NEW HOLLAND TJ280/330/380 TJ430/480/530

REPAIR MANUAL

Book 1

Section 00 - General Information
Section 10 - Engine

NEW HOLLAND

SERVICE

87525642 2/06

Repair Manual Number 87525639

Book 1 - Publication 87525642
Section 00 - General
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Section 39 - Frames

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Section 44 - Axles, Wheels

Book 6 - Publication 87525647
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Section 55 - Electrical System, Controller

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Section 55 - Electrical System, Controller (Continued)
Section 90 - Cab, Hood, Seat

Electrical Schematic for Powershift Transmission - 87517739
Hydraulic Schematic - 87522497

NOTE: Engine repair information is not contained within this tractor Repair Manual. For engine repair, refer to appropriate engine repair manual as follows:

87515682 - For 8.3 & 9.0L 6 Cylinder, 24 Valve CNH Engine with High Pressure Common Rail Fuel System.

87523643 - For 12.9L 6 Cylinder, Engine.

You can order Repair Manual Books separately (see publication numbers above) or you can order a complete Repair Manual 87525639

BOOK 1 - 87525642

Section 00

Chapter 1

STANDARD TORQUE SPECIFICATION

January, 2006

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 graphites, 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-Feet	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-Feet	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-Feet	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-Feet	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 00

Chapter 2

SAFETY

SAFETY

WARNING: *THIS SAFETY ALERT SYMBOL INDICATES IMPORTANT SAFETY MESSAGES IN THIS MANUAL. WHEN YOU SEE THIS SYMBOL, CAREFULLY READ THE MESSAGE THAT FOLLOWS AND BE ALERT TO THE POSSIBILITY OF PERSONAL INJURY OR DEATH.*** M171B

To prevent injury always follow the Warning, Caution and Danger notes in this section and throughout the manual.

Put the “Do Not Operate” tag shown below on the key for the key switch when keys are removed for servicing or repairing the machine. Tags are available from your service parts supplier.

Before servicing a machine, park the machine on hard level ground. Turn off the engine, apply the parking brake and remove the key from the key switch. Put blocks in front of and behind either the front or rear wheels.

MS99B001

WARNING: *Read the operators manual to familiarize yourself with the correct control functions.* M489

WARNING: *Operate the machine and equipment controls from the seat position only. Any other method could result in serious injury.* M490

WARNING: *This is one man machine, no riders allowed.* M491

WARNING: *Before starting engine study Operators Manual safety messages. Read all safety signs on machine. Clear the area of other persons. Learn and practice safe use of controls before operating. It is your responsibility to understand and follow manufacturers instructions on machine operation, service, and to observe pertinent laws and regulations. Operator and Service Manuals may be obtained from your equipment dealer.* M103A

WARNING: *If you wear clothing that is too loose or do not use the correct safety equipment for your job, you can be injured. Always wear clothing that will not catch on objects. Extra safety equipment that can be required includes hard hat, safety shoes, ear protection, eye or face protection, heavy gloves and reflector clothing.* M492

WARNING: *When working in the area of the fan belt with the engine running, avoid loose clothing if possible, and use extreme caution.* M493

WARNING: *When doing checks and tests on the equipment hydraulics, follow the procedures as they are written. DO NOT change the procedure.* M494

WARNING: *When putting the hydraulic cylinders on this machine through the necessary cycles to check operation or to remove air from a circuit, make sure all people are out of the way.* M495

WARNING: *Always wear heat protective gloves to prevent burning your hands when handling heated parts.* SM121A

WARNING: *Lower all attachments to the ground or use stands to safely support the attachments before you do any maintenance or service.* M496

WARNING: *Hydraulic oil or diesel fuel leaking under pressure can penetrate the skin and cause infection or other injury.*
To Prevent Personal Injury:
Relieve all pressure, before disconnecting fluid lines. Before applying pressure, make sure all connections are tight and components are in good condition.
Never use your hand to check for suspected leaks under pressure.
Use a piece of cardboard or wood for this purpose. If injured by leaking fluid, see your doctor immediately. SM171A

WARNING: *When removing hardened pins such as a pivot pin, or a hardened shaft, use a soft head (brass or bronze) hammer or use a driver made from brass or bronze and a steel head hammer.* M497

WARNING: *When using a hammer to remove and install pivot pins or separate parts using compressed air or using a grinder, wear eye protection that completely encloses the eyes (approved goggles or other approved eye protectors).* M498

WARNING: *Use suitable floor (service) jacks or chain hoist to raise wheels or tracks off the floor. Always block machine in place with suitable safety stands* M499

WARNING: *When servicing or repairing the machine. Keep the shop floor and operators compartment and steps free of oil, water, grease, tools, etc. Use an oil absorbing material and or shop cloths as required. Use safe practices at all times.* M500

WARNING: *Some components of this machine are very heavy. Use suitable lifting equipment or additional help as instructed in the Service Manual.* M501

WARNING: *Engine exhaust fumes can cause death. If it is necessary to start the engine in a closed place, remove the exhaust fumes from the area with an exhaust pipe extension. Open the door and get outside air into the area.* M502

WARNING: *When the battery electrolyte is frozen, the battery can explode if (1), you try to charge the battery, or (2), you try to jump start and run the engine. To prevent the battery electrolyte from freezing, try to keep the battery at full charge. If you do not follow these instructions, you or others in the area can be injured.* M503

WARNING: *Batteries contain acid and explosive gas. Explosions can result from sparks, flames or wrong cable connections. To connect the jumper cables correctly to the battery of this machine see the Operators Manual. Failure to follow these instructions can cause serious injury or death.* M504

ROLL OVER PROTECTIVE STRUCTURE (ROPS)

ROPS, the operators seat, the seat belts and all mounting, accessories and wiring inside the operators protective system must be carefully checked after a tractor accident and all parts with damage must be replaced immediately. DO NOT TRY TO MAKE REPAIRS OR WELD THE ROPS.

Safety Rules:

1. Do not make modifications to the ROPS. Example, welding an accessory to the ROPS or drilling a hole in the ROPS.

2. Special fasteners are used to install the operator protective parts. Replacement parts must be the same as given in the Parts Catalog.

Section 00

Chapter 3

LUBRICATION AND MAINTENANCE

January, 2006

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ENGINE LUBRICATION

Engine Oil Selection

NH AMBRA™ Super Gold HSP 15W-40 Engine Oil is recommended for use in your TJ Series Tractor engine for normal ambient termperatures.

Use only engine oil meeting API Service Classification CI-4 that meets or exceeds Cummins Engineering Specifications 20076.

NOTE: *Do not put Performance Additives or other oil additive products in the engine oil. Oil change intervals must be reduced to 250 service hours or less if CI-4 oil is not used.*

RH04F059

RR04F002

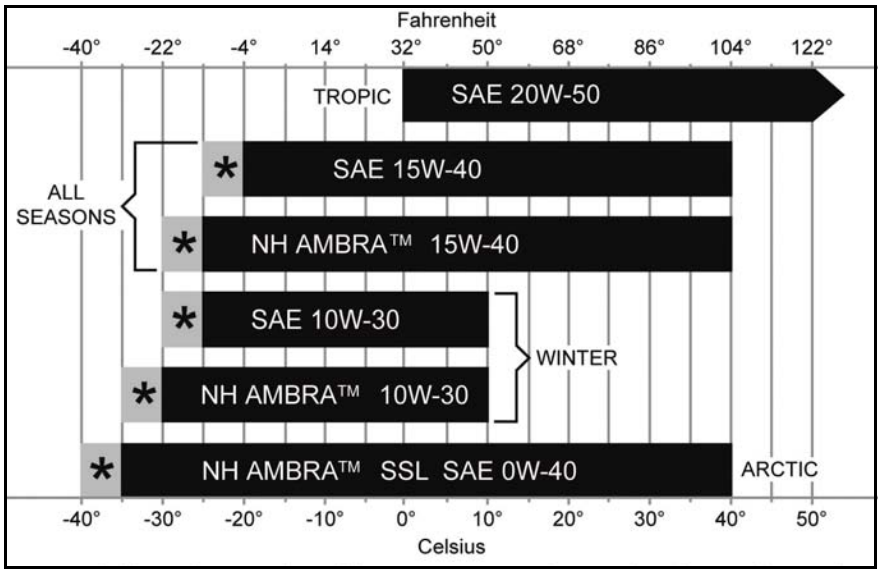
Synthetic Lubricants

Synthetic lubricants are available for your machine. Synthetics are used just as you would use mineral-based lubricants.

IMPORTANT: *The use of synthetic oils does NOT permit extension of recommended service intervals. All synthetic oils must meet or exceed the API service requirements.*

Engine Oil Viscosity/Temperature Usage Recommendation

See the chart below for recommended viscosity at ambient air temperature ranges.



Engine Coolant Solutions

> **WARNING:** *Check and service cooling system according to the maintenance instructions. Hot coolant can spray out if deaeration tank cap is removed while system is hot. To remove the deaeration tank cap, let system cool, turn to first notch, then wait until all pressure is released. Scalding can result from fast removal of deaeration tank cap.*
>
> R141C

Case recommends the use of fully forumulated antifreeze or coolant containing a pre-charge of Supplemental Coolant Additive (SCA). The antifreeze or coolant MUST meet the specifications outlined in TMC RP329 (ethylene glycol) or RP330 (propylene glycol). The use of fully formulated antifreeze or coolant greatly simplifies cooling system maintenance.

NOTE: *Copies of the TMC specifications can be obtained through Cummins Engine Company, Inc.*

Fully formulated ANTIFREEZE contains balanced amounts of antifreeze, SCA and buffering compounds, but does NOT contain 50% water. Fully formulated COOLANT contains balanced amounts of antifreeze, SCA and buffering compounds already premixed 50/50 with deionized water.

COMPLEAT™ engine coolant is premixed with ethylene or propylene antifreeze, deionized water and SCA in proper proportions available in one-gallon containers. When using this premix coolant, no extra dilution or mixing is required. However, periodic testing must be done to ensure SCA levels are within the recommended range. See SCA Service Requirements in this manual.

Antifreeze must be used in any climate for both freezing and boiling point protection. Case recommends a 50% concentration level of ethylene glycol or propylene glycol in most climates. Ethylene and propylene glycol can be mixed if necessary.

IMPORTANT: *You must check the concentration level using a refractometer. Both propylene and ethylene glycol protection levels (or a mixture of both) can be measured with the refractometer. Do NOT use a floating ball hydrometer. Using floating ball hydrometers can give incorrect readings.*

Do NOT use sealing additives in the cooling system. The use of sealing additives will build up in coolant low flow areas, clog coolant filters, and plug radiators and coolers. Do NOT install any additives or inhibitors that are not approved.

Change the coolant solution at the change interval recommended. The heat generated by the diesel engine causes a natural change in the inhibitors in the coolant which results in loss of protection.

Coolant loss can lead to dilution of corrosion and liner-pitting protection due to incorrect top-off practices. The top-off process is simplified by the use of fully formulated antifreezes and coolants because SCA addition is not required. Even small leaks at the hose clamps, radiator cores, cylinder head gaskets, and water pumps result in significant coolant loss over time. Dilution of cooling system protection is avoided, regardless of the amount of coolant loss, by using fully formulated coolant for system top-off.