CAT® Lift Trucks

Service Manual

Chassis & Mast

MC/FC

GP40N	CT40A-00011-99999	DP40NB	CT12D-00011-99999
GP45N	CT29E-50001-79999	DP45NB	CT19F-50001-79999
GP50CN	CT29E-80001-99999	DP50CNB	CT19F-80001-99999
GP50N	CT33D-50001-79999	DP50NB	CT28E-50001-79999
GP55N	CT33D-80001-99999	DP55NB	CT28E-80001-99999

For use with 854F and TB45 Service Manuals

99739-6B110

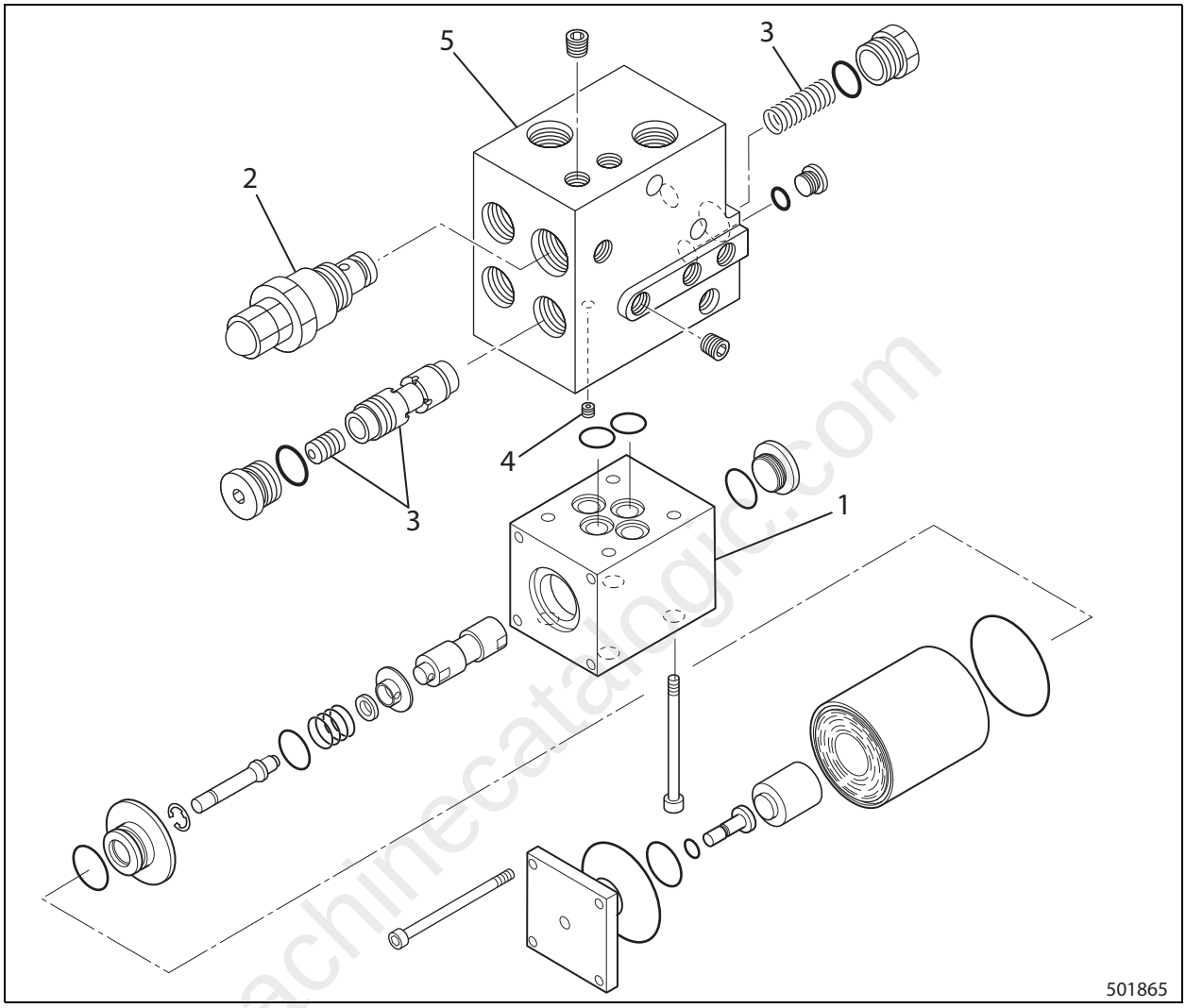
VCM signal allocation (CN1)

Pin No.	Circuit No. (Wire color)	MC	FC	Signal name
1	611	○	○	Mode selection switch
2	-	-	-	Oil temperature switch (Hydraulic oil, wet disc brake)
3	-	-	-	Lift operation switch
4	-	-	-	Tilt operation switch
5	615	-	○	Mast high switch (option)
6	616	○	○	Speed limit switch
7	617	○	○	Power/soft mode switch
8	618	○	○	Power/soft mode switch
9	619	○	○	Contact-type FC control 4V-5V switch
10	620	○	○	Parking brake pressure switch
11	621	○	○	T/M variable force solenoid
12	622	○	○	Illumination sensor signal (+)
13	623	○	○	Illumination sensor signal (-)
14	624	○	○	Oil pressure sensor power supply(+5V)
15	625	○	○	Oil pressure LIFT signal
16	-	-	-	AUX sensor signal
17	627	○	○	Oil pressure sensor GND
18	600	○	○	Power supply (+12V)
19	-	-	-	Steering sensor power supply(+12V)
20	-	-	-	Steering sensor GND
21	-	-	-	Steering sensor [angle 1]
22	-	-	-	Steering sensor [angle 2]
23	-	-	-	Steering sensor [neutral]
24	-	-	-	AUX out 1
25	960	○	○	Power supply GND
26	601	○	○	Power supply (+12V)
27	637	-	○	Tilt angle sensor power supply (+5V)
28	638	-	○	Tilt angle sensor signal
29	639	-	○	Tilt angle sensor GND
30	640	○	○	Unload solenoid output
31	641	○	○	Lift lock solenoid output
32	642	○	○	Unload/lift lock return
33	643	○	○	Warning alarm output
34	961	○	○	Power supply GND

5. Disassembling and Assembling Parking Brake Valve

5.1 Disassembling Parking Brake

Disassembly sequence



1. Solenoid valve assembly
2. Main relief valve
3. Spool, Slug, Spring
4. Orifice
5. Parking brake valve block

Inspecting parking brake valve after disassembly

(1) Inspection of springs

(2) Check springs for cracks and settling.

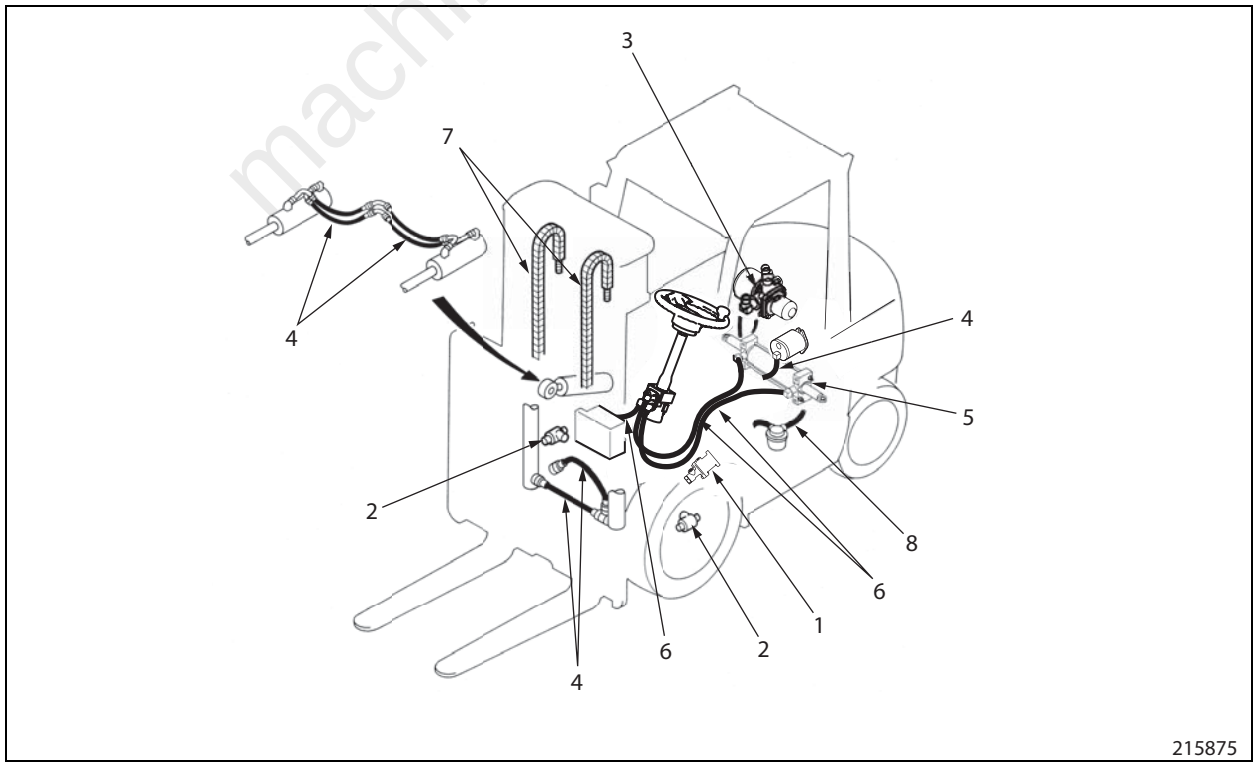
3. Periodic Inspection Parts

The important parts (marked with *) and elements for safe operation listed below must be replaced at every designated replacement period.

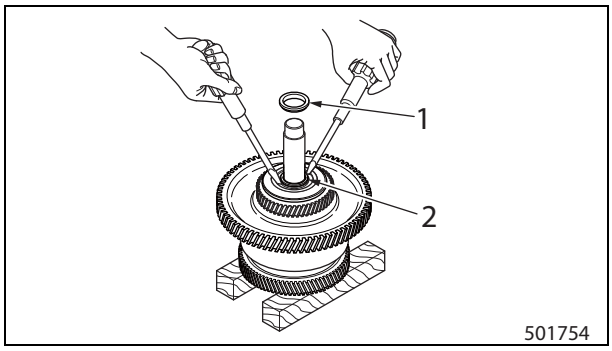
3.1 Periodic Replacement Parts

No.	Periodic Replacement Parts	Replacement period			Remark
		Yearly (year)	Monthly (month)	Service hours (hour)	
1	*Brake valve rubber parts and hoses	1		2000	
2	*Rubber parts for brake wheel cylinder	1		2000	
3	*LPG repair kit (LPG model only)		30	6000	
4	*High pressure hoses	1		2000	
5	*Rubber parts for power cylinder	2		4000	
6	*Power steering hoses	2		4000	
7	*Lift chains	2		4000	
8	*Fuel hoses	2		4000	
9	Engine oil filter element		3	500	Also 1 month after delivery
10	Fuel filter elements		6	1000	Also 1 month after delivery
11	Hydraulic tank return filter		6	1000	Also 1 month after delivery
12	Air cleaner element		6	1000	Clean every 2 weeks
13	Engine coolant	1		2000	
14	*LPG fuel filter (LPG model only)	1		2000	

Note: (*) indicates important security parts.

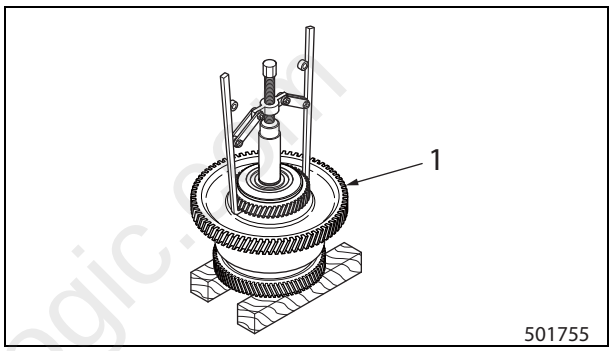


(4) Remove the spacer from the shaft using two flathead screwdrivers.
(5) Remove the snapring.



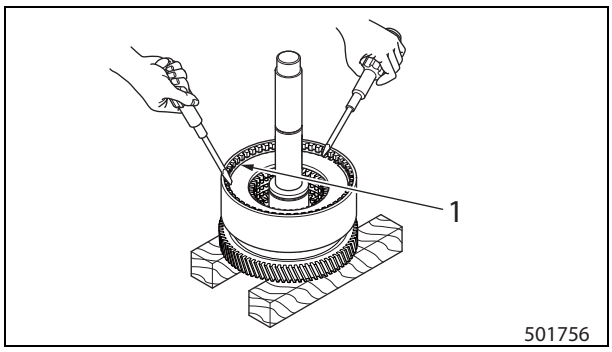
1. Spacer 2. Snapring

(6) Remove F2 clutch gear from clutch drum using the puller (special tool).



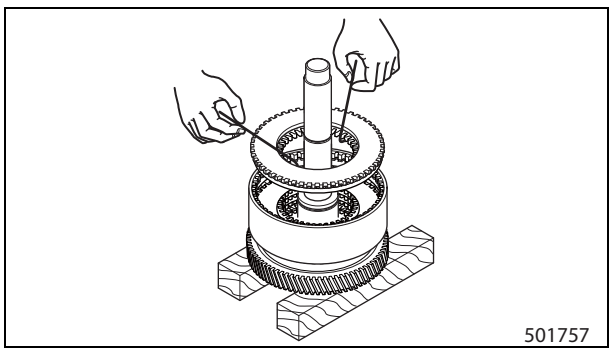
1. F2 clutch gear

(7) Remove the bearing by tapping with a round bar.
(8) Remove the snapring from clutch drum using two flathead screwdrivers.



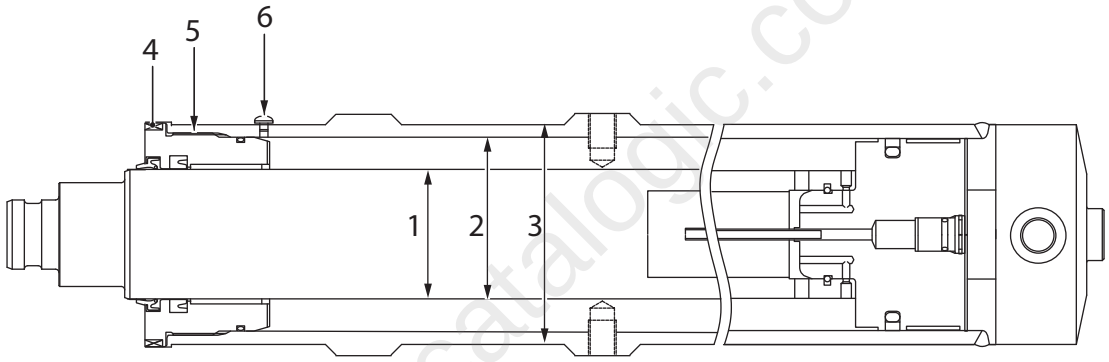
1. Snapring

(9) Using a wire with a shaped hook at the end, remove the pressure plate, mating plate, and friction plate from clutch drum.



34.3 First Cylinder for Duplex and Triplex Masts

Ref.	Item		Truck class	
			4.0 to 4.5 ton	5.0C to 5.5 ton
1	Rod outside diameter	Standard value	70 mm (2.76 in.)	75 mm (2.95 in.)
2	Cylinder inside diameter	Standard value	100 mm (3.94 in.)	110 mm (4.33 in.)
3	Cylinder outside diameter	Standard value	115 mm (4.53 in.)	127 mm (5.00 in.)
4	Cylinder head thread size	Standard value	M105 x 2	M115 x 2
5	Cylinder head	Tightening torque	647 ± 150 N·m (65.97 ± 15.30 kgf·m) [477.20 ± 110.63 lbf·ft]	834 ± 191 N·m (85.0 ± 19.48 kgf·m) [615.13 ± 149.87 lbf·ft]
6	Plug	Tightening torque	3.92 ± 0.98 N·m (0.40 ± 0.10 kgf·m) [2.89 ± 0.72 lbf·ft]	3.92 ± 0.78 N·m (0.40 ± 0.08 kgf·m) [2.89 ± 0.58 lbf·ft]



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4. Battery and Maintenance

4.1 Battery Specific Gravity Condition and Adjustment

Specific gravity reading at 20°C (68°F)	Condition	Adjustment
1.280 to 1.265 or more	Good	If the difference in S.G. between any two cells is 0.020 or less, continue to use as is. If the difference is more than 0.020, discharge the battery in an efficient manner. If the battery recovers, adjust the electrolyte S.G. while charging the battery.
Less than 1.260 to 1.225 or more	Half charged	Recharge battery to adjust electrolyte S.G. Check for short-circuit, loose connections or corrosion in the electrical components.
1.220 or less	Low battery (caution required)	Charge battery. If the difference in S.G. between cells is too much, adjust the electrolyte S.G. while charging.
If the difference in S.G. between cells is 0.040 or more.	A cell with a low S.G. may have a short circuit. Electrolyte leaked, or electrolyte rate is too high or too low.	Charge the battery until the voltage and S.G. of the cells become even. Adjust S.G. to the range between 1.280 and 1.265 during charging. If the difference in S.G. between cells is more than 0.040 and a low S.G. is found in any of the cells, replace the battery with a new one. Conduct a high current discharge test after leaving the battery for 12 to 96 hours.

4.2 Relationship Between Electrolyte Specific Gravity and State of Charge

The battery charge condition can be determined by the electrolyte S.G. (1.280 to 1.265), and also it can be determined by the rate of electrolyte decrease. If the electrolyte in the battery cell decreases to the level where the pole plates are exposed within one month, the battery may be overcharged. If the electrolyte amount remains sufficient for more than three months, the battery may be poorly charged.

2.2 Sheet Symbol

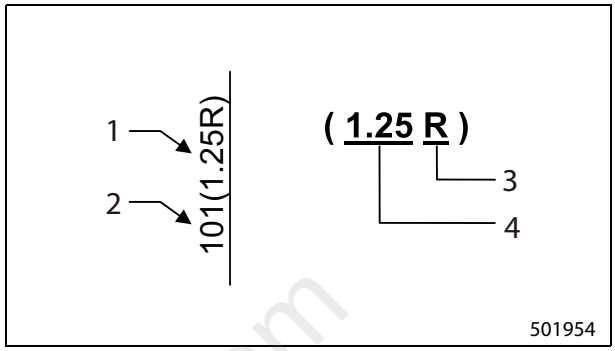
A sheet symbol is provided in each circuit diagram sheet so that the relationship between diagrams can be clarified. The sheet symbol consists of "SH" and two digit numbers, for example, “SH-01" or “SH-02".

2.3 Connecting Lines

(1) There are two thicknesses of the line which connect between elements in the circuit diagram. Each line is used as follows:

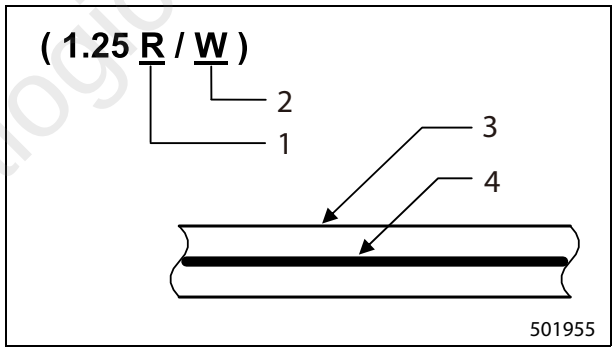
- Thick line: Connecting lines for the electric wires size of 20 mm^2 (0.78 in^2) or above.
- Thin line: All other connecting lines except the above.

(2) Connecting lines are represented by the circuit number, wire diameter and wire color. For the connecting lines of 0.5 mm^2 (0.02 in^2) wire size, the wire diameter is omitted.



1. Wire diameter, wire color
2. Circuit number
3. Wire color
4. Wire diameter

(3) Here are two types of wires: the one having only one color and the one having a colored stripe (combination of two colors).



1. Base color
2. Stripe color
3. Base color
4. Stripe color

Color codes

Symbol	Color	Symbol	Color	Symbol	Color
B	Black	Br	Brown	P	Pink
W	White	L	Blue	Sb	Sky blue
R	Red	Lg	Light green	V	Purple
G	Green	O	Orange		
Y	Yellow	Gr	Gray		

Full Version Available

Caterpillar DP45NB Forklift Service and Operator Manual (99739-6B110)

Caterpillar DP45NB Forklift service manual, covers hydraulics, mast, drive unit, wiring, and diesel engine work. Searchable PDF download.