

2243 Diesel Professional Greensmower

TECHNICAL MANUAL

**John Deere
Lawn & Grounds Care Division
TM1562 (01MAY94)**



M82380

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
- Component Location
- System Schematic
- Theory of Operation
- Troubleshooting Chart
- Diagnostics
- Tests and Adjustments
- Repair

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

Each section will be identified with a symbol rather than a number. The groups and pages within a section will be consecutively numbered.

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

We appreciate your input on this manual. To help, there are postage paid post cards included at the back. If you find any errors or want to comment on the layout of the manual please fill out one of the cards and mail it back to us.

Safety



Specifications and General Information



Engine (Diesel)



Electrical



Power Train (Hydrostatic)



Steering



Brakes



Hydraulics



Miscellaneous



Attachments



COPYRIGHT© 1994
JOHN DEERE HORICON WORKS
Horicon, Wisconsin
All rights reserved

**Thanks very much for your reading,
Want to get more information,
Please click here, Then get the complete
manual**

JustClickHere 

NOTE:

**If there is no response to click on the link above,
please download the PDF document first, and then
click on it.**

**Have any questions please write to me:
admin@servicemanualperfect.com**

RECOGNIZE SAFETY INFORMATION



T81389

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.

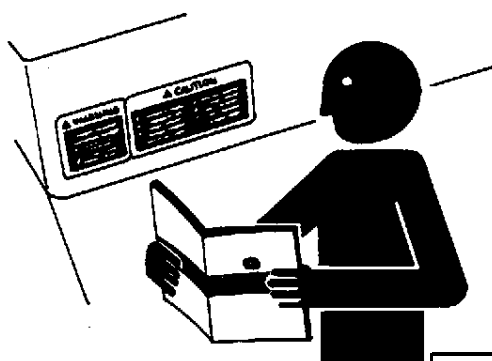
Follow recommended precautions and safe servicing practices.

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

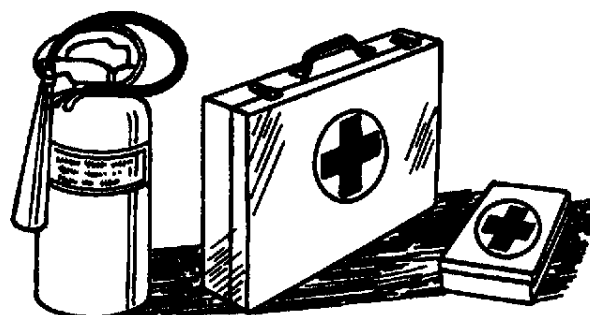


TS201

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



TS291



TS227

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.

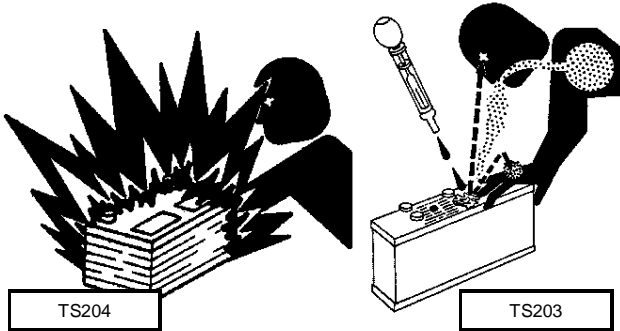
Keep a first aid kit and fire extinguisher handy.

Keep emergency numbers for doctors, ambulance service, hospital, and fire department near your telephone.

SAFETY



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. Use proper jump start procedure.

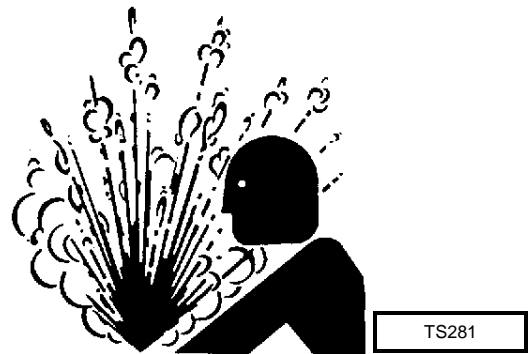
- **If you spill acid on yourself:**

1. Flush your skin with water.
2. Apply baking soda or lime to help neutralize the acid.
3. Flush your eyes with water for 15-30 minutes.
4. Get medical attention immediately.

- **If acid is swallowed:**

1. Do not induce vomiting.
2. Drink large amounts of water or milk, but do not exceed 1.9 L (2 quarts).
3. Get medical attention immediately.

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.

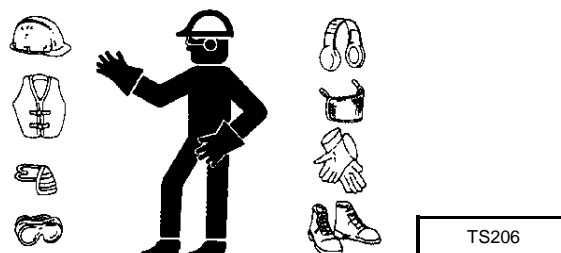
USE SAFE SERVICE PROCEDURES

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.

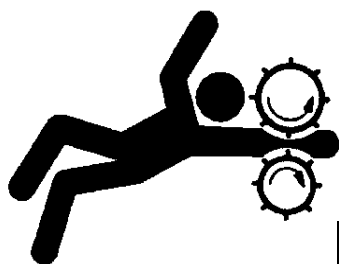
Operating equipment safely requires the full attention of the operator. Do not wear radio or music headphones while operating machine.



Service Machine 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.

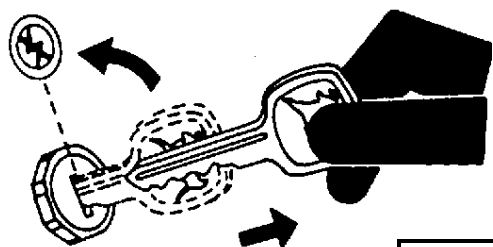


TS228

Use Proper Tools

Use tools appropriate to the work. Makeshift tools 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. Use only service parts meeting John Deere specifications.

Park Machine Safely

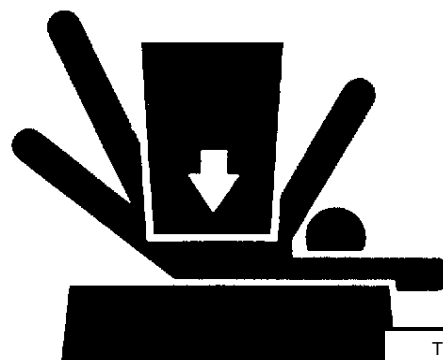


TS230

• Before working on the machine:

1. Lower all equipment to the ground.
2. Stop the machine and remove the key.
3. Disconnect the battery ground strap.
4. Hang a "DO NOT OPERATE" tag in operator station.

Support Machine Properly and Use Proper Lifting Equipment



TS229

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 A 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.

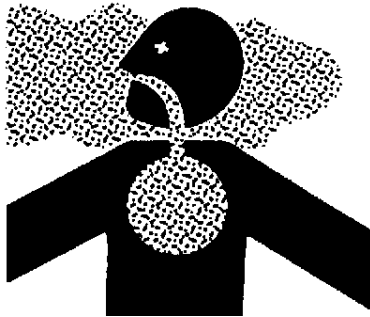
SAFETY



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 A Ventilated Area



TS220

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.

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



TS952

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

Do not attempt to mount 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 tire pressure resulting in a tire explosion. Welding can structurally weaken or deform the wheel.

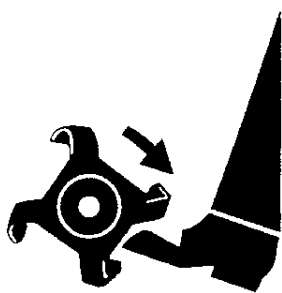
When inflating tires, use a clip-on chuck and extension hose long enough to allow you stand to one side and NOT in front of or over the tire assembly. Use a safety cage if available.

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

AVOID INJURY FROM ROTATING BLADES



TS283

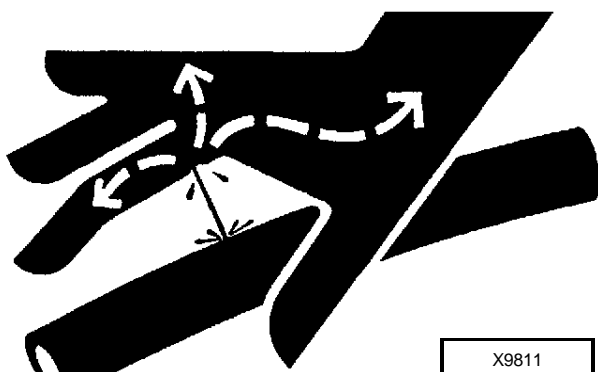


TS275

Keep hands and feet away while machine is running. Shut off power to service, lubricate or unlatch cutting units.

USE CARE AROUND HIGH-PRESSURE FLUID LINES

Avoid High-Pressure Fluids



X9811

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

Avoid the hazard by relieving pressure before disconnecting 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.

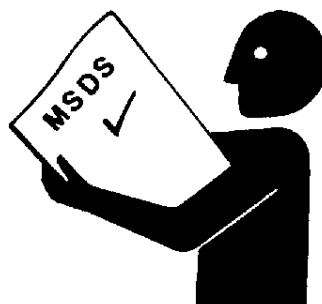
Avoid Heating Near Pressurized Fluid Lines



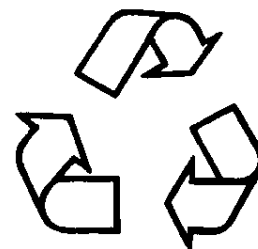
TS953

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.

HANDLE CHEMICAL PRODUCTS SAFELY



TS1132



TS1133

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.

SAFETY



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



TS231

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

CONTENTS

Page



SPECIFICATIONS AND GENERAL INFORMATION

GENERAL SPECIFICATIONS

VEHICLE SPECIFICATIONS	1-3
------------------------------	-----

REPAIR SPECIFICATIONS

METRIC BOLT AND CAP SCREW TORQUE VALUES	1-6
UNIFIED INCH BOLT AND CAP SCREW TORQUE VALUES	1-7
SERVICE RECOMMENDATIONS FOR O-RING BOSS FITTINGS	1-8
SERVICE RECOMMENDATIONS FOR FLAT FACE O-RING SEAL FITTINGS	1-9

FUEL, LUBRICANTS AND COOLANT

DIESEL FUEL	1-10
DIESEL ENGINE OIL	1-10
OILSCAN AND COOLSCAN	1-11
GREASE	1-11
ENGINE COOLANT RECOMMENDATIONS	1-11
ENGINE COOLANT SPECIFICATIONS	1-12
JOHN DEERE ENGINE COOLING FLUID	1-13
HYDRAULIC/HYDROSTATIC DRIVE OIL	1-14

SERIAL NUMBER LOCATIONS

MACHINE IDENTIFICATION NUMBER	1-15
ENGINE SERIAL NUMBER	1-15
TRANSAXLE SERIAL NUMBER	1-15
CUTTING UNIT SERIAL NUMBER	1-15

OPERATIONAL CHECKOUT PROCEDURES

INTERLOCK SYSTEM	1-16
OPERATIONAL CHECKOUT PROCEDURES	1-17
ENGINE OIL CHECK	1-17
ENGINE COOLANT LEVEL CHECK	1-17
HYDRAULIC RESERVOIR OIL LEVEL CHECK	1-18
PARKING BRAKE LOCK CHECK	1-18
INDICATOR LAMPS CHECK—ENGINE OFF	1-19
START CIRCUIT CHECK	1-19
MOW/TRANSPORT LEVER INTERLOCK CHECK	1-20
HYDROSTATIC DRIVE NEUTRAL INTERLOCK CHECK	1-20
PARKING BRAKE INTERLOCK CHECK	1-20
SEAT SWITCH INTERLOCK CHECK	1-21
INDICATOR LAMP CHECK—ENGINE RUNNING	1-21



Operational Checkout Procedures Contionued

Page

THROTTLE LEVER CHECK.....1-22

STEERING CHECK1-22

TRANSAXLE FORWARD AND REVERSE CHECK.....1-22

TRANSAXLE NEUTRAL RETURN CHECK1-22

TRANSAXLE NEUTRAL CREEP CHECK1-23

CUTTING UNIT LIFT CHECK.....1-23

VEHICLE SPECIFICATIONS**ENGINE**

Make	Yanmar
Type.	Diesel
Model	3TNE68
Aspiration	Natural
Horsepower (SAEJ1940)	13.4 kW (18 hp)
Cylinders	3
Displacement	585 cm ³ (35.7 cu in.)
Stroke/Cycle	4 Cycle
Bore.	68 mm (2.68 in.)
Stroke	72 mm (2.83 in.)
Compression Ratio	23:1
Slow Idle	1400± 75 rpm
Fast Idle	2975± 75 rpm
Firing Order.	1-3-2-1
Timing	14° BTDC
Valving.	Overhead Valves
Combustion System	Indirect Injection
Lubrication	Pressurized
Oil Filter.	Full Flow Filter
Cooling System.	Liquid Cooled
Air Cleaner	Semi-Cyclone Dry Type Dual Stage
Muffler	Horizontal discharge below frame
Engine Oil Capacity.	2.3 L (2.4 qt)
Weight.	81 kg (178.2 lbs)

FUEL SYSTEM

Fuel Tank Location	One on each side of machine
Fuel Tank Capacity (Total).	37.9 L (10 gal)
Fuel (min. octane).	Diesel #1 or #2
Fuel Pump Location	On Left-hand side of engine
Fuel Delivery.	Inline Indirect Injection
Fuel Shut-Off.	Fuel Shutoff Solenoid
Fuel Filter	Replaceable 5 Micron



GENERAL SPECIFICATIONS

ELECTRICAL



Ignition.	Electronic
Type of Starter.	Solenoid Shift
Charging System.	16 amp Alternator, Regulated
Battery Type	BCI Group, 22F
Battery Voltage	12V
Battery Reserve Capacity at 25 amp	68 minutes
Battery Cold Cranking amps at 0° F	341 amps
Headlights	Optional
Warning Lights	Engine Oil Pressure, Battery Discharge, Engine Coolant Temperature, Hydraulic/Hydrostatic Oil Temperature
Indicator Lights	Pre-Heat Indicator (Glow Plugs)
Gauges	Hourmeter
Ignition Interlock Switches.	Neutral Start, Operator Presence, Parking Brake, Mow/Transport Lever

POWER TRAIN

Drive Wheels.	Front
Traction Drive	Hydrostatic, 2 Pedal Control
Pump Type	Piston Traction Drive
Pump Drive	Flex Coupler on Engine Flywheel to Driven Coupler on Pump Shaft
Transaxle.	Motor Axle, Hydrostatic Pump Driven
Travel Speeds	
Forward	
Mowing Speed	0—6.4 km/h (0—4 mph)
Transport Speed	0—13.7 km/h (0—8.5 mph)
Reverse	0—4.8 km/h (0—3 mph)

STEERING

Type.	Power, Hydraulic, Rear Wheel, Tilt Column
---------------	---

BRAKES

Type.	Mechanical, Single Pedal, 2 Wheel Disk, 15.2 cm (6 in.) Dia. Disks
Parking Brake	Brake Pedal Lock Lever

GENERAL SPECIFICATIONS

HYDRAULICS

Pump Type	Double Gear
Pump Drive	Driven Coupler from Hydrostatic Pump Shaft
System	Mow (Reel Drive), Lift and Steering
Mow Control Valve	Electro-Hydraulic, One valve on/off
Lift Control Valve	Electro-Hydraulic, One valve raise/lower
Cutting Unit Lift	Front Cylinder, Rear Cylinder
Hydrostatic/Hydraulic System	
Capacity (Total)	22.7 L (6.6 gal)
Hydraulic Reservoir Capacity	16.6 L (4.4 gal)
Filter	10 Micron, Replaceable
Oil Cooler	Standard (Part of Radiator)
Optional Equipment	Auxiliary Oil Cooler, Mow/Backlap Valve



CUTTING UNITS

Number of Cutting Units	3
Cutting Unit Drive	Direct Hydraulic Motor
Reel Diameter	12.7 cm (5 in.)
Number of Blades	9
Front Rollers	Optional—Smooth or Grooved
Clip Frequency	5.6 mm (0.22 in.), 6.4 km/h (4.0 mph)
Bed Knife Adjustment	Reel-to-Bed Knife
Height of Cut	2.4—19 mm (3/32—3/4 in.)
Backlapping	Optional Hydraulic Valve, Variable Speed Adjustment Capability

WEIGHTS AND DIMENSIONS

Empty Weight (less attachments)	467 kg (1030 lb)
Cutting Unit Weight	34 kg (74 lb)
Wheel Base	1.30 m (4 ft 3 in.)
Tread Width	1.02 m (3 ft 4 in.)
Mowing Position Width	1.57 m (5 ft 2 in.)
Turning Radius (uncut circle)	0.60 m (23.6 in.)
Overall Length	2.26 m (7 ft 5 in.)
Overall Width	1.83 m (6 ft)
Overall Height	1.26 m (4 ft 2 in.)





















WHEELS AND TIRES

Standard	18 x 9.50-8.00 2 ply, Smooth
Optional	18 x 9.50-8.00 RS 2 ply, Turf

(Specifications and design subject to change without notice.)

REPAIR INFORMATION

METRIC BOLT AND CAP SCREW TORQUE VALUES

Property Class and Head Markings	4.8		8.8		9.8		10.9		12.9	
										
Property Class and Nut	5		10		10		12		12	
										

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	Nm	lb-ft	Nm	lb-ft	Nm	lb-ft	Nm	lb-ft	Nm	lb-ft	Nm	lb-ft	Nm	lb-ft	Nm	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	190
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 values if a different torque value or tightening procedure is given for a specific application. Torque values listed are for general use only. Check tightness of fasteners periodically.













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

Fasteners should be replaced with the same or higher grade. If higher grade fasteners are used, these should only be tightened to the strength of the original. Make sure fasteners threads are clean and that you properly start thread engagement. This will prevent them from failing when tightening.

Tighten plastic insert or crimped steel-type lock nuts to approximately 50 percent of the dry torque shown in the chart, applied to the nut, not to 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 without any lubrication.

UNIFIED INCH BOLT AND CAP SCREW TORQUE VALUES

SAE Grade and Head Markings	1 or 2 ^b No Marks 	5 	5.1 	5.2 	8 	8.2 
SAE Grade and Nut Marking	2 No Marks 	5 	5 	8 	8 	8 

TS1162

	Grade 1				Grade 2 ^b				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	Nm	lb-ft	Nm	lb-ft	Nm	lb-ft	Nm	lb-ft	Nm	lb-ft	Nm	lb-ft	Nm	lb-ft	Nm	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 values if a different torque value or tightening procedure is given for a specific application. Torque values listed are for general use only. Check tightness of fasteners periodically.

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

Fasteners should be replaced with the same or higher grade. If higher grade fasteners are used, these should only be tightened to the strength of the original. Make sure fasteners threads are clean and that you properly start thread engagement. This will prevent them from failing when tightening.

Tighten plastic insert or crimped steel-type lock nuts to approximately 50 percent of the dry torque shown in the chart, applied to the nut, not to 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 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.

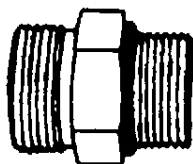
REPAIR INFORMATION

SERVICE RECOMMENDATIONS FOR O-RING BOSS FITTINGS

STRAIGHT FITTING



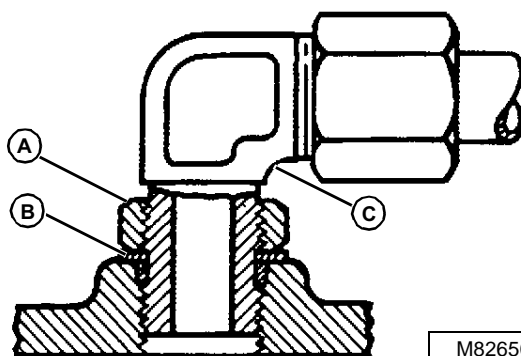
1. Inspect O-ring boss seal for dirt or defects.
2. Lubricate O-rings with petroleum jelly. Place electrical tape over threads to protect O-ring. Slide O-ring over tape and into O-ring groove of fitting. Remove tape.
3. Tighten fitting to torque value shown on chart.



M82649A

ANGLE FITTING

1. Back-off lock nut (A) and back-up washer (B) completely to head-end (C) of fitting.
2. Turn fitting into threaded boss until back-up washer contacts face of boss.
3. Turn fitting head-end counterclockwise to proper index (maximum of one turn).
4. Hold fitting head-end with a wrench and tighten locknut and back-up washer to proper torque value.



M82650A

NOTE: Do not allow hoses to twist when tightening fittings.

TORQUE VALUE

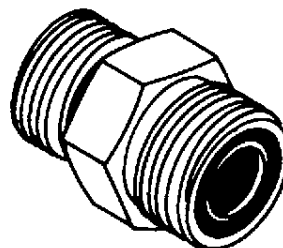
Thread Size	N•m	lb-ft
3/8-24 UNF	8	6
7/16-20 UNF	12	9
1/2-20 UNF	16	12
9/16-18 UNF	24	18
3/4-16 UNF	46	34
7/8-14UNF	62	46
1-1/16-12 UN	102	75
1-3/16-12 UN	122	90
1-5/16-12 UN	142	105
1-5/8-12 UN	190	140
1-7/8-12 UN	217	160

NOTE: Torque tolerance is $\pm 10\%$

SERVICE RECOMMENDATIONS FOR FLAT FACE O-RING SEAL FITTINGS

1. Inspect the fitting sealing surfaces. They must be free of dirt or defects.
2. Inspect the O-ring. It must be free of damage or defects.
3. Lubricate O-rings and install into groove using petroleum jelly to hold in place.
4. Push O-ring into the groove with plenty of petroleum jelly so O-ring is not displaced during assembly.

5. Index angle fittings and tighten by hand pressing joint together to insure O-ring remains in place.
6. Tighten fitting or nut to torque value shown on the chart per dash size stamped on the fitting. Do not allow hoses to twist when tightening fittings.



M82651A

FLAT FACE O-RING SEAL FITTING TORQUE

Nominal Tube O.D.		Dash Size	Thread Size (in.)	Swivel Nut Torque		Bulkhead Nut Torque	
mm	(in.)			N•m	(lb-ft)	N•m	(lb-ft)
6.35	0.250	-4	9/16-18	16	12	5.0	3.5
9.52	0.375	-6	11/16-16	24	18	9.0	6.5
12.70	0.500	-8	13/16-16	50	51	17.0	12.5
15.88	0.625	-10	1-14	69	51	17.0	12.5
19.05	0.750	-12	1-3/16-12	102	75	17.0	12.5
22.22	0.875	-14	1-3/16-12	102	75	17.0	12.5
25.40	1.000	-16	1-7/16-12	142	105	17.0	12.5
31.75	1.250	-20	1-11/16-12	190	140	17.0	12.5
38.10	1.500	-24	2-12	217	160	17.0	12.5

NOTE: Torque tolerance is +15 -20%.