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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.

CAUTION:

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.

Technical manuals are divided in two parts: repair and operation and tests. Repair sections tell how to repair the components. 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.

Technical Manuals are concise guides for specific machines. They are on-the-job guides containing only the vital information needed for diagnosis, analysis, testing, and repair.

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.

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Group 05 - Specifications

Specifications

General Specifications

Engine General Specifications:

Item	Measurement	Specification
Make		Yanmar
Model Number		3TNV76
Model Number		3TNM72
Injection Type		Indirect
Type		4-Cycle Diesel
Number of Cylinders		3
Bore (3TNV76)		76 mm
		(2.99 in.)
Bore (3TNM72)		72mm
		(2.83 in.)
Stroke (3TNV76)		82 mm
		(3.23 in.)
Stroke (3TNM72)		74 mm
		(2.91 in.)
3TNV76	Displacement	1.115 L
		(68 cu. in.)
3TNM72	Displacement	0.904 L
		(55.1 cu in.)
Firing Order		1-3-2
Direction of Rotation		Counterclockwise (viewed from flywheel)
Combustion System		Indirect Injection Type
Compression Ratio		23.4: 1
Cooling (3TNV76)	Capacity	2.8 L
		(3.0 qt)
Cooling (3TNM72)	Capacity	3.8 L
		(4.0 qt)
Cooling System	Pressure	88.2 kPa
		(12.8 psi)
Oil (With Filter)	Capacity	2.6 L
		(2.75 qt.)
Governor		Centrifugal

Engine Speed (No Load):

Item	Measurement	Specification
Slow Idle (3TNV76)	Speed	1450±25 rpm
High Idle (3TNV76)	Speed	3425 +25/-50 rpm
Slow Idle (3TNM72)	Speed	1450±25 rpm
High Idle (3TNM72)	Speed	3600 +25/-50 rpm

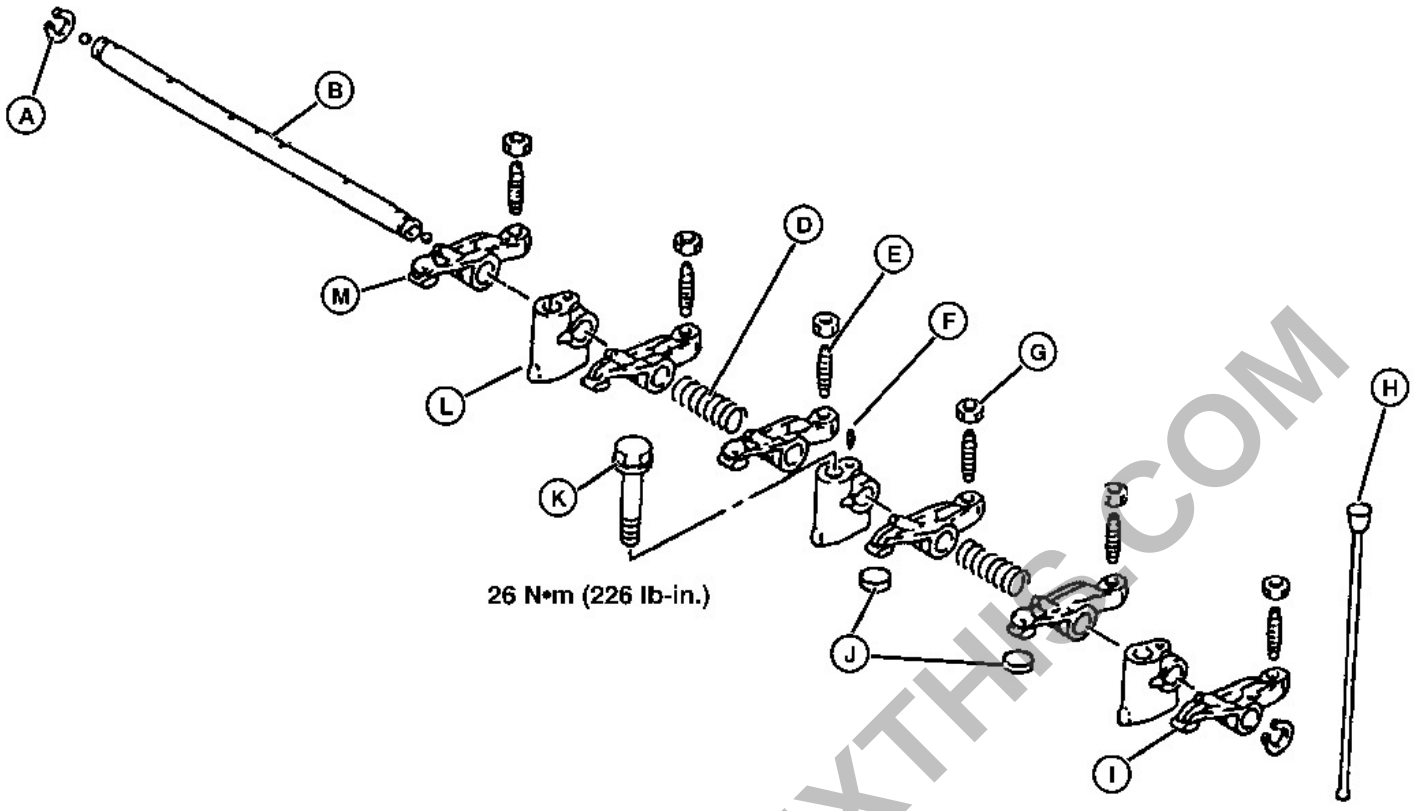
Operational Tests

Specifications:

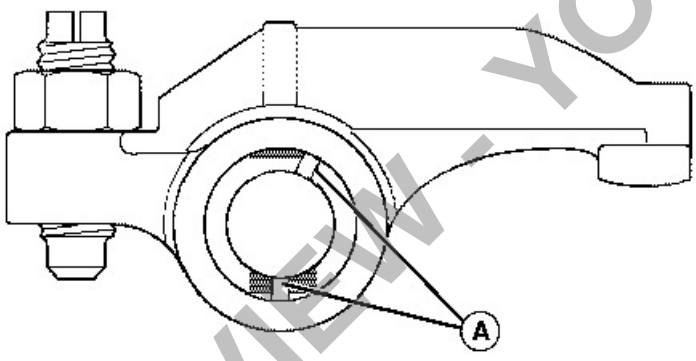
Item	Measurement	Specification
Minimum Cranking (3TNV76)	Speed	250 rpm
Cylinder Compression Standard (3TNV76)	Pressure	3432 kPa
		(498 psi)
Minimum (3TNV76)	Pressure	2746 kPa

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Rocker Arm Assembly 3TNV76



Rocker Arm Shaft

LEGEND:

A	Retaining Ring
B	Rocker Arm Shaft
C	Mounting Nut (3) M8
D	Rocker Arm Shaft Spring
E	Set Screw
F	Adjusting Screw
G	Nut
H	Push Rod
I	Intake Valve Rocker Arm
J	Valve Caps
K	Mounting Cap Screw (3) M8 X 45
L	Rocker Arm Support (3)
M	Exhaust Valve Rocker Arm

Assemble rocker shaft (B) into center support, aligning set screw hole (E) in support with hole in rocker shaft.

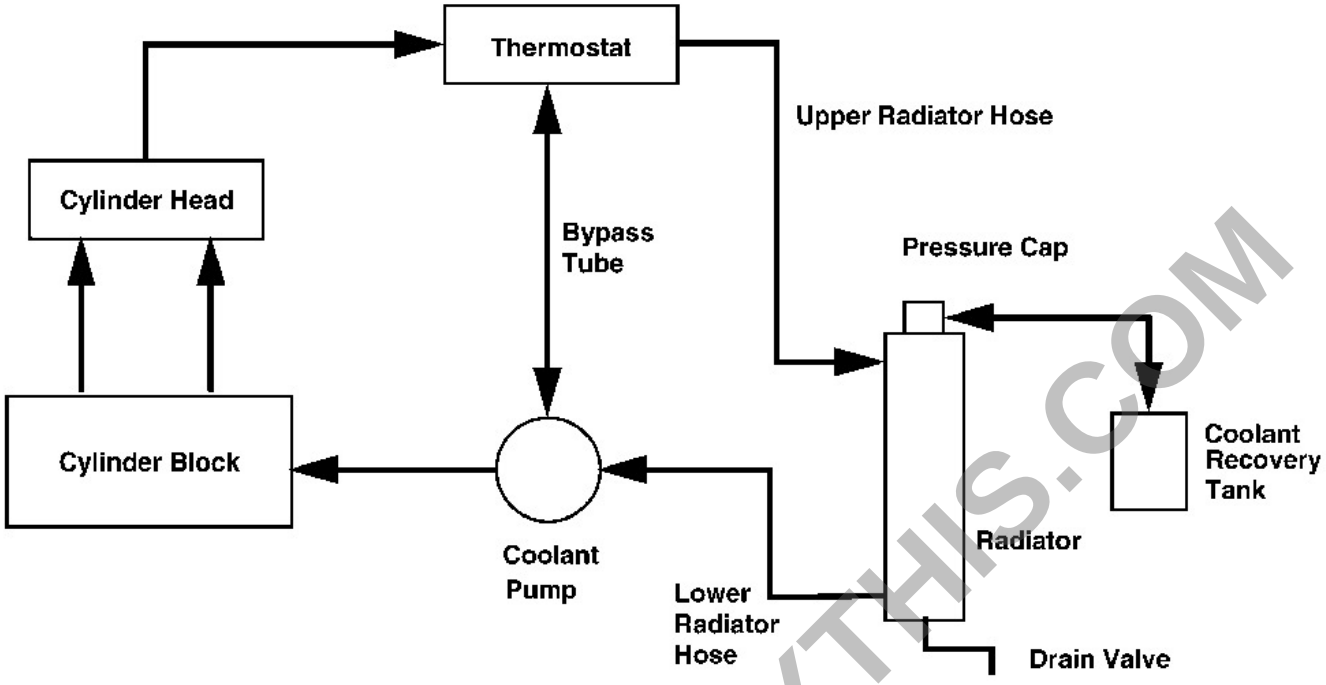
[2] - Be sure rocker arms are installed in same order as removed.

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Group 10 - Theory of Operation

Cooling System Theory of Operation



Cooling System

Function:

The cooling system allows the engine to rise to full operating temperature when engine is started cold, but keeps the engine from overheating once engine reaches operating temperature. The thermostat opens when operating temperature has been reached, circulating coolant from the hot engine to the radiator to prevent engine overheating. The cooling system is pressurized, which raises the boiling point of the coolant, and allows more heat to be carried away from the engine.

Theory of Operation:

The cooling system includes the following components: radiator, radiator cap, upper and lower radiator hoses, coolant pump, fan, thermostat, coolant recovery tank, drain hoses and drain valve.When the engine is started cold, the thermostat is closed. The impeller type coolant pump pulls coolant from the cylinder head and through the bypass tube inside the water pump housing. The water pump then pushes the coolant into the cylinder block water jacket. The coolant absorbs heat from the cylinder walls, and is then pushed up into the cylinder head, and sucked back into the water pump. This provides a fast warm-up period, as engine heat is retained and evenly distributed throughout the engine.

As the engine reaches operating temperature, **69.5-72.5°C (157-163°F)** , the thermostat opens, and the hot coolant from the cylinder head passes through the thermostat and into the top tank of the radiator. As coolant flows down through the tubes of the radiator core, heat is transferred from the coolant to the air stream being drawn through the core by the engine fan. When the coolant reaches the bottom radiator tank, it is sucked through the lower radiator hose and into the water pump, and pushed back into the cylinder block.

When coolant system pressure exceeds **88.3±14.7 kPa (12.8±2.2 psi)** , the spring in the radiator cap pushes open to allow coolant to discharge into the coolant recovery tank. As the engine cools after shutdown, a vacuum is produced in the cooling system, and coolant is drawn back out of the coolant recovery tank through a small valve in the bottom of the radiator cap.

Air is pulled by the engine fan through a removable debris guard on the front of the radiator, through the radiator and fan, and back over engine block. The engine fan belt drives both the water pump and the cooling fan.

An electrical coolant temperature switch is located in the thermostat housing. When the coolant temperature reaches **107-113°C (225-235°F)** , the coolant temperature switch closes, lighting the coolant warning lamp on the instrument panel. This informs the operator of the high temperature condition.

The radiator can be drained with a drain valve on the lower right corner of the radiator. The engine block can be drained through the drain port on the left side of the engine near the front, next to the oil pressure switch. The coolant recovery tank can be removed and drained.

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Group 20 - Diagnostics

Starting Problems

CAUTION:

Avoid Injury! Keep away from all moving parts when testing. The engine may start to rotate at any time.

Symptom	Problem	Solution
Engine Does Not Crank	Starting procedure being used is not correct for conditions	Use correct procedure (i.e. operator on seat, machine in neutral). Check Operator's Manual.
	Battery voltage low	Charge and check battery. (See Battery - Load Test in the Electrical section.)
		Battery is not being charged. Check charging system. (See Charging Circuit Diagnosis (S/N -020000) and Charging Circuit Diagnosis (S/N 020001-) in the Electrical section.)
	Open circuit in the wiring	Repair or replace as needed. (See Cranking Circuit Diagnosis and Common Circuit Tests in the Electrical section.)
	Starting motor not functioning properly	Repair or replace starting motor.

Symptom	Problem	Solution
Engine Cranks But Does Not Start	No fuel	Faulty fuel shutoff solenoid circuit or fuel shutoff solenoid. Test electrical circuit, replace fuel shutoff solenoid.
	Fuel volume to injection pump low	Fuel filter plugged. Replace fuel filter.
		Clogged or cracked fuel lines. Clean or replace fuel lines.
		Air leak in fuel system.
		Incorrect volume of fuel being supplied to injection pump. Check or replace fuel transfer pump.
	Water in fuel.	Drain and replace fuel.
	Engine problem	Improper timing between injection pump, intake and exhaust valves. Adjust valve clearance. Check valve timing.
		Seized intake/exhaust valve. Replace valve and check valve guide.
		Cylinder, piston or piston rings worn, broken or seized. Replace rings and/or piston, bore or hone cylinder.
		Crankshaft pin or bearing seized. Regrind crank and replace bearings.

Symptom	Problem	Solution
Engine Starts But Does Not Continue Running—No Exhaust Smoke	Fuel volume to injection pump low	Fuel filter plugged. Replace fuel filter.
		Clogged or cracked fuel lines. Clean or replace fuel lines.
		Air leak in fuel system.
		Check or replace fuel transfer pump.
	Water in fuel.	Drain and replace fuel.
	Engine problem	Adjust valve clearance. Check valve timing.
		Seized intake/exhaust valve. Replace valve and check valve guide.

Symptom	Problem	Solution
Engine Starts But Does Not Continue Running—Excess Exhaust Smoke	Water in fuel.	Drain and replace fuel.
	Engine problem	Improper timing between injection pump, intake and exhaust valves. Adjust valve clearance. Check valve timing.
		Improper intake or exhaust valve clearance. Adjust valve clearance.
		Cylinder, piston or piston rings worn. Replace rings and/or piston, bore or hone cylinder.

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Group 25 - Tests and Adjustments

Cylinder Compression Test

Reason:

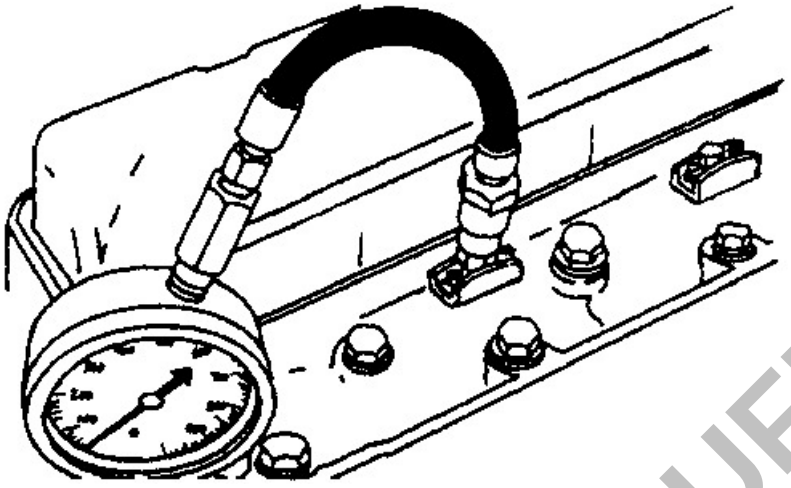
To determine the condition of the pistons, rings, cylinder walls and valves.

Procedure:

[1] - Run engine for 5 minutes to bring to operating temperature. Shut off engine.

[2] - Remove injection nozzle.

[3] -



Cylinder Compression Test

Remove heat protector from end of fuel injection nozzle, and install on Adapter.

[4] - Install JT01682 Compression Gauge Assembly

Compression Gauge Assembly

JT01682

Used to test cylinder compression.

and JDG472 Adapter

Adapter

JDG472

Used to attach Compression Gauge Assembly.

in injection port.

[5] - Disconnect fuel shutoff solenoid electrical connector.

[6] -

IMPORTANT:

Avoid damage! Do not overheat starting motor during test.

Crank engine for three seconds with starting motor.

[7] -

→NOTE:

Pressure listed is for 300 meters (1000 ft) above sea level. Reduce specification an additional 4% for each 300 meters (1000 ft) of altitude above this level.

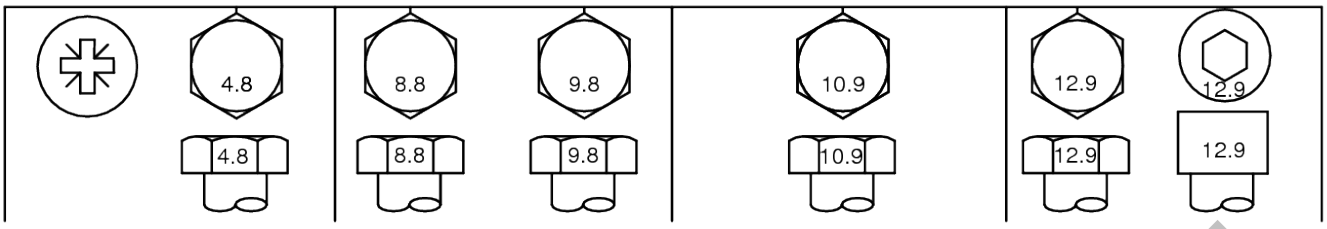
Repeat procedure and record pressure reading for each cylinder.

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Group 05 - Fastener Torques

Metric Bolt and Screw Torque Values



Metric Bolt and Screw

Metric Torque Values

	Class 4.8				Class 8.8 or 9.8				Class 10.9				Class 12.9			
	Lubricated ["Lubricated" means coated with a lubricant such as engine oil, fasteners with phosphate and oil coatings, or M20 and larger fasteners with JDM F13C, F13F or F13J zinc flake coating.]		**Dry** ["Dry" means plain or zinc plated without any lubrication, or M6 to M18 fasteners with JDM F13B, F13E or F13H zinc flake coating.]		**Lubricated** ["Lubricated" means coated with a lubricant such as engine oil, fasteners with phosphate and oil coatings, or M20 and larger fasteners with JDM F13C, F13F or F13J zinc flake coating.]		**Dry** ["Dry" means plain or zinc plated without any lubrication, or M6 to M18 fasteners with JDM F13B, F13E or F13H zinc flake coating.]		**Lubricated** ["Lubricated" means coated with a lubricant such as engine oil, fasteners with phosphate and oil coatings, or M20 and larger fasteners with JDM F13C, F13F or F13J zinc flake coating.]		**Dry** ["Dry" means plain or zinc plated without any lubrication, or M6 to M18 fasteners with JDM F13B, F13E or F13H zinc flake coating.]		**Lubricated** ["Lubricated" means coated with a lubricant such as engine oil, fasteners with phosphate and oil coatings, or M20 and larger fasteners with JDM F13C, F13F or F13J zinc flake coating.]		**Dry** ["Dry" means plain or zinc plated without any lubrication, or M6 to M18 fasteners with JDM F13B, F13E or F13H zinc flake coating.]	
Bolt or Screw Size	**N˙m**	**lb.-ft.**	**N˙m**	**lb.-ft.**	**N˙m**	**lb.-ft.**	**N˙m**	**lb.-ft.**	**N˙m**	**lb.-ft.**	**N˙m**	**lb.-ft.**	**N˙m**	**lb.-ft.**	**N˙m**	**lb.-ft.**
M6	4.8	3.5	6	4.5	9	6.5	11	8.5	13	9.5	17	12	15	11.5	19	14.5
M8	12	8.5	15	11	22	16	28	20	32	24	40	30	37	28	47	35
M10	23	17	29	21	43	32	55	40	63	47	80	60	75	55	95	70
M12	40	29	50	37	75	55	95	70	110	80	140	105	130	95	165	120
M14	63	47	80	60	120	88	150	110	175	130	225	165	205	150	260	190
M16	100	73	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	260	190	330	245	510	375	650	480	725	535	925	680	850	625	1080	800
M24	330	245	425	315	650	480	825	600	925	680	1150	850	1080	800	1350	1000
M27	490	360	625	460	950	700	1200	885	1350	1000	1700	1250	1600	1150	2000	1475
M30	675	490	850	625	1300	950	1650	1200	1850	1350	2300	1700	2150	1600	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	2760	4750	3500

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

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

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

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

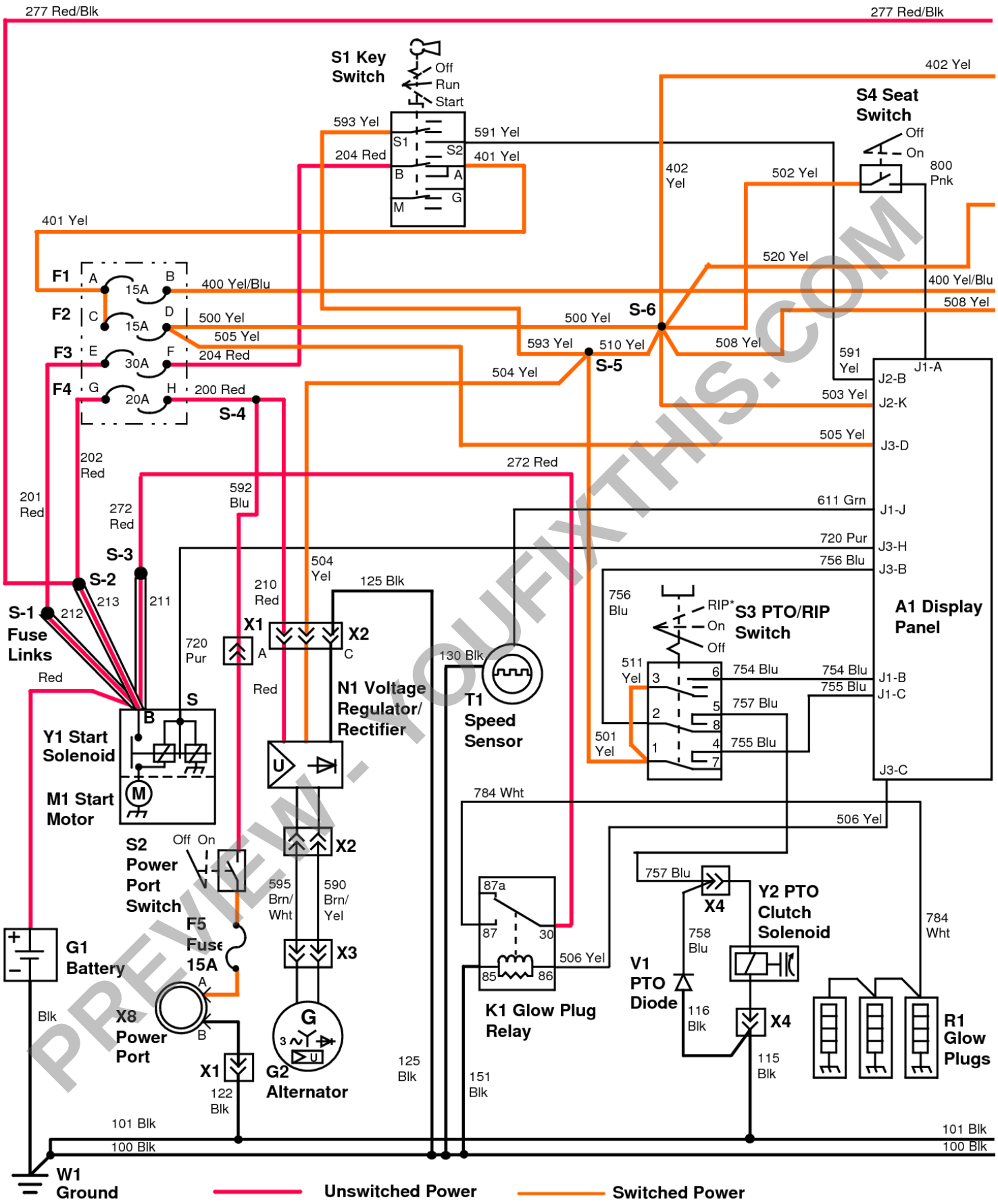
Tighten toothed or serrated-type lock nuts to the full torque value.

Reference: JDS - G200.

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Main Electrical Schematic (S/N -020000)



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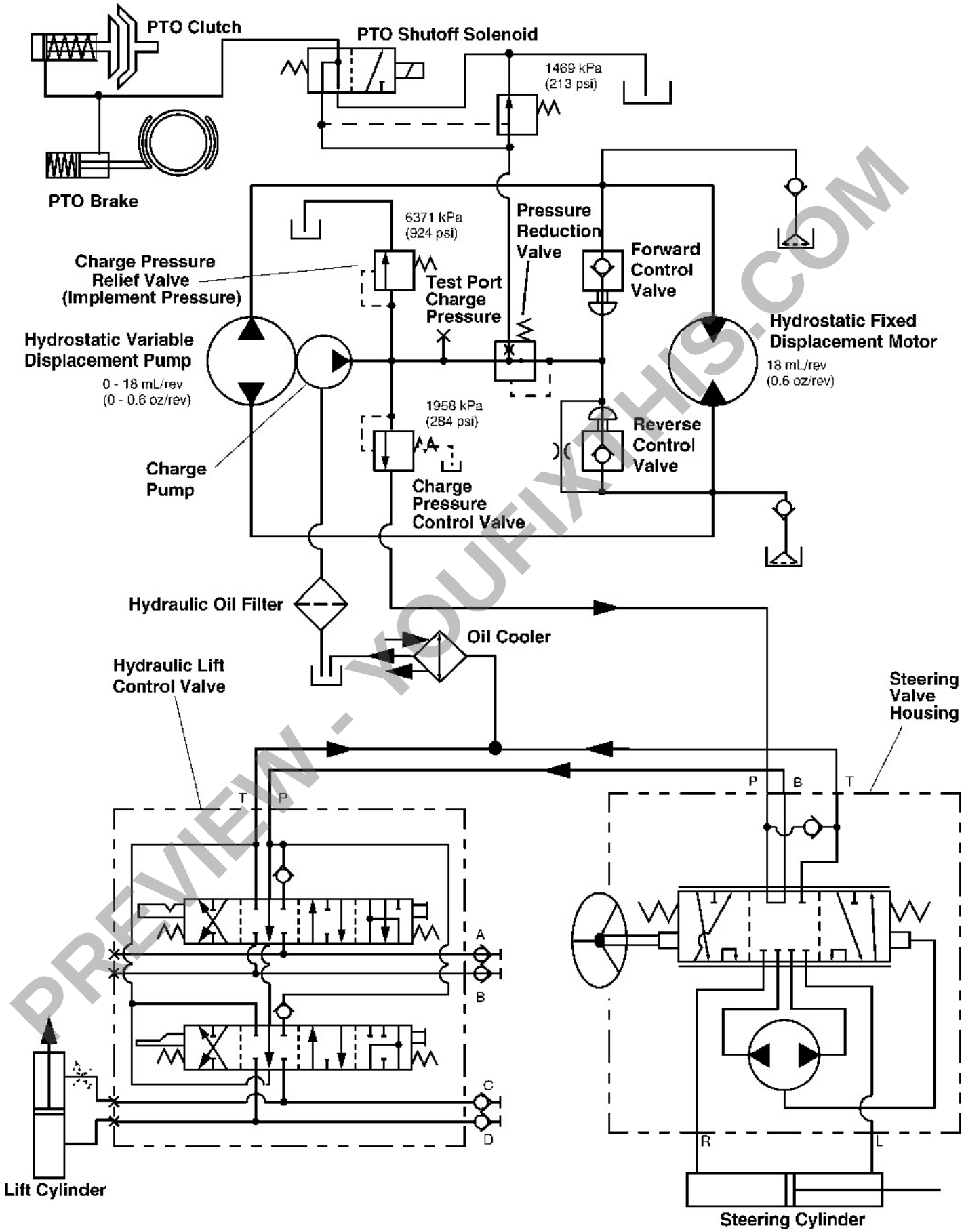
Main Electrical Schematic (S/N -020000)

Main Electrical Schematic (S/N -020000)

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Group 10 - Schematics 2WD and MFWD

Power Train - 2WD and MFWD



2WD and MFWD

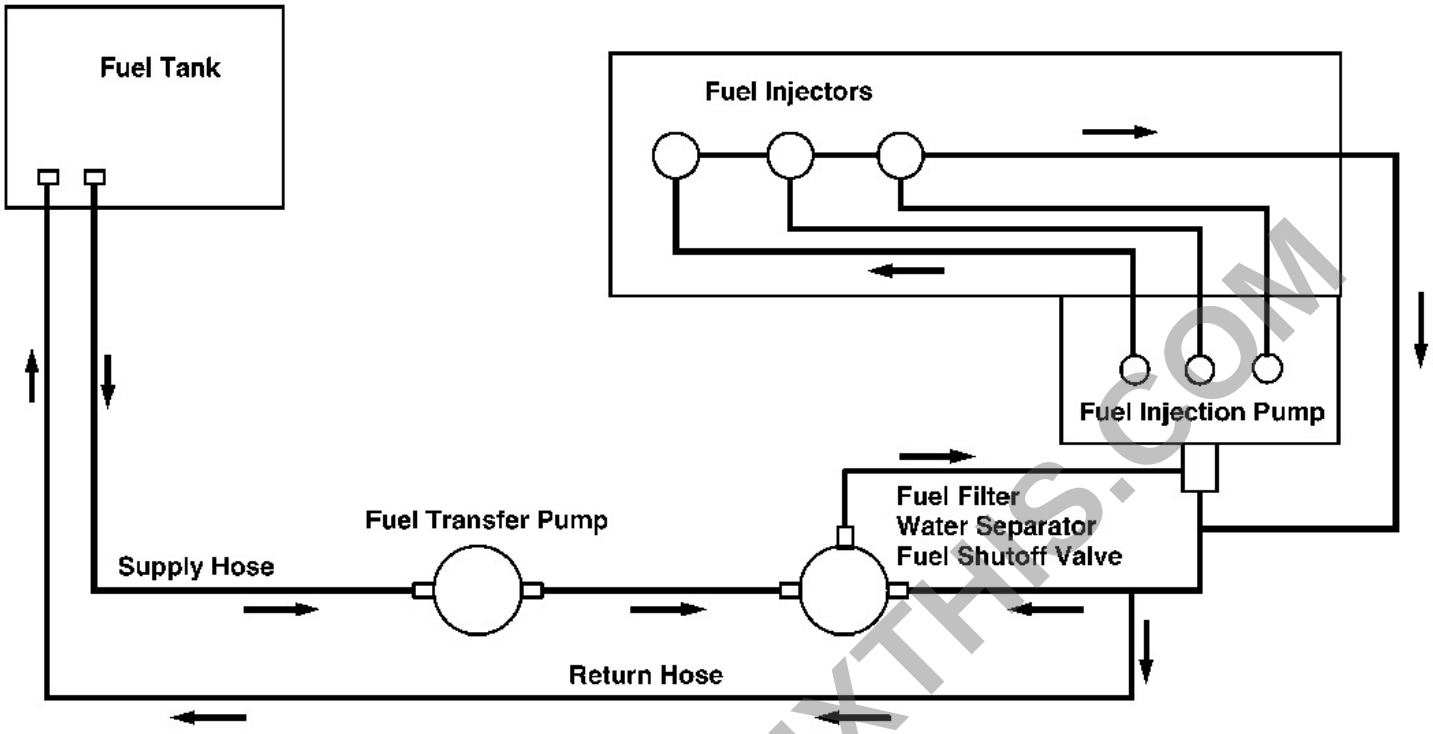
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Fuel System Theory of Operation



Fuel System

Function:

The fuel system supplies clean fuel to injection pump and nozzles, and circulates unused fuel back to the tank. An instrument panel mounted electric fuel gauge shows the operator amount of fuel remaining.

Theory of Operation:

The engine driven mechanical fuel transfer pump draws fuel from the tank and pumps it to the combination glass bowl fuel filter/water separator/fuel shutoff valve. If the fuel valve is on, fuel flows to the fuel injection pump. After the injection pump housing is full, excess fuel is recirculated, along with excess leakoff fuel from the injectors, through the fuel filter. Excess fuel is returned to the fuel tank.

The engine speed is controlled by the hand throttle lever. The throttle linkage is connected to the injection pump/governor control lever.

The fuel shutoff solenoid controls the flow of fuel inside the injection pump. When the solenoid is energized (ignition key to START position), the solenoid pulls in and allows fuel to be pumped to the injectors. When the key is turned off, return springs extend the solenoid to the shutoff position. The solenoid stops the flow of fuel inside the fuel injector pump by forcing the governor rack linkage to the NO FUEL position, causing the fuel injector pump to stop supplying fuel to the injectors.

The injection pump meters fuel as determined by the governor and delivers it at high pressure to the injection nozzles. The injection nozzle prevents flow until high pressure is reached, opening the valve and spraying atomized fuel into the pre-combustion swirl chamber. Injection lines have trapped fuel inside whenever injection is not taking place.

A small amount of fuel leaks past the nozzle valve to lubricate the fuel injection nozzle. This leakage combines with excess fuel from the injection pump and is returned to tank. Any air in the fuel system is bled out with return fuel to the fuel tank.

A float-type fuel level sensor mounted in the tank drives a instrument panel mounted gauge, informing the operator of the fuel level.

The fuel shutoff solenoid has two coils inside; one pull-in, and one hold-in coil. The hold-in coil is energized whenever the key switch is in the ON or START position. The pull-in coil is energized only when in the START position and start criteria are met.

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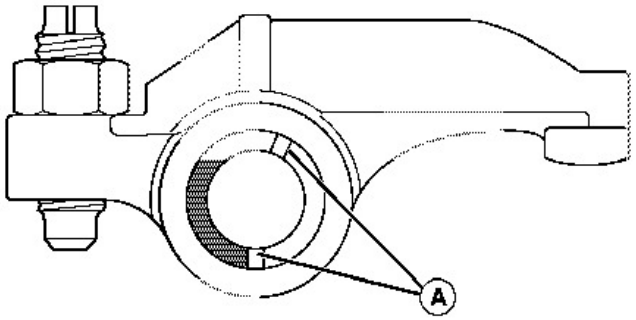
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Item	Measurement	Specification
		(226 lb.-in.)

[4] - Adjust valve clearance. (See Valve Clearance Adjustments .)

[5] - Install valve cover. (See Valve Cover Remove and Install .)

[6] -



LEGEND:
A Oil Holes (2 used)

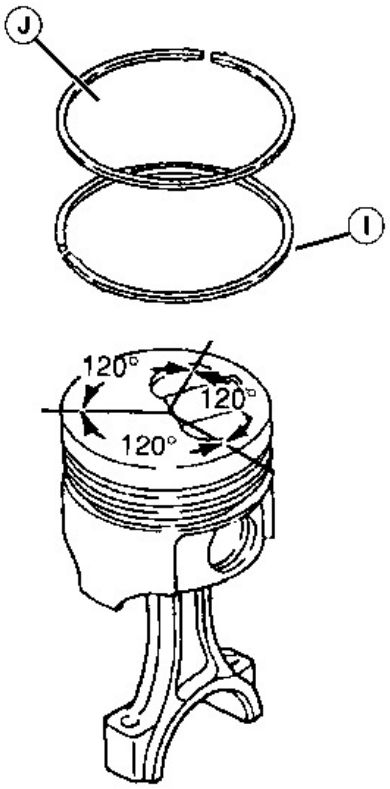
Rocker Arm Shaft

Make sure oil holes (A) are oriented as shown when assembling rocker arm shaft components. Assemble rocker shaft (G) aligning set screw hole in shaft with set screw (C) in number one cylinder shaft support (flywheel end).

[7] - Be sure rocker arms, supports and springs are installed in same order as removed.

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LEGEND:

I	Compression Ring
J	Compression Ring

Piston and Connecting Rod

Install second compression ring (I). Turn ring until gap is 120° away from oil ring gap.

[7] - Install first compression ring in top groove. Turn ring until gap is 120° away from second ring gap.

Inspection and Replacement:

[1] - Inspect all parts for wear or damage. Replace as necessary.

[2] - Measure crankshaft connecting rod journal diameter. (See Crankshaft and Main Bearings—3TNV76 or Crankshaft and Main Bearings—3TNM72 in this section.)

[3] - Install connecting rod cap and bearing inserts on connecting rod. Install old connecting rod cap screws and tighten to specifications.

Item	Measurement	Specification
Connecting Rod Cap Screws (Lubricating Oil Applied)	Torque	22.6-27.5 N·m (16.6-20.2 lb.-ft.)

[4] - Measure connecting rod bearing diameter.

Item	Measurement	Specification
Connecting Rod Large End Bearing (3TNV76)	ID	41.98-42.00 mm (1.653-1.654 in.)
Connecting Rod Large End Bearing	Thickness	1.50-1.51 mm (0.059 in.)
Connecting Rod Large End Bearing	Oil Clearance	0.02-0.05 mm (0.001-0.002 in.)
Connecting Rod Large End Bearing Wear Limit	Oil Clearance	0.11 mm (0.004 in.)
Connecting Rod Large End Bearing (3TNM72)	ID	37.98-38.01 mm (1.495-1.496 in.)

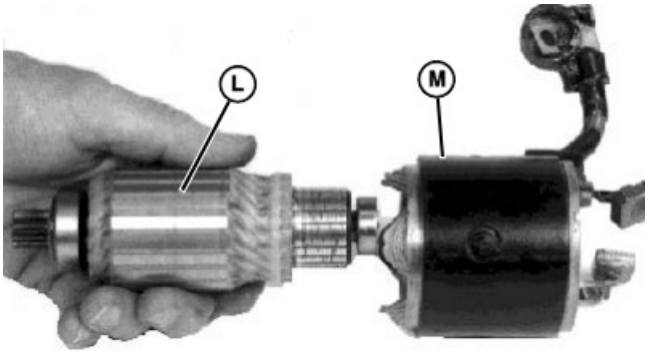
If bearing diameter exceeds wear limit, replace bearing inserts.

If bearing clearance (bearing ID minus crankshaft journal OD) exceeds specification, grind crankshaft connecting rod journals and install undersized bearing inserts, or replace bearing inserts and crankshaft.

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[8] -



LEGEND:

L	Armature
M	Field Coil Housing

Armature

Remove the armature (L) from the field coil housing (M).

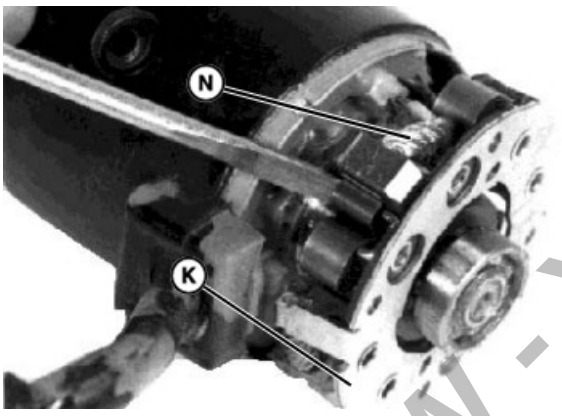
[9] - Inspect and test the brushes, holder, field coil and armature. (See Starting Motor Inspect and Test .)

Assembly:

Assembly is done in the reverse order of disassembly.

→NOTE:

Apply multipurpose grease to bearing cup inside rear cover.



LEGEND:

K	Brush Holder
N	Field Coil Brush Wire

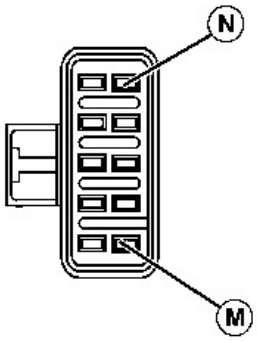
Starting Motor

IMPORTANT:

Avoid Damage! When installing the rear cover, be sure the field coil brush wires (N) do not touch the cover. Turn the brush holder (K) slightly to take up slack in the brush wires. Press the wires inward to clear the rear cover.

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LEGEND:

M	503 Yel Wire
N	742 Blu/Wht Wire

J2 Connector

Is battery voltage present at A1 display panel, J2 connector 503 Yel wire (M)?

Result:

YES: Go to next step.

NO: Check 500 Yel wire, S-6 splice, and 503 Yel wire and connections.

(6) Step 6

Action:

If rear PTO option is not installed - Is battery voltage present at A1 display panel, J2 connector 742 Blu/Wht wire (N)?

Result:

YES: Go to next step.

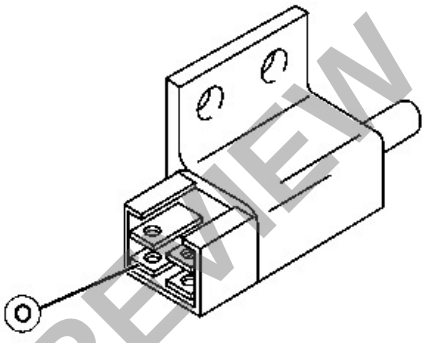
NO: Check 500 and 520 Yel, 743 Pur, and 742 Blu/Wht wires and connections.

(7) Step 7

Action:

LEGEND:

O	402 Yel Wire



RIO Switch

Is battery voltage present at S7 RIO switch, 402 Yel wire (O)?

Result:

YES: Go to next step.

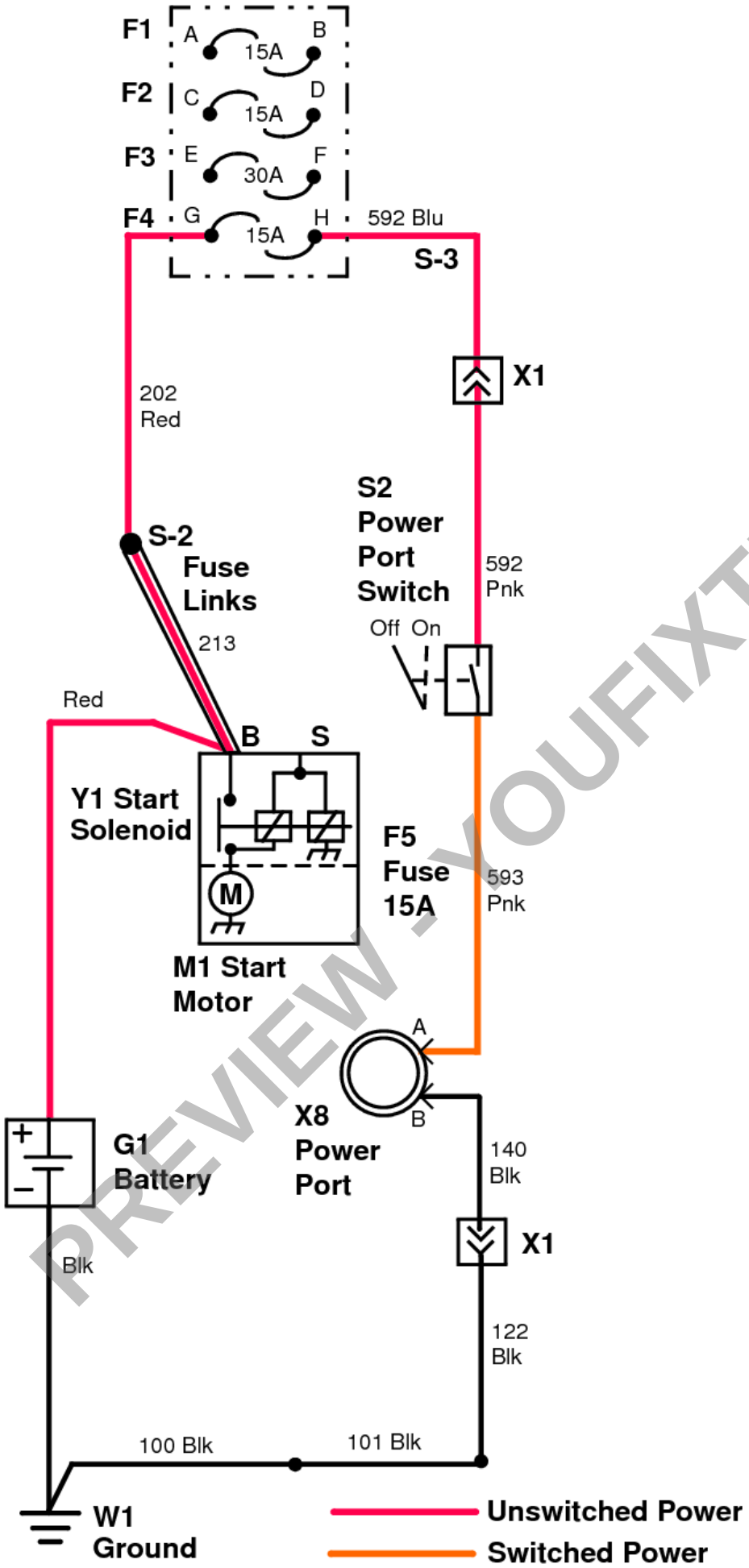
NO: Check 500 Yel wire, S-6 splice, and 402 Yel wire and connections.

(8) Step 8

Action:

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Transaxle Test

Transaxle Checks

Test Conditions:

- Park brake engaged.
- Engine not running.

Transaxle

(1) Step 1

Action:

When checking dipstick, oil at proper level and viscosity?

Result:

YES: Go to next step.

NO: Add or change hydraulic oil and filter.

(2) Step 2

Action:

Check transaxle (drive machine). No leaks? Transaxle engages in specified time?

Item	Measurement	Specification
Transaxle Engagement	Time	0.5—1.0 sec.

Result:

YES: Go to next step.

NO: Replace leaking and worn seals.

(3) Step 3

Action:

Differential lock engages within a short distance when differential lock pedal is depressed? (Machine wants to continue in a straight line. Differential lock will disengage when you release the traction pedal.)

Result:

YES: Go to next step.

NO: Check linkage springs and all linkage connections. Inspect differential and lock collar and pins. Check for broken differential shift fork return spring.

(4) Step 4

Action:

Check differential and axles (jack one wheel off ground). During a turn, any noise from axles or differential? (AWS wheel hubs in knuckle housing should have movement (wobble)).

Result:

NO: Go to next step.

YES: Noise in the turn: Check all bearings then differential side gears and bevel pinions.

(5) Step 5

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B	Snap Ring
C	Needle Bearing
D	Washer
E	Seal
F	Needle Bearing
G	Washer
H	Cap Screw
I	Ball Bearing
J	Snap Ring
K	Mid-Mount PTO Gear
L	PTO Output Shaft
M	Snap Ring
N	PTO Idler Gear
O	PTO Idler Shaft
P	Washer
P	Fuel Tank
Q	Solenoid Harness
R	Rear Transaxle Cover
S	Hitch Plate
T	Transaxle Cover Plate

Remove plug to drain oil from transaxle.

[2] - Remove fuel tank (P).

[3] - Remove hitch plate (S).

[4] - Disconnect PTO solenoid harness (Q).

[5] - Remove rear transaxle cover (R) or transaxle cover plate (T).

[6] - Remove PTO clutch assembly (A).

[7] -

→NOTE:

When removing snap ring (B), be sure not to lose needle bearing (C) or washers (D).

Remove PTO idler gear assembly.

[8] - Remove PTO gear.

[9] - Left axle must be removed to remove PTO output shaft assembly. (See Rear Axle Assembly (for appropriate model) in Section 50, Group 30.)

[10] - Inspect ball bearings and needle bearing for smooth rotation.

[11] -

→NOTE:

Idler gear and shaft must be replaced as a set.

Inspect gears and splines for missing or chipped teeth, wear or damage. Replace parts if necessary.

Installing:

[1] - If replaced, install new needle bearing from inside case with bearing identification marks toward the inside of the case. Push bearing tight against shoulder in bore.

[2] - Install new seal with the open, spring side towards the inside of the case.

[3] - Push seal against shoulder in bore.

[4] - Install mid-mount PTO gear so side with the longer center hub is towards bearing.

[5] - Clean mating surfaces of rear cover and case. Be sure threaded holes are clean and two O-rings are in position in rear cover.

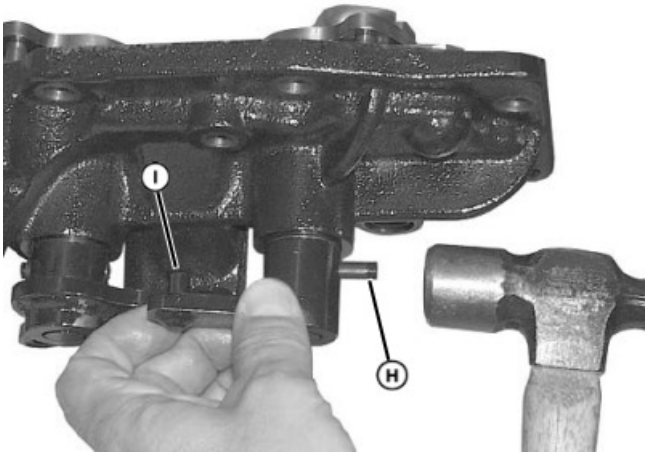
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Item	Measurement	Specification
		13 in.

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LEGEND:

H	Spring Pin
I	Left Control Lever Pin

Spring Control

Install spring pin (H) through control lever and shaft.

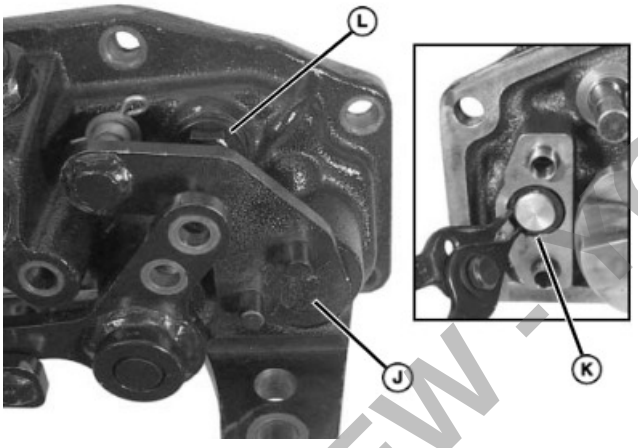
[12] -

→NOTE:

Partial spring tension should hold left control lever pin (I) against right control lever.

Carefully remove wrench from eccentric cam and swash plate tab.

[13] -



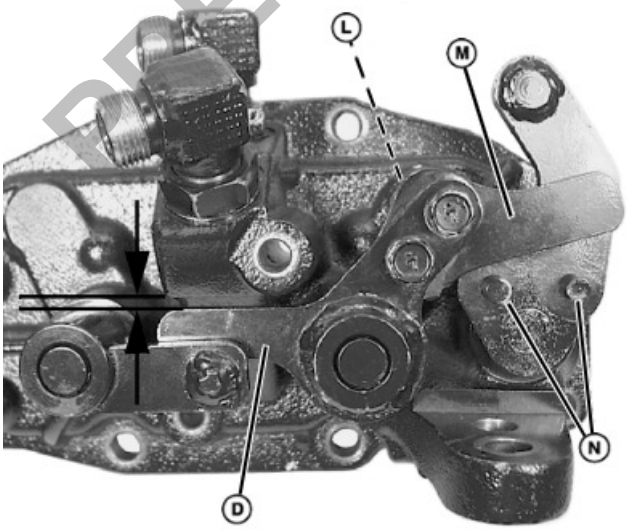
LEGEND:

J	Cam Lever
K	Snap Ring
L	Eccentric Cam

Cover

Install cam lever (J) through cover. Secure cam lever with snap ring (K).

[14] -



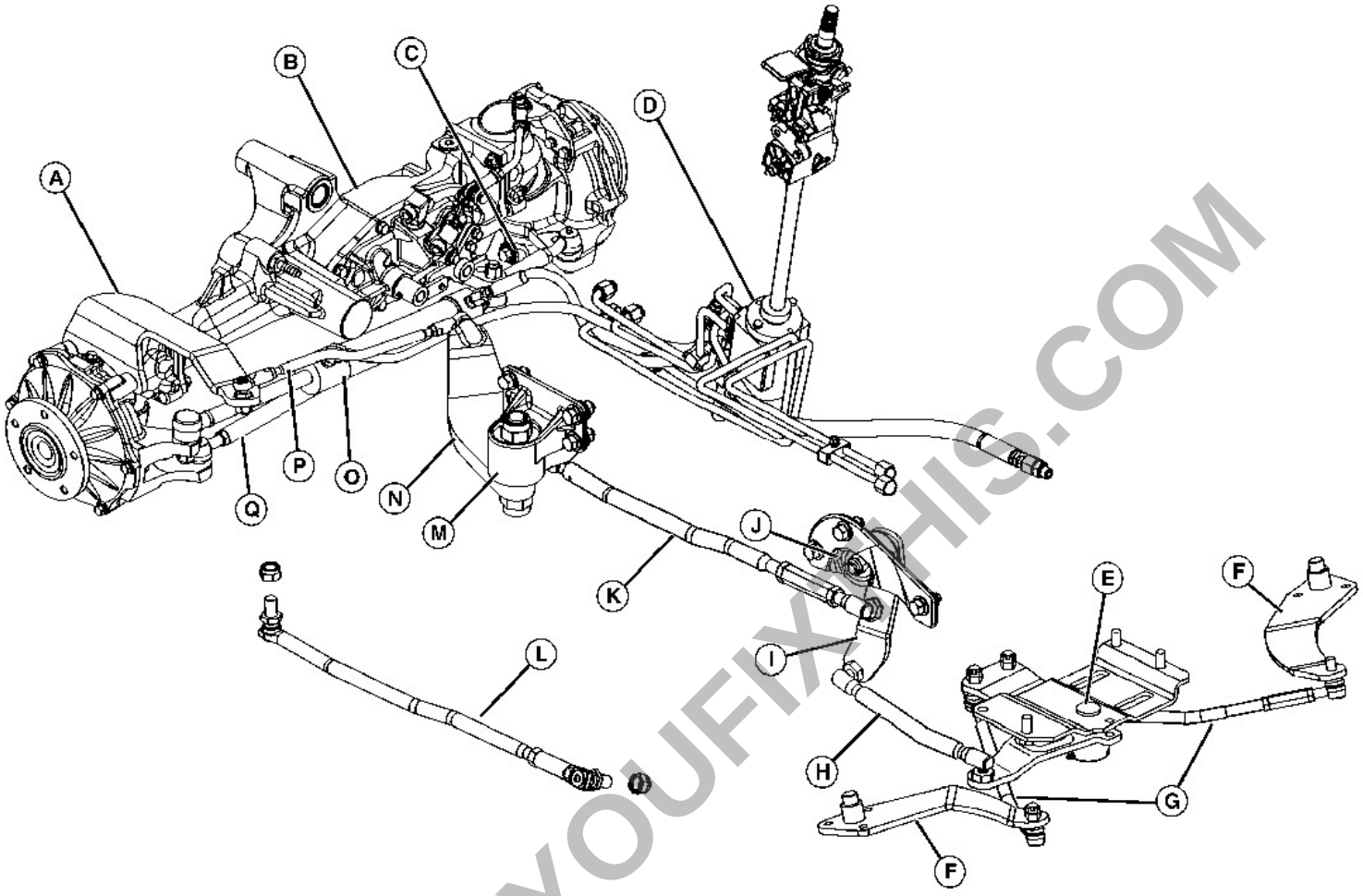
LEGEND:

D	Lever Arm
L	Eccentric Cam
M	Adjustment Plate
N	Cam Lever Pins (2 used)

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Steering Components - All Wheel Steer HFWD



All Wheel Steer HFWD

LEGEND:

A	Steering Arm
B	Front Axle (HFWD)
C	Tie Rod
D	Steering Control Unit (SCU)
E	Rear Tie Rod Pivot
F	Rear Wheel Steering Arm
G	Tie Rod, Rear (2)
H	Link Rod, Rear
I	Pivot Arm
J	Bearing Housing
K	Link Rod, Middle (SN -50000)
L	Link Rod, Middle (SN 50001-)
M	Bearing Housing
N	Steering Arm, Front
O	Steering Cylinder
P	Link Rod, Front
Q	Tie Rod, Front

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→NOTE:

Outer race of two tapered bearings (D) is slip fit.

Remove pivot plate components.

[4] - Inspect bearings and ball joints for wear. Replace as necessary.

Assembly:

[1] - Apply extreme pressure grease to rollers of bearings.

[2] - Install snap ring, upper bearing and seal into pivot plate. Install seal with closed side into bore first and even with top of pivot plate.

[3] - Install pivot plate, spacer, lower bearing, washer and nut. Tighten nut while making sure slot of nut aligns with hole in pivot shaft.

[4] - Install cotter pin. Fill cavity with extreme pressure grease and install cap seal.

Installation:

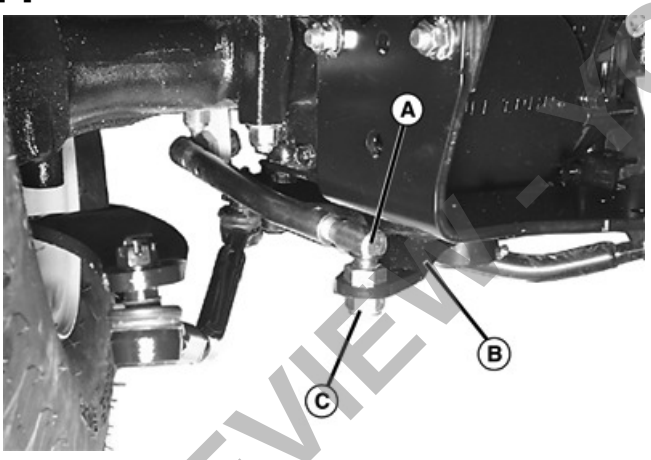
[1] - Install pivot assembly using cap screws and washers. Tighten cap screws to specification.

Item	Measurement	Specification
Rear Axle Pivot Bracket Cap Screws	Torque	91 N·m (67 lb-ft)

[2] - Install right and left tie rods with castle nuts (A) and cotter pins.

[3] - Check and adjust rear axle toe-in. (See Toe-In Adjustment All Wheel Steering .)

[4] -



LEGEND:

A	Rear Rod
B	Pivot Plate
C	Lock Nut

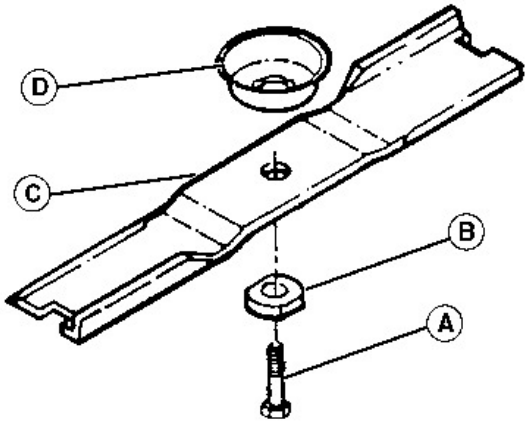
Pivot Plate

Connect rear rod (A) to pivot plate (B) using lock nut (C). Tighten lock nut to specification.

Item	Measurement	Specification
Rear Pivot Plate Lock Nut	Torque	170 N·m (125 lb-ft)

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LEGEND:

A	Cap Screw
B	Washer
C	Blade
D	Deflector Cup

Blade

- Check that deflector cup (D) is properly seated between mower spindle and blade (C).
- Position mower blade (C) with cutting edge toward ground onto mower spindle.
- Install and hand-tighten cap screw (A) with washer (B) until mower blade is in full contact with spindle.
- Make sure to install blade washer with concave side toward blade.
- Tighten blade cap screw to specification.

Item	Measurement	Specification
Blade Cap Screw (48C, 54C, and 62C Decks)	Torque	68 N·m (50 lb-ft)

Item	Measurement	Specification
Blade Cap Screw (60D Deck)	Torque	88 N·m (65 lb-ft)

Sharpen and Balance Blades

Procedure:

[1] -

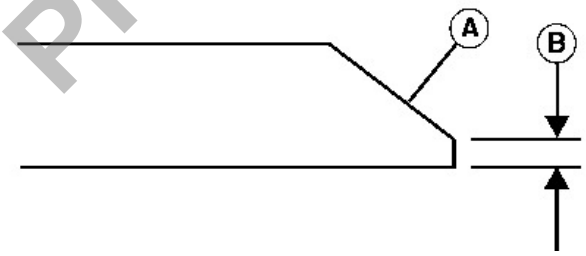
CAUTION:

Avoid Injury! Blades are sharp. Always wear gloves when handling blades or working near blades. Always wear safety eye protection when grinding.

Clean blade.

[2] - Sharpen blade using grinder, file or power sharpener.

[3] -



LEGEND:

A	Bevel
B	Cutting Edge

Blade

Do not alter original bevel (A). Blade should have cutting edge (B) to specification rather than a razor-type edge.

Item	Measurement	Specification
Blade Edge	Length	0.40 mm (0.016 in.)

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