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Form No. 07155SL Rev A

Service Manual

ProCore[®] 864/1298

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NOTES



Service Manual

ProCore® 864/1298

Preface

The purpose of this publication is to provide the service technician with information for troubleshooting, testing and repair of major systems and components on the ProCore 864 and 1298 aerators.

REFER TO THE OPERATOR'S MANUALS FOR OPERATING, MAINTENANCE AND ADJUSTMENT INSTRUCTIONS. Space is provided in Chapter 2 of this book to insert the Operator's Manuals and Parts Catalogs for your machine. Replacement Operator's Manuals are available on the internet at www.toro.com or by sending complete Model and Serial Number to:

The Toro Company
Attn. Technical Publications
8111 Lyndale Avenue South
Minneapolis, MN 55420

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



This safety symbol means **DANGER, WARNING, or CAUTION, PERSONAL SAFETY INSTRUCTION**. When you see this symbol, carefully read the instructions that follow. Failure to obey the instructions may result in personal injury.

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

IMPORTANT: The **IMPORTANT** notice will give important instructions which must be followed to prevent damage to systems or components on the machine.



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Safety Instructions

The ProCore 864 and 1298 are designed and tested to offer safe service when operated and maintained properly. Although hazard control and accident prevention partially are dependent upon the design and configuration of the machine, these factors 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. To reduce the potential for injury or death, comply with the following safety instructions.



Before Operating

1. Read and understand the contents of the Operator's Manual before starting and operating the aerator. Become familiar with the controls and know how to stop the machine quickly. A replacement Operator's Manual is available on the Internet at www.Toro.com or by sending the complete model and serial number to:

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8111 Lyndale Avenue South
Bloomington, Minnesota 55420-1196

2. Keep all shields, safety devices and decals in place. If a shield, safety device or decal is defective, illegible or damaged, repair or replace it before operating the machine.

3. Make sure that the tractor is carefully selected to assure the best performance and safe operation of the ProCore aerator.

4. Make sure that operator is familiar with safe tractor operation.

5. Tighten any loose nuts, bolts or screws to ensure machine is in safe operating condition.

6. Make sure that the ProCore aerator is properly attached to tractor.

While Operating

1. Operator should be on the tractor when starting the engine and when operating the aerator. Stay away from the aerator coring head when it is engaged.
2. Before starting the engine on the tractor:
 - A. Apply the parking brake.
 - B. Make sure traction lever or transmission is in neutral and PTO is disengaged.
 - C. Refer to Tractor Operator's Manual for safe starting procedures.
3. Do not run tractor engine in a confined area without adequate ventilation. Exhaust fumes are hazardous and could possibly be deadly.
4. If abnormal vibration is detected, disengage PTO and stop tractor immediately. Determine source of vibration and correct problem(s) before resuming the use of aerator.
5. While operating, the combination of the tractor and the ProCore aerator may exceed noise levels of 85dB(A) at the operator position. Hearing protection is recommended for prolonged exposure to reduce the potential of permanent hearing damage.
IMPORTANT: Never operate aerator without tine heads installed.
IMPORTANT: Never operate the tractor PTO in excess of 540 RPM or damage to the aerator could occur.
6. Before leaving the operator's position of the tractor:
 - A. Disengage PTO power to aerator and lower aerator to the ground.
 - B. Apply parking brake on tractor. Stop engine and remove key from ignition switch.
 - C. Wait for all moving parts to stop before leaving the tractor.

Maintenance and Service

1. Before servicing or making adjustments to aerator, disengage tractor PTO, position aerator on a level surface and lower aerator to the ground. Apply tractor parking brake, stop engine and remove key from the ignition switch.
2. Make sure machine is in safe operating condition by keeping all nuts, bolts and screws tight.
3. Use care when checking or servicing the coring head: wear gloves and use caution.
4. Never step over the PTO shaft to reach other side of aerator. Walk around the machine instead.
5. Before disconnecting aerator from tractor, install storage stand to aerator hitch frame and park aerator on a hard, level surface.
6. After servicing the aerator, be sure that all guards and covers are properly installed and that the rear hood is secured shut.
7. At the time of manufacture, the machine conformed to all applicable safety standards. To assure optimum performance and continued safety certification of the machine, use genuine Toro replacement parts and accessories. Replacement parts and accessories made by other manufacturers may result in non-conformance with the safety standards, and the warranty may be voided.
8. If major repairs are ever needed or assistance is desired, contact an Authorized Toro Distributor.

Safety and Instruction Decals

Numerous safety and instruction decals are affixed to the ProCore 864 and 1298. If any decal becomes illegible or damaged, install a new decal. Part numbers for replacement decals are listed in your Parts Catalog. Order replacement decals from your Authorized Toro Distributor.



Product Records and Maintenance

Product Records and Maintenance

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Product Records

Insert Operator's Manual and Parts Catalog for your ProCore 864 or 1298 at the end of this chapter. Additionally, if any optional equipment or accessories have been installed to your ProCore, insert the Installation Instructions, Operator's Manuals and Parts Catalogs for those options at the end of this chapter.

Maintenance

Maintenance procedures and recommended service intervals for the ProCore 864 or 1298 are covered in the Operator's Manual. Refer to that publication when performing regular equipment maintenance.

Equivalents and Conversions

Decimal and Millimeter Equivalents

Fractions	Decimals	mm	Fractions	Decimals	mm		
	1/64	0.015625	— 0.397	33/64	0.515625	— 13.097	
	1/32	0.03125	— 0.794	17/32	0.53125	— 13.494	
	3/64	0.046875	— 1.191	35/64	0.546875	— 13.891	
1/16	—	0.0625	— 1.588	9/16	—	0.5625	— 14.288
	5/64	0.078125	— 1.984	37/64	0.578125	— 14.684	
	3/32	0.09375	— 2.381	19/32	—	0.59375	— 15.081
	7/64	0.109275	— 2.778	39/64	0.609375	— 15.478	
1/8	—	0.1250	— 3.175	5/8	—	0.6250	— 15.875
	9/64	0.140625	— 3.572	41/64	0.640625	— 16.272	
	5/32	0.15625	— 3.969	21/32	—	0.65625	— 16.669
	11/64	0.171875	— 4.366	43/64	0.671875	— 17.066	
3/16	—	0.1875	— 4.762	11/16	—	0.6875	— 17.462
	13/64	0.203125	— 5.159	45/64	0.703125	— 17.859	
	7/32	0.21875	— 5.556	23/32	—	0.71875	— 18.256
	15/64	0.234375	— 5.953	47/64	0.734375	— 18.653	
1/4	—	0.2500	— 6.350	3/4	—	0.7500	— 19.050
	17/64	0.265625	— 6.747	49/64	0.765625	— 19.447	
	9/32	0.28125	— 7.144	25/32	—	0.78125	— 19.844
	19/64	0.296875	— 7.541	51/64	0.796875	— 20.241	
5/16	—	0.3125	— 7.938	13/16	—	0.8125	— 20.638
	21/64	0.328125	— 8.334	53/64	0.828125	— 21.034	
	11/32	0.34375	— 8.731	27/32	—	0.84375	— 21.431
	23/64	0.359375	— 9.128	55/64	0.859375	— 21.828	
3/8	—	0.3750	— 9.525	7/8	—	0.8750	— 22.225
	25/64	0.390625	— 9.922	57/64	0.890625	— 22.622	
	13/32	0.40625	— 10.319	29/32	—	0.90625	— 23.019
	27/64	0.421875	— 10.716	59/64	0.921875	— 23.416	
7/16	—	0.4375	— 11.112	15/16	—	0.9375	— 23.812
	29/64	0.453125	— 11.509	61/64	0.953125	— 24.209	
	15/32	0.46875	— 11.906	31/32	—	0.96875	— 24.606
	31/64	0.484375	— 12.303	63/64	0.984375	— 25.003	
1/2	—	0.5000	— 12.700	1	—	1.000	— 25.400
	1 mm = 0.03937 in.			0.001 in. = 0.0254 mm			

U.S. to Metric Conversions

	To Convert	Into	Multiply By
Linear Measurement	Miles	Kilometers	1.609
	Yards	Meters	0.9144
	Feet	Meters	0.3048
	Feet	Centimeters	30.48
	Inches	Meters	0.0254
	Inches	Centimeters	2.54
	Inches	Millimeters	25.4
Area	Square Miles	Square Kilometers	2.59
	Square Feet	Square Meters	0.0929
	Square Inches	Square Centimeters	6.452
	Acre	Hectare	0.4047
Volume	Cubic Yards	Cubic Meters	0.7646
	Cubic Feet	Cubic Meters	0.02832
	Cubic Inches	Cubic Centimeters	16.39
Weight	Tons (Short)	Metric Tons	0.9078
	Pounds	Kilograms	0.4536
	Ounces (Avdp.)	Grams	28.3495
Pressure	Pounds/Sq. In.	Kilopascal	6.895
	Pounds/Sq. In.	Bar	0.069
Work	Foot-pounds	Newton-Meters	1.356
	Foot-pounds	Kilogram-Meters	0.1383
	Inch-pounds	Kilogram-Centimeters	1.152144
Liquid Volume	Quarts	Liters	0.9463
	Gallons	Liters	3.785
Liquid Flow	Gallons/Minute	Liters/Minute	3.785
Temperature	Fahrenheit	Celsius	1. Subtract 32°
			2. Multiply by 5/9

Torque Specifications

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

These Torque Specifications for the installation and tightening of fasteners shall apply to all fasteners which do not have a specific requirement identified in this Service Manual. The following factors shall be considered when applying 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, hardness of the surface underneath the fastener's head or similar condition which affects the installation.

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

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

Fastener Identification

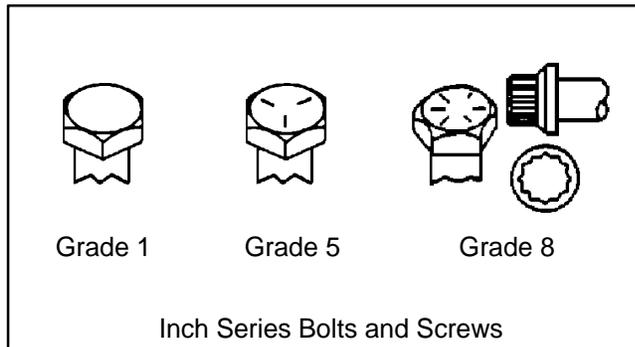


Figure 1

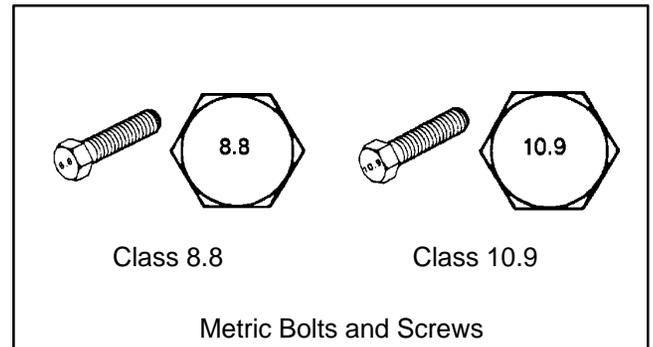


Figure 2

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

Thread Size	Grade 1, 5 & 8 with Thin Height Nuts	SAE Grade 1 Bolts, Screws, Studs & Sems with Regular Height Nuts (SAE J995 Grade 2 or Stronger Nuts)		SAE Grade 5 Bolts, Screws, Studs & Sems with Regular Height Nuts (SAE J995 Grade 2 or Stronger Nuts)		SAE Grade 8 Bolts, Screws, Studs & Sems with Regular Height Nuts (SAE J995 Grade 5 or Stronger Nuts)	
	in-lb	in-lb	N-cm	in-lb	N-cm	in-lb	N-cm
# 6 – 32 UNC	10 ± 2	13 ± 2	147 ± 23	15 ± 2	170 ± 20	23 ± 2	260 ± 20
# 6 – 40 UNF				17 ± 2	190 ± 20	25 ± 2	280 ± 20
# 8 – 32 UNC	13 ± 2	25 ± 5	282 ± 30	29 ± 3	330 ± 30	41 ± 4	460 ± 45
# 8 – 36 UNF				31 ± 3	350 ± 30	43 ± 4	485 ± 45
# 10 – 24 UNC	18 ± 2	30 ± 5	339 ± 56	42 ± 4	475 ± 45	60 ± 6	675 ± 70
# 10 – 32 UNF				48 ± 4	540 ± 45	68 ± 6	765 ± 70
1/4 – 20 UNC	48 ± 7	53 ± 7	599 ± 79	100 ± 10	1125 ± 100	140 ± 15	1580 ± 170
1/4 – 28 UNF	53 ± 7	65 ± 10	734 ± 113	115 ± 10	1300 ± 100	160 ± 15	1800 ± 170
5/16 – 18 UNC	115 ± 15	105 ± 17	1186 ± 169	200 ± 25	2250 ± 280	300 ± 30	3390 ± 340
5/16 – 24 UNF	138 ± 17	128 ± 17	1446 ± 192	225 ± 25	2540 ± 280	325 ± 30	3670 ± 340
	ft-lb	ft-lb	N-m	ft-lb	N-m	ft-lb	N-m
3/8 – 16 UNC	16 ± 2	16 ± 2	22 ± 3	30 ± 3	41 ± 4	43 ± 4	58 ± 5
3/8 – 24 UNF	17 ± 2	18 ± 2	24 ± 3	35 ± 3	47 ± 4	50 ± 4	68 ± 5
7/16 – 14 UNC	27 ± 3	27 ± 3	37 ± 4	50 ± 5	68 ± 7	70 ± 7	95 ± 9
7/16 – 20 UNF	29 ± 3	29 ± 3	39 ± 4	55 ± 5	75 ± 7	77 ± 7	104 ± 9
1/2 – 13 UNC	30 ± 3	48 ± 7	65 ± 9	75 ± 8	102 ± 11	105 ± 10	142 ± 14
1/2 – 20 UNF	32 ± 3	53 ± 7	72 ± 9	85 ± 8	115 ± 11	120 ± 10	163 ± 14
5/8 – 11 UNC	65 ± 10	88 ± 12	119 ± 16	150 ± 15	203 ± 20	210 ± 20	285 ± 27
5/8 – 18 UNF	75 ± 10	95 ± 15	129 ± 20	170 ± 15	230 ± 20	240 ± 20	325 ± 27
3/4 – 10 UNC	93 ± 12	140 ± 20	190 ± 27	265 ± 25	359 ± 34	375 ± 35	508 ± 47
3/4 – 16 UNF	115 ± 15	165 ± 25	224 ± 34	300 ± 25	407 ± 34	420 ± 35	569 ± 47
7/8 – 9 UNC	140 ± 20	225 ± 25	305 ± 34	430 ± 45	583 ± 61	600 ± 60	813 ± 81
7/8 – 14 UNF	155 ± 25	260 ± 30	353 ± 41	475 ± 45	644 ± 61	660 ± 60	895 ± 81

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

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

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

Standard Torque for Dry, Zinc 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 ± 5 in-lb	640 ± 60 N-cm	78 ± 7 in-lb	885 ± 80 N-cm
M6 X 1.0	96 ± 9 in-lb	1018 ± 100 N-cm	133 ± 13 in-lb	1500 ± 150 N-cm
M8 X 1.25	19 ± 2 ft-lb	26 ± 3 N-m	27 ± 2 ft-lb	36 ± 3 N-m
M10 X 1.5	38 ± 4 ft-lb	52 ± 5 N-m	53 ± 5 ft-lb	72 ± 7 N-m
M12 X 1.75	66 ± 7 ft-lb	90 ± 10 N-m	92 ± 9 ft-lb	125 ± 12 N-m
M16 X 2.0	166 ± 15 ft-lb	225 ± 20 N-m	229 ± 22 ft-lb	310 ± 30 N-m
M20 X 2.5	325 ± 33 ft-lb	440 ± 45 N-m	450 ± 37 ft-lb	610 ± 50 N-m

Product Records and Maintenance

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

NOTE: 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.

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

Other Torque Specifications

SAE Grade 8 Steel Set Screws

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

Wheel Bolts and Lug Nuts

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

** For steel wheels and non-lubricated fasteners.

Thread Cutting Screws (Zinc Plated Steel)

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

Thread Cutting Screws (Zinc Plated Steel)

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

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

Conversion Factors

$$\begin{aligned} \text{in-lb} \times 11.2985 &= \text{N-cm} \\ \text{ft-lb} \times 1.3558 &= \text{N-m} \end{aligned}$$

$$\begin{aligned} \text{N-cm} \times 0.08851 &= \text{in-lb} \\ \text{N-m} \times 0.7376 &= \text{ft-lb} \end{aligned}$$



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Service and Repairs

Roller

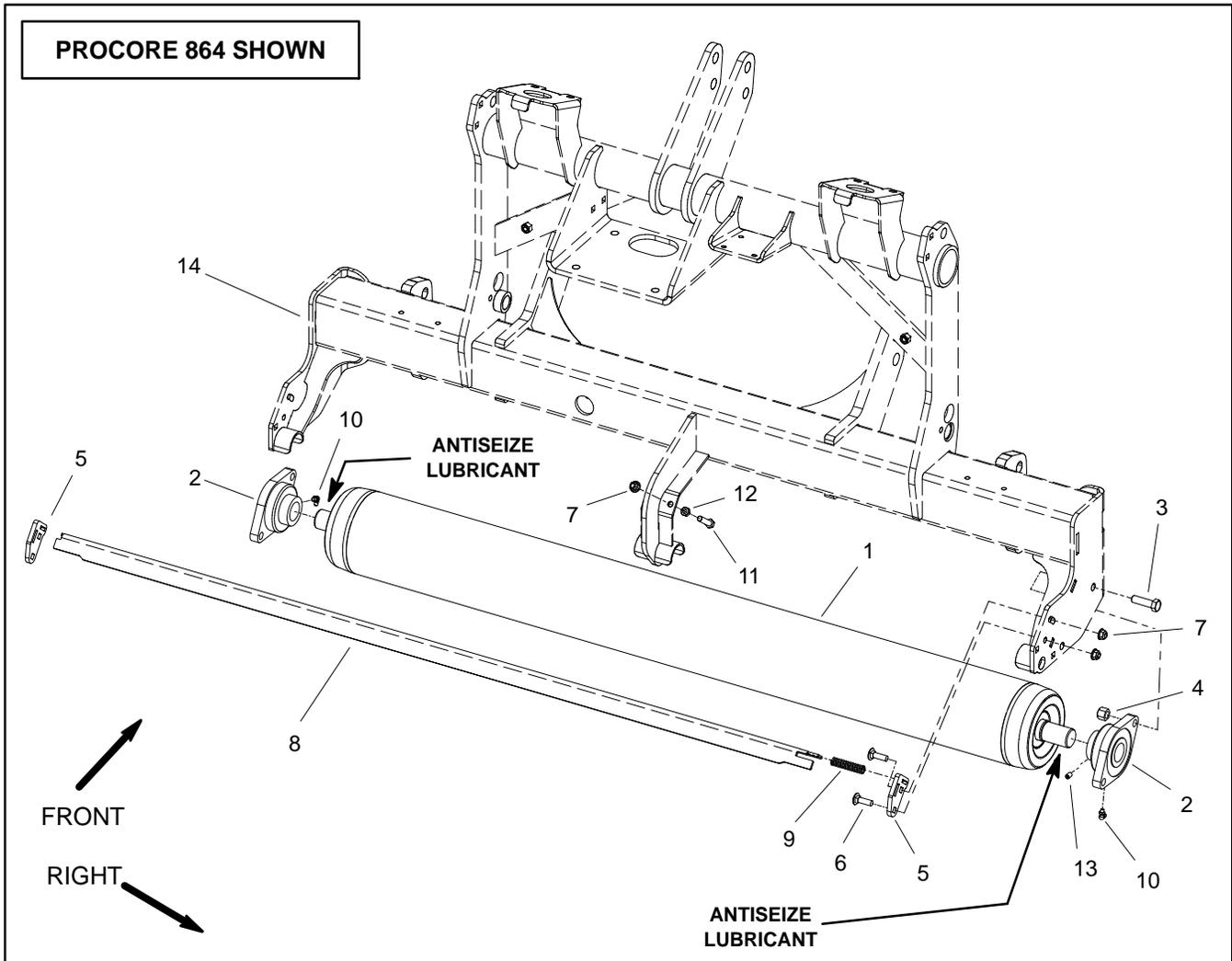


Figure 1

- | | | |
|-----------------------------------|------------------------------------|-----------------|
| 1. Roller | 6. Carriage screw (2 used per arm) | 11. Bolt |
| 2. Flange bearing (2 used) | 7. Flange nut | 12. Hex nut |
| 3. Cap screw (2 used per bearing) | 8. Roller scraper | 13. Set screw |
| 4. Lock nut (2 used per bearing) | 9. Compression spring | 14. Hitch frame |
| 5. Scraper arm (2 used) | 10. Grease fitting | |

Roller Removal (Fig. 1)

1. Position aerator on a firm, level surface with aerator attached to tractor. Disengage PTO, apply tractor parking brake, stop engine and remove key from the ignition switch. Support aerator to prevent it from moving.
2. Chock roller to prevent it from moving.
3. Loosen flange bearings from roller shaft:
 - A. Loosen set screw (item 2.1) that secures each bearing locking collar to roller shaft.
 - B. Using the blind hole in bearing locking collars as a striking point, unlock collars from roller shaft by rotating the collars with a punch in the opposite direction of normal roller rotation.
4. Remove two (2) cap screws and lock nuts that secure both flange bearings (item 2) to aerator frame.
5. Start engine on tow vehicle. Slowly raise aerator while allowing roller to remain on the ground. Stop tow vehicle engine. Support raised aerator to prevent it from lowering unexpectedly.



6. Remove roller with flange bearings from under machine.
7. Slide bearings from roller shaft.

Roller Installation (Fig. 1)

1. Clean roller shaft ends and apply antiseize lubricant to shaft ends. Slide bearings onto roller shafts. Do not tighten set screws at this time.



2. Position roller with flange bearings under raised aerator.
3. Start engine on tow vehicle. Slowly lower aerator to position aerator frame to roller assembly.
4. Align holes in bearing flanges with holes in aerator frame. Orientate bearing so that grease fittings point to front of aerator. Secure both flange bearings to frame with two (2) cap screws and lock nuts.
5. Check that roller is free to rotate and no binding exists. Center roller between bearings.
6. Using the blind hole in the flange mount bearing locking collars as a striking point, lock collars to roller shaft by rotating the collars with a punch in the direction of normal roller rotation. Tighten set screw (item 2.1) to secure each bearing locking collar to roller shaft.
7. Check that clearance between roller scraper and roller is from 0.060" to 0.090" (1.5 to 2.2 mm) along entire length of scraper. Adjust scraper position if necessary.
8. Lubricate grease fittings on roller bearings.

Turf Guards

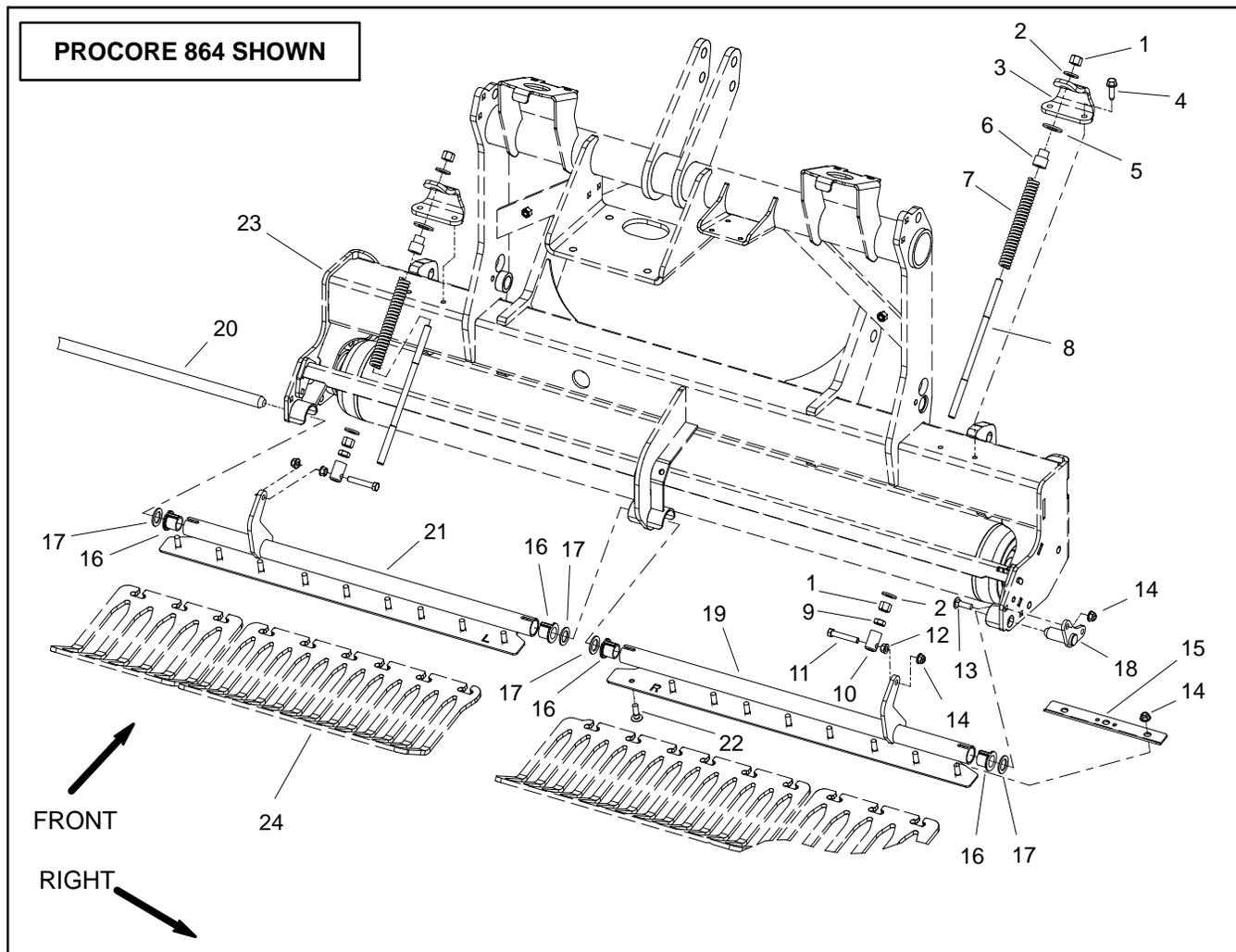


Figure 2

- | | | |
|-------------------------------|----------------------|--------------------|
| 1. Lock nut | 9. Jam nut | 17. Thrust washer |
| 2. Thrust washer | 10. Spring tube | 18. Stub shaft |
| 3. Spring bracket | 11. Cap screw | 19. RH turf guard |
| 4. Screw (2 used per bracket) | 12. Flange nut | 20. Shaft |
| 5. Flat washer | 13. Carriage screw | 21. LH turf guard |
| 6. Spring rod sleeve | 14. Flange nut | 22. Rib neck screw |
| 7. Compression spring | 15. Turf guard clamp | 23. Hitch frame |
| 8. Spring rod | 16. Flange bushing | 24. Turf guard |

Removal (Fig. 2)

1. Position aerator on a firm, level surface. If attached to tractor, disengage PTO, apply tractor parking brake, stop engine and remove key from the ignition switch.
2. Disconnect spring assembly from turf guard:
 - A. Remove flange nut (item 12) that secures spring assembly to turf guard.
 - B. Slide end of cap screw (item 11) from bracket on turf guard.
 - C. Position spring assembly away from turf guard.
3. On both sides of frame, loosen and remove two (2) carriage screws and flange nuts that secure turf guard pivot shafts to frame.

NOTE: On ProCore 864 machines, the LH pivot shaft extends completely through the LH turf guard and into the RH turf guard.

4. Slide pivot shafts from frame and turf guard.

NOTE: On ProCore 864 machines, there is one (1) thrust washer on each side of the turf guard. On ProCore 1298 machines, there are two (2) thrust washers on each side of turf guard (Fig. 3).

5. Remove turf guard assembly from machine. Locate and retrieve thrust washer(s) from each side of turf guard.
6. Disassemble turf guard and spring assembly as needed using Figure 2 as a guide.
7. If necessary, use press to remove rib neck screws (item 22) from turf guard.

Installation (Fig. 2)

1. If rib neck screws were removed from turf guard, use press to install screws into turf guard. Make sure that screw heads are flush with turf guard surface.
2. Assemble turf guard and spring assembly as needed using Figure 2 as a guide. If spring assembly was taken apart, use dimensions shown in Figure 4 during the assembly process.
3. Make sure that keyed flange bushing (item 16) is correctly placed in each end of turf guard. Position turf guard assembly to aerator.

NOTE: On ProCore 864 machines, there is one (1) thrust washer on each side of the turf guard. On ProCore 1298 machines, there are two (2) thrust washers on each side of turf guard (Fig. 3).

4. Place thrust washer(s) between each side of turf guard and frame.
5. On both sides of frame, slide turf guard pivot shafts through frame and into turf guard. Secure pivot shafts to frame with two (2) carriage screws and flange nuts.
6. Connect spring assembly to turf guard:
 - A. Slide end of cap screw (item 11) through bracket on turf guard.
 - B. Secure spring assembly to turf guard with flange nut.

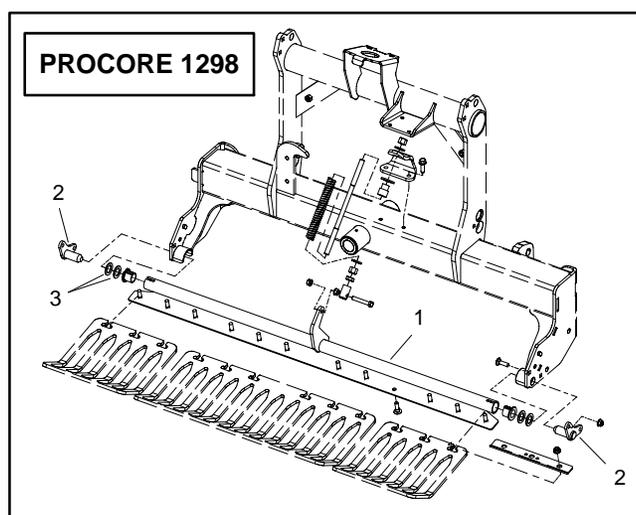


Figure 3

1. Turf guard
2. Stub shaft
3. Thrust washer

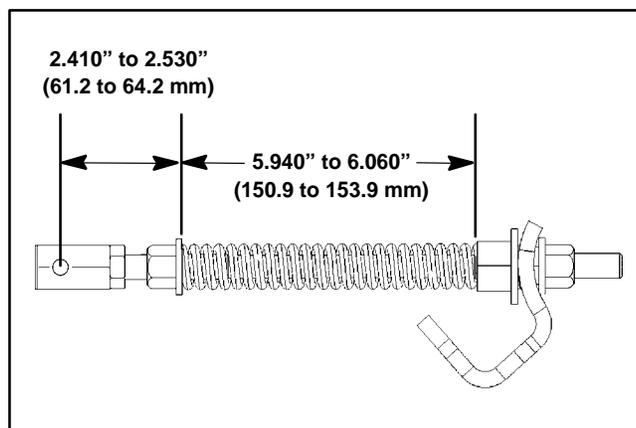


Figure 4

Front Covers (ProCore 864)

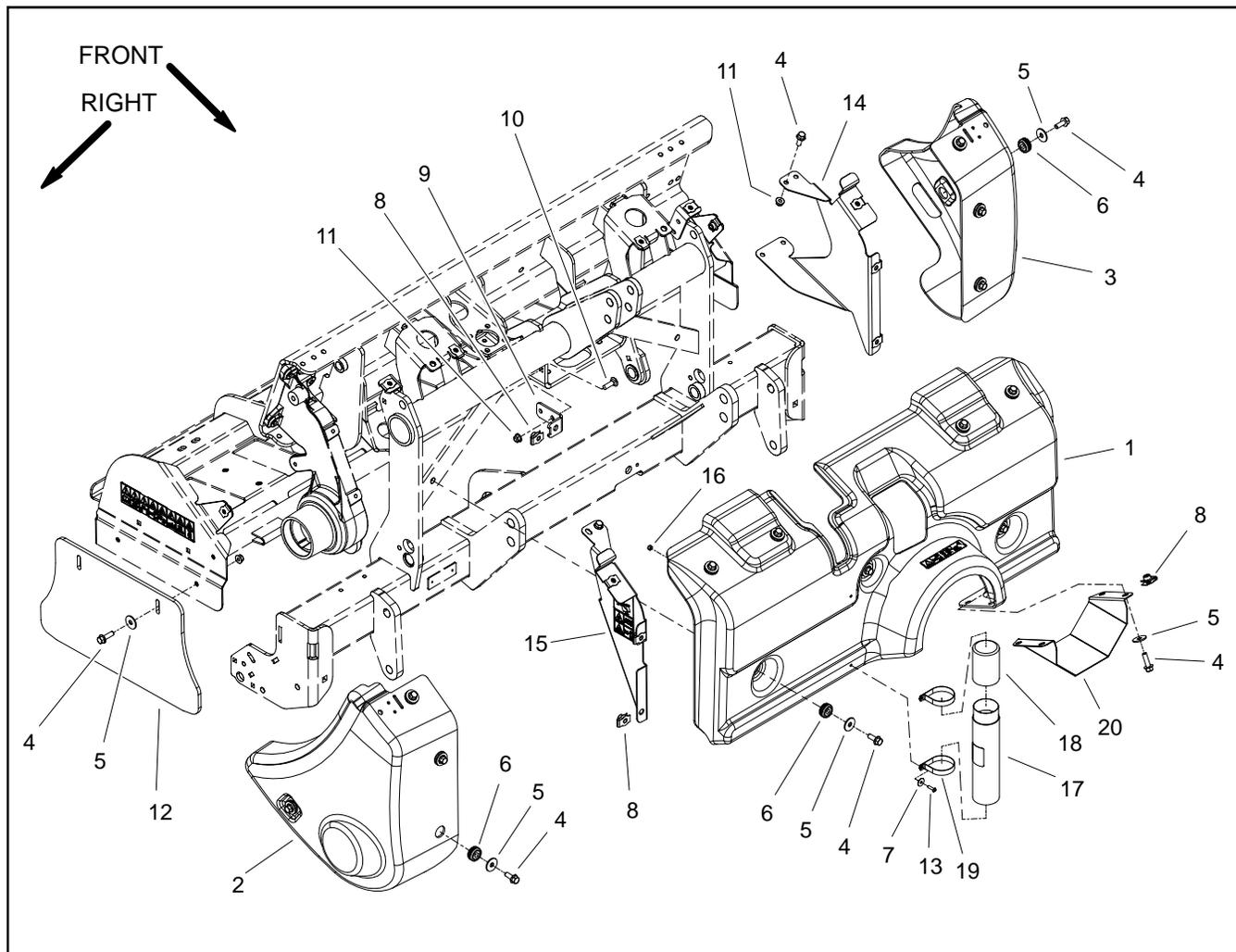


Figure 5

- | | | |
|----------------------|---|-----------------------|
| 1. Front cover | 8. Tinnerman nut | 15. RH shield support |
| 2. RH pulley shield | 9. Front cover support (3 used) | 16. Lock nut (2 used) |
| 3. LH pulley shield | 10. Carriage screw (2 used per support) | 17. Manual housing |
| 4. Flange head screw | 11. Flange nut | 18. Housing cap |
| 5. Flat washer | 12. Side shield (2 used) | 19. R-Clamp (2 used) |
| 6. Iso mount | 13. Screw (2 used) | 20. PTO shield |
| 7. Flat washer | 14. LH shield support | |

Removal (Fig. 5)

1. Position aerator on a firm, level surface. If attached to tractor, disengage PTO, apply tractor parking brake, stop engine and remove key from the ignition switch.
2. Remove rear hood.
3. To remove either pulley shield (items 2 or 3), remove four (4) flange head screws and flat washers that secure pulley shield to coring frame. Remove pulley shield.
4. To remove front cover (item 1):
 - A. Remove four (4) flange head screws and four (4) flat washers that secure PTO shield (item 20) to front cover. Remove PTO shield.
 - B. Remove one of the pulley shields (see step 3 above).
 - C. Remove seven (7) flange head screws and flat washers that secure front cover to frame. Remove front cover.

Installation (Fig. 5)

1. Make sure that tinnerman nuts (item 8) are properly positioned to frame. Also, make sure that iso mounts (item 6) are placed in cover holes.
2. Position front cover to aerator frame and secure with removed fasteners. Attach PTO shield to front cover with removed fasteners.
3. After front cover is installed, position pulley shield to aerator frame and secure with removed fasteners.
4. Install rear hood.

Front Covers (ProCore 1298)

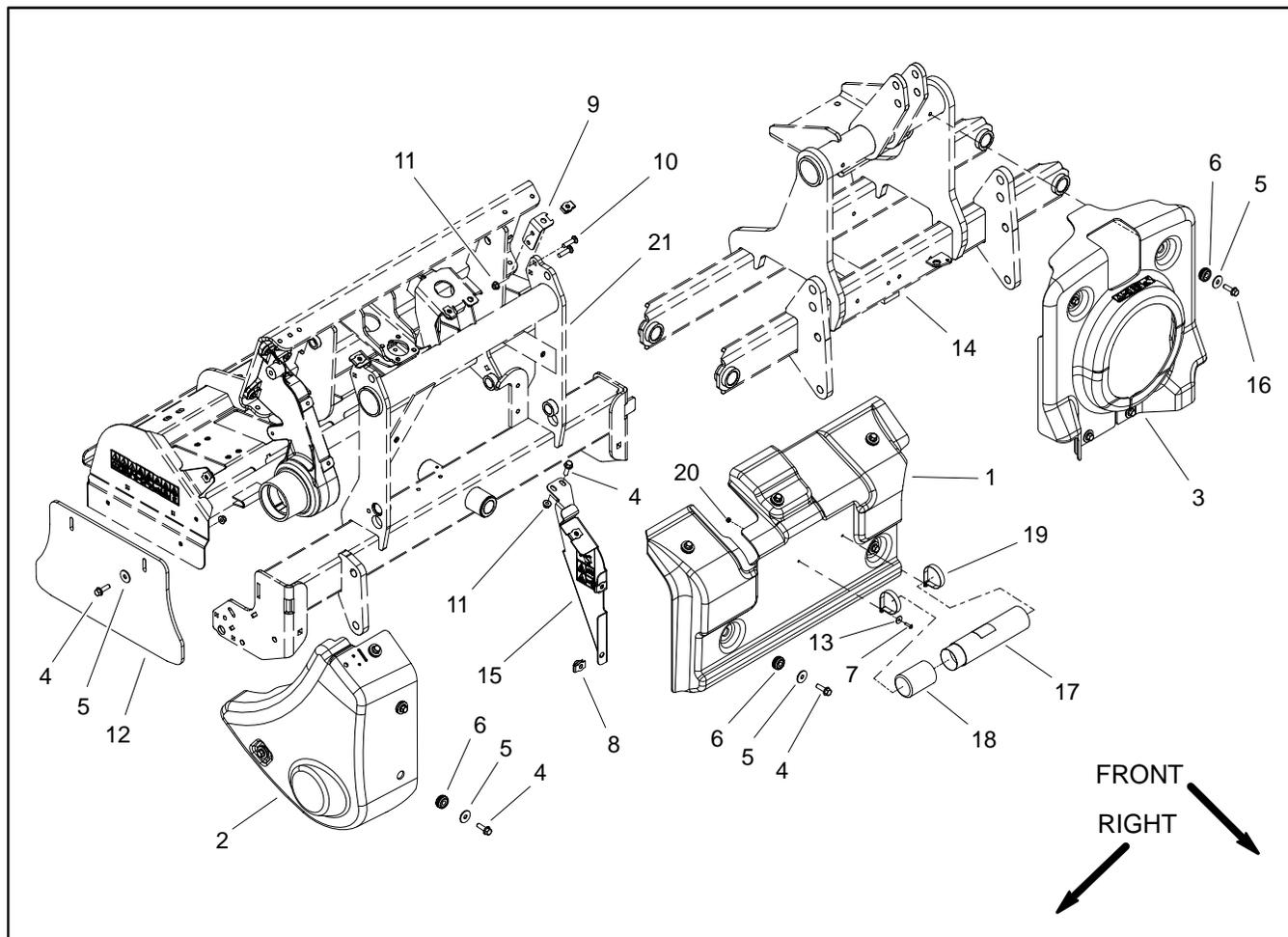


Figure 6

- | | | |
|-----------------------------|---------------------------------|-------------------------------|
| 1. Front cover (RH shown) | 8. Tinnerman nut | 15. Shield support (RH shown) |
| 2. Pulley shield (RH shown) | 9. Front cover support (2 used) | 16. Screw (4 used) |
| 3. Yoke cover | 10. Carriage screw (4 used) | 17. Manual housing |
| 4. Flange head screw | 11. Flange nut (8 used) | 18. Housing cap |
| 5. Flat washer | 12. Side shield | 19. R-clamp (2 used) |
| 6. Iso mount | 13. Flat washer (2 used) | 20. Lock nut (2 used) |
| 7. Screw (2 used) | 14. Hitch frame | 21. Subframe (RH shown) |

Removal (Fig. 6)

1. Position aerator on a firm, level surface. If attached to tractor, disengage PTO, apply tractor parking brake, stop engine and remove key from the ignition switch.
2. Remove rear hood.
3. To remove pulley shield (item 2), remove four (4) flange head screws and flat washers that secure pulley shield to coring frame. Remove pulley shield.
4. To remove front cover (item 1):
 - A. Remove one of the pulley shields (see step 3 above).
 - B. Remove five (5) flange head screws and flat washers that secure front cover to frame. Remove front cover.
5. To remove yoke cover (item 3), remove four (4) flange head screws and flat washers that secure yoke cover to hitch frame. Remove yoke cover.

Installation (Fig. 6)

1. Make sure that tinnerman nuts (item 8) are properly positioned to machine. Also, make sure that iso mounts are placed in cover holes.
2. Position cover to aerator frame and secure with removed fasteners.
3. After front cover is installed, position shield to aerator frame and secure with removed fasteners.
4. Install rear hood.

Hitch Frame (ProCore 1298)

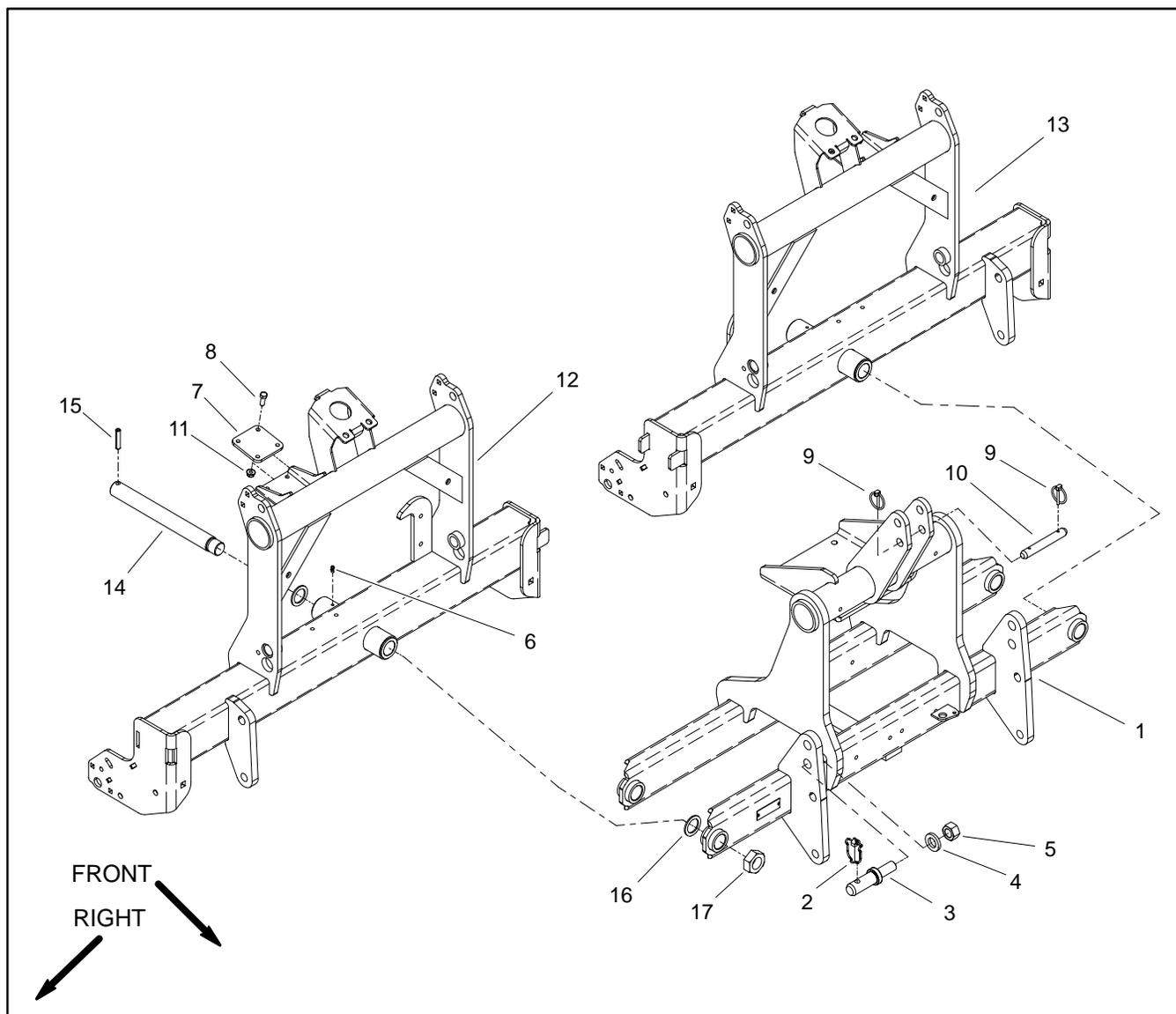


Figure 7

- | | | |
|----------------------------|---------------------------------------|----------------------------|
| 1. Hitch frame | 7. Pad (2 used) | 13. LH subframe |
| 2. Lynch pin (2 used) | 8. Flange head screw (4 used per pad) | 14. Pivot shaft (2 used) |
| 3. Link pin (2 used) | 9. Lynch pin (2 used) | 15. Roll pin (2 used) |
| 4. Washer (2 used) | 10. Clevis pin | 16. Thrust washer (4 used) |
| 5. Hex nut (2 used) | 11. Flange nut (4 used per pad) | 17. Lock nut (2 used) |
| 6. Grease fitting (2 used) | 12. RH subframe | |

Removal (Fig. 7)

1. Position aerator on a firm, level surface and disconnect aerator from tractor.
2. Support subframes, coring frames and hitch frame assemblies to prevent them from falling or shifting unexpectedly.
3. Remove front covers (see Front Covers (ProCore 1298) Removal in this section).
4. Disconnect both coring head driveshafts from gearbox (see Driveshaft Removal in the Service and Repairs section of Chapter 4 – Coring Head). Position and support driveshafts away from hitch frame.
5. Remove gearbox from hitch frame (see Gearbox Removal in the Service and Repairs section of Chapter 4 – Coring Head).
6. Remove lock nuts that secure pivot shafts to subframes and hitch frame.
7. Make sure that aerator frame sections are supported.
8. Slide both pivot shafts from subframe and hitch frame. Locate and retrieve thrust washer (item 16) from each side of subframe.
9. Lift subframe assemblies from hitch frame. Remove hitch frame.
10. Inspect bushings in subframe for wear or damage (Fig. 8). Replace bushings if necessary.

Installation (Fig. 7)

1. Position hitch frame to subframe assemblies.
2. Connect both subframes to hitch frame:
 - A. Place thrust washer on each side of subframe pivot tube.
 - B. Slide pivot shaft through hitch frame, both thrust washers and subframe pivot. Make sure that roll pin in pivot shaft is positioned in frame reliefs.
 - C. Install lock nut onto pivot shaft. Tighten lock nut until the total clearance between the subframe and hitch frame is from 0.010" to 0.030" (0.3 to 0.7 mm).

3. Install gearbox to hitch frame (see Gearbox Installation in the Service and Repairs section of Chapter 4 – Coring Head).
4. Connect both coring head driveshafts to gearbox (see Driveshaft Installation in the Service and Repairs section of Chapter 4 – Coring Head).
5. Install front covers (see Front Covers (ProCore 1298) Installation in this section).
6. Lubricate grease fittings on subframe pivot tubes.

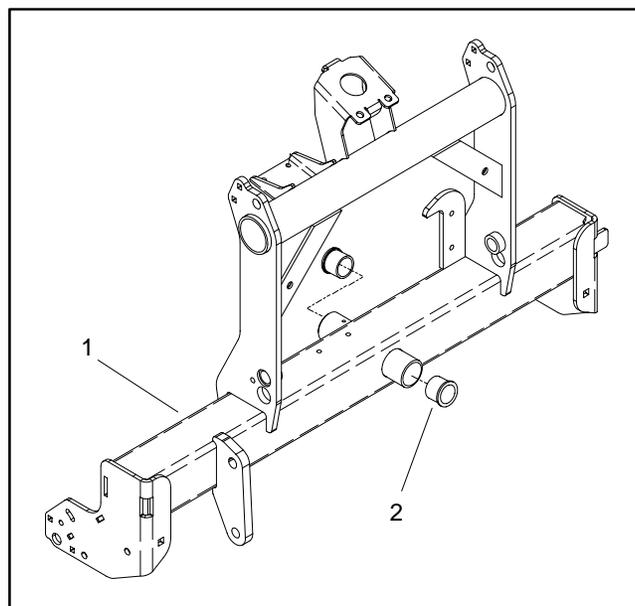


Figure 8

1. Subframe
2. Flange bushing

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Specifications

Item	Description
Gearbox Lubricant Capacity	GL-5 API, SAE 80W-90 gear lube 56 US fl. oz. (1.65 liter)

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General Information

ProCore 864 Coring Head

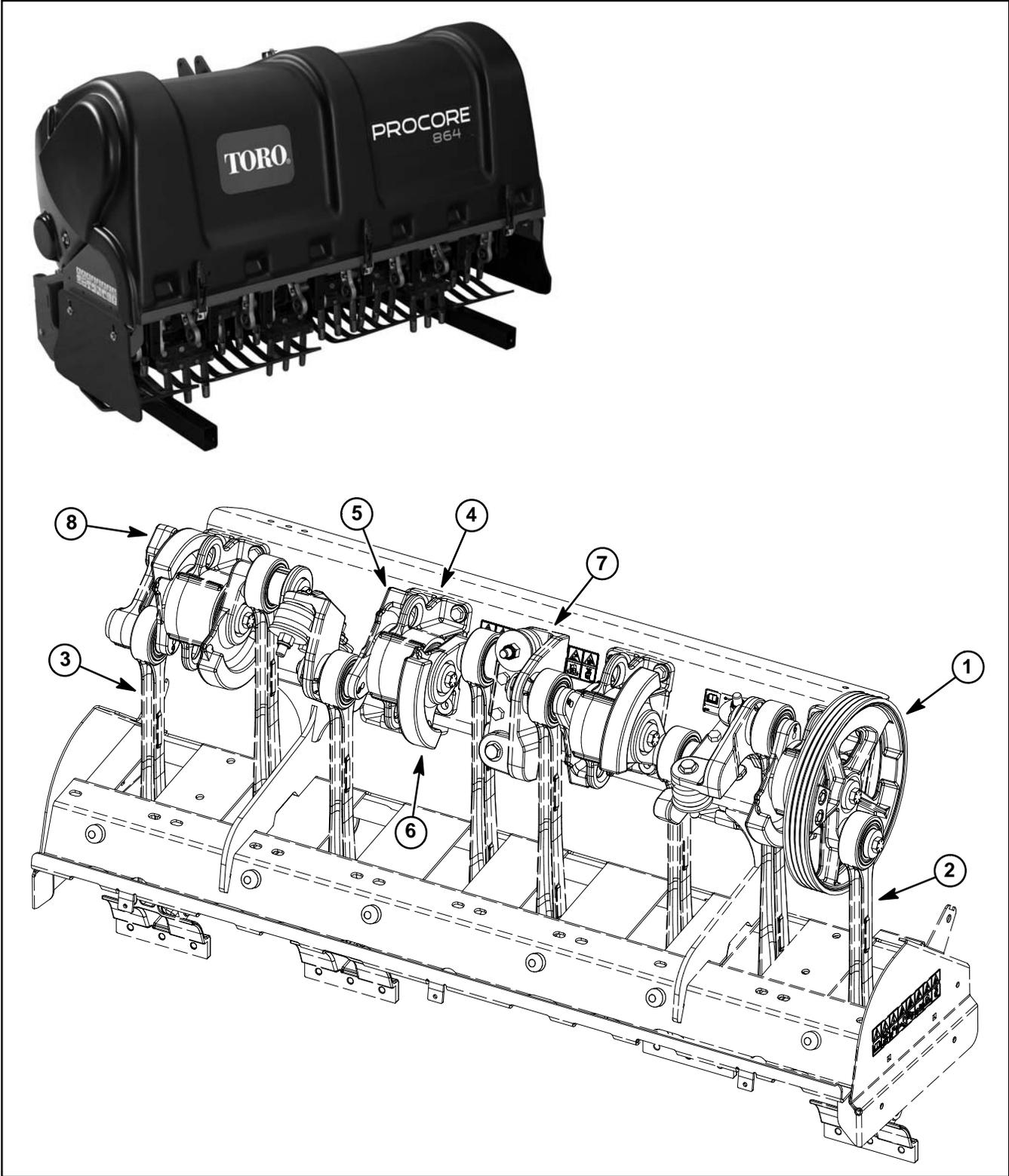


Figure 1

- 1. Driven pulley
- 2. #1 stomper arm
- 3. #8 stomper arm
- 4. Bearing housing (4 used)
- 5. Crankarm (2, 4, 6) (4 used)
- 6. Crankarm (3, 5) (3 used)
- 7. Coupler assembly (3 used)
- 8. Counter weight

Operation

The coring head of the ProCore 864 consists of a frame, a coring crankshaft assembly, turf holders, tine holders and aerating tines. The crankshaft assembly operates eight (8) stomper arms with rotolink assemblies to provide vertical tine motion. The coring head frame pivots to allow aerating depth control.

Drive for the coring head comes from the tow tractor PTO. A gearbox on the ProCore is turned by a driveshaft connected to the tractor PTO. The gearbox provides rotation for the coring head crankshaft assembly.

The gearbox rotates a single driveshaft which in turn rotates a pulley to drive the coring crankshaft assembly with a 4 groove drive belt. This drive belt is tensioned by a spring loaded idler pulley.

The coring crankshaft is composed of multiple crankarms, bearings, bearing housings and couplings. The crankshaft assembly is designed to ensure minimal vibration during aerator operation.

Aeration depth control is performed by adjusting the coring head depth control assembly to obtain the desired aerating depth.

Turf holders are used to prevent damage to the turf as the tines are lifted from the ground.

A variety of tines, tine heads and turf holders are available for use on the ProCore 864. See the Operator's Manual for available options.

Coring Crankshaft (Fig. 1)

The coring crankshaft assembly is composed of eight (8) crankarms. The crankarms are timed for proper aerating operation. Coring crankshaft positions are identified based on their relationship with the crankshaft driven pulley. The #1 position is at the pulley side of the crankshaft (Fig. 1).

The crankshaft assembly is supported with four (4) identical bearing housing assemblies. Each bearing housing supports two (2) crankarms.

The crankarm used in the #1 crankshaft position is incorporated into the driven pulley. The remaining odd numbered crankshaft positions (#3, #5 and #7) use the same crankarm. These crankarm castings can be identified with the numbers 3 and 5 in the castings. Crankarms used in even numbered crankshaft positions (#2, #4, #6 and #8) are the same component. These crankarms can be identified with the numbers 2, 4 and 6 in the crankarm castings.

Three (3) coupler assemblies are used to connect the crankarms that are secured in the bearing housings. These coupler assemblies use the same components: a #2 coupling, a #3 coupling, a coupling plate, two (2) iso-mounts and necessary fasteners. The #2 couplings attach to even numbered crankarms. The #3 couplings are secured to odd numbered crankarms.

Two counterweights are incorporated into the ProCore 864 coring crankshaft to ensure the rotational balance of the crankshaft assembly. One of the counterweights is bolted to the driven pulley. The second counterweight is attached to the #8 crankarm position.

The stomper arms and rotolink assemblies used on the ProCore 864 are the same for all crankshaft positions.

Coring Crankshaft Timing

On the ProCore 864 aerator, each pair of crankarms joined through a bearing housing are assembled with the crankarm journals positioned 180° apart. The coupler assemblies that connect these pairs of crankarms allow for proper phasing of the crankshaft to allow minimal operating vibration.

NOTE: On the ProCore 864, the numbers cast into the crankarms will not align with the raised indicator marks on the bearing housings.

ProCore 1298 Coring Head

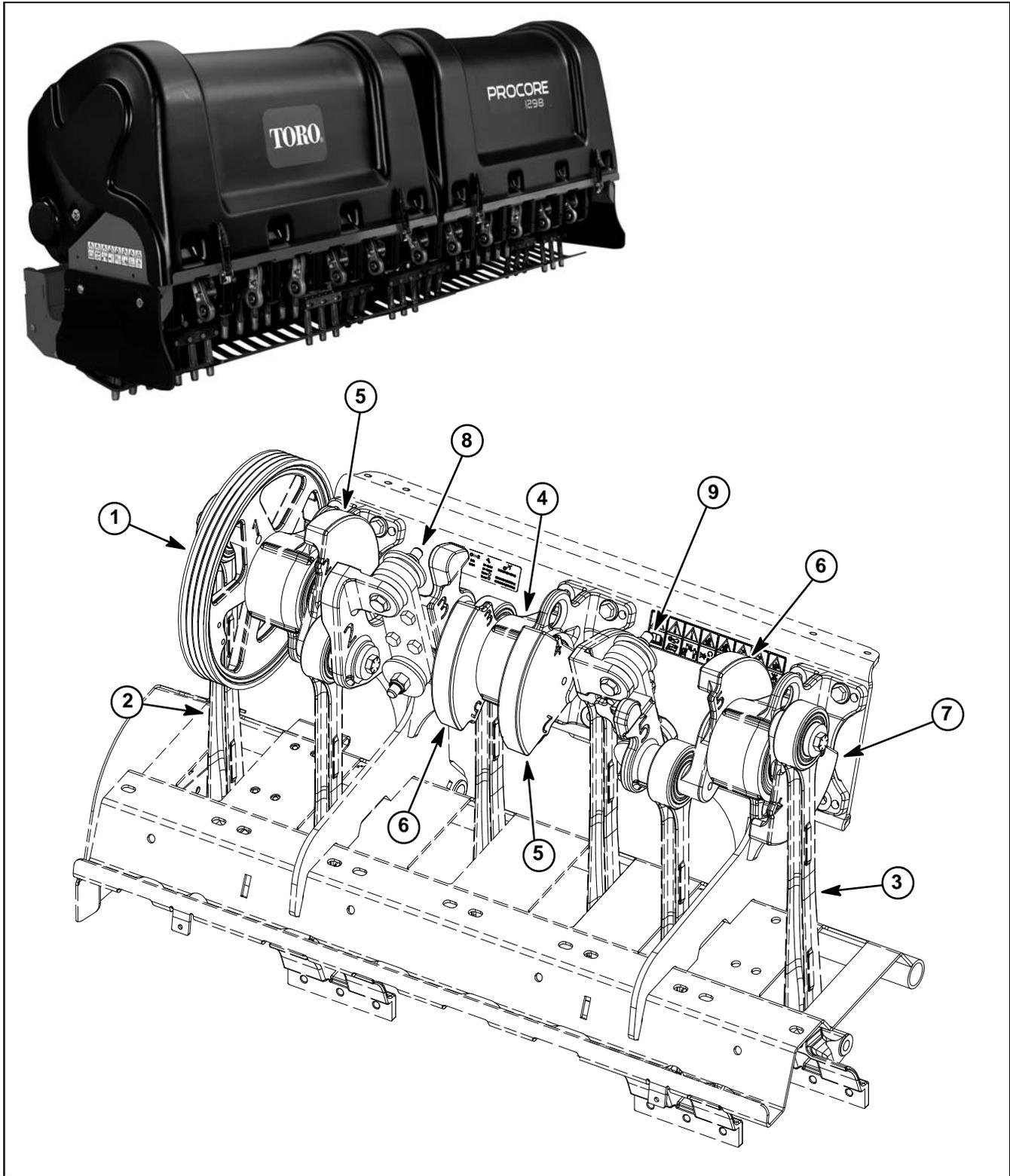


Figure 2

- 1. Driven pulley
- 2. #1 stomper arm
- 3. #6 stomper arm
- 4. Bearing housing (3 used)
- 5. Crankarm (#2 and #4)
- 6. Crankarm (#3 and #5)
- 7. Crankarm (#6)
- 8. Coupling assembly (2 / 3)
- 9. Coupling Assembly (4 / 5)

Operation

The ProCore 1298 is comprised of two (2) independent coring heads connected with a pivoting subframe system. Each of the coring heads includes a coring crankshaft assembly, turf holders, tine holders and aerating tines. The crankshaft assembly operates six (6) stomper arms with rotolink assemblies to provide vertical tine motion. The coring head frame pivots to allow aerating depth control.

Drive for the dual coring heads comes from the tow tractor PTO. A single gearbox on the ProCore is turned by a driveshaft connected to the tractor PTO. The gearbox provides rotation for the two (2) coring head crankshaft assemblies.

The ProCore gearbox rotates two (2) driveshafts. Each of these driveshafts rotates a coring head crankshaft with a pulley and 4 groove drive belt tensioned by a spring loaded idler pulley.

The two (2) coring crankshafts are composed of multiple crankarms, bearings, bearing housings and couplings. For assembly purposes, proper crankshaft component position is identified by alignment marks on bearing housings and numbers cast into crankarms and coupling components. Crankarm journals are timed to ensure minimal vibration.

Aeration depth control is performed by adjusting the coring head depth control assembly to obtain the desired aerating depth.

Turf holders are used to prevent damage to the turf as the tines are lifted from the ground.

A variety of tines, tine heads and turf holders are available for use on the ProCore 1298. See the Operator's Manual for available options.

Coring Crankshaft (Fig. 2)

Each of the ProCore 1298 coring crankshaft assemblies is composed of six (6) crankarms. The crankarms are timed for proper aerating operation. Coring crankshaft positions are identified based on their relationship with the crankshaft driven pulley. The #1 position is at the pulley side of the crankshaft (Fig. 2).

The crankshaft assembly on each of the coring heads is supported with three (3) identical bearing housing assemblies. Each bearing housing supports two (2) crankarms.

The crankarm used in the #1 crankshaft position is incorporated into the driven pulley. Crankarms used in crankshaft positions #2 and #4 are the same component. These crankarms can be identified with the numbers 2, 4 and 6 in the crankarm castings. Crankarms used in crankshaft positions #3 and #5 use the same crankarm and can be identified with the numbers 3 and 5 in the castings. The crankarm used in crankshaft position #6 is different than other crankarms and has the numbers 2, 4 and 6 in the casting.

Two (2) coupler assemblies are used to connect the crankarms that are secured in the bearing housings. These coupler assemblies use two (2) couplings, a coupling plate, two (2) iso-mounts and necessary fasteners. The couplings used on the ProCore 1298 are all different. The couplings are identified with the crankshaft position in the coupling casting.

The stomper arms and rotolink assemblies used on the ProCore 1298 are the same for all crankshaft positions.

Coring Crankshaft Timing

When properly assembled, the crankshaft position numbers on the crankarms will align with the raised alignment marks on the bearing housing (Fig. 3). The timing of either coring head is not dependent on the adjacent coring head.

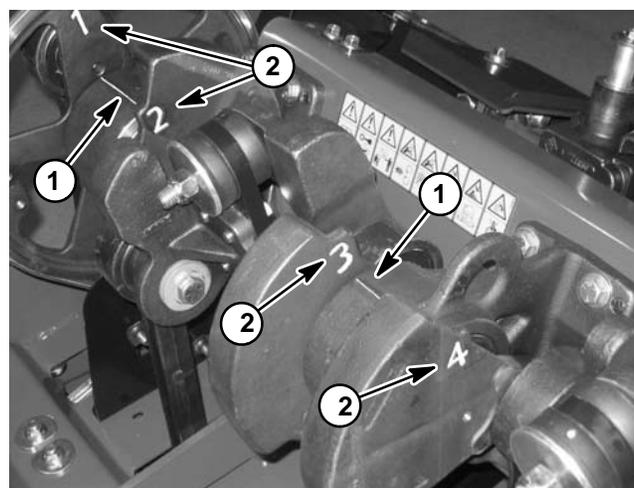


Figure 3

- 1. Housing timing mark
- 2. Crankarm position

Coring Head Adjustments

See Operator's Manual for adjustment procedures for the coring head on the ProCore 864 and 1298.



CAUTION

Never work on the coring head with the tow tractor PTO engaged or engine running. Always disengage the PTO, stop tractor engine, remove key from the ignition switch and wait for all machine movement to stop before performing any service to coring head components.

Special Tools

Compression Spring Tool

Use to remove and install the coring head compression springs. Obtain these items locally.

NOTE: The ProCore 864 uses two (2) compression springs for its single coring frame. The ProCore 1298 uses one (1) compression spring for each of its dual coring frames.

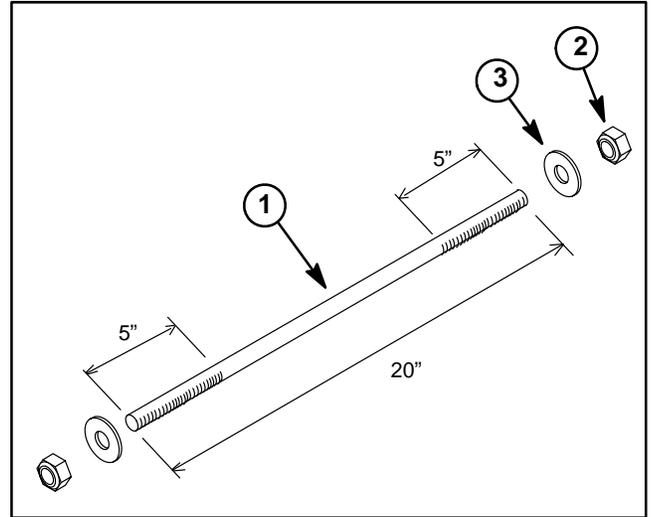


Figure 4

1. Threaded rod (1/2" or 5/8" diameter)
2. Nut (2 used)
3. Flat washer (2 used)

Coring Head Drive Pulley Tool

Use to remove the coring head drive pulley. Obtain these items locally.

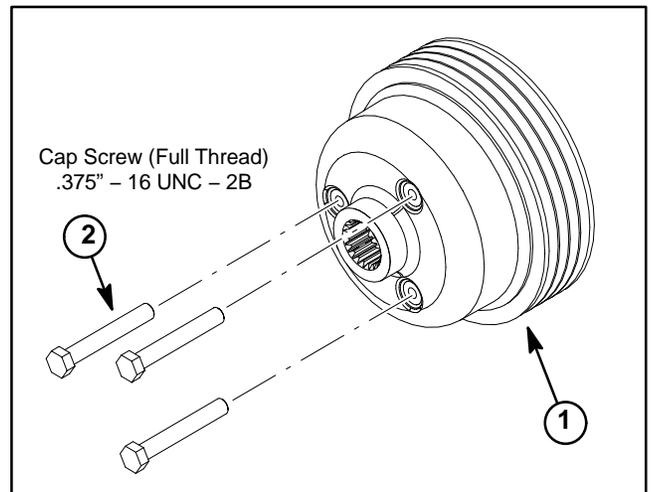


Figure 5

1. Drive pulley
2. Cap screw (full thread)

Service and Repairs

Rotolink Damper Assemblies

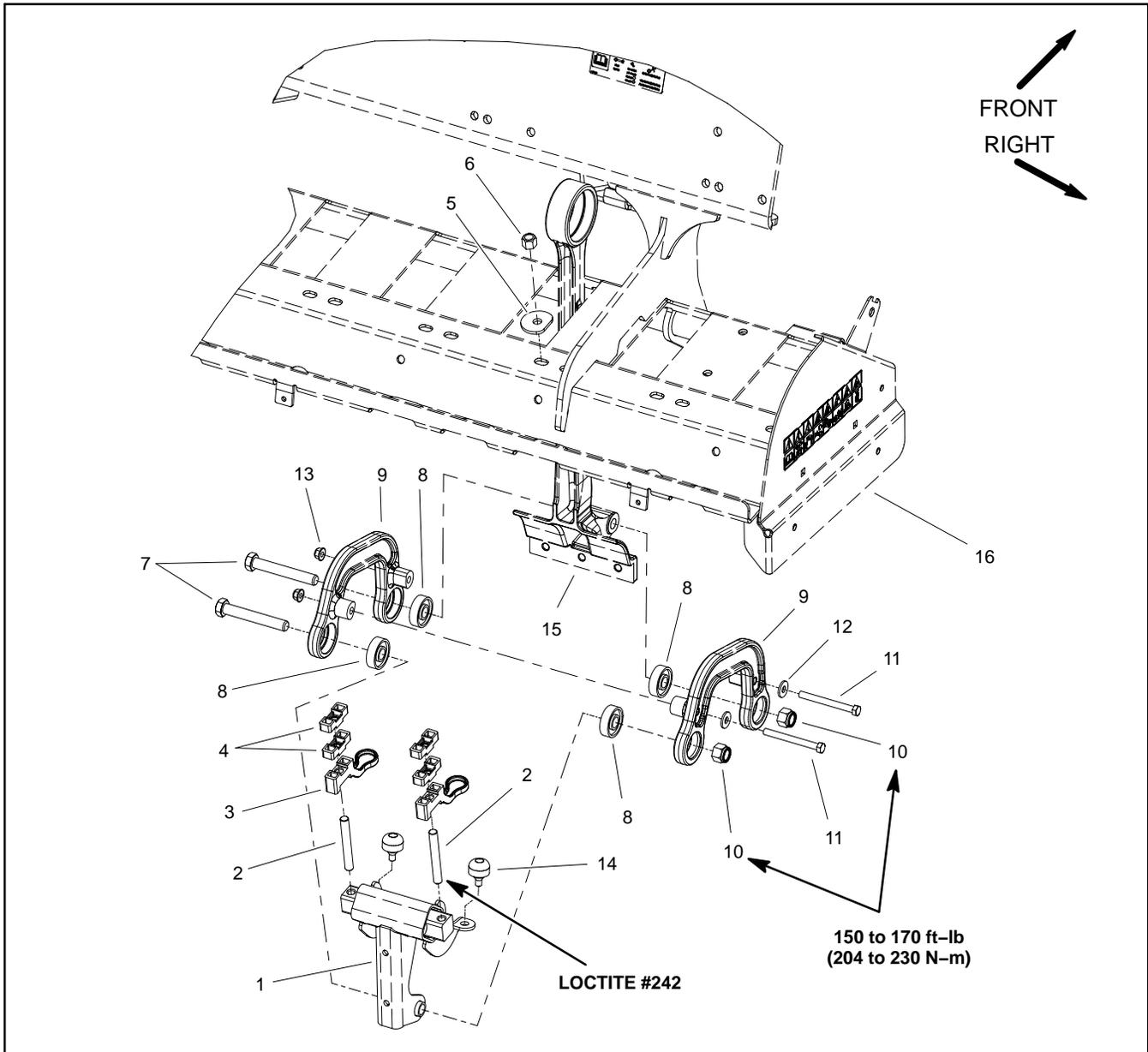


Figure 6

- | | | |
|-------------------------------------|-----------------|---|
| 1. Rotolink damper | 7. Cap screw | 12. Hardened washer |
| 2. Stud (2 used per rotolink) | 8. Ball bearing | 13. Flange nut |
| 3. Bumper (2 used per rotolink) | 9. Damper link | 14. Rubber bumper (2 used per rotolink) |
| 4. Standoff (4 used per rotolink) | 10. Lock nut | 15. Stomper arm |
| 5. Hardened D washer | 11. Cap screw | 16. Coring head frame |
| 6. Flange nut (2 used per rotolink) | | |

NOTE: The rotolink damper assemblies for all stomper arms used on ProCore 864 and 1298 aerators are identical.

Disassembly (Fig. 6)

1. Position aerator on a firm, level surface. If attached to tractor, disengage PTO, apply tractor parking brake, stop engine and remove key from the ignition switch.
2. Remove rotolink components as needed using Figure 6 as a guide.

Assembly (Fig. 6)

1. If studs (item 2) were removed from rotolink damper (item 1), apply Loctite #242 (or equivalent) to threads of studs. Thread stud fully into damper.
2. If bearings (item 8) were removed from damper links, press new bearings into links. Make sure that bearings are pressed completely to the shoulder of the link bore.
3. Assemble all components before fully tightening any fasteners so there is no preload on rotolink damper components. Tighten fasteners in the following order:
 - A. Secure damper links (item 9) to stomper arm (item 15) and damper (item 1). Torque lock nuts (item 10) from **150 to 170 ft-lb (204 to 230 N-m)**.
 - B. Tighten two (2) flange nuts (item 13) that secure damper links.
 - C. Tighten two (2) flange nuts (item 6) that secure damper to frame.
4. After assembly, rotate coring crankshaft by hand to make sure that no binding occurs.

Stomper Arms

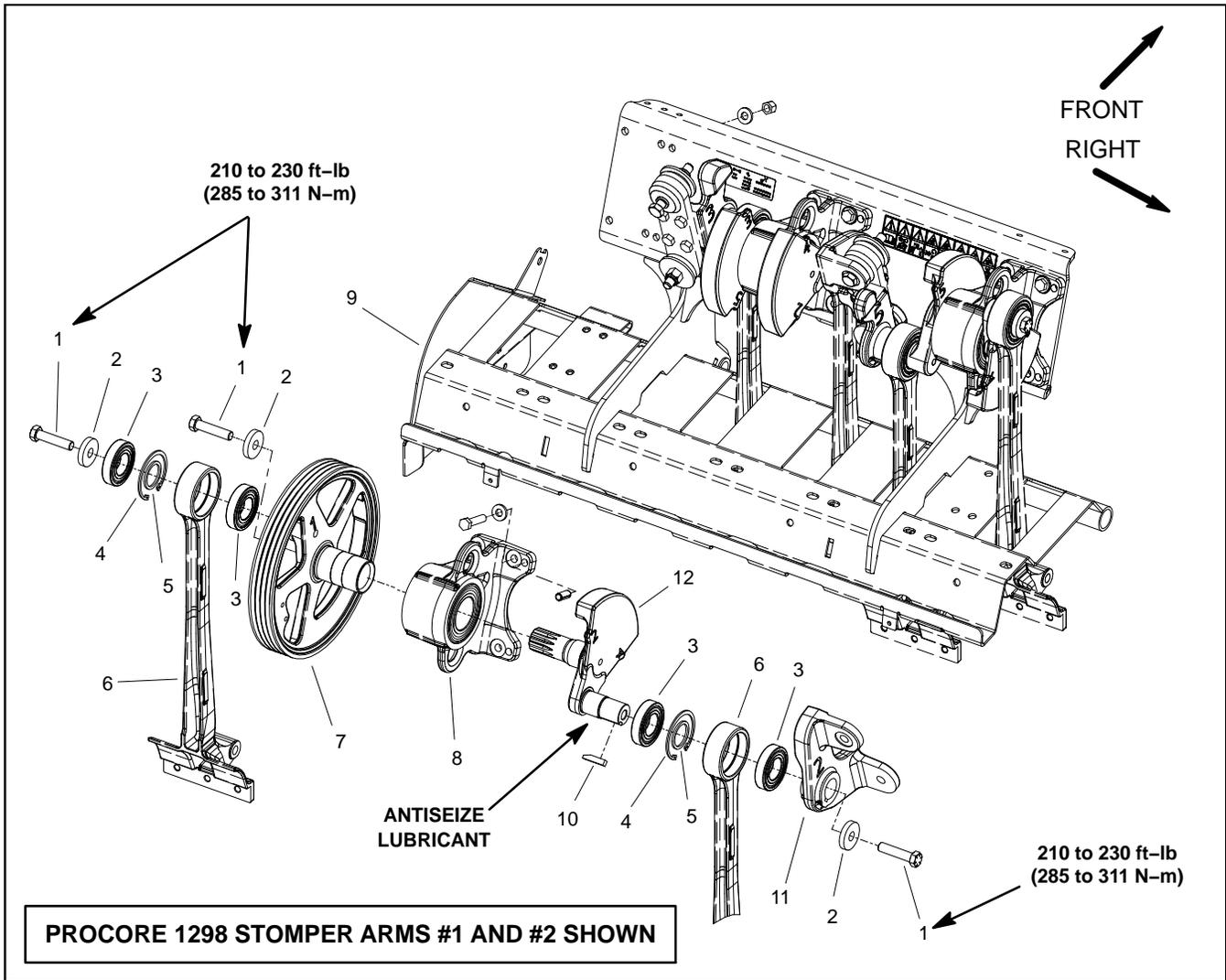


Figure 7

- | | | |
|----------------------------------|-----------------------------|----------------------|
| 1. Cap screw | 5. Bearing spacer | 9. Coring head frame |
| 2. Flat washer | 6. Stomper arm | 10. Square key |
| 3. Ball bearing (2 used per arm) | 7. Crankshaft driven pulley | 11. Coupling |
| 4. Retaining ring | 8. Bearing housing assembly | 12. Crankarm |

NOTE: All stomper arms used on ProCore 864 and 1298 aerators are identical. Coring crankshaft positions are identified based on their relationship with the crankshaft driven pulley. The #1 position is at the pulley side of the coring crankshaft (Fig. 8).

IMPORTANT: Before disassembling the coring crankshaft, label location of components that are to be removed. Correct component location and orientation are necessary for proper aerator operation.

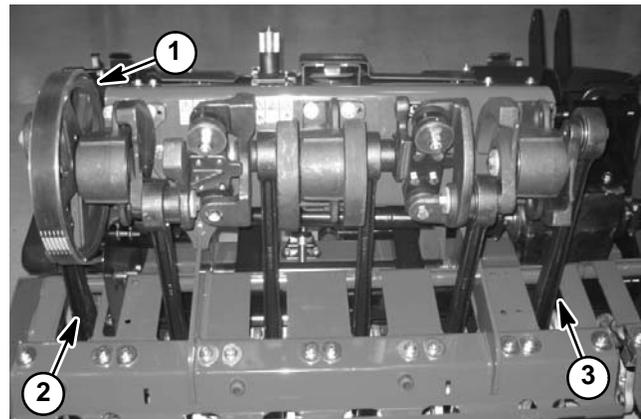


Figure 8

1. Crankshaft driven pulley
2. #1 position (ProCore 1298 LH coring head shown)
3. #6 position (ProCore 1298 LH coring head shown)

Removal (Fig. 7)

1. Position aerator on a firm, level surface. If attached to tractor, disengage PTO, apply tractor parking brake, stop engine and remove key from the ignition switch.
2. Remove rear hood.
3. For stomper arm that is to be removed, remove two (2) flange nuts and hardened D washers that secure rotolink damper to coring head frame (Fig. 9) (see Rotolink Damper Assemblies in this section).

**WARNING**

As crankshaft components are removed from machine, the crankshaft will become out of balance and may rotate quickly, creating pinch points and potential for personal injury. Be cautious when disassembling the coring crankshaft.

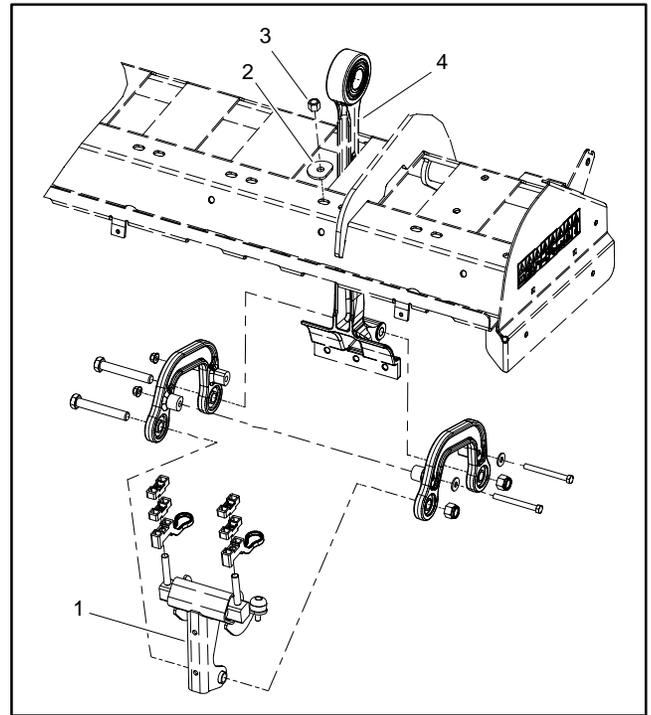


Figure 9

- | | |
|----------------------|------------------------|
| 1. Rotolink damper | 3. Flange nut (2 used) |
| 2. D washer (2 used) | 4. Stomper arm |

4. If an outside stomper arm is to be removed:
 - A. If #1 (pulley side) stomper arm is being removed, remove coring head drive belt (see Coring Head Drive Belt Removal in this section).
 - B. Remove cap screw and flat washer that retain stomper arm to coring crankshaft.
 - C. If #8 (final) stomper arm is being removed from a ProCore 864, remove counter weight (item 3, Fig. 10) from coring crankshaft.
 - D. Support stomper arm assembly to prevent it from falling during removal. Slide stomper arm from coring crankshaft. Carefully lower stomper arm assembly from coring head frame.
5. If an inside stomper arm is to be removed:
 - A. Remove fasteners that secure coupling plate to coupling on stomper arm to be removed (Fig. 11).
 - B. Remove cap screw and flat washer that secures coupling and stomper arm to coring crankshaft.
 - C. Slide coupling from coring crankshaft. Locate and retrieve square key.
 - D. Support stomper arm assembly to prevent it from falling during removal. Slide stomper arm from coring crankshaft. Carefully lower stomper arm assembly from coring head frame.
6. If necessary, remove ball bearings, bearing spacer and retaining ring from stomper arm.

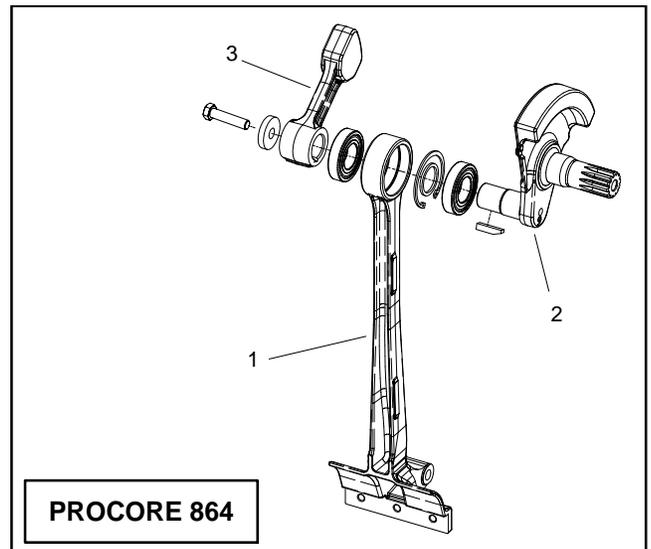


Figure 10

- | | |
|---------------------|-------------------|
| 1. Stomper arm (#8) | 3. Counter weight |
| 2. Crankarm | |

7. If necessary, remove tines and tine holders from stomper arm (see Operator's Manual).

8. Remove rotolink damper components from stomper arm as needed (see Rotolink Damper Assemblies in this section).

Installation (Fig. 7 and 11)

1. If bearings were removed from stomper arm, install retaining ring into groove in upper bore of stomper arm. Make sure that retaining ring is properly seated in groove. Position bearing spacer and press two (2) ball bearings into stomper arm bore.

2. Install all rotolink damper components that were removed during disassembly (see Rotolink Damper Assemblies in this section).

3. Apply antiseize lubricant liberally to crankarm shaft surface.

4. Raise stomper arm assembly up through coring head frame. Slide stomper arm onto coring crankshaft.

5. Secure stomper arm to coring crankshaft in the reverse order of disassembly.

A. Torque grade 5, 5/8" cap screws (item 4, Fig. 11) from **150 to 170 ft-lb (204 to 230 N-m)**.

B. Torque grade 8, 5/8" cap screws (item 1, Fig. 7) from **210 to 230 ft-lb (285 to 311 N-m)**.

C. Torque 1/2" cap screws (item 6, Fig. 11) from **70 to 80 ft-lb (95 to 108 N-m)**.

6. Secure rotolink damper to coring head frame with two (2) lock nuts and hardened D washers (Fig. 9) (see Rotolink Damper Assemblies in this section).

7. After assembly, rotate coring crankshaft by hand to make sure that no binding occurs.

8. If removed, install tine holders and tines to stomper arm (see Operator's Manual).

9. If removed, install coring head drive belt (see Coring Head Drive Belt Installation in this section).

10. Install rear hood.

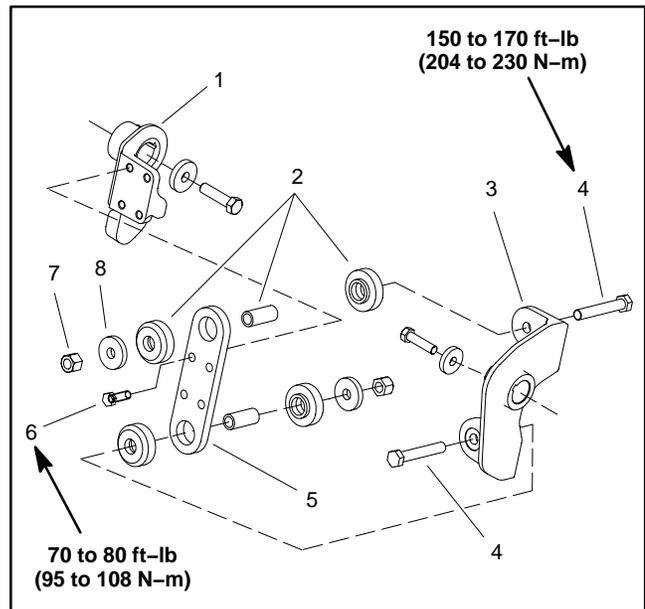


Figure 11

- | | |
|------------------------|-------------------------|
| 1. Coupling (#3 shown) | 5. Coupling plate |
| 2. Iso mount (2 used) | 6. Cap screw (4 used) |
| 3. Coupling (#2 shown) | 7. Lock nut (2 used) |
| 4. Cap screw (2 used) | 8. Flat washer (2 used) |

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Coring Crankshaft Bearing Housings (ProCore 864)

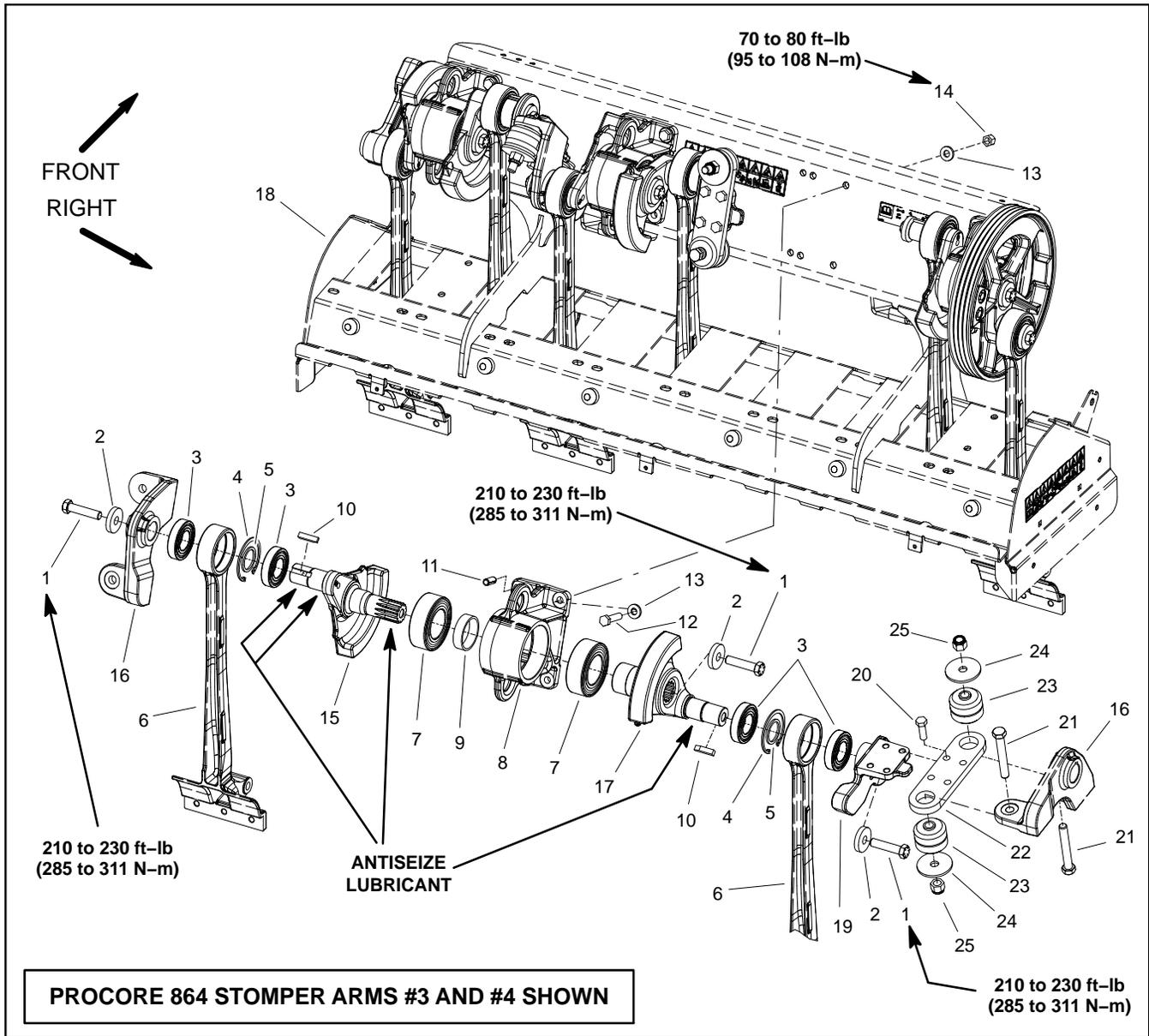


Figure 12

- | | | |
|--------------------------------------|--|--|
| 1. Cap screw | 10. Square key | 18. Coring head frame |
| 2. Flat washer | 11. Spring pin (2 used per housing) | 19. Coupling (#3 casting) (3 used) |
| 3. Ball bearing (2 used per arm) | 12. Cap screw (4 used per housing) | 20. Cap screw (4 used per plate) |
| 4. Retaining ring | 13. Hardened washer | 21. Cap screw (2 used per plate) |
| 5. Bearing spacer | 14. Lock nut (4 used per housing) | 22. Coupling plate (3 used) |
| 6. Stomper arm (8 used) | 15. Crankarm (#2/4/6 casting) (4 used) | 23. Iso mount (2 used per plate) |
| 7. Ball bearing (2 used per housing) | 16. Coupling (#2 casting) (3 used) | 24. Snubbing washer (2 used per plate) |
| 8. Bearing housing (4 used) | 17. Crankarm (#3/5/7 casting) (3 used) | 25. Lock nut (2 used per plate) |
| 9. Bearing spacer | | |

NOTE: The bearing housings used on ProCore 864 aerators are identical. Coring crankshaft positions are identified based on their relationship with the crankshaft driven pulley. The #1 position is at the pulley side of the coring crankshaft (Fig. 13).

IMPORTANT: Before disassembling the coring crankshaft, label location of components that are to be removed. Correct component location and orientation are necessary for proper aerator operation.

Removal (Fig. 12)

1. Position aerator on a firm, level surface. If attached to tractor, disengage PTO, apply tractor parking brake, stop engine and remove key from the ignition switch.
2. Remove rear hood.
3. If bearing housing for #1 and #2 stomper arms is to be removed, remove coring head drive belt (see Coring Head Drive Belt Removal in this section).



WARNING

As crankshaft components are removed from machine, the crankshaft will become out of balance and may rotate quickly, creating pinch points and potential for personal injury. Be cautious when disassembling the coring crankshaft.

4. Remove stomper arms and couplings on both sides of bearing housing that is to be removed (see Stomper Arm Removal in this section).
5. Drive spring pins (item 11) from bearing housing and coring head frame.
6. Support bearing housing assembly to prevent it from falling. Remove fasteners that secure bearing housing assembly to coring head frame. Remove bearing housing assembly from machine.
7. Disassemble bearing housing assembly:
 - A. Remove cap screw (item 1) and flat washer (item 2) that fasten crankarms together. Note that crankarm journals are positioned 180° from each other.
 - B. Slide crankarms from bearing housing.
 - C. If necessary, remove bearings and bearing spacer from bearing housing.
8. If necessary, remove counterweight from driven pulley (Fig. 15).

Installation (Fig. 12)

1. Install new bearings if they were removed from bearing housing:
 - A. Install new bearing into one side of housing by pressing on outer race of bearing.
 - B. Position bearing spacer into bearing housing.
 - C. Install second new bearing into housing by pressing on outer race of bearing. Make sure that spacer is centered between bearings.

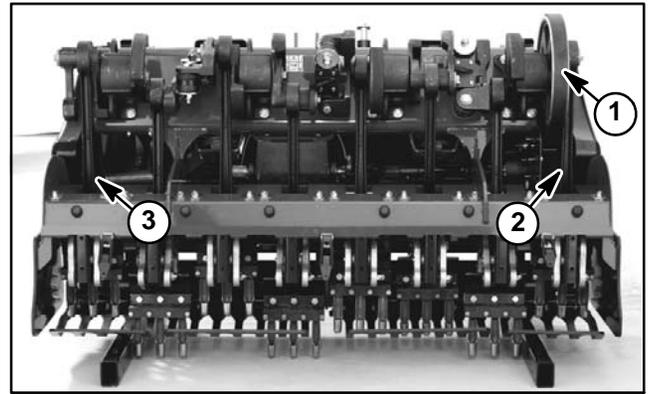


Figure 13

1. Crankshaft driven pulley
2. #1 crankshaft position
3. #8 crankshaft position

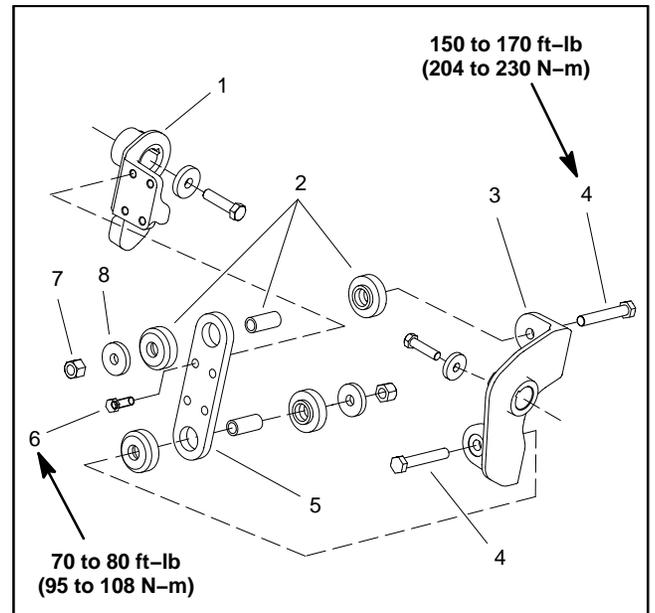


Figure 14

1. Coupling (#3 shown)
2. Iso mount (2 used)
3. Coupling (#2 shown)
4. Cap screw (2 used)
5. Coupling plate
6. Cap screw (4 used)
7. Lock nut (2 used)
8. Washer (2 used)

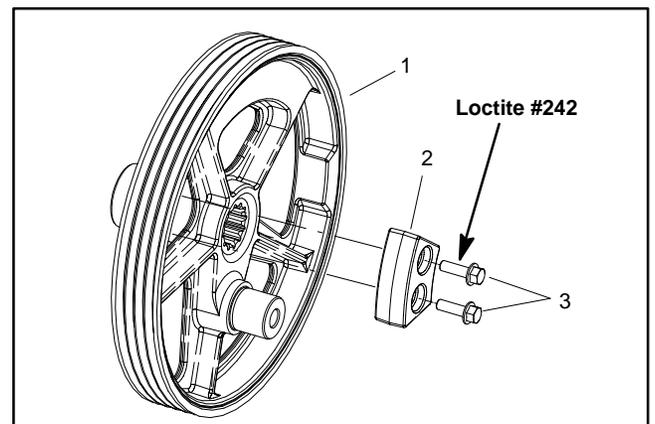


Figure 15

1. Driven pulley
2. Counterweight
3. Flange head screw

2. If counterweight was removed from driven pulley, apply Loctite #242 (or equivalent) to threads of flange head screws and secure counterweight to pulley.

3. Apply antiseize lubricant liberally to crankarm splines and journals.

4. Install crankarms into bearing housing. Make sure that crankarm journals are positioned 180° from each other.

5. Install cap screw (item 1) and flat washer (item 2) to retain crankarms. Do not fully tighten cap screw.

6. Drive new spring pins (item 11) into coring head frame holes.

7. Position bearing housing assembly to coring head frame. Make sure that crankarms identified with 2/4/6 in the casting are orientated toward the left side of the machine.

8. Secure bearing housing to frame with four (4) cap screws, eight (8) hardened washers and four (4) lock nuts. Torque fasteners from **70 to 80 ft-lb (95 to 108 N-m)**.

9. Install stomper arms and couplings to crankarms on both sides of bearing housing (see Stomper Arm Installation in this section). Do not fully tighten fasteners.

IMPORTANT: On the ProCore 864, the numbers cast into the crankarms will not align with the raised indicator marks on the bearing housings.

10. Once all stomper arm and crankarm components have been installed, fully tighten fasteners in the following order (Fig. 16). Tighten fasteners to the torque specifications identified in Figures 12 and 14:

- A. Cap screw used to secure crankarms.
- B. Cap screws that secure top of stomper arms.
- C. Cap screws that secure coupling plates (Fig. 14).
- D. Lock nuts that secure rotolink dampers to frame (see Rotolink Damper Assemblies in this section).

11. After assembly, rotate coring crankshaft by hand to make sure that no binding occurs.

12. If removed, install coring head drive belt (see Coring Head Drive Belt Installation in this section).

13. Install rear hood.

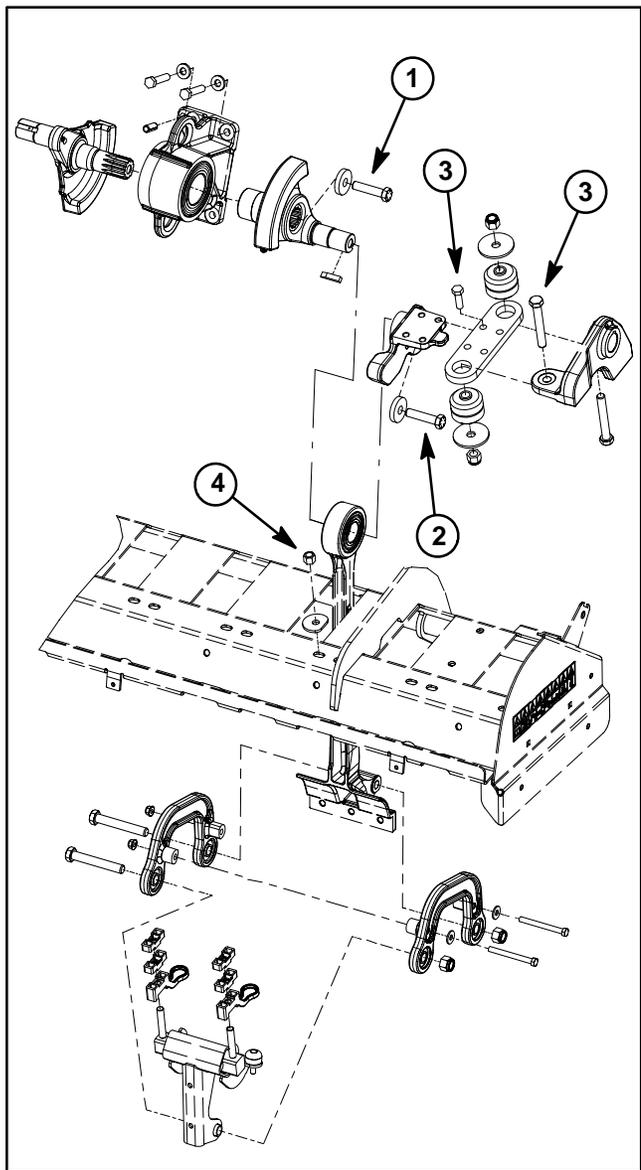


Figure 16

- 1. Crankarm screw
- 2. Stomper arm screw
- 3. Coupling plate screw
- 4. Damper lock nut

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Coring Crankshaft Bearing Housings (ProCore 1298)

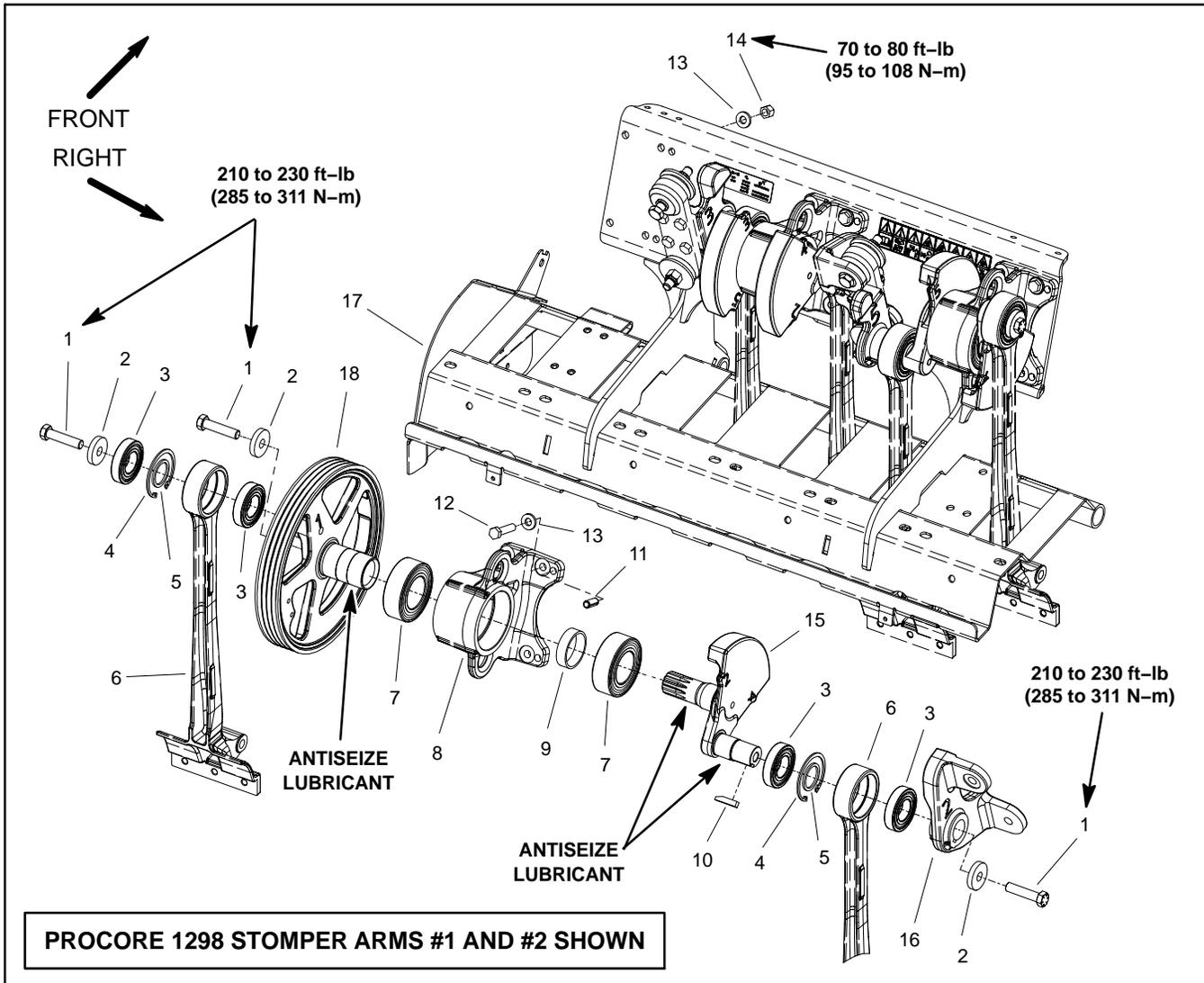


Figure 17

- | | | |
|----------------------------------|--------------------------------------|-----------------------------------|
| 1. Cap screw | 7. Ball bearing (2 used per housing) | 13. Hardened washer |
| 2. Flat washer | 8. Bearing housing | 14. Lock nut (4 used per housing) |
| 3. Ball bearing (2 used per arm) | 9. Bearing spacer | 15. Crankarm |
| 4. Retaining ring | 10. Square key | 16. Coupling |
| 5. Bearing spacer | 11. Spring pin (2 used per housing) | 17. Coring head frame |
| 6. Stomper arm | 12. Cap screw (4 used per housing) | 18. Crankshaft driven pulley |

NOTE: The bearing housings used on ProCore 1298 aerators are identical. Coring crankshaft positions are identified based on their relationship with the crankshaft driven pulley. The #1 position is at the pulley side of the coring crankshaft (Fig. 18).

IMPORTANT: Before disassembling the coring crankshaft, label location of components that are to be removed. Correct component location and orientation are necessary for proper aerator operation.

Removal (Fig. 17)

1. Position aerator on a firm, level surface. If attached to tractor, disengage PTO, apply tractor parking brake, stop engine and remove key from the ignition switch.
2. Remove rear hood.



WARNING

As crankshaft components are removed from machine, the crankshaft will become out of balance and may rotate quickly, creating pinch points and potential for personal injury. Be cautious when disassembling the coring crankshaft.

3. If bearing housing for #1 and #2 stomper arms is to be removed, remove coring head drive belt (see Coring Head Drive Belt Removal in this section).
4. Remove stomper arms and couplings on both sides of bearing housing that is to be removed (see Stomper Arm Removal in this section).
5. Drive spring pins (item 11) from bearing housing and coring head frame.
6. Support bearing housing assembly to prevent it from falling. Remove fasteners that secure bearing housing assembly to coring head frame. Remove bearing housing assembly from machine.
7. Disassemble bearing housing assembly:
 - A. Remove cap screw (item 1) and flat washer (item 2) that fasten crankarms together. Take note of alignment of crankarm identification number with timing mark on bearing housing (Fig. 19).
 - B. Slide crankarms from bearing housing.
 - C. If necessary, remove bearings and bearing spacer from bearing housing.

Installation (Fig. 17)

1. Install new bearings if they were removed from bearing housing:
 - A. Install new bearing into one side of housing by pressing on outer race of bearing.
 - B. Position bearing spacer into bearing housing.
 - C. Install second new bearing into housing by pressing on outer race of bearing. Make sure that spacer is centered between bearings.

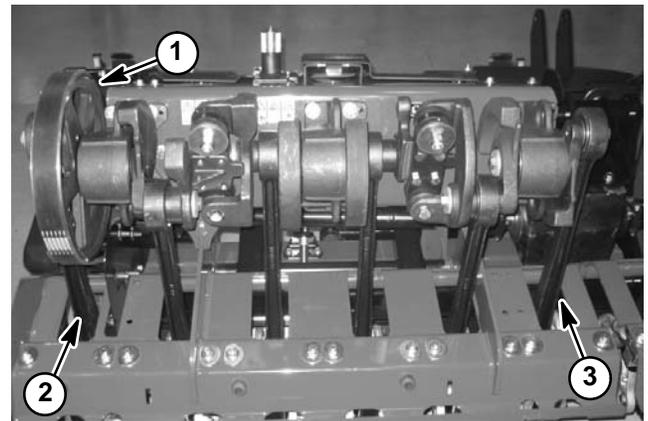


Figure 18

1. Crankshaft driven pulley
2. #1 position (ProCore 1298 LH coring head shown)
3. #6 position (ProCore 1298 LH coring head shown)

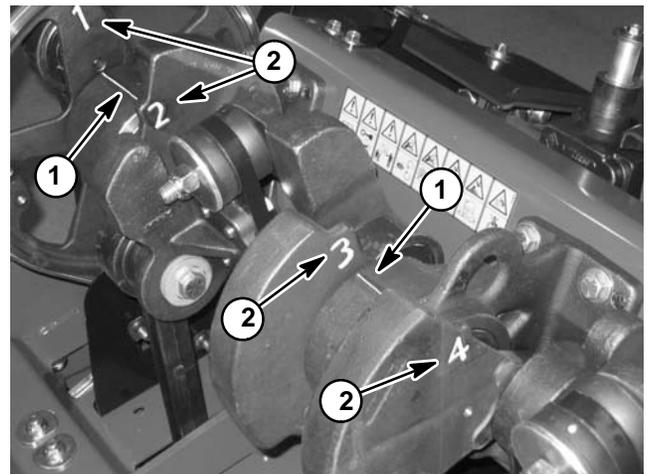


Figure 19

1. Housing timing mark
2. Crankarm position

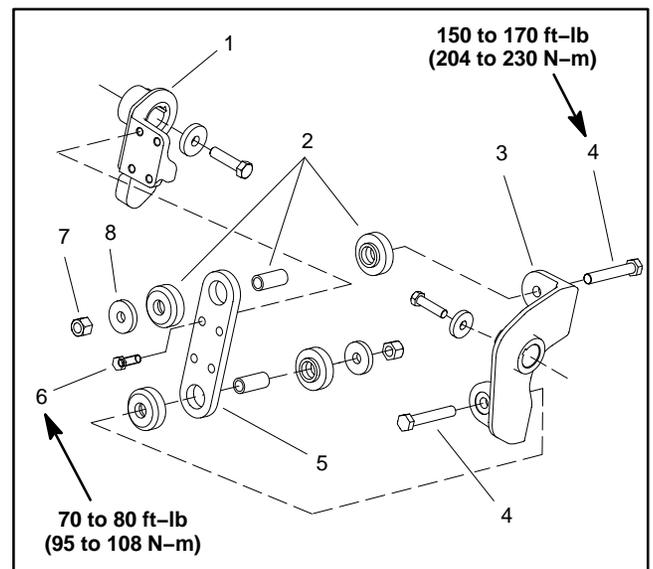


Figure 20

- | | |
|------------------------|-------------------------|
| 1. Coupling (#3 shown) | 5. Coupling plate |
| 2. Iso mount (2 used) | 6. Cap screw (4 used) |
| 3. Coupling (#2 shown) | 7. Lock nut (2 used) |
| 4. Cap screw (2 used) | 8. Flat washer (2 used) |

2. Apply antiseize lubricant liberally to crankarm splines and journals.

3. Install crankarms into bearing housing. Make sure that correct identification number on crankarm is aligned with timing mark on bearing housing (Fig. 19).

4. Install cap screw (item 1) and flat washer (item 2) to retain crankarms. Do not fully tighten cap screw.

5. Drive new spring pins (item 11) into coring head frame holes.

6. Position bearing housing assembly to coring head frame.

7. Secure bearing housing to frame with four (4) cap screws, eight (8) hardened washers and four (4) lock nuts. Torque fasteners from **70 to 80 ft-lb (95 to 108 N-m)**.

8. Install stomper arms and couplings to crankarms on both sides of bearing housing (see Stomper Arm Installation in this section). Do not fully tighten fasteners.

9. Make sure that when #1 crankarm (at pulley) is aligned with cast mark on bearing housing, all subsequent crankarm cast timing numbers are in numerical order (Fig. 19).

10. Once all stomper arm and crankarm components have been installed, fully tighten fasteners in the following order (Fig. 21). Tighten fasteners to the torque specifications identified in Figures 17 and 20:

- A. Cap screw used to secure crankarms.
- B. Cap screws that secure top of stomper arms.
- C. Cap screws that secure coupling plates (Fig. 20).
- D. Lock nuts that secure rotolink dampers to frame (see Rotolink Damper Installation in this section).

11. After assembly, rotate coring crankshaft by hand to make sure that no binding occurs.

12. If removed, install coring head drive belt (see Coring Head Drive Belt Installation in this section).

13. Install rear hood.

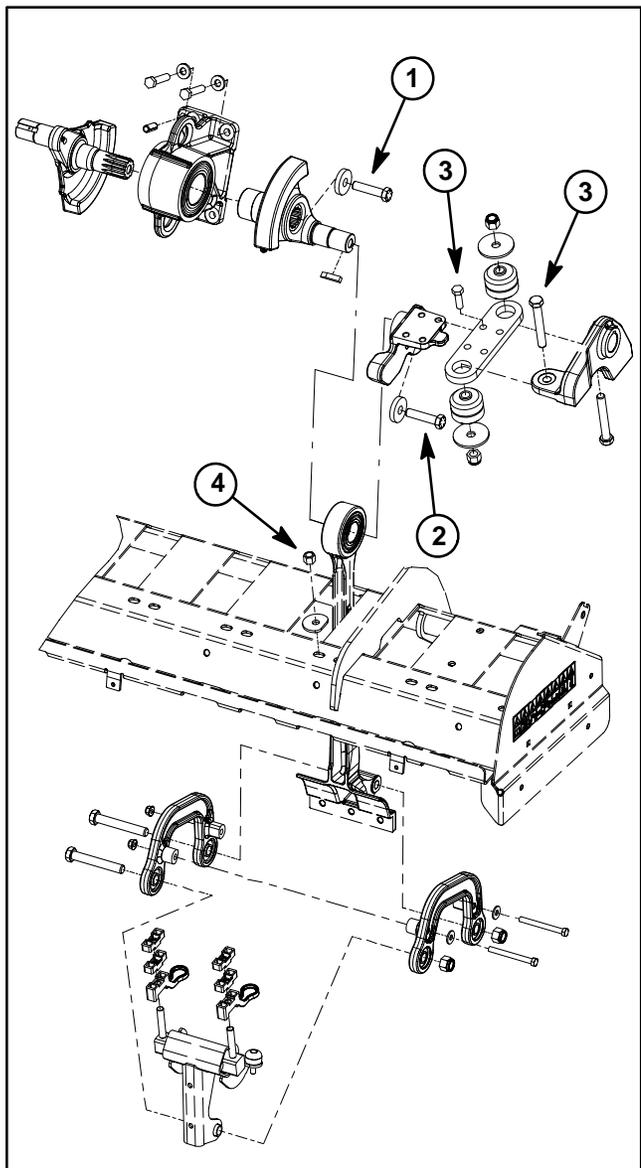


Figure 21

- 1. Crankarm screw
- 2. Stomper arm screw
- 3. Coupling plate screw
- 4. Damper lock nut

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Coring Head Drive Belt

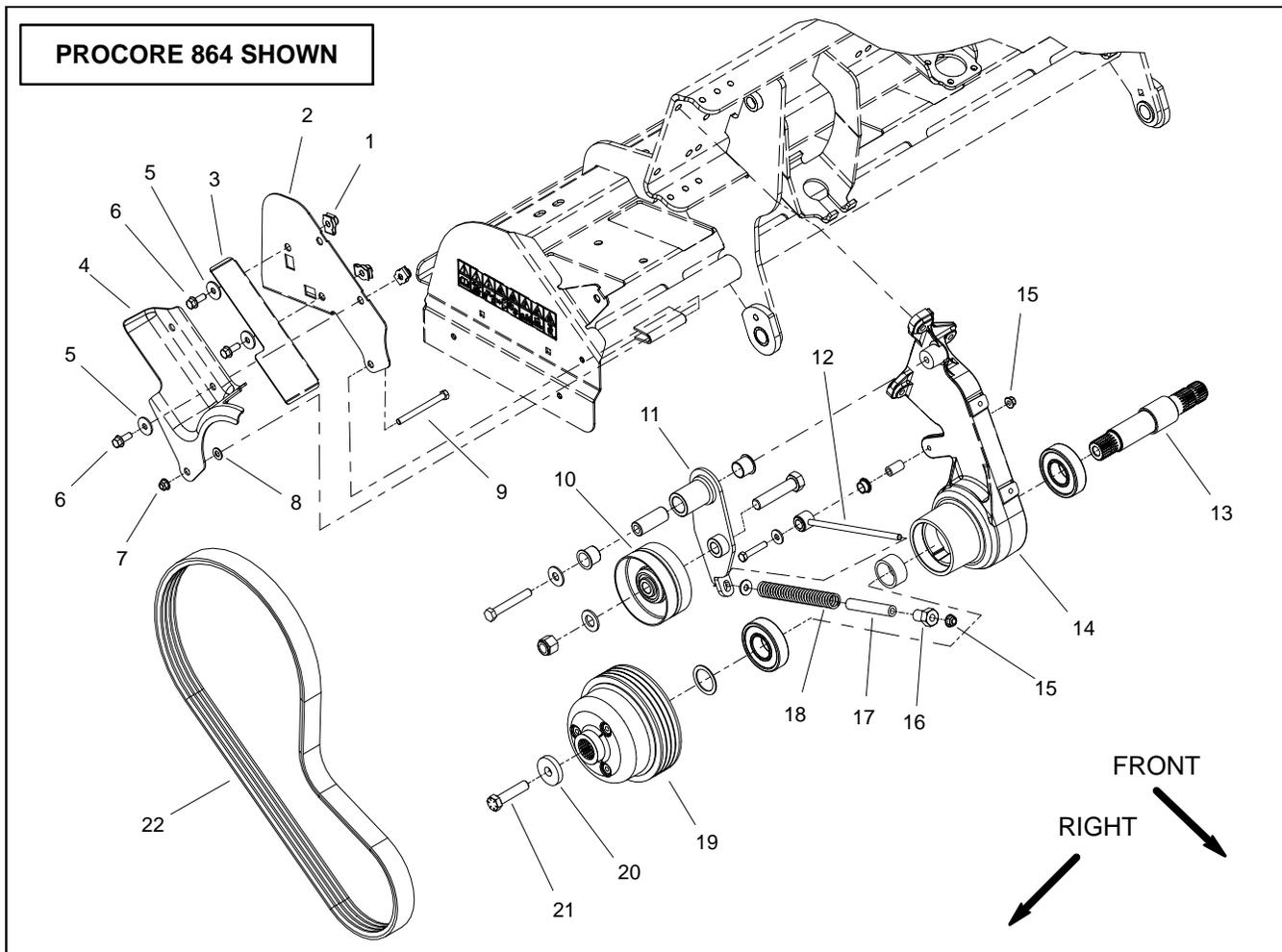


Figure 22

- | | | |
|-------------------------------|--------------------|------------------------|
| 1. Tinnerman nut (4 used) | 9. Cap screw | 16. Idler nut |
| 2. Belt guard support | 10. Idler pulley | 17. Spacer hose |
| 3. Dirt shield | 11. Idler arm | 18. Compression spring |
| 4. Belt guard | 12. Spring mount | 19. Pulley |
| 5. Flat washer (4 used) | 13. Pulley shaft | 20. Flat washer |
| 6. Flange head screw (4 used) | 14. Pulley support | 21. Cap screw |
| 7. Flange nut | 15. Lock nut | 22. Drive belt |
| 8. Flat washer | | |

Removal (Fig. 22)

1. Position aerator on a firm, level surface. If attached to tractor, disengage PTO, apply tractor parking brake, stop engine and remove key from the ignition switch.
2. Remove rear hood from machine to allow access to coring head drive belt.
3. Remove pulley shield from machine (see Cover Removal in the Service and Repairs section of Chapter 3 – Chassis).
4. Remove fasteners (items 5, 6 and 7) that secure belt guard to support. Remove belt guard from machine. Flat washer (item 8) and cap screw (item 9) can remain on frame.

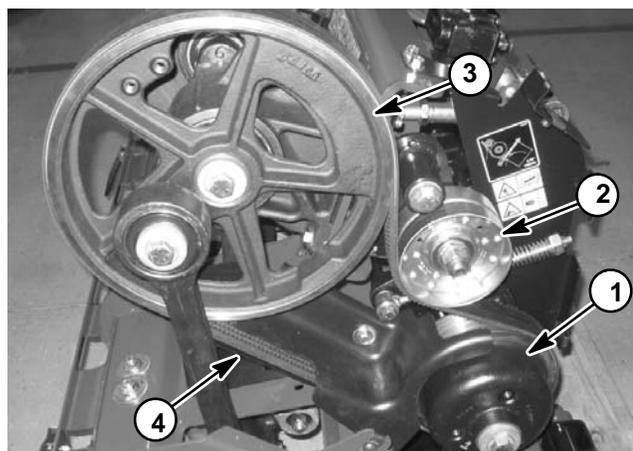


Figure 23

- | | |
|-----------------|------------------|
| 1. Drive pulley | 3. Driven pulley |
| 2. Idler pulley | 4. Drive belt |

5. Loosen lock nut (item 15) that secures idler nut in position on idler spring mount. Loosen idler nut (item 16) to remove idler tension on drive belt.



CAUTION

Be careful when lifting the idler pulley. The idler pulley is spring loaded and may cause personal injury.

6. Lift and hold idler pulley away from belt. Remove belt from drive pulley. Carefully lower idler pulley.

7. Loosen and remove two (2) flange nuts and hardened D washers that secure rotolink damper for #1 stomper arm (see Rotolink Damper Disassembly in this section). Lower rotolink damper from coring head frame.

8. Remove drive belt from driven pulley on coring crankshaft.

9. Route drive belt down through coring head frame and around lower end of #1 stomper arm to remove coring head drive belt from machine (Fig. 24 and 25).

Installation (Fig. 22)

1. Route drive belt around lower end of #1 stomper arm and up through coring head frame (Fig. 24 and 25).

2. Position drive belt to driven pulley on coring crankshaft.

3. Lift idler pulley, route drive belt under idler pulley and install belt onto drive pulley (Fig. 23).

4. Apply tension to idler pulley by adjusting idler nut (item 16) until compression spring length is **5.750" (145 mm)**. Secure idler nut location with lock nut (item 15).

5. Raise rotolink damper for #1 stomper arm to coring head frame. Make sure that damper standoffs and bumper are on damper studs. Secure damper to coring head frame with two (2) D washers and lock nuts (see Rotolink Damper Assembly in this section).

6. Make sure that tinnerman nuts (item 1), flat washer (item 8) and cap screw (item 9) are on frame. Position belt guard to machine. Secure belt guard to support with flange nut (item 7), two (2) flange head screws (item 6) and flat washers (item 5).

7. Install pulley shield to machine (see Cover Installation in the Service and Repairs section of Chapter 3 – Chassis).

8. Install rear hood to machine.

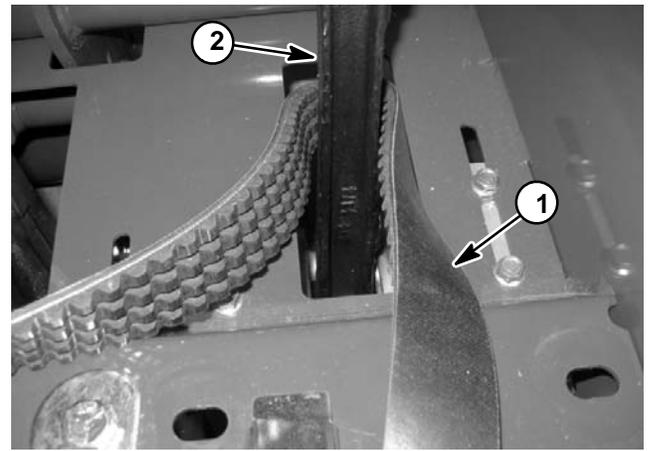


Figure 24

- 1. Drive belt
- 2. #1 stomper arm

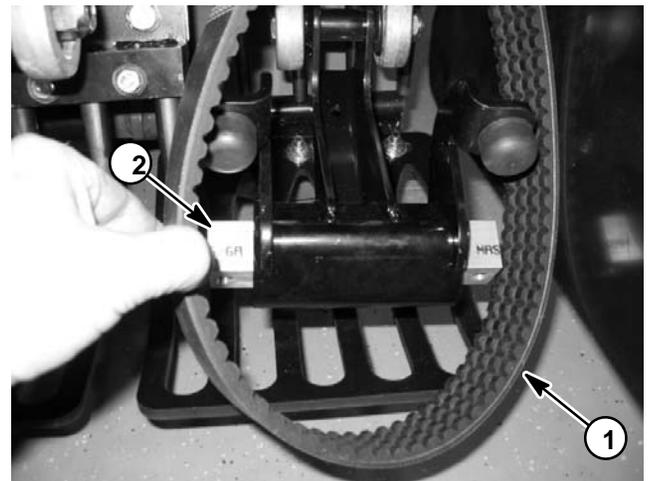


Figure 25

- 1. Drive belt
- 2. #1 rotolink damper

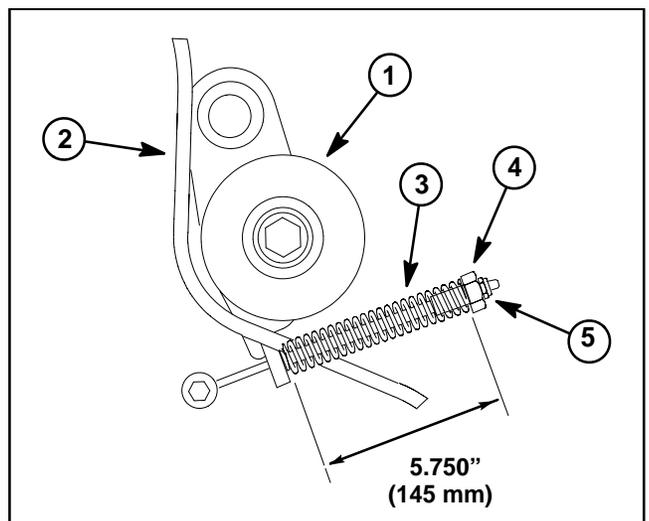


Figure 26

- 1. Idler pulley
- 2. Drive belt
- 3. Compression spring
- 4. Idler nut
- 5. Lock nut

Coring Head Drive

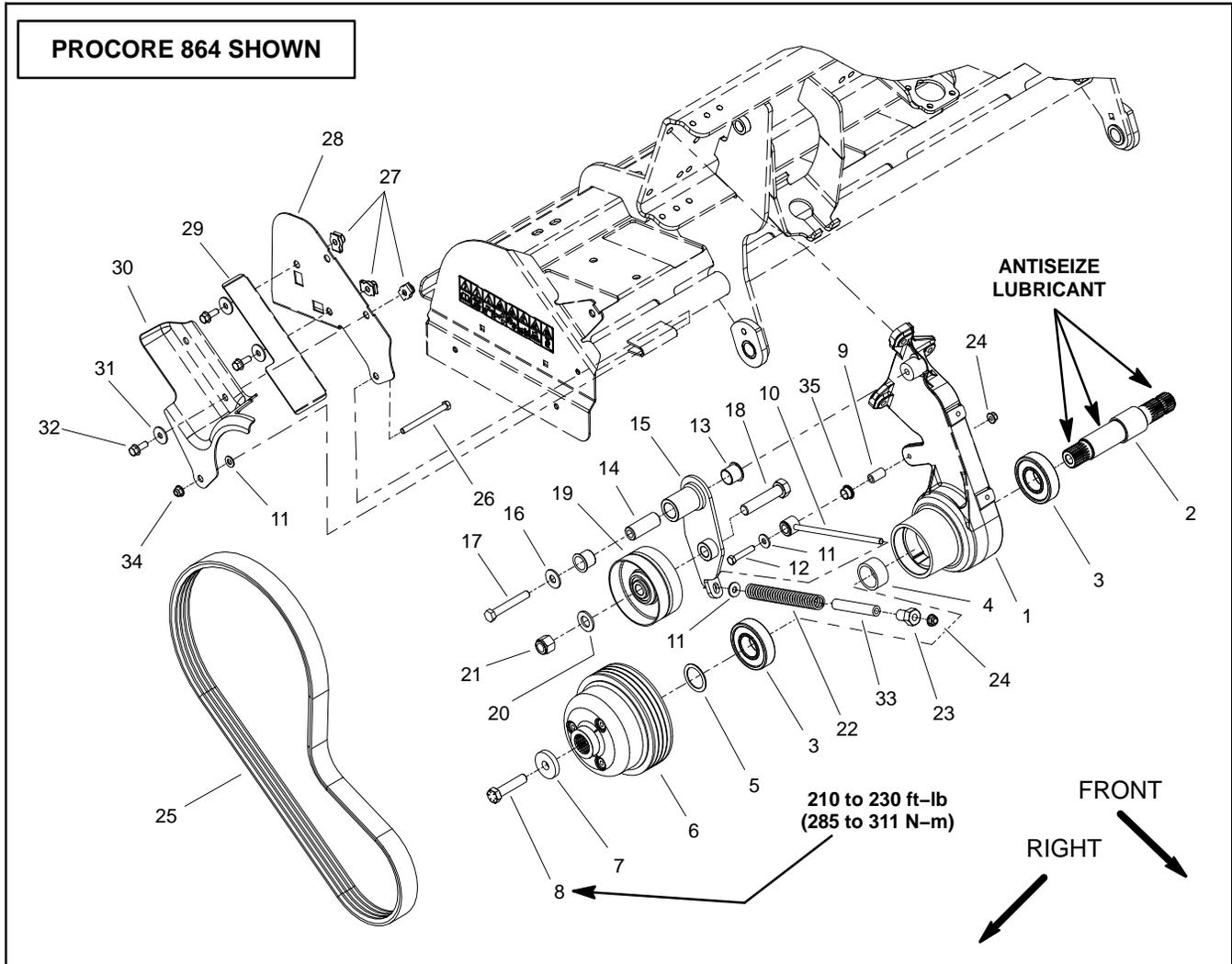


Figure 27

- | | | |
|---------------------|-----------------------------|--------------------------------|
| 1. Pulley support | 13. Flange bushing (2 used) | 25. Drive belt |
| 2. Pulley shaft | 14. Pivot sleeve | 26. Cap screw |
| 3. Bearing (2 used) | 15. Idler arm | 27. Tinnerman nut (4 used) |
| 4. Bearing spacer | 16. Flat washer | 28. Belt guard support |
| 5. Shim washer | 17. Cap screw | 29. Dirt shield |
| 6. Pulley | 18. Cap screw | 30. Belt guard |
| 7. Flat washer | 19. Idler pulley | 31. Flat washer (4 used) |
| 8. Cap screw | 20. Flat washer | 32. Flange head screw (6 used) |
| 9. Spacer tube | 21. Lock nut | 33. Spacer hose |
| 10. Spring mount | 22. Compression spring | 34. Flange nut |
| 11. Washer | 23. Idler nut | 35. Bushing (2 used) |
| 12. Cap screw | 24. Lock nut | |

The coring head on the ProCore 864 is driven by a single 4 grooved banded belt on the right side of the coring head. The ProCore 1298 dual coring heads are each driven by a banded belt on the outside of the coring head. The drive belt, drive pulley, belt tensioning system and other coring head drive components are similar on both the ProCore 864 and 1298.

Removal (Fig. 27)

1. Position aerator on a firm, level surface. If attached to tractor, disengage PTO, apply tractor parking brake, stop engine and remove key from the ignition switch.
2. Remove rear hood from machine.
3. Remove front cover and pulley shield from machine (see Cover Removal in the Service and Repairs section of Chapter 3 – Chassis).
4. Remove coring head drive belt (see Coring Head Drive Belt Removal in this section).
5. Remove driveshaft from pulley shaft (see Driveshaft Removal in this section).
6. Remove pulley (item 6) from pulley shaft:

A. Install a .375" – 16 UNC – 2B screw into one of the threaded pulley holes leaving 1" to 2" of the screw extending from the pulley surface. Do not tighten screw with a wrench. Use a suitable pry bar between the pulley flange and screw extension to prevent the pulley and pulley shaft from rotating.

B. Remove cap screw and flat washer that secure pulley to pulley shaft.

C. If needed, the use of three (3) .375" – 16 UNC – 2B screws (see Special Tools) can be installed into threaded holes of pulley to aid in pulley removal. Tighten screws progressively and evenly until the pulley is loose on the pulley shaft.

7. Remove additional components as necessary using Figure 27 as a guide.

Installation (Fig. 27)

1. Install all removed components using Figure 27 as a guide.
 - A. If pulley shaft (item 2) was removed, apply anti-seize lubricant to shaft bearing surface before sliding shaft into bearing bores.
 - B. Apply antiseize lubricant to splines of pulley shaft (item 2) before installing pulley and driveshaft.

C. As drive pulley (item 6) is being installed, place 0, 1 or 2 shims (item 5) between outer shaft bearing and drive pulley to align drive pulley with driven pulley on coring crankshaft. Pulleys should be aligned within 0.070" (1.8 mm).

D. Install a .375" – 16 UNC – 2B screw into one of the threaded pulley holes leaving 1" to 2" of the screw extending from the pulley surface. Make sure that the end of the screw does not contact pulley drive housing. Use a suitable pry bar between the pulley flange and screw extension to prevent the pulley and pulley shaft from rotating.

E. Secure drive pulley to pulley shaft with flat washer and cap screw. Torque cap screw from **210 to 230 ft-lb (285 to 311 N-m)**.

F. Remove screw from pulley hole.

2. Install coring head drive belt (see Coring Head Drive Belt Installation in this section). Make sure that drive belt is properly tensioned.
3. Install driveshaft to pulley shaft (see Driveshaft Installation in this section).
4. Install front cover and pulley shield to machine (see Cover Installation in the Service and Repairs section of Chapter 3 – Chassis).
5. Install rear hood to machine.

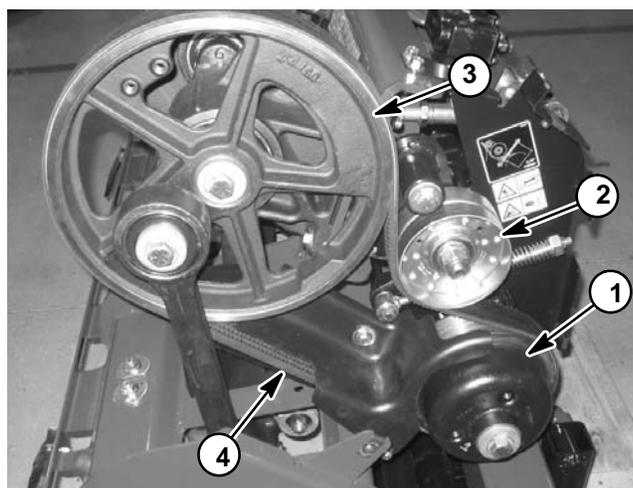


Figure 28

- | | |
|-----------------|------------------|
| 1. Drive pulley | 3. Driven pulley |
| 2. Idler pulley | 4. Drive belt |

Coring Head Pivot (H-Frame)

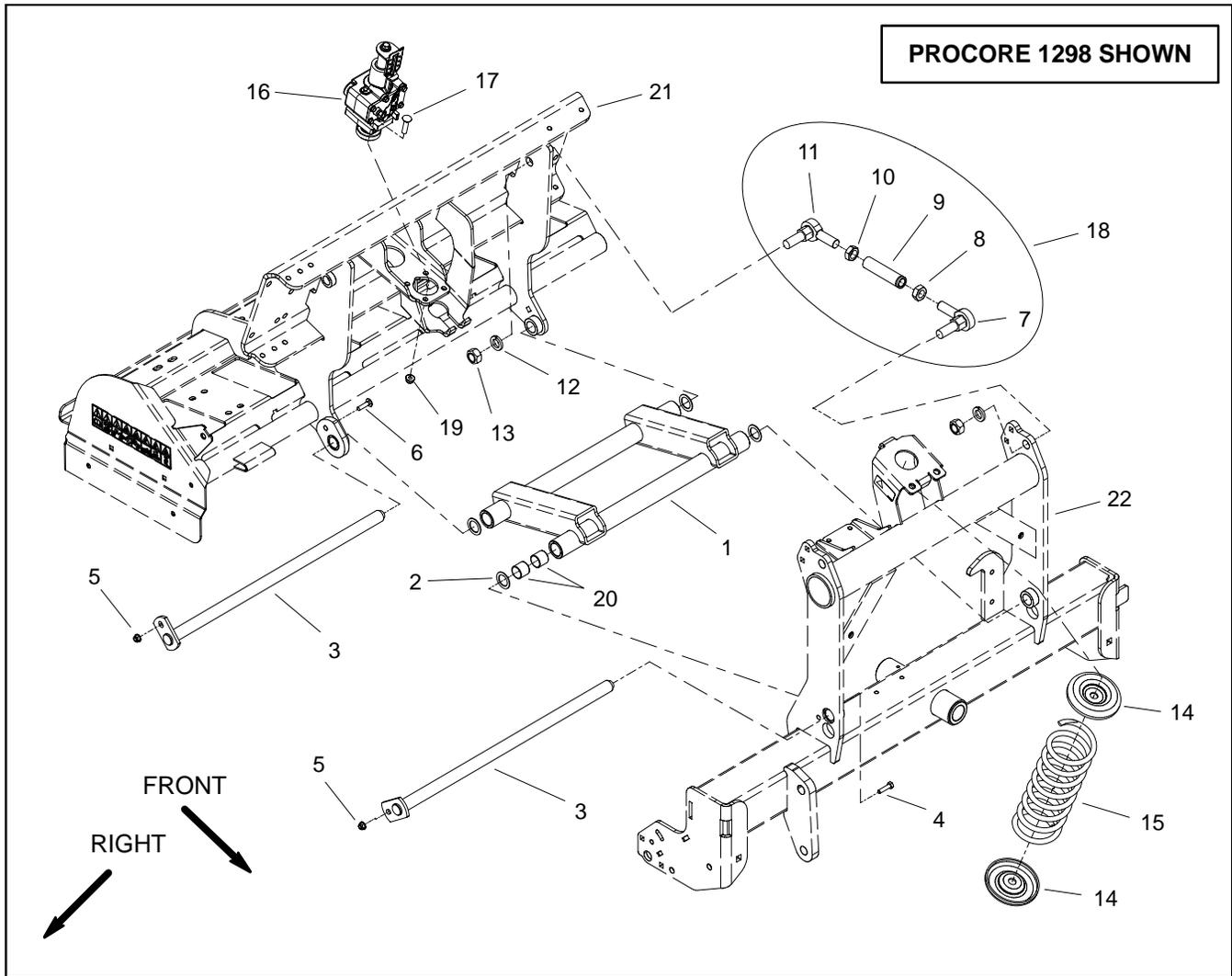


Figure 29

- | | | |
|----------------------------------|--------------------------|----------------------------------|
| 1. H-frame | 9. Upper link (2 used) | 16. Depth control assembly |
| 2. Thrust washer (4 used) | 10. Jam nut (2 used) | 17. Carriage screw (4 used) |
| 3. Pivot shaft (2 used) | 11. Rod end (2 used) | 18. Upper link assembly |
| 4. Cap screw | 12. Lock washer (4 used) | 19. Flange nut (4 used) |
| 5. Flange nut | 13. Hex nut (4 used) | 20. Bushing (8 used) |
| 6. Carriage screw | 14. Spring cup | 21. Coring head frame (RH shown) |
| 7. Rod end (LH threads) (2 used) | 15. Compression spring | 22. Subframe (RH shown) |
| 8. Jam nut (LH threads) (2 used) | | |

Disassembly (Fig. 29)

1. Position aerator on a firm, level surface. If attached to tractor, disengage PTO, apply tractor parking brake, stop engine and remove key from the ignition switch.
2. Remove rear hood from machine. Adjust coring head depth to the deepest setting.
3. Remove front cover and pulley shield from machine (see Cover Removal in the Service and Repairs section of Chapter 3 – Chassis).
4. Support the aerator to prevent the machine from moving.

NOTE: The ProCore 1298 uses one (1) compression spring for each of its dual coring frames. The ProCore 864 uses two (2) compression springs for its single coring frame.

	WARNING
<p>THE CORING HEAD FRAME IS SPRING LOADED! To prevent possible personal injury, use compression spring tool (see Special Tools) to remove compression spring(s) before disassembling the coring head pivot.</p>	

5. Use compression spring tool (see Special Tools) to remove compression spring(s) from coring head frame:
 - A. Install compression spring tool threaded rod through holes in each spring cup (item 1), then install washer and nut on both ends of rod.
 - B. Tighten upper nut on rod to compress spring (item 2).
 - C. With tool compressing the spring, carefully lift bottom of spring, slide it from coring head frame, lower from hitch frame and remove from machine.
 - D. If working on ProCore 864, repeat for second compression spring.
6. Make sure that machine is well supported with jackstands or blocking.

	CAUTION
<p>The ProCore 864 coring head frame assembly weighs approximately 900 pounds (408 kg). The ProCore 1298 coring head frame assembly weighs approximately 675 pounds (306 kg). Make sure that proper lift or hoist is used to support coring head frame during repairs.</p>	

7. Using suitable lift or hoist, raise coring head slightly using lifting eyelets on coring crankshaft as lift points (Fig. 30). Use appropriate jackstands or blocking to support the coring head to prevent it from shifting.
8. Remove upper link assemblies (item 21) from hitch frame and coring head frame.
9. Remove fasteners (items 4, 5 and 6) that secure end of pivot shafts to machine.
10. Carefully slide pivot shafts from H-frame. Locate and retrieve four (4) thrust washers (item 2) from between H-frame and machine frame.
11. Remove H-frame from machine.
12. If necessary, remove bushings (item 20) from H-frame.

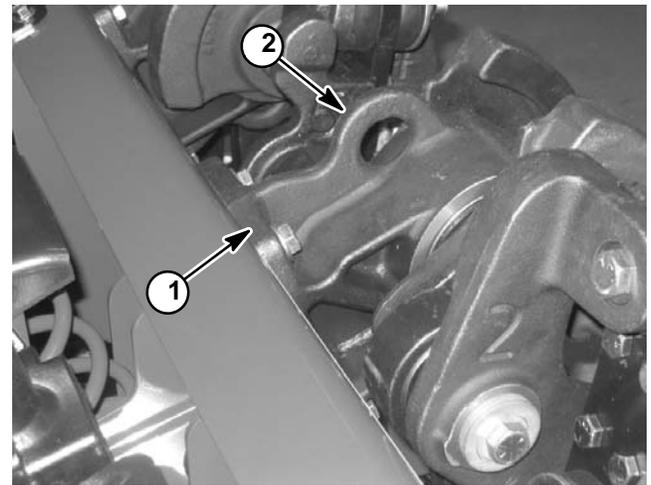


Figure 30

1. Bearing housing
2. Lifting eyelet

Assembly (Fig. 29)

1. If upper links were disassembled, note that link has a groove on the end that has left hand threads. Install rod ends equally to make link assembly from 8.170" to 8.230" (208 to 209 mm) long (rod center to rod center) (Fig. 31). Also, align rod ends before tightening jam nuts.
2. If bushings were removed from H-frame, press new bushings into H-frame bores. Bushings should be recessed into the H-frame at least 0.030" (0.8 mm).

IMPORTANT: When installing pivot shafts, make sure that both sides of H-frame are aligned with holes in frame before installing pivot shaft.

3. Position H-frame to hitch frame making sure that thrust washers are placed between H-frame and hitch frame. Align both sides of H-frame to pivot shaft holes in hitch frame. Slide pivot shaft through hitch frame and H-frame. Secure pivot shaft to hitch frame with cap screw and flange nut.

4. Position coring head to allow alignment of both sides of H-frame to pivot shaft holes in coring head frame. Slide pivot shaft through coring head frame and H-frame. Secure pivot shaft to coring head frame with carriage screw and flange nut.

5. Position upper link assemblies to hitch frame and coring head frame. Make sure that link assemblies (Fig. 31) have the groove installed in the same direction. Secure upper link rod ends to machine with lock washer and hex nut.

6. Install compression spring(s) to coring head frame:

A. With compression spring tool (see Special Tools) compressing the spring, position upper end of spring to hitch frame and then slide bottom of spring to coring head frame spring bracket.

B. Loosen lower nut on threaded rod to allow spring (item 2) to extend.

C. Remove compression spring tool threaded rod, washers and nuts from spring cups (item 1) and spring.

D. If working on ProCore 864, repeat for second spring.

7. Install pulley shield and front cover to machine (see Cover Installation in the Service and Repairs section of Chapter 3 – Chassis).

8. Install rear hood to machine.

9. Adjust aerator to desired depth setting.

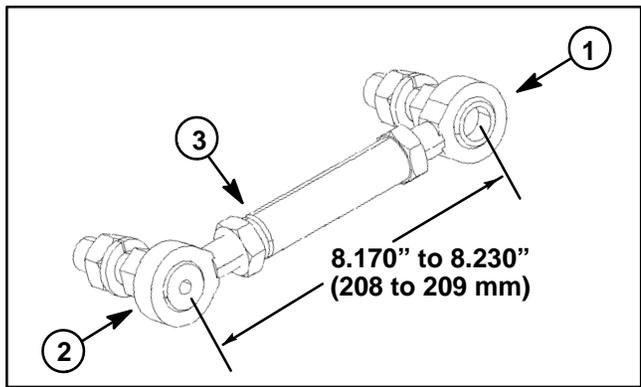


Figure 31

- 1. Rod end (RH threads)
- 2. Rod end (LH threads)
- 3. Link groove

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Depth Control Assembly

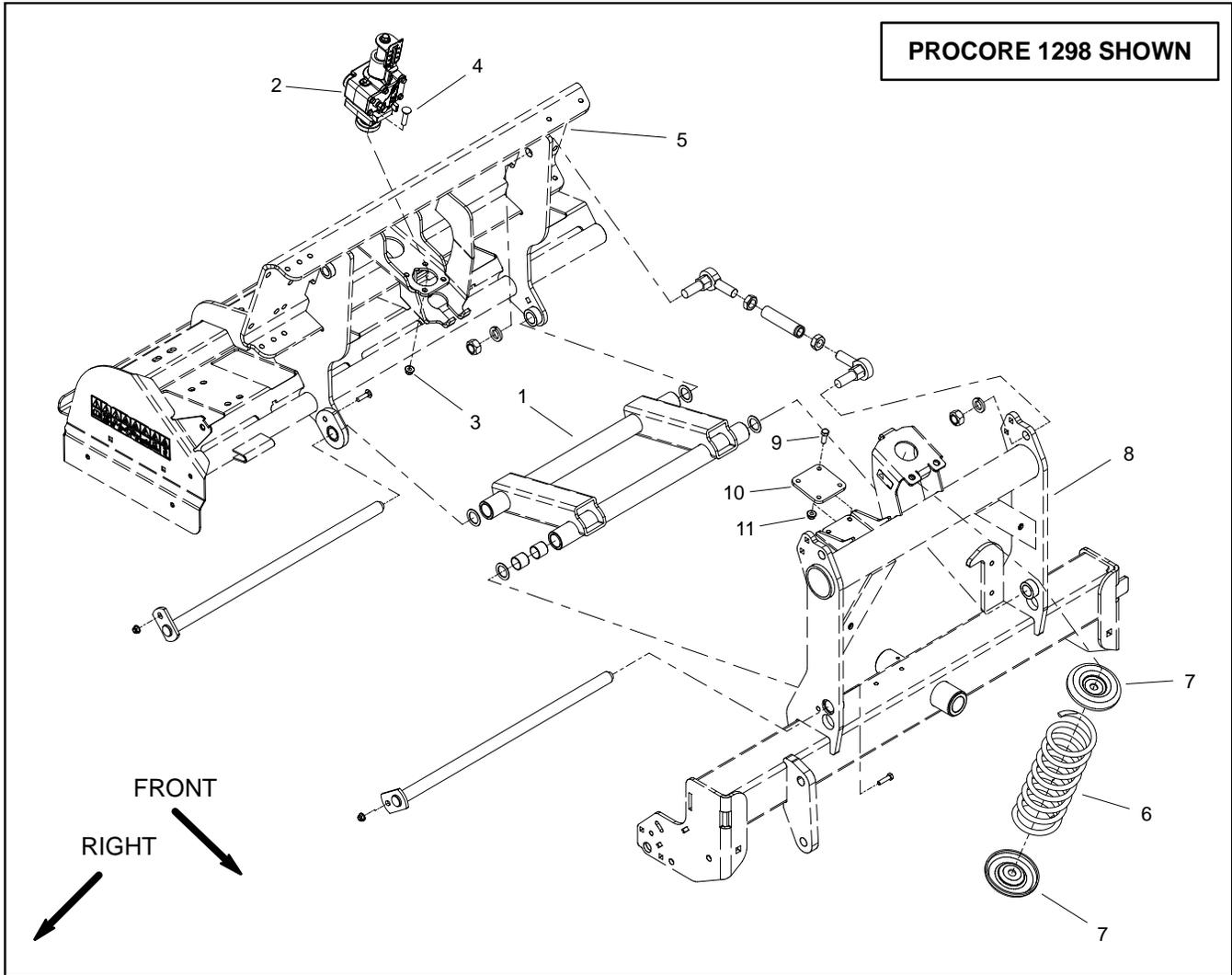


Figure 32

- | | | |
|----------------------------|-----------------------|-------------------------------|
| 1. H-frame | 5. Coring head frame | 9. Flange head screw (4 used) |
| 2. Depth control assembly | 6. Compression spring | 10. Pad |
| 3. Flange nut (4 used) | 7. Spring cup | 11. Flange nut (4 used) |
| 4. Carriage screw (4 used) | 8. Hitch frame | |

Removal (Fig. 32)

1. Position aerator on a firm, level surface. If attached to tractor, disengage PTO, apply tractor parking brake, stop engine and remove key from the ignition switch.
2. Remove rear hood from machine.
3. Remove front cover to allow access to depth control assembly (see Cover Removal in the Service and Repairs section of Chapter 3 – Chassis).
4. Use compression spring tool (see Special Tools) to compress coring head compression spring(s) slightly. The springs do not have to be removed from machine.
 - A. Install compression spring tool threaded rod through holes in each spring cup (item 7), then install washer and nut on both ends of rod.
 - B. Tighten upper nut on rod to compress spring (item 6) until upper spring cup is approximately 1/2" (13 mm) from spring seat on hitch frame.
 - C. If working on ProCore 864, repeat for second compression spring.



CAUTION

The ProCore 864 coring head frame assembly weighs approximately 900 pounds (408 kg). The ProCore 1298 coring head frame assembly weighs approximately 675 pounds (306 kg). Make sure that proper lift or hoist is used to support coring head frame during repairs.

5. Use suitable lift or hoist and lifting eyelets on coring crankshaft as lift points (Fig. 33) to raise coring head. Raise coring head so that clearance exists between depth control assembly and pad on hitch frame.
6. Use appropriate jackstands or blocking to support the coring head to prevent it from shifting or lowering.
7. Remove four (4) carriage screws and flange nuts that secure depth control assembly to coring frame.
8. Remove depth control assembly from coring frame.

Installation (Fig. 32)

1. Make sure that coring frame is supported in a raised position to prevent unexpected lowering of coring frame.
2. Position depth control assembly to coring frame.
3. Secure depth control assembly to coring frame with four (4) carriage screws and flange nuts.
4. Use appropriate hoist to lower coring frame so that depth control assembly is supporting coring frame.
5. Remove compression spring tool from coring head compression spring(s):
 - A. Loosen lower nut on threaded rod to allow spring (item 2) to extend. Make sure that upper spring cup (item 1) extends into spring seat on hitch frame.
 - B. Remove compression spring tool components (threaded rod, washers and nuts) from spring.
 - C. If working on ProCore 864, repeat for second spring.
6. Adjust aerator to desired depth setting.
7. Install front cover to machine (see Cover Installation in the Service and Repairs section of Chapter 3 – Chassis).
8. Install rear hood to machine.

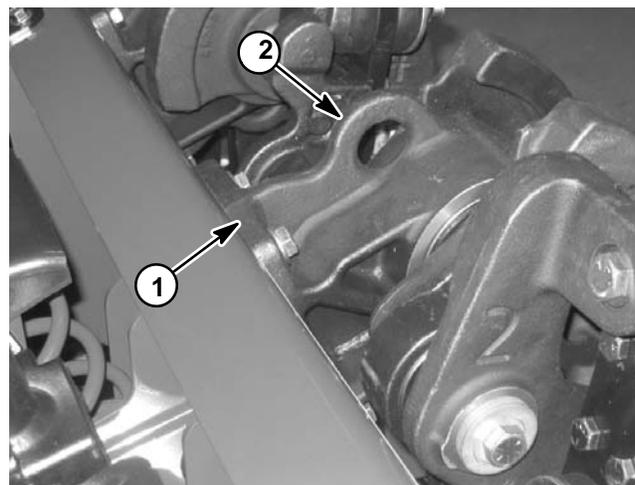


Figure 33

1. Bearing housing
2. Lifting eyelet

Depth Control Assembly Service

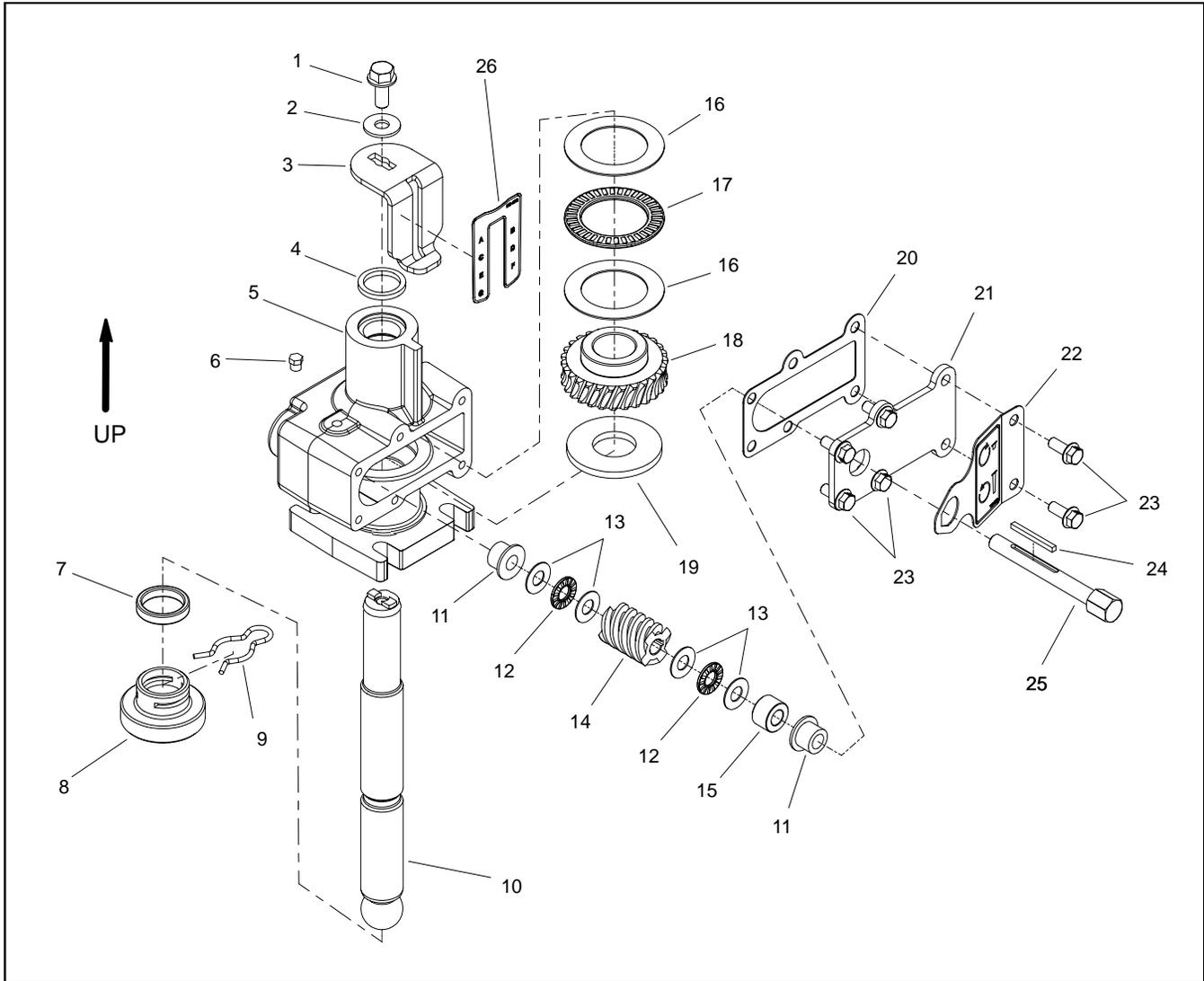


Figure 34

- | | | |
|-----------------------|-------------------------|--------------------------------|
| 1. Flange head screw | 10. Depth control shaft | 19. Plain washer |
| 2. Flat washer | 11. Flange bushing | 20. Gasket |
| 3. Depth control gage | 12. Thrust bearing | 21. Cover |
| 4. Oil seal | 13. Thrust washer | 22. Lock plate |
| 5. Depth control hub | 14. Worm | 23. Flange head screw (6 used) |
| 6. Plug | 15. Worm gear spacer | 24. Key |
| 7. Oil seal | 16. Bearing washer | 25. Adjustment shaft |
| 8. Shoe | 17. Thrust bearing | 26. Decal |
| 9. Hairpin clip | 18. Worm gear | |

Disassembly (Fig. 34)

1. Remove flange head screw (item 1), flat washer (item 2) and depth control gage (item 3) from top of depth control shaft.
2. Remove hairpin clip (item 9) and shoe (item 8) from bottom of depth control shaft.
3. Unscrew depth control shaft (item 10) and remove from depth control hub.
4. Remove upper and lower oil seals (items 4 and 7) from depth control hub. Take care to not damage seal bores in hub. Discard seals.
5. Remove six (6) flange head screws (item 23) that secure lock plate and cover to depth control hub. Remove lock plate, cover and gasket.
6. Slide adjustment shaft assembly from depth control hub. Remove flange bushings (item 11), thrust washers (item 13), thrust bearings (item 12), worm (item 14), key (item 24) and worm gear spacer (item 15) from adjustment shaft.
7. Remove plain washer (item 19) from depth control hub.
8. Slide worm gear (item 18) with two (2) bearing washers (item 16) and thrust bearing (item 17) from depth control hub. Remove bearing washers and thrust bearing from worm gear flange.
9. Clean and inspect all components. Replace all components that are worn or damaged.

Assembly (Fig. 34)

1. Apply grease to depth control components:
 - A. Pack thrust bearings (items 12 and 17) 60% to 100% full with grease.
 - B. Fill all threads of depth control shaft (item 10) 60% to 100% full with grease.
 - C. Fill all gear teeth voids of worm (item 14) and worm gear (item 18) 60% to 100% full with grease.
2. Place bearing washer (item 16), greased thrust bearing (item 17) and then second bearing washer onto flange of greased worm gear (item 18).
3. Position worm gear assembly into depth control hub. Slide plain washer (item 19) between worm gear and control hub.
4. Place inner flange bushing (item 11) into depth control hub.
5. Install components onto adjustment shaft (item 25):
 - A. Slide outer flange bushing (item 11), worm gear spacer (item 15), thrust washer (item 13), greased thrust bearing (item 12) and second thrust washer onto shaft.
 - B. Place key (item 24) into shaft slot, align worm (item 14) with key and then slide greased worm onto shaft.
 - C. Place thrust washer (item 13), greased thrust bearing (item 12) and final thrust washer onto shaft.
6. Slide assembled adjustment shaft into inner flange bushing in depth control hub. Make sure that inner flange bushing is still properly positioned in hub bore.
7. Place gasket (item 20) and cover (item 21) onto depth control hub. Make sure that outer flange bushing (item 11) is properly positioned into cover bore. Install four (4) flange head screws that surround adjustment shaft. Do not fully tighten screws at this time.
8. Lightly oil upper and lower oil seals. Install seals into depth control hub taking care to not damage seals during installation.
9. Insert greased depth control shaft (item 10) into bottom of depth control hub and thread shaft into worm gear. Take care to not damage seals during depth control shaft installation.
10. Position lock plate (item 22) to cover and secure with two (2) flange head screws. Fully tighten all six (6) cover screws.
11. Place shoe (item 8) on bottom of depth control shaft and secure with hairpin clip.
12. Position depth control gage (item 3) to top of depth control shaft and align slot in gage with tab on shaft. Secure gage to control shaft with flat washer and flange head screw.

Driveshafts

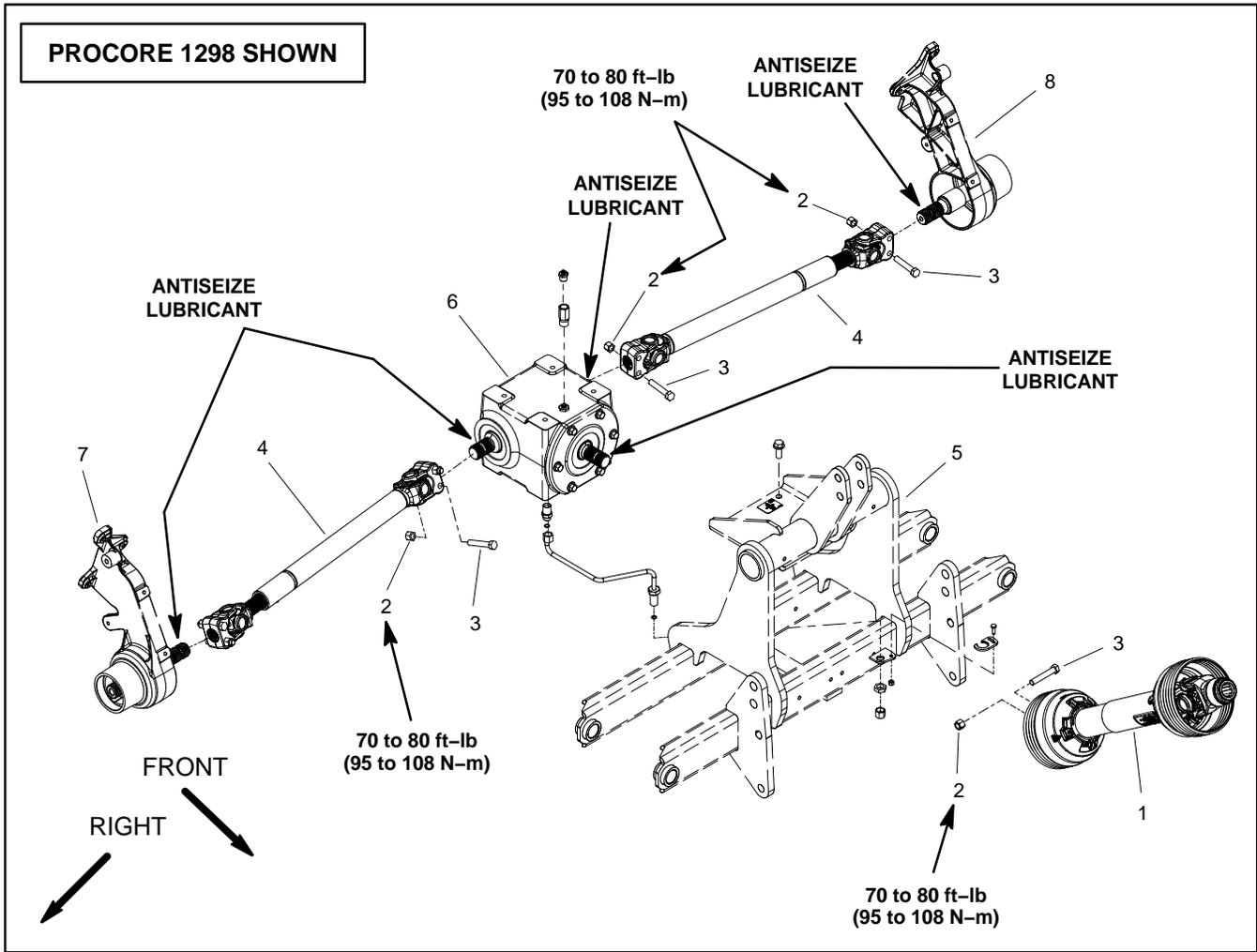


Figure 35

- | | | |
|-------------------|---------------------------|-------------------------------|
| 1. PTO driveshaft | 4. Coring head driveshaft | 7. RH pulley support assembly |
| 2. Lock nut | 5. Hitch frame | 8. LH pulley support assembly |
| 3. Cap screw | 6. Gearbox | |

NOTE: The ProCore 1298 uses two (2) identical coring head driveshafts (shown in Figure 35). The ProCore 864 uses one (1) coring head driveshaft.

Removal (Fig. 35)

1. Position aerator on a firm, level surface. If attached to tractor, disengage PTO, apply tractor parking brake, stop engine and remove key from the ignition switch.
2. Remove front covers to allow access to driveshaft (see Cover Removal in the Service and Repairs section of Chapter 3 – Chassis).
3. Remove two (2) cap screws and lock nuts from both end yokes of driveshaft.
4. Slide driveshaft end yokes from shafts and remove driveshaft from machine.

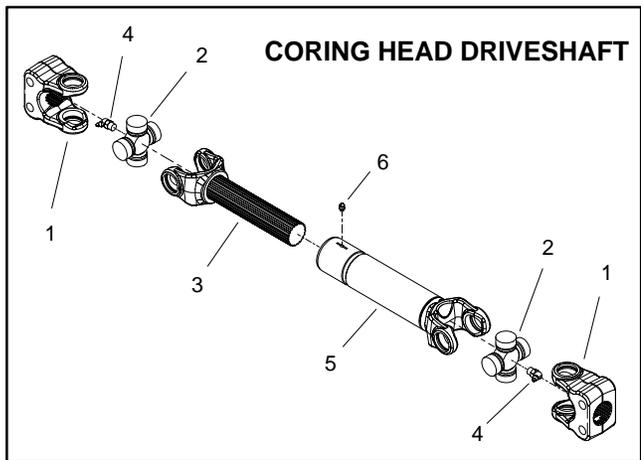


Figure 36

- | | |
|-----------------------|-------------------|
| 1. End yoke | 4. Grease fitting |
| 2. Cross and bearings | 5. Tube and yoke |
| 3. Shaft and yoke | 6. Grease fitting |

5. If necessary, remove guards from PTO driveshaft (Fig. 38):

- A. Press clip end and rotate clip from guard.
- B. Rotate bushing to disengage bushing from guard.
- C. Slide guard from driveshaft.
- D. Remove bushing from groove in yoke. Clean bushing and groove.

Installation (Fig. 35)

1. Apply antiseize lubricant to shaft surfaces.
2. If driveshaft halves were separated, note that splines on shaft and tube have a blind spline to ensure alignment of end yokes when the driveshaft is assembled. Align blind spline in shaft and tube when assembling driveshaft halves.
3. Install guards to PTO driveshaft if removed (Fig. 38):
 - A. Grease bushing groove in yoke and install bushing into groove.
 - B. Slide guard onto driveshaft and insert guard openings over bushing tabs.
 - C. Rotate bushing to engage bushing tabs and guard.
 - D. Secure bushing and guard by pushing the clip into guard.
4. Position driveshaft to aerator:
 - A. Coring head driveshaft should be installed with slip tube yoke to gearbox (Fig. 36).
 - B. PTO driveshaft should be installed with safety slide lock yoke toward tractor (Fig. 37).
5. Align splines of driveshaft yokes with shafts. Slide driveshaft end yokes onto shafts.
6. Secure driveshaft end yokes to shafts with two (2) cap screws and lock nuts. Torque lock nuts from **70 to 80 ft-lb (95 to 108 N-m)**.
7. Lubricate driveshaft grease fittings.
8. Install front covers to machine (see Cover Installation in the Service and Repairs section of Chapter 3 – Chassis).

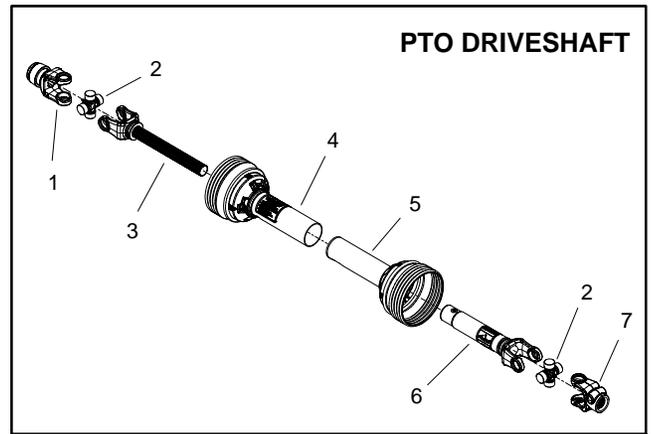


Figure 37

- | | |
|---------------------------|------------------|
| 1. Safety slide lock yoke | 5. Inner guard |
| 2. Cross and bearings | 6. Tube and yoke |
| 3. Shaft and yoke | 7. End yoke |
| 4. Outer guard | |

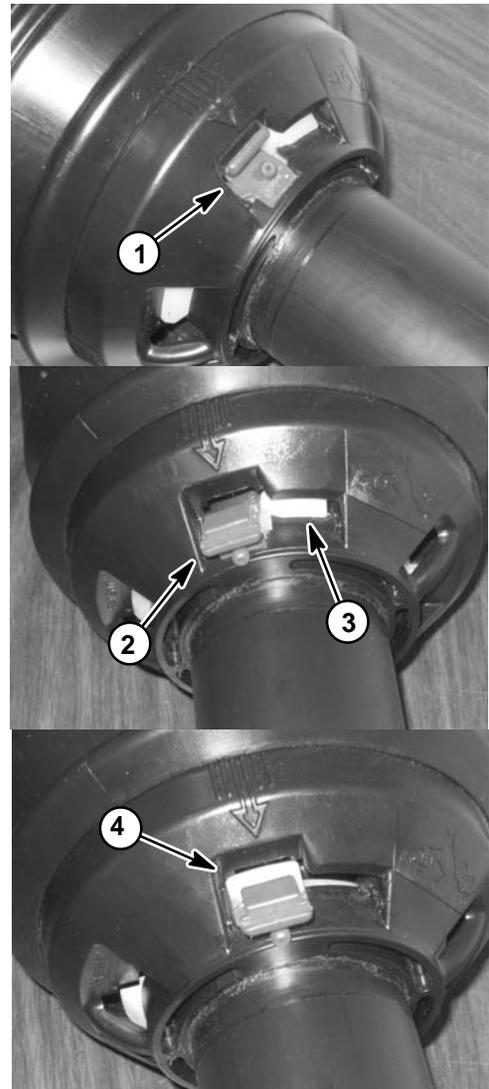


Figure 38

- | | |
|--------------------|-------------------------|
| 1. Clip (locked) | 3. Bushing (engaged) |
| 2. Clip (unlocked) | 4. Bushing (disengaged) |

Driveshaft Cross and Bearing Service

1. Remove driveshaft from aerator (see Driveshaft Removal in this section).

IMPORTANT: When placing yoke in vise, clamp lightly on the solid part of the yoke to prevent yoke damage. Also, the use of a vise with soft jaws is recommended.

2. Lightly clamp yoke in vise. Remove snap rings that secure bearings in each yoke. Remove yoke from vise.

IMPORTANT: Yokes must be supported when removing and installing bearings to prevent damage.

3. Use a press to remove cross and bearings from yokes:

A. Place a small socket against one bearing and a large socket against the yoke on the opposite side.

B. While supporting the large socket, apply pressure on small socket to partially push the opposite bearing into the large socket.

C. Remove yoke from press, grasp partially removed bearing and tap on yoke to completely remove the bearing.

D. Repeat process for remaining bearings.

E. Thoroughly clean and inspect all components.

4. To install new cross and bearings:

A. Apply a coating of grease to bearing bores of end yoke and shaft yoke. Also, apply grease to bearings and seal of bearing assembly. Make sure that all bearing rollers are properly seated in bearing cage.

B. Press one bearing partially into yoke.

IMPORTANT: Take care when installing cross into bearing to avoid damaging bearing seal.

C. Carefully insert cross into bearing and yoke.

D. Hold cross in alignment and press bearing in until it hits the yoke.

E. Carefully place second bearing into yoke bore and onto cross shaft. Press bearing into yoke.

F. Install snap rings to secure bearings in place.

G. Repeat procedure for other yoke.

H. Grease cross until grease comes out of all four (4) bearing cups.

5. Make sure that assembled joint moves without binding. Slight binding can usually be eliminated by lightly rapping the yoke lugs with a soft faced hammer. If binding continues, disassemble joint to identify source of binding.

6. If driveshaft halves were separated during cross and bearing service, note that splines on shaft and tube have a blind spline to ensure alignment of end yokes when the driveshaft is assembled. Align blind spline in shaft and tube when assembling driveshaft halves.

7. Install driveshaft to aerator (see Driveshaft Installation in this section).

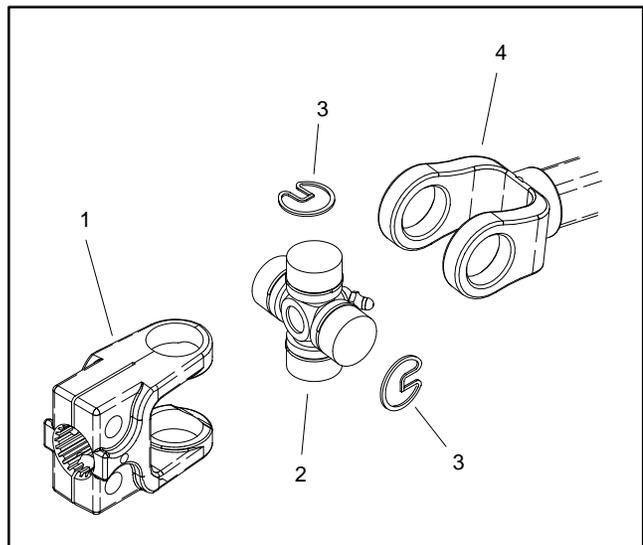


Figure 39

- | | |
|--------------------------|-----------------------|
| 1. End yoke | 3. Snap ring (4 used) |
| 2. Cross and bearing kit | 4. Shaft yoke |

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Gearbox

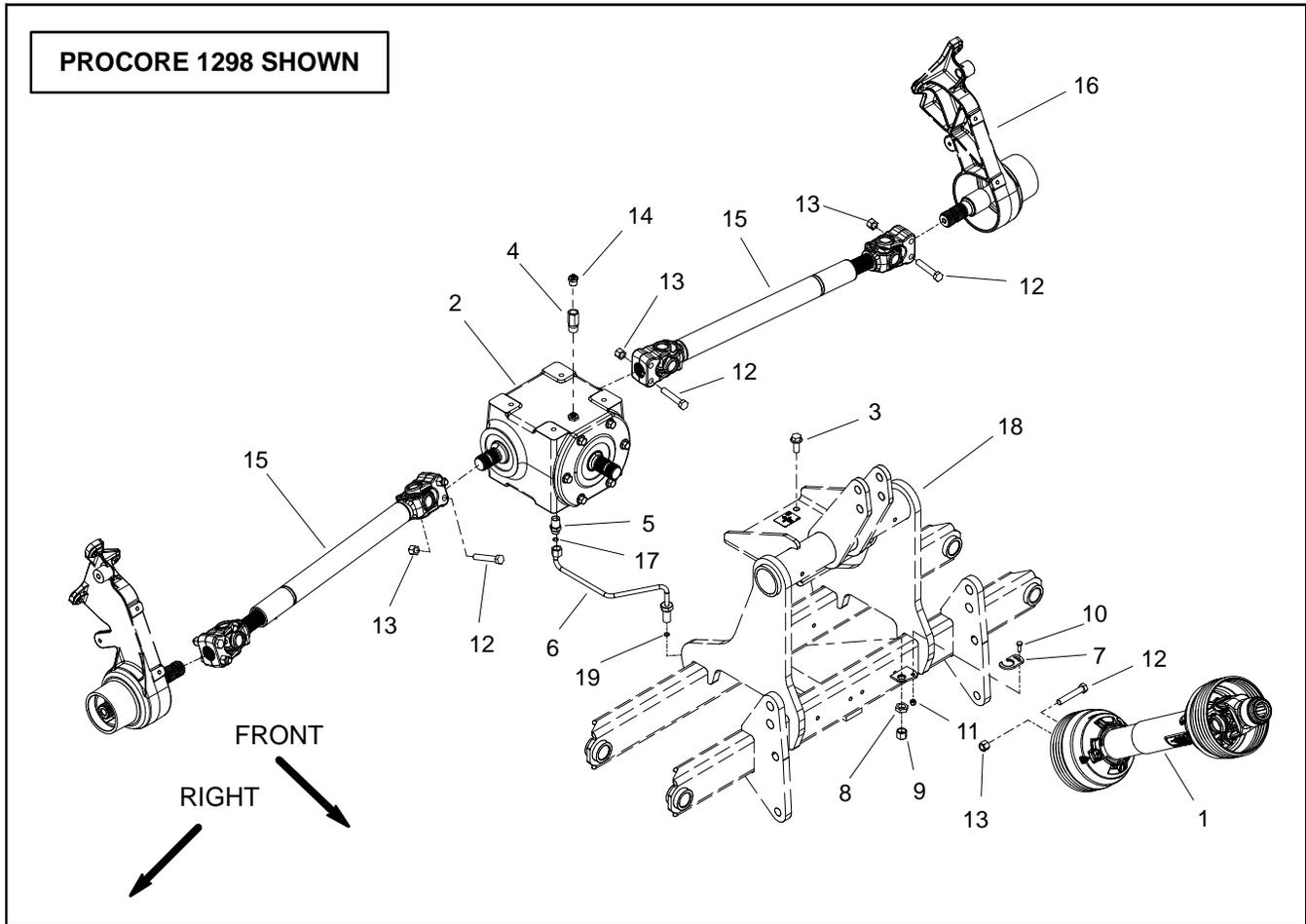


Figure 40

- | | | |
|-------------------------------|---------------|----------------------------|
| 1. PTO driveshaft | 8. Lock nut | 14. Relief vent |
| 2. Gearbox | 9. Cap | 15. Coring head driveshaft |
| 3. Flange head screw (4 used) | 10. Cap screw | 16. Pulley drive |
| 4. Reducer fitting | 11. Lock nut | 17. O-ring |
| 5. Adapter | 12. Cap screw | 18. Hitch frame |
| 6. Tube | 13. Lock nut | 19. O-ring |
| 7. Hardline keeper | | |

Removal (Fig. 40)

1. Position aerator on a firm, level surface. If attached to tractor, disengage PTO, apply tractor parking brake, stop engine and remove key from the ignition switch.
2. Remove front cover from hitch frame (see Front Cover Removal in the Service and Repairs section of Chapter 3 – Chassis).
3. Drain lubricant from gearbox.

NOTE: The ProCore 864 uses one (1) coring head driveshaft. The ProCore 1298 has two (2) coring head driveshafts.

4. Disconnect PTO and coring head driveshaft(s) from gearbox shafts (see Driveshafts Removal in this section).
5. Disconnect drain tube from adapter on bottom of gearbox.



6. Support gearbox to prevent it from shifting.
7. Remove four (4) flange head screws that secure gearbox to hitch frame.
8. Carefully remove gearbox from machine.

Installation (Fig. 40)



1. Position gearbox to machine hitch frame. Secure gearbox to frame with four (4) flange head screws.
2. Make sure that O-ring is positioned in groove in adapter on bottom of gearbox. Connect drain tube to adapter.
3. Connect PTO and coring head driveshaft(s) to gearbox shafts (see Driveshafts Installation in this section).
4. Fill gearbox with proper lubricant (see Operator's Manual).
5. Install front cover to machine (see Front Cover Installation in the Service and Repairs section of Chapter 3 – Chassis).

Gearbox Service

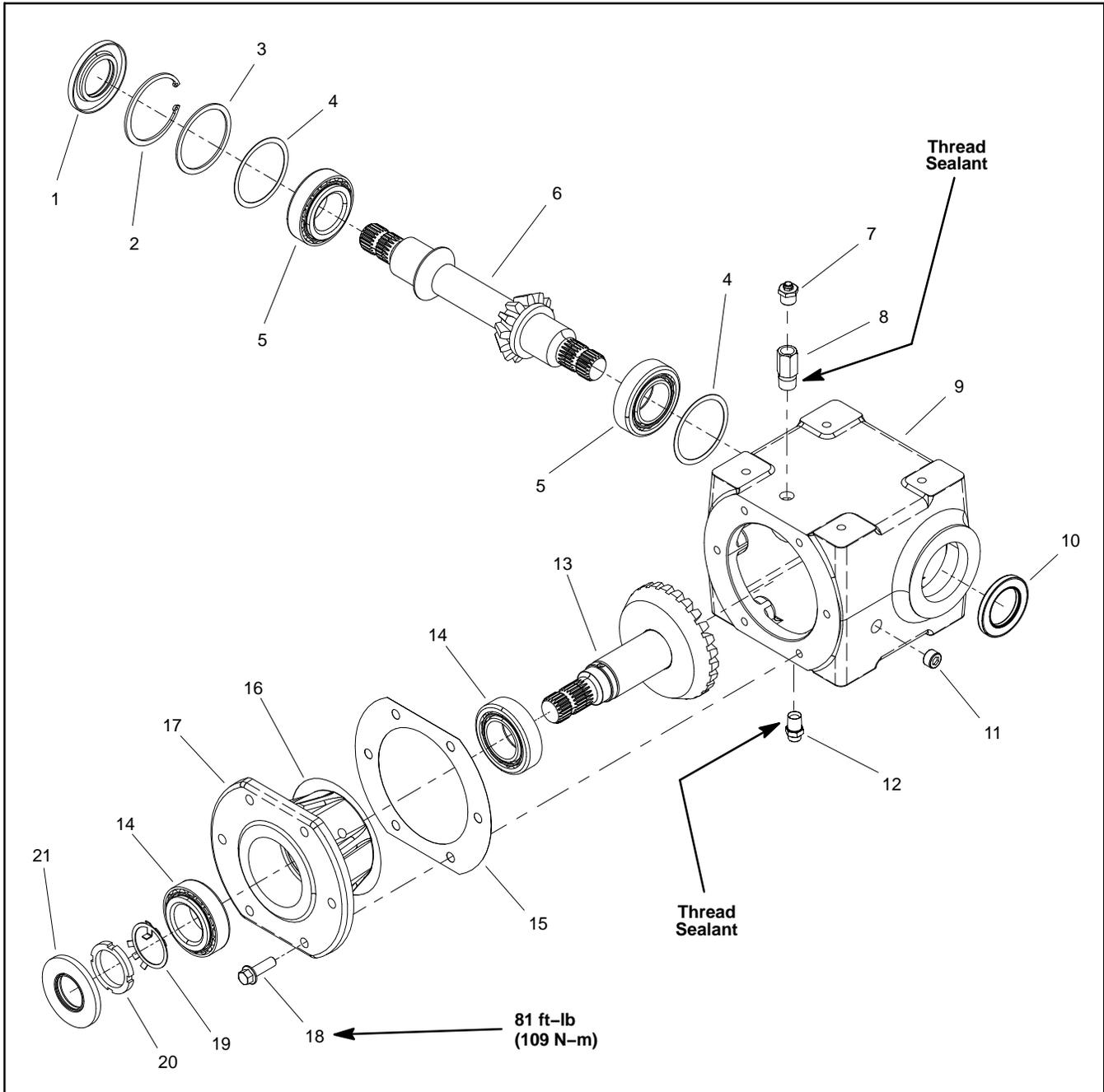


Figure 41

- | | | |
|---------------------------|----------------------------|--------------------------------|
| 1. Oil seal | 8. Fitting | 15. Gasket |
| 2. Retaining ring | 9. Housing | 16. O-ring |
| 3. Hard shim | 10. Oil seal | 17. Quill |
| 4. Soft shim | 11. Plug | 18. Flange head screw (6 used) |
| 5. Bearing (cup and cone) | 12. Adapter | 19. Retaining shim |
| 6. Cross shaft | 13. Input gear and shaft | 20. Lock nut |
| 7. Relief vent | 14. Bearing (cup and cone) | 21. Oil seal |

NOTE: The gearbox used on ProCore 864 and 1298 machines is identical.

Disassembly (Fig. 41)

1. Remove six (6) flange head screws that secure quill assembly to gearbox housing.

NOTE: Gaskets (item 15) are used to adjust gearbox backlash. Take note of number of gaskets to assist in assembly process.

2. Pull quill assembly from gearbox housing. Remove and discard O-ring and gasket(s).

3. Disassemble quill assembly:

- A. Remove oil seal (item 21) from quill housing. Discard oil seal.
- B. Bend retaining tab of retaining shim and remove lock nut and shim from shaft. Discard retaining shim.
- C. Remove outer bearing. Slide shaft and inner bearing from quill housing.
- D. Remove inner bearing from shaft.
- E. Use press to remove bearing cups from quill housing.

4. Remove oil seal (item 1) from housing to allow removal of cross shaft assembly. Discard oil seal.

5. Remove retaining ring that secures cross shaft assembly in gearbox housing.

NOTE: Soft shims (item 4) between hard shim (item 3) and outer bearing (item 5) are used to adjust cross shaft end play. Take note of number and location of shims to assist in assembly process.

6. Slide cross shaft assembly from gearbox housing. Note location of hard shim (item 3) and soft shim(s) just inside retaining ring location. Remove outer bearing cup and both bearing cones from cross shaft.

NOTE: Soft shims (item 4) between inner bearing cup and gearbox housing are used to adjust gear mesh and pattern. Take note of number of shims to assist in assembly process.

7. Remove inner bearing cup from gearbox housing. Remove soft shim(s) from between inner bearing cup location and gearbox housing. Note the number of soft shim(s).

8. Remove and discard remaining oil seal (item 10) from gearbox housing. Discard oil seal.

9. Thoroughly clean and inspect all gearbox components. Replace all worn or damaged parts.

Assembly (Fig. 41)

NOTE: Soft shims (item 4) between inner bearing cup and gearbox housing are used to adjust gear mesh and pattern. During assembly, install same number of soft shims as were removed.

1. Position soft shim(s) in housing and then press inner bearing cup fully into housing bore.

2. Press inner and outer bearing cones onto cross shaft. Make sure that bearings are pressed fully to shoulders on shaft.

3. Install cross shaft assembly into gearbox housing:

A. Slide cross shaft assembly into gearbox housing.

NOTE: Soft shims (item 4) between hard shim and outer bearing are used to adjust cross shaft end play. During assembly, install same number of soft shims as were removed.

B. Position outer bearing cup, soft shim(s) and hard shim (item 3) onto cross shaft. Secure cross shaft with retaining ring.

C. Check that cross shaft has from 0.001" to 0.003" (0.03 to 0.07 mm) end play. If necessary, add or remove soft shim(s) between outer bearing and hard shim to adjust end play.

4. Assemble quill assembly:

A. Install bearing cups into quill housing. Make sure that cups are fully installed to shoulder in housing.

B. Install inner bearing cone fully onto shaft.

C. Slide shaft into housing.

D. Slide outer bearing cone onto shaft.

E. Install retaining shim and then lock nut onto shaft. Make sure that tab on retaining shim is aligned with slot in shaft.

F. Tighten lock nut until shaft has from 0.001" to 0.003" (0.03 to 0.07 mm) end play. Secure lock nut in place by bending a locking tab on retaining shim into one of the slots in the lock nut.

5. Lightly grease O-ring (item 16) and install into groove of quill housing.

NOTE: Gaskets (item 15) are used to adjust gearbox backlash. During assembly, install same number of gasket(s) as were removed.

6. Position gasket(s) to quill housing and install housing assembly into gearbox housing. Make sure that gear teeth mesh properly with gear on cross shaft. Secure quill housing with six (6) flange head screws. Torque screws **81 ft-lbs (109 N-m)**.

7. Check gearbox backlash (Fig. 42):

A. Clamp the output shaft of gearbox in a soft jawed vise.

B. Lightly clamp a pair of locking pliers onto the gearbox input shaft.

C. Mount a dial indicator with a magnetic base to the vise so that the dial indicator touches the pliers 3.100" (78.7 mm) from the center of the input shaft.

D. Rotate the pliers and monitor the dial indicator reading to check gearbox backlash. Allowable backlash is from 0.006" to 0.013" (0.16 to 0.33 mm).

E. If backlash adjustment is necessary, remove gasket(s) from between quill and gearbox housing to decrease backlash. Increase backlash by installing additional gasket(s). Recheck backlash after any gasket change. Repeat process until backlash is correct.

F. Remove gearbox from vise.

8. After backlash is correct, check gear pattern to assure that proper gear mesh exists:

A. Remove quill housing assembly and coat gear teeth on cross shaft with gear mounting compound.

B. Install quill housing into gearbox housing using the same number of gaskets and secure with six (6) flange head screws. Torque screws **81 ft-lbs (109 N-m)**.

C. Rotate the input shaft to establish a gearmesh pattern in the gear mounting compound. Rotating the input shaft 1/2 turn will allow all cross shaft gear teeth to contact input shaft gear teeth.

D. Remove quill assembly from gearbox and inspect the pattern on the gear teeth.

E. Ideal pattern should cover from 40% to 80% of the gear face width (Fig. 43). The contact area should be in the center of each tooth and extend from 20% to 50% of the gear face height. The pattern should not run off the tooth heel, toe or top.

F. If necessary, adjust the number of soft shim(s) between housing and inner bearing cone to correct gear pattern. Make sure to also check and adjust cross shaft end play.

G. Recheck backlash if any changes are made. Adjust backlash if necessary.

9. Apply a light coating of grease on seal lips and seal OD. Install seals into gearbox bores taking care to not damage seals during installation. Seals should be installed until they are flush with the housing.

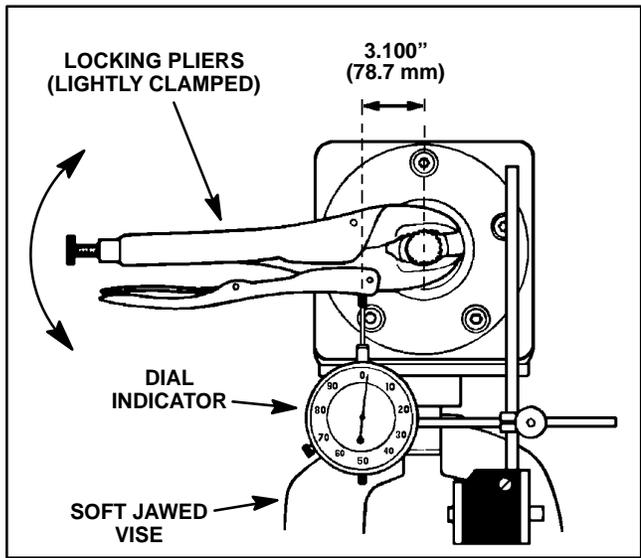


Figure 42

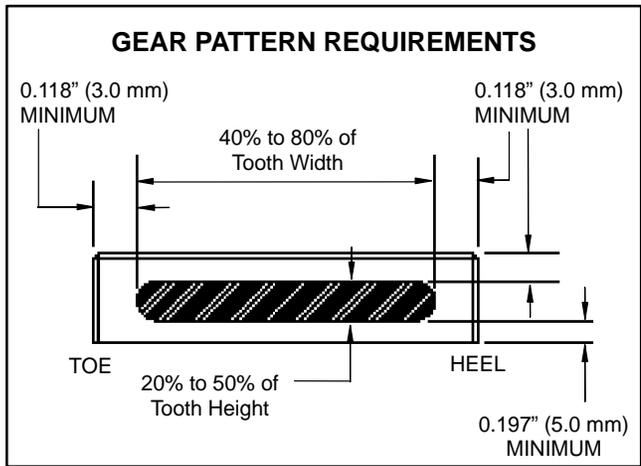


Figure 43

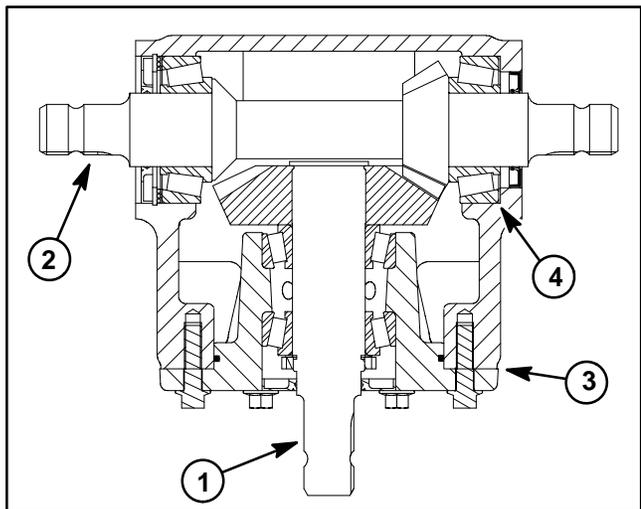


Figure 44

- 1. Input gear and shaft
- 2. Cross shaft
- 3. Gasket location
- 4. Soft shim location

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