

Service Manual

**GP15K, GP18K, GP20K, GP25K, GP30K, GP35K
DP15K, DP18K, DP20K, DP25K, DP30K, DP35K
Chassis & Mast**

GP15K ET31A-60001-up

GP18K ET31A-85001-up

GP20K ET17B-15001-up

GP25K ET17B-65001-up

GP30K ET13D-45001-up

GP35K ET13D-65001-up

DP15K ET16B-65001-up

DP18K ET16B-85001-up

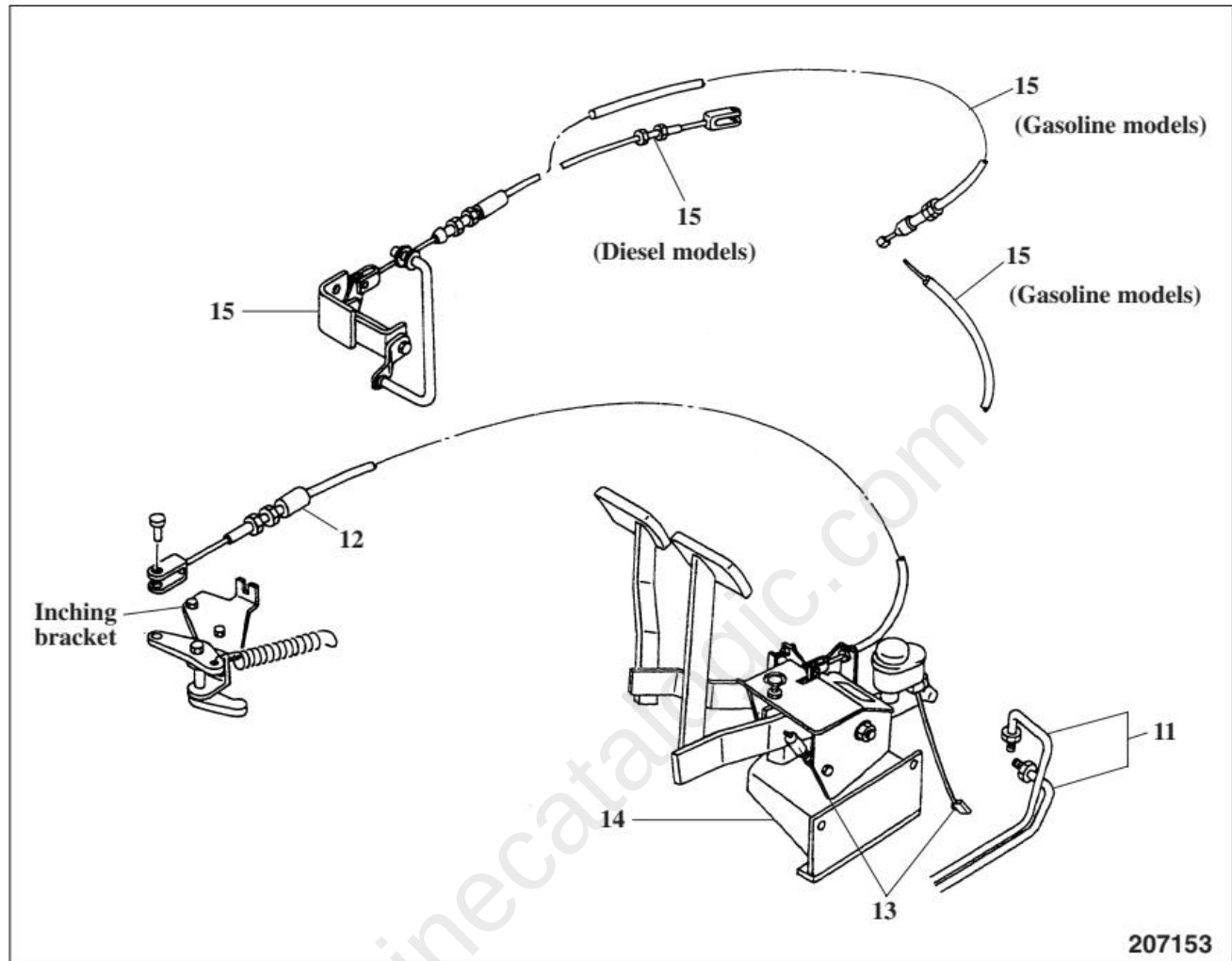
DP20K ET18B-15001-up

DP25K ET18B-65001-up

DP30K ET14C-45001-up

DP35K ET14C-65001-up

AC

Control Linkage**Sequence**

- | | | | |
|----|--|----|---|
| 11 | Brake pipes | 14 | Pedal assembly |
| 12 | Inching cable, Clevis pin, Washer, Snap pin | 15 | Throttle cable, Accelerator pedal bracket, Pin, Washer, Choke cable |
| 13 | Connector (Brake fluid level sensor, Stop lamp switch) | | |

Suggestion

To remove inching cable 12, pull out pins and loosen lock nuts at the transmission and inching pedal sides of the cable.

Suggestions

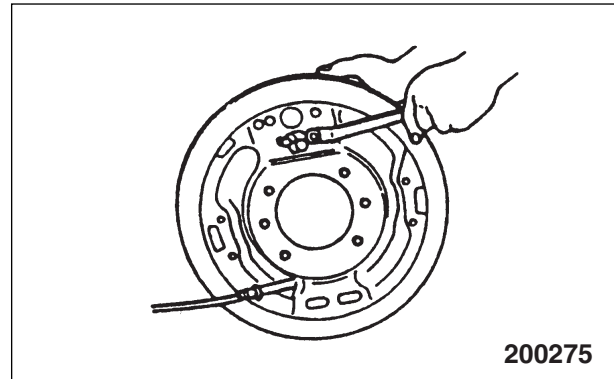
1. Wheel cylinder installation

Apply the liquid packing to the mounting face of the wheel cylinder before positioning the cylinder in place; and secure it by tightening to the specified torque:

A = Assembly standard

B = Repair or service limit Unit: N·m (kgf·m) [lbf·ft]

	1 to 1.8 ton models	2 to 3.5 ton models
Tightening torque for wheel cylinder	8 to 12 (0.8 to 1.2) [6 to 9]	18 to 26 (1.8 to 2.7) [13 to 20]



2. Greasing

Apply the specified brake grease to the following parts, forming a thin coat of grease at each:

- (1) Shoe ledges (6 places)

The ledges are those portions of the backing plate in contact with the shoe.

- (2) Anchor pin surface in contact with the shoe ends

3. Shoe and lining installation

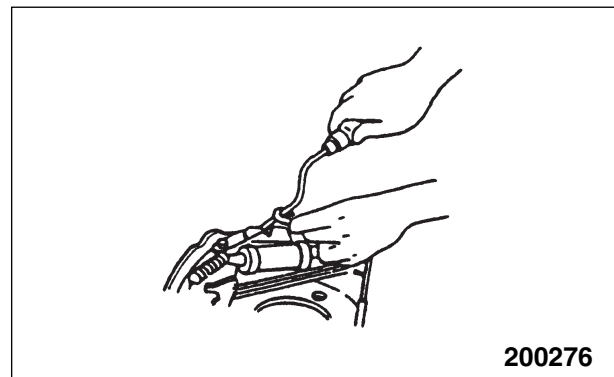
Check to be sure that each push rod of the wheel cylinder is snugly fitted to its shoe web.

4. Return spring installation

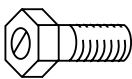
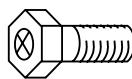
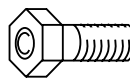
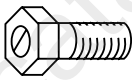
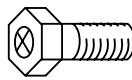
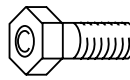
Use a special tool to install the return springs to the backing plate pins.

Special tool needed

Spring installer	65309-15413
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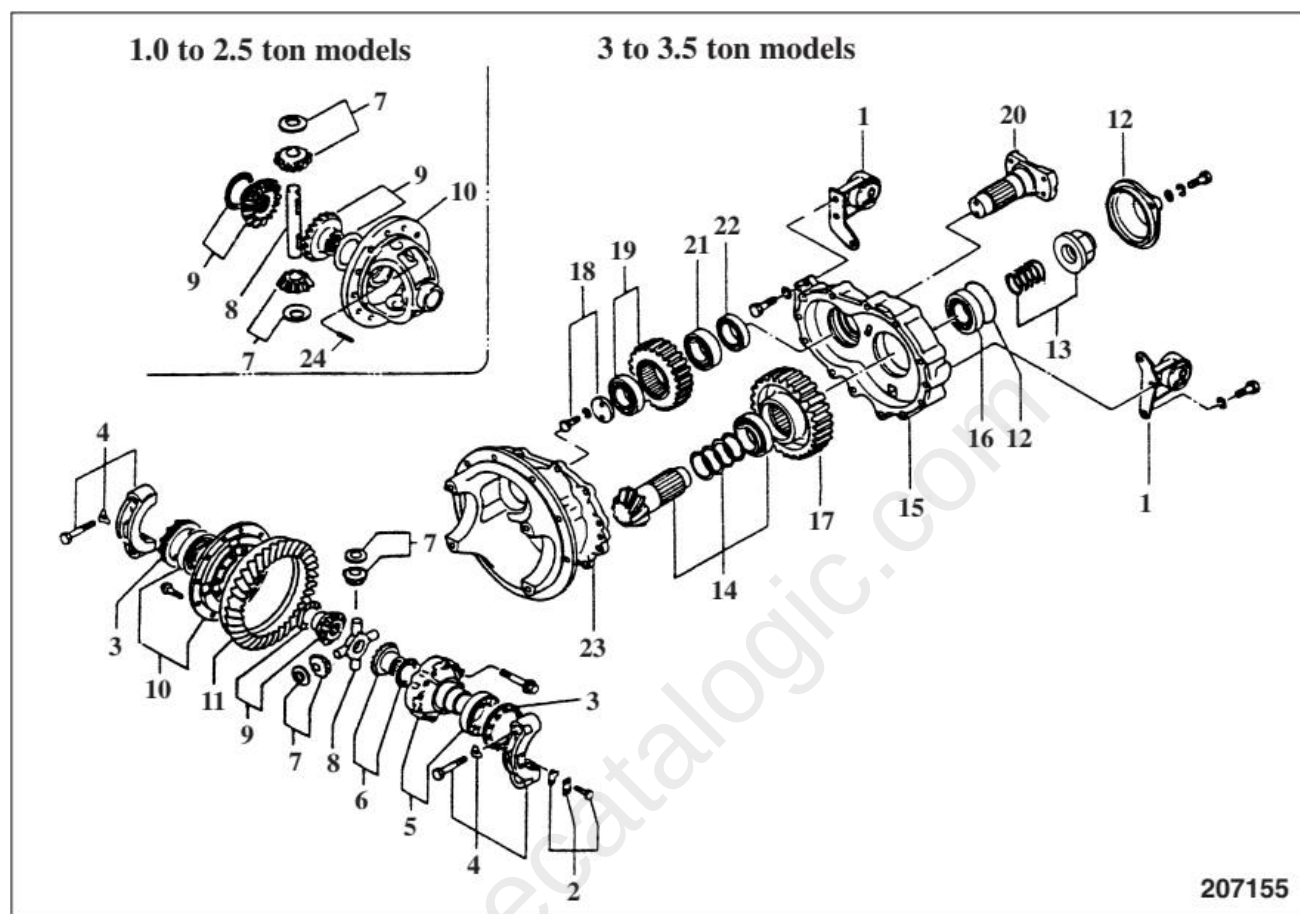


SERVICE DATA

	With spring washer				101656										
	Nominal size		Pitch												
Metric coarse thread	mm	in.	mm	in.	N·m	kgf·m	lbf·ft	N·m	kgf·m	lbf·ft	N·m	kgf·m	lbf·ft		
	10	0.39	1.5	0.06	33.3	3.4	24.6	43.1	4.4	31.8	67.7	6.9	49.9		
	12	0.47	1.75	0.07	58.8	6.0	43.4	76.5	7.8	56.4	115.7	11.8	85.3		
	14	0.55	2	0.08	96.4	9.8	70.9	124.5	12.7	91.9	182.4	18.6	134.5		
	16	0.63	2	0.08	147.14	15.0	108.5	191.2	19.5	141.0	274.6	28.0	202.5		
	18	0.71	2.5	0.10	203.0	20.7	149.7	264.8	27.0	195.3	383.4	39.1	282.8		
	20	0.79	2.5	0.10	286.4	29.2	211.2	371.7	37.9	274.1	536.4	54.7	395.6		
	22	0.87	2.5	0.10	383.4	39.1	282.8	499.2	50.9	368.2	715.9	73.0	528.0		
	24	0.95	3	0.12	492.3	50.2	363.1	640.4	65.3	472.3	924.8	94.3	682.1		
	27	1.06	3	0.12	724.7	73.9	534.5	942.2	96.1	695.1	1350.4	137.7	996.0		
	30	1.18	3.5	0.14	969.9	98.9	715.3	1259.2	128.4	928.7	1843.7	188.0	1359.8		
	33	1.30	3.5	0.14	1328.8	135.5	980.1	1727.0	176.1	1273.7	2477.2	252.6	1827.1		
	36	1.42	4	0.16	1676.0	170.9	1236.1	2180.0	222.3	1607.9	3199.9	326.3	2360.1		
	39	1.54	4	0.16	2219.2	226.3	1636.8	2884.1	294.1	2127.2	4118.8	420.0	3037.9		
	42	1.65	4.5	0.18	2754.7	280.9	2031.8	3581.4	365.2	2641.5	5137.7	523.9	3789.4		
	Nominal size		Pitch		Without spring washer									101656	
															
	10	0.39	1.5	0.06	39.2	4.0	28.9	51.0	5.2	37.6	79.4	8.1	58.6		
	12	0.47	1.75	0.07	69.6	7.1	51.4	90.2	9.2	66.5	135.3	13.8	99.8		
	14	0.55	2	0.08	112.8	11.5	83.2	146.1	14.9	107.8	215.7	22.0	159.1		
	16	0.63	2	0.08	172.6	17.6	127.3	224.6	22.9	165.6	323.6	33.0	238.7		
	18	0.71	2.5	0.10	239.3	24.4	176.5	311.9	31.8	230.0	451.1	46.0	332.7		
	20	0.79	2.5	0.10	336.4	34.3	248.1	437.4	44.6	322.6	630.6	64.3	465.1		
	22	0.87	2.5	0.10	392.3	40.0	289.3	587.4	59.9	433.3	842.4	85.9	621.3		
	24	0.95	3	0.12	578.6	59.0	426.7	753.2	76.8	555.5	1088.5	111.0	802.9		
	27	1.06	3	0.12	852.2	86.9	628.5	1108.2	113.0	817.3	1588.7	162.0	1171.7		
	30	1.18	3.5	0.14	1140.5	116.3	841.2	1481.8	151.1	1092.9	2168.3	221.1	1599.2		
	33	1.30	3.5	0.14	1563.2	159.4	1153.0	2031.9	207.2	1498.7	2915.5	297.3	2150.4		
	36	1.42	4	0.16	1972.1	201.1	1454.6	2564.4	261.5	1891.4	3765.8	384.0	2777.5		
	39	1.54	4	0.16	2610.5	266.2	1925.4	3393.1	346.0	2502.6	4845.5	494.1	3573.8		
	42	1.65	4.5	0.18	3241.1	330.5	2390.5	4212.9	429.6	3107.3	6044.8	616.4	4458.4		

Remarks: 1. The tolerance on these torque is $\pm 10\%$.

2. These torques are for “dry” condition.

Reduction Differential**Disassembly****Sequence [3-ton models]**

- | | |
|---|--|
| 1 Mount bracket assembly (right and left) | 12 Cover, O-ring |
| 2 Lock washer, Lock pawl, Bolt, Plate | 13 Lock nut, Shims |
| 3 Adjusting screw | 14 Reduction bevel pinion, Tapered roller bearing (inner), Shims |
| 4 Bearing cap, Lock washer, Bolt | 15 Carrier cover |
| 5 Differential case (right), Tapered roller bearing | 16 Tapered roller bearing |
| 6 Differential gear, Thrust washer | 17 Driven gear |
| 7 Differential pinion, Thrust washer (not used in 1-ton models) | 18 Plate |
| 8 Differential spider | 19 Drive gear, Ball bearing |
| 9 Differential gear, Thrust washer | 20 Input flange |
| 10 Differential case (left), Tapered roller bearing | 21 Ball bearing |
| 11 Reduction bevel gear | 22 Oil seal |
| | 23 Differential carrier |

NOTE

For the disassembly sequence for 1, 2-ton models, see the next page.

Sequence

- | | |
|---|---|
| 1 Tie rod, Nuts | 28 Elbow, O-ring |
| 2 End cover | 29 Plug, O-ring, Spring, Poppet |
| 3 O-ring | 30 Plug, O-ring |
| 4 Main relief valve, O-ring | 31 Shutoff valve assembly |
| 5 Solenoid, O-ring | 32 Lift section |
| 6 Connector, O-ring | 33 O-ring |
| 7 Plug, O-ring | 34 Spring, Poppet |
| 8 Piston, Spring | 35 Cap, O-ring |
| 9 Spool, Spring | 36 Cap, O-ring |
| 10 Sleeve, Snap ring | 37 Spool |
| 11 Plug, O-ring | 38 Screw, Spring seat, Spring |
| 12 Shuttle | 39 Spool head, O-ring |
| 13 Sleeve | 40 Tilt lock valve, Spring |
| 14 Spring seat, Spring | 41 Solenoid, O-ring |
| 15 Plate, Set screw, Nut, (Flow divider relief valve) | 42 Shuttle, Sleeve |
| 16 Housing, O-ring, Poppet | 43 Tilt section |
| 17 Spring | 44 O-ring |
| 18 Plug, O-ring, Spring, Poppet | 45 Spring, Poppet |
| 19 Inlet section | 46 Cap, O-ring |
| 20 O-ring | 47 Spool |
| 21 Cap, O-ring, Spring | 48 Screw, Spring seat, Spring |
| 22 Spool | 49 Cap, O-ring |
| 23 Cap, O-ring, Spacer, Spring, Spring seat | 50 Solenoid |
| 24 Screw, Spring seat | 51 Shuttle, Sleeve |
| 25 Lift lock valve, Spring | 52 Shutoff valve assembly (or Overload relief valve (option)) |
| 26 Solenoid, O-ring | 53 Attachment section |
| 27 Shuttle, Sleeve | |

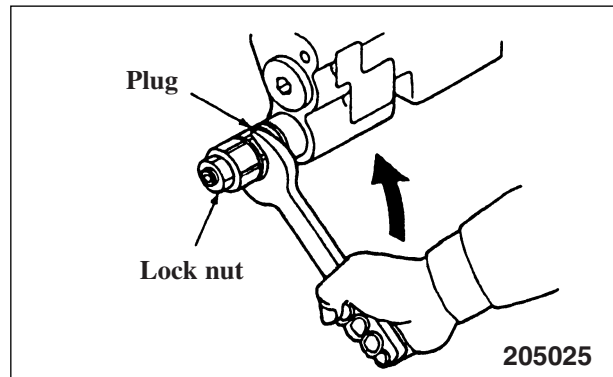
Suggestions

1. Main relief valve

Do not remove main relief valve 4 unless it is defective. This applies to overload relief valve 52 (option) of the attachment section.

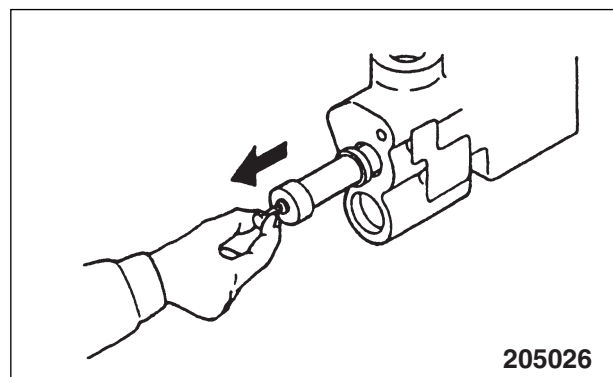
NOTE

To remove the main relief valve for cleaning or inspection, loosen its plug. Loosening the lock nut will disturb the pressure setting.



2. Inlet section

- (1) To remove connector 6, loosen plug 7 two or three full turns.
- (2) To remove spool 9, screw a bolt into the hole (M6 × 1) of the spool and pull out the spool squarely by gripping the bolt before removing sleeve 10.



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