

PARTS & SERVICE NEWS

REF NO. AA00216A

DATE March 22, 2001

(C)

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This PARTS AND SERVICE NEWS supercedes AA00216, dated November 6, 2000 which should be discarded

SUBJECT: Grader tandem drive chain inspection and replacement campaign.

PURPOSE: To inspect and replace (if necessary) the grader's final drive chain.

APPLICATION: 830B Motor Grader Serial Number 210431
 830C Motor Grader Serial Number 210008 thru 210504
 850B Motor Grader Serial Number 210303 thru 210559
 850C Motor Grader Serial Number 203802 thru 210484
 870B Motor Grader Serial Number 203762 thru 210400
 870C Motor Grader Serial Number 210016 thru 210449
 GD530A-2BC Motor Grader Serial Number 210164 thru 210375
 GD530A-2BY Motor Grader Serial Number 203850 thru 210532
 GD530A-2CC Motor Grader Serial Number 210529 thru 210330
 GD530A-2CY Motor Grader Serial Number 210019 thru 210567
 GD530A-2E Motor Grader Serial Number 210359 thru 210458
 GD530AW-2CY Motor Grader Serial Number 210097 thru 210457
 GD530AW-2E Motor Grader Serial Number 210098
 GD650A-2BY Motor Grader Serial Number 210534 thru 210545
 GD650A-2CY Motor Grader Serial Number 210006 thru 210576
 GD650A-2E Motor Grader Serial Number 210128 thru 210318
 GD650AW-2CY Motor Grader Serial Number 210041 thru 210541
 GD670A-2BY Motor Grader Serial Number 210491 thru 210554
 GD670A-2CY Motor Grader Serial Number 210015 thru 210542
 GD670A-2E Motor Grader Serial Number 210173
 GD670AW-2CY Motor Grader Serial Number 210241 thru 210562

FAILURE CODE: 2BH7DA

DESCRIPTION:

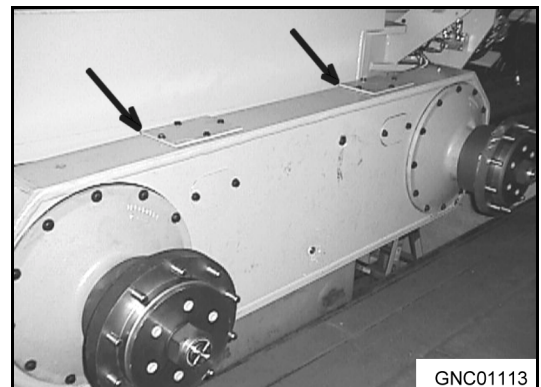
Graders with the planetary final drive option have been experiencing a high rate of chain failures. The cause of the failure has been identified as a substitution of parts by our chain manufacturer that give the chain less than desired fatigue life. For this field campaign we want to inspect and identify all potentially problem chains and replace those that have been identified with new chain.

The following replacement part kit must be ordered:

Table 1: Replacement Parts

| Part Number | Qty | Description |
|----------------------------------|----------|---|
| 8100 614 H91 | 1 | Kit – Tandem chain |
| This kit includes: | | |
| 1431 923 H1 | 4 | Gasket |
| 1438 387 H91 | 4 | Chain (Return unused parts to CMO) |
| 90 971 | 8 | Cone (Return unused parts to CMO) |
| 90 972 | 8 | Cup (Return unused parts to CMO) |
| 1432 441 H91 | 2 | Axle weldment (Return unused parts to CMO) |
| 1432 440 H91 | 2 | Axle weldment (Return unused parts to CMO) |
| 1278 105 H1 | 4 | Seal (Return unused parts to CMO) |
| 471 64A H45 | 12 | Shim (Return unused parts to CMO) |
| 1285 283 H1 | 10 | Shim (Return unused parts to CMO) |
| 1285 284 H1 | 2 | Shim (Return unused parts to CMO) |
| Distributor supplied shop items: | | |
| 1400 102 H91 | 17.4 gal | Oil Hydraulic./Transmission Fluid (Required if the chains must be changed) |
| 159 907 | As Req'd | Gasket Compound |

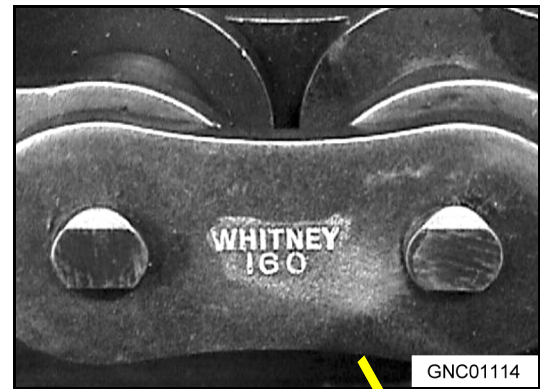
1. Park the grader on a level place, set the parking brake and place the moldboard on the ground.
2. Thoroughly clean the tandem cases and wheel areas.
3. Remove the top cover plates from the four corners of the tandems.



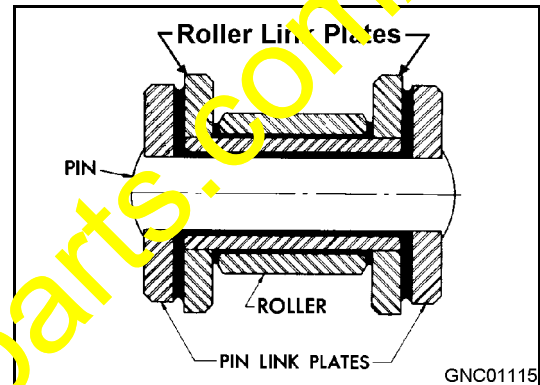
4. With a flashlight and mirror look at the chain side plate marking. If it is "Whitney 160" proceed to step 6.
5. If it is anything else you have completed this field campaign. Go to step 24.

Remark

Record what the chain marking are for all four chains and submit this information with the claim paper work. You must have this information recorded for your campaign to be processed and paid.



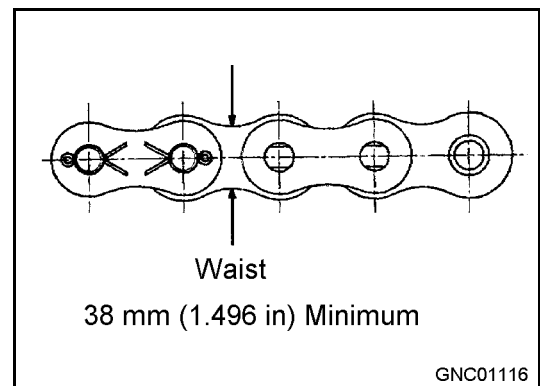
6. Identify the link chain roller side plates. The link stipulates are the inside



7. Measure the waist width of a typical link plate through all 4 cover plates with a vernier caliper. If the waist width is under 38 mm (1.496 in), this machine must have that tandem case chain changed. Proceed to step 11.
8. If the chain waist dimension is over 38 mm (1.496 in) you are done with this campaign. Go to step 24.

Remark

Record the waist width measurements on the claim for each chain (4). You must have this dimension recorded for your claim to be processed and paid.



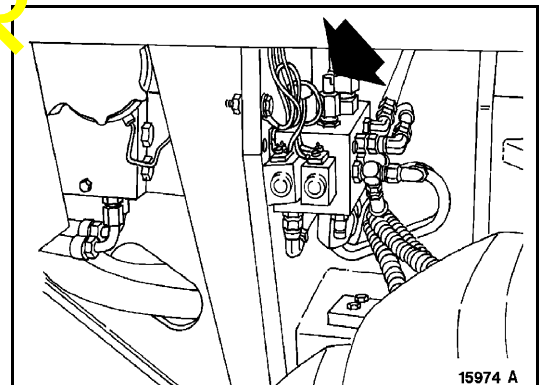
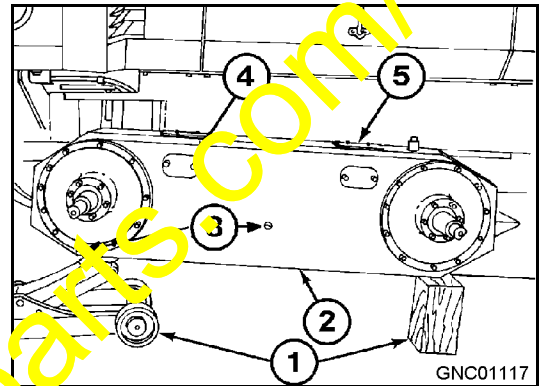
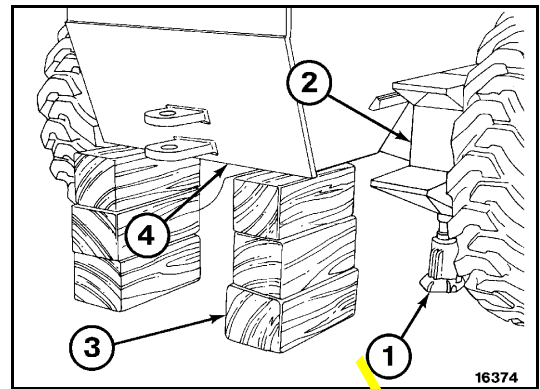
REPLACING THE CHAIN

9. Park grader where both tandems and all four rear tires are within reach of a 2 Ton lifting device. Position moldboard crossways under grader resting solidly on ground.
10. Place a 10 Ton jack (1) under the rear of each tandem case (2). Place adequate blocking or support stand (3) under the rear of the frame (4) to support unit when jacks are removed.
11. Place adequate shoring under the tandem cases to support the machine with the 4 rear tires off the ground. Remove jacks.

Remark

With heel of moldboard positioned in front of rear tires, extending one lift cylinder at a time will also tend to raise the rear of the frame, to place blocking under it. DO NOT support grader with moldboard.

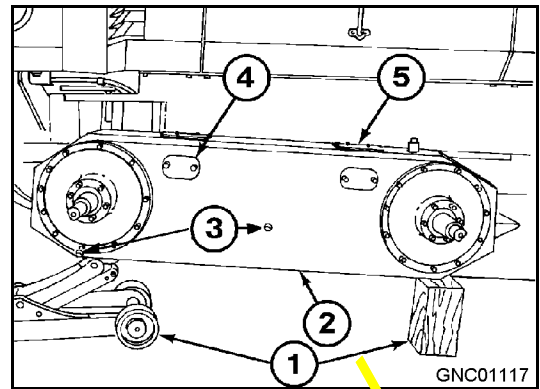
12. Before shutting the engine down release the parking brake. At the junction block, turn the needle valve (arrow) to lock fluid in the parking brake circuit to keep the brake released. Do not forget to reopen the valve upon completion of this work.
13. Lockout the machine so it cannot be started. Shutdown engine. Disconnect (-) negative battery cables from batteries to prevent accidental starting of unit.



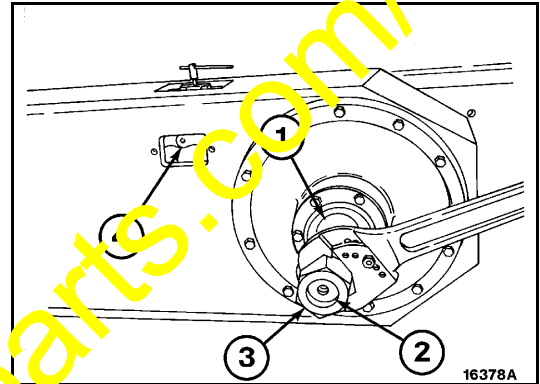
14. Remove level check plugs (3) to drain fluid from the side of the case. Examine magnets to see if there is a normal amount of metal filings from the break-in hours of this grader.

Remark

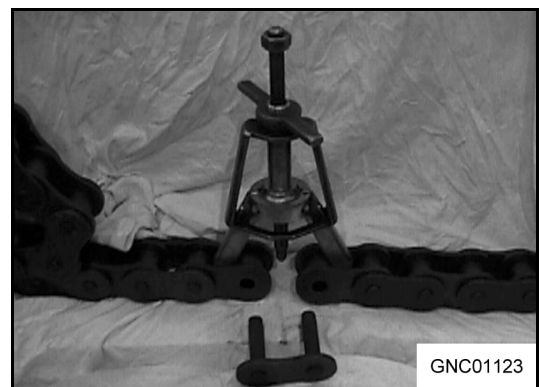
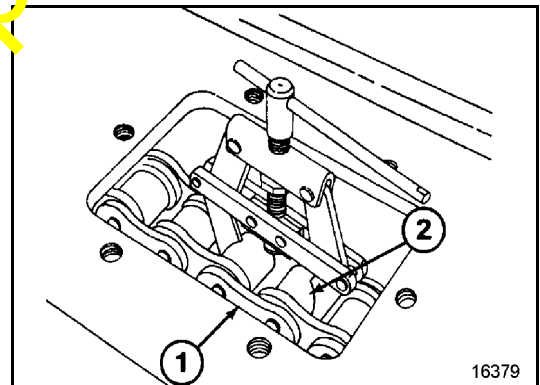
Tandem case holds approximately 32.9 L (8.7 gal).



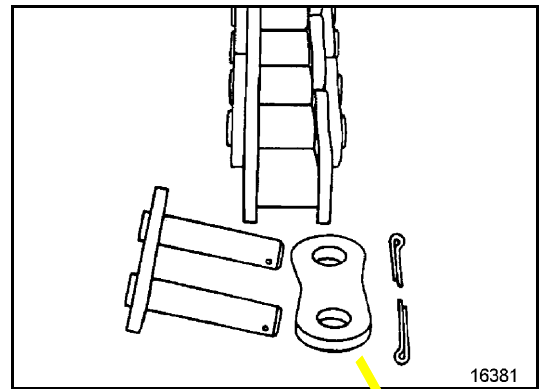
15. Remove the eight side plate covers (4) from tandem cases from the ends that must have the chain replaced. Rotate axle assembly until the master link (4) is accessible through side access hole.



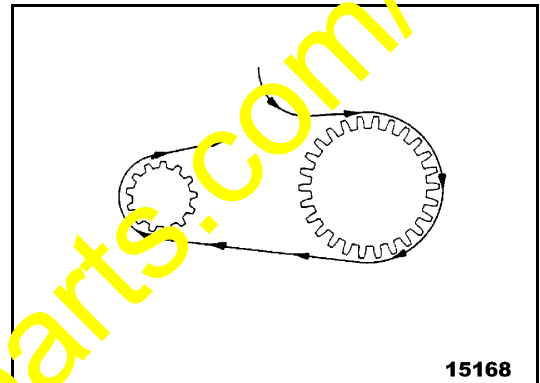
16. Remove master link (1) from chain (2)
17. Repeat step 15 & 16 procedure, removing the remaining chain sections that must be replaced. (All chain sections that are not 38 mm (1.496 in) minimum waist width must be changed)



18. Examine the chain rollers. All should roll freely. If they do not roll freely and there was an excessive amount of iron fillings on the magnetic plugs, you are authorized to replace the axle shaft bearings. Proceed to step 27.



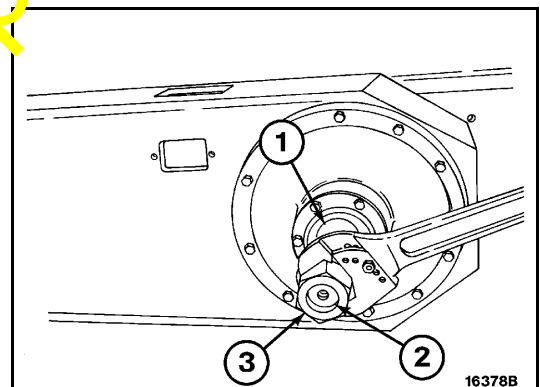
19. If all rollers roll free, replace the chains.
20. Install chains into tandem case by lowering them over the axle sprockets and bringing them up over final drive sprockets



21. Rotate axle assembly until master link can be installed through side access hole.
22. Draw both ends of chain together using chain puller.

Remark

Rotating the final drive input shaft will position chain so that master link may be installed through side access hole.

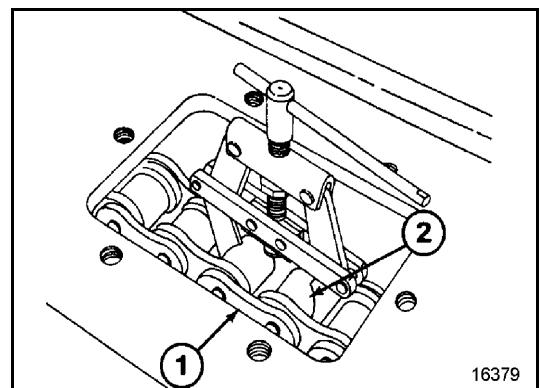


23. Install master link (1) in chain (2) with cotter pin side towards the sides of the case.

Remark

The Link Plate is a drive fit. Do not enlarge the link plate holes.

24. Install gasket P/N 1431 923 H1. Place a bead of gasket compound P/N 159 907 around the threads of the mount bolts. Install the bolts and cover plate.



 Bolts: 37.9 Nm (28 lbf ft)

You have completed this field campaign.

25. Sprockets should be checked for evidence of chain climbing on the teeth. If an excessive amount of climbing is noticeable, If they show signs of mushrooming or severe side plate wear you are authorized to change the sprockets.

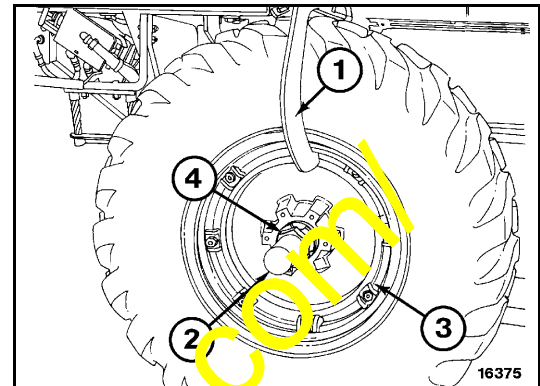
DISASSEMBLY OF WHEELS AXLE ASSEMBLIES

26. Remove axle nut and washer from axle.

Remark

If the grader is equipped with wheel weights, they should be removed to help gain access to the axle nut.

Using tire tongs, sling tire (1). Install wheel knocker tool (2) on axle (4). Strike wheel knocker tool with hammer to free wheel (3) from taper of axle.



Remark

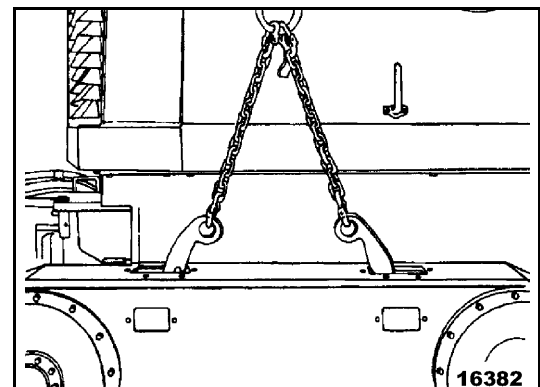
Make sure that wheel knocker tool is tight against end of axle while hitting it with hammer. If the knocker is not tight, the axle threads will absorb the impact causing possible damage to them. Placing a small washer between the end of the axle and wheel knocker tool will help ensure that the knocker is against the axle. See Section 2, of shop manual section F-11.80K Special Tools for manufacturing details of wheel knocker tool.

Tire must have solid contact with the ground. This can be accomplished by pivoting the tandem case with a jack.

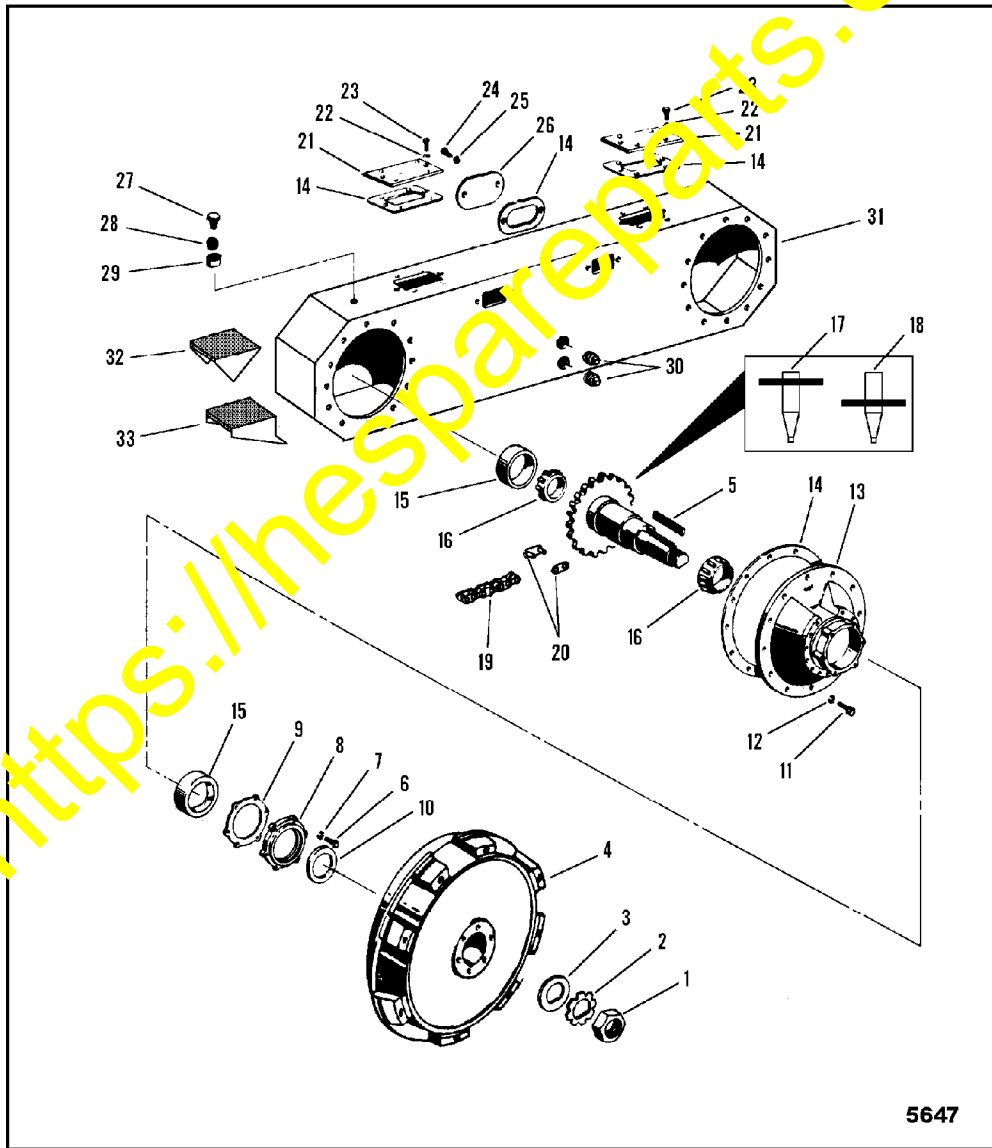
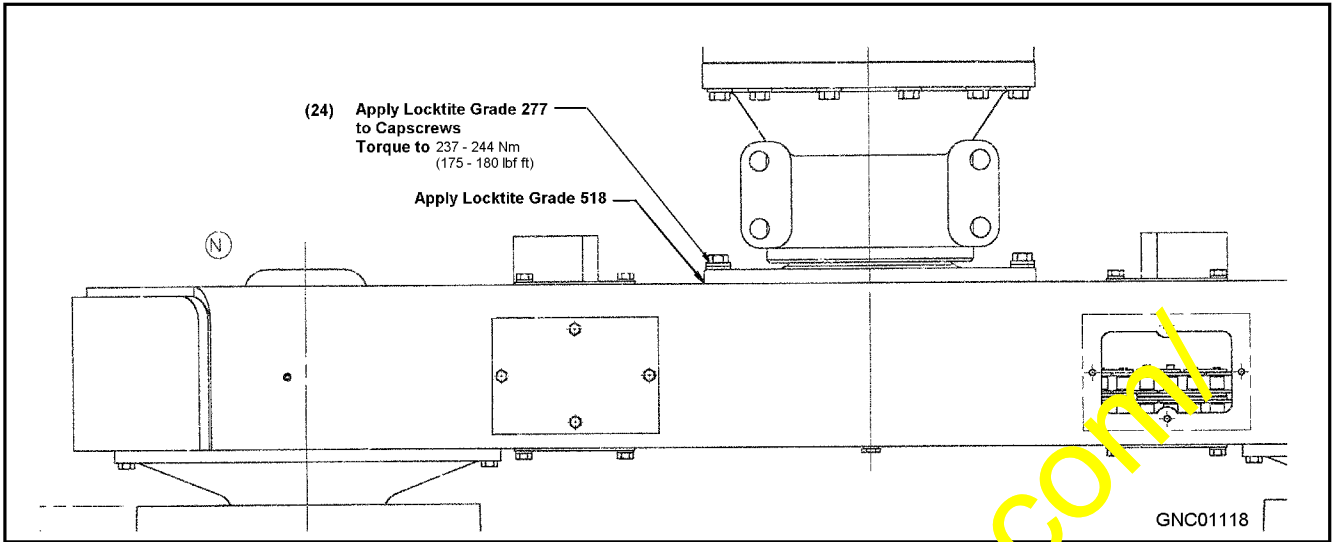
27. Repeat this procedure for remaining wheel and tire assemblies. Mark all locations of tires for reassembly.
28. After wheel is free from the tapered portion of the axle, carefully remove the wheel knocker tool, key and tire from axle.
29. Since the bearings must be replaced, it is easier to lay the tandem case flat to reset the bearings.
30. Insert chain through the top cover plate holes.
31. Remove the (24) bolts on tandem case.

Remark

Each tandem case mount bolt must have 2 washers on the bolt. Remember when re-installing the tandem case.



32. Lay tandem case flat on blocks.



33. Remove six bolts (6) and hardened washers (7), bearing retainer (8) and shims (9) from tandem housing (13). Remove oil seal (10) from retainer if necessary.
34. Remove twelve prevailing-torque bolts (11) and hardened washers (12) and tandem housing (13) from tandem case weldment (31). Remove outer bearing cup (15) from tandem housing if necessary.
35. Using axle lifting tool, remove axle and sprocket weldment (17 and/or 18) from tandem case weldment (31). Remove two bearing cones (16) from axle if necessary.

Remark

See Section 2, *Special Tools* for manufacturing details of axle lifting tool.

CLEANING AND INSPECTION

36. Clean all metal parts thoroughly using a suitable cleaning fluid. It is recommended that parts be immersed in cleaning fluid and moved up and down slowly until all oils, lubricants, and/or foreign materials are dissolved and parts are thoroughly clean.



WARNING! Care should be exercised to avoid inhalation of vapors, exposure to skin and creating fire hazards when using solvent type cleaners.

37. Inspect bores and bearing surfaces of cast parts and machined surfaces for scratches, wear, grooves and dirt. Remove any scratches and burrs with crocus cloth. Remove foreign matter. Replace any parts that are deeply grooved or scratched which would affect their operation.
38. Freeze 4 of the bearing cups. Drive the inner bearing cup (15) in tandem case weldment (31), Insure that it is completely seated.
39. Heat two bearing cones (16) in warm oil (Max. temperature 121 - 149° C [250 - 300° F]). After bearings are thoroughly heated, install them on axle sprocket weldment (17 and/or 18). When bearing cones have cooled, use a suitable driver to ensure that they are properly seated.
40. Using axle lifting tool, position axle and sprocket weldment (17 and/or 18) in tandem case weldment (31).

Remark

See service manual 1-1180K Section 2, *Special Tools* for manufacturing details of axle tool.

41. Prime and coat mating surfaces of tandem housing (13) and tandem case weldment (31) with Lactate 518. Secure housing to case with twelve hardened washers (12) and prevailing-torque bolts (11).



Bolts: 94.9 Nm (70 lbf ft)

Remark

Thoroughly clean surface to be sealed with degreasing solvent. Apply primer "N" (spray can-accelerator) liberally to one surface to shorten curing time. Apply gasket-sealant as required to other surface. Assemble without excessive lateral movement.

42. Install outer bearing cup (15) in tandem housing (13), if removed at disassembly.


43. To obtain proper preload of bearings, position a 1.524 mm (0.060 in) thick shim pack and wheel bearing retainer (8) in tandem housing (13) (Do not install oil seal). Install three hardened washers (7) and bolts (6) 120° apart and torque evenly, while turning axle and sprocket in both directions to be sure bearings are seated properly.

 **N·m** Bolts: 94.9 Nm (70 lbf ft)

Remark

Shims come in 0.030 in (CORAL), 0.015 in (PINK), 0.005 in (BLUE), 0.003 in (GREEN) and 0.002 in (RED) sizes. If combination of these shims do not match the desired thickness, go to the closest, higher combination.

44. Install axle rolling torque tool on end of axle shaft. Then using a dial indicator torque wrench measure the rolling torque.

 **N·m** Rolling torque **must be** 3.4 - 4.5 Nm (30 - 40 lbf in)

Remark

Do not use a clicker type torque wrench.

Remark

See "Special Tools" for manufacturing details of axle sprocket rolling torque tool. See service manual F-11.80K Section 2.

45. If rolling torque is not within limits, add or subtract shims to shim pack to obtain proper rolling torque.
46. Remove two bolts (6), hardened washers (7) and retainer (8) from housing (13) after shim pack value is determined.
47. Install oil seal (10) into retainer (8). Position shim pack (9) (Determined in Step 48) and wheel bearing retainer (8) on tandem housing (13). Install six hardened washers (7) and bolts (6).

 **N·m** Bolts: 94.9 Nm (70 lbf ft)

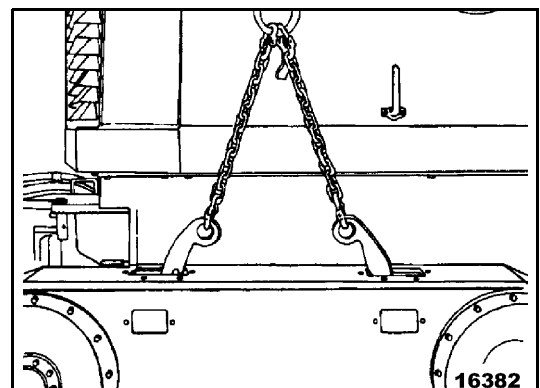
48. Repeat the bearing setting process above for each of the three remaining wheels.

INSTALLATION

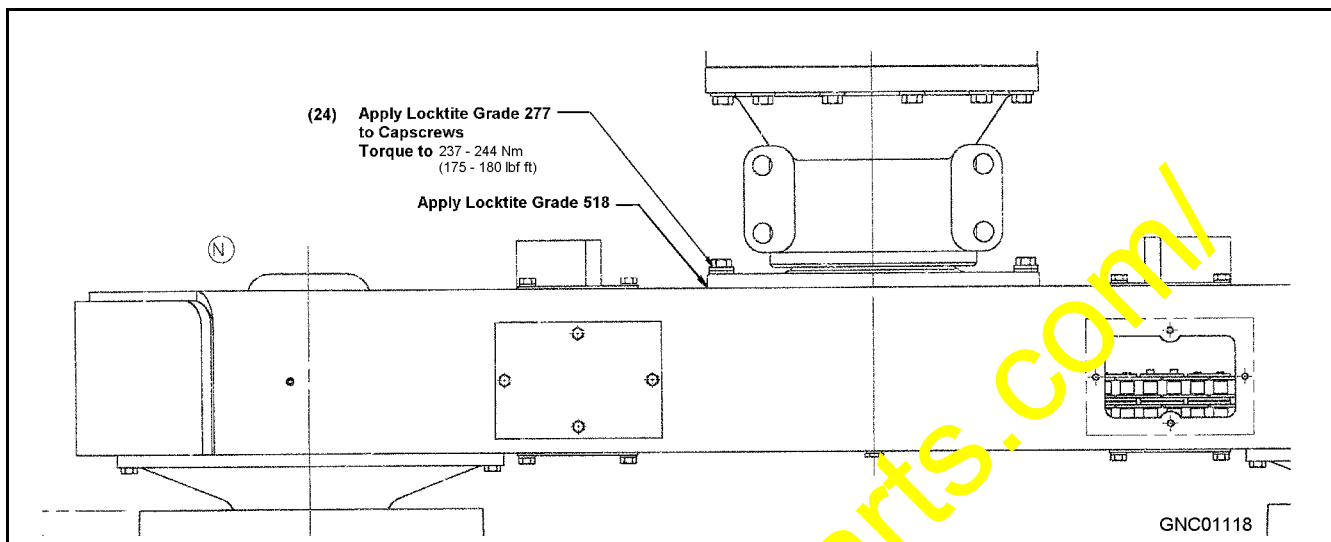
49. Prepare mating surfaces of tandem case (1), and final drive with Loctite 518, following manufacturer's directions.

Remark

Thoroughly clean surface to be sealed with degreasing solvent. Apply primer "N" (spray can-accelerator) liberally to one surface to shorten curing time. Apply gasket-sealant as required to other surface. Assemble without excessive lateral movement.



50. Apply Loctite 518 to all bolt threads. Install seven of the hardened washers and bolts (two washers per bolt) that secure the final drive and tandem case together, into the tandem-mounting sleeve. With the seven bolts in a row, rotate the sleeve until they are located at the top of the sleeve under the frame.



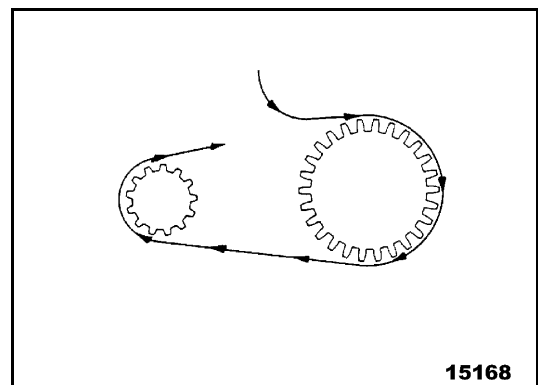
51. Using a 2-Ton lifting device, sling tandem case as shown above.
 52. Position the tandem case against the final drive assembly, aligning the sleeve with the case. Install the remaining seventeen hardened washers and bolts to secure tandem to final drive.

 **N·m** 24 bolts: 203.4 Nm (150 lbf ft)



WARNING! Position jacks under tandem case to prevent rocking.

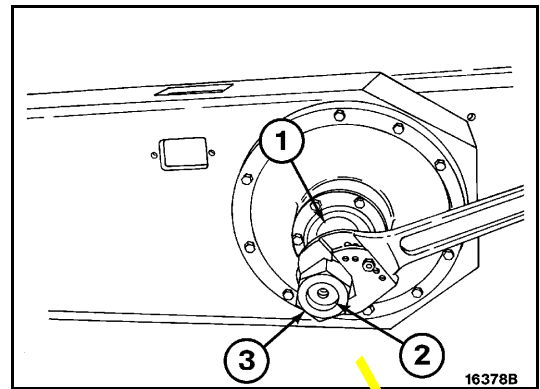
53. Install chains into tandem case by lowering them over the axle sprockets and bringing them up over final drive sprockets



54. Position two washers (1) on axle (2).
55. Install two axle nuts (3) and rotate axle assembly until master link can be installed through side access hole.
56. Draw both ends of chain together using chain puller.

Remark

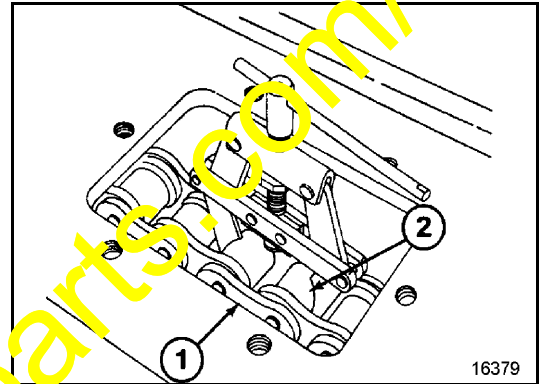
Rotating the final drive input shaft will position chain so that master link may be installed through side access hole.



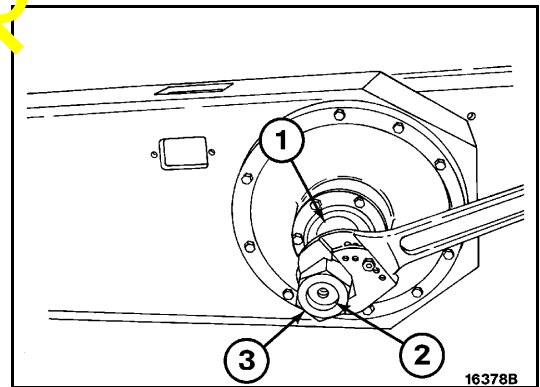
57. Install master link (1) in chain (2) with cotter pin side towards sides of tandem case.

Remark

The Link Plate is a drive fit. Do not enlarge the link plate Holes.



58. Remove axle nuts (3) and washers (1) from axle (2).

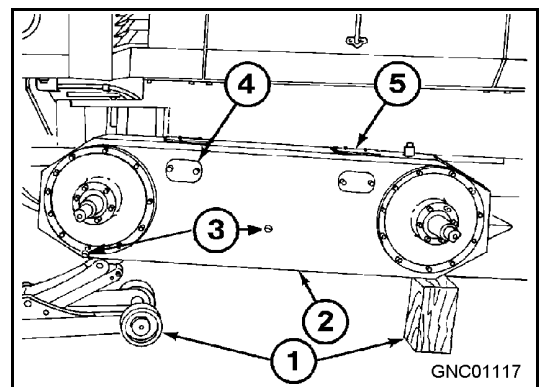


59. Install four side access hole covers (4) and two top access hole covers (5) on tandem case.

Remark

Seal access covers with Loctite 518, following manufacturer's instructions.

60. Be sure drain plug (3) is securely in place and fill tandem case (2) with 32.9 L (8.7 gal) of oil.

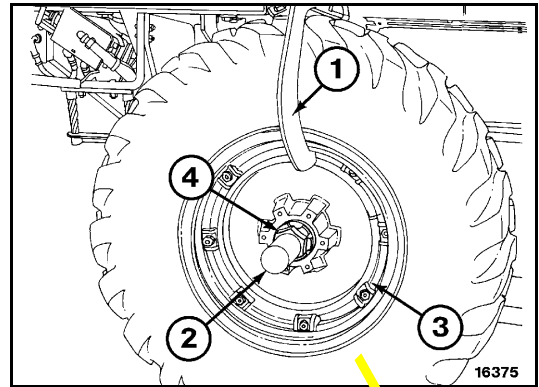



Remark

Apply Loctite 592, to drain plug and oil level plug.

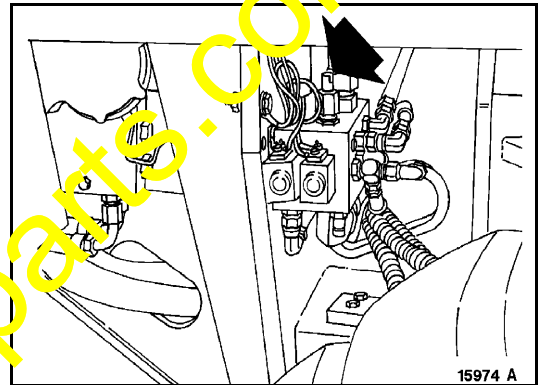
61. Leave jack and blocking (1) under tandem case.

62. Using tire tongs, sling tire. Position wheel (1) on axle (2). Align keyways and install key. Install washer (3), lock washer (4) and axle nut (5) on axle.




 **N·m** Torque axle nuts: 2643.8 Nm (1950 lbf ft)

63. The unit must be roaded, then the nuts must be torqued again to ensure proper setting of tapers.
 64. Remove blocking from under unit once the remaining tandem and tires are installed.
 65. At the junction block, turn the needle valve (arrow) to **unlock** the locked fluid in the parking brake circuit that was used to keep the brake released that was done in step 14.



66. Perform "Road Testing" at this time.

 **N·m** Re-torque axle nuts: 2643.8 Nm (1950 lbf ft)

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