SEBM001007

Shop Manual

KOMATSU®

D31E,P,PL,PLL-20
D31P-20A
D31S,Q-20
D37E-5,D37P-5A
BULLDOZERS

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SPECIFICATIONS

D31E, P-20
D31P-20A
D31PL, PLL-20

Machine model				D31E-20	D31P-20	D31P-20A	D31PL-20	D31PLL-20
Serial No.				42001 – 42713	45001 – 47616	45001 – 47616	45001 – 47616	45001 – 47652
Weight	Operating weight • Bare tractor		kg	5,060	5,750	5,720	6,130	6,610
	• With dozer		kg	6,090	6,700	6,800	7,060	7,550
Performance	Blade capacity		m^3	1.7	1.52	1.52	1.02	1.02
	Min. turning radius		m	2.2	2.5	2.6	3.2	3.3
	Gradeability		deg	30	30	30	30	30
	Stability		deg	35	35	35	35	35
	Speed ranges	Forward 1st	km/h	2.2	2.2	2.2	2.2	2.2
		Forward 2nd	km/h	3.9	3.9	3.9	3.9	3.9
		Forward 3rd	km/h	6.5	6.5	6.5	6.5	6.5
		Reverse 1st	km/h	2.4	2.2	2.4	2.4	2.4
		Reverse 2nd	km/h	4.3	3.9	4.3	4.3	4.3
		Reverse 3nd	km/h	7.1	7.1	7.1	7.1	7.1
	Ground pressure	Bare tractor	kPa (kg/cm²)	40.2 (0.41)	21.6 (0.22)	21.6 (0.22)	12.7 (0.13)	11.8 (0.12)
		With dozer	kPa (kg/cm²)	48.1 (0.49)	25.5 (0.26)	25.5 (0.26)	14.7 (0.15)	13.7 (0.14)
Dimensions	Overall length	Bare tractor	mm	2,910	3,035	3,035	3,025	3,410
		With dozer	mm	3,840	3,845	3,940	3,875	4,300
	Overall width	Bare tractor	mm	1,790	2,050	2,250	2,950	2,950
		With dozer	mm	2,415	2,435	2,875	3,425	3,425
	Overall height	To top of canopy	mm	—	2,735	2,735	2,735	2,735
		To tip of exhaust pipe	mm	2,675	2,695	2,695	2,695	2,695
		To top of operator's compartment	mm	1,955	2,045	2,045	2,045	2,045
	Track gauge		mm	1,450	1,450	1,650	1,900	1,900
	Length of track on ground		mm	1,880	2,185	2,185	2,185	2,570
	Width of track shoe (standard)		mm	330	600	600	1,050	1,050
	Min. ground clearance (to drain port of steering case)		mm	315	380	380	380	380

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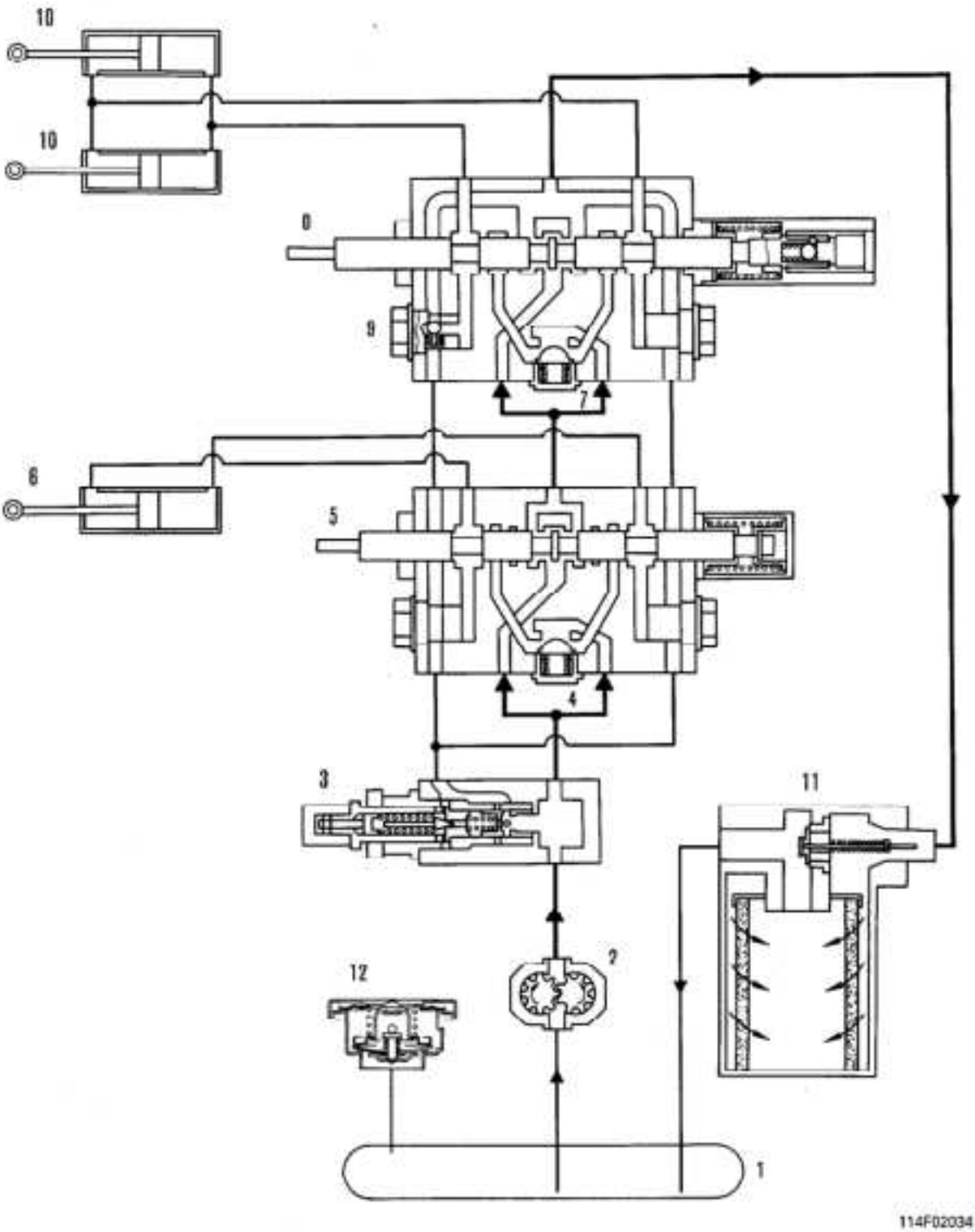
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HYDRAULIC CIRCUIT SYSTEM

STRAIGHT TILTDOZER

D31P, PL, PLL-20

* Engine running, hydraulic control lever in "HOLD".

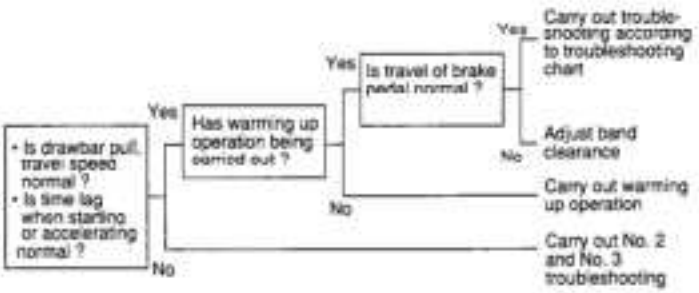


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H-4. Steering does not work properly

Checks before troubleshooting

- Before carrying out the troubleshooting, check the following points.



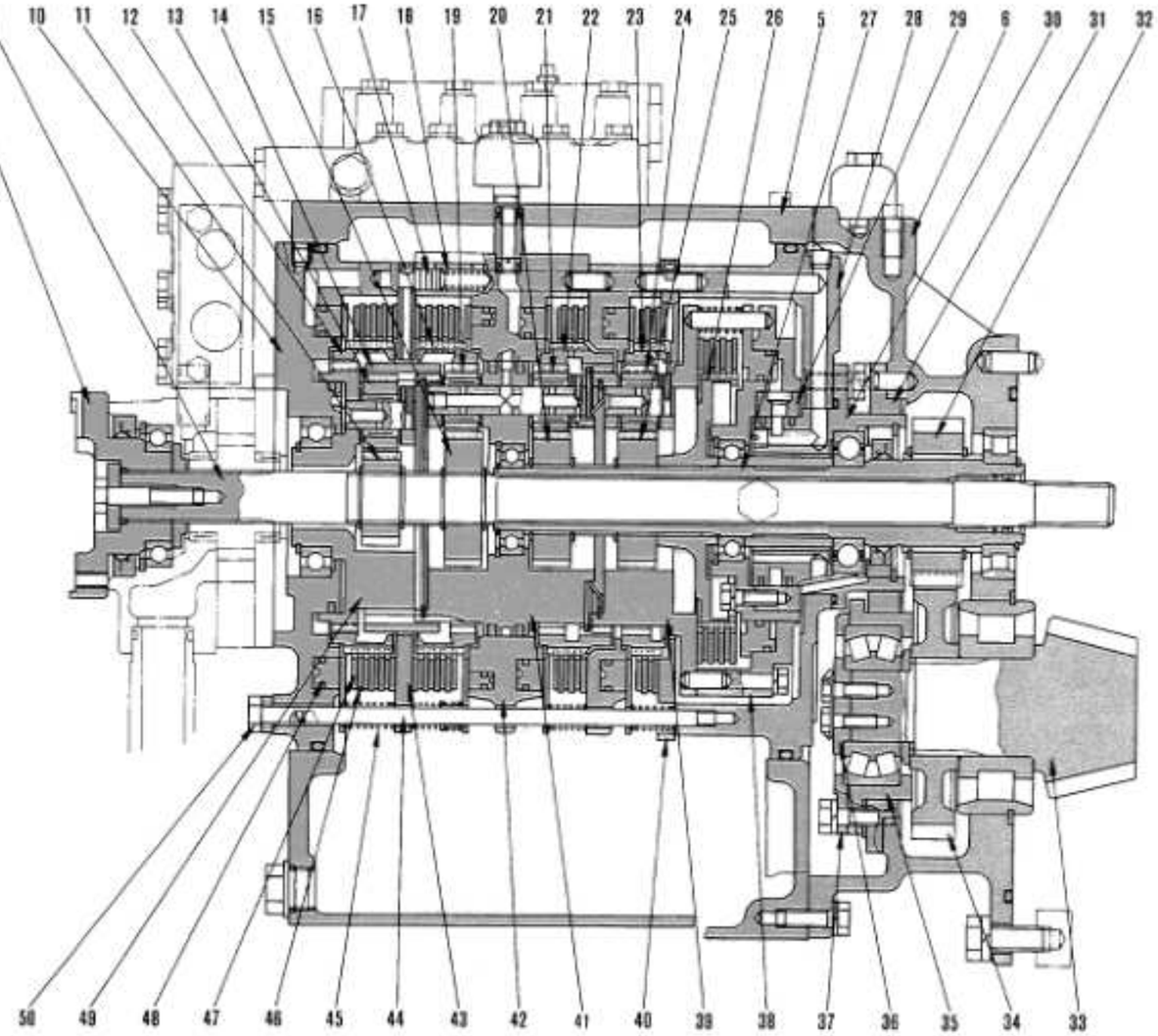
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No.	Problems \ Remedy	Causes: Line filter clogged	Dirt caught in valve	Defective brake cylinder packing	Brake cylinder twisted	Steering cylinder twisted
		Transmission - PPC valve: a	PPC valve: b	Actuator: c	Actuator: d	Actuator: e
		○	×	△ ×	×	×
1	Time lag is excessive when steering to both left and right	○				
2	Time lag is excessive when steering in one direction (left or right)		○		○	○
3	Steering lever is heavy		○			
4	When steering lever is returned to neutral, machine does not travel in a straight line		○			
5	Machine turns gradually, but does not turn on the spot		○		○	
6	Machine cannot even turn gradually			○		○

Troubleshooting tools	Hydraulic tester	

X: Replace △: Repair
A: Adjust C: Clean

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9. Input shaft
10. No.1 clutch housing
11. No.1 sun gear (24 teeth)
12. No.1 ring gear (72 teeth)
13. No.1 planet gear (21 teeth)
14. No.1 ring gear (66 teeth)
15. No.2 sun gear (36 teeth)
16. No.2 ring gear (72 teeth)
17. Transmission lubrication valve
18. Valve spring
19. No.2 planet gear (18 teeth)
20. No.3 sun gear (36 teeth)
21. No.3 planet gear (18 teeth)
22. No.3 ring gear (72 teeth)
23. No.4 ring gear (72 teeth)
24. No.4 planet gear (18 teeth)
25. No.4 sun gear (36 teeth)
26. No.5 ring gear
27. Output shaft
28. No.5 clutch housing
29. Seat
30. Cage
31. Plate
32. Transfer drive gear (21 teeth)
33. Pinion shaft (13 teeth)
34. Transfer driven gear (35 teeth)
35. Bearing cage
36. Retainer
37. Retainer
38. No.5 piston housing
39. No.4 carrier
40. Plate
41. No.2 and No.3 carrier
42. No.2 and No.3 clutch housing
43. Plate
44. Tie rod pin
45. Clutch spring
46. Clutch plate
47. Clutch disc
48. Clutch piston
49. No.1 carrier
50. Tie rod bolt

OUTLINE

The D31-20 and D37-5 bulldozer is equipped with a planetary type, "3-forward and 3-reverse speed" transmission which is a combined structure of a planetary gear mechanism and disc clutches.

The rotational direction and the revolution of the transmission output shaft is selected by fixing two disc clutches out of five disc clutches by means of control valve operation.

No.1 clutch is fixed in reverse, No.2 clutch in forward, No.3 clutch in third speed, No.4 clutch in second speed, and No.5 clutch in first speed.

Any speed can by selected from three forward speeds and three reverse speeds by fixing either No.1 or No.2 clutch and one clutch amoung No.3, No.4, and No.5 clutches and by combining two of the above.

Speeds and operating clutches

Speed		Operating clutch
Forward	Neutral	—
	First speed	No.2 and No.5 clutches
	Second speed	No.2 and No.4 clutches
	Third speed	No.2 and No.3 clutches
Reverse	Neutral	—
	First speed	No.1 and No.5 clutches
	Second speed	No.1 and No.4 clutches
	Third speed	No.1 and No.3 clutches

Number of discs and plates on each clutch

Clutch No.	Number of discs	Number of plates
No.1 clutch	4	4
No.2 clutch	4	4
No.3 clutch	3	3
No.4 clutch	2	2
No.5 clutch	3	4

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