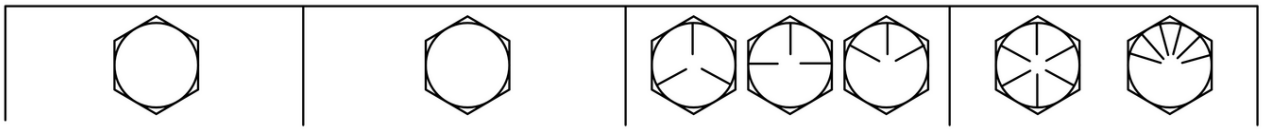
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Unified Inch Bolt and Screw Torque Values



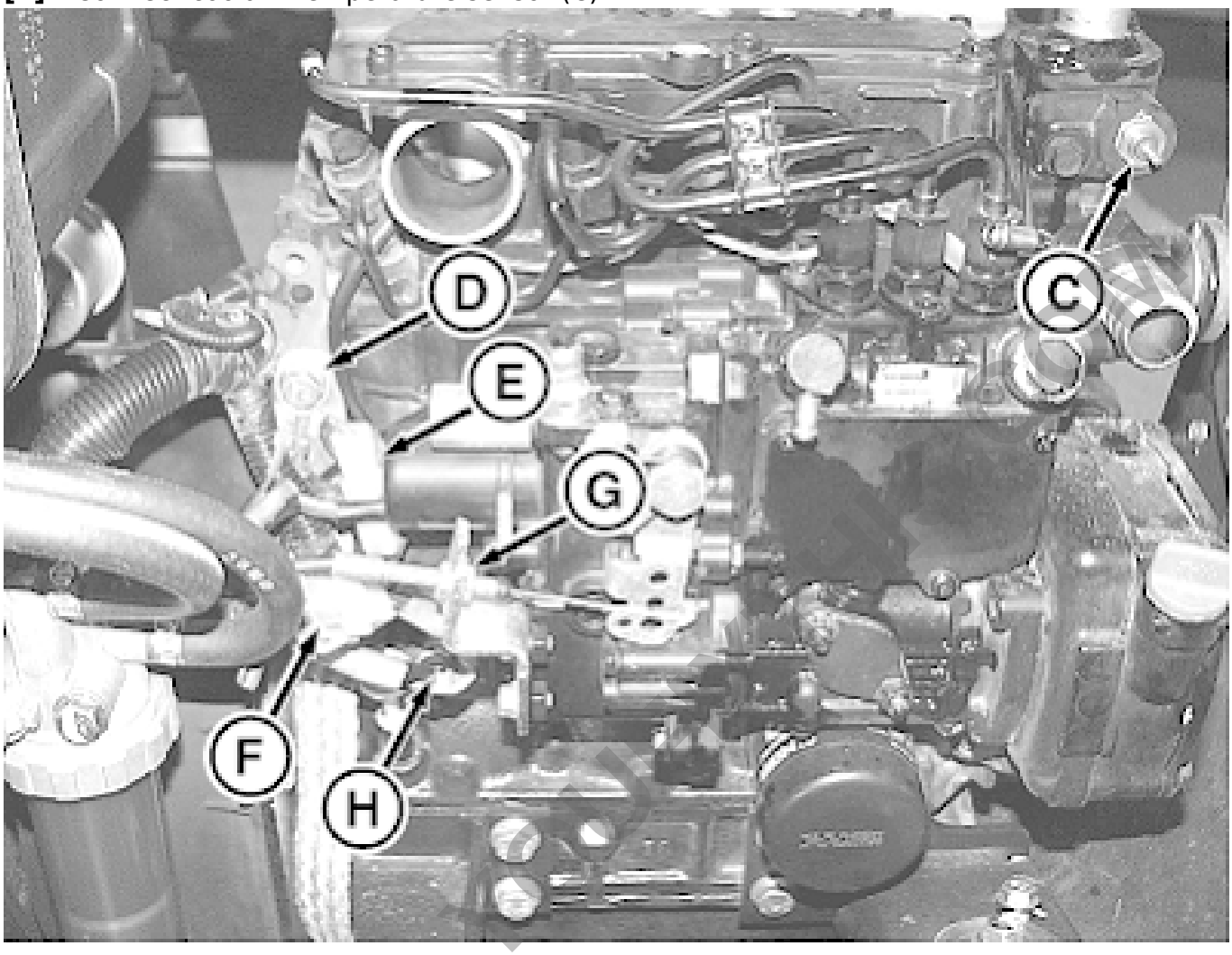
Unified Inch Bolt and Screw

Bolt or Screw Size	SAE Grade 1				SAE Grade 2 [Grade 2 applies for hex cap screws (not hex bolts) up to 6 in. (152 mm) long. Grade 1 applies for hex cap screws over 6 in. (152 mm) long, and for all other types of bolts and screws of any length.]				SAE Grade 5, 5.1 or 5.2				SAE Grade 8 or 8.2			
	Lubricated ["Lubricated" means coated with a lubricant such as engine oil, fasteners with phosphate and oil coatings, or 7/8 in. and larger fasteners with JDM F13C, F13F or F13J zinc flake coating.]		Dry ["Dry" means plain or zinc plated without any lubrication, or 1/4 to 3/4 in. 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 7/8 in. and larger fasteners with JDM F13C, F13F or F13J zinc flake coating.]		Dry ["Dry" means plain or zinc plated without any lubrication, or 1/4 to 3/4 in. 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 7/8 in. and larger fasteners with JDM F13C, F13F or F13J zinc flake coating.]		Dry ["Dry" means plain or zinc plated without any lubrication, or 1/4 to 3/4 in. 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 7/8 in. and larger fasteners with JDM F13C, F13F or F13J zinc flake coating.]		Dry ["Dry" means plain or zinc plated without any lubrication, or 1/4 to 3/4 in. fasteners with JDM F13B, F13E or F13H zinc flake coating.]	
	N˙m	**lb.-in.**	**N˙m**	**lb.-in.**	**N˙m**	**lb.-in.**	**N˙m**	**lb.-in.**	**N˙m**	**lb.-in.**	**N˙m**	**lb.-in.**	**N˙m**	**lb.-in.**	**N˙m**	**lb.-in.**
1/4	3.7	33	4.7	42	6	53	7.5	66	9.5	84	12	106	13.5	120	17	150
													N˙m	**lb.-ft.**	**N˙m**	**lb.-ft.**
5/16	7.7	68	9.8	86	12	106	15.5	137	19.5	172	25	221	28	20.5	35	26
									N˙m	**lb.-ft.**	**N˙m**	**lb.-ft.**				
3/8	13.5	120	17.5	155	22	194	27	240	35	26	44	32.5	49	36	63	46
			N˙m	**lb.-ft.**	**N˙m**	**lb.-ft.**	**N˙m**	**lb.-ft.**								
7/16	22	194	28	20.5	35	26	44	32.5	56	41	70	52	80	59	100	74
	N˙m	**lb.-ft.**														
1/2	34	25	42	31	53	39	67	49	85	63	110	80	120	88	155	115
9/16	48	35.5	60	45	76	56	95	70	125	92	155	115	175	130	220	165
5/8	67	49	85	63	105	77	135	100	170	125	215	160	240	175	305	225
3/4	120	88	150	110	190	140	240	175	300	220	380	280	425	315	540	400
7/8	190	140	240	175	190	140	240	175	490	360	615	455	690	510	870	640
1	285	210	360	265	285	210	360	265	730	540	920	680	1030	760	1300	960
1-1/8	400	300	510	375	400	300	510	375	910	670	1150	850	1450	1075	1850	1350
1-1/4	570	420	725	535	570	420	725	535	1280	945	1630	1200	2050	1500	2600	1920
1-3/8	750	550	950	700	750	550	950	700	1700	1250	2140	1580	2700	2000	3400	2500
1-1/2	990	730	1250	930	990	730	1250	930	2250	1650	2850	2100	3600	2650	4550	3350

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[7] - Connect coolant temperature sensor (C).



Engine Connectors Right Hand Side

LEGEND:

C	Coolant Temperature Sensor
D	Cap Screw
E	Glow Plug Harness Connector
F	Fuel Shutoff Solenoid Connector
G	Jam Nuts
H	Oil Pressure Switch

[8] - Install cap screw (D) securing ground strap and wires to engine.

[9] - Connect glow plug harness connector (E).

[10] - Connect fuel shutoff solenoid connector (F).

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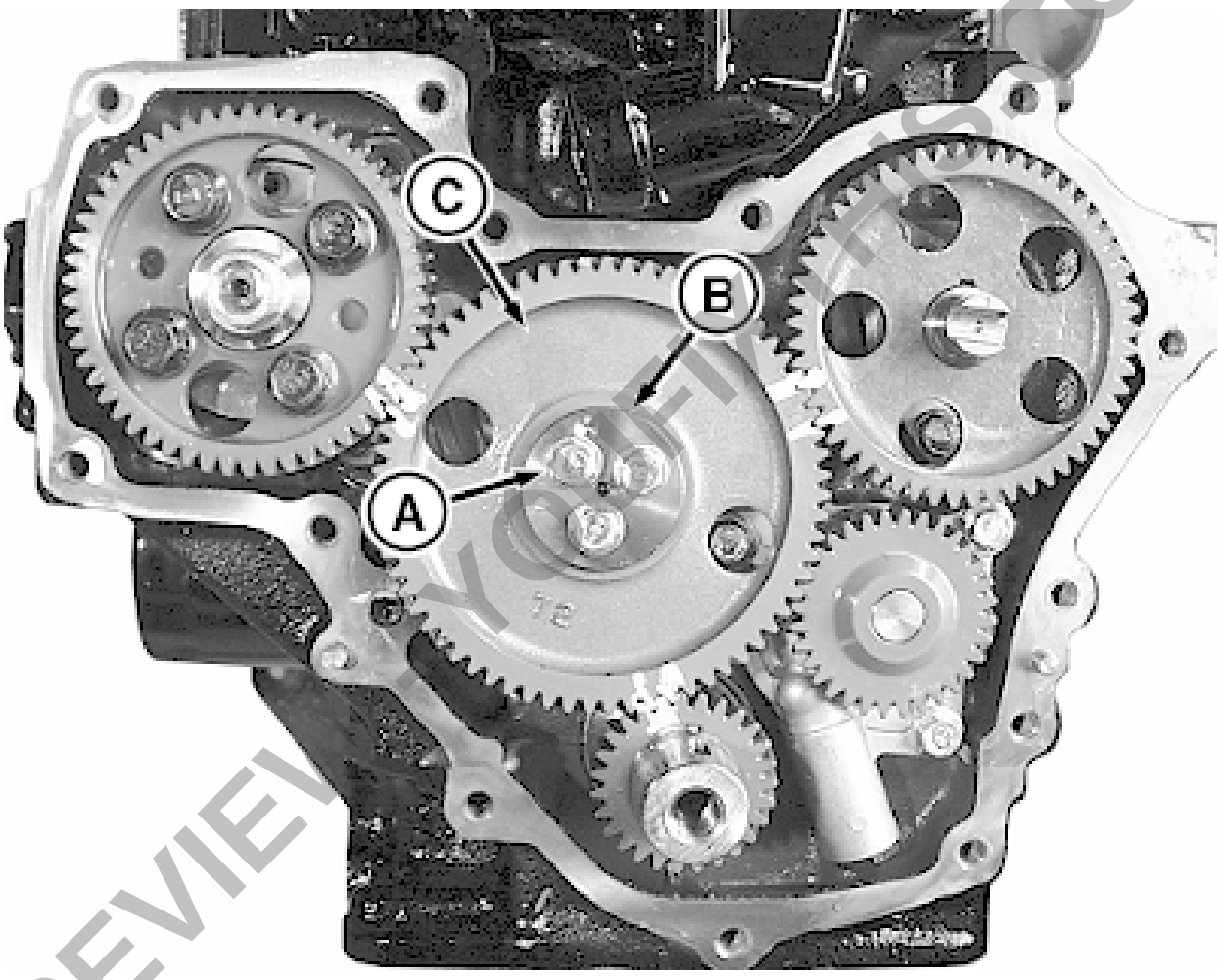
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Remove, Inspect, and Install Idler Gear

[1] - Check backlash of timing gears. (See Check Timing Gear Backlash in Section 220, Group 15.)

[2] -

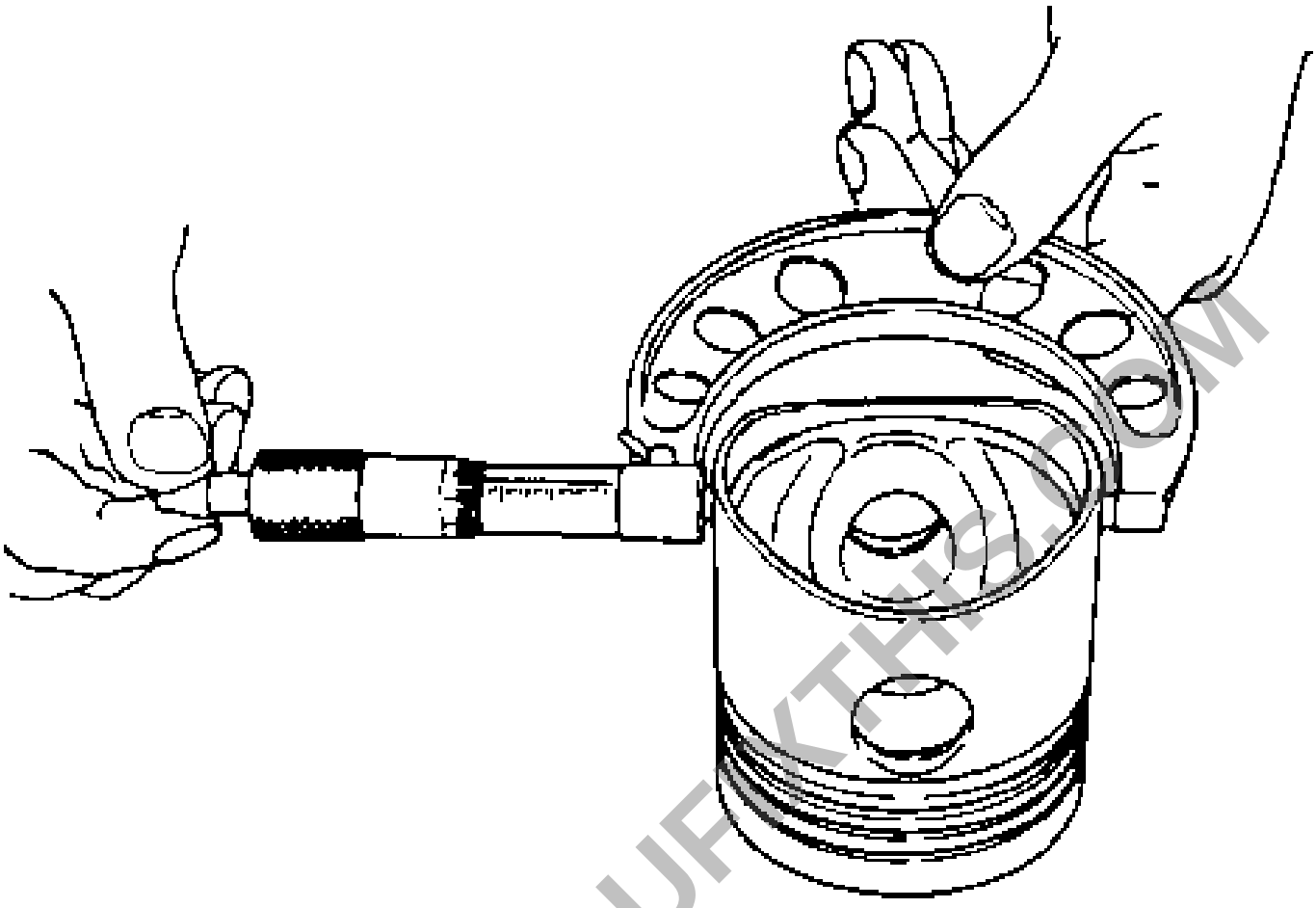
→NOTE:



Idler Gear 3TNM74

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Piston Diameter Measurement Location

LEGEND:

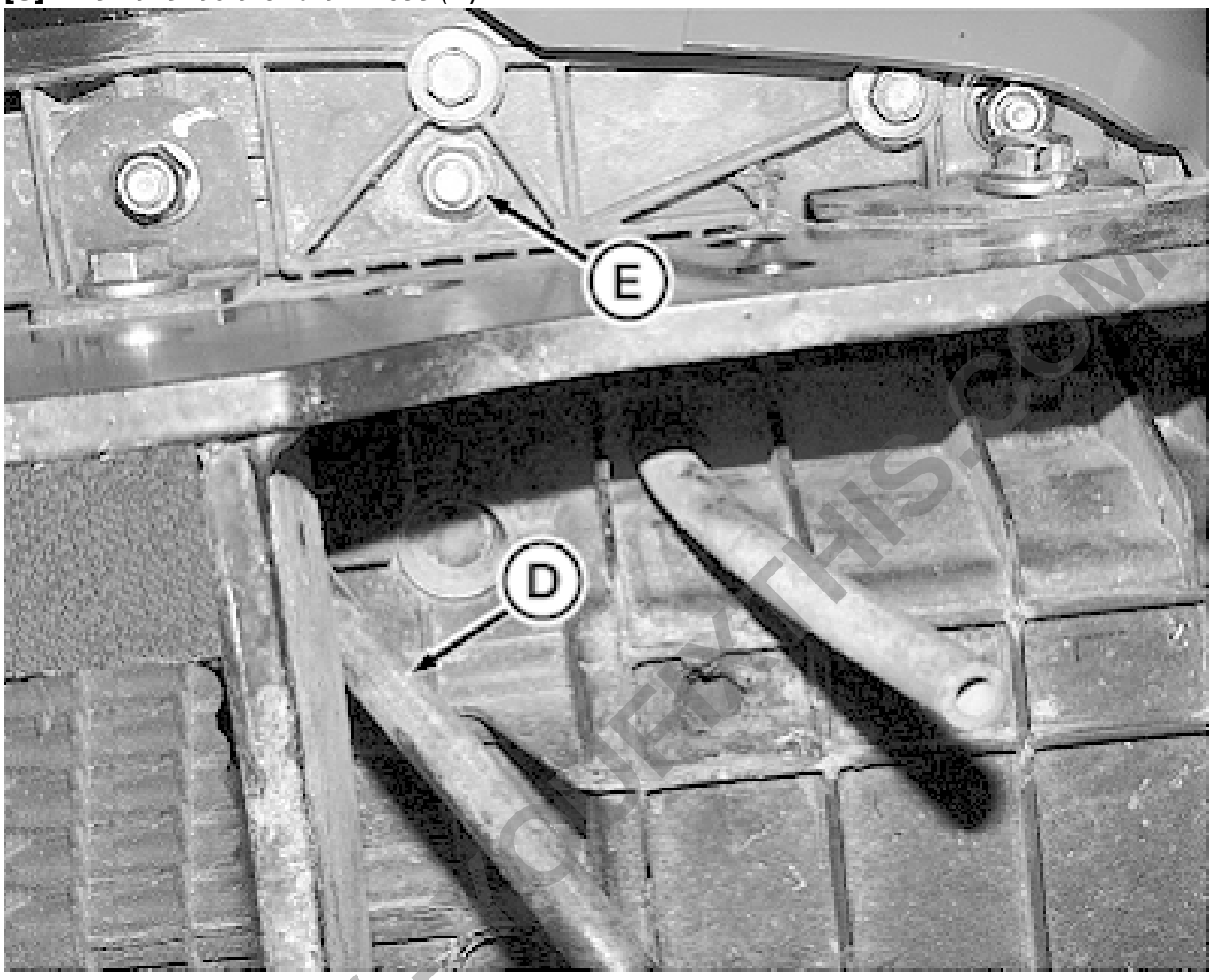
A Distance From Skirt Bottom

Item	Measurement	Specification
3TNM74 Piston Outside Diameter		
	Distance (A)	22—25 mm (0.866—0.984 in.)
Standard Piston	OD	73.96—73.99 mm (2.912—2.913 in.)
Wear Limit	OD	73.91 mm (2.910 in.)
3TNV76 Piston Outside Diameter		
	Distance (A)	22—25 mm (0.866—0.984 in.)
Standard Piston	OD	75.96—75.99 mm (2.991—2.992 in.)
Wear Limit	OD	75.91 mm (2.989 in.)
3TNV80 Piston Outside Diameter		

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[8] - Remove radiator drain hose (D).



Radiator Support Rod

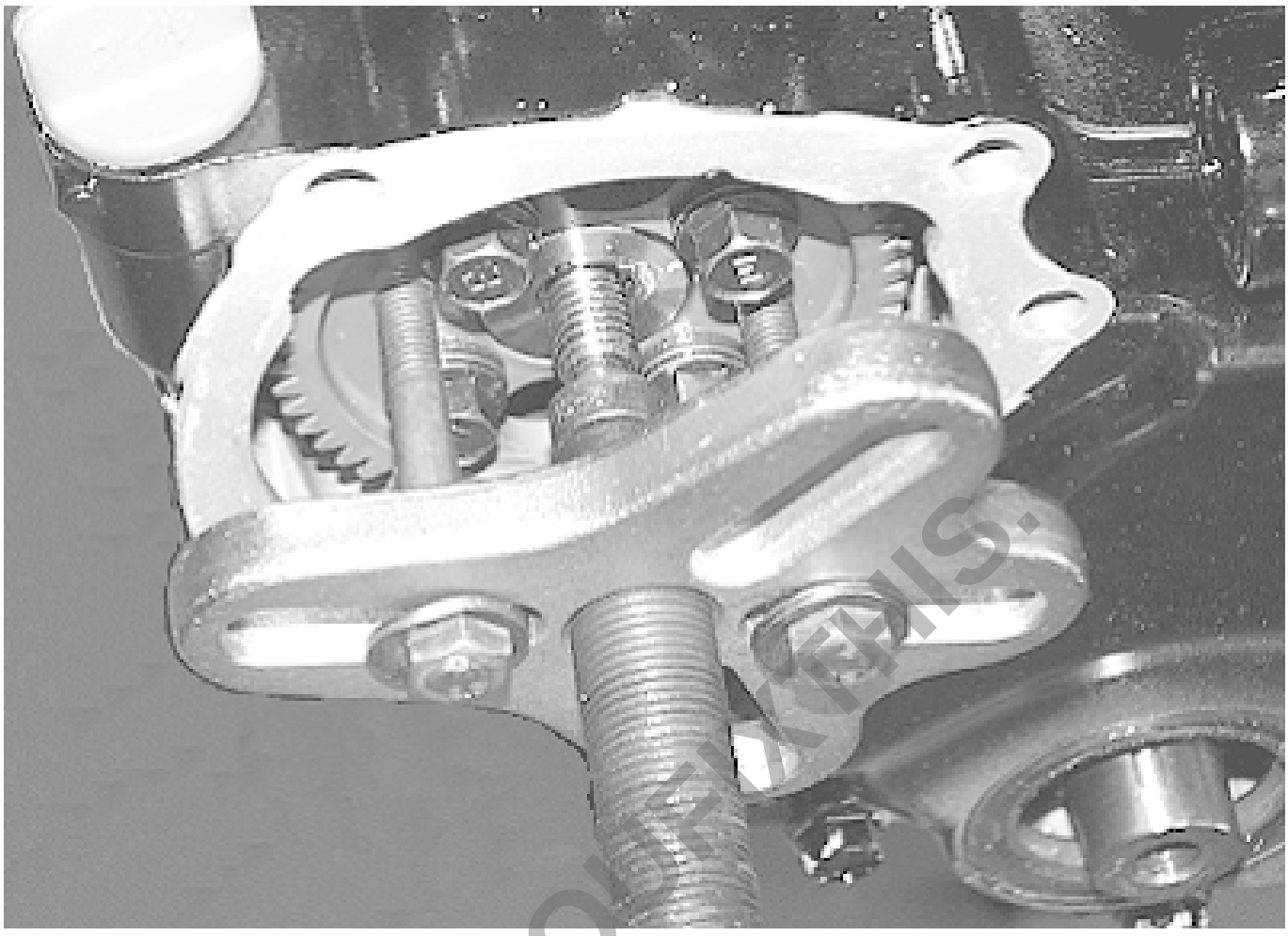
LEGEND:

D	Drain Hose
E	Nut

[9] - Remove nut (E) from oil cooler support rod.

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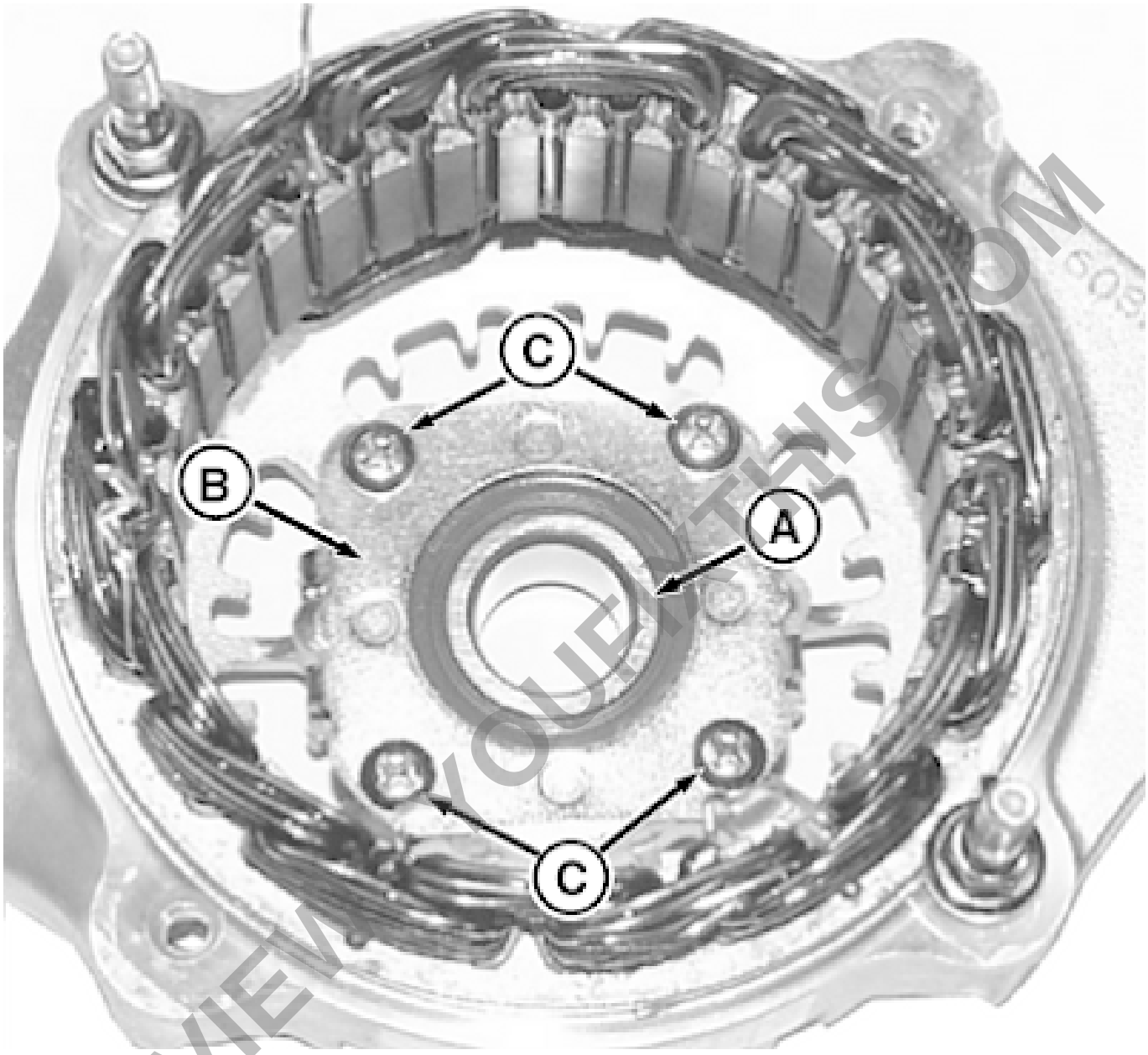


Injector Pump Gear Removal

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Assemble Alternator



Alternator Case and Bearing

LEGEND:

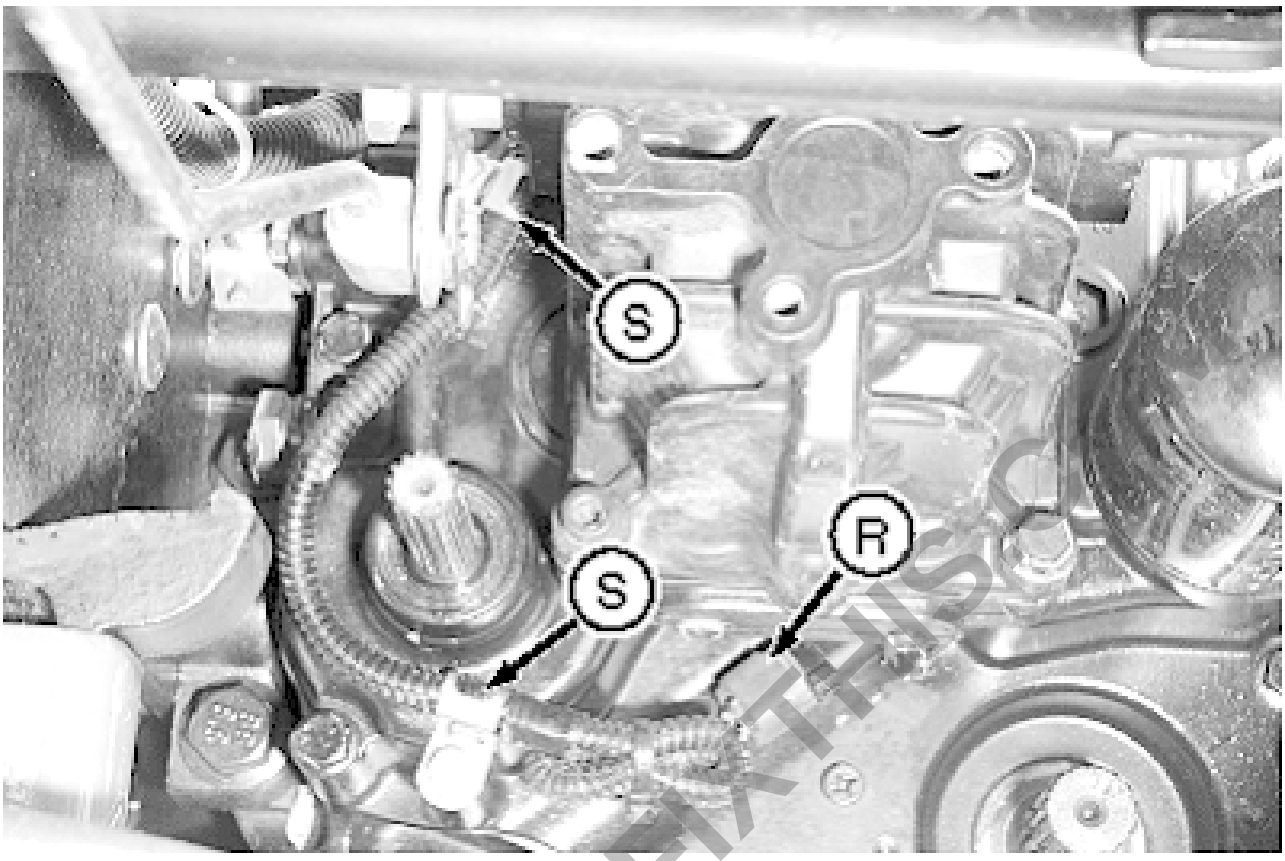
A	Bearing
B	Retainer Plate
C	Screws

[1] - Press new bearing (A) into case and install retainer plate (B).

[2] - Install four screws (C).

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Wiring Harness Connectors

LEGEND:

R	Switch Connector
S	Retainers

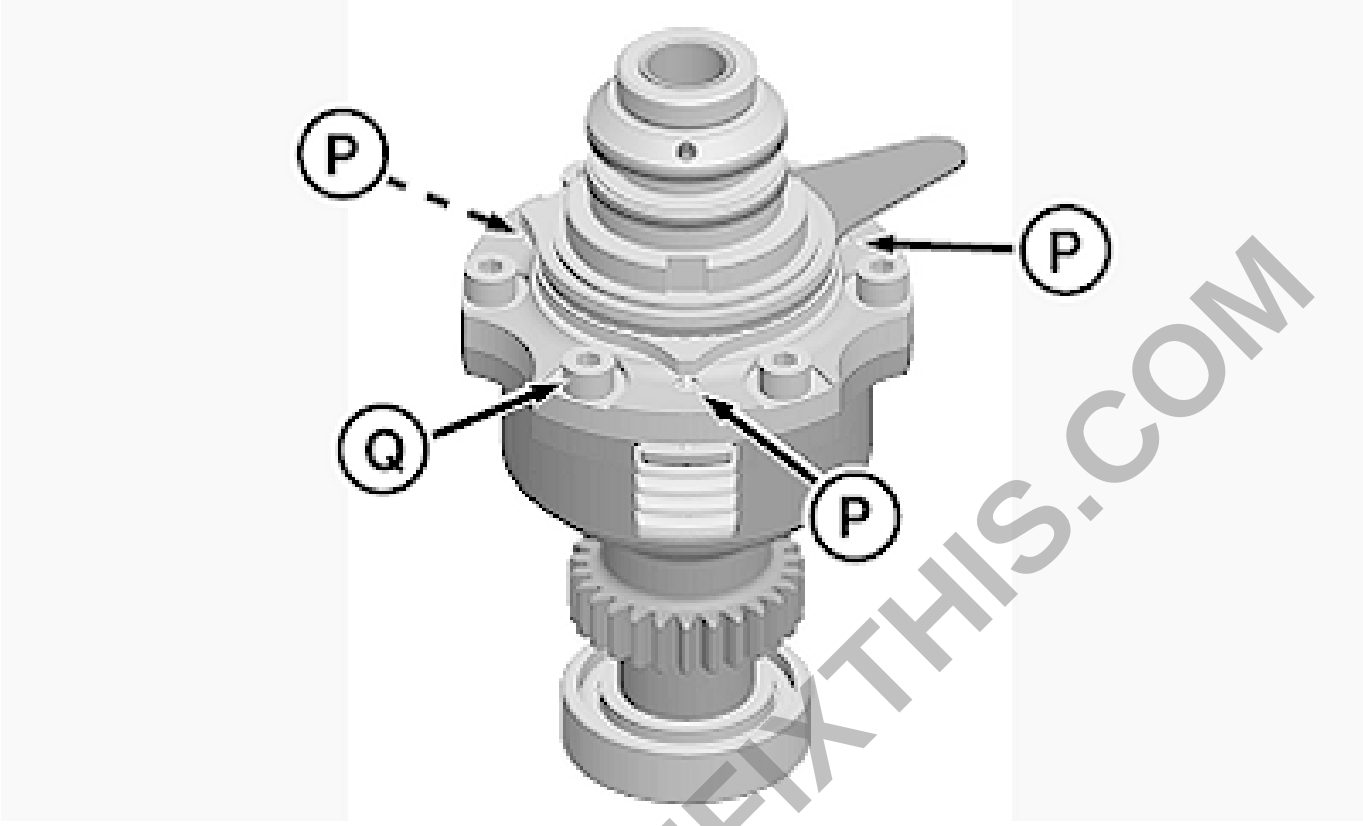
h. Secure wire harness with two retainers (S).

[10] - Install foot rest. Ensure that fuel hoses (T) are captured in foot rest retaining slot and through relief notch in firewall.

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[11] - Grease three interlock pins (P) to hold them in place and install into clutch cylinder.



Clutch Assembly

LEGEND:

P	Interlock Pins (3 used)
Q	Socket-Head Bolt (6 used)

[12] - Assemble clutch drum to clutch cylinder with flange indentations aligned.

[13] - Apply thread lock and sealer (medium strength) to six socket-head bolts (Q).

Number	Name	Use
• T43512 (us) • TY9473 (canadian) • 242 Loctite ™ (loctite)	Thread Lock and Sealer (Medium Strength)	Apply to clutch cylinder-to-clutch drum socket head bolts.

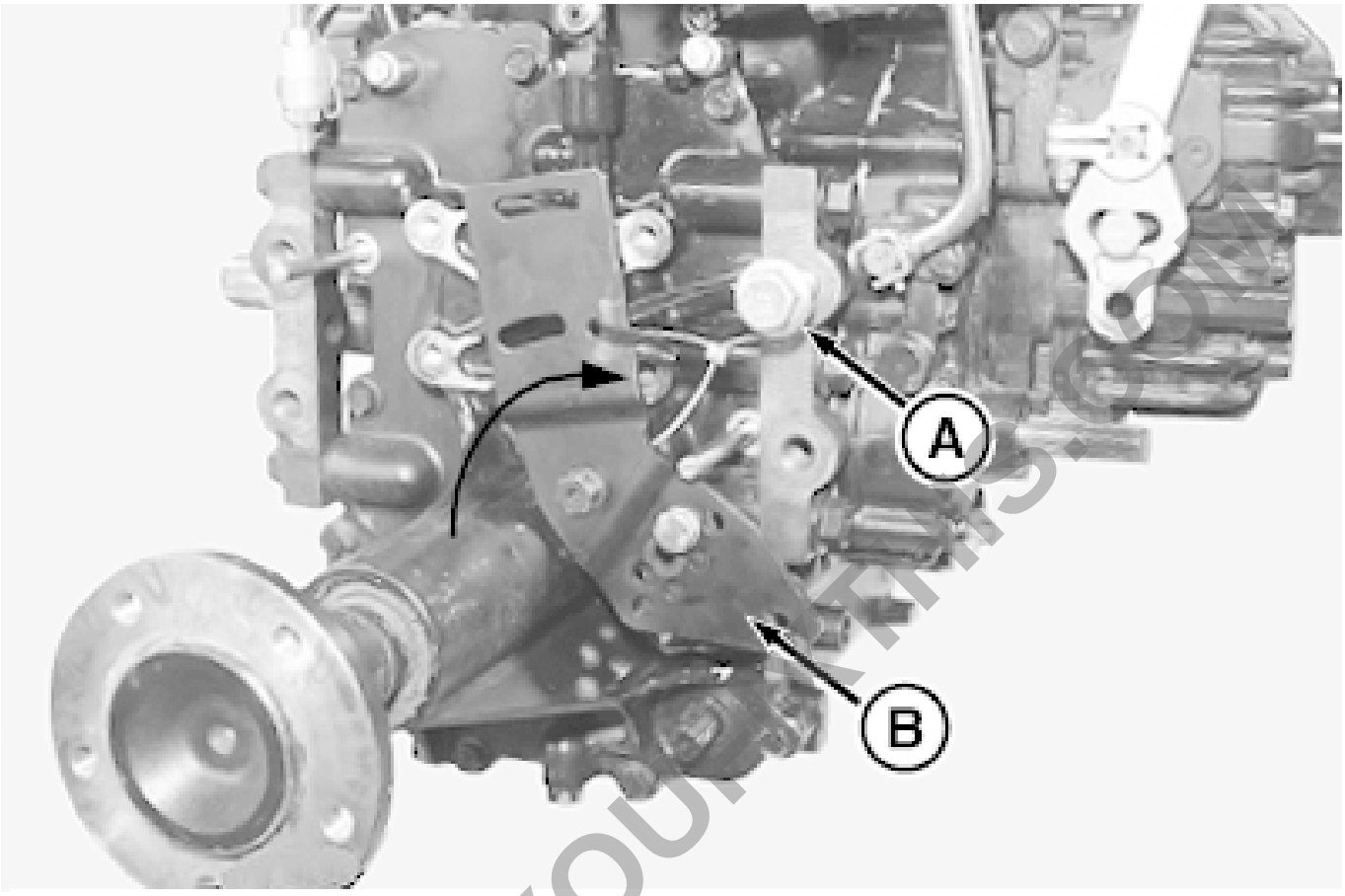
[14] - Install bolts and tighten incrementally in a cross pattern to specification.

Item	Measurement	Specification
Clutch Drum-to-Clutch Cylinder Socket Head Bolts	Torque	29 N·m (21 lb.-ft.)

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Remove and Install Differential



Bell Crank

LEGEND:

A	Bolt
B	Bell Crank

[1] - Remove bell cranks from both sides of differential lock shaft.

[2] - Hold brake bell crank in an engaged position to keep brake disks in position for easier assembly.

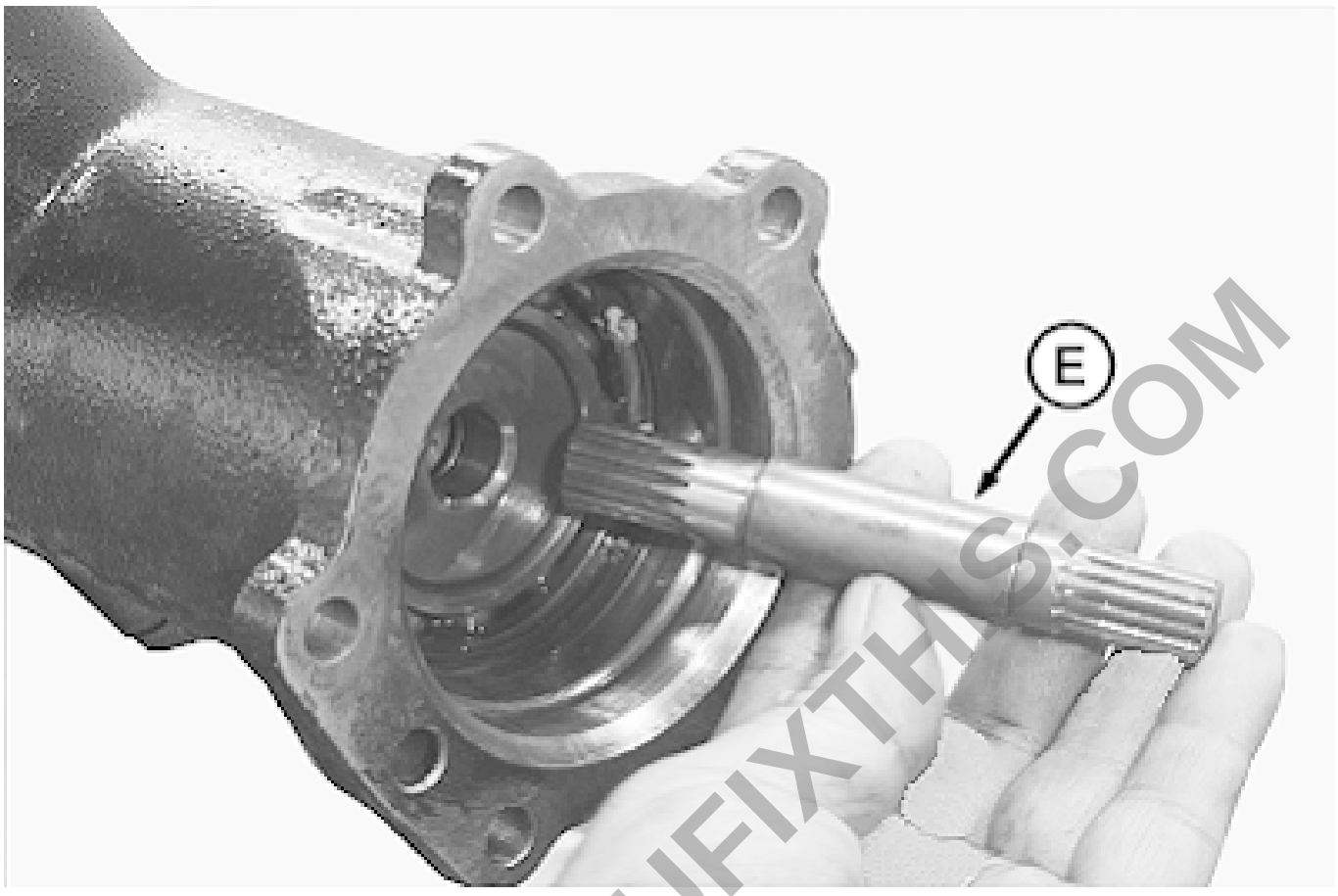
a. Install a bolt (A) for this procedure.
b. Install the external bell crank.
c. Turn brake bell crank (B) clockwise until tight and place a tie wrap between end of external bell crank and installed bolt (A) to keep pressure on brake disks.

[3] - Remove suction manifold and suction screen from case.

[4] - Remove right axle and axle housing assembly.

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MFWD Axle Shaft

LEGEND:

E	Axle Shaft

[8] -

→NOTE:

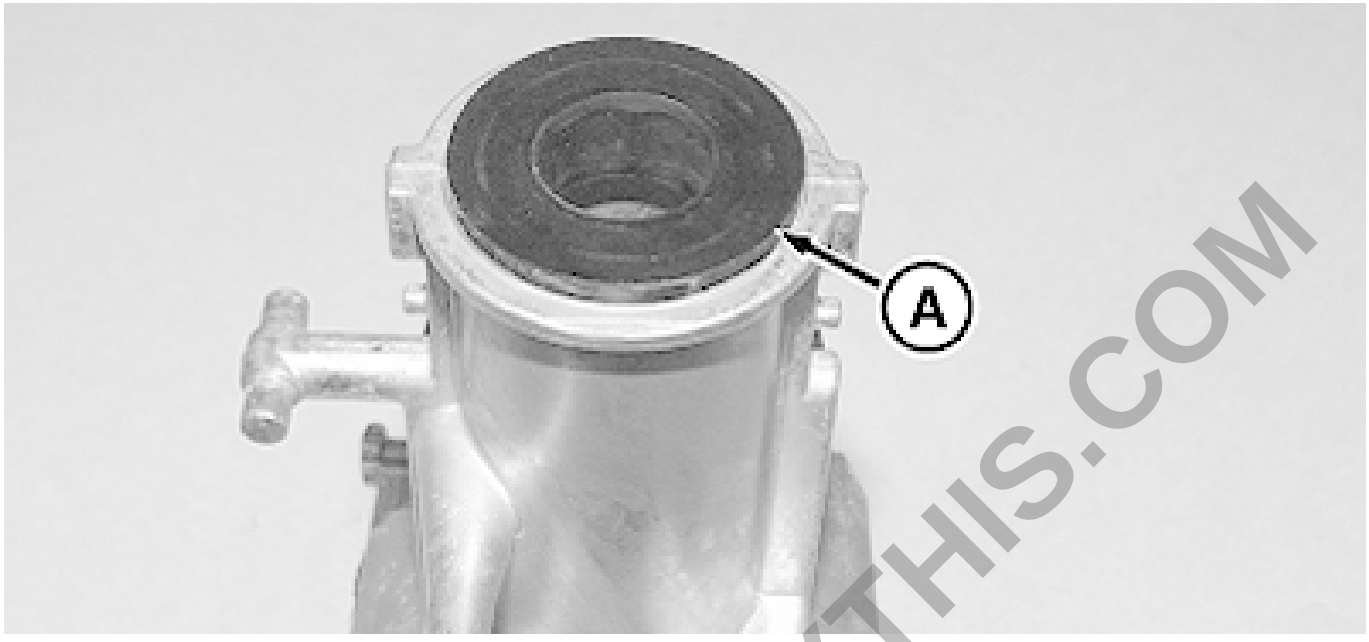
Rotate axle flange to align inner axle to spindle gear.

Align bolt holes and locating pin, and install outer axle assembly to axle tube.

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Assemble Tilt Steering Assembly



Steering Shaft Bushing

LEGEND:

A	Bushings

[1] - Install bushings (A) into housing.

[2] - Install sector gear into bracket making sure raised area (B) is properly engaged in hole. Install cap screw and tighten nut (C).

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Specifications

Item	Measurement	Specification
Torque Specifications		
Rockshaft Housing-to-Transmission Bolts	Torque	55 N·m (40 lb.-ft.)
Hydraulic Pipe Fittings	Torque	50 N·m (37 lb.-ft.)
Rockshaft Cross-Brace Bolts	Torque	80 N·m (60 lb.-ft.)
Rockshaft Bushing Insertion	Depth	6.4 mm (0.25 in.)
Rockshaft Relief Valves	Torque	37 N·m (27 lb.-ft.)
Valve Stem Nut	Torque	55 N·m (40 lb.-ft.)
Feedback Housing-to-Rockshaft Housing	Torque	47 N·m (39 lb.-ft.)
Feedback Valve-to-Housing	Torque	40 N·m (30 lb.-ft.)
Feedback Housing Cover Bolts	Torque	28 N·m (20 lb.-ft.)
Control Arm Lock Nut	Torque	55 N·m (40 lb.-ft.)
Seat Mounting Bracket Front Bolts	Torque	55 ±11 N·m (40.5 ± 8 lb.-ft.)
Clearance Specification		
Rockshaft Lift Arms to ROPS Cross-Brace	Clearance (minimum)	25 mm (1 in.)

Other Material

Number	Name	Use
• PM37465 (us) • PM38628 (canadian) • RTV Blue Loctite ™ (loctite)	Form-in-Place Gasket	Apply to mating surfaces of rockshaft housing and transmission, and rockshaft housing and feedback position housing.

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Group 15 - 3-Point Hitch

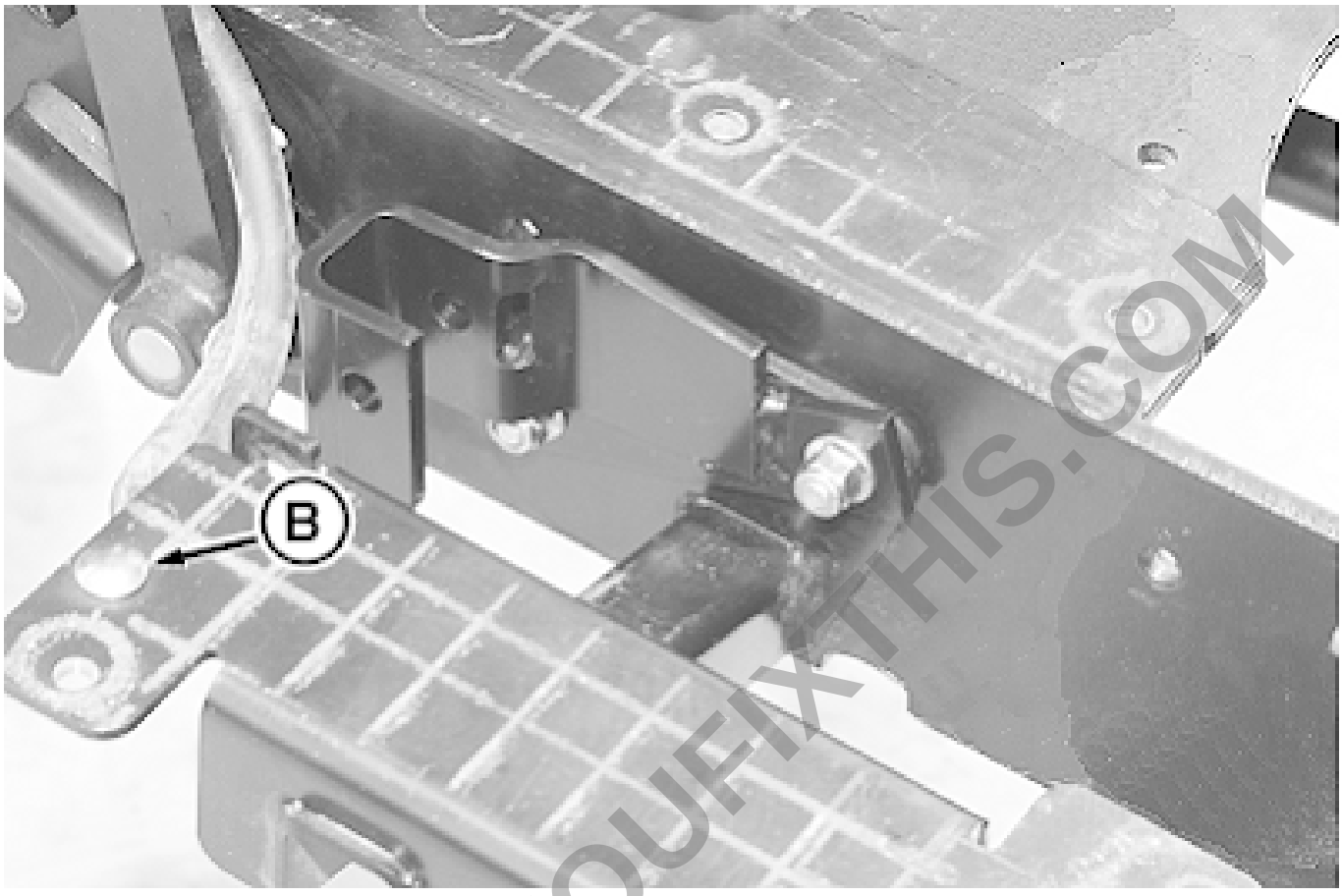
Summary of References

- Adjust 3-Point Hitch
- Remove and Install 3-Point Hitch

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[3] - Remove hex nut and carriage bolt (B) securing fuel hose retainer. Move fuel hoses aside.



Retainer

LEGEND:

B	Nut and Bolt

[4] - Install hose support to footrest bracket and frame. Secure bracket with hex stop nut (C). Tighten nut to specification

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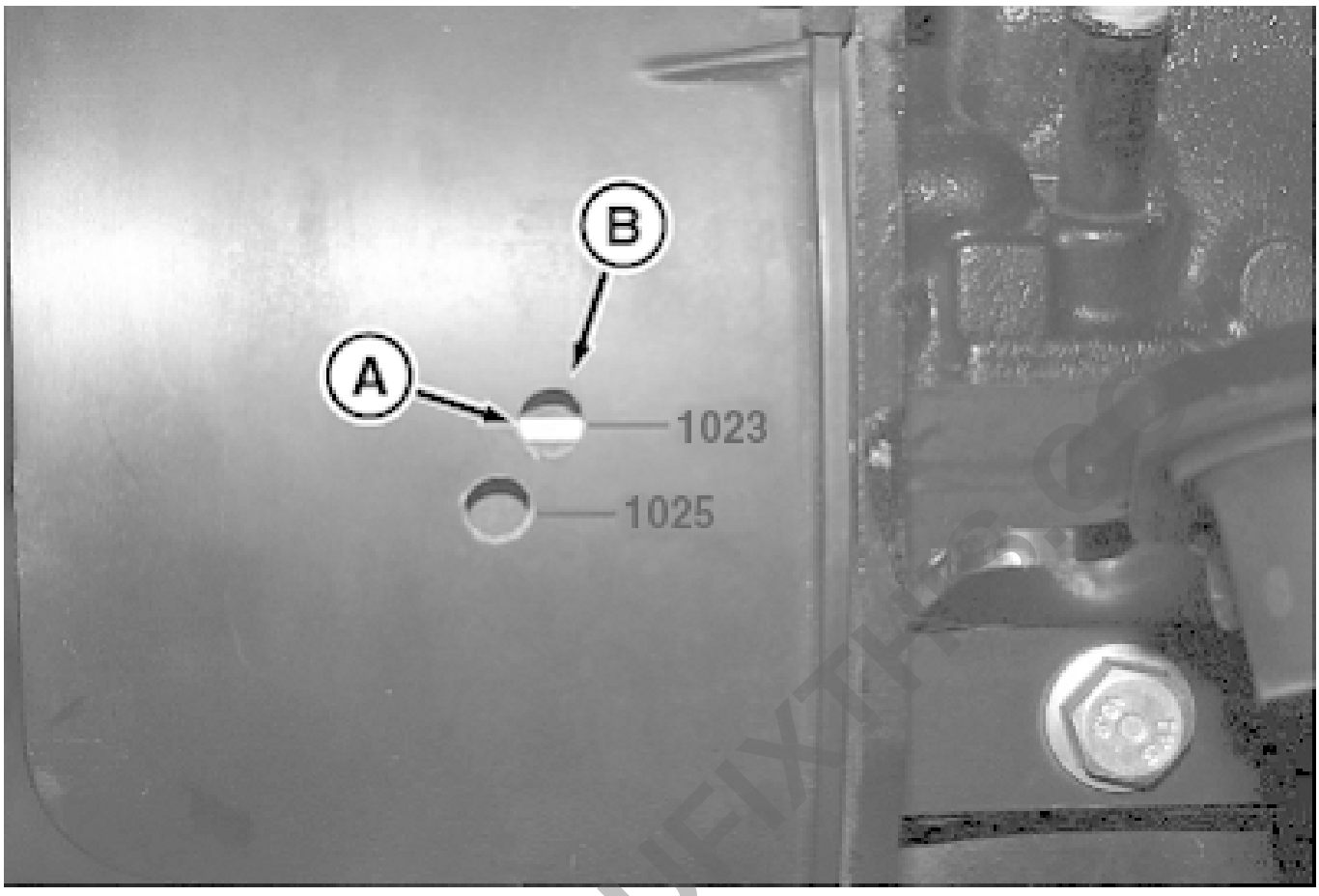
Group 20 - Fenders

Summary of References

- Remove Right Fender
- Install Right Fender
- Remove Left Fender and Fuel Tank
- Install Left Fender and Fuel Tank

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Timing Mark Window (3TNM74 shown)

LEGEND:

A	Timing Mark (TDC)
B	Window

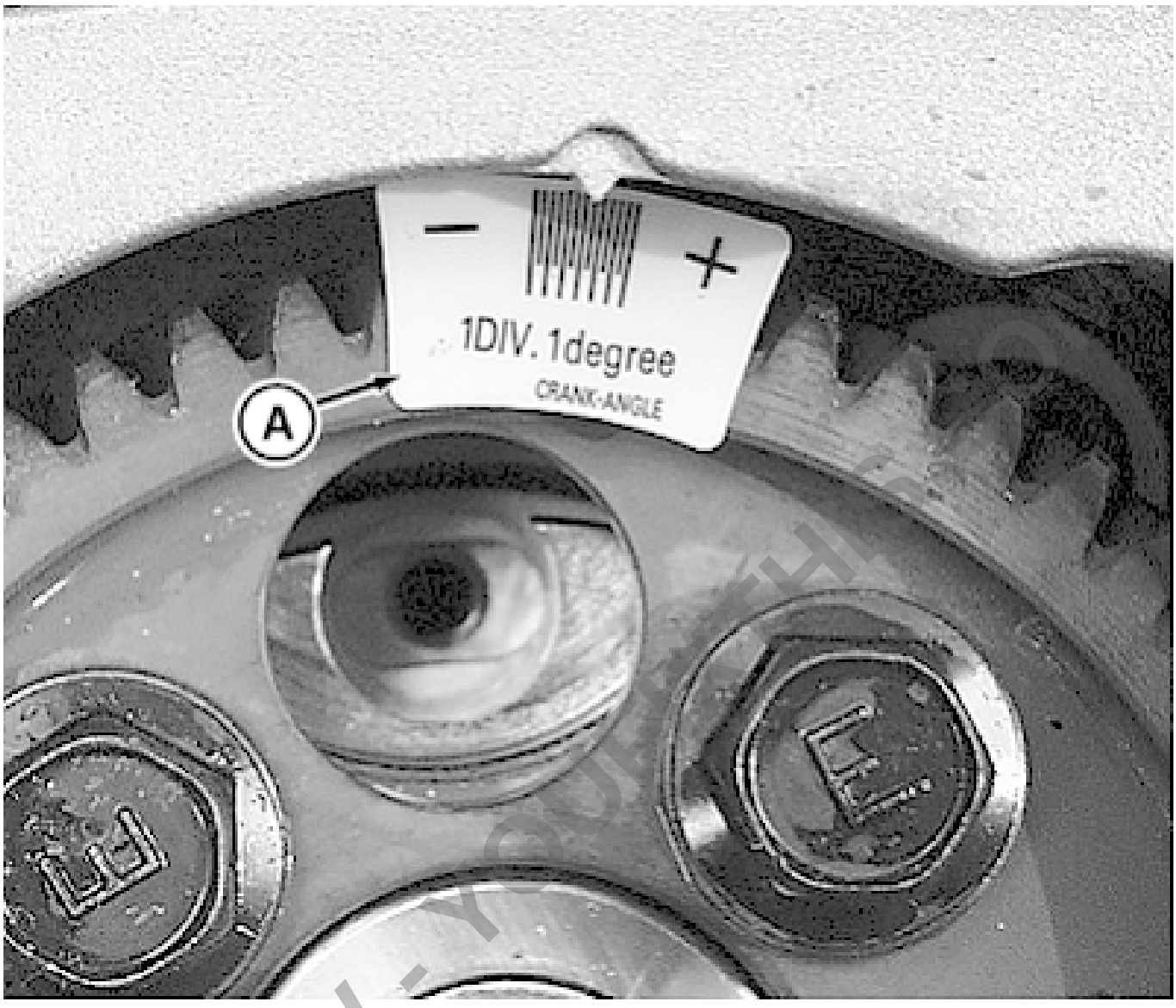
Turn the flywheel while watching for the number 1 cylinder TDC mark (A) to appear in the 1023E window (B) for 3TNM74 engines, the 1025R lower window for the 3TNV80 and 3TNV76 engines. Align the number 1 TDC mark (A) on the flywheel in the center of the window.

[6] - Try to move rocker arms push rods for No. 1 cylinder:

- If rocker arm and push rod are loose, the piston is at TDC on the compression stroke. Proceed to next step.
- If rocker arms or push rods are not loose, rotate flywheel one revolution and align mark as in previous step again. Recheck rocker arm and push rods.

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Fuel Injection Pump Timing Gear Sticker

LEGEND:

A	Timing Sticker

Clean off the oil from the timing gear under the pointer in the timing gear cover. Install the sticker (A) on the gear with the center of the grid under the pointer.

[3] -

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Tachometer

The tachometer display is driven by pulses from the alternator while the engine is running. An engine speed of 3000 rpm correlates to an input frequency of 465 Hz.

Engine Temperature Gauge and Indicator Light

Changes in engine coolant temperature are sensed by a variable-resistance temperature sender. The module translates that resistance value into a temperature reading. A colored scale on the temperature gauge indicates the safe (green) and unsafe (red) zones of operation.

Should engine heating become excessive (red zone), the overheat indicator light glows and stays lit until the temperature drops sufficiently to safe (green zone) levels. PTO operation is suspended for the duration of the overheat condition.

Hour Meter

The hour meter records the hours of engine operation. Time is measured to within ±5% and displayed to the nearest 0.1 hour. Accumulation of time occurs when the key is on, AND (tachometer is above 450 rpm OR [EOP Initial State is close to the previously recorded value, AND engine oil pressure input is open, AND seat switch is active]). While accumulating, the hour glass icon flashes at the rate of once per second.

Diagnostic Trouble Codes

The error codes are displayed on the LCD panel to indicate a problem on certain outputs and the reasons for not being able to turn on the fuel solenoid. The error codes will be displayed for 2 seconds every 10 seconds as long as the fault persists, except for Fuel Solenoid OFF codes. Fuel Solenoid can be OFF, if during initial power-up, PTO switch is ON or Neutral switch is OFF.

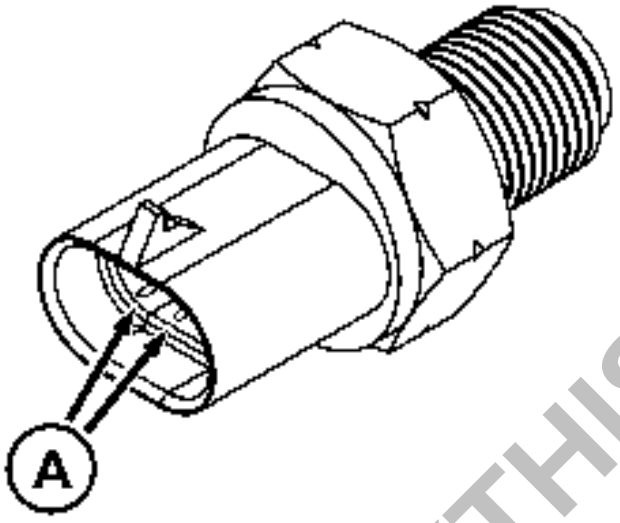
→NOTE:

Fault will have to be active for at least 0.5 seconds before the error is displayed to avoid nuisance errors.

Description	Code	Notes
Fuel Solenoid OFF	SHIFt to NEut	Neutral Switch OFF
	SHUt Pto OFF	PTO ON (front, mid or rear)
Pull-in Coil Output Fault	Pull CoIL FAuLt	Coil Open or short to Gnd
Hold-in Coil Output Fault	HoLd CoIL FAuLt	Coil Open or short to Gnd

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Neutral Switch Test



Neutral Switch

LEGEND:

A	Terminals

[1] - Park machine safely.

[2] - Disconnect wiring harness from switch.

[3] - Attach ohmmeter leads across the switch terminals (A).

[4] - Shift the transmission range to high or low.

- Range in gear position: no continuity
- Neutral position: continuity

[5] - If continuity is not correct, drain the transmission and remove switch.

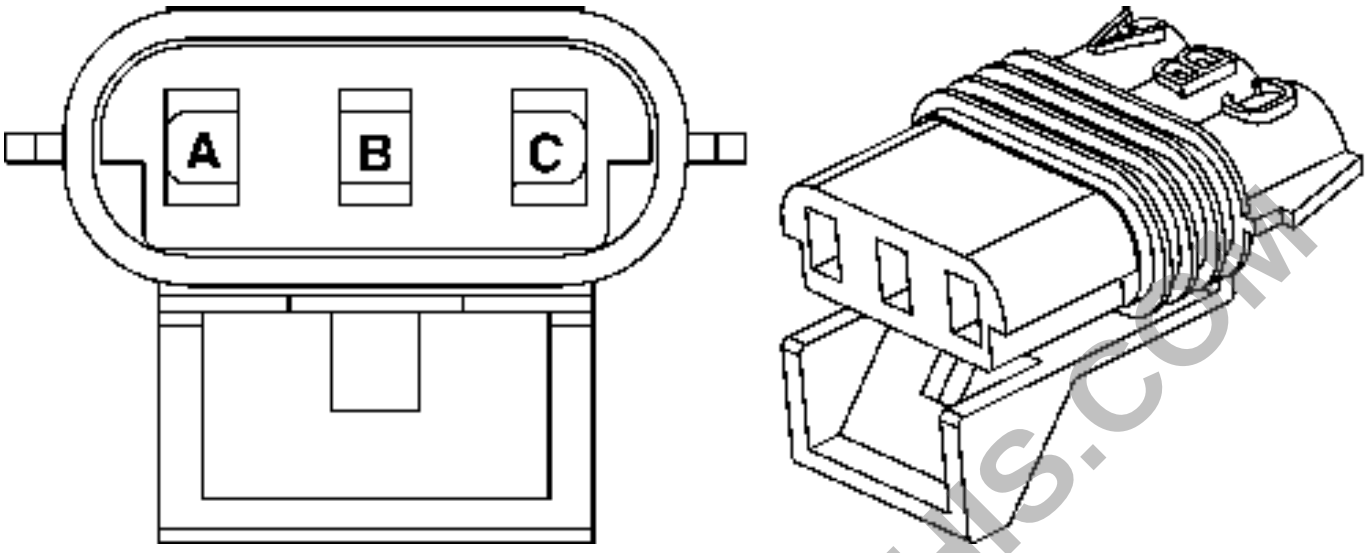
[6] - Test switch continuity in OPEN and CLOSED positions.

- OPEN (plunger released): no continuity
- CLOSED (plunger depressed): continuity

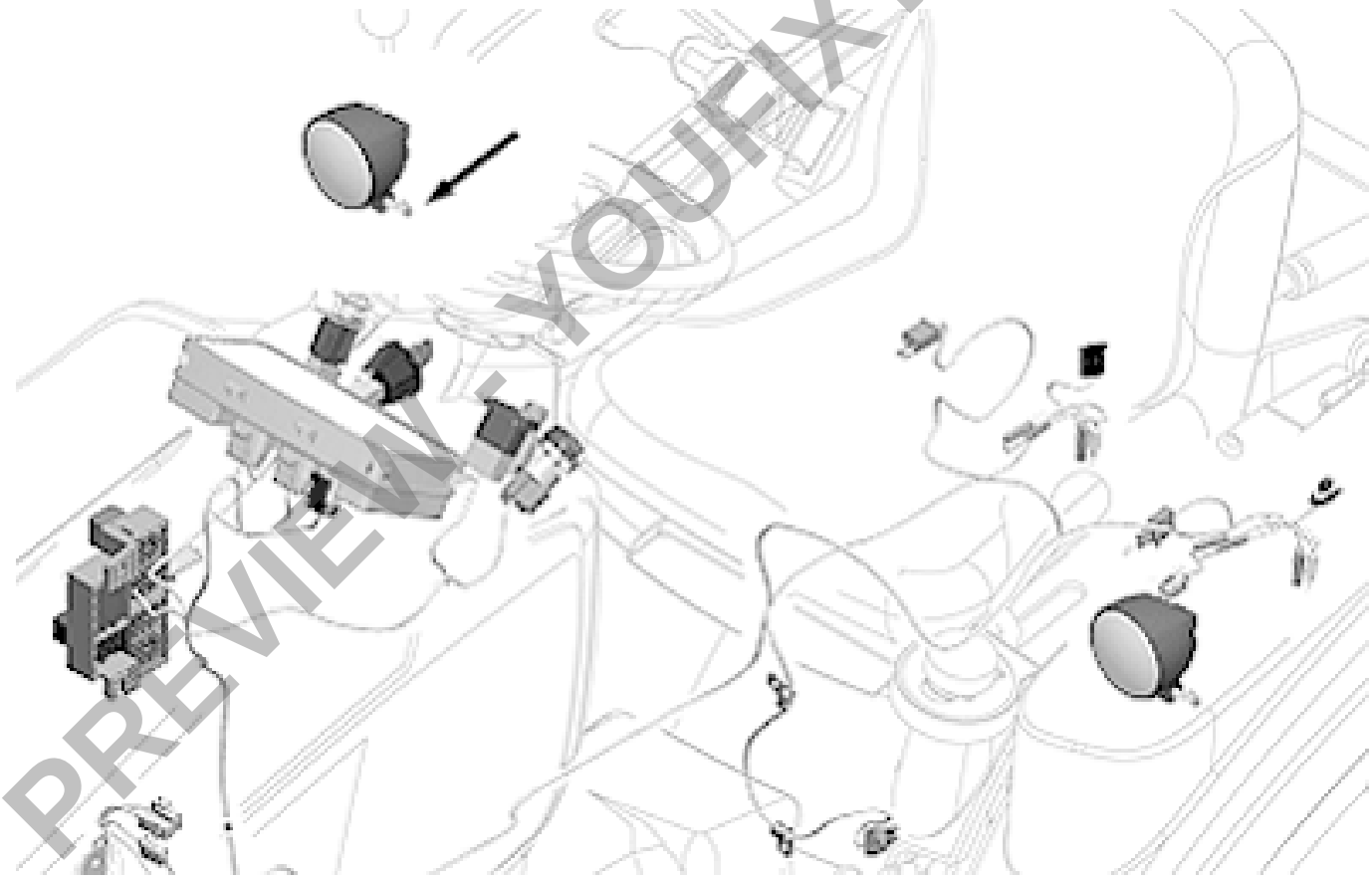
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X54 RH Fender Light Connector



X54 RH Light Connector

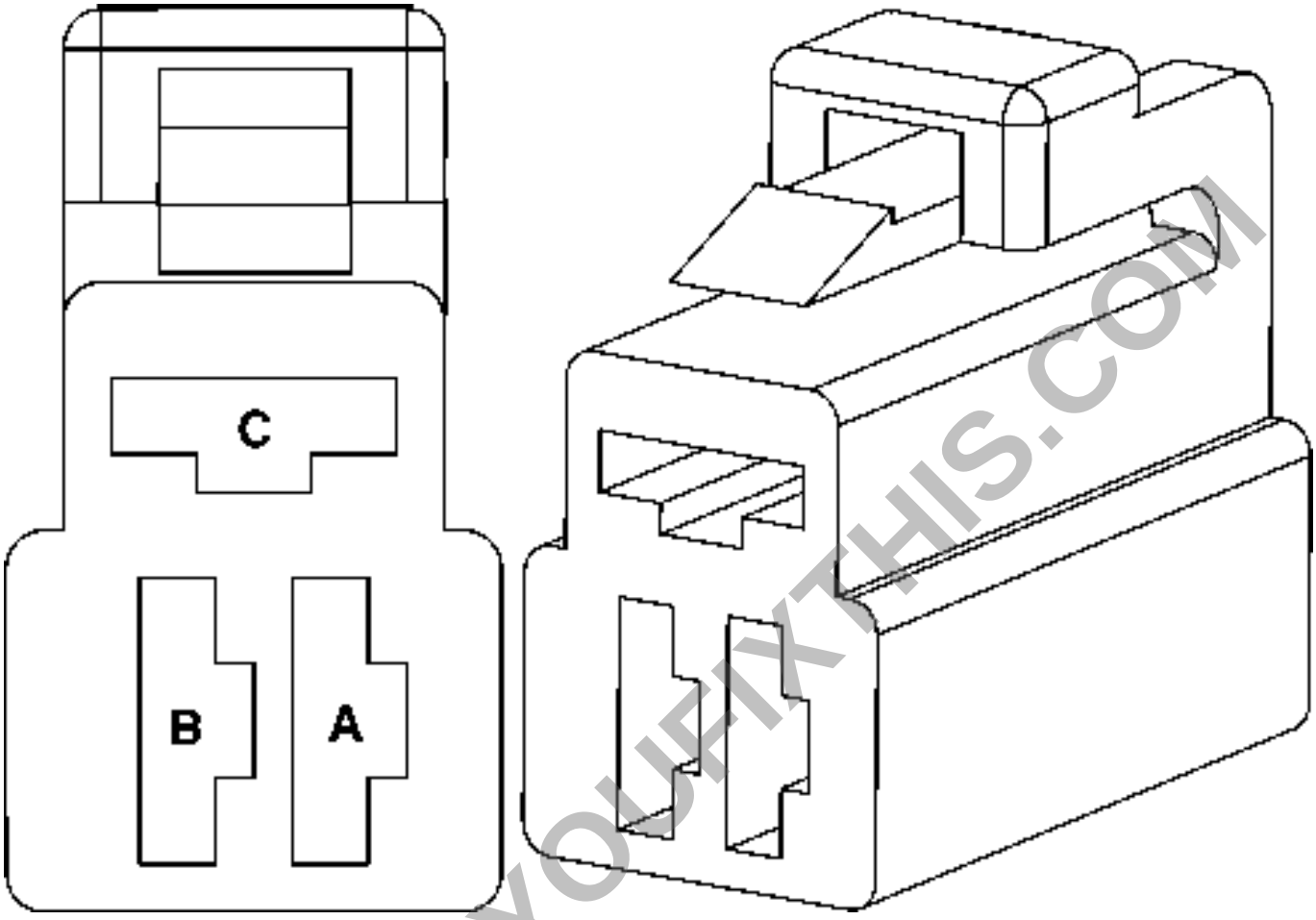


X54 Component Location

X54 RH Fender Light Connector	
Schematic:	—
Wiring Harnesses:	1025R, 1026R EEC
Terminal	**Circuit Number**

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X—Y02 Fuel Shutoff Solenoid Connector



X-Y02 Fuel Shutoff Solenoid Connector

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[10] - Rotate eccentric forward or backward until wheels stop turning. Mark eccentric position (E) on adjuster hex and arm.

[11] - Continue eccentric rotation until wheels begin to rotate in opposite direction. Rotate eccentric in opposite direction until wheels stop turning, and mark eccentric position on arm.

[12] - Position eccentric adjuster between marks on arm. Tighten lock nut while holding eccentric position.

[13] - Press, and then release both forward and reverse motion control pedals to verify adjustment. Readjust eccentric as necessary.

[14] - Check for worn or binding travel pedal control linkage if eccentric adjustment does not prevent creep. Disconnect linkage and repeat eccentric adjustment.

[15] - Check for wear in hydrostatic pump if eccentric adjustment is not effective with control linkage disconnected. Check for binding or wear of swash plate shaft bushing, pump or motor valve plate wear, and neutral return spring condition.

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Group 05 - Component Location

Summary of References

- Hydraulic Pump
- PTO Solenoid

Hydraulic Pump

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