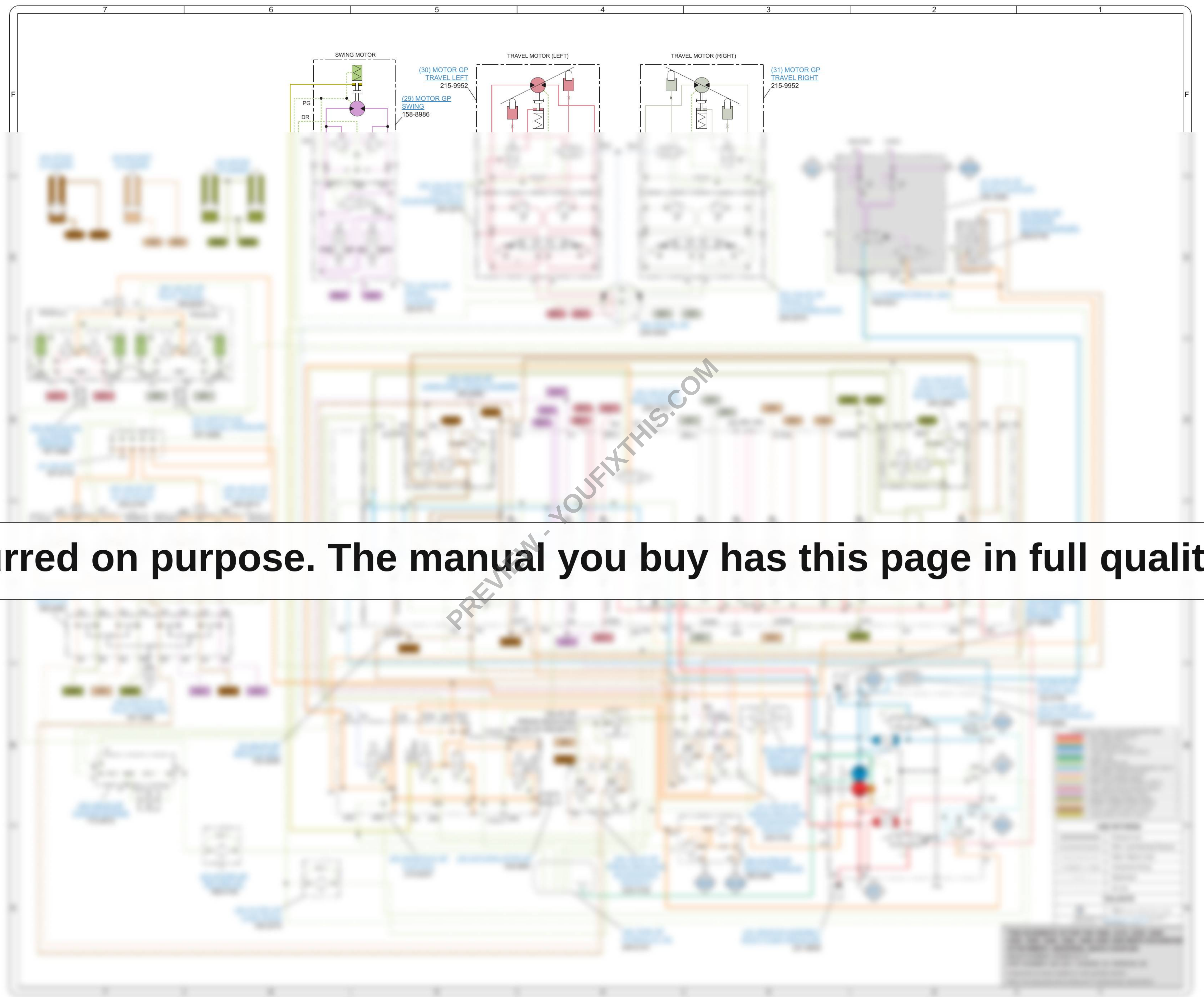
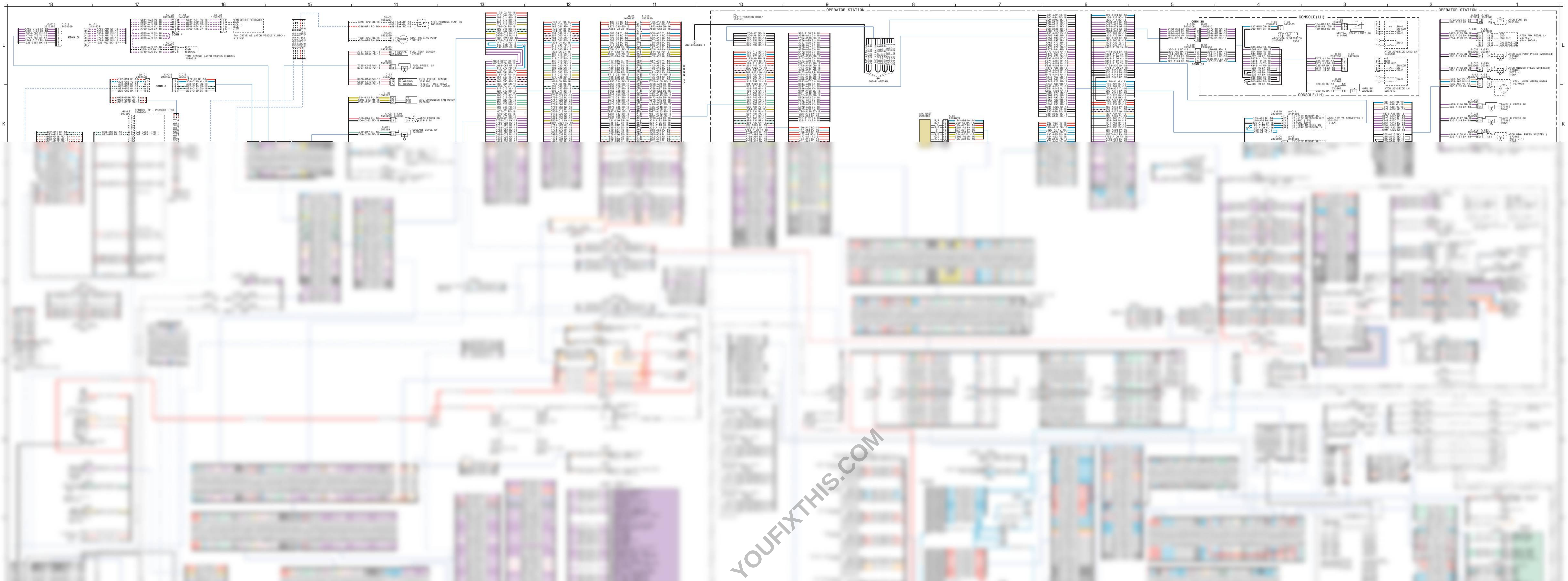




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Note: Caterpillar does not recommend the checking of the actual bearing clearances particularly on small engines. This is because of the possibility of obtaining inaccurate results and the possibility of damaging the bearing or the journal surfaces. Each Caterpillar engine bearing is quality checked for specific wall thickness.

Note: The measurements should be within specifications and the correct bearings should be used. If the crankshaft journals and the bores for the block and the rods were measured during disassembly, no further checks are necessary. However, if the technician still wants to measure the bearing clearances, Tooling (A) is an acceptable method. Tooling (A) is less accurate on journals with small diameters if clearances are less than 0.10 mm (0.004 inch).

NOTICE

Lead wire, shim stock or a dial bore gauge can damage the bearing surfaces.

The technician must be very careful to use Tooling (A) correctly. The following points must be remembered:

- Ensure that the backs of the bearings and the bores are clean and dry.
- Ensure that the bearing locking tabs are properly seated in the tab grooves.
- The crankshaft must be free of oil at the contact points of Tooling (A) .

1. Put a piece of Tooling (A) on the crown of the bearing that is in the cap.

Note: Do not allow Tooling (A) to extend over the edge of the bearing.

2. Use the correct torque-turn specifications in order to install the bearing cap. Do not use an impact wrench. Be careful not to dislodge the bearing when the cap is installed.

Note: Do not turn the crankshaft when Tooling (A) is installed.

3. Carefully remove the cap, but do not remove Tooling (A) . Measure the width of Tooling (A) while Tooling (A) is in the bearing cap or on the crankshaft journal. Refer to Illustration 1.
-

6. Remove spring (8) and spool (7) .
7. Remove O-ring seals (9) from plugs (4) and (5) .

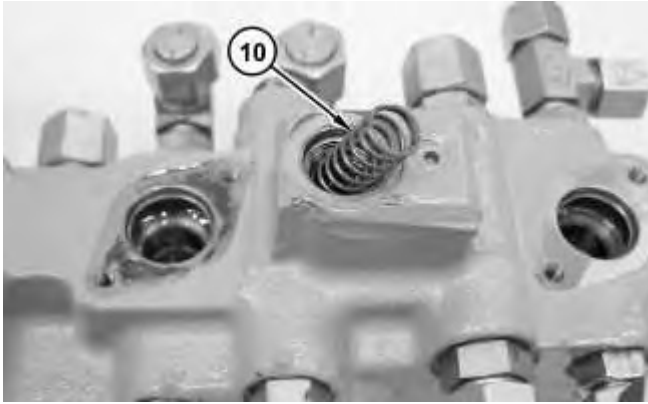


Illustration 5

g01211576

8. Remove spring (10) .

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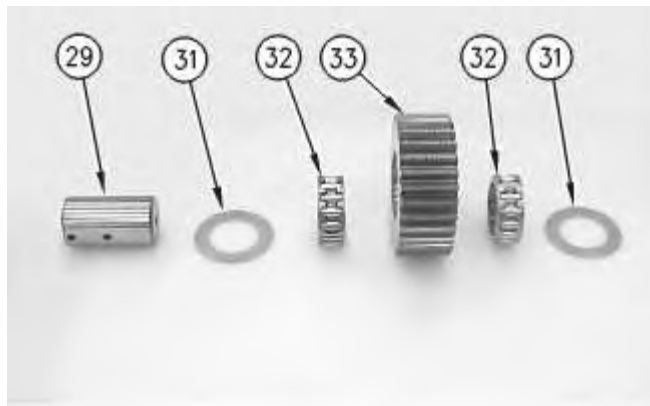


Illustration 17

g00893674

21. Assemble carrier assembly (28), as follows.

- a. Install bearings (32) in planetary gear (33) .
- b. Install thrust washers (31) and planetary gear (33) in the carrier assembly.
- c. Use a deburring tool in order to remove the metal burr from the openings in the carrier. Install planetary shaft (29) in the carrier assembly.
- d. Drive spring pin (30) into planetary shaft (29) .

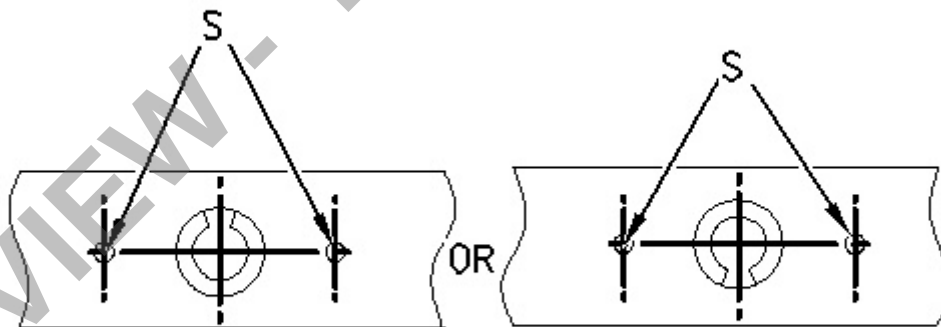


Illustration 18

g00941047

The stake mark is at position (S) .

- e. Orient the split in spring pin (30) vertically to the carrier. Align the split in the spring pin to the top or to the bottom. Make a stake mark on each side of the spring pin hole in the carrier. Each stake mark should be approximately 1.5 mm (0.06 inch) from the outside diameter of the spring pin hole.

-
1. Prior to disassembling the recoil spring assembly, make sure that Tooling (A) is on a level surface.
 2. Prior to disassembling the recoil spring thoroughly clean the outside surface.

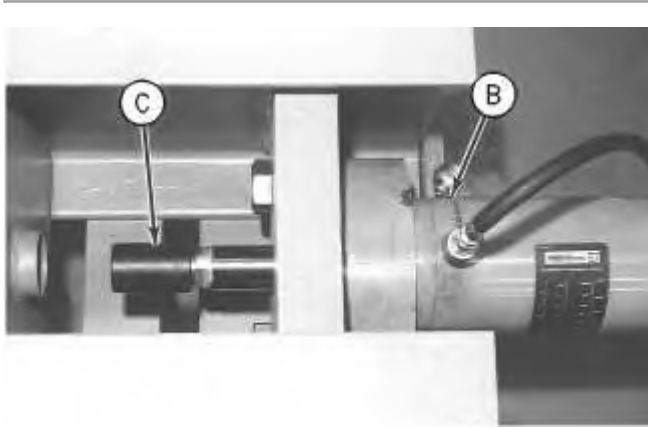


Illustration 1

g00483426

3. Install Tooling (C) on Tooling (B) , as shown.



Illustration 2

g00494710

Schematic

320D, 321D, 323D, 324D, 325D, 329D, 330D, 336D, 336D₂ and 336D MHPU Excavator Hydraulic System - Attachment

320D:	323D:	324D:	329D:	330D:	336D:
A6F1-UP	RAC1-UP	EJC1-UP	XDB1-UP	GGE1-UP	J2F1-UP
A8F1-UP	SDC1-UP	MND1-UP	BFC1-UP	B6H1-UP	LMG1-UP
A9F1-UP	WGC1-UP	T2D1-UP	CZF1-UP	THJ1-UP	MYG1-UP
KGF1-UP	CYD1-UP	JJG1-UP	JBF1-UP	LRM1-UP	KDJ1-UP
MCH1-UP	SED1-UP	BTK1-UP	WDK1-UP	ERN1-UP	WRK1-UP
TDH1-UP	YSD1-UP	SYM1-UP	EBM1-UP	JLP1-UP	PPN1-UP
FAL1-UP	NDE1-UP	JAT1-UP	TPM1-UP	MWP1-UP	MYP1-UP
KLM1-UP	WNE1-UP		YFW1-UP	RAS1-UP	JWR1-UP
SPN1-UP	ZMF1-UP	325D:	SCY1-UP	EDX1-UP	DTS1-UP
WBN1-UP	JLG1-UP	GPB1-UP	DTZ1-UP	T2Y1-UP	WET1-UP
GDP1-UP	BYM1-UP	PKE1-UP			PGW1-UP
PCX1-UP	PBM1-UP	LAL1-UP			
PHX1-UP	NES1-UP	MCL1-UP			
	DKW1-UP	AZP1-UP			
	SBZ1-UP	A3R1-UP	336D MHPU:	336D ₂ :	
321D:		GBR1-UP	M3M1-UP	WDC1-UP	
TXA1-UP		T2S1-UP	M3N1-UP	YCF1-UP	
PBD1-UP		CYW1-UP		XBH1-UP	
NAS1-UP				TLY1-UP	

Universal Quick Coupler

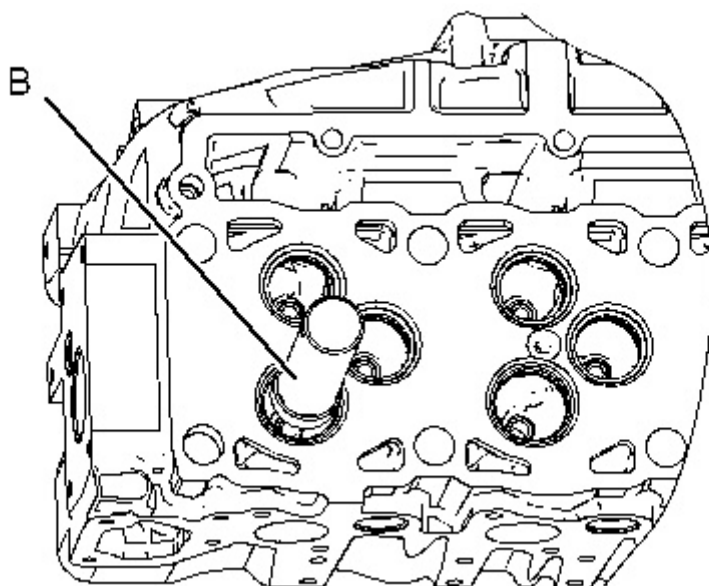


Illustration 1

g01124395

1. Use Tooling (A) to remove the inlet valve guides from the cylinder head assembly. Use Tooling (B) to remove the exhaust valve guides from the cylinder head assembly.

Installation Procedure

Table 2

Required Tools			
Tool	Part Number	Part Description	Qty
A	1U-7793	Valve Guide Driver	1
B	9U-6895	Valve Guide Driver	1
C	1U-7792	Guide Collar	1
D	149-4008	Guide Collar	1

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

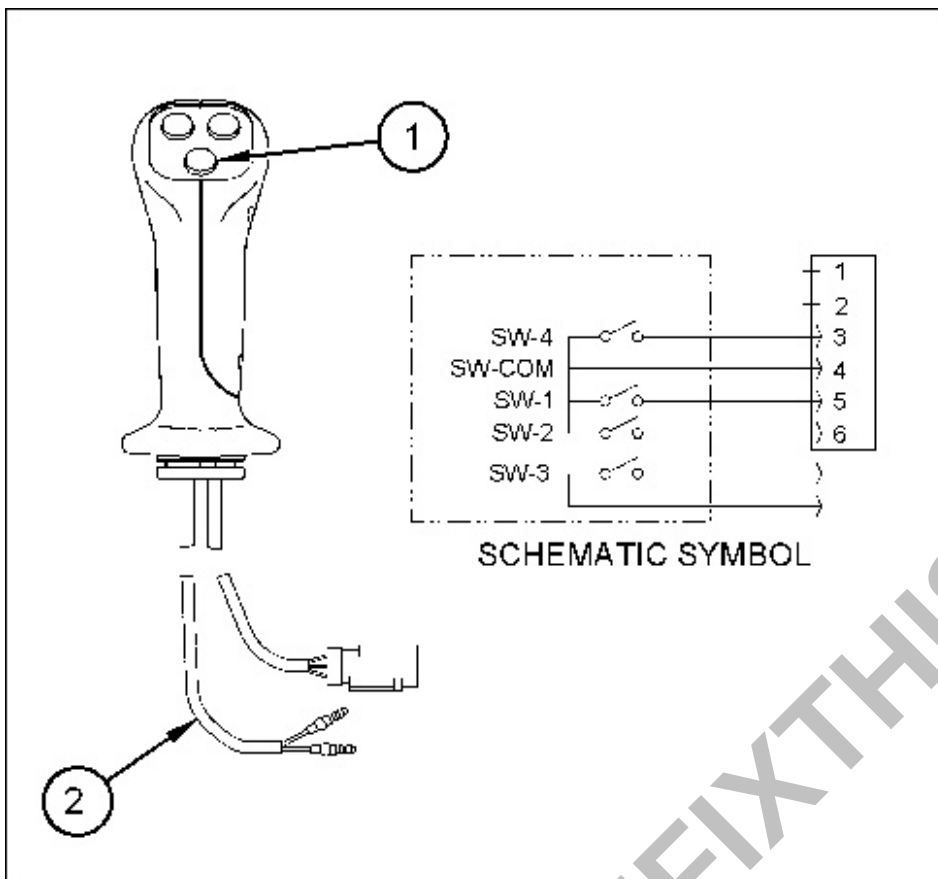


Illustration 3

g01144596

Right Joystick (3-Button, Trigger Switch)

(1) Low Idle Switch (SW-3)

(2) Low Idle Switch (SW-3) Connections

Cat ET Service Connector

(located behind the operator's seat, under the Right Side Switch Console)

(4) Back of Operator seat (shifted forward for access)

(5) Backup Switches

(6) Right Side Switch Console

(7) Cat ET Service Connector

The service connector for the Cat ET is located in the operators compartment. The connector is located behind the seat on the right side of the cab.

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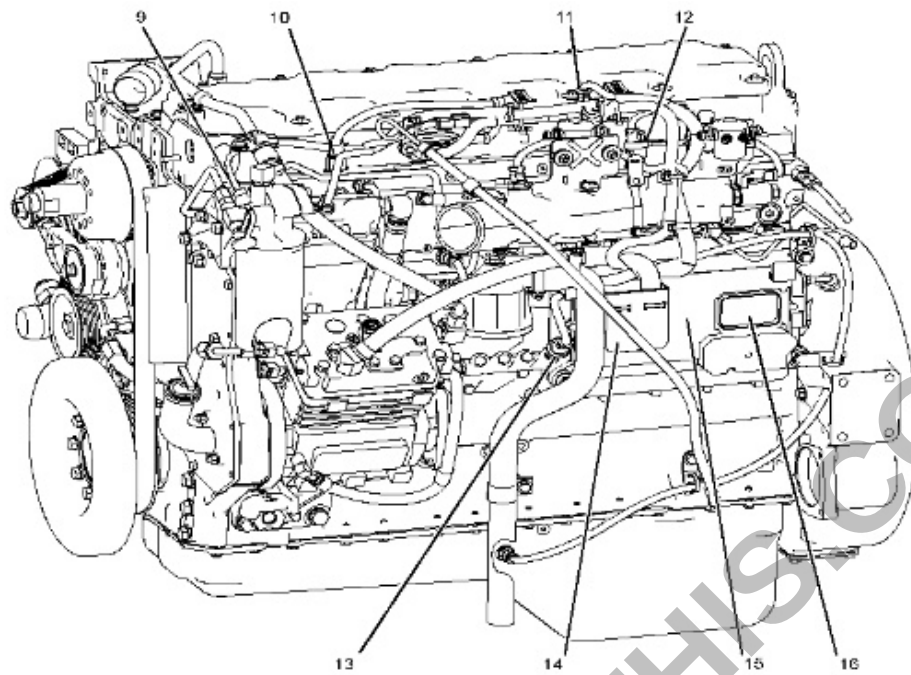


Illustration 3

g01255900

A typical left side view of the C7 engine

- (9) Fuel pressure sensor
- (10) Injection actuation pressure sensor
- (11) Atmospheric pressure sensor
- (12) Boost pressure sensor for the intake manifold
- (13) Engine oil pressure sensor
- (14) J2/P2 connectors
- (15) ECM
- (16) J1/P1 connectors

- B. Thoroughly inspect the ECM connectors. Thoroughly inspect the connectors for each pressure sensor. Refer to the diagnostic functional test Troubleshooting, "Electrical Connectors - Inspect".

9. Release the hydraulic system pressure. Refer to Disassembly and Assembly, "Hydraulic System Pressure - Release".



Illustration 5

g01217511

10. Position Tooling (H) under guards (4) . Remove bolts (5) . The weight of each guard (4) is approximately 23 kg (50 lb).

Note: The guards can be heavier due to debris on top of the guards.

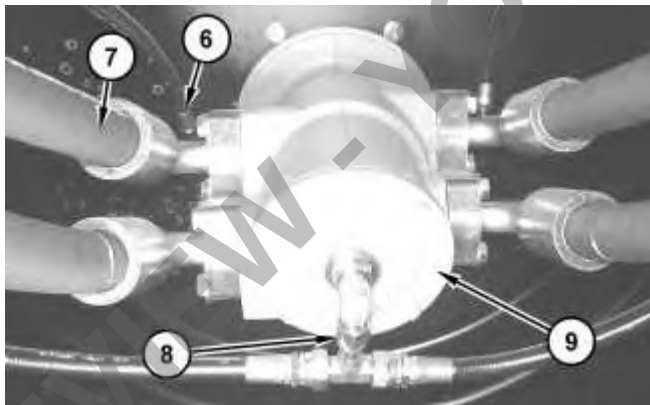


Illustration 6

g01207683

11. Drain the oil from the hydraulic oil tank into a suitable container for storage or disposal. Refer to Operation and Maintenance Manual, "Hydraulic System Oil - Change".
12. Disconnect hose assemblies (6) and (7) . Disconnect fitting (8) from swivel (9) .

System 11

A machine configured with a System 11 will offer Combined Function with Hydraulic Control and Medium Pressure. System 11 will have the following components:

- One mechanical relief valve located in the swing motor compartment above the boom foot.
- Hydraulic controls in the cab.
- Medium pressure for tool rotation.

Refer to Illustrations 7, 8, and 9 for component descriptions.

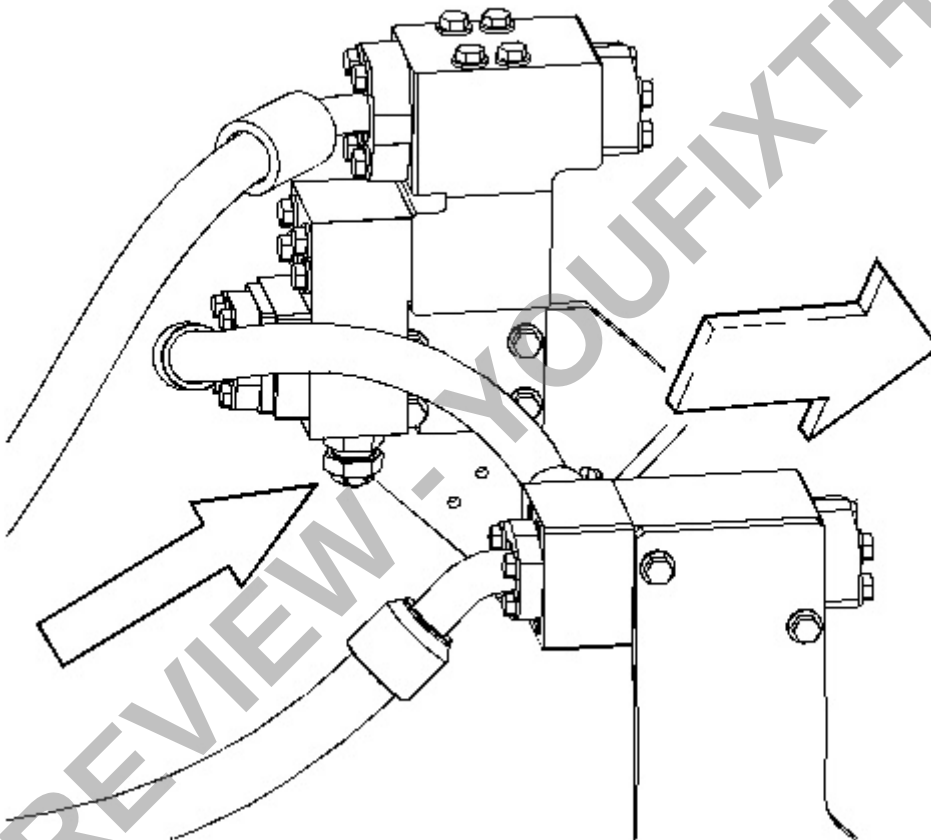


Illustration 7

g02722471

Mechanical Tool Relief located above the boom foot

Testing and Adjusting

320D, 320D2, 321D, 323D, 323D2, 324D, 325D, 328D, 329D, 330D, 336D, 336D2, 340D and 340D2 Excavators Tool Control System

Media Number -REN7389-24

Publication Date -01/10/2013

Date Updated -08/10/2013

i03203210

Medium Pressure: Default Value of Work Tool Parameters

SMCS - 5000

S/N - AZP1-UP

S/N - BTK1-UP

S/N - BZP1-UP

S/N - CWG1-UP

S/N - CYW1-UP

S/N - CZF1-UP

S/N - DHE1-UP

S/N - DTZ1-UP

S/N - EBM1-UP

S/N - EDX1-UP

S/N - EFT1-UP

S/N - EJT1-UP

S/N - FAL1-UP

S/N - FAR1-UP

S/N - GBC1-UP

S/N - GDP1-UP

S/N - GMX1-UP

S/N - HJC1-UP

S/N - J2F1-UP

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D and 340D2 Excavators and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-22

Publication Date -01/11/2013

Date Updated -21/11/2013

i03758399

MID 039 - CID 1597 - FMI 03

SMCS - 5479-038-V4

Conditions Which Generate This Code:

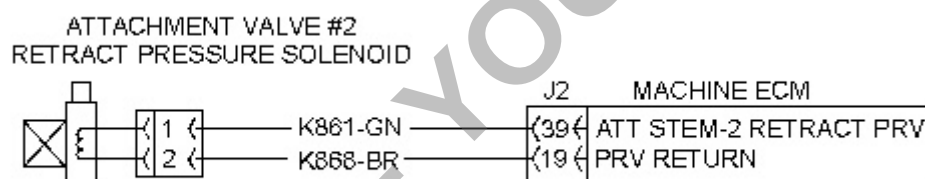


Illustration 1

g02027063

Schematic of the Attachment Valve #2 Retract Pressure Solenoid

This diagnostic code is associated with the "Attachment Valve #2 Retract Pressure" Solenoid. The FMI 03 diagnostic code means that the Machine ECM has determined that the voltage is above normal.

The possible causes of the diagnostic code are listed below:

- The solenoid has failed.
- The energizer circuit of the solenoid for the modulating valve is shorted to the +battery circuit.
- The ECM has failed. This is unlikely.

			Distance from the centerline of the mounting pin to the support assembly (1) is 180.0 ± 3.0 mm (7.09 ± 0.12 inch).
C	-	-	Orientation of support assembly is 30 ± 3 degrees.
2	4	8T-4196 Bolt	Torque to 39 ± 8 N·m (29 ± 6 lb ft).

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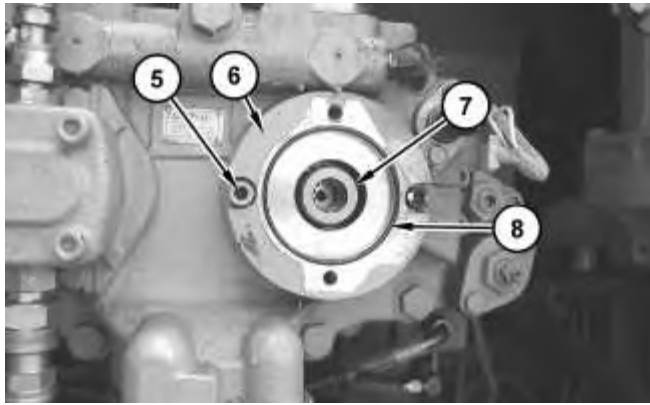


Illustration 2

g01213408

2. Install coupling (7) and O-ring seal (8). Install adapter (6) and bolts (5).

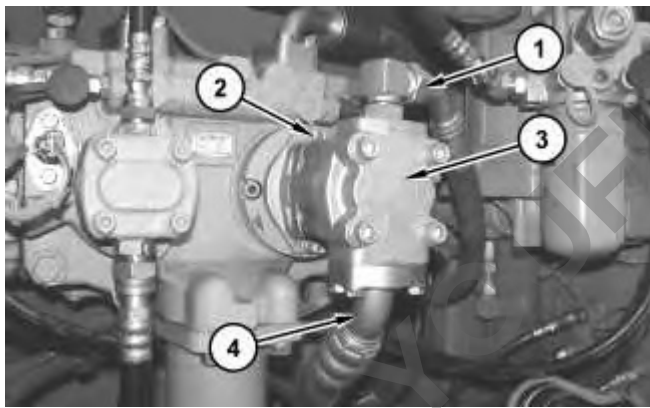


Illustration 3

g01213402

3. Install gear pump (3). Install bolts (2). Connect hose assemblies (1) and (4).



Illustration 4

g01209599

4. Remove Tooling (A).

S/N - TSN1-UP

S/N - TZL1-UP

S/N - WDK1-UP

S/N - WLT1-UP

S/N - XDB1-UP

S/N - YFW1-UP

Installation Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	FT-2674	Vacuum Cap	1

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, "Caterpillar Dealer Service Tool Catalog" for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

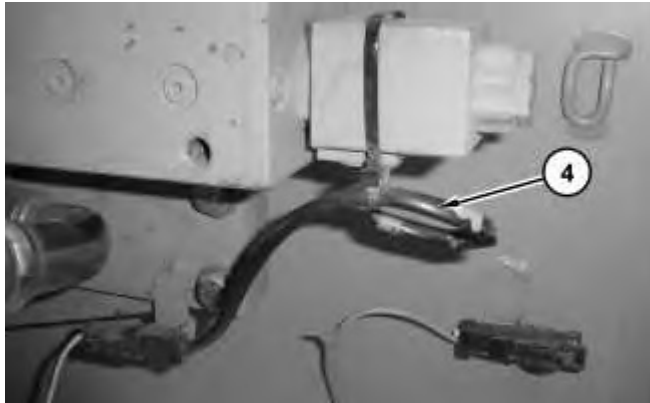


Illustration 3

g01219868

3. Connect harness assembly (4) .

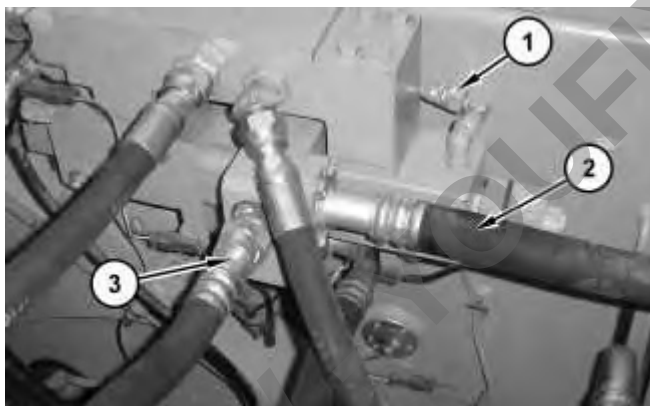


Illustration 4

g01219839

4. Connect hose assemblies (1), (2), and (3) .

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- (3) Engine Speed Dial Indicator
- (4) Fuel Gauge
- (5) Hydraulic Oil Temperature Gauge
- (6) Engine Coolant Temperature Gauge
- (7) Keypad

The monitoring system display will display various warnings and information about the condition of the machine. The monitoring system display has three gauges and a number of alert indicators. Each gauge is dedicated to a parameter within a machine system. The monitoring system will allow the user to do the following:

- View system status information
- View parameters
- View service intervals
- Perform calibrations
- Troubleshoot machine systems

Some of the possible parameters of the machine systems are listed: fuel level, engine coolant temperature and hydraulic oil temperature. The gauges receive information from sensors or senders that are connected to the controller. The controller uses the information from each sensor input to calculate the value that is shown on the gauges.

The alert indicators will notify the operator of an abnormal condition in a machine system. The controller uses information from pressure switches, sensors and other inputs in order to determine when an abnormal condition is present. The controller will send a message to the monitoring system display. Then, the monitoring system will display a pop up alert indicator for the machine system with the abnormal condition.

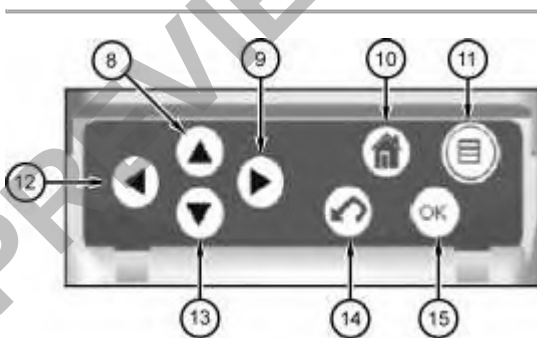


Illustration 2

g01152977

Keypad

- (8) Up key
- (9) Right key

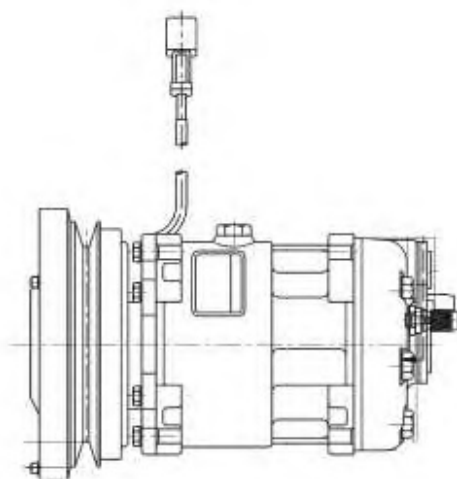


Illustration 1

g01127048

3E-1906 Refrigerant Compressor Gp (Typical Refrigerant Compressor)

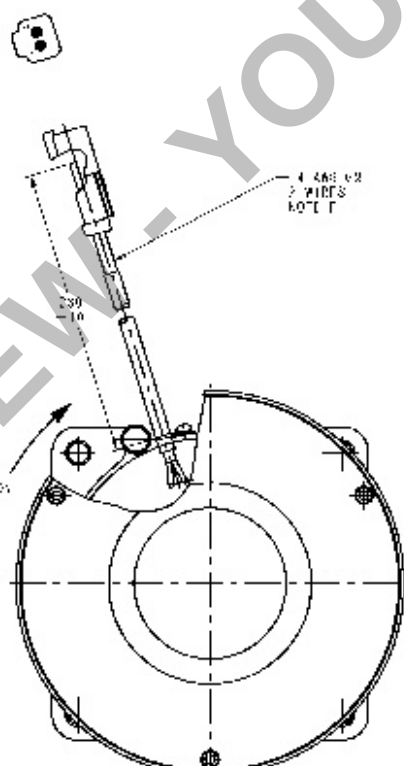


Illustration 2

g01123619

Wire lead and pin location for field coil

S/N - TRH1-UP

S/N - TSN1-UP

S/N - TZL1-UP

S/N - WDK1-UP

S/N - WLT1-UP

S/N - XDB1-UP

S/N - YFW1-UP

Removal Procedure

Note: Cleanliness is an important factor. Before the disassembly procedure, the exterior of the component should be thoroughly cleaned. This will help to prevent dirt from entering the internal mechanism.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, "Caterpillar Tools and Shop Products Guide" for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.



WARNING

Personal injury can result from contact with refrigerant.

Contact with refrigerant can cause frost bite. Keep face and hands away to help prevent injury.

Protective goggles must always be worn when refrigerant lines are opened, even if the gauges indicate the system is empty of refrigerant.



Illustration 24

g00708235

31. Install new O-ring seals (5) on plugs (4) that were in the cover.

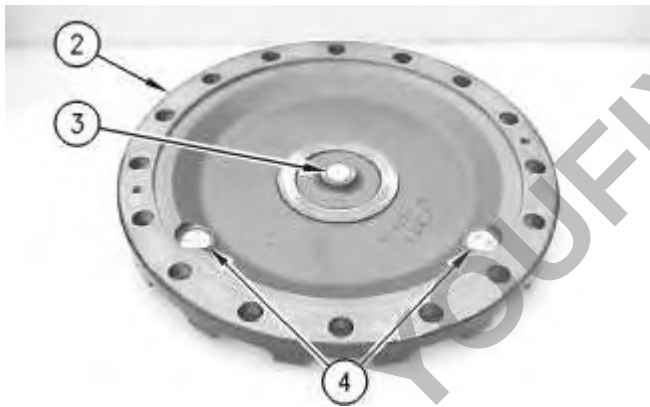
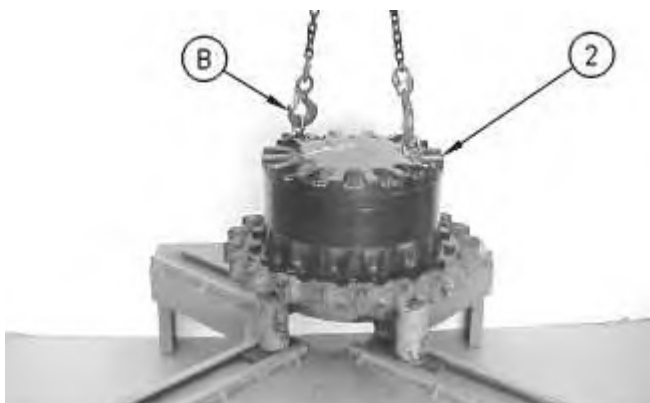


Illustration 25

g00708091

32. Install plugs (4) in cover (2) . Tighten plugs (4) to a torque of $80 \pm 10 \text{ N}\cdot\text{m}$ ($59 \pm 7 \text{ lb ft}$).
33. Install thrust plate (3) in cover (2) .
34. Apply Tooling (F) to the mating surface of the ring gear.



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