WALK BEHIND POWER MOWER DRIVE SYSTEMS

SERVICE MANUAL
This service manual was written expressly for Toro servicing dealers. The Toro Company has made every effort to make the information in this manual complete and correct.

This manual was written with the assumption that the reader has basic mechanical knowledge and skills. This book contains material covering the Toro and Lawn-Boy Walk Behind Mower Drive Systems models from 1990 through 2006, and may be specified for use on products built after 2006 that are similar in design.

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
LCE Service Training Department
8111 Lyndale Avenue South
Bloomington, MN  55420

The Toro Company reserves the right to change product specifications or this manual without notice.
THIS PAGE INTENTIONALLY LEFT BLANK.
# TABLE OF CONTENTS

## QUICK REFERENCE

Transmission Remove and Replace
- 3 speed transmission ................................................................. 4-5
- 21" steel & cast deck Personal Pace, Easy Stride transmission .......... 2-3
- 22" steel deck transmission, Toro and Lawn-Boy ............................ 3-10
- 21" Lawn-Boy Insight ................................................................. 3-20

Transmission Internal Repair
- 3 speed transmission ................................................................. 4-6
- Spur/Bevel gear transmission ...................................................... 2-4
- Bevel gear transmission ............................................................ 3-16

Wheel Clutch Troubleshooting & Repair
- Rocking Key style ........................................................................ 5-2
- Spring Ratchet style ..................................................................... 5-9

Blade Clutch System Troubleshooting & Repair
- Blade Brake Clutch System ......................................................... 6-2
- Blade Override System (Toro - BOS) Blade Clutch System (Lawn-Boy - BCS) ......................................................... 6-28

Handle Disassembly
- Toro 2 Bail handle ....................................................................... 7-2
- Personal Pace Easy Stride (Generation 1) ...................................... 7-3
- Personal Pace Easy Stride (Generation 2) ...................................... 7-6
- Lawn-Boy Sens-a-Speed ............................................................. 7-9

Belt Replacement
- Mowers with Toro Blade Brake Clutch ........................................... 8-3
- Mowers with Toro Blade Override System ..................................... 8-3
- Zone start 21" Rear Wheel Drive Toro & Lawn-Boy (except Insight) ......................................................................................... 8-2
- Zone start 22" Toro Rear Wheel Drive .......................................... 3-10
- Zone start 22" Toro Front Wheel Drive ........................................ 3-5
- Lawn-Boy Insight Zone Start ....................................................... 3-19
- Lawn-Boy Insight with Blade Clutch System ............................... 8-3
# TABLE OF CONTENTS

## WORM DRIVE TRANSMISSION

### GENERAL

- Internally Clutched
  - Description ................................................................. 1-2
  - Lubrication ................................................................. 1-3
  - The Shifting Process ..................................................... 1-3
  - Removal & Installation (front wheel drive applications) ......... 1-4
  - Disassembly ........................................................................ 1-5
  - Assembly ........................................................................... 1-7
  - Controls ............................................................................ 1-9
  - Adjustment ......................................................................... 1-10

### CONSTANT MESH

- Description ........................................................................ 1-11
- Removal & Installation ...................................................... 1-12
- Controls ............................................................................ 1-13

## WHEEL CLUTCH

- Description ........................................................................ 1-14

## SINGLE SPEED SPUR/BEVEL GEAR TRANSMISSION

### GEAR CASE ASSEMBLY

- Description ........................................................................ 2-2
- Lubrication ......................................................................... 2-3
- Transmission Remove & Replace ........................................... 2-3
- Transmission Internal Repair .............................................. 2-4
- Assembly ........................................................................... 2-5

## SINGLE SPEED BEVEL GEAR TRANSMISSION

### EXPLODED VIEW - SINGLE SPEED BEVEL GEAR TRANSMISSION

- General Information ............................................................ 3-2
- Front Axle & Transmission Assembly ................................... 3-3

## 22” FRONT WHEEL DRIVE MODELS

- Remove Transmission ........................................................ 3-4
- Transmission Disassembly .................................................. 3-5
- Transmission Assembly ....................................................... 3-7
- Assembly Tips ..................................................................... 3-8
- Belt Service - Front Wheel Drive Models ............................... 3-9

## 22” TORO & LAWN-BOY REAR WHEEL DRIVE MODELS

- Transmission Removal & Belt Replacement .......................... 3-10
- Rear Axle Disassembly ........................................................ 3-15
- Transmission Disassembly .................................................. 3-16
- Transmission Assembly ....................................................... 3-16
- Axle Assembly Tips ............................................................. 3-17

## LAWN-BOY INSIGHT TRANSMISSION REMOVE & REPLACE

- Transmission Removal & Belt Replacement .......................... 3-19
- Transmission Disassembly .................................................. 3-20
- Transmission Assembly ....................................................... 3-24
- Axle Assembly Tips ............................................................. 3-24
- Transmission Installation Tips ............................................. 3-25

## THREE SPEED TRANSMISSION

### GEAR CASE ASSEMBLY ..................................................... 4-2

### OPERATION

- Input System ...................................................................... 4-3
<table>
<thead>
<tr>
<th>TABLE OF CONTENTS</th>
</tr>
</thead>
</table>

Speed Reduction System .......................................................... 4-3  
Gear Selection System ................................................................. 4-4  
Removal - Toro Vacu Power/Lawn-Boy Medallion Models ....................... 4-5  
Removal - Recycler/Rear Bagger Chassis ......................................... 4-6  
Alternate Method ............................................................................. 4-6  
Disassembly ....................................................................................... 4-6  
Transmission - Assembly ................................................................. 4-7  
Output Shaft Assembly ....................................................................... 4-8  
Input Shaft Assembly ......................................................................... 4-9  
Intermediate Shaft Assembly ............................................................. 4-10 
Installation ......................................................................................... 4-10 
Special Assembly Notes for Toro Vacu Power/Lawn-Boy Medallion ........... 4-11  
TROUBLESHOOTING TIPS - 3 SPEED TRANSMISSION .............................. 4-12  
Hard Shifting ...................................................................................... 4-12  
Slipping Gears ................................................................................... 4-12  

WHEEL PINION CLUTCH  
GEAR CASE & WHEEL ASSEMBLY, ROCKING KEY STYLE .......................... 5-2  
Wheel Pinion Clutch ............................................................................ 5-3  
Component Definitions ........................................................................ 5-3  
Test for Function ................................................................................. 5-4  
Quick Test ............................................................................................ 5-4  
Rear Height-of-Cut & Wheel Pinion Clutch - Disassembly ..................... 5-4  
Rear Height-of-Cut & Wheel Pinion Clutch - Assembly ......................... 5-5  
GEAR CASE & WHEEL ASSEMBLY SPRING RATCHET STYLE ............... 5-8  
Spring Ratchet Key Style ..................................................................... 5-9  
Servicing the System .......................................................................... 5-9  
WHEEL PINION SERVICE ..................................................................... 5-9  

BLADE BRAKE CLUTCH SYSTEMS (BBC), BLADE OVERRIDE SYSTEM (BOS),  
BLADE CLUTCH SYSTEM (BCS)  
BLADE BRAKE CLUTCH SYSTEM  
Description ........................................................................................ 6-2  
BBC Clutch Option .............................................................................. 6-2  
Control Box Operation ......................................................................... 6-2  
Handle Controls ................................................................................... 6-3  
Control Box Disassembly ..................................................................... 6-3  
Control Box Assembly ......................................................................... 6-6  
TORO BBC SERVICE GUIDE ............................................................... 6-7  
BLADE BRAKE CLUTCH ASSEMBLY (Toro Vacu Power/Lawn-Boy Medallion) ... 6-10  
TORO VACU POWER/LAWN-BOY MEDALLION BBC  
Bellcrank System Disassembly (Toro Vacu Power/Lawn-Boy Medallion) .... 6-12  
Bellcrank System Assembly (Toro Vacu Power/Lawn-Boy Medallion) ....... 6-13  
BBC Cover and Screen ......................................................................... 6-14  
Under Deck Components Disassembly (Toro Vacu Power/Lawn-Boy Medallion) 6-15  
Under Deck Components Assembly (Toro Vacu Power/Lawn-Boy Medallion) 6-17  
BBC Cable Removal (Toro Vacu Power/Lawn-Boy Medallion) ................. 6-19  
BBC Cable Installation (Toro Vacu Power/Lawn-Boy Medallion) ............. 6-20  
ENGINE & BLADE ASSEMBLY (Toro Recycler/Rear Bagger) ................... 6-21  
TORO RECYCLER/REAR BAGGERBBC  
Idler Arm System Disassembly (Recycler/Rear Bagger) ........................... 6-22  
Idler Arm System Assembly (Recycler/Rear Bagger) ............................... 6-25  

WPM Drive Systems Manual
## TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>BBC Cable Removal (Recycler/Rear Bagger)</td>
<td>6-27</td>
</tr>
<tr>
<td>BBC Cable Installation (Recycler/Rear Bagger)</td>
<td>6-28</td>
</tr>
<tr>
<td>BLADE OVERRIDE SYSTEM (BOS), BLADE CLUTCH SYSTEM (BCS)</td>
<td>6-28</td>
</tr>
<tr>
<td>Disassembly</td>
<td>6-28</td>
</tr>
<tr>
<td>Brake Arm Assembly</td>
<td>6-32</td>
</tr>
<tr>
<td>BOS/BCS System Assembly</td>
<td>6-33</td>
</tr>
<tr>
<td><strong>HANDLES AND CONTROL CABLES</strong></td>
<td></td>
</tr>
<tr>
<td>Toro 2 Bail Handle</td>
<td>7-2</td>
</tr>
<tr>
<td>Personal Pace Generation 1/Easy Stride Generation 1</td>
<td>7-3</td>
</tr>
<tr>
<td>Operation</td>
<td>7-3</td>
</tr>
<tr>
<td>Disassembly</td>
<td>7-3</td>
</tr>
<tr>
<td>Reassembly</td>
<td>7-5</td>
</tr>
<tr>
<td>Adjusting the Personal Pace Cable</td>
<td>7-6</td>
</tr>
<tr>
<td>Personal Pace Generation 2/Easy Stride Generation 2</td>
<td>7-6</td>
</tr>
<tr>
<td>Handle Removal</td>
<td>7-6</td>
</tr>
<tr>
<td>Adjusting the Personal Pace/Easy Stride Cable</td>
<td>7-8</td>
</tr>
<tr>
<td>Lawn-Boy 2 Bail Handle</td>
<td>7-8</td>
</tr>
<tr>
<td>Lawn-Boy Sens-a-Speed</td>
<td>7-9</td>
</tr>
<tr>
<td>Operation</td>
<td>7-9</td>
</tr>
<tr>
<td>Handle Disassembly, Zone Start Models</td>
<td>7-9</td>
</tr>
<tr>
<td>Assembly</td>
<td>7-10</td>
</tr>
<tr>
<td>Cable Adjustment</td>
<td>7-11</td>
</tr>
<tr>
<td>Self-Propel Cable</td>
<td>7-11</td>
</tr>
<tr>
<td>Handle Disassembly, Lawn-Boy Blade Clutch System (BCS) Models</td>
<td>7-11</td>
</tr>
<tr>
<td>3 Speed Transmission Models</td>
<td>7-13</td>
</tr>
<tr>
<td>3 Speed Control Cables</td>
<td>7-13</td>
</tr>
<tr>
<td>BBC Cable Adjustment (Toro Vacu Power/Lawn-Boy Medallion)</td>
<td>7-15</td>
</tr>
<tr>
<td>Toro BBC Cable Adjustment (Recycler/Rear Bagger)</td>
<td>7-16</td>
</tr>
<tr>
<td>Toro BOS Control</td>
<td>7-17</td>
</tr>
<tr>
<td>Toro BOS Control Cable Adjustment</td>
<td>7-18</td>
</tr>
<tr>
<td>Lawn-Boy BCS Control</td>
<td>7-18</td>
</tr>
<tr>
<td>Lawn-Boy BCS Control Cable Adjustment</td>
<td>7-18</td>
</tr>
<tr>
<td><strong>SELF-PROPEL BELT REPLACEMENT</strong></td>
<td></td>
</tr>
<tr>
<td>Toro 21&quot; Front Wheel Drive</td>
<td>8-2</td>
</tr>
<tr>
<td>22&quot; Front Wheel Drive</td>
<td>8-2</td>
</tr>
<tr>
<td>22&quot; Rear Wheel Drive</td>
<td>8-2</td>
</tr>
<tr>
<td>21&quot; Steel &amp; Cast Deck Toro &amp; Lawn-Boy Mowers Belt Replacement</td>
<td>8-2</td>
</tr>
<tr>
<td>21&quot; Cast Deck Mowers with 3 Speed Transmission</td>
<td>8-2</td>
</tr>
<tr>
<td>21&quot; Toro &amp; Lawn-Boy Mowers with Blade Brake Clutch</td>
<td>8-3</td>
</tr>
<tr>
<td>21&quot; Toro Mowers with Blade Override System &amp; Lawn-Boy Mower with Blade Brake Clutch</td>
<td>8-3</td>
</tr>
<tr>
<td>21&quot; Lawn-Boy Insight Mowers</td>
<td>8-3</td>
</tr>
</tbody>
</table>
Using this manual

Following each model number in the list below are codes identifying the type of deck material, transmission, wheel pinion clutch, hand controls, and if it has a blade clutch system. Use this information to select the correct sections of the service manual for the mower being serviced.

### Code List

- **1B** - one bail
- **2B** - two bail
- **3S** - 3 speed
- **21” stl** - 21” steel deck
- **22” stl** - 22” steel deck
- **B** - bevel gear
- **BBC** - blade brake clutch
- **BBC VP** - blade brake clutch for Vacu Power
- **BOS** - blade override system
- **CD** - cast deck
- **CDVP** - cast deck Vacu Power
- **ES1** - Easy Stride 1st generation
- **ES2** - Easy Stride 2nd generation
- **Ins** - Insight
- **PP1** - Personal Pace 1st generation
- **PP2** - Personal Pace 2nd generation
- **RK** - rocking key
- **SB** - spur bevel
- **SR** - spring ratchet
- **SS** - Sens-a-Speed
- **W** - worm

### Table of Contents

<table>
<thead>
<tr>
<th>Model</th>
<th>Trans R&amp;R</th>
<th>Trans Internal Repair</th>
<th>Wheel Pinion</th>
<th>Handle Repair</th>
<th>Blade Clutch</th>
</tr>
</thead>
<tbody>
<tr>
<td>10301</td>
<td>CD</td>
<td>SB</td>
<td>RK</td>
<td>2B</td>
<td>None</td>
</tr>
<tr>
<td>10302</td>
<td>CD</td>
<td>SB</td>
<td>RK</td>
<td>2B</td>
<td>None</td>
</tr>
<tr>
<td>10304</td>
<td>CD</td>
<td>SB</td>
<td>RK</td>
<td>2B</td>
<td>None</td>
</tr>
<tr>
<td>10305</td>
<td>CD</td>
<td>SB</td>
<td>RK</td>
<td>2B</td>
<td>None</td>
</tr>
<tr>
<td>10307</td>
<td>CD</td>
<td>SB</td>
<td>RK</td>
<td>2B</td>
<td>None</td>
</tr>
<tr>
<td>10309</td>
<td>CD</td>
<td>SB</td>
<td>RK</td>
<td>2B</td>
<td>None</td>
</tr>
<tr>
<td>10310</td>
<td>CD</td>
<td>SB</td>
<td>RK</td>
<td>2B</td>
<td>None</td>
</tr>
<tr>
<td>10311</td>
<td>CD</td>
<td>SB</td>
<td>RK</td>
<td>2B</td>
<td>None</td>
</tr>
<tr>
<td>10312</td>
<td>CD</td>
<td>SB</td>
<td>RK</td>
<td>2B</td>
<td>None</td>
</tr>
<tr>
<td>10313</td>
<td>CD</td>
<td>SB</td>
<td>RK</td>
<td>2B</td>
<td>None</td>
</tr>
<tr>
<td>10314</td>
<td>CD</td>
<td>SB</td>
<td>RK</td>
<td>2B</td>
<td>None</td>
</tr>
<tr>
<td>10316</td>
<td>CD</td>
<td>SB</td>
<td>RK</td>
<td>2B</td>
<td>None</td>
</tr>
<tr>
<td>10317</td>
<td>CD</td>
<td>SB</td>
<td>RK</td>
<td>2B</td>
<td>None</td>
</tr>
<tr>
<td>10318</td>
<td>CD</td>
<td>SB</td>
<td>RK</td>
<td>2B</td>
<td>None</td>
</tr>
<tr>
<td>10319</td>
<td>CD</td>
<td>SB</td>
<td>RK</td>
<td>2B</td>
<td>None</td>
</tr>
<tr>
<td>10320</td>
<td>CD</td>
<td>SB</td>
<td>RK</td>
<td>2B</td>
<td>None</td>
</tr>
<tr>
<td>10321</td>
<td>CD</td>
<td>SB</td>
<td>RK</td>
<td>2B</td>
<td>None</td>
</tr>
<tr>
<td>10323</td>
<td>CD</td>
<td>SB</td>
<td>RK</td>
<td>2B</td>
<td>None</td>
</tr>
<tr>
<td>10324</td>
<td>CD</td>
<td>SB</td>
<td>RK</td>
<td>2B</td>
<td>None</td>
</tr>
<tr>
<td>10324C</td>
<td>CD</td>
<td>SB</td>
<td>RK</td>
<td>2B</td>
<td>None</td>
</tr>
<tr>
<td>10327</td>
<td>CD</td>
<td>SB</td>
<td>RK</td>
<td>2B</td>
<td>None</td>
</tr>
<tr>
<td>10328</td>
<td>CD</td>
<td>SB</td>
<td>RK</td>
<td>2B</td>
<td>None</td>
</tr>
<tr>
<td>10329</td>
<td>CD</td>
<td>SB</td>
<td>RK</td>
<td>2B</td>
<td>None</td>
</tr>
<tr>
<td>10330</td>
<td>CD</td>
<td>SB</td>
<td>RK</td>
<td>2B</td>
<td>None</td>
</tr>
</tbody>
</table>
# TABLE OF CONTENTS

### Code List

- 1B - one bail
- 2B - two bail
- 3S - 3 speed
- 21" stl - 21” steel deck
- 22" stl - 22” steel deck
- B - bevel gear
- BBC - blade brake clutch
- BBC VP - blade brake clutch for Vacu Power
- BOS - blade override system
- CD - cast deck
- CDVP - cast deck Vacu Power
- ES1 - Easy Stride 1st generation
- ES2 - Easy Stride 2nd generation
- Ins - Insight
- PP1 - Personal Pace 1st generation
- PP2 - Personal Pace 2nd generation
- RK - rocking key
- SB - spur bevel
- SR - spring ratchet
- SS - Sens-a-Speed
- W - worm

## Model | Trans R&R | Trans Internal Repair | Wheel Pinion | Handle Repair | Blade Clutch
--- | --- | --- | --- | --- | ---
10331 | CD | SB | RK | 2B | None
10332 | CD | SB | RK | 2B | None
10334 | CD | SB | RK | 2B | None
10335 | CD | SB | RK | 2B | None
10342 | CD | SB | RK | 2B | None
10343 | CD | SB | RK | 2B | None
10344 | CD | SB | RK | 2B | None
10345 | CD | SB | RK | 2B | None
10356 | CD | SB | RK | 2B | None
10357 | CD | SB | RK | 2B | None
10358 | CD | SB | RK | 2B | None
10359C | CD | SB | RK | 2B | None
10360 | CD | SB | RK | 2B | None
10361 | CD | SB | RK | 2B | None
10362 | CD | SB | RK | 2B | None
10363 | CD | SB | RK | 2B | None
10515 | CD | 3S | RK | 2B | None
10516 | CD | 3S | RK | 2B | None
10517 | CD | 3S | RK | 2B | None
10518 | CD | 3S | RK | 2B | None
10519 | CD | 3S | RK | 2B | None
10520 | CD | 3S | RK | 2B | None
10521 | CD | 3S | RK | 2B | None
10522 | CD | 3S | RK | 2B | None
10523 | CD | 3S | RK | 2B | None
10524 | CD | 3S | RK | 2B | None
10525 | CD | 3S | RK | 2B | None
10527 | CD | 3S | RK | 2B | None
10528 | CD | 3S | RK | 2B | None
10533 | CD | 3S | RK | BBC | BBC VP
10545 | CD | 3S | RK | 2B | None
## Code List

1B - one bail  
2B - two bail  
3S - 3 speed  
21” stl - 21” steel deck  
22” stl - 22” steel deck  
B- bevel gear  
BBC - blade brake clutch  
BBC VP - blade brake clutch for Vacu Power  
BOS - blade override system  
CD - cast deck  
CDVP - cast deck Vacu Power  
ES1 - Easy Stride 1st generation  
ES2 - Easy Stride 2nd generation  
Ins - Insight  
PP1 - Personal Pace 1st generation  
PP2 - Personal Pace 2nd generation  
RK - rocking key  
SB - spur bevel  
SR - spring ratchet  
SS - Sens-a-Speed  
W - worm

<table>
<thead>
<tr>
<th>Model</th>
<th>Trans R&amp;R</th>
<th>Trans Internal Repair</th>
<th>Wheel Pinion</th>
<th>Handle Repair</th>
<th>Blade Clutch</th>
</tr>
</thead>
<tbody>
<tr>
<td>10546</td>
<td>CD</td>
<td>3S</td>
<td>RK</td>
<td>2B</td>
<td>None</td>
</tr>
<tr>
<td>10547</td>
<td>CD</td>
<td>3S</td>
<td>RK</td>
<td>2B</td>
<td>None</td>
</tr>
<tr>
<td>10548</td>
<td>CD</td>
<td>3S</td>
<td>RK</td>
<td>2B</td>
<td>None</td>
</tr>
<tr>
<td>10550</td>
<td>CD</td>
<td>SB</td>
<td>RK</td>
<td>ES1</td>
<td>None</td>
</tr>
<tr>
<td>10551</td>
<td>CD</td>
<td>SB</td>
<td>RK</td>
<td>ES1</td>
<td>None</td>
</tr>
<tr>
<td>10552</td>
<td>CD</td>
<td>SB</td>
<td>RK</td>
<td>ES1</td>
<td>None</td>
</tr>
<tr>
<td>10655</td>
<td>22stl</td>
<td>B</td>
<td>SR</td>
<td>ES2</td>
<td>None</td>
</tr>
<tr>
<td>10656</td>
<td>22stl</td>
<td>B</td>
<td>SR</td>
<td>ES2</td>
<td>None</td>
</tr>
<tr>
<td>10672</td>
<td>Ins</td>
<td>B</td>
<td>SR</td>
<td>SS</td>
<td>None</td>
</tr>
<tr>
<td>10673</td>
<td>Ins</td>
<td>B</td>
<td>SR</td>
<td>SS</td>
<td>None</td>
</tr>
<tr>
<td>10682</td>
<td>Ins</td>
<td>B</td>
<td>SR</td>
<td>2B</td>
<td>None</td>
</tr>
<tr>
<td>10684</td>
<td>Ins</td>
<td>B</td>
<td>SR</td>
<td>2B</td>
<td>None</td>
</tr>
<tr>
<td>10684C</td>
<td>Ins</td>
<td>B</td>
<td>SR</td>
<td>2B</td>
<td>None</td>
</tr>
<tr>
<td>10685</td>
<td>Ins</td>
<td>B</td>
<td>SR</td>
<td>SS</td>
<td>None</td>
</tr>
<tr>
<td>10686</td>
<td>Ins</td>
<td>B</td>
<td>SR</td>
<td>SS</td>
<td>None</td>
</tr>
<tr>
<td>10686C</td>
<td>Ins</td>
<td>B</td>
<td>SR</td>
<td>SS</td>
<td>None</td>
</tr>
<tr>
<td>10687</td>
<td>Ins</td>
<td>B</td>
<td>SR</td>
<td>SS</td>
<td>BCS</td>
</tr>
<tr>
<td>10695</td>
<td>Ins</td>
<td>B</td>
<td>SR</td>
<td>SS</td>
<td>None</td>
</tr>
<tr>
<td>10696</td>
<td>Ins</td>
<td>B</td>
<td>SR</td>
<td>SS</td>
<td>None</td>
</tr>
<tr>
<td>10696C</td>
<td>Ins</td>
<td>B</td>
<td>SR</td>
<td>SS</td>
<td>None</td>
</tr>
<tr>
<td>10697</td>
<td>Ins</td>
<td>B</td>
<td>SR</td>
<td>SS</td>
<td>BCS</td>
</tr>
<tr>
<td>10910</td>
<td>CD</td>
<td>SB</td>
<td>RK</td>
<td>2B</td>
<td>None</td>
</tr>
<tr>
<td>10910B</td>
<td>CD</td>
<td>SB</td>
<td>RK</td>
<td>2B</td>
<td>None</td>
</tr>
<tr>
<td>10926</td>
<td>CD</td>
<td>SB</td>
<td>RK</td>
<td>2B</td>
<td>None</td>
</tr>
<tr>
<td>10927</td>
<td>CD</td>
<td>SB</td>
<td>RK</td>
<td>2B</td>
<td>None</td>
</tr>
<tr>
<td>10928</td>
<td>CD</td>
<td>3S</td>
<td>RK</td>
<td>?</td>
<td>None</td>
</tr>
<tr>
<td>10929</td>
<td>CD</td>
<td>SB</td>
<td>RK</td>
<td>2B</td>
<td>None</td>
</tr>
<tr>
<td>10995</td>
<td>Ins</td>
<td>B</td>
<td>SR</td>
<td>SS</td>
<td>None</td>
</tr>
<tr>
<td>10997</td>
<td>CD</td>
<td>B</td>
<td>SR</td>
<td>SS</td>
<td>BCS</td>
</tr>
<tr>
<td>11001</td>
<td>CD</td>
<td>3S</td>
<td>RK</td>
<td>2B</td>
<td>None</td>
</tr>
<tr>
<td>11001B</td>
<td>CD</td>
<td>3S</td>
<td>RK</td>
<td>2B</td>
<td>None</td>
</tr>
<tr>
<td>11003</td>
<td>CD</td>
<td>3S</td>
<td>RK</td>
<td>2B</td>
<td>None</td>
</tr>
</tbody>
</table>
TABLE OF CONTENTS

Code List

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1B</td>
<td>one bail</td>
</tr>
<tr>
<td>2B</td>
<td>two bail</td>
</tr>
<tr>
<td>3S</td>
<td>3 speed</td>
</tr>
<tr>
<td>21&quot;</td>
<td>21&quot; steel deck</td>
</tr>
<tr>
<td>22&quot;</td>
<td>22&quot; steel deck</td>
</tr>
<tr>
<td>B</td>
<td>bevel gear</td>
</tr>
<tr>
<td>BBC</td>
<td>blade brake clutch</td>
</tr>
<tr>
<td>BBC VP</td>
<td>blade brake clutch for Vacu Power</td>
</tr>
<tr>
<td>BOS</td>
<td>blade override system</td>
</tr>
<tr>
<td>CD</td>
<td>cast deck</td>
</tr>
<tr>
<td>CDVP</td>
<td>cast deck Vacu Power</td>
</tr>
<tr>
<td>ES1</td>
<td>Easy Stride 1st generation</td>
</tr>
<tr>
<td>ES2</td>
<td>Easy Stride 2nd generation</td>
</tr>
<tr>
<td>Ins</td>
<td>Insight</td>
</tr>
<tr>
<td>PP1</td>
<td>Personal Pace 1st generation</td>
</tr>
<tr>
<td>PP2</td>
<td>Personal Pace 2nd generation</td>
</tr>
<tr>
<td>RK</td>
<td>rocking key</td>
</tr>
<tr>
<td>SR</td>
<td>spring ratchet</td>
</tr>
<tr>
<td>SS</td>
<td>Sens-a-Speed</td>
</tr>
<tr>
<td>W</td>
<td>worm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model</th>
<th>Trans R&amp;R</th>
<th>Trans Internal Repair</th>
<th>Wheel Pinion</th>
<th>Handle Repair</th>
<th>Blade Clutch</th>
</tr>
</thead>
<tbody>
<tr>
<td>16212</td>
<td>W</td>
<td>Worm</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>16212B</td>
<td>W</td>
<td>Wom</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>16212W</td>
<td>W</td>
<td>Worm</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>16212WG</td>
<td>W</td>
<td>Worm</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>16401</td>
<td>W</td>
<td>Worm</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>16402</td>
<td>W</td>
<td>Wom</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>16404</td>
<td>W</td>
<td>Worm</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>16411</td>
<td>W</td>
<td>Worm</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>16775</td>
<td>W</td>
<td>Worm</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>16776</td>
<td>W</td>
<td>Worm</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>16785</td>
<td>W</td>
<td>Worm</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>16793</td>
<td>W</td>
<td>Worm</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>20001</td>
<td>22stl</td>
<td>B</td>
<td>SR</td>
<td>2B</td>
<td>None</td>
</tr>
<tr>
<td>20003</td>
<td>22stl</td>
<td>B</td>
<td>SR</td>
<td>2B</td>
<td>None</td>
</tr>
<tr>
<td>20005</td>
<td>22stl</td>
<td>B</td>
<td>SR</td>
<td>2B</td>
<td>None</td>
</tr>
<tr>
<td>20007</td>
<td>22stl</td>
<td>B</td>
<td>SR</td>
<td>2B</td>
<td>None</td>
</tr>
<tr>
<td>20011</td>
<td>22stl</td>
<td>SB</td>
<td>RK</td>
<td>2B</td>
<td>None</td>
</tr>
<tr>
<td>20012</td>
<td>22stl</td>
<td>B</td>
<td>SR</td>
<td>2B</td>
<td>None</td>
</tr>
<tr>
<td>20013</td>
<td>22stl</td>
<td>B</td>
<td>SR</td>
<td>PP2</td>
<td>None</td>
</tr>
<tr>
<td>20014</td>
<td>22stl</td>
<td>B</td>
<td>SR</td>
<td>PP2</td>
<td>None</td>
</tr>
<tr>
<td>20016</td>
<td>22stl</td>
<td>B</td>
<td>SR</td>
<td>2B</td>
<td>None</td>
</tr>
<tr>
<td>20017</td>
<td>22stl</td>
<td>B</td>
<td>SR</td>
<td>PP2</td>
<td>None</td>
</tr>
<tr>
<td>20018</td>
<td>22stl</td>
<td>B</td>
<td>SR</td>
<td>PP2</td>
<td>None</td>
</tr>
<tr>
<td>20019</td>
<td>22stl</td>
<td>B</td>
<td>SR</td>
<td>2B</td>
<td>None</td>
</tr>
<tr>
<td>20020</td>
<td>CD</td>
<td>SB</td>
<td>RK</td>
<td>2B</td>
<td>None</td>
</tr>
<tr>
<td>20021</td>
<td>CD</td>
<td>SB</td>
<td>RK</td>
<td>2B</td>
<td>None</td>
</tr>
<tr>
<td>20028</td>
<td>CD</td>
<td>SB</td>
<td>RK</td>
<td>2B</td>
<td>None</td>
</tr>
<tr>
<td>20031</td>
<td>22stl</td>
<td>B</td>
<td>SR</td>
<td>PP2</td>
<td>None</td>
</tr>
<tr>
<td>20036</td>
<td>CD</td>
<td>SB</td>
<td>RK</td>
<td>PP2</td>
<td>None</td>
</tr>
<tr>
<td>20037</td>
<td>CD</td>
<td>SB</td>
<td>RK</td>
<td>PP2</td>
<td>None</td>
</tr>
<tr>
<td>20038</td>
<td>CD</td>
<td>SB</td>
<td>RK</td>
<td>PP2</td>
<td>None</td>
</tr>
<tr>
<td>20039</td>
<td>CD</td>
<td>SB</td>
<td>RK</td>
<td>PP2</td>
<td>None</td>
</tr>
</tbody>
</table>
### Code List

- **1B** - one bail
- **2B** - two bail
- **3S** - 3 speed
- **21” stl** - 21” steel deck
- **22” stl** - 22” steel deck
- **B** - bevel gear
- **BBC** - blade brake clutch
- **BBC VP** - blade brake clutch for Vacu Power
- **BOS** - blade override system
- **CD** - cast deck

**Model** | **Trans R&R** | **Trans Internal Repair** | **Wheel Pinion** | **Handle Repair** | **Blade Clutch**
---|---|---|---|---|---
20041 | 22stl | B | SR | PP2 | None
20044 | CD | 3SP | RK | 1B | None
20047 | 22stl | B | RK | PP2 | None
20049 | 22stl | B | SR | PP2 | None
20051 | 22stl | B | SR | PP2 | None
20054 | CD | SB | RK | PP2 | None
20055 | CD | SB | RK | PP2 | None
20056 | CD | SB | RK | PP2 | BOS
20057 | CD | SB | RK | PP2 | None
20058 | CD | SB | RK | PP2 | BOS
20070 | 22stl | B | SR | PP2 | None
20079 | 22stl | B | SR | PP2 | None
20106 | CD | 3SP | RK | 1B | BBC
20107 | CD | 3SP | RK | 1B | BBC
20210 | CD | 3SP | RK | 1B | BBC
20211 | CD | 3SP | RK | 1B | BBC
20214 | CD | 3SP | RK | 1B | None
20216 | CD | 3SP | RK | 1B | None
20218 | CD | 3SP | RK | 1B | None
20219 | CD | 3SP | RK | 1B | BBC
20320 | CD | 3SP | RK | 1B | None
20321 | CD | 3SP | RK | 1B | None
20322 | CD | 3SP | RK | 1B | None
20324 | CD | 3SP | RK | 1B | BBC
20325 | CD | 3SP | RK | BBC | BBC
20327B | CD | 3SP | RK | 1B | None
20328B | CD | 3SP | RK | 1B | None
20436 | CD | 3SP | RK | 1B | None
20436WF | CD | 3SP | RK | 1B | None
20437 | CD | 3SP | RK | 1B | None
20438 | CD | 3SP | RK | BBC | BBC
20438WF | CD | 3SP | RK | BBC | BBC

**CDVP** - cast deck Vacu Power
**ES1** - Easy Stride 1st generation
**ES2** - Easy Stride 2nd generation
**Ins** - Insight
**PP1** - Personal Pace 1st generation
**PP2** - Personal Pace 2nd generation
**RK** - rocking key
**SB** - spur bevel
**SR** - spring ratchet
**SS** - Sens-a-Speed
**W** - worm
# TABLE OF CONTENTS

## Code List

1B - one bail  
2B - two bail  
3S - 3 speed  
21” stl - 21” steel deck  
22” stl - 22” steel deck  
B- bevel gear  
BBC - blade brake clutch  
BBC VP - blade brake clutch for Vacu Power  
BOS - blade override system  
CD - cast deck

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CDVP</td>
<td>cast deck Vacu Power</td>
</tr>
<tr>
<td>ES1</td>
<td>Easy Stride 1st generation</td>
</tr>
<tr>
<td>ES2</td>
<td>Easy Stride 2nd generation</td>
</tr>
<tr>
<td>Ins</td>
<td>Insight</td>
</tr>
<tr>
<td>PP1</td>
<td>Personal Pace 1st generation</td>
</tr>
<tr>
<td>PP2</td>
<td>Personal Pace 2nd generation</td>
</tr>
<tr>
<td>RK</td>
<td>rocking key</td>
</tr>
<tr>
<td>SB</td>
<td>spur bevel</td>
</tr>
<tr>
<td>SR</td>
<td>spring ratchet</td>
</tr>
<tr>
<td>SS</td>
<td>Sens-a-Speed</td>
</tr>
<tr>
<td>W</td>
<td>worm</td>
</tr>
</tbody>
</table>

## Model Table

<table>
<thead>
<tr>
<th>Model</th>
<th>Trans R&amp;R</th>
<th>Trans Internal Repair</th>
<th>Wheel Pinion</th>
<th>Handle Repair</th>
<th>Blade Clutch</th>
</tr>
</thead>
<tbody>
<tr>
<td>20439</td>
<td>CD</td>
<td>3SP</td>
<td>RK</td>
<td>BBC</td>
<td>BBC</td>
</tr>
<tr>
<td>20439WF</td>
<td>CD</td>
<td>3SP</td>
<td>RK</td>
<td>BBC</td>
<td>BBC</td>
</tr>
<tr>
<td>20462</td>
<td>CD</td>
<td>3SP</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>20463</td>
<td>CD</td>
<td>3SP</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>20464</td>
<td>CD</td>
<td>3SP</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>20465</td>
<td>CD</td>
<td>3SP</td>
<td>RK</td>
<td>BBC</td>
<td>BBC</td>
</tr>
<tr>
<td>20466</td>
<td>CD</td>
<td>3SP</td>
<td>RK</td>
<td>BBC</td>
<td>BBC</td>
</tr>
<tr>
<td>20470</td>
<td>CD</td>
<td>3SP</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>20472</td>
<td>CD</td>
<td>3SP</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>20473</td>
<td>CD</td>
<td>3SP</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>20474</td>
<td>CD</td>
<td>3SP</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>20475</td>
<td>CD</td>
<td>3SP</td>
<td>RK</td>
<td>BBC</td>
<td>BBC</td>
</tr>
<tr>
<td>20476</td>
<td>CD</td>
<td>3SP</td>
<td>RK</td>
<td>BBC</td>
<td>BBC</td>
</tr>
<tr>
<td>20478</td>
<td>CD</td>
<td>3SP</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>20479</td>
<td>CD</td>
<td>3SP</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>20480</td>
<td>CD</td>
<td>3SP</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>20481</td>
<td>CD</td>
<td>3SP</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>20482</td>
<td>CD</td>
<td>3SP</td>
<td>RK</td>
<td>BBC</td>
<td>BBC</td>
</tr>
<tr>
<td>20483</td>
<td>CD</td>
<td>3SP</td>
<td>RK</td>
<td>BBC</td>
<td>BBC</td>
</tr>
<tr>
<td>20486</td>
<td>CD</td>
<td>3SP</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>20487</td>
<td>CD</td>
<td>3SP</td>
<td>RK</td>
<td>BBC</td>
<td>BBC</td>
</tr>
<tr>
<td>20488</td>
<td>CD</td>
<td>3SP</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>20489</td>
<td>CD</td>
<td>3SP</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>20490</td>
<td>CD</td>
<td>3SP</td>
<td>RK</td>
<td>BBC</td>
<td>BBC</td>
</tr>
<tr>
<td>20494</td>
<td>CD</td>
<td>3SP</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>20495</td>
<td>CD</td>
<td>3SP</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>20622</td>
<td>CD</td>
<td>3SP</td>
<td>RK</td>
<td>BBC</td>
<td>BBC</td>
</tr>
<tr>
<td>20632</td>
<td>CD</td>
<td>3SP</td>
<td>RK</td>
<td>BBC</td>
<td>BBC</td>
</tr>
<tr>
<td>20652</td>
<td>21” stl</td>
<td>SB</td>
<td>RK</td>
<td>PP1</td>
<td>None</td>
</tr>
<tr>
<td>20654</td>
<td>21” stl</td>
<td>SB</td>
<td>RK</td>
<td>PP2</td>
<td>None</td>
</tr>
<tr>
<td>20655</td>
<td>22” stl</td>
<td>B</td>
<td>SR</td>
<td>PP2</td>
<td>None</td>
</tr>
<tr>
<td>20656</td>
<td>22” stl</td>
<td>B</td>
<td>SR</td>
<td>PP2</td>
<td>None</td>
</tr>
</tbody>
</table>
TABLE OF CONTENTS

Code List

1B - one bail  CDVP - cast deck Vacu Power
2B - two bail  ES1 - Easy Stride 1st generation
3S - 3 speed  ES2 - Easy Stride 2nd generation
21" stl - 21" steel deck  Ins - Insight
22" stl - 22" steel deck  PP1 - Personal Pace 1st generation
B - bevel gear  PP2 - Personal Pace 2nd generation
BBC - blade brake clutch  RK - rocking key
BBC VP - blade brake clutch  SB - spur bevel
for Vacu Power  SR - spring ratchet
BOS - blade override system  SS - Sens-a-Speed
CD - cast deck  W - worm

<table>
<thead>
<tr>
<th>Model</th>
<th>Trans</th>
<th>Trans</th>
<th>Wheel</th>
<th>Handle</th>
<th>Blade</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>R&amp;R</td>
<td>Internal Repair</td>
<td>Pinion</td>
<td>Repair</td>
<td>Clutch</td>
</tr>
<tr>
<td>20666</td>
<td>CD</td>
<td>3SP</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>20667</td>
<td>CD</td>
<td>3SP</td>
<td>RK</td>
<td>BBC</td>
<td>BBC</td>
</tr>
<tr>
<td>20668</td>
<td>CD</td>
<td>3SP</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>20677</td>
<td>CD</td>
<td>3SP</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>20680</td>
<td>CD</td>
<td>3SP</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>20692</td>
<td>CD</td>
<td>3SP</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>20695</td>
<td>CD</td>
<td>3SP</td>
<td>RK</td>
<td>BBC</td>
<td>BBC</td>
</tr>
<tr>
<td>20761B</td>
<td>CD</td>
<td>3SP</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>20763B</td>
<td>CD</td>
<td>3SP</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>20764B</td>
<td>CD</td>
<td>3SP</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>20764BC</td>
<td>CD</td>
<td>3SP</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>20766B</td>
<td>CD</td>
<td>3SP</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>20766BC</td>
<td>CD</td>
<td>3SP</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>20767B</td>
<td>CD</td>
<td>3SP</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>20768B</td>
<td>CD</td>
<td>3SP</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>20776</td>
<td>CD</td>
<td>3SP</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>20777</td>
<td>CD</td>
<td>3SP</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>20778</td>
<td>CD</td>
<td>3SP</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>20781</td>
<td>CD</td>
<td>SB</td>
<td>RK</td>
<td>PP2</td>
<td>None</td>
</tr>
<tr>
<td>20783</td>
<td>CD</td>
<td>SB</td>
<td>RK</td>
<td>PP2</td>
<td>None</td>
</tr>
<tr>
<td>20784</td>
<td>CD</td>
<td>SB</td>
<td>RK</td>
<td>PP2</td>
<td>None</td>
</tr>
<tr>
<td>20786</td>
<td>CD</td>
<td>3SP</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>20787</td>
<td>CD</td>
<td>3SP</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>20792</td>
<td>CD</td>
<td>SB</td>
<td>RK</td>
<td>PP2</td>
<td>None</td>
</tr>
<tr>
<td>20793</td>
<td>CD</td>
<td>SB</td>
<td>RK</td>
<td>PP2</td>
<td>None</td>
</tr>
<tr>
<td>20795</td>
<td>CD</td>
<td>SB</td>
<td>RK</td>
<td>PP2</td>
<td>None</td>
</tr>
<tr>
<td>20796</td>
<td>CD</td>
<td>SB</td>
<td>RK</td>
<td>PP2</td>
<td>None</td>
</tr>
<tr>
<td>20817</td>
<td>CD</td>
<td>SB</td>
<td>RK</td>
<td>PP2</td>
<td>None</td>
</tr>
<tr>
<td>20819</td>
<td>CD</td>
<td>SB</td>
<td>RK</td>
<td>PP2</td>
<td>None</td>
</tr>
<tr>
<td>20828</td>
<td>CD</td>
<td>SB</td>
<td>RK</td>
<td>PP2</td>
<td>None</td>
</tr>
<tr>
<td>20831</td>
<td>CD</td>
<td>SB</td>
<td>RK</td>
<td>PP2</td>
<td>None</td>
</tr>
<tr>
<td>20832</td>
<td>CD</td>
<td>SB</td>
<td>RK</td>
<td>PP2</td>
<td>None</td>
</tr>
</tbody>
</table>
## TABLE OF CONTENTS

### Code List

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1B</td>
<td>one bail</td>
</tr>
<tr>
<td>2B</td>
<td>two bail</td>
</tr>
<tr>
<td>3S</td>
<td>3 speed</td>
</tr>
<tr>
<td>21&quot;</td>
<td>21&quot; steel deck</td>
</tr>
<tr>
<td>22&quot;</td>
<td>22&quot; steel deck</td>
</tr>
<tr>
<td>B</td>
<td>bevel gear</td>
</tr>
<tr>
<td>BBC</td>
<td>blade brake clutch</td>
</tr>
<tr>
<td>BBC VP</td>
<td>blade brake clutchfor Vacu Power</td>
</tr>
<tr>
<td>BOS</td>
<td>blade override system</td>
</tr>
<tr>
<td>CD</td>
<td>cast deck</td>
</tr>
<tr>
<td>CDVP</td>
<td>cast deck Vacu Power</td>
</tr>
<tr>
<td>ES1</td>
<td>Easy Stride 1st generation</td>
</tr>
<tr>
<td>ES2</td>
<td>Easy Stride 2nd generation</td>
</tr>
<tr>
<td>Ins</td>
<td>Insight</td>
</tr>
<tr>
<td>PP1</td>
<td>Personal Pace 1st generation</td>
</tr>
<tr>
<td>PP2</td>
<td>Personal Pace 2nd generation</td>
</tr>
<tr>
<td>RK</td>
<td>rocking key</td>
</tr>
<tr>
<td>SR</td>
<td>spring ratchet</td>
</tr>
<tr>
<td>SS</td>
<td>Sens-a-Speed</td>
</tr>
<tr>
<td>W</td>
<td>worm</td>
</tr>
</tbody>
</table>

### Table

<table>
<thead>
<tr>
<th>Model</th>
<th>Trans R&amp;R</th>
<th>Trans Internal Repair</th>
<th>Wheel Pinion</th>
<th>Handle Repair</th>
<th>Blade Clutch</th>
</tr>
</thead>
<tbody>
<tr>
<td>20833</td>
<td>CD</td>
<td>SB</td>
<td>RK</td>
<td>PP2</td>
<td>None</td>
</tr>
<tr>
<td>20905</td>
<td>CD</td>
<td>Worm</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>20906B</td>
<td>CD</td>
<td>Worm</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>20911B</td>
<td>CD</td>
<td>Worm</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>20915</td>
<td>CD</td>
<td>Worm</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>20916B</td>
<td>CD</td>
<td>Worm</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>20920</td>
<td>CD</td>
<td>Worm</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>20920B</td>
<td>CD</td>
<td>Worm</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>20921B</td>
<td>CD</td>
<td>Worm</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>20925</td>
<td>CD</td>
<td>Worm</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>20925B</td>
<td>CD</td>
<td>Worm</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>20926B</td>
<td>CD</td>
<td>Worm</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>20927B</td>
<td>CD</td>
<td>Worm</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>26620B</td>
<td>CD VP</td>
<td>3 SP</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>26620BF</td>
<td>CD VP</td>
<td>3 SP</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>26620BG</td>
<td>CD VP</td>
<td>3 SP</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>26621</td>
<td>CD VP</td>
<td>3 SP</td>
<td>RK</td>
<td>BBC</td>
<td>BBC VP</td>
</tr>
<tr>
<td>26621B</td>
<td>CD VP</td>
<td>3 SP</td>
<td>RK</td>
<td>BBC</td>
<td>BBC VP</td>
</tr>
<tr>
<td>26622</td>
<td>CD VP</td>
<td>3 SP</td>
<td>RK</td>
<td>BBC</td>
<td>BBC VP</td>
</tr>
<tr>
<td>26623</td>
<td>CD VP</td>
<td>3 SP</td>
<td>RK</td>
<td>BBC</td>
<td>BBC VP</td>
</tr>
<tr>
<td>26624</td>
<td>CD VP</td>
<td>3 SP</td>
<td>RK</td>
<td>BBC</td>
<td>BBC VP</td>
</tr>
<tr>
<td>26625B</td>
<td>CD VP</td>
<td>3 SP</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>26625BG</td>
<td>CD VP</td>
<td>3 SP</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>26626</td>
<td>CD VP</td>
<td>3 SP</td>
<td>RK</td>
<td>BBC</td>
<td>BBC VP</td>
</tr>
<tr>
<td>26630B</td>
<td>CD VP</td>
<td>3 SP</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>26630BC</td>
<td>CD VP</td>
<td>3 SP</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>26630BG</td>
<td>CD VP</td>
<td>3 SP</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>26631B</td>
<td>CD VP</td>
<td>3 SP</td>
<td>RK</td>
<td>BBC</td>
<td>BBC VP</td>
</tr>
<tr>
<td>26631BC</td>
<td>CD VP</td>
<td>3 SP</td>
<td>RK</td>
<td>BBC</td>
<td>BBC VP</td>
</tr>
<tr>
<td>26632</td>
<td>CD VP</td>
<td>3 SP</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>26632B</td>
<td>CD VP</td>
<td>3 SP</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
</tbody>
</table>
### Code List

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1B</td>
<td>one bail</td>
</tr>
<tr>
<td>2B</td>
<td>two bail</td>
</tr>
<tr>
<td>3S</td>
<td>3 speed</td>
</tr>
<tr>
<td>3L</td>
<td>3L</td>
</tr>
<tr>
<td>21&quot;</td>
<td>21&quot;</td>
</tr>
<tr>
<td>22&quot;</td>
<td>22&quot;</td>
</tr>
<tr>
<td>B</td>
<td>bevel gear</td>
</tr>
<tr>
<td>BBC</td>
<td>blade brake clutch for Vacu Power</td>
</tr>
<tr>
<td>BBC VP</td>
<td>blade brake clutch for Vacu Power</td>
</tr>
<tr>
<td>BOS</td>
<td>blade override system</td>
</tr>
<tr>
<td>CD</td>
<td>cast deck</td>
</tr>
<tr>
<td>CDVP</td>
<td>cast deck Vacu Power</td>
</tr>
<tr>
<td>ES1</td>
<td>Easy Stride 1st generation</td>
</tr>
<tr>
<td>ES2</td>
<td>Easy Stride 2nd generation</td>
</tr>
<tr>
<td>Ins</td>
<td>Insight</td>
</tr>
<tr>
<td>PP1</td>
<td>Personal Pace 1st generation</td>
</tr>
<tr>
<td>PP2</td>
<td>Personal Pace 2nd generation</td>
</tr>
<tr>
<td>RK</td>
<td>rocking key</td>
</tr>
<tr>
<td>SB</td>
<td>spur bevel</td>
</tr>
<tr>
<td>SR</td>
<td>spring ratchet</td>
</tr>
<tr>
<td>SS</td>
<td>Sens-a-Speed</td>
</tr>
<tr>
<td>W</td>
<td>worm</td>
</tr>
</tbody>
</table>

### Table of Models

<table>
<thead>
<tr>
<th>Model</th>
<th>Trans R&amp;R</th>
<th>Trans Internal Repair</th>
<th>Wheel Pinion</th>
<th>Handle Repair</th>
<th>Blade Clutch</th>
</tr>
</thead>
<tbody>
<tr>
<td>26633</td>
<td>CD VP</td>
<td>3 SP</td>
<td>RK</td>
<td>BBC</td>
<td>BBC VP</td>
</tr>
<tr>
<td>26633B</td>
<td>CD VP</td>
<td>3 SP</td>
<td>RK</td>
<td>BBC VP</td>
<td></td>
</tr>
<tr>
<td>26635B</td>
<td>CD VP</td>
<td>3 SP</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>26635BC</td>
<td>CD VP</td>
<td>3 SP</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>26635BG</td>
<td>CD VP</td>
<td>3 SP</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>26636</td>
<td>CD VP</td>
<td>3 SP</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>26636B</td>
<td>CD VP</td>
<td>3 SP</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>26637</td>
<td>CD VP</td>
<td>3 SP</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>26638</td>
<td>CD VP</td>
<td>3 SP</td>
<td>RK</td>
<td>BBC</td>
<td>BBC VP</td>
</tr>
<tr>
<td>26639</td>
<td>CD VP</td>
<td>3 SP</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>26640B</td>
<td>CD VP</td>
<td>3 SP</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>26640BC</td>
<td>CD VP</td>
<td>3 SP</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>26643</td>
<td>CD VP</td>
<td>3 SP</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>26643B</td>
<td>CD VP</td>
<td>3 SP</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>26680</td>
<td>CD VP</td>
<td>3 SP</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>26680WG</td>
<td>CD VP</td>
<td>3 SP</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>26682</td>
<td>CD VP</td>
<td>3 SP</td>
<td>RK</td>
<td>BBC</td>
<td>BBC VP</td>
</tr>
<tr>
<td>26683</td>
<td>CD VP</td>
<td>3 SP</td>
<td>RK</td>
<td>BBC VP</td>
<td></td>
</tr>
<tr>
<td>27500</td>
<td>CD VP</td>
<td>3 SP</td>
<td>RK</td>
<td>BBC</td>
<td>BBC VP</td>
</tr>
<tr>
<td>27501</td>
<td>CD VP</td>
<td>3 SP</td>
<td>RK</td>
<td>BBC VP</td>
<td></td>
</tr>
<tr>
<td>27502</td>
<td>CD VP</td>
<td>3 SP</td>
<td>RK</td>
<td>BBC VP</td>
<td></td>
</tr>
<tr>
<td>20442</td>
<td>CD</td>
<td>SB</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>20444</td>
<td>CD</td>
<td>SB</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
<tr>
<td>20711</td>
<td>CD</td>
<td>SB</td>
<td>RK</td>
<td>1B</td>
<td>None</td>
</tr>
</tbody>
</table>
THIS PAGE INTENTIONALLY LEFT BLANK.
Worm Drive Transmission

Single Speed Spur/Bevel Gear Transmission

Single Speed Bevel Gear Transmission

Three Speed Transmission

Wheel Pinion Clutch

Blade Brake Clutch Systems (BBC), Blade Override System (BOS), Blade Clutch Systems (BCS)

Handles and Control Cables

Self-Propel Belt Replacement
GENERAL

There are two versions of the worm drive transmission. The first is a clutch type and is used on 21" front wheel drive mowers. The second version is constant mesh and is used on International 48cm rear wheel drive mowers.

INTERNALLY CLUTCHED

Description

This is a worm and helical gear transmission. The worm shaft (input shaft) is driven by a belt from the engine crankshaft. A spring which hooks into the tab on the front of the transmission (where the roll pin is) and to the mower housing, pivots the transmission forward to maintain tension on the belt.

The worm is in constant mesh with the helical gear. The clutching action is provided by a sliding clutch jaw. A shift fork moves the clutch jaw to engage and disengage the transmission. When the clutch jaw engages the helical gear, power is transferred from the clutch jaw to the sleeve inside the clutch jaw. The sleeve is pinned to the axle. The axle then begins to rotate (Fig. 001).

A. Belt  E. Shift Fork  
B. Spring  F. Sleeve  
C. Helical Gear  G. Input Shaft  
D. Clutch Jaw  (worm shaft)
Lubrication

This transmission requires 90 wt. gear oil. A variable weight such as 85w90 is acceptable as long as the range includes 90 weight. The second part of the requirement is an EP rating of GL 5 or higher.

The transmission has a fill/check plug in the front. With the transmission level, fill until level with the hole. NOTE: This is equal to about the center of the axle.

Unless the case is cracked, oil can not leak out. Even if a seal fails, oil will leak out only to the bottom of the seal on the axle.

If gear failure occurs, the resulting friction can cook the oil down to a smear in the bottom of the case. This does not indicate a lack of lubrication.

This type of transmission will last less than 30 minutes with no lubrication. If a transmission lasts even a few weeks in consumer use, it had lubrication to start.

The Shifting Process

The upper end of the clutch fork slides over a groove in a spring loaded rod. This spring pushes the shift fork and clutch jaw towards the engaged position (Fig. 002).

When the shift arm is pulled to the rear by the shift cable, the pin moves to the left side of the mower, then to the rear. This moves the shift pin, the shift fork, and the clutch jaw to the disengage position.

NOTE: Dirt packed in the latch plate can prevent disengagement. The dust filter and dust cover help prevent this failure.

When the shift cable is engaged, tension on the shift arm is released. The spring on the shift rod applies pressure to the rod, fork, and clutch jaw to engage the transmission.
WORM DRIVE TRANSMISSION

Removal & Installation (front wheel drive applications)

1. Remove the belt cover and unhook the spring on the front of the transmission. Slip the belt off the transmission pulley (Fig. 004).

2. Raise the front of the mower off the bench and support it with blocks.

3. Disconnect the shift cable.

4. Remove both front wheels and wheel covers (Fig. 005).

5. Pivot (both) front spring arms forward until they point straight down. (This removes the tension from the pivot arms so the roll pin can be removed) (Fig. 006).
6. Place a block of wood under the wheel pinion for support and drive the roll pin out of the axle (Fig. 007). Repeat the process on the other side.

7. The wheel pinion, thrust washer, pivot, and spring arm will now slide off the end of the axle (Fig. 008). Repeat the process on the other side.

8. Remove the transmission from the chassis.

9. Reverse the procedure to install.

**NOTE:** Support the wheel pinions with the wood block while driving the roll pins in. This will prevent the axle from being bent. Fill the transmission with oil after it is installed in the mower (Fig. 009).

Note the front of the transmission is identified by the oil fill/check screw and the flat tab which is part of the lower case.

Disassembly

1. Cut and discard the push-on retainer on top of the transmission pulley. Remove the belt and pulley.
WORM DRIVE TRANSMISSION

2. Drive the roll pins out of the flanges in the front and rear of the case. (These pins align the top and bottom parts of the case) (Fig. 010).

3. Remove the 4 self-tapping screw that connect the top and bottom cases.

**Note:** If you turn this transmission on its side or upside down, oil may leak out of the top. This is not a sealed case.

4. Remove the transmission cover. The shift fork may come with the cover or may fall into the bottom of the case (Fig. 011).

5. Push the worm shaft out of the cover. This may require a little pressure.

6. To remove the axle, slide the clutch jaw to the side and drive the roll pin out of the sleeve and axle (Fig. 012).

7. If the axle bearings are to be re-used, clean the end of the axle before drawing it out of the case.

8. Remove the sleeve, clutch jaw, helical gear, and thrust washer (Fig. 013)
9. Clean the old gasket material from the mating surfaces of the case and cover.

10. A hook or small screwdriver can be used to pry the seals out of the case.

11. An arbor press or large vise will be needed when removing and replacing the bushings.

12. Clean the oil residue and any metal shavings from the case.

13. Worm and helical gears are sold as a set. Even after a short run time, they will develop a wear pattern. Replacing only one gear will result in rapid failure (Fig. 014).

14. Remove the screw from the shift arm and remove the shift arm, dust cover, and wear plate (Fig. 015). If the ball bearing is to be replaced, press it out at this time.

15. Remove the roll pin and pull shifter rod out of the cover. Clean the cover.

Assembly

1. Use bushing installation tool P/N 27-0460, to press in new axle bushings. This tool helps keep the bushing straight and keeps the inner diameter of the bushing correctly sized.
WORM DRIVE TRANSMISSION

3. Note: Some replacement axles have more than one hole that can be used to pin the sleeve to the axle. Refer to the original axle to identify the correct hole to use. Then drive a roll pin through the sleeve and axle (Fig. 017).

2. Clean the rust and dirt from both ends of the axle. Wipe the inner diameter of the bushings with a clean cloth. Lightly oil the axle and insert it into the gearcase. When facing the front of the gearbox, insert the short end of the axle from left to right. Install the thrust washer, helical gear, and the sleeve and clutch jaw. Then push the axle through the other side of the case.

A. Tool P/N 27-0460

4. Using a seal protector, slide new seals down each side of the axle. Install the seal with the lip facing the transmission. The outer edge of the seal should be flush with the outside of the case. If a seal protector is not available, wrap a piece of cellophane around the axle (Fig. 018).

A. Seal protector or Cellophane  B. Seal
5. If the bearing in the cover is being replaced, use tool P/N 27-0490 to press it in place. This bearing only has one seal. Install the bearing such that the seal is visible from the top of the cover and the open side faces the gears. Press the bearing in until it is fully seated in the case (Fig. 019).

6. Install worm shaft in bearing.

7. Use a new gasket. Install the cover on the bottom case and start the 4 self-tapping screws. Do not fully tighten them.

8. Install the front and rear roll pins to align the cover and case. Then secure the 4 self-tapping screws.

9. Fill the transmission with gear oil AFTER it is installed in the mower. The top of this transmission is not sealed. It will leak if tipped on its side (Fig. 020).

Controls

There are two control cables used with this system. One cable operates the engine kill switch and flywheel brake; the other controls the transmission.
WORM DRIVE TRANSMISSION

Adjustment

The transmission cable is a standard lever type. Since the spring and pin on top of the transmission pushes the shift fork towards the engaged position, the cable pulls the shift arm to the rear to disengage the transmission. The adjustment point is on the mower housing just to the rear of the transmission. To adjust, pull the control to the rear (disengage). Go to the cable clamp/adjustment. Loosen the clamp, pull the cable to the rear until the shift lever is as far back as it will go. Hold it there and tighten the clamp (Fig. 021).

Fig 021

A. Cable Clamp
CONSTANT MESH

Description

This transmission is very similar to the "INTERNALLY CLUTCHED" on page 1 – 1. However, the helical gear is different as there is no internal clutching (Fig. 022). Engagement and disengagement is accomplished by pivoting the transmission to tighten or loosen the belt.

Internal repair procedures are the same, as is the lubrication requirement, 90 wt. gear oil rated GL-5 or higher.

The constant mesh type transmission is used in a 48cm rear wheel drive application.

Fig 022

1. Jam nut
2. Lock washer
3. Half pulley
4. V Belt
5. Pulley spacer
6. Gearbox cover
7. Shaft & worm
8. Ball bearing
9. Gearbox gasket
10. Check plug
11. Gasket check plug
12. Bushing
13. Oil Seal
14. Output shaft
15. Traction bracket
16. Thread forming screw
17. Gearbox case
18. Thrust washer
19. Roll pin
20. Helical gear
21. Thrust washer
22. Bushing
23. Roll pin
## WORM DRIVE TRANSMISSION

### Removal and Installation

#### Fig 023

![Diagram of WORM DRIVE TRANSMISSION](image-url)

<table>
<thead>
<tr>
<th>Ref. No.</th>
<th>Qty</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>Rear Pivot Assembly RH (incl. Ref. #2, 4, 5 &amp; 14)</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>Grease Fitting</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>Washer</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
<td>Sleeve Bushing</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td>Grease Seal</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>Rear Pivot Assembly LH (incl. Ref. #3, 4, 5 &amp; 14)</td>
</tr>
<tr>
<td>7</td>
<td>2</td>
<td>Locknut</td>
</tr>
<tr>
<td>9</td>
<td>1</td>
<td>Thread Forming Screw</td>
</tr>
<tr>
<td>10</td>
<td>2</td>
<td>Trigger Return Spring</td>
</tr>
<tr>
<td>11</td>
<td>1</td>
<td>H.O.C. Saddle</td>
</tr>
<tr>
<td>12</td>
<td>2</td>
<td>Thread Forming Screw</td>
</tr>
<tr>
<td>13</td>
<td>1</td>
<td>Push Nut</td>
</tr>
<tr>
<td>14</td>
<td>2</td>
<td>Needle Bearing</td>
</tr>
<tr>
<td>15</td>
<td>2</td>
<td>Friction Washer</td>
</tr>
<tr>
<td>16</td>
<td>4</td>
<td>Keyed Thrust Washer</td>
</tr>
<tr>
<td>17</td>
<td>4</td>
<td>Retaining Ring</td>
</tr>
<tr>
<td>18</td>
<td>1</td>
<td>LH Rocking Key</td>
</tr>
<tr>
<td>19</td>
<td>2</td>
<td>Pinion Gear</td>
</tr>
<tr>
<td>20</td>
<td>2</td>
<td>Compression Spring</td>
</tr>
<tr>
<td>21</td>
<td>2</td>
<td>Wheel Cover</td>
</tr>
<tr>
<td>22</td>
<td>2</td>
<td>Tire &amp; Gear Assy Wheel (incl. Ref. #24)</td>
</tr>
<tr>
<td>23</td>
<td>2</td>
<td>Wheel Bolt</td>
</tr>
<tr>
<td>24</td>
<td>4</td>
<td>Wheel Bushing</td>
</tr>
<tr>
<td>25</td>
<td>2</td>
<td>Wheel Spacer</td>
</tr>
<tr>
<td>26</td>
<td>2</td>
<td>Clutch Washer</td>
</tr>
<tr>
<td>27</td>
<td>2</td>
<td>Rear Suspension Plate</td>
</tr>
<tr>
<td>28</td>
<td>4</td>
<td>Thread Forming Screw</td>
</tr>
<tr>
<td>34</td>
<td>2</td>
<td>Roll Pin</td>
</tr>
<tr>
<td>35</td>
<td>1</td>
<td>Gearbox Assembly</td>
</tr>
</tbody>
</table>

---

1-12 WPM Drive Systems Manual
To remove the transmission from the mower proceed as follows:

1. Remove both rear wheels.

2. Remove the retaining rings, springs, gears, keys, clutches, and pivot arms on both sides (“Wheel Pinion Clutch” on page 5-2).

3. Remove the belt.

4. There is a suspension bracket on each side that secures the transmission and pivot arms to the chassis. Each bracket has 2 screws. Once they are removed, the transmission will drop out.

To install, reverse the above process.

Fill the transmission level with the fill plug opening after it is installed in the chassis. The top of the transmission is not sealed, so it may leak if filled and tipped.

**Controls**

**Adjusting Wheel Traction Drive**

1. Stop the engine.

2. Rotate the adjustment knob under the lower left-hand side of the control panel ¼ turn clockwise to tighten the belt, or ½ turn counterclockwise to loosen the belt. Hold the control cable while rotating the knob to prevent the cable from turning (Fig. 024).

![Fig 024](image1)

3. To check the adjustment, slowly squeeze the control bar towards the handle. The cable is adjusted correctly when resistance is felt when the control bar is approximately 1” (25mm) from the upper handle (Fig. 025).

![Fig 025](image2)
WORM DRIVE TRANSMISSION

4. If loss of traction or improper engagement still occurs after adjustment, repeat steps 2 – 3 until properly adjusted.

WHEEL CLUTCH

See Rocking Key Wheel Clutch, page 5-3.
SINGLE SPEED SPUR/BEVEL GEAR TRANSMISSION

1. Worm Drive Transmission

2. Single Speed Spur/Bevel Gear Transmission

3. Single Speed Bevel Gear Transmission

4. Three Speed Transmission

5. Wheel Pinion Clutch


7. Handles and Control Cables

8. Self-Propel Belt Replacement
SINGLE SPEED SPUR/BEVEL GEAR TRANSMISSION

GEAR CASE ASSEMBLY

**Ref. No.** | **Qty** | **Description**
--- | --- | ---
1 | 1 | Gear Case Casting
2 | 1 | Gear Case Cover
3 | 1 | HWH Screw
4 | 1 | Retaining Ring
5 | 2 | Flat Washer
6 | 2 | Groove Pin
7 | 2 | Lock Nut NI
8 | 2 | Washer
9 | 1 | Thrust Washer
10 | 1 | Bushing

**Ref. No.** | **Qty** | **Description**
--- | --- | ---
11 | 2 | Output Bushing
12 | 1 | Intermediate Shaft
13 | 1 | Pulley Half
14 | 2 | Ball Bearing
15 | 2 | Pulley Spacer
16 | 2 | Bevel Gear 15t Spur, 37t
17 | 2 | Pinion Gear Bevel
18 | 2 | Gear
19 | 2 | Output Shaft

**Fig 026** snglspspurbvlgearbox
Description

This basic transmission has been in use for several years. There are minor variations, such as different shafts on the bevel pinion gear to accommodate belt alignment on different chassis. All use a bevel pinion input gear which mates with a combination bevel/spur gear, which drives a final spur gear.

Lubrication

Proper lubrication for this transmission is 2.5 – 3 fluid ounces (7.1cc – 9.0cc) of lithium based No. 2 grease.

Transmission Removal and Replacement

1. Raise the rear of the mower and support with a block (Fig. 027).

2. Remove transmission belt cover.

3. Remove both rear wheels.

4. Remove retaining ring, spring, thrust washer, and pinion from both axles (Fig. 028). Refer to “Wheel Pinion Clutch” on page 5-3 for additional information about the clutch mechanism.

5. Continue disassembly, remove rocking key, clutch washer, klip ring, keyed thrust washer, pivot arm thrust washer, and friction ring. The pivot arm and spring arm will then slide off the axle (Fig. 029).

A. Wood block
6. Remove the belt guide. Note the location of the spacer under the front mounting screw (Fig. 030). Do not try to force the belt off the pulley without removing the belt guide. This often results in damage to the belt or slightly bending the belt guide, causing an increased tendency for belt jumping.

On some models, removing these 2 screws makes transmission removal easier (Fig. 032).

![Fig 030](PICT-1880a)

A. End cap

7. The transmission can be moved to the right until the short end of the axle clears the housing and the transmission can be removed (Fig. 031). Some models have the axle shaft retained by an end cap.

Transmission Internal Repair

The nut on the pulley can be removed now. The spacer under the pulley varies with the chassis and the length of the shaft on the pinion (Fig. 033). Remove the self-tapping screws holding the cover on the transmission.

![Fig 031](3128-0074)

![Fig 033](3428-0008)
Before removing the parts from the case, note the quantity and location of the thrust washers (Fig. 034).

Remove the axle and intermediate shaft with the gears. The bearing in the cover should be sealed on both sides. Inspect the bearing and its seals for damage (Fig. 035). Replace as necessary. The bearing is pressed into the cover. Make sure bearing is fully seated.

Clean the gears in solvent and inspect carefully. Any damaged gear must be replaced. Also replace the mate for the damaged gear. When gears run together, they develop a wear pattern that will result in premature failure if only one gear is replaced. The exception for this is if the transmission has VERY little running time before failure.

The axle has two roll pins through it. One connects the single spur gear to the axle (Fig. 036). The other pin aligns the axle and transmission case.

Assemble with the correct number of thrust washers. Refer to the parts manual if there is any doubt at all. It is not possible to locate the shafts and bearings in the wrong location, due to differences in sizes.
Prior to installation of oil impregnated bushings, it is wise to apply a light coating of engine oil to the running surface (Fig. 037). Add grease and install the cover.

Finally, install the spacer and pulley on the input shaft. The internal gears will help hold the pinion while the nut is tightened (Fig. 038).

Insert the transmission back into the chassis. Refer to the section on the wheel pinion clutch for assembly instructions.

Install self propel cable. Adjust as needed; see “Handles and Control Cables” Section 7.
SINGLE SPEED BEVEL GEAR TRANSMISSION

Worm Drive Transmission

Single Speed Spur/Bevel Gear Transmission

Single Speed Bevel Gear Transmission

Three Speed Transmission

Wheel Pinion Clutch

Blade Brake Clutch Systems (BBC), Blade Override System (BOS), Blade Clutch Systems (BCS)

Handles and Control Cables

Self-Propel Belt Replacement
A. Nut  
B. Washer  
C. Pulley  
D. Spacer  
E. Housing  
F. Bearing  
G. Pinion

H. Bushing  
I. Thrust washer  
J. Bevel Gear  
K. Bushing  
L. Roll pin  
M. Axle
GENERAL INFORMATION

This transmission was first used on 22” steel deck models for 2002. It is used in both front wheel and rear wheel drive configurations. The bevel gear is reversed when used in the front drive versus the rear drive to change axle shaft direction of rotation.

In both cases, the gears are in constant mesh. Clutching is done by rocking the transmission to tighten or loosen the drive belt (Fig. 040). The control cable will move the transmission to tighten the belt. When released, the weight of the transmission causes it to rock towards the engine to disengage.
### SINGLE SPEED BEVEL GEAR TRANSMISSION

#### FRONT AXLE AND TRANSMISSION ASSEMBLY

![Diagram of Front Axle and Transmission Assembly](image)

**Ref. No.** | **Qty** | **Description**                   | **Ref. No.** | **Qty** | **Description**                   
-------------|---------|-----------------------------------|-------------|---------|-----------------------------------
1            | 2       | Bolt-Shoulder                     | 14          | 2       | Spring-Compression               
2            | 2       | Wheel Gear ASM                    | 15          | 2       | Key                               
2:1          | 2       | Bushing                           | 16          | 1       | Transmission ASM                 
3            | 4       | Klipring-Locking                  | 17          | 1       | Gasket-Gearbox                    
4            | 2       | Gear-Pinion, 13T                   | 18          | 2       | Screw-HWH                         
5            | 6       | Washer-Thrust                      | 19          | 1       | Bracket-Pivot, Fwd               
7            | 2       | Cover-Wheel                        | 20          | 2       | Screw-HWH                         
7:1          | 1       | Cover                              | 21          | 1       | Spacer                            
7:2          | 1       | Washer-Stepped                     | 22          | 1       | V-Belt                            
8            | 2       | Arm-Pivot, Front                   | 23          | 2       | Pulley-Half, Front               
9            | 2       | Arm-Spring                         | 24          | 1       | Washer-Flat                       
10           | 2       | Knob-Lever, HOC                    | 25          | 1       | Nut-Lock                          
11           | 2       | Ring-Retaining                     | 26          | 1       | Cover-Belt, Front                
12           | 2       | Retainer-Bearing, HOC              | 27          | 1       | Washer                            
13           | 2       | Bearing-Ball                       |             |         |                                   

**Fig 041**

3354-613 Rev A
22” FRONT WHEEL DRIVE MODELS

Remove Transmission

1. Block the front of the mower up. There are two screws that secure the belt cover to the housing. They are accessed from the bottom (Fig. 042).

2. Slip the belt out between the transmission pulley and belt guide.

3. Grip the axle with locking pliers and remove the locknut on the transmission pulley (Fig. 043).

4. Remove the nut, washer, transmission pulley halves, and spacer.

5. Remove the belt guide.

6. Remove both front wheels; note there is a washer between the wheel and wheel cover.

7. To remove the wheel pinions, remove the klip ring and thrust washer. The pinion will now slide off the axle (Fig. 044).

Note: The spring-loaded drive key is under the pinion.

8. Remove the wheel cover.
9. Remove the two bolts and nuts securing each pivot arm to the housing. There is a notch in the pivot arm for clearance of a socket (Fig. 045).

The axle assembly will now drop out of the chassis (Fig. 046).

10. Remove the klip ring and thrust washer from each end of the axle (the left side has 2 thrust washers, the right side, one). The bearing, bearing retainer, HOC plate, spring arm and pivot arm all come off as one unit (Fig. 047).

11. To disassemble the pivot arm assembly, compress the components with two clamps or locking pliers (Fig. 048).
The snap ring can now be removed. Loosen the clamps with care due to the spring arm tension. Separate the spring arm components (Fig. 049).

1. Remove the 4 screws holding the cover onto the transmission. The axle, bearings, and bevel gear can be lifted out (Fig. 050).

2. Since the pulley was previously removed, the input shaft will now slip out of the transmission case.

3. If the input bearing is to be removed, press it out of the case now.

4. Slide the bearings and thrust washer off the axle. Drive the roll pin out and the bevel gear can be removed (Fig. 051).

Transmission Disassembly

Transmission Assembly

Assemble in reverse order.

See Assembly Tips next page.
Assembly Tips

1. The same axle is used for both front and rear drive versions. There are two holes in the axle about one inch apart. Front wheel drive transmissions use the hole in the axle that is about 5 ¾" (14.6cm) from the end or closest to the center of the axle (Fig. 052).

   Slip the gear on such that the teeth and longest hub face the longer end of the axle. Drive the pin into place. A double check is that neither of the pin holes should be visible when the gear is installed.

2. Install the trust washer on the side of the gear with the shorter hub, away from the gear teeth (Fig. 053).

3. Install the transmission bearings with the flange facing the gear (Fig. 054).

4. If the input bearing was removed, press the new one in until it bottoms in the case.

5. Fill the transmission case approximately 2/3 full with #2 lithium base grease.

6. Assemble the bearing, bearing retainer, height of cut plate, spring arm and pivot arm. Use two clamps or vise grips to compress the assembly so the snap ring can be installed.

   **Note:** Install the snap ring with the sharp edge facing away from the spring arm.
7. Coat the axle, key, and spring with #2 molybendum disulfide base grease or anti-seize compound before installing the pinion (Fig. 055).

8. The wheel pinion is marked with an R and L for right and left. Identify right and left from the operator’s position (Fig. 056). On the right side, the letter R should face out. The letter L should face out on the left side. If the wheel pinions are reversed, the wheels will not drive.

Belt Service - Front Wheel Drive Models

To replace the self-propelled drive belt, proceed as follows:

1. Drain the fuel and oil and tip the mower on its right side.

2. Remove the two screws securing the belt cover from under the housing (Fig. 057).

3. Slip the belt off the transmission pulley and push it towards the engine (Fig. 058).

Note: For more information on the wheel clutch see Section 5, Wheel Pinion Clutch.
SINGLE SPEED BEVEL GEAR TRANSMISSION

4. Remove one of the mounting screws for the belt guide and loosen the other. DO NOT bend the belt guide (Fig. 059).

Fig 059

Note: Blade removed for clarity. The blade can be removed, but it is not required for belt replacement.

5. Slip the belt out of the crankshaft pulley and over the blade (Fig. 060).

Fig 060

22” TORO & LAWN-BOY REAR WHEEL DRIVE MODELS

Transmission Removal and Belt Replacement

On rear wheel drive models, it is necessary to separate the rear drive assembly from the mower housing in order to change the drive belt.

1. Drain fuel and oil from the engine.

2. Remove the single retaining screw from the center of the bag door spring. Slide the door to one side and remove it from the rear HOC side plates (Fig. 061).

Fig 061
3. Remove the plug from the hole next to where the self propel cable goes through the chassis (Fig. 062).

4. Tip the mower on its side. The cable snaps in from the top and connects to an arm on the transmission belt guide (Fig. 063).

5. The cable tool (P/N 105-6819) will compress the locking tabs on the cable so it can be removed from the housing.

6. Slide the cable tool over the end of the cable and push (Fig. 064). At the same time, reach around the mower and pull the cable out of the housing.

7. With the plug removed from the larger hole next to the cable, move the cable through the slot (Fig. 065).
8. Push it into the larger hole (Fig. 066).

9. Remove both rear wheels and both wheel covers.

10. Remove the stop cable from the engine (Fig. 067) and disconnect the self propel cable spring from the transmission.

11. Pinch the ends of the lower handle together to disengage them from the pins on the HOC plates (Fig. 068).

12. Tip the mower onto its right side (carburetor up) and remove the blade.

13. Remove one of the belt guide screws and loosen the other enough to pivot the guide away (Fig. 069). Do not bend the belt guide. Slide the pulley/blade adapter and belt off the crankshaft.

A. Stop cable
14. Place the mower right side up and remove the three hex head and one Allen head cap screws on each side that hold the height of cut plates to the chassis (Fig. 070). The transmission assembly will now drop down.

15. There is a cross brace underneath the mower that is held in place by two of the cap screws shown above (Fig. 071).

16. The belt cover must be removed in order to remove the belt (Fig. 072).

17. Remove 3 screws that secure the belt cover to the housing (Fig. 073).
SINGLE SPEED BEVEL GEAR TRANSMISSION

18. Pull the belt cover out from under the rear wall and the belt is exposed (Fig. 074).

19. Clamp the axle with locking pliers and remove the pulley nut and transmission pulley (Fig. 075). Do not bend the belt guide. The pulley must be lifted up slightly to slip the belt off.

20. The cable may be unhooked from the arm on the transmission to help prevent cable damage (Fig. 076).

Note: It is not necessary to remove the transmission to replace the control cable.

21. Pull the belt towards the crankshaft and remove.

If only the belt is to be replaced, install a new one now. Reverse the process to assemble.

If transmission service is necessary proceed as follows.
Rear Axle Disassembly

1. Remove the klip rings and thrust washers that secure the pinions to the axle (Fig. 077).

2. When removing the pinions, note that there is a spring-loaded key under them.

3. Remove the other thrust washer and retaining ring holding the pivot assembly to the axle (Fig. 078).

4. The pivot assembly will slide off the axle. This includes the bearing, bearing retainer, HOC plate, spring arm, and pivot arm (Fig. 079).

5. Clamp the pivot assembly with 2 pairs of locking pliers or other clamps and remove the snap ring (Fig. 080).
SINGLE SPEED BEVEL GEAR TRANSMISSION

6. You can now release the clamps and separate the HOC plate, spring arm, and pivot arm (Fig. 081).

2. Since the pulley was previously removed, the input shaft will now slip out of the transmission case.

3. If the input bearing is to be removed, press it out now.

4. Slide the bearings and thrust washer off the axle. Drive the roll pin out and the bevel gear can be removed (Fig. 083).

Transmission Disassembly

1. Remove the 4 screws holding the cover on the transmission. The axle, bearings, and bevel gear can be lifted out (Fig. 082).

Transmission Assembly

Assemble in reverse order.
Axle Assembly Tips

1. The same axle is used for both front and rear wheel drive models. There are two holes in the axle about one inch apart.

   Rear wheel drive models use the hole about 4-3/4” (12cm) from the end. Slip the gear on such that the teeth and the longest hub face the short end of the axle. Drive the pin into place. A double check is that neither of the pin holes should be visible when the gear is installed (Fig. 084).

2. Install the thrust washer on the side of the gear with the shortest hub, away from the gear teeth (Fig. 084).

3. Install the transmission bearings with the flange facing the gear (Fig. 085).

4. Fill the transmission approximately 2/3 full with #2 Lithium base grease (1.5 oz or 43gm).

5. Assemble the bearing, bearing retainer, HOC plate, spring arm, and pivot arm. Use two vise grips or clamps to compress the assembly so the snap ring can be installed (Fig. 086).

   Note: Install the snap ring with the sharp edge facing away from the spring arm.
6. Coat the axle, key, and spring with #2 molybendum disulfide grease or anti-seize compound before installing the pinion (Fig. 087).

7. The wheel pinion is marked with an R and L for right and left. Identify right and left from the operator’s position (Fig. 088). On the right side, the R should face outward. The letter L should face outward on the left side. If the wheel pinions are reversed, the wheels will not drive.

Note: See Chapter 5 for more information on Wheel Clutches.
SINGLE SPEED BEVEL GEAR TRANSMISSION

LAWN-BOY INSIGHT TRANSMISSION REMOVE AND REPLACE

Rear Axle and Transmission Assembly

![Diagram of Rear Axle and Transmission Assembly]

<table>
<thead>
<tr>
<th>Ref. No.</th>
<th>Qty</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>Bolt-Shoulder</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>Rear Wheel ASM</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>Klipring-Locking</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
<td>Gear-Pinion, 15T</td>
</tr>
<tr>
<td>6</td>
<td>6</td>
<td>Washer-Thrust</td>
</tr>
<tr>
<td>7</td>
<td>2</td>
<td>Wheel Cover ASM</td>
</tr>
<tr>
<td>7:1</td>
<td>1</td>
<td>Cover-Wheel</td>
</tr>
<tr>
<td>7:2</td>
<td>1</td>
<td>Washer-Stepped</td>
</tr>
<tr>
<td>8</td>
<td>2</td>
<td>Ring-Retaining</td>
</tr>
<tr>
<td>9</td>
<td>1</td>
<td>Arm-Rear, Pivot, LH</td>
</tr>
<tr>
<td>10</td>
<td>2</td>
<td>Arm-Spring, Rear</td>
</tr>
<tr>
<td>11</td>
<td>2</td>
<td>Knob-Lever, HOC</td>
</tr>
<tr>
<td>12</td>
<td>2</td>
<td>Retainer-Bearing, HOC</td>
</tr>
<tr>
<td>13</td>
<td>2</td>
<td>Bearing-Ball</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ref. No.</th>
<th>Qty</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>2</td>
<td>Spring-Compression</td>
</tr>
<tr>
<td>15</td>
<td>2</td>
<td>Key</td>
</tr>
<tr>
<td>16</td>
<td>1</td>
<td>Transmission ASM</td>
</tr>
<tr>
<td>17</td>
<td>1</td>
<td>Washer-Shield</td>
</tr>
<tr>
<td>18</td>
<td>1</td>
<td>Bracket-Transmission</td>
</tr>
<tr>
<td>19</td>
<td>2</td>
<td>Screw-HWH</td>
</tr>
<tr>
<td>20</td>
<td>1</td>
<td>Spacer</td>
</tr>
<tr>
<td>21</td>
<td>2</td>
<td>Pulley-Half</td>
</tr>
<tr>
<td>22</td>
<td>1</td>
<td>V-Belt</td>
</tr>
<tr>
<td>23</td>
<td>1</td>
<td>Washer-Flat</td>
</tr>
<tr>
<td>24</td>
<td>1</td>
<td>Nut-Lock</td>
</tr>
<tr>
<td>25</td>
<td>1</td>
<td>Shield-Trailing</td>
</tr>
<tr>
<td>27</td>
<td>1</td>
<td>Washer</td>
</tr>
<tr>
<td>28</td>
<td>1</td>
<td>Arm-Rear Pivot, RH</td>
</tr>
</tbody>
</table>
Transmission Removal & Belt Replacement

The following steps will show one method of replacing the belt or removing the transmission on the Lawn-Boy Insight mowers.

1. Prepare the mower. Drain the gas and oil and disconnect the spark plug wire.

2. Remove two screws that secure the rear cover (Fig. 090).

3. Remove the 3 belt cover screws (Fig. 091).

4. The belt cover will drop off the bottom (Fig. 092).

5. If you have an electric start model, remove the battery and battery box.

6. Clamp the axle with a locking pliers and remove the nut from the transmission pulley. If you are using an air wrench, you may not need to hold the axle (Fig. 093).
7. Lift the top half of the transmission pulley off. If just replacing the belt, push the belt into the cutting chamber and slip the belt over the blade. Reverse the process to install the new belt (Fig. 094).

Note: Do not get anti-seize on the belt or the drive will slip.

9. Bend the trailing shield slightly in the middle and remove it from the mower. Rotate both rear spring arms down to disengage them from the mower housing (Fig. 096).

If the transmission is to be removed, continue:

8. Support the back of the mower on a wood block and remove the rear wheels (Fig. 095).

10. Remove klip ring, thrust washer, pinion, key spring and thrust washer (Fig. 097).
11. Remove klip ring, keyed thrust washer, and standard thrust washer (left side of mower has the standard thrust washer, right side does not) (Fig. 098).

13. Push the bearings and bearing retainers inward, towards the transmission (Fig. 100).

12. Remove the snap ring, pivot arm and spring arm (Fig. 099).

14. Unhook the traction cable from the transmission belt guide (Fig. 101 and Fig 102).
15. Remove the nut, washer, 2 pulley halves, and spacer from the transmission input shaft. Remove 2 screws securing the belt guide to the transmission (Fig. 103).

16. Push the transmission to the left, as shown, and rotate to clear the tunnel. Drop the left side down, then pull the assembly out to the left side (Fig. 104).

17. The last step is to slide the bearings and bearing retainers off the axle (Fig. 105).

A. 2 screws on top of transmission
B. Spacer
C. Pulley half
D. Pulley half
E. Washer
F. Nut
Transmission Disassembly

1. Remove the 4 screws holding the cover on the transmission. The axle, bearings, and bevel gear can be lifted out (Fig. 106).

2. Since the pulley was previously removed, the input shaft will now slip out of the transmission case.

3. If the input bearing is to be removed, press it out now.

4. Slide the bearings and thrust washer off the axle. Drive the roll pin out and the bevel gear can then be removed (Fig. 107).

Transmission Assembly & Installation

Assemble in reverse order. See Axle Assembly and Installation Tips following.

Axle Assembly Tips

1. The same axle is used for both front and rear wheel drive models. There are two holes in the axle about one inch apart.

   Rear wheel drive models use the hole about 4-3/4” (12cm) from the end. Slip the gear on such that the teeth and the longest hub face the short end of the axle. Drive the pin into place. A double check is that neither of the pin holes should be visible when the gear is installed (Fig. 108).
2. Install the thrust washer on the side of the gear with the shortest hub, away from the gear teeth (Fig. 108).

3. Install the transmission bearings with the flange facing the gear (Fig. 109).

4. Fill the transmission approximately 2/3 full with #2 Lithium base grease (1.5 oz or 43gm).

5. Assemble the bearings and bearing retainers; install the transmission in the housing (Fig. 110).

Transmission Installation Tips

1. Reconnect the cable to the belt guide and install the washer and spacer before installing the guide on the transmission.

2. Install the snap rings and klip rings with the sharp side out (in the direction of the force). The left end of the axle uses the extra thrust washer, the one without the tab. Install the snap ring, the regular thrust washer then the thrust washer with the tab.

3. Coat the axle, key, and spring with #2 molybendum disulfide grease or anti-seize compound before installing the pinion (Fig. 111).
SINGLE SPEED BEVEL GEAR TRANSMISSION

4. The wheel pinion is marked with an R and L for right and left. Identify right and left from the operator’s position (Fig. 112). On the right side, the R should face outward. The letter L should face outward on the left side. If the wheel pinions are reversed, the wheels will not drive.

5. Make sure the stepped washer is properly seated in the wheel cover. The best way is to assemble the wheel, wheel cover, and wheel bolt, then put them all on the mower together.

6. Do not use an impact wrench on the crankshaft belt guide screws. Over-tightening can cause the belt guide to deform and cause the belt not to declutch properly. Tighten firmly with a ratchet.

7. When installing the rear cover, note the bosses on the back side of the cover. They must go behind the notch in the chassis to secure the cover. The top of the cover is retained with screws (Fig. 113).

Note: Wheel Clutch Service - see Spring Ratchet Key Style Clutch, page 5-8. Control Cable Adjustment - see Handles & Control Cables.
THREE SPEED TRANSMISSION

1. Worm Drive Transmission

2. Single Speed Spur/Bevel Gear Transmission

3. Single Speed Bevel Gear Transmission

4. Three Speed Transmission

5. Wheel Pinion Clutch


7. Handles and Control Cables

8. Self-Propel Belt Replacement
THREE SPEED TRANSMISSION

GEARCASE ASSEMBLY

![Image of Gearcase Assembly]

<table>
<thead>
<tr>
<th>Ref. No.</th>
<th>Qty</th>
<th>Description</th>
<th>Ref. No.</th>
<th>Qty</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>Pinion-25T</td>
<td>21</td>
<td>1</td>
<td>Bushing - Yoke</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>Pinion-20T</td>
<td>22</td>
<td>1</td>
<td>Retainer - Fork, Shift</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>Gear-15t Spur, 37t Bevel</td>
<td>23</td>
<td>1</td>
<td>Shaft - Output</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
<td>Washer - Thrust</td>
<td>24</td>
<td>1</td>
<td>Yoke - Shift</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td>Bushing</td>
<td>26</td>
<td>1</td>
<td>Spacer</td>
</tr>
<tr>
<td>8</td>
<td>1</td>
<td>Bushing - Output</td>
<td>27</td>
<td>2</td>
<td>Pulley - Half</td>
</tr>
<tr>
<td>9</td>
<td>1</td>
<td>Washer</td>
<td>28</td>
<td>1</td>
<td>Gear - Pinion, Bevel</td>
</tr>
<tr>
<td>11</td>
<td>1</td>
<td>Gear-49 T</td>
<td>29</td>
<td>1</td>
<td>Nut - Lock NI</td>
</tr>
<tr>
<td>12</td>
<td>1</td>
<td>Gear-44 T</td>
<td>30</td>
<td>1</td>
<td>Washer - Flat</td>
</tr>
<tr>
<td>13</td>
<td>1</td>
<td>Gear-39 T</td>
<td>31</td>
<td>1</td>
<td>Bearing - Ball</td>
</tr>
<tr>
<td>14</td>
<td>1</td>
<td>Sleeve - Gear</td>
<td>32</td>
<td>1</td>
<td>Bushing - Output</td>
</tr>
<tr>
<td>15</td>
<td>1</td>
<td>Pin - Spring</td>
<td>34</td>
<td>1</td>
<td>Collar - Shift</td>
</tr>
<tr>
<td>17</td>
<td>1</td>
<td>Shaft - Intermediate</td>
<td>36</td>
<td>1</td>
<td>Clip - Spring</td>
</tr>
<tr>
<td>18</td>
<td>1</td>
<td>Case - Gear, Upper</td>
<td>37</td>
<td>1</td>
<td>Sleeve - Key, Shift</td>
</tr>
<tr>
<td>19</td>
<td>1</td>
<td>Cover - Case, Gear</td>
<td>38</td>
<td>2</td>
<td>Key - Shift</td>
</tr>
<tr>
<td>20</td>
<td>6</td>
<td>Screw - Tapping</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Fig 114

gearcaseassy
OPERATION

Input System:

Power is transferred from the engine to the transmission by a belt. The self-propel pulley at the engine is keyed to the crankshaft. The pulley on top of the transmission is supported by a ball bearing and drives a pinion gear inside the transmission. Tensioning of the belt is accomplished by pivoting the transmission. When the operator squeezes the control bar toward the handle, a control cable tilts the transmission backward and tensions the belt. When the control bar is released, gravity pivots the transmission forward to loosen the belt.

Belt guides at the engine pulley and atop the transmission ensure disengagement by forcing the belt to loop around the engine pulley (Fig. 115).

Speed Reduction System:

Speed reduction is accomplished by two sets of gears – one set on the intermediate shaft and the other set on the output shaft. The gears on the intermediate shaft are powdered metal and ride on a hexagonal shaft supported on each end by oil impregnated bushings. These gears are driven by the pinion at the bottom of the input shaft. The driven bevel gear turns the shaft so that all three gears on the intermediate shaft have the same rotational velocity (Fig. 116).

![Fig 115](image1.png)

![Fig 116](image2.png)

A. Intermediate shaft & gears  
B. Bevel gear  
C. Shift key  
D. Gear sleeve  
E. Output shaft & gears
There are also three gears on the output shaft. These three gears rotate freely on the gear sleeve. The gear sleeve is coupled to the output shaft with a roll pin so the gear sleeve always rotates with the output shaft. The gear selection system determines which one of these three gears will be coupled with the gear sleeve and the output shaft. This determines the final drive ratio.

Gear Selection System:

Gear selection is determined by moving sliding shift keys in a sleeve that is fixed to the output shaft. These keys engage one of the three gears that rotate on the gear sleeve. Once the key engages one of the gears, that gear will rotate the output shaft. Table 1 shows approximate speeds in gears for two different engine speeds.

Table 1

<table>
<thead>
<tr>
<th>Gear</th>
<th>Ground Speed @ 3000 RPM</th>
<th>Ground Speed @ 2000 RPM</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.8 mph (2.9km/h)</td>
<td>1.2 mph (1.9km/h)</td>
</tr>
<tr>
<td>2</td>
<td>2.7 mph (4.4km/h)</td>
<td>1.8 mph (2.9km/h)</td>
</tr>
<tr>
<td>3</td>
<td>3.8 mph (6.1km/h)</td>
<td>2.5 mph (4.3km/h)</td>
</tr>
</tbody>
</table>

The operator controls movement of the shift fork by means of the gear selection control and cable.

Note: There are no shift detents in or on the transmission on 1988 and newer mowers.
Removal - Toro Vacu Power/Lawn-Boy Medallion Models

Complete transmission removal on the Toro Vacu Power/Lawn-Boy Medallion mower is quite easy and is recommended for most self-propel system repairs.

1. Remove the spark plug lead from the engine to prevent accidental starting. Drain the fuel and oil.

2. Place the ground speed selector in neutral. This will make it easier to remove the speed selection cable later.

3. Remove the two flanged head self-tapping screws securing the screen panel to the housing and remove the panel (Fig. 118).

4. Remove the black plastic transmission cover from the top rear of the housing.

5. Remove the two flanged head self-tapping screws securing the belt cover to the top of the transmission. Pull the cable from belt guide and remove the belt guide.

6. Remove the transmission access cover from the rear of the housing by pressing from underneath.

7. Loosen the gear selection control cable clamp screw until the cable comes free. Do not attempt to remove the gear selection cable from the control arm at this time.

8. Turn the mower onto its right side and remove the four flanged head self-tapping screws securing the end caps to the housing (Fig. 119).

9. Slowly pull the transmission from the housing being very careful not to damage the gear selection cable. Once clear of the housing, rotate the assembly until the cable can be safely removed.
THREE SPEED TRANSMISSION

Removal - Recycler/Rear Bagger Chassis

To remove the transmission from the chassis, raise the rear and support it with blocks.

1. Remove both rear wheels and wheel covers.

2. Remove the rocking key clutches (see “Wheel Pinion Clutch” on page 5-3).

3. Slide the pivot arm and spring arm off the axles.

4. Remove the belt cover. Loosen the belt guide and slip the belt off the pulley. Disconnect shift and clutch cables.

5. Slide the transmission to the right to slip the short end of the axle out of the chassis.

Alternate Method

1. Pivot both spring arms until they point straight.

2. Remove belt cover and belt.

3. Disconnect shift and clutch cables.

4. Remove 4 self-tapping screws securing end caps to housing (Fig. 120).

Disassembly

Inspection of this transmission can be accomplished without removing the pivot arm assembly from the output shaft. Only if components on the output shaft require replacement will pivot arm removal be necessary.

1. Remove the six flanged head self-tapping screws securing the transmission cover to the transmission case. Remove the cover (Fig. 121).

2. Before disassembling further, check for proper operation of the input system, the gear reduction system and gear selection system. For more information on this, refer to “OPERATION” on page 4-3.
3. Removal of the input shaft and pulley assembly can be difficult because the input pinion has a tendency to turn as the pulley nut is loosened. This situation can be addressed by using an impact wrench or by removing the 20 (B) and 25 (A) tooth gears (Fig. 122) from the intermediate shaft and then putting the intermediate shaft assembly back onto the transmission. The hexagonal intermediate shaft can then be held with a 7/16” end wrench while the pulley nut is loosened.

**Note:** A cut-away transmission cover can be fabricated to hold the intermediate shaft in place to facilitate pulley nut removal.

5. Remove the cotter pin from the top of the shift fork and remove the shift lever.

6. Carefully pull the output shaft from the transmission case, clean, and inspect all components for wear or damage. Check the input shaft ball bearing for roughness or excessive drag and replace any parts necessary. If ball bearing replacement is required, press the ball bearing out using an arbor press.

7. If service of any of the output shaft gears, or the gear selection system, is required, remove the left pivot arm as described under “Rear Height-of-Cut and Wheel Pinion Clutch – Disassembly” on page 5-4 and 5-5.

**Note:** It is possible to replace the shift keys and spring clip without removing the pivot arm if the roll pin securing the gear sleeve to the output shaft is first driven out. However, it is not recommended since inspection of the inside of the output gears is not possible.

8. Pull the output shaft bushing, the spacer, the shift collar, the shift keys and spring clip, and the shift key sleeve from the output shaft.

9. Remove the three output shaft gears from the output shaft.

10. Drive out the roll pin securing the gear sleeve to the output shaft. Remove the gear sleeve and remaining output shaft bushing. Inspect all parts for wear and damage and replace if necessary.

### Transmission - Assembly

The transmission uses 6 oz. (177cc) No. 2 lithium-based grease as a lubricant. When assembling, be sure to coat all moving components with grease to ensure proper lubrication.
THREE SPEED TRANSMISSION

Output Shaft Assembly

1. Slide the output bushing onto the output shaft, flanged side last. Assemble from the end of the shaft closest to the hole for the roll pin.

2. Slide the gear sleeve onto the output shaft, tabs last and secure with a new roll pin.

3. Apply a light coat of lithium-based grease on the output shaft under the output busing, on the gear sleeve, and on the three output shaft gears. Slide the three output shaft gears onto the gear sleeve, notched sides last.

4. Slide the nylon shift key sleeve onto the output shaft, large end first. Make sure that it engages the tabs on the gear sleeve (Fig. 123).

5. Coat the shift key sleeve with grease and prepare the shift keys, shift collar, and spring clip for assembly as shown in Figure 124.

6. Slide the shift key assembly into the shift key sleeve until the shift collar bottoms out.

7. Complete the output shaft assembly by sliding a spacer washer and the other output bushing, flanged side first, onto the output shaft. Don’t forget to coat these components with a light coat of grease (Fig. 125).
8. If the left pivot arm was removed for servicing, reassemble now as described under “Rear Height-of-Cut and Wheel Pinion Clutch – Assembly” on page 5-5.

**Input Shaft Assembly**

1. If the input bearing was removed, press a new one into the gearcase using an arbor press. Press only on the outer race or bearing damage may result.

2. Slide the input shaft and pinion through the ball bearing and assemble the spacer and two pulley halves as shown in Figure 126. Install a flat washer and a nylon locknut finger tight.

3. The input pulley nut can be tightened after complete transmission assembly, or at this point using the process in step 3, under Disassembly, page 4-7.

4. Slip the shift fork into the slot on the shift collar and place the shift fork and output shaft assembly into the transmission.

**Note:** The long end of the shift fork shaft should go through the hole in the gearcase. Make sure that the output bushings are trapped in the proper locations. Note that the larger output bushing holes on the longer end of the shaft and the shorter output bushing goes on the shorter end of the shaft.

5. Slide the yoke bushing onto the lower end of the shift fork, then secure the shift fork with the white nylon shift fork retainer (Fig. 127).

---

![Figure 126](image1.png)

**Fig 126**

A. Pulley
B. Spacer
C. Ball bearing
D. Pinion

![Figure 127](image2.png)

**Fig 127**

A. Intermediate shaft
B. Flange
C. Shift fork retainer

---

WPM Drive Systems Manual 4-9
THREE SPEED TRANSMISSION

Intermediate Shaft Assembly

Note: Before assembling, coat the intermediate shaft with No. 2 lithium-based grease. Apply a light bead of lithium-based grease to flange.

1. Slip an intermediate shaft bushing onto the left end of the intermediate shaft, flanged end first (Fig. 128).

2. Slide the intermediate shaft gears onto the intermediate shaft in this order:
   a. 25 tooth gear
   b. 20 tooth gear
   c. 15 tooth gear/bevel gear

3. Slide 2 spacer washers onto the intermediate shaft next to the bevel gear and follow with an intermediate shaft bushing, flanged side first.

4. Drop the intermediate shaft into the gearcase, making sure that all gears engage properly.

5. Fill the gear case with 6 oz. (177cc) of No. 2 lithium-based grease, then install the cover with the six flanged head self-tapping capscrews.

6. Secure the input pulley nut.

Installation

For assembly, reverse the removal process.

Torque the belt guide fasteners to 130 in-lbs. (15 Nm) (Fig. 129).
Special Assembly Notes for Toro Vacu Power/Lawn-Boy Medallion

1. Slip the gear selection cable into the shift fork lever through the bottom as shown in Figure 130.

2. Bring the transmission assembly into position underneath the deck, making sure that the end caps are on the outside of the housing. Before securing, install the shift fork control arm onto the shift fork and secure with the cotter pin. Place the transmission and pivot arm assembly into the deck.

3. Loosely install the two front end cap fasteners.

4. Slip the two rear end cap fasteners through the safety shield guide wires then install. Tighten all four end cap fasteners (Fig. 131).

Note: End cap fastener torque: 225 in-lbs. (26 Nm)

5. Slip the traction belt into position on the transmission pulley. Make sure that it does not bind on any of the bosses.

6. Slip the end of the traction cable into the belt guide bracket from the outside. Install the belt guide bracket onto the top of the transmission, making sure that the traction belt is inside the guide.

Note: Belt guide fastener torque: 130 in-lbs. (15 Nm)

7. Slip the black plastic transmission cover into place making sure that the belt falls in the appropriate grooves. Install the upper BBC cover with the two flanged head self-tapping capscrews. Make sure that the top edge is trapped underneath the lip of the housing.
TROUBLESHOOTING TIPS - 3 SPEED TRANSMISSION

Hard Shifting

A raised boss molded into each gear causes the leading edge of the key to depress before it can enter the next gear (Fig. 132).

The ring on the shift collar end of the key holds the drive end of the key up. If dried grease or dirt keeps the keys from rocking up and down, the force required to shift gears will increase. Check the cable for free movement where it enters the transmission. These are quick checks and should be made before opening the transmission.

Slipping Gears

The actual gears are in constant mesh. Unless gear teeth are broken off, they cannot slip. If the wheels lurch forward, then pause and lurch again, along with a loud bang each time, the keys might be slipping.

Look at the key and the notch in the gear that it engages. Excessive wear to the tip of the key or the notch in the gear may be the problem (Fig. 133).

If the forces push straight on the key, it will drive the axle. However, if due to wear the force tries to depress the key, it can lower enough to disengage from the notch in the gear (Fig. 134).
Worm Drive Transmission

Single Speed Spur/Bevel Gear Transmission

Single Speed Bevel Gear Transmission

Three Speed Transmission

Wheel Pinion Clutch

Blade Brake Clutch Systems (BBC), Blade Override System (BOS), Blade Clutch Systems (BCS)

Handles and Control Cables

Self-Propel Belt Replacement
## WHEEL PINION CLUTCH

### GEARCASE AND WHEEL ASSEMBLY, ROCKING KEY STYLE

![Fig 135 gearcase wheel assy](image)

<table>
<thead>
<tr>
<th>Ref. No.</th>
<th>Qty</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>V-Belt</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>Lever-Shift</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>Pin-Cotter</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>Clamp-Cable</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td>Cap-End</td>
</tr>
<tr>
<td>6</td>
<td>2</td>
<td>O-Ring</td>
</tr>
<tr>
<td>7</td>
<td>2</td>
<td>Spring Arm ASM</td>
</tr>
<tr>
<td>8</td>
<td>2</td>
<td>Pivot Arm ASM</td>
</tr>
<tr>
<td>8:2</td>
<td>1</td>
<td>Bushing</td>
</tr>
<tr>
<td>8:3</td>
<td>1</td>
<td>Bushing</td>
</tr>
<tr>
<td>8:4</td>
<td>1</td>
<td>Fitting-Zerk</td>
</tr>
<tr>
<td>9</td>
<td>2</td>
<td>Washer-Arm, Pivot</td>
</tr>
<tr>
<td>10</td>
<td>4</td>
<td>Washer-Thrust, Keyed</td>
</tr>
<tr>
<td>11</td>
<td>4</td>
<td>Ring-Klip</td>
</tr>
<tr>
<td>12</td>
<td>2</td>
<td>Ring-Friction</td>
</tr>
<tr>
<td>13</td>
<td>2</td>
<td>Washer-Clutch</td>
</tr>
<tr>
<td>14</td>
<td>1</td>
<td>Key-Rocking, LH</td>
</tr>
<tr>
<td>15</td>
<td>1</td>
<td>Key-Rocking, RH</td>
</tr>
<tr>
<td>16</td>
<td>2</td>
<td>Gear-Pinion</td>
</tr>
<tr>
<td>17</td>
<td>2</td>
<td>Spring-Compression</td>
</tr>
<tr>
<td>18</td>
<td>2</td>
<td>Cover-Wheel</td>
</tr>
<tr>
<td>19</td>
<td>2</td>
<td>Spacer-Cover, Wheel</td>
</tr>
<tr>
<td>20</td>
<td>2</td>
<td>Wheel ASM</td>
</tr>
<tr>
<td>20:1</td>
<td>2</td>
<td>Bushing</td>
</tr>
<tr>
<td>21</td>
<td>1</td>
<td>Screw-HH</td>
</tr>
<tr>
<td>22</td>
<td>2</td>
<td>Knob-Arm</td>
</tr>
<tr>
<td>23</td>
<td>2</td>
<td>Screw-HH</td>
</tr>
<tr>
<td>24</td>
<td>2</td>
<td>Nut</td>
</tr>
<tr>
<td>25</td>
<td>2</td>
<td>Bolt-Shoulder</td>
</tr>
<tr>
<td>26</td>
<td>2</td>
<td>Output Shaft</td>
</tr>
<tr>
<td>27</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

*Not illustrated*
Wheel Pinion Clutch

The wheel pinion clutch has a three-fold purpose. One, when the transmission is engaged, it causes the pinions to move with the output shaft and drives the wheels. Two, it provides differential action to allow easy turning and excellent maneuverability. Three it disengages the wheel pinions from the output shaft when the operator is not squeezing the handle. This allows the wheels to turn backwards without turning the gears inside the transmission and provides low pull back forces similar to those on a hand-push version (Fig. 136).

Component Definitions

27. Output Shaft – turns when the operator squeezes the handle to provide power to the wheels.

8. Pivot Arm Assembly – provides support for the output shaft with a bushing and a needle bearing. It can be rotated in the end cap to change height-of-cut.

9. Washer Pivot Arm – fits in corresponding recesses on the pivot arm to protect pivot arm from premature wear.

10. Keyed Thrust Washer – internal tab fits in the keyway on the output shaft. This washer rotates with the output shaft and protects outboard clutch components from wear.

11. Clip Ring – fits in a groove on the output shaft to retain the pivot arm and spring arm. The tab at the center of the clip is extended and fits in the keyway of the output shaft to prevent rotation. If an E-clip is substituted, premature failure of the wheel pinion clutch system will result.

12. Friction Ring – fits in a circular groove in the pivot arm and works with the clutch washer to actuate the key. It does not rotate.

13. Clutch Washer – is affixed to the output shaft by means of the key so it turns with the output shaft. It is also allowed to rotate slightly with respect to the output shaft. This slight back and forth rotation actuates the wheel pinion key. Friction between the clutch washer and friction ring causes the clutch washer to lag the output shaft slightly once it is engaged. That slight rotation is all that is necessary to raise the wheel pinion key and engage the pinion.

14. LH Rocking Key – causes the wheel pinion to turn with the output shaft when up. Allows the wheel pinion to “free-wheel” when down. Clutch washer brings key up. Wheel pinion turning forward “wipes” key down. There is a left-hand and right-hand key.

15. RH Rocking Key – causes the wheel pinion to turn with the output shaft when up. Allows the wheel pinion to “free-wheel” when down. Clutch washer brings key up. Wheel pinion turning forward “wipes” key down. There is a left-hand and right-hand key.

16. Pinion Gear – positively engages the wheel gear at all times. Engagement with the output shaft is controlled by the wheel pinion key. The wheel pinion is a powdered metal part and is symmetrical so that it can be put on either way and still function properly.
17. Compression Spring – provides the light, constant, inward force necessary for proper clutch washer and friction ring engagement.

It is extremely important that the wheel pinion clutch be maintained according to the instructions in the operator’s manual, which is greasing every 25 hours with one or two pumps of grease. Greasing regularly will prevent contaminants from damaging or wearing the system.

Note: Over-greasing will also cause the system to malfunction.

Test for Function

Function

The rocking keys provide a differential action by engaging and disengaging each drive wheel individually.

When the drive is engaged and the axle begins to turn, friction between the friction ring and clutch washer cause them to rotate the tail on the key. This results in the main part of the key engaging the teeth on the inside of the pinion gear.

Should one or both wheels turn faster than the axle, the pinion rotates and pushes the key back down into the groove. The pinion can now roll freely over the key. When turning the inside wheel will drive the mower. The outside wheel must turn faster and overrides the key. When the mower is straightened out the pinion is no longer turning faster than the axle so the key re-engages the pinion.

Quick Test

If you are unsure that the keys are disengaging properly, stop the mower, shut the engine off and push the mower forward a few inches. If the keys disengage the system is working correctly. Start the engine and engage the drive, if both engage they are ok. If one or the other do not engage or disengage properly try greasing the pivot arm. Use #2 lithium grease and only one or two pumps from a hand grease gun. If grease does not help disassembly is necessary.

Rear Height-of-Cut and Wheel Pinion Clutch - Disassembly

The rear height-of-cut system and the wheel pinion clutch can be serviced with the transmission in or out of the unit. For information on removing the transmission from the unit, see Transmission – Removal, page 2-3, 4-5 or 4-6 depending on mower type.

1. Remove the shoulder bolt securing the wheel and tire assembly to the pivot arm and remove the wheel and tire assembly complete with shoulder bolt, spacers, wheel cover, and nylon locknut.
2. Remove the special retaining clip at the end of the output shaft and pull off the following six wheel pinion clutch components:
   - Spring
   - Internally tabbed thrust washer
   - Wheel pinion
   - Wheel pinion key
   - Clutch washer
   - Friction ring

3. Remove the inner special retaining clip from the output shaft and remove the following components:
   - Internally tabbed thrust washer
   - Externally tabbed thrust washer
   - Pivot arm and spring arm assembly
   - End cap (if desired)

4. Check all components at this time for damage and wear. Pay particular attention to the grooves at the end of the output shaft, the bearing surfaces on the output shaft, and the wheel pinion clutch components. Replace parts as necessary.

5. Check the innermost groove on the output shaft which is located 2-1/4" (5.7cm) in from the end of the shaft; make sure that the O-ring seal is present and intact. This seal is important to keep grease in and contaminants out. Replace it (Item 6) if necessary (Fig. 137). Some models do not have this O-ring.

6. Press the needle bearing and the oil impregnated bushing from the pivot arm using an arbor press.

7. Removal of the grease fitting is not recommended because it is pressed in. However, if damaged or lost, we suggest tapping and installing a threaded grease fitting.

8. If the spring arm knob requires replacement, push in on the detent tab, then pull the knob straight off.

Note: The detent rivet is not replaceable.

Rear Height-of-Cut and Wheel Pinion Clutch - Assembly

1. Pack the caged needle bearing with grease, then press into the outside of the pivot arm until it is flush with the groove that houses the externally tabbed thrust washer.

2. Press the oil impregnated bushing into the boss on the pivot arm until it is flush with the face of the boss.

3. If spring arm disassembly was required, install the knob making sure that the detent is pressed out about .060" (1.5mm). Install the spring arm knob so that the concave side of the knob and the convex side of the rivet align.
WHEEL PINION CLUTCH

4. Assemble the spring arm and pivot arm as shown in Figure 138.

5. To increase service life, make sure all parts are clean prior to assembly and coated with new grease.

6. If removed, install a new O-ring in the innermost groove 2-1/4” (5.7cm) in from the end on each output shaft, making sure that it is fully seated in the groove. Refer to Figure 000 (3428-0028) above. Not all models use an O-ring.

7. Slip the end cap onto the output shaft, but do not fasten at this time.

8. Slide the pivot arm and spring arm assembly onto the output shaft, boss first.

9. Slide the externally tabbed thrust washer and the internally tabbed thrust washer onto the output shaft. Make sure that the tab on the internally tabbed thrust washer enters the keyway. Secure with the special retaining clip. Make sure that the center tab fits properly into the keyway. This will prevent rotation of the clip on the output shaft.

10. Place the friction ring into the groove on the pivot arm, flat side out.

11. Slide the clutch washer onto the shaft so that the recesses for the key are facing out.

12. Place the wheel pinion key in the groove on the output shaft with the leg toward the clutch washer.

**Note:** There is a left and a right wheel pinion key. You are using the correct key if, when placed in the groove, the top of the key is flat and the straight portion of the leg is perpendicular to the shaft.

Before assembling further, rotate the clutch washer back and forth slightly, making sure that the key actuates properly (Fig. 139).

**Note:** The convex side of the spring arm rivet and the concave side of the knob on the spring arm should both be facing the housing.
13. Place the wheel pinion onto the output shaft. It is symmetrical and can be put on either way.

14. Install the internally tabbed thrust washer onto the output shaft making sure that the tab enters the keyway.

15. Slip the spring onto the end of the output shaft and secure with the special retaining clip. Again, make sure that the center tab fits properly into the keyway to prevent rotation of the clip (Fig. 140).

16. Slip the wheel, the original number of spacers, and the wheel cover onto the shoulder bolt and secure to the pivot arm using the nylon locknut.

17. Grease with No. 2 lithium-based grease. Use a hand grease gun to avoid excess pressure that may prevent the friction parts from working. As a rule, use two pumps to ensure that you do not over-grease. Be sure to grease after every 25 hours of use for maximum service life.
WHEEL PINION CLUTCH

GEARCASE AND WHEEL ASSEMBLY, SPRING RATCHET STYLE

<table>
<thead>
<tr>
<th>Ref. No.</th>
<th>Qty</th>
<th>Description</th>
<th>Ref. No.</th>
<th>Qty</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>Bolt-Shoulder</td>
<td>14</td>
<td>2</td>
<td>Spring-Compression</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>Wheel Gear ASM</td>
<td>15</td>
<td>2</td>
<td>Key</td>
</tr>
<tr>
<td>2:1</td>
<td>2</td>
<td>Bushing</td>
<td>16</td>
<td>1</td>
<td>Transmission ASM</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>Klipring-Locking</td>
<td>17</td>
<td>1</td>
<td>Gasket-Gearbox</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
<td>Gear-Pinion, 13T</td>
<td>18</td>
<td>2</td>
<td>Screw-HWH</td>
</tr>
<tr>
<td>5</td>
<td>6</td>
<td>Washer-Thrust</td>
<td>19</td>
<td>1</td>
<td>Bracket-Pivot, Fwd</td>
</tr>
<tr>
<td>7</td>
<td>2</td>
<td>Cover-Wheel</td>
<td>20</td>
<td>2</td>
<td>Screw-HWH</td>
</tr>
<tr>
<td>7:1</td>
<td>1</td>
<td>Cover</td>
<td>21</td>
<td>1</td>
<td>Spacer</td>
</tr>
<tr>
<td>7:2</td>
<td>1</td>
<td>Washer-Stepped</td>
<td>22</td>
<td>1</td>
<td>V-Belt</td>
</tr>
<tr>
<td>8</td>
<td>2</td>
<td>Arm-Pivot, Front</td>
<td>23</td>
<td>2</td>
<td>Pulley-Half, Front</td>
</tr>
<tr>
<td>9</td>
<td>2</td>
<td>Arm-Spring</td>
<td>24</td>
<td>1</td>
<td>Washer-Flat</td>
</tr>
<tr>
<td>10</td>
<td>2</td>
<td>Knob-Lever, HOC</td>
<td>25</td>
<td>1</td>
<td>Nut-Lock</td>
</tr>
<tr>
<td>11</td>
<td>2</td>
<td>Ring-Retaining</td>
<td>26</td>
<td>1</td>
<td>Cover-Belt, Front</td>
</tr>
<tr>
<td>12</td>
<td>2</td>
<td>Retainer-Bearing, HOC</td>
<td>27</td>
<td>1</td>
<td>Washer</td>
</tr>
<tr>
<td>13</td>
<td>2</td>
<td>Bearing-Ball</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Fig 141
Spring Ratchet Style

The Spring Ratchet type wheel clutch system has been used on a wide variety of models. It consists of a spring supporting a drive key which engages the pinion. When the mower drive is engaged the axle turns the key which is engaged with an internal tooth on the pinion. The pinion turns the wheel gear. When the mower is pushed or turned, the pinion must rotate faster than the axle. As the pinion rotates it depresses the key, allowing the differential action.

The axle drives both keys and pinions equally but they will ratchet individually. When the mower is pulled backwards, this type of clutch does not disengage. It will require the axle and transmission to turn backwards. It is critical to easy backing to make sure the self propel belt properly disengages.

Servicing the System

The things that can impede the function are dirt, rust or wear. The owner's manual requires that ordinary engine oil be added to each side of the pinion periodically. This is to keep the anti seize from drying up. If that is not done, it will be necessary to remove the pinion, key and spring to clean and re-lubricate with anti-seize compound.

On the left side there will be two keyed thrust washers and one regular thrust washer. Clean the end of the axle, keyway, and the parts removed. Inspect the key; if worn, replace. Make sure the thrust washers have the key tab on them. If the tab is broken, the pinion will tend to push the retaining rings out of their grooves.

Lubricate the key, spring, and axle with anti-seize compound and reassemble. Note the pinion has the letter "R" stamped on one side and "L" on the other. If you are on the right side of the mower, the letter "R" should face you when you install the pinion. The letter "L" should be visible on the left side of the mower.

WHEEL PINION SERVICE

The steps to service the wheel pinions are the same for both front and rear wheel drive models.

1. Raise the mower until the wheel is off the ground. Support with a block.

2. Remove the wheel bolt, wheel and wheel cover (Fig. 142).

3. Remove the retaining ring and thrust washer (Fig. 143).
4. Slide the wheel pinion off the axle.

**Note:** There is a spring-loaded key under the pinion (Fig. 144).

5. Behind the pinion should be another thrust washer and retaining ring (Fig. 000). (MVC-850)

Reassemble in reverse order:

1. Install one thrust washer, then the first retaining ring with the sharp edge facing the chassis (Fig. 145).

2. Lubricate with anti-seize and assemble in the original order.
Worm Drive Transmission

Single Speed Spur/Bevel Gear Transmission

Single Speed Bevel Gear Transmission

Three Speed Transmission

Wheel Pinion Clutch

Blade Brake Clutch Systems (BBC), Blade Override System (BOS), Blade Clutch Systems (BCS)

Handles and Control Cables

Self-Propel Belt Replacement
BLADE BRAKE CLUTCH SYSTEM (BBC)

Description

There are two basic blade clutching system designs. The first is commonly referred to as the BBC or Blade Brake Clutch. It has two versions which have been used on many Toro models as well as Lawn-Boy Medallion mowers. The second design was introduced in 2005 and is used on Toro (Blade Override System) and Lawn-Boy (Blade Clutch System) (Fig. 146 and Fig. 147).

The clutch operates by using a flywheel which turns with the engine crankshaft and a brake drum and blade that are free to turn separately from the flywheel. The two are connected by tensioning a drive belt between the flywheel and brake drum. The combination idler arm and brake controls the belt. When the control is engaged, the idler with the brake pad backs away from the brake drum and tightens the belt. When the control is released, a spring causes the idler to pivot towards the brake drum releasing the belt and engaging the brake. This stops the blade but allows the flywheel and crankshaft to continue to turn.

BBC Clutch Operation

The BBC control mechanism’s purpose is to actuate the deck mechanism. It does this by tensioning and loosening the BBC cable. The control mechanism meets the federal government’s “2-step” blade engagement procedure. The traction drive can also be integrated with this control system.

Before troubleshooting the BBC deck mechanism, be sure that it is adjusted properly. Refer to the BBC cable adjustment section for proper adjustments.

BBC Control Box Operation

The BBC control mechanism’s purpose is to actuate the deck mechanism. It does this by tensioning and loosening the BBC cable. The control mechanism meets the federal government’s “2-step” blade engagement procedure. The traction drive can also be integrated with this control system.
The normal or "at rest" position of the control bar is indicated by the number 1 in the Figure 148. In order to engage the blade, the operator must first "cock" the control bar down to position 2, then raise the control bar to position 3.

Notice that position 3 is approximately 5" (12cm) below the handle. This distance between position 3 and the handle is reserved for engagement of the transmission on those models equipped with self-propel. On units without self-propel, the control bar can be lifted to the handle without affecting operation of the BBC system.

After engagement of the blade, release of the control bar disengages the blade and, on self-propel models, the transmission. By gradually releasing the control bar, the operator can regulate the ground speed of self-propel models without disengaging the blade.

**Handle Controls**

The control box components and their functions (Fig. 149) are described below.

- **Left Control Housing:** serves as the cover for the BBC control mechanism. It also houses the end of traction and BBC cables.
- **Control Bar:** pivots on upper shoulder bolt. Transfers operator inputs to control box components.
- **Traction Cable:** engages the transmission by transferring inputs from the control box. The transmission is engaged when the cable is tightened; disengaged when the cable is loosened.
- **BBC Cable:** transfers inputs from the control box to the BBC deck mechanism.
e. *Traction Lever:* provides input to the traction cable since the end of the traction cable is retained in it. It also pivots on the upper shoulder bolt when the control bar is moved.

f. *Rocker Arm:* pivots on the upper carriage bolt. It is affixed solidly to the control arm by means of the roll pin. It houses both the control hook and cable lever. It also provides slot and stop for the buckling spring.

g. *BBC Cable Lever:* controls tensioning and loosening of the BBC cable since the end of the BBC cable is retained by it. Pivots freely on the upper carriage bolt. Movement is controlled by the control hook.

h. *Control Hook and Spring:* pivots on the roll pin and is spring-loaded in the counterclockwise direction by the torsion spring. The control hook “grabs” the cable lever when the control bar is cocked and releases the cable lever when the control bar is dropped.

i. *Buckling Spring:* sole purpose is to hold the control bar in the middle position when at rest. The spring is flexed or “buckled” when the control bar is operated. It rides in a slot on the rocker arm to prevent it from applying force to the control bar when the control bar is at its lowest or uppermost positions.

j. *Right Control Housing:* serves as the other half of the control box cover. Houses the leaf spring.

k. *Leaf Spring:* releases the control hook as the control bar drops to “at rest” position. Because of its orientation, it allows the control hook to slip by as the control bar is raised.

These components interact to provide control to the BBC deck mechanism. Notice in Figure 150 the position of the traction cable lever and the BBC cable lever. This is the “at rest” position; both the BBC and the transmission are disengaged. When the control bar is in this position, it is the buckling spring that supports it. Notice that the buckling spring is not flexed and is at the left end of the slot in the rocker arm.

![Fig 150 3428-0278](image)
When the control bar is cocked to its lowest position as in Figure 151. The buckling spring is flexed and moved to the right end of the rocker arm slot. Another event takes place inside the rocker arm: The spring-loaded control hook slides over the cable lever and grasps it so that when the lever is raised, the BBC cable will come with it.

When the control bar is raised to a point 5" (12.7cm) below the handle, the BBC cable has been tightened enough to engage the blade (Fig. 152).

Raising the control bar straightens the buckling spring. Also important is the function of the leaf spring. As the control bar is raised, the left tip of the control hook slips by the leaf spring without causing release of the cable lever.

Continuing to raise the control bar causes the traction lever to move and the traction cable engages the transmission.
When the control bar is released, the tip of the control hook catches on the leaf spring causing it to rotate. This releases the BBC cable lever, thereby causing the BBC to declutch and apply the blade brake (Fig. 153).

2. Bend the locking tab securing the throttle control to the control panel, then tap the throttle control out using a rubber mallet.

3. Remove the 3 flanged head screws retaining the 2 control box halves.

4. Carefully remove the 2 flange nuts retaining the control box to the handle and remove the right control box half. Be careful not to dislodge any internal components.

5. Reinstall the flange nuts to help hold things together. Determine if any of the components inside the control box are malfunctioning.

CAUTION! Wear gloves and eye protection when operating an open control box as the buckling spring could fly out.

Control Box Disassembly

NOTE: When servicing the BBC control box, be careful not to disassemble the unit any further than necessary as it will then become difficult to trouble shoot. Instead, remove the right housing half, then operate the control box while watching for proper function of internal components. See Step 5 below for more information.

1. Place a piece of duct tape over the heads of the carriage bolts passing through the handle and the BBC control box. This will prevent them from falling out later during troubleshooting.

The first and quickest method is to manually hold the ends of the cable and the end of the buckling spring while operating the control bar. However, with the right case half removed, the leaf spring is no longer in place and you will not be able to observe release of the BBC cable lever.
A better method is to make a special cut-away version of the right control box housing half as shown in Figure 154. When this cut-away version is installed, all components will function normally. Notice the cut-away cover and how it houses the leaf spring. This will aid in diagnosis.

![Cut-away Version](image)

6. If further disassembly is required, remove the buckling spring and washer from the rocker arm assembly.

7. Remove the BBC cable from the BBC cable lever and the left-hand control box half.

8. Remove the rocker arm as an assembly, complete with cable lever and control hook.

9. Remove the cable lever from the rocker arm assembly.

10. Press the roll pin from the rocker arm and remove the control hook and torsion spring.

11. Remove the traction cable from the traction lever and the left-hand control housing.

12. Pull the tape from the outside of the handle. Remove the upper carriage bolt along with the cable lever and spacer.

13. Remove the lower carriage bolt and remove the left control housing.

14. Inspect all parts for wear and/or damage and replace as required.

### Control Box Assembly

1. Slip the lower carriage bolt through the handle, then slide the left control housing onto it.

2. Slip the end of the traction cable into the traction lever. Place the control housing, traction lever, and the control bar into position as shown in Figure 155. Once in position, slide the carriage bolt through all three components.

![Control Box Assembly](image)
3. Place a piece of duct tape over the heads of the carriage bolts that slide through the handle and the left control box housing. This will aid in assembly.

4. Slide the sleeve onto the upper carriage bolt making sure that it passes through the control bar, traction lever, and left control housing.

5. Position the control hook and torsion spring in the rocker arm as shown in Figure 156. Secure with the roll pin making sure that the roll pin is flush with the side indicated in the figure. Loosely install the BBC cable lever as indicated. When correctly installed, the control hook and the cable lever will be engaged.

6. Slide the rocker arm assembly over the upper carriage bolt and sleeve making sure that the sleeve passes through the cable lever. Also make sure that the roll pin passes through the hole in the control bar.

7. Release the BBC cable lever from the control hood and install the BBC cable into the cable lever (Fig. 157).

Note: The BBC cable lever is behind the spring.
8. Slip the white nylon washer onto the J end of the buckling spring. The slotted side of the washer should face away from the end of the spring. Slip the spring into position in the rocker arm and the left control housing as shown in Figure 158.

10. Before installing the right control housing, check to make sure that both cable sheath ends are fully seated in their slots in the left housing. Also make sure that the sleeve passes through all components including the left control housing. Finally, make sure that the roll pin passes through the rocker arm and control bar.

Install the right control housing and secure with the 2 nylon locknuts or 1 locknut and 1 flange nut.

11. Install the 3 flanged head screws that retain the two control box halves.

12. Check for proper operation of the entire BBC system. Correct as required.

13. Bend the throttle control locking tab forward to provide positive lock with the throttle control and install the throttle control.

14. Adjust the BBC cable and traction cables as needed. See page 7-16.

9. Assemble the right control housing by installing the leaf spring and pin to retain the leaf spring (Fig. 159).
Disassembly Sequence

A

B

Roll pin flush with this side.

C

D

Fig 160
BLADE BRAKE CLUTCH ASSEMBLY (Toro Vacu Power/Lawn-Boy Medallion BBC)

<table>
<thead>
<tr>
<th>Ref. No.</th>
<th>Qty</th>
<th>Description</th>
<th>Ref. No.</th>
<th>Qty</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>Brake Shoe</td>
<td>22</td>
<td>1</td>
<td>HH Screw</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>Plate Hub</td>
<td>23</td>
<td>1</td>
<td>Compression Spring</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>V Belt</td>
<td>24</td>
<td>1</td>
<td>Spring Retainer</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
<td>Pulley Hub</td>
<td>25</td>
<td>1</td>
<td>Woodruff Key</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td>Lock Nut</td>
<td>26</td>
<td>1</td>
<td>Driver Pulley</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>Spring Rod</td>
<td>27</td>
<td>1</td>
<td>BBC Flywheel</td>
</tr>
<tr>
<td>7</td>
<td>1</td>
<td>Shoulder Bolt</td>
<td>28</td>
<td>2</td>
<td>Blade Bolt</td>
</tr>
<tr>
<td>8</td>
<td>1</td>
<td>Compression Spring</td>
<td>31</td>
<td>1</td>
<td>Brake Drum</td>
</tr>
<tr>
<td>9</td>
<td>1</td>
<td>Flange Bushing</td>
<td>32</td>
<td>1</td>
<td>Hub ASM</td>
</tr>
<tr>
<td>10</td>
<td>1</td>
<td>Lever Wa</td>
<td>33</td>
<td>1</td>
<td>BBC Shield</td>
</tr>
<tr>
<td>11</td>
<td>1</td>
<td>Bushing</td>
<td>34</td>
<td>1</td>
<td>Blade Spacer</td>
</tr>
<tr>
<td>12</td>
<td>1</td>
<td>Ring Seal</td>
<td>35</td>
<td>1</td>
<td>21” Blade</td>
</tr>
<tr>
<td>13</td>
<td>1</td>
<td>HWH Screw</td>
<td>36</td>
<td>1</td>
<td>Anti Scalp Cup</td>
</tr>
<tr>
<td>14</td>
<td>5</td>
<td>TAP Screw</td>
<td>37</td>
<td>2</td>
<td>Lock Nut</td>
</tr>
<tr>
<td>15</td>
<td>1</td>
<td>Flange Nut</td>
<td>38</td>
<td>1</td>
<td>Lock Nut</td>
</tr>
<tr>
<td>16</td>
<td>1</td>
<td>Cable Bracket Support</td>
<td>39</td>
<td>1</td>
<td>BBC Screen</td>
</tr>
<tr>
<td>17</td>
<td>2</td>
<td>Flat Washer</td>
<td>42</td>
<td>2</td>
<td>Vibration Damper</td>
</tr>
<tr>
<td>18</td>
<td>1</td>
<td>Bellcrank Bushing</td>
<td>43</td>
<td>1</td>
<td>Idler Pulley</td>
</tr>
<tr>
<td>19</td>
<td>1</td>
<td>Crank</td>
<td>44</td>
<td>2</td>
<td>HH Screw</td>
</tr>
<tr>
<td>20</td>
<td>1</td>
<td>Spring Pin</td>
<td>45</td>
<td>1</td>
<td>Thd Forming Screw</td>
</tr>
<tr>
<td>21</td>
<td>1</td>
<td>Control Link</td>
<td>46</td>
<td>1</td>
<td>Flat Washer</td>
</tr>
</tbody>
</table>
TORO VACU POWER/LAWN-BOY MEDALLION BBC

1. Remove the flanged head self-tapping capscrews securing the upper BBC cover to the housing and remove the upper BBC cover (Fig. 163).

2. Pull the black plastic transmission cover up to remove it from the housing (Fig. 164).

3. Remove the shoulder bolt and flanged nut securing the bellcrank to the control cable bracket. Once loose, remove the bellcrank assembly complete with control link from the unit (Fig. 165).
4. Remove the bushing from inside the bellcrank.

5. Using the control link to hold the control pin, remove the flanged head screw from the control pin (Fig. 166).

6. Remove the control link from the control pin.

7. Inspect all parts for wear and damage and replace as necessary.

CAUTION! Always wear safety goggles and gloves when disassembling items under spring tension or compression.

Bellcrank System Assembly (Toro Vacu Power/Lawn-Boy Medallion)

1. Insert the control pin into the recessed area on the bellcrank.

2. Place the spring onto the control pin. Place the spring retainer onto the spring and insert the screw into the control pin. Using the control link to prevent rotation of the control pin, tighten the flanged head screw until the retainer bottoms out on the control pin (Fig. 166).

3. Note the orientation of the control link in Figure 167. Make sure that it is installed correctly into the bellcrank.

4. Slide a flat washer and a bushing onto the shoulder bolt and slide into the front side of the bellcrank as shown in Figure 000. (3428-0088) Complete reassembly of the bell crank system by sliding another flat washer onto the carriage bolt.

Note: Lubrication of the bushing is not recommended.
5. Hook the end of the control link into the brake plate lever, then slip the BBC control cable onto the bellcrank. Finally, slip the shoulder bolt through the hole in the cable bracket support and secure with the flanged nut.

Note: The serrations in the flanged nut must fully seat on the control cable bracket.

6. Check the adjustment of the BBC cable as described under "BBC Cable Removal (Recycler/Rear Bagger)" on page 6-19.

7. Slide the black plastic transmission cover into place making sure that the belt slides into the grooves provided. Some contact between the belt and the cover may be evident.

Note: It may be necessary to push the transmission back slightly to get the transmission cover to slide in completely.

8. Place the upper BBC cover into position on the housing and secure with the two self-tapping flanged head cap screws.

9. Check for proper operation of all controls, especially the BBC, and adjust as necessary.

Note: The spring length on the bellcrank assembly is the primary indicator of proper BBC adjustment. It should measure 1” (25mm) with the blade engaged when properly adjusted. If spring measures more than 1-1/4” (32mm), correct by adjusting the BBC control cable.

**BBC Cover and Screen:**

The BBC cover and screen are two important components that keep dirt and debris out of the BBC mechanism. The screen (Fig. 168) is installed, sharp edge down, to allow air to be drawn in through the screen panel on top of the deck and down underneath the deck. This venting improves the airflow underneath the deck thereby improving quality of cut and bagging performance. Be sure to clean the screen on occasion, especially if quality of cut or bagging performance has degraded.

---

**Fig 168**

A. BBC flywheel  
B. Brake drum  
C. Bearing block  
D. Screen  

MVC-000
Under Deck Components Disassembly  
(Toro Vacu Power/Lawn-Boy Medallion)

1. Stop the engine and disconnect the spark plug lead to prevent accidental starting. Drain fuel.

2. Remove the 2 flanged nylon locknuts securing the blade to the bearing block and remove the anti-scalp cup, the blade, the blade spacer, and the lower BBC screen (Fig. 169).

3. Remove the 4 flanged head self-tapping screws securing the lower BBC cover to the housing, and remove the lower BBC cover.

4. Before disassembling further, check to make sure that the BBC components are functioning normally. Make sure that the brake and brake drum fully disengage when the control bar is cocked, then raised. Make sure that the BBC flywheel and the brake drum rotate together when the control bar is raised. Make sure that the belt loosens properly when the control bar is lowered. Repair or replace parts as required.

5. If further disassembly is required, begin by removing the crankshaft nut. An impact wrench works best. However, if you must remove it manually, use a large screwdriver or bar to wedge the BBC flywheel while removing the nut (Fig. 170).

Note: Be careful not to damage the bearing seal when removing this nut, or premature bearing failure could result.

6. Pivot the brake plate counterclockwise slightly and remove the bearing block and brake drum from the crankshaft (Fig. 171).
7. Again, pivot the brake plate counterclockwise and remove the BBC flywheel.

8. BBC Belt or Idler Pulley Replacement: If the BBC belt or idler pulley requires replacement, it can be done without removal of the brake plate. Remove the idler pulley capscrew and nylon locknut then pull the belt and pulley from the brake plate as an assembly.

Note: The hubs of the pulley are replaceable, however, the bearing inside the idler pulley is not replaceable separately.

9. If the brake pad has reached its service life or if the brake plate has been damaged, remove the other capscrew securing the brake plate to the brake plate hub and lever and remove the brake plate assembly. The brake pad is not replaceable separately.

10. If necessary, remove the flanged head capscrew securing the brake lever and hub to the housing.

CAUTION! The brake plate lever is under moderate spring-loading. Heavy gloves and eye protection are recommended when removing the brake plate lever.

Note: Do not use an air wrench on the brake lever self-tapping screw as thread damage to the housing may result.

11. Remove the brake plate and hub assembly from the housing and disassemble the seal/oil impregnated bushing, the hub, self-tapping capscrew, and washer from the brake lever. Be careful not to lose the plastic bushing which fits on the end of the brake spring rod (Fig. 172).

12. Complete disassembly of the brake plate by removing the brake plate screws and the bearing block.

13. Remove the two bearings from the bearing block by pressing the bearings out on an arbor press. Press only on the outer race to prevent bearing damage (use an appropriately sized arbor or a 1-1/8” (28mm) socket.

14. Inspect all parts for damage and/or wear and replace as necessary.

Fig 172

A. Plastic bushing  B. Brake rod

3428-0106
Under Deck Components Assembly (Toro Vacu Power/Lawn-Boy Medallion)

1. Check to make sure that the brake plate seal is in good condition, then stretch onto the brake plate bushing (Fig. 173).

2. Hook the control link into the slot on the brake lever. Place the spring and bushing onto the brake rod, then slip the bushing and brake rod through the hole provided in the brake lever. Finally, install the bushing hub and flanged head self-tapping screw with the washer through the brake lever.

Note: Brake plate capscrew torque: 225 in-lbs. (25.5 Nm)

Note: If the self-tapping screw strips the threads in the housing, do not helicoil; rather, place a hex nut in the recess provided in the top side of the deck.

3. Loosely secure the brake plate, complete with brake pad, to the brake lever and brake hub as shown in Figure 174. Note that the bolt should go through the brake plate first. Secure with a nylon locknut but do not tighten at this time. This will allow proper alignment of the idler pulley later.

4. Install an idler hub into each side of the idler pulley bearing, then slip the belt onto the idler pulley. Slip the entire assembly between the brake plate and brake lever. Secure the carriage bolt and nylon locknut as shown in Figure 174.

5. Tighten the idler pulley bolt. Make sure that the idler pulley spins freely.

Note: Idler pulley bolt torque: 100 in-lbs. (11.33 Nm)
6. Install the BBC flywheel onto the crankshaft, making certain that the slots in the BBC flywheel align with the bumps on the bottom of the self-propel pulley (Fig. 175).

![Fig 175](image)

A. Bumps  
B. Slots

Note: If the crankshaft nut is tightened with these bumps misaligned, the boss at the bottom of the keyway on the self-propel pulley will break and the self-propel pulley will be free to slide up and down on the crankshaft (Fig. 176). This can result in noisy operation, premature belt wear, and belt jumping.

![Fig 176](image)

A. Boss

7. Press the bearings into the bearing block, using an arbor press. Press only on the outer race, otherwise bearing damage will result (use an appropriately sized arbor or a 1-1/8" (28mm) socket to press the bearing into the block).

8. Make sure that the foam rubber anti-vibration pads are in place on the brake drum and assemble the brake drum bearing block and BBC screws onto the crankshaft as shown in Figure 177. Secure with the crankshaft nut.

Note: Crankshaft nut torque: 45 – 70 ft-lbs. (61 – 95 Nm)

![Fig 177](image)

CAUTION! As with disassembly, the flywheel can be wedged to tighten the nut. Make sure the bumps in the self-propel pulley stay engaged with the flywheel or the pulley will be damaged.

Note: Make sure that the blade bolts are properly aligned before tightening the crankshaft nut.

9. Install the BBC cover with the four flanged head self-tapping screws.

10. Install the BBC screen, the blade spacer, the blade, and the anti-scalp cup onto the BBC screw and secure with the two flanged nylon locknuts. Torque to 300 in-lbs. (37 Nm).

Note: Blade locknut torque: 300 in-lbs. (37 Nm)
11. Complete BBC service by checking BBC and self-propel controls, making sure that all are functioning normally. Adjust as necessary.

BBC Cable Removal (Toro Vacu Power/Lawn-Boy Medallion)

1. Remove the two flanged head self-tapping screws securing the screen panel to the housing and remove the screen panel as shown in Figure 178.

2. On early models, the end of the BBC cable sheath has two protruding ears that catch the underside of the cable bracket. Remove the cable by squeezing the ears together, then pulling the cable out vertically. Later models use a clip that must be pushed to the side to remove.

3. Bend the throttle control locking tab back slightly and tap the throttle control from the control panel with a rubber mallet. Place a piece of duct tape over the heads of the handle and the BBC control box. This will prevent the control box components from falling out of the handle during disassembly.

4. Remove the three flanged head screws securing the control box halves.

5. Remove the two nylon locknuts securing the control box to the handle and carefully remove the right control housing half.

6. Slip the end of the BBC cable from the cable lever and remove the cable (Fig. 179).
BBC / BOS / BCS

BBC Cable Installation (Toro Vacu Power/Lawn-Boy Medallion)

1. Slide a new BBC cable into the BBC cable lever. Then install the end of the cable sheath in the recess provided in the left control housing half (Fig. 180).

2. Before installing the right control housing half, make sure that the traction and BBC ends are completely seated in their recesses. Also make sure that the sleeve on the upper carriage bolt passes completely through the BBC control box components to the handle. Finally, make sure that the roll pin in the rocker arm passes through the hole in the control bar. Install the right control housing half. Secure with two nylon locknuts.

Note: The flanged locknut fits on the upper carriage bolt.

3. Install the three flanged head screws securing the control box halves.

4. Bend the throttle control locking tab forward so that it will provide positive engagement with the throttle control. Install the throttle control.

5. Hook the lower end of the BBC cable onto the bell-crank. Slip the cable through the slot in the cable bracket. Push the end of the cable sheath into the cable support bracket as shown in Figure 181.

6. Before installing the screen panel, adjust the BBC cable as described under “BBC Cable Adjustment (Toro Vacu Power/Lawn-Boy Medallion Models)”, which follows. See page 7-15.
ENGINE AND BLADE ASSEMBLY (Toro Recycler / Rear Bagger)

<table>
<thead>
<tr>
<th>Ref. No.</th>
<th>Qty</th>
<th>Description</th>
<th>Ref. No.</th>
<th>Qty</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>Gts Ohv 200 Engine</td>
<td>22</td>
<td>2</td>
<td>Lock Nut</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>Gas Cap ASM</td>
<td>23</td>
<td>1</td>
<td>HH Screw</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>Toro Nameplate</td>
<td>24</td>
<td>2</td>
<td>Flat Washer</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>Recoil Decal</td>
<td>25</td>
<td>1</td>
<td>Control Link</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>Clamp Screw</td>
<td>26</td>
<td>1</td>
<td>Bellcrank</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>Casing Clamp</td>
<td>27</td>
<td>1</td>
<td>Bellcrank Sleeve</td>
</tr>
<tr>
<td>7</td>
<td>3</td>
<td>HWH Screw</td>
<td>28</td>
<td>1</td>
<td>Lever</td>
</tr>
<tr>
<td>8</td>
<td>1</td>
<td>Belt Guide Bracket</td>
<td>29</td>
<td>1</td>
<td>HH Screw</td>
</tr>
<tr>
<td>9</td>
<td>1</td>
<td>Woodruff Key</td>
<td>30</td>
<td>1</td>
<td>Torsion Spring</td>
</tr>
<tr>
<td>10</td>
<td>1</td>
<td>Pulley</td>
<td>31</td>
<td>1</td>
<td>Washer</td>
</tr>
<tr>
<td>11</td>
<td>1</td>
<td>Flywheel</td>
<td>32</td>
<td>2</td>
<td>Bearing</td>
</tr>
<tr>
<td>12</td>
<td>2</td>
<td>Blade Bolt</td>
<td>33</td>
<td>1</td>
<td>Torsion Spring</td>
</tr>
<tr>
<td>13</td>
<td>1</td>
<td>Brake Drum ASM</td>
<td>34</td>
<td>1</td>
<td>Brake ASM</td>
</tr>
<tr>
<td>13:1</td>
<td>2</td>
<td>Vibration Dampener</td>
<td>35</td>
<td>1</td>
<td>Idler Pulley</td>
</tr>
<tr>
<td>14</td>
<td>1</td>
<td>Hub ASM</td>
<td>36</td>
<td>1</td>
<td>V Belt</td>
</tr>
<tr>
<td>15</td>
<td>1</td>
<td>Shield</td>
<td>37</td>
<td>1</td>
<td>Idler Hub Pulley</td>
</tr>
<tr>
<td>16</td>
<td>1</td>
<td>Blade Spacer</td>
<td>38</td>
<td>1</td>
<td>HH Screw</td>
</tr>
<tr>
<td>17</td>
<td>1</td>
<td>Blade Nut</td>
<td>39</td>
<td>2</td>
<td>NI Lock Nut</td>
</tr>
<tr>
<td>18</td>
<td>1</td>
<td>Recycler Blade</td>
<td>40</td>
<td>3</td>
<td>HWH Screw</td>
</tr>
<tr>
<td>19</td>
<td>1</td>
<td>Blade Stiffener</td>
<td>41</td>
<td>2</td>
<td>HH Screw</td>
</tr>
<tr>
<td>20</td>
<td>1</td>
<td>Anti-Scalp Cup</td>
<td>42</td>
<td>1</td>
<td>Rope Stop</td>
</tr>
</tbody>
</table>

Fig 182  engineandbladeassy
**TORO RECYCLER/REAR BAGGER**

**BBC**

1. Drain the fuel and oil. Remove the spark plug wire. Disassembly for the idler arm begins on top of the mower housing.

2. On the left side of the mower next to the rear wheel, loosen the clamp that secures the BBC cable to the mower housing. Near the left front wheel, unhook the spring end of the cable from the bellcrank. Remove the screw, bellcrank, sleeve, and unhook the control link from the lever (Fig. 184).

3. Take a loop of wire or rope and unhook the spring under the lever (Fig. 185). With the tension removed you can now remove the long screw through the lever. We would suggest loosening this screw, but leave it engaged at this time (Fig. 187).

---

**Idler Arm System Disassembly (Recycler/Rear Bagger)**

- A. Spring
- B. Screwdriver
- C. Wire loop
4. Turn the mower on its side. Remove the blade and the BBC cover. Brush any grass clippings out of the area. Locate the idler arm. Remove the bolt and locknut that retains the idler pulley. Note the pulley is on the deck side and there is a spacer between the pulley and idler arm (Fig. 186). With the pulley removed, the idler arm can pivot away from the brake drum and the belt can be removed.

Slide the lever off the shaft and the idler/brake shaft can be pulled down and out of the housing (Fig. 188).

5. Now reach around to the top of the housing and pull the screw out of the lever (Fig. 187).

There are two bearings pressed into the housing that the idler shaft rides on. If they are to be replaced, press them out at this time (Fig. 189).

A. Bearings
6. Now, disassemble the components on the crankshaft. If you have an impact wrench, the large nut on the crankshaft can be spun off. If you must remove it manually, wedge a bar or large screwdriver into the BBC flywheel (Fig. 190). This will hold the crankshaft so the nut can be removed.

7. Remove the hub assembly and brake drum. The flywheel is pressed onto a taper on the crankshaft. It might require a tap with a hammer to loosen (Fig. 191).

8. Roll the self-propel belt off the pulley and remove the pulley and the key in the crankshaft.

9. Inspect the pulley. One end of the keyway is blocked off. If that is broken, the pulley will bounce up and down during use and make a rattling noise (Fig. 192). There are two bumps on the outside of the pulley that are intended to engage two holes in the flywheel. If this wall is broken out or the bumps on the pulley are damaged, the pulley must be replaced. Usually this is caused by an error in assembly. Refer to "Idler Arm System Assembly (Recycler/Rear Bagger)" on page 6-25 for instructions to avoid this.
Idler Arm System Assembly (Recycler/Rear Bagger)

1. Start by installing the key and self-propel pulley. The two bumps on the pulley should face you (Fig. 193). Slip the belt over the pulley.

2. Install the flywheel. The two bumps on the pulley MUST engage the holes in the flywheel. If not, when the nut on the crankshaft is tightened, the flywheel will push the pulley upwards, either breaking the wall out of the key groove or crushing the two bumps or both.

3. Note the two small foam pads inside the brake drum (Fig. 195).

The flywheel must be installed with the side that looks like 1/2 of a pulley facing the brake drum (Fig. 194). Push the flywheel firmly on the taper of the crankshaft. If you can’t push the flywheel on far enough to hold, do not be concerned. DO NOT drive it on with a hammer.
They are noise dampeners. Without them, when the brake pad hits the drum, the drum will ring like a bell. Also look at the two blade mounting bolts. Each has a flat side on the head to prevent them from rotating when the nut is tightened (Fig. 196). Make sure the bolts are fully seated. Install the brake drum.

CAUTION! The two bumps on the pulley MUST engage the flywheel. If you do not have an impact wrench, this is where the two bumps become important. If you engage the bumps on the pulley into the flywheel, you can now wedge the flywheel and through the pulley and key, it will hold the crankshaft from rotating while you tighten the nut (Fig. 197).

4. Inspect the hub assembly if the old one is to be reused. Rust on the outside is harmless. But the seals in the bearing need to be intact. If the seals are damaged or the bearing feels rough when it is turned, replace the hub assembly.

5. Start the nut on the crankshaft. As during disassembly, an impact wrench works best.

6. Slip the BBC belt over the parts on the crankshaft.

7. Check the shaft of the idler/brake arm. Clean as necessary and apply a light coat of grease.
8. Slip the spring over the shaft. One tang of the spring must engage the tab as shown (Fig. 198).

![Fig 198](image)

9. Start the shaft into the hole in the housing. Rotate the idler/brake arm clockwise so the upper tab on the spring can engage the boss in the housing. Rotate the idler/spring arm counterclockwise (Fig. 199) and push the rest of the way into the housing. The brake pad should now ride on the brake drum.

![Fig 199](image)

10. Hold the idler/brake arm in place. Slip the spring over the end on top of the deck as shown. Install the lever and install the screw through the lever and idler/brake arm shaft (Fig. 200). Once the screw is secured take a loop of wire or rope and hook the end of the spring. Pull it towards you and hook the end as shown.

![Fig 200](image)

BBC Cable Removal (Recycler/Rear Bagger)

1. Loosen the cable clamp and pull cable out from under the screw (Fig. 201).

![Fig 201](image)
2. Unhook the spring and cable from the bellcrank (Fig. 202).

3. Bend the throttle control locking tab back slightly and tap the throttle control from the control panel with a rubber mallet. Place a piece of duct tape over the heads of the handle and the BBC control box mounting bolts. This will prevent control box components from falling out of the handle during disassembly.

4. Remove the three flanged head screws securing the control box halves.

5. Remove the two nylon locknuts securing the control box to the handle and carefully remove the right control housing half.

6. Slip the end of the BBC cable from the cable lever and remove the cable (Fig. 203).

Fig 202

Bend the throttle control locking tab back slightly and tap the throttle control from the control panel with a rubber mallet. Place a piece of duct tape over the heads of the handle and the BBC control box mounting bolts. This will prevent control box components from falling out of the handle during disassembly.

Fig 203

A. BBC cable lever B. BBC cable

BBC Cable Installation (Recycler/Rear Bagger)

1. Slide a new BBC cable into the BBC cable lever. Install the end of the cable sheath in recess provided in the left control housing half.

2. Before installing the right control housing half, make sure that the traction and BBC ends are completely seated in their recesses. Also make sure that the sleeve on the upper carriage bolt passes completely through the BBC control box components to the handle. Finally, make sure that the roll pin in the rocker arm passes through the hole in the control bar. Install the right control housing half. Secure with two nylon locknuts.

Note: The flanged locknut fits on the upper carriage bolt.

3. Install the three flanged head screws securing the control box halves.
4. Bend the throttle control locking tab forward so that it will provide positive engagement with the throttle control. Install the throttle control.

5. Hook the spring on the end of cable and into the bellcrank arm (Fig. 204).

6. Slip end of cable under screw. See page 7-16.

**Disassembly**

The following steps are disassembly of the system, including the steps necessary to replace the blade drive and self-propel belts.

1. Drain the fuel and oil and tip the mower on its side. We recommend carburetor side up to prevent any oil or gasoline from draining into the air filter and causing hard starting.

2. Remove the two locknuts securing the blade (Fig. 205).

3. Remove the blade and blade stiffener (Fig. 206).

**BLADE OVERRIDE SYSTEM (BOS)**

**BLADE CLUTCH SYSTEM (BCS)**

Both Toro and Lawn-Boy use the same blade clutching system on some models. On Toro it is named the Blade Override System. On Lawn-Boy it is named the Blade Clutch System.

It is designed to allow the blade to stop while the engine keeps running. This is especially helpful when bagging, as the engine will not need to be restarted each time you stop to empty the bag.
4. Remove the blade support and disc (Fig. 207).

5. Remove the 3 capscrews and lift off the belt cover (Fig. 208).

6. Remove the brake pivot bolt. You will need a second wrench to hold the bolt head (Fig. 209).

7. Unhook both springs from the slot in the brake arm (Fig. 210).
8. Lift the brake assembly and blade drive belt from the mower (Fig. 211).

9. To replace the blade drive belt, remove the idler pulley bolt (Fig. 212).

10. The components of the idler assembly are shown here (Fig. 213).

11. Continuing with the disassembly, remove the bolt securing the pulley to the crankshaft.

Note: Use a large screwdriver or pry bar to keep the pulley from turning while you unscrew the bolt (Fig. 214).
12. Rock the pulley half slightly and lift it off. The blade bolts will now drop out of their pockets (Fig. 215).

13. Lift the crankshaft pulley half off of the crankshaft. Note this pulley half is keyed to the crankshaft and this pulley half is also the drive pulley for the self-propel belt. Go to the transmission to continue replacing the self-propel belt (Fig. 216).

14. Remove the two bolts holding the anchor plate to the chassis (Fig. 217).

15. The anchor plate contains a pivot screw with a bushing. Remove the locknut (Fig. 218).
16. The bushing has a notch removed from the flange end. Align that notch in the bushing with the tab in the anchor plate (Fig. 219).

Fig 219
A. Tab  B. Notch

Brake Arm Assembly

2. Place the bearing with the flange side down on the spacer and place the washer on top of the bearing (Fig. 221).

Fig 221

3. Install the belt, belt guide, and carriage bolt on the brake arm and secure with the carriage bolt (Fig. 222).

Fig 222

1. Place the spacer with the large diameter down on the brake arm (Fig. 220).

Fig 220
BOS/BCS System Assembly

Assemble all other parts in reverse order.

Bolt torque as follows:
Blade nuts: 350 - 400 in-lbs. (39.5 – 45.2 Nm)
Crankshaft Bolt: 45 - 55 ft-lbs. (60.9 – 74.5 Nm)
HANDLES AND CONTROL CABLES

There are four types of handle and control assemblies on mowers not covered in other parts of this manual. This section will cover disassembly and repair of those types.

Toro 2 Bail Handle

The 2 bail style is shown here. The top bail is the engine kill. Release it and the ignition is grounded and a brake comes on to help stop the flywheel. The lower bail is the self propel bail. Squeeze it to tension the belt and drive the transmission. It should be adjusted so that lowering the bail about 1" (25mm) disengages the self propel.

Handle disassembly is self explanatory so we will not discuss that.

The engine stop cable is not adjustable. If it fails to function, it must be replaced.

The self propel cable is adjustable through a clamp which is typically located a few inches down the handle. Loosen this clamp and push the cable jacket up or down to adjust. When the bail is lowered about 1" (25mm) the drive should disengage. This is a gap that is comfortable for most operators.

Some models used a knob to adjust the self propel cable (Fig. 224).

The engine stop cable is not adjustable. If it fails to function, it must be replaced.

The self propel cable is adjustable through a clamp which is typically located a few inches down the handle. Loosen this clamp and push the cable jacket up or down to adjust. When the bail is lowered about 1" (25mm) the drive should disengage. This is a gap that is comfortable for most operators.

Some models used a knob to adjust the self propel cable (Fig. 224).

A. Self-propel cable adjuster

Fig 223  3428-0049

Fig 224  fig 19

1. Knob
2. Cable

Turning the knob tightens or loosens the cable. When the bail is lowered about 1" (25mm) the drive should disengage.
HANDLES AND CONTROL CABLES

Personal Pace Generation 1/Easy Stride Generation 1

This is the original Toro Personal Pace/ Lawn Boy Easy Stride system. The handle is telescoping and as it slides, it tensions the transmission drive belt.

Operation

The best way to use this system is as follows: Hold your elbows at your sides and your hands straight out in front of you and just walk. If you want to go faster, walk faster. The key is keeping your elbows at your sides. This applies the right amount of pressure to the handle to engage the drive. If you just push the handle down it will engage too rapidly and the mower will jump forward.

Disassembly

1. Squeeze the ends of the control bail to disengage it from the handle. Disconnect the cable from the bail and set aside (Fig. 226).

2. Turn the handle over and remove the cable clamp, screw and the cable from the pocket (Fig. 227).
3. Remove 6 screws from the traction rod retainer (Fig. 228).

5. Disconnect the cable from the traction lever (Fig. 230).

4. Remove the traction rod retainer. Note the location of the traction control rod (Fig. 229).

6. Unhook the springs from each side of the handle (Fig. 231).
7. Slide the handle up and off (Fig. 232).

8. If you need to replace the traction control rod or either of the springs, one of the handle guides will need to be removed. The guides are held on by 2 screws (Fig. 233).

Reassembly

Reassemble in reverse order.

1. There are 3 bosses on the inside of the guide. The top and bottom ones receive the mounting screws. The boss in the photo must line up with the end of the control rod. This boss keeps the rod from moving sideways and falling out of the handle (Fig. 234).

2. One end of the springs goes into a hole in the handle, the other around the traction control rod. The springs apply pressure to the handle to hold it in the retracted, upper position (Fig. 235).
HANDLES AND CONTROL CABLES

Adjusting the Personal Pace Cable

Ensure the transmission belt is disengaged, transmission tilted forward. Loosen the cable clamp on the handle. When you pull the cable down the personal place handle should raise to the stop. Hold the cable and secure the clamp (Fig. 236).

This is the second generation of the personal pace/easy stride handle assembly. It works the same as the original in the sense that the handle is telescoping. As the handle is depressed it tightens the self propelled belt and drives the transmission.

Handle Removal

To ease removal of the Personal Pace handle from a 22” Recycler, make a tool from a piece of metal strapping or banding material. You will need two pieces about 5” (12.7cm) long each. Bend them as shown in the photo and round the ends to remove burrs. This tool permits the handle to slide up and over the internal handle stops (Fig. 238).

1. Disconnect the control cables and the key switch (electric start models) from the upper handle and Personal Pace handle. Separate the upper and lower handle. Remove the brake bail by pressing the two ends together until they come out of the holes in the handle.

Personal Pace Generation 2/Easy Stride

Generation 2
2. Install the tool over the stop in the handle guides as shown, one on each side. Push the handle down. The tool will allow the handle to slide over the stop built into the handle guide (Fig. 239).

3. As the handle begins to slide downward, pull the traction control bar farther out of the handle (Fig. 240).

4. Continue pushing the handle down until it slides off the end of the upper handle (Fig. 241).

5. When reinstalling the handle, reconnect the spring as shown. The spring should push the handle upwards toward the disengage position (Fig. 242).

A. Traction Control Bar
HANDLES AND CONTROL CABLES

Adjusting the Personal Pace/Easy Stride Cable

Ensure the transmission belt is disengaged, transmission tilted forward. Loosen the cable clamp on the handle. When you pull the cable down the Personal Pace/Easy Stride handle should raise to the stop. Hold the cable and secure the clamp (Fig. 243).

Lawn-Boy 2 Bail Handle

The 2 bail style is shown here (Fig. 244). The top bail is the engine stop. Release it and the ignition is grounded and a brake comes on to help stop the flywheel. The lower bail is the self propel bail. Squeeze it to tension the belt and drive the transmission.

The engine stop cable is not adjustable. If it does not function, it must be replaced.

The self propel cable is adjustable through a clamp. It should be adjusted so that lowering the bail about 1” (25mm) disengages the self propel. This is a gap that is comfortable for most operators.
The Lawn-Boy Sens-a-Speed handle is made in two forms, zone start and blade clutch. The basic function is the same but the addition of the blade clutch mechanism makes the handle for those models a little more complex.

**Operation**

The top mounted bail is the engine stop control on zone start models and the blade control on blade clutch models.

On a zone start model, pull the top bail down and hold to keep the engine running. The Sens-a-Speed handle telescopes and as it is depressed tensions the transmission drive belt. To operate this keep your elbows at your sides, hold your hands straight out in front of you and walk. If you want to go faster, walk faster. Do not push the Sens-a-Speed handle down. That will activate the drive too aggressively and the mower will jump forward.

On blade clutch models, the engine on and off is controlled by a switch on the left hand handle. The bail engages and disengages the blade. The Sens-a-Speed handle controls the self propel the same way as on a zone start model.

**Handle Disassembly, Zone Start Models**

1. Loosen the cable clamp and disconnect the Sens-a-Speed cable (Fig. 246).

![Fig 245](DSC-4864a)

**A. Top bail**

![Fig 246](DSC-4869a)
2. Squeeze the ends of the upper bail to disengage them from the handle. On some models the right side of the bail may be connected to the pin by a push nut. The push nut can be removed or the bail removed with the pin attached (Fig. 247).

4. Slide the pin out of the left hand handle and pull the upper handle up and out.

5. The plastic sleeves will slide off the upper handle.

6. The springs can be removed from the top slides if necessary.

**Assembly**

If the handle has been binding, clean the top slides and the sleeves before assembling. Dirt and grit in the sliding part of the handle can cause a bind.

Assemble in reverse order. When you install the upper handle, line up the holes and install the pivot pins (Fig. 249).
Cable Adjustment

The engine brake cable is not adjustable. If it fails to function it will need to be replaced.

Self-Propel Cable

To properly adjust the self propel cable, loosen the cable clamp, pull the cable downward to remove all the slack (Fig. 250) then push the cable jacket up 1/8” (3.17cm) (Fig. 251) and secure with the cable clamp.

Handle Disassembly, Lawn-Boy Blade Clutch System (BCS) Models

1. Remove the upper wire bail. On the right hand side it slides over a pin. On some models this pin has a push nut on it (Fig. 252). It can be compressed so that either the bail slides off the pin or it draws the pin out of the handle. Either is acceptable.
HANDLES AND CONTROL CABLES

2. Remove the e-clip on the left side pivot pin (Fig. 253).

3. Slide the pivot assembly, bail and the brake cable to the right until the bail slides off the pin (Fig. 254).

4. Continue sliding the pivot assembly and brake cable off the pin.

5. Remove the shoulder bolt that the traction lever pivots on and remove the traction lever.

6. Pull the pin out of the left hand handle. Note it is snapped in and will require a locking pliers or something similar to remove. When removed, the springs will push the handle upwards (Fig. 255).
7. Slide the upper handle out of the top slide.

Reverse the process to assemble.

Note how the switch assembly, bail and control cable are assembled before they are installed on the pin (Fig. 256).

The traction control cable tilts the transmission backward to tighten the belt and engage the transmission (Fig. 258). It must tighten sufficiently to fully drive the transmission, yet allow the transmission to rock forward and loosen the belt to disengage.

3 Speed Control Cables

The shift cables are not adjustable. To install the shift cable, insert the end of the cable in the shift arm and slip the end of the cable jacket into the bracket (Fig. 257).

3 Speed Transmission Models

Handles on 3 speed models are basic and easily disassembled.
The adjustment point for this cable is a knob, jam nuts, or a clamp to the handle (Fig. 259 and Fig. 260).

The objective is to have the wheels begin to drive when the bail is about 1” (25mm) below the upper handle, yet be able to lower the bail enough to stop the wheels without releasing the bail (Fig. 261).

To adjust, turn the knob or loosen the cable clamp and slide the cable jacket up or down. Secure with the clamp.

A. Clamp

A. Blade brake cable   B. Jam nuts
1. Remove the two flanged head self-tapping screws securing the screen panel to the housing and remove the screen panel (Fig. 262).

2. With the engine off and the spark plug wire disconnected, cock and lift the control bar to engage the blade. Tape the control bar to the handle with the blade engaged, then measure the length of the over-travel spring (Fig. 263). When adjusted properly, it should measure 1” (25mm). If it does, skip ahead to step 5. Otherwise proceed with adjustment in the following step.

3. There is a turnbuckle in the cable about halfway between the control panel and the chassis. Adjust the turnbuckle until the over-travel spring measures 1” (25mm).

4. Remove the tape from the handle and disengage the blade.
HANDLES AND CONTROL CABLES

5. Install the screen panel with the two flanged head self-tapping screws. Make sure that the top edge of the screen panel is under the lip at the top of the housing. The screen is installed, sharp edge down, to allow air to be drawn in through the screen panel on top of the deck and down underneath the deck. This venting improves the airflow underneath the deck thereby improving quality of cut and bagging performance. Be sure to clean the screen on occasion, especially if quality of cut or bagging performance has degraded.

Note: An overly tight cable will cause the BBC to disengage before the bail can be raised to the normal operating position. Cock the bail downward and raise to the handle. If the BBC disengages and you hear the brake engage with a snap, the cable is likely too tight. Excessive cable tension causes the control hook in the control box to release. It doesn't do any permanent damage to any parts. Loosen the cable slightly and repeat the test.

Toro BBC Cable Adjustment (Recycler/Rear Bagger)

The cable adjustment is the clamp on top of the housing on the left side of the mower. Loosen the screw holding the cable clamp. Pull the cable to the rear just enough to remove the slack (Fig. 265). Hold and tighten the clamp. The spring on the forward end of the cable should be suspended just off the housing.

Note: An overly tight cable will cause the BBC to disengage before the bail can be raised to the normal operating position. Cock the bail downward and raise to the handle. If the BBC disengages and you hear the brake engage with a snap, the cable is likely too tight. Excessive cable tension causes the control hook in the control box to release. It doesn't do any permanent damage to any parts. Loosen the cable slightly and repeat the test.

On BBC models, the control bail also controls the transmission belt engagement. The adjustment point is a knob about halfway between the control panel and transmission. Ideally, the cable should be set so that the transmission drive will disengage when the bail is lowered about 1” (25mm). This allows the bail to be lowered so that the wheels stop driving and the BBC remains engaged, but the gap isn’t so large that the handle is hard to hold (Fig. 264). This measurement is not an exact requirement. It can be varied to accommodate a customer with small hands, etc.
On BBC models, the control bail also controls the transmission belt engagement. The adjustment point is a knob about halfway between the control panel and transmission. Ideally, the cable should be set so that the transmission drive will disengage when the bail is lowered about 1" (25mm). This allows the bail to be lowered so that the wheels stop driving and the BBC remains engaged, but the gap isn’t so large that the handle is hard to hold (Fig. 266). This measurement is not an exact requirement. It can be varied to accommodate a customer with small hands, etc.

**Toro BOS Control**

The BOS control is the upper bail on the handle. For the required 2 step engagement, there is a pivoting stop on the right hand handle. Rotate it out of the way and then pull the bail down for blade engagement (Fig. 267).

![Fig 267](image_url)
HANDLES AND CONTROL CABLES

Toro BOS Control Cable Adjustment

The blade clutch control is adjusted by removing the cover between the engine and bag door. Loosen the cable clamp and draw the cable to the rear to remove the slack. Now push the cable outer jacket forward 5/8” (1.5cm) and secure. This will create 5/8” (1.5cm) slack in the cable (Fig. 268).

Lawn-Boy BCS Control Cable Adjustment

Lawn-Boy Insight and Insight Gold:

1. Remove the grass bag and tunnel (Fig. 270).

2. Loosen cable clamp. Draw cable to rear to remove slack. Now push outer jacket of cable forward 5/8” (1.5cm) and secure. This will create 5/8” (1.5cm) slack in the cable (Fig. 271).

Lawn-Boy BCS Control

To engage the blade clutch, press the control button. Then pull the control bar to the handle. To disengage the blade, release the control bar. (Fig. 269).
Lawn-Boy Insight Platimun:

1. Remove the gas and oil and tip the mower on its side with the air filter up.

2. Remove the BCS cover and belt cover.

3. Loosen the 2 cap-screws securing the bracket to the housing. Pull the cable to the rear to remove the slack. Push the cable forward 5/8" (1.5cm) and secure. This will create 5/8" (1.5cm) of slack (Fig. 272).

4. Install the BCS cover, belt cover and tunnel.
SELF-PROPEL BELT REPLACEMENT

Worm Drive Transmission

Single Speed Spur/Bevel Gear Transmission

Single Speed Bevel Gear Transmission

Three Speed Transmission

Wheel Pinion Clutch

Blade Brake Clutch Systems (BBC), Blade Override System (BOS), Blade Clutch Systems (BCS)

Handles and Control Cables

Self-Propel Belt Replacement
There are several different procedures for replacing the self propelled belt. Mowers with a blade clutch mechanism are the most complex as parts of that will need to be removed to access the self propel belt.

**Toro 21” Front Wheel Drive**

See Worm Drive Transmission page 1-1.

These mowers usually have a model number that starts with 16xxx.

Remove the belt cover, push the top of the transmission to the rear to create slack in the belt and remove the belt. Push the belt towards the engine. Drain fuel and oil to prevent spillage and tip the mower on its side, air filter side up. Slip the belt off the crankshaft pulley. In some cases there might not be enough clearance between the blade and mower housing. It might be necessary to remove the blade to slip the belt off.

Reverse the process to assemble.

**22” Rear Wheel Drive**

These are steel deck mowers, made in both Toro and Lawn-Boy brands.

In order to replace the self propel drive belt the transmission must be removed from the chassis. This is necessary to access the pulley and belt guide on top of the transmission. See Single Speed Bevel Gear Transmission, Rear Wheel Drive Models, Transmission Removal and Belt Replacement, see page 3-10.

Do not bend the belt guides or force the belt between the pulley and belt guide. Drain the gas and oil before tipping the mower to avoid fuel spillage. Remove or loosen the belt guide mounting screws and move the belt guide out of the way. A bent belt guide will cause an increased tendency for belt jumping and damage.

**21” Steel and Cast Deck Toro and Lawn-Boy Mowers Belt Replacement**

Drain the gasoline and oil before tipping the mower to avoid fuel spillage. Remove the belt cover. Loosen or remove the belt guides so the belt can be replaced without forcing. See the Single Speed Spur/Bevel Gear Transmission section for a typical transmission and drive layout, see page 2-2.

**21” Cast Deck Mowers with 3 Speed Transmission**

Made in both Toro and Lawn-Boy brands.

To replace the belt, drain both the gasoline and oil from the engine. Remove the belt cover, just behind the engine on top of the mower, to access the transmission. Loosen or remove the belt guides so the belt can be replaced without forcing. See the section on the three speed transmission starting on page 4-1.
SELF-PROPEL BELT REPLACEMENT

21” Toro and Lawn-Boy Mowers with Blade Brake Clutch

Part of the blade clutch must be disassembled to access the self propel belt. See the BBC section starting on page 6-1 for more information.

21” Toro Mowers with Blade Override System and Lawn-Boy Mower with Blade Clutch System

Part of the BOS or BCS must be removed to replace the self propel belt. (See page 6-18 for more information.) The Lawn-Boy Insight has a black access cover just to the rear of the engine on top of the chassis. Remove it for easy access to the top of the transmission.

21” Lawn-Boy Insight Mowers

The Zone Start models use a basic self propel system. See Transmission Remove and Replace, page 3-19, which also explains the belt replacement process.
THIS PAGE INTENTIONALLY LEFT BLANK.