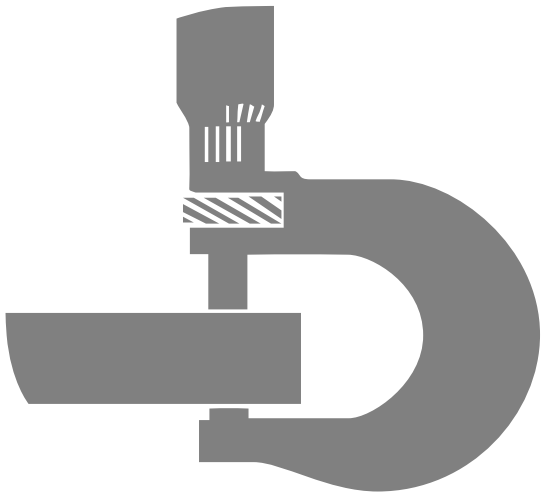
3029
4039, 4045
6059, 6068
Engines (Saran)
(-499999CD)

COMPONENT TECHNICAL MANUAL



John Deere Usine de Saran
CTM3274 (01JUL99)
European Version
Printed in Germany
ANGLAIS

3029, 4039, 4045, 6059, 6068 Engines (Saran) (-499999CD)

CTM3274 (01JUL99)

Introduction

FOREWORD

This manual is written for an experienced technician. Essential tools required in performing certain service work are identified in this manual and are recommended for use.

Live with safety: Read the safety messages in the introduction of this manual and the cautions presented throughout the text of the manual.

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

Use this component technical manual in conjunction with the machine technical manual. An application listing in the introduction identifies product-model/component type-model relationship. See the machine technical manual for information on component removal and installation, and gaining access to the components.

This manual is divided in two parts: repair and operation and tests. Repair sections contain necessary instructions to repair the component. Operation and tests sections help you identify the majority of routine failures quickly.

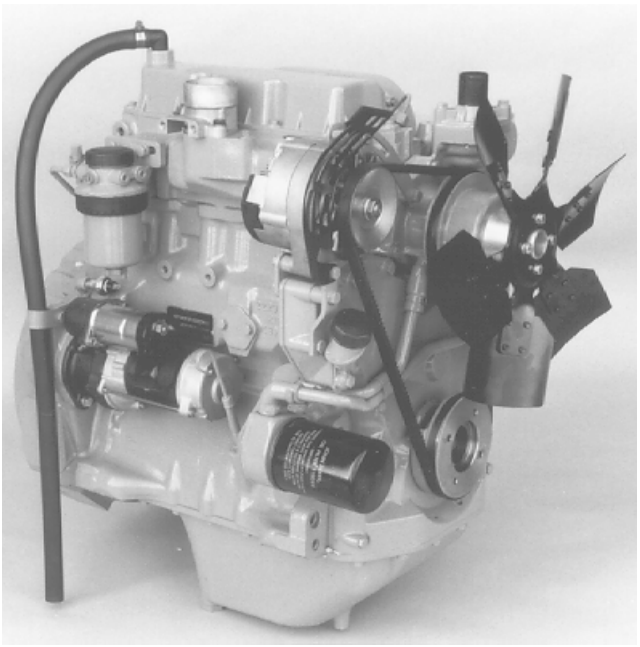
Information is organized in groups for the various components requiring service instruction. At the beginning of each group are summary listings of all applicable essential tools, service equipment and tools, other materials needed to do the job, service parts kits, specifications, wear tolerances, and torque values.

Component Technical Manuals are concise service guides for specific components. Component technical manuals are written as stand-alone manuals covering multiple machine applications.

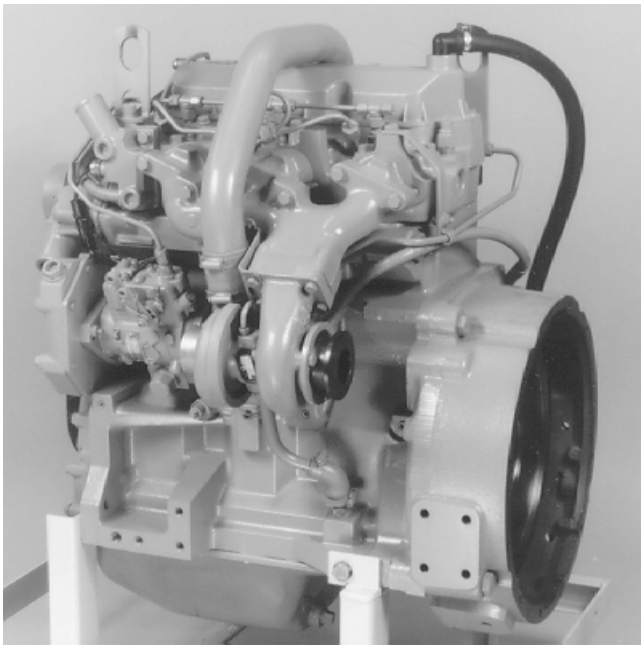
Fundamental service information is available from other sources covering basic theory of operation, fundamentals of troubleshooting, general maintenance, and basic type of failures and their causes.

DX,CTMIFC -19-22MAY92

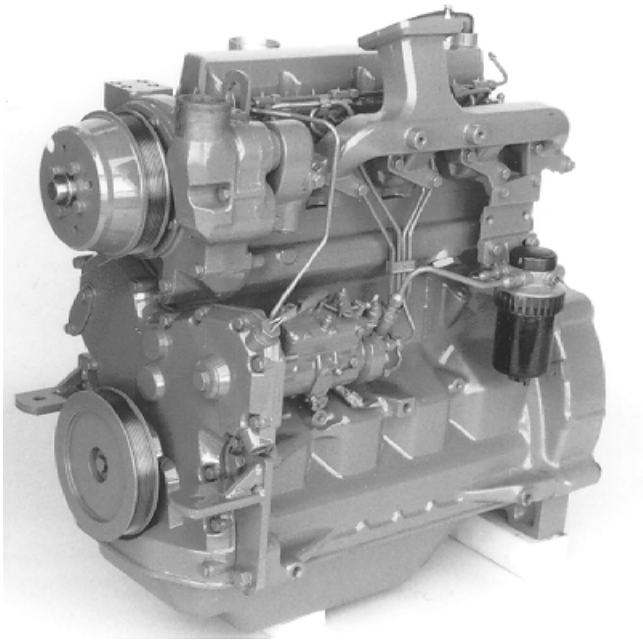
ENGINE IDENTIFICATION VIEWS



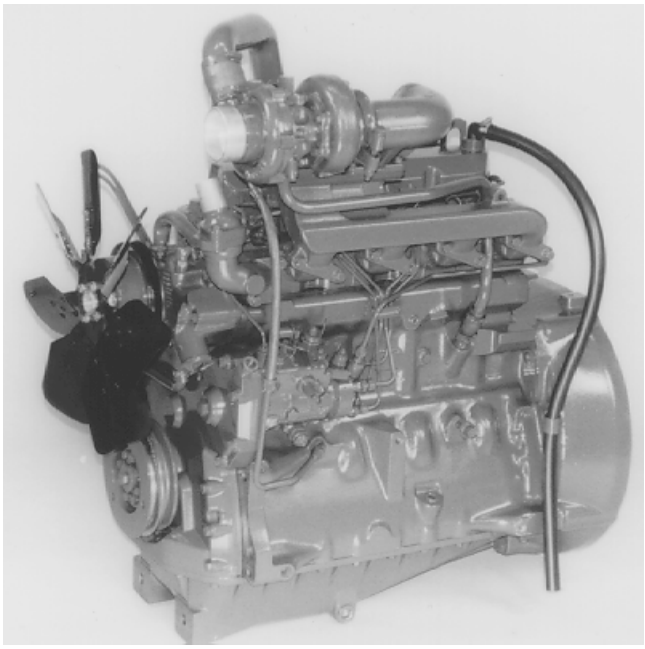
3029D



3029T



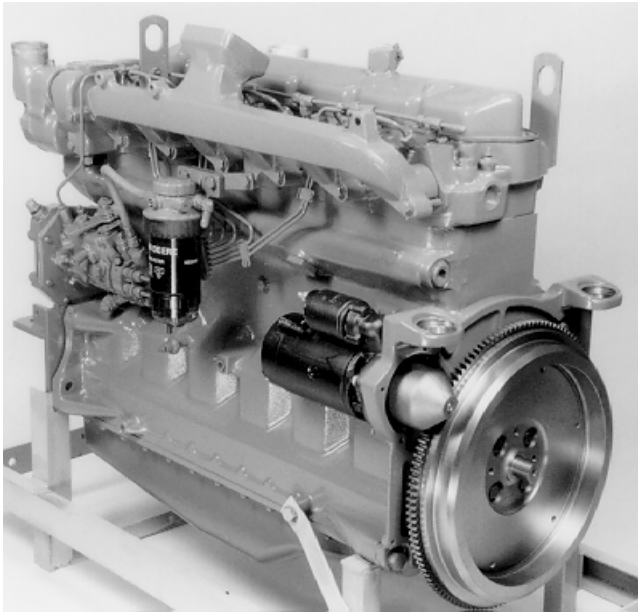
4039D



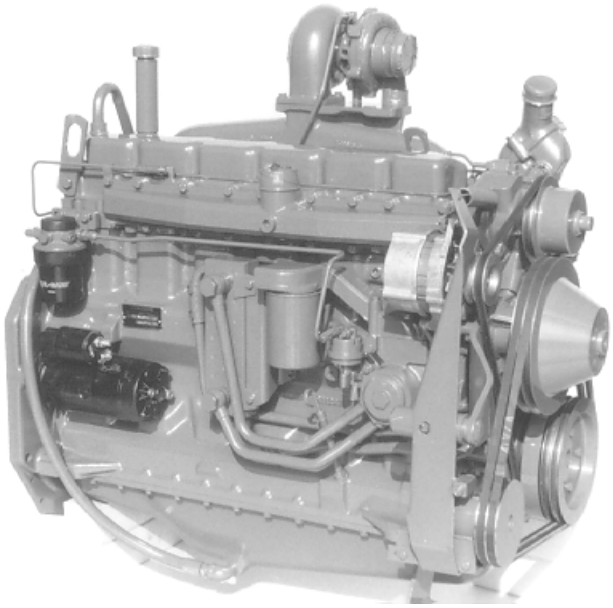
4039T

CD,3274,G00,27 -19-04JAN99

ENGINE IDENTIFICATION VIEWS (CONT'D)



6068D



6068H

CD,3274,G00,28 -19-04JAN99

Engine application chart

This Component Technical Manual contains service information on the 3029, 4039, 4045, 6059 and 6068 engines produced by JOHN DEERE Saran (FRANCE) for the applications listed in the application chart.

NOTE: Information on how to remove and reinstall the engine in the vehicle is contained in the relevant Technical Manual.

3000-SERIES TRACTORS	ENGINE MODEL	SERIAL NUMBER
3100	CD3029DRT65	(189846 -)
3110	CD3029DRT65	
3200/3200X	CD4039DRT35	(181345 -)
3210/3210X	CD4039DRT35	
3300/3300X	CD4045DRT35	(182145 -)
3310/3310X	CD4045DRT35	
3400/3400X	CD4039TRT35	(181775 -)
3410/3410X	CD4039TRT35	

4000-SERIES TELESCOPIC HANDLERS	ENGINE MODEL	SERIAL NUMBER
4400	CD4039TF005	(237697 -)
4500	CD4039TF005	

5000-SERIES TRACTORS (Agritalia-built)	ENGINE MODEL	SERIAL NUMBER
5300/5300N	CD3029DAT01	(315424 -)
5400/5400N	CD3029TAT02	(289398 -)
5500/5500N	CD4039TAT01	(346168 -)

5000-SERIES TRACTORS (Augusta-built)	ENGINE MODEL	SERIAL NUMBER
5400N	CD3029TLV01	
5500N	CD4039TLV01	(201353 -)

5000-SERIES TRACTORS (For India)	ENGINE MODEL	SERIAL NUMBER
5300	CD3029DPY01	(383283 -)

(Continued on next page)

CD,3274,G00,24 -19-04JAN99

ENGINE APPLICATION CHART (CONT')

6000-SERIES TRACTORS	ENGINE MODEL	SERIAL NUMBER
6100 (Direct fan drive)	CD4045DL001	(101582 -)
6100 (Viscous fan drive)	CD4045DL002	(101582 -)
6200 (Direct fan drive)	CD4039TL001	(101625 -)
6200 (Viscous fan drive)	CD4039TL004	(101625 -)
6300 (Direct fan drive)	CD4039TL003	(101649 -)
6300 (Viscous fan drive)	CD4039TL006	(101649 -)
6400 (Direct fan drive)	CD4045TL001	(101682 -)
6400 (Viscous fan drive)	CD4045TL003	(101682 -)
6506 (Viscous fan drive)	CD6068DL001	(214852 -)
6600 (Viscous fan drive)	CD6059TL001	(128886 -)
6800 (Viscous fan drive)	CD6068TL001	(124505 -)
6900 (Viscous fan drive)	CD6068TL002	(186326 -)

WATERLOO TRACTORS	ENGINE MODEL	SERIAL NUMBER
7600	T06068TRW01	

ZWEIBRÜCKEN COMBINES	ENGINE MODEL	SERIAL NUMBER
2054	6068HZ001	(116452 -)
2254	6068HZ001	

ENGINES FOR CHINESE COMBINES	SERIAL NUMBER
CD6059TYC01	(367019 -)
CD6059TYC02	(363170 -)

ENGINES FOR GOLDONI TRACTORS	SERIAL NUMBER
CD3029DFG21	(287123 -)
CD3029DFG22	(287325 -)
CD3029TFG21	(287526 -)

(Continued on next page)

CD,3274,G00,25 -19-04JAN99

ENGINE APPLICATION CHART (CONT')

SARAN OEM ENGINES	SERIAL NUMBER	SARAN OEM ENGINES	SERIAL NUMBER
CD3029DF		CD3029TF	
CD3029DF001		CD3029TF001	
CD3029DF005	(162670 -)	CD3029TF002	(170797 -)
CD3029DF031		CD3029TF031	
CD3029DF032		CD3029TF032	(176015 -)
CD3029DF033	(177875 -)	CD3029TF033	(177880 -)
CD3029DF034		CD3029TF120	
CD3029DF120		CD3029TF121	
CD3029DF121		CD3029TF123	(354029 -)
CD3029DF122	(263024 -)	CD3029TF160	
CD3029DF123	(312932 -)	CD3029TF161	(288419 -)
CD3029DF124	(340207 -)	CD3029TF162	
CD3029DF128		CD3029TF163	(342829 -)
CD3029DF160			
CD3029DF161	(288417 -)		
CD3029DF162			
CD3029DF163			
CD3029DF164			
CD3029DF165			
CD4039DF		CD4039TF	
CD4039DF001		CD4039TF001	
CD4039DF002		CD4039TF002	
CD4039DF004	(152613 -)	CD4039TF003	(169516 -)
CD4039DF005	(165009 -)	CD4039TF004	(152616 -)
CD4039DF006	(340212 -)	CD4039TF005	
CD4039DF007	(378895 -)	CD4039TF006	(339780 -)
CD4039DF008		CD4039TF007	(379066 -)
CD4039DF031		CD4039TF008	
CD4039DF032		CD4039TF031	
		CD4039TF032	(166826 -)
CD4045DF001		CD4045TF001	
CD4045DF031		CD4045TF002	(170081 -)
		CD4045TF003	(342250 -)
		CD4045TF008	
		CD4045TF031	

(Continued on next page)

CD,3274,G00,29 -19-04JAN99

ENGINE APPLICATION CHART (CONT')

SARAN OEM ENGINES	SERIAL NUMBER	SARAN OEM ENGINES	SERIAL NUMBER
CD6059DF		CD6059TF	
CD6059DF001		CD6059TF001	
CD6059DF002		CD6059TF002	(158390 -)
CD6059DF003		CD6059TF003	(158394 -)
		CD6059TF004	
		CD6059TF005	(166159 -)
		CD6059TF006	(166960 -)
		CD6059TF008	(341217 -)
CD6068DF001		CD6068TF001	
		CD6068TF002	(187378 -)
		CD6068TF003	
		CD6068TF004	(344260 -)
		CD6068TF008	
		CD6068TF009	

CD,3274,G00,30 -19-04JAN99

HANDLE FLUIDS SAFELY—AVOID FIRES

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.

TS227 -UN-23AUG88

DX,FLAME -19-29SEP98

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).

TS204 -UN-23AUG88

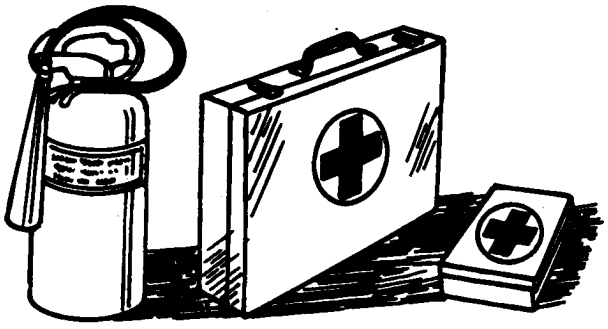
DX,SPARKS -19-03MAR93

PREPARE FOR EMERGENCIES

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.



TS291 -UN-23AUG88

DX,FIRE2 -19-03MAR93

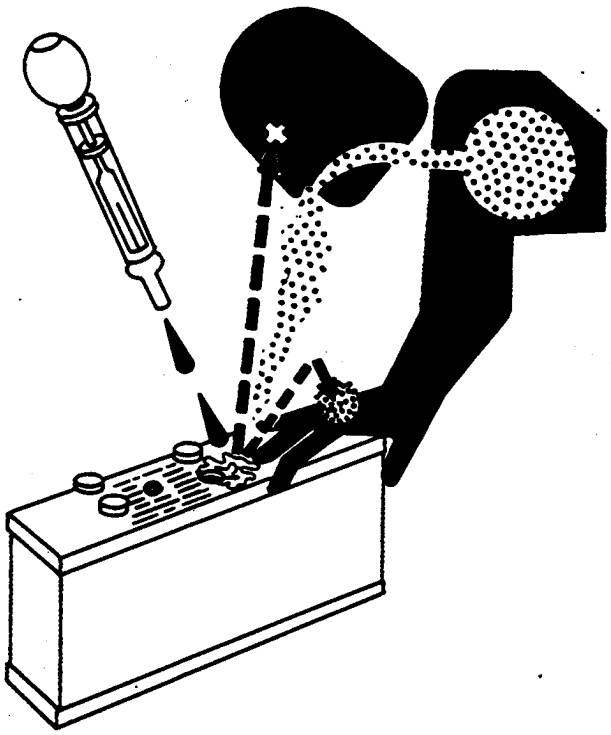
PREVENT ACID BURNS

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 the hazard 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. Get medical attention immediately.

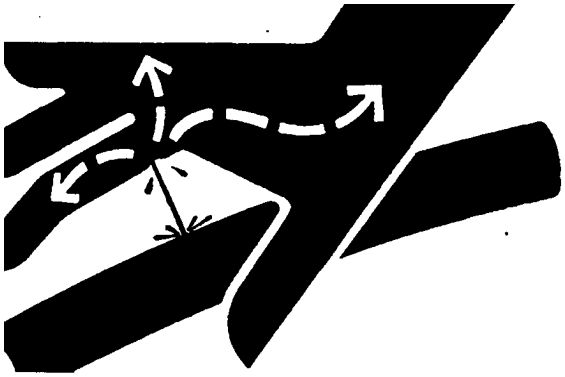
If acid is swallowed:
1. Do not induce vomiting.
2. Drink large amounts of water or milk, but do not exceed 2 L (2 quarts).
3. Get medical attention immediately.



TS203 -UN-23AUG88

DX,POISON -19-21APR93

AVOID HIGH-PRESSURE FLUIDS



X9811 -UN-23AUG88

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

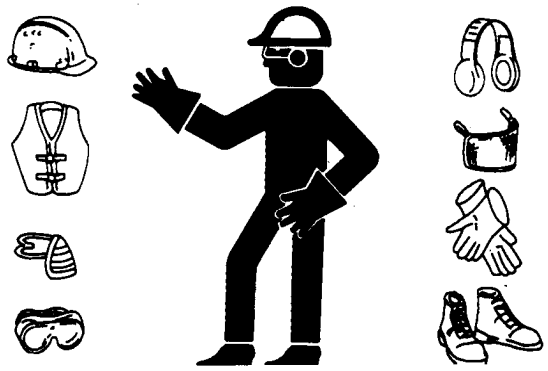
Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure.

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.

DX,FLUID -19-03MAR93

WEAR PROTECTIVE CLOTHING



TS206 -UN-23AUG88

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.

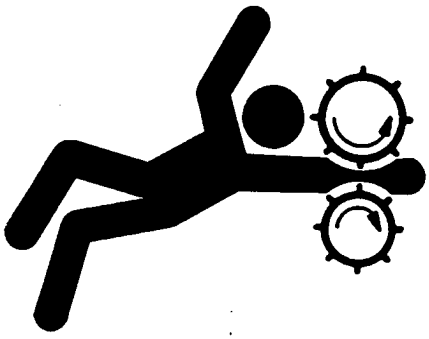
Operating equipment safely requires the full attention of the operator. Do not wear radio or music headphones while operating machine.

DX,WEAR -19-10SEP90

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.



TS228 -UN-23AUG88

DX,LOOSE -19-04JUN90

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 pipe extension.

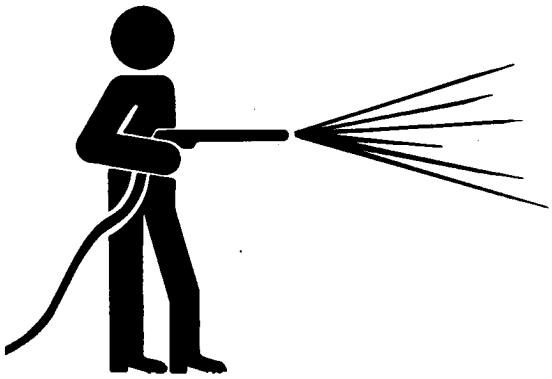
If you do not have an exhaust pipe extension, open the doors and get outside air into the area.

TS220 -UN-23AUG88

DX,AIR -19-04JUN90

WORK IN CLEAN AREA

Before starting a job:
- Clean work area and machine.
- Make sure you have all necessary tools to do your job.
- Have the right parts on hand.
- Read all instructions thoroughly; do not attempt shortcuts.



T6642EJ -UN-18OCT88

DX,CLEAN -19-04JUN90

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.

TS220 -UN-23AUG88

DX,PAINT -19-03MAR93

AVOID HEATING NEAR PRESSURIZED FLUID LINES

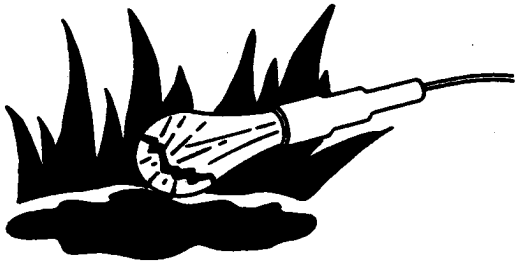
Flammable spray can be generated by heating near pressurized fluid lines, resulting in severe burns to yourself and bystanders. Do not heat by welding, soldering, or using a torch near pressurized fluid lines or other flammable materials. Pressurized lines can be accidentally cut when heat goes beyond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

TS953 -UN-15MAY90

DX,TORCH -19-03MAR93

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.



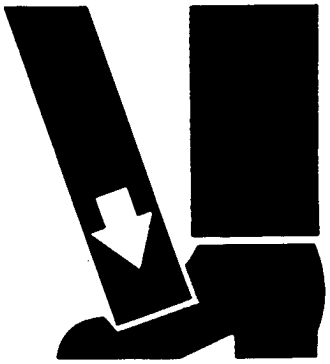
TS223 -UN-23AUG88

DX,LIGHT -19-04JUN90

USE PROPER LIFTING EQUIPMENT

Lifting heavy components incorrectly can cause severe injury or machine damage.

Follow recommended procedure for removal and installation of components in the manual.



TS226 -UN-23AUG88

DX,LIFT -19-04JUN90

PRACTICE SAFE MAINTENANCE

Understand service procedure before doing work. Keep area clean and dry.

Never lubricate, service, or adjust machine while it is moving. Keep hands, feet , and clothing from power-driven parts. Disengage all power and operate controls to relieve pressure. Lower equipment to the ground. Stop the engine. Remove the key. Allow machine to cool.

Securely support any machine elements that must be raised for service work.

Keep all parts in good condition and properly installed. Fix damage immediately. Replace worn or broken parts. Remove any buildup of grease, oil, or debris.

On self-propelled equipment, disconnect battery ground cable (-) before making adjustments on electrical systems or welding on machine.

On towed implements, disconnect wiring harnesses from tractor before servicing electrical system components or welding on machine.

TS218 -UN-23AUG88

DX,SERV -19-04FEB99

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.

TS779 -UN-08NOV89

DX,REPAIR -19-04JUN90

DISPOSE OF WASTE PROPERLY

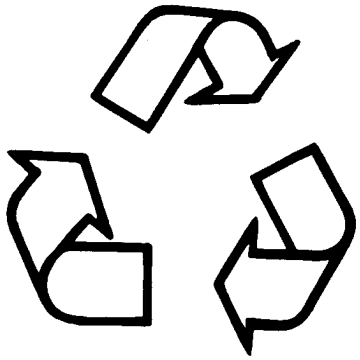
Improperly disposing of waste can threaten the environment and ecology. Potentially harmful waste used with John Deere equipment include such items as oil, fuel, coolant, brake fluid, filters, and batteries.

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.

Air conditioning refrigerants escaping into the air can damage the Earth's atmosphere. Government regulations may require a certified air conditioning service center to recover and recycle used air conditioning refrigerants.

Inquire on the proper way to recycle or dispose of waste from your local environmental or recycling center, or from your John Deere dealer.



TS1133 -UN-26NOV90

DX,DRAIN -19-03MAR93

LIVE WITH SAFETY

00
8

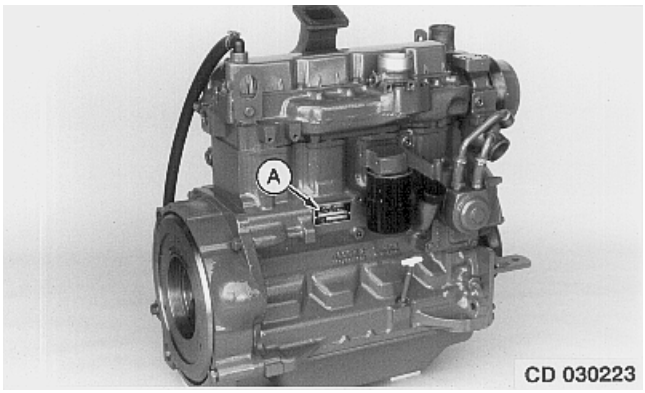
Before returning machine to customer, make sure machine is functioning properly, especially the safety systems. Install all guards and shields.

TS231 -19-07OCT88

DX,LIVE -19-15APR98

ENGINE IDENTIFICATION

The engine can be identified from the serial plate (A) located on the right-hand side of the engine.
Some applications also have an additional serial plate located on top of the flywheel housing. Refer to the engine type to identify repair information in the Component Technical Manual.



-UN-07MAR95
CD30223

CD,3274,G01,1 -19-24FEB92

ENGINE PLATE INFORMATION (EARLIER DESIGN)

Three types of plates are used on engines and give the following information:

First line (all plates)

CD . . . . . Manufacturing factory
(CD = Saran, T0 = Dubuque)
4045 . . . . . Engine model designation
4 = Number of cylinders
045 = Total displacement
(045 = 4.5 liters)
D . . . . . Aspiration code
D = Naturally Aspirated
H = air-to-air aftercooled
T = Turbocharged
000000 . . . . Sequential serial number

Second line (all plates)

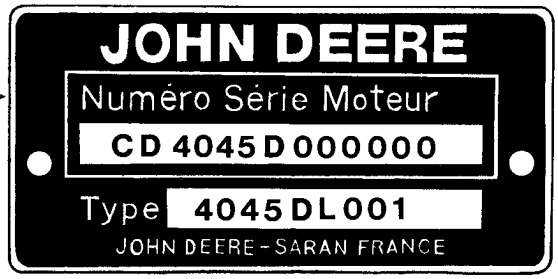
4045D . . . . . See above
L . . . . . User code
F = OEM application
L = Mannheim
RW = Waterloo Tractor
Z = Zweibrücken
001 . . . . . Application number

Third line (OEM plates only)

First field . . . . . Not used
Second field . . . . . Absorption coefficient of smoke emissions (shown on certain OEM engines)

A—Plate used on John Deere equipment
B—Plate used on OEM engines
C—Generic plate used on certain OEM engines

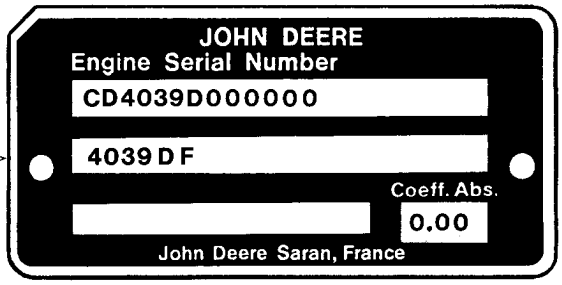
A



CD 030230

-UN-07MAR95
CD30230

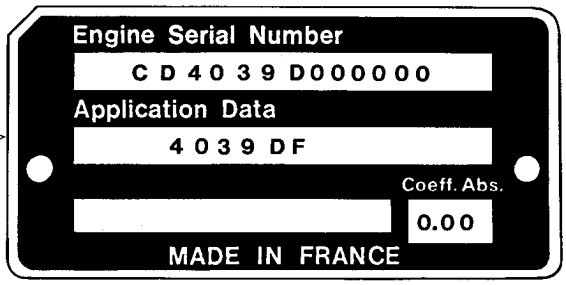
B



CD 030224

-UN-07MAR95
CD30224

C



CD 030225

-UN-07MAR95
CD30225

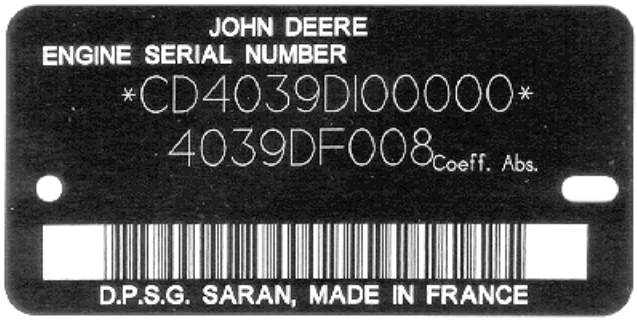
CD,3274,G01,2 -19-04JAN99

ENGINE PLATE INFORMATION (LATER DESIGN)

A new engine plate design as shown, is now affixed to the engine.

01
2

Information on this new plate is the same as previously.



-UN-22FEB99
CD30705

CD,3274,G01,10 -19-04JAN99

REPOWER ENGINE PLATE

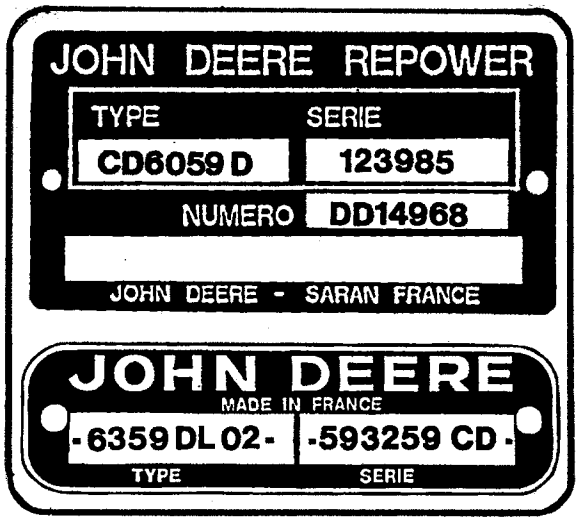
A specific plate is fixed on repower engines for proper identification. This plate gives the following information:

First line
First field . . . . . Engine type
Second field . . . . . Sequential serial number

Second line
DD———— . . . . . Repower engine part number

The third line contains a bar code information for factory use.

NOTE: The serial number plate from original engine must be fixed on the repower plate as shown.



-UN-22FEB99
CD30706

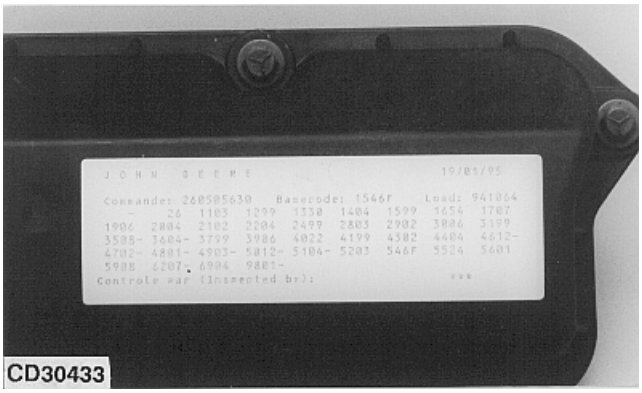
CD,3274,G01,6 -19-04JAN99

OEM ENGINE OPTION CODE LABEL

An option code label is secured to the top of the valve cover and identifies the factory installed options on each OEM engine to ensure correct parts acquisition.

Always provide option code information and engine base code when ordering repair parts. A listing of option codes is given in Parts Catalogs and Operator's Manual.

NOTE: Before "hot tank" cleaning, ensure that option codes are recorded elsewhere.



-UN-10MAY95 CD30433

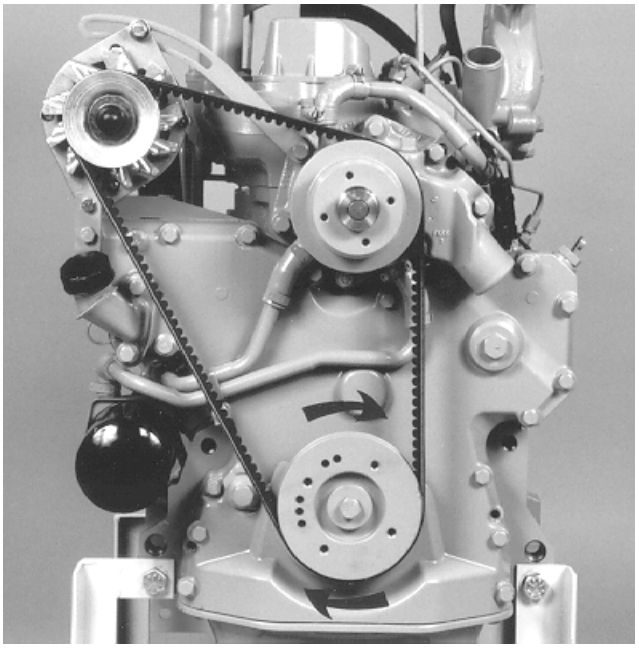
CD,3274,G01,3 -19-01FEB94

ENGINE REFERENCES

Direction of engine rotation:
Clockwise rotation when viewed from water pump end.

Engine front reference:
The water pump end is the "front" of the engine. Cylinder number 1 is at the front of engine.

Engine side references:
"Right-hand" and "left-hand" sides are determined by facing the flywheel end (rear) of the engine. Right-hand side is the camshaft side while left-hand side is the fuel injection pump side.



-UN-04MAY98 CD30525

CD,CTM125,005 -19-01DEC97

BASIC ENGINE SPECIFICATIONS (3029 - 4039 & 6059)

GENERAL	UNIT of Measure	3029D	3029T	4039D	4039T	6059D	6059T
Number of Cylinders	---	3	3	4	4	6	6
Bore	mm (in.)	106.5 (4.19)	106.5 (4.19)	106.5 (4.19)	106.5 (4.19)	106.5 (4.19)	106.5 (4.19)
Stroke	mm (in.)	110 (4.33)	110 (4.33)	110 (4.33)	110 (4.33)	110 (4.33)	110 (4.33)
Displacement	L ($in.^3$)	2.9 (179)	2.9 (179)	3.9 (239)	3.9 (239)	5.9 (359)	5.9 (359)
Compression Ratio	---	17.8:1	17.8:1	17.8:1	17.8:1	17.8:1	17.8:1
Firing Order	---	1-2-3	1-2-3	1-3-4-2	1-3-4-2	1-5-3-6-2-4	1-5-3-6-2-4
Injection System	---	Direct	Direct	Direct	Direct	Direct	Direct
Aspiration	---	Natural	Turbocharged	Natural	Turbocharged	Natural	Turbocharged
Rated Speed*	rpm	2500	2500	2500	2500	2500	2500
Power** @ Rated Speed	kW (hp)	43 (58)	59 (79)	60 (80)	82 (110)	89 (120)	123 (165)
Power** @ 1800 rpm	kW (hp)	35 (47)		49 (66)	76 (102)		123 (165)
Power** @ 1500 rpm	kW (hp)	31 (42)		40 (54)	63 (85)		104 (140)
Weight (dry)	kg (lbs)	323 (712)	330 (728)	422 (931)	458 (1010)	518 (1143)	525 (1158)

**Vary by application; refer to the machine technical or operator's manual for specific engine speeds and powers.*

***Without fan.*

CD,3274,G01,8 -19-01FEB94

BASIC ENGINE SPECIFICATIONS (4045 & 6068)

GENERAL	UNIT of Measure	4045D	4045T	6068D	6068T	6068H
Number of Cylinders	---	4	4	6	6	6
Bore	mm (in.)	106.5 (4.19)	106.5 (4.19)	106.5 (4.19)	106.5 (4.19)	106.5 (4.19)
Stroke	mm (in.)	127 (5.00)	127 (5.00)	127 (5.00)	127 (5.00)	127 (5.00)
Displacement	L (cu.in.)	4.5 (276)	4.5 (276)	6.8 (414)	6.8 (414)	6.8 (414)
Compression Ratio	---	17.8:1	17.2:1	17.8:1	17.2:1	17.2:1
Firing Order	---	1-3-4-2	1-3-4-2	1-5-3-6-2-4	1-5-3-6-2-4	1-5-3-6-2-4
Injection System	---	Direct	Direct	Direct	Direct	Direct
Aspiration	---	Natural	Turbo-charged	Natural	Turbo-charged	Air-to-air aftercooler
Rated Speed*	rpm	2400	2400	2400	2400	2200
Power** at Rated Speed	kW (hp)	63 (85)	86 (115)	97 (130)	130 (175)	140 (190)
Power** at 1800 rpm	kW (hp)		84 (113)			
Power** at 1500 rpm	kW (hp)		70 (95)		116 (155)	
Weight (dry)	kg (lbs)	474 (1046)	487 (1074)	588 (1297)	602 (1328)	

**Vary by application; refer to the machine technical or operator's manual for specific engine speeds and powers.*

***Without fan.*

CD,3274,G01,9 -19-04JAN99

DIESEL FUEL

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

01
6

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

Diesel fuels specified to EN 590 or ASTM D975 are recommended.

In all cases, the fuel shall meet the following properties:

• **Cetane number of 40 minimum.**
Cetane number greater than 50 is preferred, especially for temperatures below -20˚C (-4˚F) or elevations above 1500 m (5,000 ft).

• **Cold Filter Plugging Point** (CFPP) below the expected low temperature OR **Cloud Point** at least 5˚C (9˚F) below the expected low temperature.

• **Fuel lubricity** should pass a minimum of 3100 gram load level as measured by the BOCLE scuffing test.

• **Sulfur content:**
— Sulfur content should not exceed 0.5% Sulfur content less than 0.05% is preferred.
— If diesel fuel with sulfur content greater than 0.5% sulfur content is used, reduce the service interval for engine oil and filter by 50%
— DO NOT use diesel fuel with sulfur content greater than 1.0%

Bio-diesel fuels may be used ONLY if the fuel properties meet DIN 51606 or equivalent specification.

DO NOT mix used engine oil or any other type of lubricant with diesel fuel.

DX,FUEL1 -19-12FEB99

DIESEL ENGINE OIL

Use oil viscosity based on the expected air temperature range during the period between oil changes.

The following oil is preferred.

- **John Deere PLUS-50®**

The following oil is also recommended:

- John Deere TORQ-GARD SUPREME®

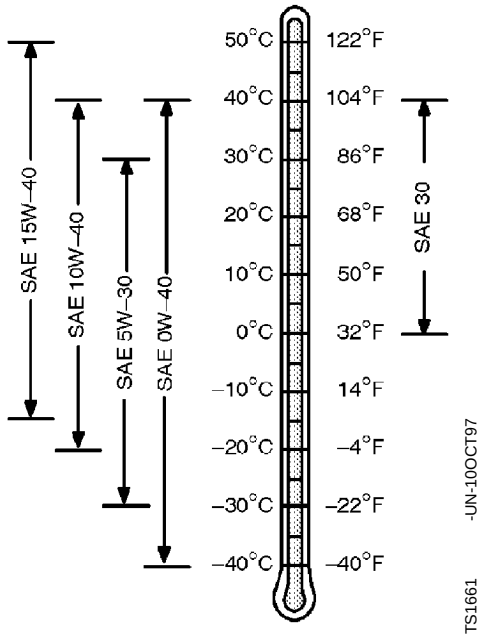
Other oils may be used if they meet one or more of the following:

- API Service Classification CG-4
- API Service Classification CF-4
- ACEA Specification E3
- ACEA Specification E2

Multi-viscosity diesel engine oils are preferred.

If diesel fuel with sulfur content greater than 0.5% is used, reduce the service interval by 50%.

Extended service intervals may apply when John Deere preferred engine oils are used. Consult your John Deere dealer for more information.



DX,ENOIL -19-10OCT97

DIESEL ENGINE COOLANT

The engine cooling system is filled to provide year-round protection against corrosion and cylinder liner pitting, and winter freeze protection to -37˚C (-34˚F).

John Deere COOL-GARD is preferred for service.

If John Deere COOL-GARD is not available, use a low silicate ethylene glycol base coolant concentrate in a 50% mixture of concentrate with quality water.

The coolant concentrate shall be of a quality that provides cavitation protection to cast iron and aluminum parts in the cooling system. John Deere COOL-GARD meets this requirement.

A 50% mixture of ethylene glycol engine coolant in water provides freeze protection to -37˚C (-34˚F). If protection at lower temperatures is required, consult your John Deere dealer for recommendations.

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

IMPORTANT: Do not use cooling system sealing additives or antifreeze that contains sealing additives.

Coolant drain intervals

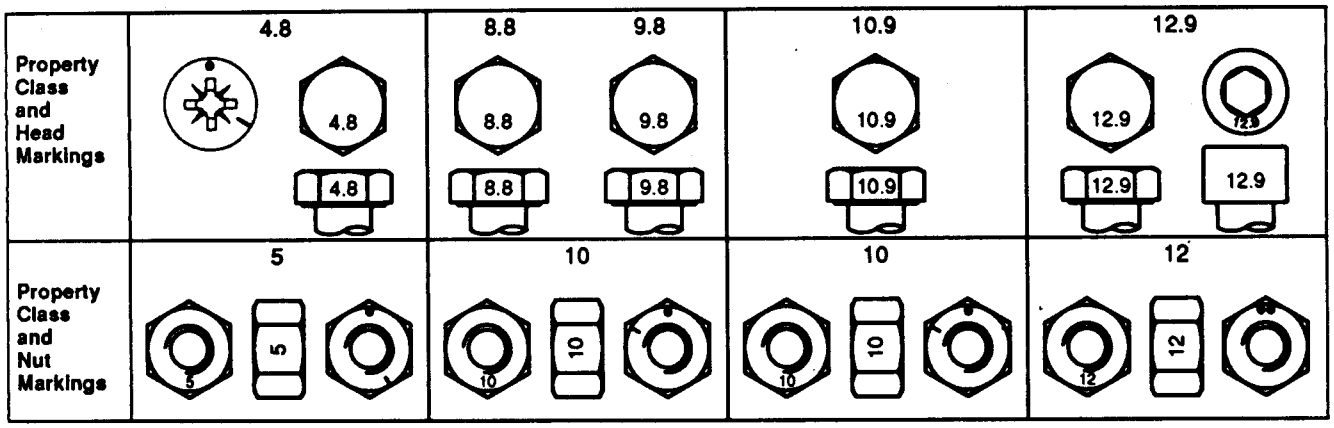
Drain the factory fill engine coolant, flush the cooling system, and refill with new coolant after the first 3 years or 3000 hours of operation. Subsequent drain intervals are determined by the coolant used for service. At each interval, drain the coolant, flush the cooling system, and refill with new coolant.

When John Deere COOL-GARD is used, the coolant drain interval is 3 years or 3000 hours operation.

If COOL-GARD is not used, the drain interval is reduced to 2 years or 2000 hours of operation.

DX,COOL8 -19-12FEB99

METRIC BOLT AND CAP SCREW TORQUE VALUES



TS1163 -19-04MAR91

Size	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]	
	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	190
M16	100	73	125	92	190	140	240	175	275	200	350	255	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 property class.

Fasteners should be replaced with the same or higher property class. If higher property class fasteners are used, these should only be tightened to the strength of the original.

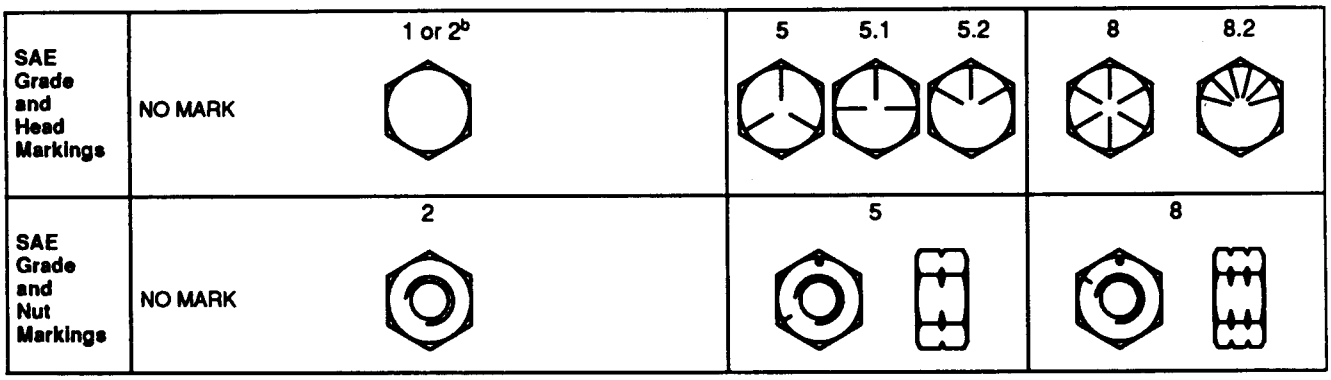
Make sure fasteners threads are clean and that you properly start thread engagement. This will prevent them from failing when tightening.

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.

DX,TORQ2 -19-20JUL94

UNIFIED INCH BOLT AND CAP SCREW TORQUE VALUES



TS1162 -19-04MAR91

Size	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]	
	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	240	175	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	400	300	510	375	400	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.

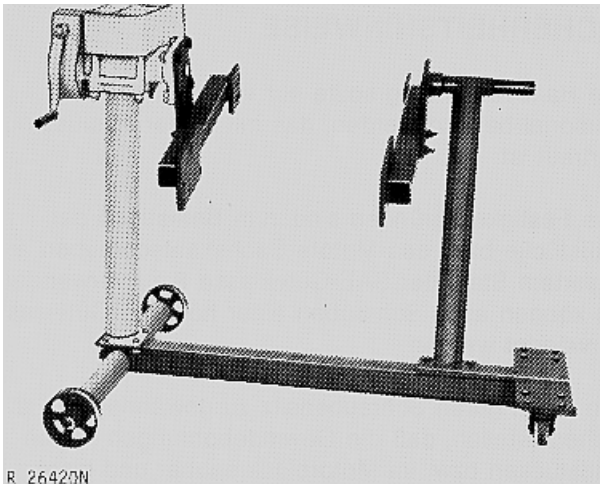
[a] "Lubricated" means coated with a lubricant such as engine oil, or fasteners with phosphate and oil coatings. "Dry" means plain or zinc plated without any lubrication.

[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.

DX,TORQ1 -19-20JUL94

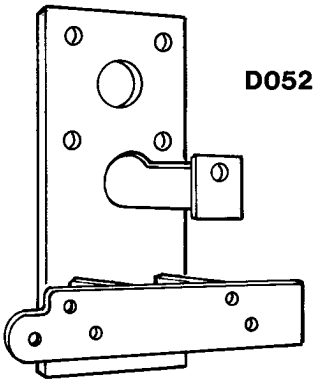
ENGINE REPAIR STAND

To facilitate engine repair, the D01003AA repair stand can be used in conjunction with D05225ST adapter for 300 series engines.



R26420N -UN-22MAY95

D01003AA repair stand



D05225ST -UN-22MAY95

D05225ST adapter

CD,3274,G02,1 -19-24FEB92

SAFETY PRECAUTIONS

This repair stand should be used only by qualified service technicians familiar with this equipment.

To maintain shear strength specifications, alloy steel SAE Grade 8 or higher cap screws must be used to mount adapters or engine.

For full thread engagement, be certain that tapped holes in adapters and engine blocks are clean and not damaged. A thread length engagement equal to 1-1/2 screw diameters minimum is required to maintain strength requirements.

To avoid structural damage or personal injury, do not exceed the maximum weight capacity. When engine weight is more than 450 kg (992 lb), it is recommended to use additional support. Approximate engine weights are listed below:

— 3 cyl. engines = 330 kg (728 lb)
— 4 cyl. engines = 450 kg (992 lb)
— 6 cyl. engines = 580 kg (1279 lb)

To prevent possible personal injury due to engine slippage, recheck to make sure engine is solidly mounted before releasing support from engine lifting device.

Never permit any part of the body to be positioned under a load being lifted or suspended. Accidental slippage may result in personal injury.

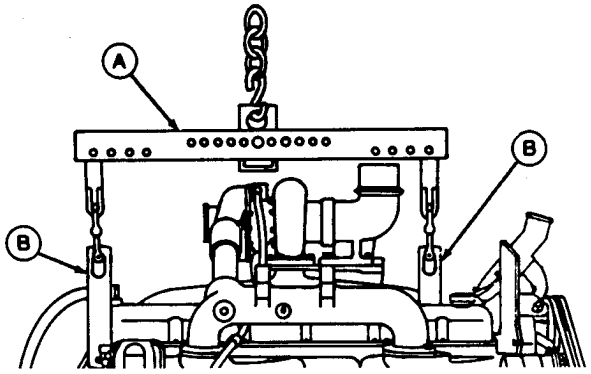
CD,3274,G02,2 -19-24FEB92

ENGINE LIFTING PROCEDURE

Attach JDG23 engine lifting sling (A), or other suitable sling, to JD-244 engine lifting eyes (B) and hoist the engine using a lifting device.

NOTE: Use of an engine lifting sling (as shown) is the preferred method for lifting engines. However, if a sling is not on hand, engine can be lifted by chain(s) attached to lifting eyes and lifting device.

IMPORTANT: If a turbocharged engine with low-profile design is to be lifted, remove the turbocharger before attaching engine to repair stand.



RG4738 -UN-18MAY90

CD,3274,G02,3 -19-01FEB94

CLEAN ENGINE

1. Cap or plug all openings on engine. If electrical components (starting motor, alternator, etc...) are not removed prior to cleaning, cover with plastic and tape securely to prevent moisture from entering.

2. Steam-clean engine thoroughly.

IMPORTANT: Never steam-clean or pour cold water on an injection pump while it is still warm. To do so may cause seizure of pump parts.

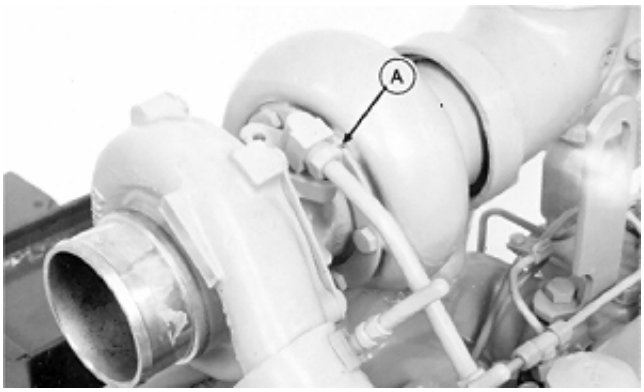
CD,3274,G02,4 -19-24FEB92

DISCONNECT TURBOCHARGER OIL INLET LINE

Drain all engine oil and coolant, if not previously done.

IMPORTANT: When servicing turbocharged engines on a rollover stand, disconnect turbo oil inlet line from turbocharger (A) or oil filter housing before rolling engine over. Failure to do so may cause a hydraulic lock upon starting engine. Hydraulic lock may cause severe engine damage.

Hydraulic lock occurs when trapped oil in the oil filter housing drains through the turbocharger, the exhaust and intake manifolds, and then into the cylinder head. After starting the engine, the trapped oil in the manifold and head is released into the cylinders filling them with oil causing hydraulic lock and severe engine damage.



RG5642 -UN-02APR90

CD,3274,G02,5 -19-24FEB92