JOHN DEERE
WORLDWIDE COMMERCIAL & CONSUMER EQUIPMENT DIVISION

Compact Utility Tractor
4105

TM102419 DECEMBER 2010

TECHNICAL MANUAL



JOHN DEERE

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INTRODUCTION

Introduction

Manual Description

This technical manual is written for an experienced technician and contains sections that are specifically for this product. It is a part of a total product support program.

The manual is organized so that all the information on a particular system is kept together. The order of grouping is as follows:

- Table of Contents
- Specifications and Information
- Identification Numbers
- Tools and Materials
- Component Location
- Schematics and Harnesses
- Theory of Operation
- Operation and Diagnostics
- Diagnostics
- Tests and Adjustments
- Repair
- Other

Note: Depending on the particular section or system being covered, not all of the above groups may be used.

The bleed tabs for the pages of each section will align with the sections listed on this page. Page numbering is consecutive from the beginning of the Safety section through the last section.

We appreciate your input on this manual. If you find any errors or want to comment on the layout of the manual please contact us.

Safety

Specifications and Information

Engine

Electrical

Power Train

Final Drive

Hydraulics

Steering

Brakes

Miscellaneous

All information, illustrations and specifications in this manual are based on the latest information at the time of publication. The right is reserved to make changes at any time without notice.

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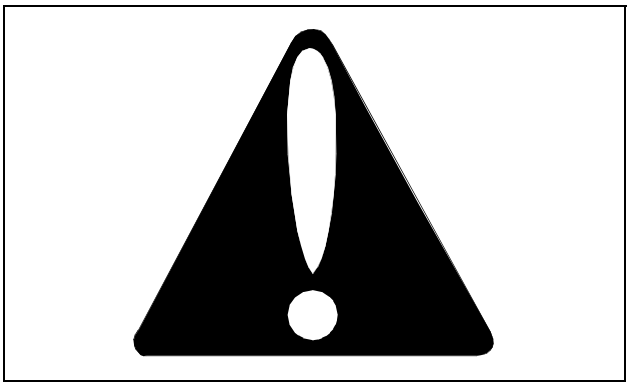
SAFETY

Safety

Recognize Safety Information



MIF

This is the safety-alert symbol. When you see this symbol on your machine or in this manual, be alert to the potential for personal injury.

Follow recommended precautions and safe servicing practices.

Understand Signal Words

A signal word - DANGER, WARNING, or CAUTION - is used with the safety-alert symbol. DANGER identifies the most serious hazards.

DANGER or WARNING safety signs are located near specific hazards. General precautions are listed on CAUTION safety signs. CAUTION also calls attention to safety messages in this manual.

Special Messages

Your manual contains special messages to bring attention to potential safety concerns, machine damage as well as helpful operating and servicing information. Please read all the information carefully to avoid injury and machine damage.

Caution: Avoid Injury! This symbol and text highlight potential hazards or death to the operator or bystanders that may occur if the hazards or procedures are ignored.

Important: Avoid Damage! This text is used to tell the operator of actions or conditions that might result in damage to the machine.

Note: General information is given throughout the manual that may help the operator in the operation or service of the machine.

Replace Safety Signs



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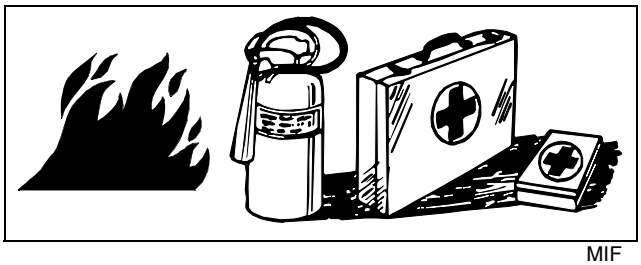
Replace missing or damaged safety signs. See the machine operator's manual for correct safety sign placement.

Handle Fluids Safely - Avoid Fires

Be Prepared For Emergencies



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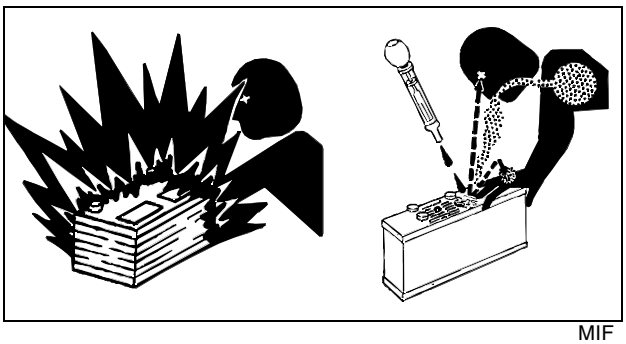
- When you work around fuel, do not smoke or work near heaters or other fire hazards.
- Store flammable fluids away from fire hazards. Do not incinerate or puncture pressurized containers.
- Make sure machine is clean of trash, grease, and debris.
- Do not store oily rags; they can ignite and burn spontaneously.
- Be prepared if a fire starts.
- Keep a first aid kit and fire extinguisher handy.
- Keep emergency numbers for doctors, ambulance service, hospital, and fire department near your telephone.

Use Care In Handling and Servicing Batteries



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Prevent Battery Explosions

- Keep sparks, lighted matches, and open flame away from the top of battery. Battery gas can explode.
- Never check battery charge by placing a metal object across the posts. Use a volt-meter or hydrometer.
- Do not charge a frozen battery; it may explode. Warm battery to 16°C (60°F).

Prevent Acid Burns

- Sulfuric acid in battery electrolyte is poisonous. It is strong enough to burn skin, eat holes in clothing, and cause blindness if splashed into eyes.

Avoid acid burns by:

- Filling batteries in a well-ventilated area.
- Wearing eye protection and rubber gloves.
- Avoiding breathing fumes when electrolyte is added.
- Avoiding spilling or dripping electrolyte.
- Use proper jump start procedure.

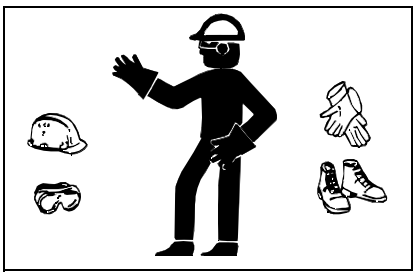
If you spill acid on yourself:

- Flush your skin with water.
- Apply baking soda or lime to help neutralize the acid.
- Flush your eyes with water for 10 - 15 minutes.
- Get medical attention immediately.

If acid is swallowed:

- Drink large amounts of water or milk.
- Then drink milk of magnesia, beaten eggs, or vegetable oil.
- Get medical attention immediately.

Wear Protective Clothing



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Wear close fitting clothing and safety equipment appropriate to the job.

Prolonged exposure to loud noise can cause impairment or loss of hearing. Wear a suitable hearing protective device such as earmuffs or earplugs to protect against objectionable or uncomfortable loud noises.

Operating equipment safely requires the full attention of the operator. Do not wear radio or music headphones while operating machine.

Use Care Around High-pressure Fluid Lines

Avoid High-Pressure Fluids



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Escaping fluid under pressure can penetrate the skin causing serious injury.

Avoid injury from escaping fluid under pressure by stopping the engine and relieving pressure in the system before disconnecting or connecting hydraulic or other lines. Tighten all connections before applying pressure.

Search for leaks with a piece of cardboard. Protect hands and body from high pressure fluids.

If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable medical source. Such information is available from Deere & Company Medical Department in Moline, Illinois, U.S.A.

Avoid Heating Near Pressurized Fluid Lines



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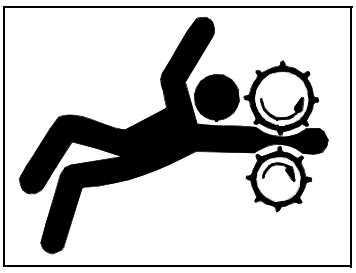
Flammable spray can be generated by heating near pressurized fluid lines, resulting in severe burns to yourself and bystanders. Do not heat by welding, soldering, or using a torch near pressurized fluid lines or other flammable materials. Pressurized lines can be accidentally cut when heat goes beyond the immediate flame area.

Parking Safely

1. Stop machine on a level surface, not on a slope.
2. Disengage PTO and stop attachments.
3. Lower attachments to the ground.
4. Lock park brake.
5. Stop engine.
6. Remove key.
7. Wait for engine and all moving parts to stop before you leave the operator's station.
8. Close fuel shut-off valve, if your machine is equipped.

Service Machines Safely

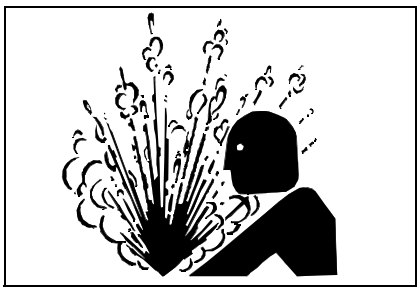


MIF

Tie long hair behind your head. Do not wear a necktie, scarf, loose clothing, or necklace when you work near machine tools or moving parts. If these items were to get caught, severe injury could result.

Remove rings and other jewelry to prevent electrical shorts and entanglement in moving parts.

Service Cooling System Safely



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Explosive release of fluids from pressurized cooling system can cause serious burns.

Shut off machine. Only remove filler cap when cool enough to touch with bare hands. Slowly loosen cap to first stop to relieve pressure before removing completely.

Use Proper Tools

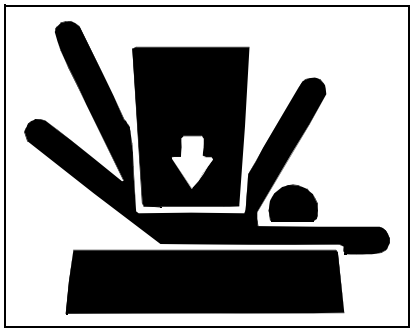
Use tools appropriate to the work. Makeshift tools and procedures can create safety hazards. Use power tools only to loosen threaded parts and fasteners. For loosening and tightening hardware, use the correct size tools. **DO NOT** use U.S. measurement tools on metric fasteners. Avoid bodily injury caused by slipping wrenches. Use only service parts meeting John Deere specifications.

Work in Clean Area

Before starting a job:

1. Clean work area and machine.
2. Make sure you have all necessary tools to do your job.
3. Have the right parts on hand.
4. Read all instructions thoroughly; do not attempt shortcuts.

Support Machine Properly and Use Proper Lifting Equipment



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If you must work on a lifted machine or attachment, securely support the machine or attachment.

Do not support the machine on cinder blocks, hollow tiles, or props that may crumble under continuous load. Do not work under a machine that is supported solely by a jack. Follow recommended procedures in this manual.

Lifting heavy components incorrectly can cause severe injury or machine damage. Follow recommended procedure for removal and installation of components in the manual.

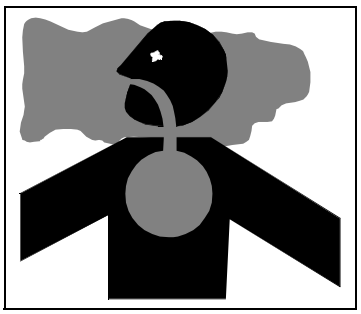
Using High Pressure Washers

Directing pressurized water at electronic/electrical components or connectors, bearings, hydraulic seals, fuel injection pumps or other sensitive parts and components may cause product malfunctions. Reduce pressure and spray at a 45 to 90 degree angle.

Illuminate Work Area Safely

Illuminate your work area adequately but safely. Use a portable safety light for working inside or under the machine. Make sure the bulb is enclosed by a wire cage. The hot filament of an accidentally broken bulb can ignite spilled fuel or oil.

Work In Ventilated Area



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Engine exhaust fumes can cause sickness or death. If it is necessary to run an engine in an enclosed area, remove the exhaust fumes from the area with an exhaust pipe extension.

If you do not have an exhaust pipe extension, open the doors and get outside air into the area.

Warning: California Proposition 65 Warning

Gasoline engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

Remove Paint Before Welding or Heating

Avoid potentially toxic fumes and dust. Hazardous fumes can be generated when paint is heated by welding, soldering, or using a torch. Do all work outside or in a well ventilated area. Dispose of paint and solvent properly. Remove paint before welding or heating: If you sand or grind paint, avoid breathing the dust. Wear an approved respirator. If you use solvent or paint stripper, remove stripper with soap and water before welding. Remove solvent or paint stripper containers and other flammable material from area. Allow fumes to disperse at least 15 minutes before welding or heating.

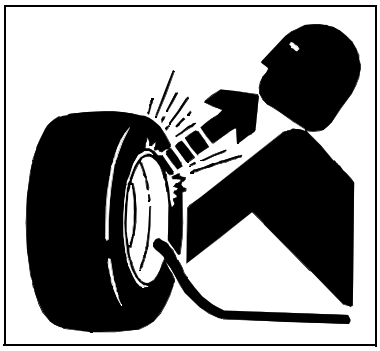
Avoid Harmful Asbestos Dust

Avoid breathing dust that may be generated when handling components containing asbestos fibers. Inhaled asbestos fibers may cause lung cancer.

Components in products that may contain asbestos fibers are brake pads, brake band and lining assemblies, clutch plates, and some gaskets. The asbestos used in these components is usually found in a resin or sealed in some way. Normal handling is not hazardous as long as airborne dust containing asbestos is not generated.

Avoid creating dust. Never use compressed air for cleaning. Avoid brushing or grinding material containing asbestos. When servicing, wear an approved respirator. A special vacuum cleaner is recommended to clean asbestos. If not available, apply a mist of oil or water on the material containing asbestos. Keep bystanders away from the area.

Service Tires Safely



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Explosive separation of a tire and rim parts can cause serious injury or death.

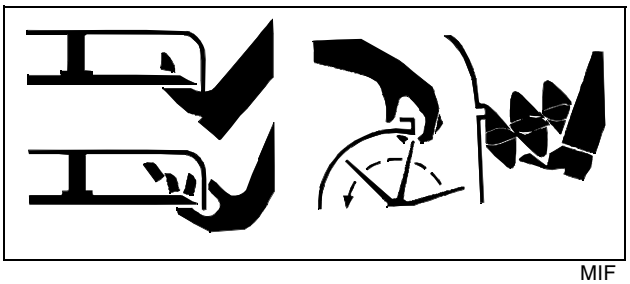
Do not attempt to mount a tire unless you have the proper equipment and experience to perform the job.

Always maintain the correct tire pressure. Do not inflate the tires above the recommended pressure. Never weld or heat a wheel and tire assembly. The heat can cause an increase in air pressure resulting in a tire explosion. Welding can structurally weaken or deform the wheel.

When inflating tires, use a clip-on chuck and extension hose long enough to allow you to stand to one side and NOT in front of or over the tire assembly. Use a safety cage if available.

Check wheels for low pressure, cuts, bubbles, damaged rims or missing lug bolts and nuts.

Avoid Injury From Rotating Blades and Augers



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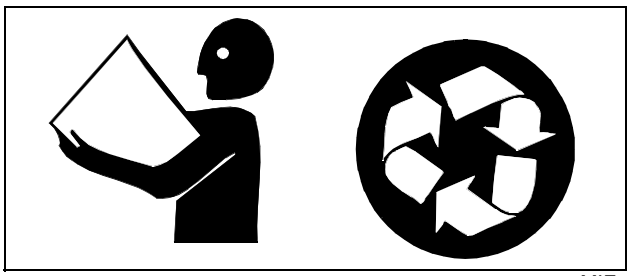
Keep hands and feet away while machine is running. Shut off power to service, lubricate or remove mower blades, augers or PTO shafts.

Handle Chemical Products Safely



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Direct exposure to hazardous chemicals can cause serious injury. Potentially hazardous chemicals used with John Deere equipment include such items as lubricants, coolants, paints, and adhesives.

A Material Safety Data Sheet (MSDS) provides specific details on chemical products: physical and health hazards, safety procedures, and emergency response techniques. Check the MSDS before you start any job using a hazardous chemical. That way you will know exactly what the risks are and how to do the job safely. Then follow procedures and recommended equipment.

Dispose of Waste Properly

Improperly disposing of waste can threaten the environment and ecology. Potentially harmful waste used with John Deere equipment include such items as oil, fuel, coolant, brake fluid, filters, and batteries. Use leakproof containers when draining fluids. Do not use food or beverage containers that may mislead someone into drinking from them. Do not pour waste onto the ground, down a drain, or into any water source. Inquire on the proper way to recycle or dispose of waste from your local environmental or recycling center, or from your John Deere dealer.

Live with Safety



MIF

Before returning machine to customer, make sure machine is functioning properly, especially the safety systems. Install all guards and shields.

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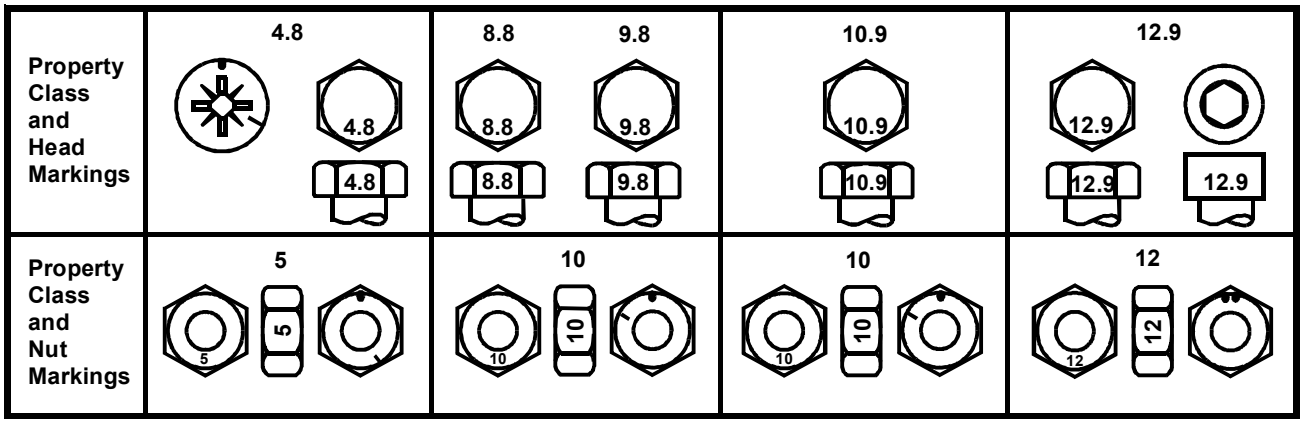
Fastener Torques

Metric Fastener Torque Values



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	Class 4.8				Class 8.8 or 9.8				Class 10.9				Class 12.9			
	Lubricated a		Dry a		Lubricated a		Dry a		Lubricated a		Dry a		Lubricated a		Dry a	
SIZE	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft
M6	4.8	3.5	6	4.5	9	6.5	11	8.5	13	9.5	17	12	15	11.5	19	14.5
M8	12	8.5	15	11	22	16	28	20	32	24	40	30	37	28	47	35
M10	23	17	29	21	43	32	55	40	63	47	80	60	75	55	95	70
M12	40	29	50	37	75	55	95	70	110	80	140	105	130	95	165	120
M14	63	47	80	60	120	88	150	110	175	130	225	165	205	150	260	109
M16	100	73	125	92	190	140	240	175	275	200	350	225	320	240	400	300
M18	135	100	175	125	260	195	330	250	375	275	475	350	440	325	560	410
M20	190	140	240	180	375	275	475	350	530	400	675	500	625	460	800	580
M22	260	190	330	250	510	375	650	475	725	540	925	675	850	625	1075	800
M24	330	250	425	310	650	475	825	600	925	675	1150	850	1075	800	1350	1000
M27	490	360	625	450	950	700	1200	875	1350	1000	1700	1250	1600	1150	2000	1500
M30	675	490	850	625	1300	950	1650	1200	1850	1350	2300	1700	2150	1600	2700	2000
M33	900	675	1150	850	1750	1300	2200	1650	2500	1850	3150	2350	2900	2150	3700	2750
M36	1150	850	1450	1075	2250	1650	2850	2100	3200	2350	4050	3000	3750	2750	4750	3500

DO NOT use these hand torque values if a different torque value or tightening procedure is given for a specific application. Torque values listed are for general use only and include a ±10% variance factor. Check tightness of fasteners periodically. DO NOT use air powered wrenches.

Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical grade.

Fasteners should be replaced with the same grade. Make sure fastener threads are clean and that you properly start thread engagement. This will prevent them from failing when tightening.

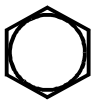
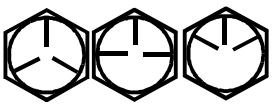
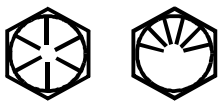
When bolt and nut combination fasteners are used, torque values should be applied to the NUT instead of the bolt head.

Tighten toothed or serrated-type lock nuts to the full torque value.

a *"Lubricated" means coated with a lubricant such as engine oil, or fasteners with phosphate and oil coatings. "Dry" means plain or zinc plated (yellow dichromate - Specification JDS117) without any lubrication*.

Reference: JDS - G200.

Inch Fastener Torque Values

SAE Grade and Head Markings	**No Marks** 			
SAE Grade and Nut Markings	**No Marks** 			

MIF

	Grade 1				Grade 2b				Grade 5, 5.1 or 5.2				Grade 8 or 8.2			
	Lubricated a		Dry a		Lubricated a		Dry a		Lubricated a		Dry a		Lubricated a		Dry a	
SIZE	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft
1/4	3.7	2.8	4.7	3.5	6	4.5	7.5	5.5	9.5	7	12	9	13.5	10	17	12.5
5/16	7.7	5.5	10	7	12	9	15	11	20	15	25	18	28	21	35	26
3/8	14	10	17	13	22	16	27	20	35	26	44	33	50	36	63	46
7/16	22	16	28	20	35	26	44	32	55	41	70	52	80	58	100	75
1/2	33	25	42	31	53	39	67	50	85	63	110	80	120	90	150	115
9/16	48	36	60	45	75	56	95	70	125	90	155	115	175	130	225	160
5/8	67	50	85	62	105	78	135	100	170	125	215	160	215	160	300	225
3/4	120	87	150	110	190	140	240	175	300	225	375	280	425	310	550	400
7/8	190	140	240	175	190	140	240	175	490	360	625	450	700	500	875	650
1	290	210	360	270	290	210	360	270	725	540	925	675	1050	750	1300	975
1-1/8	470	300	510	375	470	300	510	375	900	675	1150	850	1450	1075	1850	1350
1-1/4	570	425	725	530	570	425	725	530	1300	950	1650	1200	2050	1500	2600	1950
1-3/8	750	550	950	700	750	550	950	700	1700	1250	2150	1550	2700	2000	3400	2550
1-1/2	1000	725	1250	925	990	725	1250	930	2250	1650	2850	2100	3600	2650	4550	3350

DO NOT use these hand torque values if a different torque value or tightening procedure is given for a specific application. Torque values listed are for general use only and include a ±10% variance factor. Check tightness of fasteners periodically. DO NOT use air powered wrenches.

Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical grade.

Fasteners should be replaced with the same grade. Make sure fastener threads are clean and that you properly start thread engagement. This will prevent them from failing when tightening.

When bolt and nut combination fasteners are used, torque values should be applied to the NUT instead of the bolt head.

Tighten toothed or serrated-type lock nuts to the full torque value.

a *"Lubricated" means coated with a lubricant such as engine oil, or fasteners with phosphate and oil coatings. "Dry" means plain or zinc plated (yellow dichromate - Specification JDS117) without any lubrication*.

b *"Grade 2" applies for hex cap screws (Not Hex Bolts) up to 152 mm (6 in.) long. "Grade 1" applies for hex cap screws over 152 mm (6 in.) long, and for all other types of bolts and screws of any length.*

Reference: JDS - G200

Metric Fastener Torque Value - Grade 7 (Special)

Size	Steel or Gray Iron Torque	Aluminum Torque
	N•m (lb-ft)	N•m (lb-ft)
M6	11 (8)	8 (6)
M8	24 (18)	19 (14)
M10	52 (38)	41 (30)
M12	88 (65)	70 (52)
M14	138 (102)	111 (82)
M16	224 (165)	179 (132)

Gasket Sealant Application

Cleaning:

Clean both surfaces that will be joined using 100% isopropyl alcohol. Wipe excess off with a clean cloth. Cleaner/degreaser can be substituted for isopropyl alcohol.

How to Dispense/Apply/Assemble Gasket Sealants:

Dispense approximately 1 to 2 ounces of flexible form-in-place gasket on a clean sheet or table top. Avoid using excess amounts that may be exposed for long periods of time. This will help prevent contamination from surrounding atmosphere such as dust with metal content.

Using an ink roller or similar devise, apply to one surface of the joint by loading the roller from a plastic sheet and transferring the material in a thin film to the joint. The application should be the thinnest film possible, but providing complete coverage. This can be judged by the appearance of the joint once it is put together. Excessive amounts of will cause incorrect bearing end play, extend cure time, and will cause runoff of the material. A small bead or buildup at the joint is permissible and indicates good dispersion through the joint. Excess can be wiped from the joint. Joining should take place within three minutes after sealant application.

Apply proper cap screw torque and sequence as applicable. Allow a minimum of 30 minutes before air test or adding oil for test stand usage.

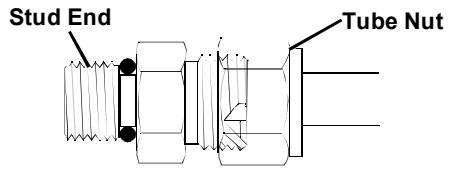
Disassemble:

Cured material can be removed with a wire brush or scraper. Chemical cleaners are available for customer use, should they be deemed necessary.

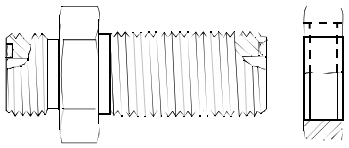
SPECIFICATIONS AND INFORMATION O-RING SEAL SERVICE

O-Ring Seal Service Recommendations

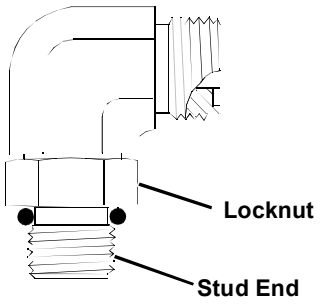
Face Seals With Inch Stud Ends Torque



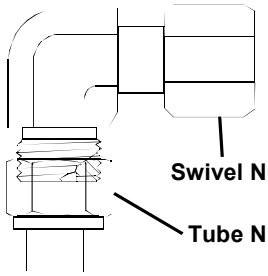
Stud Straight and Tube Nut



Bulkhead Union and Bulkhead Locknut



90 Adjustable Stud Elbow



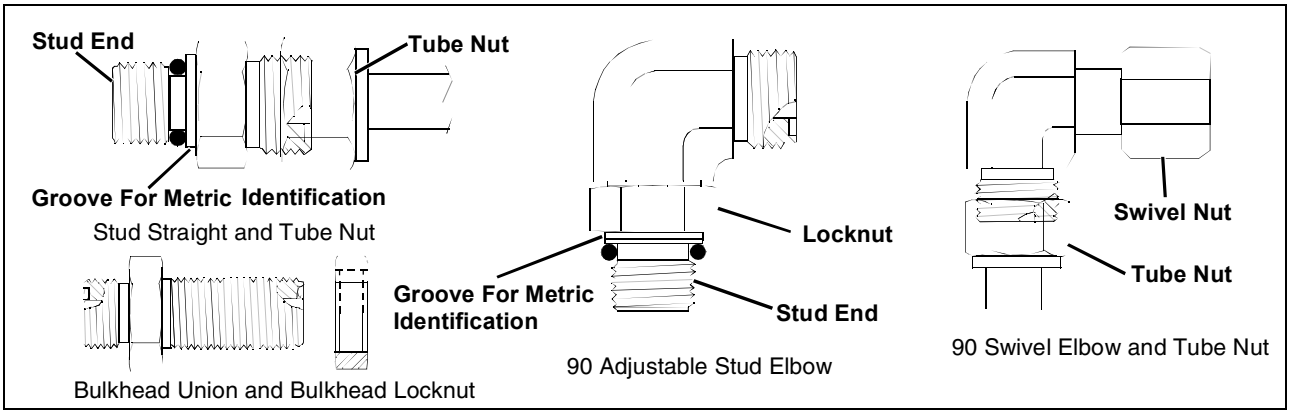
90 Swivel Elbow and Tube Nut

MIF

Nominal Tube OD/Hose ID				Face Seal Tube/Hose End					O-Ring Stud Ends		
Metric Tube OD	Inch Tube OD			Thread Size	Tube Nut/ Swivel Nut Torque		Bulkhead Lock Nut Torque		Thread Size	Straight Fitting or Lock Nut Torque	
mm	Dash Size	in.	mm	in.	N•m	lb-ft	N•m	lb-ft	in.	N•m	lb-ft
5	-3	0.188	4.76						3/8-24	8	6
6	-4	0.250	6.35	9/16-18	16	12	12	9	7/16-20	12	9
8	-5	0.312	7.94						1/2-20	16	12
10	-6	0.375	9.52	11/16-16	24	18	24	18	9/16-18	24	18
12	-8	0.500	12.70	13/16-16	50	37	46	34	3/4-16	46	34
16	-10	0.625	15.88	1-14	69	51	62	46	7/8-14	62	46
19	-12	0.750	19.05	1-3/16-12	102	75	102	75	1-1/16-12	102	75
22	-14	0.875	22.22	1-3/16-12	102	75	102	75	1-3/16-12	122	90
25	-16	1.000	25.40	1-7/16-12	142	105	142	105	1-5/16-12	142	105
32	-20	1.25	31.75	1-11/16-12	190	140	190	140	1-5/8-12	190	140
38	-24	1.50	38.10	2-12	217	160	217	160	1-7/8-12	217	160

Note: Torque tolerance is +15%, -20%

Face Seals With Metric Stud Ends Torque



MIF

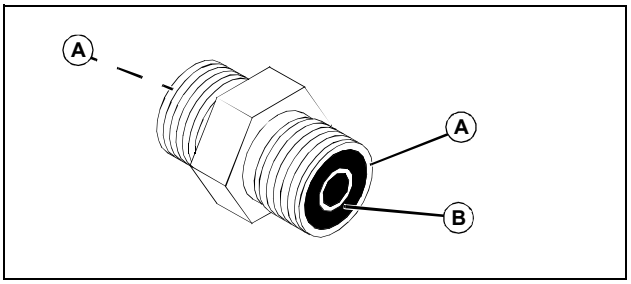
Nominal Tube OD/Hose ID				Face Seal Tube/Hose End						O-Ring Stud Ends, Straight Fitting or Lock Nut					
Metric Tube OD	Inch Tube OD			Thread Size	Hex Size	Tube Nut/ Swivel Nut Torque		Bulkhead Lock Nut Torque		Thread Size	Hex Size	Steel or Gray Iron Torque		Aluminum Torque	
mm	Dash Size	in.	mm	in.	mm	N•m	lb-ft	N•m	lb-ft	mm	mm	N•m	lb-ft	N•m	lb-ft
6	-4	0.250	6.35	9/16-18	17	16	12	12	9	M12X1.5	17	21	15.5	9	6.6
8	-5	0.312	7.94												
										M14X1.5	19	33	24	15	11
10	-6	0.375	9.52	11/16-16	22	24	18	24	18	M16X1.5	22	41	30	18	13
12	-8	0.500	12.70	13/16-16	24	50	37	46	34	M18X1.5	24	50	37	21	15
16	-10	0.625	15.88	1-14	30	69	51	62	46	M22X1.5	27	69	51	28	21
	-12	0.750	19.05	1-3/16-12	36	102	75	102	75	M27X2	32	102	75	46	34
22	-14	0.875	22.22	1-3/16-12	36	102	75	102	75	M30X2	36				
25	-16	1.000	25.40	1-7/16-12	41	142	105	142	105	M33X2	41	158	116	71	52
28										M38X2	46	176	130	79	58
32	-20	1.25	31.75	1-11/16-12	50	190	140	190	140	M42X2	50	190	140	85	63
38	-24	1.50	38.10	2-12	60	217	160	217	160	M48X2	55	217	160	98	72

Note: Torque tolerance is +15%, -20%

SPECIFICATIONS AND INFORMATION O-RING SEAL SERVICE

O-Ring Seal Service Recommendations

O-Ring Face Seal Fittings



MIF

1. Inspect the fitting sealing surfaces (A). They must be free of dirt or defects.

2. Inspect the O-ring (B). It must be free of damage or defects.

3. Lubricate O-rings and install into groove using petroleum jelly to hold in place during assembly.

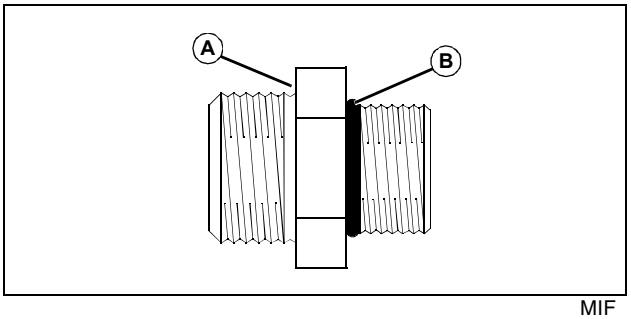
4. Index angle fittings and tighten by hand pressing joint together to insure O-ring remains in place.

Important: Avoid Damage! Do not allow hoses to twist when tightening fittings. Use two wrenches to tighten hose connections; one to hold the hose, and the other to tighten the swivel fitting.

5. Tighten fitting or nut to torque value shown on the chart per dash size stamped on the fitting.

O-Ring Boss Fittings

1. Inspect boss O-ring boss seat. It must be free of dirt and defects. If repeated leaks occur, inspect for defects with a magnifying glass. Some raised defects can be removed with a slip stone.



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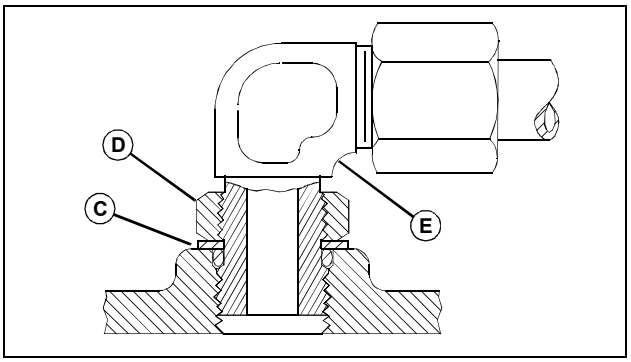
2. Put hydraulic oil or petroleum jelly on the O-ring (B). Place electrical tape over the threads to protect O-ring from nicks. Slide O-ring over the tape and into the groove (A) of fitting. Remove tape.



MIF

3. For angle fittings, loosen special nut (D) and push special washer (C) against threads so O-ring can be installed into the groove of fitting.

4. Turn fitting into the boss by hand until special washer or washer face (straight fitting) contacts boss face and O-ring is squeezed into its seat.

5. To position angle fittings (E), turn the fitting counter-clockwise a maximum of one turn.

6. Tighten straight fittings to torque value shown on chart. For angle fittings, tighten the special nut to value shown in the chart while holding body of fitting with a wrench.

Straight Fitting or Special Nut Torques

Thread Size	Torque[a]		Number of Flats[b]
	N•m	lb-ft	
3/8-24 UNF	8	6	2
7/16-20 UNF	12	9	2
1/2-20 UNF	16	12	2
9/16-18 UNF	24	18	2
3/4-16 UNF	46	34	2
7/8-14 UNF	62	46	1-1/2
1-1/16-12 UN	102	75	1
1-3/16-12 UN	122	90	1
1-5/16-12 UN	142	105	3/4
1-5/8-12 UN	190	140	3/4
1-7/8-12 UN	217	160	1/2

[a]Torque tolerance is ± 10 percent.

[b]To be used if a torque wrench cannot be used. After tightening fitting by hand, put a mark on nut or boss; then tighten special nut or straight fitting the number of flats shown.

General Information

Diesel Fuel

Caution: Avoid Injury! California Proposition 65 Warning: Diesel engine exhaust and some of its elements from this product are known to the State of California to cause cancer, birth defects, or other reproductive harm.

In general, diesel fuels are blended to satisfy the low air temperature requirements of the geographical area in which they are sold.

In North America, diesel fuel is usually specified to **ASTM D975** and sold as either **Grade 1** for cold air temperatures or **Grade 2** for warm air temperatures.

If diesel fuels being supplied in your area DO NOT meet any of the above specifications, use diesel fuels with the following equivalent properties:

- **Cetane Number 40 (minimum)**

A cetane number **greater than 50 is preferred**, especially for air temperatures below -20°C (-4°F) or elevations above 1500 m (5000 ft).

- **Cold Filter Plugging Point (CFPP)**

The air temperature at which diesel fuel **begins to cloud or jell** - at least 5°C (9°F) below the expected low air temperature range.

- **Sulfur Content of 0.05% (maximum)**

Diesel fuels for highway use in the United States now require sulfur content to be **less than 0.05%.**

If diesel fuel being used has a sulfur content **greater than 0.05%, reduce the service interval for engine oil and filter by 50%.**

Consult your local diesel fuel distributor for properties of the diesel fuel available in your area.

Diesel Fuel Lubricity

Diesel fuel must have adequate lubricity to ensure proper operation and durability of fuel injection system components. Fuel lubricity should pass a **minimum of 3300 gram load level** as measured by the **BOCLE** scuffing test.

Diesel Fuel Storage

Important: Avoid Damage! Stale or contaminated fuel can produce varnish and plug fuel injectors, affect engine performance and/or damage fuel injectors and pumps.

Keep all dirt, scale, water or other foreign material out of fuel.

Do not store diesel fuel in galvanized containers which can react to zinc coating and form flakes.

It is recommended that diesel fuel be stored **only** in a clean, approved **polyethylene plastic** container **without** any metal screen or filter. This will help prevent any accidental sparks from occurring. Store fuel in an area that is well ventilated to prevent possible igniting of fumes by an open flame or spark, this includes any appliance with a pilot light.

Keep fuel in a safe, protected area and in a clean, properly marked **("diesel fuel")** container. **Do not** use de-icers to attempt to remove water from fuel. **Do not** depend on fuel filters to remove water from fuel. It is recommended that a water separator be installed in the storage tank outlet. **Be sure** to properly discard unstable or contaminated diesel fuel and/or their containers when necessary.

Diesel Engine Oil

Use the appropriate oil viscosity based on the expected air temperature range during the period between recommended oil changes. Operating outside of these recommended oil air temperature ranges may cause premature engine failure.

The following John Deere oils are PREFERRED**:**

- **PLUS-50® - SAE 15W-40;**
- **TORQ-GARD SUPREME® - SAE 5W-30**.

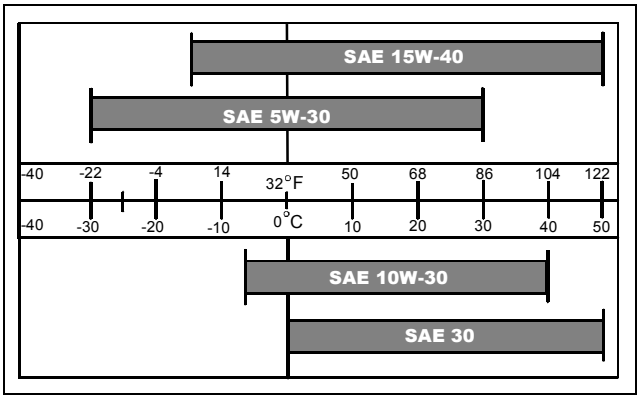
The following John Deere oils are **also** recommended, based on their specified temperature range:

- **TURF-GARD® - SAE 10W-30;**
- **PLUS-4® - SAE 10W-30;**
- **TORQ-GARD SUPREME® - SAE 30.**

Other oils may be used if above John Deere oils are not available, provided they meet one of the following specifications:

- SAE 15W-40 - API Service Classifications CF - 4 or higher;
- SAE 5W-30 - API Service Classification CC or higher;
- SAE 10W-30 - API Service Classification CF or higher;
- SAE 30 - API Service Classification CF or higher.

Important: Avoid Damage! If diesel fuel with sulfur content greater than 0.5% is used, reduce the service interval for oil and filter by 50%.



Break-In Engine Oil - Diesel

Important: Avoid Damage! Only use this specified break-in oil in rebuilt or remanufactured engines for the first 100 hours (maximum) of operation. Do not use PLUS - 50®, SAE 15W40 oil or oils meeting specifications API CG - 4 or API CF - 4, these oils will not allow rebuilt or remanufactured engines to break-in properly.

The following John Deere oil is PREFERRED:

- **BREAK - IN ENGINE OIL**.

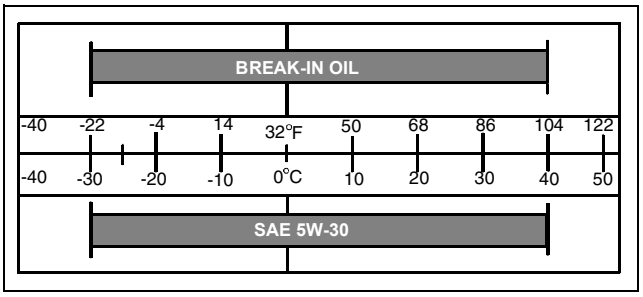
John Deere BREAK - IN ENGINE OIL is formulated with special additives for aluminum and cast iron type engines to allow the power cylinder components (pistons, rings, and liners as well) to “wear-in” while protecting other engine components, valve train and gears, from abnormal wear. Engine rebuild instructions should be followed closely to determine if special requirements are necessary.

John Deere BREAK - IN ENGINE OIL is also recommended for non-John Deere engines, both aluminum and cast iron types.

If this preferred John Deere oil is not available, use a break-in engine oil meeting the following specification during the first 100 hours of operation:

- API Service Classification CE or higher.

Important: Avoid Damage! After the break-in period, use the John Deere oil that is recommended for this engine.



Hydrostatic Transmission and Hydraulic Oil

Use the appropriate oil viscosity based on these air temperature ranges. Operating outside of these recommended oil air temperature ranges may cause premature hydrostatic transmission or hydraulic system failures.

Important: Avoid Damage! Only use a quality oil in this transmission. Mixing of LOW VISCOSITY HY - GARD® and HY - GARD® oils is permitted.

DO NOT mix any other oils in this transmission.

DO NOT use engine oil or “Type F” (Red) Automatic Transmission Fluid in this transmission.

DO NOT use BIO-HY-GARD® in this transmission.

The following John Deere transmission and hydraulic oil is **PREFERRED**:

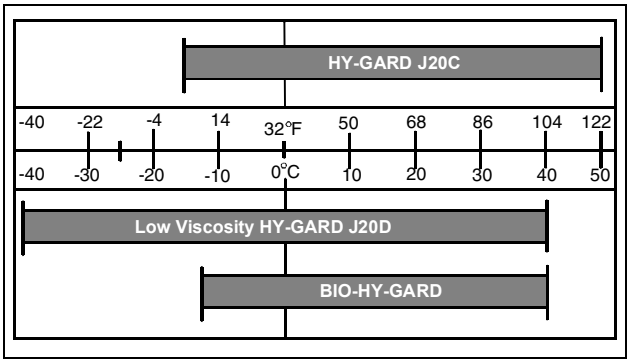
- **LOW VISCOSITY HY - GARD® - JDM J20C**.

The following John Deere oil is also recommended if above preferred oil is not available:

- **HY - GARD® - JDM J20D.**

Other oils may be used if above recommended John Deere oils are not available, provided they meet one of the following specifications:

- John Deere Standard JDM J20C;
- John Deere Standard JDM J20D.



Alternative Lubricants

Use of alternative lubricants could cause reduced life of the component.

If alternative lubricants are to be used, it is recommended that the factory fill be thoroughly removed before switching to any alternative lubricant.

Synthetic Lubricants

Synthetic lubricants may be used in John Deere equipment if they meet the applicable performance requirements (industry classification and/or military specification) as shown in this manual.

The recommended air temperature limits and service or lubricant change intervals should be maintained as shown in the operator's manual, unless otherwise stated on lubricant label.

Avoid mixing different brands, grades, or types of oil. Oil manufacturers blend additives in their oils to meet certain specifications and performance requirements. Mixing different oils can interfere with the proper functioning of these additives and degrade lubricant performance.

Anti-Corrosion Grease

This anti-corrosion grease is formulated to provide the best protection against absorbing moisture, which is one of the major causes of corrosion. This grease is also superior in its resistance to separation and migration.

The following anti-corrosion grease is **preferred:**

- DuBois MPG-2™ Multi-Purpose Polymer Grease - M79292.

Other greases may be used if they meet or exceed the following specification:

- John Deere Standard JDM J13A2, NLGI Grade 1.

Lubricant Storage

All machines operate at top efficiency only when clean lubricants are used. Use clean storage containers to handle all lubricants. Store them in an area protected from dust, moisture, and other contamination. Store drums on their sides. Make sure all containers are properly marked as to their contents. Dispose of all old, used containers and their contents properly.

Mixing of Lubricants

In general, avoid mixing different brands or types of lubricants. Manufacturers blend additives in their lubricants to meet certain specifications and performance requirements. Mixing different lubricants can interfere with the proper functioning of these additives and lubricant properties which will downgrade their intended specified performance.

Oil Filters

Important: Avoid Damage! Filtration of oils is critical to proper lubrication performance. Always change filters regularly.

The following John Deere oil filters are PREFERRED:

- AUTOMOTIVE AND LIGHT TRUCK ENGINE OIL FILTERS.

Most John Deere filters contain pressure relief and anti-drainback valves for better engine protection.

Other oil filters may be used if above recommended John Deere oil filters are not available, provided they meet the following specification:

- ASTB Tested In Accordance With SAE J806.

Coolant

Recommended Engine Coolant

Important: Avoid Damage! Using incorrect coolant mixture can cause overheating and damage to the radiator and engine:

- **Do not operate engine with plain water.**
- **Do not exceed a 50% mixture of coolant and water.**
- **Aluminum engine blocks and radiators require approved ethylene-glycol based coolant.**

The engine cooling system is filled to provide year-round protection against corrosion and cylinder liner pitting, and winter freeze protection to -37 degrees C (-34 degrees F). If protection at lower temperatures is required, consult your John Deere dealer for recommendations.

The following coolants are preferred:

- John Deere COOL-GARD II™ Premix
- John Deere COOL-GARD Premix
- John Deere COOL-GARD PG Premix

John Deere COOL-GARD II Premix and John Deere COOL-GARD Premix are available in a concentration of 50% propylene glycol.

John Deere COOL-GARD PG Premix is available in a concentration of 55% propylene glycol.

Additional recommended coolants:

- John Deere COOL-GARD II Concentrate in a 40% to 60% mixture of concentrate with water.
- John Deere COOL-GARD Concentrate in a 40% to 60% mixture of concentrate with water.

If the recommended coolants are unavailable, use an ethylene glycol or propylene glycol base coolant that meets the following specification:

- ASTM D3306 prediluted (50%) coolant.
- ASTM D3306 coolant concentrate in a 40% to 60% mixture of concentrate with water.

Check container label before using to be sure it has the appropriate specifications for your machine. Use coolant with conditioner or add conditioner to coolant before using.

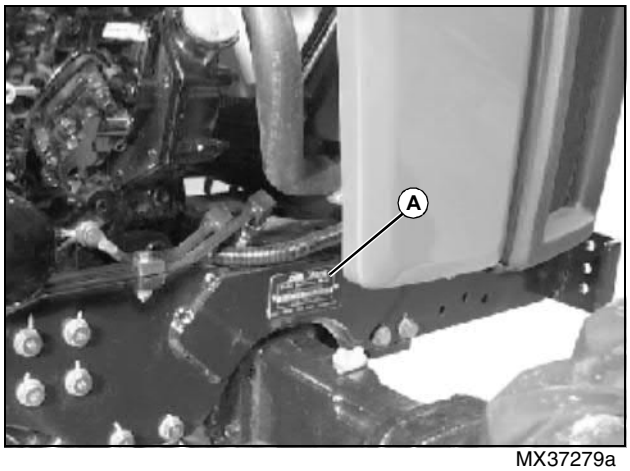
Water Quality

- Water quality is important to the performance of the cooling system. Distilled, deionized, or demineralized water is recommended with ethylene glycol base engine coolant concentrate.

Serial Number Locations

Machine Product Identification Number

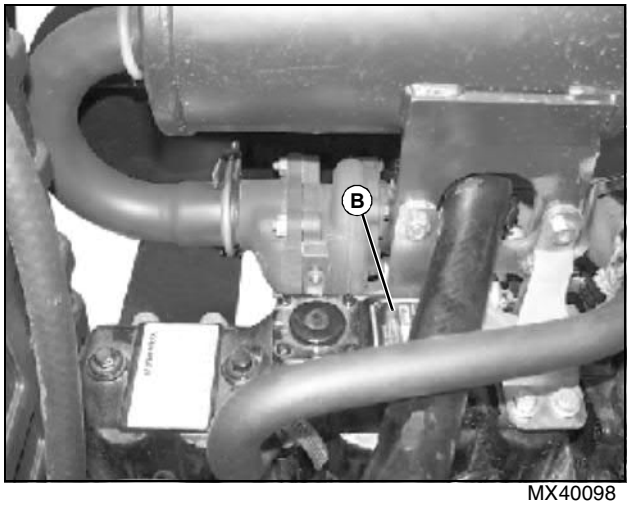
When ordering parts or submitting a warranty claim, it is IMPORTANT that the machine product identification number (PIN) and component serial numbers are included. The location of the PIN and component serial numbers are shown.



MX37279a

Located (A) on right side of frame.

Engine Serial Number



MX40098

Located (B) on top of engine.

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ENGINE - DIESEL SPECIFICATIONS

Specifications

General Specifications

Specifications:

Make	**Yanmar**
Model	**3TNV84T-BKJT**
Type	**Diesel**
Number of Cylinders	**3**
Bore	**84 mm (3.31 in.)**
Stroke	**90 mm (3.54 in.)**
Displacement	**1.496 L (91.32 cu in.)**
Firing Order (No. 1 Cylinder Closest to Flywheel)	**1 - 3 - 2**
Direction of Rotation	**Counterclockwise (viewed from flywheel)**
Combustion System	**Direct Injection Type**
Cooling	**Liquid**
Cooling System Capacity	**Approximately 5.3 L (5.6 qt)**
Oil Capacity (with filter)	**Approximately 4.3 L (4.5 qt)**
Governor	**Centrifugal**
Slow Idle	**950 ± 50 rpm**
High Idle (No Load)	**2975 ± 50 rpm**
Rated Speed	**2800 ± 25 rpm**

Tests and Adjustments Specifications

Specifications:

Valve Clearance	**0.15 - 0.25 mm (0.006 - 0.010 in.)**
Connecting Rod Side Play	**0.2 - 0.4 mm (0.008 - 0.016 in.)**
Connecting Rod Bearing Clearance	**0.04 - 0.07 mm (0.002 - 0.003 in.)**
Crankshaft End Play	**0.09 - 0.27 mm (0.004 - 0.011 in.)**
Crankshaft Main Bearing Clearance	**0.04 - 0.07 mm (0.001 - 0.003 in.)**
Camshaft End Play	**0.05 - 0.25 mm (0.002 - 0.010 in.)**
Alternator Drive Belt Deflection	**10 - 15 mm (0.4 - 0.6 in.)**

Timing Gear Backlash:

All Except Hydraulic Pump Gear	**0.07 - 0.15 mm (0.003 - 0.005 in.)**
Hydraulic Pump Gear	**0.11 - 0.19 mm (0.004 - 0.008 in.)**

Fuel Injection Nozzle:

Opening Pressure	**21600 - 22600 kPa (3133 - 3278 psi)**
Leakage at 11032 kPa (1600 psi)	**None for a minimum of 10 seconds**

Chatter and Spray Pattern at 21600 - 22600 kPa (3133 - 3278 psi)

Slow Hand Lever Movement	**Fine Stream; Chatter Sound**
Fast Hand Lever Movement	**Fine Atomized Spray; 150° Spray Pattern**

ENGINE - DIESEL SPECIFICATIONS

Repair Specifications

Valve Train:

Rocker Arm Shaft OD	15.966 - 15.984 mm (0.6285 - 0.6295 in.)
Rocker Arm Shaft Wear Limit	15.94 mm (0.6275 in.)
Rocker Arm and Shaft Support Bushing ID	16.00 - 16.02 mm (0.630 - 0.631 in.)
Wear Limit	16.09 mm (0.633 in.)
Oil Clearance	0.02 - 0.05 mm (0.001 - 0.002 in)
Wear Limit	0.15 mm (0.006 in.)
Push Rod Bend	0.0 - 0.03 mm (0.0 - 0.001 in.)

Cylinder Head and Valves:

Cylinder Head Distortion	0.0 - 0.05 mm (0.0 - 0.002 in.)
Wear Limit	0.15 mm (0.006 in.)
Intake Valve Seat Width	1.07 - 1.24 mm (0.042 - 0.049 in.)
Intake Valve Seat Width (Wear Limit)	1.74 mm (0.069 in.)
Exhaust Valve Seat Width	1.24 mm - 1.45 mm (0.042 - 0.049 in.)
Exhaust Valve Seat Width (Wear Limit)	1.94 mm (0.076 in.)
Intake Valve Stem OD	7.96 - 7.98 mm (0.313 - 0.314 in.)
Intake Valve Stem OD (Wear Limit)	7.9 mm (0.311 in.)
Exhaust Valve Stem OD	7.96 - 7.97 mm (0.313 - 0.314 in.)
Exhaust Valve Stem OD (Wear Limit)	7.9 mm (0.311 in.)
Valve Head Thickness Intake	1.24 - 1.44 mm (0.049 - 0.057 in.)
Valve Head Thickness Exhaust	1.35 - 1.55 mm (0.053 - 0.061 in.)
Wear Limit	0.50 mm (0.020 in.)
Intake Valve Recession	0.31 - 0.51 mm (0.012 - 0.020 in.)
Intake Valve Recession Wear Limit	1.00 mm (0.039 in.)
Exhaust Valve Recession	0.3 - 0.5 mm (0.012 - 0.020 in.)
Wear Limit	1.00 mm (0.039 in.)
Valve Guide Stem-To-Guide Oil Clearance:	
Intake	0.04 - 0.07 mm (0.001 - 0.003 in.)
Exhaust	0.05 - 0.08 mm (0.002 - 0.003 in.)
Exhaust (Wear Limit)	0.20 mm (0.008 in.)
Valve Guide ID	8.01 - 8.03 mm (0.315 - 0.316 in.)
Valve Guide ID (Wear Limit)	8.10 mm (0.319 in.)
Valve Guide Projection	15 mm (0.591 in.)
Valve Spring Free Length	42.0 mm (1.654 in.)
Maximum Spring Inclination	1.10 mm (0.044 in.)
Valve Spring Tension (Measured With Spring Compressed 1.0 mm (0.039 in.)	2.36 - 3.10 kg (5.20 - 6.84 lb)
Valve Seat Surface Angle Exhaust Valve	45°
Valve Seat Surface Angle Intake Valve	30°
Valve Timing:	
Intake Valve Opens	10° - 20° BTDC
Intake Valve Closes	40° - 50° ABDC
Exhaust Valve Opens	51° - 61° BBDC
Exhaust Valve Closes	13° - 23° ATDC
Piston-to-Cylinder Head Clearance	0.66 - 0.78 mm (0.026 - 0.031 in.)

ENGINE - DIESEL SPECIFICATIONS

Connecting Rod

Large End Bearing ID	51 - 51.01 mm (2.008 - 2.008 in.)
Large End Bearing Thickness	1.49 - 1.50 mm (0.059 - 0.059 in.)
Oversize	1.625 mm (0.064 in.)
Oil Clearance	0.02 - 0.05 mm (0.001 - 0.002 in.)
Oil Clearance (Wear Limit)	0.13 mm (0.005 in.)
Connecting Rod Side Play	0.2 - 0.4 mm (0.008 - 0.016 in.)

Piston Rings

First Compression Piston Ring Groove Width	2.065 - 2.08 mm (0.081 - 0.082 in.)
First Compression Piston Ring Width	1.97 - 1.99 mm (0.078 - 0.078 in.)
First Compression Ring Minimum Side Clearance	0.075 - 0.110 mm (0.003 - 0.004 in.)
Second Compression Piston Ring Groove Width	2.035 - 2.05 mm (0.080 - 0.081 in.)
Second Compression Piston Ring Width	1.97 - 1.99 mm (0.078 - 0.078 in.)
Second Compression Piston Ring Minimum Side Clearance	0.035 - 0.07 mm (0.001 - 0.003 in.)
Oil Control Piston Ring Groove Width	4.015 - 4.03 mm (0.158 - 0.159 in.)
Oil Control Piston Ring Width	3.97 - 3.99 mm (0.156 - 0.157 in.)
Oil Control Piston Ring Minimum Side Clearance	0.025 - 0.06 mm (0.001 - 0.002 in.)
Piston Ring End Gap	0.20 - 0.40 mm (0.008 - 0.016 in.)
Wear Limit	1.50 mm (0.059 in.)

Piston Pin

Piston Pin OD	25.99 - 26.00 mm (1.023 - 1.024 in.)
Piston Pin OD (Wear Limit)	25.90 mm (1.020 in.)
Piston Pin Bushing ID	23.025 - 23.038 mm (0.906 - 0.907 in.)
Wear Limit	23.10 mm (0.909 in.)
Piston Pin-To-Rod Bore Oil Clearance	0.025 - 0.047 mm (0.001 - 0.002 in.)
Wear Limit	0.2 mm (0.008 in.)
Piston Pin Bore (In Piston) ID	26.00 - 26.009 mm (1.023 - 1.024 in.)
Piston Pin Bore (In Piston) ID (Wear Limit)	26.02 mm (1.024 in.)
Piston Pin-To-Piston Oil Clearance	0.00 - 0.022 mm (0.0 - 0.0009 in.)
Wear Limit	0.12 mm (0.005 in.)

Piston

Standard Piston OD	83.95 - 83.98 mm (3.305 - 3.306 in.)
Standard Piston OD (Wear Limit)	83.90 mm (3.303 in.)
Oversize Piston OD	84.20 - 84.23 mm (3.315 - 3.316 in.)
Oversize Piston OD (Wear Limit)	84.10 mm (3.311 in.)

Cylinder Bore ID

Cylinder Bore ID	84.00 - 84.03 mm (3.307 - 3.308 in.)
Cylinder Bore ID (Wear Limit)	84.20 mm (3.315 in.)
Oversize Bore ID	84.25 - 84.28 mm (3.317 - 3.318 in.)
Piston-to-Cylinder Clearance	0.040 - 0.070 mm (0.0016 - 0.0027 in.)
Cylinder Roundness	0.01 - 0.03 mm (0 - 0.001 in.)
Wear Limit	0.03 mm (0.001 in.)
Cylinder Taper	0.00 - 0.01 mm (0 - 0.0004 in.)
Wear Limit	0.03 mm (0.001 in.)
Deglazing	30 - 40° crosshatch pattern

Deboring	**30 - 40° crosshatch pattern**

Crankshaft and Main Bearings

Connecting Rod Crankshaft Journal OD	**47.95 - 47.96 mm (1.888 - 1.888 in.)**
Wear Limit	**47.91 mm (1.886 in.)**
Main Bearing Journal OD	**53.95 - 53.96 mm (2.124 - 2.124 in.)**
Wear Limit	**53.91 mm (2.122 in.)**
Main Bearing Oil Clearance	**0.04 - 0.07 mm (0.002 - 0.003 in.)**
Main Bearing Oil Clearance (Wear Limit)	**0.16 mm (0.006 in.)**
Crankshaft Bend (Maximum)	**0.02 mm (0.001 in.)**
Crankshaft End Play	**0.13 - 0.23 mm (0.005 - 0.009 in.)**

Camshaft

Camshaft End Play	**0.05 - 0.20 mm (0.002 - 0.008 in.)**
Camshaft Bend	**0 - 0.02 mm (0 - 0.001 in.)**
Wear Limit	**0.05 mm (0.002 in.)**
Camshaft Side Gap	**0.05 - 0.25 mm (0.002 - 0.010 in.)**
Lobe Height (Intake and Exhaust)	**38.64 - 38.77 mm (1.521 - 1.526 in.)**
Wear Limit	**38.40 mm (1.512 in.)**
Bearing Journal OD:	
Flywheel Side and Gear Side	**44.93 - 44.95 mm (1.769 - 1.770 in.)**
Intermediate Journal	**44.91 - 44.94 mm**
Wear Limit	**44.85 mm (1.766 in.)**
Oil Clearance (Gear and Flywheel Ends)	**0.04 - 0.13 mm (0.002 - 0.005 in.)**
Oil Clearance (Intermediate)	**0.07 - 0.12 mm (0.003 - 0.005 in.)**

Camshaft Followers

Stem OD	**11.98 - 11.99 mm (0.471 - 0.472 in.)**
Wear Limit	**11.93 mm (0.470 in.)**
Bore ID	**12.00- 12.02 mm (0.472 - 0.473 in.)**
Wear Limit	**12.05 mm (0.474 in.)**
Oil Clearance	**0.01 - 0.04 mm (0.0004 - 0.0016 in.)**
Wear Limit	**0.12 mm (0.005 in.)**

Idler Gear

Shaft OD	**45.95 - 45.98 mm (1.809 - 1.810 in.)**
Wear Limit	**45.93 mm (1.808 in.)**
Bushing ID	**46.00 - 46.03 mm (1.811 - 1.812 in.)**
Wear Limit	**46.08 mm (1.814 in.)**
Clearance	**0.15 mm (0.006 in.)**

Oil Pump

Rotor Shaft OD to Cover Hole ID Clearance	**0.01 - 0.04 mm (0.001 - 0.002 in.)**
Wear Limit	**0.20 mm (0.08 in.)**
Inner Rotor to Outer Rotor Clearance	**0.03 - 0.09 mm (0.001 - 0.004 in.)**
Wear Limit	**0.15 mm (0.006 in.)**
Outer Rotor to Pump Body Clearance	**0.10 - 0.16 mm (0.004 - 0.006 in.)**
Wear Limit	**0.25 mm (0.010 in.)**

ENGINE - DIESEL SPECIFICATIONS

Operational Tests

Specifications:

Cooling System Test Pressure	**88 ± 15 kPa (12.8 ± 2.2 psi)**
Thermostat Opening Temperature	**107 - 113° C (224 - 235° F)**
Minimum Lift Height above 85° C (185° F)	**8.0 mm (0.135 in.)**
Radiator Cap Opening Pressure	**88 ± 15 kPa (12.8 ± 2.2 psi)**
Cylinder Compression Difference Between Cylinders (maximum)	**200 - 300 kPa (29 - 43 psi)**
Oil Pressure (Rated Speed)	**294 - 392 kPa (42.6 - 56.8 psi)**
Slow Idle (Minimum)	**58.8 kPa (8.5 psi)**
Oil Relief Valve Opening Pressure	**294 - 392 kPa (43 - 57 psi)**
Oil Pressure Switch Opening Pressure	**49 ± 9.8 kPa (7.1 ± 1.4 psi)**

Torque Values, Non-Standard Fasteners

Specifications:

Cylinder Head Bolts (Lubricating Oil Applied)	**85 - 91 N•m (63 - 67 lb-ft)**
Connecting Rod Bolts (Lubricating Oil Applied)	**44 - 49 N•m (33 - 36 lb-ft)**
Flywheel Mounting Bolts (Lubricating Oil Applied)	**83 - 88 N•m (62 - 65 lb-ft)**
Main Bearing Bolts (Lubricating Oil Applied)	**93 - 98 N•m (63 - 72 lb-ft)**
Crankshaft Pulley Bolt (Lubricating Oil Applied)	**113 - 122 N•m (83 - 90 lb-ft)**
Fuel Injector Nozzle Nut	**6.8 - 8.8 N•m (60 - 78 lb-in.)**
Governor Weight Support Nut	**44 - 49 N•m (33 - 36 lb-ft)**
Rocker Arm Mounting Cap Screw and Nut	**26 N•m (19 lb-ft)**
Oil Pump Mounting Cap Screw	**25 N•m (18 lb-ft)**
Starting Motor Mounting Bolts	**47 N•m (35 lb-ft)**
Lock plate set bolt	**11.8 - 12.8 N•m (105 - 113 lb-in.)**
Thrust bearing set screw	**1.2 - 1.4 N•m (11 - 12 lb-in.)**
Seal plate set screw	**1.2 - 1.4 N•m (11 - 12 lb-in.)**

Special Tools

Note: Order tools according to information given in the U.S. SERVICE-GARD™ Catalog or in the European Microfiche Tool Catalog (MTC).

Special or Required Tools

Tool Name	Tool No.	Tool Use
Dial Indicator	(English, in.) D17526CI or (Metric, mm) D17527CI	Use with JDG451 to measure valve recess.
Spring Compression Tester	D01168AA	Test valve spring compression.
Valve Inspection Center	D05058ST	Check valves for out-of-round.
End Brush	D17024BR	Clean valve seat and bores.
Compression Test Adapter	JDG1687	To check cylinder compression pressure on diesel engines
Universal Pressure Test Kit	JT05470 (D15027NU or FKM10002)	Used to check engine oil pressure.
Cooling System Pressure Pump	D05104ST	Used to pressure test radiator cap and cooling system.
Magnetic Follower Holder Kit	D15001NU	Hold cam followers when removing and installing camshaft.
Nozzle Cleaning Kit	JDF13	Use to clean fuel injection nozzles.
Valve Guide Service Kit	JT07096A	Service valve guides.
Pressure Gauge 0 - 200 kPa (0 - 2 bar) (0 - 30 psi), Hose and Fittings.	JT05470	Measure supply pump pressure in rotary injection pump systems. Assemble test equipment from JT05470 Universal Pressure Test Kit or any other suitable equipment.
Noncontact Temperature Measuring Gun	JT07254	Spots heat problems early in your electrical and mechanical systems.

Other Materials

Other Material

Part No.	Part Name	Part Use
	Brake Kleen or Ignition Cleaner	Remove sealant from crankshaft flange.
	PLASTIGAGE®	Check main bearing-to-crankshaft journal oil clearance.
PM37463	John Deere RTV Clear Silicone	Seals rear oil seal case and flywheel housing to engine block. Seals oil pan to timing gear housing and engine block.
PM37418 LOCTITE® No. 242	Thread Lock and Sealer (Medium Strength)	Apply to threads of crankshaft pulley cap screw.
AR44402	Valve Stem Lubricant	Lubricate valve stems.

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