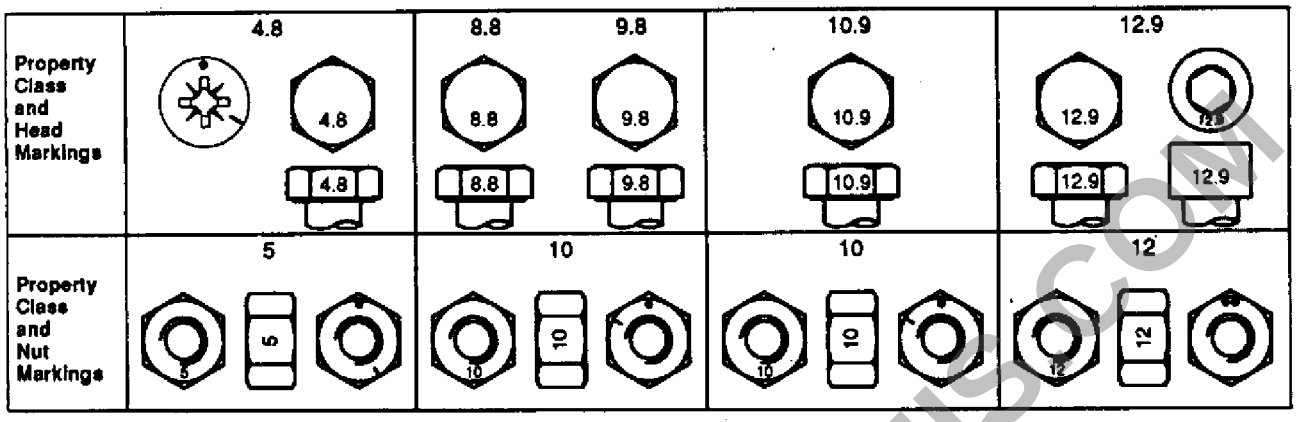
METRIC BOLT AND CAP SCREW TORQUE VALUES



-19-04MAR91
TS1163

Size	Class 4.8				Class 8.8 or 9.8				Class 10.9				Class 12.9			
	Lubricated[a]		Dry[a]		Lubricated[a]		Dry[a]		Lubricated[a]		Dry[a]		Lubricated[a]		Dry[a]	
	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft
M6	4.8	3.5	6	4.5	9	6.5	11	8.5	13	9.5	17	12	15	11.5	19	14.5
M8	12	8.5	15	11	22	16	28	20	32	24	40	30	37	28	47	35
M10	23	17	29	21	43	32	55	40	63	47	80	60	75	55	95	70
M12	40	29	50	37	75	55	95	70	110	80	140	105	130	95	165	120
M14	63	47	80	60	120	88	150	110	175	130	225	165	205	150	260	190
M16	100	73	125	92	190	140	240	175	275	200	350	225	320	240	400	300
M18	135	100	175	125	260	195	330	250	375	275	475	350	440	325	560	410
M20	190	140	240	180	375	275	475	350	530	400	675	500	625	460	800	580
M22	260	190	330	250	510	375	650	475	725	540	925	675	850	625	1075	800
M24	330	250	425	310	650	475	825	600	925	675	1150	850	1075	800	1350	1000
M27	490	360	625	450	950	700	1200	875	1350	1000	1700	1250	1600	1150	2000	1500
M30	675	490	850	625	1300	950	1650	1200	1850	1350	2300	1700	2150	1600	2700	2000
M33	900	675	1150	850	1750	1300	2200	1650	2500	1850	3150	2350	2900	2150	3700	2750
M36	1150	850	1450	1075	2250	1650	2850	2100	3200	2350	4050	3000	3750	2750	4750	3500

DO NOT use these values if a different torque value or tightening procedure is given for a specific application. Torque values listed are for general use only. Check tightness of fasteners periodically.

Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical property class.

Fasteners should be replaced with the same or higher property class. If higher property class fasteners are used, these should only be tightened to the strength of the original.

Make sure fasteners threads are clean and that you properly start thread engagement. This will prevent them from failing when tightening.

Tighten plastic insert or crimped steel-type lock nuts to approximately 50 percent of the dry torque shown in the chart, applied to the nut, not to the bolt head. Tighten toothed or serrated-type lock nuts to the full torque value.

[a] "Lubricated" means coated with a lubricant such as engine oil, or fasteners with phosphate and oil coatings. "Dry" means plain or zinc plated without any lubrication.

DX,TORQ2 -19-16APR92

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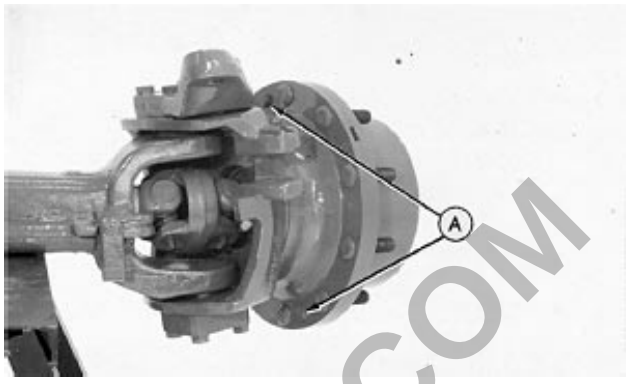
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REMOVE AND DISASSEMBLE PLANETARY CARRIER

IMPORTANT: If ring gear retainer is removed and the hub is allowed to tip away from knuckle shoulder (or axle housing shoulder on non-steerable), a new hub oil seal must be installed.

Drain planetary carrier lube oil.

Remove two cap screws (A) holding planetary carrier to wheel hub.

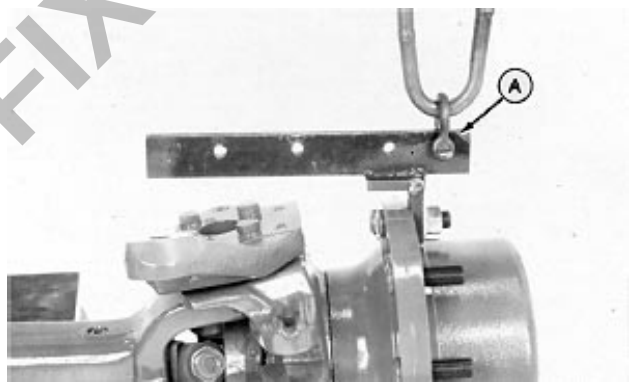


RW18247 -UN-15AUG90

Steerable Axle

RX,4415,10A -19-10SEP92

Attach DFRW4 Axle Wheel Hub Tool (A) to carrier. Remove carrier from wheel hub using pry slots. (See Dealer Fabricated Tools—Group 99.)



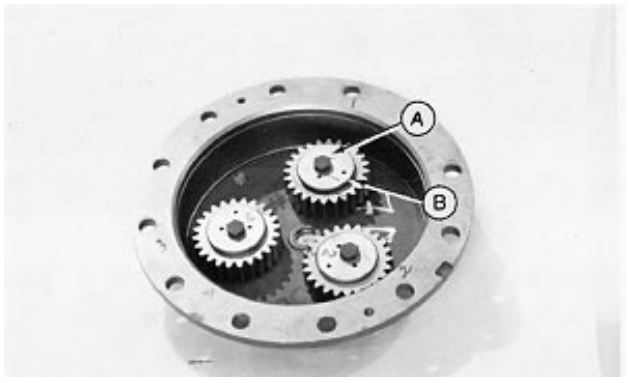
RW18246 -UN-15AUG90

RX,CTM4415,8 -19-19FEB91

Make a mark on planet pinions, retainers and housing so parts are installed in their original locations.

Remove cap screw (A) and retainer (B).

Remove planet pinions, needle bearings, and thrust washers.



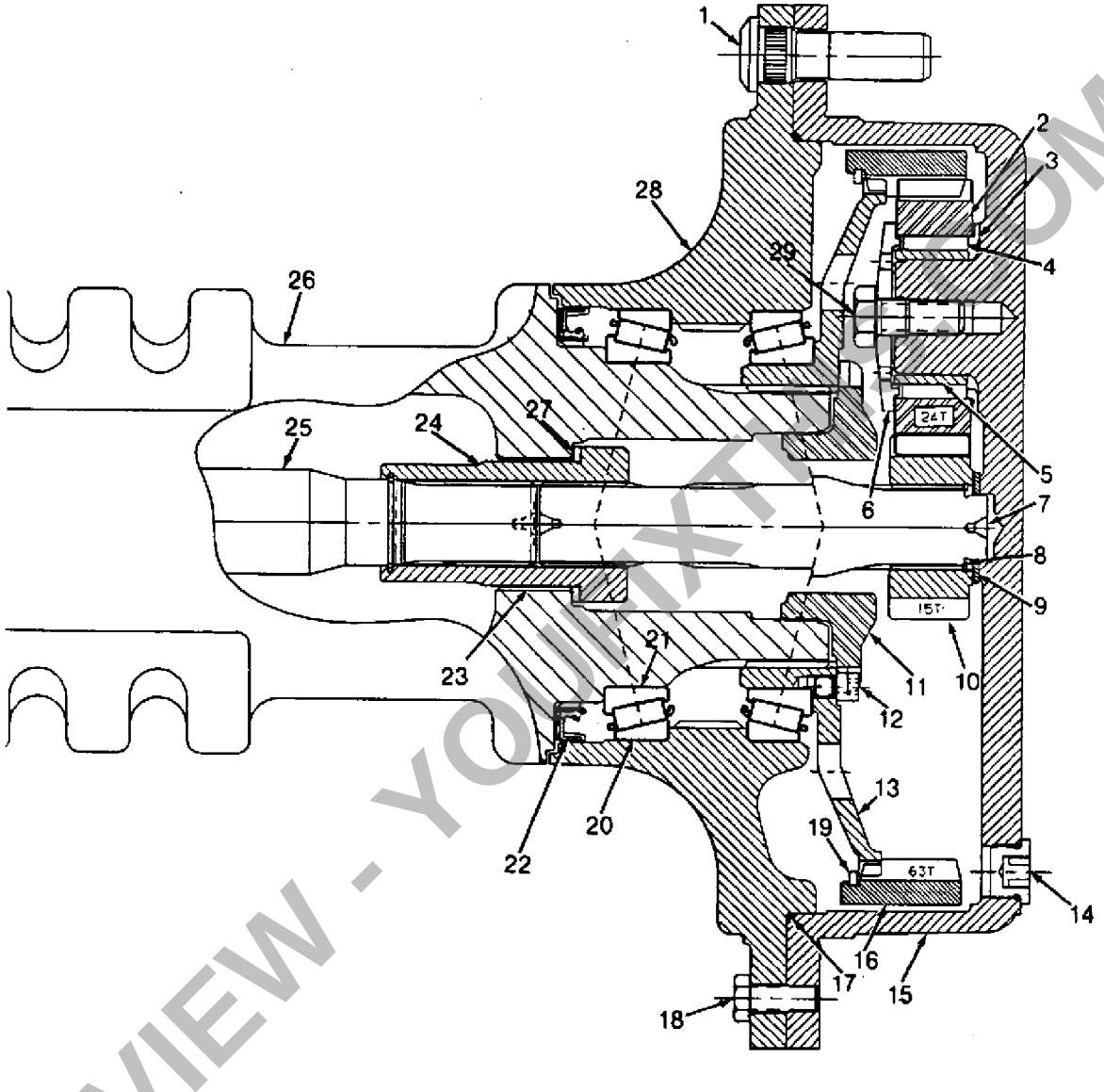
RW12918 -UN-16APR90

RX,CTM4415,9 -19-19FEB91

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PLANETARY CARRIER AND WHEEL HUB (NON-STEERABLE)



1—Bolt or Tapped Hole (20 or 24)
2—Planet Pinion (6)
3—Thrust Washer (6)
4—Needle Roller (516 or 198)
5—Bearing Race (6)
6—Retainer (6)
7—Final Drive Shaft (2)
8—Retaining Ring (2)
9—Thrust Washer (2)
10—Sun Pinion (2)
11—Retainer (2)
12—Special Screw (2)
13—Ring Gear Hub (2)
14—Plug (2)
15—Planetary Carrier (2)
16—Ring Gear (2)
17—O-Ring Packing (2)
18—Hex Screw (2)
19—Snap Ring (2)
20—Bearing Cup (4)
21—Bearing Cone (4)
22—Oil Seal (2)
23—Bushing (2)
24—Coupler (2)
25—Axle Shaft (2)
26—Axle Housing
27—Thrust Washer (2)
28—Wheel Hub (2)
29—Hex Screw (6)

RX,4415,8A -19-10SEP92

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GENERAL OUTBOARD PLANETARY AXLE SPECIFICATIONS (OEM APPLICATIONS)

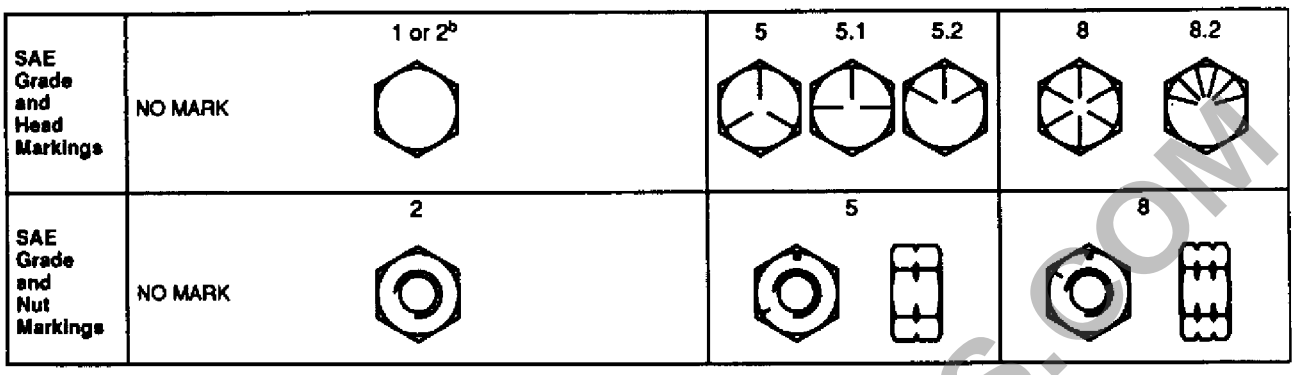
Description	1100 Series Non-Steerable	1150 Series Steerable
Input Pinion and Ring Gear Options:	2.588:1 3.071:1 3.727:1 4.625:1	2.588:1 3.071:1 3.727:1 4.625:1
Input Yoke Options:	1410, 1480, 1550 5C, 6C	1410, 1480, 1550 5C, 6C
Mounting Options:		
Non-Oscillating	yes	yes
Oscillating-Raised Pivot	yes	yes
Oscillating-Center Pivot	yes	yes
Inboard Wet Disk Brakes:	Optional	Optional
Differential Options:		
Standard	yes	yes
No-Spin	yes	yes
Limited Slip	yes	yes
Outboard Planetary Final Drive Ratio Options:		
Standard—335 mm Bolt Circle	5.200:1	5.200:1
High-Torque—425 mm Bolt Circle	5.200:1	5.200:1
Standard—335 mm Bolt Circle	5.786:1	5.786:1
High-Torque—425 mm Bolt Circle	5.786:1	5.786:1
Dimensions:		
Width (Axle Flange-to-Flange)		
Standard	1870 mm (73.6 in.)	1881 mm (74.1 in.)
High-Torque	1914 mm (75.4 in.)	1925 mm (75.8 in.)
Width (Overall)		
Standard	2126 mm (83.7 in.)	2137 mm (84.1 in.)
High-Torque	2096 mm (82.5 in.)	2107 mm (83.0 in.)
Bolt Circle		
Standard	335 mm (13.2 in.)	335 mm (13.2 in.)
High-Torque	425 mm (16.7 in.)	425 mm (16.7 in.)
Wheel Mounting Holes		
Standard	10	10
High-Torque	12	12
Oil Capacity:		
Differential Case	14 L (15 qt)	8.5 L (9 qt)
Wheel Hub (Each)		
Standard	1.9 L (2 qt)	1.9 L (2 qt)
High-Torque	2.8 L (3 qt)	2.8 L (3 qt)

RX,4410,1A -19-10SEP92

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UNIFIED INCH BOLT AND CAP SCREW TORQUE VALUES



TS1162 -19-04MAR91

Size	Grade 1				Grade 2[b]				Grade 5, 5.1, or 5.2				Grade 8 or 8.2			
	Lubricated[a]		Dry[a]		Lubricated[a]		Dry[a]		Lubricated[a]		Dry[a]		Lubricated[a]		Dry[a]	
	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft
1/4	3.7	2.8	4.7	3.5	6	4.5	7.5	5.5	9.5	7	12	9	13.5	10	17	12.5
5/16	7.7	5.5	10	7	12	9	15	11	20	15	25	18	28	21	35	26
3/8	14	10	17	13	22	16	27	20	35	26	44	33	50	36	63	46
7/16	22	16	28	20	35	26	44	32	55	41	70	52	80	58	100	75
1/2	33	25	42	31	53	39	67	50	85	63	110	80	120	90	150	115
9/16	48	36	60	45	75	56	95	70	125	90	155	115	175	130	225	160
5/8	67	50	85	62	105	78	135	100	170	125	215	160	215	160	300	225
3/4	120	87	150	110	190	140	240	175	300	225	375	280	425	310	550	400
7/8	190	140	240	175	190	140	240	175	490	360	625	450	700	500	875	650
1	290	210	360	270	290	210	360	270	725	540	925	675	1050	750	1300	975
1-1/8	470	300	510	375	470	300	510	375	900	675	1150	850	1450	1075	1850	1350
1-1/4	570	425	725	530	570	425	725	530	1300	950	1650	1200	2050	1500	2600	1950
1-3/8	750	550	950	700	750	550	950	700	1700	1250	2150	1550	2700	2000	3400	2550
1-1/2	1000	725	1250	925	990	725	1250	930	2250	1650	2850	2100	3600	2650	4550	3350

DO NOT use these values if a different torque value or tightening procedure is given for a specific application. Torque values listed are for general use only. Check tightness of fasteners periodically.

Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical grade.

Fasteners should be replaced with the same or higher grade. If higher grade fasteners are used, these should only be tightened to the strength of the original.

Make sure fasteners threads are clean and that you properly start thread engagement. This will prevent them from failing when tightening.

Tighten plastic insert or crimped steel-type lock nuts to approximately 50 percent of the dry torque shown in the chart, applied to the nut, not to the bolt head. Tighten toothed or serrated-type lock nuts to the full torque value.

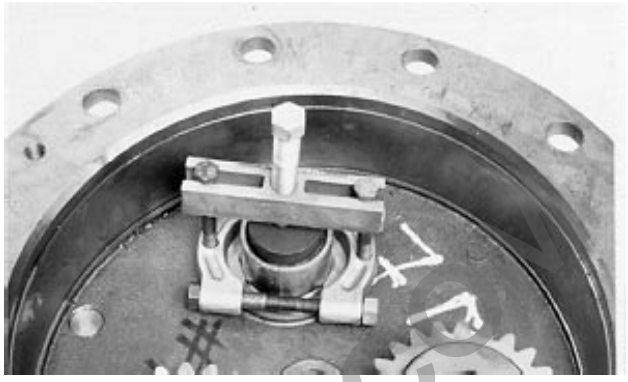
[a] "Lubricated" means coated with a lubricant such as engine oil, or fasteners with phosphate and oil coatings. "Dry" means plain or zinc plated without any lubrication.

[b] Grade 2 applies for hex cap screws (not hex bolts) up to 152 mm (6-in.) long. Grade 1 applies for hex cap screws over 152 mm (6-in.) long, and for all other types of bolts and screws of any length.

DX,TORQ1 -19-15MAR91

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Remove needle bearing inner race using a D01217AA Puller and a 27508 (1-9/16 in.).



RW12919 -UN-16APR90

RX,CTM4415,10 -19-19FEB91

IMPORTANT: If retainer (C) is removed and wheel hub is allowed to tip, damage to hub oil seal may occur which will require seal replacement.

Inspect planetary carrier ring gear for excessive wear or damage.

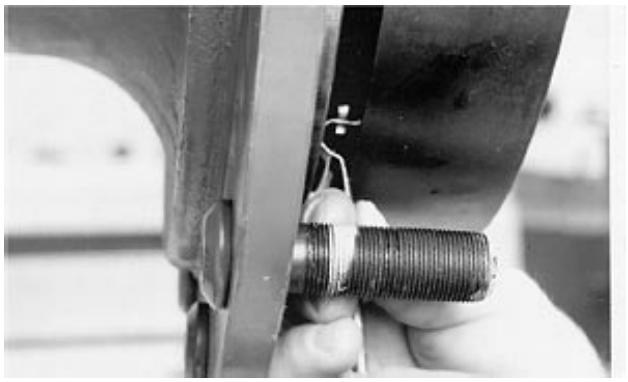


RW12932 -UN-16APR90

RX,CTM4415,11 -19-19FEB91

Remove snap ring to remove ring gear.

Install ring gear and fasten with snap ring making sure snap ring fits securely in groove.

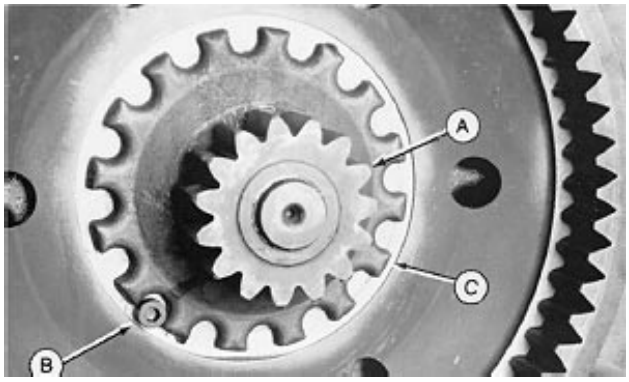


RW13024 -UN-16APR90

RX,CTM4415,12 -19-19FEB91

Remove sun gear shaft (A) and thrust washer.

Remove allen-head screw (B) and retainer (C).



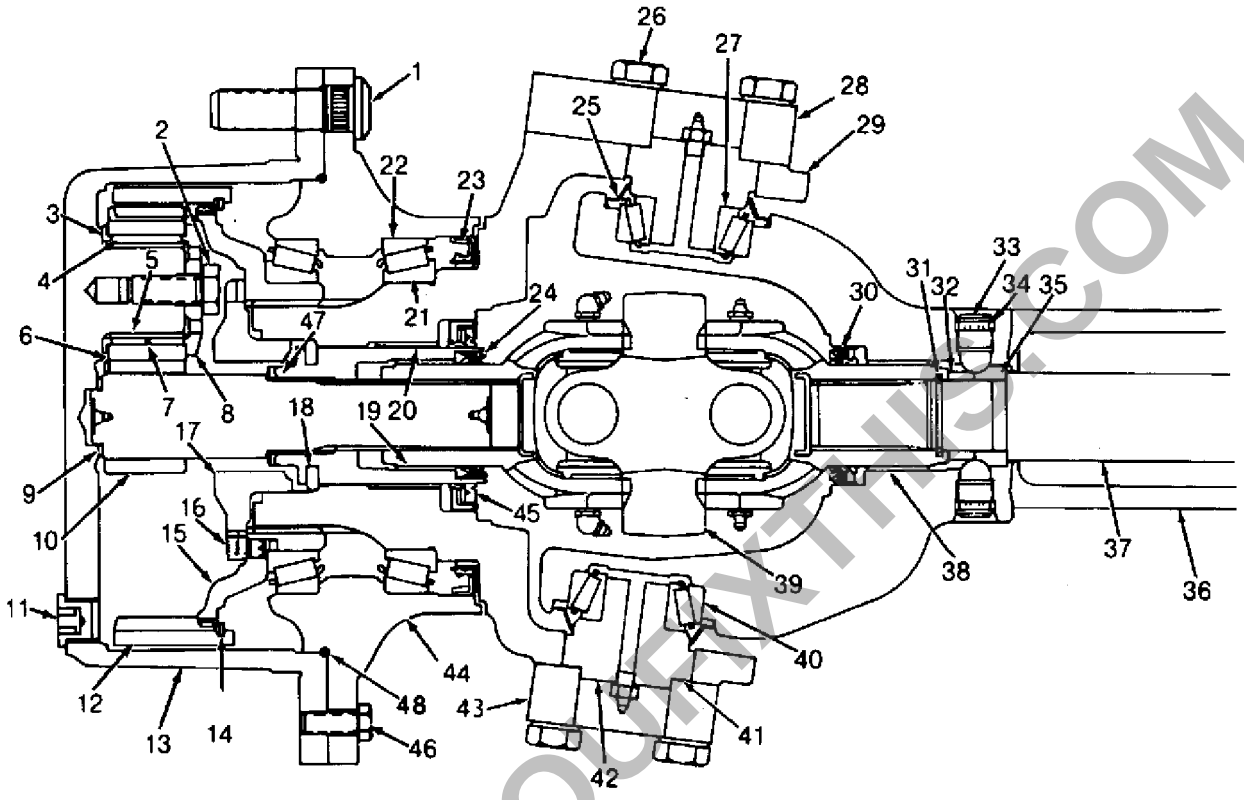
RW12920 -UN-16APR90

RX,CTM4415,13 -19-19FEB91

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PLANETARY CARRIER, WHEEL HUB, AND KNUCKLE-SPINDLE (STEERABLE)



RW18392 -UN-08SEP92

1—Bolt or Tapped Hole (20 or 24)
2—Screw (6)
3—Thrust Washer (6)
4—Needle Roller (516 or 198)
5—Bearing Race (6)
6—Planet Pinion (6)
7—Thrust Washer (6)
8—Retainer (6)
9—Thrust Washer (2)
10—Shaft (2)
11—Plug (2)
12—Ring Gear (2)
13—Planetary Carrier (2)
14—Snap Ring (2)
15—Ring Gear Hub (2)
16—Screw (2)
17—Ring Gear Hub Retainer (2)
18—Half Washer (4)
19—Bushing (2)
20—Bushing (2)
21—Bearing Cone (4)
22—Bearing Cup (4)
23—Oil Seal (2)
24—Oil Seal (2)
25—Grease Seal (4)
26—Screw (16)
27—Bearing Cone (4)
28—Steering Arm
29—Knuckle Spindle Housing
30—Oil Seal (2)
31—Retaining Ring (2)
32—Spacer (2)
33—Set Screw (4)
34—O-Ring (4)
35—Axle Retaining Sleeve (2)
36—Axle Housing
37—Axle Shaft (2)
38—Bushing (2)
39—U-Joint Assembly (2)
40—Bearing Cup (4)
41—Shims
42—King Pin (4)
43—King Pin Cap (2)
44—Wheel Hub (2)
45—Oil Seal (2)
46—Screw (4)
47—Oil Seal Sleeve (2)
48—O-Ring Packing (2)

RX,4415,9A -19-10SEP92

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GENERAL OUTBOARD PLANETARY AXLE SPECIFICATIONS (JOHN DEERE APPLICATIONS)

Machine Application	7000 Series Tractor
Description	1150 Series Steerable
Input Pinion and Ring Gear Ratio:	2.588:1
Input Yoke:	1480
Mounting:	Oscillating-Raised Pivot
Differential:	Limited Slip
Outboard Planetary Final Drive:	Standard
Outboard Planetary Final Drive Ratio:	5.200:1
Dimensions:	
Width (Axle Flange-to-Flange)	1881 mm (74.1 in.)
Width (Overall)	2137 mm (84.1 in.)
Bolt Circle	335 mm (13.2 in.)
Wheel Mounting Holes	10
Oil Capacity:	
Differential Case	8.5 L (9 qt)
Wheel Hub (Each)	1.9 L (2 qt)

RX,4410,9A -19-10SEP92

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Make alignment identification marks on ring gear hub and knuckle-spindle spline (or axle housing) at top position (A).



RW13429 -UN-16APR90

RX,CTM4415,14 -19-20FEB91

Attach DFRW4 Axle Wheel Hub Tool (A) to wheel hub stud. (See Dealer Fabricated Tools—Group 99.)

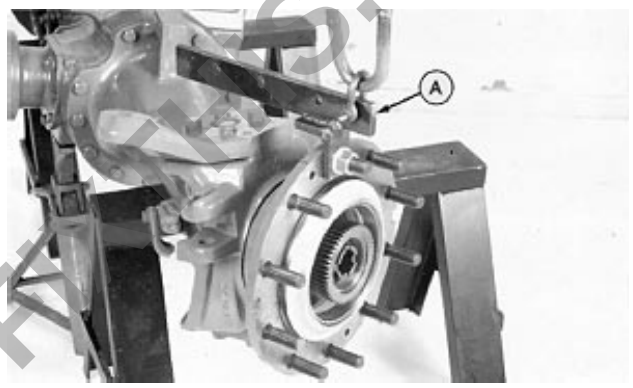
IMPORTANT: Be careful ring gear hub bearing does not fall to floor when hub is removed.

Remove ring gear hub.

Remove wheel hub from knuckle-spindle (or axle housing).

Remove oil seal and bearing from wheel hub.

Remove bearing cups from wheel hub if necessary.



RW18248 -UN-15AUG90

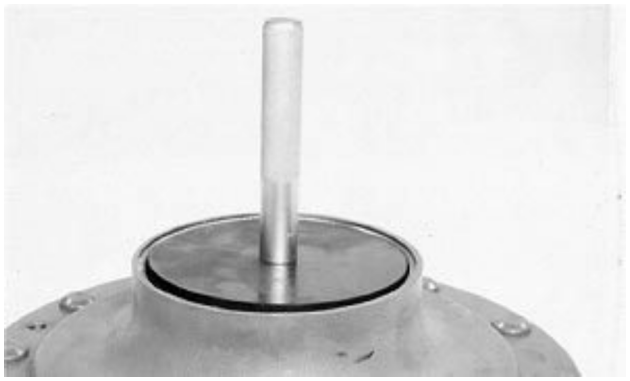
RX,CTM4415,15 -19-26FEB91

ASSEMBLE AND INSTALL PLANETARY CARRIER

Clean and inspect all parts for excessive wear or damage.

Clean sealing and bearing surfaces of knuckle-spindle (or axle housing).

Install bearing cups into wheel hub using a JDG618 Seal Installer.



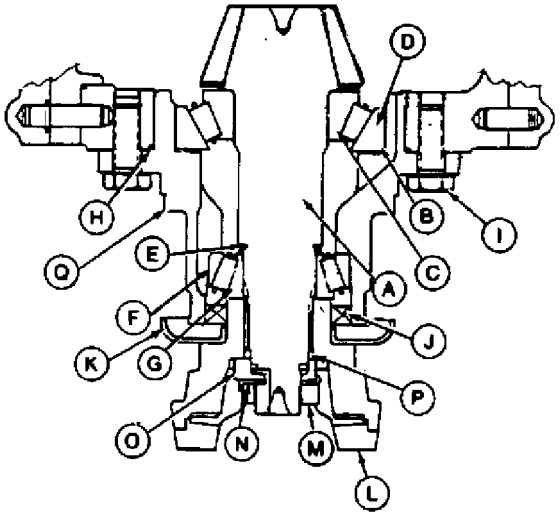
RW12945 -UN-16APR90

RX,CTM4415,16 -19-19FEB91

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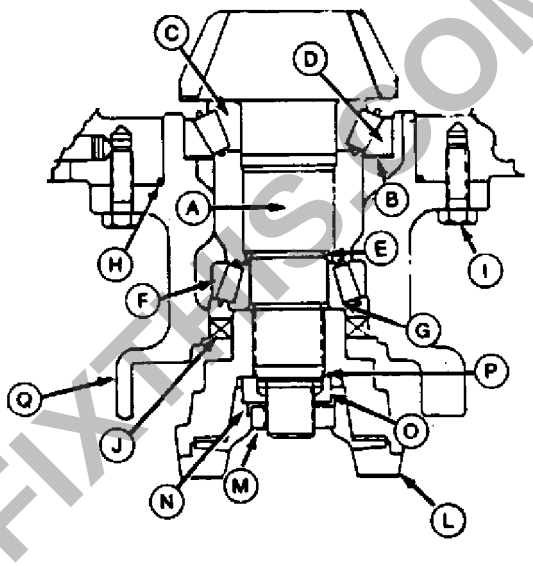
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INPUT QUILL AND DIFFERENTIAL DRIVE SHAFT



RW22224 -UN-25AUG92

OEM Application



RW22225 -UN-25AUG92

John Deere Application

A—Pinion Shaft
B—Shim Pack
C—Roller Bearing
D—Bearing Cup
E—Load Ring
F—Bearing Cup
G—Roller Bearing
H—O-Ring Packing
I—Cap Screw
J—Oil Seal
K—Slinger*
L—Yoke
M—Nut
N—Lock Plate
O—Special Washer
P—O-Ring Packing
Q—Differential Input Quill

** OEM Application*

RX,4430,3A -19-10SEP92

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Group 20—Wheel Hubs, Knuckle-Spindle, and Axles
Group 25—Brakes
Group 30—Input Quill and Differential
Group 35—Steering
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HANDLE FLUIDS SAFELY—AVOID FIRES

When you work around fuel, do not smoke or work near heaters or other fire hazards.

Store flammable fluids away from fire hazards. Do not incinerate or puncture pressurized containers.

Make sure machine is clean of trash, grease, and debris.

Do not store oily rags; they can ignite and burn spontaneously.



TS227 -UN-23AUG88

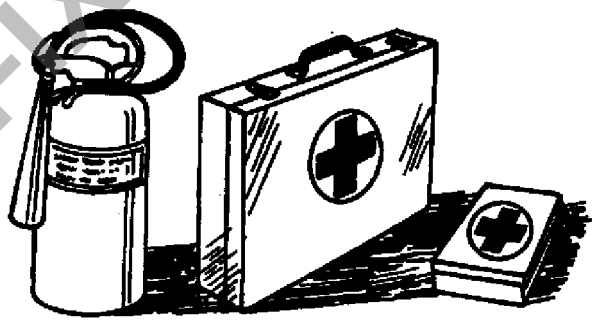
DX,FLAME -19-04JUN90

PREPARE FOR EMERGENCIES

Be prepared if a fire starts.

Keep a first aid kit and fire extinguisher handy.

Keep emergency numbers for doctors, ambulance service, hospital, and fire department near your telephone.

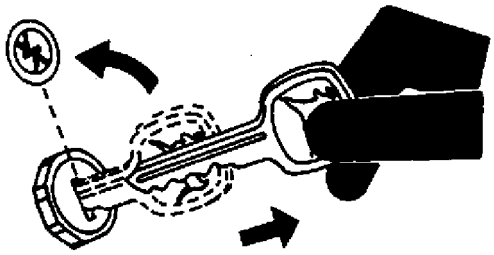


TS291 -UN-23AUG88

DX,FIRE2 -19-04JUN90

PARK MACHINE SAFELY

Before working on the machine:
- Lower all equipment to the ground.
- Stop the engine and remove the key.
- Disconnect the battery ground strap.
- Hang a “DO NOT OPERATE” tag in operator station.



TS230 -UN-24MAY89

DX,PARK -19-04JUN90

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