# SERVICE MANUAL

for

SNAPPER PRO Gear Drive Power Units

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</table>
Section I
GENERAL INFORMATION

CONTENTS

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<td>1.5 - 1.6</td>
</tr>
</tbody>
</table>
Section I - GENERAL INFORMATION

1.1 The following lists identify the SNAPPER Gear Drive Power Units covered in this manual. Please note there is no coverage given the Hydro (H) Units - they are in a separate manual. The Mower Units are also in a separate manual, but they are listed below to aid in the identification of the Power Units.

### SERIES 4 (PRO)

<table>
<thead>
<tr>
<th>POWER UNITS</th>
<th>MOWER UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>PL71404KWV</td>
<td>PMA7364</td>
</tr>
<tr>
<td>PP71604BV</td>
<td>PMA7484</td>
</tr>
<tr>
<td>PL71254KW</td>
<td>PMA7524</td>
</tr>
<tr>
<td>PL71254KV</td>
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<tr>
<td>PP71404KWW</td>
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<td>PP71404KV</td>
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### SERIES 0 (PRO GEAR, PRO GEAR EXPRESS)

<table>
<thead>
<tr>
<th>POWER UNITS</th>
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<tbody>
<tr>
<td>SPP90KW</td>
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</tr>
<tr>
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<td>SP320</td>
</tr>
<tr>
<td>SPL140KH</td>
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</tr>
<tr>
<td>SPL140KW</td>
<td>SP520</td>
</tr>
<tr>
<td>SPP1250KW</td>
<td>SPE360</td>
</tr>
<tr>
<td>SPP140KW</td>
<td></td>
</tr>
<tr>
<td>SPP140KH</td>
<td></td>
</tr>
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<td>SPE1250KW</td>
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<td>SPL160BV</td>
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</tr>
<tr>
<td>SPP160BV</td>
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</tbody>
</table>

**NOTE**
Model Number explanations are graphically shown on Page 1.3. Please learn this identification system. It will help in many ways.

1.2 These lists begin with coverage of the PRO7 Series 4, which was produced in 1992, and conclude with the PRO7 Series 2.

The "Master Profiles" which list the year of production for the Power Units and their compatible Mower Units are shown on Page 1.4.

### SERIES 0 (PRO7)

<table>
<thead>
<tr>
<th>POWER UNITS</th>
<th>MOWER UNITS</th>
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<tbody>
<tr>
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<td>PMA7480</td>
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### SERIES 1 (PRO7)

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<td>PMA7361</td>
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<td>PP71401KWW</td>
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<td>PP71401KV</td>
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### SERIES 2 (PRO7)

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<td>PMA7362</td>
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<td>PP71252KV</td>
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<td>PP71402KV</td>
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<td>PL71402KV</td>
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<td>PL71402KWW</td>
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<td>PL71252KW</td>
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<td>PL71402KWV</td>
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### Example 1

<table>
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<td>7</td>
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<td>L</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>K</td>
<td>W</td>
</tr>
<tr>
<td>W</td>
<td>V</td>
<td></td>
</tr>
</tbody>
</table>

- **MODEL DESIGNATION**: P
- **ENGINE HP DESIGNATION**: L
- **SERIES DESIGNATION**: 7
- **ENGINE AND OPTIONS**: 1

### Example 2

<table>
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<tr>
<td>P</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>K</td>
<td>V</td>
</tr>
</tbody>
</table>

- **MODEL DESIGNATION**: P
- **ENGINE HP DESIGNATION**: P
- **SERIES DESIGNATION**: 7
- **ENGINE AND OPTIONS**: 1

### PREFIX EXPLANATION

- **S**: Snapper Commercial Walk Behind Mower
- **E**: Express Model
- **7**: PRO7 Series
- **P**: Pro- Mid-Size
- **P**: Pistol Grip Handle
- **L**: Loop Handle

### BODY EXPLANATION

<table>
<thead>
<tr>
<th>Body HP</th>
<th>90 - 9 HP</th>
<th>125 - 12 1/2 HP</th>
</tr>
</thead>
<tbody>
<tr>
<td>14 - 14 HP</td>
<td>14 - 14 HP</td>
<td>16 - 16 HP</td>
</tr>
</tbody>
</table>

- **0**: Series
- **1**: "
- **2**: "
- **4**: "

### SUFFIX EXPLANATION

- **KW**: Kawasaki
- **KH**: Kohler
- **K**: Kohler
- **B**: Briggs & Stratton
- **V**: Overhead Valve
- **E**: Electric Start

**Note:** The above information does not contain the prefix letter "H" which denotes the Hydro Model of the PRO7 Series. Adjustments and repairs of the Hydro Power Units are covered in a separate manual.
### Section I - GENERAL INFORMATION

1.4 MASTER PROFILES FOR MODELS BUILT FROM 1992 THRU 1998

#### PRO GEAR COMMERCIAL WALK BEHIND - '95

<table>
<thead>
<tr>
<th>POWER UNITS</th>
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<tbody>
<tr>
<td>SPP90KW</td>
<td>SP300 - 80904</td>
</tr>
<tr>
<td>SPP1250KW</td>
<td>SP360 - 80905</td>
</tr>
<tr>
<td>SPL1250KW</td>
<td>SP480 - 80906</td>
</tr>
<tr>
<td>SPP140KW</td>
<td>SP520 - 80907</td>
</tr>
<tr>
<td>SPP140KH</td>
<td>SP8096</td>
</tr>
<tr>
<td>SPP140KH</td>
<td>SP82358</td>
</tr>
<tr>
<td>SPL140BH</td>
<td>SP82358</td>
</tr>
<tr>
<td>SPL140KH</td>
<td>SP82358</td>
</tr>
<tr>
<td>LITERATURE PACK</td>
<td>Operator Manual - 2-8970</td>
</tr>
<tr>
<td></td>
<td>Dealer Set-Up - 2-8964</td>
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<tr>
<td></td>
<td>Parts Manual - 06925</td>
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</table>

#### PRO GEAR COMMERCIAL WALK BEHIND - '97

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<td>SP360 - 80905</td>
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<td>3) SPP140KW</td>
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<tr>
<td>4) SPL140KW</td>
<td>SP520 - 80907</td>
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<td>5) SPP140KH</td>
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<td>1) Literature Pack - 2-8987</td>
<td>Operator Manual - 4-3798</td>
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<td>Dealer Set-Up - 2-8964</td>
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<td>Parts Manual - 06925</td>
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<tr>
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<td>Operator Manual - 4-51992</td>
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<td></td>
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<tr>
<td></td>
<td>Parts Manual - 06927</td>
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<tr>
<td>3) Literature Pack - 2-8982</td>
<td>Operator Manual - 4-3798</td>
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<td>4) Literature Pack - 2-8982</td>
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<td>5) Literature Pack - 2-8981</td>
<td>Operator Manual - 4-3798</td>
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<td>Parts Manual - 06925</td>
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<td></td>
<td>Dealer Set-Up - 2-8964</td>
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<td>Parts Manual - 06925</td>
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#### PRO GEAR COMMERCIAL WALK BEHIND - '98

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<td>1) SPE1250KW</td>
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<td>2) SPE140KW</td>
<td>84273</td>
</tr>
<tr>
<td>3) SPE150KH</td>
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<td>1) Literature Pack - 59982</td>
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1.4 SERVICE - PRO GEAR DRIVE POWER UNITS
Section I - GENERAL INFORMATION

INTRODUCTION

1.5 HOW TO USE THIS MANUAL

This manual contains the Service and Maintenance information required to properly inspect, service and repair the PRO Gear Drive Power Units, Series 0 thru Series 4.

The manual is divided into sections for quick, easy reference. Carefully read all procedures described for servicing a particular component BEFORE repairs are started, to avoid needless disassembly.

NOTE

References to the RIGHT and LEFT sides are determined by facing forward while standing behind the handlebar controls.

1.6 WARNINGS & CAUTIONS

Details of standard workshop safety procedures are not included in this manual. WARNINGS & CAUTIONS occur where procedures, if improperly performed, could cause personal injury, and/or damage to the unit or its components. These WARNINGS & CAUTIONS do not cover all conceivable ways hazardous consequences could be created by improperly following the instructions or by the incorrect use of service tools.

1.7 SERIAL NUMBER LOCATION

The unit serial number is located on the rear deck in different places, according to unit model.

1.8 TOOL REQUIREMENTS

The normal complement of U.S. Standard tools found in most repair shops are all that will normally be needed to repair SNAPPER PRO Gear Drive Power Units. Special tools and meters are mentioned where needed in the manual. Refer to the specified Parts Manual for special tools available through SNAPPER Dealers.

NOTE

Throughout the following sections of this manual, the word "unit" will be used (in most cases) in lieu of PRO Gear Drive Power Unit.

1.9 SPECIFICATIONS - GENERAL

A. ENGINE SPECIFICATIONS

Refer to the Engine Manufacturer's Manuals.

B. TRANSMISSION SPECIFICATIONS

The Power Units covered in this manual will have one of the following transmissions:

1. Peerless 700 Series (3, 4 & 5 Speed).
2. Peerless MST 205 Series (5 Speed).

Refer to the Transmission Manufacturer's Repair Manuals.

C. TIRE SPECIFICATIONS

The Power Units covered in this manual are furnished with tires having six (6) different part numbers. Regardless of the unit model or tire part num-

ber, traction tire pressure is not to exceed 28 PSI.

1.10 SPECIFICATIONS - TORQUE VALUES

Standard Torque Specifications and Capscrew Markings Chart. The values given here are based on the use of clean and dry threads. Reduce torque by 10 percent when threads are lubricated with engine oil and by 20 percent if new plated capscrews are used.

<table>
<thead>
<tr>
<th>CAPSCREW</th>
<th>SAE 1 or 2</th>
<th>SAE 5</th>
<th>SAE 6 or 7</th>
<th>SAE 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>BODY SIZE</td>
<td>Torque</td>
<td>Torque</td>
<td>Torque</td>
<td>Torque</td>
</tr>
<tr>
<td>Inches - Thread</td>
<td>Ft - Lb</td>
<td>Ft - Lb</td>
<td>Ft - Lb</td>
<td>Ft - Lb</td>
</tr>
<tr>
<td>1/4 - 20</td>
<td>5</td>
<td>8</td>
<td>10</td>
<td>12</td>
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<tr>
<td>- 28</td>
<td>6</td>
<td>10</td>
<td>12</td>
<td>14</td>
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<tr>
<td>5/16 - 28</td>
<td>11</td>
<td>17</td>
<td>19</td>
<td>24</td>
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<td>- 24</td>
<td>13</td>
<td>19</td>
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<td>27</td>
</tr>
<tr>
<td>3/8 - 16</td>
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<td>- 24</td>
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<td>1/2 - 13</td>
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<td>- 20</td>
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<td>85</td>
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<td>9/16 - 12</td>
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<td>- 18</td>
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<td>167</td>
<td>210</td>
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<td>- 18</td>
<td>95</td>
<td>170</td>
<td>240</td>
<td>240</td>
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<td>3/4 - 10</td>
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<td>- 16</td>
<td>115</td>
<td>295</td>
<td>420</td>
<td>420</td>
</tr>
</tbody>
</table>

1.11 WORKSHOP SAFETY HINTS

A. DO NOT run engine in an enclosed area - exhaust fumes are hazardous to your health.

B. DO NOT smoke, light a fire or create any sparks near gasoline - it is extremely flammable.

C. DO NOT use gasoline as a solvent. Fumes are dangerous. Always use non-flammable solvents.

D. DO NOT store gasoline in an area where sparks or flames are present such as near water heaters or furnaces - gasoline fumes are extremely explosive.

E. ALWAYS disconnect the spark plug wire and secure the end away from the plug BEFORE inspecting, servicing or repairing the unit or attachments. Precautions prevent accidents such as unintentional start-ups!

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Section I - GENERAL INFORMATION

F. ALWAYS make adjustments and do repairs in a well lit and well-ventilated area.

G. ALWAYS wear protective safety goggles when using pressurized air to clean the machine or parts.

H. DO NOT use a jack to support the unit in a raised position. Use a chain hoist, "jack stands" or other stable supports that will hold up BOTH sides of the frame at the same time. This approach is especially important when raising and supporting the rear end of the unit. With the mower unit attached, the front caster wheels will pivot - therefore, both sides of the rear deck must be securely supported. Be sure to chock (block) the wheels that remain on the surface.

NOTE
Read the Operator's & Engine Owner's Manuals and instructions BEFORE operating equipment.
## Section II
### TROUBLESHOOTING

**CONTENTS**

<table>
<thead>
<tr>
<th>ITEM</th>
<th>PAGE No.</th>
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<tbody>
<tr>
<td>Engine</td>
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<tr>
<td>Transmission</td>
<td>2.3</td>
</tr>
<tr>
<td>Service &amp; Lubrication</td>
<td>2.3 - 2.4</td>
</tr>
<tr>
<td>Traction Drive</td>
<td>2.4</td>
</tr>
<tr>
<td>Service Notes</td>
<td>2.5 - 2.6</td>
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</table>
# Section II - TROUBLESHOOTING

## ENGINE

<table>
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<th>PROBLEM</th>
<th>SOLUTION</th>
<th>PAGE</th>
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</thead>
<tbody>
<tr>
<td>Engine does not start.</td>
<td>Key OFF.</td>
<td>Turn Key to Run.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fuel Tank empty.</td>
<td>Fill Fuel Tank.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Engine Throttle Control not at FAST (Rabbit) position.</td>
<td>Put Engine Throttle Control to FAST (Rabbit) position.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Choke NOT closed.</td>
<td>Put Throttle Control in CHOKE I01 position. Check adjustment.</td>
<td>(See Engine Manual)</td>
</tr>
<tr>
<td></td>
<td>Spark Plug Wire loose or disconnected.</td>
<td>Connect Spark Plug Wire.</td>
<td>(See Engine Manual)</td>
</tr>
<tr>
<td></td>
<td>Operator Presence Control (OPC) Switch out of adjustment.</td>
<td>Adjust Switch</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Blade Clutch Switch in ON position.</td>
<td>Pull Blade Clutch Lever to OFF position.</td>
<td></td>
</tr>
<tr>
<td>Spark Plug bad.</td>
<td></td>
<td>Install new Spark Plug.</td>
<td>(See Engine Manual)</td>
</tr>
<tr>
<td>Dirty Air Filter.</td>
<td></td>
<td>Clean Air Filter.</td>
<td>(See Engine Manual)</td>
</tr>
<tr>
<td>Transmission not in NEUTRAL.</td>
<td></td>
<td>Shift Transmission Lever to NEUTRAL.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SYMPTOM</th>
<th>PROBLEM</th>
<th>SOLUTION</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vent in Gas Cap plugged.</td>
<td>Clean Vent or install new Gas Cap.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Air Filter dirty.</td>
<td>Clean or install new Air Filter.</td>
<td>(See Engine Manual)</td>
</tr>
<tr>
<td></td>
<td>Spark Plug not gapped correctly.</td>
<td>Check and set Spark Plug gap.</td>
<td>(See Engine Manual)</td>
</tr>
<tr>
<td></td>
<td>Spark Plug bad.</td>
<td>Install new Spark Plug.</td>
<td>(See Engine Manual)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SYMPTOM</th>
<th>PROBLEM</th>
<th>SOLUTION</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Spark Plug not gapped correctly.</td>
<td>Clean and set Spark Plug gap.</td>
<td>(See Engine Manual)</td>
</tr>
<tr>
<td></td>
<td>Fuel Filter plugged or dirty.</td>
<td>Replace Fuel Filter.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SYMPTOM</th>
<th>PROBLEM</th>
<th>SOLUTION</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine Idles Poorly.</td>
<td>Dirty Air Filter.</td>
<td>Clean or replace Filter.</td>
<td>(See Engine Manual)</td>
</tr>
<tr>
<td></td>
<td>Fuel Filter plugged.</td>
<td>Replace Fuel Filter</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SYMPTOM</th>
<th>PROBLEM</th>
<th>SOLUTION</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine Overheats.</td>
<td>Engine Oil low in Crankcase.</td>
<td>Add Oil.</td>
<td>(See Engine Manual)</td>
</tr>
<tr>
<td></td>
<td>Fins are clogged.</td>
<td>Clean.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SYMPTOM</th>
<th>PROBLEM</th>
<th>SOLUTION</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mower Related:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1) Blade Mounting Bolts loose.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(2) Blade out of Balance.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SP360-Belt too Tight.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mower Related:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1) Mowing grass too tall.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(2) Mowing too fast.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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2.2 SERVICE - PRO GEAR DRIVE POWER UNITS
# Section II - TROUBLESHOOTING

## TRANSMISSION

<table>
<thead>
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<th>SOLUTION</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit is Noisy.</td>
<td>Gearing is overly noisy - chatter, etc.</td>
<td>Check Oil level.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Worn Gears.</td>
<td>Remove and Replace with New Gears.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Worn Bearings - mainly Input Shaft Ball Bearing.</td>
<td>Replace Bearing.</td>
<td></td>
</tr>
<tr>
<td>Unit Jumps Out of Gear.</td>
<td>Teeth of Gears are worn beyond tolerances.</td>
<td>Replace Worn Gears.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Spring in Shifter Fork weak or broken.</td>
<td>Replace Spring.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Attaching screws for Shift Lever and Housing Assembly not properly torqued</td>
<td>Torque Screws to 10 ft. - lbs.</td>
<td></td>
</tr>
</tbody>
</table>

## SERVICE & LUBRICATION

<table>
<thead>
<tr>
<th>HOURS</th>
<th>PROCEDURE</th>
<th>COMMENTS</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>BREAK-IN</td>
<td>Check all Grease Points and add if necessary.</td>
<td>(See Service &amp; Lubrication Chart, Page 2.4)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Check all Fasteners for proper tightness.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Check Set Screws.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Change Engine Oil and Filter at 5 hours.</td>
<td>(See Engine Manual)</td>
<td></td>
</tr>
<tr>
<td>DAILY</td>
<td>Check Engine Oil.</td>
<td>Change Oil if extreme dusty conditions.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Clean Air Filter.</td>
<td>More often if needed.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Clean Air Intake Screen.</td>
<td>More often if needed.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Grease Transmission Couplings.</td>
<td>One Shot General Purpose Grease.</td>
<td></td>
</tr>
<tr>
<td>WEEKLY</td>
<td>Check Tire Pressure.</td>
<td>Add or Adjust as required.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Check Safety Interlock System.</td>
<td>Inspect OPC Switch for proper Operation.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lube Traction (Drive) Levers.</td>
<td>One Shot General Purpose Grease.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Inspect Traction Lock for Wear.</td>
<td>Replace if Worn.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Change Engine Oil and Filter. (25 Hrs.)</td>
<td>More often if needed.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Replace Air Filter. (25 Hrs.-See Pg. 4.2)</td>
<td>More often if needed.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Grease Traction Wheels. (100 Hrs.)</td>
<td>General Purpose Grease.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fuel Filter.</td>
<td>Replace with correct SNAPPER Filter.</td>
<td></td>
</tr>
<tr>
<td>MONTHLY</td>
<td>Check Set Screws.</td>
<td>(See Engine Manual)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Clean and Adjust Spark Plugs.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lube Controls and Linkages.</td>
<td>Use Medium Duty Oil.</td>
<td></td>
</tr>
<tr>
<td>YEARLY</td>
<td>Test Engine for Compression &amp; Wear.</td>
<td>Repair/Replace Parts if needed.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Test Engine Electrical System.</td>
<td>Replace Components if needed.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Test OPC Electrical Components.</td>
<td>(See Engine Manual)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Check all Bearings for Wear.</td>
<td>Replace Components if needed.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Check Transmission for Wear.</td>
<td>(See Electrical System)</td>
<td></td>
</tr>
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Section II - TROUBLESHOOTING

TRACTION DRIVE

<table>
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</thead>
<tbody>
<tr>
<td>Mower Does Not Move When</td>
<td>Transmission in neutral.</td>
<td>Select gear.</td>
<td></td>
</tr>
<tr>
<td>Traction Levers Are Released.</td>
<td>Traction Control Rod Adjustment.</td>
<td>Adjust Traction Rod.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Worn Belt or Input Pulleys.</td>
<td>Replace Belt or Pulleys.</td>
<td></td>
</tr>
<tr>
<td>Mower Does Not Track Straight.</td>
<td>Shipping or broken Traction</td>
<td>Replace Belt or adjust Traction</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Belt.</td>
<td>Levers/Rods.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unequal Air Pressure in Traction Tires.</td>
<td>Adjust Air Pressure in both tires to 28 PSI.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Traction Tires are Different Sizes.</td>
<td>Replace as required with correctly-sized tire(s).</td>
<td></td>
</tr>
</tbody>
</table>

SERVICE & LUBRICATION CHART

NOTE:
The Power Unit illustrated below is the PRO EXPRESS Model SPE1250KW. It is shown with the Mower Unit Model SPE360 attached and is intended to give a general overview of the location of the various components. Use common sense when servicing - if a sliding surface shows sign of wear, it needs lubrication. If a component is equipped with a grease fitting, it requires grease, etc.

INTERLOCK SWITCHES
INSPECT DAILY
DO NOT LUBRICATE

ENGINE
SEE ENGINE MANUAL FOR SERVICE

FUEL FILTER
REPLACE EVERY 100 HRS.

MUFFLER
INSPECT OFTEN FOR SIGNS OF DETERIORATION OR "BURN-OUT"

CUTTER DECK
IDLER ARM PIVOT
USE GP GREASE WEEKLY

CASTER SWIVEL
USE GP GREASE WEEKLY

TIRE PRESSURE
50 PSI MAX.
(CHECK DAILY)

CASTER WHEEL BEARINGS
USE GP GREASE EVERY 100 HRS.

DRIVE BELTS
INSPECT EVERY 200 HRS.

TRACTION LOCKS
INSPECT EVERY 40 HRS. FOR WEAR

TRACTION LEVERS
ONE SHOT GP GREASE WEEKLY

TRACTION IDLERS
ONE SHOT GP GREASE WEEKLY

BRAKE LEVERS
ONE SHOT GP GREASE WEEKLY

TRACTION WHEELS
USE GP GREASE EVERY 100 HRS.

TIRE PRESSURE
28 PSI MAX.
(CHECK DAILY)

CUTTER BLADE SPINDLES
CHEVRON SRI GREASE - WEEKLY

CUTTER BLADES
SHARPEN DAILY.
TORQUE TO 60-75 LBS.

REMOVE DEBRIS FROM UNDER BELT COVER & DECK CLEAN DAILY. WASH WEEKLY.
ATTENTION
Because of ongoing improvements to the PRO line of commercial mowers, there have been many variations in the electrical systems and their components. For this reason, Snapper's Product Technical Department is presently compiling a comprehensive "PRO Electrical Repair Manual" which hopefully, will solve any problem that may be encountered. Therefore, this Section covers only components testing, and shows the basic electrical diagrams and schematics for the Power Units covered in this manual.

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</tr>
<tr>
<td>Principle of Operation</td>
<td>3.2</td>
</tr>
<tr>
<td>Interlock System Analysis</td>
<td>3.2 - 3.4 &amp; 3.10</td>
</tr>
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<td>Electric Clutch</td>
<td>3.3 - 3.4</td>
</tr>
<tr>
<td>Electric Components (Wiring)</td>
<td>3.5 - 3.9</td>
</tr>
<tr>
<td>Switch &amp; Electrical Circuitry Testing, Series 1 &amp; 2</td>
<td>3.10</td>
</tr>
</tbody>
</table>
Section III - ELECTRICAL SYSTEM

INTRODUCTION
The components of the PRO Power Unit's Electrical System are as follows:
A. Key Switch (Early Models)
B. Key Switch (Later Models)
C. OPC Switch
D. Blade Clutch Switch (Manual)
E. Blade Clutch Switch (Electric)
F. Transmission (PTO) Switch
G. Fuse (if applicable)
H. Module (if applicable)
J. Electric Clutch
NOTE: The following components apply to Kawasaki Engines only.
K. Rectifier/Regulator
L. Capacitor

3.1 PRINCIPLE OF OPERATION
Together, the above components comprise the Safety Interlock System. This is an electrical loop which contains four interlock switches; key, OPC, clutch (or mower blade) and transmission switch. These switches MUST be in their appropriate modes (normally open/normally closed) before the engine can be started. If any of the four switches are not in their appropriate mode (N/O - N/C), the circuit will not be completed and the engine cannot be started.

Testing of the individual components is explained in the following “Interlock System Analysis”.

3.2 INTERLOCK SYSTEM ANALYSIS
A. KEY SWITCH TEST (EARLY MODELS)
  1. Disconnect wire from the switch terminal. See Figure 3.1.
  2. Connect the RED (+) Lead of a Test Meter to the switch terminal.
  3. Use the BLACK (-) Lead of the Test Meter to make a good ground contact with the mounting bracket of the Keyswitch.
  4. Turn Keyswitch to the ON and OFF position. With Keyswitch in the OFF position, the indicator on the Test Meter should indicate continuity.
  5. If the Test Meter does not show continuity with the Keyswitch in the OFF position, check connections of the Tester and try again. If still no continuity, replace the Keyswitch with new part.

B. KEY SWITCH TEST (LATER MODELS)
  1. Disconnect wire connectors from terminals. See Figure 3.2.
  2. Attach continuity light wires to the terminals.
  3. Turn the switch key to RUN position (making the circuit). The light should go off.
  4. The light should come on in the OFF position.

C. OPC SWITCH TEST (OPERATOR'S PRESENCE CONTROL)
  1. Disconnect wire connectors from terminals. See Figure 3.3.
  2. Attach continuity light wires to the terminals.
  3. Turn the switch key to RUN position (making the circuit). The light should go off.
  4. The light should come on in the OFF position.

NOTE
For switch tests concerning the Series 1 & 2 versions of the PRO MID-SIZE COMMERCIAL MOWERS, refer to Page 3.10.
D. BLADE CLUTCH SWITCH TEST (MANUAL)
1. Disconnect wire connectors from terminals. See Figure 3.4.

2. Attach continuity light wires to the terminals. When the switch is depressed, the light should go off.
3. Reconnect wires to the proper terminals.

E. BLADE CLUTCH SWITCH TESTS (ELECTRIC)
1. Disconnect wires from the switch terminals. See Figure 3.5.
2. Place switch in OFF position and connect tester wires to the #4 and #5 terminals only - the light should come on.
3. Place switch in ON position and connect tester wires to the #1 and #3 terminals only - the light should come on.
4. Reconnect wires to the proper terminals.

F. TRANSMISSION (PTO) SWITCH TEST
1. Remove connector from terminals. See Figure 3.6.

2. Test switch with continuity leads to switch terminals. Depress and release the bottom ball. They should make and break continuity depending on which switch is being tested.

G. FUSE CHECK
Some models of the PRO Power Unit have a fuse holder and a 15 or 20 Amp fuse contained in the main wiring harness. This fuse should be checked on a regular basis and, especially when the electric clutch will not engage or, if it suddenly disengages.

H. MODULE TEST
The module (2-2849) can be tested by following the manufacturer's instructions. If faulty, it must be replaced with a new module.

J. ELECTRIC CLUTCH TESTS
(MEASURE CLUTCH FIELD COIL)
1. Turn clutch switch and engine switch OFF.
2. Disconnect clutch wire connectors. See Figure 3.7.

3. Connect OHM meter leads to the two wires in the clutch connector. Refer to Figure 3.7.
4. If the meter reading is BELOW 2.40 OHMs or ABOVE 3.40 OHMs resistance, the clutch has failed and must be replaced.
5. If the meter reads between 2.40 and 3.40 OHMs resistance, proceed with the CLUTCH CURRENT DRAW test.

K. (MEASURE CLUTCH CURRENT DRAW)
1. With the Engine Switch and Clutch Switch OFF, disconnect the clutch wire connector. See Figure 3.8, Page 3.4.
Section III - ELECTRICAL SYSTEM

((CLUTCH CURRENT DRAW)

CONNECT LEADS TO A GOOD 12V BATTERY
(+)

10 AMP METER

HARNESS CONNECTOR CLUTCH CONNECTOR

B

FIGURE 3.8

2. Use an AMP meter with a 10 AMP scale. Connect one meter lead to clutch connector wire "A" and connect the other metal lead to a good 12 Volt battery positive (+) terminal.

3. Connect a short jumper wire to the wire "B" in the clutch connector and to the negative (-) terminal.

4. Turn clutch switch ON.

5. If the meter reads BELOW 3.5 AMPS, the electrical clutch has a problem. Replace the clutch.

6. If the meter reads 3.5 AMPS to 4.5 AMPS, proceed to the AIR GAP SETTING instructions.

7. If the reading is above 4.5 AMPS (6 to 7), there is a short in the winding. Replace clutch.

(CHECK AIR GAP SETTING)

1. With the engine switch and clutch switch OFF, locate the three air gap check "slots" as shown. See Figure 3.9.

(USING FEELER GAUGE)

ADJUSTING NUT

.TENSION SPRING

AIR GAP CHECK "SLOT" (THREE TOTAL)

FIGURE 3.9

2. Insert a .012 feeler gauge into each of the 3 slots.

3. If the gaps do not fall between .010 and .025, reset the spring-loaded adjustment nuts until the gaps are measured at .012 on the feeler gauge.

THEREFORE IF...

1. The resistance falls between 2.40 and 3.40 OHMs...

2. The amperage draw is 3.50 AMPS to 4.5 AMPS...

3. The air gaps are between .010" and .025" (or have been set to .012"), the electric clutch is within factory specifications and is not the source of a problem - check the remainder of the electrical system.

NOTE

Items "K" & "L" are applicable to Kawasaki engines only.

K. RECTIFIER/REGULATOR TEST

If this item becomes suspect of causing a problem, either check with the manufacturer's instructions for methods of testing or replace. See Figure 3.10.

RECTIFIER/REGULATOR

PIGTAIl CONNECTOR

CAPACITOR

FIGURE 3.10

L. CAPACITOR TEST

Test according to manufacturer's instructions. Replace as needed. Refer to Figure 3.10.

NOTE

A few early models of the PRO line of commercial mowers were equipped with electric start. These are not included in this manual. Information concerning these units can be found in the "Operator's" and "Parts" manuals. If further information is required, please contact "Product Technical Service" at Snapper.

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SERVICE - PRO GEAR DRIVE POWER UNITS
Section III - ELECTRICAL SYSTEM
ELECTRICAL COMPONENTS - PISTOL GRIP
PRO GEAR EXPRESS MID-SIZE WALK BEHIND MOWERS SERIES 0

KEY WITH COVER

KEYSWITCH

OPC SWITCH
(PISTOL GRIP MODELS ONLY)

BLADE CLUTCH SWITCH

15 AMP FUSE

MAIN WIRE HARNESS

TO TRANSMISSION SWITCH

TO ENGINE

TO ELECTRIC CLUTCH

* NOTE: THIS TERMINAL HAS A LOCK-OUT BARB WHICH MUST SLIDE INTO THE CONNECTOR NOTCH.

KAWASAKI ENGINE ONLY

KAWASAKI MODULE

KAWASAKI PIGTAIL

KAWASAKI CAPACITOR

GROUND TO ENGINE

TO MAIN HARNESS

TO ENGINE TERMINAL

MANUAL No. 07221 (L.R. 11/98)

SERVICE - PRO GEAR DRIVE POWER UNITS
Section III - ELECTRICAL SYSTEM
SWITCH & ELECTRICAL CIRCUITRY TESTING
PRO GEAR COMMERCIAL MOWERS SERIES 1 & 2

1. Engine should not start unless either the OPC switch or both transmission and blade switches are closed.

2. The module must have continuity at brown/green to yellow at all times or it will ground the magneto, and kill the engine.
Section IV
ENGINE

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Section IV - ENGINE

INTRODUCTION
This section covers procedures for the maintenance and disassembly of those engine components which power the different units.

These components include the filters, muffler, spark plug and fuel system.

Also covered in this section is the Removal and Installation of various engines.

4.1 ENGINE MAINTENANCE
(The following information is applicable to most engines; regardless of make, model or horsepower).

A. ENGINE OIL
1. Change engine oil after each 25 hrs of use. Use only those oils classified for Service SF, SE, SD or SC. These oils will keep the engine cleaner and will help retard the formation of gum and varnish deposits. DO NOT use oil additives!

2. Refer to the following chart for recommended grades to use with temperature range anticipated before next oil change.

<table>
<thead>
<tr>
<th>RECOMMENDED SAE VISCOSITY GRADES</th>
</tr>
</thead>
<tbody>
<tr>
<td>5W-20, 5W-30, 10W-30</td>
</tr>
<tr>
<td>Temperature Range Anticipated Before Next Oil Change</td>
</tr>
<tr>
<td>°F</td>
</tr>
<tr>
<td>°C</td>
</tr>
</tbody>
</table>

* If not available, a synthetic oil may be used having 5W-20 or 5W-30 viscosity.

B. OIL FILTER
1. Change the engine oil filter each time the oil is changed. Use only the type and brand of filter as designated in the Engine Owner’s Manual.

2. Some power units have engines which come equipped with oil filters. For those engines that do not, consult the proper Parts Manual for the availability of an oil filter kit.

C. CHANGING ENGINE OIL
1. Start engine and allow to operate until oil has warmed.

2. Remove oil drain plug and loosen oil fill/dipstick cap.

D. AIR FILTER
(Consult Engine Manual for part number of filter element).
1. Inspect filter during every engine service or every 25 operating hours - more often if mower is used under extremely dirty or dusty conditions. See Figure 4.2.

3. Allow oil to drain completely.

4. Remove oil filter (if applicable).

5. Using a clean cloth, wipe away any dirt or other debris that may have collected in the oil filter base.

6. Install new o-ring into filter base.

7. Install new filter (hand-tighten only).

8. Install oil drain plug.

NOTE
Some power units are equipped with engines which allow the engine oil to be drained through the oil filter base. See Figure 4.1.


10. Start engine and allow to operate while checking for leaks.

11. If there are no leaks, stop engine (allow unit to remain undisturbed for 5 minutes) and check oil level. If required, add oil to bring to proper level on dipstick.

NOTE
Engines will have different methods for draining engine oil.

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2. Clean the sponge filter element according to instruction label found on filter cover. If label is missing, consult engine manual.

3. Clean paper filter by tapping it gently to remove debris and dust particles. If extremely dirty, replace filter.

4. Always clean cover inside and out, and clean base before reassembly.

E. FUEL FILTER

**WARNING!**

Gasoline is flammable and must be handled with care. **DO NOT** allow open flame, matches or smoking in area. Wipe up any spills. Use approved (RED) fuel container.

Shown in Figures 4.3 & 4.4 are the two types of fuel filters found on most units.

1. **FILTER, ENGINE MANUFACTURER’S**
   - The type fuel filter shown in Figure 4.3 is supplied by the engine manufacturer. Refer to the Engine Manual for Part Number and Order Information. Make sure the replacement is correctly installed with the arrow on filter pointing toward the engine. See Figure 4.3.

2. Check the In-Line Fuel Filter at frequent intervals and replace before the screen becomes clogged with sediment.

3. **FILTER #1-4359**
   - Make sure the replacement filter is correctly installed with “IN” marking toward the fuel tank and “OUT” toward the engine. See Figure 4.4.
Section IV - ENGINE

F. MUFFLER
1. When servicing engine, inspect muffler for signs of damage or deterioration. Replace as required.

2. Make sure that muffler guard or heat shield is always in place and secure before allowing mower to leave the shop.

CAUTION
Worn out mufflers are more than just a noise nuisance and should be replaced immediately. Continued use could result in fire or explosion!

G. SPARK PLUGS
1. Spark plugs should be cleaned or replaced (if necessary), and gap reset to .030 or .035 every 100 hours of operation or every 6 months, whichever comes first.

2. To clean, remove spark plug from engine, scrape or wire brush and wash with a commercial solvent. DO NOT blast clean.

NOTE
Sparking can occur if wire terminal does not fit firmly on spark plug. Compress terminals if necessary.

H. FUEL SYSTEM
The Fuel System consists of the fuel tank and cap, (2) fuel tank straps, (3) lengths of fuel hose, an "ON/OFF" fuel valve and a fuel line filter. See Figure 4.5.

1. Check the Fuel System components frequently. Replace any parts showing worn spots or cracks.

2. Keep the fuel tank fill-cap area clean at all times. Wipe away any debris before filling tank.
Section IV - ENGINE

4.2 ENGINE REMOVAL & INSTALLATION
The following procedures are for the removal and re-installation of the units engine. Refer to the Engine Manufacturer's Service/Repair Manual for information concerning engine repairs.

A. ENGINE REMOVAL (KOHLER 12.5 & 14 HP)
1. Turn fuel shut-off valve to OFF position.

2. Disconnect the engine's electrical harness from the main harness.
   (a) Disconnect engine ground wire.
   (b) Disconnect electric clutch harness (if applicable to unit).

3. Remove the fuel line from the engine.

4. Move transmission shift lever to neutral (N), then disconnect the throttle control from the engine.

NOTE
The PRO GEAR Mid-Size Commercial Mowers, Series 1 & 2 (Manual Clutch), feature a "Reverse Speed Operation" linkage which must be disconnected before engine removal. See Figure 4.6.

5. Tilt unit back on its handles to gain access to underside of rear deck.

6. Roll the deck drive belt off the deck pulleys, then pull the belt slack up to the engine clutch pulley and remove the belt. See Figure 4.7.

7. Roll the engine/transmission belt off the transmission pulley and remove the belt.

NOTE
On those units having a fixed idler pulley, it may be necessary to loosen the idler before removal of belt. See Figure 4.7

8. MANUAL CLUTCH UNITS. Remove the engine nuts & bolts.

9. On units so equipped, it will be necessary to remove the electric clutch if the rear deck is not notched out to allow lifting engine out with clutch attached. Check for notches. See Figure 4.8.

10. Remove the electric clutch bracket. See Figures 4.9 & 4.10.

11. On units other than the Pro Express, Model SPE1250KW (Kawasaki), in order to remove the electric clutch, you must first remove the engine nuts and bolts and then slide the engine forward until the electric clutch has cleared the axle. The electric clutch may now be removed. See Step 12 & Figures 4.9 & 4.10.

12. Remove the electric clutch by first removing the Hex Hd Cap Bolt, split lockwasher and spacer. Remove the clutch from the engine driveshaft. Refer to Figures 4.9 & 4.10.

13. Lift engine out from topside of deck.


15. If replacing engine, transfer all drive components to new engine.

16. Reverse above procedure to install and connect a new or repaired engine.

SERVICE - PRO GEAR DRIVE POWER UNITS
Section IV - ENGINE

B. ENGINE REMOVAL (KAWASAKI) 12.5 & 14 HP
1. Turn fuel shut-off valve to OFF position.

2. Disconnect the engine's electrical harness from the main harness.
   (a) Disconnect engine ground wire.
   (b) Disconnect electric clutch harness (if applicable to unit).

3. Remove the fuel line from the engine.

4. Move the transmission shift lever to neutral (N), then disconnect the throttle control from the engine (see NOTE below, for Manual Clutch).

NOTE
The PRO GEAR Mid-Size Commercial Mowers, Series 1 & 2 (Manual Clutch), feature a "Reverse Speed Operation" linkage which must be disconnected before engine removal. See Figure 4.11.

5. Tilt unit back on its handles to gain access to underside of rear deck.

6. Roll the deck drive belt off the deck pulleys, then pull the belt slack up to the engine clutch pulley and remove the belt. See Figure 4.12.

FIGURE 4.9
FIGURE 4.10
FIGURE 4.11

SERIAL NO. 07221 (L.R. 11/98)
Section IV - ENGINE

7. Roll the engine/transmission belt off the transmission pulley and remove the belt.

NOTE
On those units having a fixed idler pulley, it may be necessary to loosen the idler before removal of belt.

8. MANUAL CLUTCH UNITS. Remove the engine nuts and bolts.

9. On units so equipped, it will be necessary to remove the electric clutch if the rear deck is not attached out to allow lifting engine out with clutch attached. Check for notches. See Figure 4.13.

10. Remove the electric clutch bracket. See Figures 4.14 & 4.15.

11. On units other than the Pro Express, Model SPE1250KW (Kawasaki), in order to remove the electric clutch, you must first remove the engine nuts and bolts and then slide the engine forward until the electric clutch has cleared the axle. The electric clutch may now be removed. (Proceed to Step 11, Page 4.8).

PRO GEAR MID-SIZE WBM, SERIES 0 MODELS: SPL140KH & SPP140KH

PRO GEAR COMMERCIAL MOWERS SERIES 4

FIGURE 4.12

FIGURE 4.13

FIGURE 4.14

FIGURE 4.15
Section IV - ENGINE

11. Remove the Hex Head Cap bolt, lockwasher and spacer from the engine shaft. Refer to Figure 4.14 & 4.15.

12. Remove the clutch from the engine driveshaft.

13. Lift engine out from topside of deck.

14. If replacing engine, transfer all drive components to new engine.

15. Reverse above procedure to install and connect a new or repaired engine.

NOTE
Remove PRO GEAR EXPRESS engine (Kawasaki 12.5 HP) as shown in Figure 4.16 below.

PRO GEAR EXPRESS MID-SIZE WBM SERIES 0.
MODEL SPE1250KW

KAWASAKI 12.5 HP ENGINE

LOCK-
WSHR
HEX
HD
SCREW
KEY
MACHINE
BUSHING
ENGINE PULLEY
ELECTRIC
CLUTCH
FLAT WASHER
LOCK WASHER
HEX HD CAPSCREW

FIGURE 4.16
MANUAL No. 07221 (I.R. 11/98)

4.3. ENGINE/TRANSMISSION BELT CHART

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<th>MODEL</th>
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<th>BELT PART No.</th>
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<tbody>
<tr>
<td>PL71250KW</td>
<td>06920</td>
<td>1-7334</td>
</tr>
<tr>
<td>PP71250KW</td>
<td>(I.R. 1/92)</td>
<td></td>
</tr>
<tr>
<td>PL7140KW</td>
<td>Pgs. 4 &amp; 5</td>
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<tr>
<td>PP7140KWW</td>
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<th>BELT PART No.</th>
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<tbody>
<tr>
<td>PRO736 &amp; PRO748 COMMERCIAL MOWERS - SERIES 1 &amp; 2</td>
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<td></td>
</tr>
<tr>
<td>06921</td>
<td>(Rev. 2, 7/98)</td>
<td>1-7334</td>
</tr>
<tr>
<td></td>
<td>Pgs. 4 &amp; 5</td>
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<td>06924</td>
<td>(I.R. 1/95)</td>
<td>1-7334</td>
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<tr>
<td>PRO GEAR MID-SIZE WBM - SERIES 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPP90KW</td>
<td>06925</td>
<td>1-6029 (Late Model)</td>
</tr>
<tr>
<td>SPL1250KW</td>
<td>(I.R. 12/95)</td>
<td></td>
</tr>
<tr>
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<td>SPL140KW</td>
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<td></td>
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<tr>
<td>SPP140KW</td>
<td></td>
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<tr>
<td>SPL140KHH</td>
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<th>PARTS MAN.</th>
<th>BELT PART No.</th>
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<tr>
<td>PRO GEAR EXPRESS MID-SIZE WBM - SERIES 0</td>
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<td></td>
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<tr>
<td>SPE1250KW</td>
<td>06927</td>
<td>2-9118</td>
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<td>(I.R. 10/96)</td>
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4.4 THROTTLE CONTROL ADJUSTMENT
(Kawasaki Engines) FOR POWER
UNIT MODELS:
PL71250KW, PP71250KW,
PL7140KWV & PP7140KWV, Series 0
Engine Speed on the Kawasaki Engine can be adjusted as follows:
A. Set Park Brake, Stop Blades and Engine!
B. Place Throttle Control Lever in FAST detent (RABBIT) position.
C. Loosen Screw (A). See Figure 4.17.
D. Adjust Cable (B) until a 15/64" drill bit can be placed into Hole (C) of Lever (D) and into Hole (E) of Control Plate (F).
E. Check that Throttle Control Lever is in FAST detent (RABBIT) position.
F. Tighten Screw (A).

4.5 CHOKE ADJUSTMENT
(Kawasaki Engines)
Engine Choke on the Kawasaki Engine can be adjusted as follows:
A. Place Throttle Control Lever in CHOKE position.
B. Place 15/64" drill bit through both Holes (C & E).
C. Turn Screw (G), counterclockwise with screwdriver until screw clears Choke Lever (H).
D. Turn Screw (G) clockwise until it just touches Choke Lever (H). Be sure Choke Valve (I) is completely closed when Throttle Control Lever is in Choke position.

THROTTLE & CHOKE ADJUSTMENTS. KAWASAKI ENGINES (EARLY UNITS)

FIGURE 4.17
# Section V
## TRANSMISSION & DRIVE SYSTEMS

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<td>Reverse Speed Operation (Shift Levers)</td>
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<td>Reverse Speed Operation (Adjustments, Kohler &amp; Kawasaki Engines)</td>
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<td>Transmission Removal (700 Series)</td>
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### REFERENCE LITERATURE

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<td>#06924 (I.R. 1/95)</td>
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<tr>
<td>#06925 (I.R. 12/95)</td>
<td>4 - 5 - 8</td>
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<tr>
<td>#06927 (I.R. 10.96)</td>
<td>5 - 6 - 7 - 8</td>
</tr>
</tbody>
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#### TECUMSEH/PEERLESS

- #691218 - Motion Drive Systems Mechanics Handbook
- #694942 (Rev. 3/93) Transmission and Transaxle Quick Reference Assembly Guide
- #693345C (Rev. 3/91) Transmission & Transaxle Ass’y, Chart
Section V - TRANSMISSION & DRIVE SYSTEMS

INTRODUCTION
This section covers procedures for the maintenance and disassembly of those transmission and drive components which power the different PRO units.

These components include the transmissions (Peerless MST 205, Peerless 700 Series - 3, 4 & 5 Speed), transmission shift lever assemblies, traction idler assemblies and traction and transmission drive belts.

It should be noted that most service bulletins (prior to 1994) concerning drive components will be found incorporated in the following pages. Future service bulletins should be inserted in this section for quick reference. For component breakdowns of the different transmissions and drive systems, see Figure 5.1, below, and Figure 5.2 on Page 5.3.

PEERLESS 700 SERIES TRANSMISSION - 3, 4 & 5 SPEED

(1) 3-SPEED TRANSMISSION, PART No. 4-4778 (Used on SPP90KW Only)
(2) 4-SPEED TRANSMISSION, PART No. 1-7533 (Early Production Series 1) & (Series 2)
(3) 4-SPEED TRANSMISSION, PART No. 2-4999 (Late Production Series 1 Only)
(4) 5-SPEED TRANSMISSION, PART No. 2-9388 (SP Models, Series 0)

FIGURE 5.1

SERVICE - PRO GEAR DRIVE POWER UNITS
INTRODUCTION (Continued from Page 5.2)

PEERLESS MST 205 SERIES TRANSMISSION - 5 SPEED
(Used on Power Unit Model SPE1250KW - PRO GEAR EXPRESS, SERIES 0)

FIGURE 5.2

MANUAL No. 07221 (I.R. 11/98) 5.3

SERVICE - PRO GEAR DRIVE POWER UNITS
Section V - TRANSMISSION & DRIVE SYSTEMS

5.1 TRANSMISSION LUBRICATION
The transmissions are permanently sealed. But, lubrication can be added if leakage should occur.

A. Peerless MST 205 Series
The transmission case holds 16 ounces of 80w-80 gear oil. Lubricate as follows:
1. Remove transmission switch wire plug. See Figure 5.3.

2. Remove transmission interlock switch and fiber washer.

3. Add required amount of transmission oil through switch hole.

4. Install new fiber washer, Part Number 2-9662, onto switch.

5. Install switch into transmission and tighten securely.

6. Attach switch wire plug onto switch.

B. Peerless 700 Series (3, 4 & 5 Speed)
The transmission case of this series holds 12 ounces maximum of Bentonite grease. Lubricate as follows:
1. Remove transmission switch wire plug. See Figure 5.4.

2. Remove transmission switch and fiber washer. Refer to Figure 5.4.

3. Add required amount of Bentonite grease through switch hole.

4. Install new fiber washer, Part Number 2-6992, onto switch.

5. Install switch into transmission and tighten securely.

6. Attach switch wire plug onto switch.

C. Peerless 700 Series Model 700-050
This transmission is used on Series 1, 2 & 4 of the PRO7 Power Units. Its case capacity is also a maximum of 12 ounces of Bentonite grease. Lubricate as follows:
1. Remove transmission switch wire plug. See Figure 8.4.

2. Remove transmission switch (1-7533, Series 1 early production, Series 2 & 4 - Model 700-060, 2-4999, Series 1 late production).

3. Add required amount of Bentonite grease through switch hole.

4. Install new fiber washer, Part No. 2-9662, onto switch.

5. Install switch into transmission and tighten securely.

6. Attach switch wire plug onto switch.

NOTE
The illustration in Figure 5.4 shows the 3 speed (2-8931), the 4 speed (1-7533) and 5 speed (2-93888) configurations of the Peerless 700 Series transmission used in the following Power Units:

- SPP90K
- SPL1250K
- SPL140K
- SPL140KH
- SPL140K
- SPL140K
- SPP140K
- SPL140K
- SPL140KH
- SPP140K

These transmissions are fitted with two (2) switches and a Reverse Interlock Plate (Refer to Parts Manual No. 06925 (I.R. 12/95) for parts identification).

MANUAL No. 07221 (I.R. 11/98)
Section V - TRANSMISSION & DRIVE SYSTEMS

5.2 TRANSMISSION IDENTIFICATION
All PRO Power Units covered in this Repair Manual are equipped with one of the following transmissions:

A. PEERLESS 700 Series
1. Model 700-050
2. Model 700-060
3. Model 700-069

The Model Number of the Series 700 Transmission can be found stamped on the metal tag attached to the case as shown in Figure 5.5.

B. PEERLESS 200 Series
Model MST 205

The Model Number of the Series 200 Transmission is found stamped in the case at the location shown by Figure 5.6.

5.3 SHIFTER ROD (OR FORK) CONFIGURATION
The 700 Series Transmissions found on the units covered by this manual have three different types of shifter rods. Figure 5.7 shows these different types and, also, the models on which they are used.

5.4 SHIFTER ROD (OR FORK) REPLACEMENT
If the customer has experienced shifting problems (i.e., loose or worn socket on shift handle; incorrect shift pattern; worn shifter rod) with either the 700-050 or 700-600 Model Transmission, then it should be repaired as follows:

A. Remove transmission from unit (see "Transmission Removal/Replacement").

B. Dismantle transmission per Manufacturer's Repair Manual.

C. Remove shifter assembly (includes shaft, pins and fan) from transmission case. See Figure 5.8.
D. Disassemble the Shifter Assembly. Replace the existing Shifter Rod with a Model 700-069 (square) Shifter Rod (refer to Figure 5.9).

E. Reassemble the transmission per the Manufacturer’s Repair Manual.

F. Install transmission onto unit.

G. REPLACE the existing Transmission Shift Lever with the following parts:
   1. 3-4809 Lower Shift Lever
   2. 3-4429 Upper Shift Lever
   3. Hardware as required (Refer to SNAPPER Parts Manual No. 06925, Pages 6 and 7). See Figure 5.9.

   **SHIFT LEVER PARTS (Ref. Manual No. 06925)**
   
   - GRIP, SHIFT LEVER 7-6526
   - LEVER, UPPER SHIFTER 3-4429
   - LEVER, LOWER SHIFTER 3-4809

   **FIGURE 5.9**

5.5 TRANSMISSION SHIFT LEVERS

A. The PRO Units covered in this manual were produced from 1991 through 1998 (Model Year) and were equipped with as many as seven (7) Shift Lever variations.

B. The following illustrations (Figures 5.10 thru 5.11) identify each Shift Lever and the Model/Series that they are used on.

**FIGURE 5.10**

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<th>SERIES 0 (PRO)</th>
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<td>POWER UNITS</td>
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<tr>
<td>PP7140KWV</td>
</tr>
<tr>
<td>PL7140KWV</td>
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<tr>
<td>PP71250KW</td>
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**SERIES 0 (PRO)**

**PARTS LIST**

- GRIP, SHIFT LEVER 7-6526
- LEVER, UPPER SHIFTER 3-4429
- LEVER, LOWER SHIFTER 3-4809

**NOTE:**
SEE MANUAL NO. 06925 FOR HARDWARE
5.6 REVERSE SPEED OPERATION SHIFT LEVERS
A. The Shift Lever Assemblies shown above (Figure 5.11) are attached by various mechanisms to the engine governor arms of the Series 1 (PRO7) and Series 2 (PRO7) Power Units.

B. For Hardware Parts Numbers, refer to Pages 3, 6 & 7 of SNAPPER Parts Manual No. 06921 (Rev. 2, 7/93).

C. For information explaining “Reverse Speed Operation” - and the function the Shift Lever(s) perform - refer to Page 5.8, “5.7 REVERSE SPEED OPERATION”.

---

**CAUTION**
The PRO736 and PRO748 Power Units are manufactured to intentionally reduce engine speed when shifted into reverse. Make sure engine speed is at or slightly above idle before releasing traction levers. LOSS OF CONTROL AND PHYSICAL INJURY COULD RESULT FROM HIGH SPEED OPERATION!
Section V - TRANSMISSION & DRIVE SYSTEMS

5.7 REVERSE SPEED OPERATION
Early PRO736 & PRO748 Mid-Size Commercial Mowers, Series 1 & 2 were designed and manufactured to intentionally reduce engine RPMs when shifted into REVERSE. The “travel speed” in REVERSE can be adjusted to suit individual preferences through a range of engine speeds, from idle, to several hundred RPMs above idle.

ADJUSTMENTS
A. KOHLER 12.5/14 HP Engines
A wire formed rod connects the Engine Governor Arm to an arm attached to the Transmission Shift Lever. Adjustment is made at the Shift Lever Arm. See Figure 5.12.

With engine “OFF”, loosen and move the attaching nut and bolt (at the Reverse Arm) REARWARD to reduce speed, or FORWARD to increase speed. Make adjustment with the Transmission in the REVERSE position and throttle in the FAST position. The rod must move freely at the Engine Governor Arm and at the Reverse Arm when the Transmission is in any position except REVERSE. If necessary, carefully bend the rod as needed, to obtain free movement.

B. KAWASAKI 12.5 HP Engines
A chain connects the Transmission Shift Lever to a lever which pushes against the Governor Arm to reduce engine RPMs in the REVERSE gear. Adjustment is made at the Shift Lever. See Figure 5.13.

With engine “OFF”, loosen and move attaching nut and bolt (at Reverse Arm) REARWARD to reduce speed or FORWARD to increase speed. Make adjustment with the Transmission in the REVERSE gear and Throttle in the FAST detent position.

C. KAWASAKI 14 HP Engines
A rod connected to the Transmission Shift Lever pushes against the Governor Arm to reduce engine RPMs in the REVERSE gear. Adjustment is made at the Adjust Strip. See Figure 5.14.

With engine “OFF”, loosen and move attaching nut and bolt (at Adjust Strip) FORWARD to reduce speed or REARWARD to increase speed. Make adjustment with the Transmission in REVERSE gear and Throttle in FAST detent position.
Section V - TRANSMISSION & DRIVE SYSTEMS

5.8 TRANSMISSION REMOVAL

A. Peerless MST 205 Series
(Used on Power Unit Model SPE1250KW, PRO GEAR EXPRESS, Series 0)
1. Remove fenders (Belt Guards).

2. Move Transmission Shift Lever to Neutral (N) position. See Figure 5.15.

![Figure 5.15](image)

3. Pull the L.H. & R.H. Traction Controls to their "Traction Lock" position. See Figure 5.16.

![Figure 5.16](image)

4. Remove the Traction Drive Belts from the Traction Drive Pulleys.

5. Pull up on Traction Levers to release Traction Locks.

6. Remove hairpin from Traction Rod Swivel, then remove Swivel. See Figure 5.17.

![Figure 5.17](image)

7. Move Traction Links out of the way to facilitate transmission removal.

8. Disconnect the Transmission Switch. See Figure 5.18.

![Figure 5.18](image)

9. Remove the nut and lockwasher which secures the front of the Shift Link to the Shift Lever. See Figure 5.19.

10. Separate the Shift Link from the Shift Lever. See Figure 5.19.
11. Remove the Transmission Drive Belt by elevating the rear of the Power Unit and disconnecting the Idler Arm Spring. Roll belt off pulleys. See Figure 5.20.

12. Remove the retaining ring from the transmission input pulley shaft.

13. Remove pulley and woodruff key.

14. Remove the retaining rings, washers, keys and traction pulleys from the output shafts.

15. Separate the torque bracket from the engine frame (rear deck) by removing the nut and short neck carriage bolt.

16. Remove the four nuts and bolt retainers from the four transmission bolts.

17. Remove the transmission bolts.

18. Lift up on transmission and remove it from the rear of the engine frame. Lay transmission supports and spacers aside for reassembly.

19. Repair or replace transmission. Install in reverse order.
NOTE:
THE NUMBERS IN THE SQUARES IDENTIFY THE STEPS IN SEQUENCE OF REMOVAL. REFER TO STEPS 1 THRU 19.

PEERLESS MST 205 TRANSMISSION & DRIVE
Section V - TRANSMISSION & DRIVE SYSTEMS

B. PEERLESS 700 SERIES
(Used on SP Units Only)
1. Pull the L.H. & R.H. Traction Levers up to "Traction Lock" position. See Figure 5.22.

6. If applicable to unit being repaired, disconnect the "Reverse Speed Operation" mechanism from the shift lever. Refer to Page 5.7, Step 5.6 "REVERSE SPEED OPERATION SHIFT LEVERS" for information.

7. Remove the shift lever from the transmission by removing lock nut and retaining nut.

NOTE
At this point, check for wear on the shift rod and, also, the shift handle socket. If either shows sign of excessive wear, refer to Page 5.5, Step 5.4 "SHIFTER ROD REPLACEMENT" for replacement instructions.

8. Remove the Transmission Drive Belt as follows:
(a) Elevate rear of unit.
(b) Loosen transmission belt idler nut. See Figure 5.24.
(c) Move idler pulley outwards to slacken belt.
(d) Roll belt off transmission drive pulley.

9. Remove the Transmission Drive Pulley and Key (NOTE: Some units will have set screws on the pulley - these must be loosened before removing pulley).

10. Remove the nuts and bolts from each output bearing. See Figure 5.25.

11. Separate the drive couplings from the splined transmission shafts by pulling outward on each traction drive pulley.

12. Remove bolts from under rear deck to free transmission.

SERVICE - PRO GEAR DRIVE POWER UNITS
13. Lift up on transmission and remove it from the rear of the engine frame. Lay transmission hardware aside for reassembly.

14. Repair or replace transmission. Install in reverse order.

5.9 REPLACEMENT OF OUTPUT BEARING
A. Remove fenders (Belt Guards).
B. Remove traction belts from drive pulleys.
C. Remove nuts and bolts from output bearing flange. See Figure 5.25.
D. Pull outward on drive pulley to separate coupling from transmission.
E. Remove coupling from output shaft.
F. Remove output shaft from tank bracket.
G. Move bearing flange toward drive pulley - out of the way.
H. Remove retaining ring and slide worn bearing off splined end of shaft.
J. Replace with new bearing (Part No. 1-4514).
K. Assemble in reverse order.
# Section VI
## HANDLE

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Section VI - HANDLE

INTRODUCTION
The Power Unit Handle is adjustable to four different heights. At the factory, the handle is assembled in the second hole from the bottom. If a different setting is desired, adjustment can be made as follows:

6.1 HANDLE HEIGHT ADJUSTMENT
(Covers ALL Models in this Manual)
A. Squeeze both Traction Levers (pistol grip or loop) firmly against handle to release the traction locks. Simultaneously let both traction levers move forward, allowing tension to be removed from the traction rods. See Figure 6.1.

B. The handles are secured to the tank bracket by two carriage bolts and nuts on each side. See Figure 6.2. Loosen the upper carriage bolts and nuts on both sides. Remove both lower carriage bolts and nuts.

C. Pivot the handle up or down to the desired position. Insert the lower carriage bolts into the selected hole position. Secure each with nuts. See Figure 6.3A.

NOTE
After adjusting handle height, it will be necessary to adjust the Traction Links on both sides. Also, the Traction Rods, Brakes and Blade Clutch Lever will have to be adjusted.

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Section VI - HANDLE

6.2 HANDLE REMOVAL (Pistol Grip)
The following information and illustrations cover the SPE1250KW Power Unit of the SNAPPER PRO GEAR EXPRESS, Series 0.

This information applies - with some differences - to most pistol grip versions of the other models and series covered in this manual.

A. Remove nut, bolt, washer and spacers from the OPC levers. See Figure 6.4.

FIGURE 6.5

2. After OPC switches have been removed, reattach them to the wiring harness. This will prevent their loss until the new handle has been installed.

C. Remove ignition switch hex nut and washer. Remove switch from control panel (do not disconnect wires).

D. Remove hex nut from electric clutch switch. Remove switch with wires attached.

E. Remove grip from transmission shift lever handle. See Figure 6.6.

1. Remove nuts and bolts from shift lever bracket.

2. Push shift lever through slot in control panel.

FIGURE 6.4

1. Remove hairpin and clevis pin from traction levers. Refer to Figure 6.4.

NOTE
Do not separate linkages from traction levers or traction lock lever - it is unnecessary when replacing only the handle.

2. Lower Traction Lever and Linkage Assemblies out of the way.

B. Disconnect the wires from the OPC switches. See Figure 6.5.

1. Depress retainer tabs and remove switches from control panel. Refer to Figure 6.5.
3. Cut all wire ties which secure electrical harness to handle.
4. Remove the two self-tapping screws from the throttle control.
5. Remove the throttle control from beneath the panel. See Figure 6.7.

FIGURE 6.7

F. Remove the four locknuts and bolts which secure the handle to the fuel tank support. See Figure 6.8.

NOTE
Make note of lower handle hole location before removal. To maintain adjustments, new handle should be installed in same location.

FIGURE 6.8

6.3 REVERSE THROTTLE BRACKET REMOVAL
This throttle and bracket assembly will be found on the PRO GEAR Commercial Mowers, Series 4 and the PRO GEAR Mid-Size Mowers, Series 0. Figure 6.10, below, illustrates the disassembly of the throttle & bracket.

FIGURE 6.10
Section VI - HANDLE

6.4 HANDLE INSTALLATION (Pistol Grip)

A. Install new Handle in same lower hole as old Handle. Refer to Figure 6.8.

B. Install Shift Lever Assembly to new Control Panel. Refer to Figure 6.6.

C. Install rubber grip on Shift Lever Handle.

D. Install Ignition Switch.
   1. Install Electric Clutch Switch.
   2. Install OPC Switches. Attach wires to Switches. Refer to Figure 6.5.

E. Install Traction Levers, OPC Levers and Traction Locks in reverse order of removal. Refer to Figure 6.4.

F. Install Throttle Control to Panel. Refer to Figures 6.7 & 6.10.

G. Secure Electrical Harness to new Handle with wire ties.

NOTE
See Pages 6.6 through 6.8 for removal and installation of the Loop Handle.
Section VI - HANDLE

6.5 HANDLE REMOVAL (Loop Handle)

The following information and illustrations cover the Loop Handle Models of the SNAPPER PRO GEAR WALK BEHIND MOWERS, Series 0. Most Loop Handle versions of other PRO GEAR Mowers - Series 0, 1, 2 & 4 - are included in this information.

A. Release Traction Lock by squeezing both traction levers (loops) firmly against handle.

B. Remove the hairpin from the traction rod and the brake loop strap. See Figure 6.11.

C. Remove the traction rods and brake loop straps from the loop handles. Lower rods out of the way.

D. Remove the E-ring and flat washer from the R.H. end of the pivot rod. See Figure 6.12.

E. Remove the pivot rod by pulling it out from the L.H. side. Be careful not to lose any washers or spacers which are located between the console and handle sides.

F. Remove traction levers through openings in top of control panel. See Figure 6.13.

G. On those models with manual blade engagement, disconnect the swivel from the blade clutch rod by removing the hairpin. Do not change adjustments. See Figure 6.14.
Section VI - HANDLE

H. Cut all wire ties which secure electrical harness to handle.

I. Remove the eight (8) screws (1/4 - 20 x 1/2" self-tapping) which secure the handle to the control panel. Lower panel out of the way. See Figure 6.15.

NOTE
Make note of lower handle hole location before removal. To maintain adjustments, new handle should be installed in same location.

6.7 HANDLE INSTALLATION (Loop Handle)
A. Install new handle in same lower hole location as old handle. Refer to Figure 6.16.

B. Reattach the control panel. Refer to Figure 6.15.

C. Insert the blade clutch rod swivel into the blade engagement lever. Secure with hairpin. Refer to Figure 6.14.

D. Insert traction levers through openings in top of control panel. See Figure 6.17 below.

E. Insert pivot rod through L.H. side of handle weldment, add flat washer to shaft, then start shaft into L.H. traction lever. See Figure 6.18 on Page 6.8.

F. Align L.H. traction lever with large hole in neutral latch assembly and push rod through. Refer to Figure 6.18.

G. Insert pivot rod into R.H. traction lever and push rod through to end of lever. Add flat washer and push through handle weldment.

H. Secure pivot rod on both sides with E-rings. Refer to Figure 6.18.

I. Fasten traction rods and brake loop straps to loop handles with hairpins. Refer to Figure 6.11.

J. Secure electrical harness to new handle with wire ties.
FIGURE 6.18
Section VI - HANDLE

6.8 TRACTION LINK ADJUSTMENTS
(Pistol Grip & Loop Handle)

**NOTE**

Traction Link adjustments vary with the different Models and Series of the PRO7 line of Power Units. For this reason, pay particular attention to the reference numbers and Handlebar/Traction Link Charts shown below and on the following pages in order to make sure that you are making the correct Traction Link adjustments for the unit being worked on.

Traction Links are properly adjusted when the Idlers on both sides move away from their respective Traction Belt when the Traction Levers are squeezed.

Adjust Traction Links as follows:

A. Determine Handlebar position. See Figure 6.19.

B. Refer to the reference numbers below and on following pages to identify the Model/Series of the PRO7 Power Unit. Also, refer to the accompanying “Handlebar/Traction Link Chart” to determine the correct Link position in relation to Handlebar position.

**Reference Numbers:**

•PRO GEAR MID-SIZE COMMERCIAL MOWERS
  •Series 1 & 2
  •Operator’s Manual No. 2-4680 (Rev. 1, 7/93)
  •Parts Manual No. 06921 (Rev. 2, 7/93)

**HANDLEBAR/TRACTION LINK CHART**

<table>
<thead>
<tr>
<th>HANDLEBAR STYLE</th>
<th>HANDLEBAR POSITION</th>
<th>SHORT LINK</th>
<th>LONG LINK</th>
</tr>
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<tbody>
<tr>
<td>LOOP PISTOL</td>
<td>1 HIGHEST</td>
<td>C</td>
<td>C</td>
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<td>1 HIGHEST</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>LOOP PISTOL</td>
<td>2 (FACTORY)</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>2 (FACTORY)</td>
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<tr>
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<td>3</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>LOOP PISTOL</td>
<td>4 LOWEST</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>4 LOWEST</td>
<td>A</td>
<td>A</td>
</tr>
</tbody>
</table>

C. Remove Wingnuts and Fenders.

B. Remove the Cotter Pins which secure the Short and Long Links to the Idler Arms. See Figure 6.20.

B. Reposition the Long and Short Traction Links into the holes (A, B, C) specified by chart in relation to Handlebar position. Secure Links with Cotter Pins.

**FIGURE 6.20**

**FIGURE 6.19**

**FIGURE 6.21**
## Section VI - HANDLE
(6.8 TRACTION LINK ADJUSTMENTS (Cont’d))

**Reference Numbers:**
- PRO GEAR COMMERCIAL MOWERS
- Series 4
- Operator’s Manual No. 2-8494 (I.R. 12/94)
- Parts Manual No. 06924 (I.R. 1/95)

### HANDLEBAR/TRACTION LINK CHART

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<thead>
<tr>
<th>HANDLEBAR STYLE</th>
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<tr>
<td></td>
<td>4 LOWEST</td>
<td>A</td>
<td>B</td>
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</table>

*(REFER TO FIGURE 6.21 FOR ILLUSTRATION)*

**Reference Numbers:**
- PRO GEAR MID-SIZE WALK BEHIND MOWERS
- Series 0
- Operator’s Manual No. 4-3798 (I.R. 9/96)
- Parts Manual No. 06925 (I.R. 12/95)

### HANDLEBAR/TRACTION LINK CHART
(All Models Except SPP90KW)

<table>
<thead>
<tr>
<th>HANDLEBAR STYLE</th>
<th>HANDLEBAR POSITION</th>
<th>SHORT LINK</th>
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<tr>
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<td>C</td>
<td>C</td>
</tr>
<tr>
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<td>4 LOWEST</td>
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<td>C</td>
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</table>

**HANDLE/TRACTION LINK CHART**
(Model SPP90KW Only!)

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<th>SHORT LINK</th>
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<td>B</td>
</tr>
<tr>
<td>PISTOL</td>
<td>4 LOWEST</td>
<td>B</td>
<td>B</td>
</tr>
</tbody>
</table>

*(REFER TO FIGURE 6.21 FOR ILLUSTRATION)*

---

**IMPORTANT!**
The Idler Arms on some models have a "Tooling Hole" which can be mistaken as an additional Link Adjustment Hole. Examples are shown in Figure 6.22. Do not use these holes for Link Adjustment!
Section VI - HANDLE

6.9 OPERATOR PRESENCE CONTROL (OPC) SWITCH TEST (PISTOL GRIP MODELS)
No adjustment is required for the Operator Presence Controls (OPC) on the Pistol Grip Models. To test the OPC switches, proceed as follows:
A. Place Blade Clutch Lever (or Switch) in the OFF position.
B. Shift Transmission Lever to Neutral (N) position.
C. Pull Traction Levers up to "Traction Lock" position.
D. Start engine.
E. Release Traction Locks and hold OPC Levers against Handlebar.
F. Shift Transmission Shift Lever to First (No. 1) Gear. Engine should continue to run. If not, inspect and/or replace OPC Switches and Transmission Switch.
G. If engine continues to run after shifting the Gear Lever (F, above), release the OPC Levers - this should cause the engine to stop.
H. Shift Transmission to Neutral (N) and engage mower blades. With OPC engaged, engine should continue to run.
J. If engine runs (H., above), release OPC Levers. Engine should stop.

6.10 BLADE CLUTCH LEVER SWITCH TEST (MANUAL)
The Blade Clutch Lever Switch is an integral part of the OPC system. When the Blade Clutch Lever is pulled backward to OFF position, the Interlock Switch is fully engaged. When the Blade Clutch Lever is pushed forward, to the ON position, the Interlock Switch Button is fully released. Adjust as follows:

A. STOP ENGINE! Push the Blade Clutch Lever forward to ON position.

B. Check to see that Switch Button is not touching Bellcrank.

C. If Switch Button is touching Bellcrank, adjust switch.

D. Pull Blade Clutch Lever rearward to the OFF position, loosen the Blade Switch mounting screws (underneath deck) and adjust switch until Bellcrank pushes Switch Button without hitting body of switch.

E. Push Blade Lever forward to the ON position. Bellcrank should clear switch button.

F. Test switch with a test light. Connect test light to switch terminals, move Blade Clutch Lever to ON and OFF positions. Test light should be ON when Blade Clutch Lever is in OFF position and OFF when Blade Clutch Lever is in ON position. See Figure 6.23.

6.11 OPERATOR PRESENCE CONTROL (OPC) SWITCH ADJUSTMENT (LOOP HANDLE MODELS)
When adjusted properly, the OPC Switch will cause the engine to stop if the Power Unit is in any Forward Gear, Reverse and/or the Blade Switch is left in the ON position when the operator releases the OPC Bail. Adjust as follows:

CAUTION

If the OPC Switch is not operating properly, DO NOT CONTINUE using the machine until the OPC Switch has been adjusted or replaced.

A. Loosen the OPC Switch mounting screw.
B. Slide the OPC Switch as described in Figure 6.24. Tighten screw.

C. Make OPC Switch test A. thru J. as found in 6.8 (PISTOL GRIP MODELS).

SERVICE - PRO GEAR DRIVE POWER UNITS
Section VII
STEERING/BRAKES

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REFERENCE LITERATURE

PARTS MANUAL No. ................................................................ PAGE No.
#06920 (I.R. 1/92) .................................................................... 4 - 5 - 10
#06921 (Rev. 2, 7/93) ................................................................. 4 - 5 - 22
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SERVICE - PRO GEAR DRIVE POWER UNITS

7.1
INTRODUCTION
This section covers procedures for the adjustment, disassembly and repair of the Steering/Brake Controls and assemblies found on the Power Units covered by this manual. These assemblies include the Pistol Grip and Loop Handles, Steering/Brake Controls and their various linkages.

7.1 STEERING/BRAKE ADJUSTMENTS
During operation, the mower is steered left or right by applying pressure on the appropriate control (lever or loop). If the machine is not as responsive as desired when either control is used, one or both brakes should be adjusted as follows:
A. Operate mower on level terrain with transmission shift lever in No. 1 position and blade clutch lever in OFF position. Determine which brake requires adjustment.
B. Stop mower and place both traction drives in "Park Brake" position.

1. POWER UNITS:
   PL71250KW
   PP71250KW
   PL7140KW
   PP7140KW
   (Series 0, 1 & 2)
   (a) Turn brake-adjusting wingnut clockwise slightly until desired turning response is achieved when pulling traction levers to their brake position. (Clockwise turning tightens brake band, counterclockwise loosens). See Figure 7.1.
   (b) Start mower and operate on level terrain to test steering adjustment. Readjust as required.

   (Series 0 Shown)

   FIGURE 7.1

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2. POWER UNITS:
   SPP90KW
   SPL1250KW
   SPP1250KW
   SPP140KW
   SPL140KW
   SPL140KH
   (Series 0)
   (Series 4)
   (a) Remove hairpin from brake rod adjusting block. See Figure 7.2.
   (b) Pull adjusting block from brake arm and rotate counterclockwise for more tension or clockwise for less tension.

   (Series 0, 1, 2 & 4 Shown)

   FIGURE 7.2

   (c) Install adjusting block into brake arm and install hairpin.
   (d) Start mower and operate on level terrain to test steering adjustment. Readjust as required.

3. POWER UNIT:
   SPE1250KW
   (Series 0)
   (a) Turn nut clockwise to increase brake tension. See Figure 7.3.
   (b) Start mower and operate on level terrain to test steering adjustment. Readjust as required.

   (Series 0 Pro Express)

   FIGURE 7.3

SERVICE - PRO GEAR DRIVE POWER UNITS
7.2 BRAKE ASSEMBLIES
The Brake Assemblies found on the Power Units covered by this manual are similar - the major difference is the "Brake Lever" design. All units share a common brake band - Part No. 1-7048.

The familiarization drawing below, Figure 7.4 shows the components of the different power unit designs. Differences in part numbers are noted as required. See 7.3, BRAKE BAND REMOVAL, Pg. 7.4, to begin.
Section VII - STEERING/BRAKES

7.3 BRAKE BAND REMOVAL & REPLACEMENT

A. Release traction locks to “slack” the traction drive belt.

B. Elevate rear of power unit and place on jack stands.

C. Remove fender.

D. Remove brake assembly as follows:
   1. Remove wheel scraper and nut. See Figure 7.5.

   [Diagram of brake assembly]

   Figure 7.5

   NOTE
   The PRO GEAR EXPRESS, Series 0 features the wheel scraper shown in Figures 7.6 & 7.7.

2. Remove E-ring from end of axle. See Figure 7.7.

3. Remove outside axle bushing(s).

4. Shift transmission to neutral “N”, and work traction drive belt off wheel pulley while removing traction wheel/drum assembly and bushing from axle.

5. Remove hairpin and disconnect traction brake rod swivel from brake lever.

6. Remove retainer and washer from brake pivot rod.

7. Remove hex nut from brake pivot weldment.

8. Remove brake assembly.

E. Refer to Figure 7.4 “FAMILIARIZATION DRAWING” and, also, to appropriate Parts Manual for replacement of brake band.

F. Install new/repaired brake assembly in reverse order.

G. After brake band installation, test unit (under power) for steering and braking. Adjust traction rods or brake rods as required.

[Diagram of brake assembly]
Section VII - STEERING/BRAKES

7.4 HANDLE CONTROLS ADJUSTMENTS
FOR POWER UNIT MODELS:
PP71250KW & PP7140KWV SERIES 0

A. STEERING/BRAKES ADJUSTMENT
(PISTOL GRIP/LOOP HANDLE)
If machine is not as responsive as desired when either Traction Lever is squeezed, one or both brakes should be adjusted as follows:
1. Operate mower on level terrain with Transmission Shift Lever in No. 1 position and Blade Clutch Lever in OFF position. Determine which brake requires adjustment.

2. STOP MOWER and place both Traction Drives in PARK BRAKE position.

3. TURN brake-adjusting wingnut clockwise slightly until desired turning response is achieved when pulling Traction Levers to their brake position. (clockwise turning tightens brake band, counterclockwise loosens). See “Detail - A”, Figure 7.8.

B. TRACTION ADJUSTMENT (PISTOL GRIP)
1. Remove hairpin and flatwasher from lower end of traction rod.

2. Remove swivel from traction arm.

3. Adjust swivel up or down to place upper end of slot in traction lock .12 to .18 from top of spacer. See “Detail - B”, Figure 7.8.

4. Replace swivel into traction arm and secure with hairpin. Repeat for opposite side (brakes may need adjusting after traction adjustment). (See 7.5, A., Page 7.6, for LOOP HANDLE Traction Adjustment).

C. ADDITIONAL TRACTION ADJUSTMENT
If operation requires a traction “Neutral” position between “engaged” and “brake” for maneuvering the machine in tight areas, additional Traction Rod adjustments are available as follows:
1. For a “Narrow” neutral band, place the lower traction rod swivel in Hole “A”. See “Detail - C”, Figure 7.8.

2. For a “Wide” neutral band, locate the swivel in Hole “B”.

---

DETAIL - A

LOosen
TIGHTEN

TRACTION ROD SWIVEL & HAIRPIN

BRAKE-ADJUSTING WINGNUT

MODELS: PP71250KW - PP7140KWV

TRACTION LEVER

HOLE “A”

HOLE “B”

TRACTION IDLERS

TOP OF SPACER

HEX BOLT

TRACTION LOCK

DETAIL - B

DETAIL - C

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FIGURE 7.8

7.5

SERVICE - PRO GEAR DRIVE POWER UNITS
Section VII - STEERING/BRAKES

7.5 HANDLE CONTROLS ADJUSTMENTS
FOR POWER UNIT MODELS:
PL71250KW & PL7140KWV SERIES 0
A. TRACTION ADJUSTMENT (LOOP HANDLE)
1. Remove Hair Pin from Traction Rod.
2. Remove Rod from Traction Lever.
3. Shift Transmission into No. 1 gear and pull back on machine to set Traction Belts.
4. Push forward on Traction Lever while adjusting Rod until it is 3/16" longer than hole position in Traction Lever. Insert Traction Rod into Traction Lever and secure with hair pin. Repeat for both Traction Rods. See Figure 7.9.

7.6 HANDLE CONTROLS ADJUSTMENTS
FOR POWER UNIT MODEL:
PP71251KW
A. STEERING/BRAKES ADJUSTMENT (PISTOL GRIP/LOOP HANDLE)
1. Remove Hair Pin from lower end of Traction Rod.
2. Disconnect swivel from Traction Links. See Figure 7.10.
3. Adjust rod length until end is half past the hole position in Traction Links. Insert swivel into Traction Links and secure with hair pins. Repeat for both sides.
4. Readjust Wheel Brakes as required.

NOTE
OBSERVE IDLER AS TRACTION LEVER IS PULLED UP - BOTH IDLERS SHOULD MOVE AT THE SAME TIME WHEN PROPERLY ADJUSTED.

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Section VII - STEERING/BRAKES

7.7 HANDLE CONTROLS ADJUSTMENTS FOR POWER UNIT MODELS:
SPP1250KW, SPP140KW & SPP140KH SERIES 0

A. STEERING/BRAKES ADJUSTMENT (PISTOL GRIP/LOOP HANDLE)
1. Determine extent of brake adjustment required.
2. Remove Hair Pin from Brake Rod Swivel. See Figure 7.11.
3. Remove Swivel from Brake Lever.
4. Adjust Swivel up or down on Brake Rod as required.
5. Repeat for opposite side.

B. TRACTION ADJUSTMENT (PISTOL GRIP)
1. Disconnect Brake Rod Swivel from Brake Lever. See Figure 7.11.
2. Remove Hair Pin from Traction Rod Swivel.
3. Remove Swivel from Traction Links.
4. Adjust Traction Rod Swivel up or down on Traction Rod until Traction Lever is up against Handlebar when fully-squeezed and Traction Lock is set.
5. When the Traction Levers are released, they will have the proper clearance (1/16") between Handlebar and Traction Lever. Also, the Spacer in the Traction Lock will have the proper slot clearance.

MODELS: SPP1250KW, SPP140KW & SPP140KH

7.8 HANDLE CONTROLS ADJUSTMENTS FOR POWER UNIT MODELS:
SPL1250KW, SPL140KW & SPL140KH SERIES 0

A. TRACTION ADJUSTMENT (LOOP HANDLE)
1. Disconnect Brake Rod Swivel at lower end.
2. Remove Hair Pin from Traction Rod Swivel. See Figure 7.11.
3. Remove Swivel from Traction Links.
4. Adjust Traction Rod Swivel up or down on Traction Rod until there is a 1" gap between the Loop Handle and the Dash Panel.
5. After reassembly, push forward hard on the Loop Handle. If properly adjusted, the Loop Handle should not "bottom-out" against the Dash Panel.
6. To further check the adjustment, set the Traction Lock in the Park Brake position. Push the unit forward and rearward. There should be minimal drag if adjustment is correct.
7. Reconnect Brake Rod. Adjust Brakes as required.

NOTE
OBSERVE IDLERS AS TRACTION LEVER IS PULLED UP - BOTH IDLERS SHOULD MOVE AT THE SAME TIME WHEN PROPERLY ADJUSTED.

FIGURE 7.11
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SERVICE - PRO GEAR DRIVE POWER UNITS
Section VII - STEERING/BRAKES

7.9 HANDLE CONTROLS ADJUSTMENTS FOR POWER UNIT MODEL:
SPP90KW SERIES 0

A. STEERING/BRAKES ADJUSTMENT (PISTOL GRIP ONLY)
1. Remove Hair Pin from lower end of Traction Rod.
2. Disconnect Swivel from Traction Links. See Figure 7.12.
3. Adjust Rod length until Swivel end is half past the hole position in Traction Links. Insert Swivel into Traction Links and secure with Hairpins. Repeat for both sides.
4. Readjust Wheel Brakes as required.

B. TRACTION ADJUSTMENT (PISTOL GRIP ONLY)
1. Disconnect Brake Rod Swivel from Brake Lever. See Figure 7.12.
2. Remove Hairpin from Traction Rod Swivel.
3. Remove Swivel from Traction Links.
4. Adjust Traction Rod Swivel up or down on Traction Rod until Traction Lever is up against Handlebar when fully-squeezed and Traction Lock is set.
5. When the Traction Levers are released, they will have the proper clearance (1/16") between Handlebar and Traction Lever. Also, the Spacer in the Traction Lock will have the proper slot clearance.
6. Reconnect Brake Rod. Adjust Brakes as required.

MODEL: SPP90KW

NOTE
OBSERVE IDLERS AS TRACTION LEVER IS PULLED UP - BOTH IDLERS SHOULD MOVE AT THE SAME TIME WHEN PROPERLY ADJUSTED.
Section VII - STEERING/BRAKES

7.10 HANDLE CONTROLS ADJUSTMENTS
FOR POWER UNIT MODEL:
SPE1250KW (PRO GEAR EXPRESS, SERIES 0)
A. STEERING/BRAKES ADJUSTMENT
(PISTOL GRIP)
If machine is not as responsive as desired when either Traction Lever is squeezed, one or both brakes should be adjusted as follows:
1. Operate mower on level terrain with Transmission Shift Lever in No. 1 position and Blade Clutch Lever in OFF position. Determine which brake requires adjustment.
2. STOP MOWER and place both Traction Drives in PARK BRAKE position.
3. Turn Brake-Adjusting Nut clockwise to increase brake tension. See "Detail - A", Figure 7.13.

B. TRACTION ADJUSTMENT (PISTOL GRIP)
1. Disconnect Brake Rod Swivel at lower end.
2. Remove Hairpin from lower end of Traction Rod.
3. Remove Swivel from Traction Links.
4. Adjust Traction Rod Swivel up or down on Traction Rod until there is approximately 1/16" clearance in the locking slot when Traction Lever is released. See "Detail - B", Figure 7.13.

Note:
The LOWER Traction Idler Arm will "Bottom-Out", or stop, against the rear fender-mounting stud when the Traction Lever is pulled all way up. Because of this action, clearance between the Traction Lever and Handlebar will vary with different machines - it is not critical on the PRO EXPRESS models.

5. Reconnect Brake Rod. Adjust Brakes as required.

MODEL SPE1250KW

BRAKE LEVER
BRAKE ADJUSTING NUT
BRAKE SWIVEL & HAIRPIN

DETAIL - A

TURN NUT
MORE TENSION
LESS TENSION

TRACTION LEVER
TRACTION ROD
UPPER TRACTION LINK
LOWER TRACTION LINK
TRACTION ROD SWIVEL & HAIRPIN
LOWER TRACTION IDLER ARM
TRACTION IDLERS
FENDER MOUNTING STUD
LOCKING SLOT
TOP OF SPACER
SPACER & BOLT
TRACTION LOCK

1/16" TO TOP OF SLOT

DETAIL - B

NOTE
OBSERVE IDLERS AS TRACTION LEVER IS PULLED UP - BOTH IDLERS SHOULD MOVE AT THE SAME TIME WHEN PROPERLY ADJUSTED.

FIGURE 7.13

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7.9

SERVICE - PRO GEAR DRIVE POWER UNITS
# Section VIII

**TRACTION WHEEL & TIRE REPLACEMENT**

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INTRODUCTION

This section covers procedures for the removal and replacement of the Traction Wheel Assemblies and Components. Figure 8.1, below, and Figure 8.2 on Page 8.3 show the individual assemblies of those Power Units covered in this manual.

NOTE: Part numbers for identical items (Pulleys, Brake Drums, etc.) are not shown. The Part Numbers of different items (Tires & Hub Weldments) are listed below with the Item Identification.

ASSEMBLY No. 1

PRO GEAR MID-SIZE & COMMERCIAL MOWERS
SERIES 0, 1 & 2
PL71250KW PL7140KWV
PP71250KW PP7140KWV
PL71251KW

TIRE, 6.50 x 13-6 TUBELESS (2-9861)

ASSEMBLY No. 2

PRO GEAR MID-SIZE WALK BEHIND MOWERS
SERIES 0
SPL1250KW
SPP1250KW
SPL140KW
SPP140KW
SPL140KH
SPP140KH

TIRE, 16/6.50 x 8" TUBELESS (2-7190)

Hub Weldment (1-6239)
Lube Fitting
Air Valve
Wheel Bearing

Hex Nut

Hub Weldment (2-8901 - Includes Bearings & Lube Fitting)
Lube Fitting
Wheel Bearing
Air Valve
Rim (2-7189)

FIGURE 8.1

The Power Unit Model Identification Chart (Page 1.4, Section I) should be consulted as a reference for the individual Models and their Operator/Repair Manual numbers.
Section VIII - TRACTION WHEEL AND TIRE REPLACEMENT

ASSEMBLY No. 3
PRO GEAR MID-SIZE WALK BEHIND MOWERS SERIES 0 SPP90KW

- TIRE, 4.10/3.50 x 6" TUBELESS (3-5412)
- HEX HD BOLT
- BRAKE DRUM, 6"
- PULLEY, 8"
- WHEEL BEARING
- HUB WELDMENT (3-5413)
- LUBE FITTING
- AIR VALVE
- WHEEL BEARING

ASSEMBLY No. 4
PRO GEAR EXPRESS MID-SIZE WALK BEHIND MOWERS SERIES 0 SPE1250KW

- TIRE, 16 x 6.50 x 8" TUBELESS (4-6245)
- HEX HD BOLT
- BRAKE DRUM, 6"
- PULLEYS, 8" (2)
- SPACERS (4)
- WHEEL BEARING
- HUB WELDMENT (5-4638)
- LUBE FITTING
- AIR VALVE
- WHEEL BEARING

FIGURE 8.2

MANUAL No. 07221 (I.R. 11/98) SERVICE - PRO GEAR DRIVE POWER UNITS 8.3
Section VIII - TRACTION WHEEL AND TIRE REPLACEMENT

8.1 WHEEL & TIRE REPLACEMENT

The Traction Tires used on the PRO7 Power Units are tubeless. Should Rim leakage occur, and cannot be solved by dressing the Rim, it is recommended that an Inner Tube be installed in lieu of replacing the Wheel and Tire Assembly. Tubes should be sized to fit. If a Wheel and Tire Assembly is replaced, use only the correct part number as found in the corresponding Parts Manual.

Wheel and Tire Replacement as follows:

A. Remove Fender.

B. Elevate rear of Power Unit and place on jack stands.

C. Remove Wheel Scraper and Nut. See Figure 8.3.

D. Remove E-ring from end of Axle. See Figure 8.5.

E. Remove outside Axle Bushing(s).

F. Release traction locks to “slack” the Traction Drive Belt.

G. Shift transmission to neutral “N”, and work Traction Drive Belt off Wheel Pulley while removing Traction Wheel/Drum Assembly from Axle.

H. Reverse steps A thru G to install Traction Wheel Assembly.

NOTE

The PRO GEAR EXPRESS, Series 0 features the Wheel Scraper shown in Figure 8.4.

FIGURE 8.3

FIGURE 8.4

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