2 bolts securing the speed control lever to the speed control assembly (Fig. 157).

**Fig 157** PICT-7381

4. Position the brake pedal to the brake control assembly (Fig. 158).


**Fig 158** PICT-7379

5. Install fasteners securing the brake pedal to the brake control assembly (Fig. 159):

**Note: The foot pad has been removed for photo purposes.**

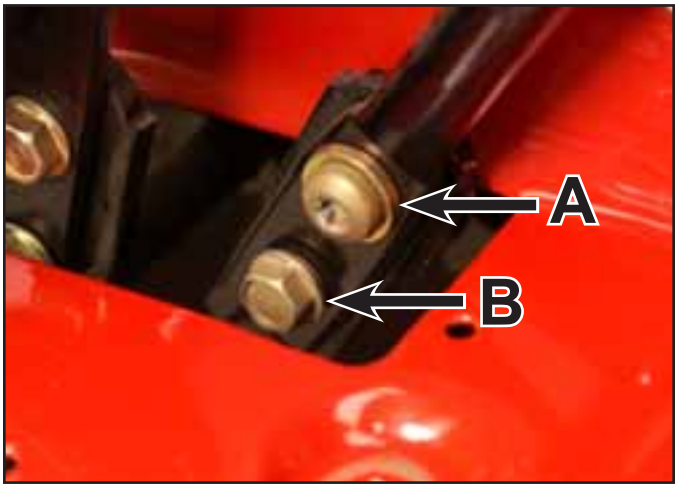


**Fig 159** PICT-7378

A. TORX screw and washer
B. Hex head bolt and lock washer

6. Install 2 screws located under the danger decal on the frame (Fig. 160).


**Fig 160** PICT-7376

7. Apply a replacement danger decal (Fig. 161).


**Fig 161** PICT-7991

8. Lift the right hand foot pad and install the carriage bolt, washer and nut securing the right fender to the frame (Fig. 162).

**Fig 162** PICT-7373

9. Lift the left foot pad and install a carriage bolt, washer and nut securing the fender to the frame (Fig. 163).

**Fig 163** PICT-7369

10. Slide the height-of-cut grip onto the height-of-cut lever (Fig. 164).

**Fig 164** PICT-7391

11. Position the seat assembly onto the fender (Fig. 165).

**Fig 165** PICT-7392

12. Install 3 of the 4 bolts securing the seat mount brackets to the fender as shown (Fig. 166).

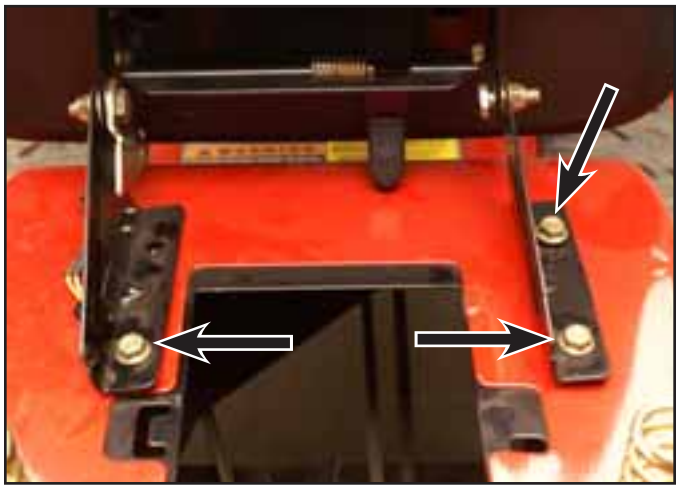

**Fig 166** PICT-7396

13. Install the 4th bolt and external lock washer securing the seat mount brackets to the fender (Fig. 167).

**Fig 167** PICT-7397

14. Using a spring removal tool (Toro part no. 92-5771), install an extension spring onto the seat mount bracket (Fig. 168).

**Fig 168** PICT-7359

15. Tighten the bolt and nut securing the left seat mount bracket to the seat bracket (Fig. 169).

**Fig 169** PICT-7358

16. Plug the 2 seat switch wires into the seat switch (Fig. 170).

**Fig 170** PICT-7357

17. Position the battery tray into the fender (Fig. 171).

**Fig 171** PICT-7354

18. Place the battery into the battery tray (Fig. 172).

**Fig 172** PICT-7353

19. Install the battery hold down rod (Fig. 173).

**Fig 173** PICT-7352

20. Connect the red battery cable to the positive battery terminal (Fig. 174).

**Fig 174** PICT-7351a

21. Connect the black battery cable to the negative battery terminal (Fig. 175).

**Fig 175** PICT-7349

22. Lower the seat.

23. Operate the tractor to ensure all controls and the seat switch operate properly.

## Tower Replacement

### Tower Removal

1. Remove the fender. Refer to “Fender Removal” on page 3-35.

2. Remove the steering wheel. Refer to “Steering Wheel Removal” on page 3-23.

3. Remove the hood. Refer to “Hood Removal” on page 3-34.

4. Remove the fuel cap. Slide the hose clamp down the fuel line. Remove the fuel line from the fuel filter and drain the fuel into a suitable container. Replace the fuel cap onto the fuel tank (Fig. 176).

**Fig 176** PICT-7300

5. Loosen the 2 screws securing the fuel tank support rods to the dash supports. Lay the support rods to the side (Fig. 177).

**Fig 177** PICT-7303

6. Lift the fuel tank out of the tower (Fig. 178).

**Fig 178** PICT-7304a

7. Unplug the hour meter from the wire harness (Fig. 179).

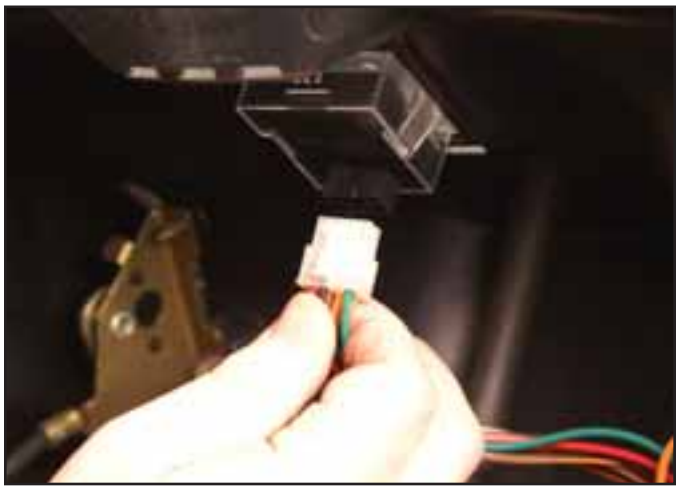

**Fig 179** PICT-7398

8. Unplug the electric PTO switch plug (Fig. 180).

**Fig 180** PICT-7400

9. Unplug the wire harness from the ignition module (Fig. 181).

**Fig 181** PICT-7401

10. Unplug the wire harness from the ignition switch (Fig. 182).

**Fig 182** PICT-7404

11. Remove the fuse holder from the tower support by depressing the tabs (Fig. 183).

**Fig 183** PICT-7405

12. Remove the throttle decal from the tower (Fig. 184).

**Fig 184** PICT-7407

13. Remove the bolt and nut securing the control knob to the throttle assembly (Fig. 185).

**Fig 185** PICT-7408

14. Remove the control knob (Fig. 186).

**Fig 186** PICT-7409

15. Remove the 2 screws securing the throttle assembly to the tower (Fig. 187).

**Fig 187** PICT-7410

16. Pull the throttle assembly out from the rear of the tower (Fig. 188).

**Fig 188** PICT-7412

17. Remove the 2 screws securing the bumper to the frame (1 bolt on the left and 1 on the right) (Fig. 189).

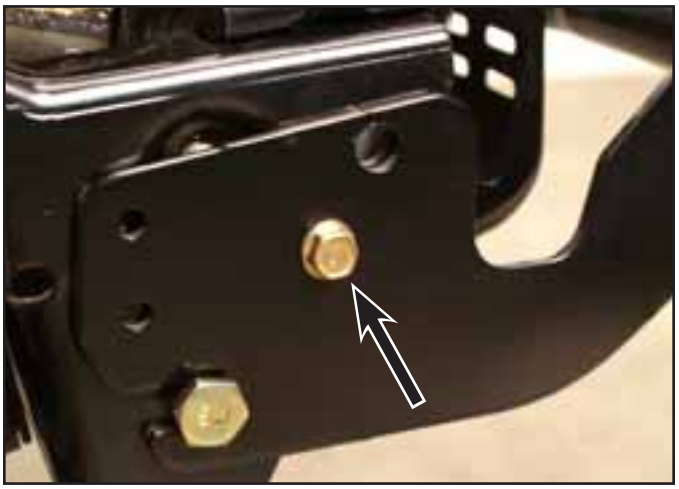

**Fig 189** PICT-7245

18. Remove the bumper (Fig. 190).

**Fig 190** PICT-7417

19. Remove the 4 screws securing the left and right side muffler brackets to the frame (2 on the left and 2 on the right (Fig. 191).

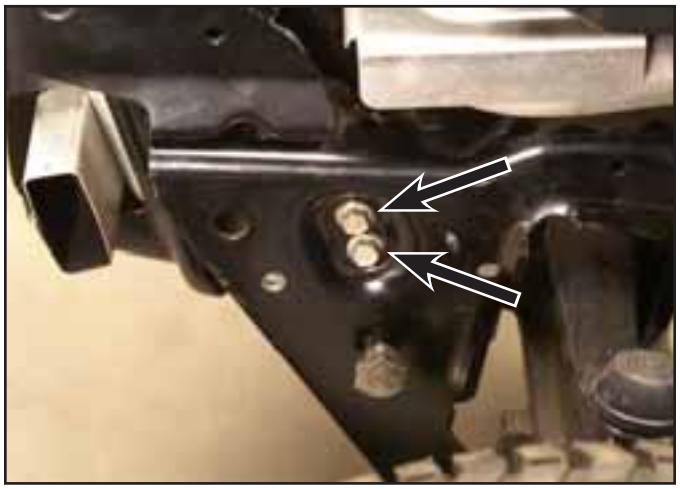

**Fig 191** PICT-7423

20. Slide the muffler and heat shield assembly off the manifold pipes (Fig. 192).

**Fig 192** PICT-7425

21. Position the throttle in the slow position and fully push the choke in (Fig. 193).

**Fig 193** PICT-7426

22. Loosen the TORX screw securing the cable clamp to the engine bracket (Fig. 194).

**Fig 194** PICT-7430

23. Remove the choke cable from the cable clamp and remove the z-bend from the engine control lever (Fig. 195).

**Fig 195** PICT-7433

24. Remove the nut securing the choke to the tower (Fig. 196).

**Fig 196** PICT-7434

25. Remove the choke assembly from the tower (Fig. 197).

**Fig 197** PICT-7436a

26. Remove the hairpins from the cruise control rod and the park brake linkage (Fig. 198).

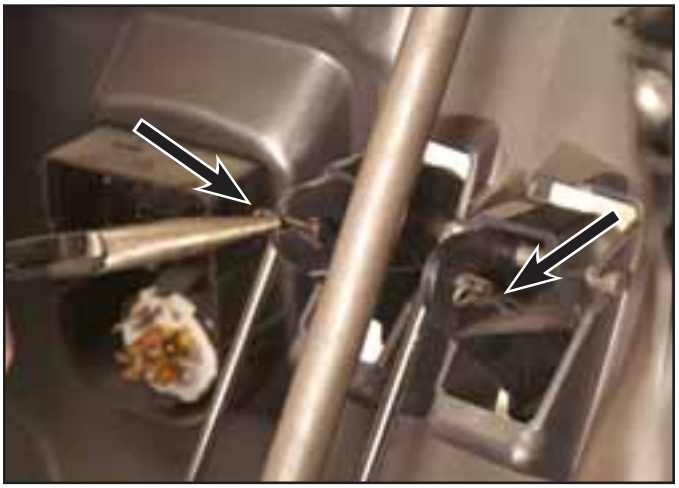

**Fig 198** PICT-7438

27. Remove the cruise control rod and park brake rod from the levers (Fig. 199).

**Fig 199** PICT-7439

28. Remove the 2 screws and washers securing the top of the tower to the top of the support brackets (Fig. 200).

**Fig 200** PICT-7446a

29. Remove the 2 bolts and 4 screws securing the bottom of the tower to the frame (3 on the left side, 3 on the right side) (Fig. 201).

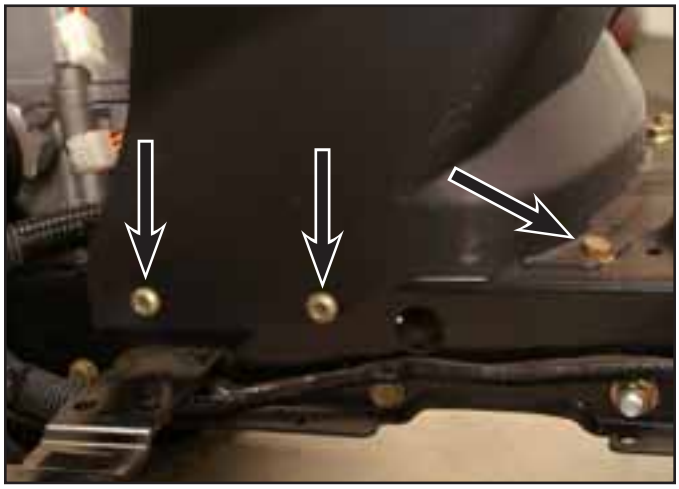

**Fig 201** PICT-7449

30. Lift the tower off the frame (Fig. 202).

**Fig 202** PICT-7453

31. Remove the 2 screws securing the left tower support to the frame (Fig. 203).

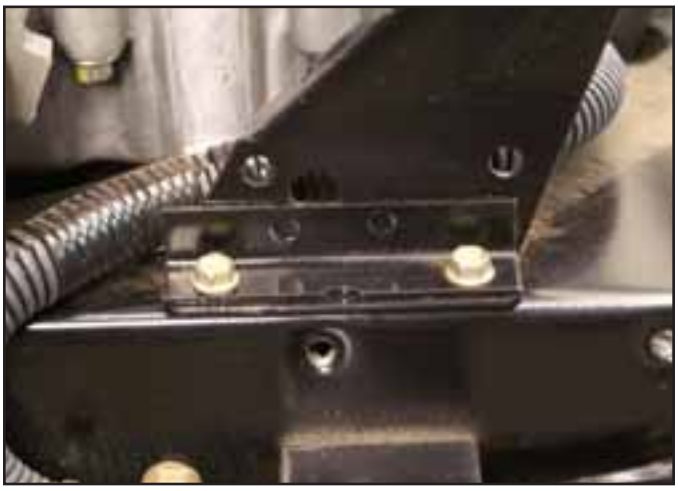

**Fig 203** PICT-7470

32. Remove the left tower support from the frame (Fig. 204).

**Fig 204** PICT-7473

33. Repeat steps 31 and 32 to remove the right tower support.

34. Remove the hour meter from the tower by squeezing the tabs (Fig. 205).

**Fig 205** PICT-7466

35. Remove the ignition switch module from the tower by depressing the 4 tabs (Fig. 206).

**Fig 206** PICT-7457

36. Remove the clip from back side of the PTO switch (Fig. 207).

**Fig 207** PICT-7458

37. Remove the PTO switch from the tower (Fig. 208).

**Fig 208** PICT-7459

38. Remove the screw securing the bent lever rod to the tower (Fig. 209).

**Fig 209** PICT-7460

39. Remove the bent lever rod, cruise control lever and parking brake lever from the tower (Fig. 210).

**Fig 210** PICT-7461

## Tower Installation

1. Position the bent lever rod, cruise control lever and parking brake lever assembly into the tower (Fig. 211).

**Fig 211** PICT-7461

Note the orientation of the levers when installed in the tower (Fig. 212).

**Fig 212** PICT-7462

2. Install the screw securing the bent lever rod to the tower (Fig. 213).

**Fig 213** PICT-7460

3. Insert the PTO switch into the tower (Fig. 214).

**Fig 214** PICT-7459

Note the orientation of the PTO switch when installed in the tower (Fig. 215).

**Fig 215** PICT-7475

4. Install the clip onto the back side of the PTO switch (Fig. 216).

**Fig 216** PICT-7458

5. Insert the ignition switch module into the tower (Fig. 217).

**Fig 217** PICT-7457

6. Install the hour meter into the tower (Fig. 218).

**Fig 218** PICT-7466

7. Position the left tower support onto the frame (Fig. 219).

**Fig 219** PICT-7473

8. Install 2 screws securing the left tower support to the frame (Fig. 220).

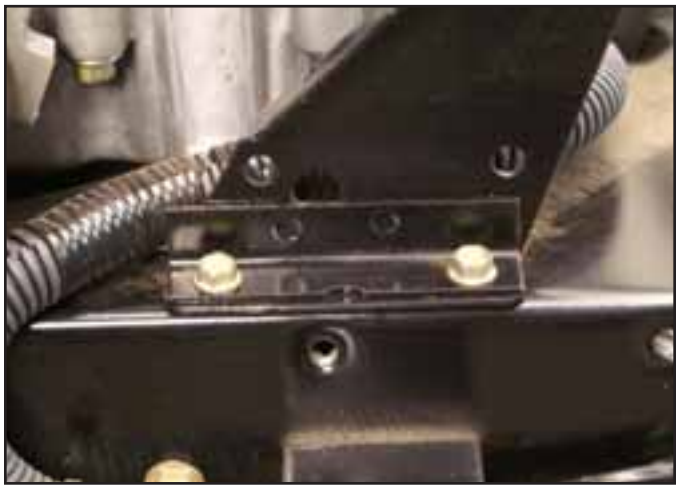

**Fig 220** PICT-7470

9. Repeat steps 7 and 8 to install the right tower support.

10. Position the tower onto the frame (Fig. 221).

**Fig 221** PICT-7453

11. Install 2 bolts and 4 screws securing the bottom of the tower to the frame (3 on the left side, 3 on the right side) (Fig. 222).

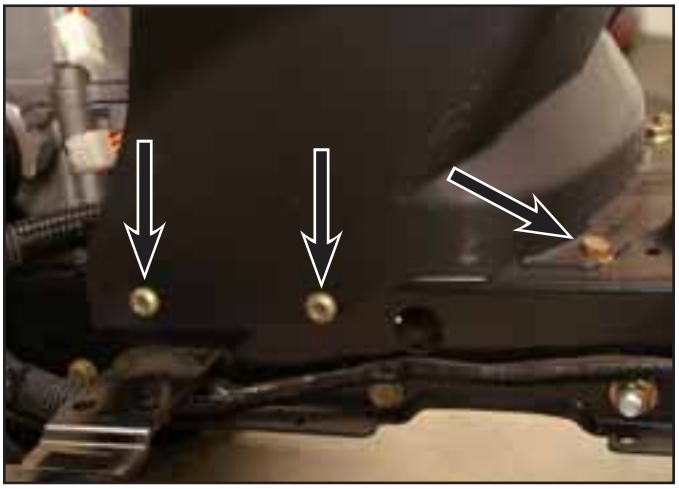

**Fig 222** PICT-7449

12. Install 2 screws and washers securing the top of the tower to the top of the support brackets (Fig. 223).

**Fig 223** PICT-7446a

13. Insert the cruise control rod and park brake rod into the levers (Fig. 224).

**Fig 224** PICT-7476

14. Install a hairpin into the cruise control rod and the park brake rod securing them to the levers (Fig. 225).

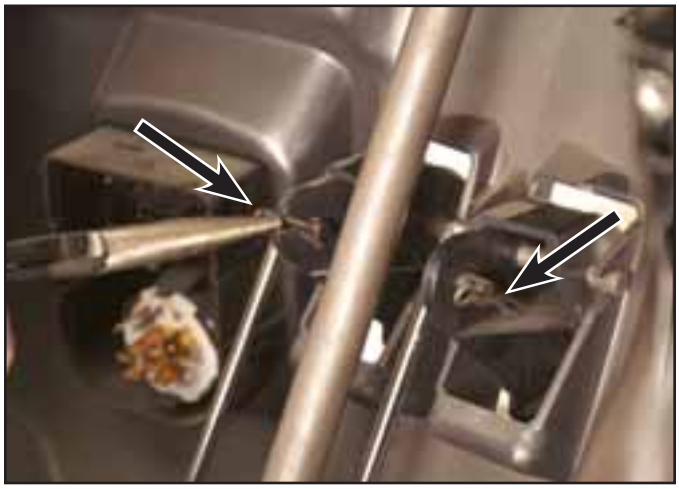

**Fig 225** PICT-7438

15. Insert the choke assembly through the tower (Fig. 226).

**Fig 226** PICT-7477

16. Route the choke cable around the left side of the engine placing the cable into the R-clamp (Fig. 227) and through the cable tie (Fig. 228).

**Fig 227** PICT-7478

**Fig 228** PICT-7479

17. Install a nut securing the choke handle to the tower (Fig. 229).

**Fig 229** PICT-7481

18. Insert the choke cable z-bend into the choke lever on the front of the engine (Fig. 230).

**Fig 230** PICT-7488

19. Place the choke cable into the cable clamp (Fig. 231).

**Fig 231** PICT-7489

20. Insert the throttle assembly from the rear of the tower (Fig. 232).

**Fig 232** PICT-7412

21. Install 2 screws securing the throttle assembly to the tower (Fig. 233).

**Fig 233** PICT-7410

22. Push the knob onto the throttle control lever (Fig. 234).

**Fig 234** PICT-7490

23. Install a bolt and nut securing the control knob to the throttle assembly (Fig. 235).

**Fig 235** PICT-7491

24. Apply a throttle decal onto the tower (Fig. 236).

**Fig 236** PICT-7407

25. Install the fuse holder into the right hand tower support (Fig. 237).

**Fig 237** PICT-7493

26. Plug the wire harness into the ignition switch (Fig. 238).

**Fig 238** PICT-7404

27. Plug the wire harness into the ignition module (Fig. 239).

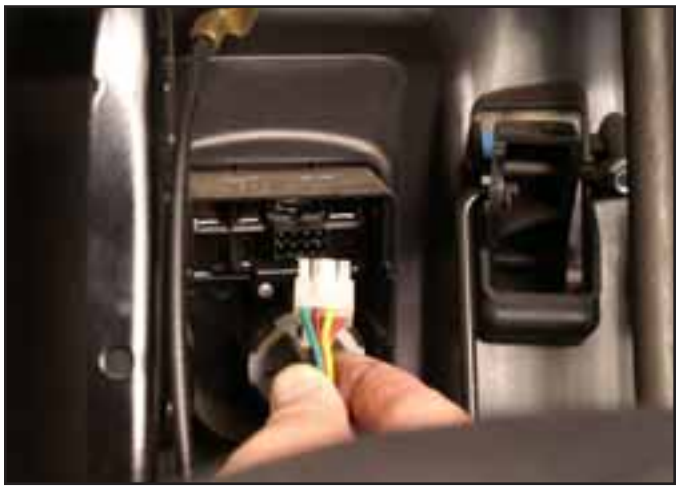

**Fig 239** PICT-7401

28. Plug the wire harness into the electric PTO switch (Fig. 240).

**Fig 240** PICT-7495

29. Plug the wire harness into the hour meter (Fig. 241).

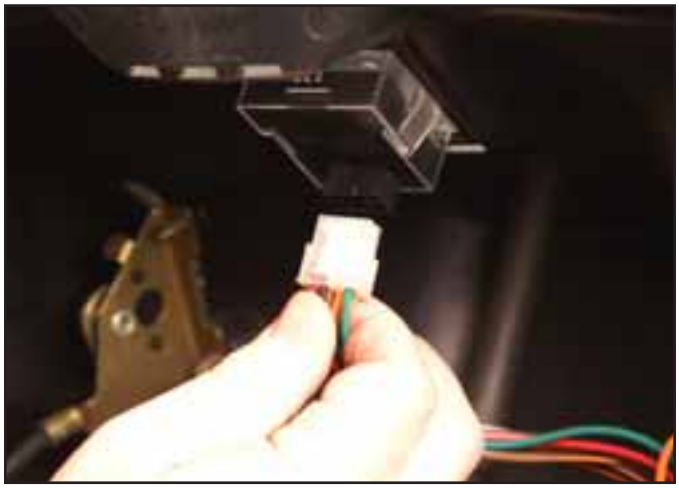

**Fig 241** PICT-7398

30. Position the fuel tank into the tower (Fig. 242).

**Fig 242** PICT-7304a

31. Position the 2 fuel tank support rods and install a screw securing each support rod to the dash supports (Fig. 243).

**Fig 243** PICT-7303

32. Slide the fuel line back onto the fuel filter and position the hose clamp to secure (Fig. 244).

**Fig 244** PICT-7300

33. Install the steering wheel. Refer to “Steering Wheel Installation” on page 3-24.

34. Install the fender. Refer to “Fender Installation” on page 3-41.

35. Adjust the throttle and choke cables. Refer to “Throttle and Choke Cable Adjustment” on page 4-10.

36. Slide the muffler and heat shield assembly onto the manifold pipes (Fig. 245).



**Fig 245** PICT-7425

37. Install 4 screws securing the left and right side muffler brackets to the frame (2 on the left and 2 on the right (Fig. 246).

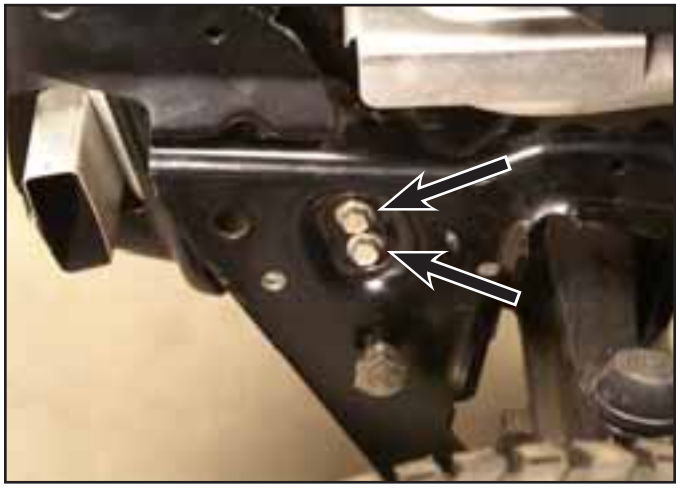

**Fig 246** PICT-7423

38. Position the bumper to the frame (Fig. 247).

**Fig 247** PICT-7417

39. Install 2 screws securing the bumper to the frame (1 bolt on the left and 1 on the right) (Fig. 248).

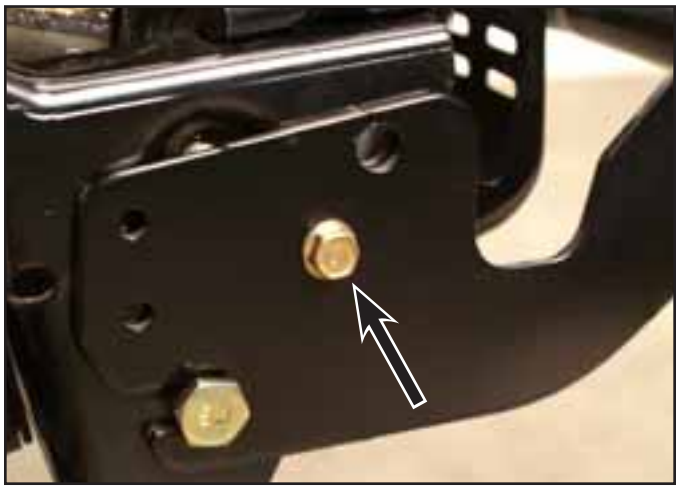

**Fig 248** PICT-7245

40. Install the hood. Refer to “Hood Installation” on page 3-34.

41. Operate the tractor to ensure all controls and the seat switch operate properly.

## Throttle Cable Replacement

### Throttle Cable Removal

1. Lift the seat to access the battery compartment.

2. Disconnect the battery cable from the negative battery terminal (Fig. 249).

**Fig 249** PICT-7349

3. Remove the hood. Refer to “Hood Removal” on page 3-34.

4. Remove the 2 screws securing the bumper to the frame (1 bolt on the left and 1 on the right) (Fig. 250).

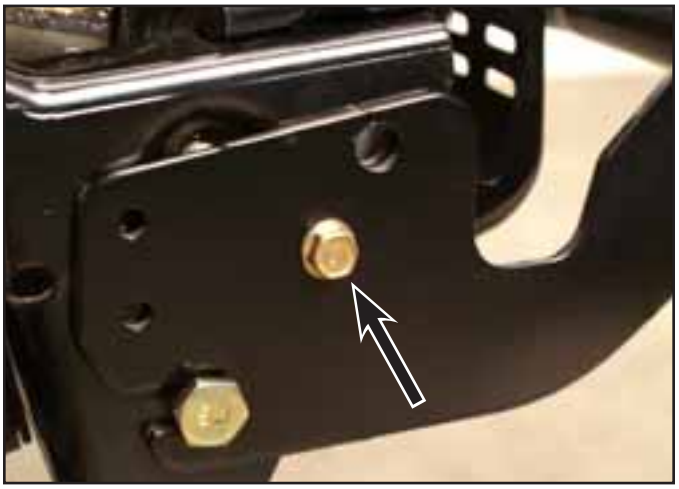

**Fig 250** PICT-7245

5. Remove the bumper (Fig. 251).

**Fig 251** PICT-7417

6. Remove the 4 screws securing the left and right side muffler brackets to the frame (2 on the left and 2 on the right (Fig. 252).

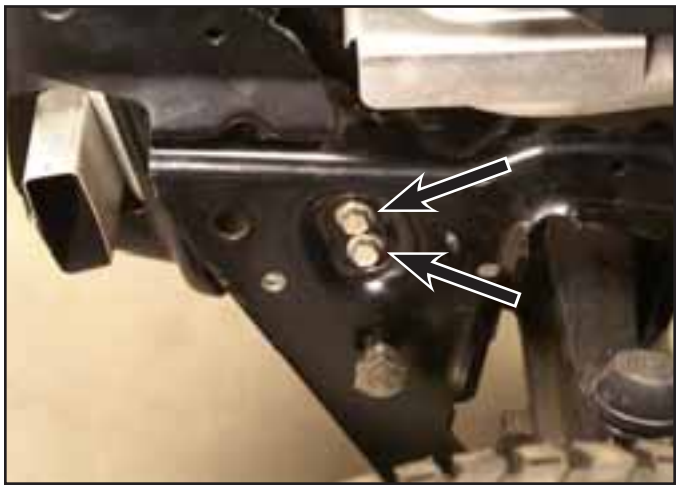

**Fig 252** PICT-7423

7. Slide the muffler and heat shield assembly off the manifold pipes (Fig. 253).

**Fig 253** PICT-7425

8. Remove the fuel cap. Slide the hose clamp down the fuel line. Remove the fuel line from the fuel filter and drain the fuel into a suitable container. Replace the fuel cap onto the fuel tank (Fig. 254).

**Fig 254** PICT-7300

9. Loosen the 2 screws securing the fuel tank support rods to the dash supports. Lay the support rods to the side (Fig. 255).

**Fig 255** PICT-7303

10. Lift the fuel tank out of the tower (Fig. 256).

**Fig 256** PICT-7304a

11. Remove the throttle decal from the tower (Fig. 257).

**Fig 257** PICT-7407

12. Remove the bolt and nut securing the control knob to the throttle assembly (Fig. 258).

**Fig 258** PICT-7491

13. Remove the control knob (Fig. 259).

**Fig 259** PICT-7490

14. Remove the 2 screws securing the throttle assembly to the tower (Fig. 260).

**Fig 260** PICT-7410

15. Pull the throttle assembly out from the rear of the tower (Fig. 261).

**Fig 261** PICT-7412

16. Loosen the cable clamp TORX screw securing the throttle and choke cables to the engine bracket (Fig. 262).

**Fig 262** PICT-7430

17. Remove the throttle cable from the clamp and the z-bend from the engine throttle bracket (Fig. 263).

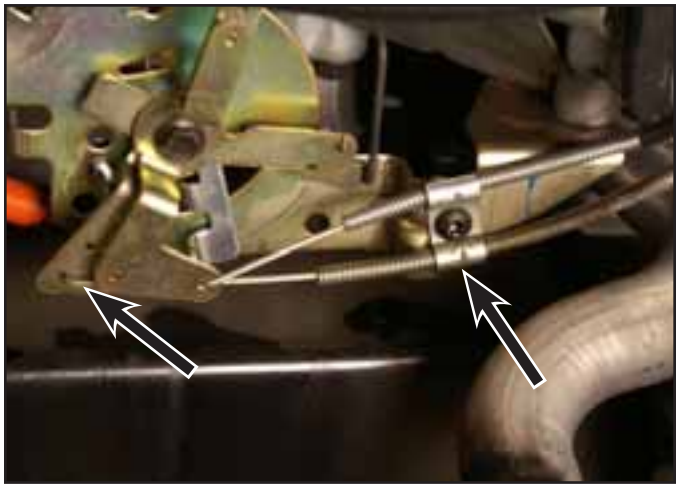

**Fig 263** PICT-7426

18. Remove the throttle cable assembly from the cable tie and R-clamp located on the left side of the engine (Fig. 264 and Fig. 265).

**Fig 264** PICT-7479

**Fig 265** PICT-7478

## Throttle Cable Installation

1. Slide the throttle cable assembly through the cable tie located on the left front corner of the engine. Place the cable into the R-clamp located on the left rear side of the engine (Fig. 266 and Fig. 267).

**Fig 266** PICT-7479

**Fig 267** PICT-7478

2. Install the throttle cable z-bend into engine throttle bracket and insert it into the cable clamp (Fig. 268).

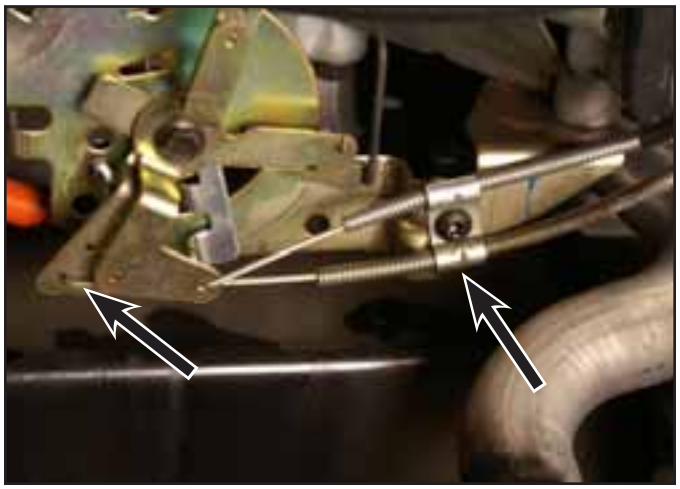

**Fig 268** PICT-7426

3. Insert the throttle assembly into the tower (Fig. 269).

**Fig 269** PICT-7412

4. Install 2 screws to secure the throttle assembly to the tower (Fig. 270).

**Fig 270** PICT-7410

5. Slide the control knob onto the throttle assembly lever (Fig. 271).

**Fig 271** PICT-7490

6. Install a bolt and nut to secure the control knob to the throttle assembly (Fig. 272).

**Fig 272** PICT-7491

7. Install a throttle decal onto the tower (Fig. 273).

**Fig 273** PICT-7407

8. Position the fuel tank into the tower (Fig. 274).

**Fig 274** PICT-7304a

9. Position the 2 fuel tank support rods and install a screw securing each support rod to the dash supports (Fig. 275).

**Fig 275** PICT-7303

10. Slide the fuel line back onto the fuel filter and position the hose clamp to secure (Fig. 276).

**Fig 276** PICT-7300

11. Adjust the throttle and choke cables. Refer to “Throttle and Choke Cable Adjustment” on page 4-10.

12. Slide the muffler and heat shield assembly onto the manifold pipes and into position (Fig. 277).

**Fig 277** PICT-7425

13. Install 4 screws securing the left and right side muffler brackets to the frame (2 on the left and 2 on the right (Fig. 278).

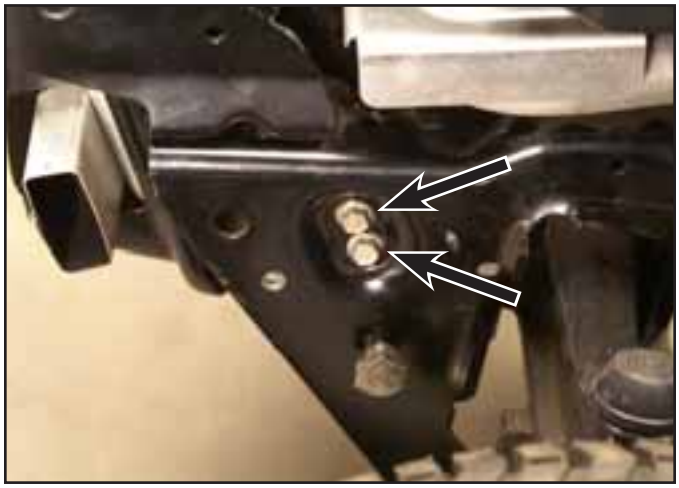

**Fig 278** PICT-7423

14. Position the bumper to the frame (Fig. 279).

**Fig 279** PICT-7417

15. Install 2 screws securing the bumper to the frame (1 bolt on the left and 1 on the right) (Fig. 280).

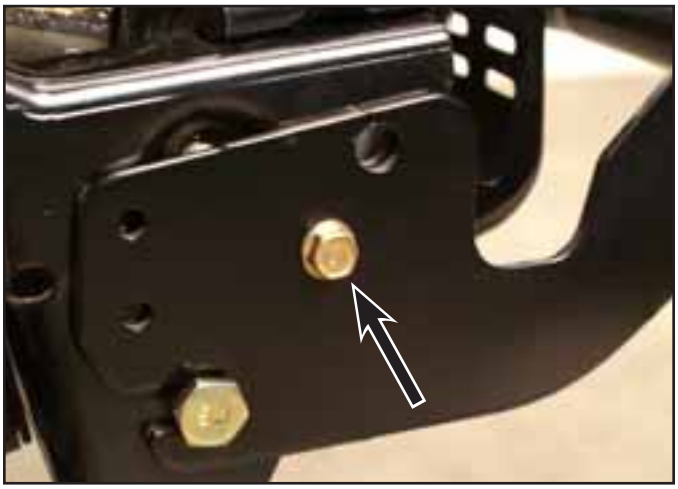

**Fig 280** PICT-7245

16. Install the hood. Refer to “Hood Installation” on page 3-34.

17. Connect the battery cable to the negative battery terminal (Fig. 281).

**Fig 281** PICT-7349

18. Lower the seat.

19. Operate the tractor to ensure all controls operate properly.

## Choke Cable Replacement

### Choke Cable Removal

1. Lift the seat to access the battery compartment.
2. Disconnect the battery cable from the negative battery terminal (Fig. 282).

**Fig 282** PICT-7349

3. Remove the hood. Refer to “Hood Removal” on page 3-34.
4. Remove the 2 screws securing the bumper to the frame (1 bolt on the left and 1 on the right) (Fig. 283).

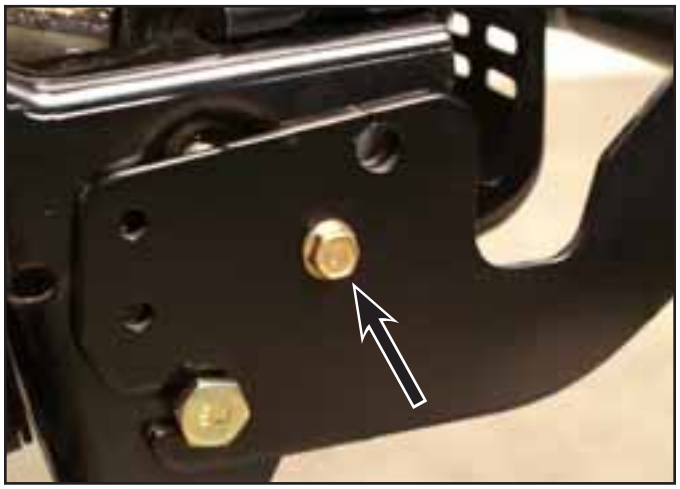

**Fig 283** PICT-7245

5. Remove the bumper (Fig. 284).

**Fig 284** PICT-7417

6. Remove the 4 screws securing the left and right side muffler brackets to the frame (2 on the left and 2 on the right (Fig. 285).

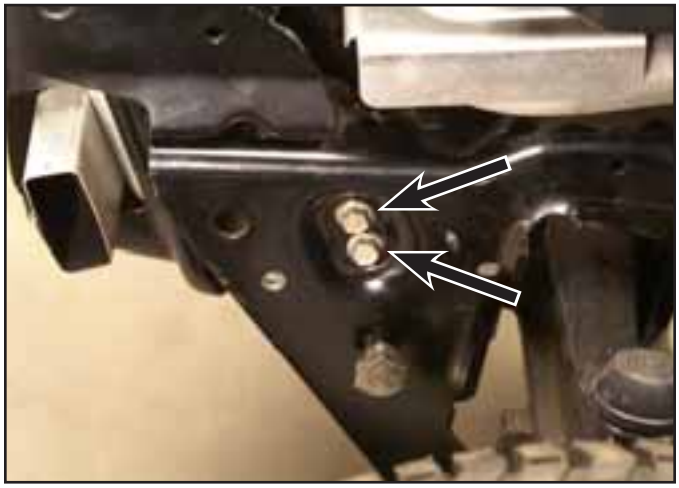

**Fig 285** PICT-7423

7. Slide the muffler and heat shield assembly off the manifold pipes (Fig. 286).

**Fig 286** PICT-7425

8. Remove the fuel cap. Slide the hose clamp down the fuel line. Remove the fuel line from the fuel filter and drain the fuel into a suitable container. Replace the fuel cap onto the fuel tank (Fig. 287).

**Fig 287** PICT-7300

9. Loosen the 2 screws securing the fuel tank support rods to the dash supports. Lay the support rods to the side (Fig. 288).

**Fig 288** PICT-7303

10. Lift the fuel tank out of the tower (Fig. 289).

**Fig 289** PICT-7304a

11. Loosen the cable clamp TORX screw securing the throttle and choke cables to the engine bracket (Fig. 290).

**Fig 290** PICT-7430

12. Remove the choke cable from the cable clamp and remove the z-bend from the engine control lever (Fig. 291).

**Fig 291** PICT-7433

13. Remove the nut securing the choke control to the tower (Fig. 292).

**Fig 292** PICT-7434

14. Remove the choke cable assembly from the machine by pulling it out through the tower (Fig. 293).

**Fig 293** PICT-7436a

## Choke Cable Installation

1. Insert the choke cable assembly through the tower (Fig. 294).

**Fig 294** PICT-7477

2. Route the choke cable around the left side of the engine placing the cable into the R-clamp (Fig. 295) and through the cable tie (Fig. 296).

**Fig 295** PICT-7478

**Fig 296** PICT-7479

3. Install a nut securing the choke cable control to the tower (Fig. 297).

**Fig 297** PICT-7481

4. Insert the choke cable z-bend into the choke lever on the front of the engine (Fig. 298).

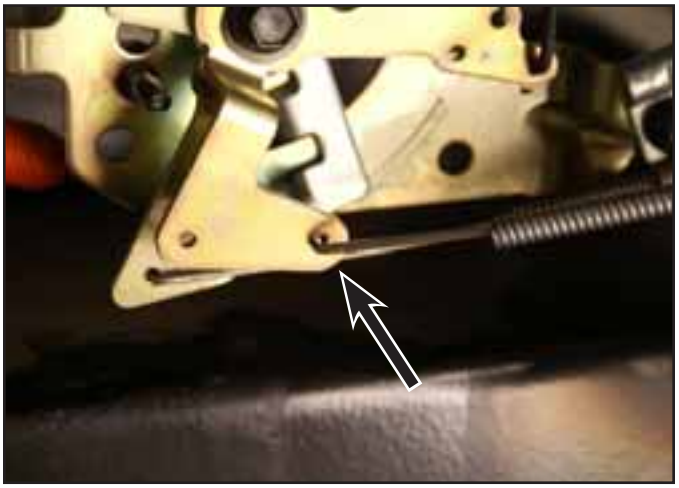

**Fig 298** PICT-7488

5. Place the choke cable into the cable clamp (Fig. 299).

**Fig 299** PICT-7489

6. Adjust the throttle and choke cables. Refer to “Throttle and Choke Cable Adjustment” on page 4-10.

7. Position the fuel tank into the tower (Fig. 300).

**Fig 300** PICT-7304a

8. Position the 2 fuel tank support rods and install a screw securing each support rod to the dash supports (Fig. 301).

**Fig 301** PICT-7303

9. Slide the fuel line back onto the fuel filter and position the hose clamp to secure (Fig. 302).

**Fig 302** PICT-7300

10. Slide the muffler and heat shield assembly onto the manifold pipes and into position (Fig. 303).

**Fig 303** PICT-7425

11. Install 4 screws securing the left and right side muffler brackets to the frame (2 on the left and 2 on the right (Fig. 304).

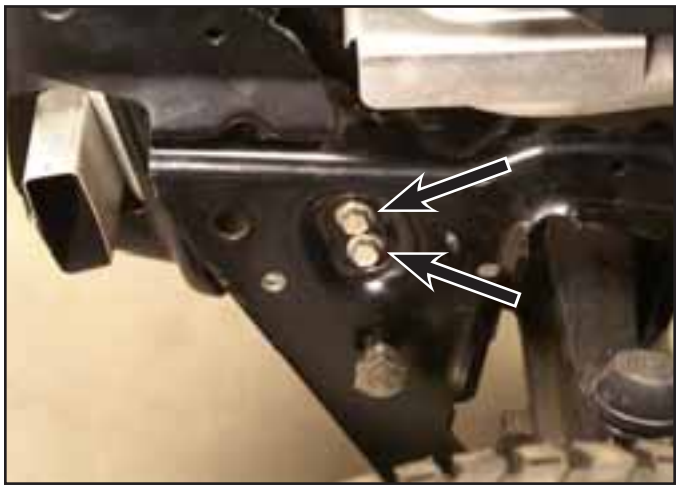

**Fig 304** PICT-7423

12. Position the bumper to the frame (Fig. 305).

**Fig 305** PICT-7417

13. Install 2 screws securing the bumper to the frame (1 bolt on the left and 1 on the right) (Fig. 306).

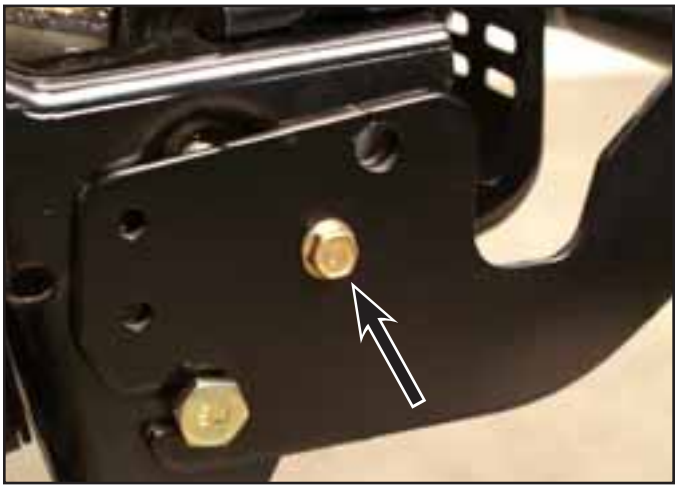

**Fig 306** PICT-7245

14. Install the hood. Refer to “Hood Installation” on page 3-34.

15. Connect the battery cable to the negative battery terminal (Fig. 307).

**Fig 307** PICT-7349

16. Lower the seat.

17. Operate the tractor to ensure all controls operate properly.

## Deck Lift Link Replacement

The following procedures were done on the right side of the tractor. The procedure is the same for the left side unless noted. The rear wheel assembly has been removed for photo purposes.

### Deck Lift Link Removal

1. Remove mower deck. Refer to:
   - “50” Mower Deck Removal” on page 7-6
   - “54” Mower Deck Removal” on page 7-29

2. Place the deck lift handle in the lowest height-of cut position.

3. Lift the seat to access the battery compartment.

4. Disconnect the black battery cable from the negative battery terminal (Fig. 308).

**Fig 308** PICT-7349

5. Disconnect the red battery cable from the positive battery terminal (Fig. 309).

**Fig 309** PICT-7351a

6. Remove the battery hold down rod (Fig. 310).

**Fig 310** PICT-7352

7. Remove the battery from the battery tray (Fig. 311).

**Fig 311** PICT-7353

8. Remove the battery tray (Fig. 312).

**Fig 312** PICT-7354

9. Remove the cotter pin securing the lift cable to the lift link (Fig. 313).

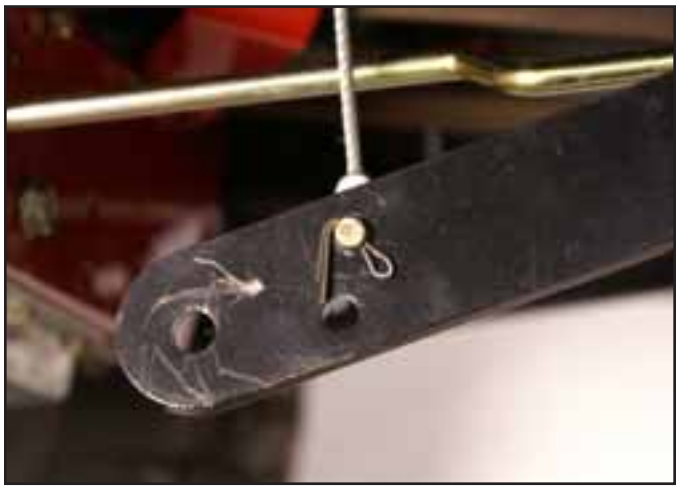

**Fig 313** PICT-7752

10. Remove the shoulder bolt and nut securing the front end of the lift link to the frame (Fig. 314).

**Fig 314** PICT-7758

11. Remove the lift link from the machine (Fig. 315).

**Fig 315** PICT-7808

## Deck Lift Link Installation

1. Position the lift link to the frame (Fig. 316).

**Fig 316** PICT-7808

2. Install a shoulder bolt and nut to secure the front end of the lift link to the frame (Fig. 317).

**Fig 317** PICT-7758

3. Insert the lower end of the lift cable into the lift link and install a cotter pin securing the lift cable to the lift link (Fig. 318).

   Right side lift cable: The lift cable must be positioned on the outside of the brake rod.

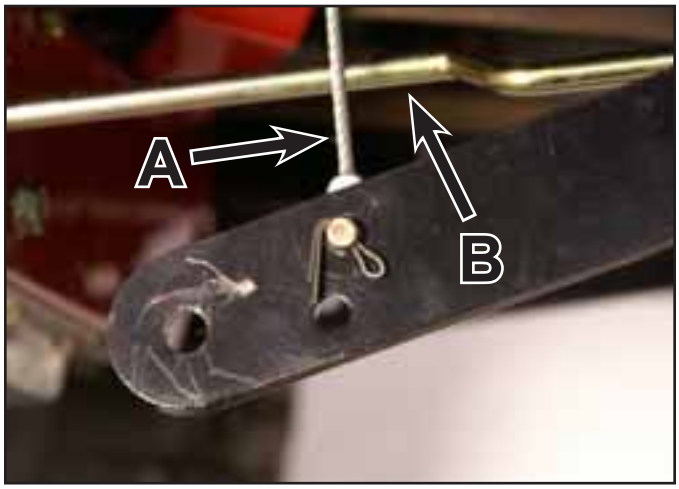


**Fig 318** PICT-7752

A. Lift cable
B. Brake Rod

Left side lift cable: The lift cable must be positioned between the transmission drive belt and the frame (Fig. 319).

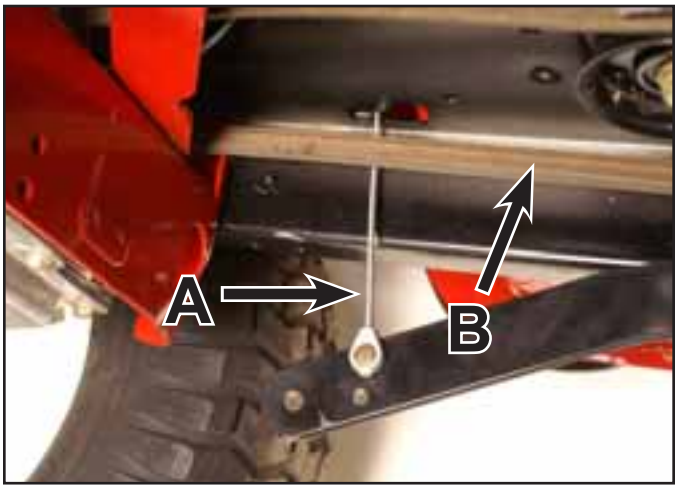


**Fig 319** PICT-7794

A. Lift cable B. Transmission drive belt

4. Position the battery tray into the fender (Fig. 320).

**Fig 320** PICT-7354

5. Place the battery into the battery tray (Fig. 321).

**Fig 321** PICT-7353

6. Install the battery hold down rod (Fig. 322).

**Fig 322** PICT-7352

7. Connect the red battery cable to the positive battery terminal (Fig. 323).

**Fig 323** PICT-7351a

8. Connect the black battery cable to the negative battery terminal (Fig. 324).

**Fig 324** PICT-7349

9. Lower the seat.

10. Install the mower deck. Refer to:
    - “50” Mower Deck Installation” on page 7-8
    - “54” Mower Deck Installation” on page 7-31

11. Operate the tractor to ensure all controls operate properly.

## Deck Lift Cable Replacement

The following procedures were performed on the right side lift cable. The procedure is the same for the left side lift cable unless noted. The wheel assembly has been removed for photo purposes.

### Deck Lift Cable Removal

1. Remove the mower deck. Refer to:
    - “50” Mower Deck Removal” on page 7-6
    - “54” Mower Deck Removal” on page 7-29

2. Place the deck lift handle in the highest height-of-cut position.

3. Lift the seat to access the battery compartment.

4. Disconnect the black battery cable from the negative battery terminal (Fig. 325).

**Fig 325** PICT-7349

5. Disconnect the red battery cable from the positive battery terminal (Fig. 326).

**Fig 326** PICT-7351a

6. Remove the battery hold down rod (Fig. 327).

**Fig 327** PICT-7352

7. Remove the battery from the battery tray (Fig. 328).

**Fig 328** PICT-7353

8. Remove the battery tray (Fig. 329).

**Fig 329** PICT-7354

9. Using a spring tool (Toro part no. 92-5771), unhook the deck lift spring from the machine (Fig. 330).

**Fig 330** PICT-7768

10. Remove the hairpin cotter securing the upper end of the lift cable to the frame (Fig. 331).

**Fig 331** PICT-7766

11. Place the deck lift handle in the lowest height-of cut position.

12. Remove the e-clip from the end of the lift shaft assembly (Fig. 332).

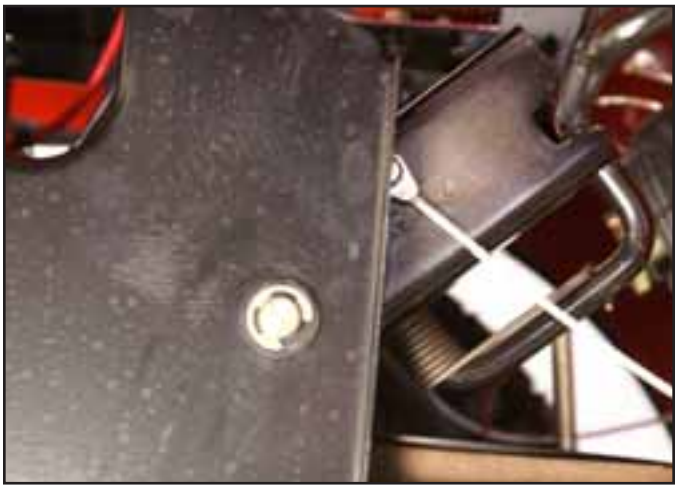

**Fig 332** PICT-7771

13. Slide the lift shaft over as far as possible and remove the upper end of the cable from the lift shaft assembly (Fig. 333).

**Fig 333** PICT-7775

14. Remove the cotter pin securing the lift cable to the lift link. Remove the end of cable from the lift link (Fig. 334).

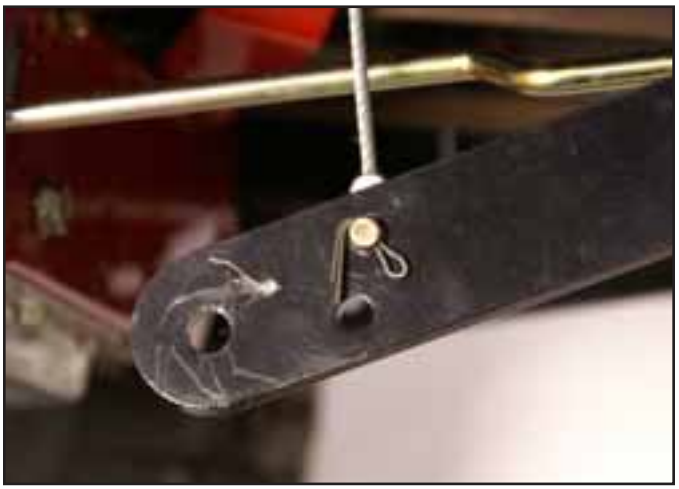

**Fig 334** PICT-7752

15. Remove the nut from the shoulder bolt that secures the roller pulley and lift cable to the frame (Fig. 335).

**Fig 335** PICT-7760

16. Remove the roller pulley and shoulder bolt (Fig. 336).

**Fig 336** PICT-7764

17. Remove the lift cable from the machine (Fig. 337).

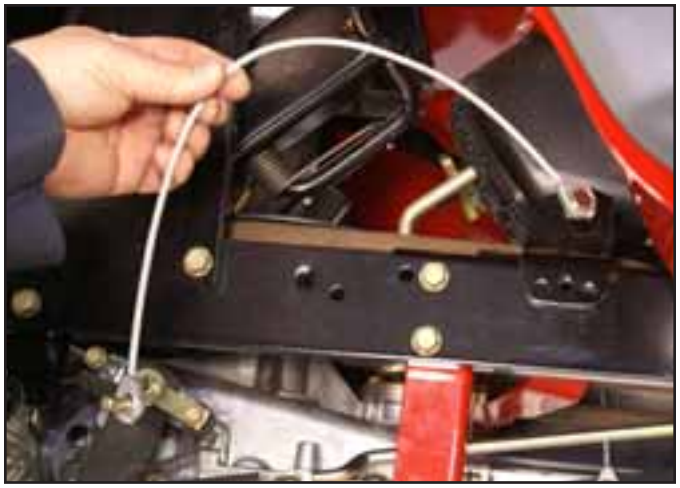

**Fig 337** PICT-7776

## Deck Lift Cable Installation

1. Place the deck lift handle in the lowest height-of cut position.

2. Position the lift cable into the machine (Fig. 338).

**Fig 338** PICT-7776

3. With the e-clip removed, slide the lift shaft over as far as possible and install the upper end of the cable into the lift shaft assembly (Fig. 339).

**Fig 339** PICT-7777

4. Install the e-clip onto the end of the lift shaft assembly (Fig. 340).

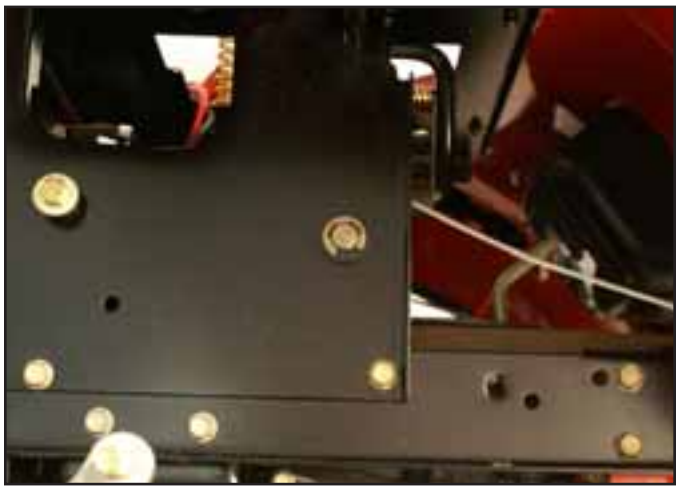

**Fig 340** PICT-7784

5. Place the deck lift handle in the highest height-of cut position.

6. Install a hairpin cotter securing the upper end of the lift cable to the lift shaft assembly (Fig. 341).

**Fig 341** PICT-7766

7. Hook the deck lift spring onto the frame (Fig. 342).

**Fig 342** PICT-7768

8. Place the deck lift handle in the lowest height-of cut position.

9. Insert the lower end of the lift cable through the hole in the frame located in front of the roller pulley bracket (Fig. 343).

**Fig 343** PICT-7790

10. Insert the shoulder bolt into the roller pulley. Place the lift cable into the groove of the roller pulley. Insert the shoulder bolt/roller assembly into the pulley bracket located on the frame (Fig. 344).

**Note: Make sure the cable stays inside the guides on the frame.**

**Fig 344** PICT-7792

11. Install a nut onto the shoulder bolt to secure the roller pulley and lift cable to the frame (Fig. 345).

**Fig 345** PICT-7760

12. Insert the lower end of the lift cable into the lift link and install a cotter pin securing the lift cable to the lift link (Fig. 346).

    Right side lift cable: The lift cable must be positioned on the outside of the brake rod.

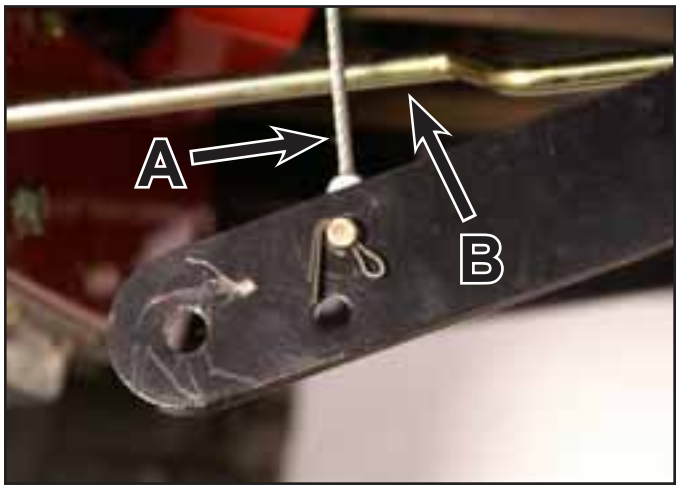


**Fig 346** PICT-7752

A. Lift cable B. Brake Rod

Left side lift cable: The lift cable must be positioned between the transmission drive belt and the frame (Fig. 347).

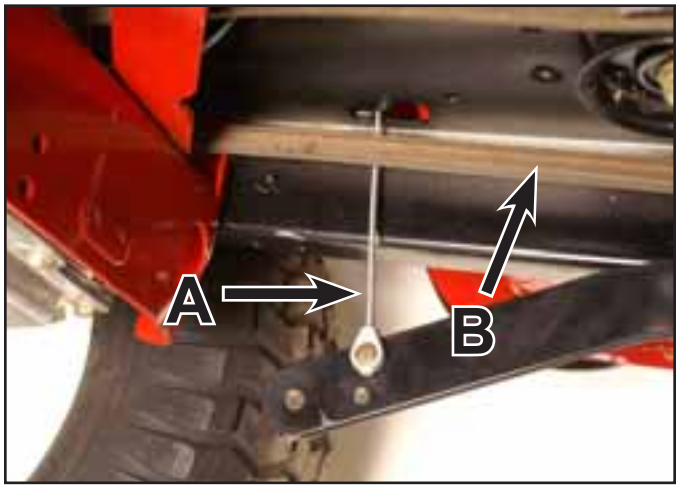


**Fig 347** PICT-7794

A. Lift cable B. Transmission drive belt

13. Position the battery tray in the fender (Fig. 348).

**Fig 348** PICT-7354

14. Place the battery into the battery tray (Fig. 349).

**Fig 349** PICT-7353

15. Install the battery hold down rod (Fig. 350).

**Fig 350** PICT-7352

16. Connect the red battery cable to the positive battery terminal (Fig. 351).

**Fig 351** PICT-7351a

17. Connect the black battery cable to the negative battery terminal (Fig. 352).

**Fig 352** PICT-7349

18. Lower the seat.

19. Install the mower deck. Refer to:
    - 50” Mower Deck Installation on page 7-8
    - 54” Mower Deck Installation on page 7-31

20. Operate the tractor to ensure all controls operate properly.

## Deck Lift Handle & Shaft Assembly Replacement

### Deck Lift Handle & Shaft Assembly Removal

1. Remove the mower deck. Refer to:
   - “50” Mower Deck Removal” on page 7-6
   - “54” Mower Deck Removal” on page 7-29

2. Place the deck lift handle in the highest height-of-cut position.

3. Remove the handle grip from the deck lift handle (Fig. 353).

**Fig 353** PICT-7391

4. Lift the seat to access the battery compartment.

5. Disconnect the black battery cable from the negative battery terminal (Fig. 354).

**Fig 354** PICT-7349

6. Disconnect the red battery cable from the positive battery terminal (Fig. 355).

**Fig 355** PICT-7351a

7. Remove the battery hold down rod (Fig. 356).

**Fig 356** PICT-7352

8. Remove the battery from the battery tray (Fig. 357).

**Fig 357** PICT-7353

9. Remove the battery tray (Fig. 358).

**Fig 358** PICT-7354

10. Remove the hairpin cotter securing the upper end of the lift cable to the lift shaft assembly (Fig. 359).

**Fig 359** PICT-7766

11. Using a spring tool (Toro part no. 92-5771), remove the deck lift spring from the machine (Fig. 360).

**Fig 360** PICT-7768

12. Place the deck lift handle in the lowest height-of-cut position.

13. Remove the e-clip from the end of the lift shaft assembly (Fig. 361).

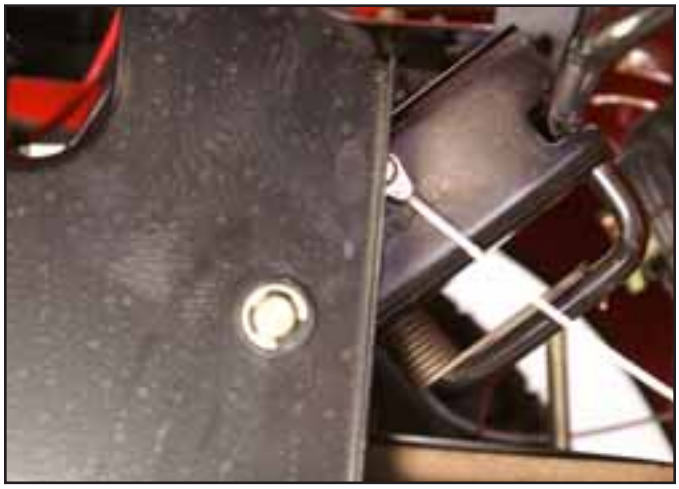

**Fig 361** PICT-7771

14. Slide the lift shaft over as far as possible and remove the upper end of the cable from the lift shaft assembly (Fig. 362).

**Fig 362** PICT-7775

15. Remove the bushing from the end of the lift shaft assembly (Fig. 363).

**Fig 363** PICT-7799

16. Repeat steps 11 thru 15 on the opposite side of the machine.

17. Slide the ends of the deck lift shaft out of the sides of the frame. Move the wire harness from above the deck lift shaft assembly. Slide the assembly back to the left and remove the lift handle from the slot in the fender. Remove the assembly through the right side of the machine (Fig. 364 and Fig. 365).



**Fig 364** PICT-7800

**Fig 365** PICT-7802

18. Remove the torsion spring from the handle and shaft assembly (Fig. 366).

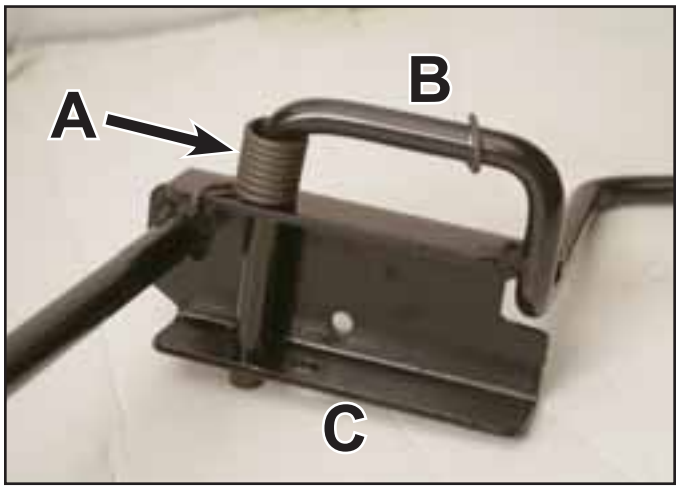


**Fig 366** PICT-7805a

A. Torsion spring
B. Handle
C. Shaft assembly

19. Remove the handle from the shaft assembly (Fig. 367).

**Fig 367** PICT-7807a

## Deck Lift Handle & Shaft Assembly Installation

1. Install the handle into the shaft assembly (Fig. 368).

**Fig 368** PICT-7807a

2. Install the torsion spring securing the handle to the shaft assembly (Fig. 369).

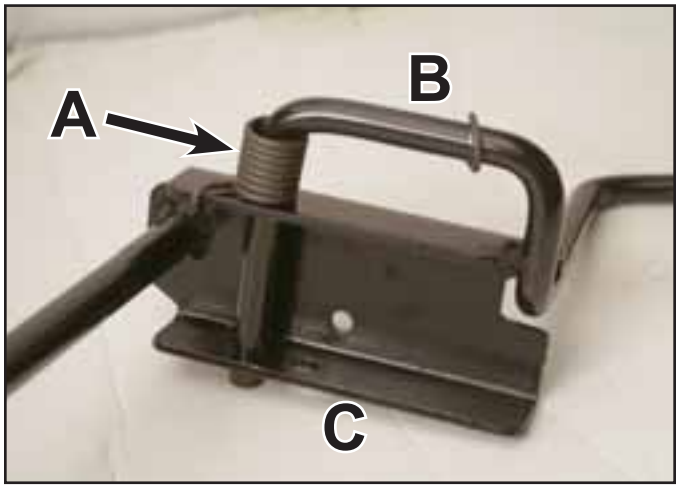


**Fig 369** PICT-7805a

A. Torsion spring
B. Handle
C. Shaft assembly

3. Insert the deck lift shaft and handle assembly in to the frame from under the right side of the fender. Insert the handle into the slot in the fender. Position the wire harness on top of the shaft assembly. Insert the ends of the shaft into the sides of the frame (Fig. 370 and Fig. 371).

**Fig 370** PICT-7802

**Fig 371** PICT-7800

4. Install a bushing over the end of the lift shaft (Fig. 372).

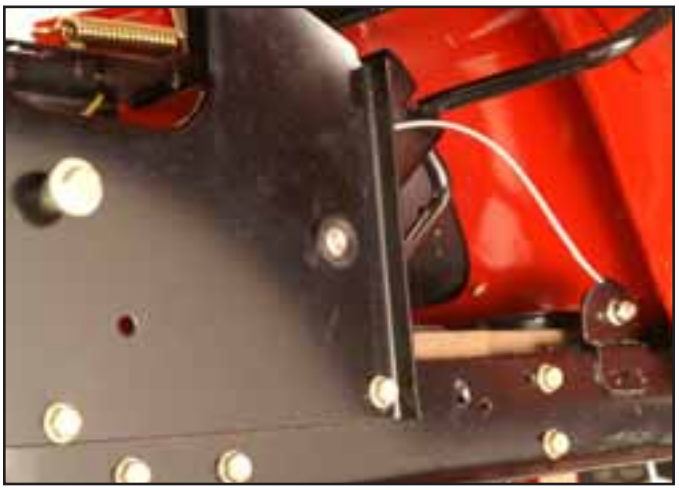

**Fig 372** PICT-7816

5. Slide the lift shaft over as far as possible and insert the upper end of the cable assembly into the hole on the side of the lift shaft assembly (Fig. 373).

**Fig 373** PICT-7775

6. Install an e-clip onto the end of the lift shaft assembly (Fig. 374).

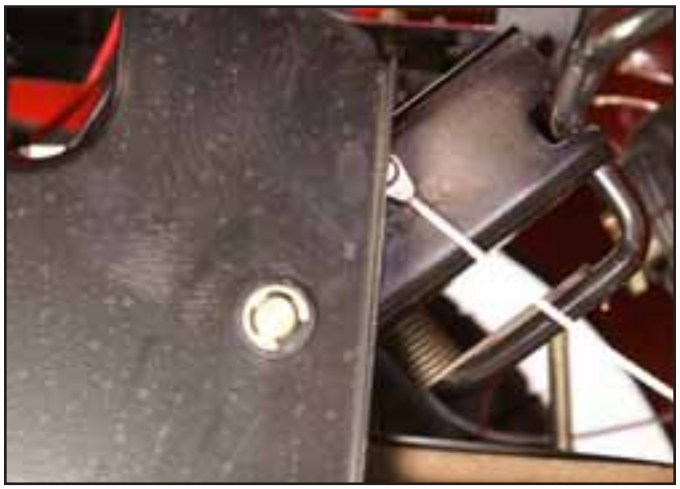

**Fig 374** PICT-7771

7. Repeat steps 4 thru 6 on the opposite side of the machine.

8. Place the deck lift handle in the highest height-of-cut position.

9. Install the deck lift spring from the lift shaft assembly to the rear frame (Fig. 375).

**Fig 375** PICT-7768

10. Install a hair pin to secure the upper end of both lift cables to the lift shaft assembly (Fig. 376).

**Fig 376** PICT-7766

11. Position the battery tray (Fig. 377).

**Fig 377** PICT-7354

12. Place the battery into the battery tray (Fig. 378).

**Fig 378** PICT-7353

13. Install the battery hold down rod (Fig. 379).

**Fig 379** PICT-7352

14. Connect the red battery cable to the positive battery terminal (Fig. 380).

**Fig 380** PICT-7351a

15. Connect the black battery cable to the negative battery terminal (Fig. 381).

**Fig 381** PICT-7349

16. Lower the seat.

17. Install the handle grip onto the deck lift handle (Fig. 382).

**Fig 382** PICT-7796a

18. Place the deck lift handle in the highest height-of-cut position.

19. Install the mower deck. Refer to:
    - “50” Mower Deck Installation” on page 7-8
    - “54” Mower Deck Installation” on page 7-31

20. Operate the tractor to ensure all controls operate properly.

## Front Wheel Toe-In Measurement & Adjustment

If there is uneven tire wear, lawn scuffing, or hard steering, toe-in may need to be adjusted. The front toe-in measurement should be 1/16” to 5/16” (1.58 to 7.93mm). This should be checked every 100 hours or once a year, whichever occurs first.

1. Place the steering wheel in position for straight ahead travel.

2. In front of the axle, measure the distance horizontally from the inside of the left rim to the inside of the right rim (Fig. 383). Note the distance.

**Fig 383** PICT-7819

3. Behind the axle, measure the distance horizontally from the inside of the left rim to the inside of the right rim (Fig. 384). Note the distance.

**Fig 384** PICT-7821

4. The measurement taken in front of the axle should be between 1/16” and 5/16” (0.16cm and 0.79cm) less than the measurement taken behind the axle.

Adjust if necessary:

5. Loosen the jam nut found on the drag link at the rear of the ball joint (Fig. 385).

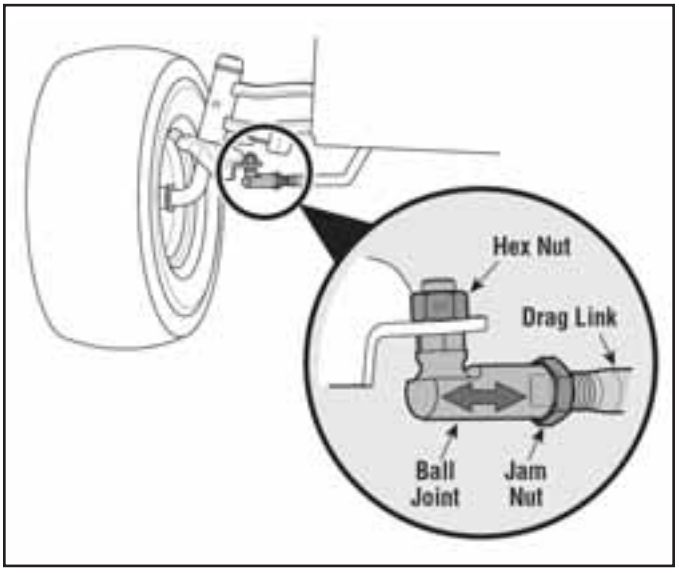


**Fig 385** fig. 12 3354-975

6. Remove the hex nut on the top of ball joint (Fig. 385).

7. Thread the ball joint toward the jam nut to shorten the drag link. Thread the ball joint away from the jam nut to lengthen the drag link (Fig. 385).

8. Replace hex nut and lock washer and retighten the jam nut after proper adjustment is achieved.

## Engine Replacement

### Engine Removal

1. Lift the seat to access the battery compartment.

2. Disconnect the battery cable from the negative battery terminal (Fig. 386).

**Fig 386** PICT-7349

3. Disconnect the battery cable from the positive battery terminal (Fig. 387).

**Fig 387** PICT-7351a

4. Remove the electric PTO clutch. Refer to “Electric PTO Clutch Removal” on page 3-29.

5. Release tension from the idler spring and slide the engine pulley off the crank shaft. Remove the transmission drive belt from the engine pulley and remove the pulley from the machine (Fig. 388).

**Fig 388** PICT-7497

6. Remove the 4 engine mounting bolts (Fig. 389).

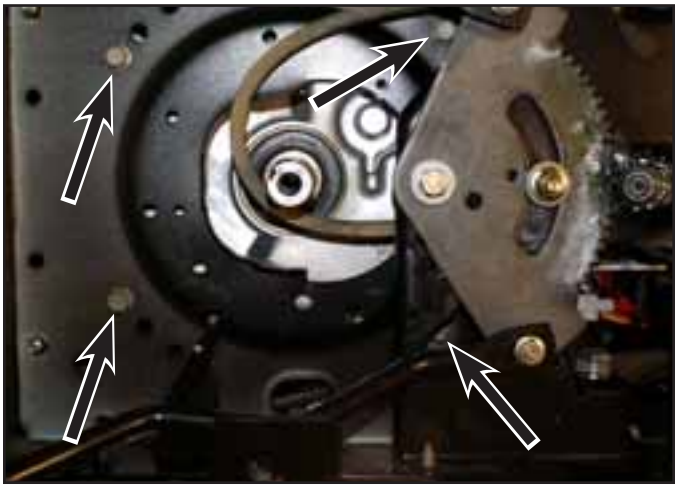

**Fig 389** PICT-7620

7. Lower the machine to the ground.

8. Remove the hood. Refer to “Hood Removal” on page 3-34.

9. Remove the 2 screws securing the bumper to the frame (1 bolt on the left and 1 on the right) (Fig. 390).

**Fig 390** PICT-7245

10. Remove the bumper (Fig. 391).

**Fig 391** PICT-7417

11. Remove the 4 screws securing the left and right side bumper brackets to the frame (2 on the left and 2 on the right) (Fig. 392).

**Fig 392** PICT-7423

12. Slide the muffler and heat shield assembly off the manifold pipes and remove it from the machine (Fig. 393).

**Fig 393** PICT-7425

13. Mark either the throttle or choke cable and corresponding engine bracket to more easily identify them upon installation (the choke is marked with tape in the photo below) (Fig. 394).

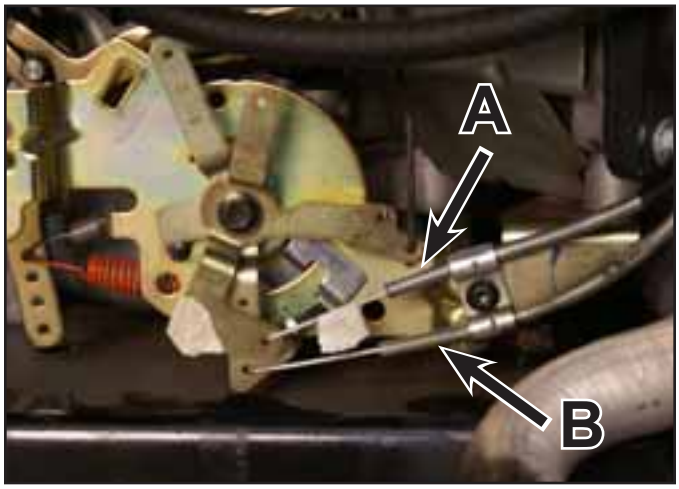


**Fig 394** PICT-7591

A. Choke (outside linkage plate)
B. Throttle (inside linkage plate)

14. Loosen the cable clamp securing the throttle and choke cable to the engine bracket (Fig. 395).

**Fig 395** PICT-7596

15. Unhook the throttle and choke cable z-bends from the engine brackets (Fig. 396).

**Fig 396** PICT-7597

16. Slide the throttle and choke cables out of the cable tie and the r-clamp located on the left side of the engine (Fig. 397).

**Fig 397** PICT-7601

17. Remove the fuel cap. Slide the hose clamp down the fuel line. Remove the fuel line from the fuel filter and drain the fuel into a suitable container. Slide the fuel line back onto the fuel filter and position the hose clamp to secure. Replace the fuel cap onto the fuel tank (Fig. 398).

**Fig 398** PICT-7300

18. Slide the other hose clamp down the fuel line and slide the fuel line off the fuel filter (Fig. 399).

**Fig 399** PICT-7603a

19. Disconnect the wire harness from the engine (Fig. 400).

**Fig 400** PICT-7605

20. Remove the nut securing the positive wire to the starter assembly. Remove the positive wire from the starter assembly (Fig. 401).

**Fig 401** PICT-7610

21. Loosen the oil dipstick. Remove the oil drain cap and install the drain hose onto the oil drain fitting. Twist the oil drain fitting counter-clockwise and pull to drain the oil from the engine (Fig. 402).

**Fig 402** PICT-7612

22. Loosen the engine oil dipstick.

23. After the oil has drained, turn the oil drain fitting clockwise to close. Tighten the oil dipstick.

24. Remove the drain hose and reinstall the oil drain cap.

25. Attach chains/straps and a hoist to the lift points on the engine. Raise and remove the engine from the frame (Fig. 403).

**Fig 403** PICT-7613

26. If the engine is being serviced, refer to the engine manufacture's service manual.

27. If a new engine is being installed:
    - Transfer the marking on the throttle/choke bracket to the bracket on the new engine.
    - Install a cable tie on the new engine to route the throttle/choke cables through.
    - Transfer the R-clamp that the throttle/choke cables get routed through to the new engine.

## Engine Installation

1. Attach chains/straps and a hoist to the lift points on the engine. Lower the engine into place on the frame (Fig. 404).

**Note: Take care to ensure the throttle and choke cables are not caught between the engine and the frame.**

**Fig 404** PICT-7613

2. Slide the positive wire onto the starter post. Install a nut securing the positive wire to the starter assembly (Fig. 405).

**Fig 405** PICT-7610

3. Plug the wire harness into the engine harness (Fig. 406).

**Fig 406** PICT-7605

4. Slide the fuel line onto the fuel filter and position the clamp to secure (Fig. 407).

**Fig 407** PICT-7603

5. Slide the throttle and choke cables through cable tie and position them into the r-clamp located on the left side of the engine (Fig. 408).

**Fig 408** PICT-7614

6. Hook the throttle and choke cable z-bends into the engine brackets (Fig. 409).

   Note the marked cable and the marked bracket.

**Fig 409** PICT-7617

7. Place the throttle and choke cables into the cable clamp. Tighten screw only enough to hold the cables in place (Fig. 410).

**Fig 410** PICT-7596

8. Remove the cable markers.

9. Raise the machine.

10. Align the engine mounting holes with the holes in the frame. Install the 4 engine mounting bolts and torque to 16 ± 2 ft-lbs. (21.7 ± 2.7 Nm) (Fig. 411).

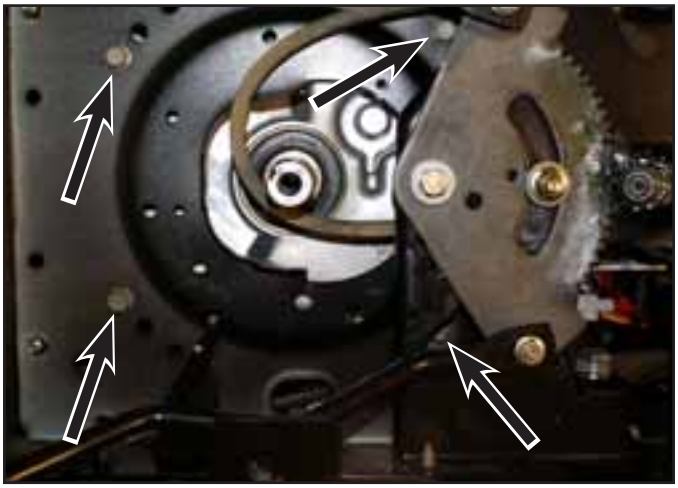

**Fig 411** PICT-7620

11. Apply anti-seize compound to the crankshaft. Slide the engine pulley onto crankshaft and install the transmission drive belt around engine pulley (Fig. 412).

**Fig 412** PICT-7497

12. Install the Electric PTO clutch. Refer to Electric PTO Clutch Installation on page 3-30.

13. Connect the battery cable to the positive battery terminal (Fig. 413).

**Fig 413** PICT-7351a

14. Connect the battery cable to the negative battery terminal (Fig. 414).

**Fig 414** PICT-7349

15. Lower the seat.

16. Adjust the throttle and choke cables. Refer to: “Throttle & Choke Cable Adjustment” on page 4-10.

17. Slide the muffler and heat shield assembly onto the manifold pipes and into position (Fig. 415).

**Fig 415** PICT-7425

18. Install 4 screws securing the left and right side bumper brackets to the frame (2 on the left and 2 on the right) (Fig. 416).

**Fig 416** PICT-7423

19. Position the bumper to the frame (Fig. 417).

**Fig 417** PICT-7417

20. Install 2 screws securing the bumper to the frame (1 bolt on the left and 1 on the right) (Fig. 418).

**Fig 418** PICT-7245

21. Install the hood Refer to “Hood Installation” on page 3-34.

22. Operate the tractor to ensure all controls operate properly.

## Throttle & Choke Cable Adjustment

The hood, front bumper and muffler assembly must be removed to make this adjustment. To remove them, follow steps 1 – 5. If they have already been removed, begin at step 6.

1. Remove the hood. Refer to “Hood Removal” on page 3-34.

2. Remove the 2 screws securing the bumper to the frame (1 bolt on the left and 1 on the right) (Fig. 419).

**Fig 419** PICT-7245

3. Remove the bumper (Fig. 420).

**Fig 420** PICT-7417

4. Remove the 4 screws securing the left and right side bumper brackets to the frame (2 on the left and 2 on the right) (Fig. 421).

**Fig 421** PICT-7423

5. Slide the muffler and heat shield assembly off the manifold pipes and remove it from the machine (Fig. 422).

**Fig 422** PICT-7425

7. Position the choke control so it is fully pushed in and the throttle control so it is in the fast position (Fig. 423 and Fig. 424).

**Fig 423** PICT-7993

Adjustment:

6. The cable clamp securing the throttle and choke cables must be loose.

**Fig 424** PICT-7992

8. Push the engine throttle bracket over to the full throttle position (Fig. 425).

**Fig 425** PICT-7995



9. Tighten the cable clamp TORX screw to secure the throttle and choke cables in position (Fig. 426).

**Fig 426** PICT-7998

10. Move both the throttle control and the choke control in through the full range of motion to ensure the cables are properly adjusted.

## Transmission Drive Belt Replacement

### Transmission Drive Belt Removal

1. Lift the seat to access the battery compartment.
2. Disconnect the battery cable from the negative battery terminal (Fig. 427).

**Fig 427** PICT-7349

3. Disconnect the battery cable from the positive battery terminal (Fig. 428).

**Fig 428** PICT-7351a

4. Remove the battery hold down rod (Fig. 429).

**Fig 429** PICT-7352

5. Remove the battery from the battery tray (Fig. 430).

**Fig 430** PICT-7353

6. Remove the battery tray (Fig. 431).

**Fig 431** PICT-7354

7. Move the flat idler pulley in the direction of the arrow to remove the transmission drive belt from the transmission pulley and variable speed pulley (Fig. 432).

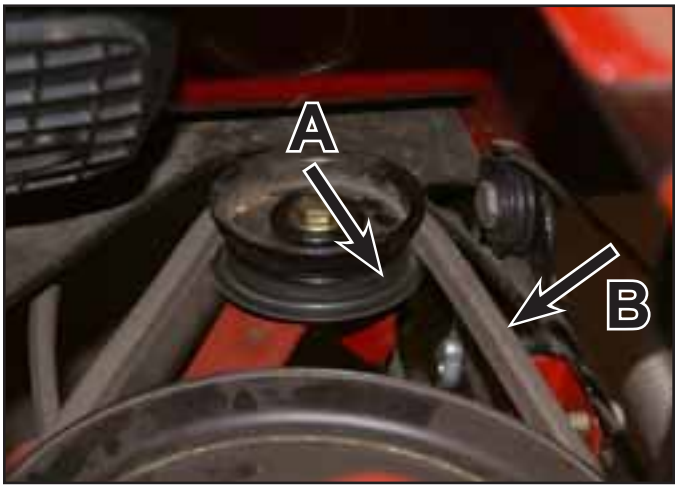


**Fig 432** PICT-7627a

A. Direction to move flat idler pulley

B. Transmission belt

8. Remove the transmission belt from the machine (Fig. 433).

**Fig 433** PICT-7628

## Transmission Drive Belt Installation

1. Route the transmission drive belt around the pulleys (Fig. 434).

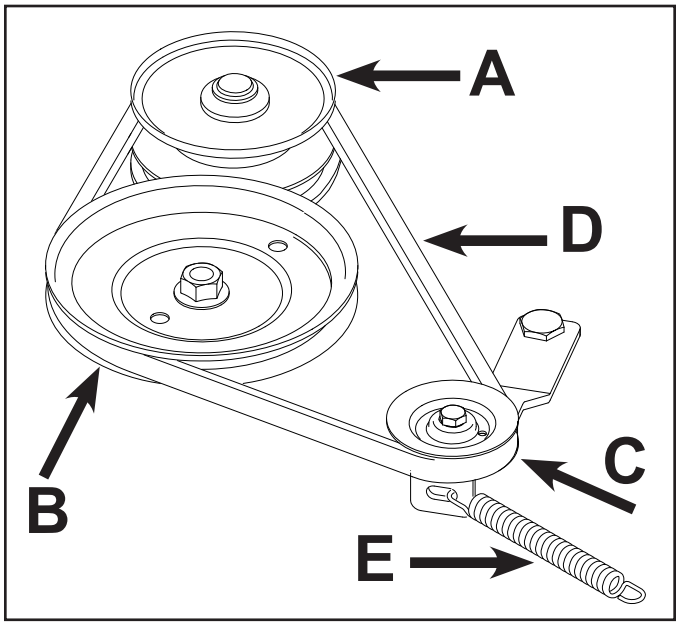


**Fig 434** belt routing iso

A. Variable speed pulley
B. Transmission pulley
C. Idler pulley
D. Transmission drive belt
E. Idler spring

2. Position the battery tray (Fig. 435).

**Fig 435** PICT-7354

3. Place the battery into the battery tray (Fig. 436).

**Fig 436** PICT-7353

5

4. Install the battery hold down rod (Fig. 437).

**Fig 437** PICT-7352

5. Connect the red battery cable to the positive battery terminal (Fig. 438).

**Fig 438** PICT-7351a

6. Connect the black battery cable to the negative battery terminal (Fig. 439).

**Fig 439** PICT-7349

7. Lower the seat.

## Variable Speed Drive Belt Replacement

### Variable Speed Drive Belt Removal

1. Remove the transmission drive belt. Refer to “Transmission Drive Belt Removal” on page 5-1.

2. Remove the shift knob (Fig. 440).

**Fig 440** PICT-7632

3. Remove the 4 screws securing the shift cover to the frame (Fig. 441).

**Fig 441** PICT-7635

4. Remove the shift cover plate from the frame and lay it to the side (Fig. 442).

**Fig 442** PICT-7636

5. Remove the Electric PTO clutch. Refer to “Electric PTO Clutch Removal” on page 3-29.

6. Slide the engine pulley off the crankshaft and remove the transmission drive belt from the engine pulley (Fig. 443).

**Fig 443** PICT-7497

7. Remove the 4 bolts securing the variable speed pulley assembly to the transmission (Fig. 444).

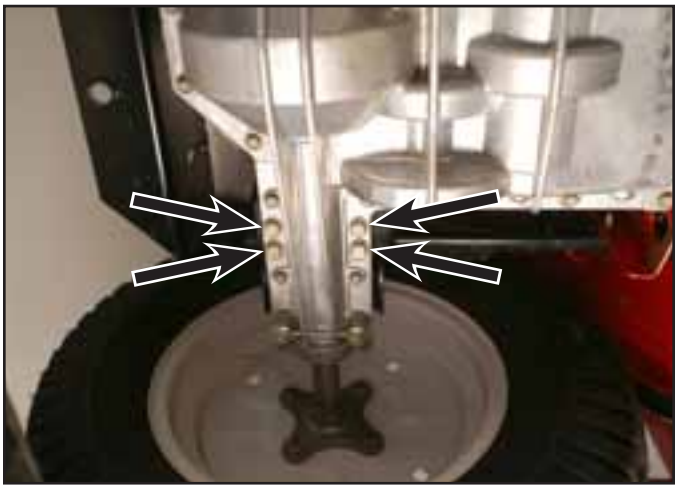

**Fig 444** PICT-7640a

8. Tilt the variable speed pulley forward and remove the belt from it (Fig. 445).

**Fig 445** PICT-7642

9. Route the belt forward and remove it from around the shift rod (Fig. 446).

**Fig 446** PICT-7644

10. Pull the belt downward (Fig. 447).

**Fig 447** PICT-7648

11. Remove the belt from around the two flat idler pulleys (Fig. 448).

**Fig 448** PICT-7649

12. Remove the transmission drive belt from around the crankshaft and remove it from above the steering support bracket (Fig. 449).

**Fig 449** PICT-7498

## Variable Speed Drive Belt Installation

1. Route the transmission drive belt through the steering support bracket and frame. Install the transmission drive belt around the crankshaft (Fig. 450).

**Note: The belt routes between the steering shaft and left side of the frame.**

**Fig 450** PICT-7622

2. Route the belt between the two idler pulleys on the center double idler bracket (Fig. 451).

**Fig 451** PICT-7649

3. Route the belt up toward the top of the transmission (Fig. 452).

**Fig 452** PICT-7648

4. Route the belt so that it is positioned around the shift rod (Fig. 453).

**Fig 453** PICT-7644

5. Tilt the variable speed pulley forward and route the belt around it into the lower pulley groove (Fig. 454).

**Fig 454** PICT-7642

6. Install 4 bolts securing the variable speed pulley assembly to the transmission (Fig. 455).

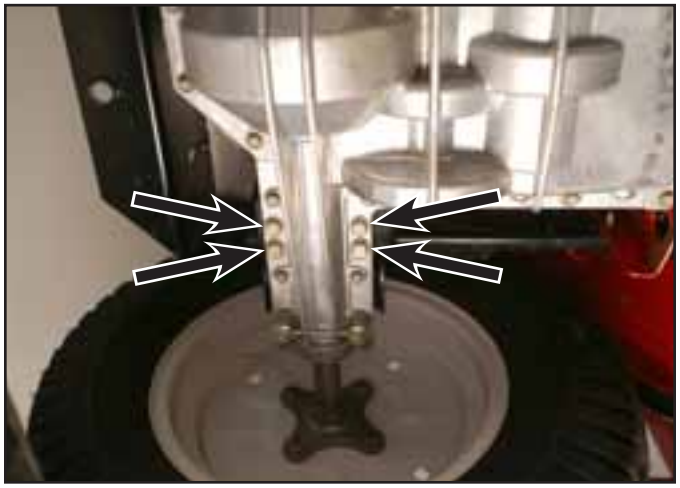

**Fig 455** PICT-7640a

7. Apply anti-seize compound to the crankshaft. Slide the engine pulley onto the crankshaft and route the transmission drive belt around the engine pulley (Fig. 456).

**Fig 456** PICT-7497

8. Install the Electric PTO clutch. Refer to “Electric PTO Clutch Installation” on page 3-30.

9. Slide the shift cover plate into the frame (Fig. 457).

**Fig 457** PICT-7636

10. Install 4 screws securing the shift cover to the frame (Fig. 458).

**Fig 458** PICT-7635

11. Slide the shift knob onto the shift lever (Fig. 459).

**Fig 459** PICT-7632

12. Install the transmission drive belt. Refer to “Transmission Drive Belt Installation” on page X-XX.

## CVT Transmission Replacement

### CVT Transmission Removal

1. Remove the mower deck. Refer to “50 inch Mower Deck Removal” on page 7-6.
2. Remove the transmission drive belt. Refer to “Transmission Drive Belt Removal” on page 5-1.
3. Remove the shift knob (Fig. 460).

**Fig 460** PICT-7632

4. Remove the 4 screws securing the shift cover to the frame (Fig. 461).

**Fig 461** PICT-7635

5. Remove the shift cover plate and lay it to the side (Fig. 462).

**Fig 462** PICT-7636

6. Remove the nut securing the shift rod assembly to the transmission (Fig. 463).

**Fig 463** PICT-7710a

7. Remove the spring washer from the shift rod assembly (Fig. 464).

**Fig 464** PICT-7709a

8. Remove the shift rod assembly from the machine (Fig. 465).

**Fig 465** PICT-7708a

9. Remove the washer from the shift rod assembly (Fig. 466).

**Fig 466** PICT-7705a

10. Loosen the 8 bolts securing the rear wheels to the wheel hub assemblies (4 on the left and 4 on the right) (Fig. 467).

**Fig 467** PICT-7502a

11. Raise and support the rear of the machine.

12. Remove the 8 lug nuts and remove the 2 wheel assemblies from the wheel hubs (Fig. 468).

**Fig 468** PICT-7503a

13. Raise the machine.

14. Remove the 4 bolts securing the variable speed pulley assembly to the transmission (Fig. 469).

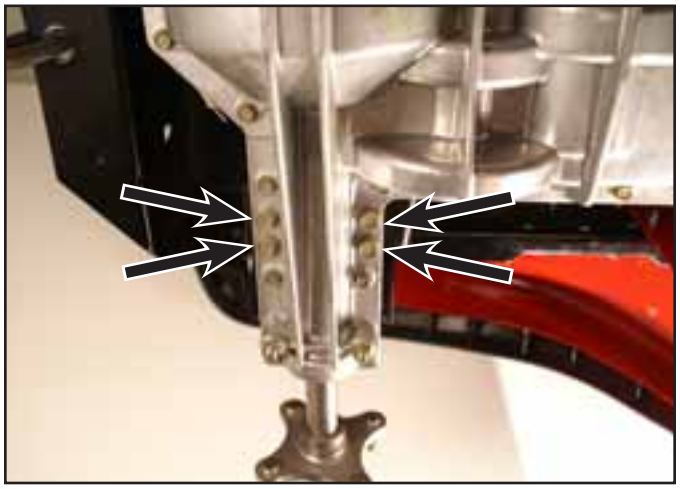

**Fig 469** PICT-8525

15. Tilt the variable speed pulley forward and remove the belt from it (Fig. 470).

**Fig 470** PICT-7642

16. Pull the belt downward (Fig. 471).

**Fig 471** PICT-8530

17. Remove the belt from the two flat idler pulleys (Fig. 472).

**Fig 472** PICT-7649

18. Remove the cotter pin securing the front end of the brake control rod to the brake linkage (Fig. 473).

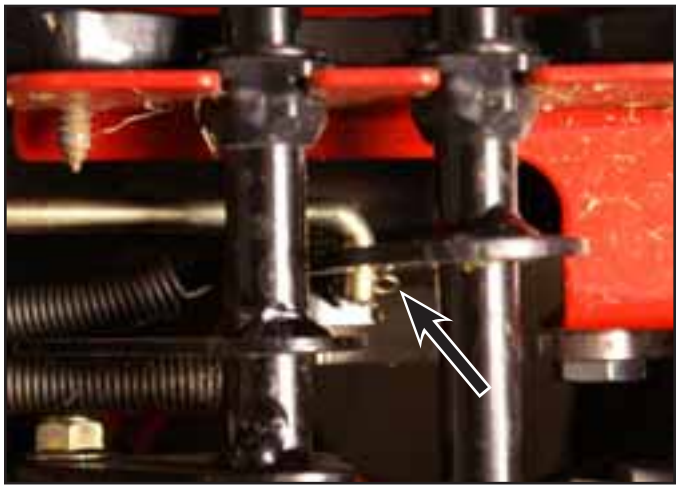

**Fig 473** PICT-7659

19. Remove the brake control rod from the linkage (Fig. 474).

**Fig 474** PICT-7660

20. Unhook the spring from the rear end of the brake control rod (Fig. 475).

**Fig 475** PICT-7662

21. Remove the brake control rod (Fig. 476).

**Fig 476** PICT-7666

22. Remove the bolt, nut and self tapping screw securing the front of the transmission to the transmission bracket (Fig. 477).

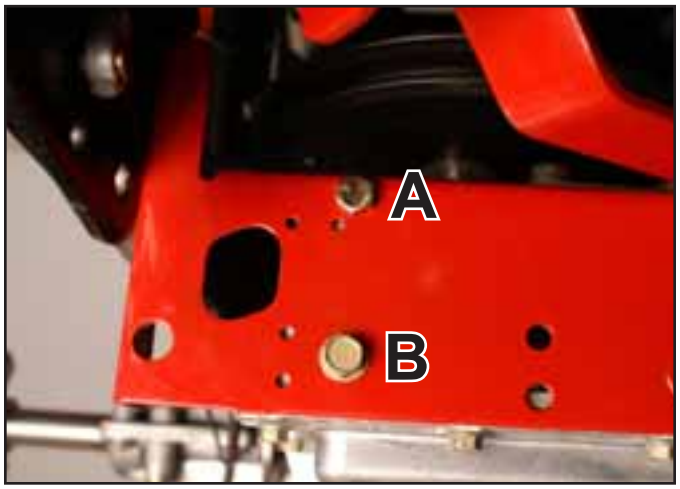


**Fig 477** PICT-7668

A. Bolt and nut
B. Self tapping screw

23. Support the transmission.

24. Remove the 4 bolts and nuts securing the sides of the transmission to the frame (2 bolts and 2 nuts on each side) (Fig. 478).

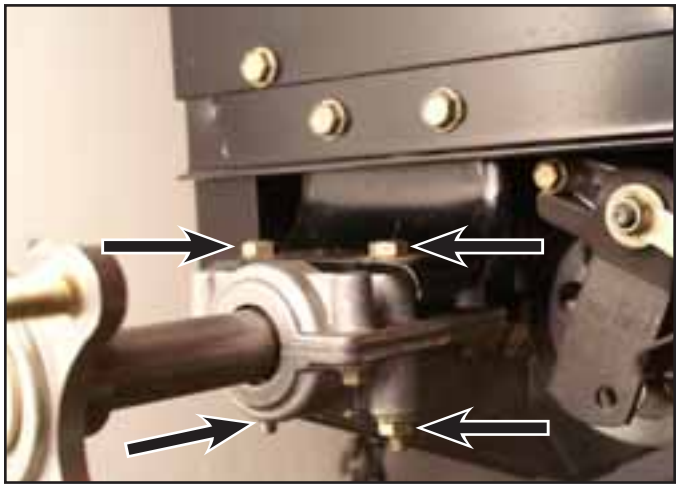

**Fig 478** PICT-7670

25. Carefully lower the transmission from the machine (Fig. 479).

**Note: Variable speed pulley will be unsecured.**

**Fig 479** PICT-7677

26. Remove the variable speed pulley from the transmission (Fig. 480).

**Fig 480** PICT-7676

27. Remove the bolt and washer securing the wheel hub assembly to the transmission axle shaft. Remove the wheel hub from the axle shaft (Fig. 481).

**Fig 481** PICT-7679a

28. Repeat step 28 to remove the opposite wheel hub assembly.

29. Remove the nut securing the transmission pulley to the transmission (Fig. 482).

**Fig 482** PICT-7682



30. Remove the transmission pulley (Fig. 483).

**Fig 483** PICT-7684

## CVT Transmission Installation

1. Position the transmission pulley onto the transmission (Fig. 484).

**Fig 484** PICT-7684

2. Install the nut securing the transmission pulley to the transmission (Fig. 485).

**Fig 485** PICT-7682

3. Slide the wheel hub onto the axle shaft. Install a bolt and washer to secure the wheel hub assembly to the transmission axle shaft (Fig. 486).

**Fig 486** PICT-7679a

4. Repeat step 2 to install the opposite wheel hub assembly.

5. Position the variable speed pulley onto the transmission (Fig. 487).

**Fig 487** PICT-7696

6. Carefully raise and support the transmission in the machine (Fig. 488).

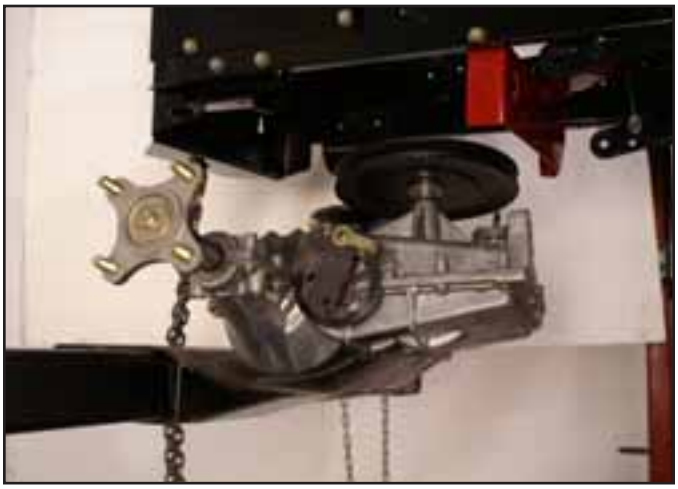

**Fig 488** PICT-7677

7. Install 4 bolts and nuts securing the sides of the transmission to the frame (2 bolts and 2 nuts on each side) (Fig. 489).

**Fig 489** PICT-7669

8. Install a bolt, nut and a self tapping screw to secure the front of the transmission to the transmission bracket (Fig. 490).

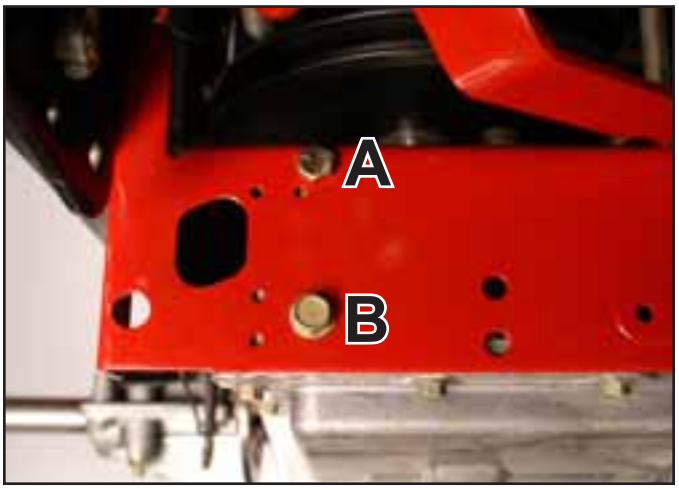


**Fig 490** PICT-7667

A. Bolt and nut B. Self tapping screw



9. Insert the brake control rod through the hole in the transmission bracket (Fig. 491).

**Fig 491** PICT-7666

10. Hook the brake control spring to the rear end of the brake control rod (Fig. 492).

**Fig 492** PICT-7662

11. Insert the front end of the brake control rod into the brake linkage (Fig. 493).

**Fig 493** PICT-7698

12. Install a cotter pin securing the front end of the brake control rod to the brake linkage (Fig. 494).

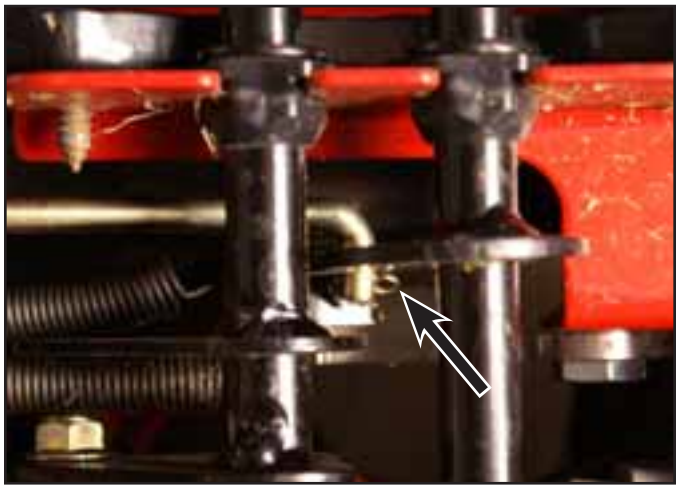

**Fig 494** PICT-7659

13. Install the 2 rear wheel assemblies onto the wheel hubs. Install 8 lug nuts to secure (Fig. 495).

**Fig 495** PICT-7503a

14. Lower the machine.

15. Tighten the 8 lug nuts securing the rear wheels to the wheel hub assemblies (Fig. 496).

**Fig 496** PICT-7502a

16. Route the transmission drive belt between the two flat idler pulleys on the center double idler bracket (Fig. 497).

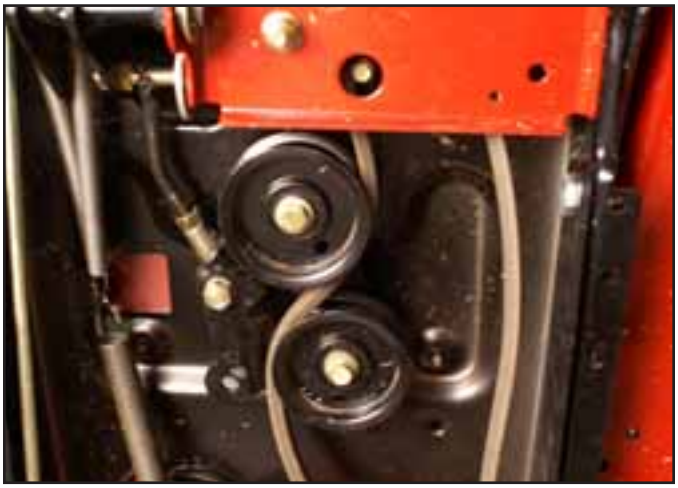

**Fig 497** PICT-7702

17. Route the belt up in front of the transmission toward the top of the transmission (Fig. 498).

**Fig 498** PICT-7648

18. Tilt the variable speed pulley forward and route the drive belt around it into the lower pulley groove (Fig. 499).

**Fig 499** PICT-7642

19. Install 4 bolts securing the variable speed pulley assembly to the transmission (Fig. 500).

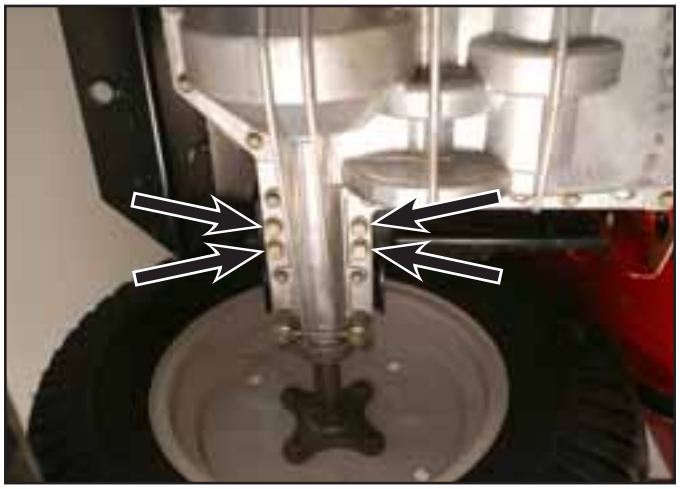

**Fig 500** PICT-7640

20. Lower the machine.

21. Slide a flat washer (with an oblong center hole) onto the transmission shift lever (Fig. 501).

**Fig 501** PICT-7705a

22. Slide the shift rod assembly onto the transmission shift lever. Ensure the rod is in between the variable speed drive belt (Fig. 502).

**Fig 502** PICT-7708a

23. Slide a spring washer (center of the washer up, OD of the washer down) onto the shift rod assembly (Fig. 503).

**Fig 503** PICT-7709a

24. Install a nut securing the shift rod assembly to the transmission shift lever (Fig. 504).

**Fig 504** PICT-7710a

25. Position the shift cover plate into the fender (Fig. 505).

**Fig 505** PICT-7636

26. Install 4 screws securing the shift cover to the frame (Fig. 506).

**Fig 506** PICT-7712

27. Slide the shift knob onto the shift rod (Fig. 507).

**Fig 507** PICT-7632

28. Install the transmission drive belt. Refer to “Transmission Drive Belt Installation” on page 5-3.

29. Install the mower deck. Refer to “50” Mower Deck Installation” on page 7-8.

30. Operate the tractor to ensure all controls operate properly.

## CVT Transmission Service

### CVT Transmission Housing Teardown

**Note: Transaxle shown does not have grease, for photo clarity. Clean and inspect all parts after disassembly. Apply a small amount of grease to all moving parts and needle bearings prior to reassembly.**

1. Remove the 23 bolts securing the housing halves together (Fig. 508).

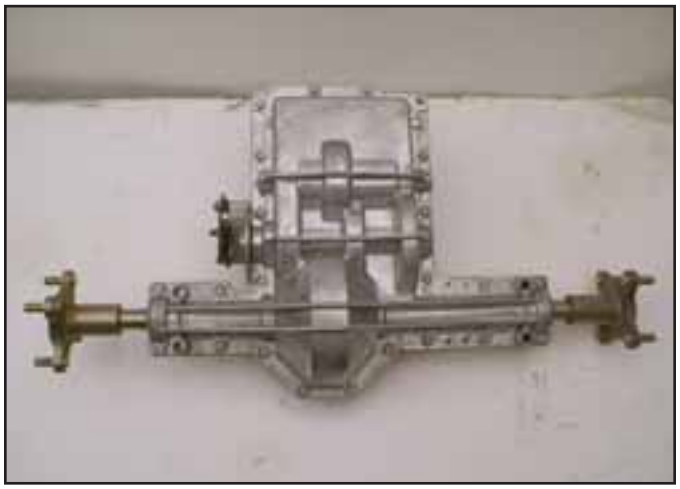

**Fig 508** PICT-8272a

2. Remove the upper housing from the lower housing assembly (Fig. 509).

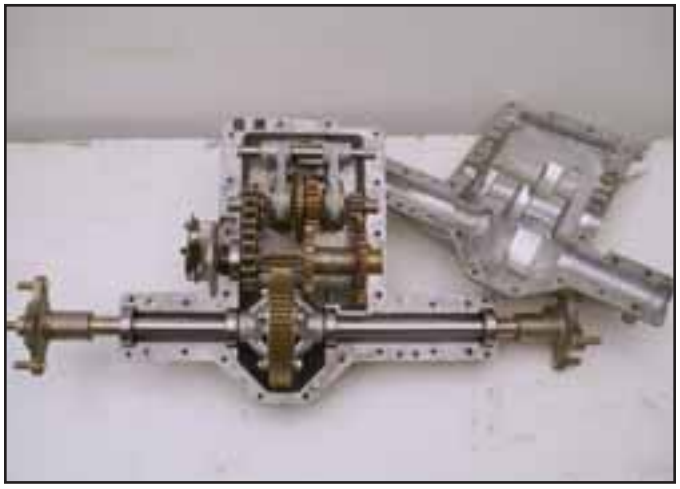

**Fig 509** PICT-8274a

3. Remove the 2 bolts securing the brake assembly to the transmission housing (Fig. 510).

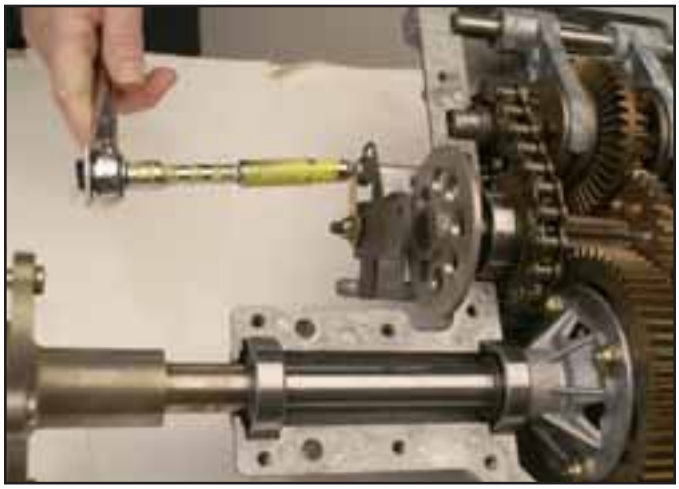

**Fig 510** PICT-8277a

4. Remove the brake assembly from the transmission (Fig. 511).

**Note: Some transmissions have 2 washers (1 on each bolt) between the brake assembly and transmission housing.**

**Fig 511** PICT-8278a

5. Remove the brake disc from the transmission shaft (Fig. 512).

**Fig 512** PICT-8280a

6. Remove the puck from the transmission housing (Fig. 513).

**Fig 513** PICT-8281

7. Remove the shift fork assembly from the transmission housing (Fig. 514).

**Fig 514** PICT-8283

8. Remove the drive shaft and right hand output shaft assemblies from the housing (Fig. 515).

**Fig 515** PICT-8284

9. Remove the differential axle assembly from the housing (Fig. 516).

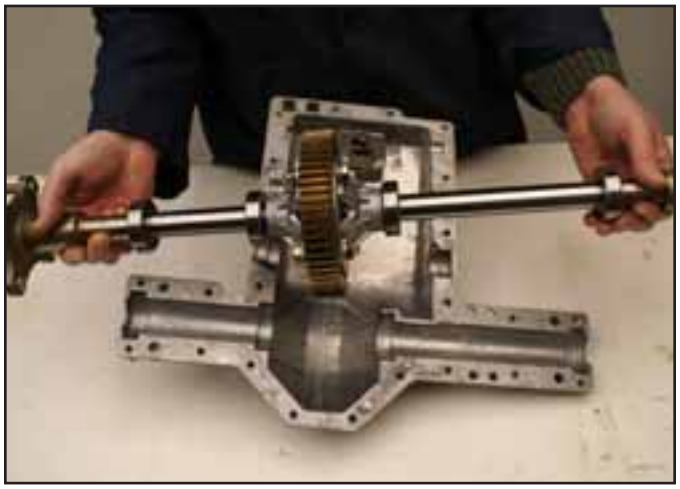

**Fig 516** PICT-8285

10. Remove the e-ring from the input shaft (Fig. 517).

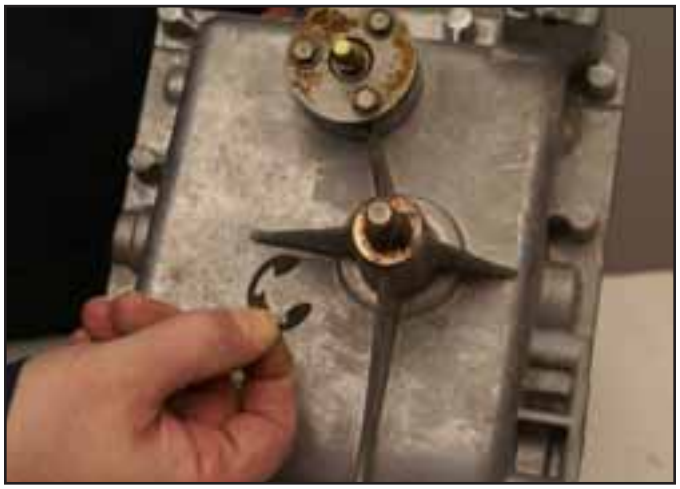

**Fig 517** PICT-8286

11. Remove the washers from the input shaft (Fig. 518).

**Fig 518** PICT-8288

12. Remove the input shaft assembly from the housing (Fig. 519).

**Fig 519** PICT-8289

13. Remove the washer from the input shaft (Fig. 520).

**Fig 520** PICT-8290a

14. Remove the snap ring that secures the bevel gear to the input shaft (Fig. 521).

**Fig 521** PICT-8293a

15. Remove the bevel gear from the input shaft (Fig. 522).

**Fig 522** PICT-8295a

16. Remove the 2 screws securing the lockout plate from the housing (Fig. 523).

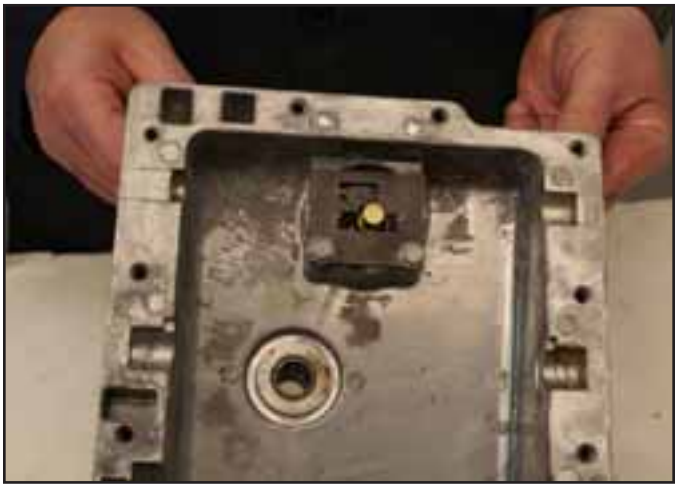

**Fig 523** PICT-8296

17. Remove the lockout plate from the housing (Fig. 524).

**Fig 524** PICT-8298

18. Turn the housing over and remove the 3 screws that secure the shift cover to the housing (Fig. 525).

**Fig 525** PICT-8299

19. Remove the shift cover from the housing (Fig. 526).

**Fig 526** PICT-8301a

20. Remove the shift lever assembly from the housing (Fig. 527).

**Fig 527** PICT-8304a

21. Remove the shifter insert from the housing (Fig. 528).

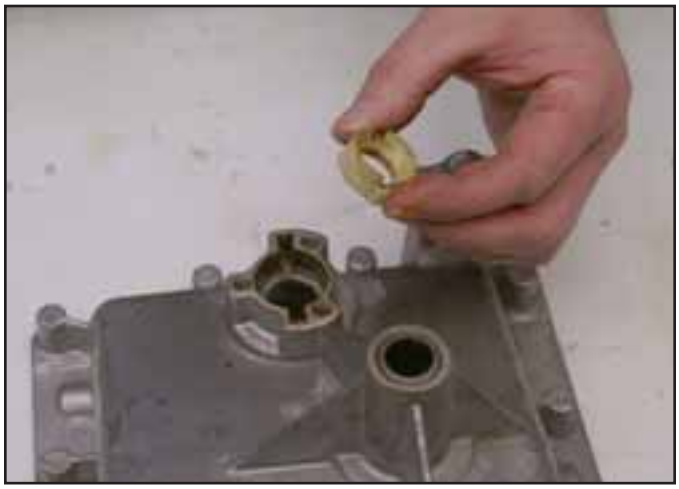

**Fig 528** PICT-8305a

22. If the bearings are being replaced, drive out the upper and lower needle bearings from the housing for the input shaft through the hole (Fig. 529).

**Fig 529** PICT-8306

## Differential Axle Assembly Service

**Note: Differential is serviced as an assembly.**

23. Remove the bolt and washer securing the wheel hub assembly to the transmission axle shaft. Remove the wheel hub from the axle shaft (Fig. 530).

**Note: Discard the bolt. It is a patch bolt and must be replaced upon installation.**

**Fig 530** PICT-8314a

24. Slide the 2 bearings off the axle (Fig. 531).

**Fig 531** PICT-8315a

25. Repeat steps 23 and 24 to remove the opposite bearings and wheel hub assembly.

26. Inspect the 4 bearings. Replace if worn or damaged (Fig. 532).

**Fig 532** PICT-8318a

27. Slide 2 bearings onto the axle shaft (Fig. 533).

**Fig 533** PICT-8315a

28. Slide the wheel hub onto the axle shaft. Install a patch bolt (new) and washer securing the wheel hub assembly to the transmission axle shaft (Fig. 534).

**Fig 534** PICT-8314a

29. Repeat steps 27 and 28 to install the opposite bearings and wheel hub assembly.

## Drive Shaft Assembly Service

30. Remove the flange bearing and flat washer from the drive shaft (Fig. 535).

**Fig 535** PICT-8321

31. Remove the 9 tooth sprocket from the drive shaft (Fig. 536).

**Fig 536** PICT-8322a

32. Remove the collar assembly from the drive shaft (Fig. 537).

**Fig 537** PICT-8323a

33. Remove the 41 tooth spur gear from the drive shaft (Fig. 538).

**Fig 538** PICT-8324a

34. Remove the 20 tooth spur gear from the drive shaft (Fig. 539).

**Fig 539** PICT-8326a

35. Remove the hi-lo collar assembly from the drive shaft (Fig. 540).

**Fig 540** PICT-8327a

36. Remove the flange bearing and flat washer from the opposite end of the drive shaft (Fig. 541).

**Fig 541** PICT-8329a

37. Remove the snap ring from the drive shaft (Fig. 542).

**Fig 542** PICT-8331a

38. Remove the 10 tooth spur gear from the drive shaft (Fig. 543).

**Fig 543** PICT-8333a

39. Inspect the drive shaft, flange bearings, washers, sprocket, spur gears, snap ring and collars. Replace if worn or damaged (Fig. 544):

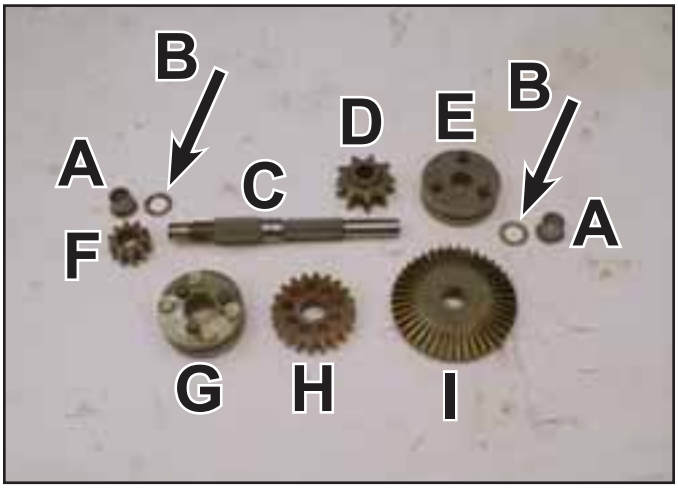


**Fig 544** PICT-8334a

A. Flange bearing (2)
B. Flat washer (2)
C. Drive shaft
D. 9 tooth sprocket
E. Hi-Lo Collar
F. 10 tooth spur gear
G. Collar assembly
H. 20 tooth spur gear
I. 41 tooth spur gear

40. Slide a 10 tooth spur gear onto the drive shaft (Fig. 545).

**Fig 545** PICT-8333a

41. Install a snap ring onto the drive shaft securing the 10 tooth spur gear (Fig. 546).

**Fig 546** PICT-8331a

42. Slide a washer and flange bearing onto the end of the drive shaft (Fig. 547).

**Fig 547** PICT-8329

43. Slide a hi-lo collar assembly onto the drive shaft (Fig. 548).

**Fig 548** PICT-8327a

44. Slide a 20 tooth spur gear onto drive shaft (Fig. 549).

**Fig 549** PICT-8326a

45. Slide a 41 tooth spur gear onto the drive shaft (Fig. 550).

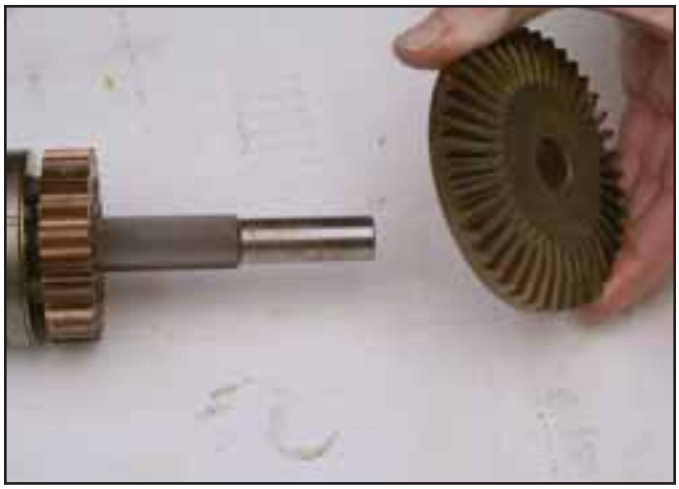

**Fig 550** PICT-8324a

46. Slide a collar assembly onto the drive shaft (Fig. 551).

**Fig 551** PICT-8323

47. Slide a 9 tooth sprocket onto the drive shaft (Fig. 552).

**Fig 552** PICT-8322

48. Slide a washer and flange bearing onto the drive shaft (Fig. 553).

**Fig 553** PICT-8321a

## Right Hand Output Shaft Assembly Service

49. Remove the seal from the output shaft (Fig. 554).

**Fig 554** PICT-8339a

50. Remove the bearing from the output shaft (Fig. 555).

**Fig 555** PICT-8340a

51. Remove the 16 tooth sprocket and chain from the output shaft (Fig. 556).

**Fig 556** PICT-8342a

52. Remove the flanged bearing from the output shaft (Fig. 557).

**Fig 557** PICT-8343a

53. Remove the 2 washers from the output shaft (Fig. 558).

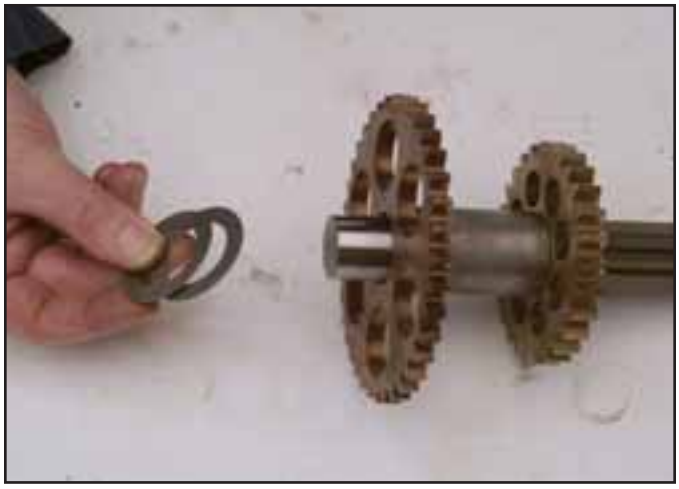

**Fig 558** PICT-8344a

54. Remove the 37 tooth spur gear from the output shaft (Fig. 559).

**Fig 559** PICT-8346a

55. Remove the shifter cover from the output shaft (Fig. 560).

**Fig 560** PICT-8347a

56. Remove the 27 tooth spur gear from the output shaft (Fig. 561).

**Fig 561** PICT-8349a

57. Inspect the flanged bearing, washers, shifter cover, output shaft, seal, ball bearing, spur gears and chain. Replace if worn or damaged Fig. 562):


**Fig 562** PICT-8350a

A. Flanged bearing
B. Washer (2)
C. Shifter cover
D. Output shaft
E. Seal
F. Ball bearing
G. 37 tooth spur gear
H. 27 tooth spur gear
I. 16 tooth spur gear
J. 22 link chain

58. Slide a 27 tooth spur gear onto the output shaft (Fig. 563).

**Fig 563** PICT-8349a

59. Slide a shifter cover onto the output shaft (Fig. 564).

**Fig 564** PICT-8347a

60. Slide a 37 tooth spur gear onto the output shaft (Fig. 565).

**Fig 565** PICT-8346a

61. Slide 2 washers onto the output shaft (Fig. 566).

**Fig 566** PICT-8344a

62. Slide a flanged bearing onto the output shaft (Fig. 567).

**Fig 567** PICT-8343a

63. Slide a 16 tooth sprocket and chain onto the output shaft (Fig. 568).

**Fig 568** PICT-8342a

64. Slide a bearing onto the output shaft (Fig. 569).

**Fig 569** PICT-8340a

65. Slide a new seal onto the output shaft (Fig. 570).

**Fig 570** PICT-8339a

66. Position the 9 tooth sprocket on the drive shaft assembly into the chain with the right hand output shaft assembly (Fig. 571).

**Fig 571** PICT-8351a

## CVT Transmission Housing Rebuild

67. If applicable, press 2 new input shaft needle bearings into the housing (Fig. 572).

**Fig 572** PICT-8310a

68. Slide the shifter insert into the housing (Fig. 573).

**Fig 573** PICT-8305a

69. Slide the shift lever assembly into the housing (Fig. 574).

**Fig 574** PICT-8304a

70. Turn the housing over and position the shift cover to the housing (Fig. 575).

**Fig 575** PICT-8301a

71. Install 3 screws to secure the shift cover to the housing (Fig. 576).

**Fig 576** PICT-8299

72. Position the lockout plate to the housing (Fig. 577).

**Fig 577** PICT-8298

73. Install 2 screws to secure the lockout plate to the housing (Fig. 578).

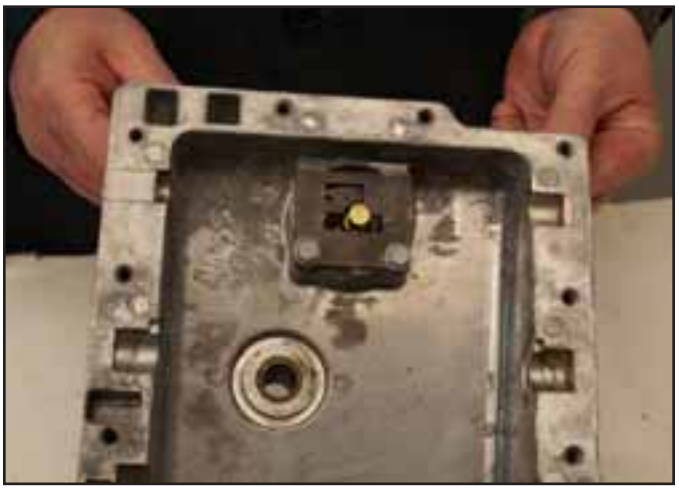

**Fig 578** PICT-8296

74. Slide a bevel gear onto the input shaft (Fig. 579).

**Fig 579** PICT-8295a

75. Install a snap ring to secure the bevel gear to the input shaft (Fig. 580).

**Fig 580** PICT-8293a

76. Slide a washer onto the input shaft (Fig. 581).

**Fig 581** PICT-8290a

77. Slide the input shaft assembly into the housing (Fig. 582).

**Fig 582** PICT-8289

78. Slide 2 washers onto the input shaft (Fig. 583).

**Fig 583** PICT-8288

79. Install an e-ring onto the input shaft to secure it to the housing (Fig. 584).

**Fig 584** PICT-8286

80. Position the differential axle assembly into the housing (Fig. 585).

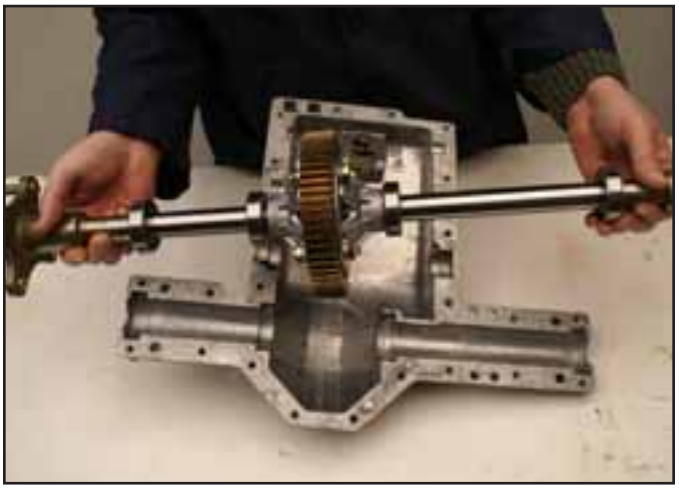

**Fig 585** PICT-8285

81. Position the drive shaft and right hand output shaft assemblies into the housing (Fig. 586).

**Fig 586** PICT-8284

**Note: Make sure the tabs of all 3 flange bearings are seated in their V notches in the housing (Fig. 587 and Fig. 588).**

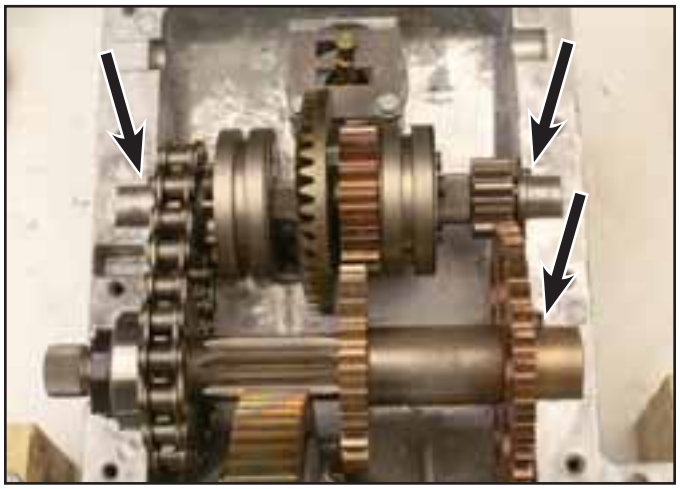

**Fig 587** PICT-8352a

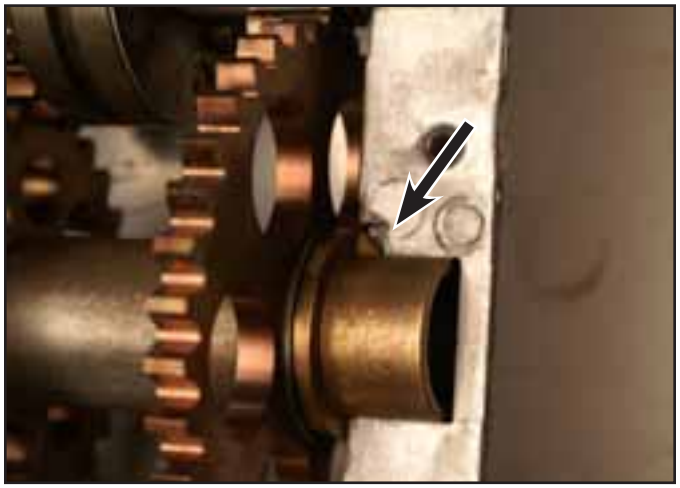

**Fig 588** PICT-8354a

82. Place the shift fork assembly into the housing (Fig. 589).

**Fig 589** PICT-8283

83. Replace the brake pucks and brake disc if worn or damaged. Install the puck into the transmission housing (Fig. 590).

**Fig 590** PICT-8281

84. Slide the brake disc onto the transmission shaft (Fig. 591).

**Fig 591** PICT-8280a

**Note: Some transmissions have 2 washers (1 on each bolt) between the brake assembly and transmission housing.**

85. Position the brake assembly to the transmission (Fig. 592).

**Fig 592** PICT-8278a

86. Install 2 bolts to secure the brake assembly to the transmission housing (Fig. 593).

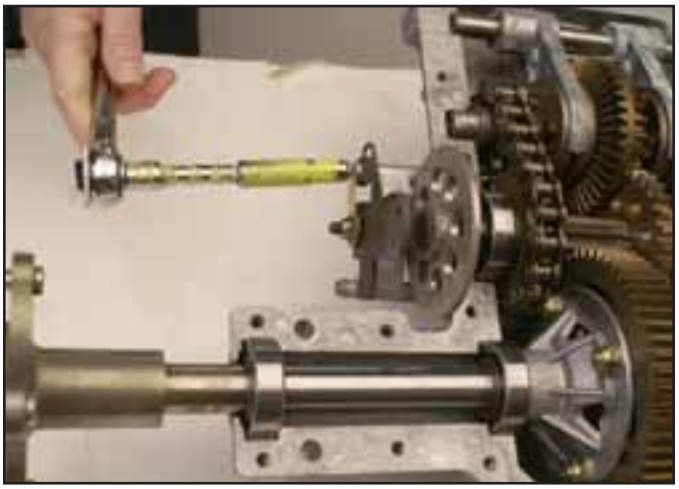

**Fig 593** PICT-8277a

87. Pack the transmission with grease: 55 oz. of Shell Darina “O” Type Grease.

88. Position the upper housing onto the lower housing (Fig. 594).

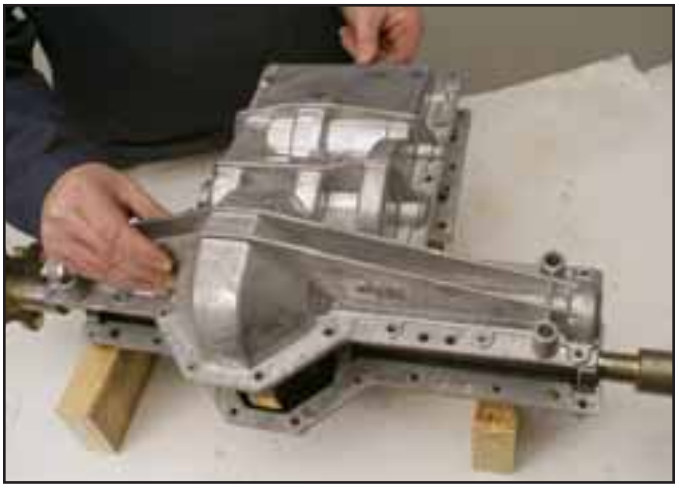

**Fig 594** PICT-8355a

89. Install 23 bolts in a crisscross pattern to secure the housing halves together (Fig. 595).

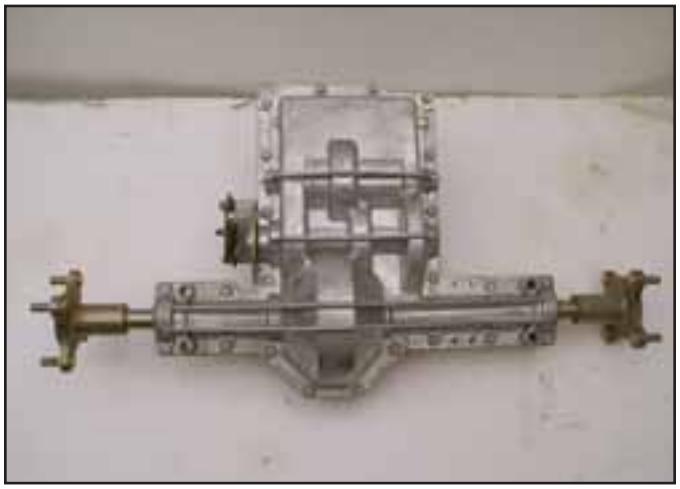

**Fig 595** PICT-8272a

## Variable Speed Pulley Service

To remove the variable speed pulley from the CVT transmission, refer to “CVT Transmission Removal” on page 5-10.

1. Remove the center bolt and washer securing the bearings to the pulley shaft (Fig. 596).

**Fig 596** PICT-7685a

2. Remove the bracket assembly from the variable speed pulley (Fig. 597).

**Fig 597** PICT-7686a

3. Remove the 3 nuts and bolts securing the bearing cup to the pulley bracket (Fig. 598).

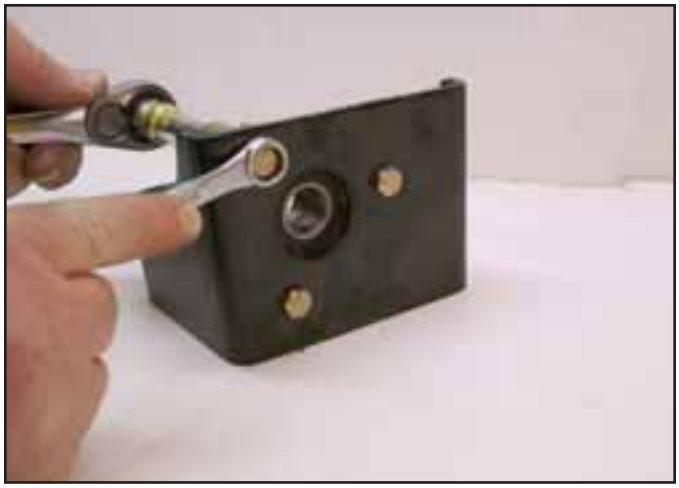

**Fig 598** PICT-7688a

4. Remove the bearing cup from the bracket (Fig. 599).

**Fig 599** PICT-7690a

5. Remove the 2 ball bearings from the bearing cup (Fig. 600).

**Fig 600** PICT-7692a

6. Inspect the bearings. Replace if worn or damaged.

7. Insert 2 bearings into the bearing cup (Fig. 601).

**Fig 601** PICT-7693a

8. Position the bearing cup assembly onto the bracket (Fig. 602).

**Fig 602** PICT-7695a

9. Install 3 bolts and nuts to secure the bearing cup assembly to the bracket (Fig. 603).

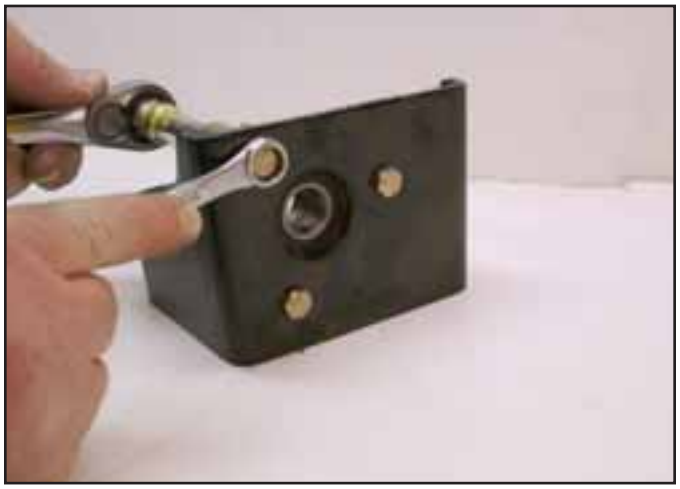

**Fig 603** PICT-7688a

10. With the pulley secure in a vise, position the bracket assembly onto the pulley (Fig. 604).

**Fig 604** PICT-7686a

11. Install a bolt and washer securing the bracket assembly to the pulley (Fig. 605).

**Fig 605** PICT-7685a

## Brake Puck Replacement

### Brake Puck Removal

1. Loosen the 4 lug nuts securing the rear wheel to the wheel hub assembly (Fig. 606).

**Fig 606** PICT-7502a

2. Raise and support the rear of the machine.

3. Remove the 4 lug nuts and remove the wheel assembly from the wheel hub (Fig. 607).

**Fig 607** PICT-7503a

4. Remove the 2 bolts securing the brake assembly to the transmission housing (Fig. 608).

**Fig 608** PICT-7717a

5. Remove the brake assembly from the transmission (Fig. 609).

**Note: Some transmissions have 2 washers between the brake assembly and the transmission (1 for each bolt).**

**Fig 609** PICT-7719a

6. Remove the brake assembly from the spring (Fig. 610).

**Fig 610** PICT-7720a

7. Remove the puck from the brake assembly (Fig. 611).

**Fig 611** PICT-7721

8. Remove the brake disc from the transmission (Fig. 612).

**Fig 612** PICT-7722

9. Remove the puck from the transmission housing (Fig. 613).

**Fig 613** PICT-7723a

10. Inspect the brake disc and 2 brake pucks. Replace if damaged or worn (Fig. 614).

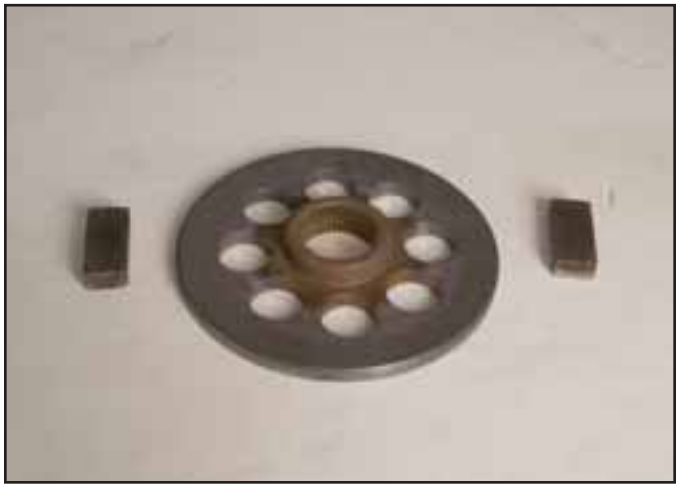

**Fig 614** PICT-7724a

## Brake Puck Installation

1. Install a puck into the transmission housing (Fig. 615).

**Fig 615** PICT-7723a

2. Slide the brake disc onto the transmission shaft (Fig. 616).

**Fig 616** PICT-7725

3. Install the puck into the brake assembly (Fig. 617).

**Fig 617** PICT-7721

4. Hook the brake assembly onto the spring (Fig. 618).

**Fig 618** PICT-7727

5. Insert 2 bolts into the brake assembly (Fig. 619).

**Fig 619** PICT-7728

6. If washers are present, slide a washer onto each of the bolts (Fig. 620).

**Fig 620** PICT-7730

7. Position the brake assembly to the transmission and install the 2 bolts to secure it (Fig. 621).

**Fig 621** PICT-7717a

8. Slide the wheel onto the wheel hub assembly and install 4 lug nuts (Fig. 622).

**Fig 622** PICT-7503a

9. Lower the machine.

10. Tighten the 4 lug nuts to secure the rear wheel to the wheel hub assembly (Fig. 623).

**Fig 623** PICT-7502a

## Brake Adjustment

**! WARNING !**

Never attempt to adjust the brakes while the engine is running. Always disengage PTO, move shift lever into neutral position, stop engine and remove key to prevent unintended starting.

If the tractor does not come to a complete stop when the brake pedal is completely depressed, or if the tractor's rear wheels can roll with the parking brake applied, the brake is in need of adjustment. The brake disc can be found on the right side of the transmission in the rear of the tractor. Adjust if necessary as follows:

Looking at the transmission from the right side of the tractor, locate the spring and brake disc (Fig. 624).

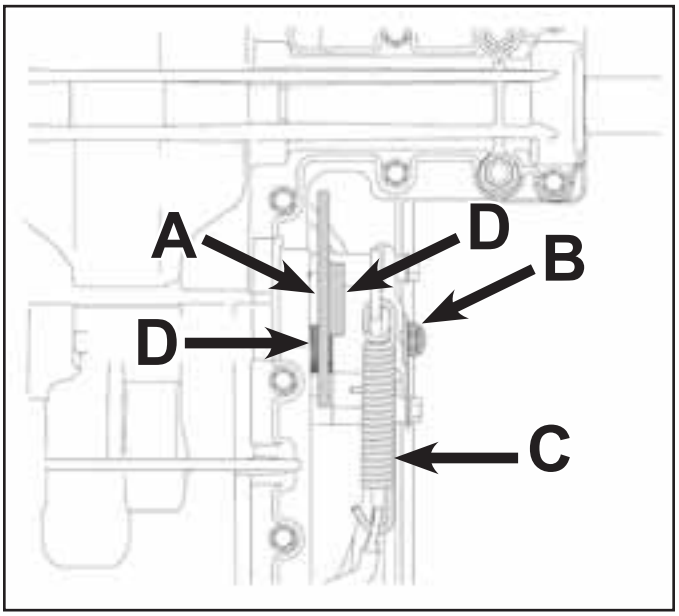


**Fig 624** fig. 11 3354-975

A. Brake disc
B. Hex nut
C. Spring
D. Brake puck (2)

1. Loosen, but do NOT remove, the hex nut found on the right side of the brake assembly (Fig. 000 abov).

2. Insert a feeler gauge set at .011" (.028mm) between the brake disc and the brake puck (Fig. 625).

**Fig 625** PICT-7731

**Note: If a feeler gauge is unavailable, a typical business card is approximately .011" (.028mm) thick.**

3. Retighten the hex nut loosened earlier, leaving a .011" (.028mm) gap between the brake disc and the brake puck.

## Autodrive Pedal Adjustment

1. Remove the mower deck. Refer to “50” Mower Deck Removal” on page 7-6.

2. The Autodrive pedal is properly adjusted when the hole found in the double idler bracket has approximately 1-3/8” (3.5cm) of travel with 10 lbs. (4.5kg) of pressure applied to the Autodrive pedal (Fig. 626 and Fig. 627).

**Fig 626** PICT-7670

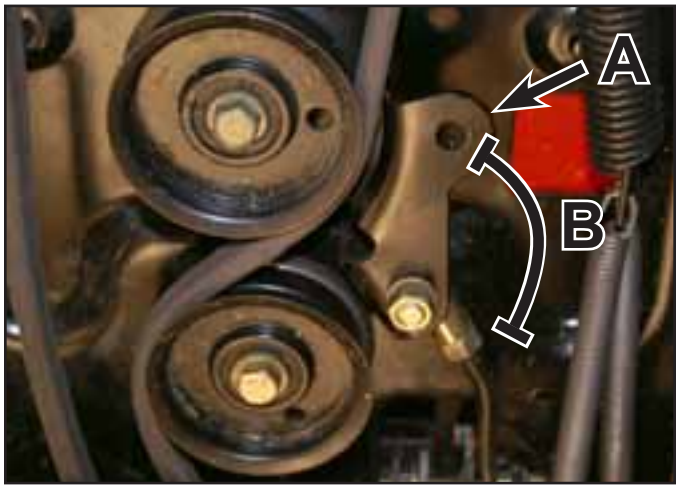


**Fig 627** PICT-7673a

A. Double idler bracket B. 1-3/8” (3.5cm) travel distance

3. If adjustment is needed:

4. Locate the speed control assembly on the underside of the steering support bracket (Fig. 628).

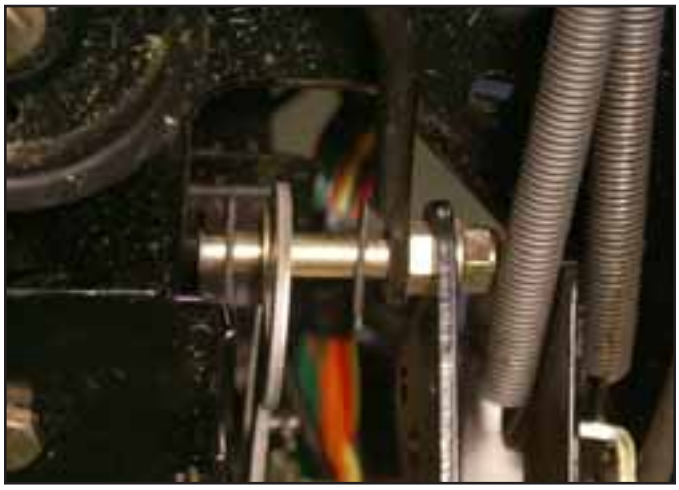

**Fig 628** PICT-7682a

5. Remove both hairpin cotters from the main pin on the speed control assembly (Fig. 629).

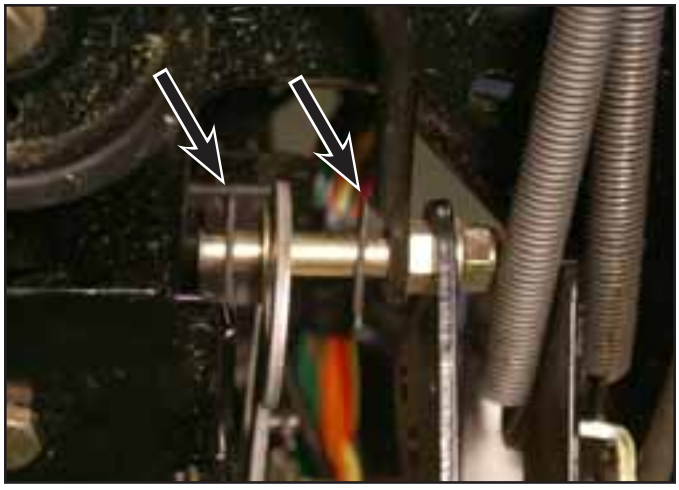

**Fig 629** PICT-7682a

6. Remove the washer from the speed control assembly (Fig. 630).

**Fig 630** PICT-7683

7. Remove the Autodrive pedal return spring (Fig. 631).

**Fig 631** PICT-7684

8. Remove the lock nut from the main pin (Fig. 632).

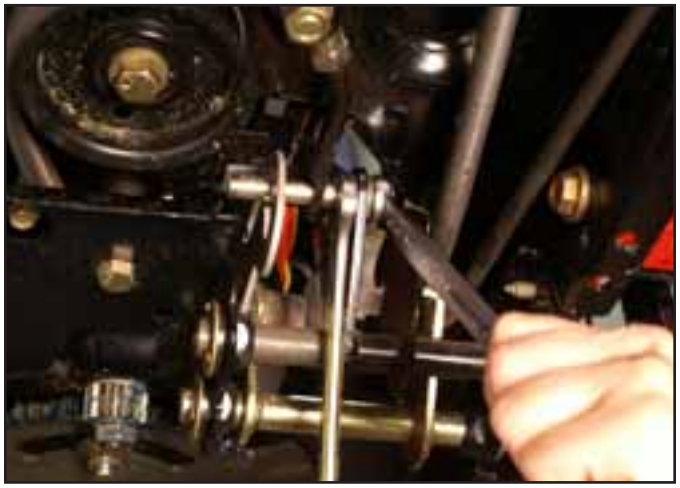

**Fig 632** PICT-7691

9. Remove the main pin from the speed control assembly (Fig. 633).

**Fig 633** PICT-7692

10. Loosen the jam nut on the idler adjustment rod. Turn the idler adjustment rod clockwise or counter-clockwise to obtain the 1-3/8” (3.5cm) idler bracket travel (Fig. 634).

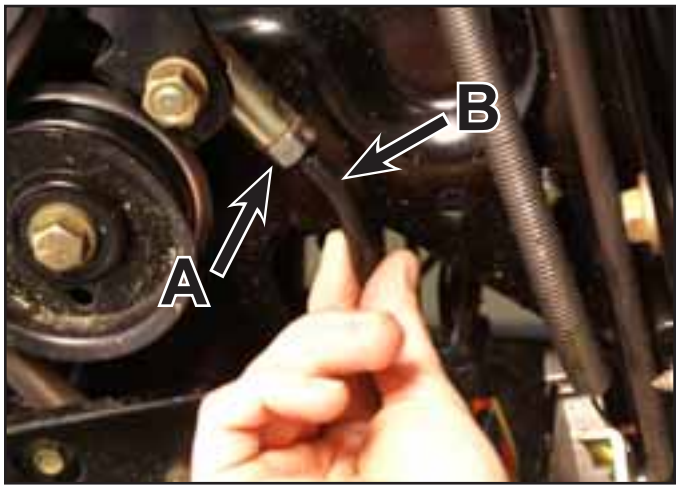


**Fig 634** PICT-7693

A. Jam nut
B. Idler adjustment rod

11. Tighten the jam nut.

12. Install the main pin through the adjustment rod, back into the lockout bracket, then through the speed control assembly. Install the jam nut onto the pin (Fig. 635).

**Note: Ensure the main pin is oriented so the hairpin holes are positioned vertically.**

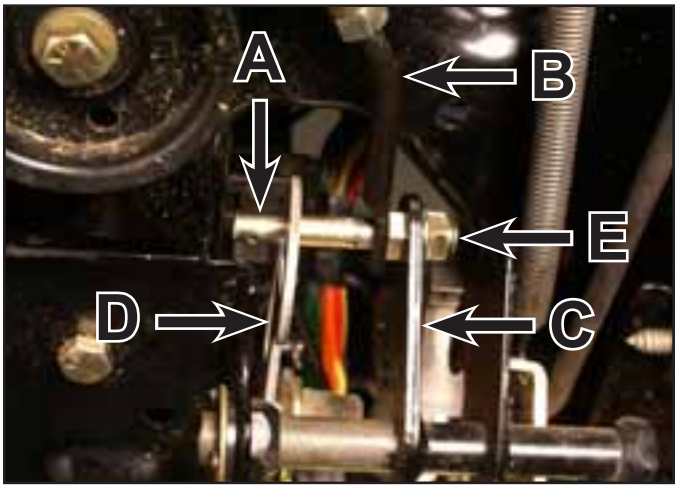


**Fig 635** PICT-7699

A. Main pin
B. Adjustment rod
C. Lockout bracket
D. Speed control assembly
E. Jam nut

13. Install a washer onto the main pin (Fig. 636).

**Fig 636** PICT-7683

14. Install 2 hairpin cotters into the main pin (Fig. 637).

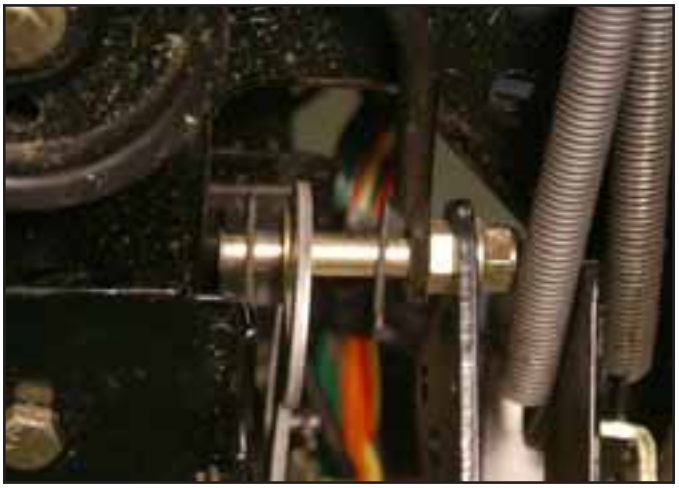

**Fig 637** PICT-7682a

15. Install the Autodrive pedal return spring into the notch on the speed control bracket (Fig. 638).

**Fig 638** PICT-7687a

16. Install the other end of the Autodrive pedal return spring to the tab on the frame (Fig. 639).

**Fig 639** PICT-7704

17. Check the travel distance on the idler bracket (approximately 1-3/8” (3.5cm) of travel with 10 lbs. (4.5kg) of pressure applied to the Autodrive pedal). If additional adjustment is needed, go back to step 3 and repeat adjustment.

18. Install the mower deck. Refer to “50” Mower Deck Installation” on page 7-8.

## Transmission Drive Belt Replacement

### Transmission Drive Belt Removal

1. Lift the seat to access the battery compartment.
2. Disconnect the battery cable from the negative battery terminal (Fig. 640).

**Fig 640** PICT-7349

3. Disconnect the battery cable from the positive battery terminal (Fig. 641).

**Fig 641** PICT-7351a

4. Remove the battery hold down rod (Fig. 642).

**Fig 642** PICT-7352

5. Remove the battery from the battery tray (Fig. 643).

**Fig 643** PICT-7353

6. Remove the battery tray (Fig. 644).

**Fig 644** PICT-7354

7. Raise the machine so the transmission drive belt can be accessed.

8. With a small pry bar, release tension from the idler spring. Remove the belt from the fixed V idler pulley and the idler pulley (Fig. 645).

**Fig 645** PICT-7496

9. Remove the Electric PTO clutch. Refer to Electric PTO Clutch Removal on page 3-29.

10. Slide the engine pulley off the crankshaft and remove the transmission drive belt from the engine pulley (Fig. 646).

**Fig 646** PICT-7497

11. Remove the transmission drive belt from around the crankshaft (Fig. 647).

**Fig 647** PICT-7498

12. Route the transmission drive belt back and remove it from above the steering support bracket (Fig. 648).

**Fig 648** PICT-7499

13. Remove the transmission drive belt from around the transmission pulley and fan. Remove the belt from the machine (Fig. 649).

**Fig 649** PICT-7501

## Transmission Drive Belt Installation

1. Route the transmission drive belt around the transmission fan and pulley (Fig. 650).

**Fig 650** PICT-7501

2. Route the transmission drive belt between the steering support bracket and frame (Fig. 651).

**Fig 651** PICT-7584

3. Position the transmission drive belt around the crankshaft (Fig. 652).

**Fig 652** PICT-7585a

4. Apply anti-seize compound to crankshaft. Slide the engine pulley onto crankshaft and install the transmission drive belt around engine pulley (Fig. 653).

**Fig 653** PICT-7497

5. With a small pry bar, extend the idler spring bracket. Route the right hand belt run between the fixed idler and the flat idler. Route the left hand belt run on the outside of the other fixed idler pulley (Fig. 654).

**Fig 654** PICT-7496a

Transmission drive belt routing (Fig. 655).

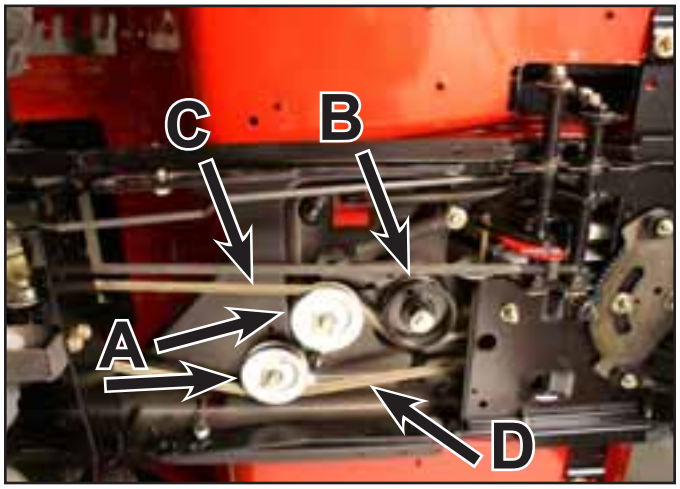


**Fig 655** PICT-7586

A. Fixed idler (2)
B. Flat idler
C. RH belt run
D. LH belt run

6. Install the Electric PTO clutch. Refer to “Electric PTO Clutch Installation” on page 3-30.

7. Install the battery tray (Fig. 656).

**Fig 656** PICT-7354

8. Install the battery to the battery tray (Fig. 657).

**Fig 657** PICT-7353

9. Install the battery hold down rod (Fig. 658).

**Fig 658** PICT-7352

10. Connect the battery cable to the positive battery terminal (Fig. 659).

**Fig 659** PICT-7351a

11. Connect the battery cable to the negative battery terminal (Fig. 660).

**Fig 660** PICT-7349

12. Lower the seat.

## Hydrostatic Transmission Replacement

### Hydrostatic Transmission Removal

1. Remove the transmission drive belt. Refer to “Transmission Drive Belt Removal” on page 5-1.

2. Loosen the 8 lug nuts securing the rear wheels to the wheel hub assemblies (Fig. 661).

**Fig 661** PICT-7502a

3. Raise and support the rear of the machine.

4. Remove the 8 lug nuts and remove the 2 wheel assemblies from the wheel hubs (Fig. 662).

**Fig 662** PICT-7503a

5. Remove the cotter pin securing the front end of the brake control rod to the brake linkage (Fig. 663).

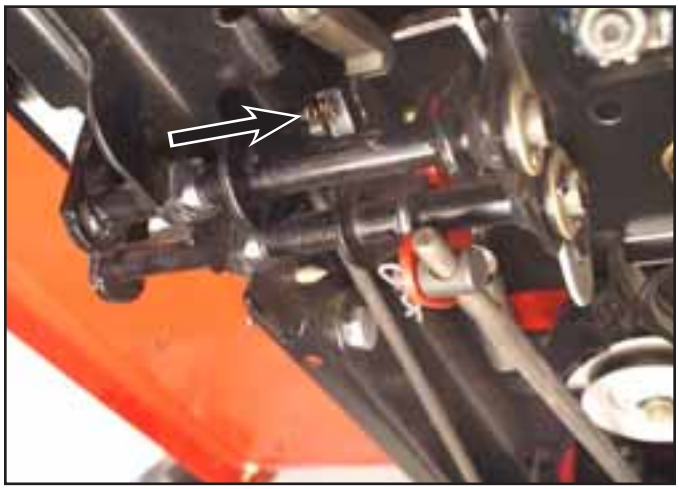

**Fig 663** PICT-7512

6. Remove the brake control rod from the linkage (Fig. 664).

**Fig 664** PICT-7513

7. Unhook the spring from the rear end of the brake control rod (Fig. 665).

**Fig 665** PICT-7518

8. Remove the brake control rod (Fig. 666).

**Fig 666** PICT-7521

9. Remove the hairpin cotter securing the front end of the speed control rod to the speed control linkage (Fig. 667).

**Fig 667** PICT-7522

10. Remove the speed control rod trunnion from the speed control linkage (Fig. 668).

**Fig 668** PICT-7523

11. Remove the cotter pin from the rear end of the speed control rod (Fig. 669).

**Fig 669** PICT-7527

12. Remove the spring from the speed control rod and transmission (Fig. 670).

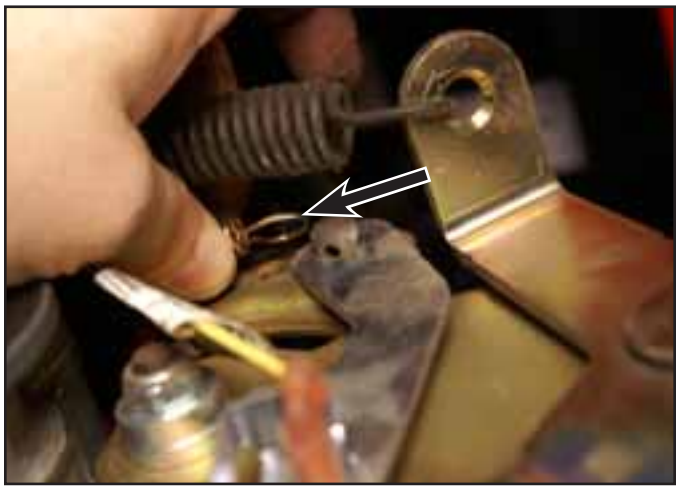

**Fig 670** PICT-7529

13. Remove the speed control rod from the transmission linkage and remove it from the machine (Fig. 671).

**Fig 671** PICT-7530

14. Remove the washer from the speed control rod (Fig. 672).

**Fig 672** PICT-7532

15. Unplug the harness wire from actuator bracket spring switch (Fig. 673).

**Fig 673** PICT-7534

16. Remove the actuator bracket/spring switch (Fig. 674).

**Fig 674** PICT-7546

17. Remove the screw securing the harness ground (Fig. 675).

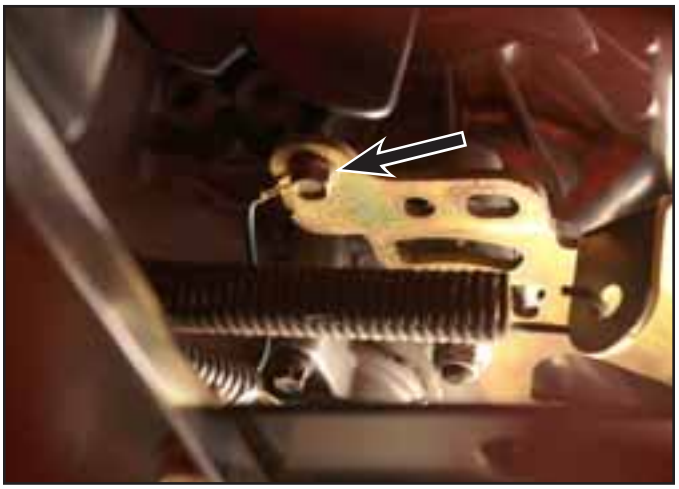

**Fig 675** PICT-7544

18. Remove the hairpin cotter securing the bypass lever to the bypass bracket on the transmission (Fig. 676).

**Fig 676** PICT-7556

19. Remove the return spring from the bypass lever (Fig. 677).

**Fig 677** PICT-7558

20. Remove the bypass lever from the bypass bracket on the transmission and remove the lever from the machine (Fig. 678).

**Fig 678** PICT-7559a

21. Remove the cable tie securing the transmission vent hose to the frame (Fig. 679).

**Fig 679** PICT-7561

22. Secure and support the transmission.

23. Remove the 2 bolts securing the front of the hydrostatic transmission to the frame (Fig. 680).

**Fig 680** PICT-7551

24. Remove the 4 bolts and nuts securing the sides of the hydrostatic transmission to the frame (2 bolts on each side) (Fig. 681).

**Fig 681** PICT-7554

25. Carefully lower the hydrostatic transmission from the machine (Fig. 682).

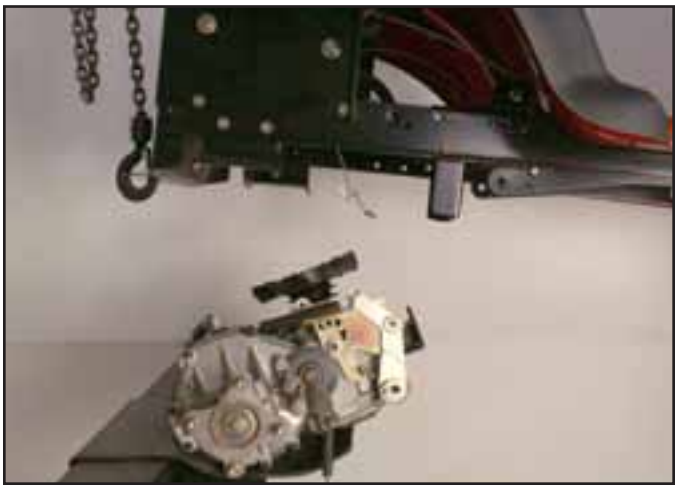

**Fig 682** PICT-7564a

26. Remove the bolt and washer securing the wheel hub assembly to the transmission axle shaft (Fig. 683).

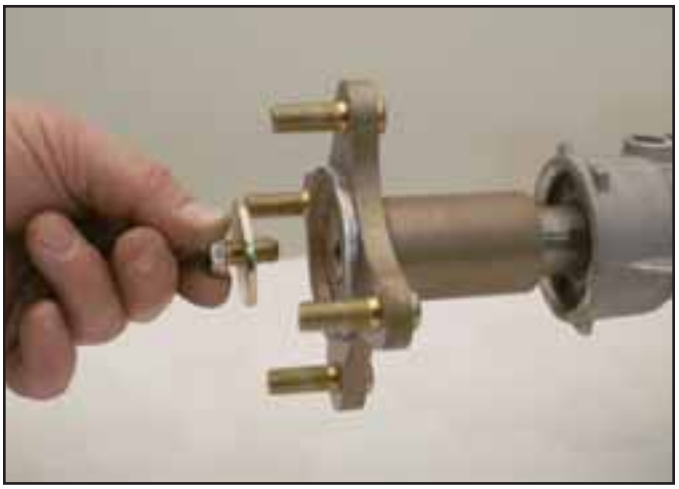

**Fig 683** PICT-7567a

27. Remove the wheel hub assembly from the transmission axle shaft (Fig. 684).

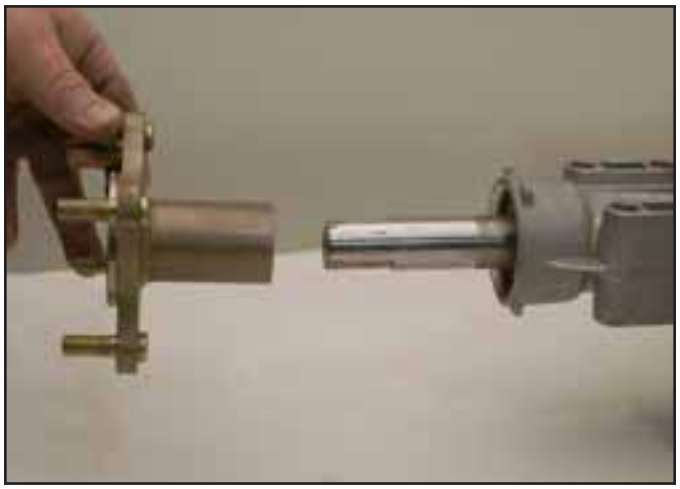

**Fig 684** PICT-7568a

28. Repeat steps 26 and 27 to remove the opposite wheel hub assembly.

## Hydrostatic Transmission Installation

1. Slide a wheel hub assembly onto each transmission axle shaft (Fig. 685).

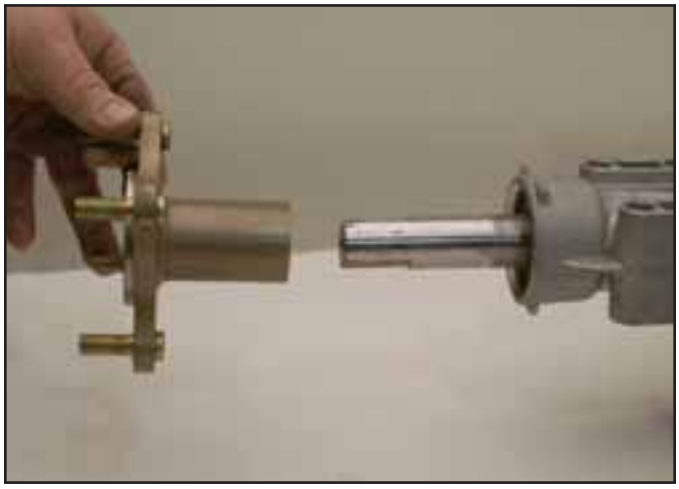

**Fig 685** PICT-7568a

2. Install a bolt and washer to secure each wheel hub assembly to the transmission axle shafts (Fig. 686).

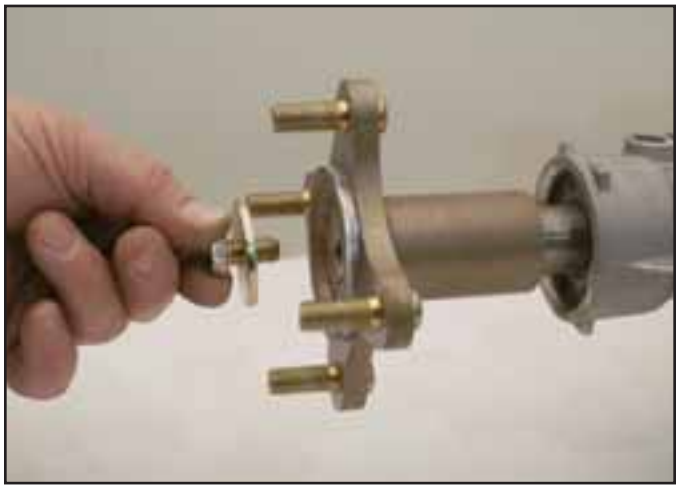

**Fig 686** PICT-7567a

3. Carefully position the hydrostatic transmission under the machine. Secure and support the transmission (Fig. 687).

**Fig 687** PICT-7564a

4. Install 4 bolts and nuts securing the sides of the hydrostatic transmission to the frame (2 bolts on each side) (Fig. 688).

**Fig 688** PICT-7554

5. Install 2 bolts securing the front of the hydrostatic transmission to the frame (Fig. 689).

**Fig 689** PICT-7551

6. Position the transmission vent tube along the left side of the frame and install a plastic push mount tie to secure it to the frame and wire harness (Fig. 690).

**Fig 690** PICT-7561

7. Insert the bypass lever into the slot on the rear of the machine. Slide the bypass lever onto the bypass bracket on the transmission (Fig. 691).

**Fig 691** PICT-7559a

8. Slide the return spring onto the bypass bracket (Fig. 692).

**Fig 692** PICT-7558

9. Install a hairpin cotter securing the bypass lever and spring to the bypass bracket on the transmission (Fig. 693).

**Fig 693** PICT-7556

10. Position the ground wire to the transmission bracket and install a screw to secure it (Fig. 694).

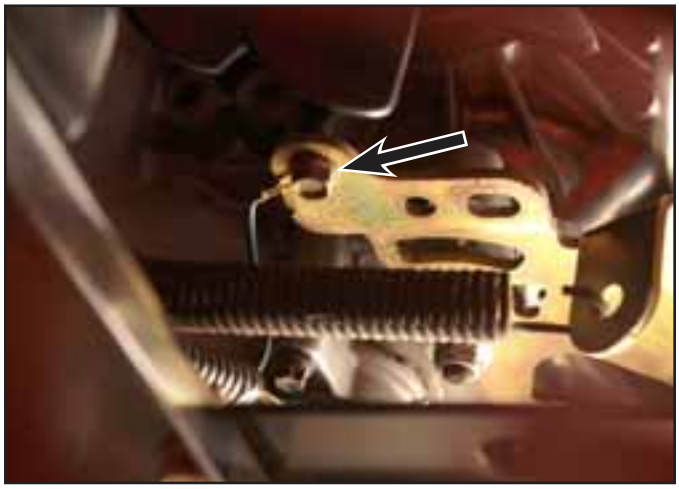

**Fig 694** PICT-7544

11. Position the actuator bracket with the spring switch to the slot in the transmission (Fig. 695).

**Fig 695** PICT-7574

12. Plug the harness wire into the actuator bracket spring switch (Fig. 696).

**Fig 696** PICT-7534

13. Slide a washer onto the rear end of the speed control rod (Fig. 697).

**Fig 697** PICT-7532

14. Position the rear end of the speed control rod into the machine and slide the speed control rod into the transmission linkage (Fig. 698).

**Fig 698** PICT-7577

15. Hook the spring onto the speed control rod (Fig. 699).

**Fig 699** PICT-7529

16. Install a cotter pin securing the spring, actuator bracket and speed control rod to the transmission (Fig. 700).

**Fig 700** PICT-7527

17. Insert the trunnion on the front end of the speed control rod into the speed control linkage (Fig. 701).

**Fig 701** PICT-7523

18. Install a hairpin cotter securing the front end of the speed control rod to the speed control linkage (Fig. 702).

**Fig 702** PICT-7522

19. Position the rear end of the brake control rod through the hole in the frame and up to the transmission (Fig. 703).

**Fig 703** PICT-7521

20. Hook the spring to the rear end of the brake control rod (Fig. 704).

**Fig 704** PICT-7518

21. Position the front end of the brake control rod into the brake control linkage (Fig. 705).

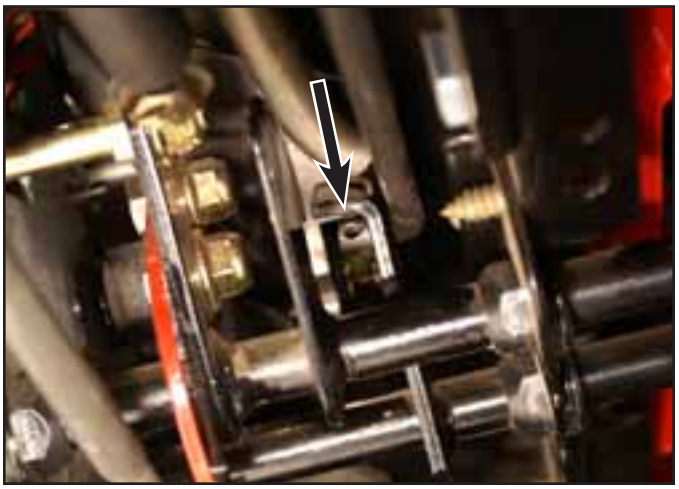

**Fig 705** PICT-7580

22. Install a cotter pin securing the front end of the brake control rod to the brake control linkage (Fig. 706).

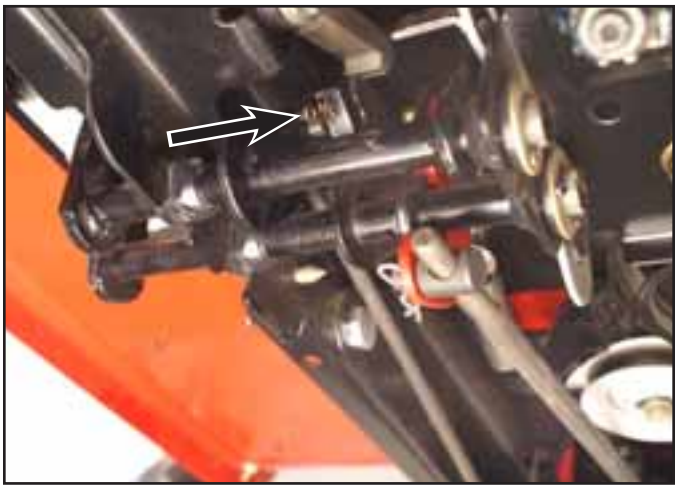

**Fig 706** PICT-7512

23. Slide the wheel assembly onto the wheel hub assembly (Fig. 707).

**Fig 707** PICT-7503a

24. Install 4 lug nuts securing the wheel assembly to the wheel hub assembly (Fig. 708).

**Fig 708** PICT-7502a

25. Repeat steps 23 and 24 to install the second wheel assembly to the opposite wheel hub.

26. Install the transission drive belt. Refer to “Transmission Drive Belt Installation” on page 5-3.

27. Tighten the 8 lug nuts securing the rear wheels to the wheel hub assemblies (Fig. 709).

**Fig 709** PICT-7502a

28. If a new transmission was installed, purge the system, adjust the brake and adjust neutral. Refer to:
    - “Purging the System” on page 6-20
    - “Brake Adjustment” on page 5-52
    - “Neutral Adjustment” on page 6-22

29. Operate the tractor to ensure all controls operate properly.

## Purging the System

Due to the effect air has on efficiency in hydrostatic drive applications, it is critical that it be purged from the system.

These purge procedures should be implemented any time a hydrostatic system has been opened to facilitate maintenance or any additional oil has been added to the system.

Air creates inefficiency because its compression and expansion rate is higher than the oil in hydrostatic drive systems.

The resulting symptoms in hydrostatic systems may be:

1. Noisy operation
2. Lack of power or drive after short term operation
3. High operation temperature and excessive expansion of oil

Before starting, make sure the transaxle is at the specified oil level (Fig. 710).

**Note: Fill unit until oil is flowing out of Port B.**

The following procedures should be performed with the vehicle drive wheels off the ground, then repeated under normal operating conditions.

1. With the bypass valve open and the engine running, slowly move the directional control (foot control) in both forward and reverse directions 5 to 6 times; as air is purged from the unit, the oil level will drop.
2. With the bypass valve in the closed position and the engine running, slowly move the directional control valve (foot control) in both forward and reverse directions 5 to 6 times. After stopping the engine, check the oil level and add oil as required.

**Note: Fill unit until oil is flowing out of Port B (Fig. 710).**

3. It may be necessary to repeat Steps 1 and 2 until all the air is completely purged from the system. When the transaxle moves forward and reverse at normal speed purging is complete.



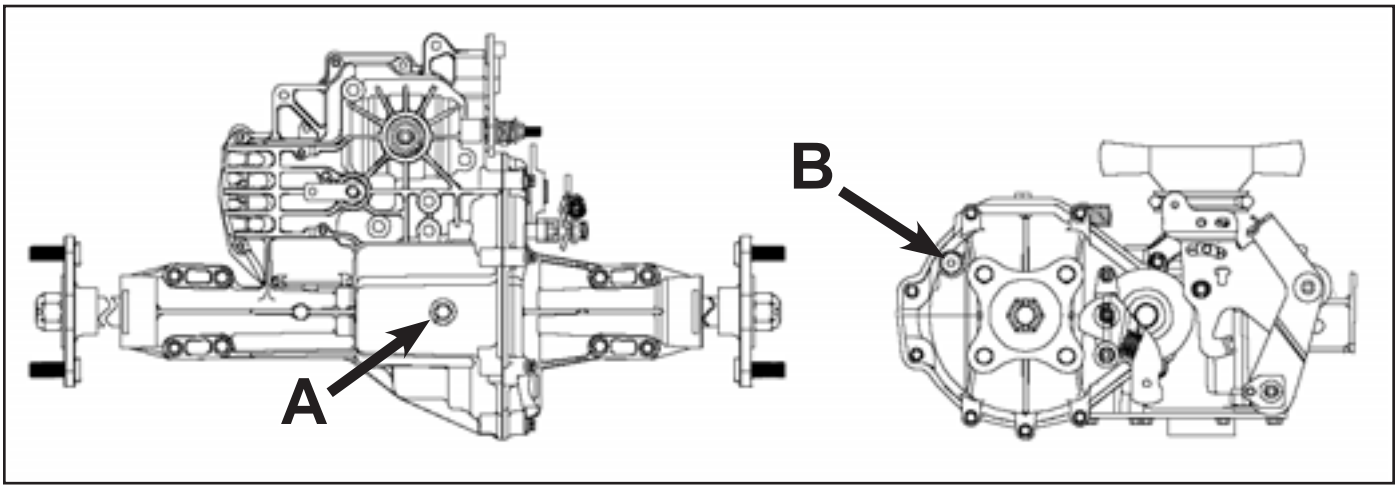


**Fig 710** fig. 3 310-3000

A. Fluid fill port

B. Fluid level port - oil should flow from this port

## Fluid Change

The Hydro-Gear transaxle is factory filled and does not require periodic oil change. In the event of oil contamination or degradation, oil replacement may correct certain performance problems:

1. Remove the transaxle from the machine. Refer to “Hydrostatic Transmission Removal” on page 6-6.

2. Completely drain the oil from the transaxle through the top fluid fill port, Port A (Fig. 711).

3. Fill unit until oil is flowing out of Port B (Fig. 711):

| Fluid Description | Volume |
|---|---|
| 20W-50 engine oil | 0.95 gal (116.5oz) |

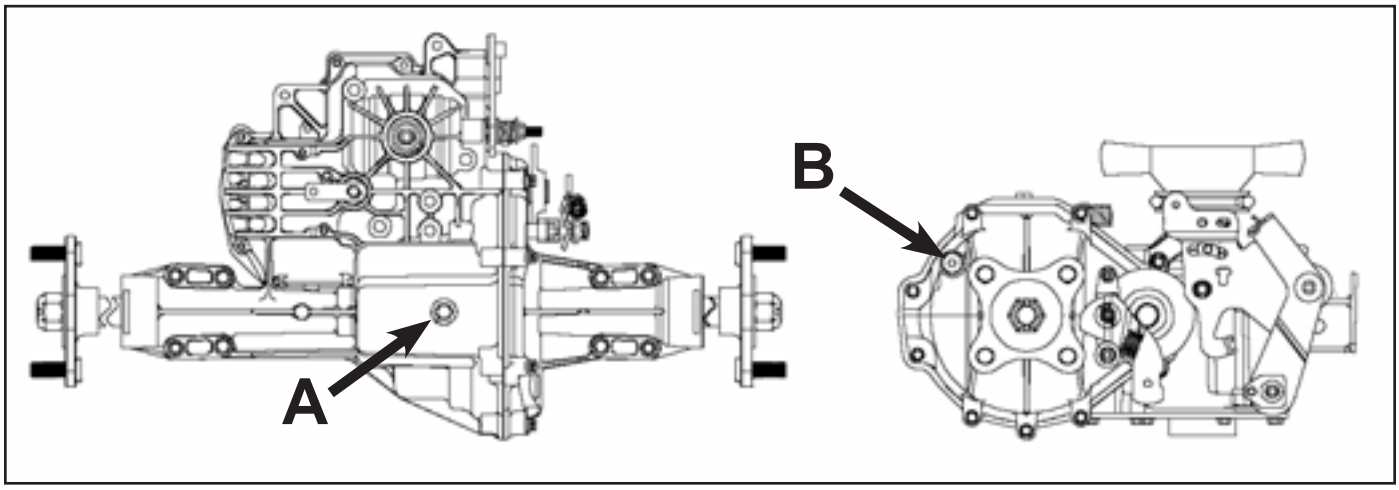


**Fig 711** fig. 3 310-3000

A. Fluid fill port

B. Fluid level port - oil should flow from this port

4. Install the transaxle into the machine. Refer to “Hydrostatic Transmission Installation” on page X-XX.

5. Purge the system. Refer to “Purging the System” on page X-XX.

## Neutral Adjustment

Before making a neutral adjustment, the transmission must be warmed up for at least 10 minutes.

1. Loosen the 4 lug nuts securing the right rear wheel to the wheel hub assembly (Fig. 712).

**Fig 712** PICT-7502a

2. Raise and support the rear of the machine.

3. Remove the 4 lug nuts and remove the wheel assembly from the wheel hub (Fig. 713).

**Fig 713** PICT-7503a

4. Locate the neutral adjusting puck and loosen the Allen head bolt. If it's difficult to loosen, heat the aluminum housing near the bolt with a propane torch (Fig. 714).

**Fig 714** PICT-7822

5. Start the engine and run it at full throttle.

6. Rotate the adjusting puck in both directions and watch the axle direction. Adjust the puck so it is set at the midpoint between forward and reverse axle rotation. Make sure the axle is not moving.

7. Once in neutral, hold the puck with an adjustable wrench so it won't move. Tighten the Allen head bolt (Fig. 715).

**Fig 715** PICT-7823

8. Operate the foot control in forward and reverse. Allow the pedal to return to the neutral position to test the adjustment.

9. Slide the wheel assembly onto the wheel hub assembly (Fig. 716).

**Fig 716** PICT-7503a

10. Install 4 lug nuts securing the wheel assembly to the wheel hub assembly (Fig. 717).

**Fig 717** PICT-7502a

11. Lower the machine to the ground.

12. Tighten the 4 lug nuts (Fig. 718).

**Fig 718** PICT-7502a

## Brake Puck Replacement

### Brake Puck Removal

1. Loosen the 4 lug nuts securing the right rear wheel to the wheel hub assembly (Fig. 719).

**Fig 719** PICT-7502a

2. Raise and support the rear of the machine.

3. Remove the 4 lug nuts and remove the wheel assembly from the wheel hub (Fig. 720).

**Fig 720** PICT-7503a

4. Loosen the lower bolt securing the brake assembly to the transmission housing (Fig. 721).

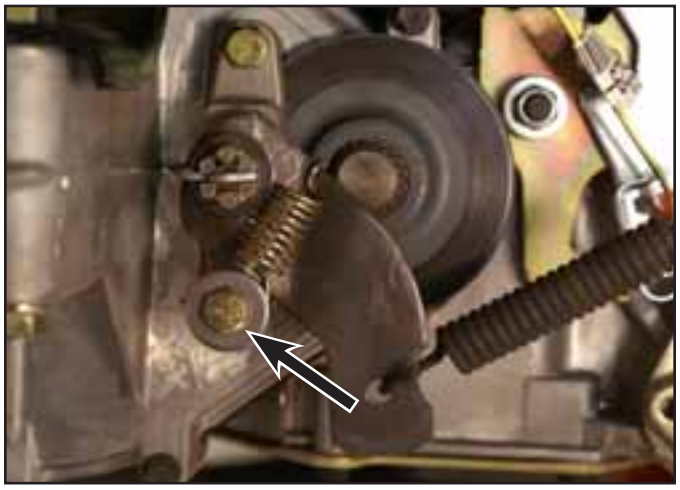

**Fig 721** PICT-7733

5. Remove the brake arm spring (Fig. 722).

**Fig 722** PICT-7734

6. Remove the lower bolt, washer, and spacer from the brake assembly (Fig. 723).

**Fig 723** PICT-7736

7. Remove the upper bolt securing the brake assembly to the transmission housing (Fig. 724).

**Fig 724** PICT-7737

8. Remove the brake assembly from the transmission (Fig. 725).

**Fig 725** PICT-7738

9. Remove the brake assembly from the spring (Fig. 726).

**Fig 726** PICT-7739

10. Remove the puck from the brake assembly (Fig. 727).

**Fig 727** PICT-7741a

11. Remove the disc brake from the transmission (Fig. 728).

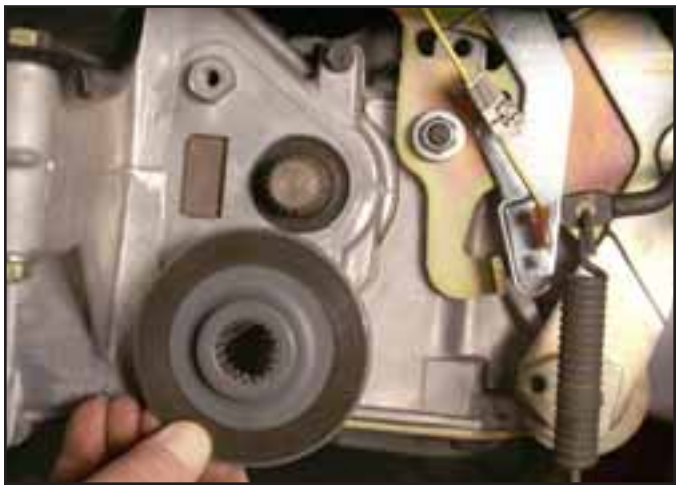

**Fig 728** PICT-7742a

12. Remove the puck from the transmission housing (Fig. 729).

**Fig 729** PICT-7743a

13. Inspect the disc brake and 2 brake pucks. Replace if damaged or worn (Fig. 730).

**Fig 730** PICT-7744a

## Brake Puck Installation

1. Install a puck into the transmission housing (Fig. 731).

**Fig 731** PICT-7743a

2. Slide the disc brake onto the transmission shaft (Fig. 732).

**Fig 732** PICT-7745

3. Install the puck into the brake assembly (Fig. 733).

**Fig 733** PICT-7741a

4. Hook the brake assembly onto the spring (Fig. 734).

**Fig 734** PICT-7747

5. Position the brake assembly to the transmission and install the top bolt to secure it (Fig. 735).

**Fig 735** PICT-7748

6. Install the lower bolt, washer and spacer to secure the brake assembly to the transmission housing (Fig. 736).

**Fig 736** PICT-7736

7. Hook the brake arm spring onto the brake arm (Fig. 737).

**Fig 737** PICT-7749

8. Hook the brake arm spring onto the lower bolt (Fig. 738).

**Fig 738** PICT-7733

9. Adjust the parking brake. See “Parking Brake Adjustment” on page 6-30.

10. Slide the wheel onto the wheel hub assembly and install 4 lug nuts (Fig. 739).

**Fig 739** PICT-7503a

11. Lower the machine.

12. Tighten the 4 lug nuts securing the rear wheel to the wheel hub assembly (Fig. 740).

**Fig 740** PICT-7502a

## Parking Brake Adjustment

**! WARNING !**

Never attempt to adjust the brakes while the engine is running. Always disengage PTO, stop engine and remove key to prevent unintended starting.

If the tractor does not come to a complete stop when the brake pedal is completely depressed, or if the tractor's rear wheels can roll with the parking brake applied, the brake is in need of adjustment. The brake disc can be found on the right side of the transmission in the rear of the tractor. Adjust if necessary as follows:

**Note: Have a replacement cotter pin on hand before beginning this adjustment.**

Looking at the transmission from the right side of the tractor, locate the brake puck and brake disc (Fig. 741).

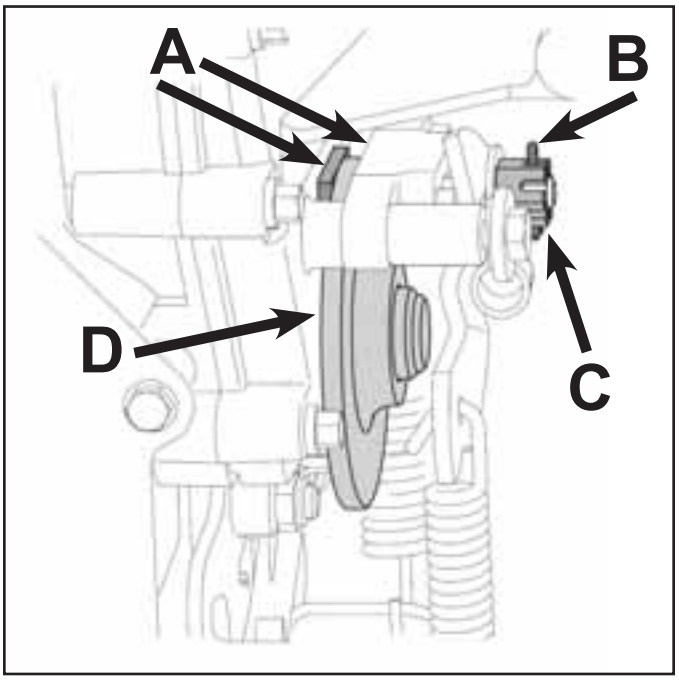


**Fig 741** fig. 11 3345-977

A. Brake puck (2)
B. Cotter pin
C. Crown nut
D. Brake disc

1. Remove and discard the cotter pin which secures the crown nut to the assembly (Fig. 741).
2. Loosen, but do NOT remove, the crown nut found on the brake assembly.
3. Insert a feeler gauge set at .011" (.28mm) between the brake disc and the brake puck (Fig. 742).

**Note: If a feeler gauge is unavailable, a typical business card is approximately .011" (.28mm) thick.**

**Fig 742** PICT-7751

4. Retighten the crown nut loosened earlier, leaving a .011" (.28mm) gap between the brake disc and each of the brake pucks.
5. Insert a new cotter pin to secure the crown nut in place. Do NOT reuse the old cotter pin.

## 50” Mower Deck Belt Replacement

### 50” Mower Deck Belt Removal

1. Remove the mower deck from the tractor. Refer to “50” Mower Deck Removal” on page 7-6.

2. Remove the 3 screws securing the left hand spindle cover to the mower deck (Fig. 743).

**Fig 743** PICT-7946

3. Remove the left hand spindle cover (Fig. 744).

**Fig 744** PICT-7949

4. Remove the 4 screws securing the right hand spindle cover to the mower deck (Fig. 000).

**Note: There is a hook retainer bracket located under one of the screws securing the right spindle cover to the mower deck (Fig. 745).**

**Fig 745** PICT-7947

5. Remove the right hand spindle cover (Fig. 746).

**Fig 746** PICT-7950a

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6. Loosen the nut from the bolt securing the pulley to the spring loaded idler assembly (Fig. 747).

**Fig 747** PICT-7952

7. Tilt the spring loaded idler pulley and remove the mower deck belt from the mower deck (Fig. 748).

**Fig 748** PICT-7953a

## 50” Mower Deck Belt Installation

1. Route the mower deck belt around the spindles and idlers. Refer to the belt routing decal (Fig. 749):

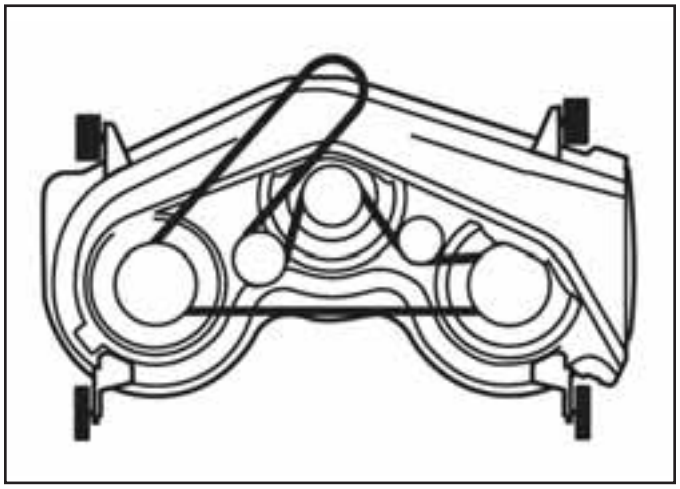

**Fig 749** decal 1 3354-977

2. Tilt the spring loaded idler pulley to route the belt around it (Fig. 750).

**Fig 750** PICT-7953a

3. Tighten the nut onto the bolt securing the pulley to the spring loaded idler assembly (Fig. 751).

**Fig 751** PICT-7952

4. Position the right hand spindle cover onto the mower deck (Fig. 752).


**Fig 752** PICT-7950

5. Install 4 screws to secure the right hand spindle cover to the mower deck (Fig. 753).

**Note: There is a hook retainer bracket located under one of the screws securing the spindle cover to the mower deck.**


**Fig 753** PICT-7947

6. Position the left hand spindle cover onto the mower deck (Fig. 754).


**Fig 754** PICT-7949

7

7. Install 3 screws to secure the left hand spindle cover to the mower deck (Fig. 755).

**Fig 755** PICT-7946

8. Install the mower deck onto the tractor. Refer to “50” Mower Deck Installation” on page 7-8.

## 50” Mower Deck Fixed Idler Replacement

The mower deck has been removed from the tractor for photo purposes.

### 50” Mower Deck Fixed Idler Removal

1. Remove the bolt, washer and nut securing the fixed idler pulley to the fixed idler mounting bracket (Fig. 756).

**Fig 756** PICT-7982

2. Remove the fixed idler pulley from the mounting bracket (Fig. 757).

**Fig 757** PICT-7984

## 50” Mower Deck Fixed Idler Installation

1. Position the fixed idler pulley onto the fixed idler mounting bracket (Fig. 758).

**Fig 758** PICT-7984

2. Install a bolt, washer and nut to secure the fixed idler pulley to the fixed idler mounting bracket (Fig. 759).

**Fig 759** PICT-7982

## 50” Mower Deck Removal

1. Place the PTO/Blade Engage knob in the disengaged (OFF) position and engage the parking brake.

2. Lower the deck by moving the deck lift lever into the bottom notch on the right fender (Fig. 760).

**Fig 760** PICT-7829

3. Using a breaker bar or ratchet, rotate the idler bracket forward and remove the deck belt from around the electric PTO clutch (Fig. 761 and Fig. 762).

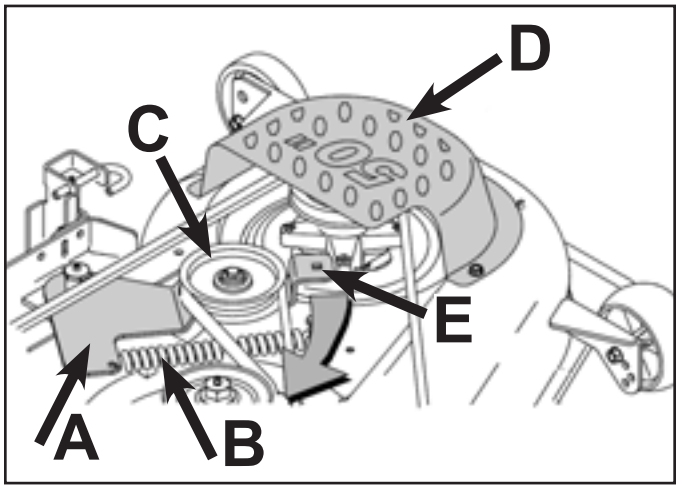


**Fig 761** fig. 20 3354-975

A. Idler bracket
B. Spring
C. Pivoting idler pulley
D. Belt guard
E. 3/8” Square hole

**Fig 762** PICT-7830

4. From the left side of the tractor, locate the deck support pin on the rear left side of the deck. Pull the deck support pin outward to release the deck from the deck lift arm. Rotate the pin so it rests on the deck hanger bracket (Fig. 763).

**Fig 763** PICT-7988

5. Repeat the above step on the tractor's right side.

6. Slide the cutting deck toward the front of the tractor allowing the hooks on the deck to release themselves from the deck stabilizer rod (Fig. 764).

**Fig 764** PICT-7987

7. Move the deck lift lever into the top notch to raise the deck lift arms up and out of the way (Fig. 765).

**Fig 765** PICT-7839

8. Turn the tractor's front wheels fully left. Slide the cutting deck (from the right side) out from underneath the tractor (Fig. 766).

**Fig 766** PICT-7986

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## 50” Mower Deck Installation

1. Place the PTO/Blade Engage knob in the disengaged (OFF) position and engage the parking brake.

2. Move the deck lift lever into the top notch to raise the deck lift arms up and out of the way (Fig. 767).

**Fig 767** PICT-7839

3. Turn the tractor’s front wheels fully left. Slide the cutting deck (from the right side) underneath the tractor (Fig. 768).

**Fig 768** PICT-7986

4. Slide the cutting deck toward the front of the tractor allowing the hooks on the deck to catch on the deck stabilizer rod (Fig. 769).

**Fig 769** PICT-7987

5. Lower the deck lift arms by moving the deck lift lever into the bottom notch on the right fender (Fig. 770).

**Fig 770** PICT-7829

6. From the left side of the tractor, locate the deck support pin on the rear left side of the deck. Pull the deck support pin outward. Lift the deck into position and release the deck support pin so that the deck is hanging and supported by the deck support pin (Fig. 771).

**Fig 771** PICT-7988

7. Repeat the above step on the tractor's right side.

8. Using a breaker bar or ratchet, rotate the idler bracket forward and route the mower deck belt around the electric PTO clutch (Fig. 772 and Fig. 773).

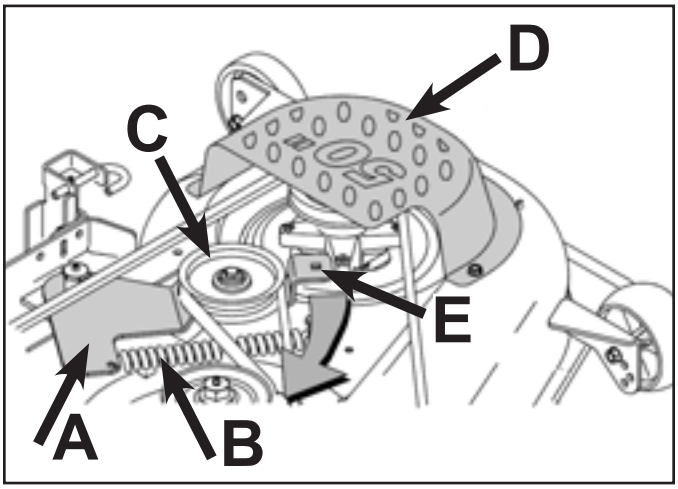


**Fig 772** Fig. 20 3354-975

A. Idler bracket
B. Spring
C. Pivoting idler pulley
D. Belt guard
E. 3/8" Square hole

**Fig 773** PICT-7990

9. Raise the deck by moving the deck lift lever into the top notch on the right fender (Fig. 774).

**Fig 774** PICT-7837

## 50” Mower Deck Spindle Replacement

The following procedure was performed on the center spindle assembly. The process is the same for all three spindle assemblies except where noted.

### 50” Mower Deck Spindle Removal

1. Remove the mower deck from the tractor. Refer to “50” Mower Deck Removal” on page 7-6.
2. If servicing a left or right spindle, remove the deck belt from the mower deck. Refer to “50” Mower Deck Belt Removal” on page 7-1.
3. Turn the mower deck over to access the underside of the mower deck.
4. Block the mower deck blade and remove the nut securing the mower deck blade to the spindle shaft (Fig. 775).

**Fig 775** PICT-7976

5. Remove the mower deck blade from the spindle shaft (Fig. 776).

**Fig 776** PICT-7978

6. Remove the 4 screws securing the spindle assembly to the mower deck (Fig 777).

**Fig 777** PICT-7980

7. Remove the spindle assembly from the mower deck (Fig. 778).

**Fig 778** PICT-012a

## 50” Mower Deck Spindle Installation

1. As necessary, apply grease to all three mower deck spindles.

2. Position the spindle assembly onto the top side of the mower deck (pulley side facing up) (Fig. 779).

**Note: The spindle grease fitting should be positioned so that it is facing toward the front of the mower deck. This will allow for easier greasing of the spindles.**

**Fig 779** PICT-012a

3. Install 4 screws securing the spindle assembly to the mower deck (Fig 780).

**Note: The screws are installed from the bottom side of the mower deck.**

**Fig 780** PICT-7980

4. Slide mower deck blade onto the spindle shaft (Fig. 781). Ensure the center of the blade is seated onto machined star end of the spindle shaft.

**Note: Make sure the blade sails face the deck.**

**Fig 781** PICT-7978

5. Block the mower deck blade and install a nut securing the mower deck blade to the spindle shaft (Fig. 782). Torque the blade nut to 80 ± 10 ft-lbs. (108 ± 13.5 Nm).

**Fig 782** PICT-019

6. Install the pulley onto the spindle. Refer to “Mower Deck Pulley Installation” on page 7-50.

7. If applicable, install the mower deck belt onto the mower deck. Refer to “50” Mower Deck Belt Installation” on page 7-2.

8. Install the mower deck onto the tractor. Refer to “50” Mower Deck Installation” on page 7-8.

## 50” Mower Deck Spindle Service

1. Secure the mower deck spindle into a vise.

2. Secure the spindle shaft and remove the nut securing the pulley to the mower deck spindle (Fig. 783).

**Fig 783** PICT-8046a

3. Remove the washer (Fig. 784).

**Fig 784** PICT-8047a

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4. Remove the pulley (Fig. 785).

**Fig 785** PICT-8048a

5. Remove the spindle shaft/shoulder spacer assembly from the spindle housing (Fig. 786).

**Fig 786** PICT-8049a

6. Remove the shoulder spacer from the spindle shaft (Fig. 787).

**Fig 787** PICT-8050a

7. Remove the bearing and 2 spacers from the pulley side of the housing (Fig. 788).

**Fig 788** PICT-7742a

8. Press the second bearing out of the blade side of the housing (Fig. 789).

**Note: Since this bearing is staked in place it WILL be damaged if removed.**

**Fig 789** PICT-7745a

9. Inspect the bearings and spacers and replace if worn or damaged.

10. Press the blade side bearing into the housing (Fig. 790).

**Fig 790** PICT-7740

11. Secure the housing assembly into a vise and stake the housing to retain the bearing (Fig. 791).

**Fig 791** PICT-7748a

12. Insert 2 spacers into the spindle housing (Fig. 792).

**Fig 792** PICT-7749a

13. Install a bearing into the pulley side of the spindle housing (Fig. 793).

**Fig 793** PICT-7750a

14. Install a shoulder spacer onto the spindle shaft cupped side down (Fig. 794).

**Fig 794** PICT-8050a

15. Install the spindle shaft and shoulder spacer assembly into the spindle housing (Fig. 795).

**Fig 795** PICT-8049a

16. Place the spindle housing into a vise.

17. Install the pulley (Fig. 796).

**Fig 796** PICT-8048a

18. Install a washer onto the spindle shaft (Fig. 797).

**Fig 797** PICT-8047a

19. Secure the spindle shaft and install a nut to secure the pulley to the mower deck spindle (Fig. 798).

**Fig 798** PICT-8046a

20. Remove the mower deck spindle from the vise.

## 50” Mower Deck Spring Loaded Idler Replacement

### 50” Mower Deck Spring Loaded Idler Removal

1. Remove the Mower Deck from the Tractor. Refer to “50” Mower Deck Removal” on page 7-6.

2. Remove the mower deck belt. Refer to “50” Mower Deck Belt Removal” on page 7-1.

3. Remove the bolt, washer and nut securing the pulley to the spring loaded idler (Fig. 799).

**Fig 799** PICT-7955

4. Remove the pulley from the idler bracket (Fig. 800).

**Fig 800** PICT-7956

5. Remove the spacer from the idler bracket (Fig. 801).

**Fig 801** PICT-7957

6. Using a spring tool (Toro part no. 92-5771), unhook the idler spring from the spring post on the mower deck (Fig. 802).

**Fig 802** PICT-7960

7. Remove the idler spring from the idler bracket (Fig. 803).

**Fig 803** PICT-7962

8. Remove the nut from the shoulder bolt securing the idler bracket to the mower deck (Fig. 804).

**Fig 804** PICT-7963

9. Remove the idler bracket from the mower deck (Fig. 805).

**Fig 805** PICT-7966

10. Remove the washer from below the idler assembly mounting bracket (Fig. 806).

**Fig 806** PICT-7967

11. Remove the spacer from on top of the idler assembly mounting bracket (Fig. 807).

**Fig 807** PICT-7969

12. Remove the shoulder bolt from the idler bracket (Fig. 808).

**Fig 808** PICT-7972

### 50” Mower Deck Spring Loaded Idler Installation

1. Insert the shoulder bolt into the idler bracket (Fig. 809).

**Fig 809** PICT-7972

2. Position the spacer on top of the idler assembly mounting bracket (Fig. 810).

**Fig 810** PICT-7969

3. Position a washer on the underside of the idler assembly mounting bracket (Fig. 811).

**Fig 811** PICT-7967

4. Insert the idler bracket shoulder bolt through the idler assembly mower mounting bracket and washer (Fig. 812).

**Fig 812** PICT-7966

5. Install a nut onto the shoulder bolt securing the idler bracket to the mower deck (Fig. 813).

**Fig 813** PICT-7963

6. Hook the idler spring onto the idler bracket (Fig. 814).

**Fig 814** PICT-7962

7. Using a spring tool (Toro part no. 92-5771), hook the idler spring to the spring post on the mower deck (Fig. 815).

**Fig 815** PICT-7960

8. Position a spacer onto the idler bracket (Fig. 816).

**Fig 816** PICT-7957

9. Position the pulley onto the idler bracket (Fig. 817).

**Fig 817** PICT-7956

10. Loosely install a bolt, washer and nut to secure the pulley to the spring loaded idler (Fig. 818).

**Fig 818** PICT-7955

11. Apply grease to the idler assembly shoulder bolt (Fig. 819).

**Note: Check and apply grease to each of the mower deck spindles as needed.**

**Fig 819** PICT-7975

12. Install the mower deck belt. Refer to “50” Mower Deck Belt Installation” on page 7-2.

13. Install the Mower Deck onto the Tractor. Refer to “50” Mower Deck Installation” on page 7-8.

## 54” Mower Deck Belt Replacement

The following procedures were done with the mower deck removed from the mower for photo purposes. To replace the mower deck belt the mower deck can remain on the tractor.

### 54” Mower Deck Belt Removal

1. Place the PTO/Blade Engage knob in the disengaged (OFF) position and engage the parking brake.

2. Lower the deck by moving the deck lift lever into the bottom notch on the right fender (Fig. 820).

**Fig 820** PICT-7829

3. Using a breaker bar or ratchet, rotate the idler bracket forward and remove the deck belt from around the electric PTO clutch (Fig. 821 and Fig. 822).

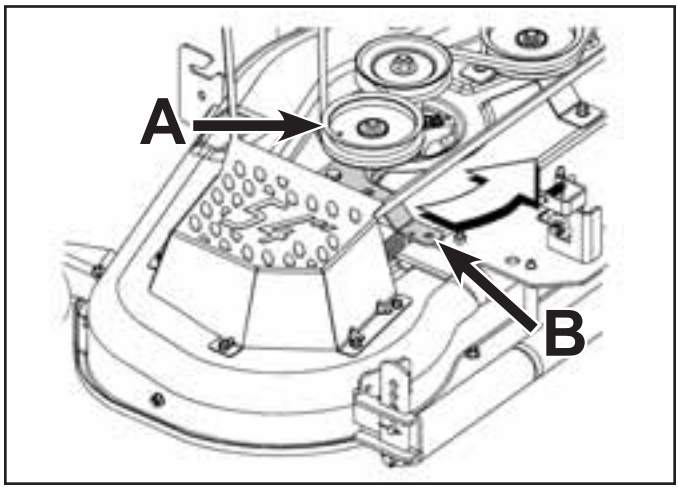


**Fig 821** fig. 22 3354-977

A. Idler pulley B. 3/8” Square hole

**Fig 822** PICT-7830

4. Remove the 5 screws securing the left hand spindle cover to the mower deck (Fig. 823).

**Fig 823** PICT-7845

5. Remove the left hand spindle cover (Fig. 823).

**Fig 823** PICT-7848

6. Remove the 5 screws securing the right hand spindle cover to the mower deck (Fig. 824).

**Fig 824** PICT-7847

7. Remove the right hand spindle cover (Fig. 825).

**Fig 825** PICT-7849

8. Remove the mower deck belt from the mower deck (Fig. 826).

**Fig 826** PICT-7851

## 54” Mower Deck Belt Installation

1. Position the right hand spindle cover onto the mower deck (Fig. 827).

**Fig 827** PICT-7849

2. Install 5 screws to secure the right hand spindle cover to the mower deck (Fig. 828).

**Fig 828** PICT-7847

3. Position the left hand spindle cover onto the mower deck (Fig. 829).

**Fig 830** PICT-7848

4. Install 5 screws to secure the left hand spindle cover to the mower deck (Fig. 831).

**Fig 831** PICT-7845

## 54” Mower Deck Fixed Idler Replacement

### 54” Mower Deck Fixed Idler Removal

1. Remove the mower deck from the tractor. Refer to “54” Mower Deck Removal” on page 7-29.

2. Remove the deck belt from the mower deck. Refer to “54” Mower Deck Belt Removal” on page 7-23.

3. Remove the bolt, washer and nut securing the fixed idler pulley to the fixed idler bracket (Fig. 832).

**Fig 832** PICT-7869

4. Remove the fixed idler pulley (Fig. 833).

**Fig 833** PICT-7871

5. Remove the spacer (Fig. 834).

**Fig 834** PICT-7873

6. Remove the 4 screws securing the fixed idler bracket from the bottom side of the mower deck (Fig. 835).

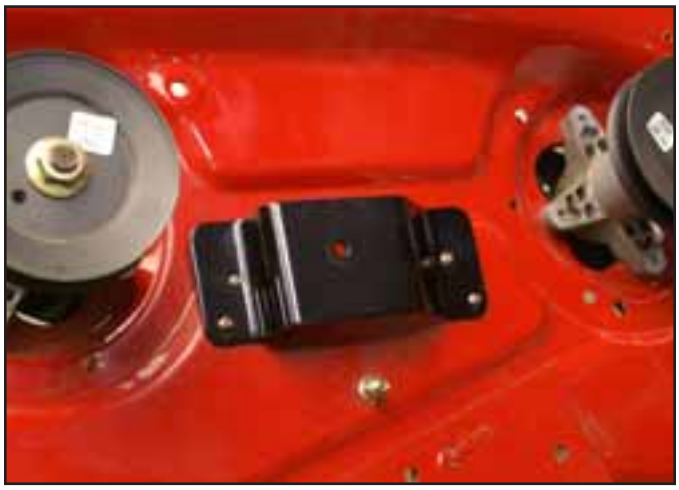

**Fig 835** PICT-7875

7. Remove the fixed idler bracket (Fig. 836).

**Fig 836** PICT-7878

### 54” Mower Deck Fixed Idler Installation

1. Position the fixed idler bracket onto the mower deck (Fig. 837).

**Fig 837** PICT-7878

2. Install 4 screws from the underside of the mower deck to secure the fixed idler bracket (Fig. 838).

**Fig 838** PICT-7875

3. Position a spacer onto the fixed idler bracket (Fig. 839).

**Fig 839** PICT-7873

4. Position the fixed idler pulley onto the spacer (Fig. 840).

**Fig 840** PICT-7871

5. Install a bolt, washer and nut to secure the fixed idler pulley to the fixed idler bracket (Fig. 841).

**Fig 841** PICT-7869

6. Install the mower deck belt onto the mower deck. Refer to “54” Mower Deck Belt Installation” on page 7-25.

7. Install the mower deck onto the tractor. Refer to “54” Mower Deck Installation” on page 7-31.

## 54” Mower Deck Removal

1. Place the PTO/Blade Engage knob in the disengaged (OFF) position and engage the parking brake.

2. Lower the deck by moving the deck lift lever into the bottom notch on the right fender (Fig. 842).

**Fig 842** PICT-7829

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3. Using a breaker bar or ratchet, rotate the idler bracket forward and remove the deck belt from around the electric PTO clutch (Fig. 843 and Fig. 844).

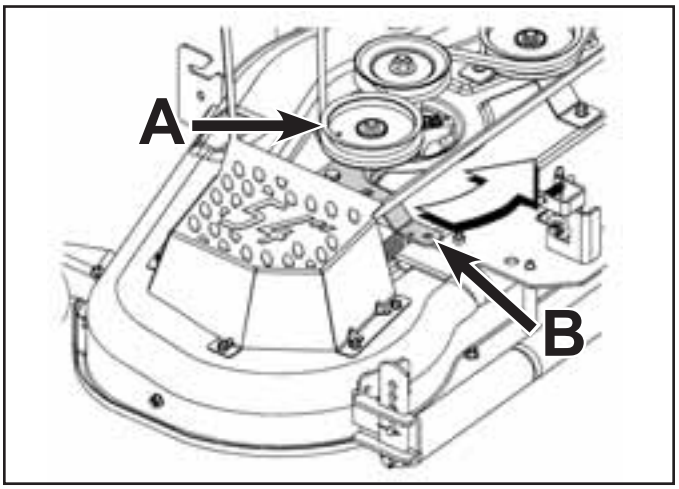


**Fig 843** fig. 22 3354-977

A. Idler pulley B. 3/8” Square hole

**Fig 844** PICT-7830

4. From the left side of the tractor, locate the deck support pin on the rear left side of the deck. Pull the deck support pin outward to release the deck from the deck lift arm. Rotate the pin so it rests on the deck hanger bracket (Fig. 845).

**Fig 845** PICT-7833

5. Repeat the above step on the tractor’s right side.

6. Gently slide the cutting deck toward the front of the tractor allowing the hooks on the deck to release themselves from the deck stabilizer rod (Fig. 846).

**Fig 846** PICT-7836

7. Move the deck lift lever into the top notch to raise the deck lift arms up and out of the way (Fig. 847).

**Fig 847** PICT-7839

8. Turn the tractor's wheels fully left. Slide the cutting deck (from the right side) out from underneath the tractor (Fig. 848).

**Fig 848** PICT-7842

## 54" Mower Deck Installation

1. Place the PTO/Blade Engage knob in the disengaged (OFF) position and engage the parking brake.

2. Move the deck lift lever into the top notch to raise the deck lift arms up and out of the way (Fig. 849).

**Fig 849** PICT-7839

3. Turn the tractor's wheels fully left. Slide the cutting deck (from the right side) underneath the tractor (Fig. 850).

**Fig 850** PICT-7842

4. Slide the cutting deck toward the front of the tractor allowing the hooks on the deck to catch on the deck stabilizer rod (Fig. 851).

**Fig 851** PICT-7836

5. Lower the deck lift arms by moving the deck lift lever into the bottom notch on the right fender (Fig. 852).

**Fig 852** PICT-7829

6. From the left side of the tractor, locate the deck support pin on the rear left side of the deck. Pull the deck support pin outward. Lift the deck into position and release the deck support pin so that the deck is hanging and supported by the deck support pin (Fig. 853).

**Fig 853** PICT-7833

7. Repeat the above step on the tractor's right side.

8. Route the mower deck belt around the spindles and idlers. Refer to the belt routing decal (Fig. 854):

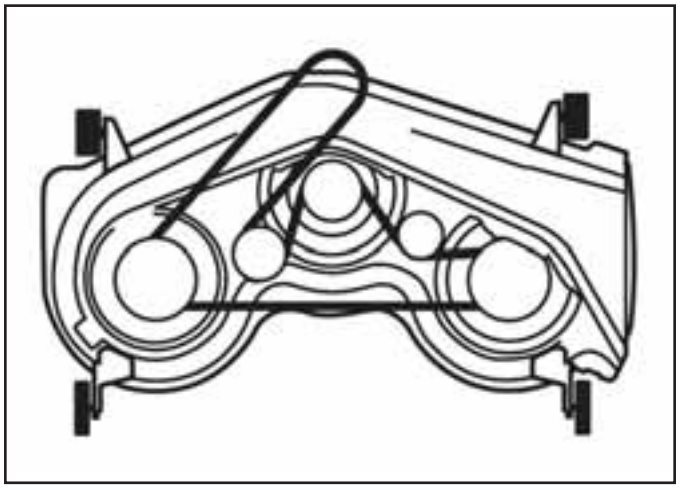

**Fig 854** decal 1 3354-977

9. Using a breaker bar or ratchet, rotate the idler bracket forward and route the mower deck belt around the electric PTO clutch (Fig. 855 and Fig. 856).

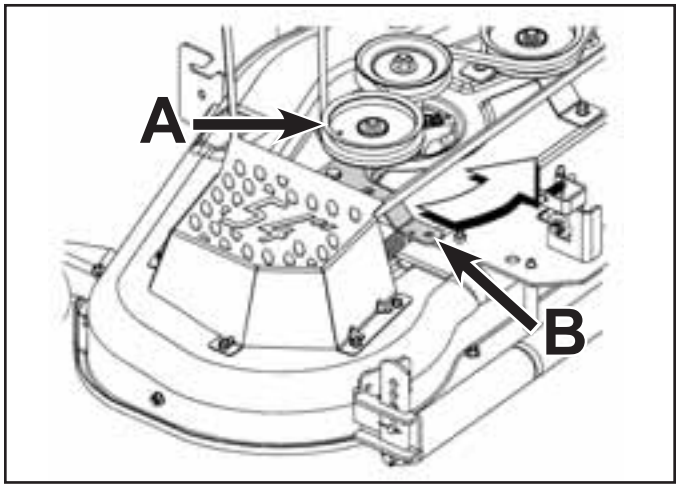


**Fig 855** fig. 22 3354-977

A. Idler pulley B. 3/8” Square hole

**Fig 856** PICT-7990

10. Raise the deck by moving the deck lift lever into the top notch on the right fender (Fig. 857).

**Fig 857** PICT-7837

## 54” Mower Deck Roller Replacement

### 54” Mower Deck Roller Removal

1. Raise the deck by moving the deck lift lever into the top notch on the right fender. Raise and support the rear of the tractor to allow clearance for the deck roller to be removed from the mower deck roller brackets (Fig. 858).

**Fig 858** PICT-7837

2. Remove the hairpin cotter from the lift bracket pin on both sides of the mower deck (Fig. 859).

**Fig 859** PICT-7929

3. Support the lift bracket and remove the lift bracket pin from the lift bracket on both sides of the mower. Gently lower the roller assembly to the ground (Fig. 860).

**Fig 860** PICT-7933

4. Slide the roller away from the mower deck and out from under the tractor (Fig. 861).

**Fig 861** PICT-7935

5. Remove the cotter pin from end of the roller shaft (Fig. 862).

**Fig 862** PICT-7940

6. Remove the height adjuster from the end of the roller shaft (Fig. 863).

**Fig 863** PICT-7943a

7. Remove the spacer from the end of the roller shaft (Fig. 864).

**Fig 864** PICT-7944a

8. Repeat steps 5 – 7 to remove the height adjuster from the other end of the roller shaft.

9. Remove the 4 deck rollers from the roller shaft (Fig. 865).

**Fig 865** PICT-7945

## 54” Mower Deck Roller Installation

1. Slide 4 deck rollers onto the roller shaft (Fig. 866).

**Fig 866** PICT-7945

2. Slide a spacer onto the end of the roller shaft (Fig. 867).

**Fig 867** PICT-7944a

3. Slide the height adjuster onto the end of the roller shaft (Fig. 868).

**Fig 868** PICT-7943

4. Install a cotter pin into end of the roller shaft (Fig. 869).

**Fig 869** PICT-7940

5. Repeat steps 2 – 4 to install the height adjuster onto the other end of the roller shaft.

6. Raise the deck by moving the deck lift lever into the top notch on the right fender. Raise and support the rear of the tractor to allow clearance for the deck roller to be installed into the mower deck roller brackets (Fig. 870).

**Fig 870** PICT-7837

7. Slide the deck roller assembly under the rear end of the mower deck (Fig. 871).

**Fig 871** PICT-7935

8. Slide the height adjuster into the mower deck roller bracket. Support the lift bracket and install the lift bracket pin into the lift bracket (Fig. 872).

**Fig 872** PICT-7933

9. Install a hairpin into the lift bracket pin (Fig. 873).

**Fig 873** PICT-7929

10. Repeat steps 8 and 9 on the other side of the deck roller.

### 54” Mower Deck Roller Adjustment

1. Place the deck lift lever in the lowest position.

2. Remove the clevis pin and hairpin cotter from the deck roller brackets on the left and right sides of the cutting deck (Fig. 874).

**Fig 874** PICT-7929

3. Position the deck roller brackets up or down through the slots on the rear of the deck until desired position is reached, then re-attach with the clevis pins and hairpin cotters just removed.

**IMPORTANT: Be certain that the left roller bracket and the right roller bracket are set in the same position.**

## 54” Mower Deck Spindle Replacement

The following procedure was performed on the left hand spindle assembly. The process is the same for all three spindle assemblies.

### 54” Mower Deck Spindle Removal

1. Remove the mower deck from the tractor. Refer to “54” Mower Deck Removal” on page 7-29.

2. Remove the deck belt from the mower deck. Refer to “54” Mower Deck Belt Removal” on page 7-23.

3. Turn the mower deck over to access the underside of the mower deck.

4. Block the mower deck blade and remove the nut securing the mower deck blade to the spindle shaft (Fig. 875).

**Fig 875** PICT-7882

5. Remove the mower deck blade from the spindle shaft (Fig. 876).

**Fig 876** PICT-7883

6. Remove the 4 screws securing the spindle assembly to the mower deck (Fig 877).

**Fig 877** PICT-7884

7. Remove the spindle assembly from the mower deck (Fig. 878).

**Fig 878** PICT-7889

## 54” Mower Deck Spindle Installation

1. Check and apply grease to all three mower deck spindles as needed.

2. Position the spindle assembly onto the top side of the mower deck (pulley side facing up) (Fig. 879).

**Note: The spindle grease fitting should be positioned so that it is facing toward the front of the mower deck. This will allow for easier greasing of the spindles.**

**Fig 879** PICT-7925

3. Install 4 screws securing the spindle assembly to the mower deck (Fig. 880).

**Note: The screws are installed from the bottom side of the mower deck.**

**Fig 880** PICT-7884

4. Slide mower deck blade onto the spindle shaft (Fig. 881). Ensure the center of the blade is seated onto machined star end of the spindle shaft.

**Note: Make sure the blade sails face the deck.**

**Fig 881** PICT-7926

5. Block the mower deck blade and install a nut securing the mower deck blade to the spindle shaft (Fig. 000). Torque the blade nut to 80 ± 10 ft-lbs. (108 ± 13.5 Nm).

6. Install the mower deck belt onto the mower deck. Refer to “54” Mower Deck Belt Installation” on page 7-25.

7. Install the mower deck onto the tractor. Refer to “54” Mower Deck Installation” on page 7-31.

## 54” Mower Deck Spindle Service

1. Secure the spindle assembly in a vice.

2. Remove the nut from the spindle shaft (Fig. 882).

**Fig 882** PICT-7894

3. Remove the pulley and the spacer from the spindle shaft (Fig. 883).

**Fig 883** PICT-7897

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4. Remove the spindle assembly from the vise and remove the spindle shaft and spacer from the spindle housing (Fig. 884).

**Fig 884** PICT-7901

5. Remove the bearing and two spacers from the pulley side of the housing (Fig. 885).

**Fig 885** PICT-7903

6. Remove the second bearing from the blade side of the spindle housing (Fig. 886).

**Fig 886** PICT-7904

7. Inspect the bearings and spacers. Replace if worn or damaged.

8. Install a bearing into the blade side of the spindle housing (Fig. 887).

**Fig 887** PICT-7906

9. Insert 2 spacers into the pulley side of the spindle housing (Fig. 888).

**Fig 888** PICT-7908a

10. Install a bearing into the pulley side of the spindle housing (Fig. 889).

**Fig 889** PICT-7910a

11. Slide the spacer onto the spindle shaft (Fig. 890).

**Fig 890** PICT-7912a

12. Slide the spindle shaft into the spindle housing by inserting it into the blade side of the housing first (Fig. 891).

**Fig 891** PICT-7913a

13. Secure the spindle housing into a vise with the pulley side up.

14. Slide a spacer onto the spindle shaft (Fig. 892).

**Fig 892** PICT-7916a

15. Slide the pulley onto the spindle shaft. Ensure the center of the pulley is seated onto machined star end of the shaft (Fig. 893).

**Fig 893** PICT-7918

**Note: Slide the pulley onto the spindle shaft so that the flanged side of the pulley is installed blade side down (Fig. 894).**

**Fig 894** PICT-7919

16. Install a nut securing the pulley to the spindle assembly (Fig. 895).

**Fig 895** PICT-7894

17. Apply grease to the spindle until it begins to appear at the weep hole (Fig. 896).

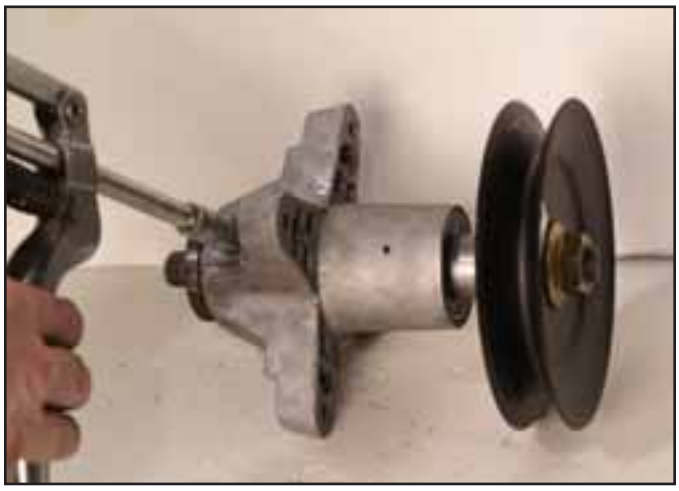

**Fig 896** PICT-7923

## 54” Mower Deck Spring Loaded Idler Replacement

### 54” Mower Deck Spring Loaded Idler Removal

1. Remove the mower deck from the tractor. Refer to “54” Mower Deck Removal” on page 7-29.

2. Remove the mower deck belt form the mower deck. Refer to “54” Mower Deck Belt Removal” on page 7-23.

3. Remove the bolt, washer and nut securing the idler pulley to the idler bracket (Fig. 897).

**Fig 897** PICT-7853

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4. Remove the idler pulley from the idler bracket (Fig. 898).

**Fig 898** PICT-7854

5. Remove the spacer from the idler bracket (Fig. 899).

**Fig 899** PICT-7856

6. Using a spring removal tool (Toro part no. 92-5771), remove the idler spring from the idler bracket and mower deck (Fig. 900).

**Fig 900** PICT-7859

7. Remove the nut and lock washer from the shoulder bolt securing the idler bracket to the mower deck (Fig. 901).

**Fig 901** PICT-7863

8. Remove the shoulder bolt, idler bracket and stabilizer bracket from the mower deck (Fig. 902).

**Fig 902** PICT-7868

## 54” Mower Deck Spring Loaded Idler Installation

1. Position the stabilizer bracket and idler bracket to the mower deck. Insert a shoulder bolt through the idler and stabilizer brackets and then through the mower deck (Fig. 903).

**Fig 903** PICT-7868

2. Install a lock washer and nut onto the shoulder bolt to secure the idler bracket to the mower deck (Fig. 904).

**Fig 904** PICT-7863

3. Hook the idler spring to the idler bracket and using a spring removal tool (Toro part no. 92-5771), hook the idler spring to the spring post on the mower deck (Fig. 905).

**Fig 905** PICT-7859

4. Position a spacer onto the idler bracket (Fig. 906).

**Fig 906** PICT-7856

5. Place the idler pulley onto the spacer (Fig. 907).

**Fig 907** PICT-7854

6. Insert a bolt and washer through the idler pulley, spacer and idler bracket. Install a nut to secure the pulley to the idler bracket (Fig. 908).

**Fig 908** PICT-7853

7. Install the deck belt. Refer to “54” Mower Deck Belt Installation” on page 7-25.

8. Install the mower deck onto the tractor. Refer to “54” Mower Deck Installation” on page 7-31.

## Mower Deck Pulley Replacement (50” & 54” Mower Decks)

The following procedure was performed on the left hand spindle pulley. The process is the same for all spindle pulley replacement. Depending on which pulley is being replaced, the spindle covers and mower deck belt may have to be removed:

Remove the mower deck from the tractor. Refer to:
- 50” Mower Deck Removal on page 7-6
- 54” Mower Deck Removal on page 7-29

Remove the mower deck belt from the mower deck. Refer to:
- 50” Mower Deck Belt Removal on page 7-1
- 54” Mower Deck Belt Removal on page 7-23

### Mower Deck Pulley Removal

1. Block the blade and remove the nut from the spindle shaft (Fig. 909).

**Fig 909** PICT-7879

2. Remove the pulley and the spacer from the spindle shaft (54” mower spindle shown) (Fig. 910).

**Fig 910** PICT-7880

## Mower Deck Pulley Installation

1. Slide the pulley and the spacer onto the spindle shaft (54” mower spindle shown) (Fig. 911).

**Fig 911** PICT-7880

2. Block the blade and install a nut onto the spindle shaft (Fig. 912).

**Fig 912** PICT-7879

If the mower deck, spindle covers and mower deck belt have to been removed:

Install the mower deck belt onto the mower deck. Refer to:

- 50” Mower Deck Belt Installation on page 7-2
- 54” Mower Deck Belt Installation on page 7-25

Install the mower deck onto the tractor. Refer to:

- 50” Mower Deck Installation on page 7-8
- 54” Mower Deck Installation on page 7-31

## Electrical System

The GT2000 Series tractor electrical components and electrical troubleshooting topics can be found in the 2006 LX Series Lawn Tractors / GT2000 Series Garden Tractors Demystification Guide (Form No. 492-9161) along with complete wiring diagrams to help diagnose electrical problems. Electrical Troubleshooting DVD, Part No. 492-9193, also contains wiring diagrams and component troubleshooting information for GT2000 Series tractors.

## GT2100, GT2200, GT2300 Wiring Diagram

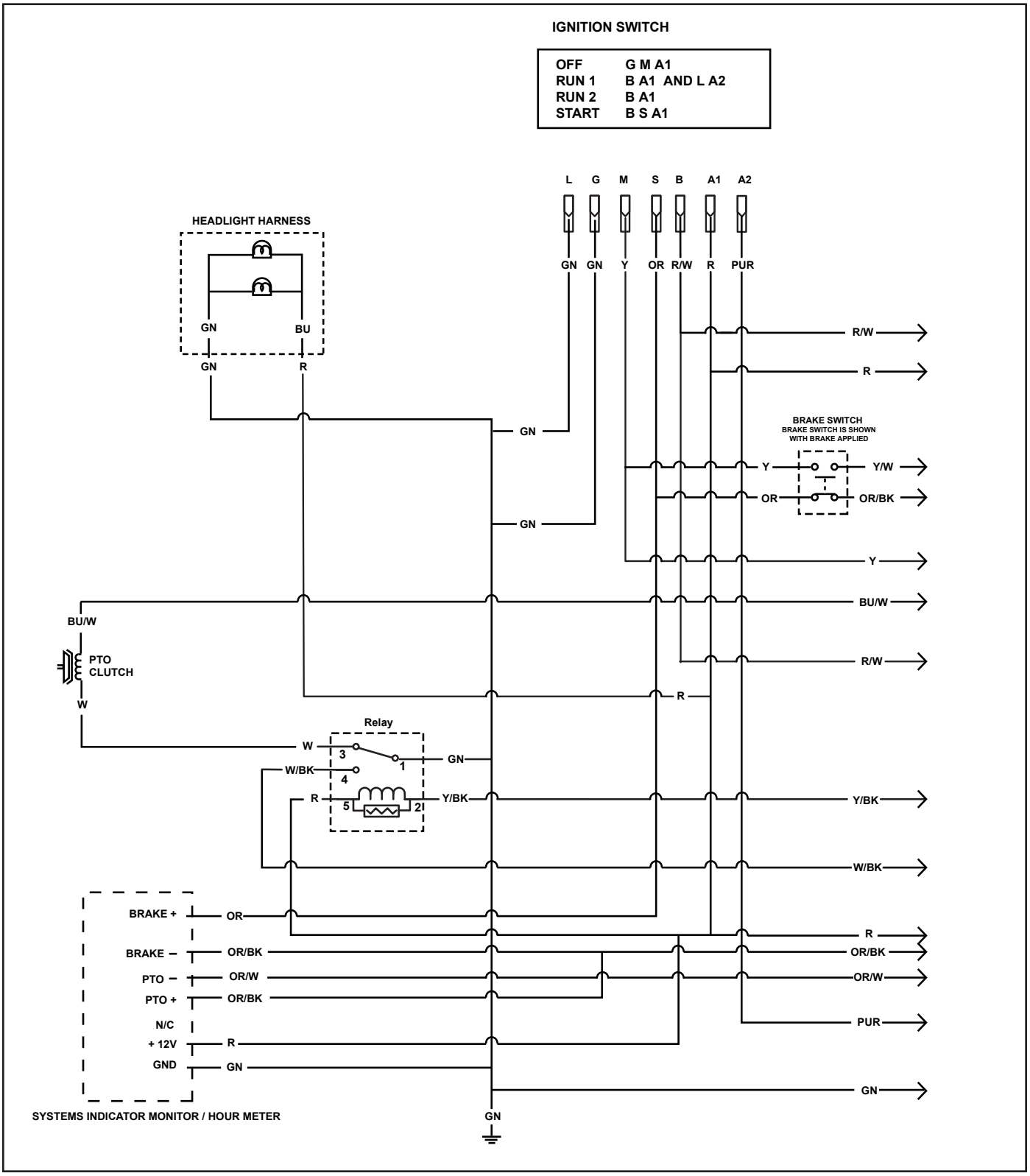


**Fig 913** GT wiring diag 1

## GT2100, GT2200, GT2300 Wiring Diagram cont.

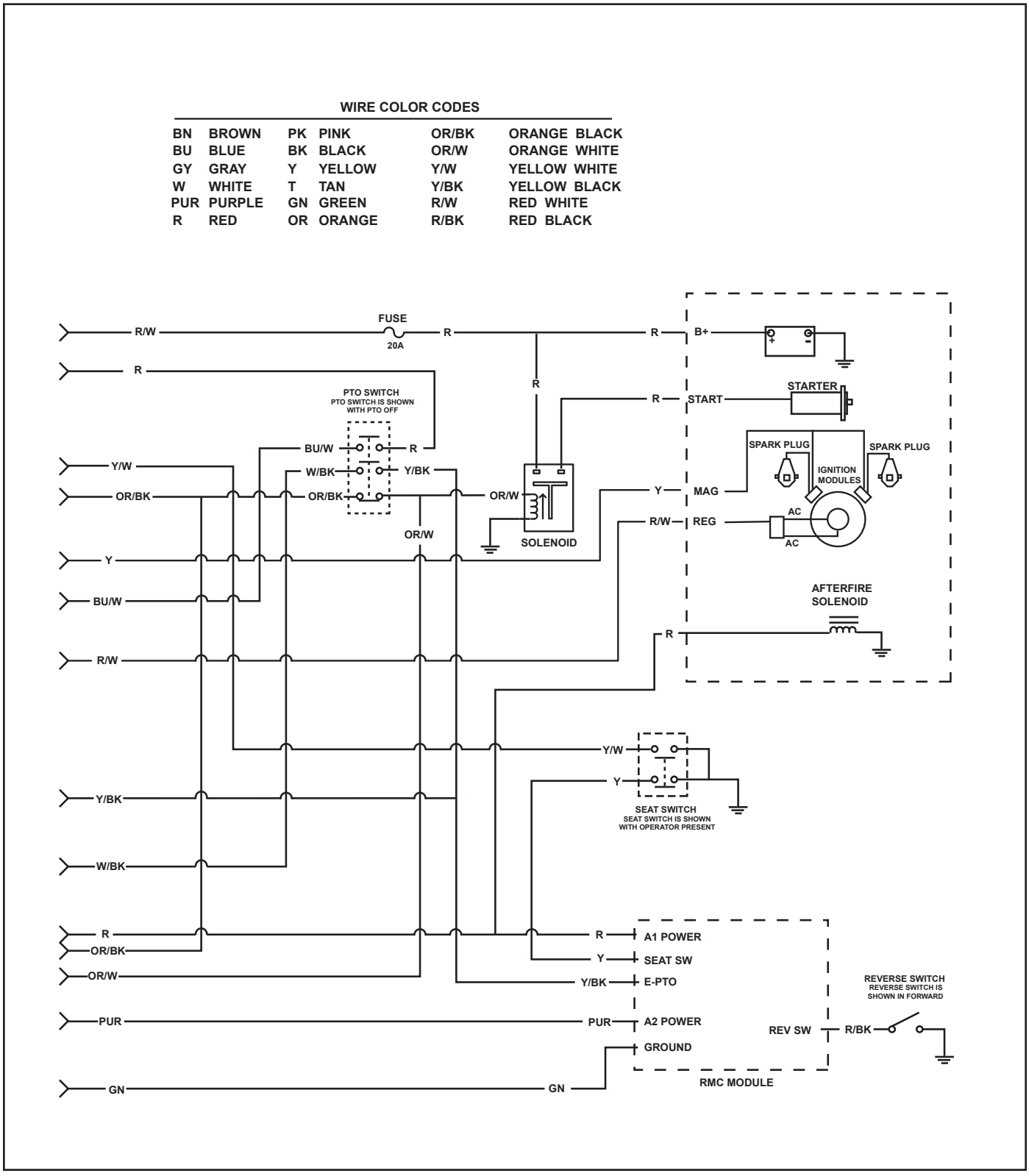


**Fig 914** GT wiring diag 2

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# Garden Tractor
# GT Series
# Service Manual

Form No. 492-9194