Form No. 14211SL Rev B

Count on it.

Service Manual

GreensPro™ 1240/1260

Models 44912/44913

8111 Lyndale Avenue South
Bloomington, MN 55420

Original Instructions (EN)

Revision History

Revision	Date	Description
-	2014	Initial Issue
A	11/2018	Incorporated GreensPro 1260. Added revision history.
B	07/2021	Updated Electrical chapter.

Reader Comments

The Toro Company Technical Assistance Center maintains a continuous effort to improve the quality and usefulness of its publications. To do this effectively, we encourage user feedback. Please comment on the completeness, accuracy, organization, usability, and readability of this manual.

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NOTES:

Preface

This service manual was written expressly for service technicians. Basic shop safety knowledge and mechanical/electrical skills are assumed. The Toro Company has made every effort to make the information in this manual complete and correct.

The purpose of this publication is to provide the service technician with information about troubleshooting, testing, and repairing major systems and components. This manual may be specified for use on numerous products. Refer to the Table of Contents for a list of the systems and the related topics covered in this manual.

Refer to the traction unit and accessory *Operator's Manuals* and *Installation Instructions* for additional information about installing, operating, maintaining, and adjusting the machine. Keep a copy of the *Operator's Manuals*, *Installation Instructions* and *Parts Catalogs* for your machine and its accessories with this *Service Manual* for reference. Additional copies of the *Operator's Manuals*, *Installation Instructions* and *Parts Catalogs* are available at www.toro.com.

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

Service Procedure Icons

The following icons appear throughout this Service Manual to bring attention to specific important details of a service procedure.

Critical Process

This icon is used to highlight:

- installing safety equipment (shields, guards, seat belts, brakes and R.O.P.S. components) that may have been removed
- dimensions or settings that must be maintained for proper machine operation
- a specific fastener tightening sequence
- component orientation that may not be obvious

Critical Torque

This icon is used to highlight an assembly torque requirement that is different than what is recommended in the Standard Torque Tables; refer to Standard Torque for Dry, Zinc Plated, and Steel Fasteners (Inch Series) (page 2–7) or Standard Torque for Dry, Zinc Plated, and Steel Fasteners (Metric Fasteners) (page 2–8).

Fluid Specifications

This icon is used to highlight fluid specifications and capacities that are less common, and may not appear on the machine service decal or in the machine *Operator's Manual*.

Note: Refer to the service decal on the machine and the machine *Operator's Manual* for commonly used fluid specifications and capacities.

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Additional Reference Materials

HYDRO−GEAR BDR SERVICE AND REPAIR MANUAL

HYDRO−GEAR P SERIES HYDROSTATIC PUMPS SERVICE AND REPAIR MANUAL

PARKER TORQMOTOR SERVICE PROCEDURE

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Safety Instructions

DANGER

This safety symbol means danger. When you see this symbol, carefully read the instructions that follow. Failure to obey the instructions could kill or cause serious permanent injury or disability.

WARNING

This safety symbol means warning. When you see this symbol, carefully read the instructions that follow. Failure to obey the instructions can result in serious injury.

CAUTION

This safety symbol means caution. When you see this symbol, carefully read the instructions that follow. Failure to obey the instructions can result in minor to moderate injury.

IMPORTANT

The *Important* notice will give the important instructions which you must follow to prevent damage to the systems or components on the machine.

Note: A **Note** will give the general information about the correct operation, maintenance, service, testing, or repair of the machine.

Think Safety First

Toro Products are tested and certified for compliance with existing safety standards and specifications. Although hazard control and accident prevention are partially dependent upon the design and configuration of the machine, hazard control and accident prevention are also dependent upon the awareness, concern and proper training of the personnel involved in the operation, transport, maintenance, and storage of the machine. Improper use or maintenance of the machine can result in injury or death.

⚠ WARNING ⚠

To reduce the potential of injury or death, comply with the safety instructions in this manual, as well as information found in the *Operator's Manuals* and the *Operator and Safety Training Videos* found on www.toro.com.

- **Avoid unexpected starting of the engine…**

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

- **Avoid lacerations and amputations…**

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

- **Avoid burns…**

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

- **Avoid fires and explosions…**

  Use extreme care in handling fuel. Fuel is flammable and its vapors are explosive.

  – Extinguish all cigarettes, cigars, pipes, and other sources of ignition.
  – Avoid spilling fuel and never smoke while working with any type of fuel or lubricant.
  – Wipe up any spilled fuel or oil immediately.
  – Never remove the fuel cap or add fuel when the engine is running.
  – Always use approved, labeled containers for storing or transporting fuel and lubricants.
  – Do not add or drain fuel in an enclosed space.
  – Do not store the machine or fuel container where there is an open flame, spark, or pilot light, such as on a water heater or other appliance.

- **Avoid asphyxiation…**

  Do not operate an engine in a confined area without proper ventilation.

- **Avoid injury from batteries…**

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

- **Avoid injury due to inferior parts…**

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

Think Safety First (continued)

- **Avoid injury to bystanders…**

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

- **Avoid injury due to projectiles…**

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

- **Avoid modifications…**

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

- **Avoid unsafe operation…**

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

- **Avoid electrical shock…**
  - Never touch electrical wires or components while the engine is running. They can be sources of shock.
  - De-energize the system if you are having to do repairs.
  - If testing electrical components ensure you are working in a dry environment.
- **Hydraulic System precautions...**
  - Release all pressure in the hydraulic system before performing any work on the system.
  - Keep your body and hands away from pin-hole leaks or nozzles that eject hydraulic fluid under high pressure. Do not use your hands to search for leaks. Hydraulic fluid escaping under pressure can have sufficient force to penetrate the skin and cause serious injury.
  - Seek medical attention right away if hydraulic fluid gets in the skin.
- **Use personal protective equipment…**
  - Use appropriate personal protective equipment (PPE) for protecting yourself from potential hazards in the environment in which you will work.
  - Each process outlined in this manual may need different PPE to protect the service person. Use the proper PPE for the task at hand.
- **Using tools…**
  - All tools should be in proper working order. Do not use tools that are broken or in disrepair.
  - Use the proper tool for the proper application.
- **Using lifts, hoists, and jacks…**
  - All lifts, hoists, and jacks should be used in accordance with the manufacturer information.
  - Inspect lifts, hoists, and jacks prior to use.
  - Do not over load lifts, hoists, and jacks.
  - Do not work under a suspended load.
  - Ensure chock blocks are used on equipment that can move.
  - Use lifts or jacks and jack stands that are rated to support the total weight of the machine and any attachments.
  - Do not rely on jacks to support the machine.
  - If you are unfamiliar with any lifts, hoists or jacks, do not use them until you know how to operate them correctly.

Think Safety First (continued)

- **Using fire extinguishers…**

  Use the proper class of fire extinguisher in case of fire.

  Ensure fire extinguishers are serviced regularly, and replace any fire extinguishers that are discharged or in use beyond their expiration dates.

  – **Class A** fire extinguishers are for ordinary combustible materials such as paper, wood, cardboard, and most plastics. The numerical rating on these types of extinguishers indicates the amount of water it holds and the amount of fire it can extinguish. Geometric symbol (green triangle).

  – **Class B** fire extinguishers are for fires that involve flammable or combustible liquids such as gasoline, kerosene, grease and oil. The numerical rating for class B extinguishers indicates the approximate number of square feet of fire it can extinguish. Geometric symbol (red square).

  – **Class C** fire extinguishers are for fires that involve electrical equipment such as appliances, wiring, circuit breakers and outlets. Never use water to extinguish class C fires - the risk of electrical shock is far too great! Class C extinguishers do not have a numerical rating. The C classification means the extinguishing agent is non-conductive. Geometric symbol (blue circle).

  – **Class ABC** fire extinguishers are a dry chemical type used for multiple purposes. See above descriptions for additional information.

Safety and Instructional Decals

Safety decals and instructions are easily visible to the operator and are located near any area of potential danger. If any decal becomes illegible or damaged, install a new decal. Decal part numbers are listed in your *Parts Catalog*, *Operator's Manual*, and accessory *Installation Instructions*. Order replacement decals from Authorized Toro Distributor.

Specifications and Maintenance

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Specifications

Overall Dimensions

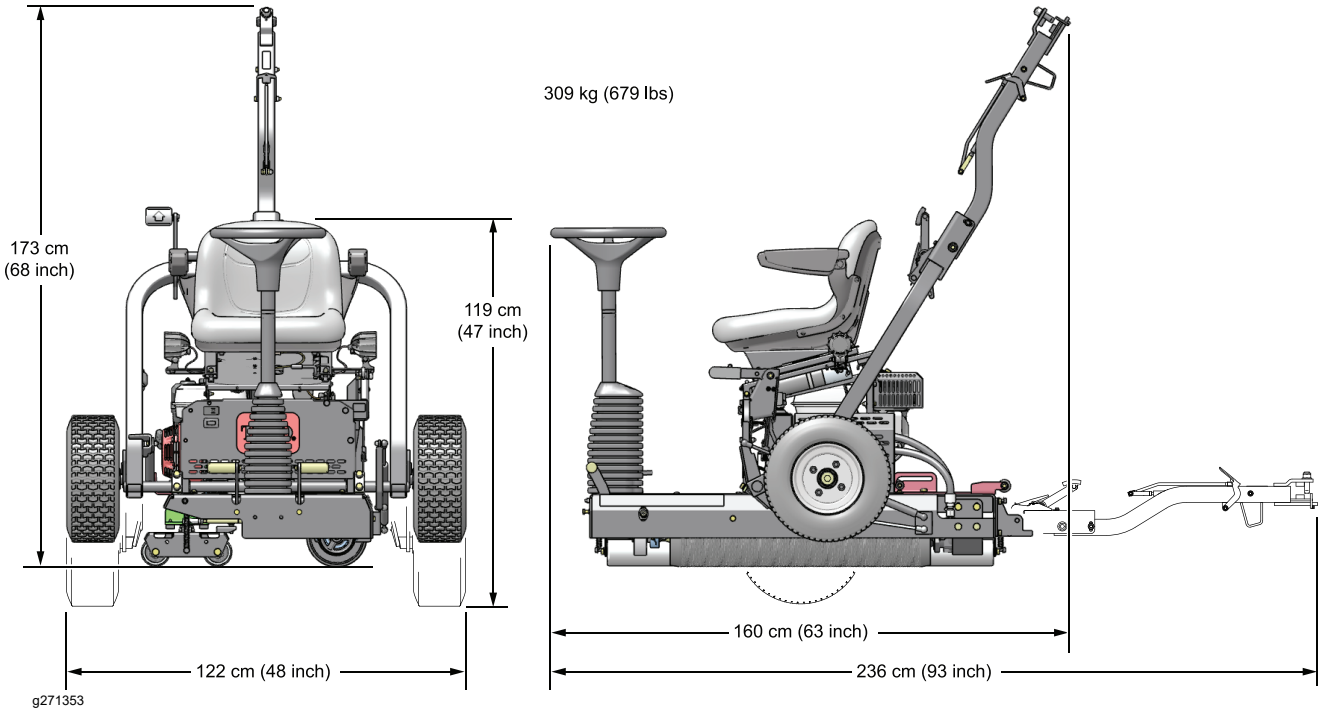

Figure 1
GreensPro 1240/1260

Engine

Item	Description
Make/Designation	Honda, 4-stroke, OHV single cylinder, air-cooled gasoline engine, GX200
Bore x Stroke	68 mm x 54 mm (2.68 x 2.13 inches)
Total displacement	196 cc (12 cu in)
Compression ratio	8.5:1
Carburetor	Float feed fixed main jet
Governor	Mechanical flyweight
Low-idle speed (no load)	GreensPro 1240 = 1,250 to 1,600 rpm GreensPro 1260 = 1,800 rpm
High-idle speed (no load)	3,600 rpm
Direction of rotation	Counterclockwise (facing PTO shaft)
Fuel	unleaded gasoline fuel with an octane rating of 87 or higher with no more than 10% Ethanol
Fuel tank capacity	3.1 L (0.82 US gallons)
Engine oil	Refer to the *Operator's Manual*
Lubrication system	Splash type
Oil capacity	0.6 L (0.63 US gallons)
Air cleaner	Dual element

Engine (continued)

Item	Description
Ignition system	Transistorized flywheel magneto
Spark plug	NGK BPR6ES
Spark plug gap	0.7 to 0.8 mm (0.028 to 0.031 inch)
Engine weight (dry)	16.1 kg (35.5 lb)

Hydraulic

Item	Description
GreensPro 1240	
Transmission	Hydro-Gear Model BDR hydrostatic transmission
Pump displacement	10.2 cc (0.62 cu in) per revolution
Motor displacement	21.8 cc (1.33 cu in) per revolution
Drive chain sprocket alignment	-0.57 to 0.57 mm (-0.02 to 0.02 inch)
Hydraulic tank capacity	2.5 L (0.66 US gallons)
GreensPro 1260	
Hydraulic pump	Hydro-Gear Model PG variable displacement axial piston pump
Pump displacement	10.2 cc (0.62 cu in) per revolution
Traction circuit relief pressure	16,000 kPa (2,320 psi)
Charge pump displacement	2.1 cc (0.13 cu in) per revolution
Charge circuit relief pressure	550 kPa (80 psi)
Hydraulic Motor	Parker Hannifin TE Series gerotor motor
Motor displacement	82 cc (5.0 in^3) per revolution
Hydraulic tank capacity	3.9 L (1.03 US gallons)
Hydraulic filter	10 micron spin-on cartridge type
Hydraulic fluid	Refer to the GreensPro *Operator's Manual*

Chassis

Item	Description
Tires	16 × 6.5-8, 4 ply, tubeless at 103 kPa (15 psi)
Steering wheel nut torque	28 to 35 N·m (20 to 26 ft-lb)
Steering roller locknut torque	92 to 124 N·m (68 to 91 ft-lb)
Transport wheel lug nut torque	108 N·m (80 ft-lb)
Tow bar mounting bolt torque	
10 mm bolt	68 to 81 N·m (50 to 60 ft-lb)
12 mm bolt	162 to 176 N·m (120 to 130 ft-lb)
Transport frame clamp bolt torque	18 to 24 N·m (13 to 18 ft-lb)

Torque Specifications

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

These torque specifications for the installation and tightening of the fasteners will apply to all the fasteners which do not have a specific requirement identified in this Service Manual. The following factors must be considered when applying the torque: cleanliness of the fastener, use of a thread sealant (e.g., Loctite), degree of lubrication on the fastener, presence of a prevailing torque feature (e.g., Nylock nut), hardness of the surface underneath the head of the fastener, or similar condition which affects the installation.

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

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

Calculating the Torque Values When Using a Drive-Adapter Wrench

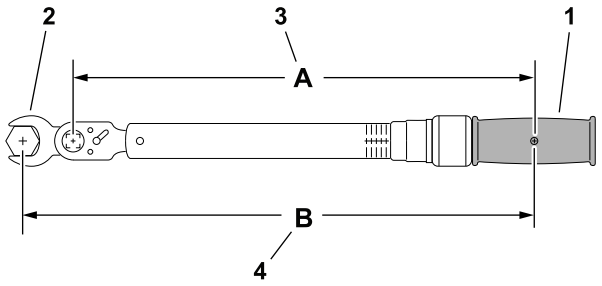

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Figure 2

Torque Conversion Factor = A / B

1. Torque wrench
2. Drive-adapter wrench (crowsfoot)
3. A (effective length of torque wrench)
4. B (effective length of torque wrench and drive-adapter wrench)

Using a drive-adapter wrench (e.g., crowfoot wrench) in any position other than 90° and 270° to the frame of the torque wrench will affect the torque value measured by the torque wrench because of the effective length (lever) of the torque wrench changes. When using a torque wrench with a drive-adapter wrench, multiply the listed torque recommendation by the calculated torque conversion factor (Figure 2) to determine proper tightening torque. When using a torque wrench with a drive-adapter wrench, the calculated torque will be lower than the listed torque recommendation.

Example: The measured effective length of the torque wrench (distance from the center of the handle to the center of the square drive) is 457 mm (18 inches).

The measured effective length of the torque wrench with the drive-adapter wrench installed (distance from the center of the handle to the center of the drive-adapter wrench) is 483 mm (19 inches).

The calculated torque conversion factor for this torque wrench with this drive-adapter wrench would be 18/19 = 0.947.

If the listed torque recommendation for a fastener is **103 to 127 N·m (76 to 94 ft-lb)**, the proper torque when using this torque wrench with a drive-adapter wrench would be **98 to 121 N·m (72 to 89 ft-lb)**.

Identifying the Fastener

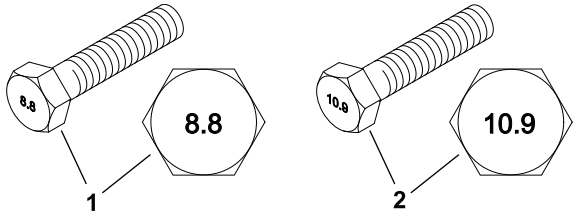

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Figure 3
Metric Bolts and Screws

1. Class 8.8
2. Class 10.9

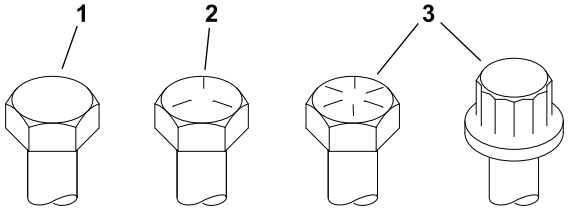

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Figure 4
Inch Series Bolts and Screws

1. Grade 1
2. Grade 5
3. Grade 8

Fasteners with a Locking Feature

IMPORTANT

If a fastener with a locking feature or previously applied thread locking compound is reused, clean the fastener threads and apply new thread locker to the fastener during installation.

Locking features are designed to create friction and prevent a fastener from loosening. Locking features can be found on externally or internally threaded fasteners. Common examples are plastic inserts incorporated into the fastener and pre-applied “dry” thread locking compound. Keep in mind, a fastener with a locking feature usually means there will be friction during initial installation and during removal.

Toro recommends replacing fasteners with a locking feature once they have been removed because the effectiveness of the locking feature diminishes with each reuse. If it is necessary to reuse a fastener with a locking feature; apply a thread locking compound (Loctite for example) to the fastener during installation. Use the appropriate strength and type of thread locking compound based on application, fastener size or information found in the product *Operators Manual*, *Service Manual* or *Installation Instructions*.

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

Thread Size	Grade 1, 5 and 8 with Thin Height Nuts	SAE Grade 1 Bolts, Screws, Studs, and Sems with Regular Height Nuts (SAE J995 Grade 2 or Stronger Nuts)		SAE Grade 5 Bolts, Screws, Studs, and Sems with Regular Height Nuts (SAE J995 Grade 2 or Stronger Nuts)		SAE Grade 8 Bolts, Screws, Studs, and Sems with Regular Height Nuts (SAE J995 Grade 2 or Stronger Nuts)	
	in-lb	in-lb	N·cm	in-lb	N·cm	in-lb	N·cm
# 6 - 32 UNC	10 ± 2	13 ± 2	147 ± 23	15 ± 2	169 ± 23	23 ± 3	262 ± 34
# 6 - 40 UNF				17 ± 2	192 ± 23	25 ± 3	282 ± 34
# 8 - 32 UNC	13 ± 2	25 ± 5	282 ± 56	29 ± 3	328 ± 34	41± 5	463 ± 56
# 8 - 36 UNF				31 ± 4	350 ± 45	43 ± 5	486 ± 56
# 10 - 24 UNC	18 ± 2	30 ± 5	339 ± 56	42 ± 5	475 ± 56	60 ± 6	678 ± 68
# 10 - 32 UNF				48 ± 5	542 ± 56	68 ± 7	768 ± 79
1/4 - 20 UNC	48 ± 7	53 ± 7	599 ± 79	100 ± 10	1130 ± 113	140 ± 15	1582 ± 169
1/4 - 28 UNF	53 ± 7	65 ± 10	734 ± 113	115 ± 12	1299 ± 136	160 ± 17	1808 ± 192
5/16 - 18 UNC	115 ± 15	105 ± 15	1186 ± 169	200 ± 25	2260 ± 282	300 ± 30	3390 ± 339
5/16 - 24 UNF	138 ± 17	128 ± 17	1146 ± 192	225 ± 25	2542 ± 282	325 ± 33	3672 ± 373
	ft-lb	ft-lb	N·m	ft-lb	N·m	ft-lb	N·m
3/8 - 16 UNC	16 ± 2	16 ± 2	22 ± 3	30 ± 3	41 ± 4	43 ± 5	58 ± 7
3/8 - 24 UNF	17 ± 2	18 ± 2	24 ± 3	35 ± 4	47 ± 5	50 ± 6	68 ± 8
7/16 - 14 UNC	27 ± 3	27 ± 3	37 ± 4	50 ± 5	68 ± 7	70 ± 7	95 ± 9
7/16 - 20 UNF	29 ± 3	29 ± 3	39 ± 4	55 ± 6	75 ± 8	77 ± 8	104 ± 11
1/2 - 13 UNC	30 ± 3	48 ± 7	65 ± 9	75 ± 8	102 ± 11	105 ± 11	142 ± 15
1/2 - 20 UNF	32 ± 4	53 ± 7	72 ± 9	85 ± 9	115 ± 12	120 ± 12	163 ± 16
5/8 - 11 UNC	65 ± 10	88 ± 12	119 ± 16	150 ± 15	203 ± 20	210 ± 21	285 ± 28
5/8 - 18 UNF	75 ± 10	95 ± 15	129 ± 20	170 ± 18	230 ± 24	240 ± 24	325 ± 33
3/4 - 10 UNC	93 ± 12	140 ± 20	190 ± 27	265 ± 27	359 ± 37	375 ± 38	508 ± 52
3/4 - 16 UNF	115 ± 15	165 ± 25	224 ± 34	300 ± 30	407 ± 41	420 ± 43	569 ± 58
7/8 - 9 UNC	140 ± 20	225 ± 25	305 ± 34	430 ± 45	583 ± 61	600 ± 60	813 ± 81
7/8 - 14 UNF	155 ± 25	260 ± 30	353 ± 41	475 ± 48	644 ± 65	667 ± 66	904 ± 89

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

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

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

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

Thread Size	Class 8.8 Bolts, Screws, and Studs with Regular Height Nuts (Class 8 or Stronger Nuts)		Class 10.9 Bolts, Screws, and Studs with Regular Height Nuts (Class 10 or Stronger Nuts)	
M5 X 0.8	57 ± 6 in-lb	644 ± 68 N·cm	78 ± 8 in-lb	881 ± 90 N·cm
M6 X 1.0	96 ± 10 in-lb	1085 ± 113 N·cm	133 ± 14 in-lb	1503 ± 158 N·cm
M8 X 1.25	19 ± 2 ft-lb	26 ± 3 N·m	28 ± 3 ft-lb	38 ± 4 N·m
M10 X 1.5	38 ± 4 ft-lb	52 ± 5 N·m	54 ± 6 ft-lb	73 ± 8 N·m
M12 X 1.75	66 ± 7 ft-lb	90 ± 10 N·m	93 ± 10 ft-lb	126 ± 14 N·m
M16 X 2.0	166 ± 17 ft-lb	225 ± 23 N·m	229 ± 23 ft-lb	310 ± 31 N·m
M20 X 2.5	325 ± 33 ft-lb	440 ± 45 N·m	450 ± 46 ft-lb	610 ± 62 N·m

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

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

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

Other Torque Specifications

SAE Grade 8 Steel Set Screws

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

Thread Cutting Screws (Zinc Plated Steel)

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

Wheel Bolts and Lug Nuts

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

*For steel wheels and non-lubricated fasteners

Thread Cutting Screws (Zinc Plated Steel)

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

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

Conversion Factors

in-lb X 11.2985 = N·cm	N·cm X 0.08851 = in-lb
ft-lb X 1.3558 = N·m	N·m X 0.7376 = ft-lb

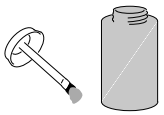
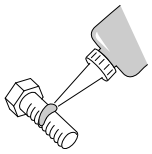
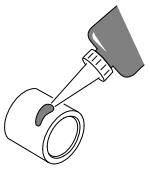
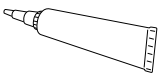
Shop Supplies

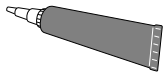
The procedures found in this *Service Manual* may recommend the use of commonly used shop supplies (lubricants, sealants, and adhesives). A symbol denoting the use of a shop supply may appear in figures that support a procedure. Always refer to the written procedure for specific information regarding the type and the application of a shop supply.

IMPORTANT

Always follow manufacturers instructions when using or storing shop supplies.

Shop Supplies

ANTI-SEIZE LUBRICANT Used to prevent corrosion, galling, and seizure between metal parts. Most often applied to shafts and bores during assembly. Unless otherwise specified, high viscosity regular grade lithium-graphite based anti-seize lubricant should be used.	
GREASE Can be used to pre-fill (pack) bearings, boots, and seals before assembly, ease installation of components during assembly, or fill cavities between moving parts through grease fittings after assembly. Unless otherwise noted, refer to the machine *Operator's Manual* or *Installation Instructions* for grease specifications.	
THREAD LOCKING COMPOUND (thread locker) Used to lock threaded fasteners in position. Available in low, medium and high strength for various size fasteners and applications. Most thread locking compounds are applied immediately prior to fastener installation. Some thread locking compounds use a "Wicking" feature, and can be applied after fastener installation. Most thread locking compounds allow the fastener to be removed with standard tools once cured. High strength thread locking compounds may require applying heat to the fastener and the surrounding area to allow fastener removal. **Note:** Some fasteners have a dry thread locking compound pre-applied (Patch-Loc) so no additional thread locking compound is necessary when installing a "new" fastener. These fasteners are designed to be removed and re-installed only once before applying additional thread locking compound is necessary.	
RETAINING COMPOUND (bearings and sleeves) An adhesive used to secure bearings, bushings, and cylindrical parts into housings or onto shafts. When cured, bearing and sleeve retaining compound fills the gap between mating parts with a hard resin that increases load distribution and protects against corrosion.	
ADHESIVE Used to secure a variety of components immediately prior to assembly. May be recommended for installing new components or when reusing a component that had a pre-applied adhesive such as hood seals, mouldings, and weather-stripping.	
THREAD SEALANT Used to seal threaded fittings and sensors from air, fuel, and oil pressure leaks and prevent galling and seizure between threaded parts. A thread sealant in paste firm is preferred over sealant tape. The sealant should remain semi-pliable to allow for component removal with standard tools. Some thread sealants may require the use of a cleaner or primer prior to use.	

GASKET COMPOUND Used to create a seal between mating parts. Gasket compounds may be used with or without the presence of a pre-formed gasket. Gasket compounds may be solvent or silicone based, and cure when exposed to air or designed to cure in an air-less environment (anaerobic). Most gasket compounds are designed to be applied to clean surfaces free of oil, chemical residue and previously used gaskets or gasket compounds.	
SILICONE SEALANT Designed for a broad variety of sealing and bonding requirements, silicone sealants are usually room temperature vulcanizing (RTV) which form a flexible silicone rubber that bonds to a wide variety of smooth or porous materials when cured. Standard silicone sealants are designed to perform in temperatures from -51°F to 232°C (-60°F to 400°F), while high temperature variants can preform in temperatures up to 343°C (650°F).	

Special Tools

You can order these special tools from your Toro Distributor. Some tools may also be available from a local tool supplier.

Hydraulic Pressure Testing Kit

Toro Part No. TOR47009

Use this kit to take various pressure readings for diagnostic tests. Quick disconnect fittings are provided to attach directly to the mating fittings on the machine test ports without the tools. A high-pressure hose is given for remote readings. Contains 1 each: 6,900 kPa (1,000 psi), 34,500 kPa (5,000 psi), and 69,000 kPa (10,000 psi) gauges.

57 LPM (15 GPM) Hydraulic Tester Kit

Toro Part No. TOR214678

Use this tester to test the hydraulic circuits and components for flow and pressure capacities. The tester flow measurement maximum is 57 LPM (15 GPM). This tester includes the following:

Inlet Hose – This hose connects the system circuit to the inlet side of the hydraulic tester.

Load Valve – Turn the valve to restrict the flow to create a simulated working load in the circuit.

Pressure Gauge – A glycerine filled pressure gauge 0 to 34,500 kPa (0 to 5,000 psi) to provide operating circuit pressure.

Flow Meter – This meter measures the actual fluid flow in the operating circuit with a gauge rated at 5 to 55 LPM (1 to 15 GPM).

Outlet Hose – A hose from the outlet side of the hydraulic tester that connects to the hydraulic system circuit.

Fittings – An assortment of hydraulic fittings are included with this kit.

Hydraulic O-Ring Kit

Toro Part No. 117-2727

This kit includes O-rings in a variety of sizes for the face seal and port seal hydraulic connections. To help prevent a hydraulic leak, replace the O-rings when you open the hydraulic connection.

Hydraulic Hose Kit

Toro Part No. TOR6007

This kit includes the fittings and hoses that are used to connect high flow hydraulic filter kit (TOR6011) to the machine hydraulic traction system components.

High Flow Hydraulic Filter Kit

Toro Part Number: TOR6011

The high flow hydraulic filter kit is designed with large flow 150 lpm(40 gpm) and high pressure (34,500 kPa or 5,000 psi) capabilities. This kit provides for bidirectional filtration which prevents filtered unwanted material from entering into the circuit regardless of the flow direction.

If a component failure occurs in the closed-loop traction circuit, contamination from the damaged part will remain in the circuit until you remove it. Install a high flow hydraulic fluid filter into the circuit when you connect the hydraulic test gauges in order to test the traction circuit components or after you replace a failed traction circuit component (e.g., piston pump or wheel motor). This filter removes contamination from the hydraulic fluid in the traction circuit, thereby preventing additional component damage. Refer to Filtering the Closed-Loop Traction Circuit (GreensPro 1260) (page 5–39)

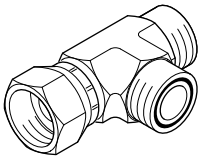
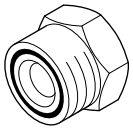
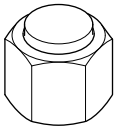
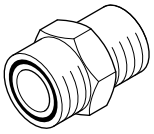
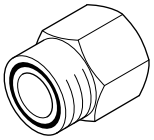
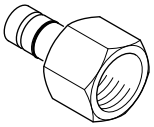
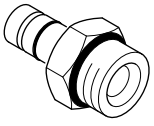
Note: This kit does not include the hydraulic hoses; refer to Hydraulic Hose Kit (page 2–13)

Note: The replacement filter element is Toro Part No. TOR6012. The filter element canister tightening torque is **34 N·m (25 ft-lb)**.

Hydraulic Test Fitting Kit

Toro Part No. TOR4079

This kit includes a variety of O-ring face seal fittings to let you connect the test gauges into the system.

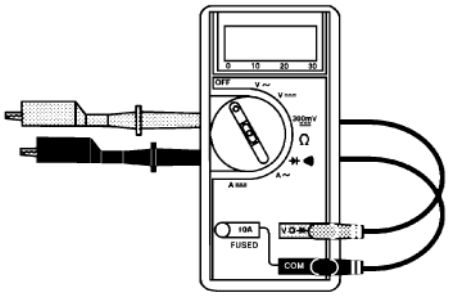
FITTING TYPE	SIZE	PART NUMBER
 SWIVEL NUT RUN TEE (2 each)	4 ORFS (9/16–18) 6 ORFS (11/16–16) 8 ORFS (13–16–16) 10 ORFS (1–14)	TOR4079–3 TOR4079–12 TOR4079–4 TOR4079–5
 PLUG (2 each)	4 ORFS (9/16–18) 6 ORFS (11/16–16) 8 ORFS (13–16–16) 10 ORFS (1–14)	TOR4079–13 TOR4079–14 TOR4079–15 TOR4079–16
 CAP (2 each)	4 ORFS (9/16–18) 6 ORFS (11/16–16) 8 ORFS (13–16–16) 10 ORFS (1–14)	TOR4079–17 TOR4079–18 TOR4079–19 TOR4079–20
 UNION (1 each)	6 ORFS (11/16–16) to 8 SAE-ORB (3/4–16) 8 ORFS (13–16–16) to 8 SAE-ORB (3/4–16) 10 ORFS (1–14) to 8 SAE-ORB (3/4–16)	TOR4079–8 TOR4079–9 TOR4079–2
 REDUCER (1 each)	10 ORFS (1–14) to 8 SAE-ORB (3/4–16) 12 ORFS (1 3/16–12) to 8 SAE-ORB (3/4–16)	TOR4079–7 TOR4079–6
 TEST CONNECTOR – FEMALE THREAD (2 each)	4 ORFS (9/16–18) 6 ORFS (11/16–16) 8 ORFS (13/16–16) 10 ORFS (1–14)	TOR4079–10 TOR4079–11 TOR4079–21 TOR4079–1
 TEST CONNECTOR – MALE THREAD (2 each)	4 SAE-ORB (7/16–20) 1/8 NPTF	TOR4079–22 TOR4079–23

Multimeter

Obtain this tool locally

The meter can test the electrical components and circuits for current, resistance, or voltage.

Note: Use a digital multimeter when testing the electrical circuits. The high impedance (internal resistance) of a digital meter in the voltage mode ensures that the excess current is not allowed through the meter. This excess current can damage the circuits that are not designed to carry it.



Battery Terminal Protector

Toro Part No. 107-0392

Use this aerosol spray on the battery terminals, ring terminals, and fork terminals to reduce corrosion problems. Apply the terminal protector to the connection after you secure the battery cable, ring terminal, or fork terminal.

Dielectric Gel

Toro Part No. 107-0342

Use the dielectric gel to prevent corrosion of unsealed connection terminals. To ensure complete coating of the terminals, liberally apply the gel to the component and wire harness connector, plug the connector into the component, unplug the connector, apply the gel to both surfaces again, and connect the harness connector to the component again. The connectors must be fully packed with gel for effective results.

Note: Do not use the dielectric gel on the sealed connection terminals as the gel can unseat the connector seals during assembly.

Table of Contents

The information In this chapter is intended to help troubleshoot machine operation issues. Keep in mind there can be more than one cause for a machine malfunction.

GEARS – The Systematic Approach to Defining, Diagnosing and Solving Problems

Gather Information

•Information reported by the customer

•Information observed by you

•Establish the what, where and when of the issue

Evaluate Potential Causes

Consider possible causes of the problem to develop a hypothesis

•Narrow down the focus of the problem

Assess Performance

•Ensure you have all the necessary tools for testing

•Test all potential causes of the failure

•Reevaluate and create a new hypothesis if necessary

Repair

•Return the unit to service by repairing, rebuilding or replacing

Solution Confirmation

•Did the issue go away

•Was the root cause of the issue correctly repaired

•Are there any other new symptoms

Starting and Operating Problems (machine serial number above 31500000)

Problem	Possible Cause	Corrective Action
Nothing happens when you attempt to start the engine.	The fuel tank is empty.	Fill the fuel tank; refer to the machine *Operator's Manual*.
	The engine oil is below the minimum level.	Fill the engine crankcase with oil; refer to the machine *Operator's Manual*.
	The engine On/Off switch is in the OFF position.	Set the engine On/Off switch to the RUN position.
	The parking brake is disengaged and the operator seat is unoccupied.	Engage the parking brake or have someone occupy the operator seat.
	The motion control linkage is not properly adjusted.	Verify motion control operation and adjust as necessary; refer to Adjusting the Control Pedal Return to Neutral Mechanism in Chapter 5 – Hydraulic System.
	The engine On/Off switch, low oil level switch, parking brake switch, operator seat switch, or neutral switch are not functioning.	Test the switch; refer to Testing the Electrical Components in Chapter 6 – Electrical System.
	The ground connection at the engine is loose or corroded.	Test, clean, or repair the ground connection at the engine.
	The interlock module is not functioning.	Test the interlock module; refer to Testing the Electrical Components in Chapter 6 – Electrical System.
	The engine ignition module is not functioning.	Test the ignition module; refer to the *Honda Engine Service Manual*. Contact your local Honda Engine Dealer or visit http://engines.honda.com for any assistance.
The engine starts with the operator's seat unoccupied and the parking brake disengaged.	The parking brake switch or operator seat switch has been bypassed.	Remove any circuit bypass and connect the switch to the machine wire harness.
	The brake switch is not functioning.	Test the switch; refer to Testing the Electrical Components in Chapter 6 – Electrical System.
	The seat switch is not functioning.	Test the switch; refer to Testing the Electrical Components in Chapter 6 – Electrical System.
	The interlock module is not functioning.	Test the interlock module; refer to Testing the Electrical Components in Chapter 6 – Electrical System.
The engine starts with the either motion control pedal depressed.	The motion control linkage is not properly adjusted.	Verify motion control operation and adjust as necessary; refer to Adjusting the Control Pedal Return to Neutral Mechanism in Chapter 5 – Hydraulic System.
	The neutral switch is not functioning.	Test the switch; refer to Testing the Electrical Components in Chapter 6 – Electrical System.
	The interlock module is not functioning.	Test the interlock module; refer to Testing the Electrical Components in Chapter 6 – Electrical System.

Starting and Operating Problems (machine serial number above 31500000) (continued)

Problem	Possible Cause	Corrective Action
The engine starts but stops when either traction pedal is pushed to a MOVE position.	The parking brake is engaged.	Disengage the parking brake.
	There is no operator in the operator seat.	Occupy the operator seat.
	The parking brake switch or operator seat switch is not functioning.	Test the switch; refer to Testing the Electrical Components in Chapter 6 – Electrical System.
Machine stops intermittently during operation.	Parking brake is not properly adjusted.	Adjust parking brake; refer to Adjusting the Parking Brake in Chapter 7 – Chassis.
	Operator weight not sufficient to engage seat switch.	Install plunder disc above seat switch; refer to Seat Switch in Chapter 6 – Electrical System.
	The engine oil is below the minimum level.	Fill the engine crankcase with oil; refer to the machine *Operator's Manual*.

General Hydraulic System Problems (GreensPro 1260)

Problem	Possible Cause	Corrective Action
Hydraulic fluid is leaking from the system.	The fitting(s), hose(s), or tube(s) are loose or damaged.	Secure or replace loose or damaged hydraulic connections.
	The O-ring(s) or seal(s) are missing or damaged.	Install a new O-ring(s) or seal(s).
The hydraulic fluid foams excessively causing fluid leakage from the hydraulic tank breather.	The hydraulic fluid level in the hydraulic tank is low.	Adjust the hydraulic fluid level.
	The hydraulic system has a wrong type of fluid.	Replace the hydraulic fluid.
	Note: Refer to the traction unit *Operator's Manual* for hydraulic fluid specifications.	
	The incompatible hydraulic fluids are mixed in the system.	Replace the hydraulic fluid.
	There is water in the hydraulic system.	Replace the hydraulic fluid.
	The pump suction line has an air leak.	Replace the pump suction line.
The hydraulic system operates hot (exceeds 95° C (203° F).	The hydraulic fluid level in the hydraulic tank is low.	Adjust the hydraulic fluid level.
	The suction filter or suction line is damaged, loose, or clogged.	Secure, clean or replace the suction filter or suction line.
	The hydraulic fluid is contaminated or the fluid viscosity is too light.	Replace the hydraulic fluid.
	Note: Refer to the traction unit *Operator's Manual* for hydraulic fluid specifications.	
	The engine RPM is too low.	Verify engine RPM and adjust if necessary.
	The traction pump tow (bypass) valve is open or damaged.	Close or replace the traction pump bypass valve.
	The charge pressure is low.	Verify charge pressure; refer to Hydraulic Pump Charge Pressure Test in Chapter 5 – Hydraulic System.
	The hydraulic pump is worn or damaged.	Verify hydraulic pump operation; refer to Hydraulic Pump Flow and Relief Pressure Test in Chapter 5 – Hydraulic System.
	The hydraulic drive motor is worn or damaged.	Repair or replace the hydraulic drive motor.
	Note: If a traction circuit component has internal wear or damage, it is possible that the other traction components are also damaged.	

Traction Circuit Problems (GreensPro 1260)

Problem	Possible Cause	Corrective Action
The traction response is sluggish.	The hydraulic fluid is very cold.	Allow the hydraulic fluid to warm by safely operating the machine at rest.
	The hydraulic fluid level in the hydraulic tank is low.	Adjust the hydraulic fluid level.
	The hydraulic pump tow (bypass) valve is open or damaged.	Close or replace the hydraulic pump bypass valve.
	The charge pressure is low.	Verify charge pressure; refer to Hydraulic Pump Charge Pressure Test in Chapter 5 – Hydraulic System.
	One or more orifice or screen in the hydraulic pump is partially obstructed or damaged.	Clean or repair the hydraulic pump passages.
	A hydraulic pump relief valve is leaking or damaged.	Verify hydraulic pump relief valve operation; refer to Hydraulic Pump Flow and Relief Pressure Test in Chapter 5 – Hydraulic System.
	The hydraulic pump is worn or damaged.	Verify hydraulic pump operation; refer to Hydraulic Pump Flow and Relief Pressure Test in Chapter 5 – Hydraulic System.
	The hydraulic drive motor is worn or damaged.	Repair or replace the hydraulic drive motor.
	Note: If a traction circuit component has internal wear or damage, it is possible that the other traction components are also damaged.	
The traction system operates in one direction only.	The motion control linkage is incorrectly adjusted, disconnected, binding, or damaged.	Verify motion control operation and repair or adjust as necessary; refer to Adjusting the Control Pedal Return to Neutral Mechanism in Chapter 5 – Hydraulic System.
	The hydraulic pump relief valves are leaking or damaged.	Verify hydraulic pump relief valve operation; refer to Hydraulic Pump Flow and Relief Pressure Test in Chapter 5 – Hydraulic System.
	The hydraulic pump is worn or damaged.	Verify hydraulic pump operation; refer to Hydraulic Pump Flow and Relief Pressure Test in Chapter 5 – Hydraulic System.

Traction Circuit Problems (GreensPro 1260) (continued)

Problem	Possible Cause	Corrective Action
No traction exists in either direction.	The hydraulic fluid level in the hydraulic tank is low.	Adjust the hydraulic fluid level.
	The hydraulic pump tow (bypass) valve is open or damaged.	Close or replace the hydraulic pump bypass valve.
	The charge pressure is low.	Verify charge pressure; refer to Hydraulic Pump Charge Pressure Test in Chapter 5 – Hydraulic System.
	The motion control linkage is incorrectly adjusted, disconnected, binding, or damaged.	Verify motion control operation and repair or adjust as necessary; refer to Adjusting the Control Pedal Return to Neutral Mechanism in Chapter 5 – Hydraulic System.
	The hydraulic pump relief valves are leaking or damaged.	Verify hydraulic pump relief valve operation; refer to Hydraulic Pump Flow and Relief Pressure Test in Chapter 5 – Hydraulic System.
	The hydraulic pump is worn or damaged.	Verify hydraulic pump operation; refer to Hydraulic Pump Flow and Relief Pressure Test in Chapter 5 – Hydraulic System.
	The hydraulic drive motor is worn or damaged.	Repair or replace the hydraulic drive motor.
	Note: If a traction circuit component has internal wear or damage, it is possible that the other traction components are also damaged.	
The hydraulic motor does not hold load in the NEUTRAL position.	The charge pressure is low.	Verify charge pressure; refer to Hydraulic Pump Charge Pressure Test in Chapter 5 – Hydraulic System.
	The hydraulic pump relief valves are leaking or damaged.	Verify hydraulic pump relief valve operation; refer to Hydraulic Pump Flow and Relief Pressure Test in Chapter 5 – Hydraulic System.
	The hydraulic pump is worn or damaged.	Verify hydraulic pump operation; refer to Hydraulic Pump Flow and Relief Pressure Test in Chapter 5 – Hydraulic System.
	The hydraulic drive motor is worn or damaged.	Repair or replace the hydraulic drive motor.
	Note: If a traction circuit component has internal wear or damage, it is possible that the other traction components are also damaged.	

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General Information

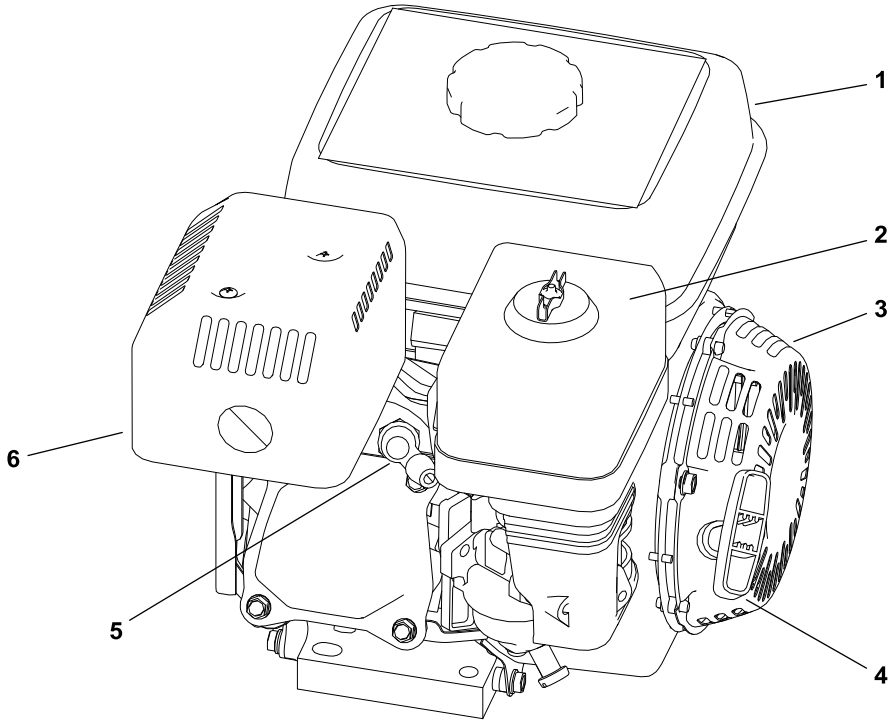

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Figure 5

1. Fuel tank
2. Air cleaner
3. Recoil starter
4. Recoil-start handle
5. Spark plug
6. Muffler

This chapter gives the information about specifications and repair of the Honda GX200 gasoline engine used in the GreensPro 1240 and 1260 machines. Described adjustments and repairs require tools that are commonly available in many service shops.

Some service and repair parts for the engine in your GreensPro machine are supplied through your Authorized Toro Distributor. Be prepared to provide your distributor with the Toro Model and Serial Number of your machine to obtain parts.

When disposing of hazardous waste products (fuel, engine oil, hydraulic fluid, filters, etc.), take them to an authorized disposal site. Waste products must not be allowed to contaminate surface water, drains, or sewer systems.

Operator's Manual

The *Operator's Manual* provides information regarding the operation, general maintenance, and maintenance intervals for your GreensPro machine. Refer to the *Operator's Manual* for additional information when servicing the machine.

Engine Owner's Manual

The engine *Owner's Manual* provides information regarding the operation, general maintenance, and maintenance intervals for the Honda GX200 engine used on your GreensPro 1240 and 1260 machines. Contact your local Honda Engine Dealer or visit http://engines.honda.com to obtain a copy of the engine *Owner's Manual*. Refer to the engine *Owner's Manual* for additional information when servicing the machine.

Engine Service Manual

Detailed information on engine troubleshooting, testing, disassembly, and assembly is given in the *Honda Service Manual*. The use of some specialized tools and test equipment is explained in the *Honda Service Manual*. Contact your local Honda Engine Dealer to obtain a copy of the engine Service Manual. However, the specialized nature of some engine repairs may dictate that the work be done at a Honda engine repair facility.

Engine Identification

The engine serial number and type are stamped on the engine near the oil filler dipstick. The engine serial number and type will assist in identifying the correct parts and service information for the Honda engine in your GreensPro machine.

Fuel Evaporative Control System

To meet worldwide emission standards, the engine that powers your GreensPro is equipped with a fuel cap that has an integrated carbon canister (Figure 6). This fuel cap captures fuel vapors from the fuel tank before venting to atmosphere.

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Figure 6

1. Fuel tank insert

To prevent saturating the carbon canister in the fuel cap, it is important to ensure that the fuel tank is not overfilled. The maximum fuel level for the fuel tank is to the bottom of the fuel tank insert. The insert also prevents the fuel from saturating the fuel cap during machine movement. Do not overfill the tank when refueling. Refer to the *Honda GX200 Owner's Manual* for additional information.

Service and Repairs

Engine

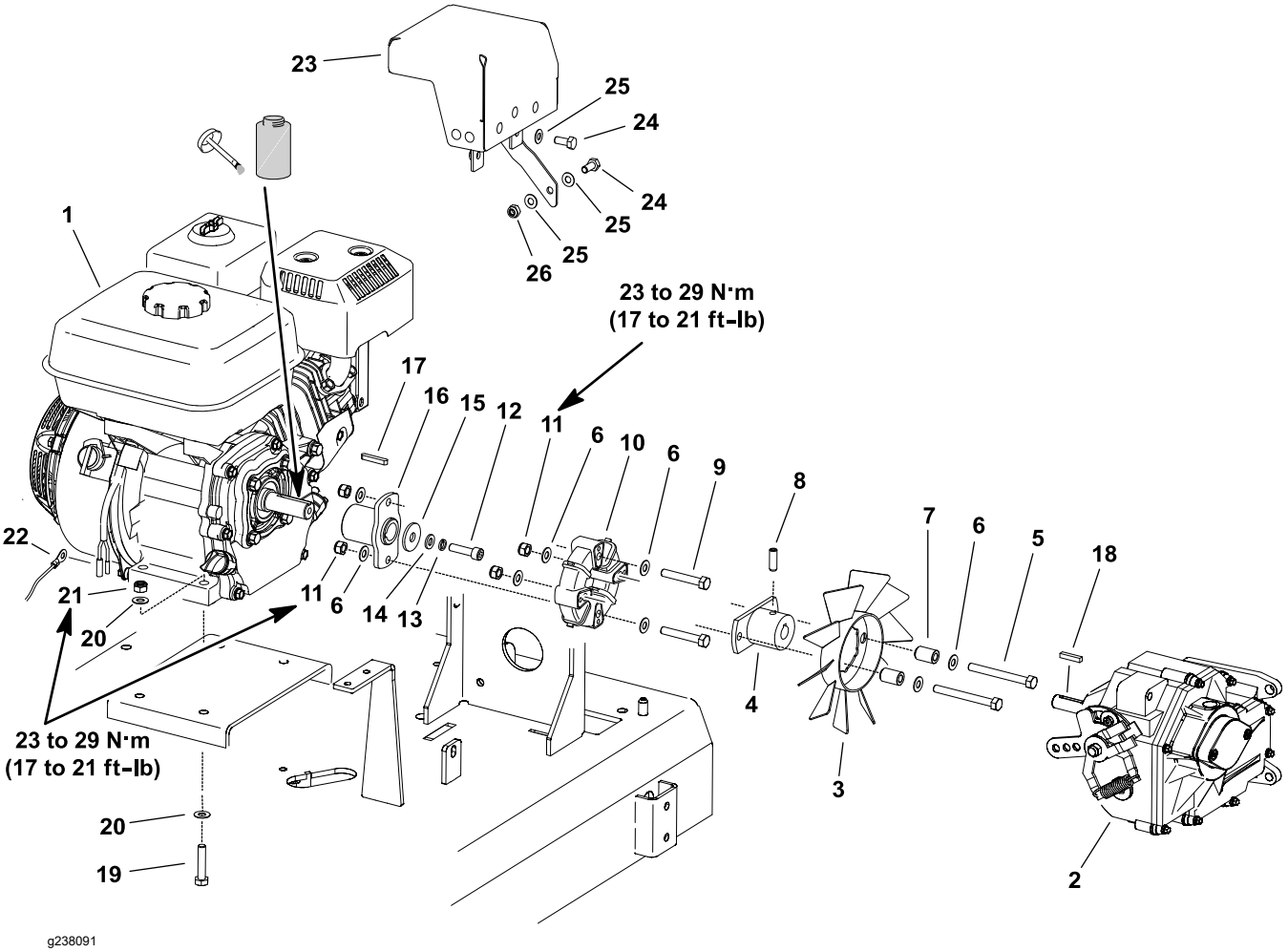

Figure 7
GreensPro 1240

1.	Engine assembly	10.	Rubber drive coupling	19.	Bolt (4 each)
2.	Transmission assembly	11.	Locknut (4 each)	20.	Flat washer (8 each)
3.	Fan	12.	Socket-head screw	21.	Locknut (4 each)
4.	Transmission drive collar	13.	Lock washer	22.	Ground wire
5.	Bolt (2 each)	14.	Flat washer	23.	Exhaust guard (serial number above 315000000)
6.	Flat washer (8 each)	15.	Hardened washer	24.	Bolt (3 each)
7.	Spacer (2 each)	16.	Engine drive collar	25.	Flat washer (4 each)
8.	Set screw	17.	Key	26.	Locknut
9.	Bolt (2 each)	18.	Key		

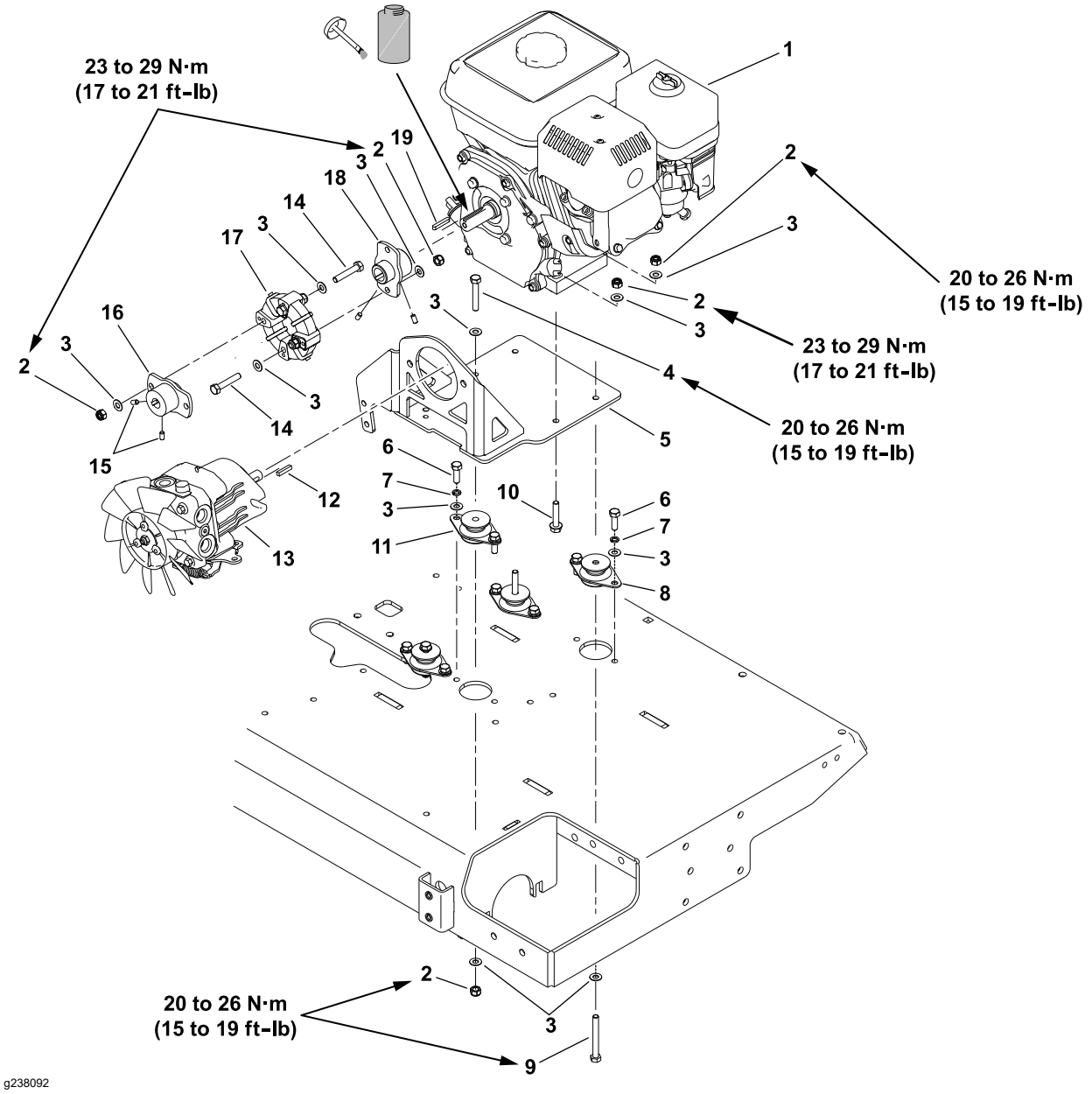

Figure 8

GreensPro 1260

1. Engine assembly
2. Hex nut (10 each)
3. Washer (26 each)
4. Bolt (2 each)
5. Engine plate
6. Bolt (8 each)
7. Spring washer (8 each)
8. Engine mount (2 each)
9. Bolt (2 each)
10. Flange-head screw (2 each)
11. Engine mount (2 each)
12. Key
13. Hydraulic pump
14. Bolt (4 each)
15. Set screw (4 each)
16. Hydraulic pump drive collar
17. Rubber drive coupling
18. Engine drive collar
19. Key

Removing the Engine

Refer to Figure 7 or Figure 8 for this procedure.

1. Remove the transmission cover from the machine; refer to Transmission Cover (page 7–58).

CAUTION

Use a suitable lifting device to safely raise and support the machine to get access to the components under the chassis.

2. Unlatch and lift the operator seat pan forward.
3. Remove the exhaust guard if equipped.
4. Disconnect the transmission/hydraulic pump drive collar from the rubber drive coupling.

   Note: On GreensPro 1240 machines, move the hydraulic fluid tank to get access to the engine wiring connections and engine mounting fasteners. Do not disconnect the hydraulic fluid lines from the hydraulic fluid tank.
5. On GreensPro 1240 machines, remove the fasteners securing the hydraulic fluid tank to the chassis (Figure 9).

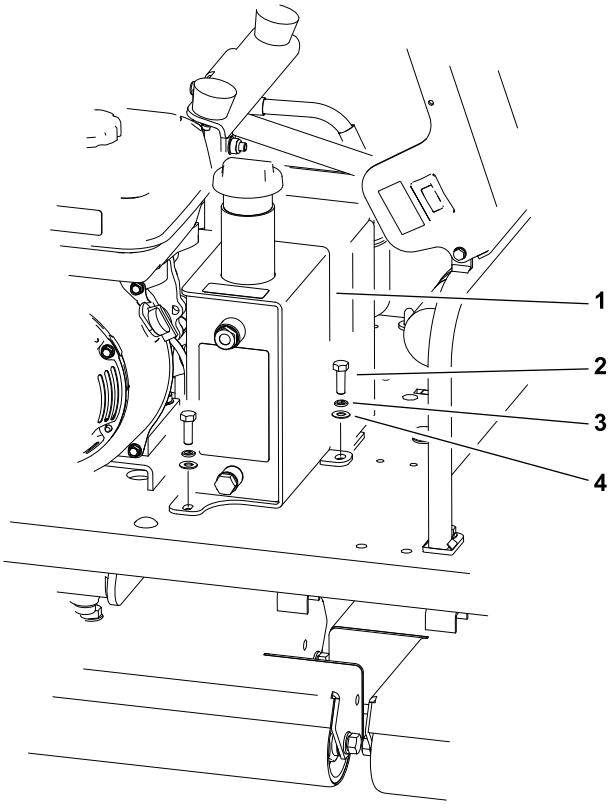

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Figure 9
(GreensPro 1240)

1. hydraulic fluid tank
2. Bolt (2 each)
3. Lock washer (2 each)
4. Flat washer (4 each)

6. Record the individual connections and disconnect the wire harness from the engine:
   A. Ground wire ring terminal to the blower housing.
   B. Two connectors to lighting coil.
   C. Two connectors to magneto ignition.

Removing the Engine (continued)

7. Remove the engine from the chassis.
8. If necessary, remove the rubber drive coupling and engine drive collar.

Installing the Engine

Refer to Figure 7 or Figure 8 for this procedure.

1. If previously removed, apply a thin coat of anti-seize lubricant to the engine output shaft and install the engine drive collar and rubber drive coupling to the engine. Tighten the nuts to **23 to 29 N·m (17 to 21 ft−lb)**.
2. Place the engine in position on the chassis.
3. Secure the transmission drive collar to the rubber drive coupling. Tighten the fasteners finger tight.

IMPORTANT

To prevent drive coupling damage, ensure that no distortion of coupling exists after securing the engine and transmission/hydraulic pump collars to the coupling. If coupling distortion is evident, loosen the engine and/or transmission/hydraulic pump and position the engine and/or transmission/hydraulic pump on frame so that the coupling is not distorted.

4. Secure the engine to the chassis.
5. Ensure that the engine, rubber drive coupling, and transmission/hydraulic pump are aligned with each other. Tighten the engine mounting fasteners:
   - GreensPro 1240 = **23 to 29 N·m (17 to 21 ft−lb)**
   - GreensPro 1260
     - fasteners through engine plate only = **23 to 29 N·m (17 to 21 ft−lb)**
     - fasteners through iso mounts = **20 to 26 N·m (15 to 19 ft−lb)**
6. Tighten the rubber drive coupling lock nuts from **23 to 29 N·m (17 to 21 ft−lb)**.
7. Connect the wire harness to the engine as recorded during disassembly:
   A. Ground wire ring terminal to the blower housing.
   B. Two connectors to lighting coil.
   C. Two connectors to magneto ignition.
8. On GreensPro 1240 machines, secure the hydraulic fluid tank to the chassis.
9. Install the exhaust guard if equipped.
10. Lower and secure the operator seat.
11. Install and secure the transmission cover to the machine; refer to Transmission Cover (page 7–58).

Chapter 5

Hydraulic System

Table of Contents

Additional Reference Materials

HYDRO−GEAR BDR SERVICE AND REPAIR MANUAL

HYDRO−GEAR P SERIES HYDROSTATIC PUMPS SERVICE AND REPAIR MANUAL

PARKER TORQMOTOR SERVICE PROCEDURE

General Information

The GreensPro *Operator's Manual* provides information regarding the operation, general maintenance procedures, and maintenance intervals for your machine. Refer to the GreensPro *Operator's Manual* for additional information when servicing the machine.

Some service and repair parts for the transmission in your GreensPro 1240 machine and for the hydraulic pump in your GreensPro 1260 machine are supplied through your Authorized Toro Distributor. Be prepared to provide your distributor with the Toro Model and Serial Number of your machine to obtain parts.

Transmission/Hydraulic Pump Service and Repair Manuals

Detailed information on troubleshooting, testing, disassembly, and assembly is provided in the Hydro-Gear Model BDR Service and Repair Manual (GreensPro 1240) and the Hydro-Gear P Series Hydrostatic Pump Service and Repair Manual (GreensPro 1260). The use of some specialized tools and test equipment is explained in the Hydro-Gear Service and Repair Manual. However, the specialized nature of some transmission repairs may dictate that the work be done at an Authorized Hydro-Gear Service Dealer.

Drive Train Operation

GreensPro 1240

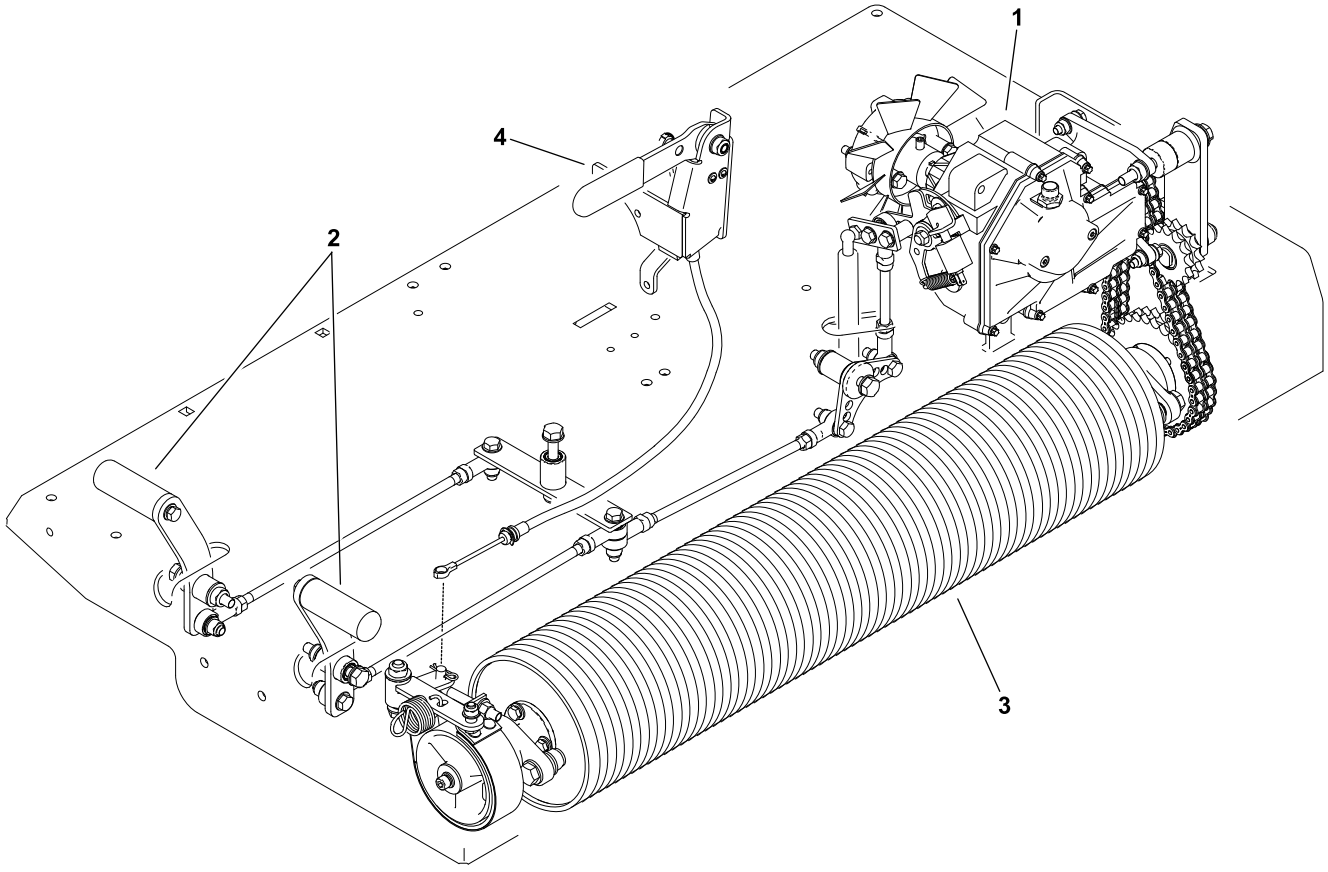

Figure 10

1. Transmission
2. Motion control pedal (2 each)
3. Drive roller
4. Parking brake lever

GreensPro 1240 machines use a hydraulic transmission driven by the engine through a rubber drive coupling to propel the machine (Figure 10). The transmission is connected to the drive roller through a double row chain. The transmission is a 10.2 cc (0.62 cu in) variable displacement bidirectional axial hydraulic pump coupled to a fixed displacement 21.8 cc (1.33 cu in) hydraulic motor.

The operator moves the motion control pedals connected to the hydraulic transmission control arm to control the machine direction and speed. With the engine running and the motion control pedals in the NEUTRAL position, the transmission supplies no drive to the traction roller, so that the machine remains stationary. When one of the motion control pedals is pressed, the motion control linkage moves the transmission control arm so that the transmission output turns the drive roller. Machine movement occurs in the direction of the motion control pedal applied.

The 2 foot-operated motion control pedals are on either side of the steering wheel column. These pedals control the motion of the traction roller. The pedals are connected to a common pedal rod pivot so that the motion control pedals cannot be pressed down at the same time. Pressing the right-hand motion control pedal will move the machine to the right, and pressing the left-hand motion control pedal will move the machine to the left. The farther the pedal is pressed, the faster the machine will move in that direction.

Most of the traction control system components are attached to the bottom of the chassis. The motion control pedals extend through the chassis, as does the linkage rod that attaches to the transmission control arm. The transmission and transmission drive components mount to the top of the chassis.

The GreensPro 1240 machines with serial number above 315000000 include a parking brake system. The band style parking brake is hand actuated. The system engages a brake hub mounted on the end of the drive roller axle. These machines include a parking brake switch, operator's seat switch, and a neutral switch as part of a safety interlock system; refer to Electrical System (page 6–2).

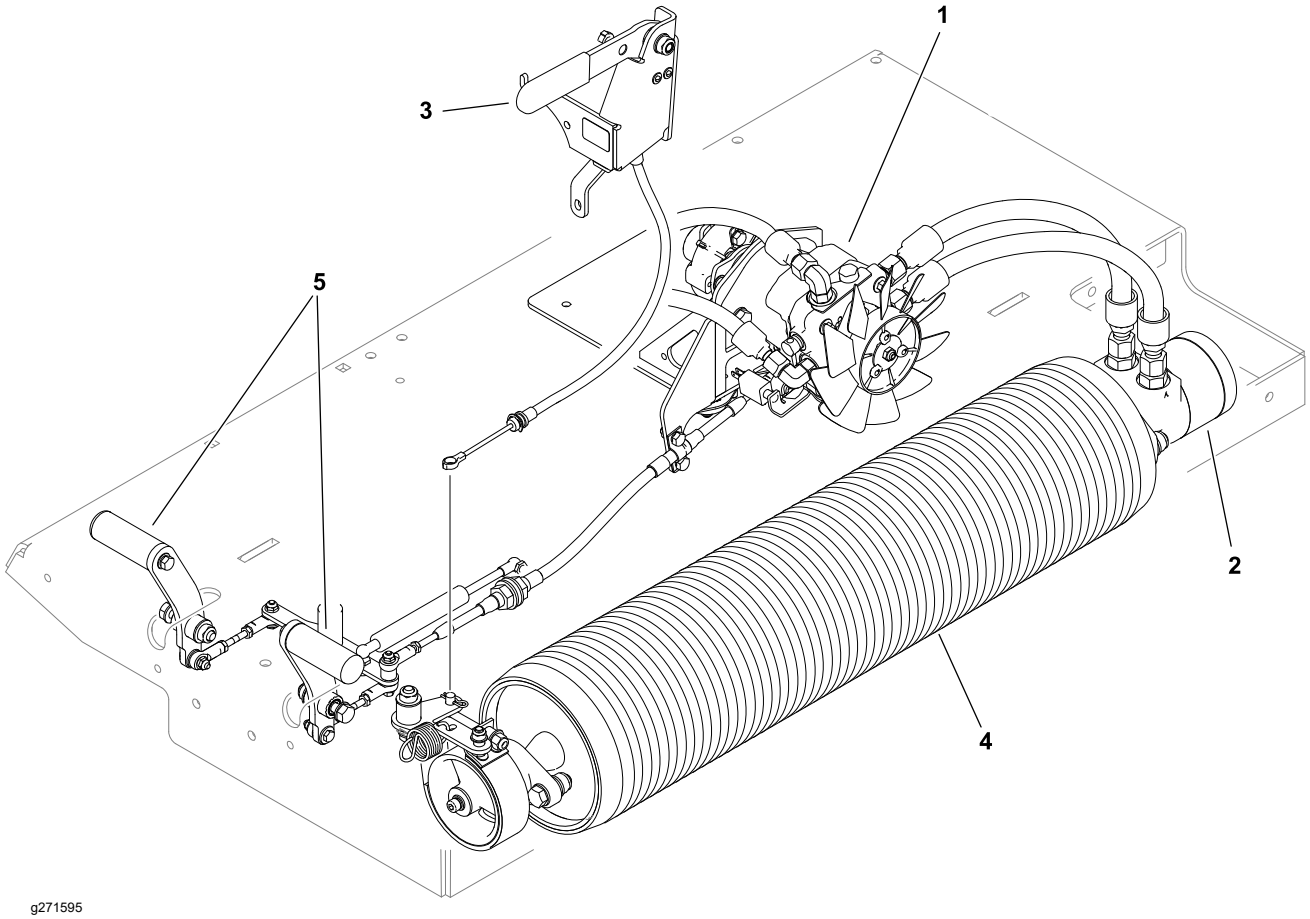

Figure 11

1. Hydraulic pump
2. Hydraulic motor
3. Parking brake lever
4. Drive roller
5. Motion control pedal (2 each)

GreensPro 1260 machines use a 10.2 cc (0.62 cu in) variable displacement bidirectional axial hydraulic pump connected to a fixed displacement 2.1 cc (0.13 cu in) hydraulic motor to propel the machine (Figure 11). The hydraulic pump is driven by the engine through a rubber drive coupling. The hydraulic motor is directly coupled to the drive roller.

The operator moves the motion control pedals connected to the hydraulic pump control arm to control the machine direction and speed. With the engine running and the motion control pedals in the NEUTRAL position, the hydraulic pump supplies no fluid to the hydraulic motor, so that the machine remains stationary. When one of the motion control pedals is pressed, the traction cable moves the hydraulic pump control arm, hydraulic fluid flows from the hydraulic pump to the hydraulic motor and so that the hydraulic motor output turns the drive roller. Machine movement occurs in the direction of the motion control pedal applied.

The 2 foot-operated motion control pedals are on either side of the steering wheel column. These pedals control the motion of the traction roller. The pedals are connected to a common pedal rod pivot so that both motion control pedals cannot be pressed down at the same time. Pressing the right-hand motion control pedal will move the machine to the right, and pressing the left-hand motion control pedal will move the machine to the left. The farther the pedal is pressed, the faster the machine will move in that direction.

Most of the traction control system components are attached to the bottom of the chassis. The motion control pedals extend through the chassis, as does the

traction cable that attaches to the hydraulic pump control arm. The hydraulic pump mounts to the top of the chassis.

The GreensPro 1260 machines include a parking brake system. The band style parking brake is hand actuated. The system engages a brake hub mounted on the end of the drive roller axle. These machines include a parking brake switch, operator's seat switch, and a neutral switch as part of a safety interlock system; refer to Electrical System (page 6–2).

Hydraulic System Components

Hydraulic System (GreensPro 1240)

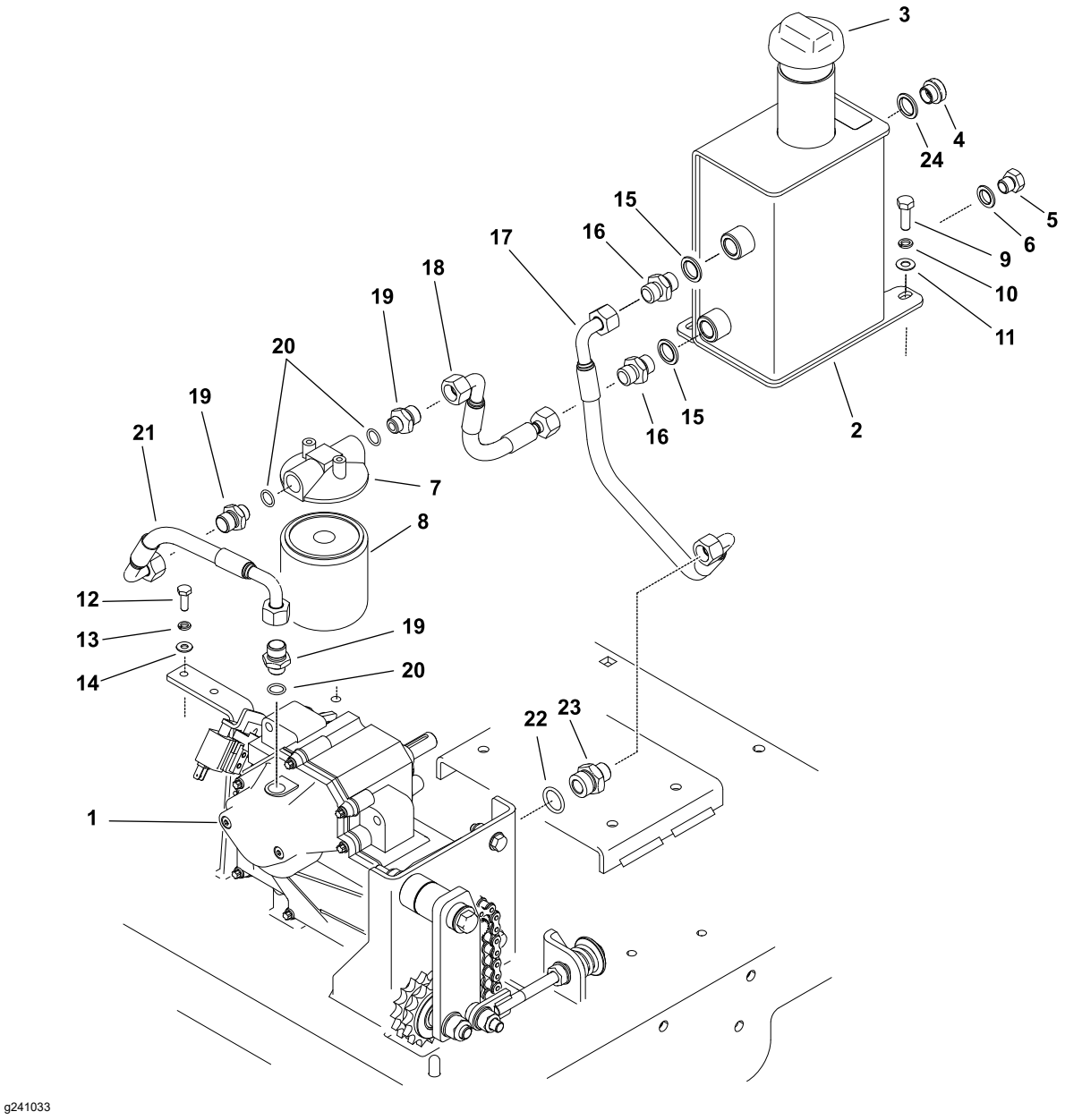

Figure 12
GreensPro 1240

1.	Transmission	9.	Bolt (2 each)	17.	Hydraulic hose – 3/8 BSPP (transmission to tank)
2.	Hydraulic tank	10.	Lock washer (2 each)	18.	Hydraulic hose – 3/8 BSPP (tank to filter)
3.	Tank cap	11.	Flat washer (2 each)	19.	Straight fitting – 9/16 SAE to 3/8 BSPP (3 each)
4.	Sight glass – 3/8 BSPP	12.	Bolt (2 each)	20.	O-ring – 9/16 SAE (3 each)
5.	Drain plug – 1/4 BSPP	13.	Lock washer (2 each)	21.	Hydraulic hose – 3/8 BSPP (filter to transmission)
6.	Dowty seal – 1/4	14.	Flat washer (2 each)	22.	O-ring – 7/8 SAE
7.	hydraulic fluid filter head	15.	Dowty seal – 3/8 (2 each)	23.	Straight fitting – 7/8 SAE to 3/8 BSPP
8.	hydraulic fluid filter element	16.	Straight fitting – 3/8 BSPP to 3/8 BSPP (2 each)	24.	Fiber gasket

Hydraulic System (GreensPro 1240) (continued)

The hydraulic system of the GreensPro 1240 machines includes the transmission, hydraulic tank, hydraulic fluid filter, and a series of hydraulic hoses (Figure 12). If a component failure occurs in the transmission, unwanted material and contamination from the damaged component will circulate throughout the system. This contamination can damage other components in the system, so remove the contamination to prevent additional component failure.

If a transmission failure occurs, disassemble the entire hydraulic system, drain the hydraulic fluid, and clean all the components and hoses in the hydraulic system. Replace the hydraulic fluid filter. Operating the machine with contaminants in the hydraulic system could cause additional damage to components of the hydraulic system.

Hydraulic System (GreensPro 1260)

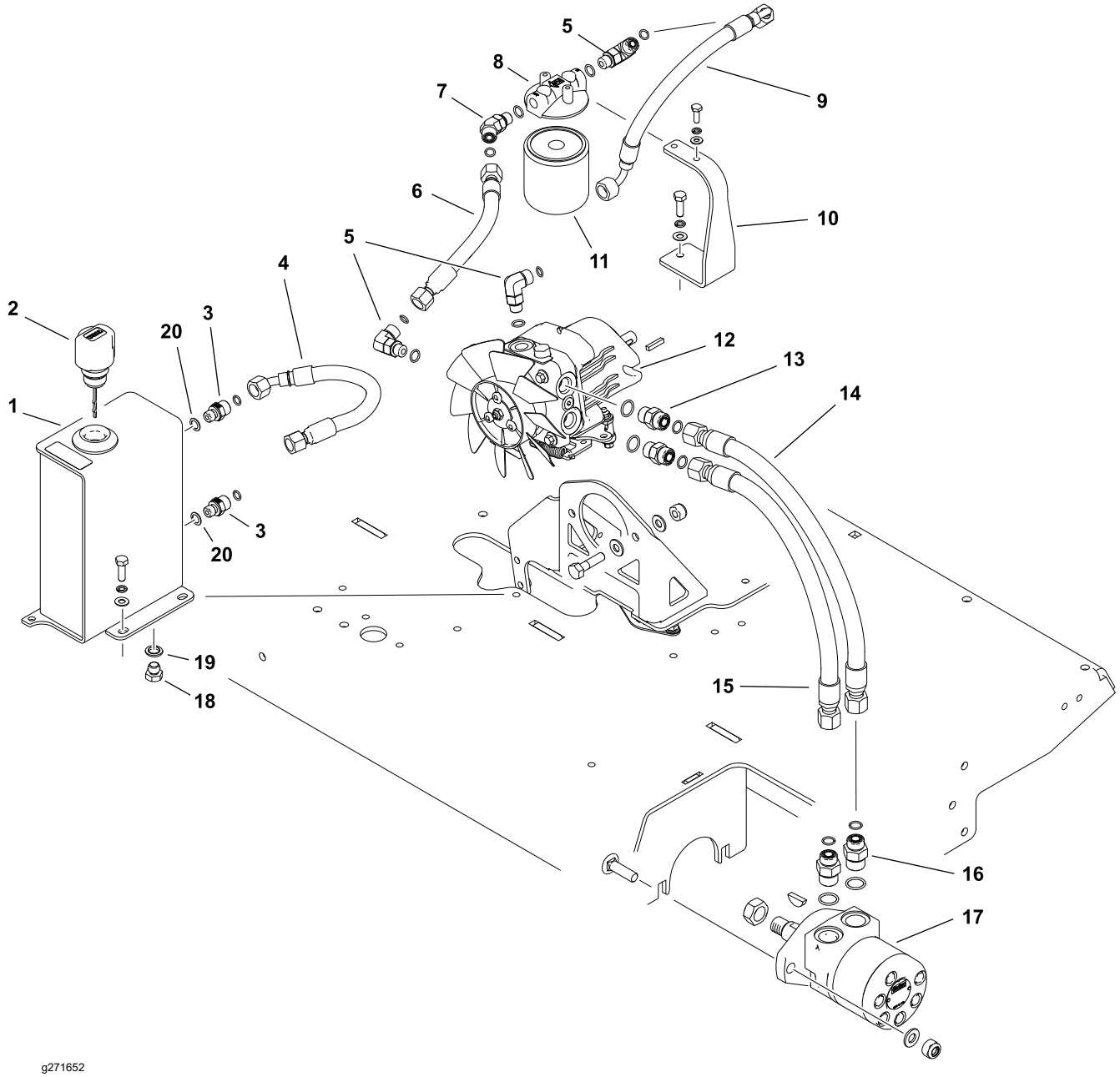

Figure 13

GreensPro 1260

1.	Hydraulic tank	8.	Hydraulic fluid filter head	15.	Hydraulic hose – 8 ORFS (pump to motor)
2.	Cap/breather/dipstick	9.	Hydraulic hose – 6 ORFS (tank to filter)	16.	Straight fitting – 10 SAE to 8 ORFS (2 each)
3.	Straight fitting – 3/8 BSPP to 6 ORFS (2 each)	10.	Filter bracket	17.	Motor
4.	Hydraulic hose – 6 ORFS (pump to tank)	11.	Hydraulic fluid filter element	18.	Drain plug – 1/4 BSPP
5.	Elbow fitting – 6 SAE to 6 ORFS (3 each)	12.	Pump	19.	Dowty seal – 1/4
6.	Hydraulic hose – 6 ORFS (filter to pump)	13.	Straight fitting – 8 SAE to 8 ORFS (2 each)	20.	ED seal – 3/8 (2 each)
7.	Elbow fitting – 6 SAE to 6 ORFS	14.	Hydraulic hose – 8 ORFS (pump to motor)		

The traction circuit of the GreensPro 1260 machines is a closed loop system that includes the hydraulic pump, hydraulic motor, hydraulic tank, hydraulic fluid filter, and a series of hydraulic hoses (Figure 13). If a component failure occurs in the traction circuit (e.g., hydraulic pump or hydraulic motor), unwanted material and contamination from the damaged component will circulate throughout the traction circuit. This contamination can damage other components in the circuit, so remove the contamination to prevent additional component failure.

The recommended method to remove contamination from the traction circuit is to temporarily install a Toro high flow hydraulic fluid filter into the circuit; refer to High Flow Hydraulic Filter Kit (page 2–13). If a traction circuit failure is suspect, the filter should be installed before connecting hydraulic test gauges to test traction circuit components or after replacing a failed traction circuit component. The filter will ensure that contaminates are removed from the closed-loop traction circuit, preventing additional component damage. Refer to Filtering the Closed-Loop Traction Circuit (GreensPro 1260) (page 5–39) for additional information on using the Toro high flow hydraulic fluid filter.

Note: If traction circuit contamination exists, the traction pump drain could allow contaminates to enter the hydraulic tank.

The alternative to using the Toro high flow hydraulic filter kit after a traction circuit component failure would be to disassemble, drain and thoroughly clean all the components, the hydraulic tank, and the hydraulic tubes and hoses in the traction circuit. If any debris remains in the traction circuit and the machine is operated, the debris can cause additional circuit component failures.

Hydraulic Hoses

The hydraulic hoses are subject to extreme conditions such as pressure differentials during operation and exposure to weather, sun, chemicals, very warm storage conditions, in addition to mishandling during operation and maintenance. These conditions can cause damage to the hose or deterioration to the hose material. Some hoses are more susceptible to these conditions than others. Examine all of the hydraulic hoses of the machine frequently and repair or replace them as necessary. Hoses that move during normal machine operation should be replaced every 2 years. Check hydraulic hoses for the following signs of deterioration or damage:

- A hose that is hard, cracked, cut, abraded, charred, leaking, or otherwise damaged.
- A hose that is kinked, crushed, flattened, or twisted.
- A hose cover that is blistered, soft, degraded, or loose.
- Hose fittings that are cracked, damaged, or badly corroded.

WARNING

Before disconnecting or performing any work on the hydraulic system, shut off the engine and press the motion control pedals to release the pressure in the system.

- **Keep your body and hands away from pin-hole leaks or nozzles that eject hydraulic fluid under high pressure.**
- **Do not use your hands to search for leaks; use a piece of paper or cardboard.**
- **Hydraulic fluid escaping under pressure can have sufficient force to penetrate the skin and cause serious injury.**
- **If hydraulic fluid is injected into your skin, the fluid damage to your body must be surgically removed within a few hours by a doctor familiar with this form of injury or gangrene may result.**

When you replace a hydraulic hose, ensure that the hose is straight (not twisted) before you tighten the fittings. Observe the imprint (layline) on the hose to do this. Using 2 wrenches, hold the hose straight with 1 wrench and tighten the hose swivel nut onto the fitting with the other wrench; refer to Installing the Hydraulic Hoses and Tubes (page 5–12).

Note: If the hose has an elbow at 1 end, tighten the swivel nut on the elbow end before you tighten the nut on the straight end of the hose.

For more hydraulic hose information, refer to the Toro Basics Series Training Book *Hydraulic Hose Servicing* (Part No. 94813SL).

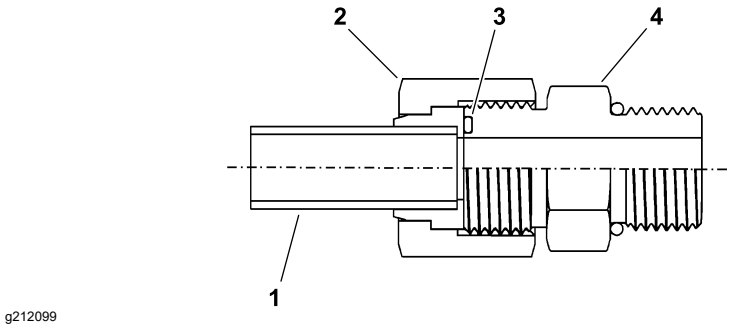

Figure 14

1. Tube or hose
2. Swivel nut
3. O-ring
4. Fitting body

1. Ensure that all the threads, the sealing surfaces of the hose/tube, and the fitting are free of burrs, nicks, scratches, or unwanted material.
2. Align the hose/tube against the body of the fitting so that the face of the hose/tube sleeve fully touches the face of the fitting.

   Note: It may be necessary to use a drive-adapter wrench (e.g., crowfoot wrench) to install a hydraulic fitting; refer to Calculating the Torque Values When Using a Drive-Adapter Wrench (page 2–5).
3. Use your hand to thread the swivel nut onto the fitting. While you hold the hose/tube in alignment with a wrench, use a torque wrench to tighten the swivel nut to the recommended torque value within the specified range of torque values; refer to the Hose/Tube Installation Torque Table (page 5–12).

IMPORTANT

The hydraulic hoses used on the GreensPro 1240 machines have BSPP (British Standard Parallel Pipe) threads. The hydraulic hoses used on the GreensPro 1260 machines have ORFS (O-Ring Face Seal) threads. If hoses are replaced, ensure that the replacement has the correct type of threads, or component damage and leakage will occur.

Hose/Tube Installation Torque Table

Size	Hose/Tube Thread Size	Installation Torque
3/8 BSPP	19	30 to 35 N·m (22 to 26 ft-lb)
6 ORFS	11/16–16	37 to 44 N·m (27 to 33 ft-lb)
8 ORFS	13/16–16	51 to 63 N·m (37 to 47 ft-lb)

4. If a torque wrench is not available or if space at the swivel nut prevents the use of a torque wrench, use the alternative procedure Flats From Wrench Resistance (FFWR) given below.

Flats From Wrench Resistance Table

Size	FFWR
3/8 BSPP	1/2 to 3/4
6 ORFS	1/2 to 3/4
8 ORFS	1/2 to 3/4

A. Use a wrench to tighten the swivel nut onto the fitting until you feel light resistance with the wrench; approximately **3.39 N·m (30 in-lb)**.

B. Put a mark on the swivel nut and body of the fitting. Hold the hose/tube in alignment with a wrench to prevent the hose/tube from turning (Figure 15).

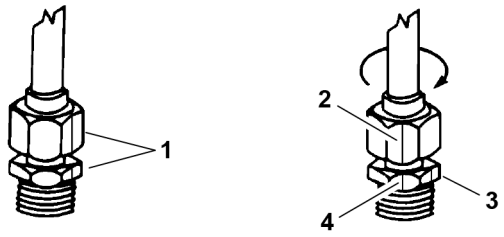

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Figure 15

1. Mark nut and fitting body
2. Final position
3. Initial position
4. Extend line

Note: The markings on the nut and body of the fitting show that the connection is correctly tightened.

C. Use a second wrench to tighten the nut to the correct Flats From Wrench Resistance (FFWR).

Installing the Hydraulic Fittings

IMPORTANT

The hydraulic fittings used on the GreensPro 1240 have BSPP (British Standard Parallel Pipe) threads for the hose connections, and both SAE and BSPP threads for the component connections. The hydraulic fittings used on the GreensPro 1260 have ORFS (O-Ring Face Seal) threads for the hose connections, and both SAE and BSPP threads for the component connections. Pay close attention to the fitting thread type and the type of seal used when replacing hydraulic tank fittings and seals, or component damage and leakage may occur.

Installing a Non-Adjustable Fitting

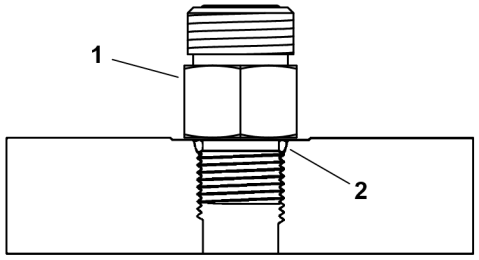

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Figure 16

1. Fitting
2. O-ring or dowty seal

1. Ensure that all the threads, the sealing surfaces of fitting, and the component port are free of burrs, nicks, scratches, or unwanted material.
2. To help prevent a hydraulic leak, replace the O-ring when you open the connection.
3. Lightly lubricate the O-ring with clean hydraulic fluid. Ensure that the threads of the fitting are clean with no lubricant applied.

IMPORTANT

Before tightening the fitting, determine the material used for the port the fitting is being installed in. Installing a fitting into an aluminum port requires reducing the installation torque.

4. Install the fitting into the port, then use a torque wrench and socket to tighten the fitting to the recommended torque value within the specified range of torque values; refer to the Fitting Installation Torque Table (page 5–16).

   Note: It may be necessary to use a drive-adapter wrench (e.g., crowfoot wrench) to install a hydraulic fitting; refer to Calculating the Torque Values When Using a Drive-Adapter Wrench (page 2–5).
5. If a torque wrench is not available or if space at the port prevents the use of a torque wrench, use the Flats From Finger Tight (FFFT) procedure given below:

   A. Install the fitting into the port and tighten the fitting down full length until finger-tight.

Installing a Non-Adjustable Fitting (continued)

B. If the port material is steel, tighten the fitting to the listed value; refer to the Flats From Finger Tight (FFFT) Table (page 5–16).

C. If the port material is aluminum, tighten the fitting to 60% of the listed value; refer to the Flats From Finger Tight (FFFT) Table (page 5–16).

Installing an Adjustable Fitting

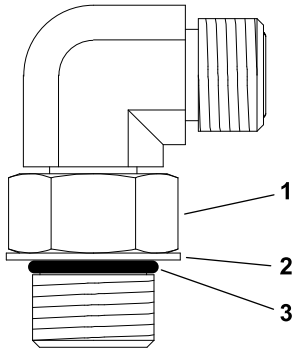

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Figure 17

1. Locknut
2. Back-up washer
3. O-ring

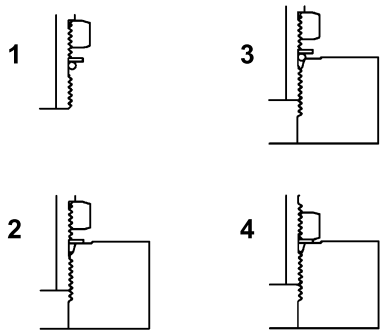

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Figure 18

1. Step 1: clearance the lock nut
2. Step 2: seat the back-up washer
3. Step 3: align the fitting
4. Step 4: tighten the lock nut

1. Ensure that all the threads, the sealing surfaces of fitting, and the component port are free of burrs, nicks, scratches, or unwanted material.
2. To help prevent a hydraulic leak, replace the O-ring when you open the connection.
3. Lightly lubricate the O-ring with clean hydraulic fluid. Ensure that the threads of the fitting are clean with no lubricant applied.
4. Turn back the lock nut as far as possible. Ensure that the back-up washer is not loose and it is pushed up as far as possible (Step 1 in Figure 18).
5. Install the adjustable fitting into the port by hand until the washer contacts the face of the port (Step 2 in Figure 18).
6. If the adjustable fitting needs to align with another component, rotate the fitting counterclockwise until it is aligned to the desired position (Step 3 in Figure 18). Do not rotate the adjustable fitting more than 1 turn counterclockwise.

IMPORTANT

Before tightening the fitting, determine the material used for the port the fitting is being installed in. Installing a fitting into an aluminum port requires reducing the installation torque.

7. Tighten the fitting lock nut (Step 4 in Figure 18):
   A. Hold the fitting in the correct alignment with a wrench and use a torque wrench and tighten the lock nut to the recommended torque value within the specified range of torque values; refer to the Fitting Installation Torque Table (page 5–16). This tightening procedure requires a drive-adapter wrench (e.g., crowfoot wrench); refer to Calculating the Torque Values When Using a Drive-Adapter Wrench (page 2–5).
   B. If a torque wrench is not available or if space at the port prevents the use of a torque wrench, hold the fitting in the correct alignment with a wrench and tighten the lock nut with a second wrench.
   C. If the port material is steel, tighten the fitting to the listed Flats From Finger Tight (FFFT) value; refer to the Flats From Finger Tight (FFFT) Table (page 5–16).
   D. If the port material is aluminum, tighten the fitting to 60% of the listed FFFT value; refer to the Flats From Finger Tight (FFFT) Table (page 5–16).

Fitting Installation Torque Table

Fitting Size	Fitting Thread Size	Installation Torque Into Steel Port	Installation Torque Into Aluminum Port
1/4 BSPP	13.5 mm (0.52 inch)–19	45 to 55 N·m (33 to 41 ft-lb)	27 to 34 N·m (20 to 25 ft-lb)
3/8 BSPP	16.7 mm (0.66 inch)–19	51 to 62 N·m (38 to 46 ft-lb)	33 to 38 N·m (24 to 28 ft-lb)
6 SAE	9/16–18	47 to 56 N·m (34 to 42 ft-lb)	28 to 35 N·m (20 to 26 ft-lb)
8 SAE	3/4–16	79 to 97 N·m (58 to 72 ft-lb)	48 to 58 N·m (35 to 43 ft-lb)
10 SAE	7/8–14	135 to 164 N·m (99 to 121 ft-lb)	82 to 100 N·m (60 to 74 ft-lb)

Flats From Finger Tight (FFFT) Table

Size	FFFT
1/4 BSPP	1.00 ± 0.25
3/8 BSPP	1.50 ± 0.25
6 SAE	1.50 ± 0.25
8 SAE	1.50 ± 0.25
10 SAE	1.50 ± 0.25

Hydraulic Schematic (GreensPro 1260)

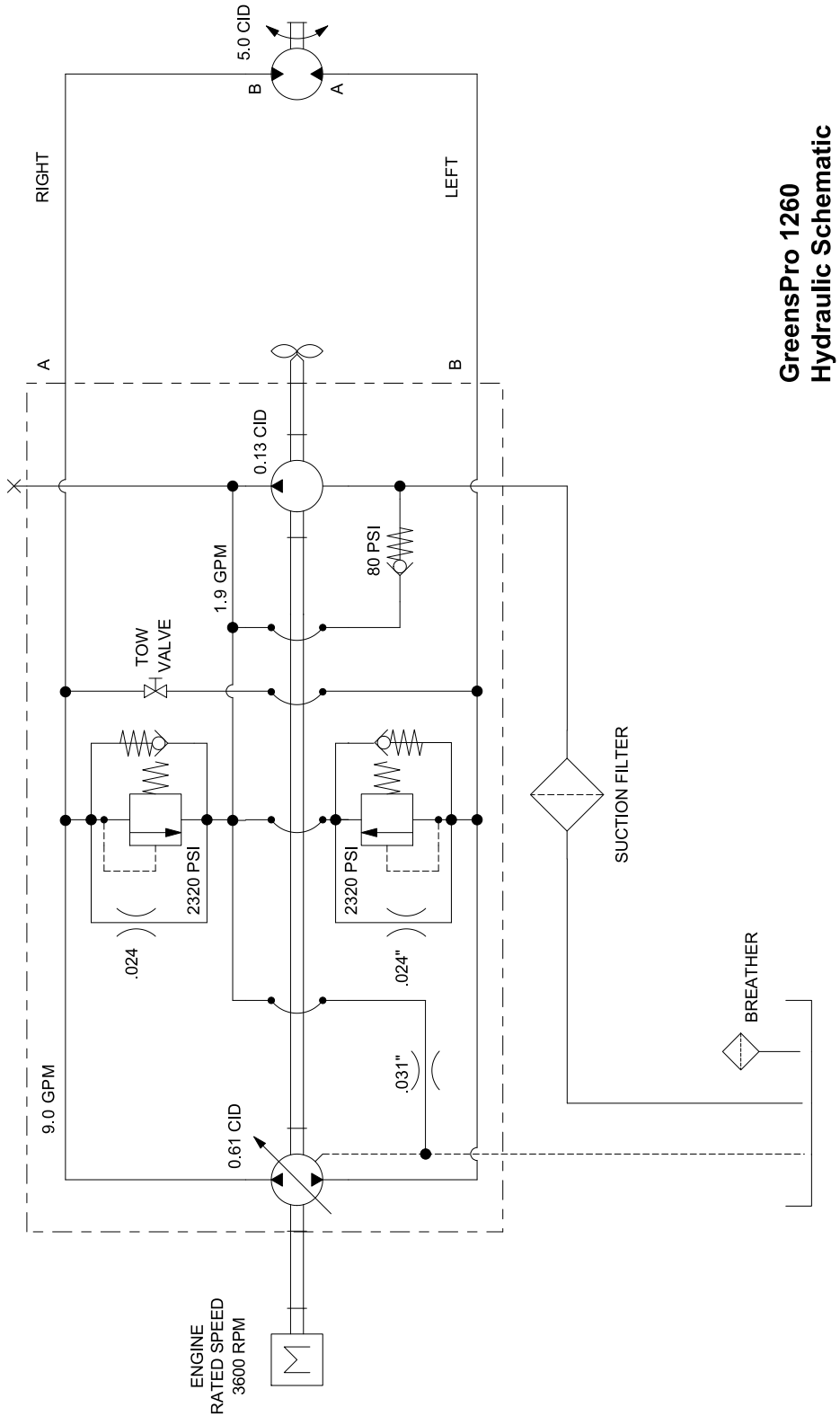

Figure 19

Hydraulic Flow Diagrams

GreensPro 1260 Traction Circuit

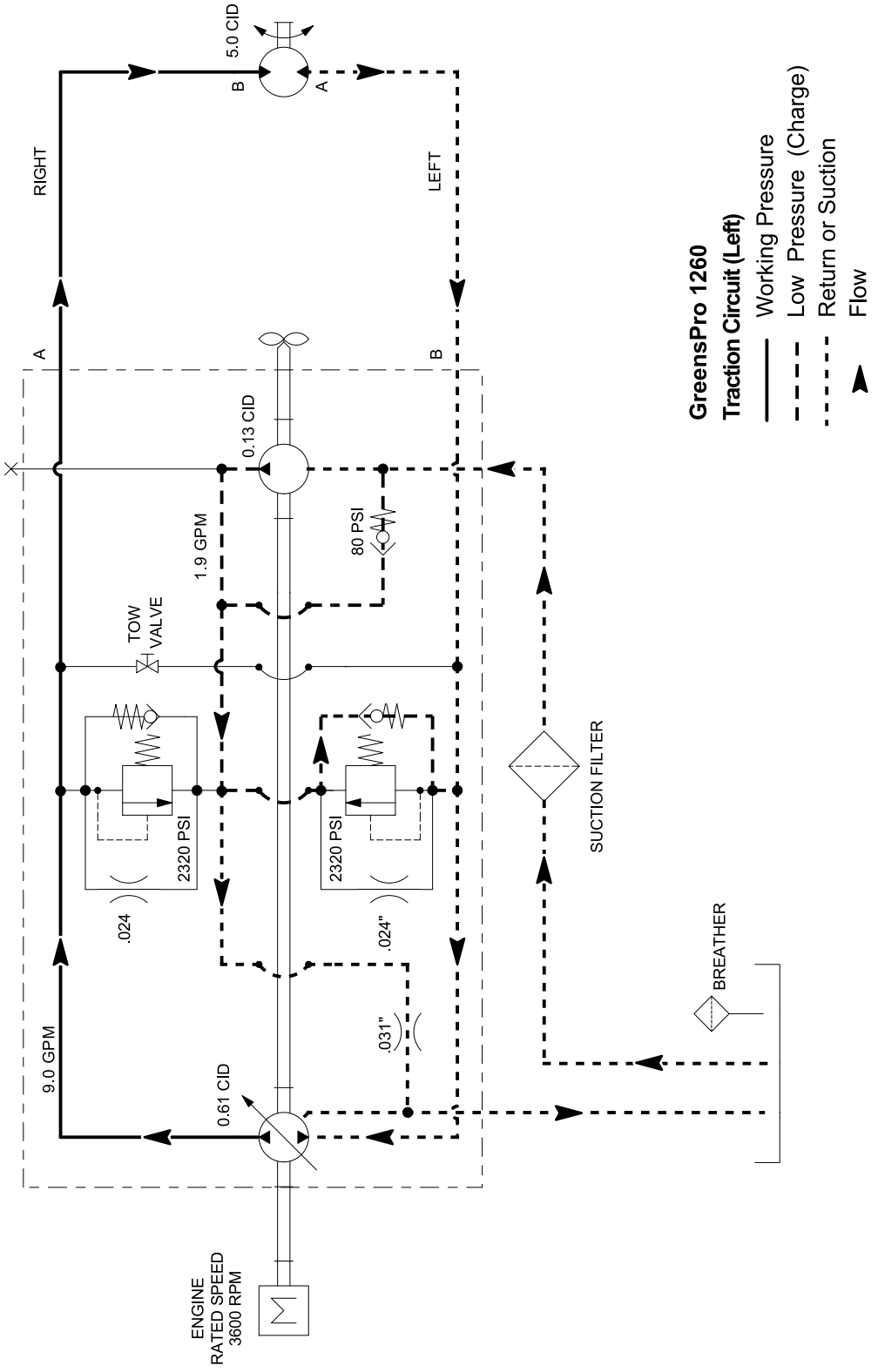

Figure 20

The hydraulic traction circuit consists of a bidirectional variable displacement piston pump connected in a closed loop to a hydraulic motor. The hydraulic pump is driven by the engine through a rubber drive coupling.

Right Direction

Pressing down the right motion control pedal, angles the hydraulic pump swash plate to create a flow of fluid. This fluid flow is directed to the hydraulic motor through the “A” port to rotate the drive roller in the right direction. The traction pressure is limited to 16,000 kPa (2,320 psi) by the right traction relief valve located in the hydraulic pump.

The angle of the swash plate determines pump flow and ultimately traction speed. When the motion control pedal is pressed a small amount, a small swash plate angle results in low pump output and lower traction speed. When the motion control pedal is pressed fully, the pump swash plate angles fully to provide maximum pump output and traction speed.

The fluid flowing through the hydraulic motor returns to the variable displacement pump and is continuously pumped through the traction circuit as long as the motion control pedal is pressed.

The hydraulic pump is equipped with a case drain to allow internal leakage to be removed from the pump. The case drain is connected to the hydraulic tank.

A gerotor charge pump in the pump provides a constant supply of charge fluid to the closed loop traction circuit for lubrication and to make up for fluid that is lost due to internal leakage in the hydraulic pump. The charge pump takes its suction from the hydraulic tank through a filter. Charge pressure is limited to 552 kPa (80 psi) by a check valve in the charge circuit. The charge pump flow is directed to the low pressure side of the closed loop circuit.

Left Direction

The traction circuit operates essentially the same to move the machine to the left direction as it does to move the machine in the right direction. However, the flow through the circuit is reversed. Pushing down the left motion control pedal angles the variable displacement pump swash plate in the hydraulic pump in the opposite direction to create a flow of fluid. This fluid is directed out the pump “B” port to the motor which turns the drive roller in the left direction. The traction pressure is limited to 16,000 kPa (2,320 psi) by the right traction relief valve located in the hydraulic pump.

The fluid flowing through the hydraulic motor returns to the variable displacement pump and is continuously pumped through the closed traction circuit as long as the motion control pedal is pushed.

The charge circuit functions the same in left direction as it does in the right direction.

Testing the Hydraulic System

The most effective procedure to isolate the problems in the hydraulic system is to use hydraulic test equipment, such as pressure gauges and flow meters in the circuits during different operational checks; refer to Special Tools (page 2–12).

WARNING

Opening the hydraulic system without releasing pressure from the system will cause the hydraulic fluid to escape, causing possible injury.

Before disconnecting or performing any work on the hydraulic system, shut off the engine and press the motion control pedals to release the pressure in the system.

WARNING

Hydraulic fluid escaping under pressure can penetrate skin and cause injury.

- **Keep your body and hands away from pin-hole leaks or nozzles that eject hydraulic fluid under high pressure.**
- **Do not use your hands to search for leaks; use a piece of paper or cardboard.**
- **Hydraulic fluid escaping under pressure can have sufficient force to penetrate the skin and cause serious injury.**
- **If hydraulic fluid is injected into your skin, the fluid damage to your body must be surgically removed within a few hours by a doctor familiar with this form of injury or gangrene may result.**

CAUTION

Failing to use gauges having the recommended pressure (kPa/psi) rating could damage the gauge and cause personal injury from contact with hot, leaking hydraulic fluid.

Use gauges with the recommended pressure rating as listed in the test procedures.

IMPORTANT

Before performing the hydraulic tests, check all obvious areas, such as fluid supply, filter, binding linkages, loose fasteners, or improper adjustments before you assume that a hydraulic component is the source of the problem.

IMPORTANT

Use 2 people to perform all the tests, with 1 person in the seat and the other to read and record the test results.

1. Use the following resources to assist with hydraulic system troubleshooting.
   - The Hydraulic Schematic (GreensPro 1260) (page 5–17)
   - The Hydraulic Flow Diagrams (page 5–18)
   - General and system specific troubleshooting tables in Chapter 3 – Troubleshooting
2. Always wear the eye protection when you performing hydraulic system tests.
3. Clean the machine fully before you disconnect or disassemble the hydraulic components.

   Note: Cleanliness is required whenever you work on the hydraulic equipment. Contamination causes too much wear on hydraulic components.
4. To prevent hydraulic system contamination, put metal caps or plugs on any hydraulic lines left open or exposed during testing or removal of components.
5. The engine must be in good operating condition. Use a non-contact tachometer (phototach) to verify and monitor engine RPM when performing a hydraulic test. Engine speed can affect the accuracy of the test readings. Use the information below when performing hydraulic system tests. If engine RPM is above or below the specified speed during a test, you will need to adjust the expected hydraulic performance parameters (aprox. 3% per 100 engine rpm at full throttle).

   Hydraulic component output volume relates directly to engine RPM. For every 100 engine rpm the following component output volumes will change by the volume listed.
   - Traction Pump: 100 engine RPM = 1 liter (34 ounces) of hydraulic fluid displaced per minute
   - Charge Pump: 100 engine RPM = 213 milliliters (7.2 ounces) of hydraulic fluid displaced per minute
6. When you use a hydraulic tester (pressure and flow), ensure that the inlet and outlet hoses are properly connected and not reversed to prevent damaging the hydraulic tester or components.
7. When you use a hydraulic tester (pressure and flow), open the tester load valve fully before you start the engine to reduce the possibility of damaging the components.
8. Install the hydraulic fittings by hand and ensure that they are not cross-threaded before you tighten them with a wrench.
9. Position any test hoses away from parts that may move during the test procedure.
10. After you connect the test equipment, check the hydraulic fluid level in the hydraulic tank and ensure that the fluid level is correct.
11. Perform all the hydraulic tests with the hydraulic fluid at normal operating temperature.
12. Record the results of all hydraulic tests performed.
13. After a hydraulic test procedure has been completed, check the hydraulic fluid level in the hydraulic tank before returning the machine to service.

Testing the Traction Circuit – Hydraulic Pump Charge Pressure Test (GreensPro 1260)

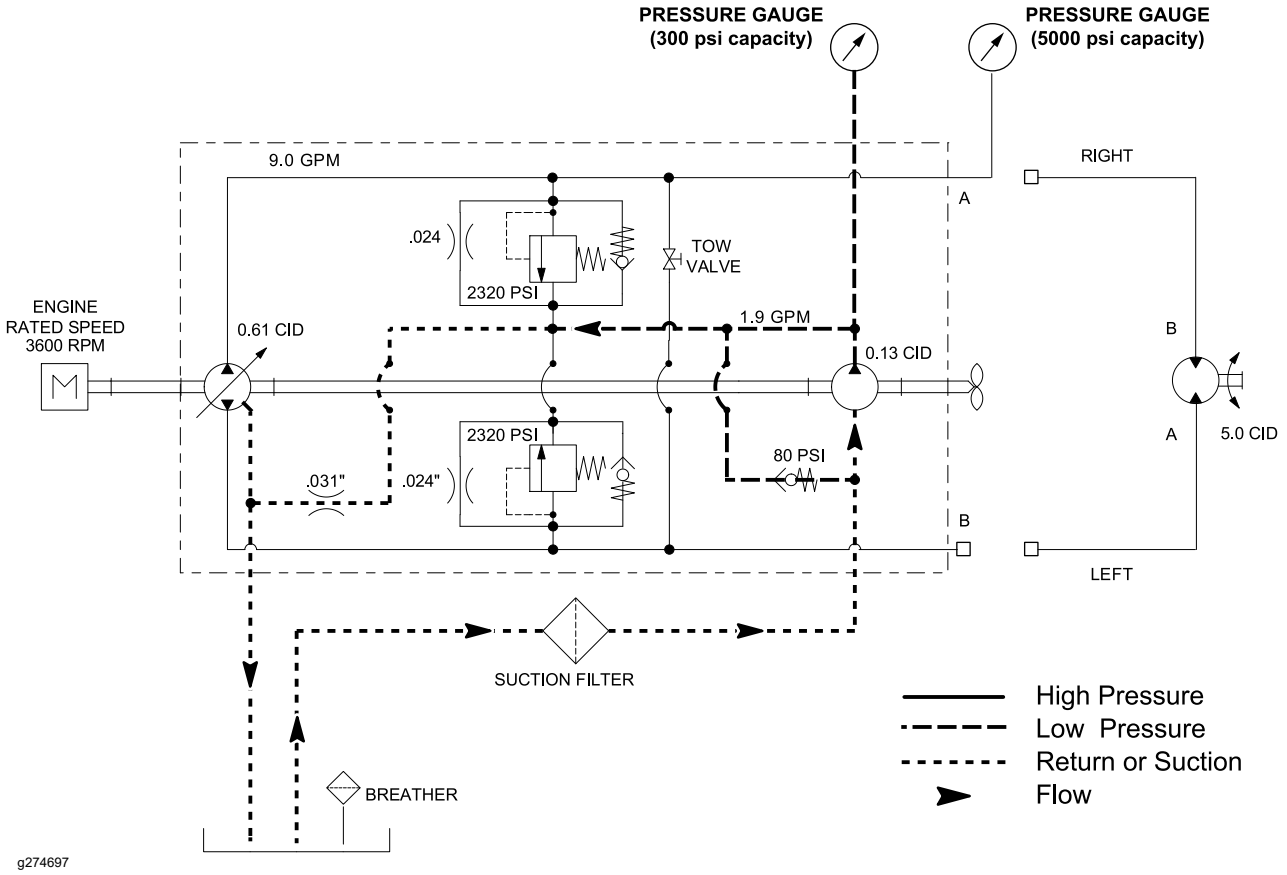

Figure 21

The charge pressure test is the first in a series of two tests recommended to determine traction circuit performance. Charge pressure testing involves recording the charge pressure with the pump under no load (swash plates closed) and comparing that reading to the charge pressure while the pump is under a moderate load (swash plates open). A charge pressure drop of more than 20% indicates an internal leak in the hydraulic pump. Continued unit operation can generate excessive heat, cause damage to seals and other components in the hydraulic system, and affect overall machine performance.

Special Equipment Required:

- Hydraulic Pressure Test Kit (Toro part no. TOR47009)
- Hydraulic Test Fitting Kit (Toro part no. TOR4079)
- #8 SAE hydraulic plug (Toro part no. 353–550)
- #8 ORFS swivel elbow (Toro part no. 94–6031)
- Non-contact tachometer (phototach)

Test Procedure

1. Ensure that the motion control pedals are correctly adjusted for the NEUTRAL position. Also, ensure that the hydraulic pump is at full stroke when the motion control pedals are moved to the full forward position.
2. Park the machine on a clean, level surface, shut off the engine, and engage the parking brake.
3. Remove the transmission cover; refer to Removing the Transmission Cover (page 7–59)

CAUTION

Before opening the hydraulic system, press the motion control pedals to release the pressure in the system and avoid injury from the pressurized hydraulic fluid.

4. Clean the junction of the hydraulic hoses and straight fittings at the hydraulic pump (Figure 22). Tag the hoses to correspond with the pump ports (A and B) then disconnect the hoses from the fittings. Plug the hoses to prevent contamination from entering the system.

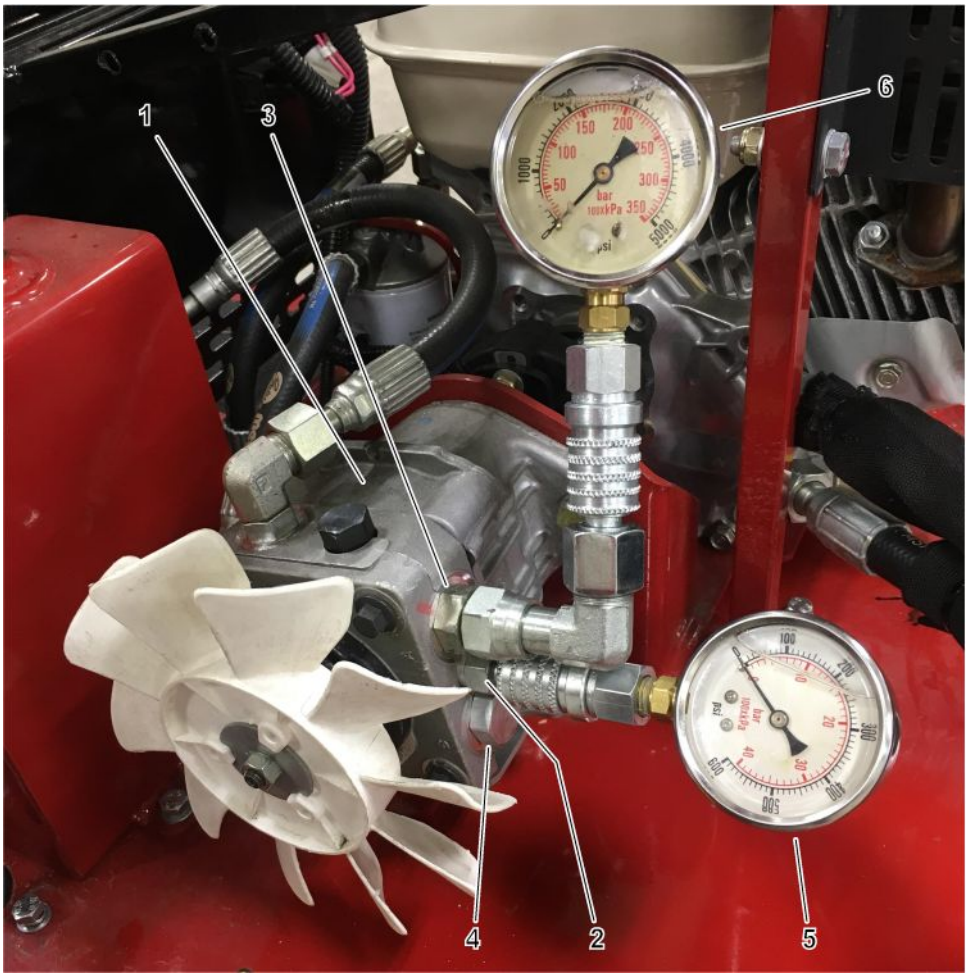

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Figure 22

1. Hydraulic pump
2. Charge circuit test port
3. Pump A port (travel right)
4. Pump B port (travel left)
5. Pressure gauge – 0 to 500 psi
6. Pressure gauge – 0 to 5000 psi

5. Remove the hydraulic fitting from the hydraulic pump B port. Plug pump B port with a #8 SAE hydraulic plug.
6. Remove the plug from the charge circuit test port and install a male test connector.
7. Install a #8 ORFS elbow and a male test connector to the hydraulic pump A port.

Test Procedure (continued)

8. Connect a 0 to 500 psi pressure gauge to the charge circuit test port
9. Connect a 0 to 5000 psi pressure gauge to the pump A port.
10. Start the engine and run it at low-idle speed. Check for hydraulic fluid leaks from the test connections and correct before continuing the test.
11. Set the throttle to full engine speed **(3,600 rpm)**. Use a non-contact tachometer (phototach) to verify the engine speed.
12. Run the engine for approximately 10 minutes to warm the hydraulic oil.

13. Record the reading on the pressure gauge at the charge circuit test port. Charge pressure (without load) should read approximately **550 kPa (80 psi)**. If charge pressure specification is not met, consider the following:

    A. Test the hydraulic pump flow and pressure relief operation; refer to Testing the Traction Circuit – Hydraulic Pump Flow and Relief Pressure Test (GreensPro 1260) (page 5–25).

    B. The hydraulic pump charge relief valve or charge pump is faulty. Repair or replace the charge relief valve or charge pump; refer to Servicing the Hydraulic Pump (GreensPro 1260) (page 5–54).

14. Sit in the operator's seat, release the parking brake, and slowly depress the **RIGHT** motion control pedal until **6895 to 10,350 kPa (1000 to 1500 psi)** is reached on the pressure gauge at the pump A port.
15. Record the reading on the pressure gauge at the charge circuit test port. Release the motion control pedal, set the throttle to low speed and shut the engine off.
16. Charge pressure (under load) should not drop more than 20% when compared to charge pressure (without load) recorded in step . If charge pressure specification is not met, test the hydraulic pump flow and pressure relief operation; refer to Testing the Traction Circuit – Hydraulic Pump Flow and Relief Pressure Test (GreensPro 1260) (page 5–25).

Testing the Traction Circuit – Hydraulic Pump Flow and Relief Pressure Test (GreensPro 1260)

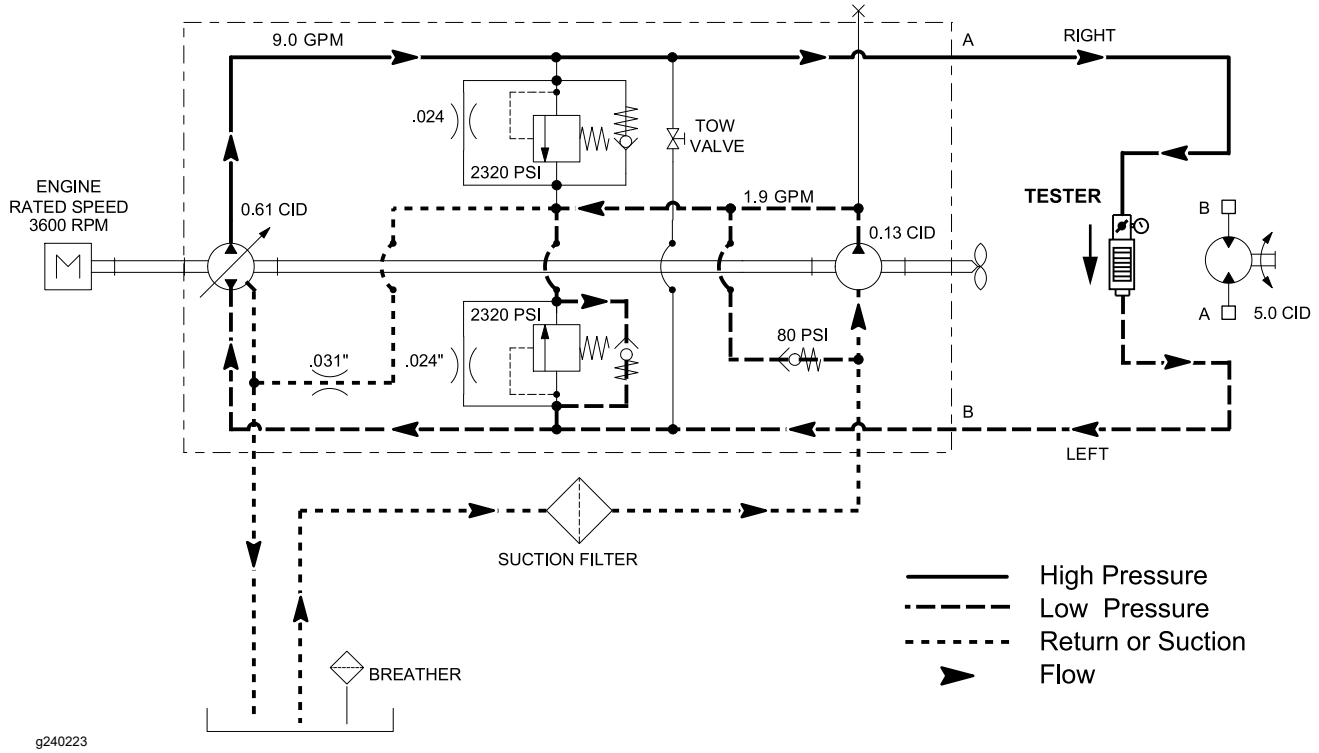

Figure 23

The hydraulic pump flow test is recommended to determine the traction circuit performance. This test compares fluid flow at a No Load with fluid flow Under Load. A drop in flow under load of more than 12% indicates an internal leak or malfunctioning relief valve in the hydraulic pump. A worn hydraulic pump or malfunctioning relief valve is less efficient. Eventually, enough fluid bypass will cause the unit to stall under heavy load conditions. Continued operation can generate excessive heat, cause damage to seals and other components in the hydraulic system, and affect overall machine performance.

Special Equipment Required:

- Hydraulic tester with flow meter with pressure gauge with a minimum 45 lpm (12 gpm) capacity.
- Non-contact tachometer (phototach)

Test Procedure

1. Ensure that the motion control pedals are correctly adjusted for the NEUTRAL position. Also, ensure that the hydraulic pump is at full stroke when the motion control pedals are moved to the full forward position.
2. Park the machine on a clean, level surface with the transport wheels in the raised and locked position, shut off the engine, and engage the parking brake.

⚠ CAUTION ⚠

Before opening the hydraulic system, press the motion control pedals to release the pressure in the system and avoid injury from the pressurized hydraulic fluid.

3. Clean the junction of the hydraulic hoses and straight fittings at the hydraulic motor (Figure 24). Tag the hoses to correspond with the motor ports (A and B) then disconnect the hoses from the fittings. Cap the motor fittings to prevent contamination from entering the system.

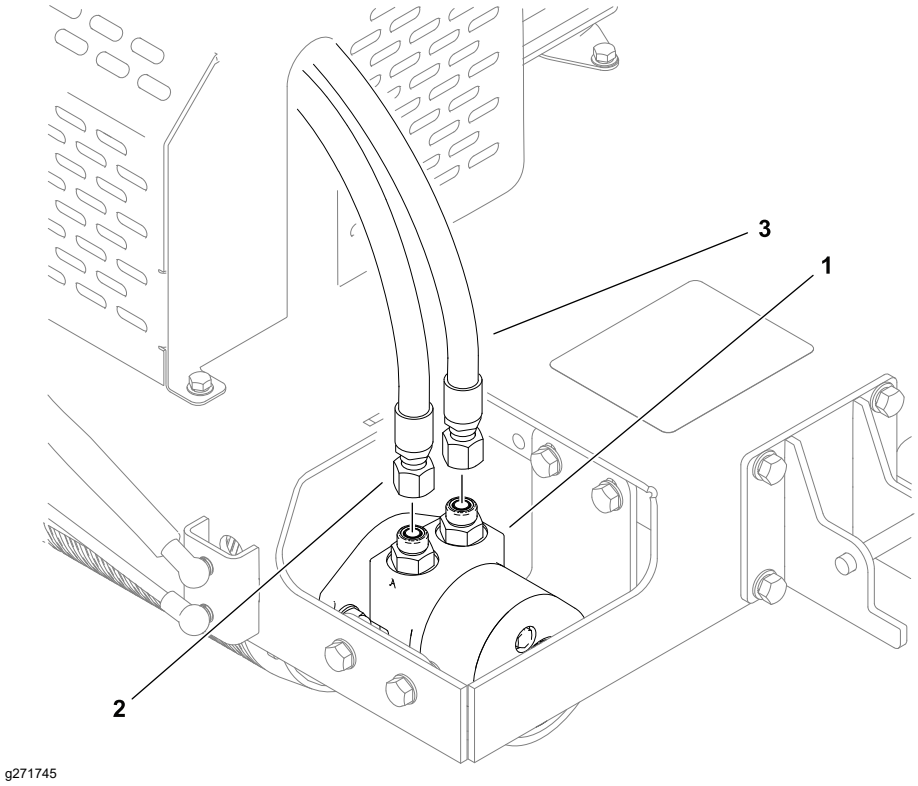

Figure 24

1. Hydraulic motor
2. Hose – motor A port (travel left)
3. Hose – motor B port (travel right)

IMPORTANT

To prevent hydraulic tester damage, make sure that the oil flow direction indicator on the tester is installed so the oil will flow from the disconnected motor B port hydraulic hose, through the tester and into the disconnected motor A port hydraulic hose.

4. Install the hydraulic tester (flow and pressure) in series with the disconnected hoses.
5. Make sure the flow control valve on the tester is fully open.
6. Start the engine and run it at low-idle speed. Check for hydraulic fluid leaks from the test connections and correct before continuing the test.
7. Set the throttle to full engine speed **(3,600 rpm)**. Use a non-contact tachometer (phototach) to verify the engine speed.
8. Verify the pump flow at No Load as follows:

A. Sit in the operator's seat, disengage the parking brake and slowly press and hold the **RIGHT** motion control pedal at the full forward position.

B. Record the tester pressure and flow readings. No Load pump output should be approximately **34 lpm (9 gpm)**.

9. Verify the pump flow Under Load as follows:

A. With the **RIGHT** motion control pedal at the full forward position, apply an additional load of **7,600 kPa (1,100 psi)** by slowly closing the tester flow control valve.

B. Record the tester pressure and flow readings.

C. Return the motion control lever to the neutral position, engage the parking brake, set the throttle to low engine speed, and shut off the engine.

10. The under load test flow reading (step 9C) should not drop more than 25% when compared to the no load test flow reading (step 8B). A difference of more than 30% may indicate the hydraulic pump is worn and should be repaired or replaced.

11. Verify the **RIGHT** traction relief valve operation as follows:

A. Start and run the engine at 3600 RPM.

B. Sit in the operator's seat, disengage the parking brake and slowly press and hold the **RIGHT** motion control pedal at the full forward position.

C. Slowly close the tester flow control valve while watching the tester pressure gauge.

The system pressure should reach **15,860 to 17,240 kPa (2,300 to 2,500 psi)** before the relief valve opens.

Note: The relief valve setting is **16,000 kPa (2,320 psi)**. An additional **690 to 1,030 kPa (100 to 200 psi)** is necessary to overcome the system charge pressure before the relief valve opens.

D. Record the tester pressure reading.

E. Open the tester flow control valve fully, engage the parking brake, set the throttle to low engine speed, and shut off the engine.

12. Verify the **LEFT** traction relief valve operation as follows:

A. Disconnect the hydraulic tester form the hydraulic hoses.

IMPORTANT

To prevent hydraulic tester damage, make sure that the oil flow direction indicator on the tester is installed so the oil will flow from the disconnected motor A port hydraulic hose, through the tester and into the disconnected motor B port hydraulic hose.

B. Install the hydraulic tester in series with the disconnected hoses.

C. Start the engine and run it at low-idle speed. Check for hydraulic fluid leaks from the test connections and correct before continuing the test.

D. Set the throttle to full engine speed.

E. Sit in the operator's seat, disengage the parking brake and slowly press and hold the **LEFT** motion control pedal at the full forward position.

F. Slowly close the tester flow control valve while watching the tester pressure gauge.

The system pressure should reach **15,860 to 17,240 kPa (2,300 to 2,500 psi)** before the relief valve opens.

Note: The relief valve setting is **16,000 kPa (2,320 psi)**. An additional **690 to 1,030 kPa (100 to 200 psi)** is necessary to overcome the system charge pressure before the relief valve opens.

G. Record the tester pressure reading.

H. Open the tester flow control valve fully, engage the parking brake, set the throttle to low engine speed, and shut off the engine.

13. If either relief pressure can not be met or is greater than specified, the specific traction relief valve is damaged and should be cleaned, or replaced.
14. After testing, disconnect the tester and connect the hydraulic hoses to the motor fittings.
15. Start the engine, check for hydraulic fluid leaks, repair any leaks as necessary, and fill the hydraulic tank with the correct quantity of new hydraulic fluid before returning the machine to service; refer to the *Operator's Manual*.

Adjustments

Adjusting the Control Pedal Return to Neutral Mechanism

The return to neutral mechanism is designed to return the transmission/hydraulic pump control lever to a neutral position (no left or right movement of the drive roller), and return the motion control pedals to a position directly across from each other when the motion control pedals are released.

This procedure involves checking and adjusting the control arm setting at the transmission/hydraulic pump first, then checking and adjusting the motion control linkage.

⚠ CAUTION ⚠

Use a suitable lifting device to safely raise and support the machine to access the components under the chassis.

Adjusting Procedure for GreensPro 1240

1. Park the machine on a clean, level surface and set the transport wheels to the lowered and locked position. Place a jack stand under the front of the chassis to prevent the machine from tipping forward. The drive roller must be off the ground and free to rotate.
2. Remove the transmission cover from the machine; refer to the Removing the Transmission Cover (page 7–59).
3. Ensure that the entire motion control linkage assembly is secure and moves freely in both directions; refer to Motion Control Linkage (GreensPro 1240) (page 7–15).
4. Remove the linkage rod from the transmission control arm (Figure 25).

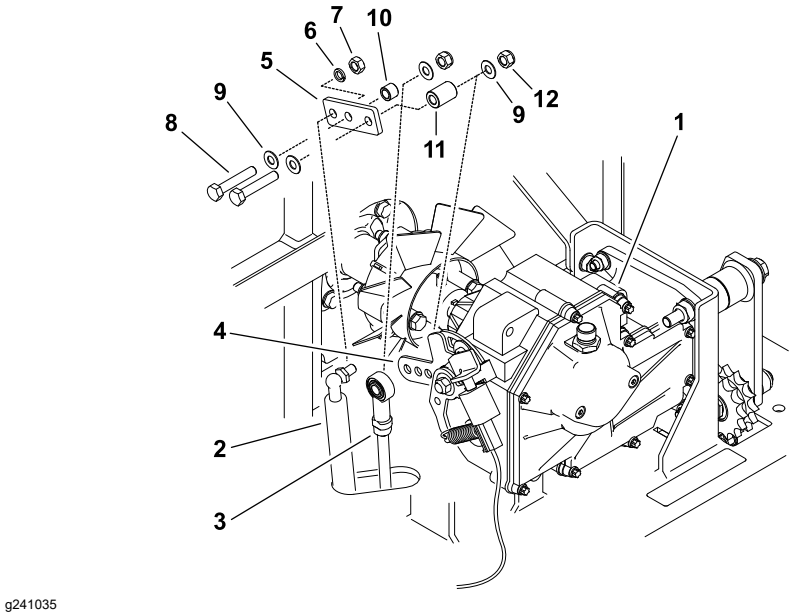

Figure 25
GreensPro 1240

1.	Transmission	7.	Hex nut
2.	Damper	8.	Bolt (2 each)
3.	Linkage rod	9.	Flat washer (4 each)
4.	Transmission control arm	10.	Spacer (linkage arm)
5.	Damper plate	11.	Spacer (damper plate)
6.	Lock washer	12.	Locknut (2 each)

5. Start the engine and set the throttle to full engine speed.
6. For machines with a serial number above 315000000, have an assistant sit in the operator's seat and disengage the parking brake.
7. If the drive roller does not rotate, shut off the engine and attach the linkage rod to the transmission control arm.
8. If the drive roller rotates, note the direction of drive roller rotation, then shut off the engine and adjust the transmission control arm assembly as follows (Figure 26):
   A. Loosen the RTN (Return To Neutral) adjustment screw until the control arm assembly can be rotated.

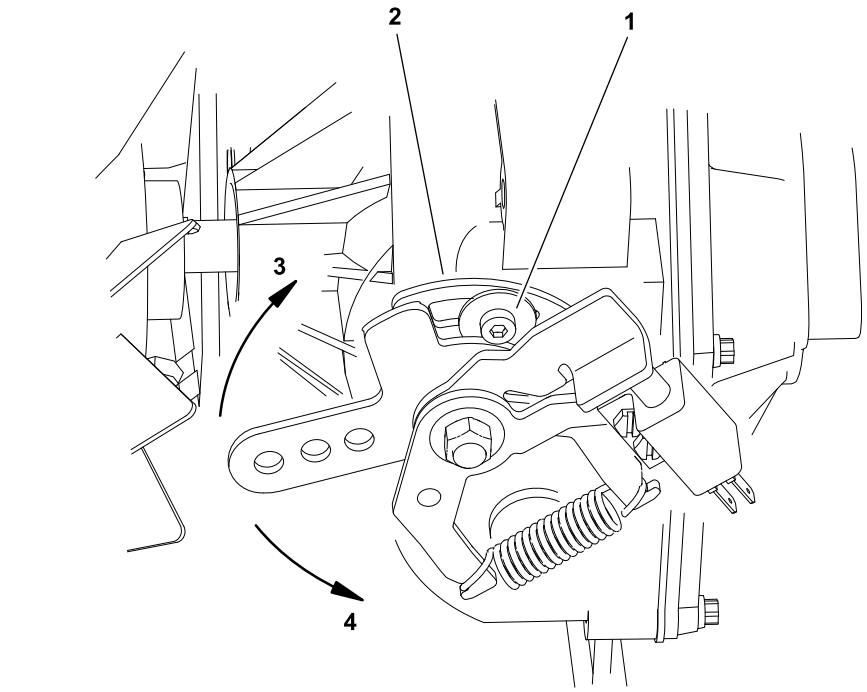

Figure 26
GreensPro 1240

1. RTN adjustment screw
2. Control arm assembly
3. To stop drive roller rotation to the left
4. To stop drive roller rotation to the right

B. Rotate the control arm assembly in the opposite direction of the drive roller rotation in small increments.

C. Tighten the RTN adjustment screw to **24 to 30 N·m (18 to 22 ft-lb)**.

D. Start the engine, set the throttle to full engine speed and check for drive roller rotation. repeat adjustment if necessary.

E. When the drive roller does not rotate, shut off the engine and attach the linkage rod to the transmission control arm.

9. Start the engine and set the throttle to full engine speed.
10. Place a straightedge across the front of both motion control pedals to align the pedals with each other (Figure 27).

Adjusting Procedure for GreensPro 1240 (continued)

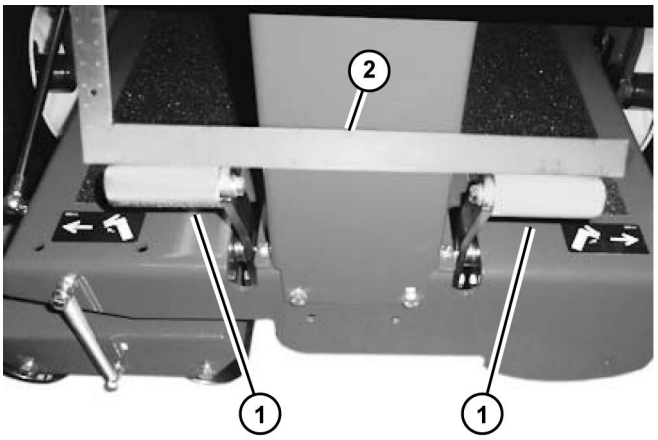

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Figure 27
GreensPro 1240

1. Motion control pedal (2 each)
2. Straightedge

11. If the drive roller rotates, adjust the linkage rods so the drive roller does not move when the motion control pedals are aligned with each other.

    Note: Each linkage rod includes 2 ball joints and 2 hex nuts. 1 ball joint and hex nut has left-hand threads, and 1 ball joint and hex nut has right-hand threads. Before attempting to loosen the hex nuts for linkage adjustment, inspect the threads on the linkage rod to determine the direction of the threads.

12. Shut off the engine and install the transmission cover; refer to Installing the Transmission Cover (page 7–59).

Adjusting Procedure for GreensPro 1260

1. Park the machine on a clean, level surface and set the transport wheels to the lowered and locked position. Place a jack stand under the front of the chassis to prevent the machine from tipping forward. The drive roller must be off the ground and free to rotate.
2. Remove the transmission cover from the machine; refer to the Removing the Transmission Cover (page 7–59).
3. Ensure that the entire motion control linkage assembly is secure and moves freely in both directions; refer to Motion Control Linkage (GreensPro 1260) (page 7–17).
4. Remove the traction cable from the pedal rod pivot (Figure 28).

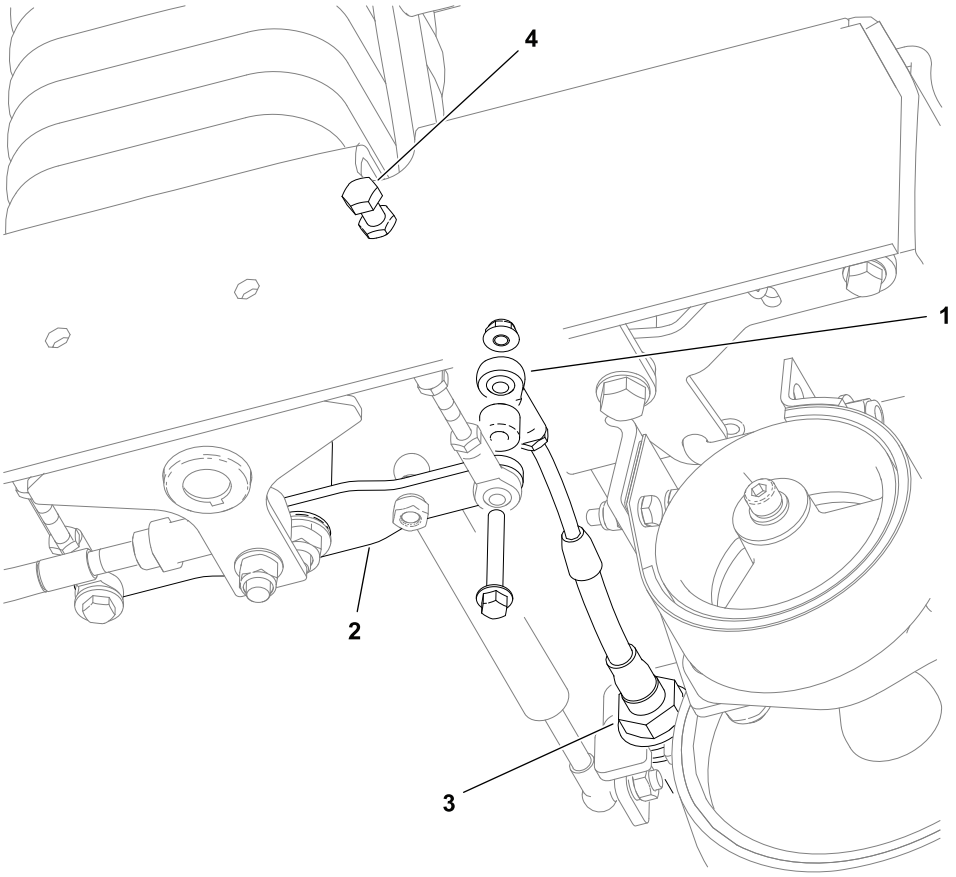

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Figure 28
GreensPro 1260

1. Traction cable
2. Pedal rod pivot assembly
3. Jam nut (2 each)
4. Pedal stop bolts (2 each)

5. Start the engine and set the throttle to full engine speed.
6. If the drive roller does not rotate, shut off the engine and attach the traction cable to the pedal rod pivot.
7. If the drive roller rotates, note the direction of drive roller rotation, then shut off the engine and adjust the transmission control arm assembly as follows (Figure 29):
   A. Loosen the RTN (Return To Neutral) adjustment screw until the control arm assembly can be rotated.

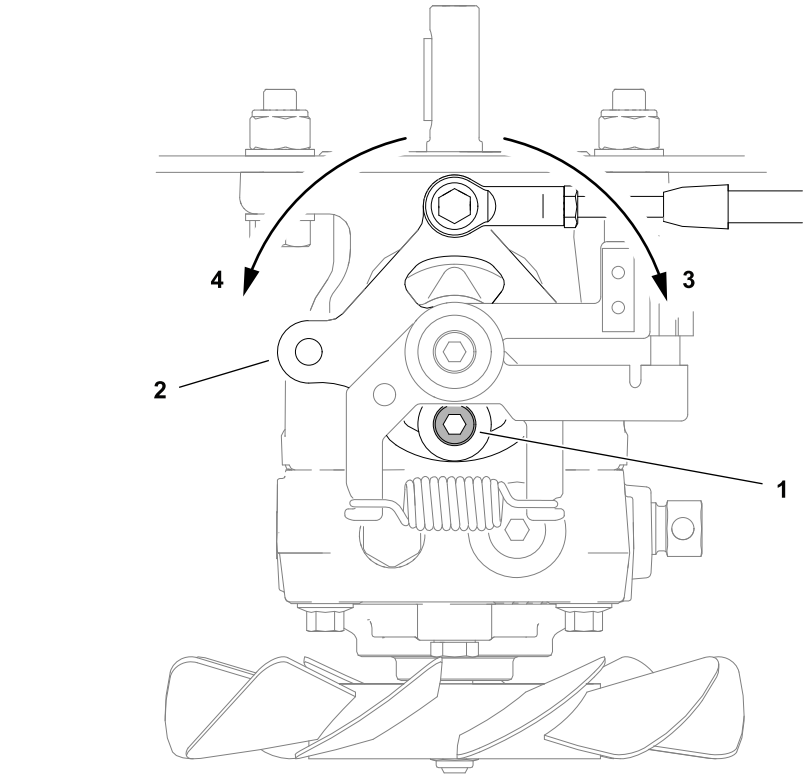


Figure 29
GreensPro 1260

1. RTN adjustment screw
2. Control arm assembly
3. To stop drive roller rotation to the left
4. To stop drive roller rotation to the right

B. Rotate the control arm assembly in the opposite direction of the drive roller rotation in small increments.

C. Tighten the RTN adjustment screw to **24 to 30 N·m (18 to 22 ft-lb)**.

D. Start the engine, set the throttle to full engine speed and check for drive roller rotation. repeat adjustment if necessary.

E. When the drive roller does not rotate, shut off the engine and install the traction cable to the pedal rod pivot.

8. Start the engine and set the throttle to full engine speed.
9. Place a straightedge across the front of both motion control pedals to align the pedals with each other.
10. If the drive roller rotates, loosen the jam nuts and adjust the traction cable so the drive roller does not move when the motion control pedals are aligned with each other.
11. Shut off the engine and install the transmission cover; refer to Installing the Transmission Cover (page 7–59).
12. The motion control pedals should contact the pedal stop bolts (item 4 in Figure 28) just before the control arm assembly reaches the end of its rotation (in both directions). Adjust the pedal stop bolts as necessary.

Service and Repairs

General Precautions for Removing and Installing the Hydraulic System Components

Before Repairing or Replacing the Components

⚠ CAUTION ⚠

Before disconnecting or performing any work on the hydraulic system, shut off the engine and press the motion control pedals to release the pressure in the system and avoid injury from the pressurized hydraulic fluid.

1. Before removing any parts from the hydraulic system, park the machine on a level surface, shut off the engine, engage the parking brake if equipped or remove the spark plug wire from the spark plug.
2. Clean the machine before you disconnect, remove, or disassemble the hydraulic components.

   Note: Cleanliness is necessary whenever you work on the hydraulic equipment. Ensure that you clean the hydraulic components, hoses, connections, and fittings.
3. Label all the disconnected hydraulic lines and hoses for proper installation after repairs are completed.
4. Record the orientation of the hydraulic fittings (especially elbow fittings) on the hydraulic components before removal.

   Note: Mark the parts, if necessary before removal and ensure that they are aligned properly when installing the hydraulic fittings, hoses, and tubes.
5. The hydraulic fluid may be hot. Be careful when you loosen and remove the hydraulic system components.
6. Install clean caps or plugs on the hydraulic lines, hydraulic fittings, and components that are left open or exposed to prevent hydraulic system contamination. Cap the opening as soon as the line or port is exposed.

After Repairing or Replacing the Components

IMPORTANT

Drain and fill the hydraulic tank and change the oil filter if the component failure is severe or the system is contaminated; refer to Flushing the Hydraulic System (page 5–38).

1. Check the hydraulic fluid level in the hydraulic tank and add correct quantity of fluid if necessary. Use hydraulic fluids that are specified in the GreensPro *Operator's Manual*.
2. When disposing of hazardous waste products (hydraulic fluid), take them to an authorized disposal site. Waste products must not be allowed to contaminate surface water, drains, or sewer systems.
3. On GreensPro 1260 machines, If a component failure occurs, filtering the traction circuit is necessary; refer to Filtering the Closed-Loop Traction Circuit (GreensPro 1260) (page 5–39)

After Repairing or Replacing the Components (continued)

4. Lubricate the O-rings, ED seals, and dowty seals with clean hydraulic fluid before installing the hydraulic components.
5. Remove all the caps or plugs from the hydraulic hoses, hydraulic fittings, and components before connecting them.
6. Use proper tightening procedures when installing the hydraulic hoses and fittings; refer to Installing the Hydraulic Hoses and Tubes (page 5–12) and Installing the Hydraulic Fittings (page 5–14).
7. After you complete the repairs, check the control linkages or cables for proper adjustment, binding, or broken parts.
8. After you complete the repairs, clean any hydraulic fluid from components, hose connections, and fittings to prevent future accumulation of dirt and unwanted material.
9. After you disconnect or replace any hydraulic components, operate the machine functions slowly until the air is out of the system; refer to Charging the Hydraulic System (page 5–42).
10. Check for hydraulic fluid leaks; refer to Checking the Hydraulic Lines and Hoses (page 5–37). Shut off the engine and repair leaks if necessary.
11. Check the hydraulic fluid level in the hydraulic tank and add correct quantity of fluid if necessary.

Checking the Hydraulic Lines and Hoses

WARNING

Hydraulic fluid escaping under pressure can penetrate skin and cause injury.

- **Ensure that all hydraulic fluid hoses and lines are in good condition and all hydraulic connections and fittings are tight before applying pressure to the hydraulic system.**
- **Keep your body and hands away from pin-hole leaks or nozzles that eject high-pressure hydraulic fluid.**
- **Use a piece of cardboard or paper to find hydraulic leaks.**
- **Release all pressure in the hydraulic system before performing any work on the system.**
- **Seek immediate medical attention if hydraulic fluid is injected into your skin.**

IMPORTANT

Check the hydraulic lines and hoses daily for leaks, kinked lines, loose mounting supports, wear, loose fittings, and hose deterioration. Repair the damaged hydraulic lines and hoses before operating the machine.

Flushing the Hydraulic System

Flush the hydraulic system whenever the system is contaminated (for example, the fluid appears milky or black, or contains metal particles).

IMPORTANT

If a component failure occurs; refer to Hydraulic System Components (page 5–7)for additional information.

1. Park the machine on a clean, level surface with the transport wheels in the raised and locked position, shut off the engine, and engage the parking brake.
2. Read and adhere to the information provided in General Precautions for Removing and Installing the Hydraulic System Components (page 5–35).

⚠ CAUTION ⚠

Flush the hydraulic system with the hydraulic fluid as warm as possible, but to prevent additional system damage, Do Not operate a machine with contaminated hydraulic fluid to warm the fluid before draining.

IMPORTANT

Follow all local codes and regulations when recycling or disposing the hydraulic fluid and filters.

3. Drain the hydraulic fluid from the hydraulic tank. Remove the tank cap and clean the tank. Consider removing and cleaning the tank if necessary; refer to Hydraulic Tanks (page 5–43).
4. Drain the hydraulic system hoses and other components from low points in the system.
5. Remove and replace the hydraulic fluid filter; refer to the *Operator's Manual*.
6. Connect all the hydraulic hoses and components that were disconnected while draining the system; refer to Installing the Hydraulic Hoses and Tubes (page 5–12).

IMPORTANT

Using other hydraulic fluids could damage the hydraulic system. Use the hydraulic fluids that are specified in the *Operator's Manual*.

7. Fill the hydraulic tank with the correct quantity of new hydraulic fluid; refer to the *Owner's Manual*.
8. Prime the hydraulic pump; refer to Priming the Hydraulic Pump (page 5–41).
9. Charge the hydraulic system; refer to Charging the Hydraulic System (page 5–42).

Filtering the Closed-Loop Traction Circuit (GreensPro 1260)

Filtering a closed-loop hydraulic system after a major component failure (e.g., hydraulic pump or hydraulic motor) is required to prevent debris from transmitting throughout the system. If a filtering tool is not used to ensure the system cleanliness, repeat failures and subsequent damage to other hydraulic components in the system, will occur. To effectively remove the contamination from the closed-loop traction circuit, use of a Toro bidirectional high flow hydraulic filter and hydraulic hose kit is recommended; refer to High Flow Hydraulic Filter Kit (page 2–13).

1. Park the machine on a clean, level surface with the engine off. Lower and lock the transport wheels (drive roller off the ground).
2. Read and adhere to the information provided in General Precautions for Removing and Installing the Hydraulic System Components (page 5–35).
3. Install a temporary hydraulic filter directly upstream of the new component as follows:
   A. If the hydraulic pump was serviced or replaced, remove the transmission cover and disconnect the hose at the pump “A” port (Figure 30).
   B. If the hydraulic motor was serviced or replaced, disconnect the hose at the motor “A” port (Figure 30).

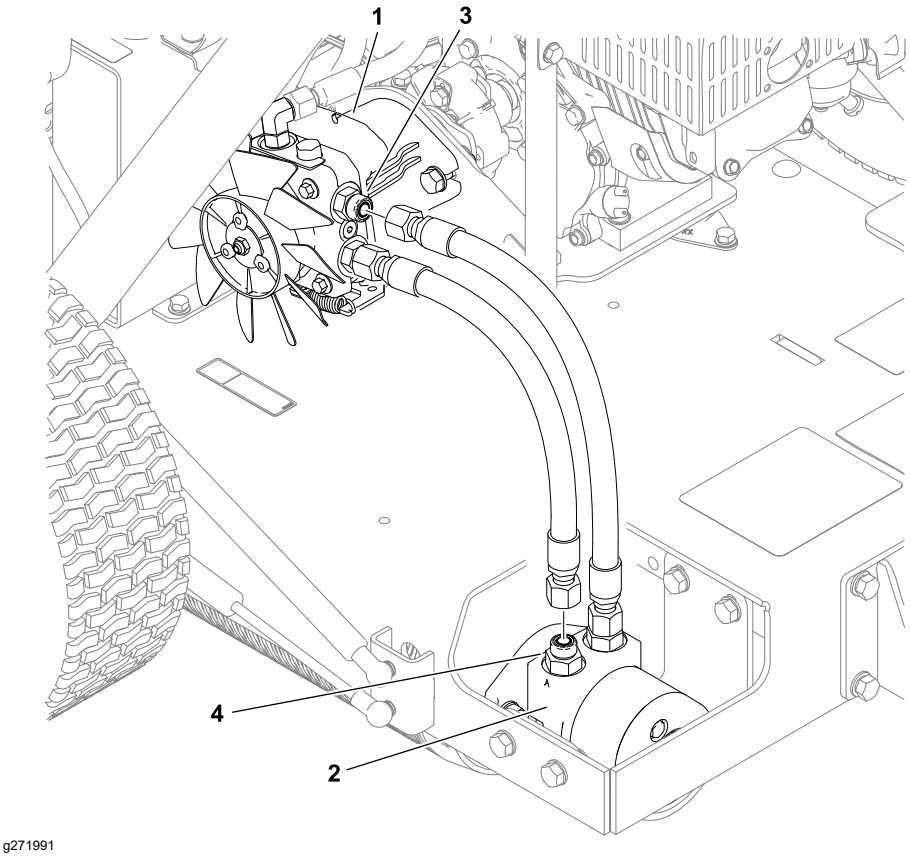


Figure 30

1. Hydraulic pump
2. Hydraulic motor
3. Hydraulic pump “A” port
4. Hydraulic motor “A” port

4. Connect the Toro high flow hydraulic filter in series between the disconnected fitting and hose. Use the hydraulic hose kit to connect the filter to the machine; refer to Hydraulic Hose Kit (page 2–13). Ensure that the fitting and hose connections are properly tightened.

Filtering the Closed-Loop Traction Circuit (GreensPro 1260) (continued)

5. Check and fill the hydraulic tank with the correct quantity of new hydraulic fluid; refer to the *Operator's Manual*.
6. Start the engine and run it at low-idle speed. Check for and correct any hydraulic leaks before proceeding.

⚠ CAUTION ⚠

Use extreme caution when performing this test. The drive roller will be rotating during the test.

IMPORTANT

While engaging the traction circuit, monitor the indicator on the high flow hydraulic filter. If the indicator shows red, either reduce the pressure on the motion control pedal or reduce the engine speed to decrease the hydraulic flow through the filter.

7. With the engine running at low-idle speed, slowly press the **LEFT** motion control pedal to the forward direction to allow flow through the traction circuit and high-flow filter. Keep the traction circuit engaged in forward for 5 minutes while gradually increasing both forward pressure on the motion control pedal and engine speed. Monitor the filter indicator to ensure that the green color is showing during operation.

   Note: With the engine running at high-idle speed and left motion control pedal pressed to the forward direction, periodically engage parking brake to increase pressure in the traction circuit.

IMPORTANT

If you are using a filter that is not bidirectional, do not press the RIGHT motion control pedal. If the flow is reversed when using a filter that is not bidirectional, unwanted material from the filter will again enter the traction circuit.

8. With a bidirectional hydraulic filter installed and the engine running at high-idle speed, alternately press the left motion control pedal and the right motion control pedal. While monitoring the filter indicator, continue this process for 5 more minutes.
9. Shut off the engine.
10. Remove the temporary hydraulic filter from the machine and install any disconnected hydraulic hoses; refer to Installing the Hydraulic Hoses and Tubes (page 5–12).
11. Check the hydraulic fluid level in the hydraulic tank and adjust as necessary; refer to the *Operator's Manual*.
12. Operate the machine and check for leaks before returning the machine to service.

Priming the Hydraulic Pump

Whenever hydraulic fluid has been drained from the pump (system drain, flush, or pump removal/installation) it is important to properly prime the hydraulic pump. Priming the hydraulic pump ensures that the pump has sufficient hydraulic fluid while charging the hydraulic system.

IMPORTANT

If the hydraulic pump was rebuilt or replaced, make sure the pump housing is at least half full of clean hydraulic fluid after installation.

1. Make sure all hydraulic connections and lines are secured tightly.
2. Check the hydraulic fluid level in the hydraulic tank and adjust as necessary; refer to the *Operator's Manual*.
3. With the ignition switch in the Off position pull the engine recoil starter 5 times. Wait 15 seconds then pull the engine recoil starter 5 more times.
4. Charge the hydraulic system; refer to Charging the Hydraulic System (page 5–42).

Charging the Hydraulic System

IMPORTANT

Air must be purged from the system to reduce the chance of component damage.

When initially starting the hydraulic system with new or rebuilt components such as motors or pumps, it is important that the hydraulic system is charged properly to remove air from the system.

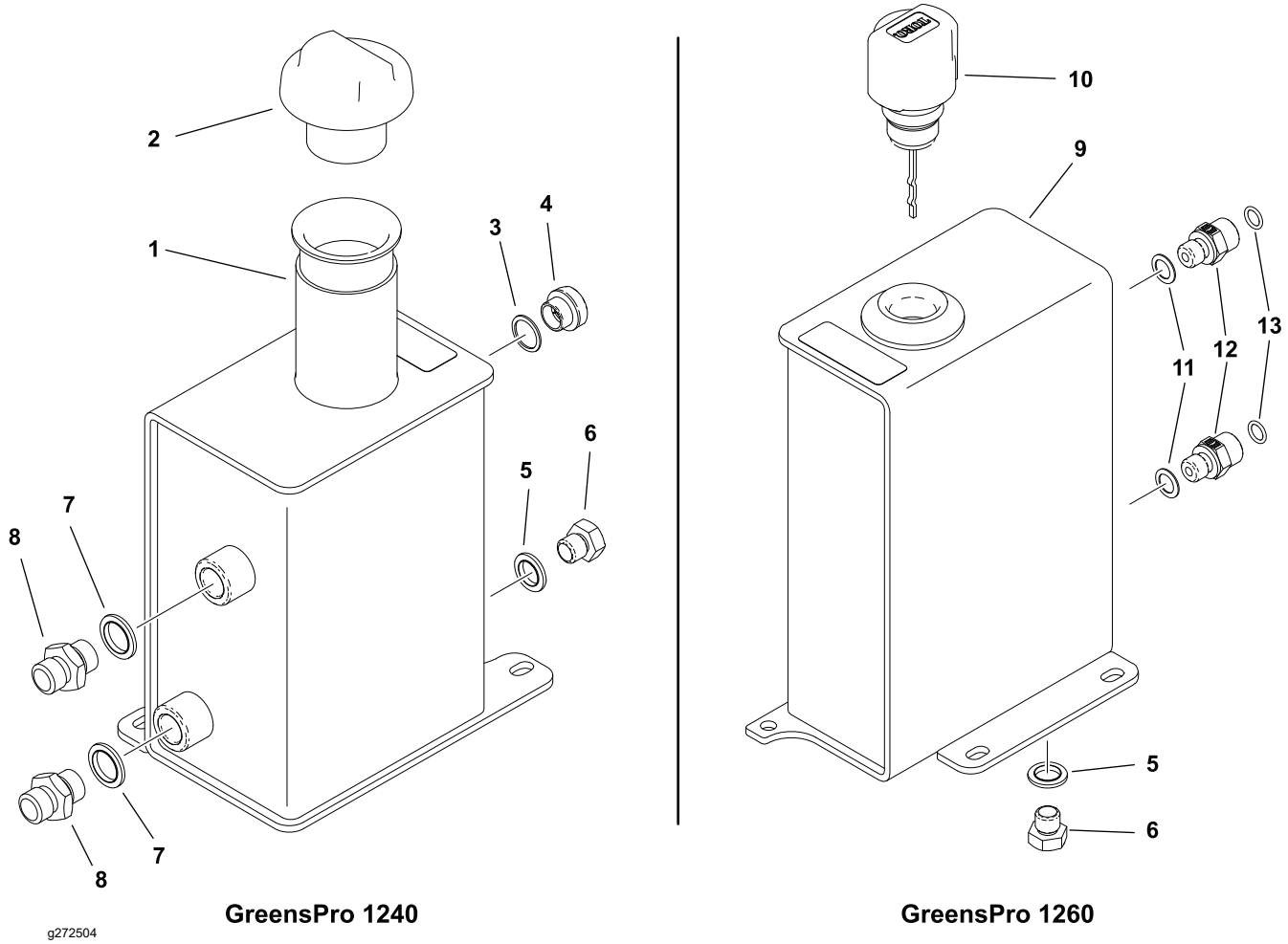
Note: Flush the hydraulic system whenever there is a severe component failure or the system is contaminated; refer to Flushing the Hydraulic System (page 5–38).

1. Park the machine on a clean, level surface with the engine off. Lower and lock the transport wheels (drive roller off ground).
2. Ensure that all of the hydraulic connections, lines, and components are secured tightly.
3. Ensure that the hydraulic tank is full. Add the correct quantity and type of hydraulic fluid if necessary; refer to the *Operator's Manual*.
4. Check the motion control linkage for proper adjustment, binding, or damaged parts.
5. Prime the hydraulic pump; refer to Priming the Hydraulic Pump (page 5–41).
6. Start the engine and run it at low-idle speed.

   Note: The transmission/hydraulic pump must pick up the hydraulic fluid and fill the hydraulic system. If there is no indication of fill in 30 seconds, shut off the engine and determine the cause.
7. After the hydraulic system starts to show signs of filling, press the motion control pedals to rotate the drive roller right and left several times.
8. Ensure that the motion control pedals return to the NEUTRAL position when released and adjust if necessary.
9. Operate the motion control pedals in the left and right directions. Make sure the drive roller is turning in the proper direction and allow the drive roller to turn slowly for ten (10) minutes.
10. Shut off the engine.
11. Operate the machine by gradually increasing its work load to full over a 10 minute period.
12. Stop the machine, check the hydraulic components for leaks and tighten any loose connections.
13. Check the hydraulic fluid level in the hydraulic tank and adjust as necessary; refer to the *Operator's Manual*.

    Note: If new fluid shows any signs of contamination, flush hydraulic system again until the fluid is clean; refer to Flushing the Hydraulic System (page 5–38).

Hydraulic Tanks



GreensPro 1240 GreensPro 1260

Figure 31

1. Hydraulic tank (GreensPro 1240)
2. Tank cap
3. Fiber gasket
4. Sight glass – 3/8 BSPP
5. Dowty seal – 1/4
6. Drain plug – 1/4 BSPP
7. Dowty seal – 3/8 (2 each)
8. Straight fitting – 3/8 BSPP to 3/8 BSPP (2 each)
9. Hydraulic tank (GreensPro 1260)
10. Tank cap/breather/dipstick
11. ED seal – 3/8 (2 each)
12. Straight fitting – 3/8 BSPP to 8 ORFS (2 each)
13. O-Ring – 8 ORFS

IMPORTANT

The hydraulic tank fittings used on the GreensPro 1240 have BSPP (British Standard Parallel Pipe) threads for the hose connections, and BSPP threads for the tank connection. The hydraulic tank fittings used on the GreensPro 1260 have ORFS (O-Ring Face Seal) threads for the hose connections, and BSPP threads for the tank connection. Pay close attention to the fitting thread type and the type of seal used when replacing hydraulic tank fittings and seals, or component damage and leakage may occur.

Transmission (GreensPro 1240)

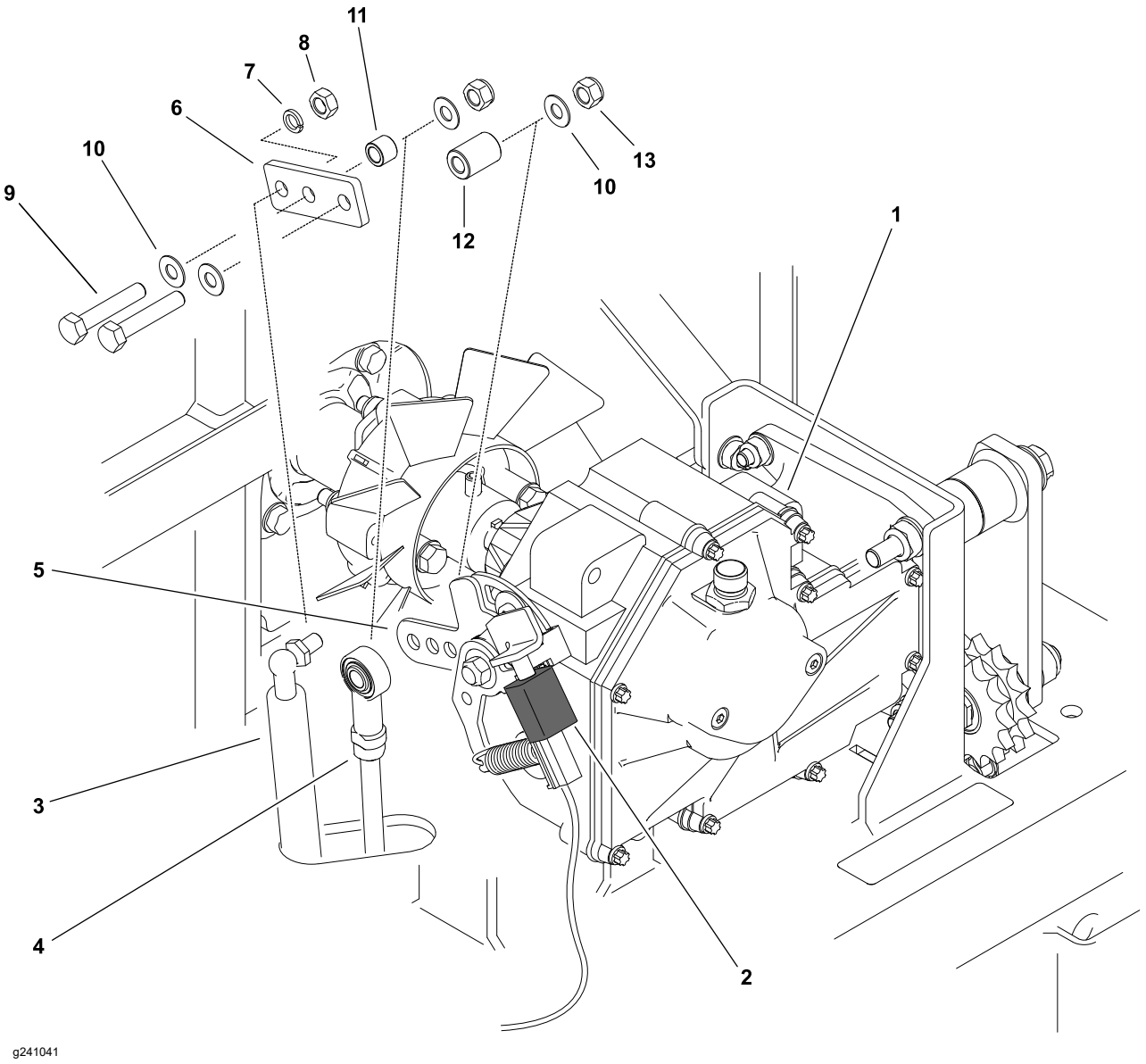


Figure 32

1. Transmission	6. Damper plate	11. Spacer (linkage arm)
2. Neutral switch (serial number above 315000000)	7. Lock washer	12. Spacer (damper plate)
3. Damper	8. Hex nut	13. Locknut (2 each)
4. Linkage rod	9. Bolt (2 each)	
5. Transmission control arm	10. Flat washer (4 each)	

Removing the Transmission

Refer to Figure 32 for this procedure.

1. Park the machine on a clean, level surfaces, shut off the engine and engage the parking brake if equipped, or remove the spark plug wire from the spark plug.
2. Press the motion control pedals to release the pressure in the system.
3. Remove the transmission cover from the machine; refer to Transmission Cover (page 7–58).

4. Read and adhere to the General Precautions for Removing and Installing the Hydraulic System Components (page 5–35).
5. Clean the hydraulic hose ends and fittings being disconnected to prevent hydraulic system contamination.
6. Drain the hydraulic fluid from the hydraulic tank into a suitable container.
7. For assembly purposes, label all the hoses and fittings. Remove the hoses from the fittings on the transmission assembly. Drain the hoses into a suitable container.
8. Install clean caps and plugs on the disconnected hoses and fittings to prevent hydraulic system contamination.
9. On machines with serial number above 315000000, disconnect the wire harness connector from the neutral switch.
10. Remove the hex nut and lock washer that secure the damper (item 3 in Figure 32) to the damper plate, and disconnect the damper from the plate.
11. Remove the bolts, flat washers, spacers, and locknuts that secure the damper plate and linkage rod to the transmission control arm (item 5 in Figure 32).
12. Remove the bolts, flat washers, locknuts, and spacers that secure the fan and transmission drive collar to the drive coupling (Figure 33).

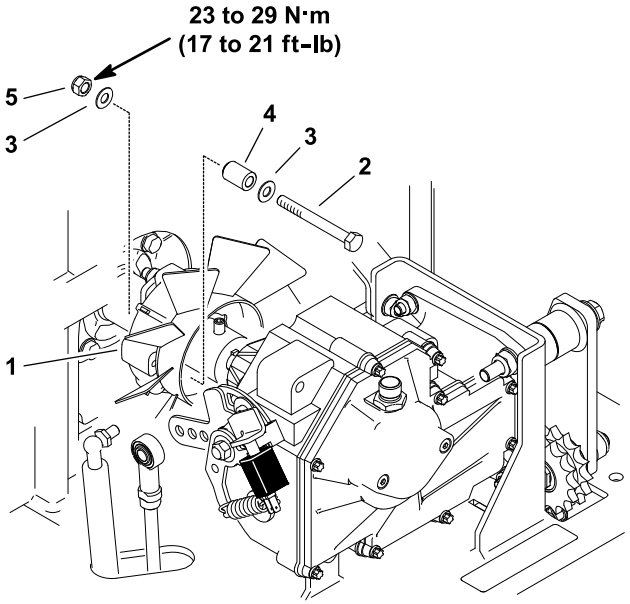


Figure 33

1. Drive coupling
2. Bolt (2 each)
3. Flat washer (4 each)
4. Spacer (2 each)
5. Locknut (2 each)

13. Remove the hex nut, spacer, and compression spring from the tension rod (Figure 34).

Removing the Transmission (continued)

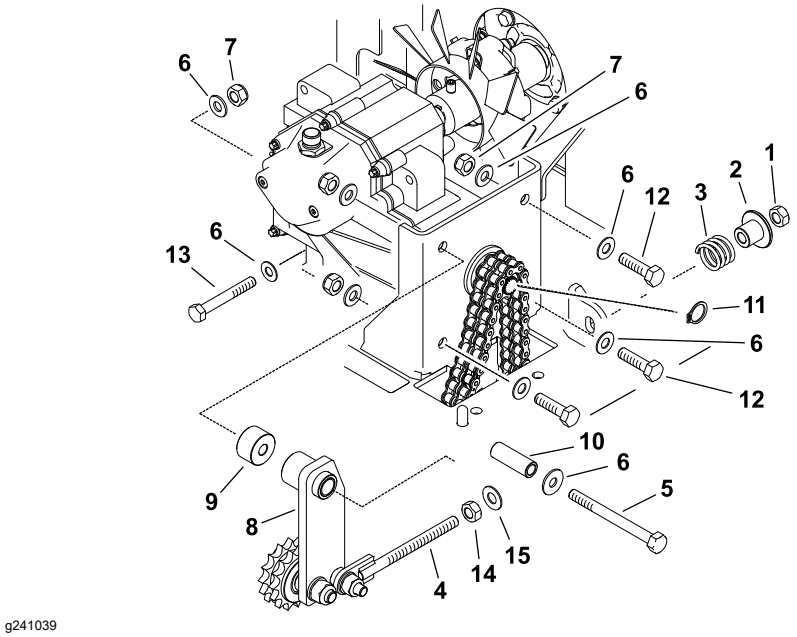


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Figure 34

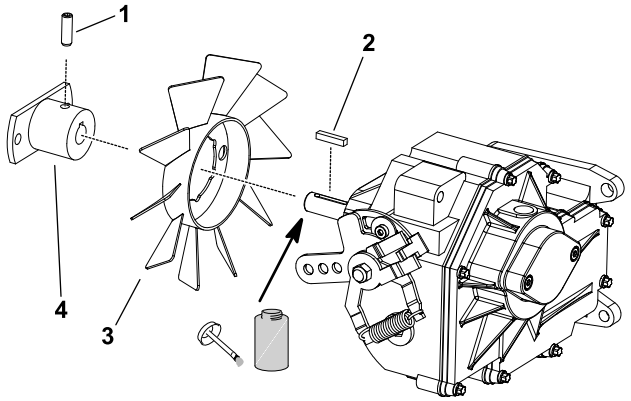
1.	Hex nut	6.	Flat washer (10 each)	11.	Retaining ring
2.	Spacer	7.	Locknut (5 each)	12.	Bolt (3 each)
3.	Compression spring	8.	Idler arm assembly	13.	Bolt
4.	Tension rod	9.	Spacer	14.	Locknut
5.	Bolt	10.	Pivot bushing	15.	Flat washer

14. Remove the bolt, flat washers, and locknut that secure the idler arm to the transmission mount, and remove the idler arm assembly.
15. Remove the retaining ring from the transmission output shaft.
16. Support the transmission and remove the bolts, flat washers, and locknuts that secure the transmission to the chassis.
17. Slide the transmission away from the transmission mount until the sprocket and drive chain are free of the transmission shaft, and remove the transmission.
18. Remove the transmission drive collar and fan if necessary.

Installing the Transmission

Refer to Figure 33 for this procedure.

1. If previously removed, apply anti-seize lubricant to the transmission input shaft and position the fan, key, and transmission drive collar onto the input shaft (Figure 35). Do not tighten the drive collar set screw at this time.



g241040

Figure 35

1. Set screw
2. Key
3. Fan
4. Drive collar

2. Place the transmission in position on the chassis.
3. Apply a thin coat of anti-seize lubricant to the transmission output shaft.
4. Position the sprocket in the drive chain. Move the transmission toward the mounting bracket while guiding the sprocket onto the output shaft.
5. Secure the transmission to the mounting bracket and lower the transmission mount with the bolts, locknuts, and flat washers.
6. Secure the sprocket to the transmission output shaft with the retaining ring (item 11 in Figure 34).

   Note: If the idler arm assembly requires service; refer to Drive Chain Idler Arm (GreensPro 1240) (page 7–13).

7. Install the flat washer and hex nut (item 14 and 15 in Figure 34) on the idler adjustment rod. Thread the nut **32 mm (1.25 inches)** onto the rod.
8. Install the idler arm assembly with the bolt, flat washers, pivot bushing, spacer, and locknut. Do not adjust the idler adjustment rod (chain tension) at this time.
9. Install the compression spring (item 3 in Figure 34), spacer, and hex nut on the idler adjustment rod.
10. Connect the transmission collar to the drive coupling (item 1 in Figure 33) with the bolts, flat washers, spacers, and locknuts. Tighten the locknuts to **23 to 29 N·m (17 to 21 ft-lb)**.

IMPORTANT

To prevent damage to the drive coupling, ensure that no distortion of coupling exists after securing the transmission collar to the coupling. If coupling distortion is evident, loosen the transmission and/or engine and position the transmission and/or engine on frame so that the coupling is not distorted.

11. Tighten the transmission drive collar set screw.

12. Secure the damper plate and linkage rod to the transmission control arm (item 5 in Figure 32) with the bolts, flat washers, spacers, and locknuts.
13. Secure the damper (item 3 in Figure 32) to the damper plate with the lock washer and hex nut.

14. Remove the caps and plugs from the hydraulic hoses and fittings and connect the hydraulic hoses to the fittings on the transmission assembly. Tighten the hose swivel nuts to **32 N·m (24 ft-lb)**.
15. Adjust the drive chain tension and lubricate the chain; refer to the *Operator's Manual*. Dri-slide® multi-purpose lubricant (or an equivalent chain specific lubricant) is recommended.
16. Fill the hydraulic tank with the correct quantity of new hydraulic fluid; refer to the *Operator's Manual*.
17. Install the transmission cover to the machine; refer to Transmission Cover (page 7–58).
18. Raise the machine onto the transport wheels and purge the air from the hydraulic system; refer to Charging the Hydraulic System (page 5–42).
19. Check the hydraulic fluid level and adjust if necessary. Check the components for leaks and correct as necessary.
20. Check the transmission and motion control pedals return to the neutral operation and adjust as necessary; refer to Adjusting the Control Pedal Return to Neutral Mechanism (page 5–29).

Servicing the Transmission (GreensPro 1240)

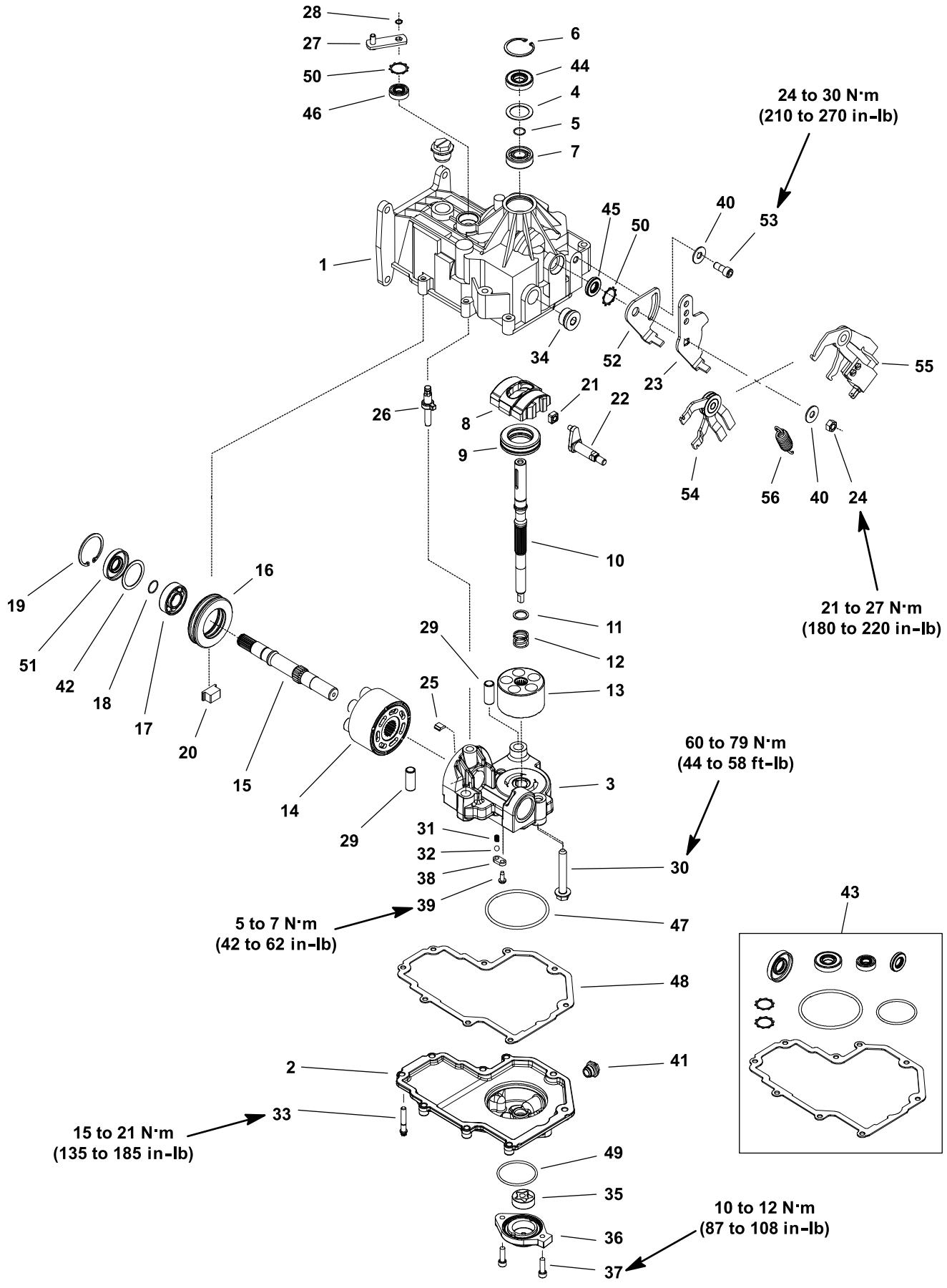


Figure 36

Servicing the Transmission (GreensPro 1240) (continued)

Figure 36 (continued)

1. Housing (upper)
2. Housing (lower)
3. Center section kit
4. Spacer
5. Retaining ring
6. Retaining ring
7. Ball bearing
8. Swashplate (variable)
9. Thrust bearing
10. Input shaft
11. Washer
12. Compression spring
13. Cylinder block kit
14. Cylinder block assembly
15. Output shaft
16. Thrust bearing
17. Ball bearing
18. Retaining ring
19. Retaining ring
20. Bearing retainer
21. Guide slot
22. Trunnion assembly
23. Control arm
24. Flange nut
25. Bypass plate kit
26. Bypass actuator
27. Bypass arm
28. Retaining ring
29. Pin (2 each)
30. Bolt (3 each)
31. Helical spring
32. Ball
33. Bolt (9 each)
34. Plug
35. Gerotor assembly
36. Charge pump housing
37. Socket-head screw (2 each)
38. Relief plate
39. Bolt
40. Pivot washer
41. Plug
42. Spacer
43. Seal kit (Incl. Ref. 44-51)
44. Lip seal
45. Lip seal
46. Lip seal
47. O-ring
48. Gasket
49. O-ring
50. Retaining ring (2 each)
51. Lip seal
52. Return arm
53. Screw
54. Neutral return assembly (serial number below 315000000)
55. Neutral return assembly (serial number above 315000000)
56. Extension spring

Refer to the Hydro-Gear BDR Service and Repair Manual for detailed information on the transmission troubleshooting, testing, disassembly, service, and assembly information.

Hydraulic Pump (GreensPro 1260)

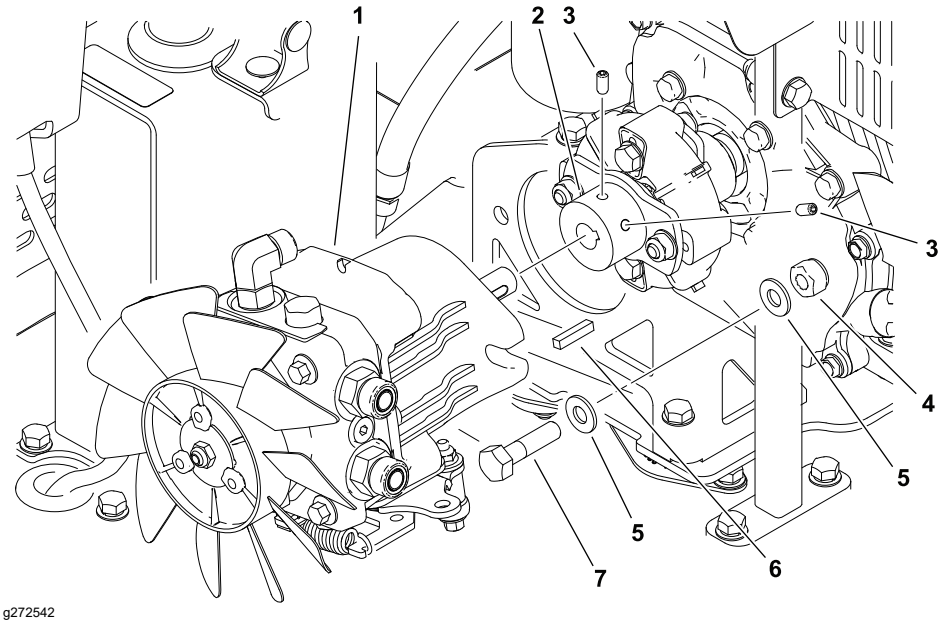


Figure 37

1. Hydraulic pump
2. Pump drive collar
3. Set screw (2 each)
4. Lock nut (2 each)
5. Plain washer (4 each)
6. Square key
7. Cap screw (2 each)

Removing the Hydraulic Pump

Refer to Figure 37 for this procedure.

⚠ CAUTION ⚠

Before opening the hydraulic system, shut off the engine and press the motion control pedals to release the pressure in the system and avoid injury from the pressurized hydraulic fluid.

⚠ CAUTION ⚠

Use a suitable lifting device to safely raise and support the machine to access the components under the chassis.

1. Park the machine on a clean, shut off the engine and engage the parking brake.
2. Remove the transmission cover from the machine; refer to Transmission Cover (page 7–58).
3. Read and adhere to the General Precautions for Removing and Installing the Hydraulic System Components (page 5–35).
4. Clean the hydraulic hose ends and fittings being disconnected to prevent hydraulic system contamination.
5. Drain the hydraulic fluid from the hydraulic tank into a suitable container.

6. For assembly purposes, label all the hoses and fittings. Remove the hoses from the fittings on the transmission assembly. Drain the hoses into a suitable container.
7. Install clean caps and plugs on the disconnected hoses and fittings to prevent hydraulic system contamination.
8. Disconnect the wire harness connector from the neutral switch.
9. Remove the traction cable clamp from the engine plate (below the frame plate). Remove the traction cable from the pedal rod pivot, then loosen the traction cable jam nuts and remove the traction cable from the frame bracket (Figure 38).

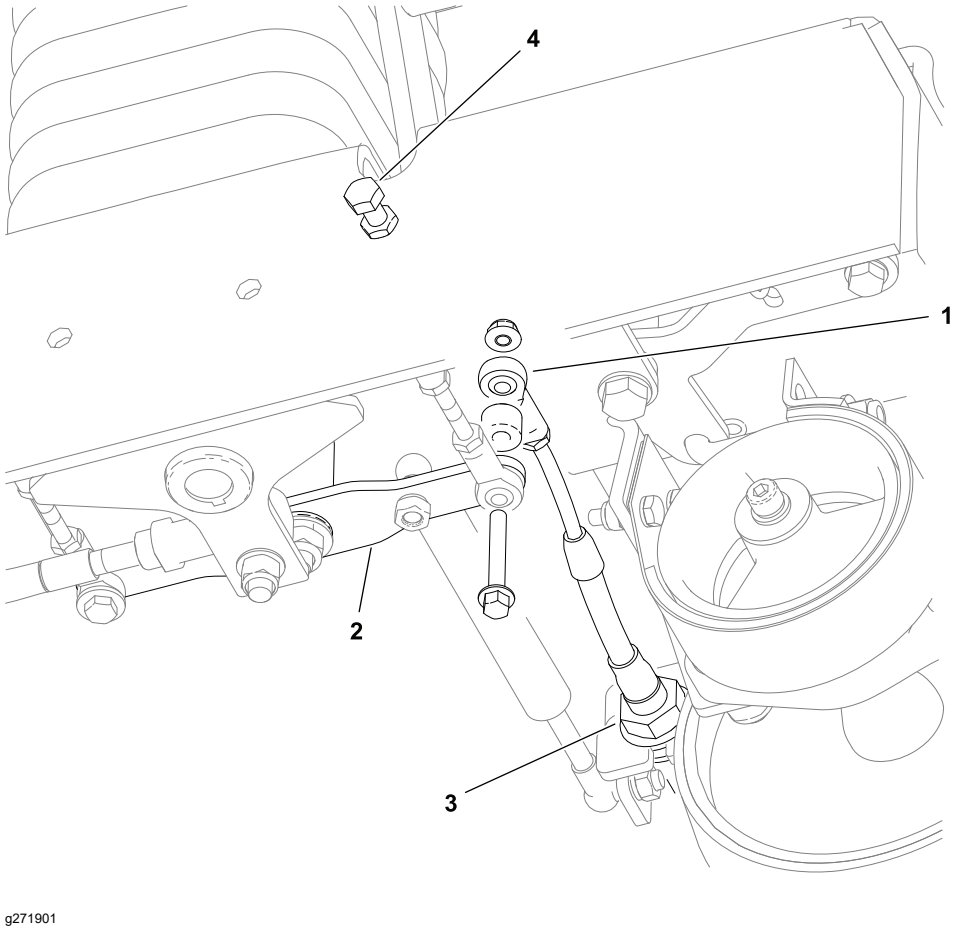


Figure 38
GreensPro 1260

1. Traction cable
2. Pedal rod pivot assembly
3. Jam nut (2 each)

10. Loosen the 2 set screws in the pump drive collar.
11. Remove the fasteners securing the hydraulic pump to the engine plate and carefully remove the hydraulic pump from the hydraulic pump drive collar. Locate and retrieve the square key.
12. Remove additional pump components as necessary.
13. If removing the hydraulic pump fittings is necessary, record the orientation of the fittings for assembly purposes and discard the fitting O-rings.

Installing the Hydraulic Pump

Refer to Figure 37 for this procedure.

1. If the hydraulic fittings were removed from the pump, lubricate and install new O-rings to the fittings. Install the fittings into the pump; refer to Installing the Hydraulic Fittings (page 5–14).

IMPORTANT

Ensure that you do not damage the machine components while installing the hydraulic pump.

2. Position the square key (item 4 in Figure 37) to the key slot in the hydraulic pump shaft.
3. Insert the hydraulic pump shaft into the hydraulic pump drive collar through the engine plate.
4. Secure the hydraulic pump to the engine plate with the 2 bolts (item 7 in Figure 37), 4 plain washers, and 2 nuts.
5. Remove the caps and plugs from the hydraulic hoses and fittings.
6. Use the labels that you attached during the removal process to correctly connect the hydraulic hoses to the fittings on the hydraulic pump; refer to Installing the Hydraulic Hoses and Tubes (page 5–12).
7. Secure the neutral switch (item 17 in Figure 37) to the control arm with the 2 slotted-head screws and tapped plate.
8. Connect the wire harness electrical connector to the neutral switch.
9. Position the traction cable and bushing to the hydraulic pump control arm and secure the traction cable to the control arm with the flange-head screw (item 13 in Figure 37), flat washer, and flange nut.
10. Install the transmission cover to the machine; refer to Transmission Cover (page 7–58).
11. Check the hydraulic fluid level in the hydraulic tank and add correct quantity of fluid if necessary; refer to the *Operator's Manual*.
12. Operate the machine functions slowly until air is out of system; refer to Charging the Hydraulic System (page 5–42).
13. Check the hydraulic pump and motion control pedal return to neutral operation and adjust as necessary; refer to Adjusting the Control Pedal Return to Neutral Mechanism (page 5–29).

Servicing the Hydraulic Pump (GreensPro 1260)

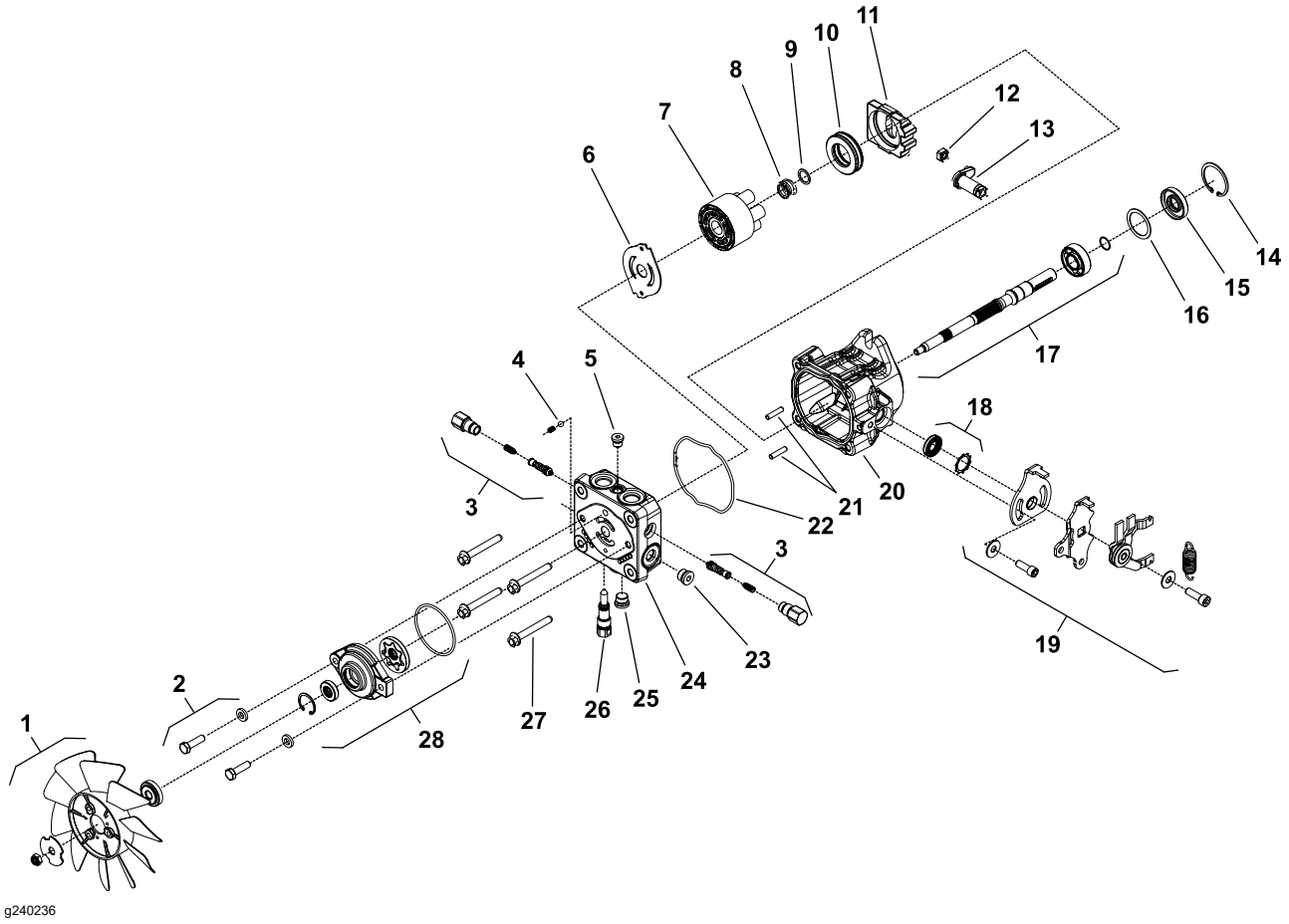


Figure 39

1. Fan/hub kit
2. Charge pump bolt kit
3. Shock valve kit (2 each)
4. Charge relief kit
5. Plug
6. Valve plate
7. Cylinder block
8. Spring
9. Flat washer
10. Thrust bearing
11. Swash plate
12. Guide slot
13. Trunnion arm
14. Retaining ring
15. Lip seal
16. Flat washer
17. Shaft kit
18. Trunnion seal/retainer kit
19. Control arm kit
20. Hydraulic pump housing
21. Headless pin (2 each)
22. O-ring
23. Plug
24. End cap
25. Plug
26. Bypass valve
27. Flange-head bolt (4 each)
28. Charge pump kit

IMPORTANT

If a hydraulic pump failure occurs; refer to Hydraulic System (GreensPro 1260) (page 5–9) for information regarding the importance of removing contamination from the hydraulic system.

For the hydraulic pump repair information; refer to the Hydro−Gear P Series Hydrostatic Pumps Service and Repair Manual.

Hydraulic Motor (GreensPro 1260)

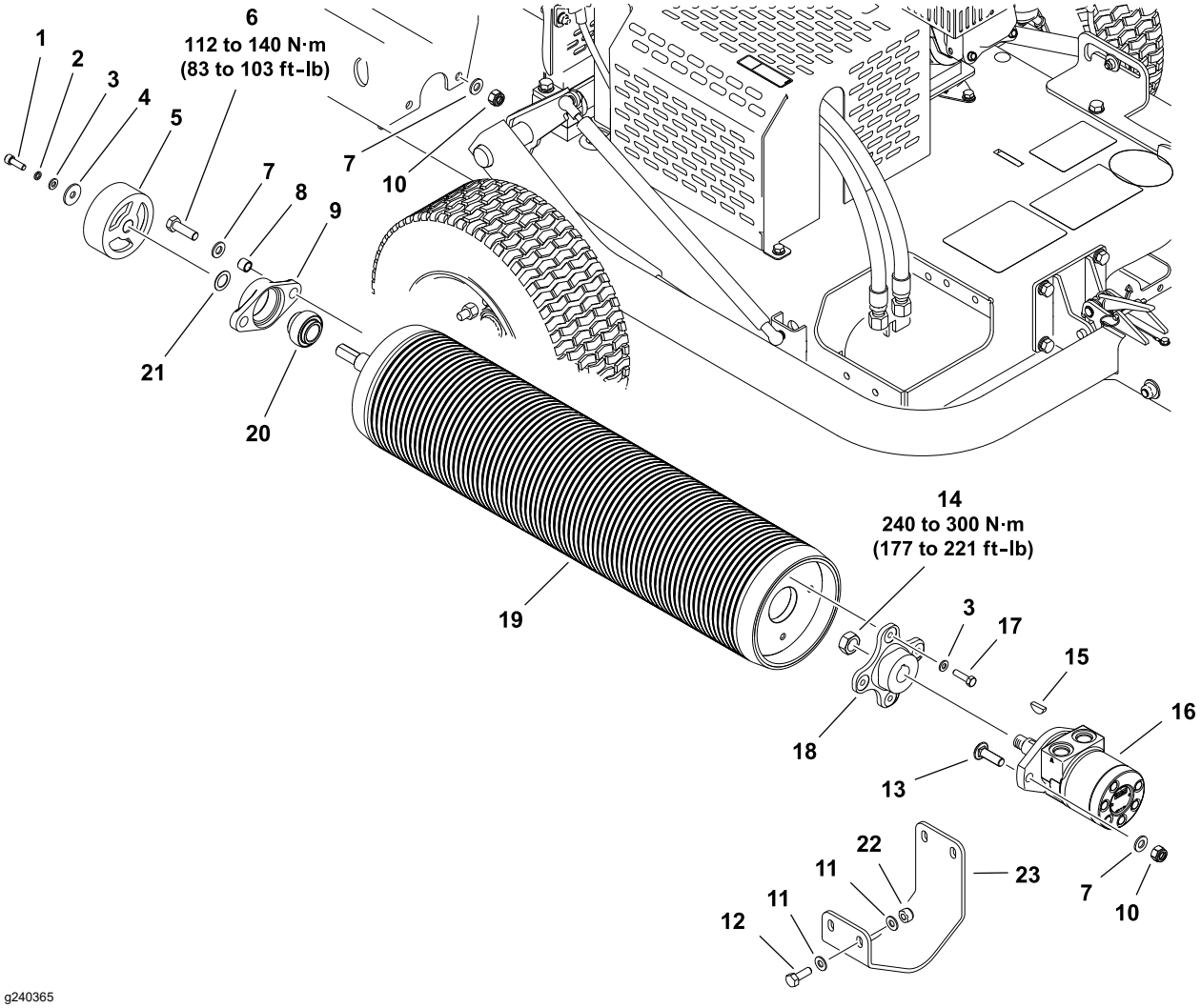


Figure 40
GreensPro 1260

1.	Socket-head screw	9.	Bearing housing	17.	Bolt (4 each)
2.	Spring washer	10.	Locknut (4 each)	18.	Drive roller hub
3.	Plain washer (5 each)	11.	Plain washer (8 each)	19.	Drive roller
4.	Hardened washer	12.	Bolt (4 each)	20.	Bearing
5.	Brake hub	13.	Carriage screw (2 each)	21.	Shim (as required)
6.	Bolt (2 each)	14.	Wheel motor nut	22.	Nut (4 each)
7.	Plain washer (6 each)	15.	Woodruff key	23.	Motor guard
8.	Spacer (2 each)	16.	Hydraulic motor		

The hydraulic motor and drive roller should be removed from machine as an assembly. Once removed from the machine, the hydraulic motor can be separated for service.

Removing the Hydraulic Motor and Drive Roller Assembly

Refer to Figure 40 for this procedure.

CAUTION

Before opening the hydraulic system, shut off the engine and press the motion control pedals to release the pressure in the system and avoid injury from the pressurized hydraulic fluid.

CAUTION

Use a suitable lifting device to safely raise and support the machine to access the components under the chassis.

1. Park the machine on a clean, level surface and set the transport wheels to the lowered and locked position.
2. Read the General Precautions for Removing and Installing the Hydraulic System Components (page 5–35).
3. Remove the motor guard from the chassis (Figure 40).
4. Clean the hydraulic hose ends and fittings on the hydraulic motor to prevent contaminants from entering into the hydraulic system.
5. For assembly purposes, label all the hydraulic connections at the hydraulic motor. Loosen and remove the hydraulic hoses from the fittings on the hydraulic motor. Allow the hoses to drain into a suitable container.
6. Install clean caps or plugs on the hydraulic hoses and fittings to prevent system contamination.
7. Remove the parking brake; refer to Removing the Parking Brake (page 7–30).

CAUTION

The weight of the hydraulic motor and drive roller assembly is approximately 50 kg (110 lb).

8. Support the hydraulic motor and drive roller assembly to prevent it from falling during removal.
9. Remove the fasteners that secure the drive roller bearing to the chassis. Retrieve the sleeves from the bearing mounting holes.
10. Loosen the fasteners that secure the hydraulic motor to the chassis and remove the hydraulic motor and drive roller assembly.
11. Remove the fasteners that secure the drive roller hub to the drive roller.
12. Remove the wheel motor nut and pull drive roller hub from the hydraulic motor shaft. Discard the wheel motor nut.
13. Locate and retrieve the woodruff key from the motor shaft.
14. Remove the 2 carriage screws, 2 plain washers, and 2 locknuts from the hydraulic motor.
15. If necessary, remove the fittings from the hydraulic motor and discard the fitting O-rings.

Installing the Hydraulic Motor and Drive Roller Assembly

Refer to Figure 40 for this procedure.

1. If the hydraulic fittings were removed, lubricate and install new O-rings and properly tighten the fittings; refer to Installing the Hydraulic Fittings (page 5–14).
2. Position the woodruff key in the motor shaft.
3. Install the drive roller hub onto the motor shaft and secure with new wheel motor nut (item 16 in Figure 40). Tighten the wheel motor nut to **240 to 300 N·m (177 to 221 ft-lb)**.
4. Secure the drive roller hub and motor to the drive roller with the previously removed fasteners.
5. Loosely install the carriage screws, plain washers, and locknuts to the hydraulic motor.
6. Loosen the bearing set screw.

⚠ CAUTION ⚠

The weight of the hydraulic motor and drive roller assembly is approximately 50 kg (110 lb).

7. Support the hydraulic motor and drive roller assembly to prevent it from falling during installation.
8. Position the hydraulic motor and drive roller assembly in the chassis. Ensure that the sleeves are installed in each bearing housing mounting hole and secure the bearing assembly and hydraulic motor to the chassis with the previously removed fasteners. Tighten the bearing mounting fasteners from **112 to 140 N·m (83 to 103 ft-lbs)**. Tighten the bearing set screw.
9. Install the parking brake; refer to Installing the Parking Brake (page 7–31).
10. Remove the caps and plugs from the hydraulic hoses and fittings.
11. Lubricate and install new O-rings to the fittings connect the hydraulic hose; refer to Installing the Hydraulic Hoses and Tubes (page 5–12).
12. Secure the motor guard (item 23 in Figure 40) to the chassis with the previously removed fasteners.
13. Check the hydraulic fluid level in the hydraulic tank and adjust if necessary; refer to the *Operator's Manual*.
14. Operate the machine functions slowly until air is purged from the hydraulic system; refer to Charging the Hydraulic System (page 5–42).

Servicing the Hydraulic Motor (GreensPro 1260)

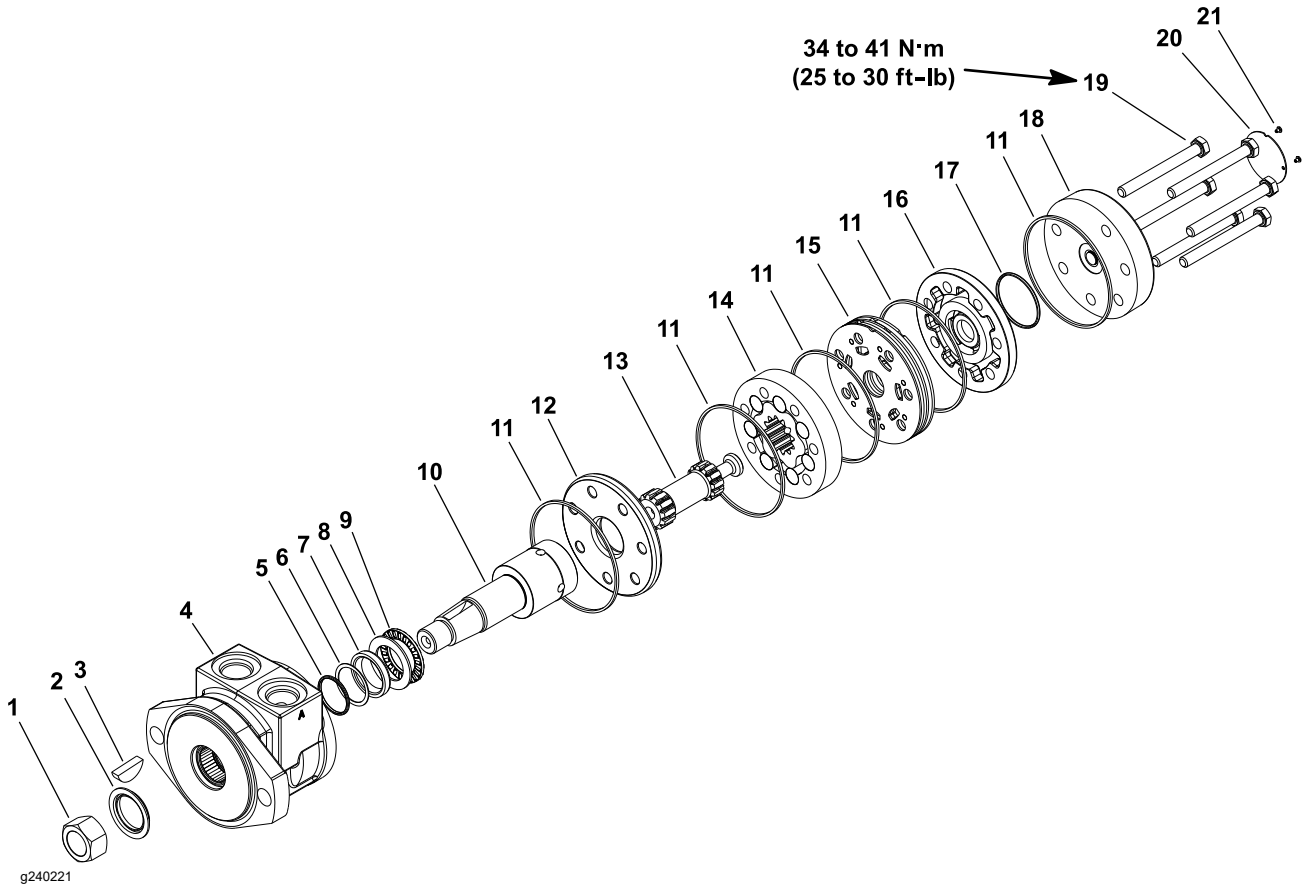


Figure 41

1. Wheel motor nut
2. Dirt and water seal
3. Woodruff key
4. Housing assembly
5. Back-up ring
6. Back-up washer
7. Shaft seal
8. Thrust washer
9. Thrust bearing
10. Coupling shaft
11. Seal ring (5 each)
12. Wear plate
13. Drive link
14. Rotor set
15. Manifold
16. Commutator assembly
17. Commutator seal
18. End cover
19. Special bolt (6 each)
20. Identification tag
21. Drive screw (2 each)

IMPORTANT

If a hydraulic motor fails; refer to Hydraulic System (GreensPro 1260) (page 5–9) for information regarding the importance of removing contamination from the traction circuit.

For the hydraulic motor repair procedures; refer to the Parker Torqmotor Service Procedure.

Chapter 6

Electrical System

Table of Contents

General Information

The *Operator's Manual* provides information regarding the operation, general maintenance, and maintenance intervals for your GreensPro machine. Refer to the *Operator's Manual* for additional information when servicing the machine.

Electrical System

Some of the electrical system components used on GreensPro machines are part of the Honda engine. These components include the engine ON/OFF switch, ignition module, lighting coil, Oil Alert™ unit, and oil level switch. Service information for these components can be found in the *Honda Engine Service Manual*. Contact your local Honda Engine Dealer or visit http://engines.honda.com for assistance.

Service information for the remainder of the electrical system components used on GreensPro machines can be found in this chapter. The components include the hour meter, worklight switch, and on machines above serial number 315000000, a seat switch, neutral switch, parking brake switch, resistor assembly, and interlock module.

IMPORTANT

Before performing any welding on the machine, disconnect the wire harness ground connector from the engine to prevent damage to the machine electrical system.

Electrical Schematics and Wire Harness Drawings/Diagrams

Electrical Drawing Designations

Note: A splice used in a wire harness will be identified on the wire harness diagram by SP. The manufacturing number of the splice is also identified on the wire harness diagram (e.g., SP01 is splice number 1).

Wire Color

The following abbreviations are used for wire harness colors on the electrical schematics and wire harness drawings in this chapter.

ABBREVIATION	COLOR
BK	BLACK
BR or BN	BROWN
BU	BLUE
GN	GREEN
GY	GRAY
OR	ORANGE
PK	PINK
R or RD	RED
T	TAN
VIO	VIOLET
W or WH	WHITE
Y or YE	YELLOW

Numerous harness wires used on the Toro machines include a line with an alternate color. These wires are identified with the wire color and line color with either a / or _ separating the color abbreviations listed above (e.g., R/BK is a red wire with a black line, OR_BK is an orange wire with a black line).

Wire Size

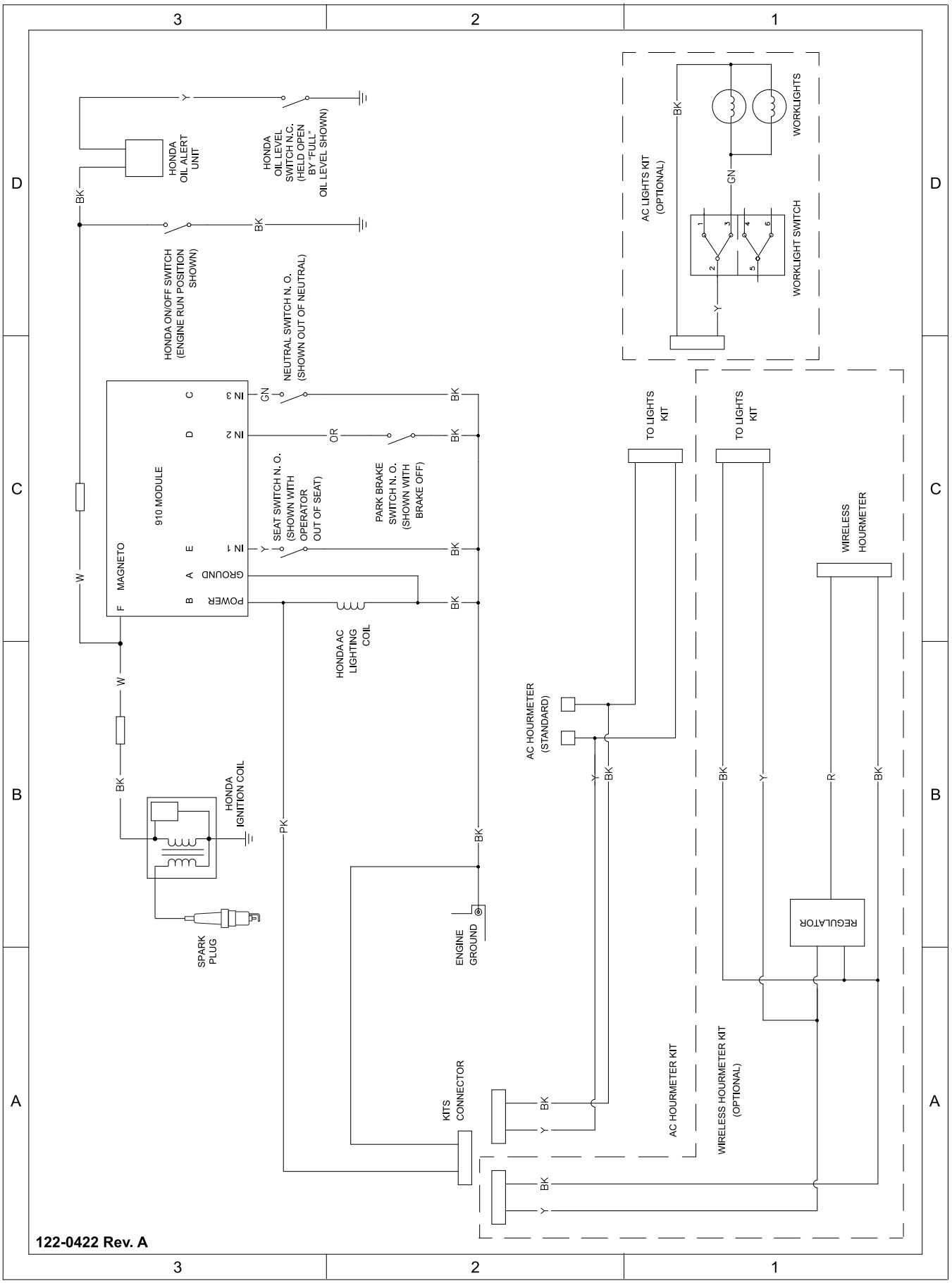
The individual wires of the electrical harness diagrams in this chapter identify both the wire color and the wire size.

Examples:

- 16 BK = 16 AWG (American Wire Gauge) wire that has a black insulator
- 050 R = 0.5 mm metric wire that has a red insulator (AWG equivalents for metric wire appear in the following table)

AWG Equivalents for Metric Wire		
Diagram Label	**Metric Size**	**AWG Equivalent**
050	0.5 mm	20 GA
175	0.75 mm	18 GA
100	1.0 mm	16 GA
150	1.5 mm	14 GA

Electrical Schematic – GreensPro 1240 (s/n 315000000 up)



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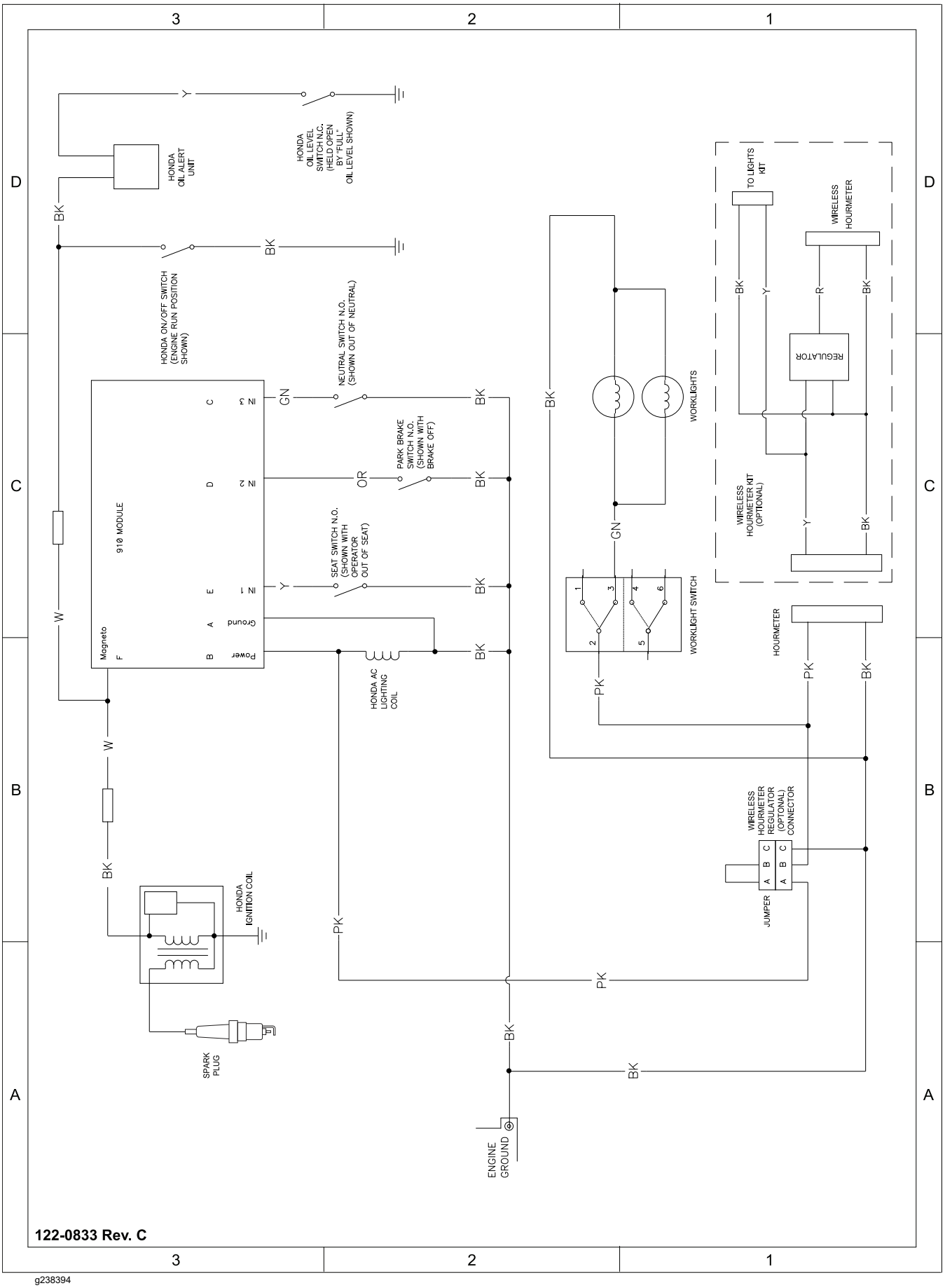
Electrical Schematic – GreensPro 1260



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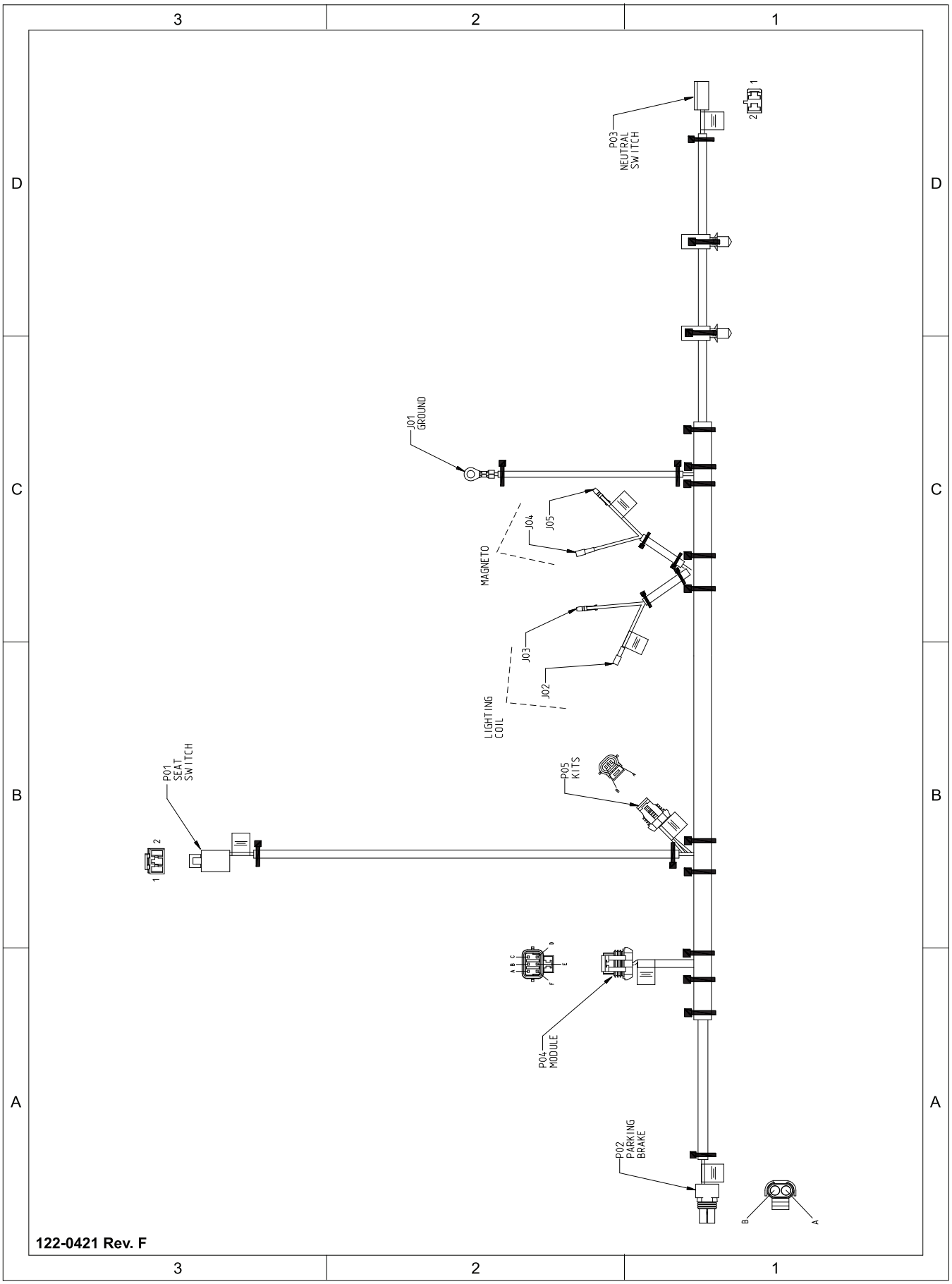
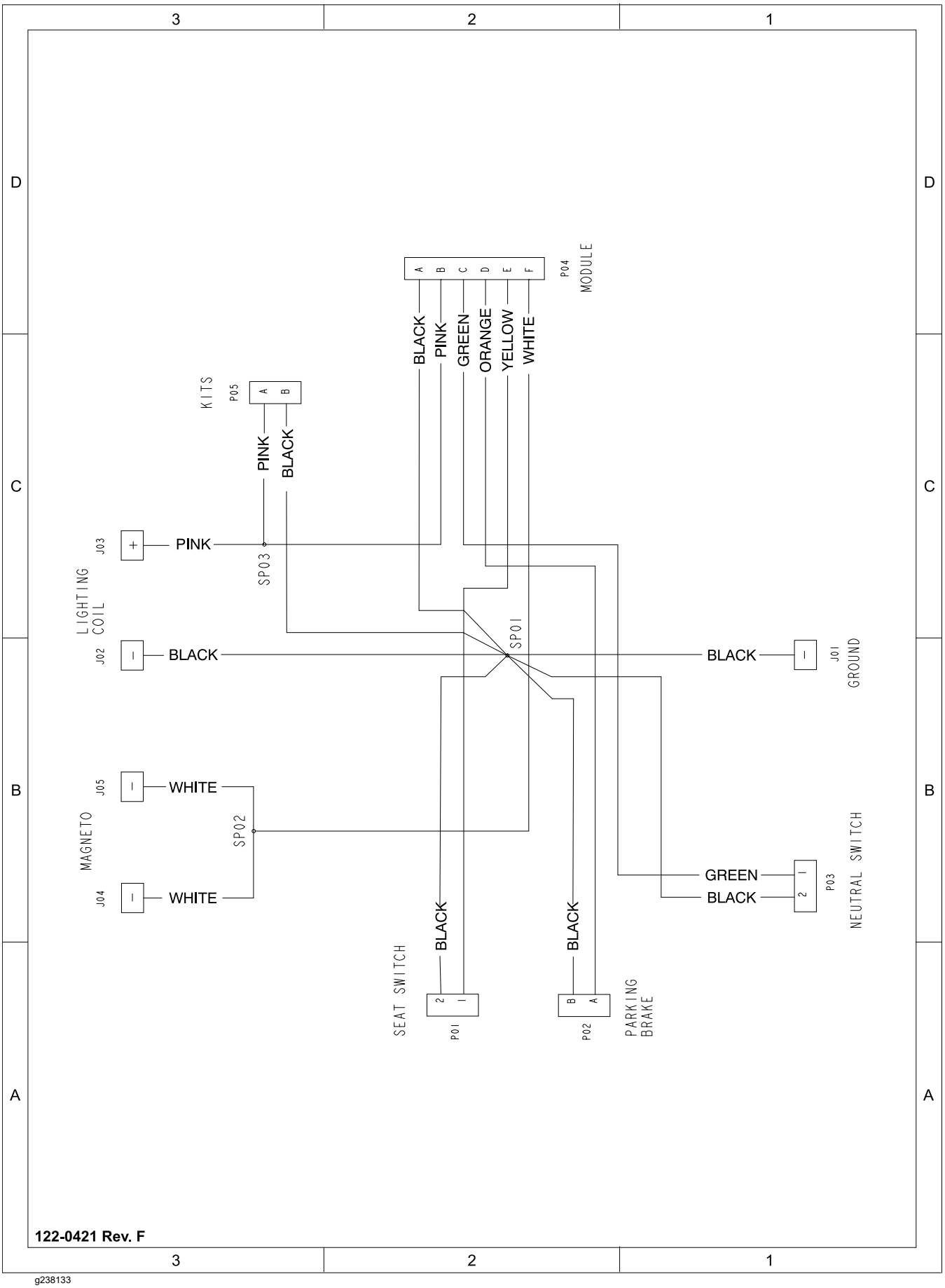
GreensPro 1240 (s/n 315000000 up) Wire Harness Drawing – Main



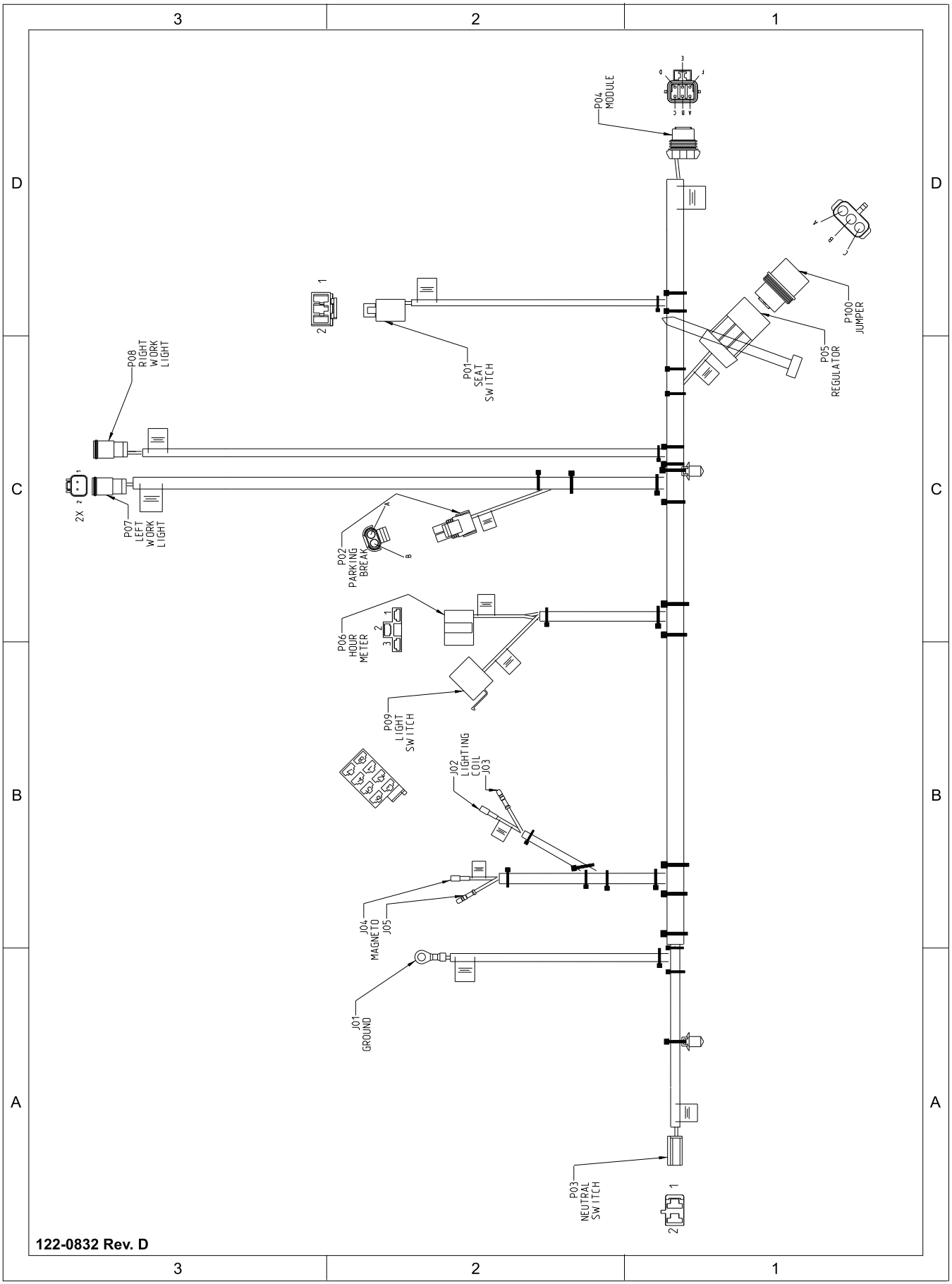
g238134

GreensPro 1240 (s/n 315000000 up) Wire Harness Diagram – Main

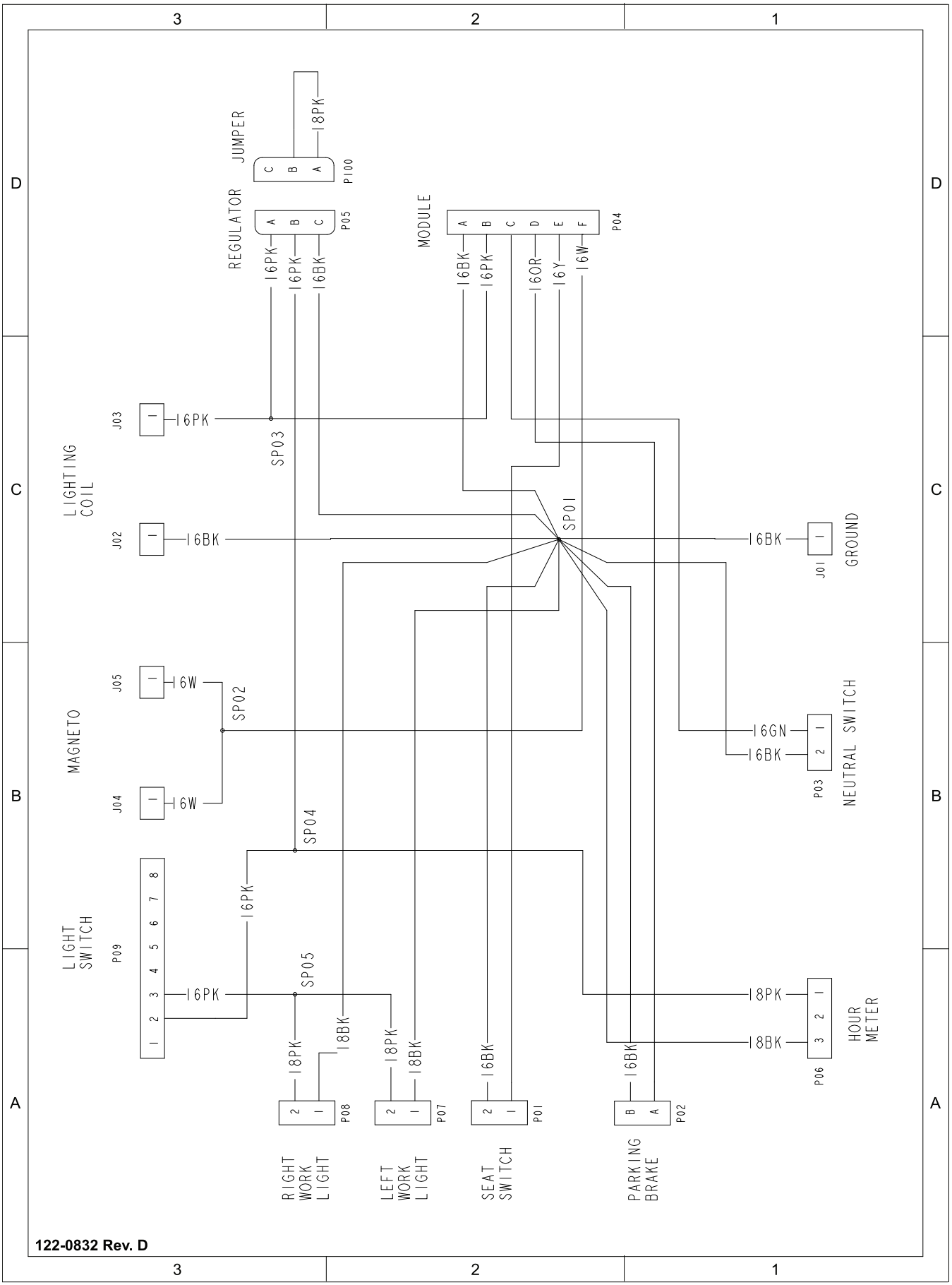


g238133

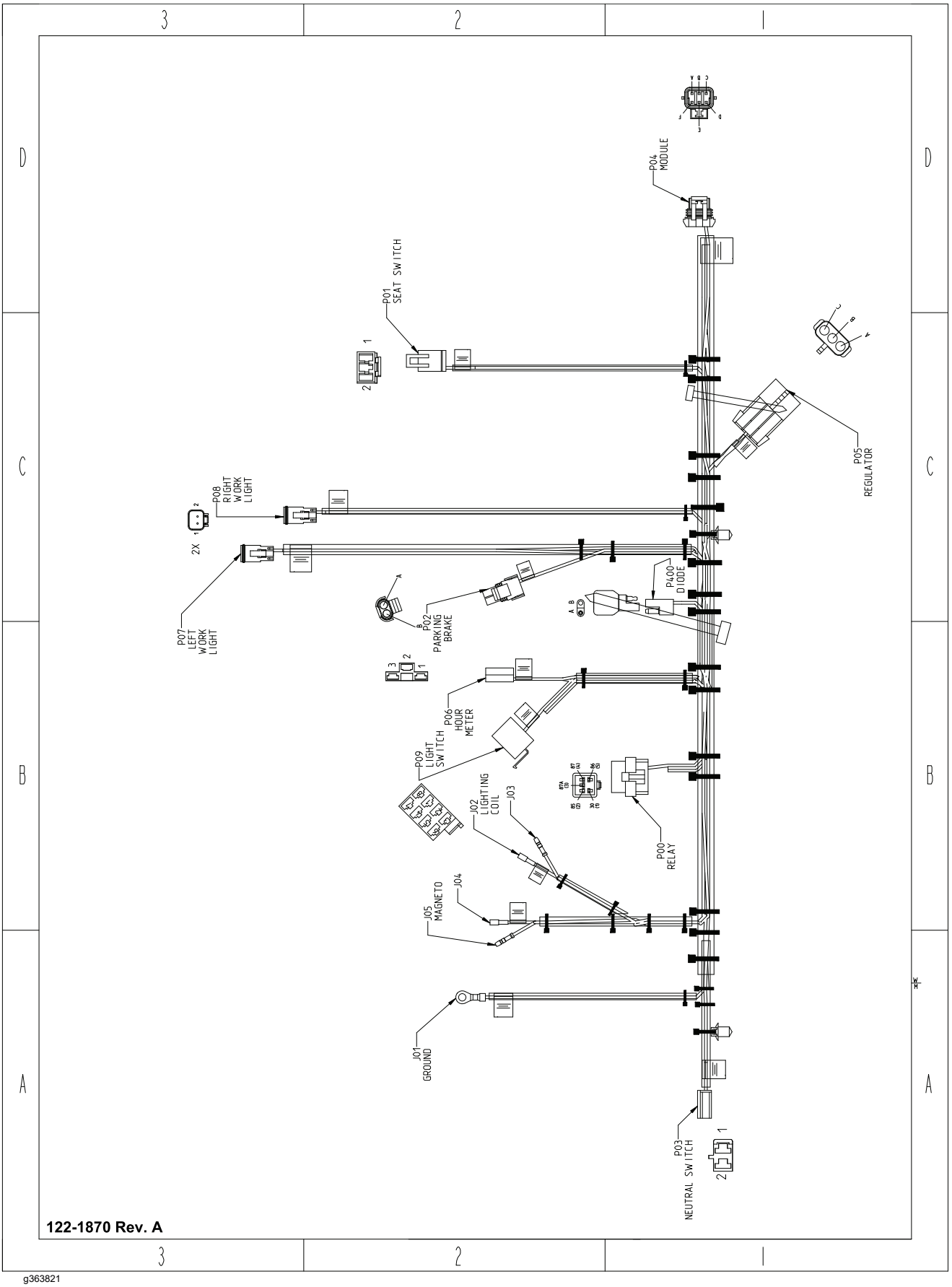
GreensPro 1260 Wire Harness Drawing – Main (s/n below 407900000)



GreensPro 1260 Wire Harness Diagram – Main (s/n below 407900000)

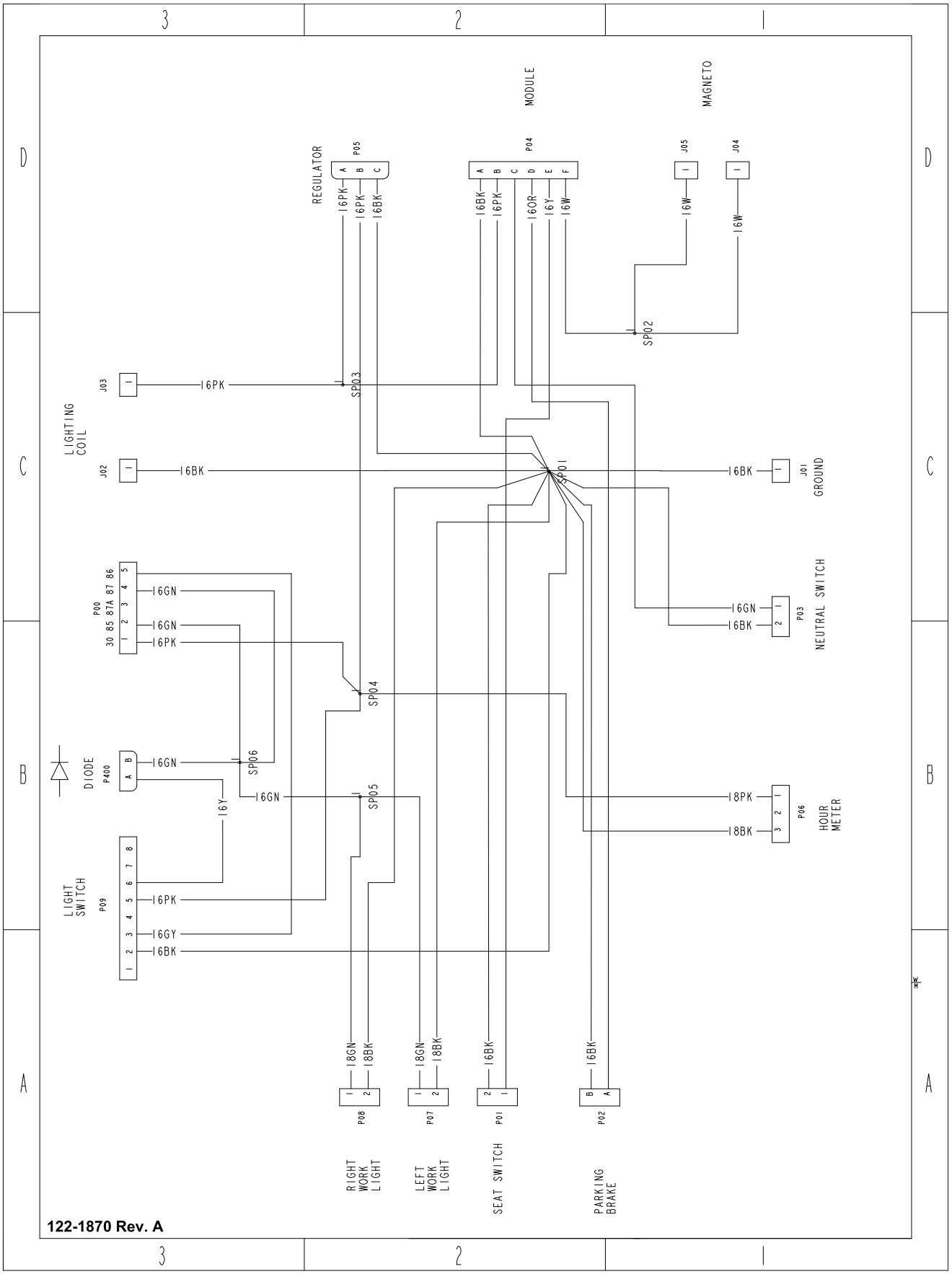


GreensPro 1260 Wire Harness Drawing – Main (s/n 407900000 to 409400000)



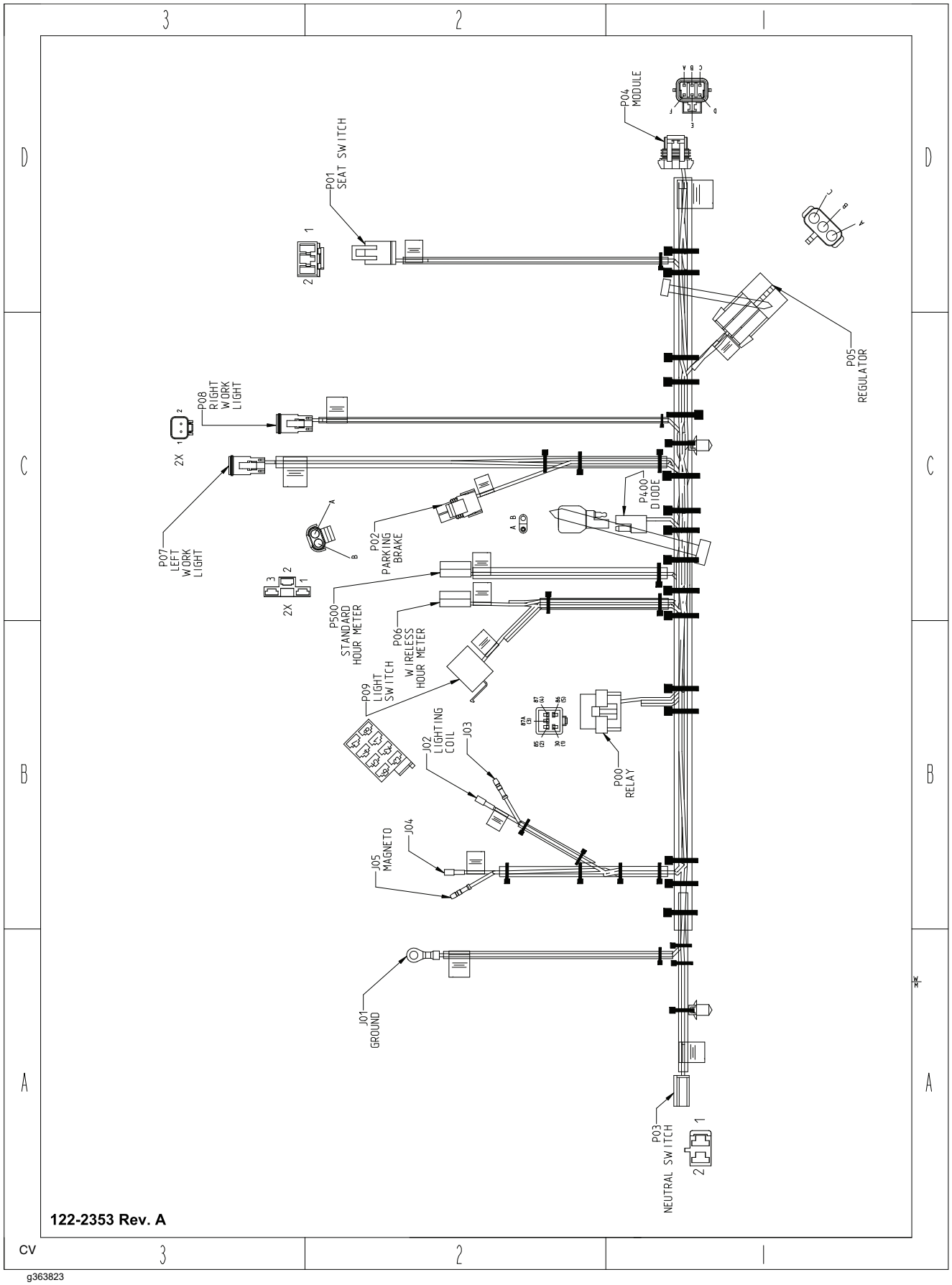
g363821

GreensPro 1260 Wire Harness Diagram – Main (s/n 407900000 to 409400000)

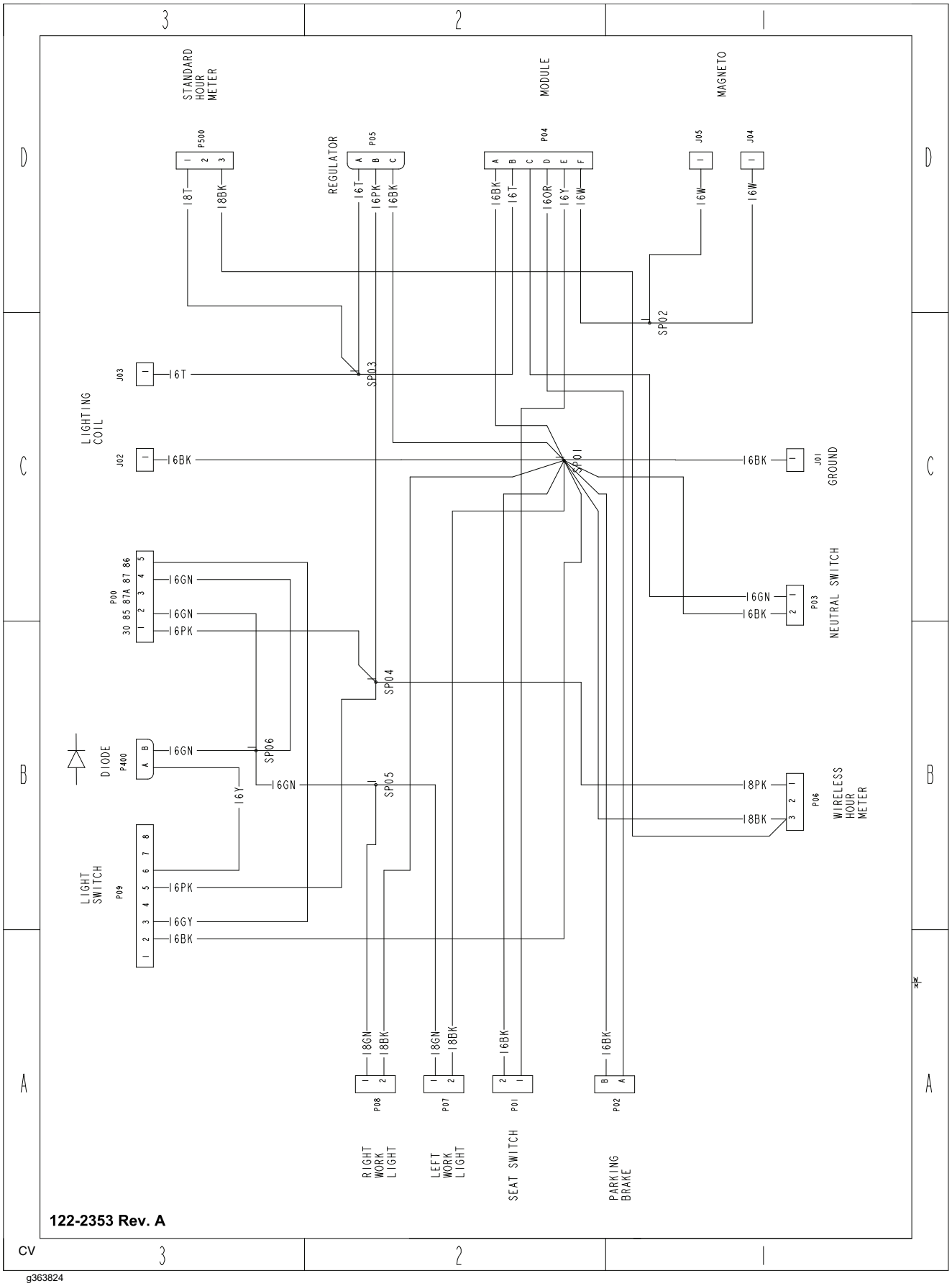


g363822

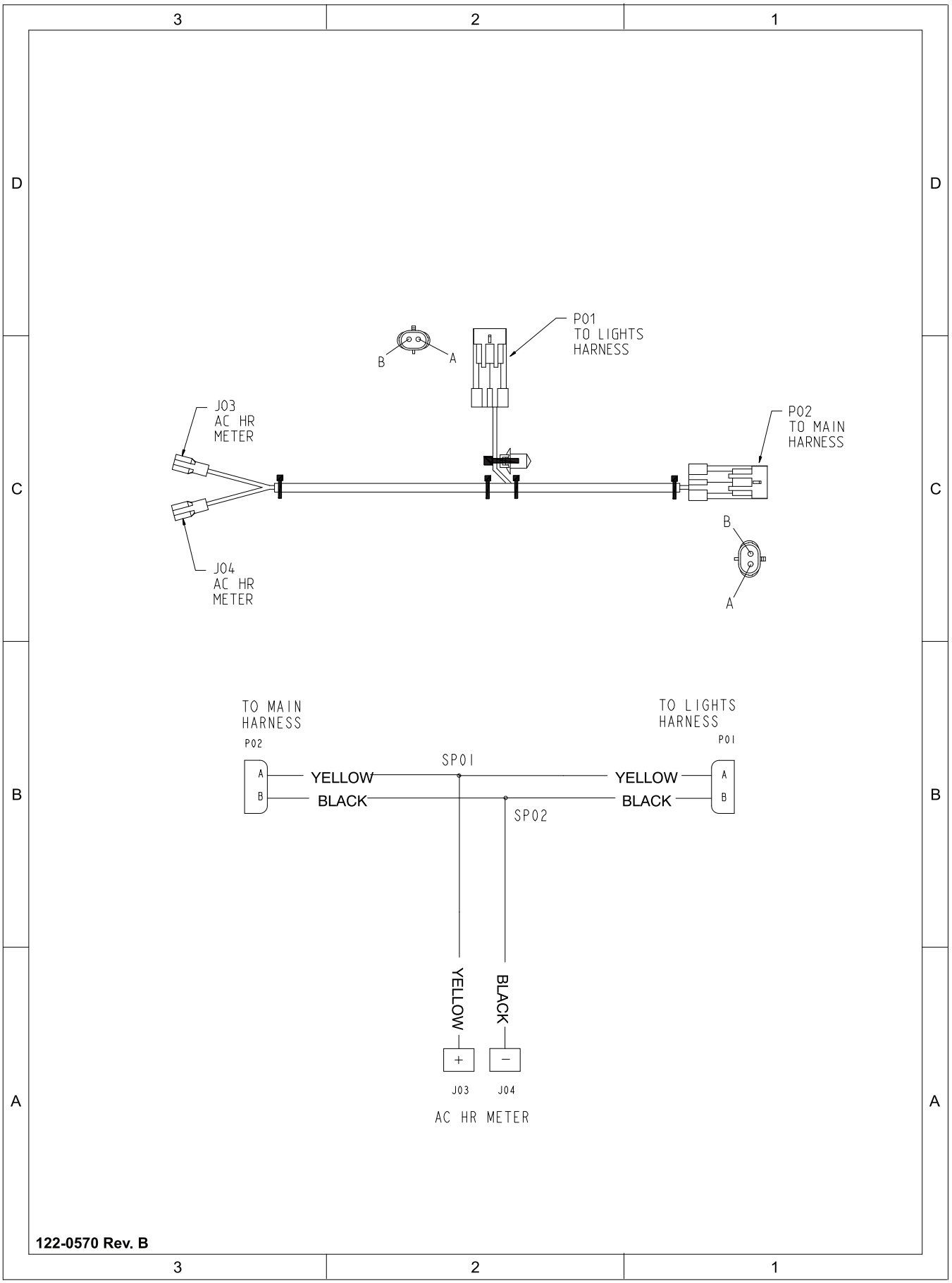
GreensPro 1260 Wire Harness Drawing – Main (s/n above 409400000)



GreensPro 1260 Wire Harness Diagram – Main (s/n above 409400000)



GreensPro 1240 Wire Harness – AC Hour Meter (Standard)



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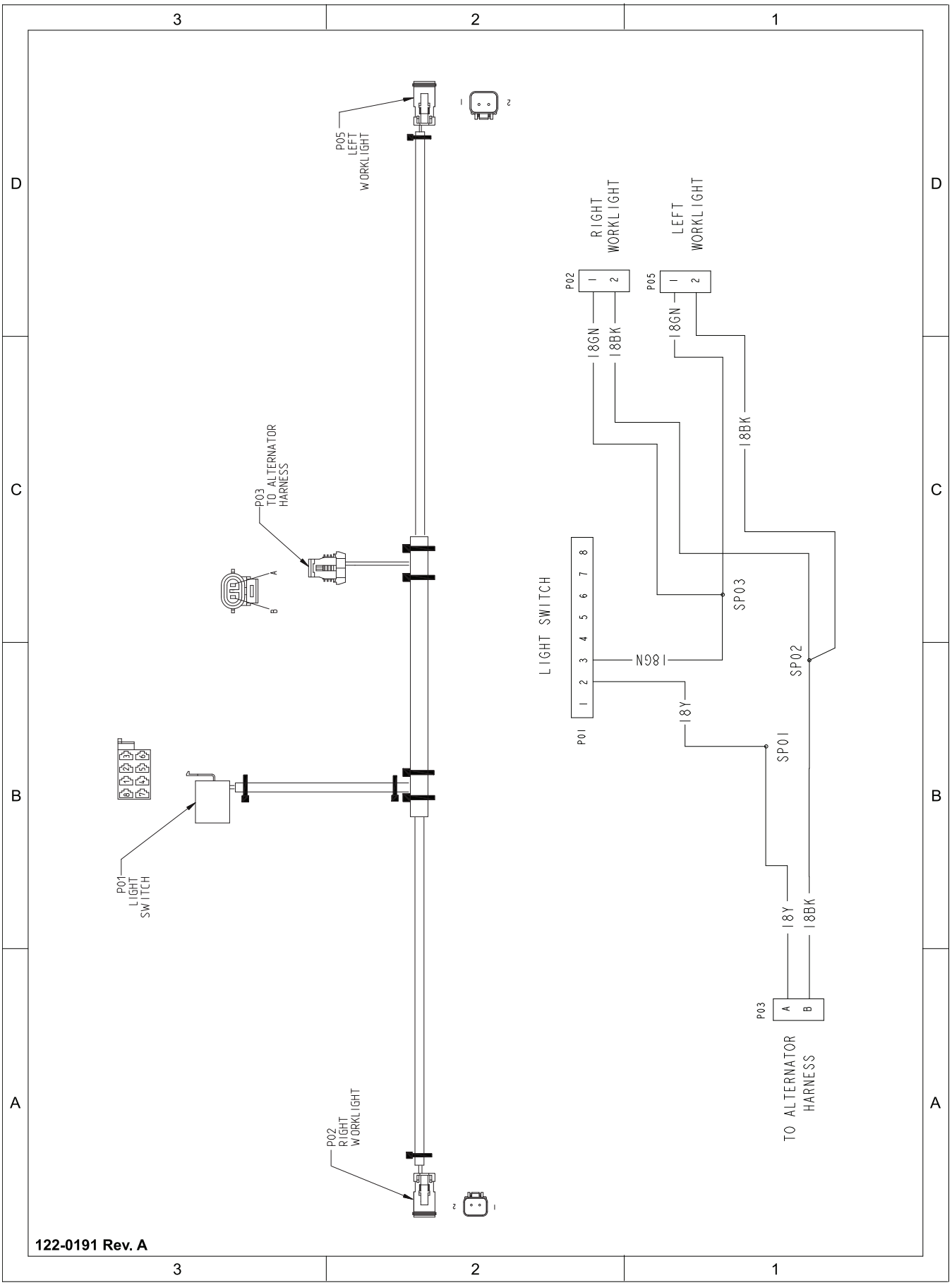
GreensPro 1240 Wire Harness – AC Lights Kit (Optional)



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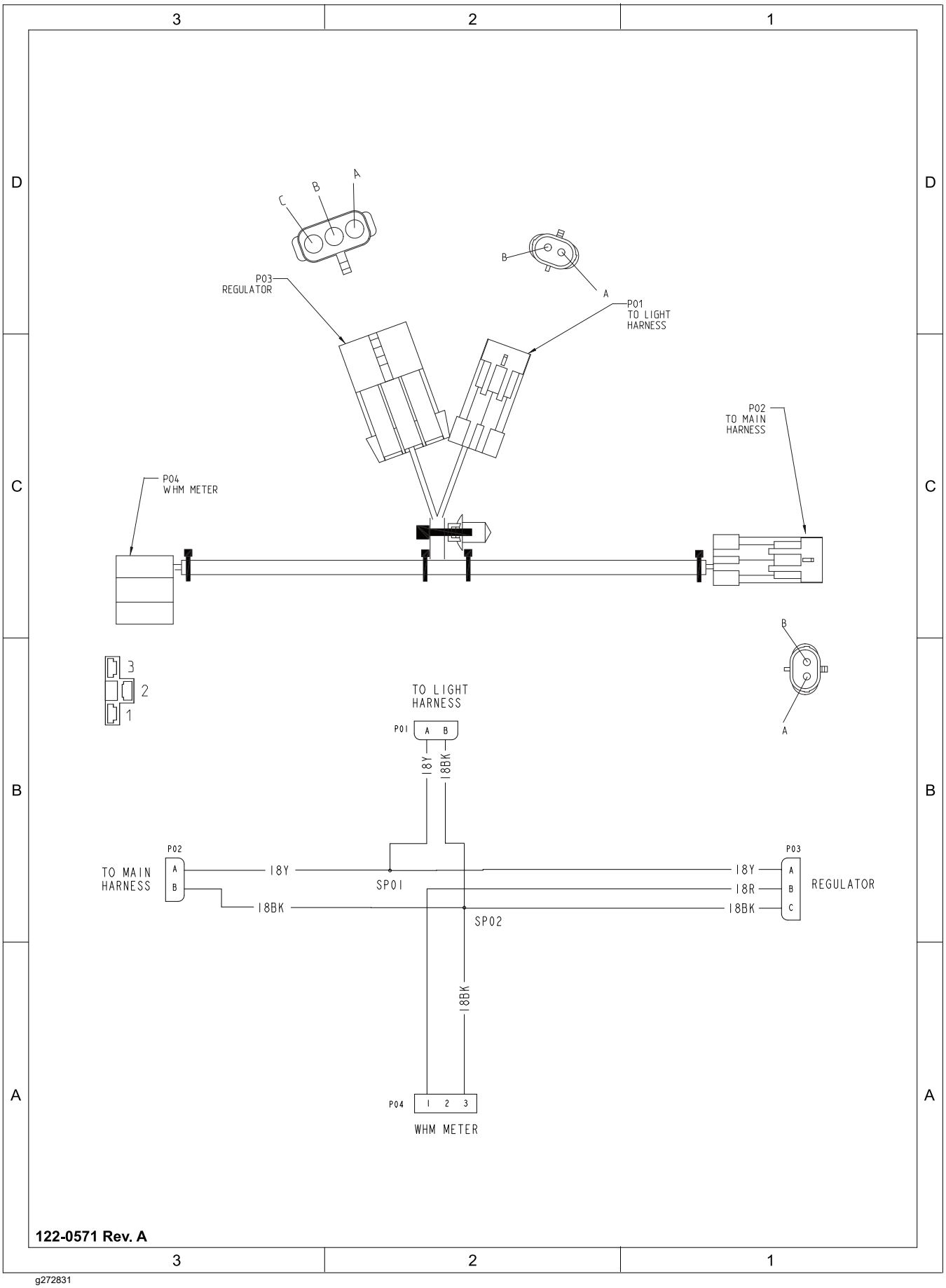
GreensPro Wire Harness – Wireless Hour Meter Kit (Optional)



g272831

Electrical System Quick Checks

Checking the Operation of the Interlock Switches

⚠ CAUTION ⚠

Do not disconnect the safety switches. They are for the operator's protection.

Check the operation of the interlock switches daily for proper operation.

Replace any malfunctioning switches or repair any damaged wiring before operating the machine.

All GreensPro machines above serial number 315000000 are equipped with an Interlock Module which monitors the position of the parking brake switch, seat switch, and neutral switch .

1. Test the parking brake input:
   A. Engage the parking brake and start the engine.
   B. With the operator's seat unoccupied, disengage the parking brake. The engine should stop in approximately 1 second.
2. Test the seat switch input:
   A. Engage the parking brake and start the engine.
   B. Sit in the operator seat and disengage the parking brake.
   C. Lift your weight from the operator seat. The engine should stop in approximately 1 second.
3. Test the neutral switch input:
   A. Engage the parking brake and start the engine.
   B. Sit in the operator seat.
   C. With the parking brake engaged, move the motion control pedals into a MOVE position. The engine should stop in approximately 1 second.

If the machine does not react as described in the previous procedure, test the individual switches in the interlock system as described in Testing the Electrical Components (page 6–18).

Testing the Electrical Components

Some of the electrical system components used on GreensPro machines are part of the Honda engine. These components include the engine ON/OFF switch, ignition module, lighting coil, Oil Alert™ unit, and oil level switch. Service information for these components can be found in the *Honda Engine Service Manual*. Contact your local Honda Engine Dealer or visit http://engines.honda.com for assistance.

The following are testing procedures for the remainder of the electrical system components used on GreensPro machines. The components include the hour meter, worklight switch, and on machines above serial number 315000000, a seat switch, neutral switch, parking brake switch, resistor assembly, and interlock module.

Note: For accurate resistance and/or continuity checks, electrically disconnect the component being tested from the circuit (e.g., unplug the seat switch connector before doing a continuity check of the switch).

Interlock Module (machine serial number above 31500000)

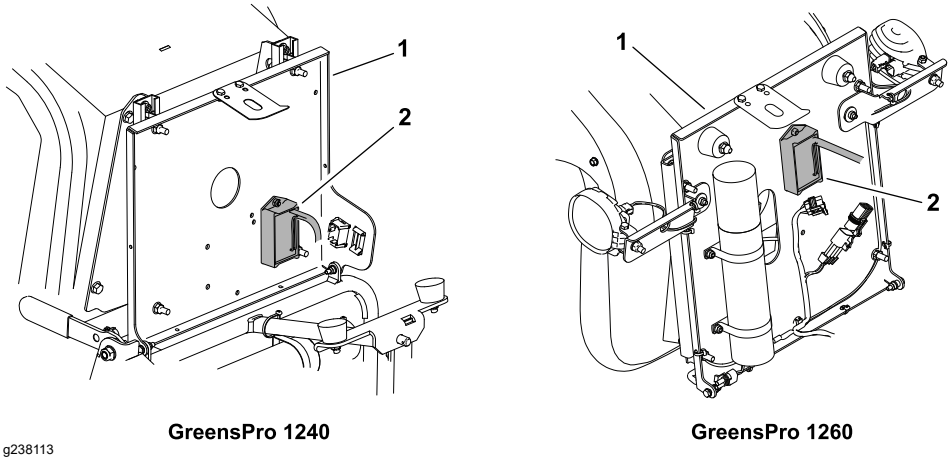


Figure 42

1. Seat pan
2. Interlock module

An interlock module is used to manage the machine interlock system. The interlock module is attached to the underside of the seat pan (Figure ?).

The interlock module is a micro-controller that senses the condition of various machine switches (inputs). Based on the state of the inputs, the module controls the engine ignition system circuit (circuit ground).

The interlock module is a solid state device, and there is no method to test the module directly. The control module may be damaged if an attempt is made to test it with an electrical test device, such as a digital multimeter.

Testing the Interlock Module

1. Park the machine on a level surface, engage the parking brake, and shut off the engine.
2. Ensure that the wire harness ground connection at the engine blower housing is secure and free of corrosion.
3. Disconnect the wire harness connector from the interlock module (Figure ?). Check the wire harness connector for corrosion and clean the connector if necessary.

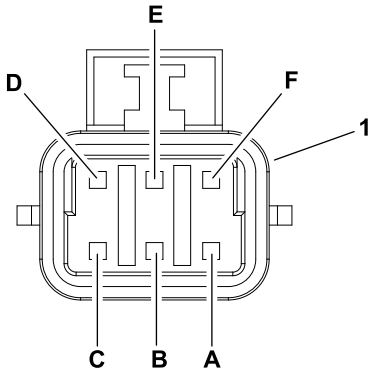


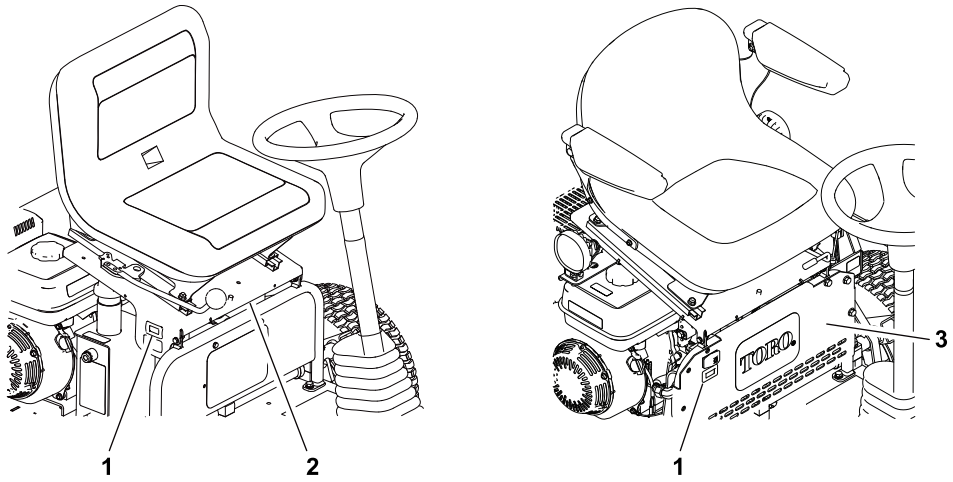
Figure 43

1. Interlock module wire harness connector (at wire harness)

Testing the Interlock Module (continued)

4. Check the seat switch, parking brake switch, and neutral switch and their circuit wiring for proper operation; refer to individual component testing procedures.
5. Check the Honda electrical components (engine ON/OFF switch, oil level switch, Oil Alert unit, and ignition module) and their circuit wiring for proper operation; refer to Electrical Schematics and Wire Harness Drawings/Diagrams (page 6–3) and the *Honda Engine Service Manual*.
6. Check the engine lighting coil output; refer to the *Honda Engine Service Manual*.
7. If the lighting coil output, all interlock switches, and the Honda electrical components and their circuit wiring are operating correctly, the interlock module may be damaged. Replace the interlock module if necessary.
8. After testing, apply a film of dielectric grease to the module terminals and connect the machine wire harness connector to the interlock module.

Hour Meter



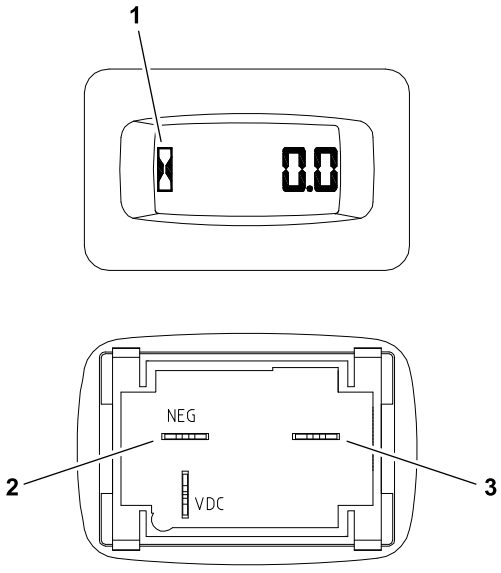
GreensPro 1240 GreensPro 1260

g238111

Figure 44

1. Hour meter
2. Seat pan
3. Seat support plate

On GreensPro 1240 machines, the hour meter is located on the right side of the seat pan. On GreensPro 1260 machines, the hour meter is located on the right side of the seat support plate (Figure ?). The hour meter has a digital display that shows the total hours of machine operation at all time. The hour meter is powered by the engine lighting coil and records whenever the engine is running. An hourglass icon flashes on the display when the hour meter is recording.



g238110

Figure 45

1. Hourglass icon
2. Negative terminal
3. Positive terminal

Testing the Hour Meter

1. Park the machine on a level surface, engage the parking brake if equipped.
2. Disconnect the wire harness connector from the hour meter (Figure ?).

Testing the Hour Meter (continued)

3. Start the engine and set to high idle.
4. Use a multimeter (AC voltage setting) and check for approximately 20 VAC at the wire harness terminals.
5. Shut off the engine.
6. If voltage is present at the wire harness terminals, and the hour meter does not display or record while the engine is running, record the machine hours if possible and replace the hour meter.
7. If voltage is not present at the wire harness terminals, check the wire harness terminals for corrosion, and check the wire harness for circuit continuity; refer to the Electrical Schematics and Wire Harness Drawings/Diagrams (page 6–3).
8. Check the engine lighting coil; refer to the *Honda Engine Service Manual*.
9. After testing, apply a film of dielectric grease to the hour meter terminals and connect the machine wire harness connector to the hour meter.

Worklight Switch

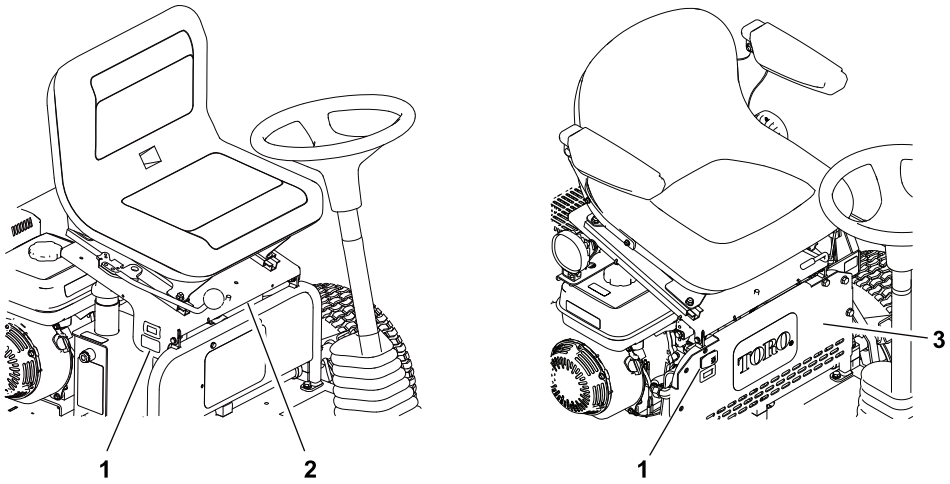


Figure 46

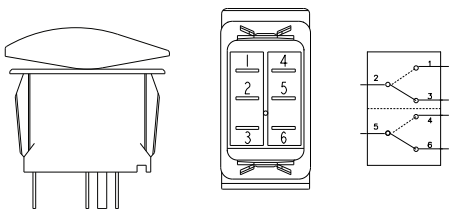
1. Worklight switch
2. Seat pan
3. Seat support plate

On GreensPro 1240 machines, the worklight switch is optional and is located on the right side of the seat pan. On GreensPro 1260 machines, the worklight switch is standard and is located on the right side of the seat support plate (Figure ?).

Testing the Worklight Switch

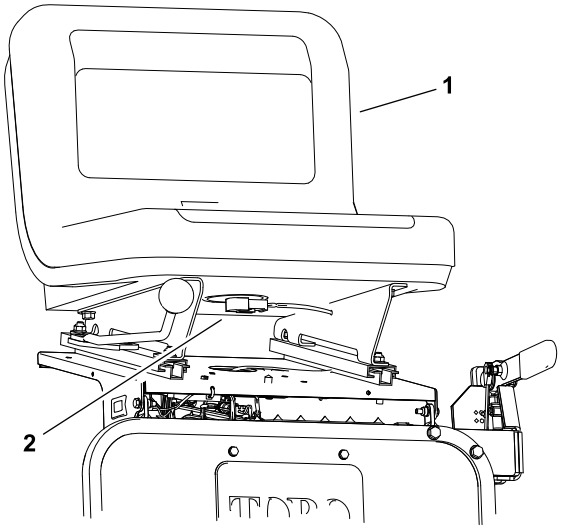
1. Park the machine on a level surface, engage the parking brake (if equipped), and shut off the engine.
2. Disconnect the wire harness connector from the worklight switch.
3. Check the wire harness connector for corrosion and clean the connector if necessary.
4. Use a multimeter (ohms setting) and the following table to determine whether continuity exists between the various terminals for each switch position.

POSITION	CLOSED CIRCUITS
OFF	2 + 3, 5 + 6
ON	2 + 1, 5 + 4



5. Replace the worklight switch if testing determines that it is damaged.
6. If the worklight switch testing is correct and a circuit problem still exists, check the wire harness for the circuit continuity; refer to the Electrical Schematics and Wire Harness Drawings/Diagrams (page 6–3).
7. After testing, apply a film of dielectric grease to the switch terminals and connect the machine wire harness connector to the worklight switch.

Seat Switch (machine serial number above 31500000)



g238117

Figure 47
GreensPro 1240

1. Operator seat
2. Seat switch

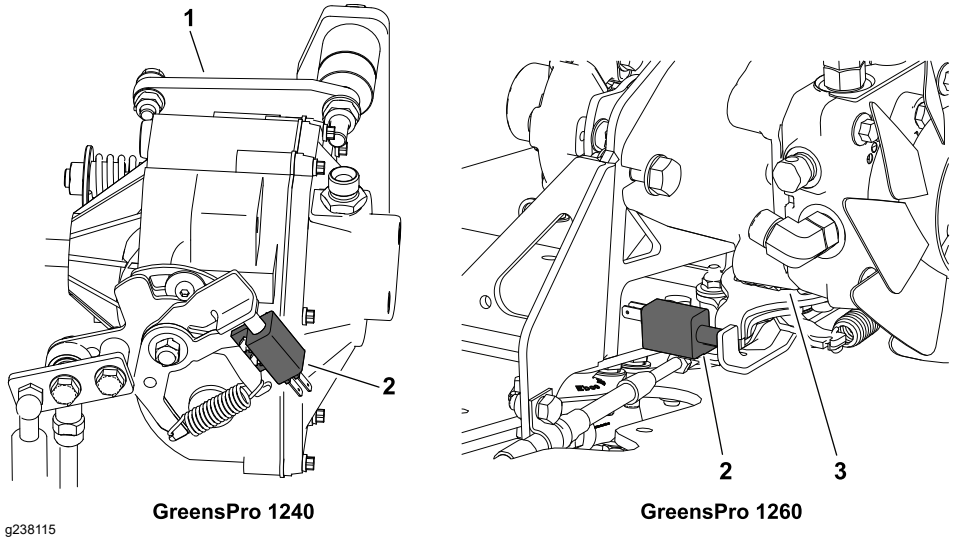
An operator's seat switch as part of the machine interlock system. The seat switch is attached to the bottom of the seat (Figure ?). When an operator sits in the seat, the seat cushion presses the switch plunger and closes the switch. When the seat is empty the switch is allowed to return to its normally open position. The interlock module monitors the position of the seat switch (open or closed). Using inputs from the seat switch and other switches in the interlock system, the interlock module opens or closes the engine ignition circuit (controls circuit ground).

Note: Beginning with machine serial number 40190001, an adhesive backed spacer (puck) was added to the top of the seat switch to improve switch sensitivity. The puck may be added to the seat switch on all GreensPro machines if necessary.

Testing the Seat Switch

1. Park the machine on a level surface, engage the parking brake, and shut off the engine.
2. Disconnect the wire harness connector from the seat switch.
3. Check the wire harness connector for corrosion and clean the connector if necessary.
4. Use a multimeter (ohms setting) and test the switch. The switch is closed (continuity exists between the terminals) when weight is applied to the seat cushion, and open (no continuity exists between the terminals) when the seat is empty.
5. Replace the seat switch if testing determines that it is damaged.
6. If the seat switch testing is correct and a circuit problem still exists, check the wire harness for the circuit continuity; refer to the Electrical Schematics and Wire Harness Drawings/Diagrams (page 6–3).
7. After testing, apply a film of dielectric grease to the switch terminals and connect the machine wire harness connector to the seat switch.

Neutral Switch (machine serial number above 31500000)



GreensPro 1240 GreensPro 1260

Figure 48

1. Transmission
2. Neutral switch
3. Hydraulic pump

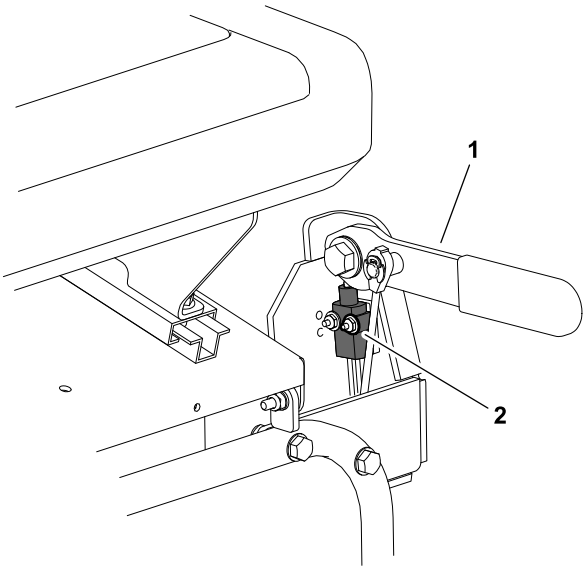
A neutral switch as part of the machine interlock system (Figure ?). The neutral switch is part of the transmission/pump control arm assembly. When either motion control pedal is pressed, the switch is allowed to return to its normally open condition. The control arm assembly presses the switch plunger when either traction pedal is released, returning the transmission to neutral and closing the switch. The interlock module monitors the position of the neutral switch (open or closed). Using inputs from the neutral switch and other switches in the interlock system, the interlock module opens or closes the engine ignition circuit (controls circuit ground).

Note: Check the motion control linkage operation before testing the switch; refer to Adjusting the Control Pedal Return to Neutral Mechanism (page 5–29).

Testing the Neutral Switch

1. Park the machine on a level surface, engage the parking brake, and shut off the engine.
2. Disconnect the wire harness connector from the neutral switch.
3. Check the wire harness connector for corrosion and clean the connector if necessary.
4. Use a multimeter (ohms setting) and test the switch. The switch is closed (continuity exists between the terminals) when both the motion control pedals are in the NEUTRAL (rearward) position, and open (no continuity exists between the terminals) when either motion control pedal is in a MOVE (forward) position.
5. Replace the neutral switch if testing determines that it is damaged.
6. If the neutral switch testing is correct and a circuit problem still exists, check the wire harness for the circuit continuity; refer to the Electrical Schematics and Wire Harness Drawings/Diagrams (page 6–3).
7. After testing, apply a film of dielectric grease to the switch terminals and connect the machine wire harness connector to the neutral switch.

Parking Brake Switch (machine serial number above 31500000)



g238116

Figure 49

1. Parking brake lever
2. Parking brake switch

A parking brake switch as part of the machine interlock system (Figure ?). The parking brake switch is located below the brake lever. When the parking brake is applied, the parking brake lever presses the parking brake switch plunger, closing the switch. The parking brake lever moves away from the switch when the parking brake is released, allowing the switch to return to its normally open condition. The interlock module monitors the position of the parking brake switch (open or closed). Using inputs from the parking brake switch and other switches in the interlock system, the interlock module opens or closes the engine ignition circuit (controls circuit ground).

Testing the Parking Brake Switch

1. Park the machine on a level surface, engage the parking brake, and shut off the engine.
2. Disconnect the wire harness connector from the parking brake switch.
3. Check the wire harness connector for corrosion and clean the connector if necessary.
4. Use a multimeter (ohms setting) and test the switch. The switch is closed (continuity exists between the terminals) when the parking brake is applied (raised), and open (no continuity exists between the terminals) when the parking brake is released (lowered).
5. Replace the parking brake switch if testing determines that it is damaged.
6. If the parking brake switch testing is correct and a circuit problem still exists, check the wire harness for the circuit continuity; refer to the Electrical Schematics and Wire Harness Drawings/Diagrams (page 6–3).
7. After testing, apply a film of dielectric grease to the switch terminals and connect the machine wire harness connector to the parking brake switch.

Table of Contents

General Information

The *Operator's Manual* provides information regarding the operation, general maintenance, and maintenance intervals for your GreensPro machine. Refer to the *Operator's Manual* for additional information when servicing the machine.

Steering Operation

The steering system of the GreensPro machines includes a number of components that cause the front and rear steering head to turn when the operator moves the steering wheel. The rotation of the steering heads allows the machine to change the direction. The amount the steering wheel can be turned is limited, so the turning circle of the greens roller is relatively large.

GreensPro 1240 Steering System

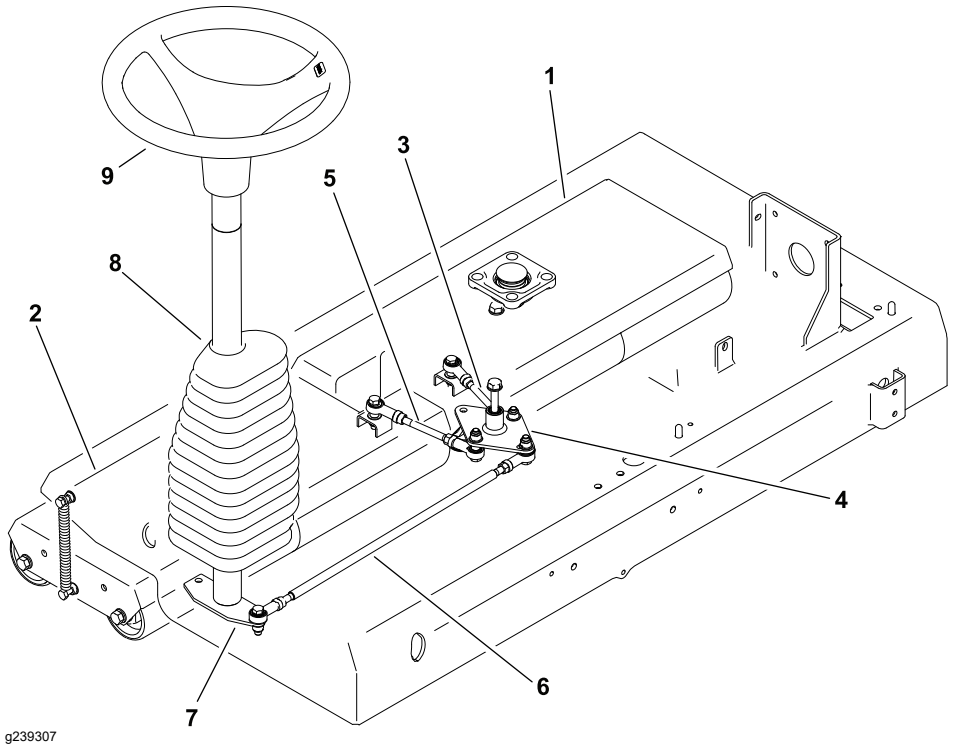


Figure 50
GreensPro 1240

1. Rear steering head
2. Front steering head
3. Rear steering head linkage arm
4. Steering disc assembly
5. Front steering head linkage arm
6. Steering pivot rod
7. Steering pivot
8. Steering column assembly
9. Steering wheel

The steering system components include the steering wheel and attached steering column, which is connected to the steering pivot, steering pivot rod, steering disc assembly, front and rear steering head linkage arms, and front and rear steering head assemblies (Figure 50). With the exception of the steering wheel and steering column, the steering system components are attached to the underside of the chassis.

When the steering wheel is turned by the operator, the steering pivot is rotated. Steering pivot movement causes the steering disc assembly to be rotated through the steering pivot rod. The steering disc assembly is connected to 2

GreensPro 1240 Steering System (continued)

steering heads by the steering head linkage arms. Rotation of the steering disc assembly causes rotation of the steering heads, which allows the machine to turn while in motion.

GreensPro 1260 Steering System

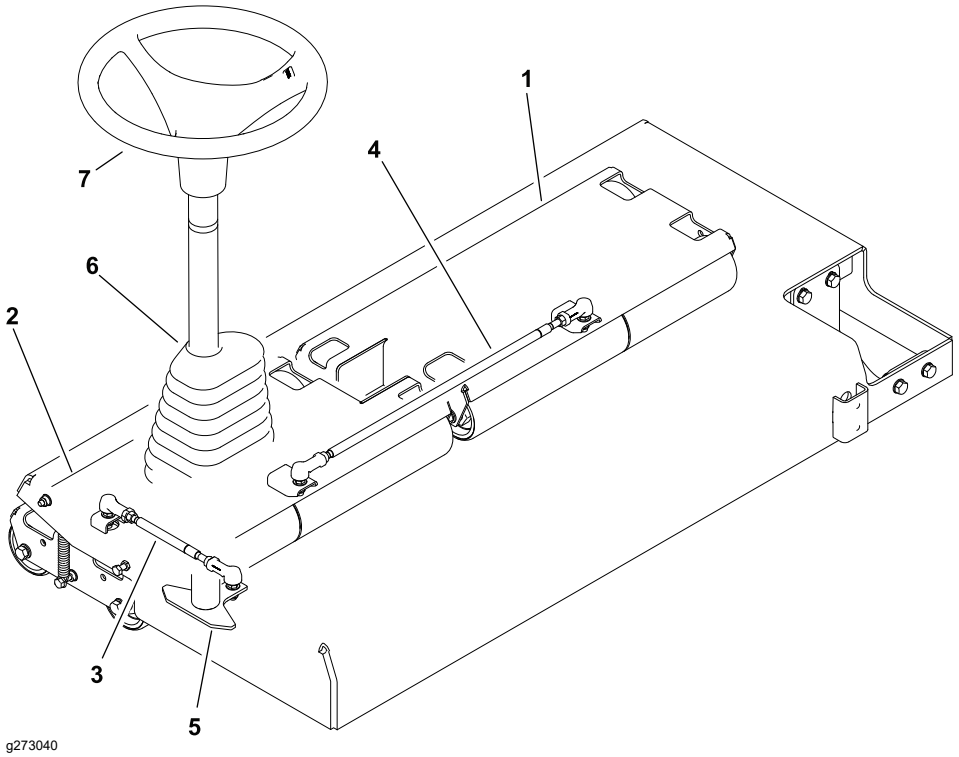


Figure 51
GreensPro 1260

1. Rear steering head
2. Front steering head
3. Steering rod – short
4. Steering rod – long
5. Steering pivot
6. Steering column assembly
7. Steering wheel

The steering system components include the steering wheel and attached steering column, which is connected to the steering pivot, 2 steering pivot rods, and front and rear steering head assemblies (Figure 51). With the exception of the steering wheel and steering column, the steering system components are attached to the underside of the chassis.

When the steering wheel is turned by the operator, the steering pivot is rotated. Steering pivot movement causes the front steering head to be rotated by the first (short) steering rod (item 3). The front steering head and rear steering head are connected by another (long) steering rod (item 4). Turning of the front steering head causes the rear steering head to turn, which allows the machine to turn while in motion.

Transport Frame Operation

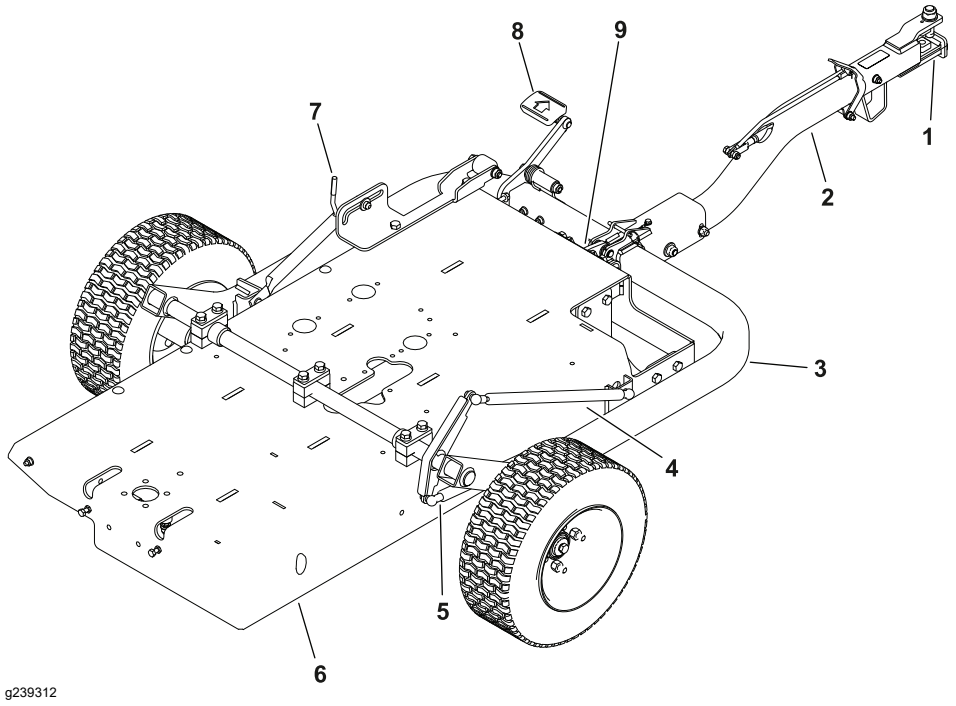


Figure 52

Transport frame in lowered position (chassis raised)

1. Auto hitch slide
2. Tow bar
3. Transport frame
4. Damper
5. Gas spring
6. Chassis
7. Latch (raised)
8. Lift pedal
9. Latch (lowered)

The transport frame of the GreensPro machines is placed in the raised position (chassis lowered) during machine operation, or in the lowered position (chassis raised) when transporting the machine (Figure 52). Refer to the *Operator's Manual* for additional information on raising and lowering the transport frame.

When moving the transport frame into the lowered (transport) position, a gas spring and lift pedal are provided to help raise the chassis off the ground. The assembly is held in the lowered position by a latch mechanism attached to the transport frame near the tow bar. During transport, the tow bar includes an auto hitch slide to lock the machine onto the tow vehicle.

A damper prevents the chassis from lowering too fast when moving the transport frame into the raised position. The transport frame is held in the raised position by a latch mechanism attached to the chassis.

Adjustments

Adjusting the Steering Linkage

⚠ CAUTION ⚠

Use a suitable lifting device to safely raise and support the machine to access the components under the chassis.

1. Insert a block between the steering pivot assembly and chassis to prevent the steering pivot assembly from moving during adjustment, and to position steering pivot assembly square with the chassis (Figure 53). Block should be approximately **19 mm (0.75 inch)** thick.

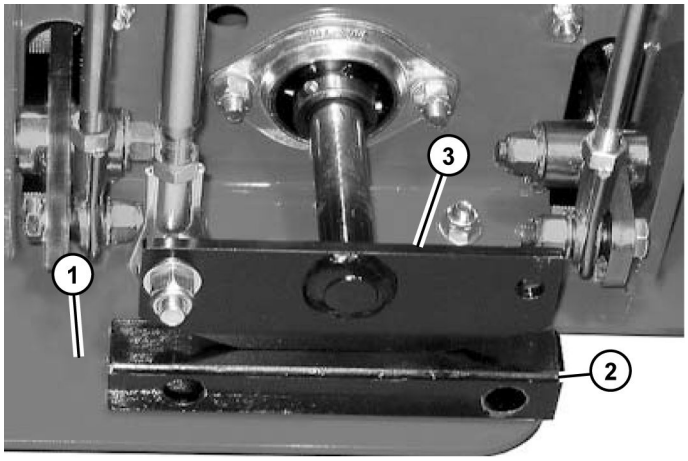


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Figure 53
GreensPro 1240 shown

1. Chassis frame
2. Block
3. Steering pivot assembly

2. **For GreensPro 1240:**

   Note: Each steering linkage rod includes 2 ball joints and 2 hex nuts. To allow adjustment, 1 ball joint and 1 hex nut has left-hand threads, and 1 ball joint and 1 hex nut has right-hand threads. Before attempting to loosen the hex nuts for linkage adjustment, inspect the threads on the linkage rod to determine the thread direction.

   A. Loosen the hex nuts and turn the steering pivot rod until the steering head linkage arm ball joints (on steering disc) are aligned front to back (Figure 54). Do not tighten the steering pivot rod hex nuts at this time.

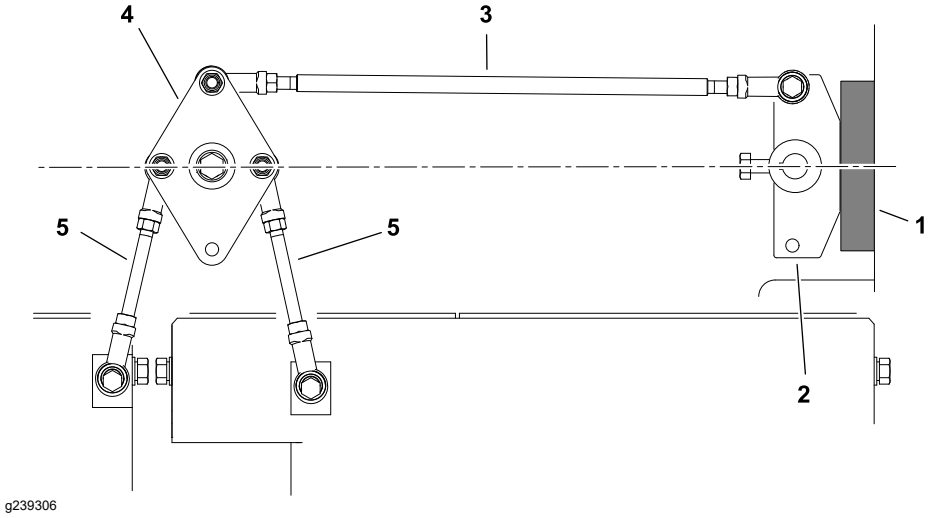


Figure 54
GreensPro 1240

1. Block
2. Steering pivot assembly
3. Steering pivot rod
4. Steering disc
5. Steering head linkage arm (2 each)

B. Loosen the hex nuts of both steering head linkage arms. Turn the steering head linkage arms until the front and rear steering head rollers are aligned with each other to within **2 mm (0.08 inch)**. Place a straightedge across the steering rollers to ensure that the steering rollers are in alignment and adjust the steering head linkage arms as necessary to achieve alignment (Figure 55).

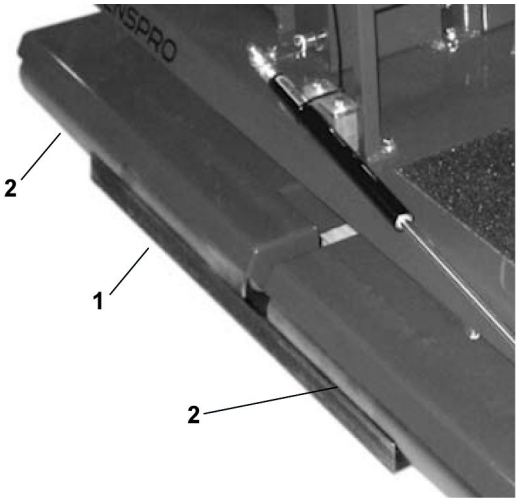


Figure 55

1. Straightedge
2. Steering roller

3. **For GreensPro 1260:**

   Note: Each steering linkage rod includes 2 ball joints and 2 hex nuts. To allow adjustment, 1 ball joint and 1 hex nut has left-hand threads, and 1 ball joint and 1 hex nut has right-hand threads. Before attempting to loosen the hex nuts for linkage adjustment, inspect the threads on the linkage rod to determine the thread direction.

   A. Loosen the hex nuts and turn the short (front) steering rod (item 3 in Figure 56) until the front outer steering roller is aligned with the chassis frame. Do not tighten the steering pivot rod hex nuts at this time.

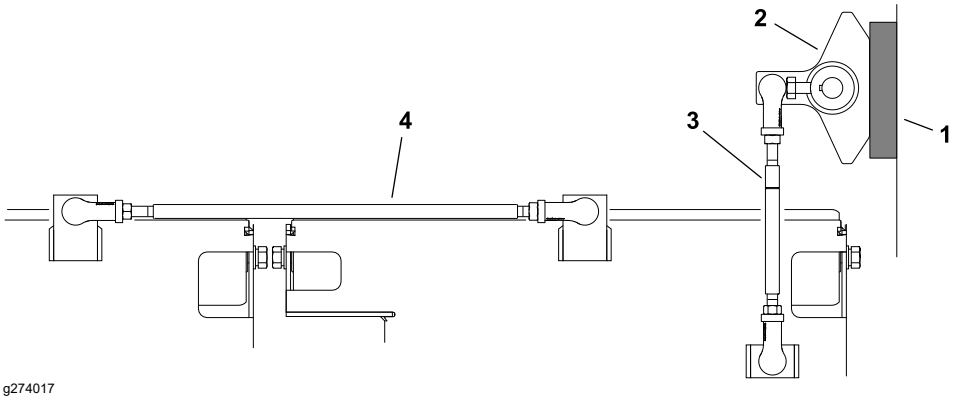


Figure 56
GreensPro 1260

1. Block
2. Steering pivot assembly
3. Steering rod – short
4. Steering rod – long

   B. Loosen the hex nuts of the long (rear) steering rod (item 4 in Figure 56) until the rear outer steering roller is aligned with the chassis frame. Do not tighten the steering pivot rod hex nuts at this time.

   C. Place a straightedge across the steering rollers to ensure the steering rollers are in alignment with each other (Figure 57). Adjust the steering rods as necessary to achieve alignment.

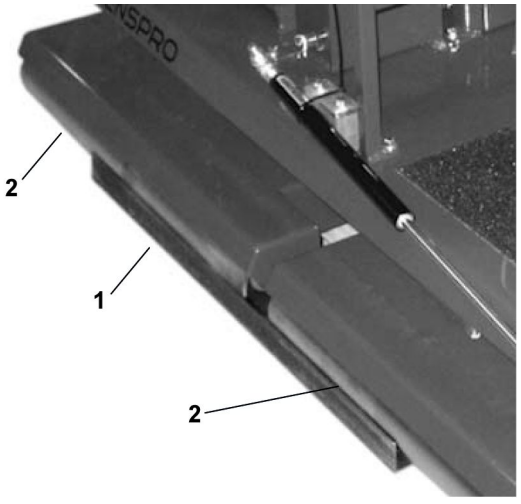


Figure 57

1. Straightedge
2. Steering roller

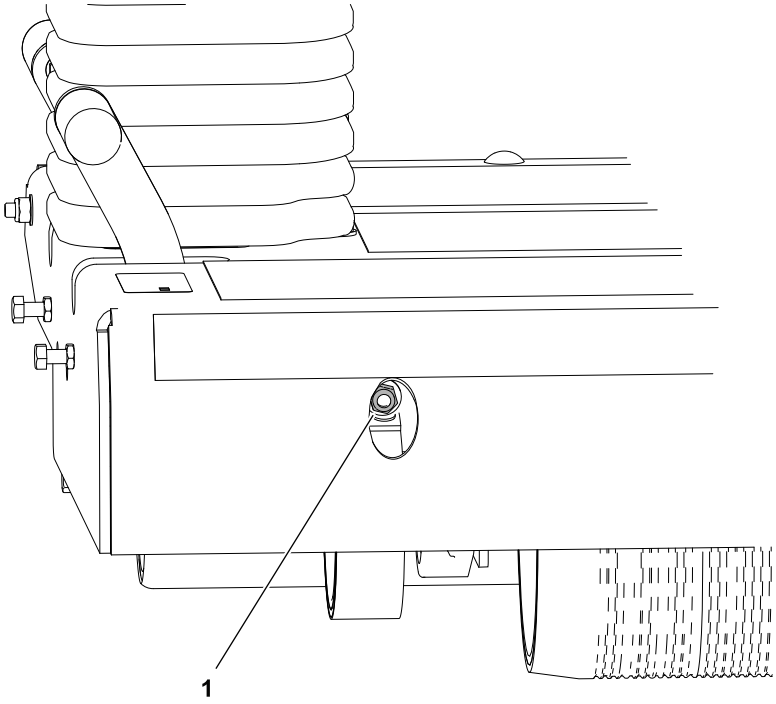
Adjusting the Steering Linkage (continued)

4. Tighten the hex nuts on all the linkage arms/steering rods.
5. If necessary, remove and install the steering wheel square with the machine; refer to Steering Wheel (page 7–33).
6. Remove the block from the steering pivot assembly and chassis.

Adjusting the Parking Brake

Ensure that the parking brake prevents the machine from rolling when it is parked, and that the brake fully disengages when the brake handle is in the disengaged position. Adjust the parking brake as necessary (Figure 58).

- To increase the brake force, tighten the brake lock nut.
- To decrease the brake force, loosen the brake lock nut.



g273283

Figure 58

1. Brake adjustment lock nut

Adjusting the Tow Bar Height

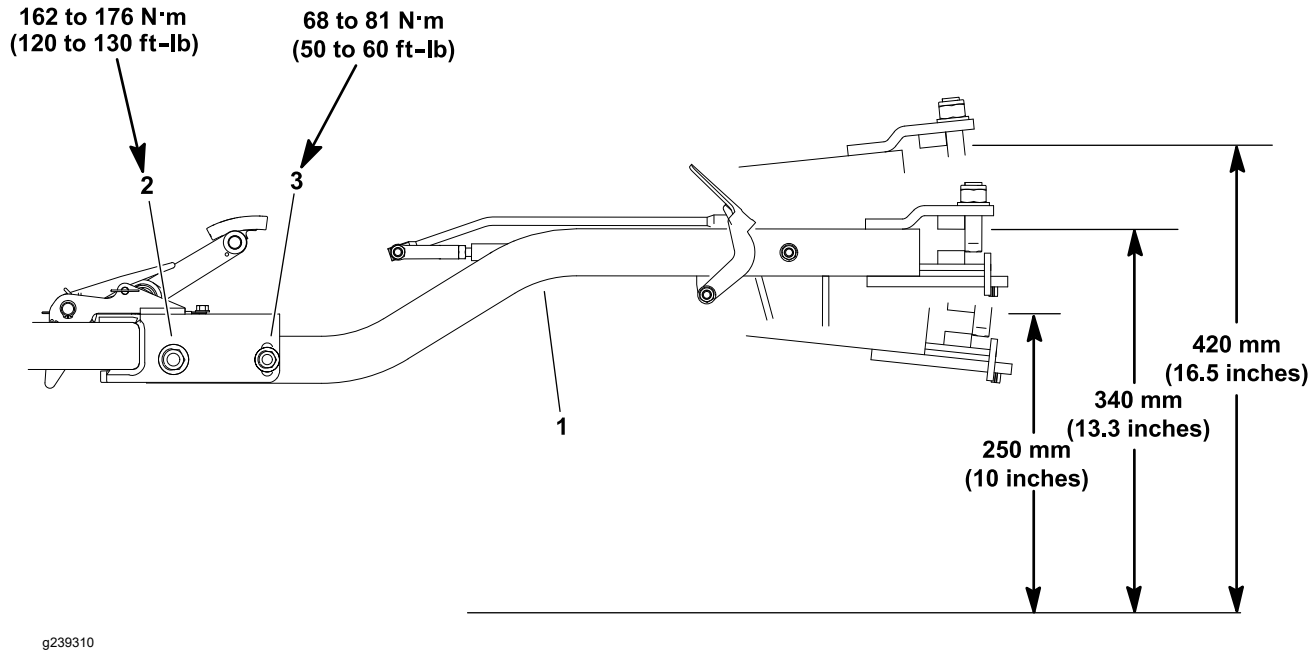


Figure 59

1. Tow bar
2. Front locknut – 12 mm
3. Rear fasteners – 10 mm

The tow bar height of the GreensPro machines can be set to 3 different heights to suit a variety of tow vehicles (Figure 59).

1. Park the machine on a clean, level surface with the transport wheels in the raised and locked position. Shut off the engine.
2. Loosen, but do not remove the front locknut (12 mm) that secures the tow bar to the transport frame.
3. Support the hitch end of the tow bar and remove the rear fasteners (10 mm) that secure the tow bar to the transport frame.
4. Move the tow bar to 1 of the 3 height settings and install the rear fasteners (10 mm).

5. Tighten the fasteners that secure the tow bar to the transport frame:

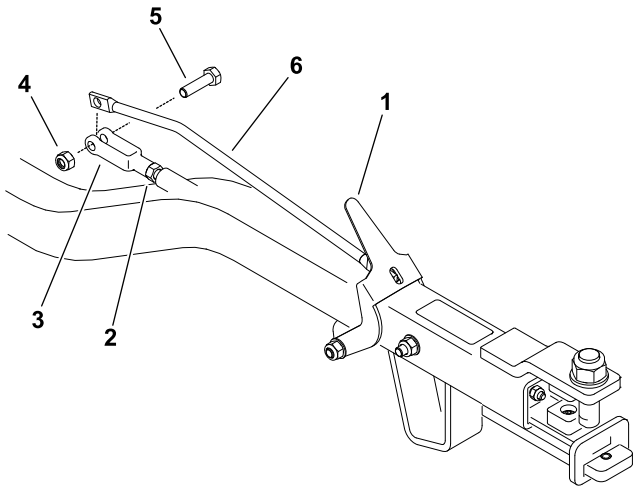
   10 mm bolt = 68 to 81 N·m (50 to 60 ft-lb)

   12 mm bolt = 162 to 176 N·m (120 to 130 ft-lb)

Auto Hitch Slide

The auto hitch mechanism ensures that the GreensPro remains safely connected to the tow vehicle during transport; refer to the *Operator's Manual*. When properly adjusted, the auto hitch lever must be allowed to reach its fully pressed position without restriction from the auto hitch slide. Proper adjustment also allows the slide to reach its stop when the lever is fully released. Check and adjust the auto hitch mechanism as necessary, and after the hitch components are repaired or replaced.

1. To adjust the auto hitch slide, remove the bolt and locknut that secure the lever rod to the adjustable yoke (Figure 60).

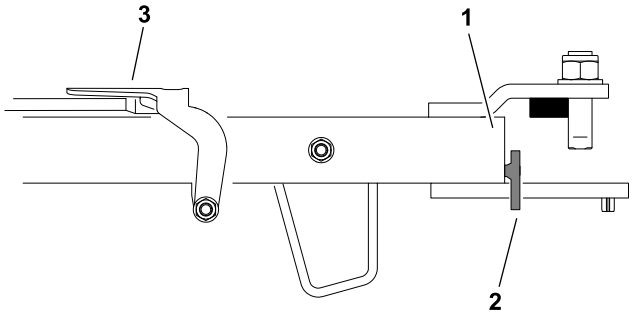


g239303

Figure 60

1. Lever
2. Hex nut
3. Adjustable yoke
4. Locknut
5. Bolt
6. Lever rod

2. Loosen the hex nut against the adjustable yoke and turn the yoke as necessary to increase or decrease the amount of slide travel/lever movement.
3. Temporary install the bolt and locknut that secure the adjustable yoke to the lever rod and check the auto hitch slide mechanism as follows:
   A. Fully press the auto hitch lever downward (Figure 61). The lever should reach the fully pressed position with the lever rod contacting the tow bar. The auto hitch slide should be as close to the end of the tow bar as possible without making contact. Adjust as necessary.

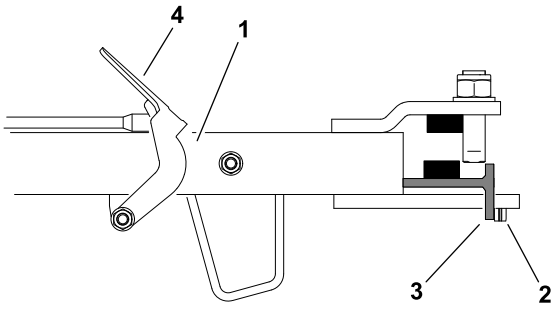


g239304

Figure 61

1. Tow bar
2. Auto hitch slide
3. Lever (pressed)

B. Release the auto hitch lever (Figure 62). The lever should remain in the fully released position. The auto hitch slide should contact the roll pin stop before the lever contacts the tow bar. Adjust as necessary.



g239305

Figure 62

1. Tow bar
2. Roll pin stop
3. Auto hitch slide
4. Lever (released)

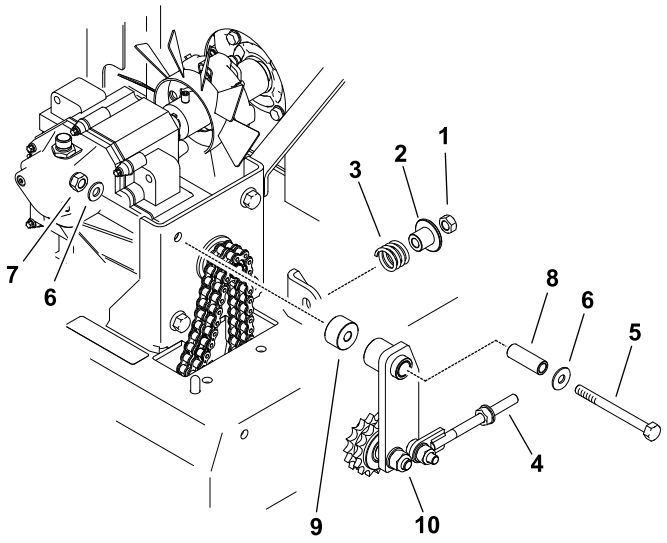
4. Tighten the hex nut against adjustable yoke, and tighten the bolt and locknut that secure the lever rod to the adjustable yoke.

Service and Repairs

Drive Chain Idler Arm (GreensPro 1240)

Removing the Drive Chain Idler Arm

1. Park the machine on a clean, level surface with the transport wheels in the raised and locked position. Shut off the engine. Engage the parking brake if equipped, or remove the spark plug wire from the spark plug.
2. Remove the transmission cover from the machine; refer to Removing the Transmission Cover (page 7–59).
3. Remove the hex nut (item 1 in Figure 63), spacer, and compression spring from the idler adjustment rod.



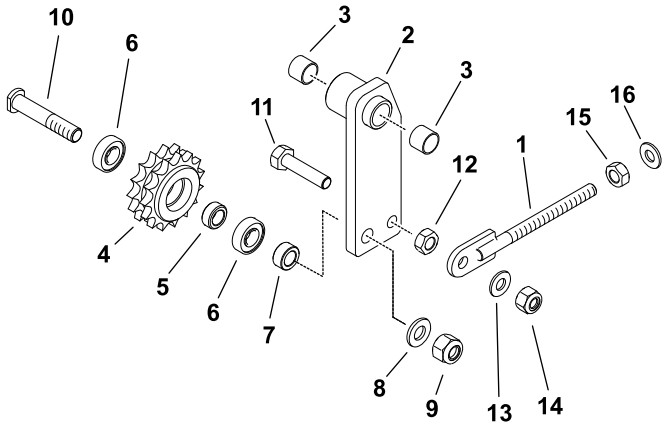
g241025

Figure 63

1.	Hex nut	6.	Flat washer (2 each)
2.	Spacer	7.	Locknut
3.	Compression spring	8.	Pivot bushing
4.	Idler adjustment rod	9.	Spacer
5.	Bolt	10.	Idler arm assembly

4. Remove the bolt, flat washers, locknut, pivot bushing, and spacer that secure the idler arm to the chassis, and remove the idler arm assembly (Figure 64).

Removing the Drive Chain Idler Arm (continued)



g241026

Figure 64

1. Idler adjustment rod
2. Idler arm
3. Bushing (2 each)
4. Idler sprocket assembly
5. Spacer
6. Bearing (2 each)
7. Spacer
8. Flat washer
9. Locknut
10. Bolt
11. Bolt
12. Hex nut
13. Flat washer
14. Locknut
15. Hex nut
16. Flat washer

5. Repair and replace the idler arm assembly components as necessary.

Installing the Drive Chain Idler Arm

1. If removed, install the idler sprocket assembly on the idler arm with the bolt, idler gear bushing, flat washer, and locknut (Figure 64).
2. If removed, install the idler adjustment rod on the idler arm with the bolt, hex nut, flat washer, and locknut. Tighten the bolt to the idler arm with the hex nut, and adjust the locknut so that the idler adjustment rod is free to pivot on the bolt.

3. Install the flat washer and hex nut on the idler adjustment rod. Thread the nut **32 mm (1.25 inches)** onto the rod.
4. Install the idler arm assembly with the locknut, flat washers, bolt, pivot bushing, and spacer.
5. Install the compression spring, spacer, and hex nut on the idler adjustment rod (Figure 63).
6. Adjust the drive chain tension and lubricate the chain; refer to the *Operator's Manual*. Dri-slide multi-purpose lubricant (or an equivalent chain specific lubricant) is recommended.
7. Install the transmission cover to the machine; refer to Transmission Cover (page 7–58).

Motion Control Linkages

Motion Control Linkage (GreensPro 1240)

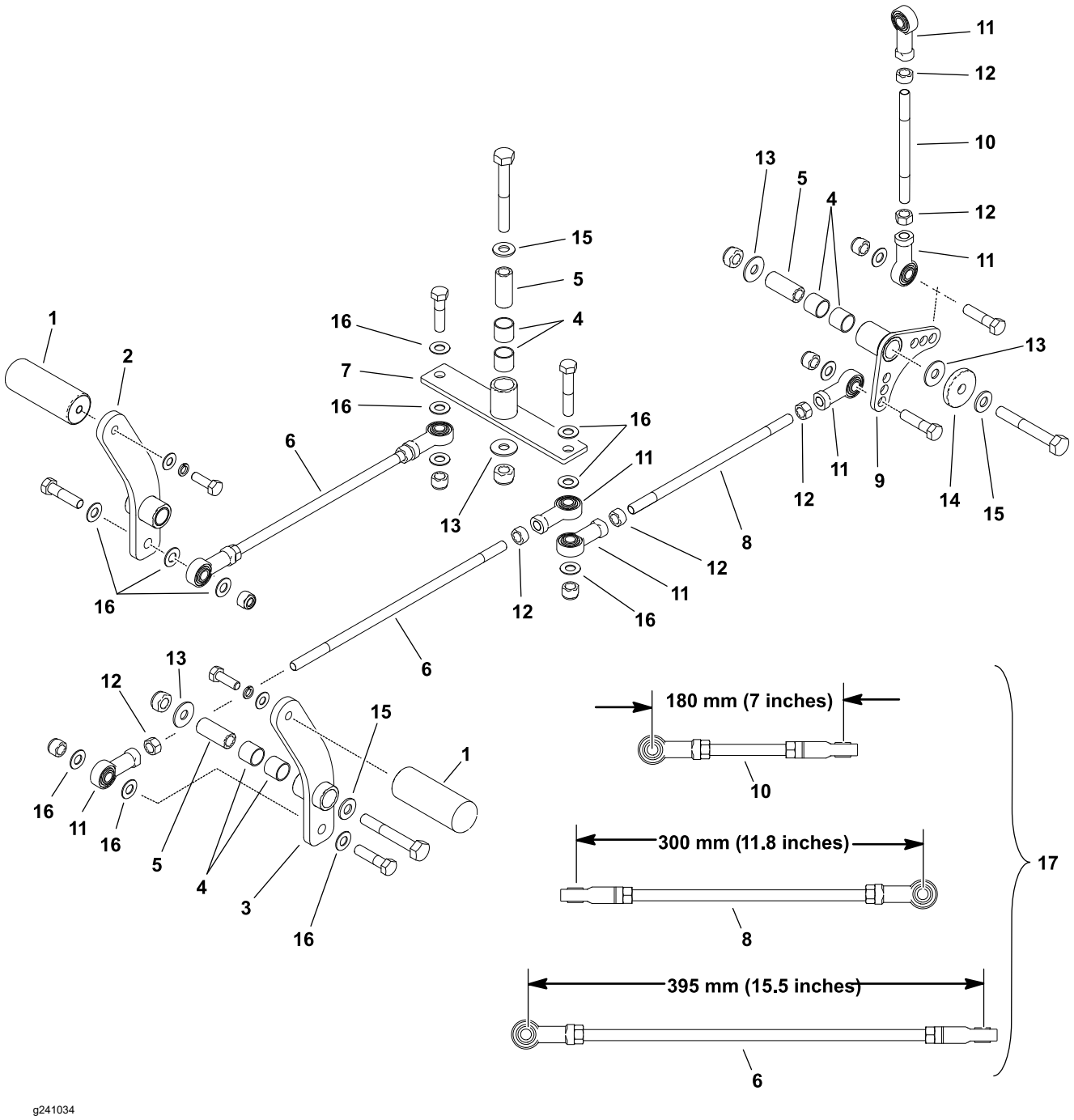


Figure 65
GreensPro 1240

1. Pedal (2 each)
2. Motion pedal assembly (right)
3. Motion pedal assembly (left)
4. Bushing (8 each)
5. Pivot bushing (4 each)
6. Pedal linkage rod (2 each)
7. Rod pivot assembly
8. Quadrant linkage rod
9. Quadrant lever assembly
10. Transmission linkage rod
11. Rod end (left or right-hand thread) (4 each)
12. Hex nut (left or right-hand thread) (4 each)
13. Thick washer (5 each)
14. Collar
15. Flat washer (4 each)
16. Flat washer (14 each)
17. Initial assembly lengths (before final adjustment)

The entire motion control linkage assembly must be secure and move freely in both directions. Repair or replace the motion control linkage assembly components as necessary (Figure 65).

⚠ CAUTION ⚠

Use a suitable lifting device to safely raise and support the machine to get access to the components under the chassis.

Each linkage rod includes 2 ball joints and 2 hex nuts. To allow adjustment, 1 ball joint and hex nut has left-hand threads, and 1 ball joint and hex nut has right-hand threads. Before attempting to loosen the hex nuts for linkage disassembly or adjustment, inspect the threads on the linkage rod to determine the thread direction.

Note: Leave the linkage rod hex nuts loose until the rod ends have been secured and the rod length is adjusted.

After assembly, check the transmission and motion control pedal return to neutral operation and adjust as necessary; refer to Adjusting the Control Pedal Return to Neutral Mechanism (page 5–29).

Motion Control Linkage (GreensPro 1260)

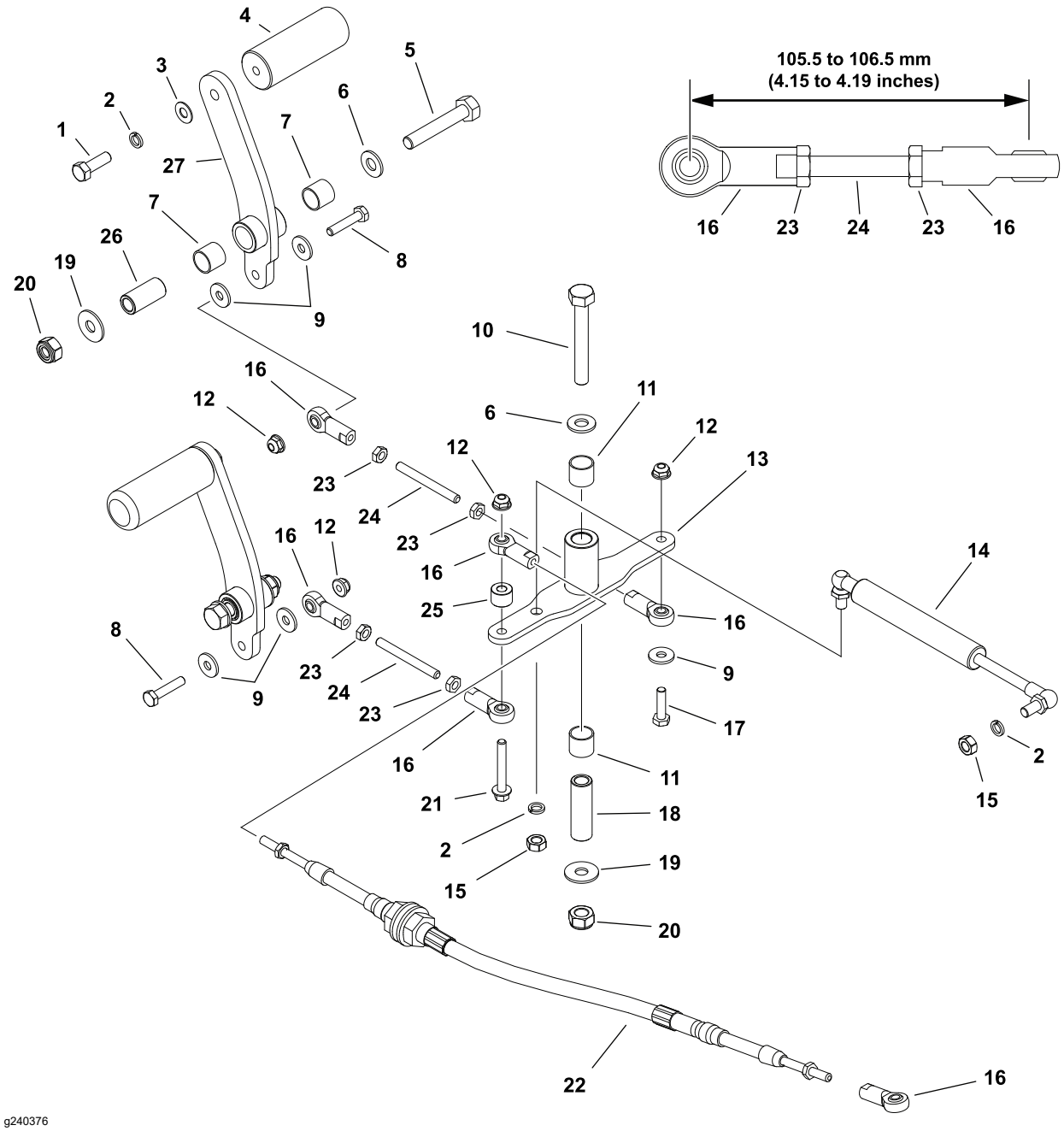


Figure 66
GreensPro 1260

1. Bolt (2 each)
2. Spring washer (4 each)
3. Washer (2 each)
4. Pedal (2 each)
5. Bolt (2 each)
6. Plain washer (3 each)
7. Split bushing (4 each)
8. Bolt (2 each)
9. Flat washer (5 each)
10. Bolt
11. Split bushing (2 each)
12. Flange nut (4 each)
13. Pedal rod pivot assembly
14. Damper
15. Hex nut (2 each)
16. Ball joint (6 each)
17. Bolt
18. Pivot bushing
19. Plated washer (3 each)
20. Locknut (3 each)
21. Flange-head screw
22. Traction cable
23. Jam nut (4 each)
24. Pedal rod (2 each)
25. Bushing
26. Pivot bushing (2 each)
27. Motion pedal assembly (2 each)

The entire motion control linkage assembly must be secure and move freely in both directions. The motion control pedals should contact the pedal stop bolts just before the control arm assembly reaches the end of its rotation (in both directions). Repair or replace the motion control linkage assembly components as necessary (Figure 66).

⚠ CAUTION ⚠

Use a suitable lifting device to safely raise and support the machine to get access to the components under the chassis.

Both of the linkage rod ends have right-hand threads. One of the linkage rod ends must be disconnected from the machine to adjust the linkage rod length.

Note: Leave the linkage rod hex nuts loose until the rod ends have been secured and the rod length is adjusted.

After assembly, check the hydraulic pump and motion control pedal return to neutral operation and adjust as necessary; refer to Adjusting the Control Pedal Return to Neutral Mechanism (page 5–29).

Drive Roller (GreensPro 1240)

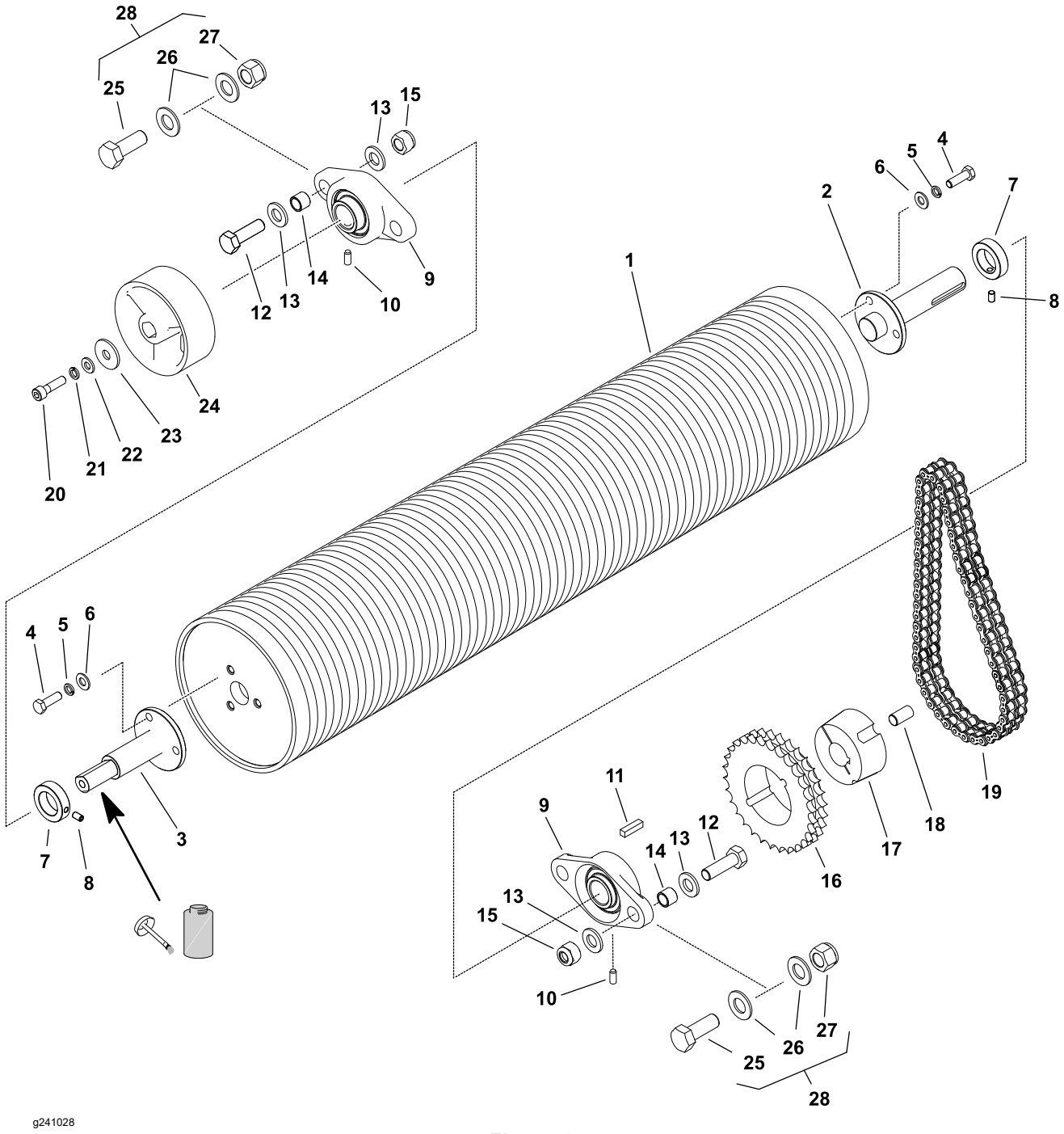


Figure 67
GreensPro 1240

1. Drive roller
2. Roller shaft (drive)
3. Roller shaft (brake)
4. Bolt (6 each)
5. Lock washer (6 each)
6. Flat washer (6 each)
7. Bearing collar (2 each)
8. Set screw (2 each)
9. Bearing (2 each)
10. Set screw (2 each)
11. Key
12. Bolt 12 mm (4 each)
13. Flat washer 12 mm (8 each)
14. Sleeve (4 each)
15. Locknut 12 mm (4 each)
16. Sprocket
17. Taper lock bushing
18. Set screw (2 each)
19. Drive chain
20. Socket-head screw
21. Lock washer
22. Flat washer
23. Hardened washer
24. Brake hub
25. Bolt 16 mm (4 each)
26. Flat washer 16 mm (8 each)
27. Locknut 16 mm (4 each)
28. Serial number below 315000000

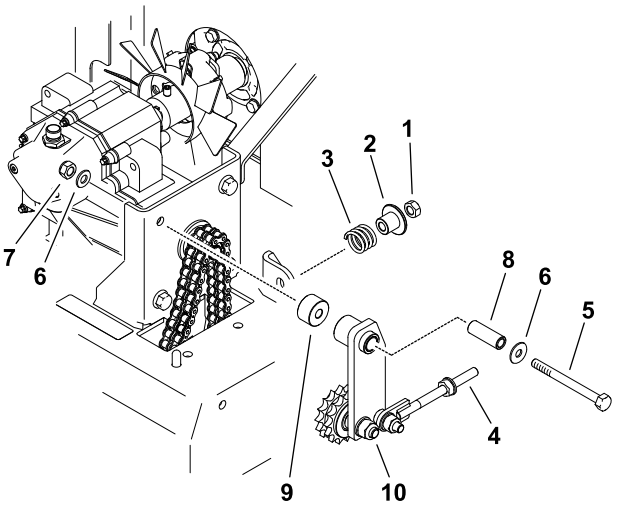
Removing the Drive Roller (GreensPro 1240)

Refer to Figure 67 for this procedure.

⚠ CAUTION ⚠

Use a suitable lifting device to safely raise and support the machine to get access to the components under the chassis.

1. Remove the transmission cover from the machine; refer to Removing the Transmission Cover (page 7–59).
2. Remove the hex nut, spacer, and compression spring (item 3 in Figure 68) from the idler adjustment rod.

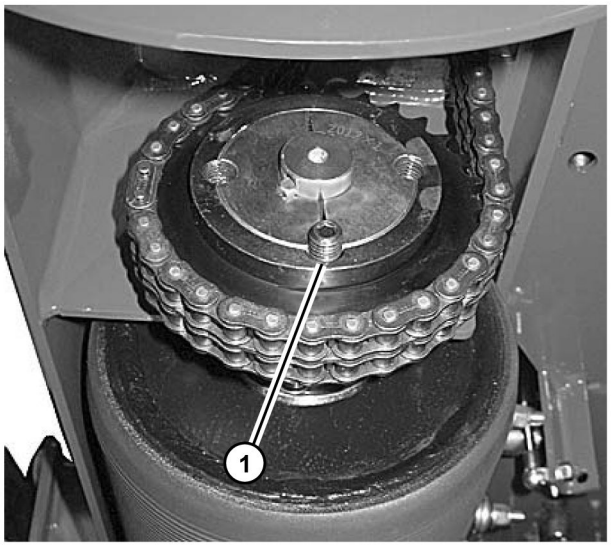


g241029

Figure 68

1.	Hex nut	6.	Flat washer (2 each)
2.	Spacer	7.	Locknut
3.	Compression spring	8.	Pivot bushing
4.	Idler adjustment rod	9.	Spacer
5.	Bolt	10.	Idler arm assembly

3. Remove the bolt, flat washers, locknut, pivot bushing, and spacer, and remove the idler arm assembly from the machine.
4. Remove the drive roller sprocket from the taper lock bushing:
   A. Remove the 2 set screws that secure the sprocket to the taper lock bushing.
   B. Oil the thread and the end of 1 of the set screws and insert the screw in removal hole (Figure 69). The bushing removal hole is threaded on the bushing side.



g241030

Figure 69

1. Set screw in bushing removal hole

C. Tighten the set screw until the bushing is loose in the sprocket.

Note: It may be necessary to tap on the sprocket to loosen the bushing.

5. Use a straight blade screwdriver in the taper lock bushing slot to spread the bushing slightly if necessary and remove the taper lock bushing, drive chain, sprocket, and key from the driver roller shaft.
6. Remove the parking brake assembly if equipped; refer to Removing the Parking Brake (page 7–30).

⚠ CAUTION ⚠

The weight of the drive roller assembly is approximately 30 kg (66 lb).

Support the drive roller assembly during removal.

7. Remove the bolts, flat washers, and locknuts that secure the bearings to the chassis, and remove the drive roller assembly.
8. Retrieve the sleeves from the bearing mounting holes if equipped.

Installing the Drive Roller (GreensPro 1240)

Refer to Figure 67 for this procedure.

Note: Machines with serial number below 315000000 use 16 mm fasteners to secure the drive roller bearings to the chassis. These machines do not require the use of sleeves in the bearing mounting holes.

1. Loosen the bearing and bearing collar set screws.
2. Lift the drive roller assembly into position. Drive chain must encircle the drive end of the roller shaft.
3. If applicable, ensure that the sleeves (item 14 in Figure 67) are installed in each bearing housing mounting hole. Attach the bearings to the chassis with the bolts, flat washers, and locknuts.
4. Tighten the bearing set screws.

5. Move the bearing collars against the bearings and tighten the bearing collar set screws.
6. Install the parking brake assembly if equipped; refer to Installing the Parking Brake (page 7–31).

   Ensure that the entire width of the brake band contacts the brake hub when the brake is engaged. Loosen and adjust the drive roller bearings and bearing collars to align the brake band to the brake hub if necessary.
7. Ensure that the tapered surfaces of the drive roller sprocket and taper lock bushing are clean (no oil, grease, dirt, rust, etc.).
8. Position the sprocket on drive end roller shaft with the small end of the inner taper toward the roller and the drive chain on the sprocket.
9. Install the key (item 11 in Figure 67) on the shaft. Use a straight blade screwdriver in the taper lock bushing slot to spread the taper lock bushing slightly if necessary and slide the bushing onto the roller shaft and key with the small end of the outer taper toward the roller. Rotate the drive roller as necessary to align the mounting holes in bushing with the mounting holes in sprocket.
10. Oil the threads and end of the set screws and install the set screws loosely into the bushing installation holes (Figure 70). The bushing installation holes are threaded on the sprocket side.

g241031

Figure 70

1. Set screws in bushing installation holes

Note: The small drive sprocket is designed to move slightly along the transmission output shaft. Keep this feature in mind if necessary when installing and aligning the drive chain and drive roller sprocket.

11. Use a straightedge across the drive chain side the plates, slide the sprocket and taper lock bushing on the roller shaft so that the drive chain and straightedge are aligned to within **0.57 mm (0.02 inch)**.

IMPORTANT

When tightening the taper lock bushing set screws, tighten in 3 equal steps and in an alternating pattern.

12. Tighten the set screws that secure the taper lock bushing and sprocket; tighten the set screws to **31 N·m (23 ft-lb)** in 3 equal steps and in an alternating pattern.
13. Check that the roller drive chain alignment is still correct and adjust if necessary.
    A. Machines without a parking brake: loosen and adjust the drive roller bearings and bearing collars to allow for correct drive chain alignment.
    B. Machines with a parking brake: loosen and adjust the sprocket and taper lock bushing location on roller shaft.
14. Install the idler arm assembly (item 10 in Figure 68) with the locknut, flat washers, bolt, pivot bushing, and spacer.
15. Install the compression spring, spacer, and hex nut on the idler adjustment rod.
16. Adjust the drive chain tension and lubricate the chain; refer to the *Operator's Manual*. Dri-slide multi-purpose lubricant (or equivalent) is recommended for chain lubrication.
17. Adjust the parking brake if equipped; refer to the *Operator's Manual*.
18. Install the transmission cover to the machine; refer to Installing the Parking Brake (page 7–31).

Servicing the Drive Roller (GreensPro 1240)

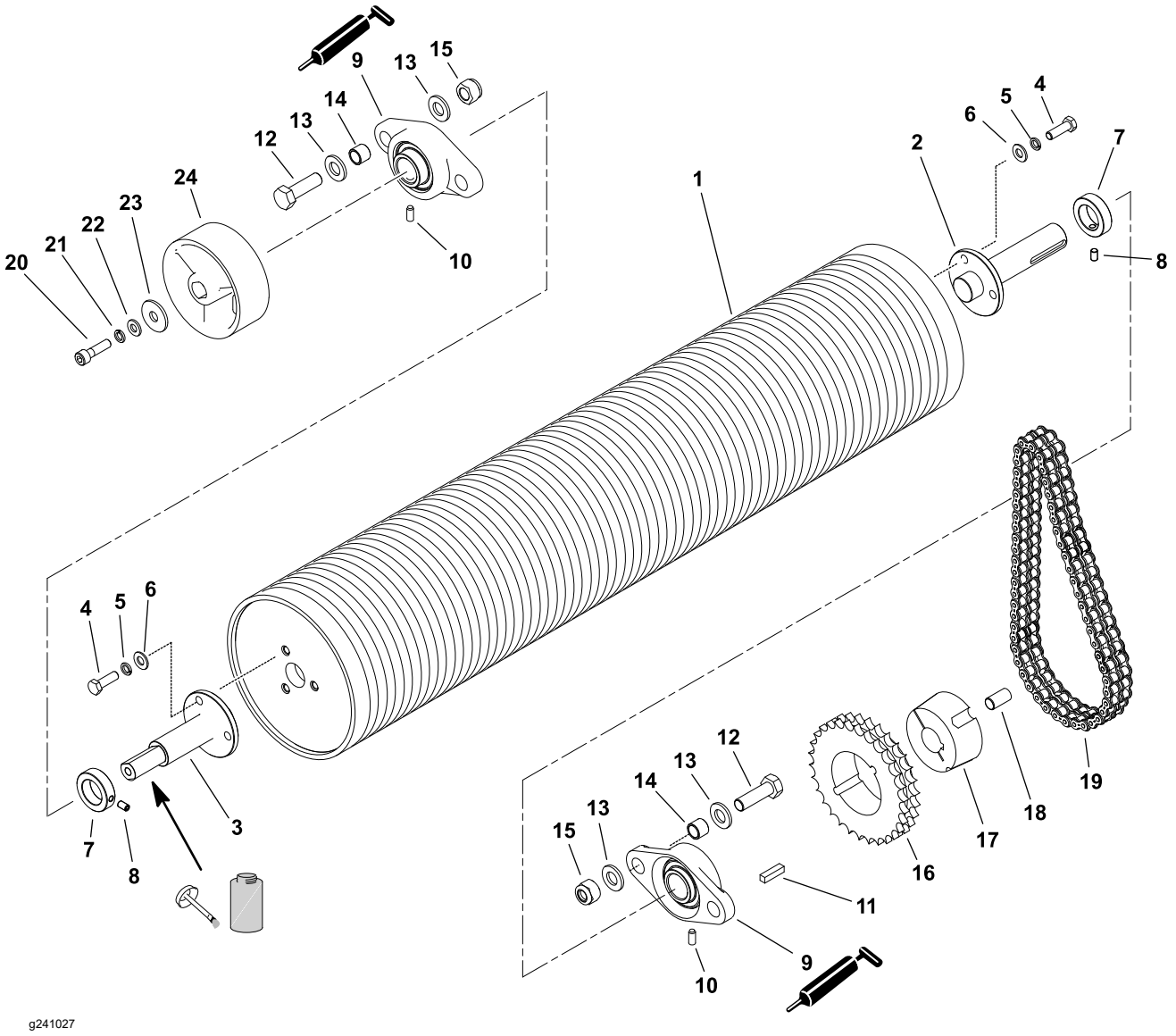


Figure 71
GreensPro 1240

1. Drive roller	9. Bearing (2 each)	17. Taper lock bushing
2. Roller shaft (drive)	10. Set screw (2 each)	18. Set screw (2 each)
3. Roller shaft (brake)	11. Key	19. Drive chain
4. Bolt (6 each)	12. Bolt (4 each)	20. Socket-head screw
5. Lock washer (6 each)	13. Flat washer (8 each)	21. Lock washer
6. Flat washer (6 each)	14. Spacer (4 each)	22. Flat washer
7. Bearing collar (2 each)	15. Locknut (4 each)	23. Hardened washer
8. Set screw (2 each)	16. Sprocket	24. Brake hub

Disassembling the Drive Roller (GreensPro 1240)

Refer to Figure 71 for this procedure.

1. Record the distance from the end of the drive roller to each of the bearing collars before removal.

Disassembling the Drive Roller (GreensPro 1240) (continued)

2. Loosen the set screws and remove the bearing collars and bearing assemblies.
3. Remove the bolts, lock washers, and flat washers that secure the roller shafts to the drive roller, and remove the roller shafts.

Assembling the Drive Roller (GreensPro 1240)

Refer to Figure 71 for this procedure.

1. Install the roller shafts with the bolts, lock washers, and flat washers.

   Note: It may be necessary to re-position the bearings and bearing collars during the drive roller installation.

2. Position the bearing collars on the roller shafts in locations recorded during disassembly and lightly tighten the set screws.
3. Position the bearings on the roller shafts against bearing collars and lightly tighten the bearing collar set screws.
4. Lubricate the bearing grease fittings until grease is visible on the outer surface of the bearing. Wipe away any excess grease.

Drive Roller (GreensPro 1260)

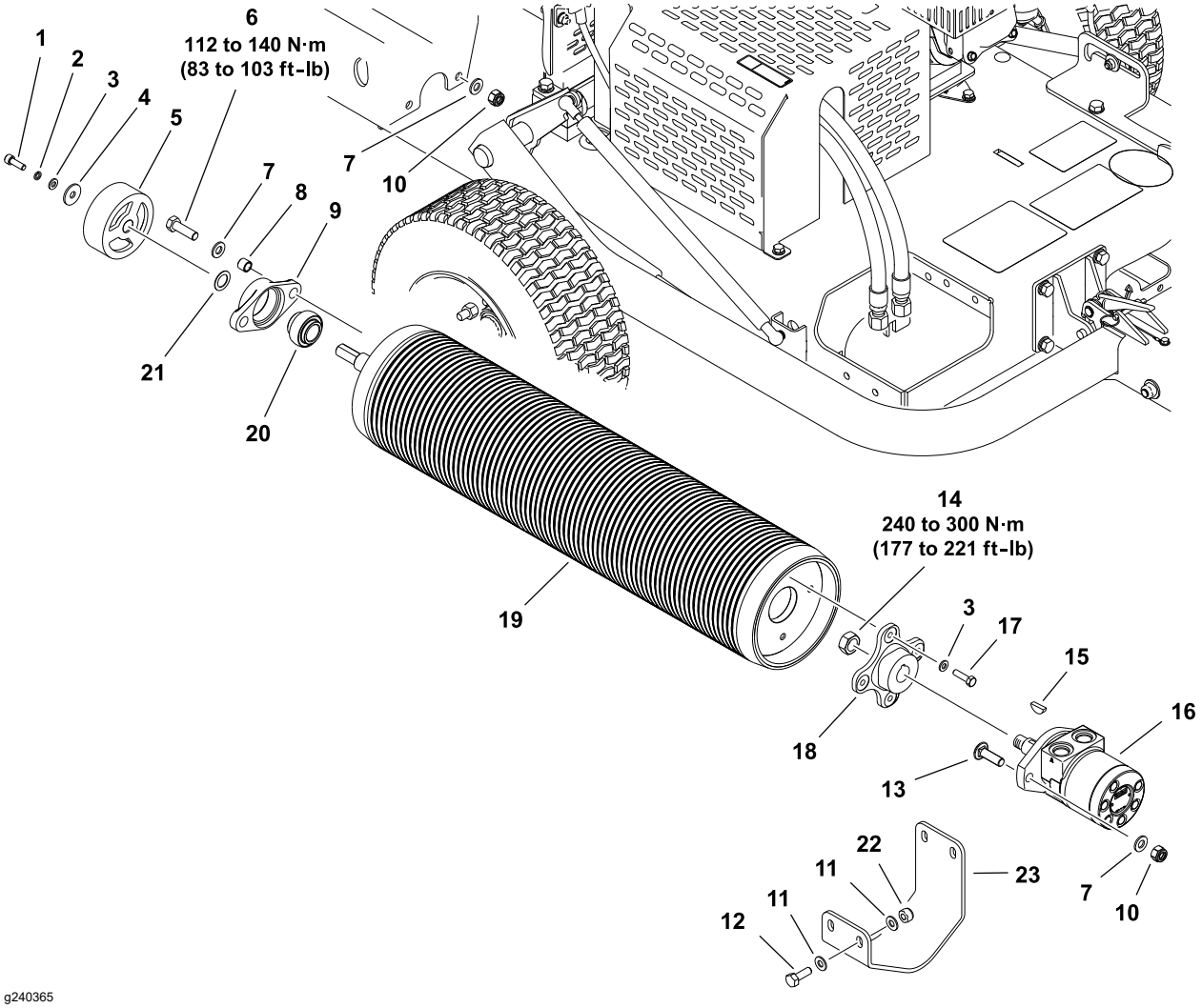


Figure 72

1. Socket-head screw	10. Locknut (4 each)	19. Bolt (4 each)
2. Spring washer	11. Plain washer (8 each)	20. Drive roller hub
3. Plain washer (5 each)	12. Bolt (2 each)	21. Drive roller
4. Hardened washer	13. Carriage screw (2 each)	22. Bearing
5. Brake hub	14. Bolt (2 each)	23. Spacer
6. Bolt (2 each)	15. Chassis	24. Nut (4 each)
7. Plain washer (6 each)	16. Wheel motor nut	25. Motor guard
8. Spacer (2 each)	17. Woodruff key	
9. Bearing housing	18. Hydraulic motor	

The hydraulic motor and drive roller should be removed from machine as an assembly. Once removed from the machine, the drive roller can be separated for service.

Removing the Drive Roller (GreensPro 1260)

Refer to Figure 72 for this procedure.

Note: Disconnecting the hydraulic hoses from the drive motor may not be necessary to remove the drive roller.

Removing the Drive Roller (GreensPro 1260) (continued)

1. Remove the drive roller assembly; refer to Removing the Hydraulic Motor and Drive Roller Assembly (page 5–55).
2. Remove the hydraulic motor and drive hub from the drive roller.

Installing the Drive Roller (GreensPro 1260)

Refer to Figure 72 for this procedure.

1. Secure the hydraulic motor and drive hub to the drive roller.
2. Install the drive roller assembly; Installing the Hydraulic Motor and Drive Roller Assembly (page 5–56).

Servicing the Drive Roller (GreensPro 1260)

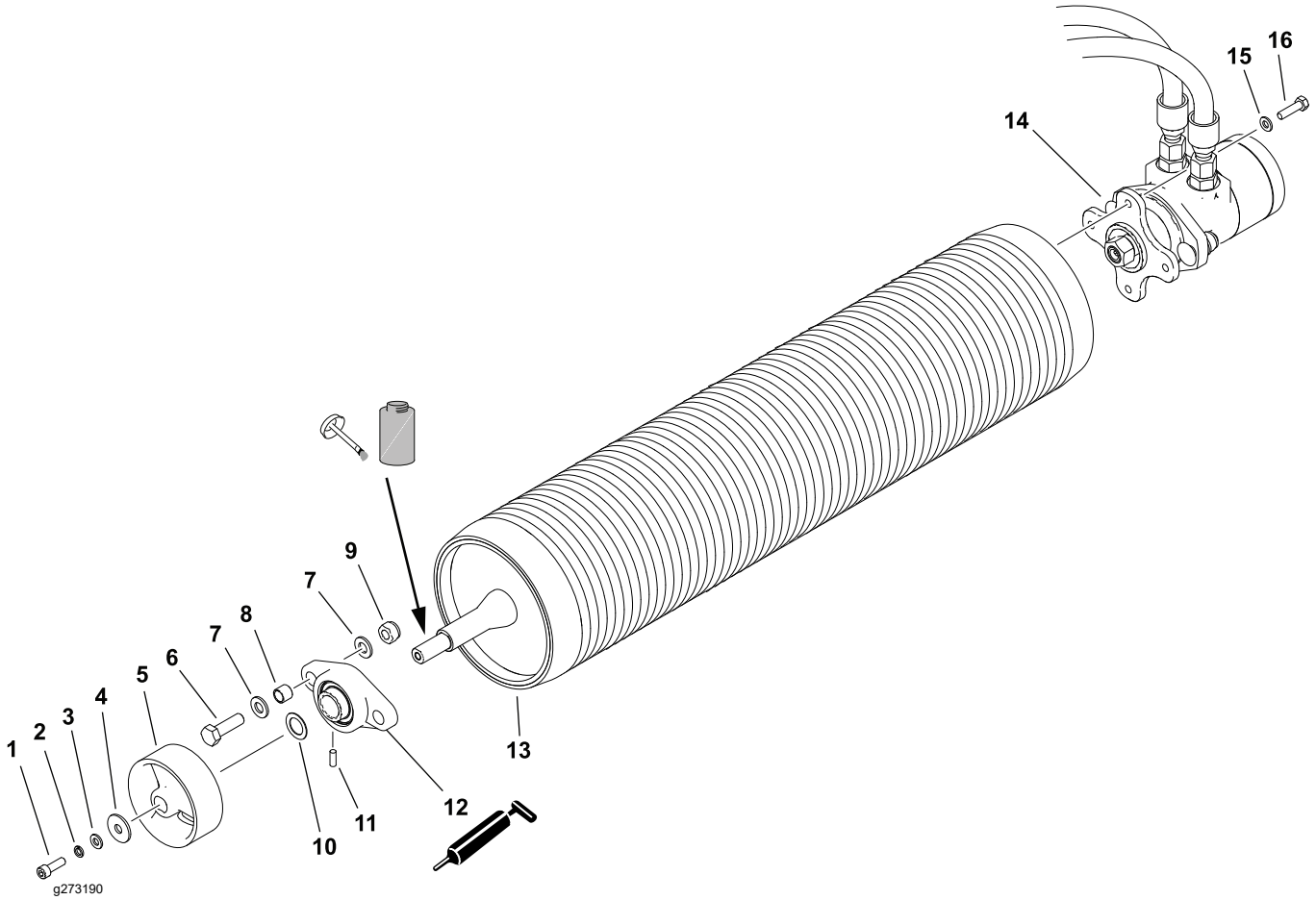


Figure 73
GreensPro 1260

1. Socket-head screw
2. Lock washer
3. Plain washer
4. Hardened washer
5. Brake hub
6. Bolt (2 each)
7. Plain washer (4 each)
8. Spacer (2 each)
9. Locknut (2 each)
10. Shim (as required)
11. Set screw
12. Bearing housing
13. Drive roller
14. Motor and drive hub assembly
15. Plain washer (2 each)
16. Cap screw (2 each)

Disassembling the Drive Roller (GreensPro 1260)

Refer to Figure 73 for this procedure.

1. Record the distance from the end of the drive roller to the bearing before removal.
2. Loosen the set screw and remove the bearing assembly.

Assembling the Drive Roller (GreensPro 1260)

Refer to Figure 73 for this procedure.

Note: It may be necessary to re-position the bearing during the drive roller installation.

1. Position the bearing on the roller shaft in the location recorder during disassembly and lightly tighten the bearing collar set screw.

2. Lubricate the bearing grease fitting until grease is visible on the outer surface of the bearing. Wipe away any excess grease.

Parking Brake (machine serial number above 315000000)

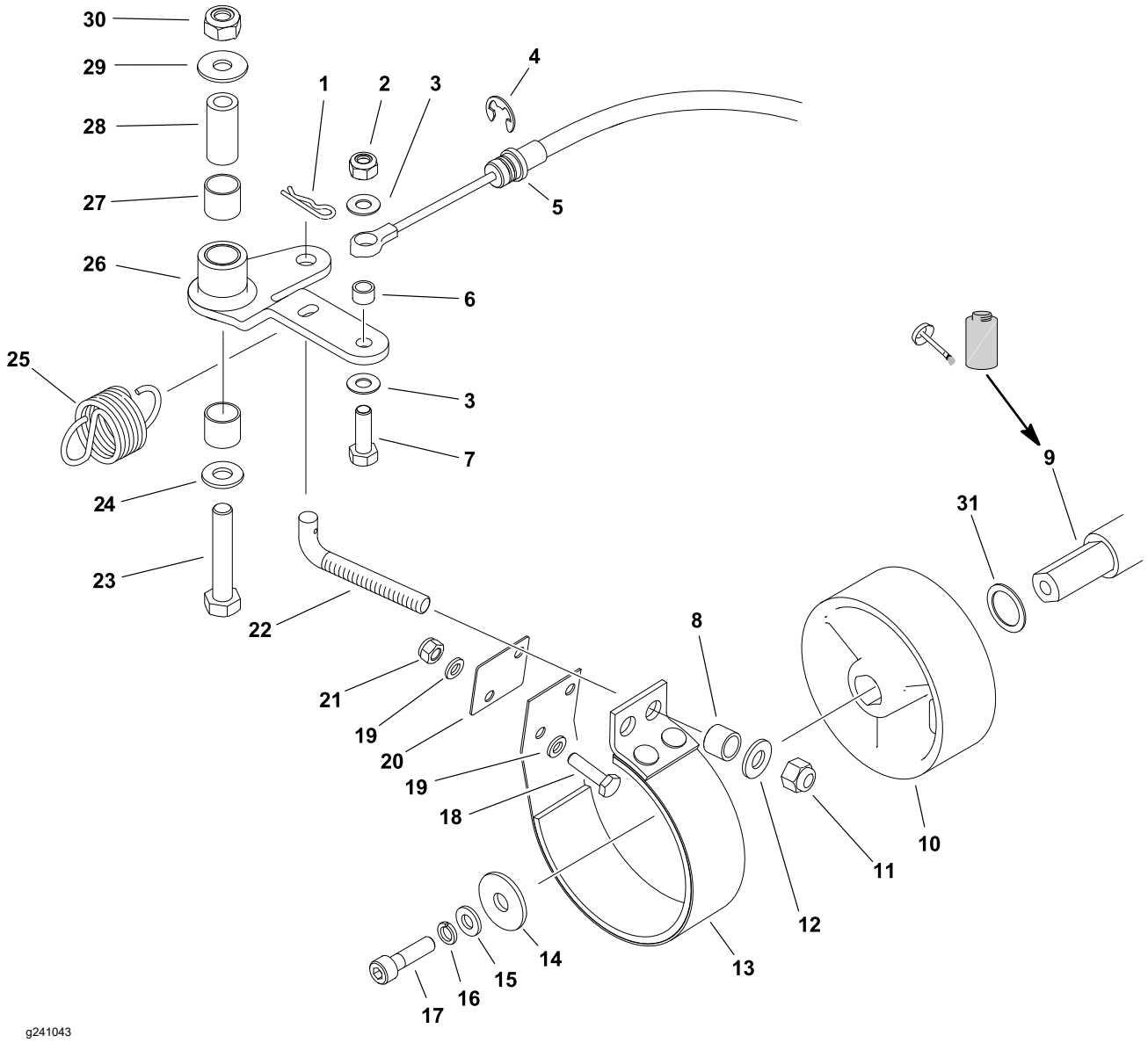


Figure 74

1. Hairpin cotter
2. Locknut
3. Flat washer (2 each)
4. E-ring
5. Brake cable
6. Sleeve
7. Bolt
8. Spacer
9. Drive roller shaft
10. Brake hub
11. Locknut
12. Flat washer
13. Brake band
14. Hardened washer
15. Flat washer
16. Lock washer
17. Socket-head screw
18. Bolt (2 each)
19. Flat washer (4 each)
20. Shim (as necessary)
21. Locknut (2 each)
22. Brake rod
23. Bolt
24. Flat washer
25. Brake return spring
26. Brake pivot arm
27. Bushing (2 each)
28. Pivot bushing
29. Flat washer
30. Locknut
31. Shim – 1260 (as required)

Removing the Parking Brake

Refer to Figure 73 for this procedure.

Removing the Parking Brake (continued)

⚠ CAUTION ⚠

Use a suitable lifting device to safely raise and support the machine to get access to the components under the chassis.

1. Ensure that the parking brake is disengaged.
2. Disconnect the brake return spring from the chassis.
3. Remove the locknut, flat washer, and spacer from the brake rod.
4. Remove the hairpin cotter from the brake rod, and remove the brake rod from the brake pivot arm.
5. Remove the socket-head screw, lock washer, flat washer, and hardened washer that secure the brake hub to the drive roller shaft, and remove the brake hub from the shaft.

   Note: GreensPro 1260 machines may use shims behind the brake hub. Retrieve the shims if used.
6. Remove the 2 bolts, 4 flat washers, and 2 locknuts that secure the brake band to the chassis, and remove the brake band and shims (if any) from the chassis.
7. If necessary, remove the brake pivot arm (item 26) as follows:
   A. Remove the bolt, 2 flat washers, pivot bushing, and locknut that secure the brake pivot arm to the chassis.
   B. Remove the bolt, 2 flat washers, locknut, and sleeve that secure the brake cable to the brake pivot arm, and disconnect the brake cable from the brake pivot arm.
   C. Remove the brake pivot arm from the machine.
8. Repair or replace the parking brake components as necessary.

Installing the Parking Brake

Refer to Figure 74 for this procedure.

1. If previously removed, install the brake pivot arm (item 26).
   A. Connect the brake cable to the brake pivot arm with the bolt, 2 flat washers, sleeve, and locknut.
   B. Insert the pivot bushing in the brake pivot arm and secure the brake pivot arm to the chassis with the bolt, 2 flat washers, and locknut.

   Note: GreensPro 1260 machines may use shims behind the brake hub. If shims were removed during disassembly, Fit the same number of shims on the roller shaft before installing the brake hub.
2. Apply a thin coat of anti-seize lubricant to the brake end of the drive roller shaft. Install the brake hub with the hardened washer, flat washer, lock washer, and socket-head screw. Tighten the screw finger tight and wipe away any excess lubricant.
3. Place shims between the brake band and chassis until adding 1 more shim would cause the band lining to contact the brake hub (Figure 75).

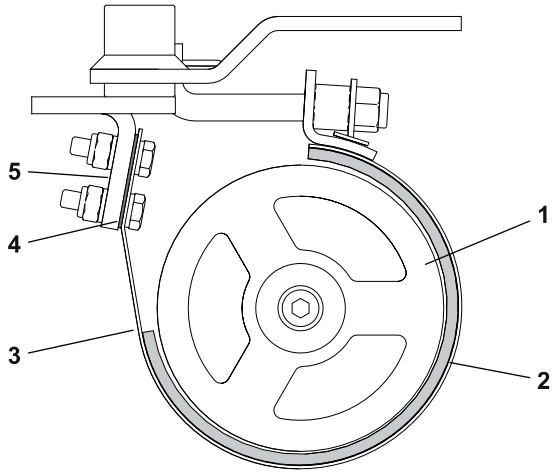


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Figure 75

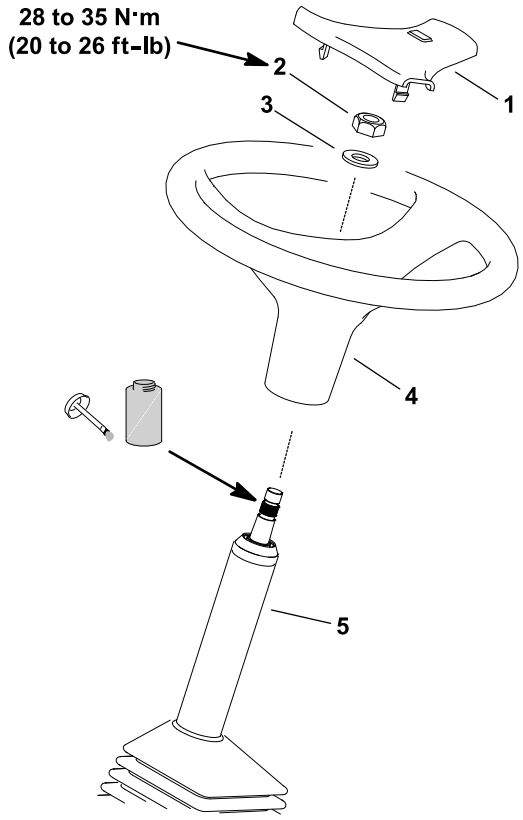
1. Brake hub
2. Band lining
3. Brake band
4. Shim
5. Chassis

4. Install the brake band and shims (if any) with the 2 bolts, 4 flat washers, and 2 locknuts.

   Note: On GreensPro 1260 machines, use shims behind the brake hub to center the hub in the brake band if necessary.

5. Tighten the socket-head screw that secures the brake hub to the drive roller shaft.
6. Install the brake rod (item 22) to the brake pivot arm with the hairpin cotter.
7. Pass the brake rod through the brake band and install the spacer, flat washer, and locknut on the end of the brake rod.
8. Connect the brake return spring to the chassis.
9. Adjust the parking brake; refer to the GreensPro *Operator's Manual*.

Steering Wheel



g239308

Figure 76

1. Steering wheel cover
2. Locknut
3. Flat washer
4. Steering wheel
5. Steering column

Removing the Steering Wheel

Refer to Figure 76 for this procedure.

1. Park the machine on a clean, level surface with the transport wheels in the raised and locked position. Shut off the engine. Engage the parking brake if equipped, or remove the spark plug wire from the spark plug.
2. Remove the steering wheel cover from the steering wheel by carefully prying up on one of the cover spokes.
3. Remove the locknut and flat washer that secure the steering wheel to the steering column.
4. Remove the steering wheel from the steering column. Use a suitable puller if necessary.

Installing the Steering Wheel

Refer to Figure 76 for this procedure.

1. Clean the tapered surfaces of the steering wheel and steering column.
2. Apply a thin coat of anti-seize lubricant to the splines of steering column and ensure to keep the anti-seize lubricant from the steering column taper. Slide the steering wheel onto the steering column.

Installing the Steering Wheel (continued)

3. Secure the steering wheel to the steering column with the flat washer and locknut; tighten the locknut to **28 to 35 N·m (20 to 26 ft-lb)**.

4. Install the steering wheel cover onto the steering wheel.

Steering Column

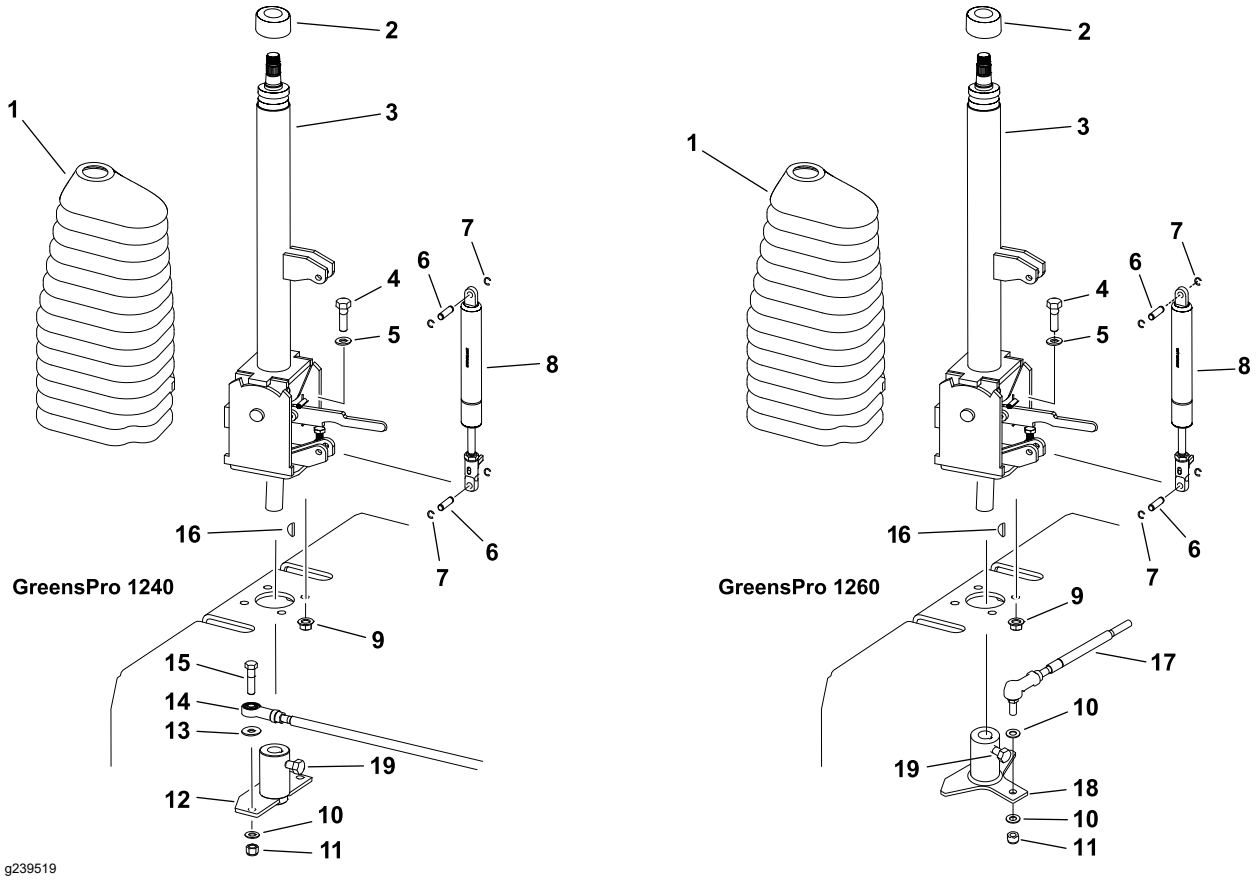


Figure 77

1. Steering column boot
2. Bearing cover
3. Steering column
4. Bolt (4 each)
5. Flat washer (4 each)
6. Pivot pin (2 each)
7. E-ring (4 each)
8. Gas spring assembly
9. Flange nut (4 each)
10. Flat washer
11. Locknut
12. Steering pivot
13. Flat washer
14. Steering pivot linkage rod
15. Bolt
16. Woodruff key
17. Steering pivot rod
18. Steering pivot
19. Set screw

Removing the Steering Column

Refer to Figure 77 for this procedure.

⚠ CAUTION ⚠

Use a suitable lifting device to safely raise and support the machine to get access to the components under the chassis.

1. Remove the steering wheel; refer to Removing the Steering Wheel (page 7–33).
2. Remove the bearing cover from the top of the steering column.
3. Remove the steering column boot as follows:
   A. Set the steering column tilt to the fully rearward position.
   B. Gently pull the steering column boot over the tilt control lever.

C. Set the steering column tilt to the fully forward position.

D. Carefully lift the boot up and off the steering column.

4. The steering column gas spring assembly controls the steering column tilt position. If the gas spring assembly replacement is necessary, remove the gas spring assembly as follows:

   A. Set the steering column tilt to the fully forward position.

   B. Remove an E-ring (item 7) from an end of each pivot pin.

⚠ CAUTION ⚠

Be careful when removing or installing the gas spring assembly. The assembly may extend suddenly and cause personal injury.

   C. Remove the 2 pivot pins out, and remove the gas spring assembly.

5. Remove the steering pivot linkage rod from the steering pivot.
6. Loosen the steering pivot set screw and pull the steering pivot and woodruff key from the steering column.
7. Remove the 4 bolts, 4 flat washers, and 4 flange nuts that secure the steering column to the chassis, and remove the steering column.

Installing the Steering Column

Refer to Figure 77 for this procedure.

1. Place the steering column in position on the chassis and secure the steering column with the 4 bolts, 4 flat washers, and 4 flange nuts.

2. Install the woodruff key and steering pivot on the steering column. Set the distance from the top of the steering pivot to the underside of the chassis top plate to **32 mm (1.25 inches)** for GreensPro 1240 machines or **25 mm (1 inch)** for GreensPro 1260 machines and tighten the set screw (Figure 78).

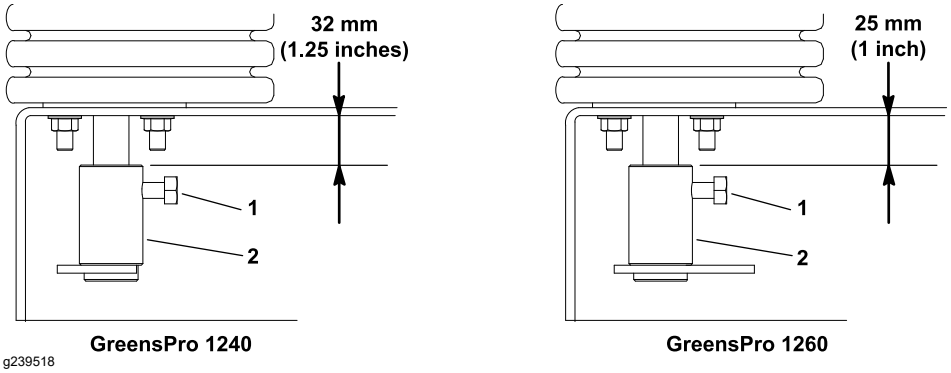


Figure 78

1. Set screw
2. Steering pivot

3. Secure the steering pivot linkage rod to the steering pivot.
4. If removed, install the steering column gas spring assembly.
5. Install the steering column boot as follows:

   A. Carefully pull the boot down over the steering column.

   B. Set the steering column tilt to the fully rearward position.

C. Gently pull the steering column boot over the tilt control lever.
D. Set the steering column tilt to the fully forward position.
E. Pull the front of the boot down over the base of the steering column.

6. Install the bearing cover over the top of the steering column.
7. Install the steering wheel; refer to Installing the Steering Wheel (page 7–33).

Steering Linkage

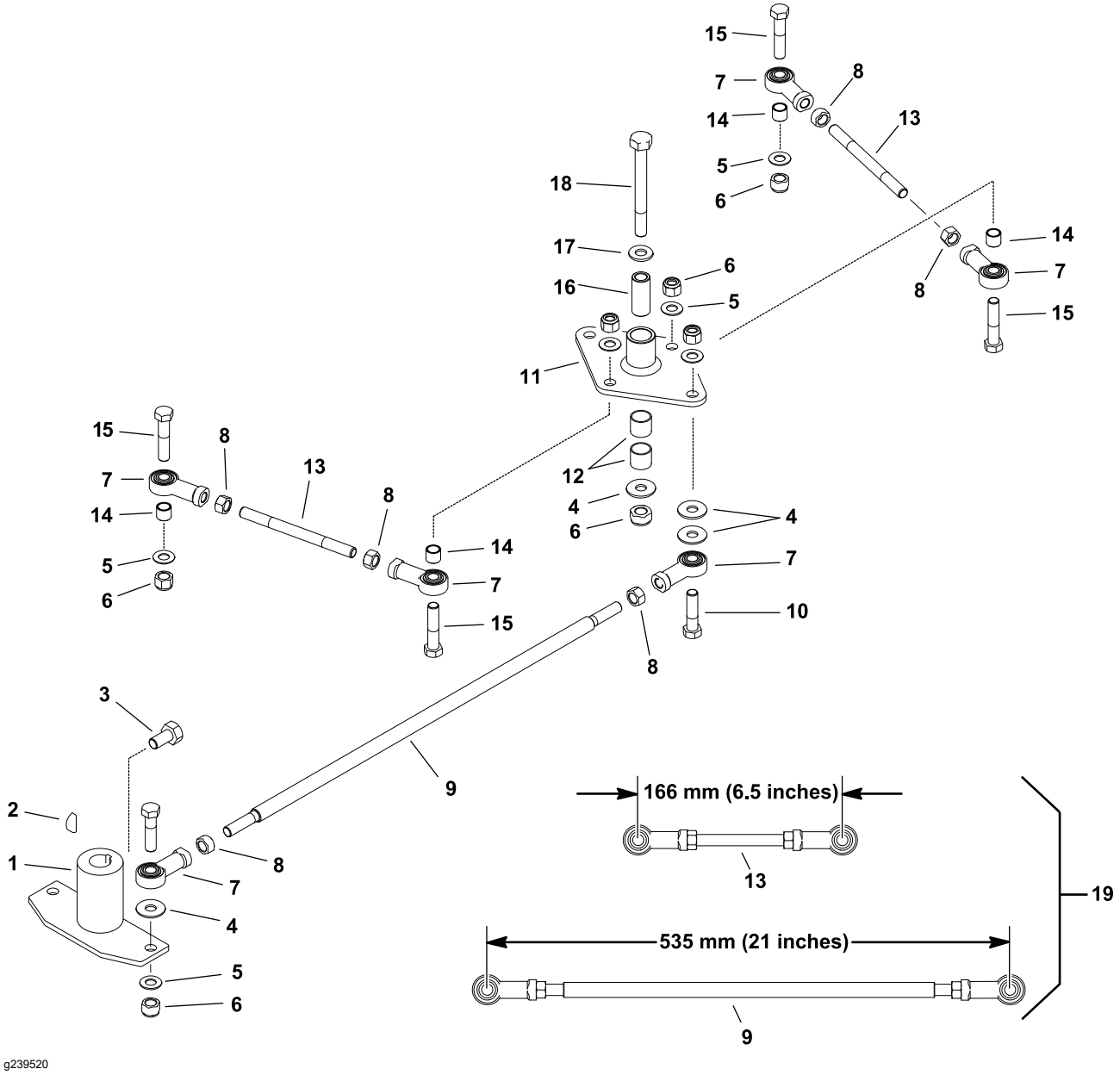


Figure 79
GreensPro 1240

1. Steering pivot
2. Woodruff key
3. Set screw
4. Flat washer (4 each)
5. Flat washer (6 each)
6. Locknut (6 each)
7. Ball joint (left or right) (6 each)
8. Hex nut (left or right) (6 each)
9. Steering pivot linkage rod
10. Bolt (2 each)
11. Steering disc
12. Bushing (2 each)
13. Steering head linkage rod (2 each)
14. Spacer (4 each)
15. Bolt (4 each)
16. Pivot bushing
17. Flat washer
18. Bolt
19. Initial assembly lengths (before final adjustment)

Steering Linkage (continued)

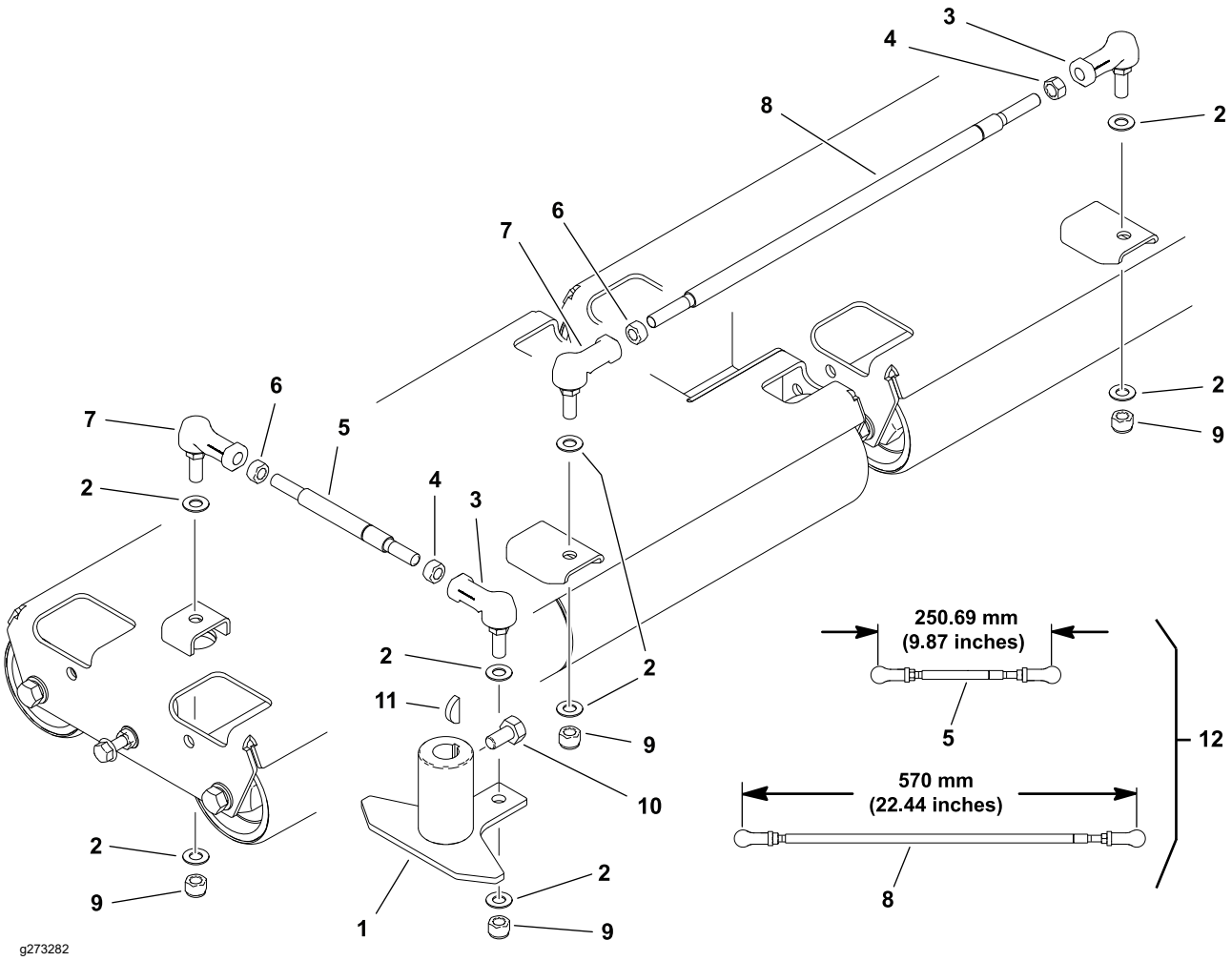


Figure 80

GreensPro 1260

1.	Steering pivot	5.	Steering pivot rod – short	9.	Locknut (4 each)
2.	Flat washer (8 each)	6.	Hex nut (right-hand thread) (2 each)	10.	Set screw
3.	Ball joint (left-hand thread) (2 each)	7.	Ball joint (right-hand thread) (2 each)	11.	Woodruff key
4.	Hex nut (left-hand thread) (2 each)	8.	Steering pivot rod – long	12.	Initial assembly lengths (before final adjustment)

The entire steering linkage assembly must be secure and move freely in both directions. Repair or replace the steering linkage assembly components as necessary (Figure 79 or Figure 80).

⚠ CAUTION ⚠

Use a suitable lifting device to safely raise and support the machine to get access to the components under the chassis.

Each linkage rod includes 2 ball joints and 2 hex nuts. To allow adjustment, 1 ball joint and 1 hex nut has left-hand threads, and 1 ball joint and 1 hex nut has right-hand threads. Before attempting to loosen the hex nuts for linkage adjustment, inspect the threads on the linkage rod to determine the thread

direction. GreensPro 1260 linkage rods have a groove cut in the rod near the end with left-hand threads.

Note: Leave the linkage rod hex nuts loose until the rod ends have been secured and the rod length is adjusted.

The distance from the top of the steering pivot to the underside of the chassis top plate should be **32 mm (1.25 inches)** for GreensPro 1240 machines or **25 mm (1 inch)** for GreensPro 1260 machines (Figure 81). Loosen set screw and adjust if necessary.

After assembly, check the steering operation and adjust as necessary; refer to Adjusting the Steering Linkage (page 7–5).

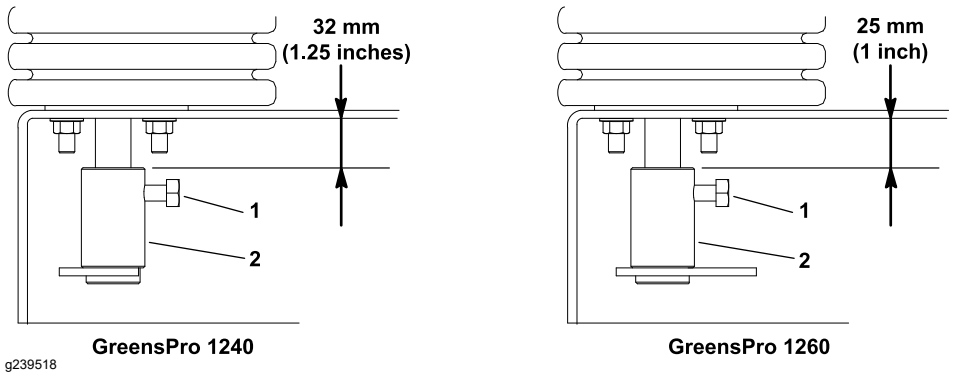


Figure 81

1. Set screw
2. Steering pivot

Steering Rollers

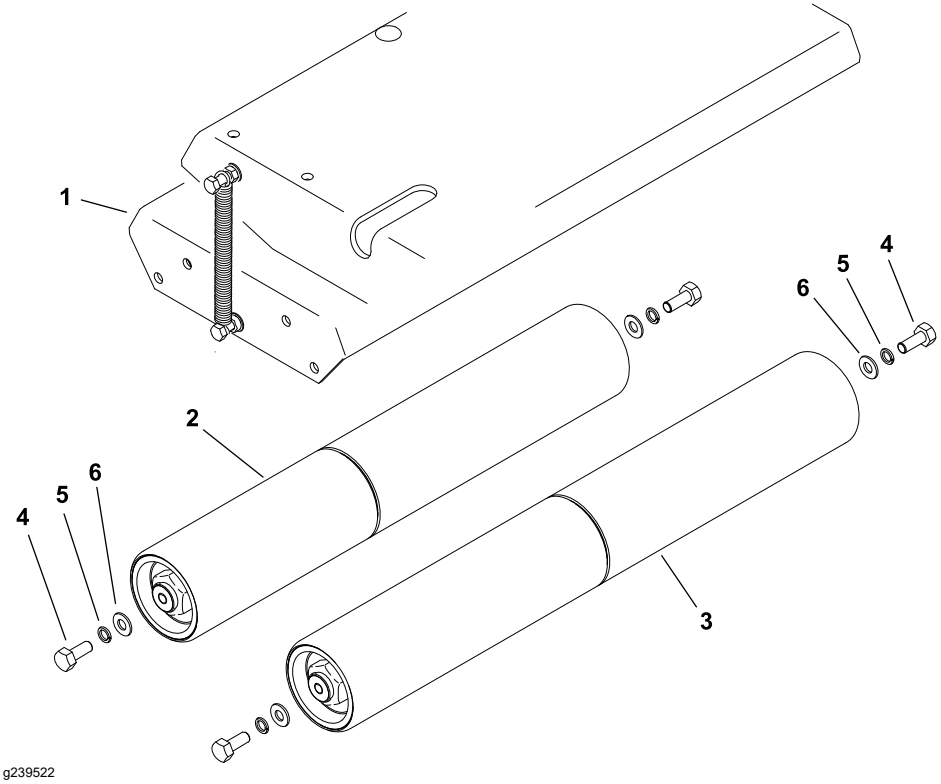


Figure 82

Front steering head assembly shown

1. Steering head frame
2. Roller assembly (short)
3. Roller assembly (long)
4. Bolt (2 each per roller)
5. Lock washer (2 each per roller)
6. Flat washer (2 each per roller)

Removing the Steering Roller

Refer to Figure 82 for this procedure.

⚠ CAUTION ⚠

Use a suitable lifting device to safely raise and support the machine to get access to the components under the chassis.

1. Turn the steering wheel to the left or right if necessary to access the steering roller bolts.
2. Remove the 2 bolts, 2 lock washers, and 2 flat washers and lower the steering roller assembly from the steering head.

Installing the Steering Roller

Refer to Figure 82 for this procedure.

1. Turn the steering wheel to the left or right if necessary to access the steering roller mounting holes.
2. Secure the steering roller assembly to the steering head with the 2 bolts, 2 lock washers, and 2 flat washers.

Servicing the Steering Rollers

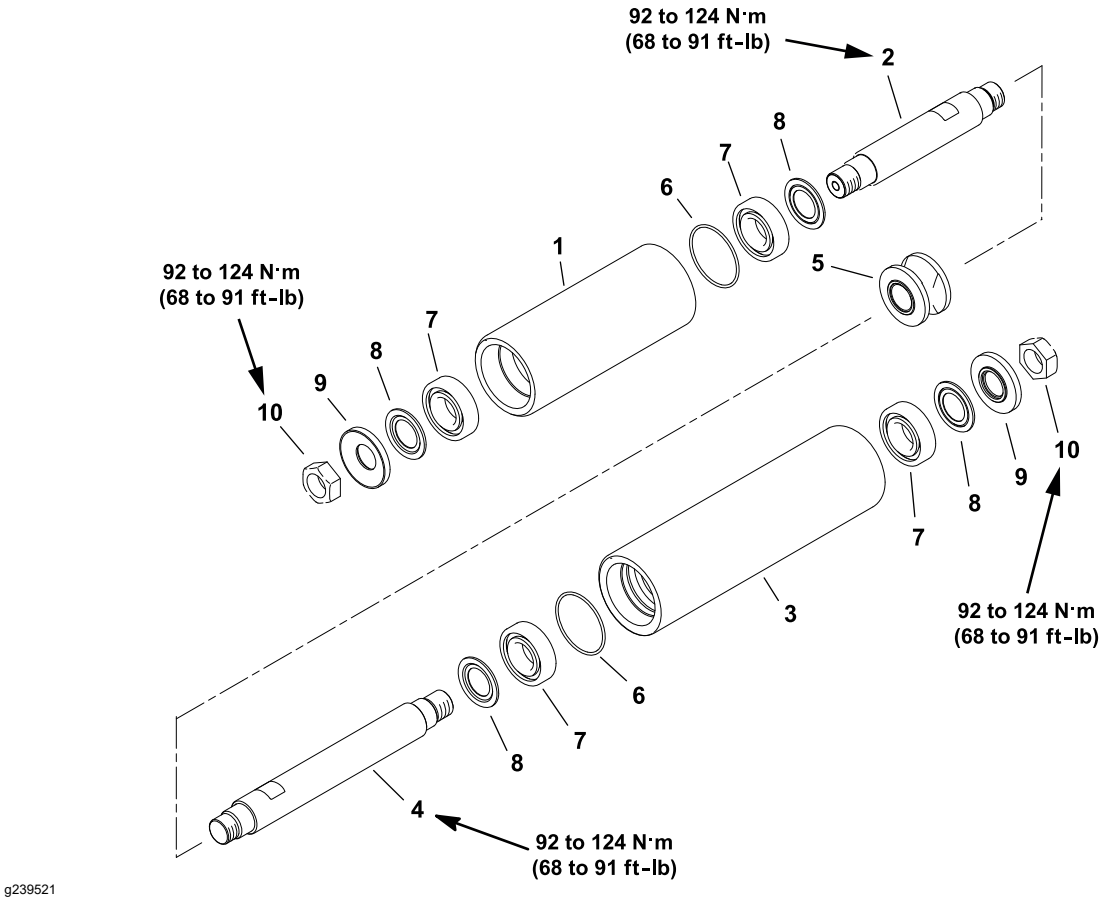


Figure 83

1. Roller tube (short)
2. Roller shaft (short)
3. Roller tube (long)
4. Roller shaft (long)
5. Roller sleeve
6. O-ring (2 each)
7. Bearing (4 each)
8. Flocked seal (4 each)
9. Bearing spacer (2 each)
10. Locknut (2 each)

1. Remove the parts as necessary to repair the steering rollers. Discard the flocked seals and O-rings.
2. Clean all the components before assembly.
3. If a bearing or bearing housing is removed, ensure that it is pressed into position fully during installation.

4. Thread the roller shafts into the roller sleeve and tighten the roller shafts to **92 to 124 N·m (68 to 91 ft-lb)**.

5. Install new flocked seals and O-rings. Install the flocked seals with flocked side of seal against the bearing.

6. Thread the locknuts onto the roller shafts and tighten the locknuts to **92 to 124 N·m (68 to 91 ft-lb)**.

Steering Heads

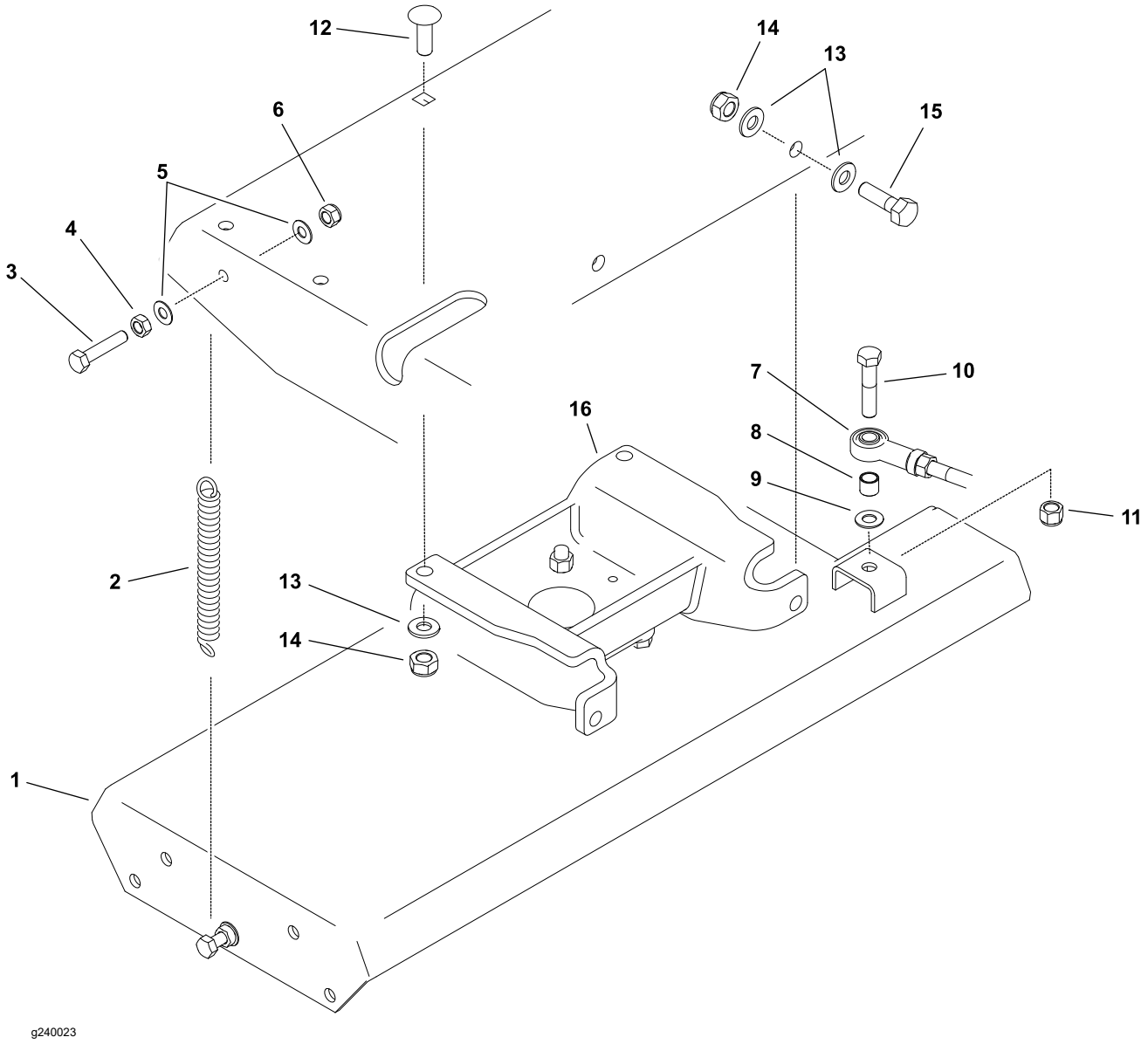


Figure 84

Front steering head assembly (GreensPro 1240)

1. Steering head assembly
2. Spring
3. Bolt
4. Hex nut
5. Flat washer (2 each)
6. Locknut
7. Steering head linkage rod
8. Spacer
9. Flat washer
10. Bolt
11. Locknut
12. Carriage bolt (2 each)
13. Flat washer (6 each)
14. Locknut (4 each)
15. Bolt (2 each)
16. Roller support

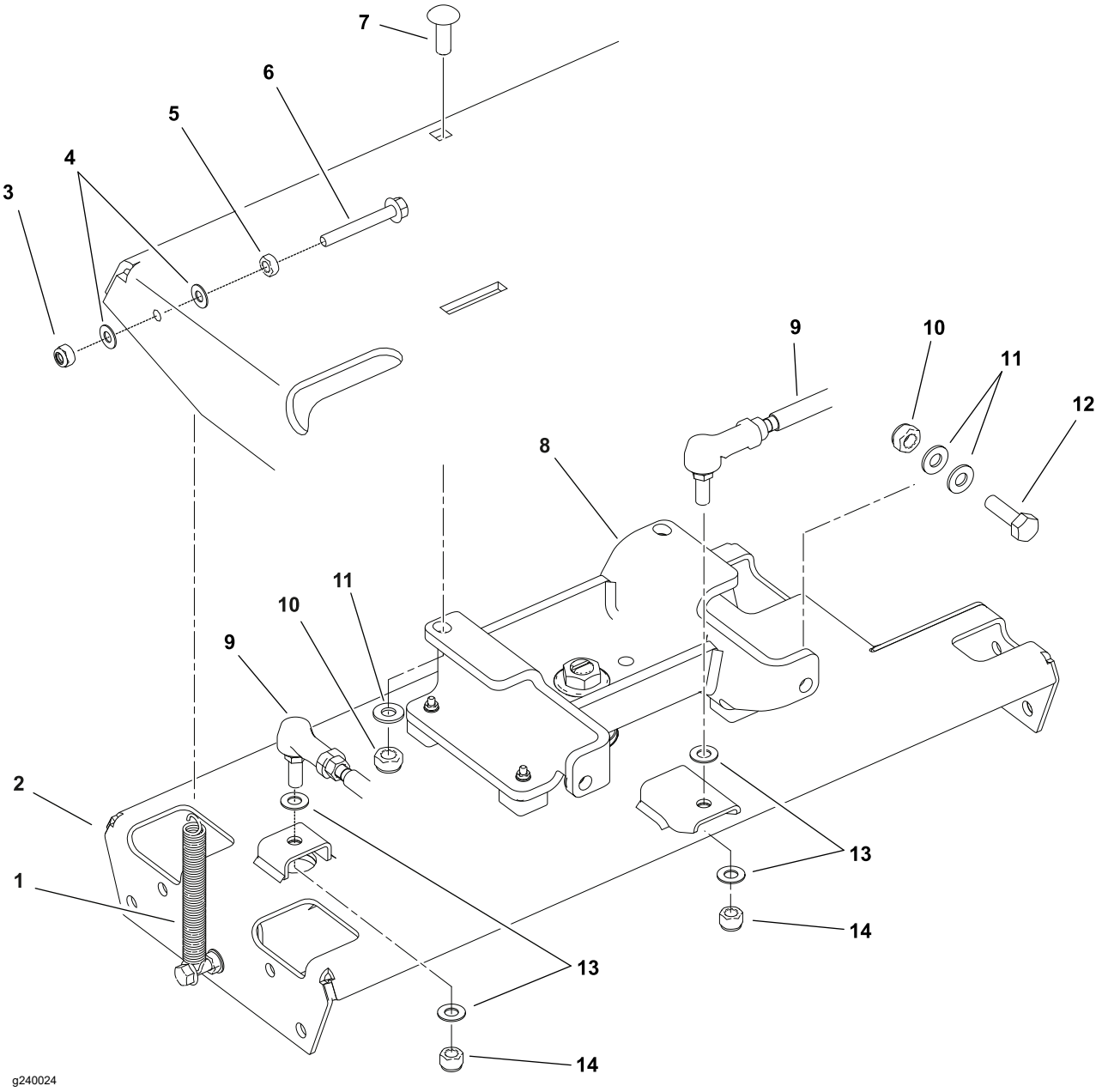


Figure 85

Front steering head assembly (GreensPro 1260)

1. Spring
2. Steering head assembly
3. Locknut
4. Flat washer (2 each)
5. Hex nut
6. Flange-head screw
7. Carriage bolt (2 each)
8. Roller support
9. Steering pivot rod (2 each)
10. Locknut (4 each)
11. Flat washer (6 each)
12. Bolt (2 each)
13. Flat washer (4 each)
14. Locknut (2 each)

Removing the Steering Head

Refer to Figure 84 or Figure 85 for this procedure.

CAUTION

Use a suitable lifting device to safely raise and support the machine to get access to the components under the chassis.

1. Remove the steering roller; refer to Removing the Steering Roller (page 7–41).

CAUTION

Be careful when removing or installing the spring. The spring is under load and may cause personal injury.

2. Remove the tension spring.
3. Remove the steering head linkage/pivot rod(s) from the steering head.
4. Support the steering head assembly, remove the fasteners that secure the roller support to the inner chassis plate, and remove the steering head assembly.

Installing the Steering Head

Refer to Figure 84 or Figure 85 for this procedure.

CAUTION

Use a suitable lifting device to safely raise and support the machine to get access to the components under the chassis.

1. Support the steering head assembly and install the fasteners that secure the roller support to the chassis.
2. Install the steering head linkage/pivot rod(s) to the steering head.

CAUTION

Be careful when removing or installing the spring. The spring is under load and may cause personal injury.

3. Install the tension spring with the fasteners previously removed.
4. Install the steering roller; refer to Installing the Steering Roller (page 7–41).

Servicing the Steering Head (GreensPro 1240)

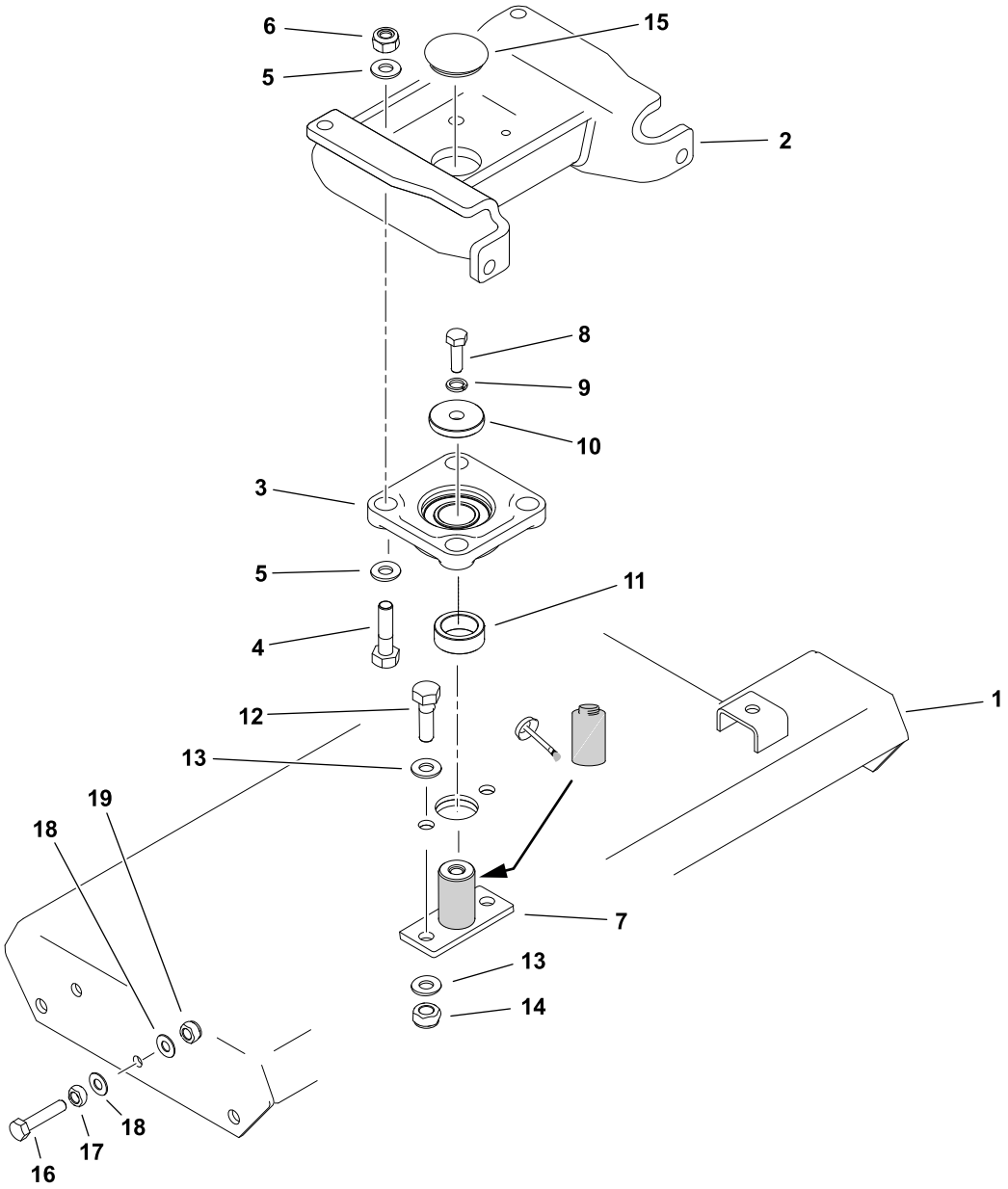


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Figure 86

Front steering head assembly (GreensPro 1240)

1. Steering head frame
2. Roller support
3. Bearing
4. Bolt (4 each)
5. Flat washer (8 each)
6. Locknut (4 each)
7. Pivot shaft
8. Bolt
9. Lock washer
10. Collar
11. Spacer
12. Bolt (2 each)
13. Flat washer (4 each)
14. Locknut (2 each)
15. Cap
16. Bolt
17. Hex nut
18. Flat washer (2 each)
19. Locknut

Disassembling the Steering Head

Refer to Figure 86 for this procedure.

Disassembling the Steering Head (continued)

1. Remove the cap from the roller support.
2. Remove the bolt and lock washer that secure the collar (item 10) to the pivot shaft.
3. Lift the roller support with the bearing and collar still attached from the pivot shaft.
4. Remove the fasteners that secure the bearing to the roller support. Separate the bearing from the roller support and remove the collar.
5. Remove the spacer from the pivot shaft.
6. Remove the pivot shaft if necessary.
7. Repair or replace the steering head assembly components as necessary.

Assembling the Steering Head

Refer to Figure 86 for this procedure.

1. Install the pivot shaft if previously removed.
2. Apply a thin coat of anti-seize lubricant to the pivot shaft and install the spacer on the pivot shaft.
3. Place the collar (item 10) between the bearing and roller support and secure the bearing to the roller support with the fasteners previously removed.
4. Fit the bearing and roller support assembly over the pivot shaft and secure the collar to the pivot shaft with the bolt and lock washer.
5. Install the cap in the roller support.
6. Lubricate the bearing through grease fitting until the grease is visible on outside of the bearing. Wipe away any excess grease.

Servicing the Steering Head (GreensPro 1260)

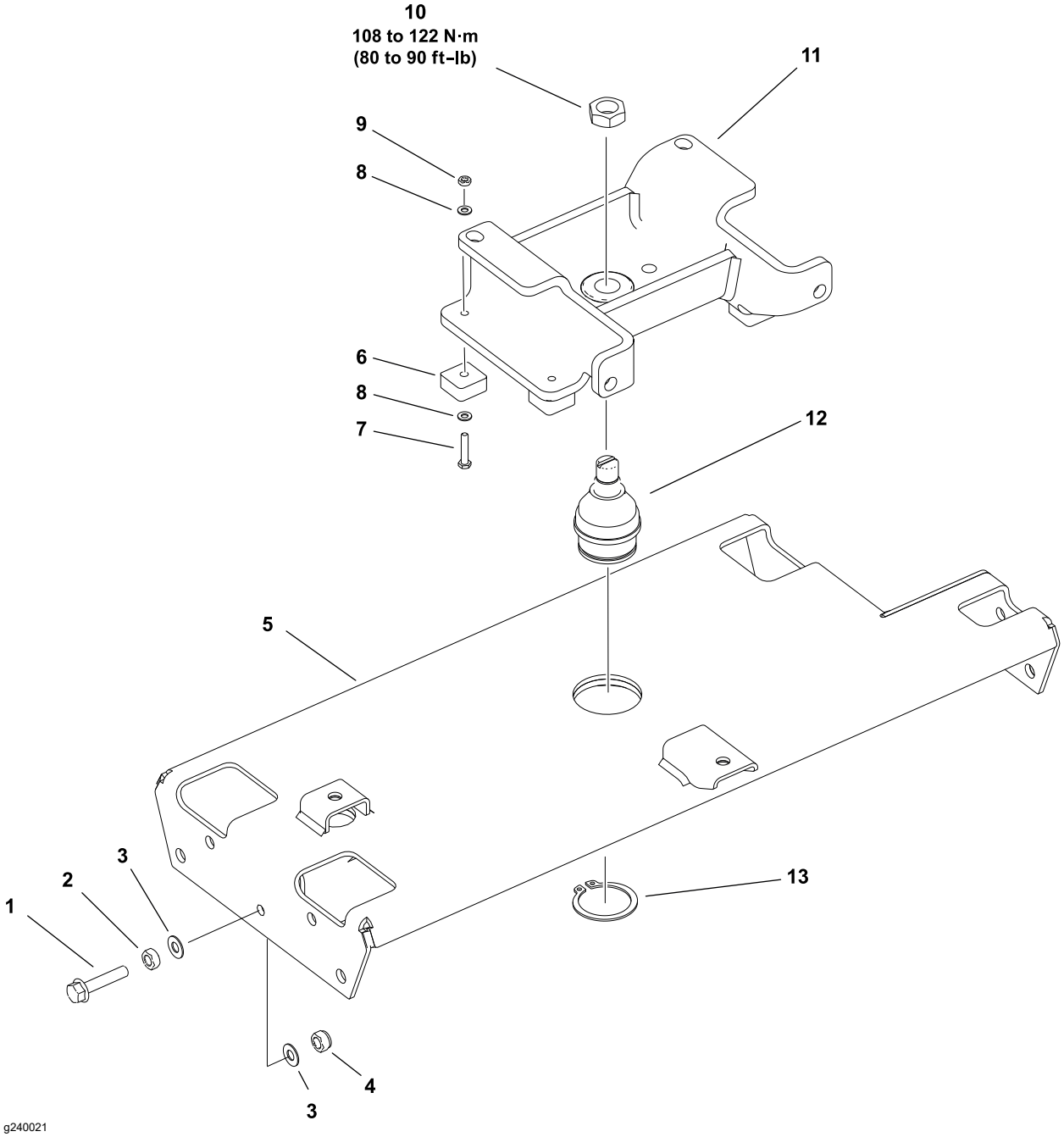

Figure 87

Front steering head assembly (GreensPro 1260)

1. Flange-head screw
2. Hex nut
3. Flat washer (2 each)
4. Locknut
5. Steering head frame
6. Rubber pad (4 each)
7. Cap screw (4 each)
8. Flat washer (8 each)
9. Locknut (4 each)
10. Jam nut
11. Roller support
12. Ball joint
13. Retaining ring

Disassembling the Steering Head

Refer to Figure 87 for this procedure.

1. Remove the retaining ring and lift the roller support with ball joint from the steering head frame.

Disassembling the Steering Head (continued)

2. Remove the jam nut and use a ball joint “pickle” fork to separate the ball joint from the roller support.
3. Remove the rubber pads to the roller support if necessary.
4. Repair or replace the steering head assembly components as necessary.

Assembling the Steering Head

Refer to Figure 87 for this procedure.

1. Secure the 4 rubber pads to the roller support.

2. Secure the ball joint to the roller support and tighten the jam nut from **108 to 122 N·m (80 to 90 ft-lb)**.
3. Place the roller support with ball joint into the steering head frame and install the retaining ring.

Transport Wheels and Hubs

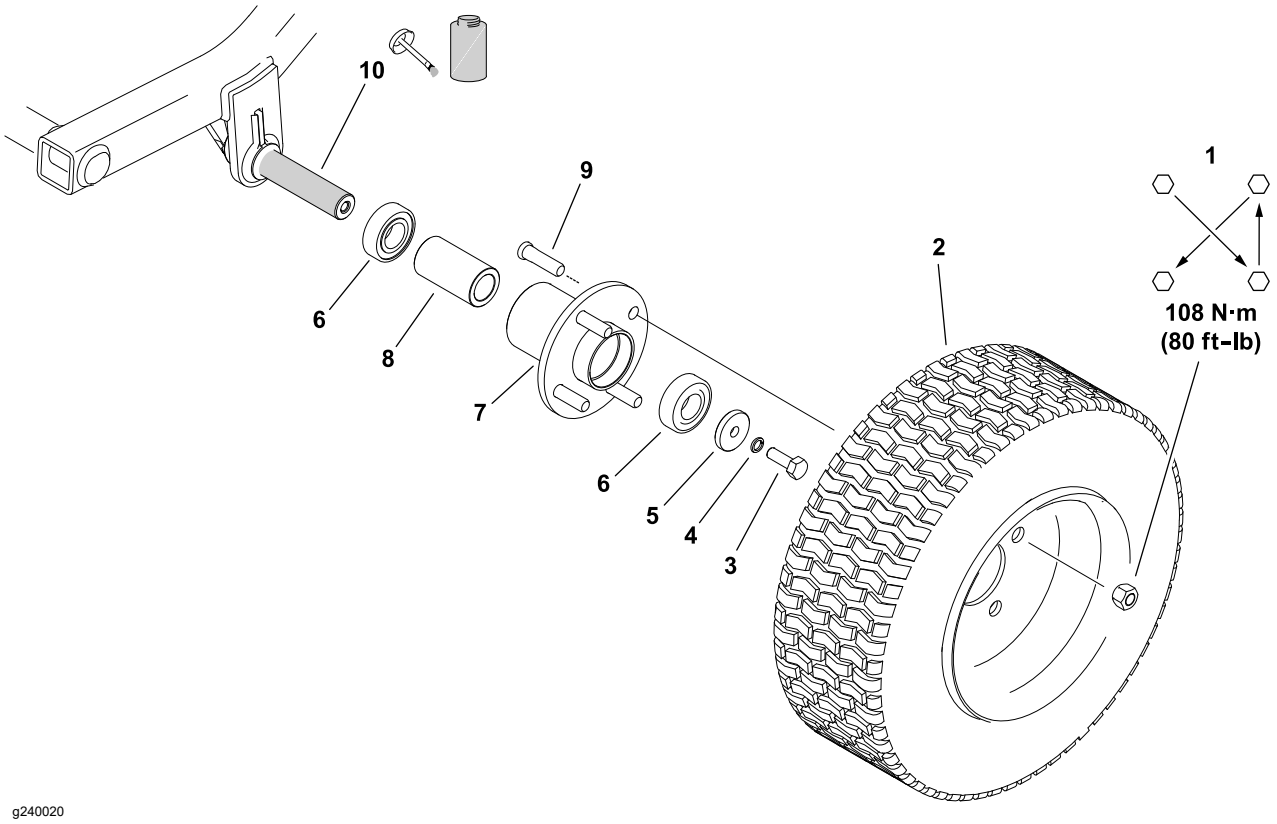

Figure 88

1. Wheel-lug nut (4 each)
2. Wheel and tire assembly
3. Bolt
4. Lock washer
5. Collar
6. Bearing (2 each)
7. Hub assembly
8. Bearing spacer
9. Drive stud (4 each)
10. Spindle

Removing the Wheel and Hub

Refer to Figure 88 for this procedure.

1. Park the machine on a clean, level surface with the transport wheels in the raised and locked position. Shut off the engine.
2. Remove the 4 wheel-lug nuts, and remove the wheel and tire assembly from the hub.
3. Remove the bolt, lock washer, and collar that secure the hub assembly to the spindle, and remove the hub from the spindle.
4. Inspect the bearings in the hub assembly and replace as necessary.

Installing the Wheel and Hub

Refer to Figure 88 for this procedure.

1. Clean all the components before assembly.
2. If a bearing or a drive stud (item 9) is removed, ensure that it is pressed into position fully during installation.
3. Apply a thin coat of anti-seize lubricant to the spindle and secure the hub assembly to the spindle with the bolt, lock washer, and collar.

4. Install the wheel and tire assembly with the 4 wheel-lug nuts and tighten the wheel-lug nuts to **108 N·m (80 ft-lb)** in an alternating pattern.

Installing the Wheel and Hub (continued)

5. Adjust the tire pressure to **103 kPa (15 psi)** before returning the machine to service.

Transport Frame

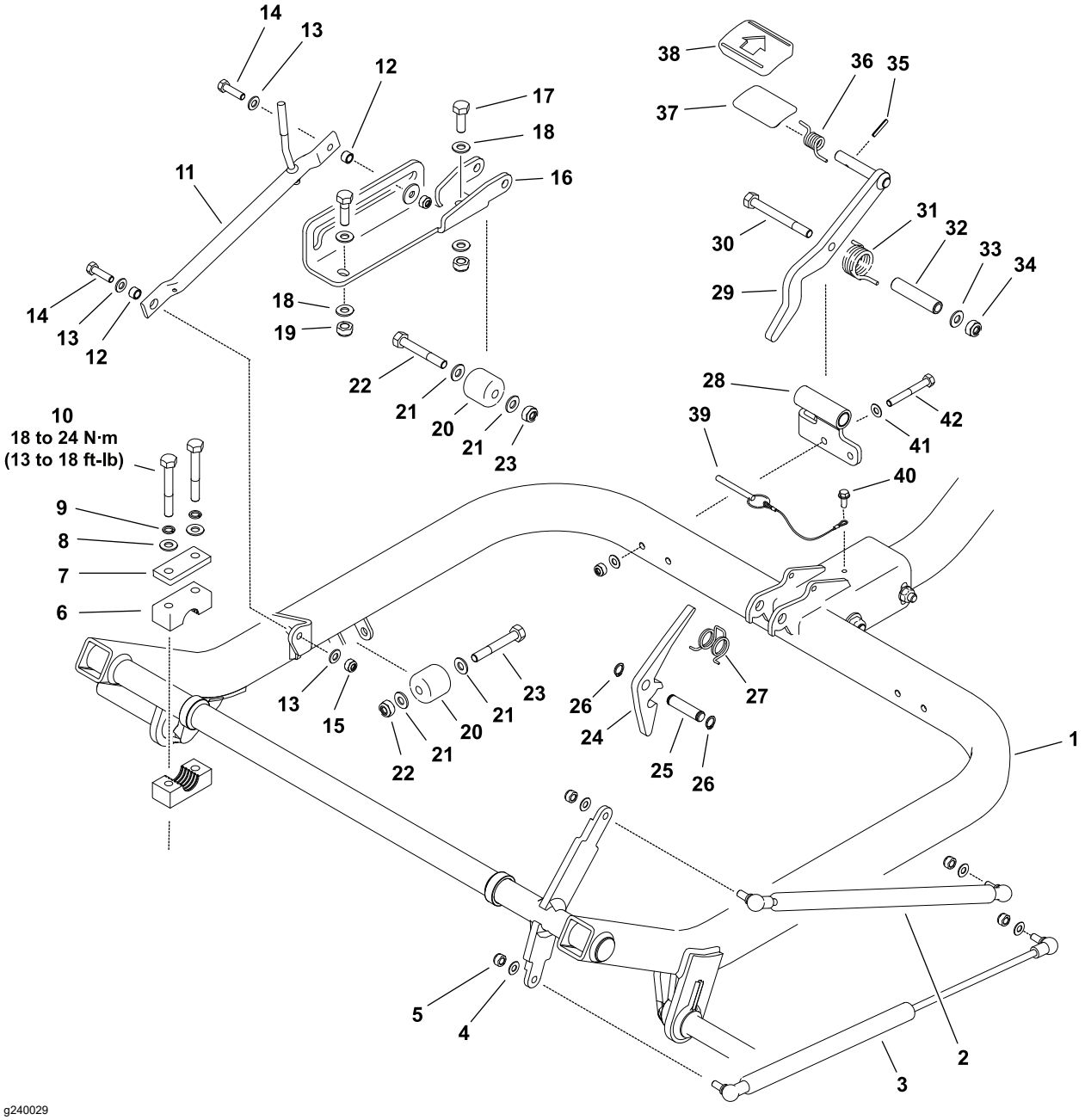

Figure 89

1. Transport frame
2. Damper
3. Gas spring
4. Washer (4 each)
5. Locknut (4 each)
6. Clamp (3 each)
7. Clamp plate (3 each)
8. Flat washer (6 each)
9. Lock washer (6 each)
10. Bolt (6 each)
11. Latch (raised)
12. Sleeve (2 each)
13. Flat washer (4 each)
14. Bolt (2 each)
15. Locknut (2 each)
16. Slide bracket
17. Bolt (2 each)
18. Flat washer (4 each)
19. Locknut (2 each)
20. Roller (2 each)
21. Flat washer (4 each)
22. Locknut (2 each)
23. Bolt (2 each)
24. Latch (lowered)
25. Pin
26. Retaining ring
27. Torsion spring
28. Pedal pivot
29. Lift lever
30. Bolt
31. Torsion spring
32. Pivot bushing
33. Washer
34. Locknut
35. Roll pin
36. Torsion spring
37. Pedal
38. Pad
39. Safety pin
40. Washer-head screw

The transport frame must be secure and move freely in both the raise and lower directions. The latches must hold the transport frame securely in both the raised and lowered positions. Repair or replace the transport frame components as necessary.

With the exception of the transport frame itself, the transport frame components can be removed for repair or replacement without removing the transport frame from the chassis.

Removing the Transport Frame

Refer to Figure 89 for this procedure.

1. Park machine on a clean, level surface with the transport wheels in the raised but unlocked position. Shut off the engine. Engage the parking brake if equipped, or remove the spark plug wire from the spark plug.
2. Remove the transmission cover from the machine; refer to Removing the Transmission Cover (page 7–59).
3. Disconnect the main wire harness at the following locations:
   A. Hour meter harness
   B. Interlock module (machine serial number above 315000000)
   C. Seat switch (machine serial number above 315000000)
   D. Parking brake switch (machine serial number above 315000000)
4. Disconnect the parking brake cable from the brake lever if equipped (Figure 90).

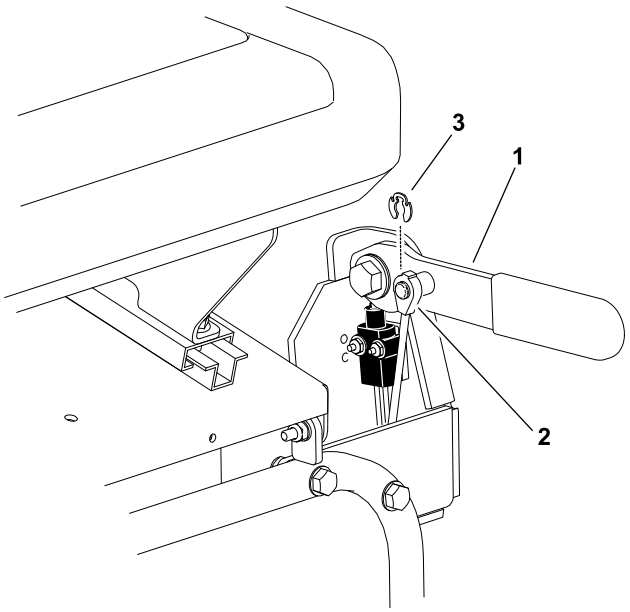

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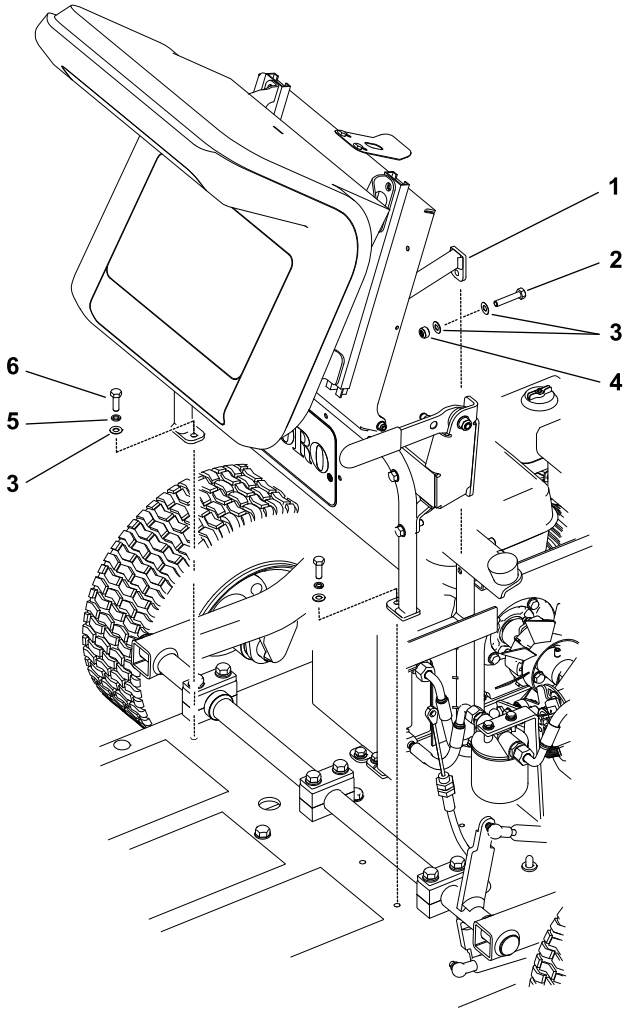
Figure 90
GreensPro 1240

1. Parking brake lever
2. Parking brake cable
3. E-ring

5. Remove the fasteners that secure the seat support to the chassis and rear support frame, and remove the seat support from the machine with seat, seat pan, manual tube, etc. attached (Figure 91).



g240031

Figure 91

GreensPro 1240

1. Seat support assembly
2. Bolt
3. Washer (4 each)
4. Hex nut
5. Spring washer (2 each)
6. Bolt (2 each)

6. Remove the fasteners that secure the latch (item 11 in Figure 89) to the transport frame.
7. Remove the fasteners that secure the damper (upper strut) (item 2 in Figure 89) to the transport frame.

⚠ CAUTION ⚠

Be careful when removing or installing the gas spring. The gas spring is under heavy load and may cause personal injury.

8. Allow the transport frame to hinge forward past the removed latch, releasing all load from the gas spring (item 3 in Figure 89). Remove the fasteners that secure the gas spring to the transport frame.

Removing the Transport Frame (continued)

9. Support the hitch end of the transport frame and remove the bolts, lock washers, flat washers, clamp plates, and upper halves of the clamps from the chassis.

⚠ CAUTION ⚠

The weight of the transport frame assembly is approximately 47 kg (104 lb).

10. Use a suitable lifting device to safely lift the transport frame assembly from the chassis.

Installing the Transport Frame

Refer to Figure 89 for this procedure.

1. Use a suitable lifting device to safely lift the transport frame assembly onto the chassis.

2. Center the transport frame over chassis left to right and secure the transport frame to the chassis with the bolts, lock washers, flat washers, clamp plates, and clamps. Tighten the clamp bolts from **18 to 24 N·m (13 to 18 ft-lb)**.
3. Move the transport frame past the latch and install the gas spring (item 3) to the transport frame.
4. Install the damper (item 2) to the transport frame.
5. Secure the latch lever to the transport frame with the fasteners previously removed.
6. Install the seat support to the chassis with seat, seat pan, manual tube, etc. attached. Secure the seat support to the chassis and rear support frame with the fasteners previously removed.
7. Connect the parking brake cable if equipped.
8. Connect the main wire harness at the following locations:
   A. Hour meter harness
   B. Interlock module (machine serial number above 315000000)
   C. Seat switch (machine serial number above 315000000)
   D. Parking brake switch (machine serial number above 315000000)
9. Install the transmission cover to the machine; refer to Installing the Transmission Cover (page 7–59).
10. Check the transport frame for proper latch and lift pedal operation before returning the machine to service; refer to the *Operator's Manual*.

Tow Bar

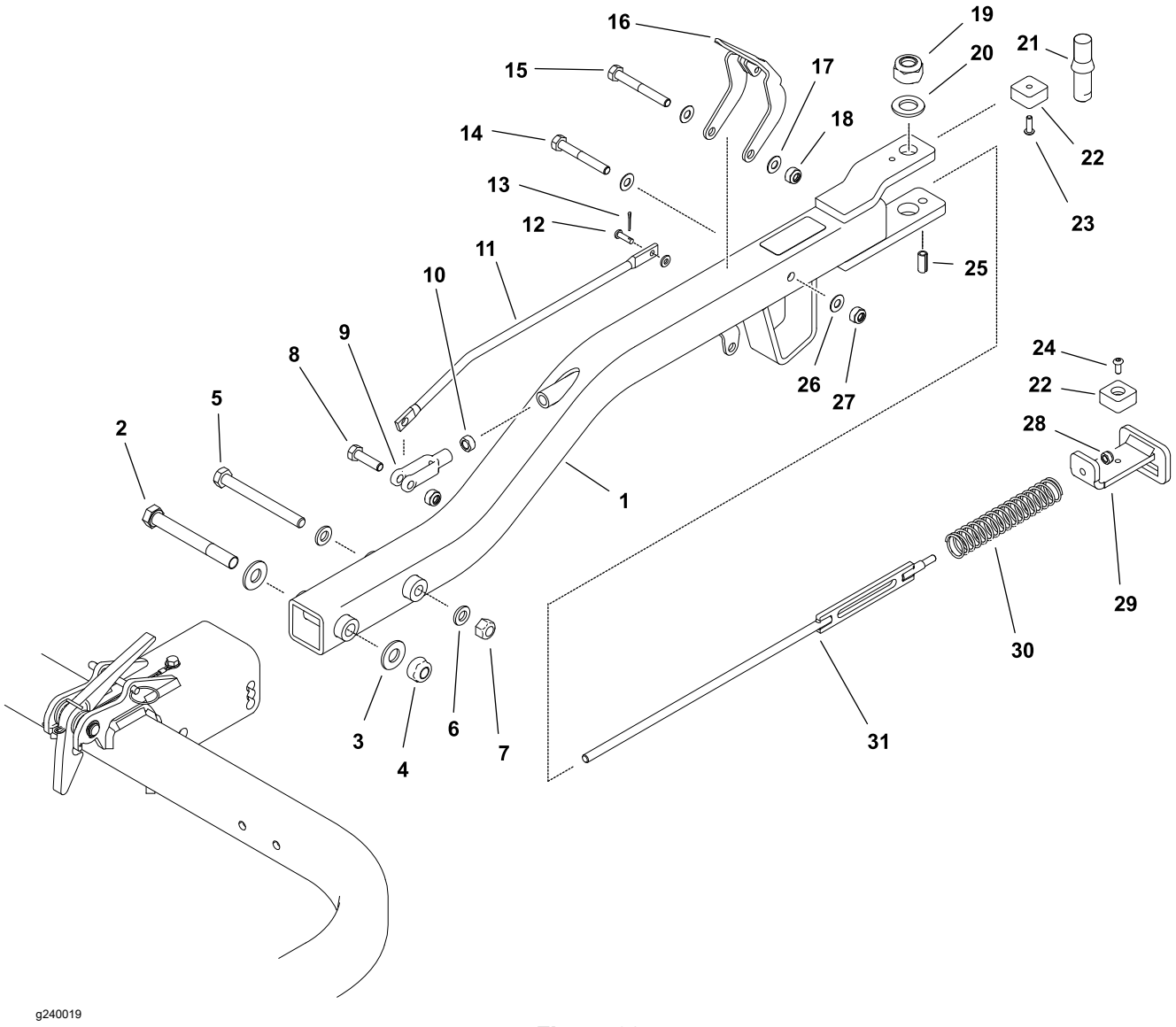


Figure 92

1. Tow bar
2. Bolt (12 mm)
3. Flat washer (2 each)
4. Locknut (12 mm)
5. Bolt (10 mm)
6. Flat washer (2 each)
7. Locknut (10 mm)
8. Bolt
9. Adjustable yoke
10. Hex nut
11. Lever rod
12. Clevis pin
13. Cotter pin
14. Bolt
15. Bolt
16. Lever
17. Flat washer (2 each)
18. Locknut
19. Locknut
20. Washer
21. Tow pin
22. Rubber pad (2 each)
23. Button-head screw
24. Button-head screw
25. Roll pin stop
26. Flat washer (2 each)
27. Locknut
28. Locknut
29. Auto hitch slide
30. Compression spring
31. Slide rod

The tow bar must be securely attached to the transport frame, and the auto hitch slide must move freely in both the directions. Repair or replace the tow bar components as necessary (Figure 92).

With the exception of the tow bar itself, the tow bar components can be removed for repair or replacement without removing the tow bar from the transport frame.

Tow Bar (continued)

Determine desired tow bar height during assembly; refer to Adjusting the Tow Bar Height (page 7–10). Check and adjust the auto hitch slide after assembly; refer to Auto Hitch Slide (page 7–11).

Transmission Cover

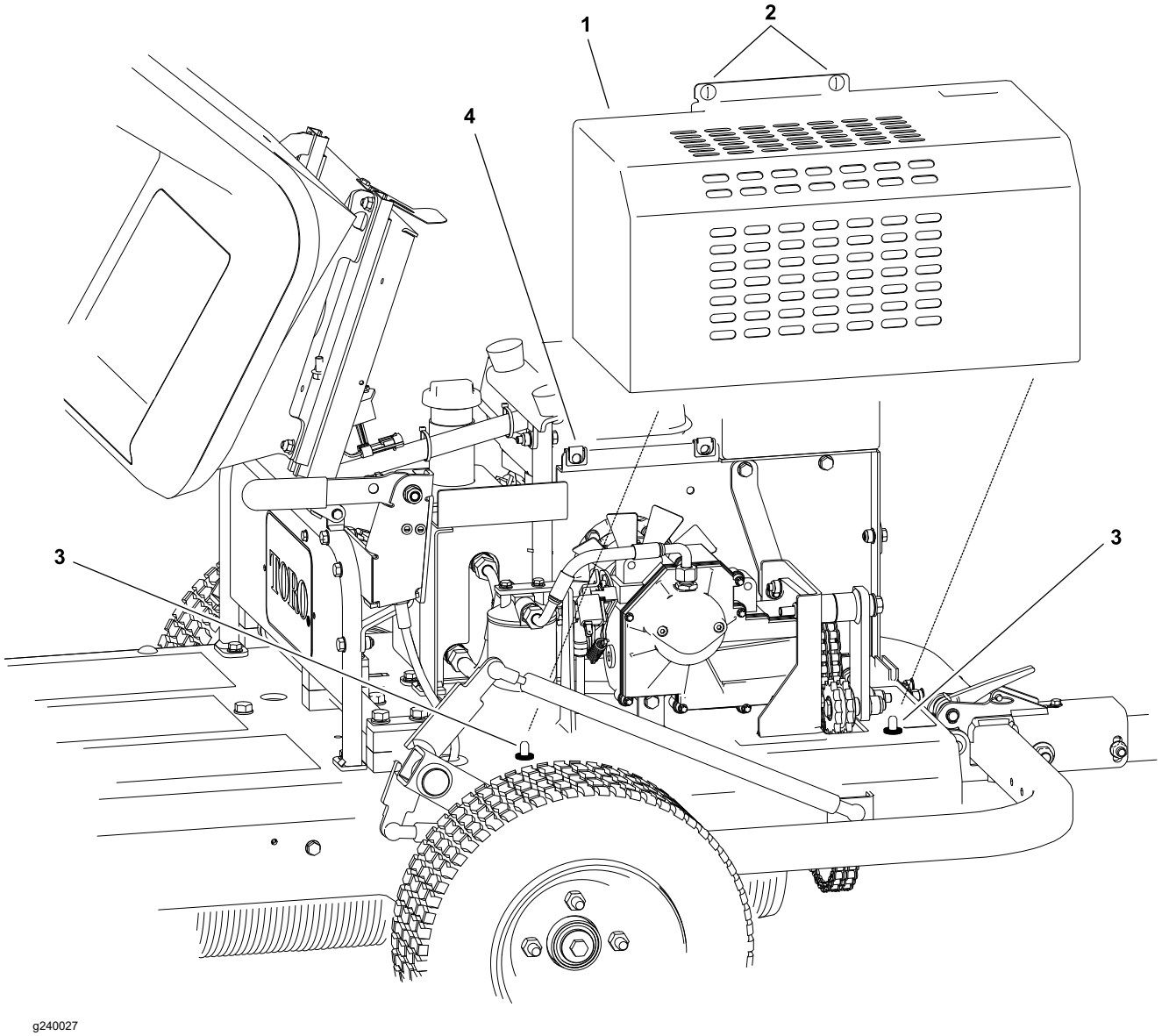


Figure 93
GreensPro 1240

1. Transmission cover
2. Quick-release screw (2 each)
3. Alignment pin with rubber washer (2 each)
4. Screw retainer (2 each)

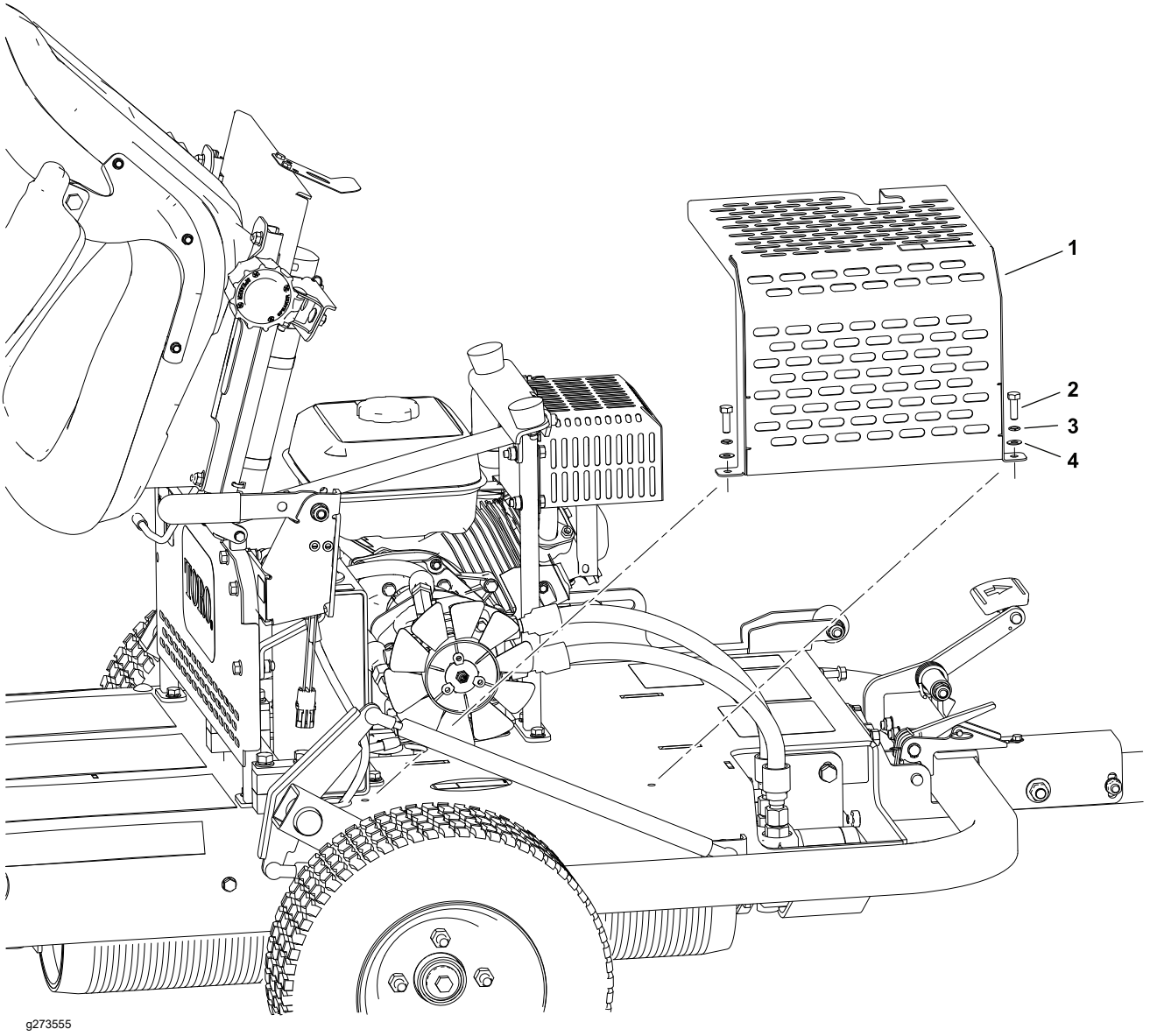


Figure 94
GreensPro 1260

1. Transmission cover
2. Bolt (3 each)
3. Spring washer (3 each)
4. Washer (3 each)

Removing the Transmission Cover

1. Tilt the steering column to the full forward position.
2. Release the latch and pivot the seat pan forward.
3. On GreensPro 1240 machines, turn the quick-release screws counterclockwise 1/4 turn and remove the transmission cover from the machine (Figure 93).
4. On GreensPro 1260 machines, remove the 3 bolts, 3 spring washers, and 3 washers that secure the transmission cover to the chassis and remove the transmission cover from the machine (Figure 94).

Installing the Transmission Cover

1. Tilt the steering column to the full forward position.
2. Release the latch and pivot the seat pan forward.

Installing the Transmission Cover (continued)

3. On GreensPro 1240 machines, lower the transmission cover over alignment pins and rubber washers, align the quick-release screws with the screw retainers (slide retainers forward or backward if necessary), and tighten the quick-release screws (Figure 93)
4. On GreensPro 1260 machines, secure the transmission cover with the 3 bolts, 3 spring washers, and 3 washers (Figure 94).