SERVICE MANUAL

Wheel Loader

LW110.B

6-72402NA

1. Trim along dashed line.
2. Slide into pocket on Binder Spine.

TYPE 1-4

SERVICE MANUAL
Wheel Loader
LW110.B
6-72402NA
1. Trim along dashed line.
2. Slide into pocket on Binder Spine.
TYPE 1-4

SERVICE MANUAL
Wheel Loader
LW110.B
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SERVICE MANUAL
Wheel Loader
LW110.B
6-72402NA
1. Trim along dashed line.
2. Slide into pocket on Binder Spine.
TYPE 1-4

LW 110.B Wheel Loader Service Manual

6-72402

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NEW HOLLAND CONSTRUCTION, LLC.
500 EIGHTH AVENUE
CAROL STREAM, IL 60188 U.S.A.

Issued October, 2003/Revised September, 2004

LW 110.B Wheel Loader
Service Manual
6-72402

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6-72402

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NOTE: New Holland Construction LLC reserves the right to make improvements in design or changes in specifications at any time without incurring any obligation to install them on units previously sold.

NEW HOLLAND CONSTRUCTION, LLC.
245 E NORTH AVENUE
CAROL STREAM, IL 60188 U.S.A.

Issued October, 2003/Revised September, 2004

SECTION INDEX

GENERAL

NEW HOLLAND CONSTRUCTION, LLC.
245 E NORTH AVENUE
CAROL STREAM, IL 60188 U.S.A.

Section 1001

GENERAL TORQUE SPECIFICATIONS

CNH America LLC.
245 E NORTH AVENUE
CAROL STREAM, IL 60188 U.S.A.

Bur 6-49790

Printed in U.S.A.
Issued January, 2004

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TORQUE SPECIFICATIONS - DECIMAL HARDWARE

Use the torques in this chart when special torques are not given. These torques apply to fasteners with both UNC and UNF threads as received from suppliers dry, or when lubricated with engine oil. Not applicable if special graphities, Molydisulfide greases, or other extreme pressure lubricants are used.

Grade 5 Bolts, Nuts, and Studs

Size	Pound-Inches	Newton metres
1/4 inch	108 to 132	12 to 15
5/16 inch	204 to 252	23 to 28
3/8 inch	420 to 504	48 to 57
Size	Pound-Feet	Newton metres
7/16 inch	54 to 64	73 to 87
1/2 inch	80 to 96	109 to 130
9/16 inch	110 to 132	149 to 179
5/8 inch	150 to 180	203 to 244
3/4 inch	270 to 324	366 to 439
7/8 inch	400 to 480	542 to 651
1.0 inch	580 to 696	787 to 944
1-1/8 inch	800 to 880	1085 to 1193
1-1/4 inch	1120 to 1240	1519 to 1681
1-3/8 inch	1460 to 1680	1980 to 2278
1-1/2 inch	1940 to 2200	2631 to 2983

Grade 8 Bolts, Nuts, and Studs

Size	Pound-Inches	Newton metres
1/4 inch	144 to 180	16 to 20
5/16 inch	288 to 348	33 to 39
3/8 inch	540 to 648	61 to 73
Size	Pound-Feet	Newton metres
7/16 inch	70 to 84	95 to 114
1/2 inch	110 to 132	149 to 179
9/16 inch	160 to 192	217 to 260
5/8 inch	220 to 264	298 to 358
3/4 inch	380 to 456	515 to 618
7/8 inch	600 to 720	814 to 976
1.0 inch	900 to 1080	1220 to 1465
1-1/8 inch	1280 to 1440	1736 to 1953
1-1/4 inch	1820 to 2000	2468 to 2712
1-3/8 inch	2380 to 2720	3227 to 3688
1-1/2 inch	3160 to 3560	4285 to 4827

NOTE: *Use thick nuts with Grade 8 bolts.*

TORQUE SPECIFICATIONS - METRIC HARDWARE

Use the following torques when specifications are not given.

These values apply to fasteners with coarse threads as received from supplier, plated or unplated, or when lubricated with engine oil. These values do not apply if graphite or Molydisulfide grease or oil is used.

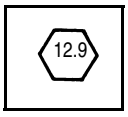
Grade 8.8 Bolts, Nuts, and Studs

Size	Pound-Inches	Newton metres
M4	24 to 36	3 to 4
M5	60 to 72	7 to 8
M6	96 to 108	11 to 12
M8	228 to 276	26 to 31
M10	456 to 540	52 to 61
Size	Pound-Feet	Newton metres
M12	66 to 79	90 to 107
M14	106 to 127	144 to 172
M16	160 to 200	217 to 271
M20	320 to 380	434 to 515
M24	500 to 600	675 to 815
M30	920 to 1100	1250 to 1500
M36	1600 to 1950	2175 to 2600

Grade 10.9 Bolts, Nuts, and Studs

Size	Pound-Inches	Newton metres
M4	36 to 48	4 to 5
M5	84 to 96	9 to 11
M6	132 to 156	15 to 18
M8	324 to 384	37 to 43
Size	Pound-Feet	Newton metres
M10	54 to 64	73 to 87
M12	93 to 112	125 to 150
M14	149 to 179	200 to 245
M16	230 to 280	310 to 380
M20	450 to 540	610 to 730
M24	780 to 940	1050 to 1275
M30	1470 to 1770	2000 to 2400
M36	2580 to 3090	3500 to 4200

Grade 12.9 Bolts, Nuts, and Studs



Usually the torque values specified for grade 10.9 fasteners can be used satisfactorily on grade 12.9 fasteners.

TORQUE SPECIFICATIONS - STEEL HYDRAULIC FITTINGS

Tube OD Hose ID	Thread Size	Pound-Inches	Newton metres
37 Degree Flare Fitting			
1/4 inch 6.4 mm	7/16-20	72 to 144	8 to 16
5/16 inch 7.9 mm	1/2-20	96 to 192	11 to 22
3/8 inch 9.5 mm	9/16-18	120 to 300	14 to 34
1/2 inch 12.7 mm	3/4-16	180 to 504	20 to 57
5/8 inch 15.9 mm	7/8-14	300 to 696	34 to 79
Tube OD Hose ID	Thread Size	Pound-Inches	Newton metres
3/4 inch 19.0 mm	1-1/16-12	40 to 80	54 to 108
7/8 inch 22.2 mm	1-3/16-12	60 to 100	81 to 135
1.0 inch 25.4 mm	1-5/16-12	75 to 117	102 to 158
1-1/4 inch 31.8 mm	1-5/8-12	125 to 165	169 to 223
1-1/2 inch 38.1 mm	1-7/8-12	210 to 250	285 to 338

Tube OD Hose ID	Thread Size	Pound-Inches	Newton metres
Straight Threads with O-ring			
1/4 inch 6.4 mm	7/16-20	144 to 228	16 to 26
5/16 inch 7.9 mm	1/2-20	192 to 300	22 to 34
3/8 inch 9.5 mm	9/16-18	300 to 480	34 to 54
1/2 inch 12.7 mm	3/4-16	540 to 804	57 to 91
Tube OD Hose ID	Thread Size	Pound-Inches	Newton metres
5/8 inch 15.9 mm	7/8-14	58 to 92	79 to 124
3/4 inch 19.0 mm	1-1/16-12	80 to 128	108 to 174
7/8 inch 22.2 mm	1-3/16-12	100 to 160	136 to 216
1.0 inch 25.4 mm	1-5/16-12	117 to 187	159 to 253
1-1/4 inch 31.8 mm	1-5/8-12	165 to 264	224 to 357
1-1/2 inch 38.1 mm	1-7/8-12	250 to 400	339 to 542

Split Flange Mounting Bolts		
Size	Pound-Inches	Newton metres
5/16-18	180 to 240	20 to 27
3/8-16	240 to 300	27 to 34
7/16-14	420 to 540	47 to 61
Size	Pound-Feet	Newton metres
1/2-13	55 to 65	74 to 88
5/8-11	140 to 150	190 to 203

TORQUE SPECIFICATIONS - STEEL HYDRAULIC FITTINGS

Nom. SAE Dash Size	Tube OD	Thread Size	Pound-Inches	Newton metres	Thread Size	Pound-Inches	Newton metres
O-ring Face Seal End					**O-ring Boss End Fitting or Lock Nut**		
-4	1/4 inch 6.4 mm	9/16-18	120 to 144	14 to 16	7/16-20	204 to 240	23 to 27
-6	3/8 inch 9.5 mm	11/16-16	216 to 240	24 to 27	9/16-18	300 to 360	34 to 41
-8	1/2 inch 12.7 mm	13/16-16	384 to 480	43 to 54	3/4-16	540 to 600	61 to 68
					Thread Size	Pound-Inches	Newton metres
-10	5/8 inch 15.9 mm	1-14	552 to 672	62 to 76	7/8-14	60 to 65	81 to 88
Nom. SAE Dash Size	Tube OD	Thread Size	Pound-Inches	Newton metres	1-1/16-12	85 to 90	115 to 122
					1-3/16-12	95 to 100	129 to 136
-12	3/4 inch 19.0 mm	1-3/16-12	65 to 80	90 to 110	1-5/16-12	115 to 125	156 to 169
-14	7/8 inch 22.2 mm	1-3/16-12	65 to 80	90 to 110	1-5/8-12	150 to 160	203 to 217
-16	1.0 inch 25.4 mm	1-7/16-12	92 to 105	125 to 140	1-7/8-12	190 to 200	258 to 271
-20	1-1/4 inch 31.8 mm	1-11/16-12	125 to 140	170 to 190			
-24	1-1/2 inch 38.1 mm	2-12	150 to 180	200 to 254			

Section 1002

FLUIDS AND LUBRICANTS

NEW HOLLAND CONSTRUCTION, LLC.
245 E NORTH AVENUE
CAROL STREAM, IL 60188 U.S.A.

Bur 6-72451

Issued October, 2003 Revised September, 2004

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CAPACITIES AND LUBRICANTS

Engine Oil
- Capacity with Filter Change ..... 11.3 litres (12 U.S. quarts)
- Type of oil ..... New Holland AMBRA Mastergold HSP engine oil

Engine Cooling System
- Capacity ..... 21.8 litres (23 U.S. quarts)
- Type of Coolant ..... Ethylene glycol and water mixed for lowest ambient temperature (at least 50/50 mix)

Fuel Tank
- Capacity ..... 189 litres (50 U.S. gallons)
- Type of Fuel ..... See Diesel fuel specifications

Hydraulic System
- Hydraulic Reservoir Refill Capacity with Filter Change ..... 68.5 litres (18 U.S. gallons)
- Total System Capacity ..... 113.6 litres (30 U.S. gallons)
- Type of Oil ..... New Holland AMBRA Master-Tran

Transmission
- Total System Capacity ..... 26 litres (6.87 U.S. gallons)
- Refill Capacity with Filter Change ..... 18.9 litres (20.0 U.S. quarts)
- Type of Oil ..... New Holland AMBRA Master-Tran

Axles
- Front Axle Capacity ..... 22 litres (23.2 U.S. quarts)
- Rear Axle Capacity ..... 23.2 litres (24.5 U.S. quarts)
- Type of Lubricant ..... New Holland AMBRA TRX Transaxle Fluid, 80W-140
- Capacity ..... 2.1 litres (2.25 U.S. quarts)
- Type of Lubricant ..... New Holland AMBRA Limited Slip Additive

Brake System
- Type of Fluid (Same as Hydraulic System) ..... New Holland AMBRA Master-Tran

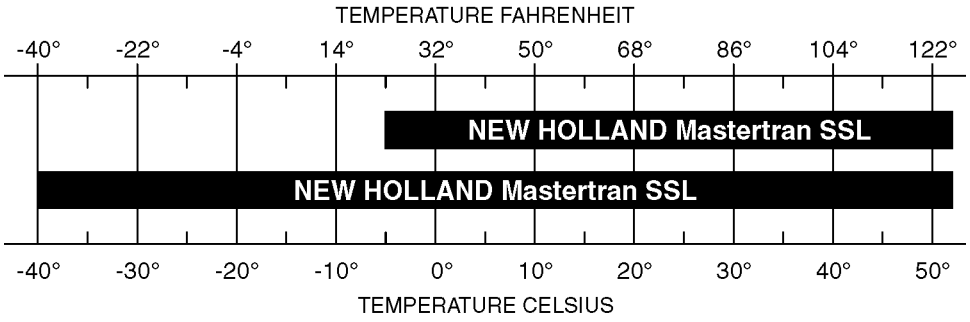
NOTE: *DO NOT use an alternate oil in the axles. The brake components in the axles could be damaged as a result of using an alternate oil.*

CONVERSION FORMULAS

Imperial quart = litres x 0.879877

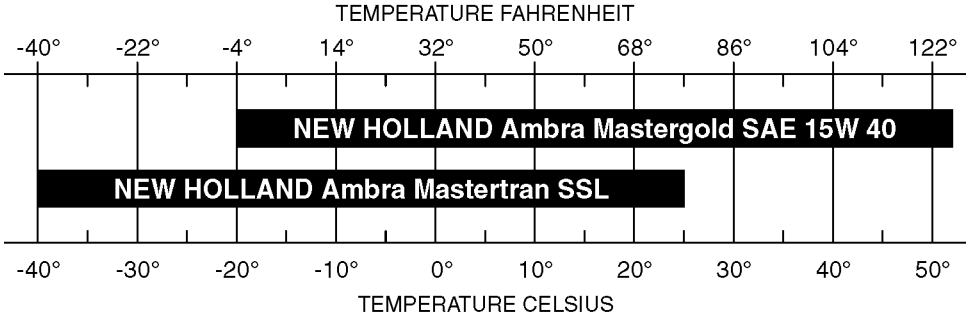
Imperial gallons = litres x 0.219969

HYDRAULIC OIL TEMPERATURE CHART



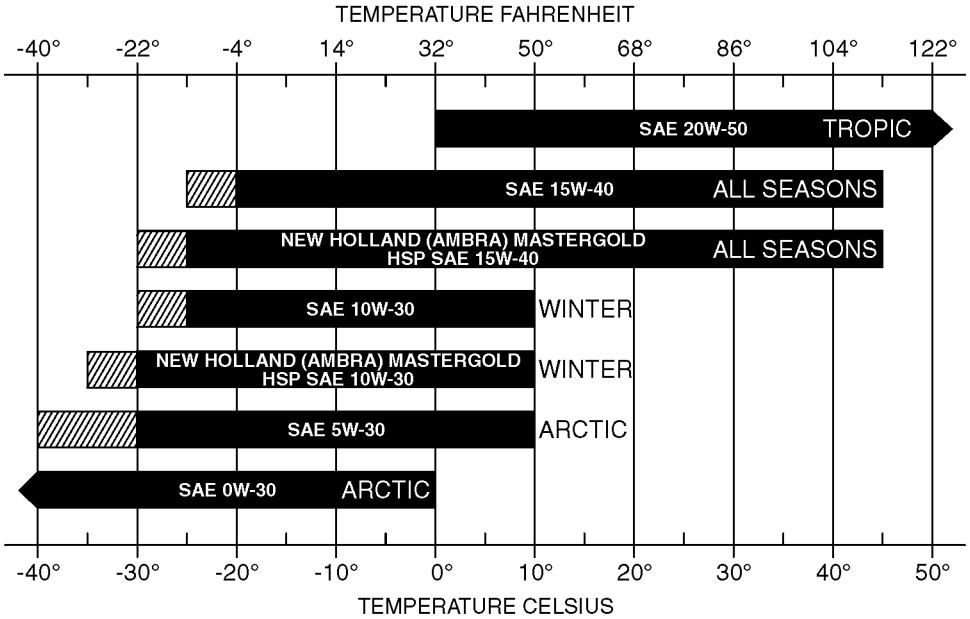
BC04F191

TRANSMISSION OIL TEMPERATURE CHART



BC04F194

ENGINE OIL TEMPERATURE CHART



Indicates the use of an Engine Oil Heater or a Jacket Water Heater is required.

BC04F170

ENGINE OIL RECOMMENDATIONS

New Holland AMBRA Engine oil is recommended for use in your New Holland engine. New Holland AMBRA Engine Oil will lubricate your engine correctly under all operating conditions.

If New Holland AMBRA Multi-Viscosity or Single Grade Engine Oil is not available, use only oil meeting API engine oil service category CH.

RH99K130

NOTE: *Do not put performance additives or other oil additive products in the engine crankcase. The oil change intervals given in this manual are according to tests with New Holland lubricants.*

DIESEL FUEL SYSTEM

Use No. 2 diesel fuel in the engine of this machine. The use of other fuels can cause the loss of engine power and high fuel consumption.

In very cold temperatures, a mixture of No. 1 and No. 2 diesel fuels is temporarily permitted. See the following Note.

NOTE: *See your fuel dealer for winter fuel requirements in your area. If the temperature of the fuel lowers below the cloud point (wax appearance point), wax crystals in the fuel will restrict the fuel filter and cause the engine to lose power or not start.*

The diesel fuel used in this machine must meet the specifications as shown below in, “Specifications for Acceptable No. 2 Diesel Fuel”, or “Specification D975-81” of the American Society for Testing and Materials.

Fuel Storage

If you keep fuel in storage for a period of time, you can get foreign material or water in the fuel storage tank. Many engine problems are caused by water in the fuel.

Keep the fuel storage tank outside and keep the fuel as cool as possible. Remove water from the storage container at regular periods of time.

Fill the fuel tank at the end of the daily operating period to prevent condensation in the fuel tank.

Specifications for Acceptable No. 2 Diesel Fuel

API gravity, minimum 34
Flash point, minimum .....60°C (140°F)
Cloud point (wax appearance point), maximum .....-20°C (-5°F) See Note above
Pour point, maximum .....-26°C (-15°F) See Note above
Distillation temperature, 90% point .....282 to 338°C (540 to 640°F)
Viscosity, at 38°C (100°F)
Centistokes ..... 2.0 to 4.3
Cetane number, minimum ..... 43 (45 to 55 for winter or high altitudes)
Water and sediment, by volume, maximum 0.05%

MAINTENANCE SCHEDULE

Model LW 110.B

Instructions

AS REQUIRED

22 SERVICE THE AIR CLEANER IF THE AIR CLEANER WARNING LAMP ILLUMINATES ..... SEE OPERATORS MANUAL
30 REPLACE THE TRANSMISSION FILTER
IF THE TRANSMISSION FILTER RESTRICTION WARNING LAMP ILLUMINATES.....USE NEW HOLLAND FILTER
19 CHECK THE RADIATOR COOLANT LEVEL IF THE WARNING LAMP ILLUMINATES ..... SEE OPERATORS MANUAL
6 REPLACE THE HYDRAULIC FILTER IF THE HYDRAULIC FILTER WARNING LAMP ILLUMINATES.....USE NEW HOLLAND FILTER
CHECK THE AIR CONDITIONING DRIVE TENSION (IF EQUIPPED) NOT SHOWN .....ADJUST AS REQUIRED

EVERY 10 HOURS OF OPERATION OR EACH DAY - WHICHEVER OCCURS FIRST

16 CHECK THE ENGINE OIL LEVEL..... SEE OPERATORS MANUAL

EVERY 50 HOURS OF OPERATION

1 CHECK THE COOLANT RESERVOIR FLUID LEVEL..... ETHYLENE GLYCOL AND WATER
29 CHECK THE TRANSMISSION OIL LEVEL (ENGINE RUNNING AND OIL WARM)..... SEE OPERATORS MANUAL
5 CHECK THE HYDRAULIC RESERVOIR FLUID LEVEL ..... SEE OPERATORS MANUAL
38 LUBRICATE THE BUCKET AND BELLCRANK PIVOT POINTS (10 FITTINGS) TC ..... NEW HOLLAND AMBRA GR 75 MD GREASE
39 LUBRICATE THE BELLCRANK AND BUCKET PIVOTS (6 FITTINGS) Z-BAR ..... NEW HOLLAND AMBRA GR 75 MD GREASE

EVERY 100 HOURS OF OPERATION

7 LUBRICATE THE STEERING CYLINDER PIVOTS - ROD AND CLOSED END (4 FITTINGS) . NEW HOLLAND AMBRA GR 75 MD GREASE
40 LUBRICATE THE LOADER LIFT ARM AND CYLINDER PIVOTS (7 FITTINGS) Z-BAR..... NEW HOLLAND AMBRA GR 75 MD GREASE
26 LUBRICATE THE FRONT DRIVE SHAFT SUPPPORT BEARING (1 FITTING)..... NEW HOLLAND AMBRA GR 75 MD GREASE
8 LUBRICATE THE LOADER LIFT ARM AND CYLINDER PIVOTS (14 FITTINGS) TC..... NEW HOLLAND AMBRA GR 75 MD GREASE

EVERY 250 HOURS OF OPERATION

19 CHECK THE RADIATOR COOLANT LEVEL..... ETHYLENE GLYCOL AND WATER
2 CHANGE THE ENGINE OIL AND REPLACE THE ENGINE OIL FILTER..... SEE OPERATORS MANUAL
34 CHECK THE BATTERY FLUID LEVEL..... SEE OPERATORS MANUAL
36 CHECK THE TIRE CONDITION AND AIR PRESSURE..... SEE OPERATORS MANUAL
12 CLEAN THE CAB AIR FILTERS (IF EQUIPPED) ..... SEE OPERATORS MANUAL

EVERY 500 HOURS OF OPERATION

3 REPLACE THE FUEL FILTER .....USE NEW HOLLAND FILTER
33 DRAIN WATER AND SEDIMENT FROM THE FUEL TANK ..... SEE OPERATORS MANUAL
14 REPLACE THE IN-LINE FUEL FILTER .....USE NEW HOLLAND FILTER

EVERY 1000 HOURS OF OPERATION

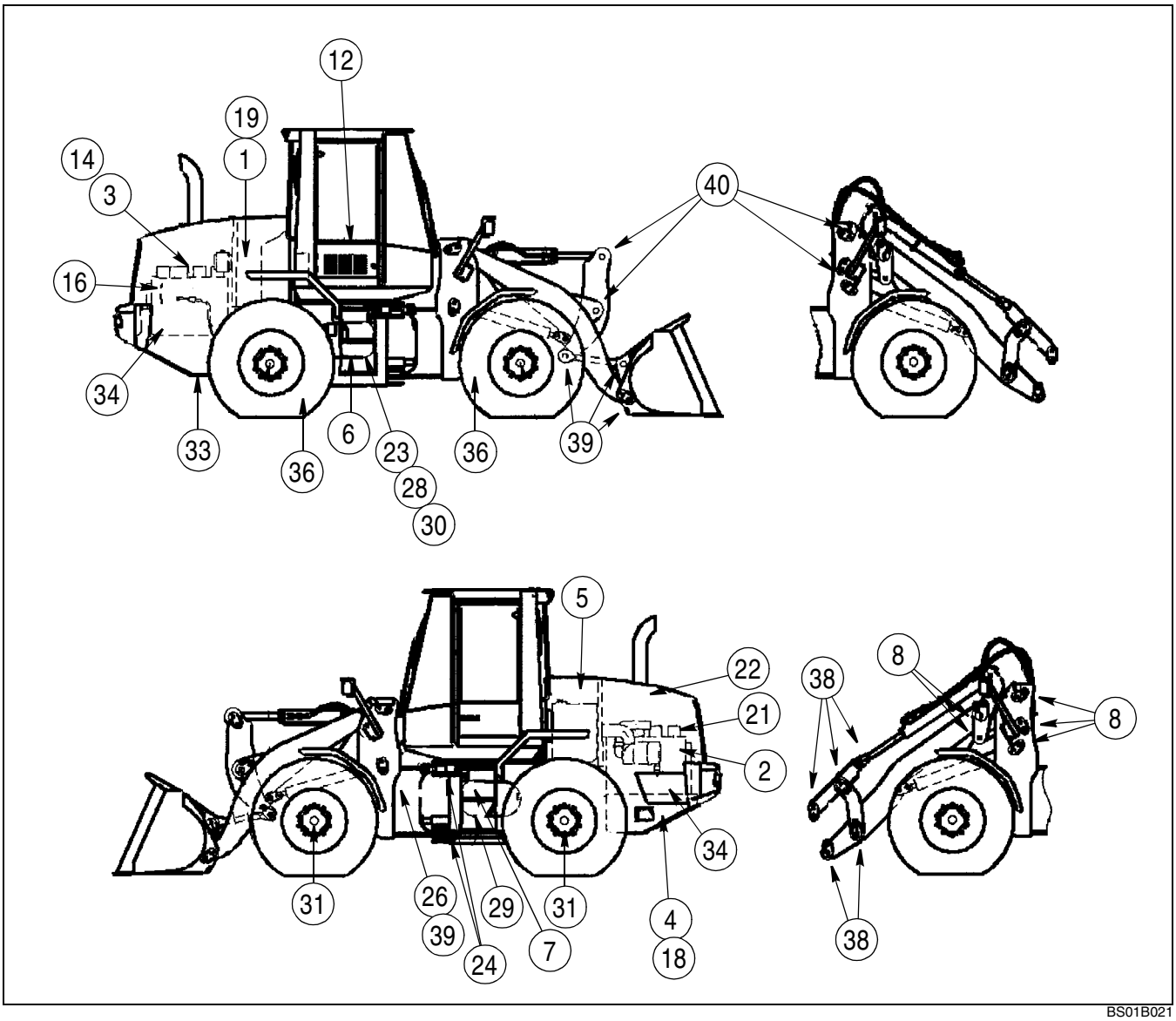
21 CHECK THE ENGINE VALVE CLEARANCES .....SEE SERVICE MANUAL
6 REPLACE THE HYDRAULIC FILTER.....USE NEW HOLLAND FILTER
30 REPLACE THE TRANSMISSION OIL FILTER .....USE NEW HOLLAND FILTER
28 CHANGE THE TRANSMISSION OIL..... SEE OPERATORS MANUAL
23 CLEAN THE TRANSMISSION BREATHER.....CLEAN WITH SOLVENT
24 LUBRICATE THE UPPER AND LOWER CHASSIS PIVOTS (2 FITTINGS)..... NEW HOLLAND AMBRA GR 75 MD GREASE
31 CHANGE THE FRONT/REAR AXLE OIL ..... SEE OPERATORS MANUAL

EVERY 2000 HOURS OF OPERATION OR EACH YEAR - WHICHEVER OCCURS FIRST

4 CHANGE THE HYDRAULIC OIL ..... SEE OPERATORS MANUAL
18 DRAIN, FLUSH AND REFILL THE ENGINE COOLING SYSTEM ..... ETHYLENE GLYCOL AND WATER
22 REPLACE THE AIR CLEANER ELEMENTS ..... USE NEW HOLLAND FILTERS

MAINTENANCE SCHEDULE

Model LW 110.B



BS01B021

See your Operators manual for maintenance of safety related items and for detailed information of the service items on this chart. Operators and service manuals are available for this machine from your dealer.

NOTES

Section
1003

METRIC CONVERSION CHART

CNH America LLC.
245 E NORTH AVENUE
CAROL STREAM, IL 60188 U.S.A.

Bur 6-49810

Printed in U.S.A.
Issued January, 2004

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CONVERSION FACTORS

Metric to U.S.

	MULTIPLY	BY	TO OBTAIN
Area:	sq. meter hectare	10.763 91 2.471 05	square foot acre
Force:	newton newton	3.596 942 0.224 809	ounce force pound force
Length:	millimeter meter kilometer	0.039 370 3.280 840 0.621 371	inch foot mile
Mass:	kilogram	2.204 622	pound
Mass/Area:	kilogram/hectare	0.000 466	ton/acre
Mass/Energy:	gr/kW/hr.	0.001 644	lbs/hp/hr.
Mass/Volume:	kg/cubic meter	1.685 555	lb/cubic yd.
Power:	kilowatt	1.341 02	horsepower
Pressure:	kilopascal bar	0.145 038 14.50385	lb/sq. inch lb/sq. inch
Temperature:	degree C	1.8 x C +32	degree F
Torque:	newton meter newton meter	8.850 748 0.737 562	lb/inch lb/foot
Velocity:	kilometer/hr.	0.621 371	miles/hr.
Volume:	cubic centimeter cubic meter cubic meter milliliter litre litre litre litre	0.061 024 35.314 66 1.307 950 0.033 814 1.056 814 0.879 877 0.264 172 0.219 969	cubic inch cubic foot cubic yd. ounce (US fluid) quart (US liquid) quart (Imperial) gallon (US liquid) gallon (Imperial)
Volume/Time:	litre/min. litre/min.	0.264 172 0.219 969	gallon/min. (US liquid) gallon/min. (Imperial)

U.S. to Metric

	MULTIPLY	BY	TO OBTAIN
Area:	square foot acre	0.092 903 0.404 686	square meter hectare
Force:	ounce force pound force	0.278 014 4.448 222	newton newton
Length:	inch foot mile	25.4 * 0.304 8 * 1.609 344 *	millimeter meter kilometer
Mass:	pound ounce	0.453 592 28.35	kilogram gram
Mass/Area:	ton/acre	2241 702	kilogram/hectare
Mass/Energy:	lb/hp/hr	608.277 4	gr/kW/hr
Mass/Volume:	lb/cubic yd.	0.593 276	kg/cubic meter
Power:	horsepower	0.745 700	kilowatt
Pressure:	lbs/sq. in. lbs/sq. in. lbs/sq. in.	6.894 757 0.069 0.070 303	kilopascal bar kg/sq. cm
Temperature:	degree F	1.8 F - 32	degree C
Torque:	pound/inch pound/foot	0.112 985 1.355 818	newton meter newton meter
Velocity:	miles/hr.	1.609 344 *	kilometer/hr.
Volume:	cubic inch cubic foot cubic yard ounce (US fluid) quart (US liquid) quart (Imperial) gallon (US) gallons (Imperial)	16.387 06 0.028 317 0.764.555 29.573 53 0.946 353 1.136 523 3.785 412 4.546 092	cubic centimeter cubic meter cubic meter milliliter litre litre litre litre
Volume/Time:	gallon/min.	3.785 412	litre/min.

* = exact

SECTION INDEX

ENGINES

NEW HOLLAND CONSTRUCTION, LLC.
245 E NORTH AVENUE
CAROL STREAM, IL 60188 U.S.A.

Section
2000

ENGINE AND RADIATOR REMOVAL AND INSTALLATION

Issued October, 2003

NEW HOLLAND CONSTRUCTION, LLC.
245 E NORTH AVENUE
CAROL STREAM, IL 60188 U.S.A.

Bur 6-72470

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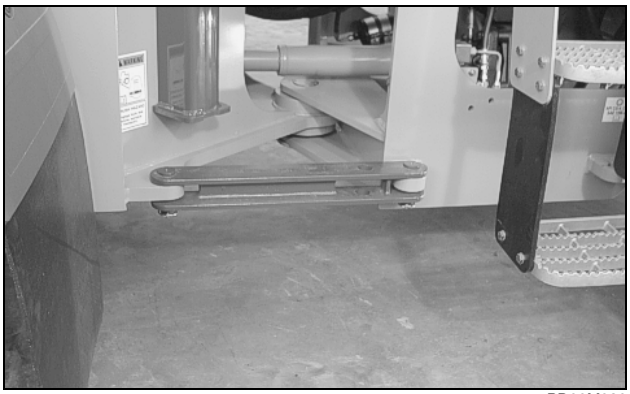
Removal

STEP 1

Park machine on a level surface and lower bucket to floor. Stop engine. Actuate brake pedal several times to discharge brake accumulators. Move loader control lever back and forth at least 30 times to release any pressure from hydraulic circuit.

STEP 2



BD00M030

Put articulation lock in LOCKED position.

STEP 3

Slowly loosen the filler cap for hydraulic reservoir to release air pressure in hydraulic reservoir.

STEP 4

Put master disconnect switch in OFF position.

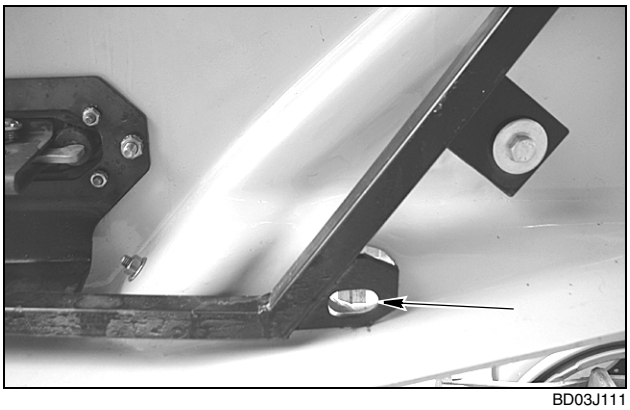
STEP 5

Disconnect battery cable from LH battery negative post. Put a plastic cap over the negative post.

STEP 6

Disconnect battery cable from RH battery positive post. Put a plastic cap over the positive post.

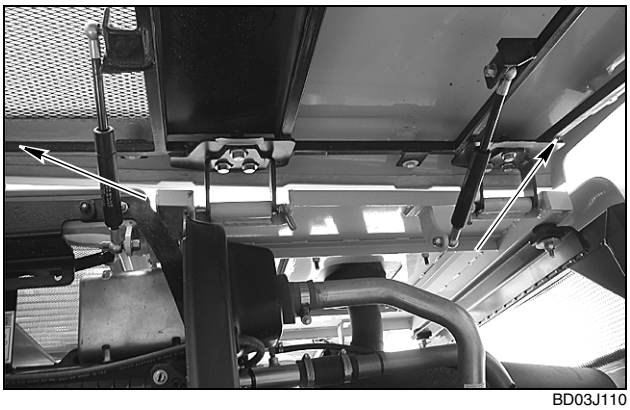
STEP 7



BD03J111

Open the engine compartment side panel, attach a lifting eye to the hole in the lower portion of the panel.

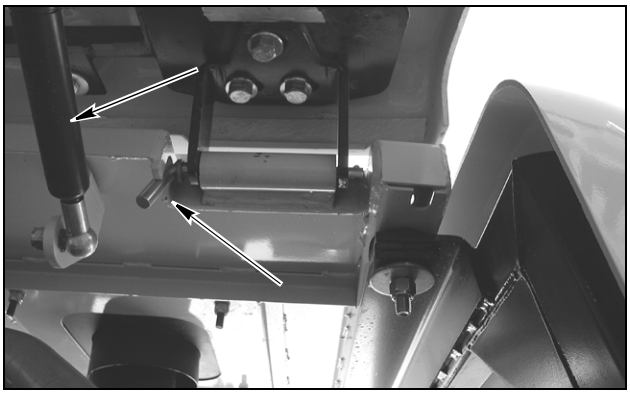
STEP 8



BD03J110

Attach lifting straps to the hinge side of the hood, attach suitable lifting equipment to the straps and take up slack in the straps.

STEP 9



BD03J112

Disconnect the gas cylinders from the side panel and hood. Remove hinge pins, remove panel from machine.