FD Series Heads

Drive to Tree Disc Saw Heads

S/N WCFD18X005001 –

S/N WCFD21X006001 –

S/N WCFD22X007001 –

TECHNICAL MANUAL
FD Series Disc Saw Heads
TMF381707 (JULY01)

CALIFORNIA
Proposition 65 Warning

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects and other reproductive harm.

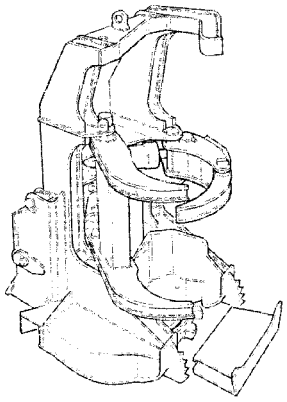
WARNING

The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

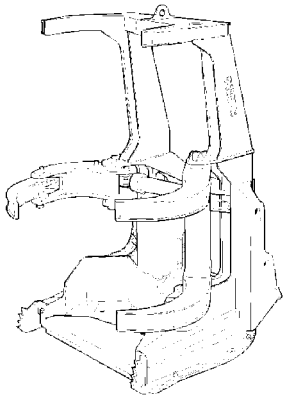
Worldwide Construction and Forestry Division

English

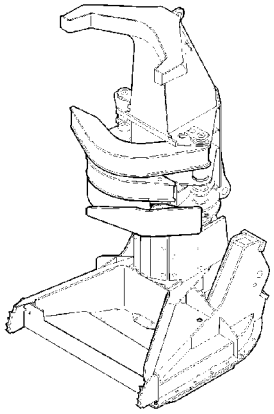
Service Technical Manual



FD18



FD21



FD22

28031

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Disc Saw Felling Heads

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07/01

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7400 Introduction

1.1 Introduction

1.1.1 General

The Workshop Manual is intended to provide technical information, component specifications, troubleshooting and removal, disassembly and reassembly procedures for most of the major components of the felling head. Use this manual in conjunction with the applicable Operator/Maintenance Manual and the applicable Carrier Workshop Manuals.

When practical, the Workshop Manual lists likely causes of malfunctions, offers test procedures to verify causes and then illustrates the steps for the adjustment or repair procedure(s).

Troubleshooting must always be a multi-step process. Use the following steps:

1. Know the operation of all machine systems.
2. Ask the operator about symptoms and when they occur.
3. Operate the machine yourself if practical.
4. List all possible causes.
5. Inspect for obvious causes.
6. Eliminate the simple ones by checking oil, changing filters, etc.
7. Carry out diagnostic procedures like pressure and leakage testing to pinpoint the cause.

Component specifications provide performance and mode of operation information that can be very useful in troubleshooting.

Disassembly and reassembly procedures are given for many major components. When possible, clearance and torques are given. If a manufacturer's workshop manual is available, it should be given priority.

Reference to special equipment for testing and repair is limited, as most repair shops or local machine shops are well equipped to fabricate on an as-needed basis to reduce downtime.

1.1.2 Models Covered By This Manual

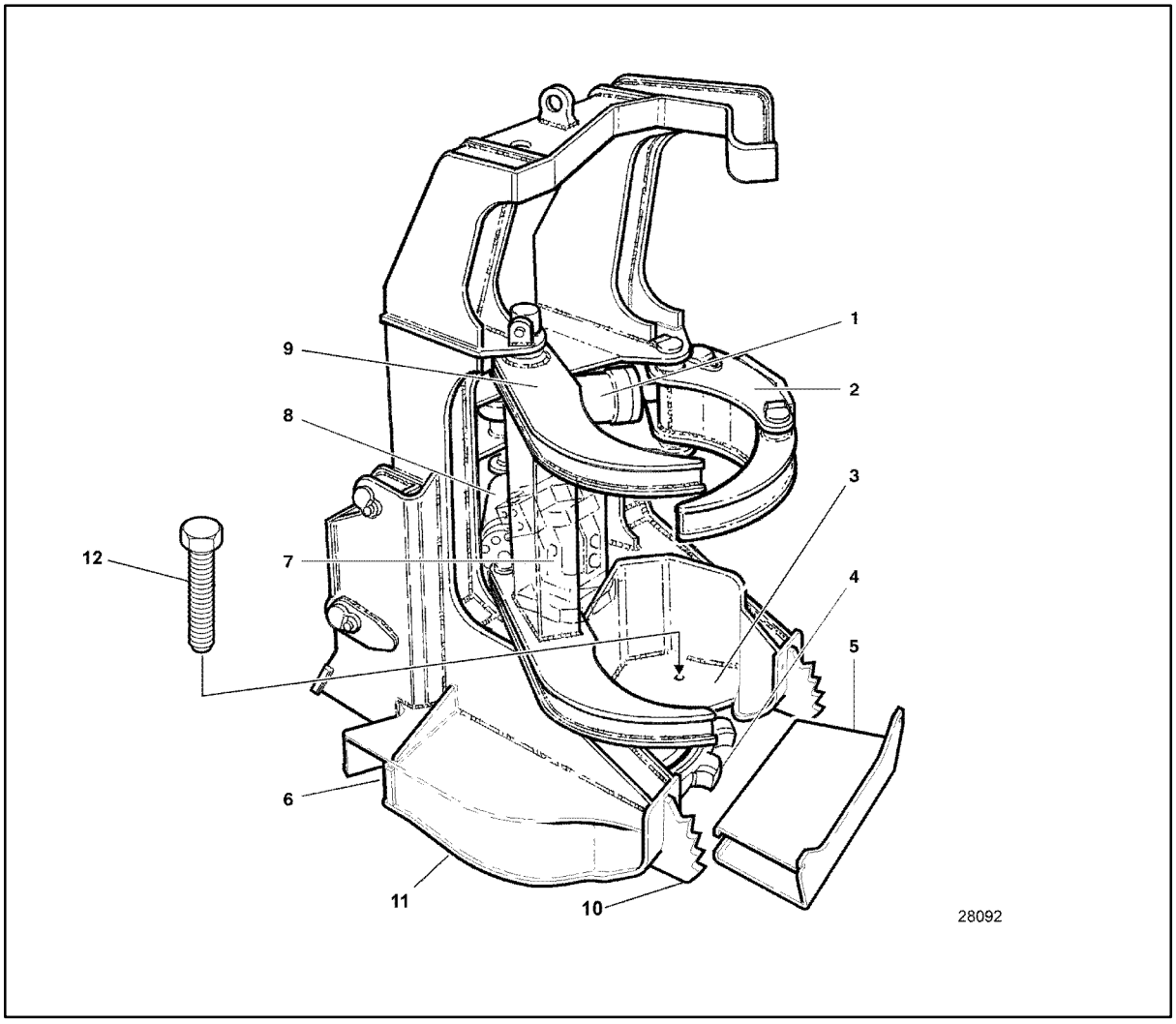
Technical information, component specifications, troubleshooting, removal, disassembly and reassembly procedures for the following model felling heads are covered in this manual:

1. FD18 (Drive to Tree)
2. FD21 (Drive to Tree)
3. FD22 (Drive to Tree)

1.2 FD18 (Drive to Tree)

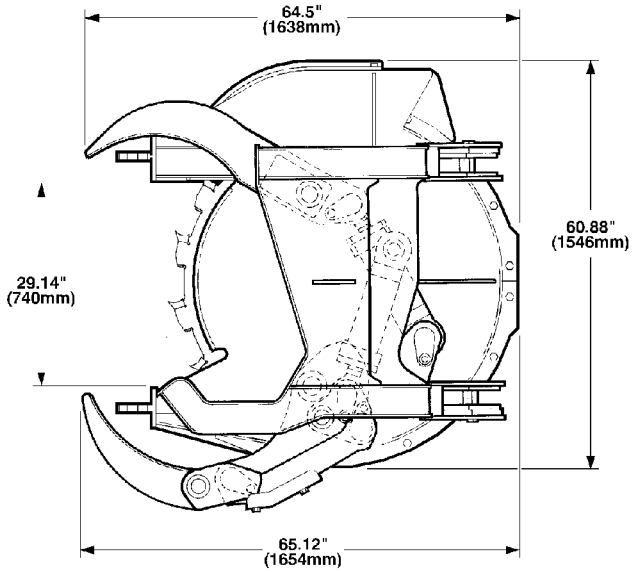
1.2.1 Component Description

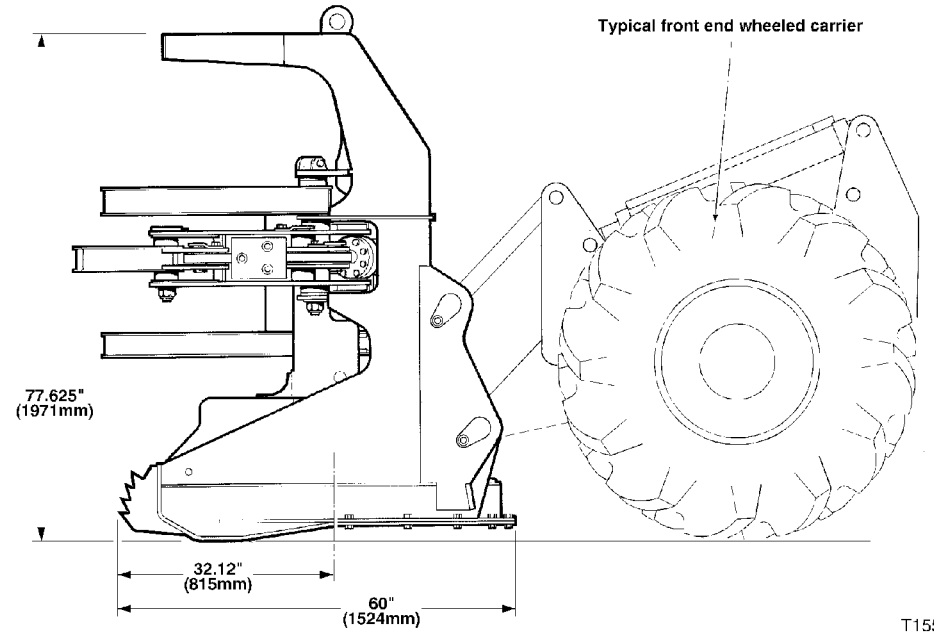
1. L.H. Clamp Arm Cylinder - 7412
2. L.H. (Accumulating) Clamp Arm - 7412
3. Butt Plate - 7411
4. Disc Saw Blade - 7430
5. Disc Saw Blade Guard - 7411
6. Chip Deflector - 7411
7. Saw Drive Hydraulic Motor - 7440
8. R.H. Clamp Arms Cylinder - 7440
9. R.H. (Harvesting) Clamp Arms - 7420
10. Nose Extensions
11. Lower Guards/Skis - 7411
12. Disc Saw Blade Locking Bolt



1.2 FD18 (Drive to Tree)

1.2.2 General Dimensions





1.2 FD18 (Drive to Tree)

1.2.3 General Specifications

Bolt Torques (lb ft/lubricated)

Disc Saw Blade Lower Flange Plate	280-320 lb. ft. (380-434 Nm) (3/4"-16 UNF)
Lower Guard Plate	300-330 lb. ft. (404-447 Nm) (3/4"-10 UNC) (locknut end)
Saw Tooth	85 lb. ft. (115 Nm) (1/2"-20 UNF)
Saw Drive Motor	300-330 lb. ft. (404-447 Nm) (3/4"-10 UNC)
Saw Motor Guard	213 lb. ft. (289 Nm) (M16x2.0)
Clamp Arm Pin Retainer Nuts	300-350 lb. ft. (407-475 Nm) (1.38"-12 UNF)
Clamp Arm Pin Retainer Bolts	200-220 lb. ft. (271-298 Nm) (3/4"-10 UNC)

Clamp Cylinders

No. Cylinders	2
Bore Diameter	4.0 in. (101.6 mm)
Rod Diameter	2.0 in. (50.8 mm)
Stroke	8.5 in. (215.9 mm)
Operating Pressure	3000 psi (207 bar)

Hydraulic Requirements

Disc Saw Blade Motor	23 gpm @ 3500 psi (87 L/m @ 241 bar)
	18 gpm @ 4000 psi (68 L/m @ 276 bar)
Clamp Cylinders	25 gpm @ 3000 psi (95 L/m @ 207 bar)

Miscellaneous

Cutting Capacity	18" (457 mm) diameter
Weight	3680 lb. (1669 kg)

Disc Saw Blade

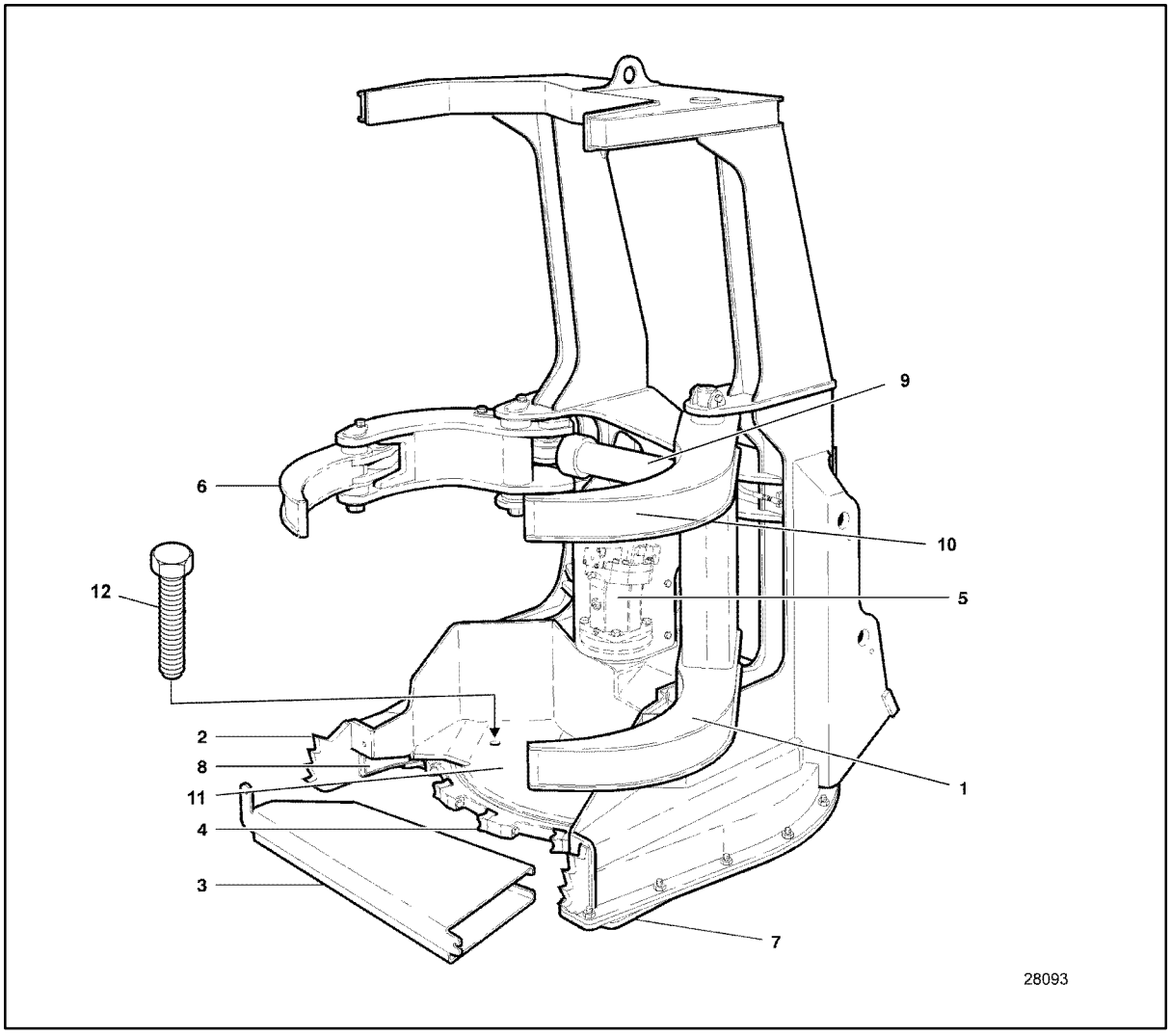
Series	4000B (NK - Narrow Kerf)
No. Teeth	16 rotatable
Type	Carbide Teeth/Hardened Teeth
Saw Speed	1300 +/- 25 rpm
Maximum Allowable Saw Disc Runout	0.100" (2.5 mm)
Diameter	49.5" (1257 mm)
Weight	537 lb. (244 kg)

Note!
Refer to OEM carrier workshop manual for applicable Service Specifications by Model.

1.3 FD21 (Drive to Tree)

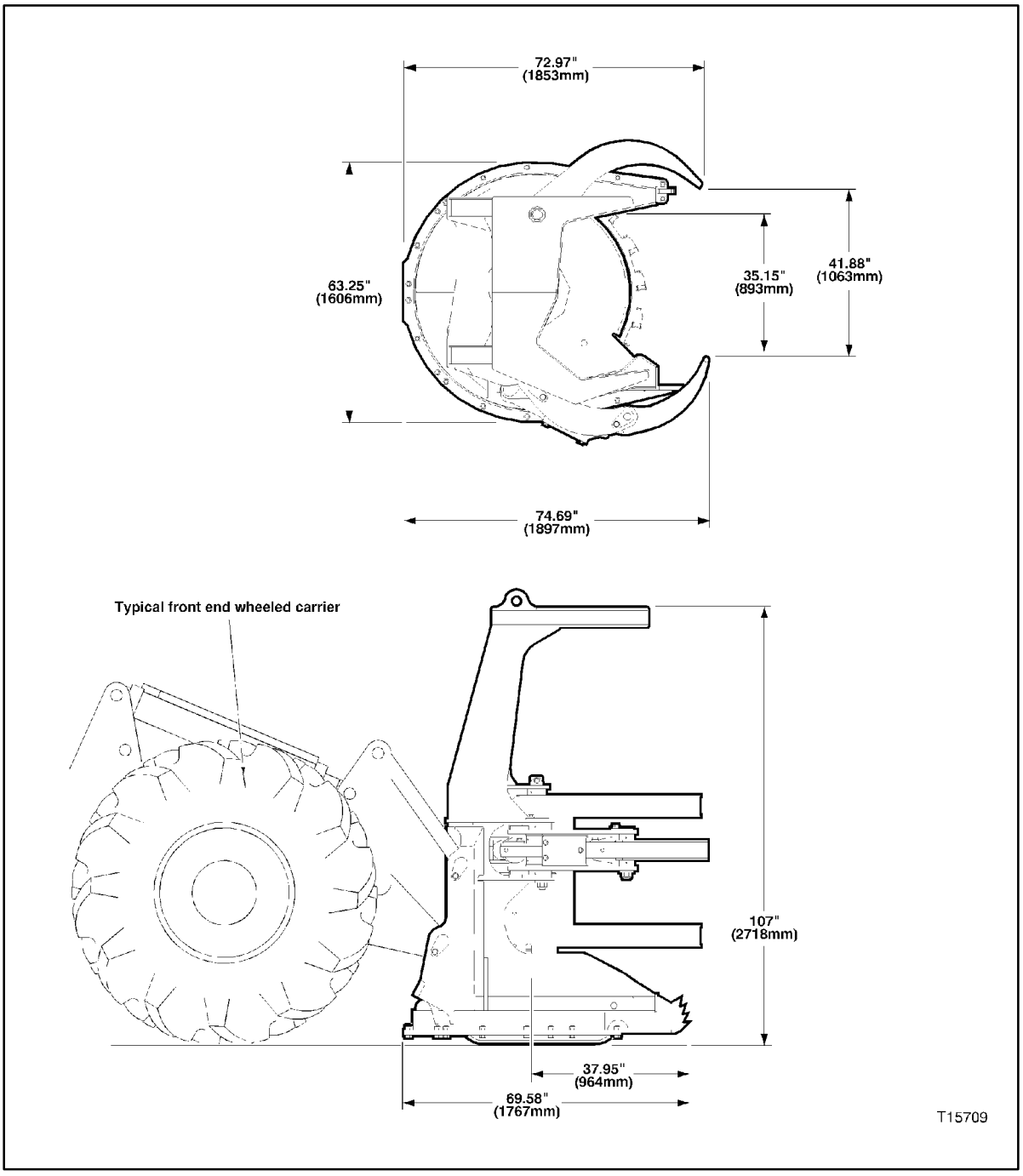
1.3.1 Component Description

1. L.H. (Harvesting) Clamp Arms - 7412
2. Nose Extensions
3. Disc Saw Blade Guard - 7411
4. Disc Saw Blade - 7430
5. Saw Drive Hydraulic Motor - 7440
6. R.H. (Accumulating) Clamp Arm - 7412
7. Lower Guards/Skis - 7411
8. Chip Deflector and Wear Plate - 7411
9. Accumulating Clamp Cylinder - 7440
10. Harvesting Clamp Cylinder - 7440
11. Butt Plate
12. Disc Saw Blade Locking Bolt



1.3 FD21 (Drive to Tree)

1.3.2 General Dimensions



1.3 FD21 (Drive to Tree)

1.3.3 General Specifications

Bolt Torques (lb ft/lubricated)

Disc Saw Blade Lower Flange Plate	280-320 lb. ft. (380-434 Nm) (3/4"-16 UNF)
Lower Guard Plate	475-525 lb. ft. (644-712 Nm)
	(locknut end) (7/8"-9 UNC)
Saw Tooth	85 lb. ft. (115 Nm) (1/2"-20 UNF)
	160 lb. ft (216 Nm) (5/8"-18 UNF)
Saw Drive Motor	300-330 lb. ft. (407-447 Nm) (3/4"-10 UNC)
Saw Motor Guard	213 lb ft (289 Nm) (M16 x 2.0)
Clamp Arm Pin Retainers	200-220 lb. ft. (271-298 Nm) (3/4"-10 UNC)
	300-350 lb. ft. (407-475 Nm) (1.38"-12 UNC)
	175-190 lb. ft. (237-258 Nm) (5/8"-11 UNC)

Clamp Cylinders

No. Cylinders	2
Bore Diameter	3.5 in. (88.9 mm)
Rod Diameter	2.0 in. (50.8 mm)
Stroke	12.38 in. (314.5 mm)
Operating Pressure	3000 psi (207 bar)

Hydraulic Requirements

Disc Saw Blade Motor	30 gpm @ 3500 psi (114 L/m @ 241 bar)
	25 gpm @ 4000 psi (95 L/m @ 276 bar)
Clamp Cylinders	30 gpm @ 3200 psi (114 L/m @ 221 bar)

Miscellaneous

Cutting Capacity	22" (559 mm) diameter
Weight	5600 lb. (2540 kg)

Disc Saw Blade

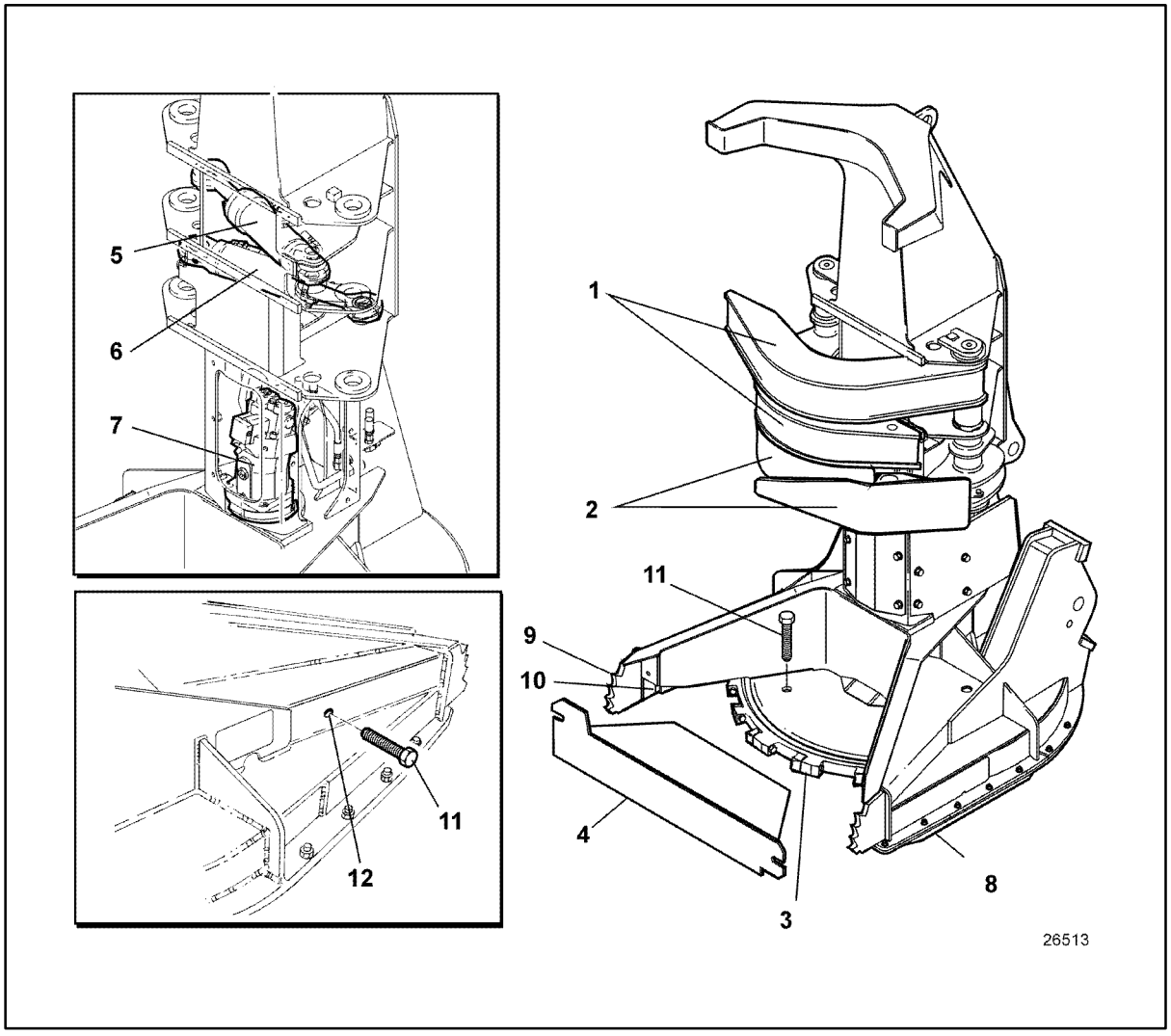
Series	4000B (NK - Narrow Kerf or WK - Wide Kerf)
No. Teeth	18 rotatable
Type	Carbide Teeth/Hardened Teeth
Saw Speed	1175 +/- 25 rpm
Maximum Allowable Saw Disc Runout	0.100" (2.5 mm)
Diameter	56.0" (1422 mm)
Weight	735 lb. (334 kg)

Note!
Refer to OEM carrier workshop manual for applicable Service Specifications by Model.

1.4 FD22 (Drive to Tree)

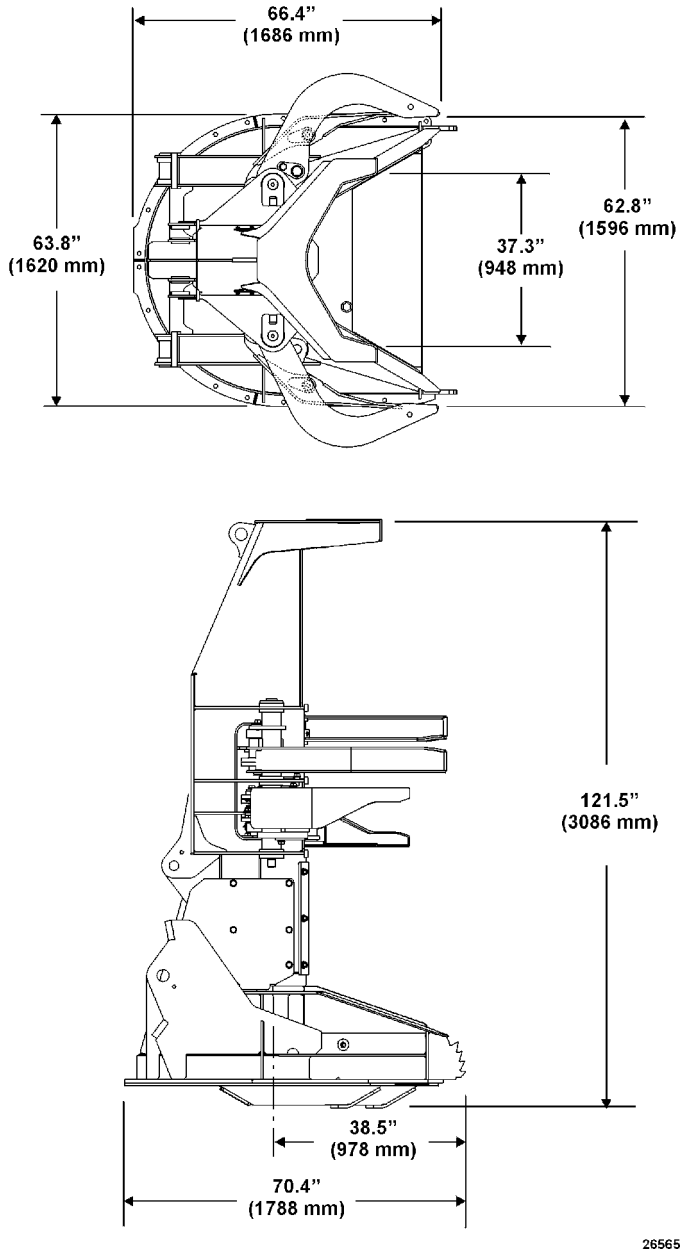
1.4.1 Component Description

1. Upper (Harvesting) Clamp Arms - 7412
2. Lower (Accumulating) Clamp Arms - 7412
3. Disc Saw Blade - 7430
4. Disc Saw Blade Guard - 7411
5. Harvesting Clamp Arms Cylinder - 7440
6. Accumulating Clamp Arms Cylinder - 7440
7. Saw Drive Hydraulic Motor - 7440
8. Lower Guards/Skis - 7411
9. Nose Extensions
10. Chip Deflector - 7411
11. Blade Locking Bolt - 7411
12. Blade Locking Bolt Storage Hole - 7411



1.4 FD22 (Drive to Tree)

1.4.2 General Dimensions



1.4 FD22 (Drive to Tree)

1.4.3 General Specifications

Bolt Torques (lb ft/lubricated)

Disc Saw Blade Lower Flange Plate	280 - 320 lb ft (380 - 434 Nm) (3/4" - 16 UNF)
Lower Guard Plate	260 - 295 lb ft (353 - 400 Nm) (locknut end) (M20 x 2.5)
Saw Tooth	85 lb ft (115 Nm) (1/2" - 20 UNF) 160 lb ft (217 Nm) (5/8" - 18 UNF)
Saw Drive Motor	260 - 295 lb ft (353 - 400 Nm) (M20 x 2.5)
Saw Motor Guard	213 lb ft (289 Nm) (M16 x 2.0)
Clamp Arm Pin Retainers	.1000 - 1300 lb. ft. (1356 - 1763 Nm)

Clamp Cylinders

No. Cylinders	2
Bore Diameter	4.0 in. (101.6 mm)
Rod Diameter	2.0 in. (50.8 mm)
Stroke	8.5 in. (215.9 mm)
Operating Pressure	3000 psi (207 bar)

Hydraulic Requirements

Disc Saw Blade Motor	30 gpm @ 3500 psi (114 L/min. @ 241 bar)
	25 gpm @ 4000 psi (95 L/min. @ 276 bar)
Clamp Cylinders	30 gpm @ 3000 psi (114 L/min. @ 207 bar)

Miscellaneous

Cutting Capacity	22" (559 mm) diameter
Weight	6245 lb (2833 kg)

Disc Saw Blade

Series	4000B (NK - Narrow Kerf or WK - Wide Kerf)
No. Teeth	18 rotatable
Type	Carbide Teeth/Hardened Teeth
Saw Speed	1175 rpm ± 25 rpm
Maximum Allowable Saw Disc Runout	0.100" (2.5 mm)
Diameter	56.0" (1422 mm)
Weight	735 lb (334 kg)

Note!
Refer to OEM carrier workshop manual for applicable Service Specifications by Model.

1.5 Torque Values

The following torque values are for use in general applications and where torque values are not otherwise specified.

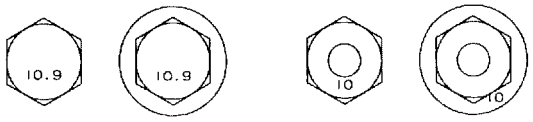
1.5.1 Steel Fasteners

This Standard applies to steel cap screws engaged with steel female thread and is applicable for all thread pitches. Torque values for other materials are to be specified on the drawings where needed.

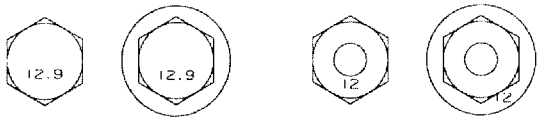
Fastener Markings

Grade 8 - Imperial

Class 10.9 - Metric



Class 12.9 - Metric



1.5 Torque Values

1.5.1 Steel Fasteners

Imperial Hex Head

Nominal Thread Diameter		Tightening Torque Values for Grade 8			
		Nm		lb.ft.	
		Min	Max	Min	Max
1/4	0.2500	12	14	9	10
5/16	0.3125	24	27	18	20
3/8	0.3750	50	55	34	40
7/16	0.4375	80	90	60	65
1/2	0.5000	125	135	90	100
9/16	0.5625	170	190	125	140
5/8	0.6250	240	255	175	190
3/4	0.7500	405	455	300	330
7/8	0.8750	645	710	475	525
1	1.000	985	1085	725	800
1-1/8	1.125	1425	1595	1050	1175
1-1/4	1.250	2000	2205	1475	1625
1-3/8	1.375	2710	2980	2000	2200
1-1/2	1.500	3525	3865	2600	2850
1-5/8	1.625	4680	5150	3450	3800
1-3/4	1.750	5850	6510	4300	4800
1-7/8	1.875	8270	7460	5500	6100
2	2.000	8810	9760	6500	7200

1.5 Torque Values

1.5.1 Steel Fasteners

Metric Hex Head

Nominal Thread Diameter	Tightening Torque Values							
	Class 10.9				Class 12.9			
	Nm		lb.ft.		Nm		lb.ft.	
	Min	Max	Min	Max	Min	Max	Min	Max
M5	7	8	5	6	8	9	6	7
M6	12	14	9	10	14	16	10	12
M8	30	35	22	24	35	40	25	28
M10	55	65	42	48	65	75	50	56
M12	100	115	75	85	120	135	85	100
M14	165	185	120	135	190	210	140	155
M16	250	285	185	210	290	330	215	245
M20	490	550	360	405	570	645	420	475
M22	665	745	490	550	775	875	570	645
M24	840	950	620	700	1000	1125	725	820
M30	1700	1900	1250	1400	1950	2200	1450	1625
M36	2900	3300	2150	2450	3425	3850	2525	2850
M42	4675	5250	3450	3900	5500	6150	4050	4550
M48	7050	7900	5200	5800	8200	9200	6050	6800

1.5 Torque Values

1.5.1 Steel Fasteners

Metric Flanged Hex Head

Nominal Thread Diameter	Tightening Torque Values for Class 10.9			
	Nm		lb.ft.	
	Min	Max	Min	Max
M5	7	8	5	6
M6	12	15	9	11
M8	32	38	23	26
M10	60	70	45	50
M12	110	125	80	90
M14	170	190	125	140
M16	265	300	195	220
M20	515	575	380	425
M22	665	745	490	550
M24	840	950	620	700

Notes:

1. Torque values shown are based on Zinc Phosphate or oil coating.
2. The torque values listed develop clamping forces that are based on material proof loads for the different class fasteners. The clamping forces developed are 85 $\pm$ 5% of proof loads.
3. All the torque values in Nm or lb.ft. are rounded to the nearest multiple of 5, or in some cases, to the nearest whole number to be in line with graduations on torque wrenches and dials.

CAUTION

Use only metric tools on metric hardware and imperial tools on imperial hardware to assure correct torque readings, and to prevent damage to tools and hardware as well as possible injury.