JOHN DEERE
WORLDWIDE CONSTRUCTION AND FORESTRY DIVISION

Skid Steer
240 and 250
TM1747 FEB03

TECHNICAL MANUAL

JOHN DEERE

Safety

Specifications and Information

Engine (Diesel)

Electrical

Power Train (Chain Case and Axles)

Power Train (Hydrostatic)

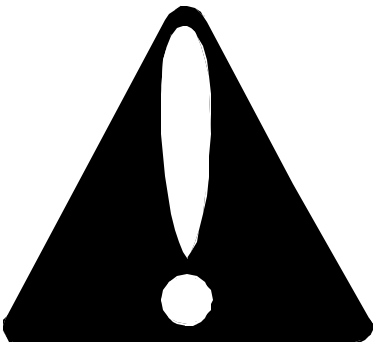
Steering

Brakes

Hydraulics

Miscellaneous M

RECOGNIZE SAFETY INFORMATION



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.

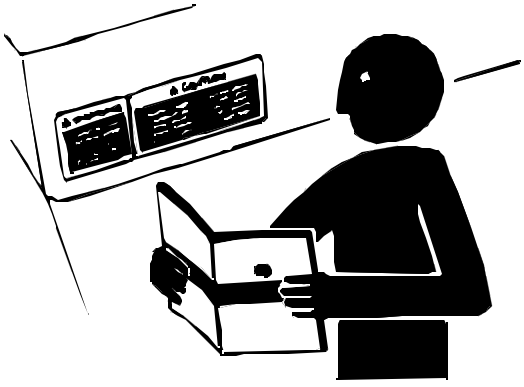
Follow recommended precautions and safe servicing practices.

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.

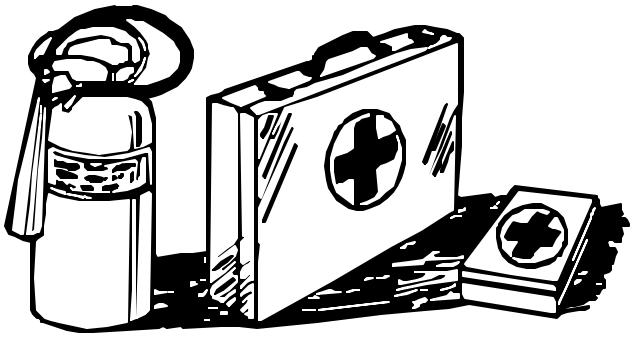
REPLACE SAFETY SIGNS



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



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.

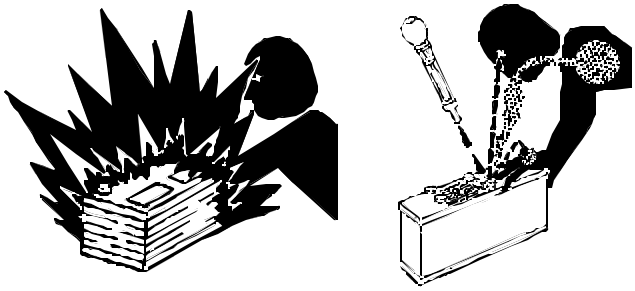
Do not store oily rags; they can ignite and burn spontaneously.

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



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:**

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

- **If you spill acid on yourself:**

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

- **If acid is swallowed:**

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

USE CARE AROUND HIGH-PRESSURE FLUID LINES

Avoid High-Pressure Fluids

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.

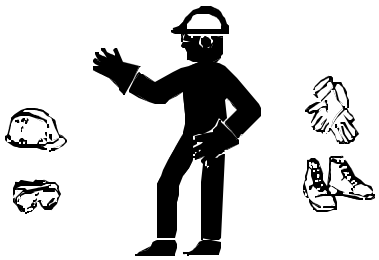
If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable medical source. Such information is available from Deere & Company Medical Department in Moline, Illinois, U.S.A., (1-800-822-8262 U.S.A. or Canada).

Avoid Heating Near Pressurized Fluid Lines

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.

USE SAFE SERVICE PROCEDURES

Wear Protective Clothing

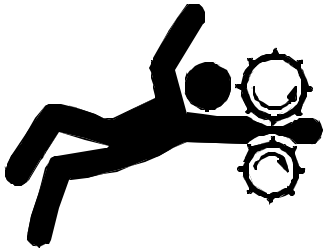


Wear close fitting clothing and safety equipment appropriate to the job.

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.

Service Machines Safely



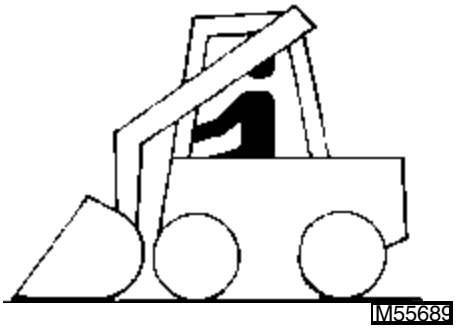
Tie long hair behind your head. Do not wear a necktie, scarf, loose clothing, or necklace when you work near machine tools or moving parts. If these items were to get caught, severe injury could result.

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

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.

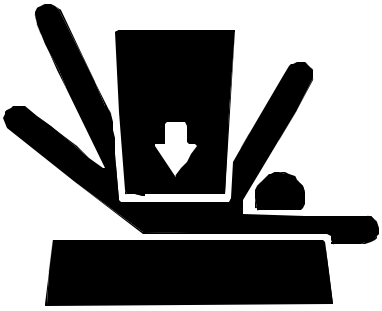
Park Machine Safely



Before working on the machine:

1. Lower all equipment to the ground.
2. Relieve hydraulic pressure.
3. Stop the engine and remove the key.
4. Disconnect the battery ground strap.
5. Hang a “DO NOT OPERATE” tag in operator station.

Support Machine Properly and Use Proper Lifting Equipment



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.

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.

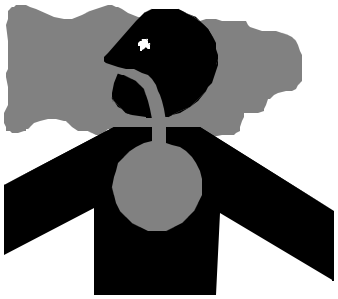
Using High Pressure Washers

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 component 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



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 duct system.

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

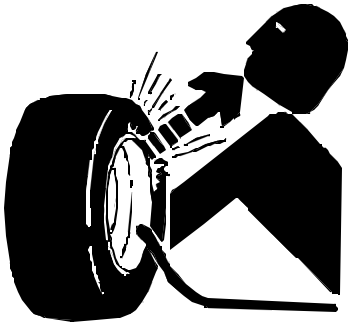
WARNING: California Proposition 65 Warning

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.

SERVICE TIRES SAFELY



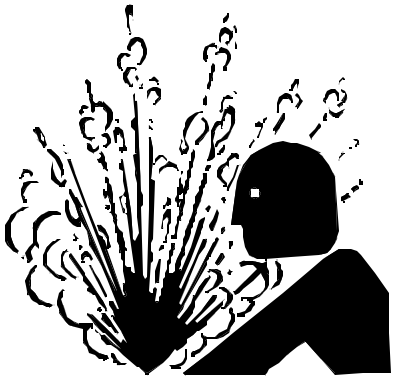
Explosive separation of a tire and rim parts can cause serious injury or death.

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.

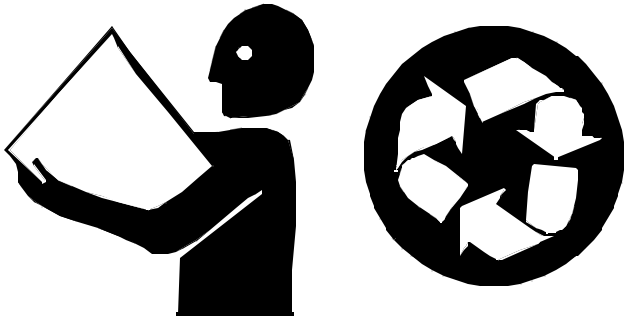
SERVICE COOLING SYSTEM SAFELY



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.

HANDLE CHEMICAL PRODUCTS SAFELY



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

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

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SPECIFICATIONS

ENGINE

Make	John Deere
Type	Diesel
Engine Model Number	
• 240	3029D
• 250	3029T
Net Horsepower at Rated Engine RPM (2400 RPM)	
• 240 (S.N. —240852)	34.3 kW (46 hp)
• 240 (S.N. 240853—)	38 kW (51 hp)
• 250	45.5 kW (61 hp)
Cylinders	3
Bore	106 mm (4.17 in.)
Stroke	110 mm (4.33 in.)
Displacement	2.9 L (179 cu in.)
Compression Ratio	17.8:1
Rated Engine RPM	2400
Lubrication	Full pressure
Oil Filter	Full flow (replaceable)
Air Cleaner	Dry paper with primary and secondary elements
Cooling System	Liquid-cooled

FUEL SYSTEM

Fuel	Diesel #2
Fuel Filter	In-line replaceable filter
Fuel Pump	Electric
Fuel Delivery	Rotary injection

ELECTRICAL SYSTEM

Type	12-volt, electric start
Charging System	Alternator, 55 amp
Battery	750 CCA (cold cranking amps)

CAPACITIES

Fuel Tank	56.7 L (15 gal)
Hydraulic Reservoir	15.6 L (4.1 gal)
Hydraulic System	23 L (6 gal)
Cooling System	9.5 L (10 qt)
Engine Oil (with Filter)	6.5 L (6.9 qt)
Chain Case (per Side)	11.4 L (3 gal)

HYDRAULICS AND HYDROSTATICS

Hydrostatic Pumps
- Type. . . . . Tandem variable displacement piston pump
- Displacement (Max) . . . . . .40.6 cm^3 (2.48 in^3) per revolution

Hydrostatic Motors
- Type. . . . . GEROLER® fixed displacement 30 series

Hydraulic/Charge Pump (Standard Flow)
- 240 . . . . . 49.1 L/min (13 gpm)
- 250 . . . . . 56.7 L/min (15 gpm)

Hydraulic/Charge Pump with High-Flow (Optional)
- 240 . . . . . 84.8 L/min (22.4 gpm)
- 250 . . . . . 98.1 L/min (25.9 gpm)

Hydrostatic System Relief Pressure . . . . . 34 474 kPa (5000 psi)
Charge Pressure . . . . . 1448 kPa (210 psi)
Hydraulic Control Valve . . . . . 3 spool open center
Filter . . . . . Spin-on canister
Hydraulic System Relief Pressure. . . . . 21 374 kPa (3100 psi)
Boom Circuit Relief Pressure . . . . . 22 753 kPa (3300 psi)
Bucket Circuit Relief Pressure (early models only) . . . . . N/A
Note: Bucket relief valve should have been removed in **Safety PIP 99KV004 or 00KV007**
Boom Breakout Force . . . . . 1406 kg (3100 lb)
Bucket Breakout Force . . . . . 2495 kg (5500 lb)

DIMENSIONS—240

(See note below.)

Operating Weight . . . . . 2811 kg (6195 lb)
SAE Rated Operating Capacities . . . . . 681 kg (1500 lb)
Maximum Ground Speed . . . . . 11.7 km/h (7.3 mph)
Overall Operating Height. . . . . .3599 mm (141.7 in.)
Height to ROPS. . . . . 1915 mm (75.4 in.)
Height to Hinge Pin . . . . . 2895 mm (114 in.)
Overall Width (less Bucket) . . . . . 1627 mm (64.1 in.)
Overall Width (with Bucket) . . . . . 1676 mm (66 in.)
Overall Length (less Bucket) . . . . . 2591 mm (102 in.)
Overall Length (with Bucket) . . . . . 3196 mm (125.8 in.)
Wheelbase . . . . . 1075 mm (42.3 in.)
Ground Clearance . . . . . 209 mm (8.2 in.)
Dump Height . . . . . 2255 mm (88.8 in.)
Dump Reach . . . . . .738 mm (29.1 in.)
Dump Angle . . . . . 45 degrees
Bucket Rollback. . . . . 35 degrees
Angle of Departure . . . . . 26 degrees

NOTE: Standard tires (10 x 16.5) and 66 in. foundry bucket used in determining dimensions.

GEROLER is a registered trademark of Eaton Corporation.

DIMENSIONS—250

(See note below.)

Operating Weight	2854 kg (6290 lb)
SAE Rated Operating Capacities	794 kg (1750 lb)
Maximum Ground Speed	11.4 km/h (7.1 mph)
Overall Operating Height	3637 mm (143.2 in.)
Height to ROPS	1950 mm (76.8 in.)
Height to Hinge Pin	2925 mm (115.2 in.)
Overall Width (less Bucket)	1750 mm (68.9 in.)
Overall Width (with Bucket)	1829 mm (72 in.)
Overall Length (less Bucket)	2591 mm (102 in.)
Overall Length (with Bucket)	3196 mm (125.8 in.)
Wheelbase	1075 mm (42.3 in.)
Ground Clearance	244 mm (9.6 in.)
Dump Height	2290 mm (90.2 in.)
Dump Reach	715 mm (28.1 in.)
Dump Angle	45 degrees
Bucket Rollback	35 degrees
Angle of Departure	27 degrees

NOTE: Standard tires (12 x 16.5) and 72 in. foundry bucket used in determining dimensions.

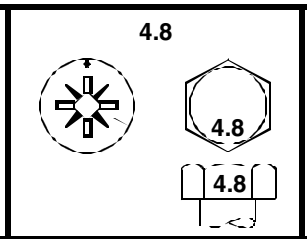
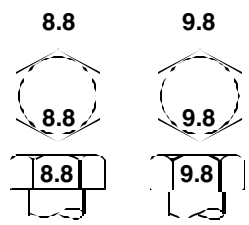
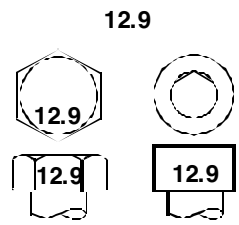
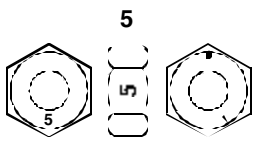
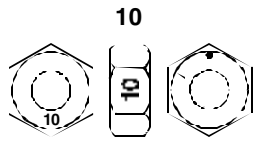
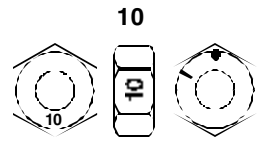
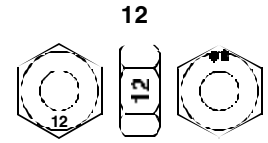
TIRES

240	10 x 16.5
250	12 x 16.5

RECOMENDED LUBRICANTS

Engine Oil	John Deere TORQ-GARD SUPREME® or PLUS-50® (See ENGINE OIL in the ENGINE section for cold weather oil)
Engine Coolant	John Deere COOL-GARD™
Hydraulic Oil and Hydrostatic Oil	John Deere HY-GARD® John Deere Low Viscosity HY-GARD® (cold weather operation)
Grease	John Deere HIGH TEMPERATURE EP GREASE John Deere MOLY HIGH TEMPERATURE EP GREASE (non-clay)
Chain Case Oil	John Deere HY-GARD® John Deere Low Viscosity HY-GARD® (cold weather operation) John Deere TORQ-GARD SUPREME® or PLUS-50®

METRIC FASTENER TORQUE VALUES

Property Class and Head Markings				
Property Class and Nut Markings				

TS1163

	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 class. 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.

METRIC FASTENER TORQUE VALUES—GRADE 7

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