

PARTS & SERVICE NEWS

REF NO.	AA03121
DATE	September 19, 2003

SUBJECT: RIPPER INSTALLATION PROCEDURE MANUAL

PURPOSE: To provide local installation procedures for the optional rear mounted ripper on the GD655-3C and GD675-3C graders Spec. A or Spec. C machines equipped with a scarifier.

APPLICATION: GD655-3C Motor Graders Serial Number 50000 thru 51000
GD675-3C Motor Graders Serial Number 50000 thru 51000

FAILURE CODE: 7C90Z9

DESCRIPTION: To add the feature of a ripper attachment to the machine.

This installation Manual will describe the installation procedure for the following Sales Unit parts:

- SF2000917A Provide ripper as a field attachment.
- SF2000917B Provide hydraulic control valve for ripper.

INTRODUCTION

When locally installing the hydraulic ripper onto the GD655-3C or GD675-3C spec A or C Motor Graders, follow the modification and installation procedures outlined in this Installation manual.

Since the ripper hydraulic circuit has a relief valve within the holding valve the 5 stack Scarifier control valve assembly must be exchanged with the 5 Stack Ripper control valve assembly,

To obtain the proper weight balance with the additional weight of the ripper the front counterweight must be exchanged for a pusher block assembly on the GD655.

Tire size should be checked. A GD655 should have at least 14:00 x 24-12 ply tires for proper capacity of a grader with a ripper. The GD675 is equipped with 12 ply tires as a minimum size.

PARTS LISTING

Item.	Part Number	Part Description	Qty.	Remarks
1	23B-785-3111	BRACKET	1	
2	23B-785-3122	LINK	1	
3	417-70-11970	PIN	1	
4	07020-00000	GREASE FITTING	1	
5	01010-81225	BOLT	1	
6	175-54-34170	WASHER	1	
7	23B-785-3231	SUPPORT	2	
8	07144-10603	BUSHING	2	
9	416-09-11120	SEAL	4	
10	01010-81240	BOLT	8	
11	01643-31232	WASHER	2	
12	07020-00000	BRACKET	2	
13	23B-785-3131	BRACKET	1	
14	23B-785-3351	ROD	2	
15	416-70-11810	BUSHING	8	
16	416-09-11140	SEAL, DUST	16	
17	07020-00000	GREASE FITTING	4	
18	07020-00675	FITTING	4	
19	01010-81225	BOLT	8	
20	175-54-34170	WASHER	8	
21	01010-82455	BOLT	4	
22	01643-32460	WASHER	4	
23	01010-82060	BOLT	4	
24	01643-32060	WASHER	4	
25	01010-82455	BOLT	10	
26	01643-32460	WASHER	10	

Item.	Part Number	Part Description	Qty.	Remarks
27	419-54-12850	SHIM	12	
28	419-54-12860	SHIM	1	
29	23B-78-53141	PIN	4	
30	23B-78-53150	PIN	4	
31	232-785-1291	SHANK	3	3 Shanks are standard. Beam will hold 5 shanks maximum.
32	234-785-1121	POINT	3	
33	113-782-1170	PIN ASSEMBLY	3	
34	232-785-1310	PIN	3	
35	04050-10070	COTTER PIN	6	
34	707-02X-7050	CYLINDER, RIPPER	1	
35	23B-60-33360	UNION	1	
36	20T-62-56710	UNION	1	
37	07002-11823	O-RING	2	
38	23B-60-33670	HOSE	1	
39	23B-60-33681	HOSE	1	
40	04435-51810	CLIP	11	
41	01435-01016	BOLT	9	
42	232-74-52131	CLIP	1	
43	01435-01220	BOLT	2	
44	07236-10315	ELBOW	2	
45	07002-12034	O-RING	2	
46	07235-10315	ELBOW	1	
47	07235-10315	ELBOW	1	
48	07002-12034	O-RING	2	
49	230-09-23140	HOSE	1	

Item.	Part Number	Part Description	Qty.	Remarks
50	230-09-23090	HOSE	1	
51	04434-52111	CLIP	1	
52	01435-01016	BOLT	1	
53	23B-61-31102	VALVE ASSEMBLY	1	
54	01010-80855	BOLT	2	
55	01643-30623	WASHER	2	
56	232-785-1411	PLATE	1	
57	237-43-17480	KNOB	1	
58	23B-846-3210	PUSHER WEIGHT	1	
59	23D-846-3190	PLUG	2	
60	419-09-11130	BOLT	4	
61	22X-22-11280	WASHER	4	
62	01580-02419	NUT	4	
63	723-15-12101	CONTROL VALVE, LH	1	
64	01010-80825	BOLT	3	
65	01643-30823	WASHER	3	
66	723-11-01320	VALVE LH ADD ON	1	
67	723-11-32770	BOLT	4	
68	23B-60-33350	UNION	2	
69	07002-11823	O-RING	2	
70	07221-20315	NUT	2	
71	07222-00312	PLUG	2	
72	23B-43-33661	LEVER	1	

Item.	Part Number	Part Description	Qty.	Remarks
73	23B-43-33420	PIN	2	
74	01640-20508	WASHER	2	
75	04052-10530	PIN	2	
76	23B-43-33410	ROD	1	
77	235-43-18380	BOLT	1	
78	04254-10823	SPACER	2	
79	01580-10806	NUT	1	
80	04250-90847	ROD END	1	
81	01508-40805	NUT	1	
82	23B-43-35641	BOOT	1	
83	23B-43-35881	PIPE	1	
84	07285-00180	CLIP	1	
85	23B-43-35511	ROD	1	
86	23B-43-A1120	SHAFT, EXTENSION	1	
87	237-43-17420	WASHER	2	
88	01010-80880	BOLT	1	
89	23B-54-A1110	SHEET, DECAL	1	
90	237-43-17480	KNOP	1	
91	23B-43-A1110	LEVER	1	
92	237-43-17440	COLLAR	1	
93	23A-43-18190	WASHER	1	

PREPARATIONS

The ripper package was developed for customers who have a need for this feature on there machine.

- Park the machine on a flat level surface; lower the work equipment to the ground. Shut off the engine and cycle the controls to remove any residual hydraulic pressure from the work equipment circuits.
- Apply the parking brake.
- Remove the key from the ignition switch until the repairs are complete. Place a tag on the steering controls advising: **“This machine is being repaired. It should not be started or moved for any reason until the tag is removed by the person doing the repairs.”**



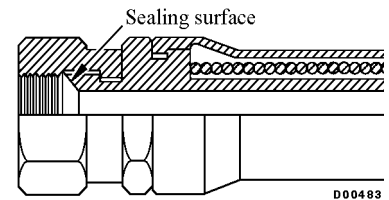
Observe all safety and precautionary standards as dictated by the environment and work conditions under which the equipment will be inspected, reworked and repaired. Consult the “shop manual”, “operator’s and maintenance manual” and your “Komatsu district service manager” with any and all questions regarding safety.

Remark

These instructions are intended to supplement the service data contained in the appropriate “Shop Manual”. Always refer to that manual for Removal, Installation, Disassembly and Reassembly instructions when not contained in this document.

TIGHTENING TORQUE FOR FLARED NUTS

Use these torques for flared part of nut.




Thread diameter		Width across flat	Tightening torque	
mm	mm		Nm	ft/lbs
10	14		12.7 ± 16.7	10 ± 12.3
14	19		24.5 ± 4.9	18.1 ± 36
18	24		49 ± 19.6	36 ± 14.5
22	27		78.5 ± 19.6	58 ± 14.5
27	32		137.3 ± 29.4	101.2 ± 21.6
30	36		176.5 ± 29.4	130 ± 21.6
33	41		196.1 ± 49	144.6 ± 36.1
36	46		245.2 ± 49	181 ± 36.1
42	55		294.2 ± 49	217 ± 36.1

INSTALLATION PROCEDURES

1. Remove the rear cover 1 and fasteners 2 and 3.
2. Remove the sixteen plugs 4 and clean the holes.
3. Remove the decal 5.

No.	Part number	Description	Qty.
1	23B-84-63123	COVER	1
2	1010-82460	BOLT	4
3	01643-32460	WASHER	4
4	07049-02430	PLUG	8
5	07049-02025	PLUG	4

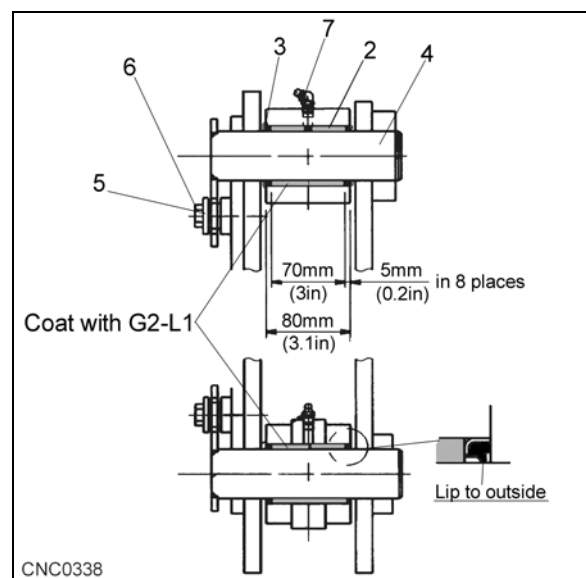
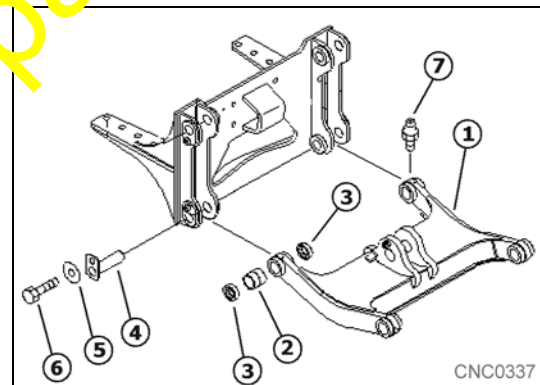
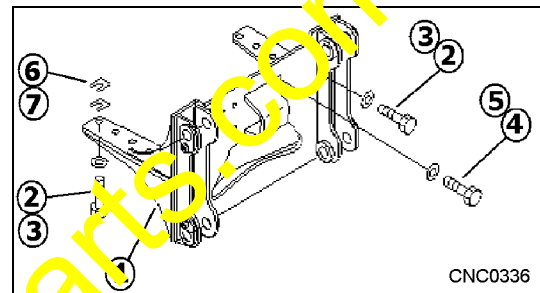
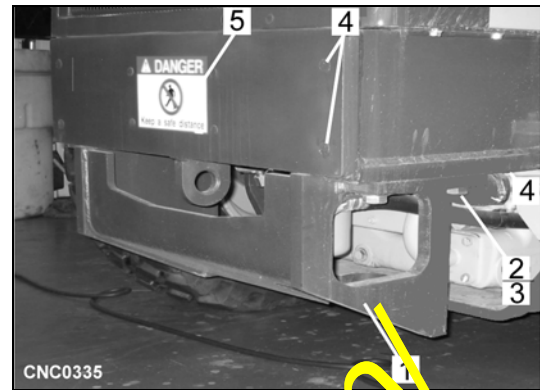
4. Mount ripper bracket on to rear frame.


 **N·m** Bolt 2 torque: 60 Nm (45 ft/lbs)
Bolt 4 torque: 33 Nm (25 ft/lbs)

5. Insert shims 6 and 7 between the bracket 1 and rear frame where ever a gap exists as required.

No.	Part number	Description	Qty.
1	23B-78-53122	LINK	1
2	416-70-11810	BUSHING	2
3	416-09-11140	DUST SEAL	4
4	23B-78-53141	PIN	2
5	175-54-34170	WASHER	2
6	175-54-34170	WASHER	2
7	07020-00060	GREASE FITTING	2

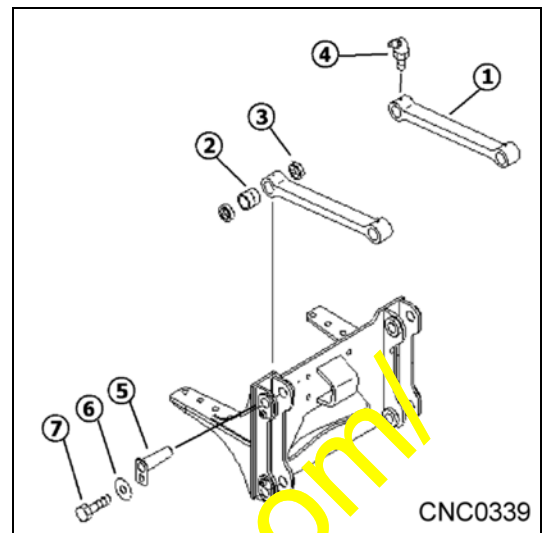
6. Preassemble the bushings 2 and seals 3 into the link 1 and rods as per the following instructions.
7. With a suitable driver install the bushing to the depth illustrated.
8. Position dust seal 3 with lip facing the outside to aid in purging grease toward the outside.
9. Coat all pins and bushings with G2-L1 grease and mount ripper link 1 to the rear frame bracket with bolt 6 and washer 5.



 Bolt 7 torque: 5.5 Nm (50 in/lbs)


10. Coat pin 5 with G2-L1 grease and mount upper rods 1 to rear frame bracket with bolt 7 and washer 6.

No.	Part number	Description	Qty.
1	23B-78-53351	ROD	2
2	416-70-11810	BUSHING	2
3	416-09-11140	DUST SEAL	4
4	07020-00675	GREASE FITTING	2
5	23B-78-53141	PIN	2
6	175-54-34170	WASHER	2
7	01010-81225	BOLT	2

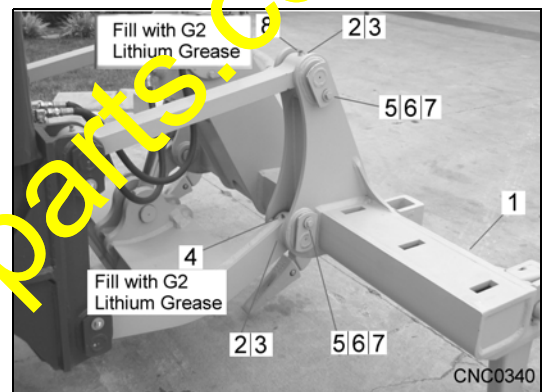


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11. Coat pins 5 with GL2-L1 grease and install ripper weldment 1 to lower link bracket and upper rods with bolt 7 and washer 6.

 Bolt 7 torque: 5.5 Nm (50 in/lbs)

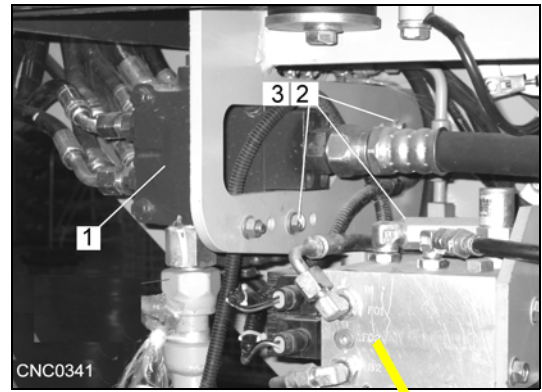
No.	Part number	Description	Qty.
1	23B-78-53111	RIPPER WELDMENT	1
2	416-70-11810	BUSHING	4
3	416-09-11140	DUST SEAL	8
4	07020-00000	GREASE FITTING	2
5	23B-78-53150	PIN	4
6	175-54-34170	WASHER	4
7	10108-1275	BOLT	4
8	07020-00675	GREASE FITTING	2



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12. Install grease fittings 4 and 8 and fill with G2-L1 grease in eight places.

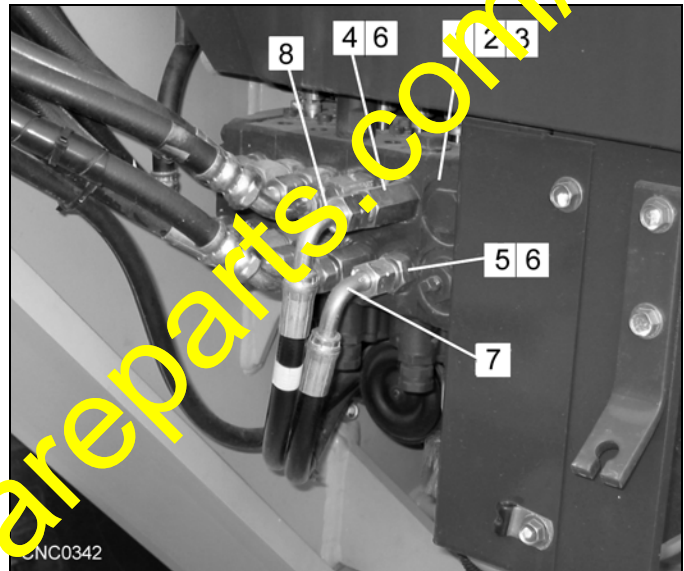
13. Mark all hoses so they can be reassembled in the same order. Clean the fitting area of the stack valve using Dry-Sol or a similar product. Be careful not to let dust or any foreign debris enter the inside of the control valve ports.
14. To prevent spilling hydraulic oil, take off the cap on the hydraulic tank to release any pressure. Reinstall the cap. If you cannot stop the oil flow then you will have to drain the hydraulic tank.
15. Remove the standard LH control valve and install the replacement LH valve 1. Reconnect the hoses and linkage.




Remark

When transferring fittings, be careful not to damage O-rings or allow any debris to enter the system. If O-rings are damaged, replace them.

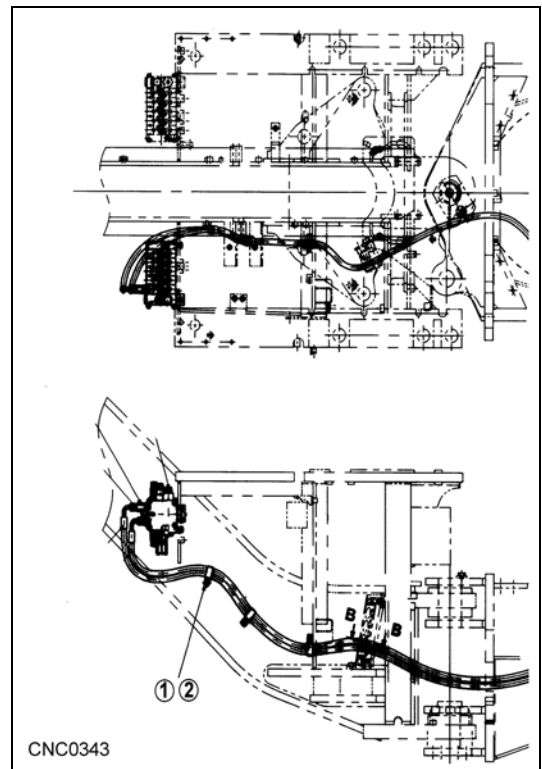
16. Install the ripper and hoses 7 and 8.



No.	Part number	Description	Qty.
1	723-15-12101	L.H. VALVE	1
2	01010-80825	BOLT	3
3	01643-30823	WASHER	3
4	23B-60-33360	UNION (LONG)	1
5	20T-62-56710	UNION (SHORT)	1
6	07002-11823	O-RING	2
7	23B-60-33681	HOSE	1
8	23B-60-33670	HOSE	1

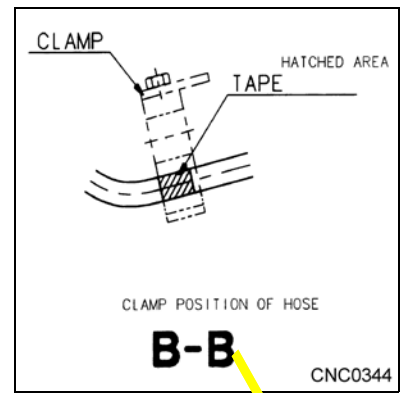
 Bolt 2 torque: 1.5 Nm (13 in/lbs)
 Bolt 1 torque: 3.5 Nm (30 in/lbs)

17. Rout hoses along the frame section as illustrated. Install the three clamp 2 with bolt 1.



No.	Part number	Description	Qty.
1	01435-01016	BOLT	3
2	04435-51810	CLIP	3

18. Rout hose through rubber front frame clamp **B-B** as shown in illustration.

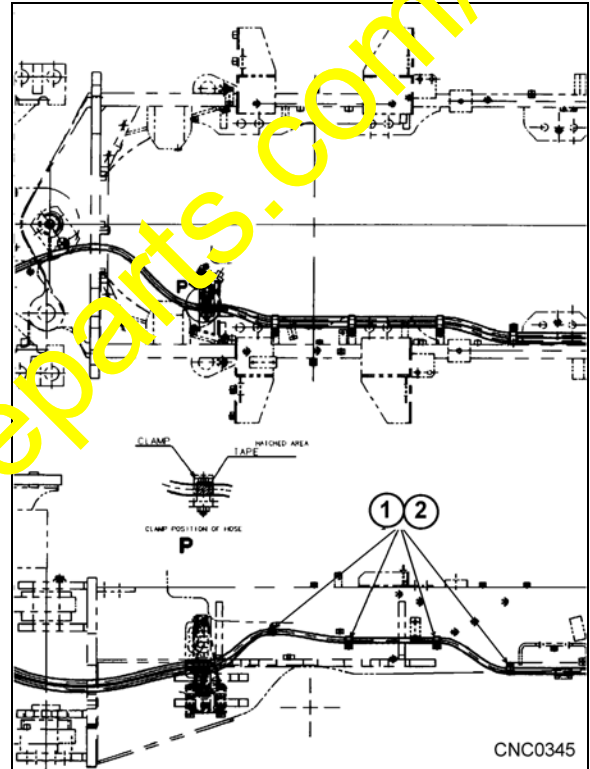


19. Rout hoses through the rear hose frame rubber clamp **P**, down the left hand side of the frame rail and clamp with the four clips 2 and bolts 1 as illustrated.


No.	Part number	Description	Qty.
1	01435-01016	BOLT	3
2	04435-51810	CLIP	3

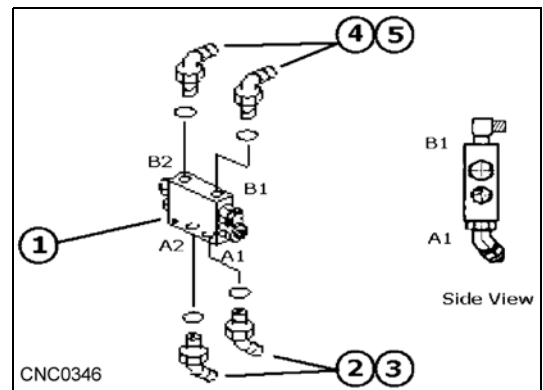
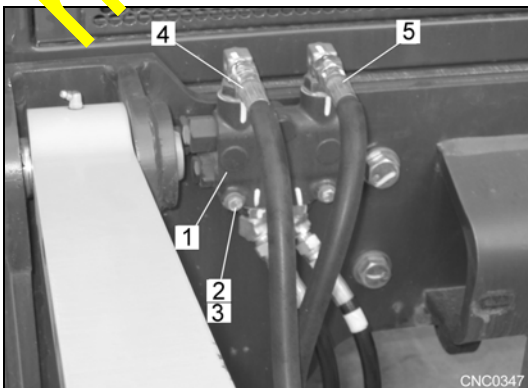
20. Preassemble the fittings to the holding valve. The 45° elbow 2 should be angled at 45°.

No.	Part number	Description	Qty.
1	23B-61-31102	CHECK VALVE	1
2	07236-10315	45° ELBOW	2
3	07002-12034	O-RING	2
4	07235-10315	90° ELBOW	2
5	07002-12034	O-RING	2



21. Mount holding valve 1 with bolt 2 and washer 3 to rear ripper bracket and attach hoses 4 and 5.


 Bolt torque: 15 Nm (13 in/lbs)



22. Continue the routing of the rear frame hoses down the left hand side of the frame rail and clamp hoses with clips 2 and bolts 1 as illustrated.

No.	Part number	Description	Qty.
1	01435-01016	BOLT	3
2	04435-51810	CLIP	3
3	232-74-52131	CLIP	1
4	01435-01220	BOLT	2


23. Attach ends of hoses to the holding valve as shown in step (21)

 **N·m** Bolt 1 torque: 3.5 Nm (30 in/lbs)

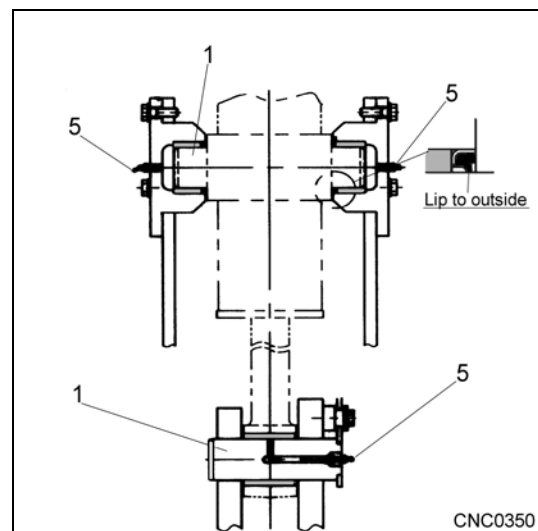
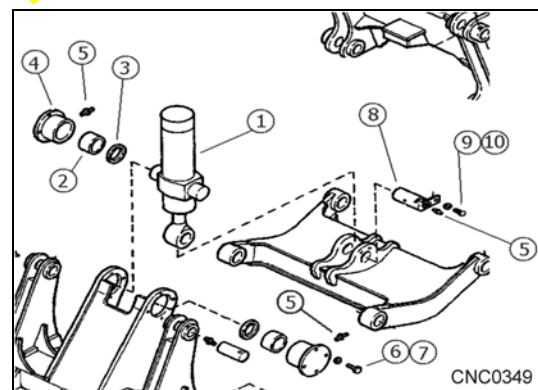
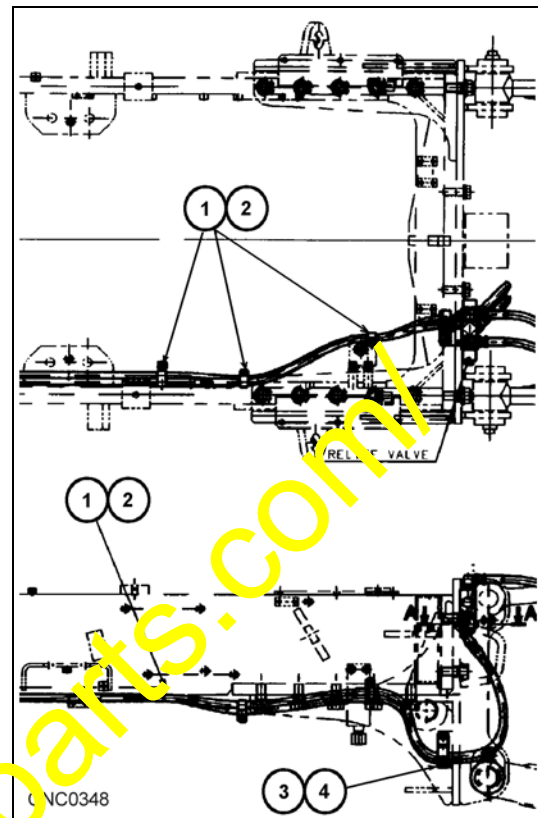
24. With a suitable driver, preassemble the ripper cylinder trunnion support 4 including bushings 2 and seal 3. See step (26) for position of the seal.

No.	Part number	Description	Qty.
1	0700-2X-7050	CYLINDER	1
2	07144-10603	BUSHING	2
3	416-09-11120	DUST SEAL	2
4	23B-78-53231	SUPPORT	2
5	07020-00000	GREASE FITTING	3
6	01010-81240	BOLT	8
7	01643-31232	WASHER	8
8	417-70-11970	PIN	1
9	01010-81225	BOLT	1
10	175-5-34170	WASHER	1

25. Apply G2-L1 grease to trunnion bosses 1 and lower link pin 8 before you install ripper cylinder.

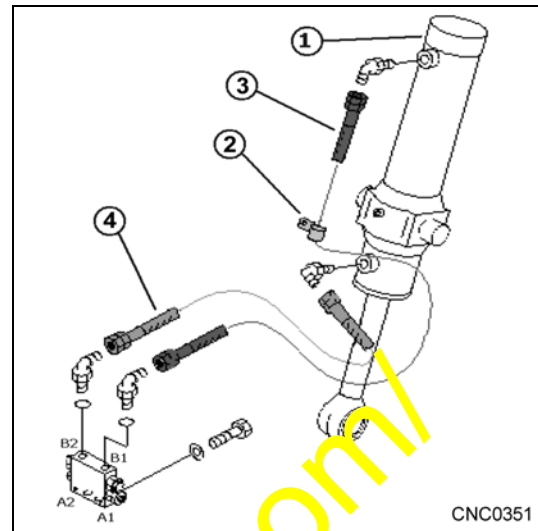
 **N·m** Bolt 6 torque: 5.5 Nm (50 in/lbs)
Bolt 9 torque: 5.5 Nm (50 in/lbs)

26. Install grease fittings 5 and fill with G2-L1 grease in three places. Connect ripper cylinder hoses 3 and 4 and fasten clip 2. Mount lower trunnion support bolt.



No.	Part number	Description	Qty.
1	(070-2X-7050)	RIPPER CYLINDER	1
2	04434-52111	CLIP	1
3	(230-09-23140)	HOSE	1
4	(230-09-23090)	HOSE	1

27. Fill hydraulic tank with oil.
28. Start the engine and keep it at a low idle speed. Extend and retract the ripper cylinder five or six times to bleed air from cylinder.

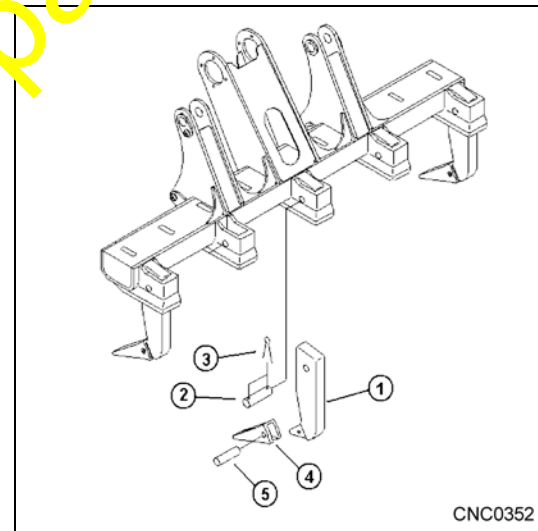


Remark

When using the hand control, the ripper should go down when lever is pushed down and up when the lever is pulled up.

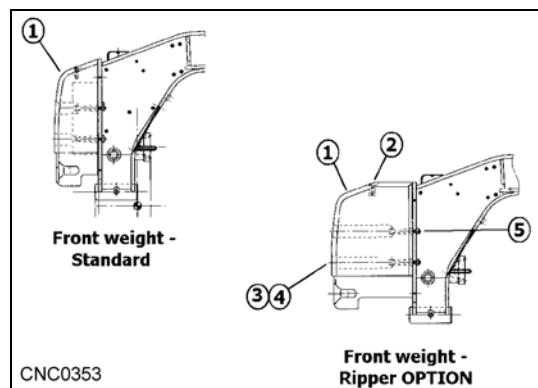
29. Check hydraulic oil level. Inspect all hose connections to be sure there are no leaks, twisted or rubbing hoses areas.
30. Install ripper shank 1 and teeth 4.


No.	Part number	Description	Qty.
1	232-78-51291	SHANK	3
2	232-78-51310	PIN	3
3	04050-10070	CUTTER PIN	6
4	234-78-51121	POINT	3
5	11378-21170	PIN ASSEMBLY	3



31. Replace the front counterweight on the GD655. The Pusher Block is standard on the GD675.

No.	Part number	Description	Qty.
1	(23B-84-63112) 23B-84-63210	COUNTERWEIGHTS	1 1 (STD)
2	23D-84-63190	PLUG	2
3	419-09-11130	BOLT	4
4	22X-22-11280	WASHER	4
5	01580-02419	NUT	4

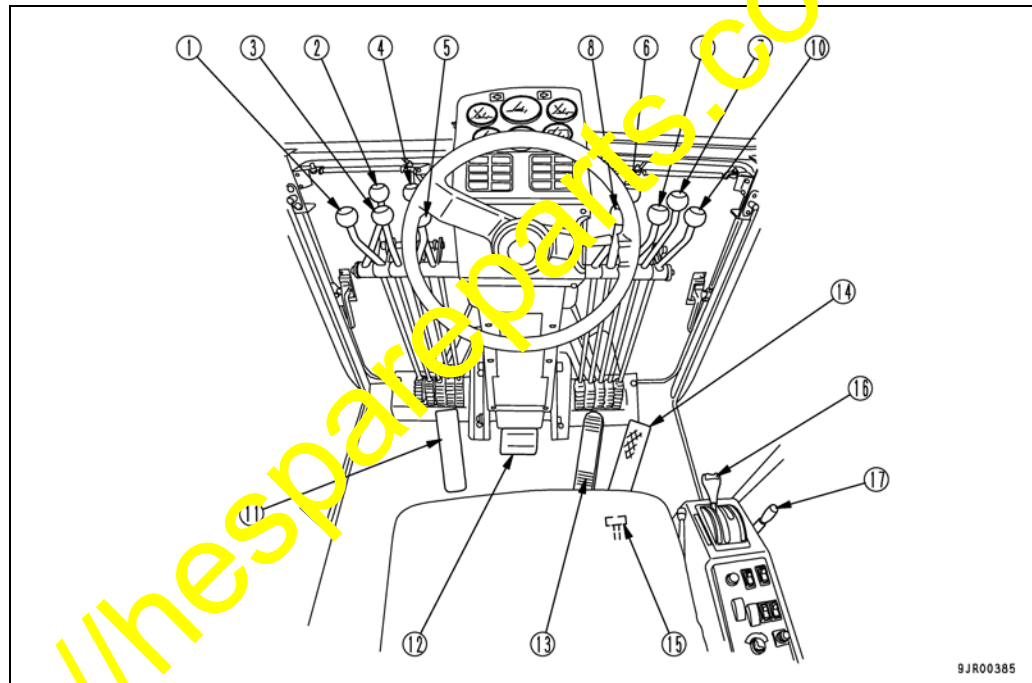


 Bolt 3 torque: 60 Nm (50 ft/lbs)

- 32. Install safety decal 1.
- 33. Install ripper decal on control knob 2.

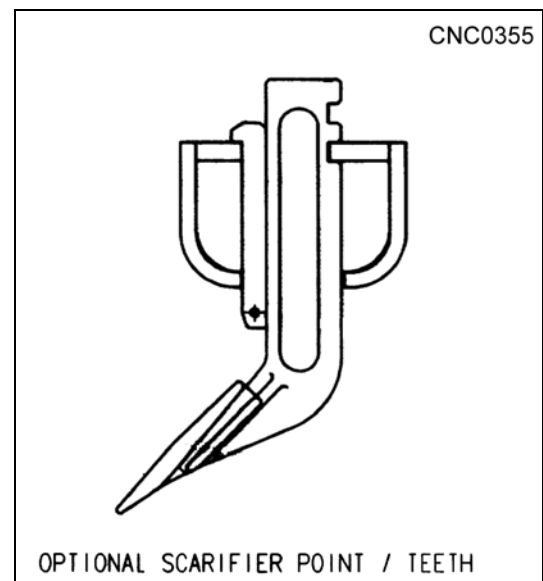


No.	Part number	Description	Qty.
1	232-785-1411	PLATE	1
2	237-43-17480	KNOB	1



- 34. If equipped with scarifier teeth, install as illustrated.

No.	Part number	Description	Qty.
1	232-71-51330	SHANK	9
2	232-78-51420	PIN	9
3	04050-18050	COTTER PIN	9
4	232-71-51320	POINT	9
5	232-71-51330	TOOL (REMOVAL)	1



HYDRAULIC SCHEMATIC

