Front Wheel Drive Axles AS and MS Series

COMPONENT TECHNICAL MANUAL

Front Wheel Drive Axles AS and MS Series

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Contents

Front Wheel Drive Axles
Group 00—Safety Information
Group 01—General Repair Information
Group 05—Steering Cylinder and Tie Rods
Group 10—Planetary Drive and Wheel Hub
Group 15—Knuckle Housing and Drive Shafts
Group 20—Axle Housing and Differenial
Group 200—Description and Method of Operation

INDX

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Index

Page

A

Adjust rolling drag torque of knuckle pin bearings 15-21
Adjustments
Basic adjustment of tread 05-29
Bevel pinion drive shaft, cone point adjustment 20-22
Bevel pinion drive shaft, rolling drag torque adjustment 20-22
Differential bearing preload 20-36
Differential, disk pack axial free play 20-28
Ring gear, backlash 20-36
Rolling drag torque of knuckle pin bearings 15-21
Steering angle 05-33
Toe-in 05-31
Axle housing
Components 20-13
Fill with oil 20-45
Installation 20-17
Removal 20-15
Repair 20-16

B

Bevel pinion drive shaft
Cone point adjustment 20-22
Installation 20-22
Removal 20-18
Repair 20-20
Rolling drag torque adjustment 20-22

C

Check and adjust toe-in 05-31
Checks
Positive front wheel lead 200-11

D

Differential
Adjust bearing preload 20-36
Components 20-11
Cross-section 20-6
Installation 20-36
Removal 20-27
Repair 20-28

Page

Ring gear, adjusting backlash 20-36
Ring gear, check load pattern 20-36
Theory of operation 200-6
Drive shaft
Components 15-7
Cross-section 15-6
Installation 15-19
Removal 15-9
Repair 15-15

F

Fill with oil
Planetary drive 10-31
Front wheel drive axle, layout 200-4
Front wheel drive, description 200-3

G

General safety and repair information 01-1

K

Knuckle housing
Components 15-7
Cross-section 15-6
Installation 15-21
Removal 15-8
Repairing 15-10
Repairing the king pin 15-10
Knuckle pin bearings
Adjust rolling drag torque of knuckle pin bearings 15-21

L

Lubricant
Mixing 00-11
Storage 00-12

M

Mixing lubricants 00-11
Multi-disk brake
Components 10-16

Recognize Safety Information

This is a safety-alert symbol. When you see this symbol on your machine or in this manual, be alert to the potential for personal injury.

Follow recommended precautions and safe operating practices.



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DX,ALERT –19–29SEP98–1/1

“Important” - Information

Information marked as IMPORTANT points out problems that may lead to machine damage. By following the directions given, these problems can be avoided.

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“Note” - Information

When marked with NOTE the information given is more detailed or contains restrictions to directions given previously. On the other hand useful information may be given belonging to certain instructions without being directly connected to them.

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Prevent Machine Runaway

Avoid possible injury or death from machinery runaway.

Do not start engine by shorting across starter terminals. Machine will start in gear if normal circuitry is bypassed.

NEVER start engine while standing on ground. Start engine only from operator’s seat, with transmission in neutral or park.



TS177 –UN–11JAN89

DX,BYPAS1 –19–29SEP98–1/1

Type Plate, AS Series Axles

The FWD axle type plate on AS-2025, AS-2035 AS-2035N and AS-2045 is located on the right-hand side of the axle housing, whereas on AS-2060 it is located on the left-hand side of the axle housing.

The FWD axle type plate on AS-2045 with TLS is located on the center axle housing.

Refer to the axle type shown on the plate to identify repair information in the Component Technical Manual.



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AS-Series Axle Application Chart

Tractors (not for North America):	AS-2025	AS-2035	AS-2035N[a]	AS-2045	AS-2060
6020	X	X	X		
6120 and 6220	X[b]	X	X		
6215	X				
6320, 6420 and 6420S	X	X[b, c]	X		
6515				X	
6520, 6620 and 6820				X[b, c]	
6920, 6920 and 6920S					X[b, c]
SE-Tractors: 6020, 6120, 6220, 6320 and 6420	X				
SE-Tractors: 6520				X	
Tractors (North America)	**AS-2025**	**AS-2035**	**AS-2035N[a]**	**AS-2045**	**AS-2060**
6120	X[b]				
6220	X[b]	X			
6320 and 6420	X	X[b, c]			
6415	X	X			
6615				X	
6120L and 6220L	X				
6320L and 6420L	X	X			
6520L		X	X		

[a]narrow track axle

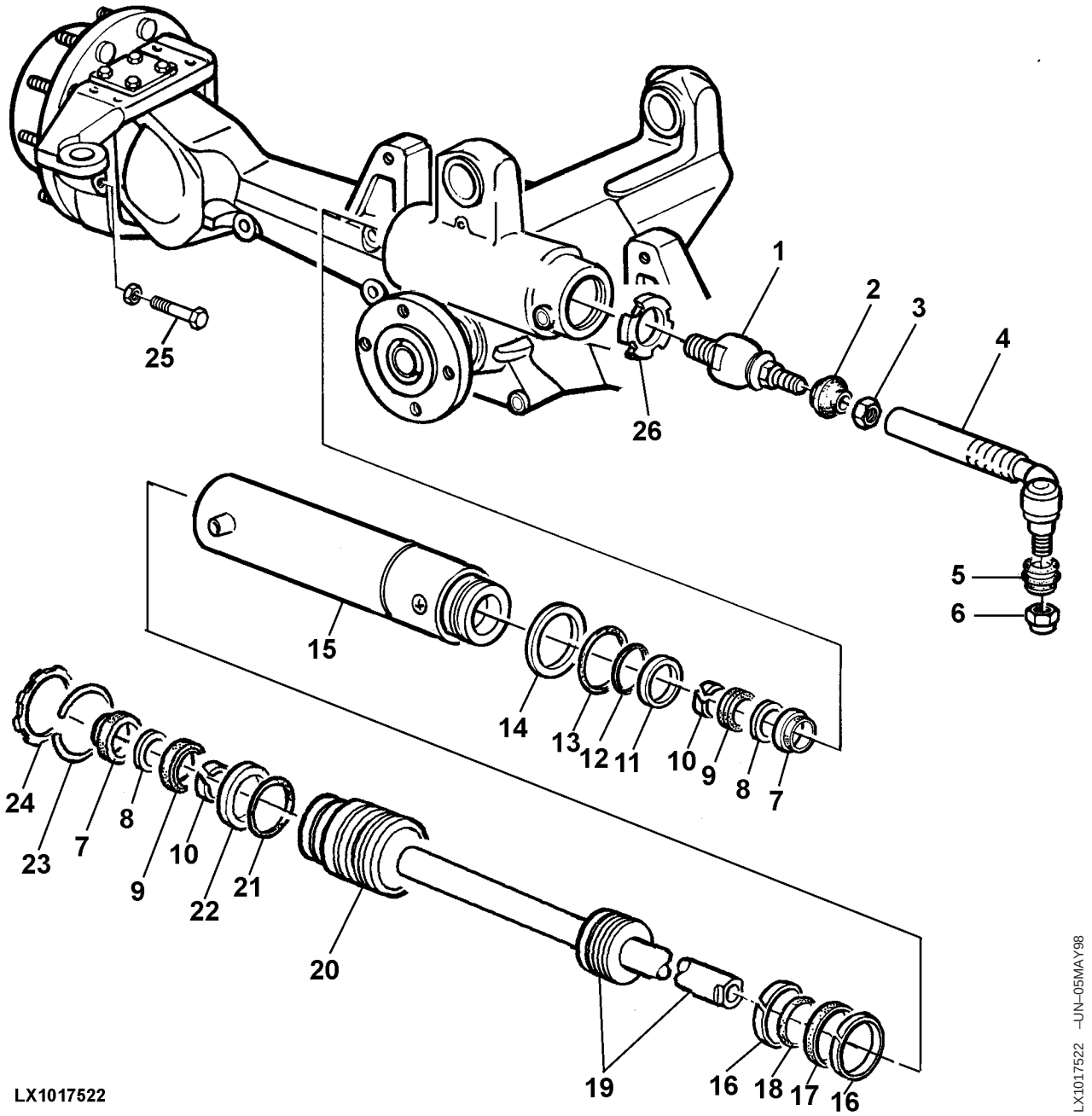
[b]also available with TLS

[c]also available with TLS and multi-disk brake

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05
6

Steering Cylinder and Tie Rod - Exploded View (AS-2025 to AS-2045)



1—Joint (2 used)
2—Sealing cap (2 used)
3—Nut (2 used)
4—Nut (2 used)
5—Sealing cap (2 used)
6—Self-locking nut (2 used)
7—Wiper seal
8—Back-up ring
9—Grooved ring
10—Guide ring
11—Back-up ring
12—O-ring
13—O-ring
14—Back-up ring
15—Cylinder sleeve
16—Guide ring
17—Oil seal
18—O-ring
19—Piston rod
20—Guide
21—O-ring
22—Back-up ring
23—Snap ring
24—Snap ring
25—Steering angle adjusting screw (2 used)
26—Slotted nut

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01
2

Front-Wheel-Drive Axles - Torques for Bolts and Nuts

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.

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.

The specified torques do not apply to coated nuts and bolts (e.g. phosphate coating).

Use a torque wrench to tighten all bolts and nuts.

Metric Standard Threads (ISO)						
Grade	**8.8**		**10.9**		**12.9**	
Dimension	**N•m**	**lb-ft**	**N•m**	**lb-ft**	**N•m**	**lb-ft**
M4	2.8	2.1	4.1	3	4,8	3.5
M5	5.5	4.1	8.1	6	9.5	7
M6	9.5	7	14	10	16.5	12
M7	15	11	23	17	28	20
M8	23	17	34	25	40	30
M10	46	34	68	50	79	58
M12	79	58	115	85	135	100
M14	125	92	185	136	215	158
M16	195	144	280	207	330	243
M18	280	207	390	288	460	339
M20	390	288	560	413	650	479
M22	530	391	750	553	880	649
M24	670	494	960	708	1100	811
M27	1000	738	1400	1033	1650	1200
M30	1350	996	1900	1401	2250	1660
M33	1850	1364	2600	1918	3000	2213
M36	2350	1733	3300	2434	3900	2876
M39	3000	2213	4300	3172	5100	3762

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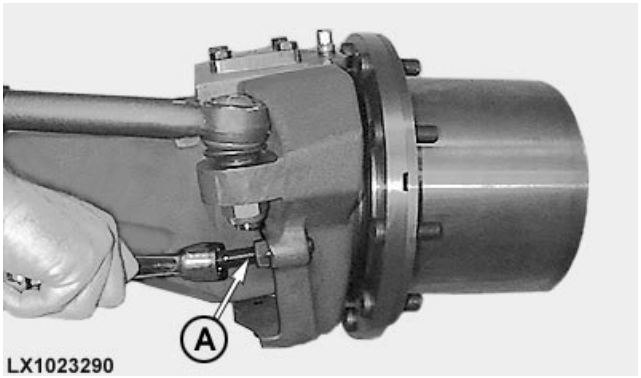
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8

Remove Tie Rods (AS-2025 to AS-2060)

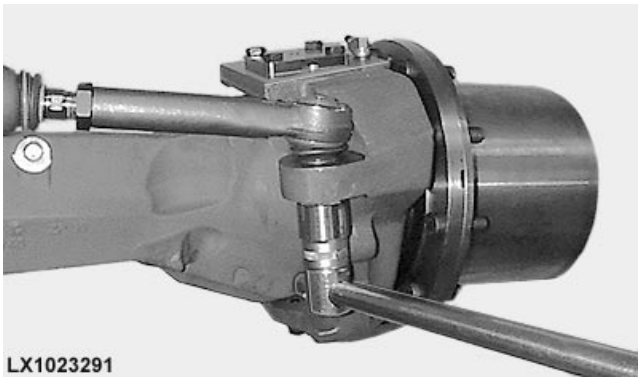
CAUTION: Follow safety and repair instructions, see "General Safety and Repair Information" in Group 01.

1. Remove stop screw (A).



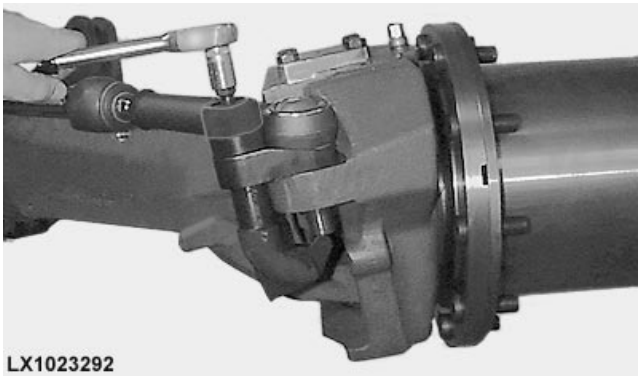
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2. Remove self-locking nut.



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3. Press tie rod out of knuckle housing.

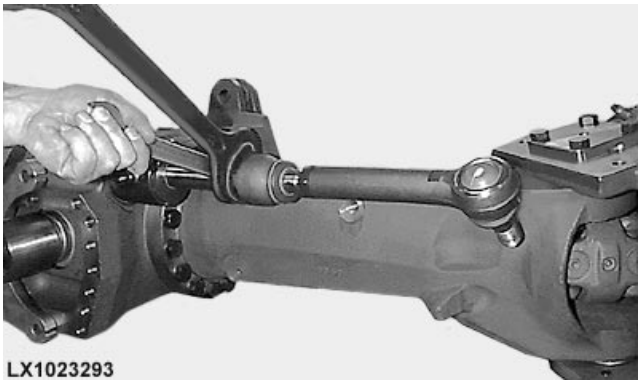


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NOTE: Thread of tie rod is locked in position with thread lock L41475 (LOCTITE® 243).

4. Separate tie rod and piston rod.

NOTE: Install tie rods, see "Install Tie Rods (AS-2025 to AS-2060)" in this Group.



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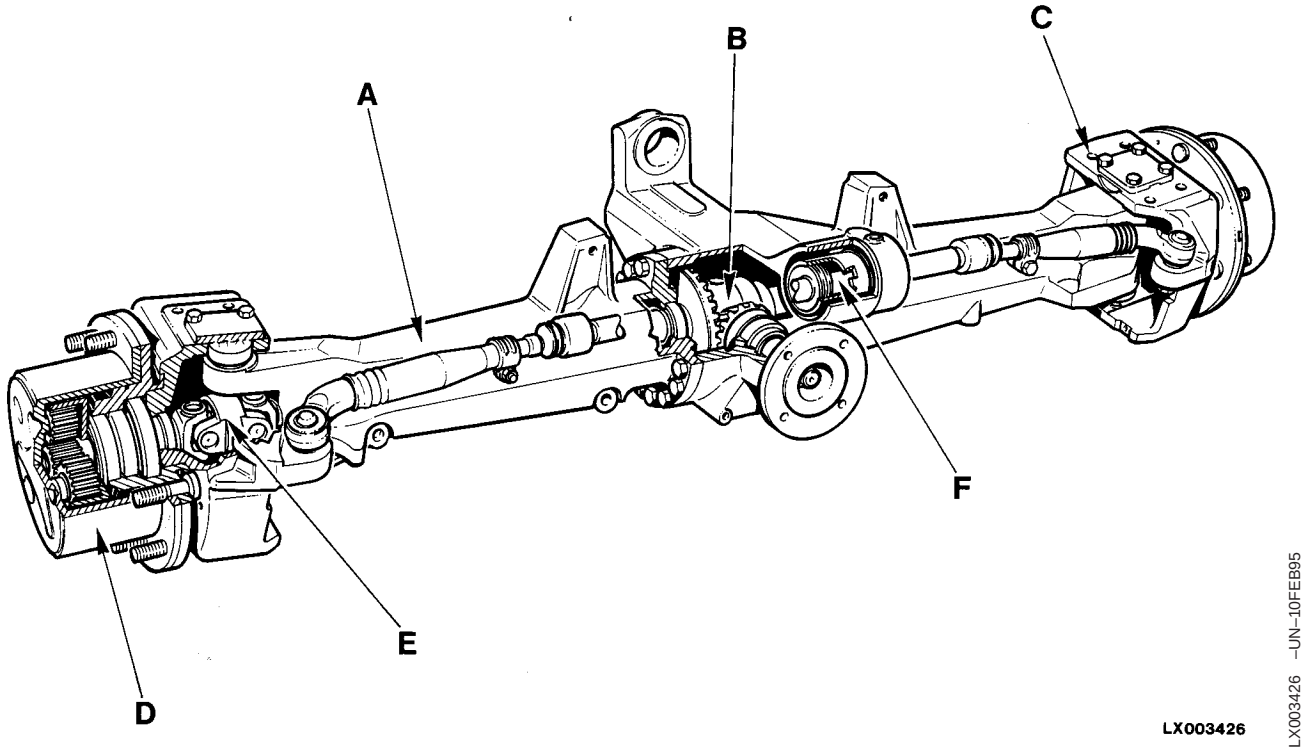
Specifications

Item	Measurement	Specification
Slotted nut on steering cylinder (AS-2025 to AS-2060)	Torque	1000 N•m 740 lb-ft
Steering cylinder on axle, cap screws (MS-2025 to MS-2045)	Torque	280 N•m 207 lb-ft
Tie rod steering piston rod (AS series):		
AS-2025 to AS-2045	Torque	300 N•m 220 lb-ft
AS-2060	Torque	350 N•m 260 lb-ft
Tie rod steering piston rod (MS series):		
Tie rods (M22x1.5)	Torque	300 N•m 220 lb-ft
Tie rods (M24x1.5)	Torque	350 N•m 260 lb-ft
Tie rod to knuckle housing, self-locking nut (AS series):		
AS-2025, AS-2035, AS-2035N	Torque	165 N•m 120 lb-ft
AS-2045	Torque	100 N•m, plus 1/2 turn (180°) 74 lb-ft, plus 1/2 turn (180°)
AS-2060	Torque	250 N•m 185 lb-ft
Tie rod to knuckle housing, self-locking nut (MS series):		
Self-locking nut (M22x1.5)	Torque	165 N•m 120 lb-ft

Continued on next page

200
4

Layout of Front Axle



LX003426 –UN–10FEB95

A—Axle housing
B—Differential
C—Knuckle housing
D—Wheel hub with planetary drive
E—Drive shaft
F—Steering cylinder

Axle housing

Axle housing (A) consists of two or three parts which are flanged together. The ends of the axle housing are shaped like forks, to which the axle knuckle housings (C) are attached.

Knuckle housing

Axle knuckle housings (C) provide the connection between the axle housing and the wheel hubs (D). The axle knuckle housings enable the axle to be steered.

Differential

Differential (B) is located in the center of the front wheel drive axle. The differential allows the two front wheels to turn at different speeds, e.g. when cornering.

The differential consists of the differential housing, ring gear and drive pinion. The drive pinion transmits power from the universal jointed shaft to the differential. Located inside the differential housing are the drive bevel gears and compensating bevel gears, together with two disk packs which permit self-locking. The differential is designed to be self-locking. In most cases, this prevents wheel spin when moving off and when the machine is in motion (e.g. due to slippery conditions).

Drive shafts

Drive shafts (E) transmit power from the differential to the wheel hubs. The universal joint on each drive shaft compensates for the different locations of the differential and wheel hubs.

Continued on next page

AS Series Axles



AS-2025 FWD axle



AS-2060 FWD axle (with TLS)

LX24603,0000239 –19–13AUG01–1/2

6. Install end disk with flat side facing disks.
7. Install snap ring.



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Check Multi-Disk Brake for Leaks

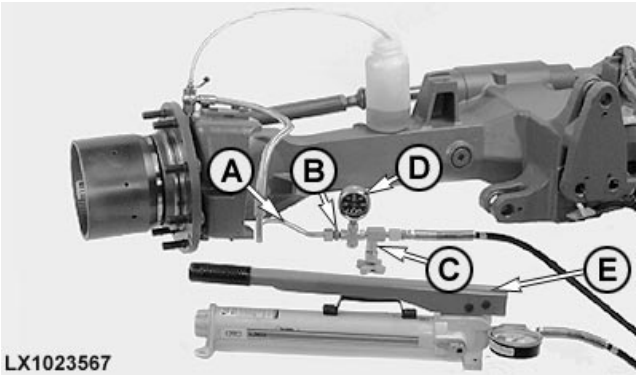
1. Connect test equipment (B) to (E).

NOTE: Fill hand pump with clean transmission/hydraulic oil.

2. Bleed brake hydraulic system and operate for at least ten times.
3. High pressure test:
   a. Build up a test pressure of 12000 kPa (120 bar; 1740 psi).
   b. Close shut-off valve between hand pump and pressure gauge.

      Within 5 minutes the maximum pressure drop must not exceed 300 kPa (3 bar; 44 psi).
4. Low pressure test:
   a. Build up a test pressure of 500 kPa (5 bar; 73 psi).
   b. Close shut-off valve between hand pump and pressure gauge.

      Within 5 minutes the pressure must not drop at all.



A—Brake oil line
B—M87733 adapter[1] and T77613 O-ring[1]
C—Shut-off valve[2]
D—FKM10207 and FKM10204 pressure gauges
E—D01019AA hand-operated hydraulic pump

[1]available as spare part

[2]part of JDH43A pressure test kit

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LX24603,0000262 –19–13SEP01–10/13

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