



Service Manual

Chassis & Mast

EC15K, EC18K, EC18KL

A3EC1-10200-up

A3EC1-20200-up

A3EC1-30200-up

A3EC2-40200-up

EC20K, EC25K

A3EC2-10200-up

A3EC2-20200-up

A3EC2-30200-up

A3EC2-40200-up

A3EC2-80200-up

EC25KE, EC25KL, EC30K

A3EC3-10200-up

A3EC3-20200-up

A3EC3-30200-up

A3EC3-40200-up

A3EC3-80200-up

EC30KL

A3EC4-40200-up

Suggestions for Disassembly

1. Remove the bevel pinion shaft 6 as follows:

- (1) Using a chisel, cut the staked portion of the nut 4, taking care not to damage the bevel pinion shaft.
- (2) Hold the input gear 15 with the special tool to prevent the bevel pinion 6 from rotating, then remove the nut 4 and shims 5.

Special tool needed

Transfer bearing tool	97E67 - 00100
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- (3) Using the bevel pinion puller (special tool), pull the bevel pinion 6 out of the bearing cone 9 (See the drawing on the right).

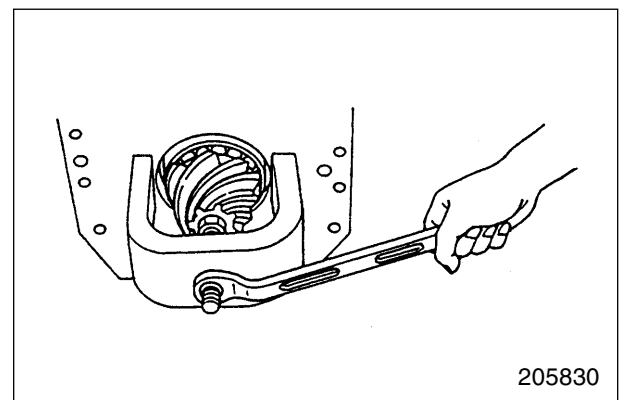
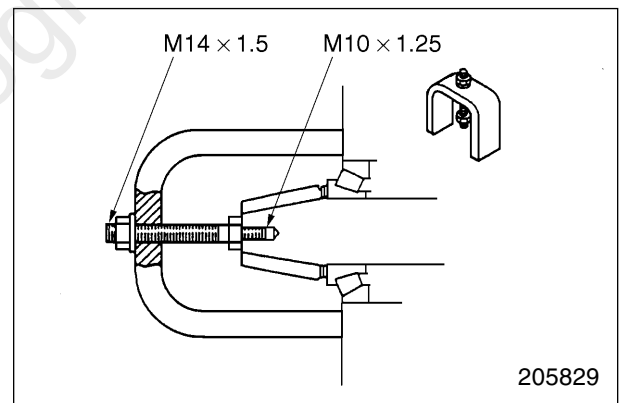
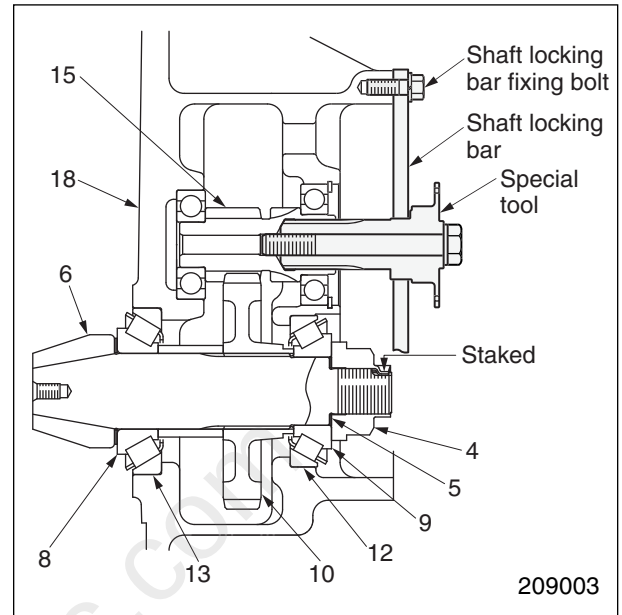
Special tool needed

Bevel pinion puller	91268 - 00300
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- (4) If the bearing cone 8 needs to be removed, use a bearing puller and a press to pull it from the bevel pinion 6.
- (5) If the bearing cups 12 and 13 need to be removed, use a bearing cup puller to pull them out of the transfer case 18.

NOTE

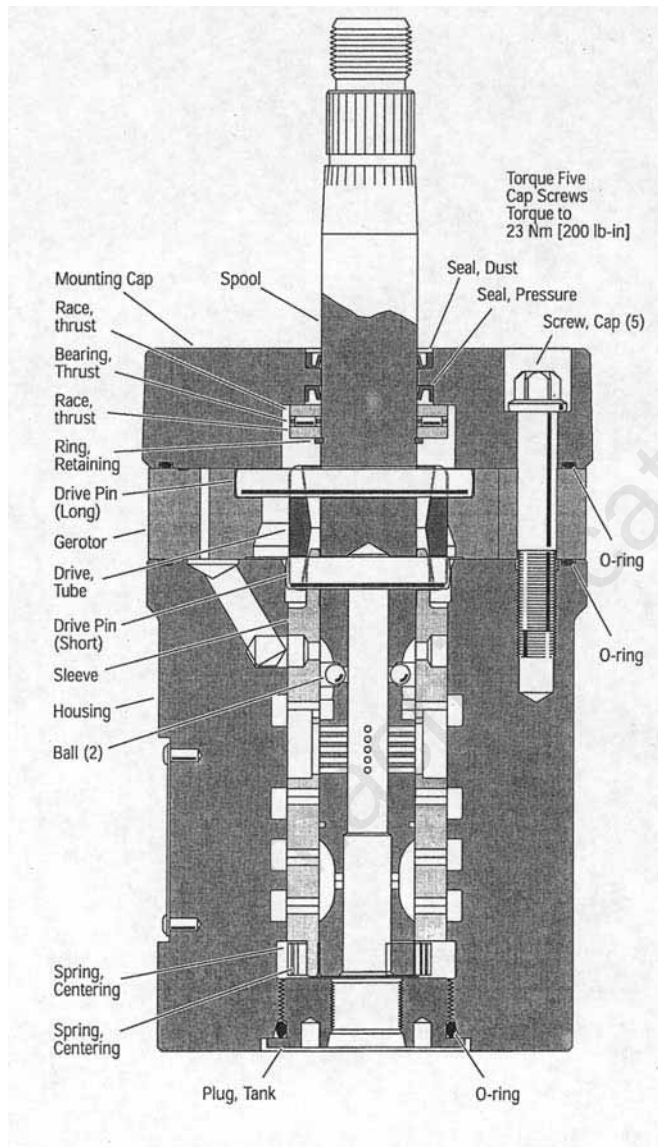
- (1) The taper roller bearing cup and cone are an exclusive pair. If either the cup or cone of a pair is faulty, replace them as a set.
- (2) The removed shims should be kept together until they are reinstalled. (This only applies when the bevel pinion and/or taper roller bearing are/is reused.)
- (3) The bevel pinion and bevel gear are an exclusive pair. If either of them is defective, replace them as a set.



STEERING GEAR: REASSEMBLY

Suggestions:

NOTE: These instructions are more in depth than routine service should require. **DO NOT** disassemble the steer gear further than required to replace serviceable components. Doing so may result in replacing entire gear.



- 1 Install o-ring (82,6 [3.25 OD) on tank plug.
- 2 Assemble tank plug into housing. Torque tank plug to 47,5 Nm [35 lb-ft].
- 3 Install o-ring (82,6 [3.25 OD) into groove.
- 4 Lay gerotor on the housing, lining up bolt holes, check alignment per scribed (mark) line..
- 5 Install pressure seal into inside cavity of mounting cap (25,4 [1.00] OD x 3,2 [.12] W).
- 6 Install dust seal (25,4 [1.00] OD x 3,2 [.12] W) into mounting cap.
- 7 Install manual steering balls (9) into spool. Grease balls to retain in holes.
- 8 Insert spool into sleeve, lining up the spring slots.
- 9 Insert smaller centering spring onto spool/ sleeve assembly.
- 10 Install larger centering spring onto spool/ sleeve assembly.
- 11 Insert shorter drive pin.
- 12 Install drive tube assembly, wider groove downward.
- 13 Slide spool/sleeve/tube assembly into housing bore, through the gerotor star. Before spool/sleeve/tube reaches the tank plug, line up pin slot in gerotor with pin slot in drive tube, insert longer drive pin, then continue to slide spool/sleeve/tube into housing until the pin sets into the gerotor.
- 14 Install the retaining ring into groove on spool.
- 15 Install bearing race-bearing-bearing race onto the retaining ring.
- 16 Grease o-ring (82,6 [3.25] OD) and install into mounting cap.
- 17 Carefully install mounting cap over spool so as not to cut or damage seals. Lining up bolt holes, check alignment per scribed (mark) line.
- 18 Install 5 bolts. torque to 23Nm [200 in-lb].

	Complaint	Possible Cause	Remedy
Parking Brake	Lever stroke is too small	Lining-to-drum clearance too small	Readjust
	Squeals during traveling	Lining-to-drum clearance too small	Readjust
		Brake drum badly distorted	Repair or replace
	Will not apply	Parking brake cable longer than specified Linings worn to service limit Lining-to-drum clearance too small Lack of brake lever operating effort	Check drum-to-lining clearance and, if brake will not apply, turn adjusting knob clockwise Replace shoe & lining assembly Readjust Readjust to 25 to 30 kgf (55 to 66 lbf) [245 to 294 N]

	Complaint	Possible Cause	Remedy
Steering System	Hard steering	a) Overloaded steer axle b) Damaged mechanical linkage	Reduce load Replace
		c) Dry mechanical linkage joints d) Mechanical joints too tight e) Kingpin bearings improperly preloaded	Lubricate Readjust Readjust
	Truck wanders	a) Damaged or worn mechanical linkage b) Loose cylinder piston	Replace Replace cylinder rod
	Truck drifts	a) Damaged or worn mechanical linkage b) Tire diameter differs between right and left	Replace Replace tire
	Erratic steering	Loose cylinder piston	Replace cylinder rod
	Excessive free play at steered wheels	Damaged or worn linkage between cylinder and steered wheels	Replace
	Axle shimmy	a) Excessive clearance between the kingpin and its bearings b) Worn or damaged hub bearing	Repair or replace Replace
	Rear tires wear prematurely or unevenly	Tire on one side differs in kind or brand from that on the other side.	Replace tires

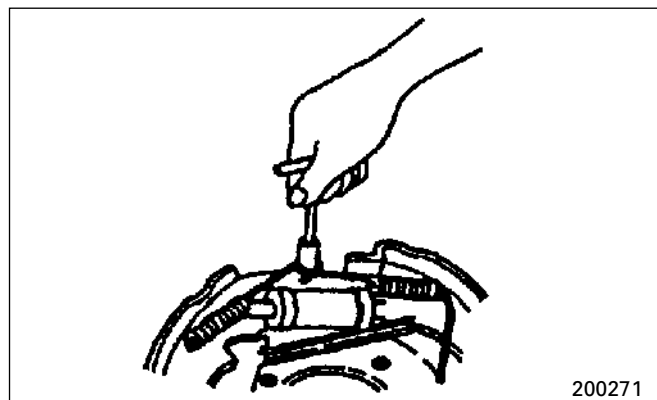
SERVICE BRAKES: DISASSEMBLY

Suggestions

Removing Return Springs

Use a special tool to remove the return springs.

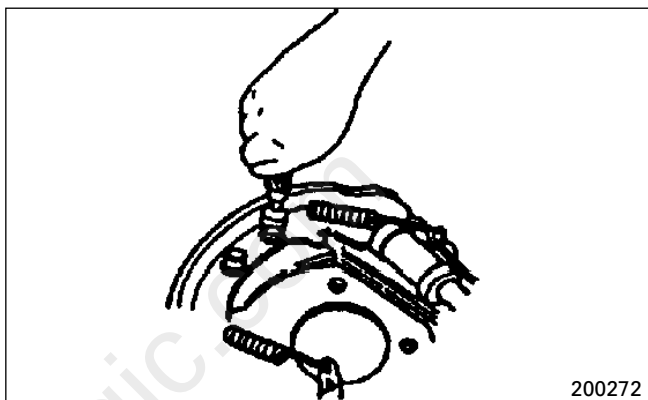
Special Tool	Part Number
Spring remover	64309-15411



Removing Hold-Down Springs

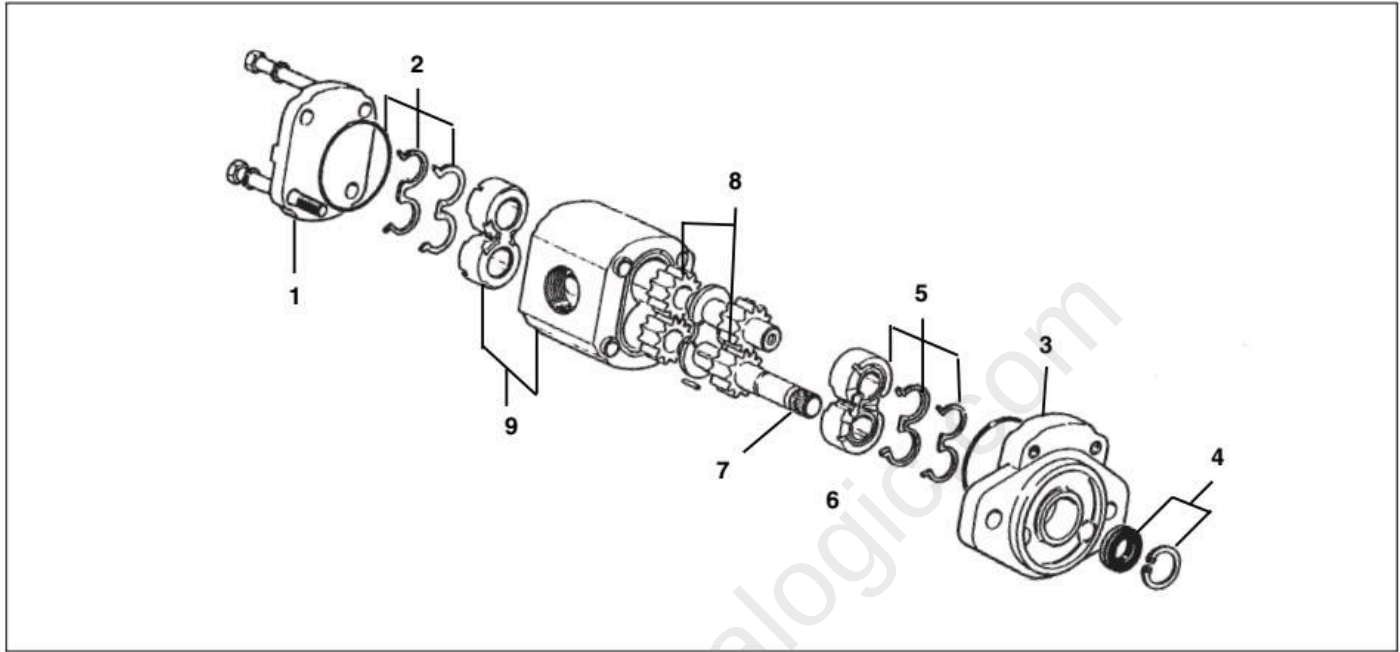
Use a special tool to remove the hold-down springs.

Special Tool	Part Number
Spring remover	64309-15412



Reassembly

Trucks with Premium Hydraulic Pump



Sequence

- | | | |
|--|--|-------------------------|
| 1. End cover | 4. Shaft seal and retainer ring | 7. Drive shaft |
| 2. O-ring, bush seal, and back-up seal | 5. O-ring, bush seal, and back-up seal | 8. Gear pack |
| 3. Flange | 6. Front bushes | 9. Body and rear bushes |

Start By:

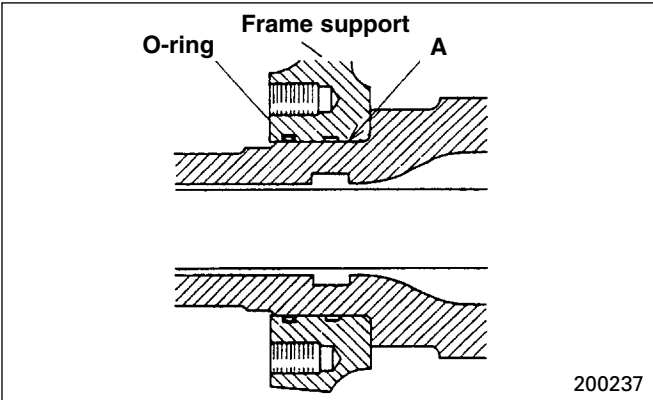
Ensure that all parts are perfectly clean. Lubricate the bushes and gears with clean hydraulic fluid. Ensure that the O-ring recess and end faces of the body remain dry. This will assist the assembly of the components with the body bores.

Reassembly

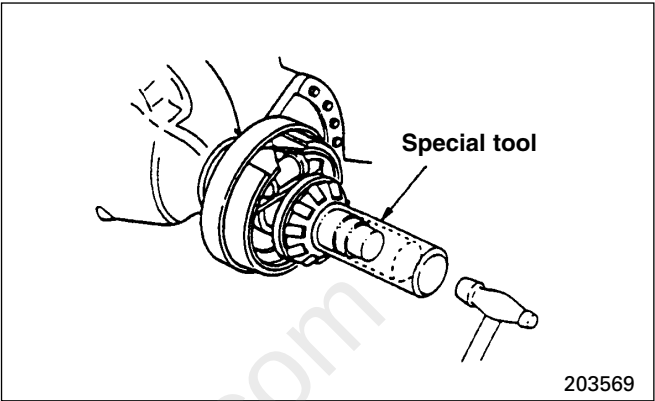
To reassemble, reverse the steps of the disassembly sequence and do the following steps.

Axle Housing

- 1. Install the O-ring in the outer groove (of the two grooves in the bore of each frame support).
- 2. Apply grease to the surfaces A of the support and axle housing.



- 2. Install the inner race and oil seal retainer of the wheel hub bearing with an installer (Special Tool).



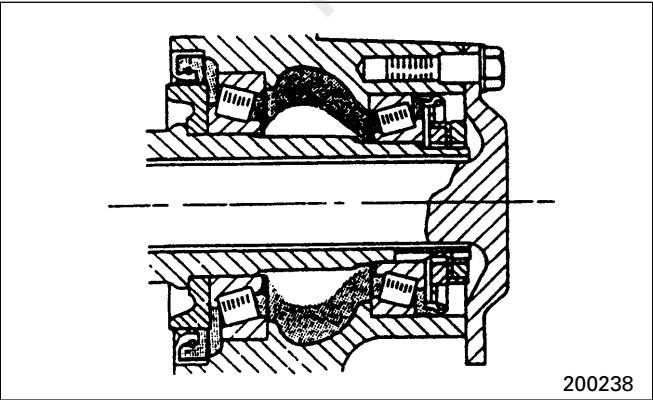
Tool	EC15K - 18KL	EC20K-30KL
Installer	64309-12300	91468-00300

Front Wheel Hub

- 1. Fill the front wheel hub, especially the roller holder and oil seal lip groove, with grease.

NOTE

Be careful not to apply grease to the brake drum.



- 3. Apply retaining compound to the flange surfaces of the axle shafts.

Tightening Torques for Standard Bolts and Nuts

Coarse Thread – With Spring Washer

	Nominal Size		Pitch		With Spring Washer								
													
	mm	in.	mm	in.	kgf-m	lbf-ft	N-m	kgf-m	lbf-ft	N-m	kgf-m	lbf-ft	N-m
Metric Fine Thread	10	0.39	1.5	0.06	3.4	24.6	33.3	4.4	31.8	43.1	6.9	49.9	67.7
	12	0.47	1.75	0.07	6.0	43.4	58.8	7.8	56.4	76.5	11.8	85.3	115.7
	14	0.55	2	0.08	9.8	70.9	96.1	12.7	91.9	124.5	18.6	134.5	182.4
	16	0.63	2	0.08	15.0	108.5	147.1	19.5	141.0	191.2	28.0	202.5	274.6
	18	0.71	2.5	0.10	20.7	149.7	203.0	27.0	195.3	264.8	39.1	282.8	383.4
	20	0.79	2.5	0.10	29.2	211.2	286.4	37.9	274.1	371.7	54.7	395.6	536.4
	22	0.87	2.5	0.10	39.1	282.8	383.4	50.9	368.2	499.2	73.0	528.0	715.9
	24	0.95	3	0.12	50.2	363.1	492.3	65.3	472.3	640.4	94.3	682.1	924.8
	27	1.06	3	0.12	73.9	534.5	724.7	96.1	695.1	942.2	137.7	996.0	1350.4
	30	1.18	3.5	0.14	98.9	715.3	969.9	128.4	928.7	1259.2	188.0	1359.8	1843.7
	33	1.30	3.5	0.14	135.5	980.12	1328.8	176.1	1273.7	1727.0	252.6	1827.1	2477.2
	36	1.42	4	0.16	170.9	1236.1	1676.0	222.3	1607.9	2180.0	326.3	2360.1	3199.9
	39	1.54	4	0.16	226.3	1636.8	2219.2	294.1	2127.2	2884.1	420.0	3037.9	4118.8
	42	1.65	4.5	0.18	280.9	2031.8	2754.7	365.2	2641.5	3581.4	523.9	3789.4	5137.7

Note

1. The tolerance on these torques is $\pm 10\%$.
2. These torques are for “dry” conditions.

Cat® Lift Trucks

Important Safety Information

Most accidents involving product operation, maintenance and repair are caused by failure to observe basic safety rules and precautions. An accident can often be avoided by recognizing potentially hazardous situations before an accident occurs. A person must be alert to potential hazards. This person should also have the necessary training, skills and tools to perform these functions properly.

Improper operation, lubrication, maintenance or repair of this product can be dangerous and could result in injury or death.

Do not operate or perform any lubrication, maintenance or repair on this product, until you have read and understood the operation, lubrication, maintenance and repair information.

Safety precautions and warnings are provided in this manual and on the product. If these hazard warnings are not heeded, bodily injury or death could occur to you or other persons.

The hazards are identified by the "Safety Alert Symbol" and followed by a "Signal Word" such as "CAUTION" or "WARNING" as shown below.



The meaning of this "Safety Alert Symbol" is as follows:

Attention! Become Alert! Your Safety is involved.

The message that appears under the warning explains the hazard and can be either written or pictorially presented.

Operations that may cause product damage are identified by NOTICE labels on the product and in this publication.

Mitsubishi Caterpillar Forklift America Inc. (MCFA) cannot anticipate every possible circumstance that might involve a potential hazard. The warnings in this publication and on the product are therefore not all-inclusive. If a tool, procedure, work method or operating technique not specifically recommended by Mitsubishi Caterpillar Forklift America Inc. (MCFA) is used, you must satisfy yourself that it is safe for you and others. You should also ensure that the product will not be damaged or made unsafe by the operation, lubrication, maintenance or repair procedures you choose.

The information, specifications, and illustrations in this publication are on the basis of information available at the time it was written. The specifications, torques, pressures, measurements, adjustments, illustrations, and other items can change at any time. These changes can affect the service given to the product. Obtain the complete and most current information before starting any job.

Cat lift truck dealers have the most current information available.

Full Version Available

Caterpillar EC25K Forklift Service Manual (99759-83110)

Caterpillar EC25K Forklift service manual, covers hydraulics, mast, drive system, wiring, and service data. Fast PDF access.

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