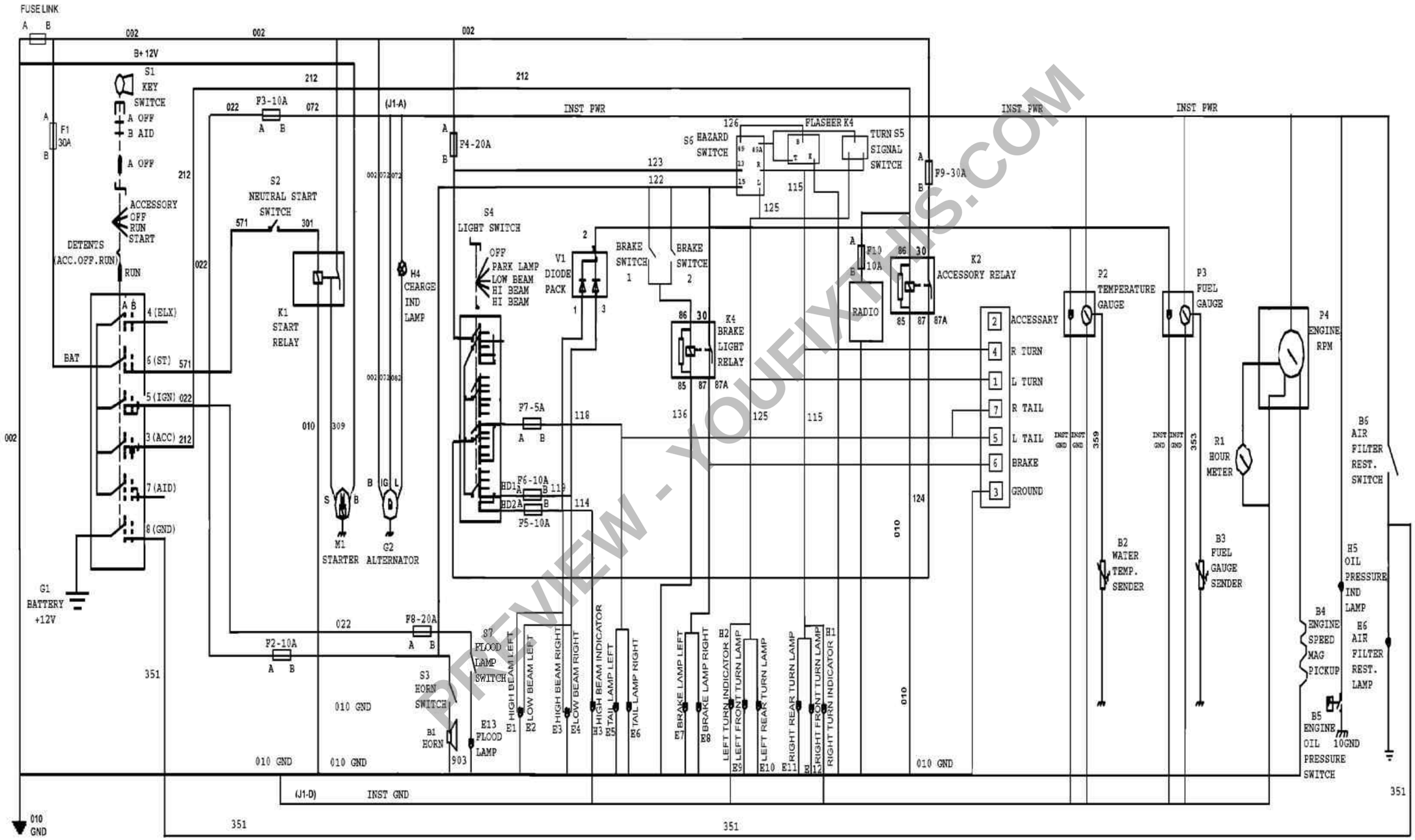


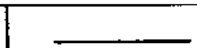
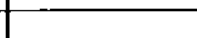
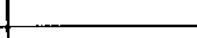
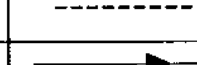
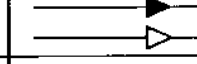
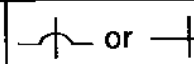
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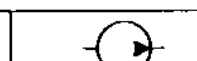
Group 35 - Hydraulic Schematics

Hydraulic Circuit Symbols

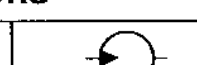
LINES

1		WORKING (MAIN) LINES
2		PILOT CONTROL LINES
3		DRAIN LINE
4		HYDRAULIC / PNEUMATIC } FLOW DIRECTION
5		CROSSING LINES
6		JOINING LINES
7		FLEXIBLE LINE

PUMPS

8		FIXED DISPLACEMENT
9		VARIABLE DISPLACEMENT

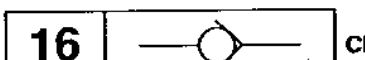
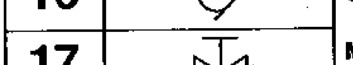
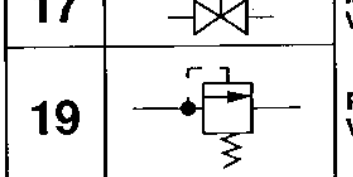
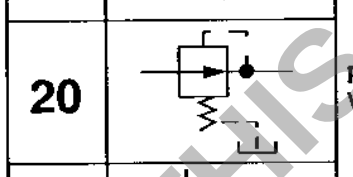
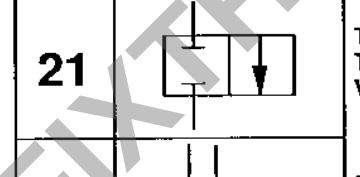
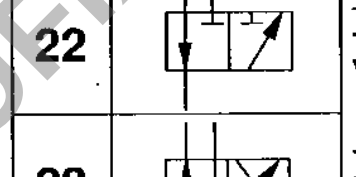
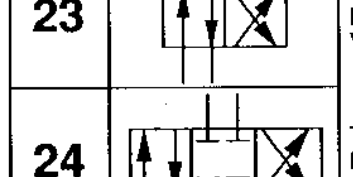
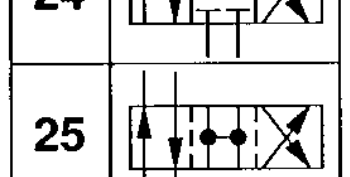
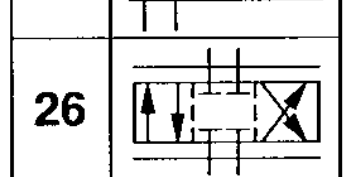
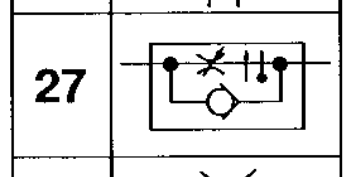
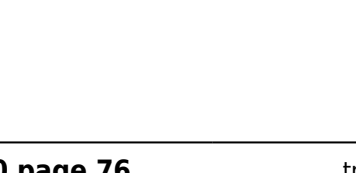
MOTORS

10		FIXED DISPLACEMENT
11		VARIABLE DISPLACEMENT

RESERVOIR

12		VENTED RESERVOIR
13		PRESSURIZED RESERVOIR
14		RESERVOIR RETURN - ABOVE FLUID LEVEL
15		RESERVOIR RETURN - BELOW FLUID LEVEL

VALVES

16		CHECK VALVE
17		MANUAL ON/OFF VALVE
19		PRESSURE RELIEF VALVE
20		PRESSURE REDUCTION VALVE
21		TWO POSITION, TWO CONNECTION VALVE
22		TWO POSITION, THREE CONNECTION VALVE
23		TWO POSITION, FOUR CONNECTION VALVE
24		THREE POSITION, FOUR CONNECTION VALVE
25		TWO POSITION, FOUR CONNECTION VALVE WITH TRANSMISSION
26		THREE POSITION, FOUR CONNECTION VALVE WITH INFINITE POSITIONING
27		ADJUSTABLE FLOW CONTROL VALVE (TEMPERATURE AND PRESSURE COMPENSATED)
18		FIXED / VARIABLE } ORIFICE

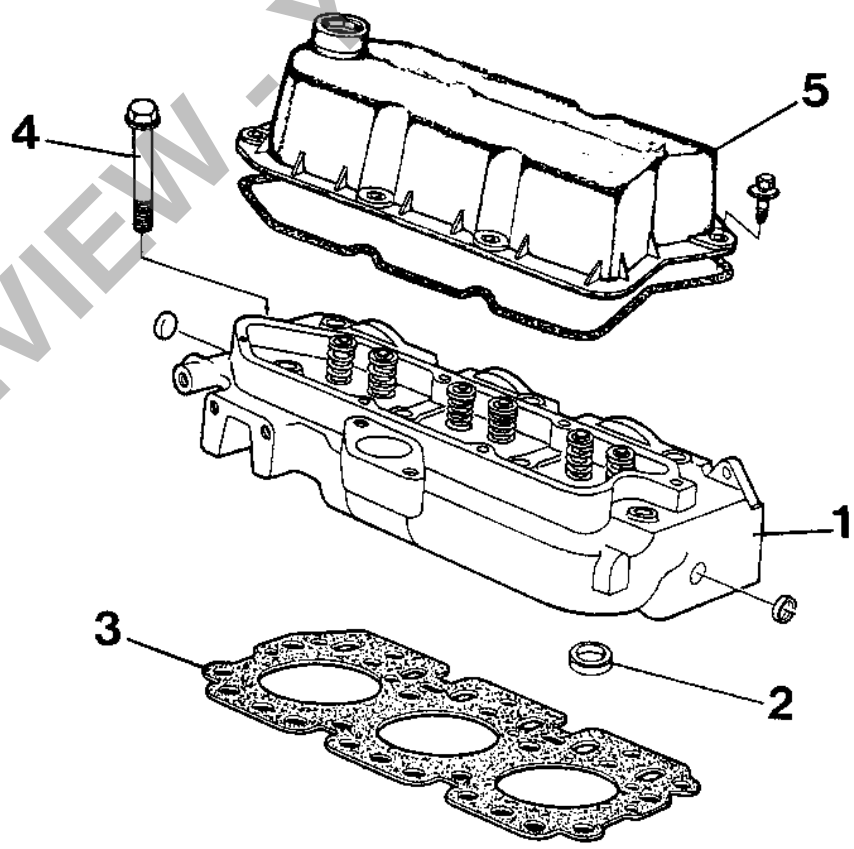
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Torques for Hardware

ITEM	TORQUE
Rocker arm shaft clamp	47 N·m
Cylinder head cap screws:	
Step 1	100 N·m
Step 2	150 N·m
Step 3	Wait 5 minutes and verify 150 N·m
Step 4	Tighten additional 60° ± 10°
Fuel injection nozzles to cylinder head	33 N·m
Intake manifold to cylinder head	47 N·m
Exhaust manifold to cylinder head	47 N·m
Rocker arm cover to cylinder head	11 N·m

Cylinder Head - Exploded View

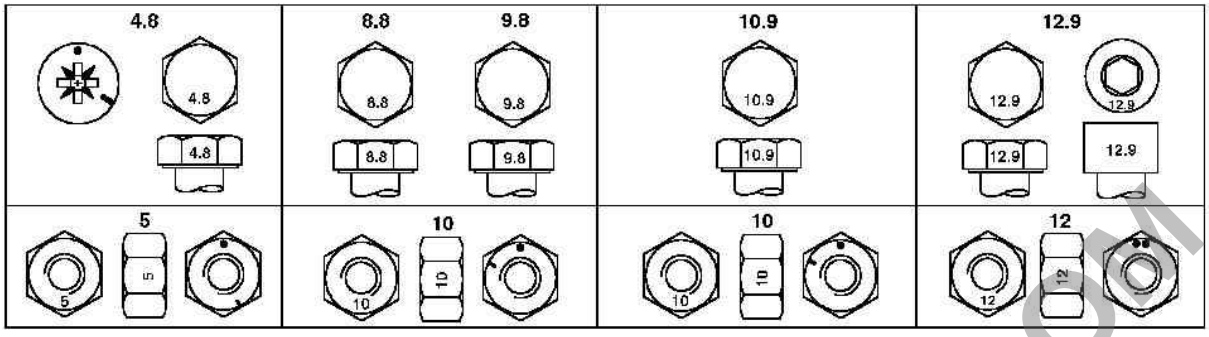


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Metric Bolt and cap screw Torque Values



Top, Property Class and Head Markings; Bottom, Property Class and Nut Markings

	Class 4.8		Class 8.8 or 9.8		Class 10.9		Class 12.9	
Size	**Lubricated [a] N·m(lb-ft)**	**Dry [b] N·m(lb-ft)**	**Lubricated [a] N·m(lb-ft)**	**Dry [b] N·m(lb-ft)**	**Lubricated [a] N·m(lb-ft)**	**Dry [b] N·m(lb-ft)**	**Lubricated [a] N·m(lb-ft)**	**Dry [b] N·m(lb-ft)**
M6	4.7 (3.5)	6 (4.4)	9 (6.6)	11.5 (8.5)	13 (9.5)	16.5 (12.2)	15.5 (11.5)	19.5 (14.5)
M8	11.5 (8.5)	14.5 (10.7)	22 (16)	28 (20.5)	32 (23.5)	40 (29.5)	37 (27.5)	47 (35)
M10	23 (17)	29 (21)	43 (32)	55 (40)	63 (46)	80 (59)	75 (55)	95 (70)
M12	40 (29.5)	50 (37)	75 (55)	95 (70)	110 (80)	140 (105)	130 (95)	165 (120)
M14	63 (46)	80 (59)	120 (88)	150 (110)	175 (130)	220 (165)	205 (150)	260 (190)
M16	100 (74)	125 (92)	190 (140)	240 (175)	275 (200)	350 (255)	320 (235)	400 (300)
M18	135 (100)	170 (125)	265 (195)	330 (245)	375 (275)	475 (350)	440 (325)	560 (410)
M20	190 (140)	245 (180)	375 (275)	475 (350)	530 (390)	675 (500)	625 (460)	790 (580)
M22	265 (195)	330 (245)	510 (375)	650 (480)	725 (535)	920 (680)	850 (625)	1080 (800)
M24	330 (245)	425 (315)	650 (480)	820 (600)	920 (680)	1150 (850)	1080 (800)	1350 (1000)
M27	490 (360)	625 (460)	950 (700)	1200 (885)	1350 (1000)	1700 (1250)	1580 (1160)	2000 (1475)
M30	660 (490)	850 (625)	1290 (950)	1630 (1200)	1850 (1350)	2300 (1700)	2140 (1580)	2700 (2000)
M33	900 (665)	1150 (850)	1750 (1300)	2200 (1625)	2500 (1850)	3150 (2325)	2900 (2150)	3700 (2730)
M36	1150 (850)	1450 (1075)	2250 (1650)	2850 (2100)	3200 (2350)	4050 (3000)	3750 (2770)	4750 (3500)

[a] "Lubricated" means coated with a lubricant such as engine oil, or fasteners with phosphate and oil coatings.

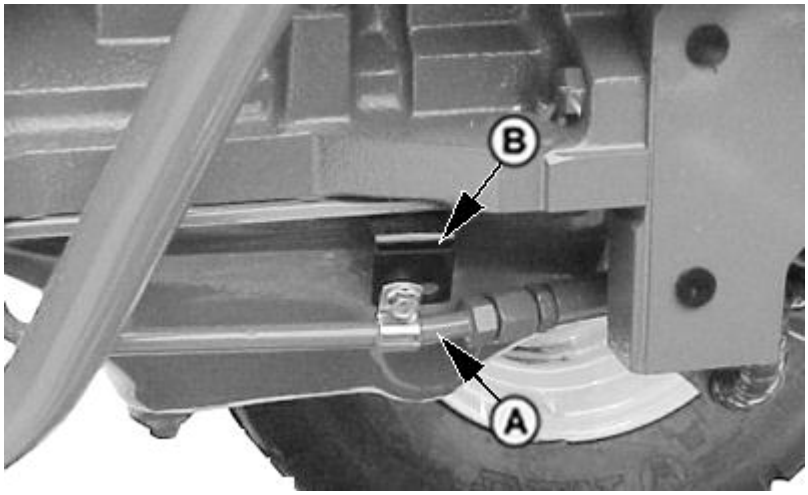
[b] "Dry" means plain or zinc plated without any lubrication.

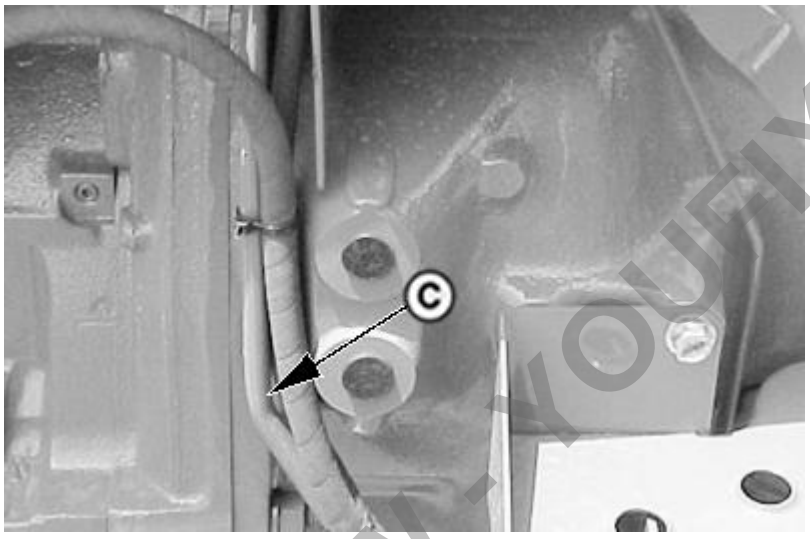
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Remove Engine

[1] -





LEGEND:

A	Hydraulic Steering Line
B	Steering Line Bracket
C	Hydraulic Steering Return Line

Disconnect battery. (See procedure in Section 40, Group 10.)

[2] - Remove air cleaner.

[3] - Remove radiator. (See procedure in Group 10.)

[4] - Remove dash panels and hood.

[5] - Remove muffler and exhaust stack.

[6] -

→NOTE:

Close all openings using caps and plugs.

Mark and disconnect hydraulic steering line (A).

[7] - Remove steering line bracket (B) from engine.

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Engine Turns Over But Will Not Start or Starts Hard

CONDITIONS:

- Range shift lever in neutral.
- Park brake engaged.
- PTO disengaged.
- Key switch OFF.
- Engine and fuel system repair in CTM8.
- Engine and fuel/air tests and adjustments found in this group.
- Ignition and electrical tests in Section 240, Group 15.

Test Location	Normal	If Not Normal
1. Fuel tank caps.	No pressure or vacuum when removed from tank.	Replace tank vent or hose.
2. Fuel tank.	Diesel fuel of correct grade for ambient temperature.	Replace with correct fuel.
3	Fuel flows at outlet when primer pump operated.	Drain water and sediment. Replace element. Bleed air from supply line.
4. Fuel leak-off line.	Small amount of fuel flows when engine running.	Clean or replace line.
5. Starter (not shown).	Turns engine over easily at 90 RPM minimum when engine is cranked.	Check starter and starting circuit.
6. Injection pump.	Delivers fuel to injection nozzles when engine is cranked (lines loosened at nozzles). Injection properly timed.	Adjust injection pump timing. Repair pump
7. Injection nozzles.	Correct spray pattern when tested. See CTM8.	Check fuel lines for obstruction. Clean, repair, adjust or replace as necessary.
8. Valves.	Intake clearance: 0.35 mm (0.014 in.) Exhaust clearance: 0.45 mm (0.018 in.)	Adjust.
9. Crankcase oil.	Flows easily.	Replace with correct viscosity.

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Group 10 - General Specifications

Machine Specifications

Item	Measurement	Specification
5303-3029D Engine, Naturally Aspirated		
Factory Observed PTO	Power	38.2 kW (51.93 hp) at 2400 RPM
Maximum Engine	Torque	180 N·m at 1400 RPM
Cylinders	Quantity	3
Bore	Distance	106.5 mm (4.19 in.)
Stroke	Distance	110 mm (4.33 in.)
Displacement	Volume	2.9 L (179 cu. in.)
Compression	Ratio	17.8:1
Cylinder Firing	Order	1-2-3
Intake Valve	Clearance	0.35 mm (0.014 in.)
Exhaust Valve	Clearance	0.45 mm (0.018 in.)
Slow Idle	Speed	800-850 RPM
Fast Idle	Speed	2575-2650 RPM
Operating Range	Speed	1400-2400 RPM
Injection Pump Timing	Position	15° ± 1° BTDC
5403-3029T Engine, Turbocharger		
Factory Observed PTO	Power	41 kW (55 hp) at 2400 RPM
Maximum Engine	Torque	234 N·m at 1400 RPM
Cylinders	Quantity	3
Bore	Distance	106.5 mm (4.19 in.)
Stroke	Distance	110 mm (4.33 in.)
Displacement	Volume	2.9 L (179 cu. in.)
Compression	Ratio	17.8:1
Cylinder Firing	Order	1-2-3
Intake Valve	Clearance	0.35 mm (0.014 in.)
Exhaust Valve	Clearance	0.45 mm (0.018 in.)
Slow Idle	Speed	800-875 RPM
Fast Idle	Speed	2575-2650 RPM
Operating Range	Speed	1500-2400 RPM
Injection Pump Timing	Position	15.75° ± 1° BTDC
Electrical System-12-Volt, Negative Ground		
Battery	Voltage	12-volt
	Cold Cranking Amps	623 CCA
Alternator	Amperage	40 amps
Starting Motor	Voltage	12 volts

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Specifications

ITEM	DIMENSIONS OF NEW PARTS	WEAR TOLERANCE
Thickness of new cylinder head	104.87-105.13 mm (4.129-4.139 in.)	
Maximum permissible amount to be machined from cylinder head	0.76 mm (0.03 in.)	
Maximum permissible out-of-flat of cylinder head sealing surface	0.08 mm (0.003 in.)	
Combustion face surface finish	1.6-3.2 micron C.L.A. (64-128 micro-in)	
valve stem diameter (standard)		
• Intake valve	7.864-7.884 mm (0.3096-0.3104 in.)	
• Exhaust valve	7.848-7.874 mm (0.3090-0.3100 in.)	
Bore for valve stem	7.912-7.938 mm (0.3115-0.3125 in.)	
Clearance between bore and valve stem	0.05 to 0.10 mm (0.002 to 0.004 in.)	0.15 mm (0.006 in.)
valve stem oversize, stem diameter larger than standard by	0.38 mm (0.015 in.) 0.76 mm (0.030 in.)	
valve seat angle (intake and exhaust)	30°	
valve face angle (intake and exhaust)	29.25°	
Maximum valve seat runout	0.08 mm (0.003 in.)	
Maximum valve face runout	0.038 mm (0.0015 in.)	
valve recess (below cylinder head surface):		
• Intake valve	0.61-1.11 mm (0.024-0.044 in.)	1.63 mm (0.064 in.)
• Exhaust valve	1.22-1.72 mm (0.048-0.068 in.)	2.26 mm (0.089 in.)
valve seat width (intake and exhaust)	1.50-2.00 mm (0.059-0.079 in.)	
valve head diameter:		
• Intake valve	46.47-46.73 mm (1.830-1.840 in.)	
• Exhaust valve	42.37-42.63 mm (1.668-1.678 in.)	
Firing order	1 - 2 - 3	
valve clearance (engine cold):		
• Intake valve	0.35 mm (0.014 in.)	
• Exhaust valve	0.45 mm (0.018 in.)	
valve lift (zero valve clearance):		
• Intake valve	11.56-12.37 mm (0.455-0.487 in)	11.13 mm (0.438 in.)
• Exhaust valve	11.28-12.12 mm (0.444-0.477 in.)	10.85 mm (0.427 in.)
Rocker arm shaft diameter	19.99-20.02 mm (0.787-0.788 in.)	19.94 mm (0.785 in.)
Rocker arm bore diameter	20.07-20.12 mm (0.790-0.792 in.)	20.17 mm (0.794 in.)
Rocker arm shaft spring tension at a length of 46 mm (1.81 in.)	18-27 N (4-6 lb)	
valve springs free height	approx. 54 mm (2.125 in.)	

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Group 05 - Safety

Recognize Safety Information



This is a 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 operating 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

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Sealant Application Guidelines

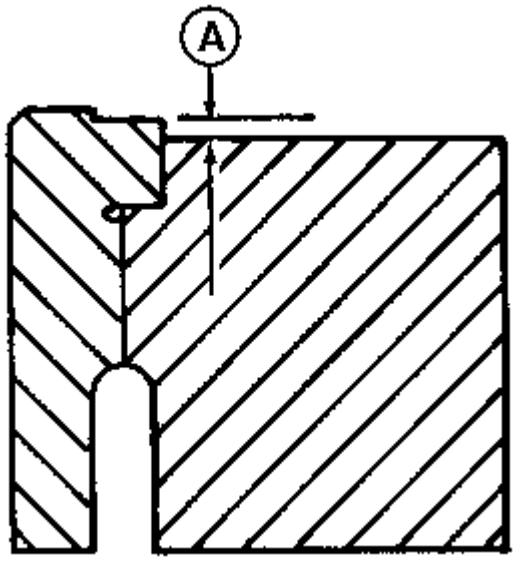
Listed below are sealants which have been tested and are used by the John Deere factory to control leakage and assure hardware retention. Use the following recommended sealants when re-assembling your John Deere engine to assure quality performance.

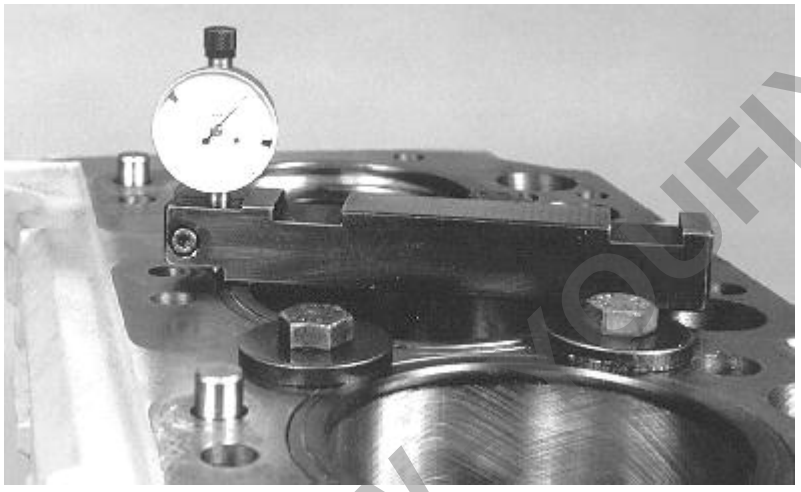
JOHN DEERE Part Number	CONTENT	PRODUCT	EXAMPLE OF USE
TY9370	6 ml tube	LOCTITE ™ 242 Thread Lock & Sealer Medium Strengh (blue)	cap screws: Crankshaft pulley Flywheel
TY9371	6 ml tube	LOCTITE ™ 271 Thread Lock & Sealer High Strenght (clear)	Studs: Water pump-to-cylinder block Injection pump-to-front plate Exhaust manifold-to-turbocharger Oil filter nipple
T43514	50 ml tube	LOCTITE ™ 277 Plastic Gasket High Strength (red)	Steel cap plugs: Cylinder block, cylinder head Water pump
DD15664 or TY6304	25 ml tube 50 ml bottle	LOCTITE ™ 515 Flexible Sealant Gen. purpose (purple)	Flywheel housing-to-cylinder block Front plate/Timing gear-to-oil pan
TY9374 or TY9375	6 ml tube 50 ml bottle	LOCTITE ™ 592 Pipe Sealant with TEFLON ™ (white)	Pipe plugs: Cylinder block, water pump Dipstick tube threads Temperature sending unit
TY15969	50 ml bottle	LOCTITE ™ 609 Retaining Compound (green)	Wear ring sleeve-to-crankshaft

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Measure Cylinder Liner Protrusion





LEGEND:

A	Liner Protrusion

[1] - Install liner without packing or O-rings. If liner does not rotate smoothy by hand, remove liner and polish lower pilot bore in block with emery cloth or D17015BR brush.

[2] - Align liner and cylinder block marks, then secure at four points with cap screws and thick washers (appro. 3 mm - 0.118 in.). Tighten to 100 N·m (74 lb-ft).

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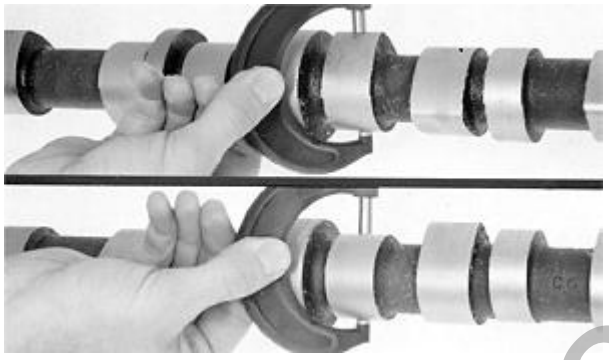
Item	Measurement	Specification
	Maximum wear	55.85 mm (2.199 in.)
Camshaft Journal-to-bore	Max. clearance	0.18 mm (0.007 in.)

If diameter or clearance are not within specifications, replace camshaft.

IMPORTANT:

To keep the initial working condition between cam lobes and cam followers, always replace cam followers when installing a new camshaft.

Measure Height of Cam Lobe



Measure longest and shortest diameter of each cam. Subtract shorter diameter from longer diameter to find the height of the cam lobe. If any lobe is not of the correct height, install a new camshaft.

Item	Measurement	Specification
Camshaft Intake Lobe	Height	6.93-7.42 mm (0.273-0.292 in.)
	Maximum wear	6.68 mm (0.263 in.)
Camshaft Exhaust Lobe	Height	6.76-7.26 mm (0.266-0.286 in.)
	Maximum wear	6.50 mm (0.256 in.)

IMPORTANT:

To keep the initial working condition between cam lobes and cam followers, always replace cam followers when installing a new camshaft.

Replace Camshaft Gear

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Specifications

Fuel Injection Pump Static Timing:

• Mico In-Line Injection Pump	Align Marks On Pump Flange And Engine Front Plate If Any, Or Centre The Pump Within The Flange Slots

Fuel Injection Pump Dynamic Timing (Cont'd):

Tractor Model	Rated Speed Rpm	Slow Idle Rpm	Fast Idle Rpm	Dynamic Timing deg
5303	2400	800-850	2575-2650	15° ±1° BTDC
5403	2400	800-875	2575-2650	15.75° ±1° BTDC

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Disassemble and Inspect Clutch Assembly



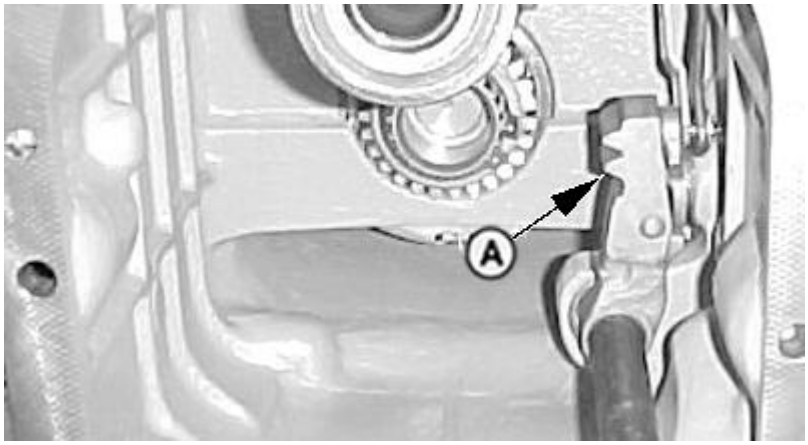


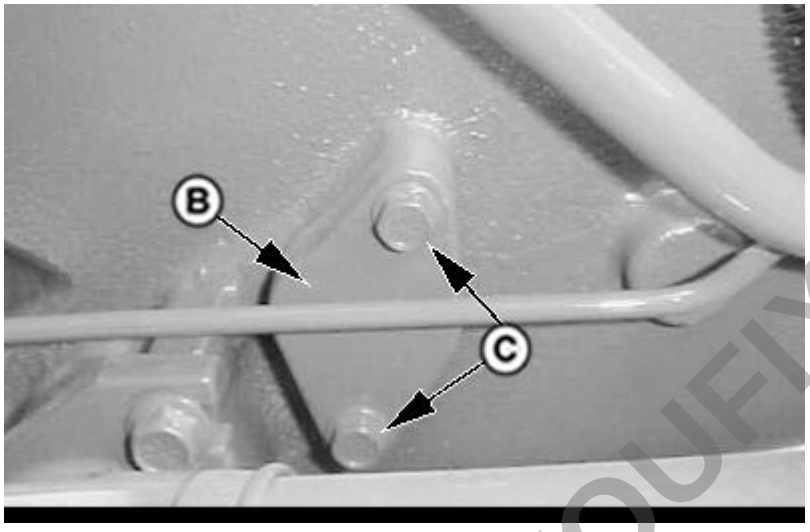
LEGEND:

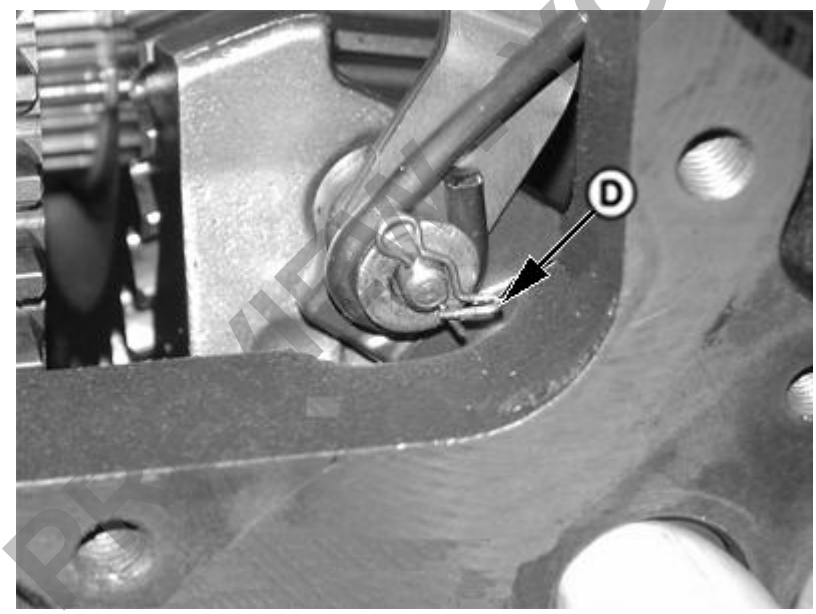
A	Lock Nut
B	PTO Pressure Plate
C	Washer
D	Spring

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LEGEND:

A	Park Pawl
B	Park Cam Cover
C	Cap Screw (2 used)
D	Spring Pin

Move gearshift lever from neutral to park position six or seven times. Leave gearshift lever in park position and verify the following items.

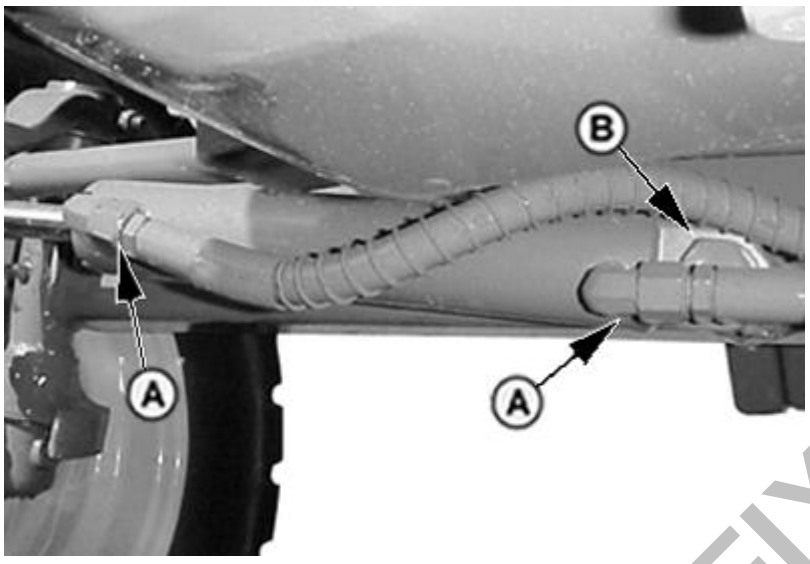
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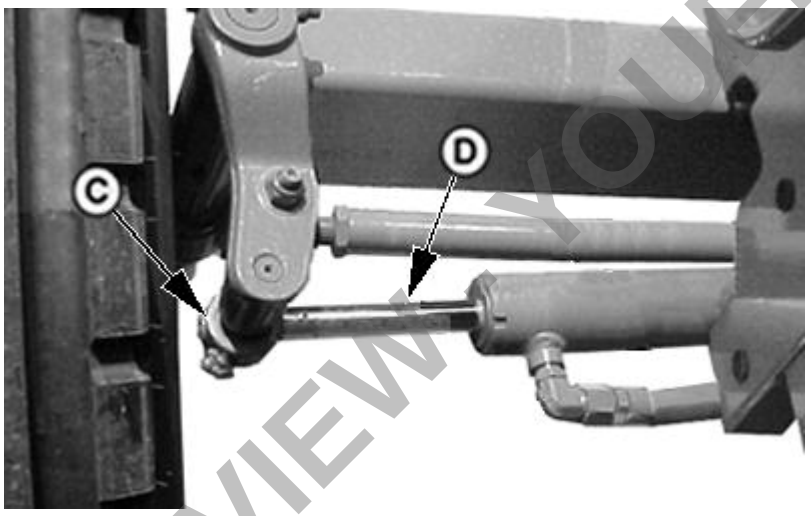
Remove and Install Steering Cylinder-2WD Axle

[1] -

→NOTE:

Tag or label steering hoses for identification to aid during installation.





LEGEND:

A	Hose
B	Lock Nut
C	Bolt
D	Steering Cylinder

PY4587Disconnect hoses (A). Close all openings using caps and plugs. Tag or label steering hoses to aid during installation

[2] - Remove lock nut (B), bolt (C) and steering cylinder (D).

[3] - Make repairs as necessary. (See procedure in this group.)

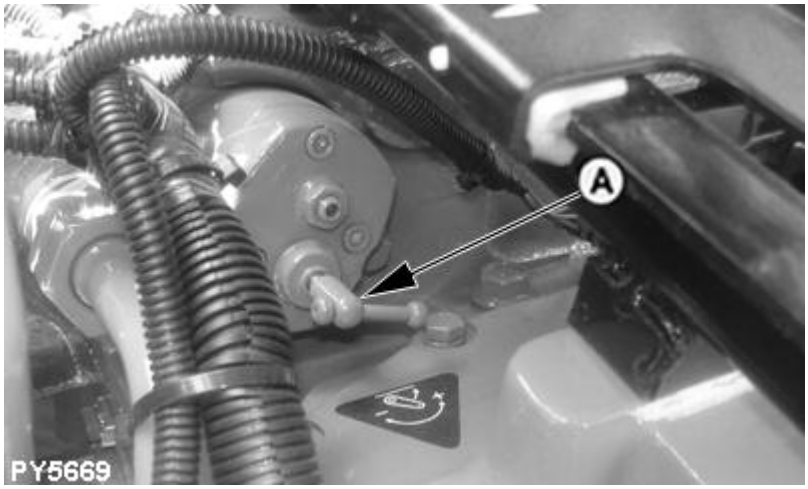
[4] - Install steering cylinder, bolt and lock nut. Tighten bolt and lock nut to specification.

Item	Measurement	Specification
2WD Steering Cylinder Mounting Bolt and Nut	Torque	290 N·m (214 lb-ft)

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Replace Rockshaft Control valve



LEGEND:

A	Rockshaft control valve

[1] - Open rate-of-drop valve and lower rockshaft arms completely.

[2] - Remove seat.

[3] - Remove cap screws and remove rockshaft control valve (A).

[4] -



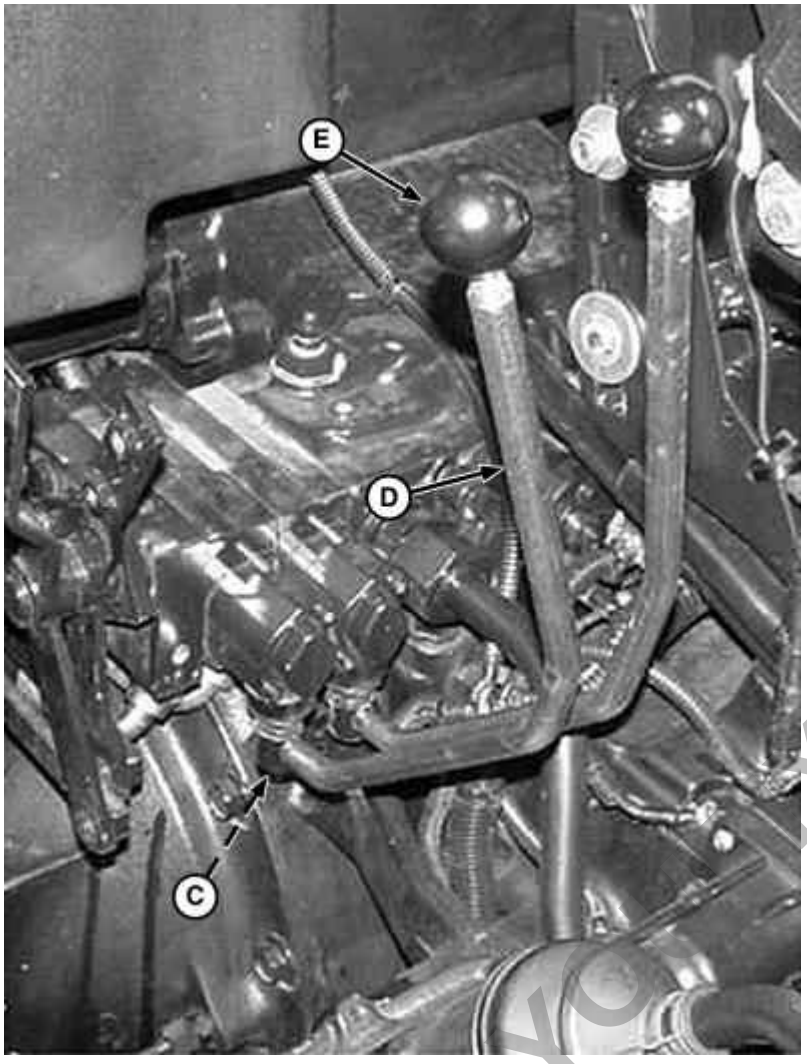
LEGEND:

A	Socket head screws (3 used)
B	Rate-of-drop valve
C	Rockshaft control valve

Remove three socket head screws (A). Firmly grab tee handle and pull straight out, removing rate-of-drop valve assembly (B) from rockshaft control valve (C).

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LEGEND:

A	Second SCV label
B	Rear Coupler Bracket
C	Set Screw
D	Lever
E	Knob

Clean the right side of rear coupler bracket (B). Make sure surface is free of grease, oil and dirt.

[10] - Remove backing on label. Position and install label (A) on right side of rear coupler bracket as shown.

[11] - Wipe the label with a clean cloth to remove air bubbles.

[12] - Install the SCV control lever (D), and knob (E). Tighten set screw (C) and knob (E) securely.

[13] - Install right control console.

[14] - Install rockshaft position and draft sensing levers.

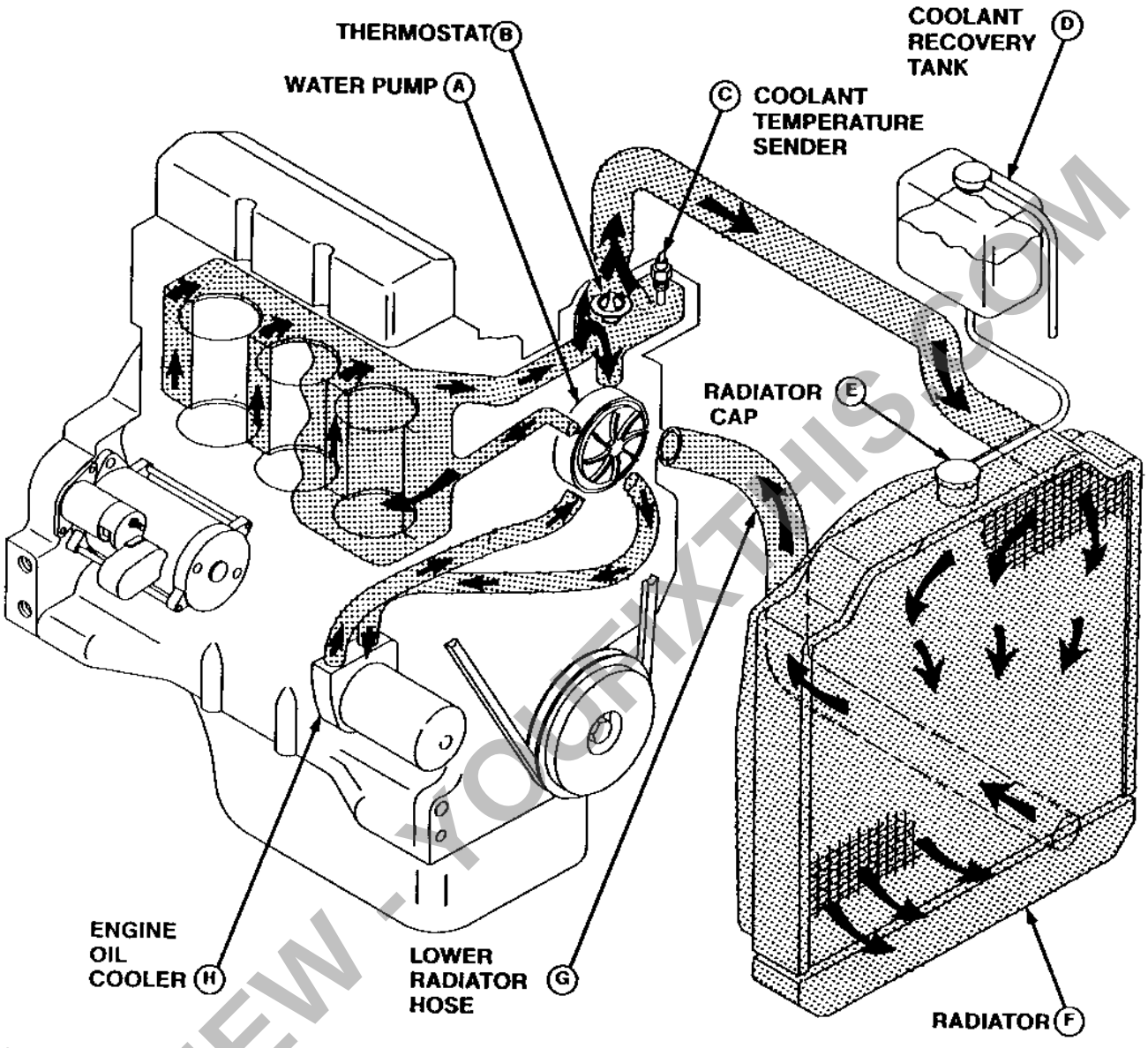
[15] - Install right rear fender and wheel. Tighten wheel to specification.

[16] - Check transmission/hydraulic oil level, adjust oil level as necessary.

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Engine Cooling System Operation



ENGINE COOLING SYSTEM OPERATION

Slide LV4445

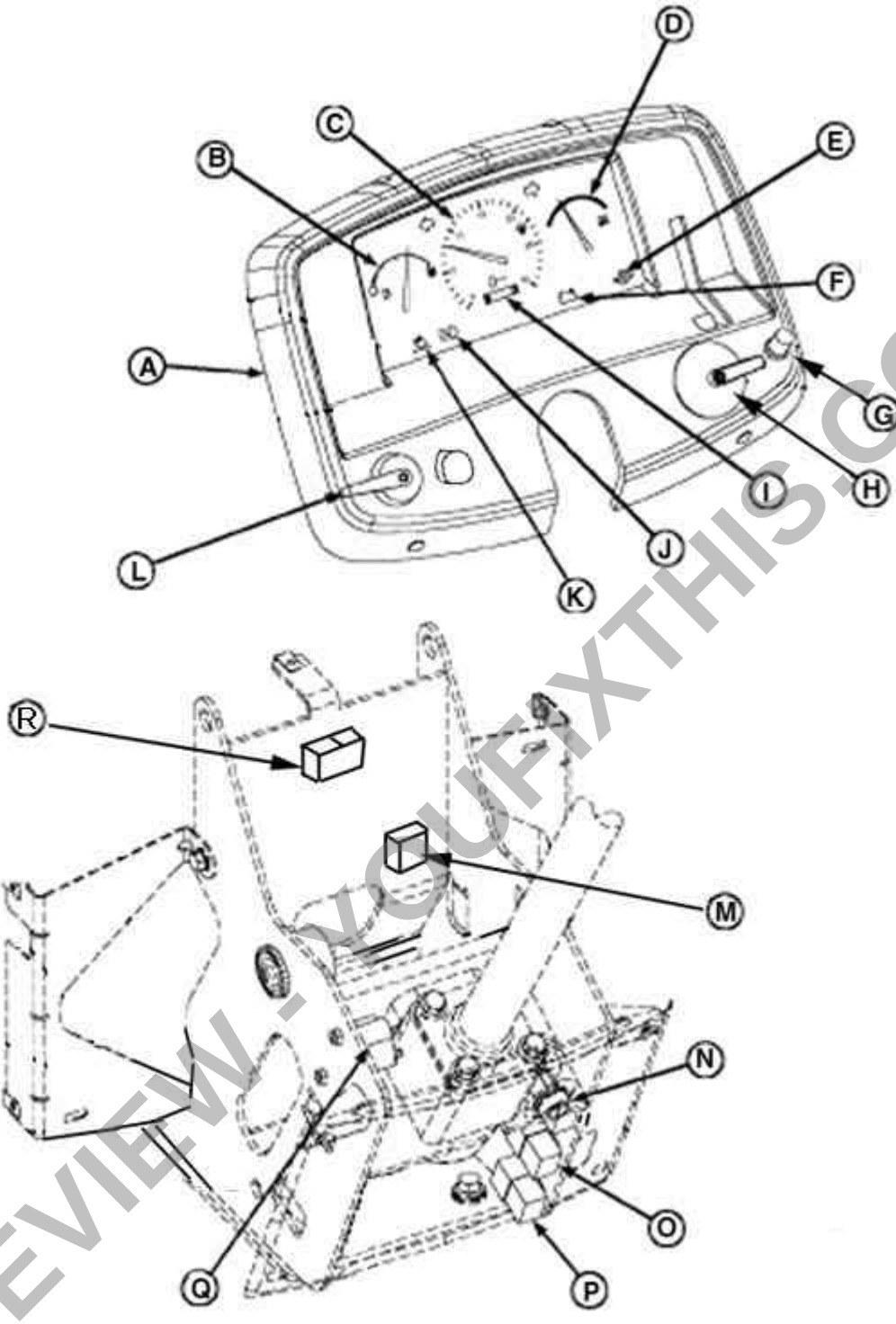
LEGEND:

A	Water Pump
B	Thermostat
C	Coolant Temperature Sender
D	Coolant Recovery Tank
E	Radiator Cap
F	Radiator
G	Lower Radiator Hose
H	Engine Oil Cooler

FUNCTION:

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DASH AND CENTER CONTROL CONSOLE ELECTRICAL COMPONENTS

LEGEND:

A	Instrument Panel
B	Fuel Gauge
C	Tachometer
D	Engine Coolant Temperature Gauge
E	Engine Oil Pressure Indicator
F	Charge Indicator
G	Horn
H	Light Switch
I	Hour Meter

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Instrument Panel System Test Points-Fuel Gauge

CONDITIONS:

- Range shift lever in N, neutral position.
- Key switch in run position.
- Meter positive lead (red) on numbered test points.
- Meter negative lead (black) on battery negative (-) post.
- Meter on DC volts.
- Electrical tests and adjustments in this Section and Group.

Test Location	Normal	If Not Normal
1. Battery positive post.	Minimum 11.8 VDC.	Test battery and charge if good. Replace bad battery.
2. Starter battery terminal.	Battery voltage.	Check for corroded connections or break in wire between battery and starter.
3. Left (large) post of fuse link junction block.	Battery voltage.	Check for corroded terminal or break in wire between battery and fuse link.
4. Right (small) post of fuse link junction block.	Battery voltage.	Check for loose or corroded terminal or replace fuse link.
5. Bottom terminal of fuse, F1.	Battery voltage.	Check for corroded connections or break in wire or splice between fuse link and fuse F1.
6. Top terminal of fuse, F1.	Battery voltage.	Check for failed fuse, F1. If fuse is good, check for corroded or loose terminals.
7. Terminal 1 of key switch	Battery voltage.	Check for corroded connections or break in wire between fuse block and key switch.

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MAJOR COMPONENTS:

- Differential Drive Shaft
- Differential Ring Gear
- Differential Carrier Assembly
- Final Drive Pinion Shafts
- Final Drive Ring Gear
- Planetary Carrier Assembly
- Axle Shaft

THEORY OF OPERATION:

Power from the differential drive shaft (A) is transmitted through the differential assembly to the final drive pinion shaft (F). The final drive pinion shaft is in mesh with the three small gears on the planetary carrier assembly (D). These small gears walk around the inside of final drive ring gear (G). The result is rotation of the axle shaft (E).

The differential assembly is a ring gear (C) bolted to the carrier (I). Inside the carrier are two bevel gears (H) and four bevel pinions (B).

When the tractor turns sharply, one axle is held stationary. The result is that the bevel pinions rotate on their own axis and walk around the stationary bevel gears. The turning ring gear transmits power through the pinion to the opposite bevel gear.

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Section 160 - HYDRAULIC SYSTEM OPERATION, TEST AND ADJUSTMENTS

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