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Group 05 - Engine Repair

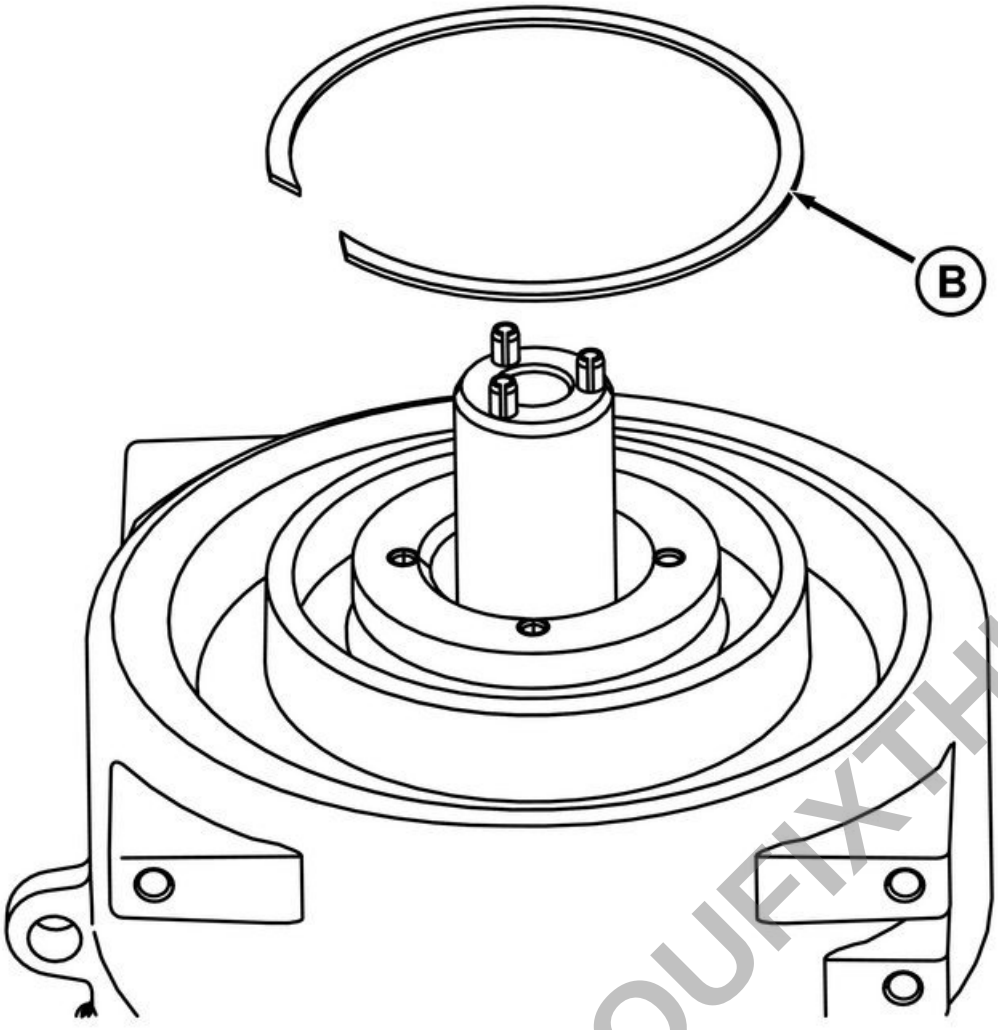
Engine Repair—Use CTM86 or CTM255

For complete repair information see: CTM86 and CTM255.

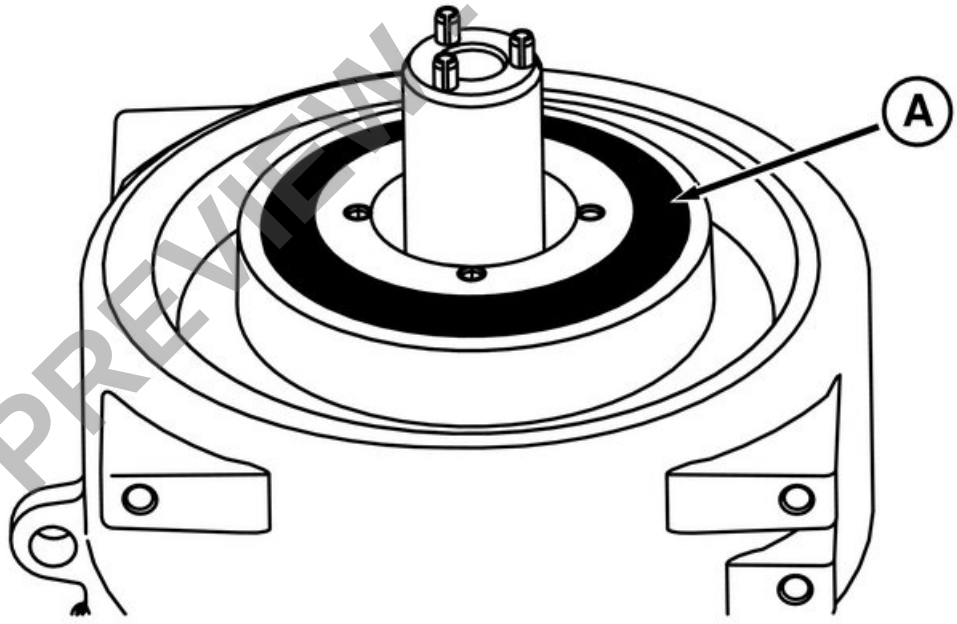
Use these component technical manuals in conjunction with this machine manual.

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Snap- Ring



Seal

LEGEND:

A	Seal
B	Snap-Ring
C	Hub with Bearing
D	Piston

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Repair Weather Pack ™ Connector



IMPORTANT:

Identify wire color locations with connector terminal letters.

Open connector body.

Insert JDG364 Extraction Tool

[Included in JT07195B Electrical Repair Kit]
over terminal contact in connector body.

Extraction Tool

JDG364

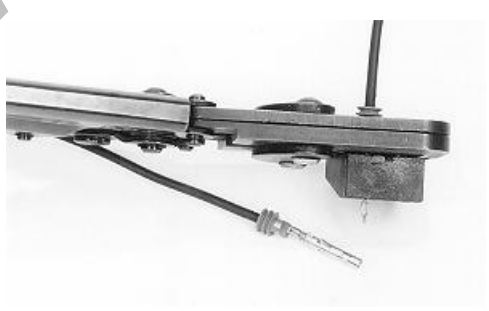
Extract wire from connectors

→NOTE:

If terminal cannot be removed, insert wire or nail through extractor tool handle and push terminal contact from connector.

Hold extractor tool fully seated and pull wire from connector body.





crimp connectors

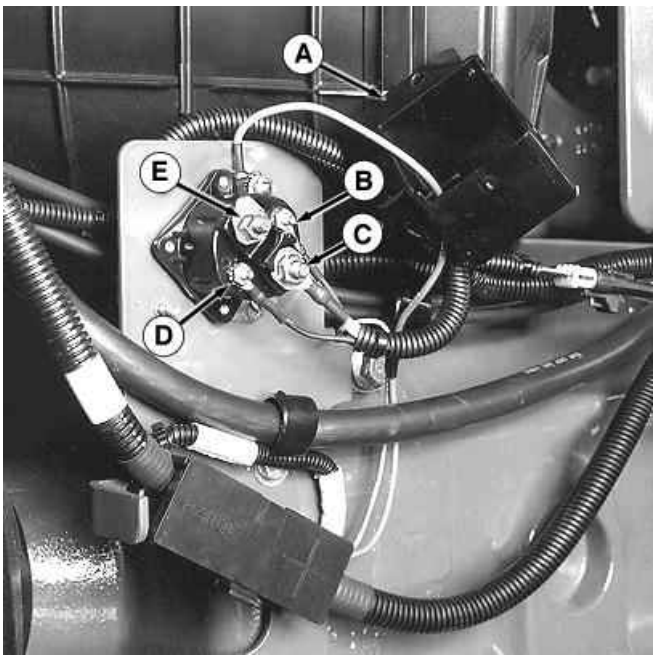
→NOTE:

Cable seals are color coded for three sizes of wire:

- **Green - 18—20 Gauge Wire**
- **Gray - 14—16 Gauge Wire**
- **Blue - 10—12 Gauge Wire**

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LEGEND:

A	Cover
B	Brown Wire 301T
C	White Wires 309AT & 309BT
D	Black Wire 101SR1
E	Red Wire 002B

Starter Circuit Relay Components

Disconnect battery ground (-) cable.

[2] - Remove relay cover (A).

[3] - Disconnect the wires from starter circuit relay. Mark the wires for identification.

[4] - Remove the relay.

[5] - Install the replacement relay and connect the wires as marked.

[6] - Install relay cover and connect battery ground (-) cable.

Replace Neutral Start Switch

[1] -

→NOTE:

The neutral start switch (B) is located in the transmission shifter control assembly, in the armrest control.

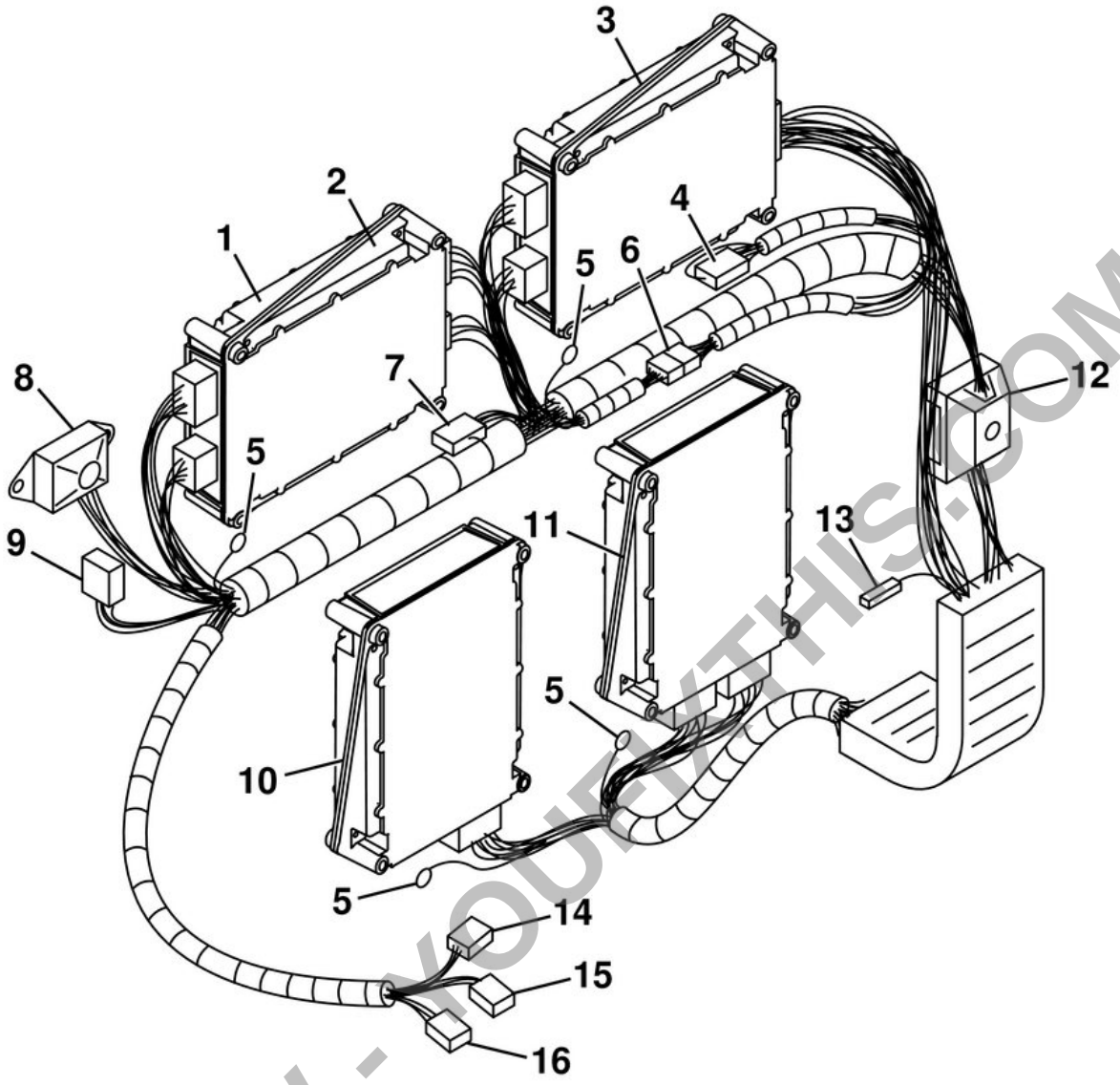
When removing the shifter control assembly from the armrest control, the speed control assembly needs to be removed at the same time.

See REMOVE ARMREST CONTROLS in Group 35 to access the transmission shifter control assembly.

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Control Units and Component Identification



Exploded View of Control Units

LEGEND:

1	[HCU/SCU (Hitch/SCV 1, 2, & 3 Control Unit) Calibration Required]
2	[SCo (SCV 4 & 5 Control Unit) Calibration Required]
3	[VCU (Vehicle Control Unit) Calibration Required]
4	Come-Home Connector
5	Control Unit Ground Wire
6	Transmission Connector
7	Splice Pack
8	CAN Terminating Connector
9	Hitch Following Connector
10	SSU (Steering Control Unit) [SSU (Steering System Control Unit) Calibration Required]
11	[ECU (Engine Control Unit) Calibration Required]
12	Chassis-to-Cab Harness Connector
13	Implement CAN Ground
14	Hitch/1 SCV Connector
15	SCV 2 & 3 Connector
16	4th & 5th SCV Connector

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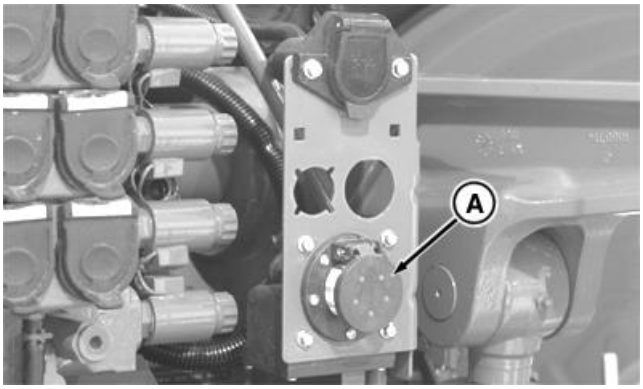
Seven Terminal Wire Chart

EUROPEAN

Terminal	Function
1	Left Turn
2	Accessory
3	Ground
4	Right Turn
5	Left Tail
6	Brakes
7	Right Tail

Replace GREENSTAR ™ Terminal Connector

[1] -



LEGEND:
A Connector

GREENSTAR Terminal Connector

Remove green panel from rear of the cab.

[2] - Disconnect connector harness from main harness.

[3] - Remove connector (A) from bracket.

Replace Three-Pin Accessory Outlets

[1] -

→NOTE:

Pin (D) provides switched power, pin (E) provides battery power, and pin (F) is ground.

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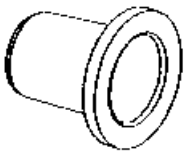
Apply T43513 Thread Lock and Sealer to outside diameter of new seal.

Number	Name	Use
• T43513 (us) • TY9474 (canadian) • 271 LOCTITE ™ (loctite)	Thread Lock and Sealer (High Strength)	Seals contacting surfaces

Install new oil seal flush with outside of pump using JDG851 Seal Installer.

Transmission Shaft Universal Seal Installer

JDG851



JDG851

Install shaft seal.

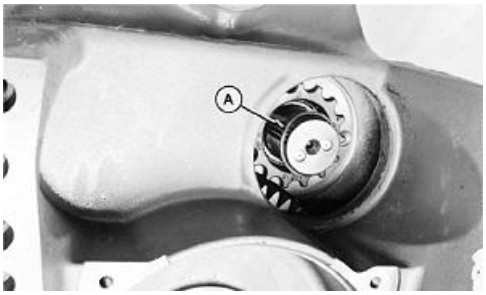
Install V-ring seal.

Install clutch return spring.

Install transmission. (See Install Transmission in this group.)

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LEGEND:

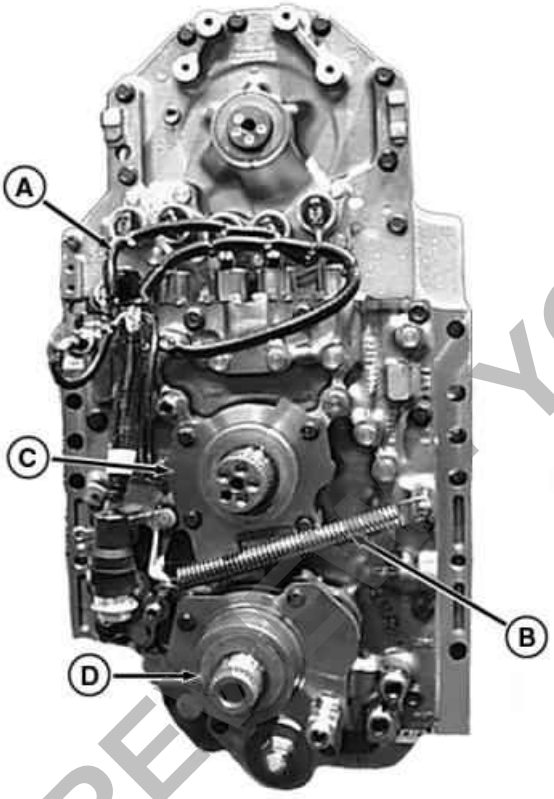
A	O-Ring

O-Ring

→NOTE:

Install an O-ring on the front of the countershaft to hold the bearing during removal of the shaft assemblies from the transmission case.

Install a U11017 (or correct size) O-Ring (A) on the front of the countershaft.



LEGEND:

A	Wiring Harness
B	Clutch Linkage Return Spring
C	Ground-Driven Pump Cover
D	Auxiliary Drive Shaft Oil Seal

Return Spring, Pump Cover, and Oil Seal

Remove the wiring harness (A) and clutch linkage return spring (B).

Remove the output shaft V-ring seal and the ground-driven pump cover (C).

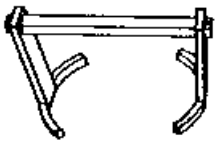
Remove the auxiliary drive shaft V-ring seal and oil seal (D).

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Spring Compressor

JDG754



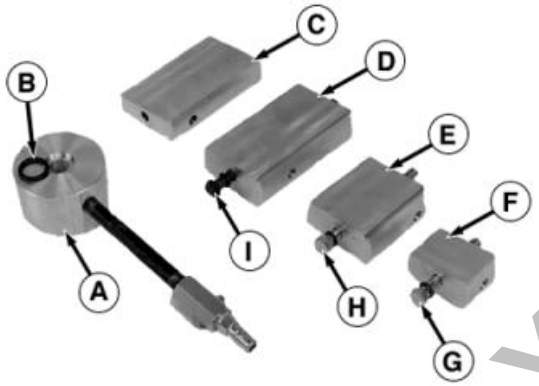
JDG754

Used to compress clutch return springs.

[5] - Compress springs and install snap ring (B).

[6] - Remove tool.

[7] -



LEGEND:

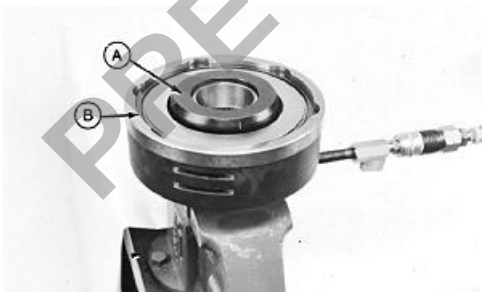
A	JDG855-3 Manifold
B	O-Ring Seal
C	JDG855-5 Mandrel
D	JDG855-4 Mandrel
E	JDG855-2 Mandrel
F	JDG855-1 Mandrel
G	Cap Screw and Washer
H	Cap Screw and Washer
I	Cap Screw and Washer

Clutch Assembly Tool

Assemble JDG855 Clutch Assembly Tool using JDG855-3 Manifold (A) and JDG855-1 Mandrel (F).

[8] - Install in a vise and attach an air hose.

[9] -



LEGEND:

A	Clutch Disk Guide
B	Snap Ring

Clutch Drum on Clutch Assembly Tool

Install clutch drum onto clutch assembly tool.

[10] - Install JDG849 Clutch Disk Guide (A) on clutch drum.

Input and Countershaft Clutch Disk Guide

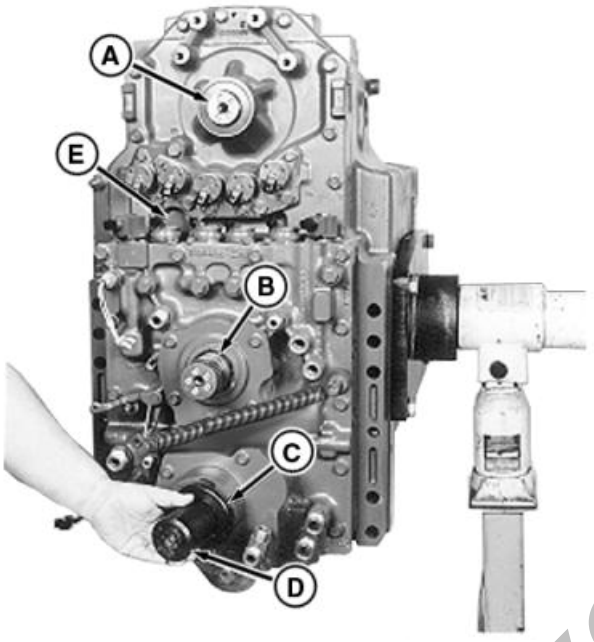
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Number	Name	Use
• TY6304 (us) • TY9484 (canadian) • 515 LOCTITE ™ (loctite)	Flexible Sealant	Used to seal joints.

Install the cover (C) and tighten cap screws.

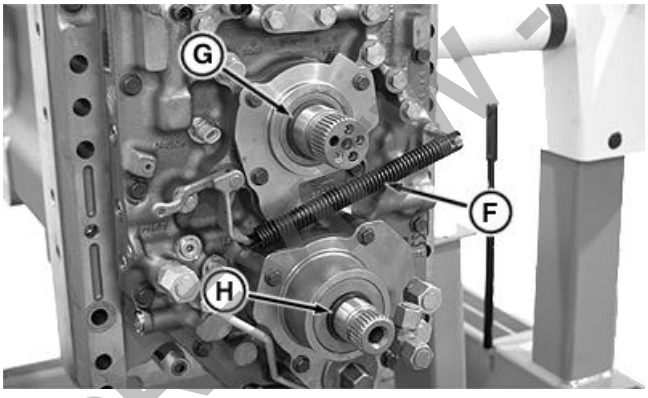
Item	Measurement	Specification
Output Shaft Front Cover Cap Screws	Torque	90 N˙m (66 lb-ft)



LEGEND:

A	Input Shaft Seal
B	Output Shaft Seal
C	Auxiliary Drive Shaft Seal
D	JDG851 Seal Installer
E	Countershaft Bore Plug
F	Clutch Pedal Return Spring
G	Output Shaft V-Ring Seal
H	Auxiliary Drive Shaft V-Ring Seal

Using JDG851 Seal Installer



Using Clutch Spring Installation Tool

Install the rear seals on the input shaft (A), output shaft (B), and auxiliary drive shaft (C) using JDG851 Seal Installer (D).

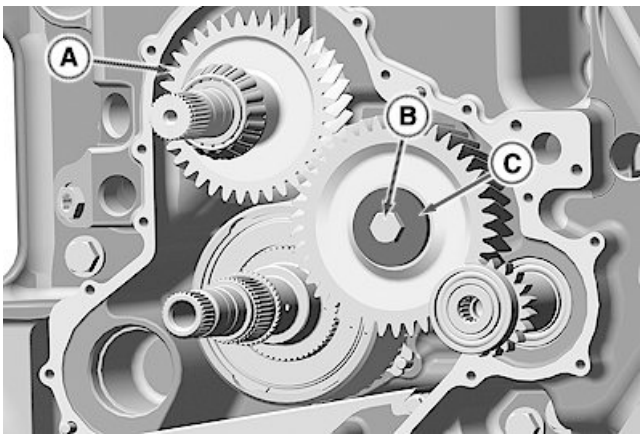
Install the input shaft-to-damper coupler hub.

Coat the outer diameter of NEW countershaft rear bore plug (E) with TY6304 Sealant and install using a hammer and brass drift.

Number	Name	Use
• TY6304 (us) • TY9484 (canadian) • 515 LOCTITE ™ (loctite)	Flexible Sealant	Seal contacting surfaces

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LEGEND:
A Input Shaft/Gear Assembly
B Differential Drive Shaft Drive Gear Retaining Cap Screw
C Washer

Input Shaft/Gear Assembly

Remove input shaft/gear assembly (A).

[13] -

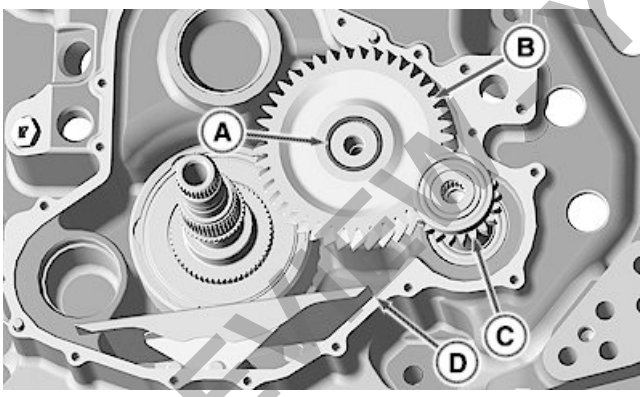
→NOTE:

Block drive wheels to prevent rear axle assembly from moving while loosening drive gear retaining cap screw.

Put blocks in front and back of both drive wheels.

[14] - Remove differential drive shaft drive gear retaining cap screw (B) and washer (C).

[15] -



LEGEND:
A O-Ring
B Drive Gear
C Hydraulic Pump Drive Output Gear Assembly

O-Ring and Drive Gear

Remove O-ring (A) and drive gear (B) from drive shaft.

[16] - Remove hydraulic pump drive output gear assembly (C).

Disassemble and Assemble Input Shaft/Gear Assembly

[1] -

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IMPORTANT:

Spiral bevel ring gear and pinion shaft are serviced as a matched set. Be sure number stamped on ring gear and pinion end of shaft are the same. Adjust cone point when replacing ring gear and pinion shaft.



Spiral Bevel Ring Gear and Pinion Shaft

Inspect ring gear teeth and remove and replace ring gear as necessary.

[27] -

CAUTION:

Heat parts in a bearing heater. Use a thermometer and do not exceed 150°C (300°F). Plan a safe handling procedure to avoid burns.

Install heated ring gear using M16 guide pins.

[28] - Install and tighten cap screws.

Item	Measurement	Specification
Ring Gear-to-Spool Cap Screws	Torque	310 N·m (229 lb-ft)

[29] -

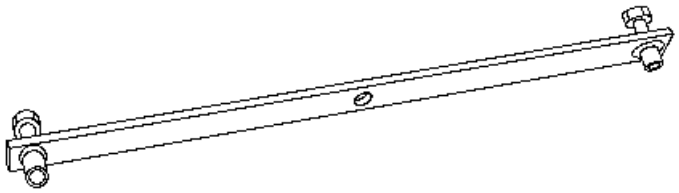
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JDG1075

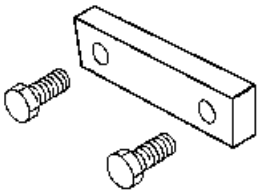
Used to measure for axle bearing preload shim pack.

Rolling Drag Torque Tool



JDG1074

JDG1074



JDG1075

Measure wheel hub rolling drag torque

[3] - Tighten the two cap screws (C).

Item	Measurement	Specification
Cap Screws	Torque	100 N˙m (74 lb-ft)

[4] - Rotate wheel hub one revolution minimum and retighten tool cap screws (C) to 100 N˙m (74 lb-ft).

[5] - Rotate wheel hub one revolution minimum.

[6] - Loosen the two tool cap screws (C) and rotate wheel hub one revolution minimum.

[7] - Tighten two tool cap screws (C) and rotate wheel hub one revolution minimum.

Item	Measurement	Specification
Tool Cap Screws	Torque	40 N˙m (30 lb-ft)

[8] - Repeat Step 7 until cap screws (C) no longer advance when tightening to 40 N˙m (30 lb-ft).

[9] - Complete the tighten and rotate steps and then measure the distance from the ring gear hub surface (D) to the axle spindle end (E) in two places on each end of the tool adjacent to the cap screws. Average the two readings.

The result at Step 9 minus 0.22 mm (0.008 in.) equals the desired shim pack.

→NOTE:

The procedure will result in correct preload on the bearings.

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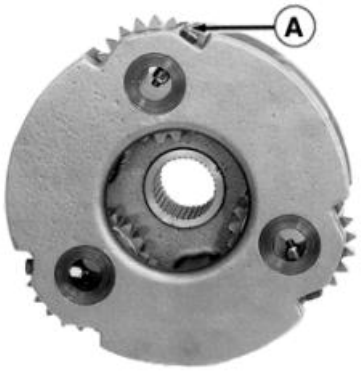
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Inspect steering planetary ring gear (B) on the final drive assembly.

[11] - Remove as necessary by removing snap ring (A).

Recondition Steering Planetary

[1] -



LEGEND:

A	Cap Screw

Cap Screw

Remove pinion shaft retaining cap screw (A) and remove pinion shaft.

[2] - Remove pinion, needle rollers, and thrust washers being careful not to lose needle rollers.

[3] -

→NOTE:

Keep parts together as a set.

Remove needle rollers, clean, inspect, and replace parts as necessary.

[4] - Assemble in reverse order making sure the long straight edges of the thrust washers are toward the center of the carrier.

[5] - Tighten pinion shaft retaining cap screws.

Item	Measurement	Specification
Pinion Shaft Retaining Cap Screws	Torque	18 N·m (159 lb-in.)

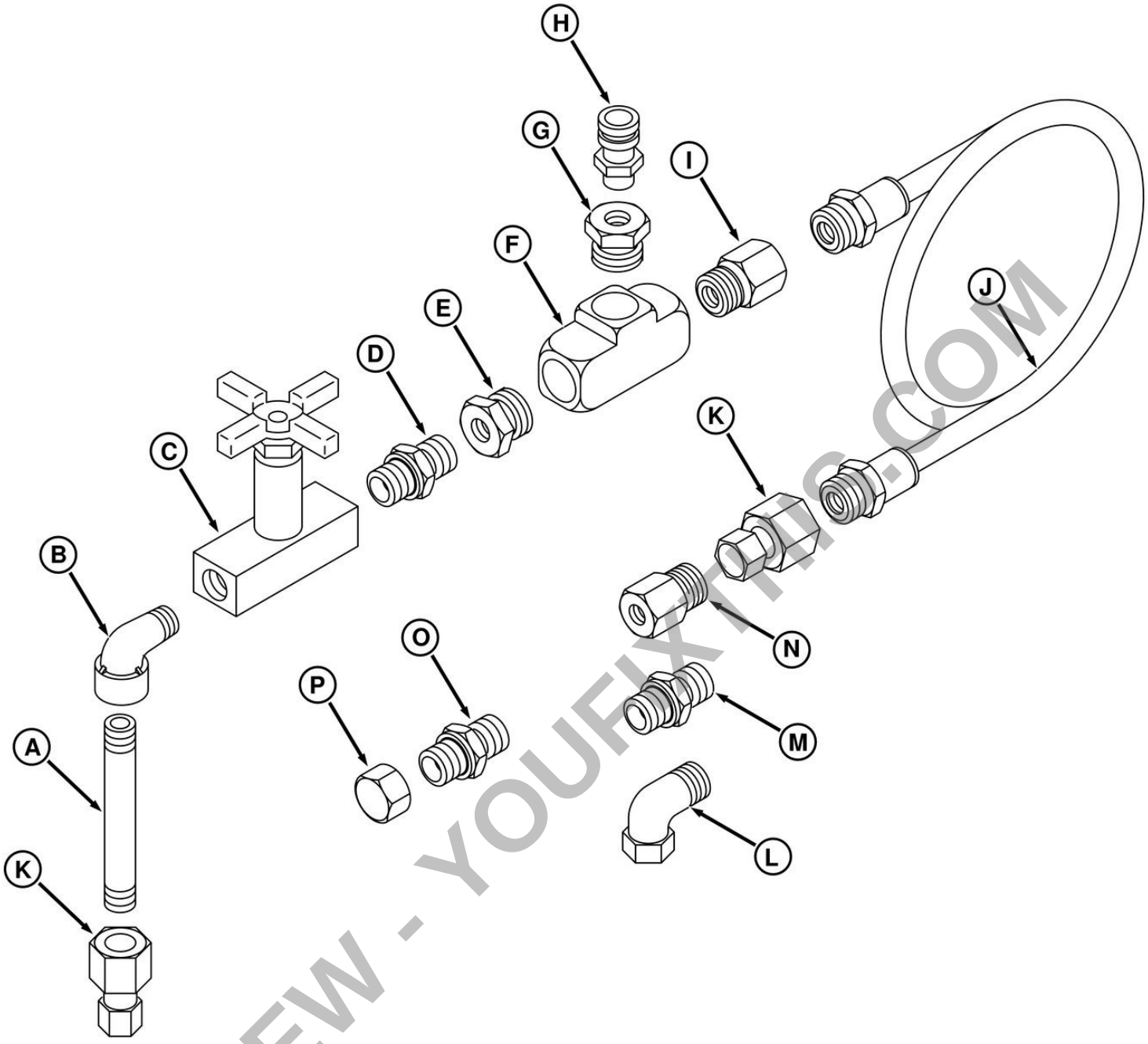
[6] - Spin all three pinion gears by hand a minimum of one full revolution after assembly. Gears must spin freely.

Install Steering Planetary, Ring Gear, and Sun Gear

[1] -

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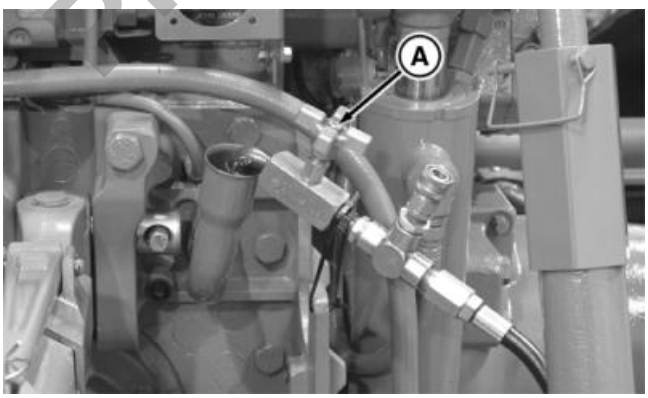
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DFRW2

Flush steering system

[4] -



LEGEND:

A	Valve

Hose Valve

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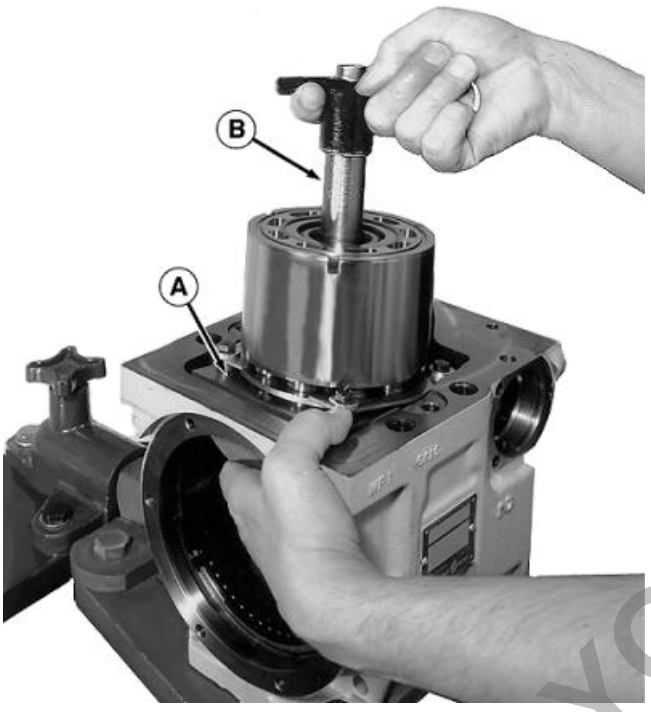
Install servo piston (A) into pump housing.

[71] - Install bronze slider block (B) onto servo arm of yoke assembly.

[72] -

→NOTE:

A second person will be needed to help align slider block into servo piston during yoke installation.



LEGEND:

A	Yoke and Piston Assembly
B	JDG1077 Yoke Installation Tool
C	Feedback Link
D	Bronze Slider Block

Using a JDG1077 Yoke Installation Tool



Feedback Link

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Group 30 - Brake Components

Specifications

Item	Measurement	Specification
Brake Disk	Thickness (New)	7.57 mm (0.298 in.)

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[19] - Operate turn signal lever to obtain PCU, Address 0.

[20] - Move control levers, one at a time, to engage all PST and PTO elements six to ten times.

[21] - Observe “PS” port gauge for a pressure change when levers are moved to engage elements.

[22] -

IMPORTANT:

No change indicates solenoid is stuck or there is no voltage to solenoid. Repair as required and repeat steps.

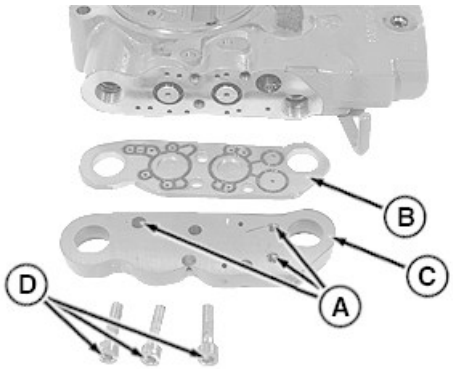
Remove test equipment and F10 diagnostic fuse.

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IMPORTANT:

Do not lose check valves (A).

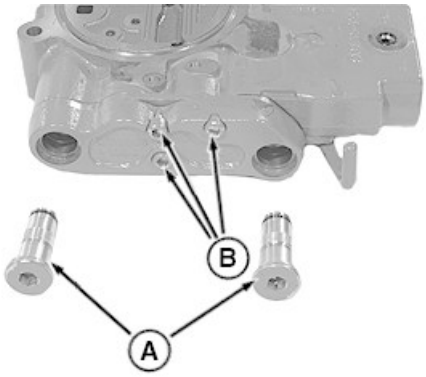


LEGEND:

A	Check Valves
B	Seal Plate
C	End Cover
D	Hex Screws

Seal Plate and Logic Plate

Install**NEW** seal plate (B), end cover (C), and**hand** tighten hex screws (D).



LEGEND:

A	Plugs
B	Hex Screws

Plugs

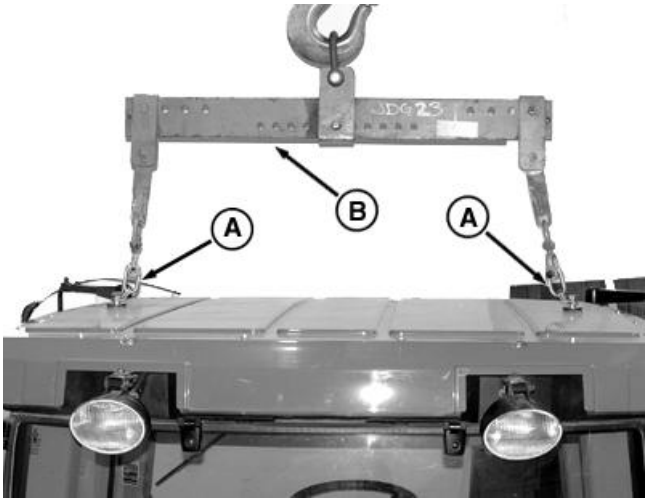
Install and tighten plugs (A).

Tighten hex screws (B).

Item	Measurement	Specification
End Cover Plug		
	Torque	162 N˙m (120 lb-ft)
End Cover Hex Screws		
	Torque	95 N˙m (70 lb-ft)

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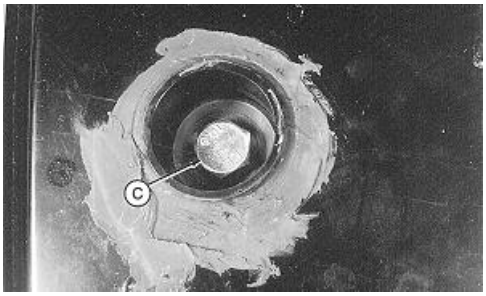
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LEGEND:

A	JDG19 Lift Brackets
B	JDG23 Lift Sling
C	Front Cab Mount Cap Screws

Lift Brackets Attached to Lift Sling



Cap Screw

Install JDG19 Lift Brackets (A) and attach JDG23 Lift Sling (B) to brackets and hoist.

Special Mounting Brackets

JDG19

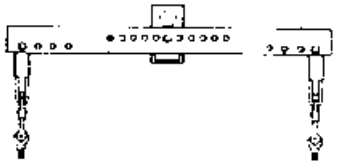


JDG19

Remove and install components.

Lift Sling

JDG23



JDG23

Remove and install cab.

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[22] - Install a new receiver-dryer compatible with R134a refrigerant. Fasten connections and mounting brackets.

[23] - Add TY27506 Leak Detection Dye to system. (See Leak Test With Dye in this group.)

→NOTE:

If dye has been installed in the system, the receiver-dryer should be tagged with a sticker from the correct kit.

[24] - Add required oil. (See Determine Correct Oil Charge in this group.)

[25] - Install compressor and connect refrigerant lines to manifold.

[26] - Connect clutch coil wire and install drive belt.

[27] - Purge system. (See Purge Air Conditioning System in this group.)

Purge Air Conditioning System

IMPORTANT:

Air compressors used for purging systems require a water separator. Purging without a separator adds moisture, creating hydrofluoric acid when combined with refrigerant oil. Acid is corrosive to metal tubing.

[1] - Connect dry nitrogen hose to gauge manifold center hose.

[2] - Connect gauge manifold suction hose to compressor suction port and open valves.

[3] - Connect gauge manifold discharge hose to compressor discharge port and open valve. Disconnect discharge hose from gauge manifold to allow purging nitrogen to atmosphere.

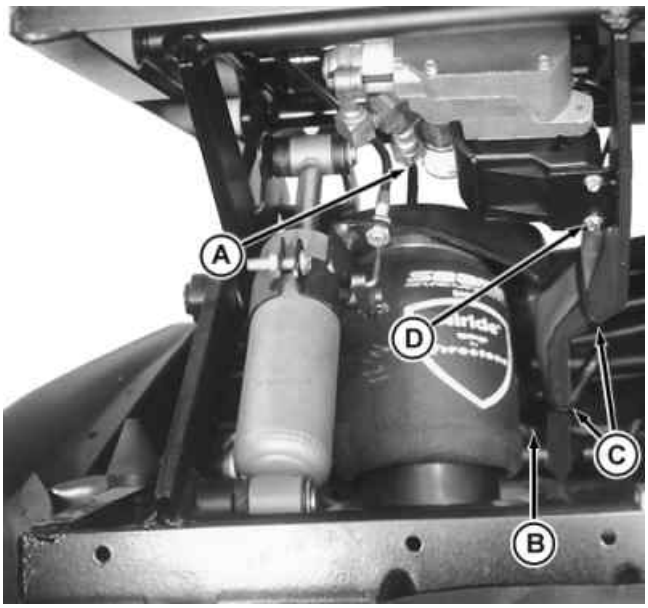
[4] - Open nitrogen tank valve and adjust regulator to 275 kPa (2.75 bar) (40 psi). Purge system for two minutes. Disconnect nitrogen supply.

[5] - Evacuate system. (See Evacuate Air Conditioning System in this group.)

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Remove and Install Compressor:



LEGEND:

A	Air Line
B	Harness Connector
C	Tie Bands
D	Screws

Seat

CAUTION:

Do not attempt to bleed air system without JDG1424 Support Block in place. It prevents injury from the sudden collapse of the scissors suspension.

Remove air line (A) from compressor valve.

Cut tie bands (C) and disconnect compressor harness (B) from seat harness.

Remove two screws (D) and remove compressor.

Install in reverse order.

Slide compressor up against cross member before tightening screws.

Replace air line as necessary.

Replace Compressor Filter:

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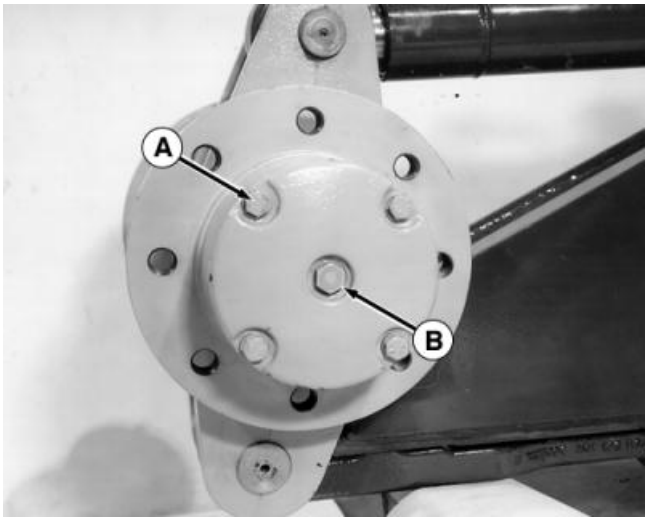
then tightening the other. (Tightening the inside screw will move the track toward the tractor chassis and tightening the outside screw will move the track away from the chassis).

→NOTE:
Do not adjust the screws by more than 1/2 turn at a time. Retighten lock nuts before driving the tractor.

Recheck alignment and repeat Step 1 above until temperatures on each side of the guide lugs for both tracks feel about the same.

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LEGEND:
A Bearing Cover Retaining Cap Screws
B Oil Level Check Plug

Bearing Cover

Apply PM37509 Cure Primer to both cover sealing surfaces.

Number	Name	Use
• PM37509 (us) • PM38611 (canadian) • 7649 LOCTITE ™ (loctite)	Cure Primer	Used to prepare sealing surface

[26] - Apply PM38657 High Flex Form-In-Place Gasket to hub sealing surfaces.

Number	Name	Use
• PM38657 (us) • PM38628 (canadian) • 17430 LOCTITE ™ (loctite)	High Flex Form-In-Place Gasket	Used to seal transmission housings.

[27] - Install cover on hub and tighten cap screws (A).

Item	Measurement	Specification
Idler Hub Cover Cap Screws	Torque	60 N˙m (44 lb-ft)

[28] - Remove plug (B) and fill to bottom of hole with transmission-hydraulic oil.

[29] - Install and tighten plug.

Item	Measurement	Specification
Idler Hub Drain Plug	Torque	34 N˙m (24 lb-ft)

[30] - Install front idler wheel.

[31] - Tension track. (See Detension and Tension the Track in Group 05.)

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