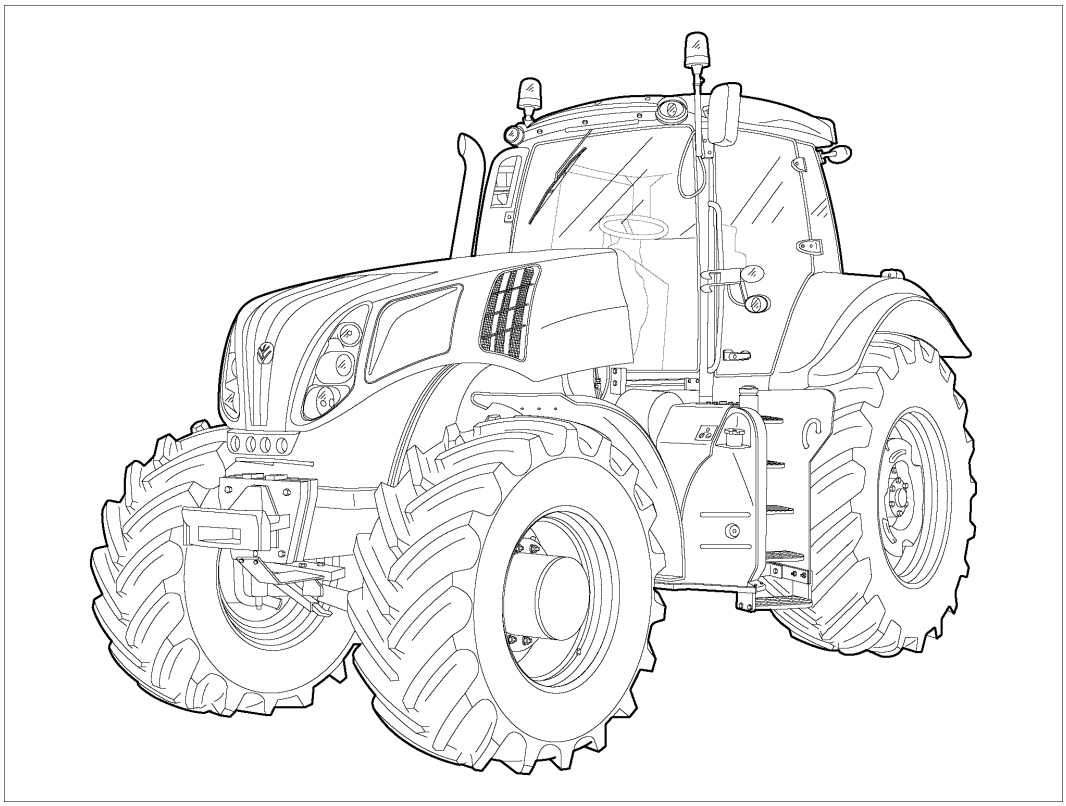
NEW HOLLAND
AGRICULTURE

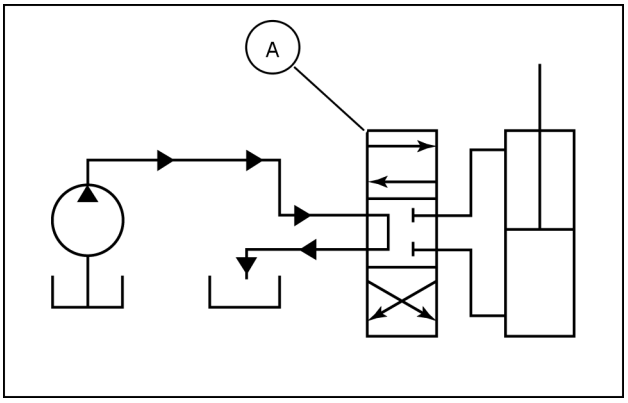
SERVICE MANUAL



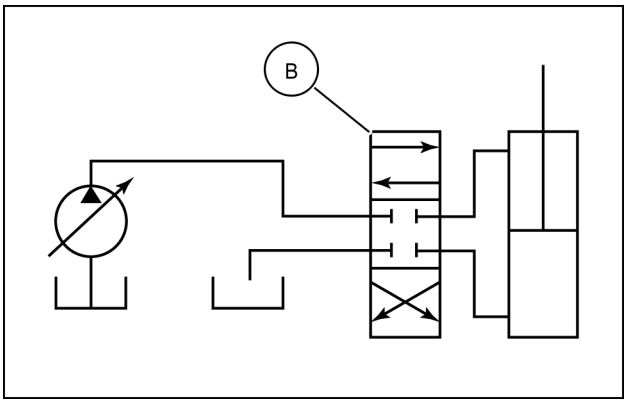
T8.275
T8.300
T8.330
T8.360
T8.390

Three position valve

Three position valves have a centered (neutral) position. The centered position can be either open or closed to flow. The open center **(A)** is usually used with a fixed displacement pump, while the closed center **(B)** is usually used with a variable displacement pump.



RCIL07CCH068AAA 4

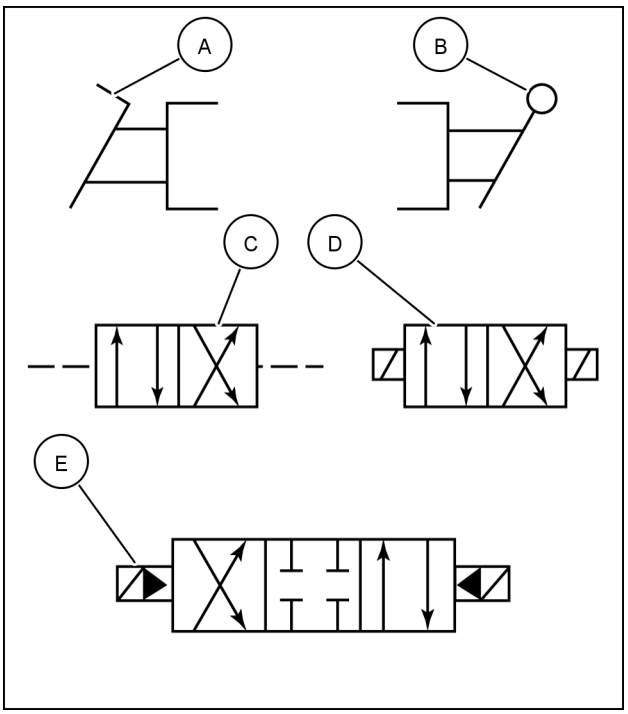


RCIL07CCH069AAA 5

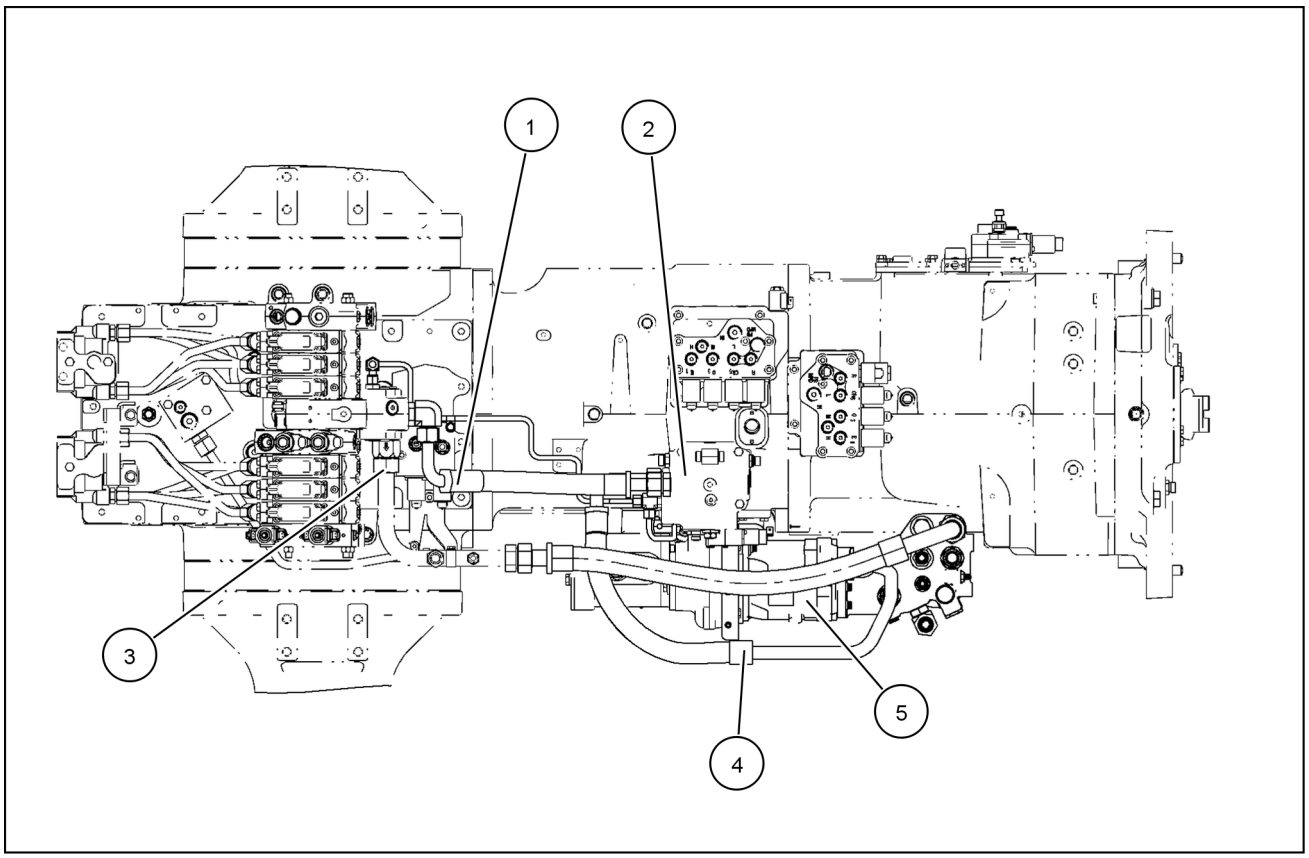
Actuating controls

Valve spools are controlled by pedals **(A)**, levers **(B)**, pilot fluid **(C)**, electric solenoids **(D)**, etc., which are called actuating controls. These actuating controls are shown by symbols placed on the ends of the envelopes.

This symbol **(E)** is used when a solenoid is controlled with internal pilot assist pressure.



RCIL07CCH017BAA 6



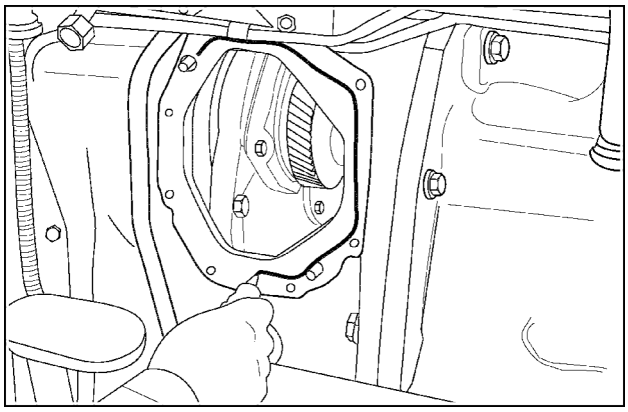
RCIL11CCH012FAE 2

1. PFC pump supply out of priority regulator valve to remote/hitch manifold	4. PFC pump supply to priority regulator valve
2. Priority regulator valve	5. High flow PFC pump
3. Return flow to main filter assembly	

Pump drive - Install

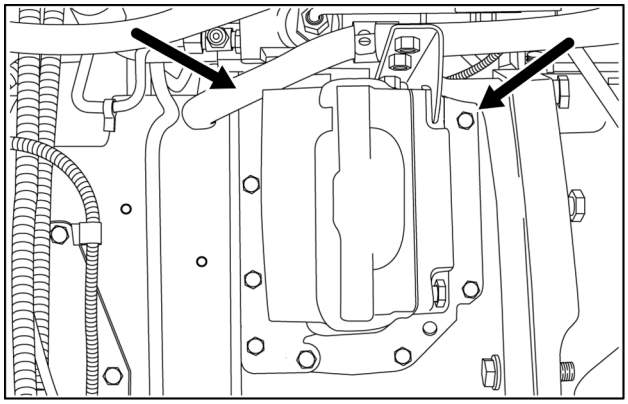
Prior operation:
Pump drive - End play (A.10.A)

1. Apply a continuous bead of **LOCTITE® 515** gasket eliminator, **4.76 mm** (**0.187 in**) wide to the mounting surface of the pump drive housing and around the bolt holes.



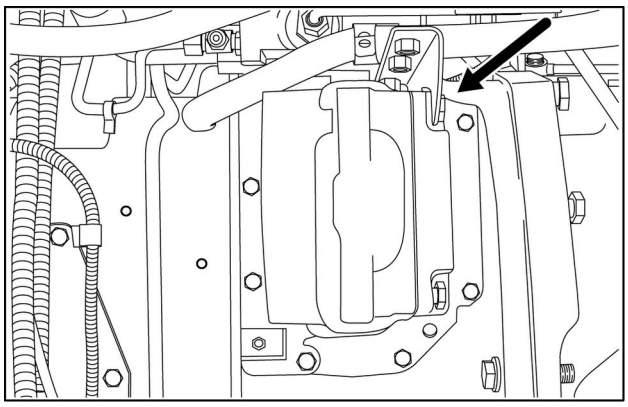
RCPH07CCH632ABC 1

2. Install the hydraulic pump drive assembly on the transmission. Torque the bolts to **52 - 61 Nm** (**38 - 45 lb ft**).



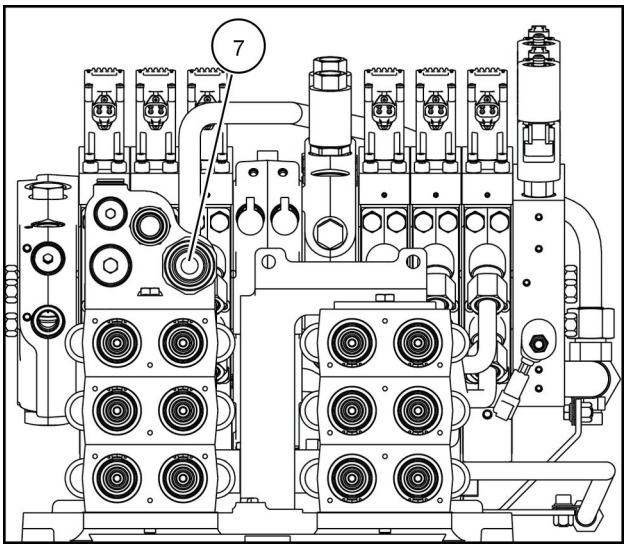
RCPH11CCH425AAA 2

3. Install the two mounting bolts for the hydraulic line bracket (outer bolt shown).



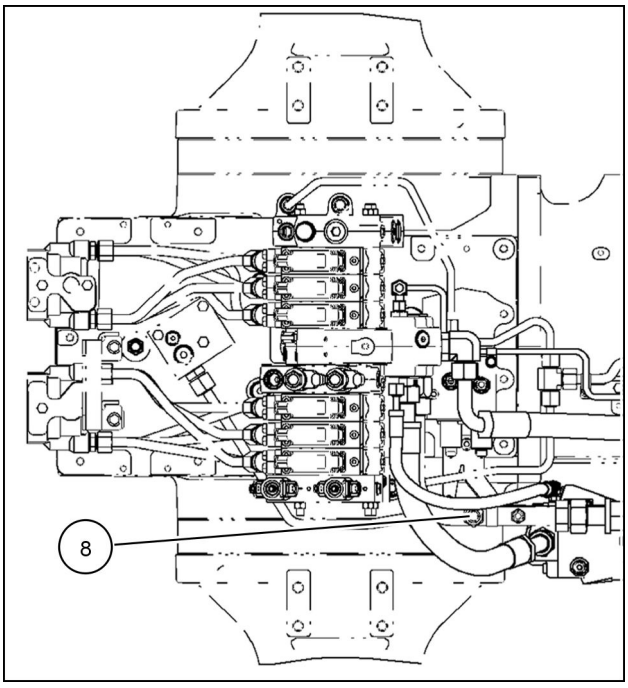
RCPH11CCH425AAA 3

6. Connect the flow meter outlet hose **(6)** to the return port **(7)** on the power beyond or motor return coupler, if equipped.



RCIL11CCH003BAA 3

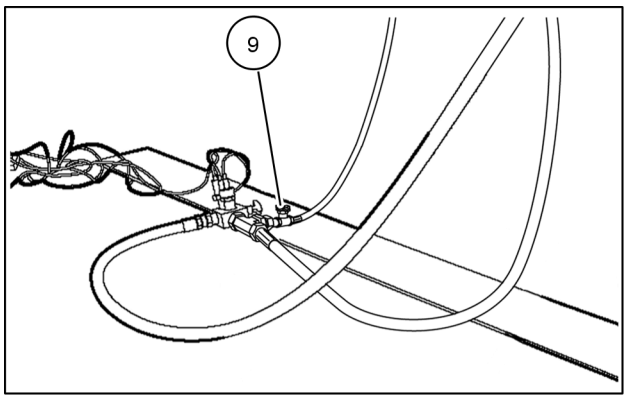
7. If power beyond or motor return are not available, locate the return tube manifold for the remote and hitch valves. The manifold is located under the cab just to right side of the remote valve stack. Remove the cap **(8)** from the manifold. Install a suitable hose between the flow meter outlet **(6)** and the open port on the manifold.



RCIL11CCH022BAE 4

8. Check that all the connections are tight. Start and run the engine at **1500 RPM**.

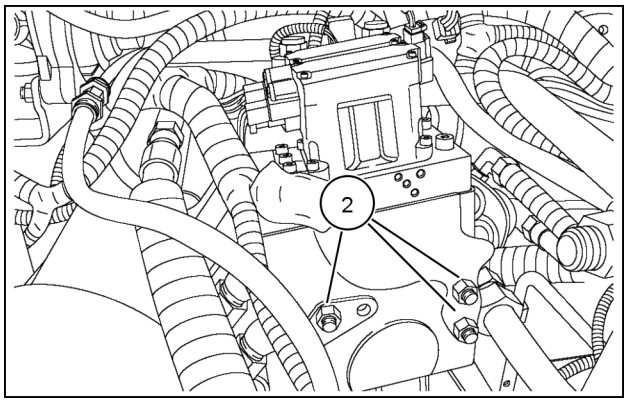
9. Adjust the load control valve **(9)** on the DATAR flow meter to **103 bar** (**1500 psi**), and heat the transmission oil to a minimum of **49 °C** (**120 °F**).



RCIL11CCH020AAE 5

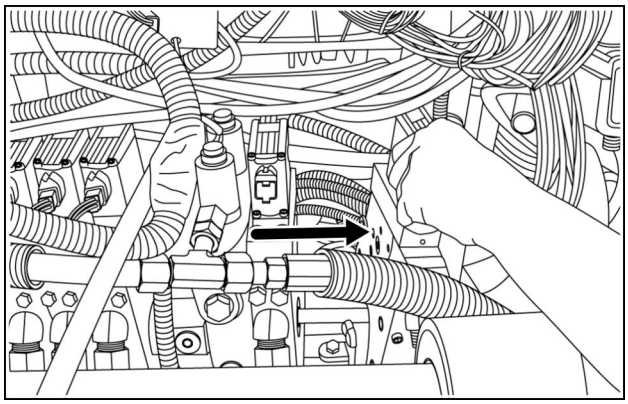
10. When the oil is heated, increase engine speed to **2000 RPM**.

5. Remove the nuts **(2)** from the studs through the valve stack.



RCPH11CCH278AAB 4

6. Remove the valve body and set aside.



RCPH11CCH195AAB 5

Next operation:
Remote control valve - Disassemble (A.10.C)

Fuse no.	Circuit	Fuse amp
24	Power mirror/radio	10
25	Tractor control unit (TCU) B+	20
26	Suspended axle B+	5
27	Front roof HID lights/roof side work lights	20
28	Tractor control unit (TCU) B+	20
29	Seat heater	10
30	Side wiper	10
31	ISO 11783	10
32	Tractor control unit (TCU) B+	5
33	Right hand armrest control system (2)	10
34	True ground speed/radar	5
35	Autoguidance	5
36	Tractor control unit (TCU) B+	20
37	Instrumentation cluster (2)	5
38	Tractor control unit (TCU) B+	15
39	PTO control system	15
40	ECU control module	10
41	Trailer tail lamps	20
42	Data bus diagnostic connector	10
43	Brakes	15
44	Transmission control system	20
45	Display B+	10
46	Right hand front post/right hand fender 3-pin connectors (2)	30
47	HVAC control module	30
48	Headliner shelf 3-pin connectors (2)	20
49	HVAC blower	30
50	Armrest control unit	10
51*	Front wiper/washer	15
52	Rear/side wiper/washer	20
53	Egress lighting	30
54	FNR switched B+	15
55	Tractor control unit (TCU) switched B+	20
56	Tractor control unit (TCU) B+	20

(1) - Unswitched power (continuous)

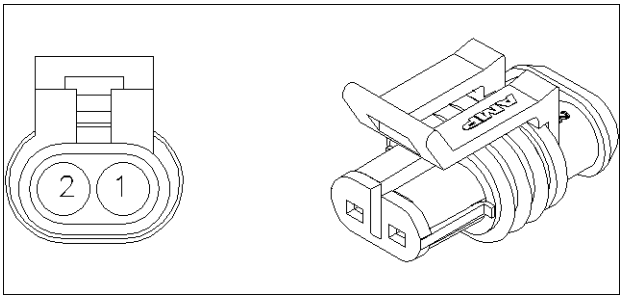
(2) - Power available when key switch is in the on position.

* = Circuit breaker

Connector - Component diagram 03

CONNECTOR X-030

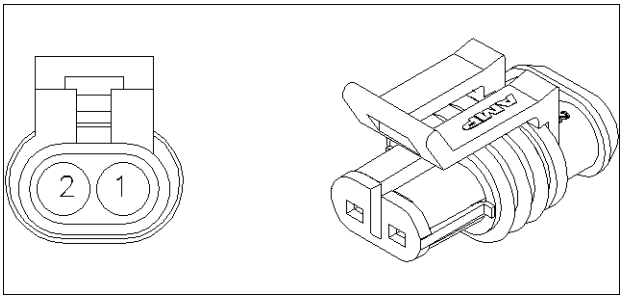
CONNECTOR X-030 - EVEN SOL			
PIN NUMBER	**WIRE NUMBER**	**CIRCUIT REFERENCE**	**ELECTRICAL SCHEMATIC FRAME**
1	2013A (VT)	EVEN CLUTCH HI	
2	581A (BK)	EVEN CLUTCH SOLENOID LO	



82012083 1

CONNECTOR X-031

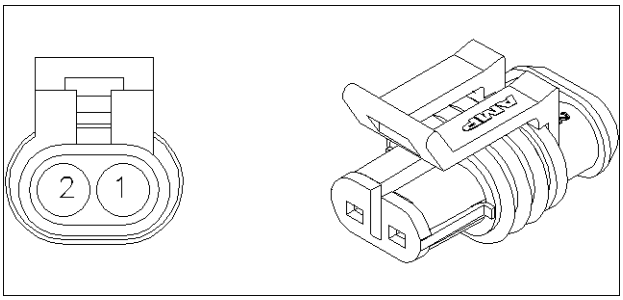
CONNECTOR X-031 - 1/2 SOL			
PIN NUMBER	**WIRE NUMBER**	**CIRCUIT REFERENCE**	**ELECTRICAL SCHEMATIC FRAME**
1	2014A (BL)	C1 CLUTCH SOLENOID HI	
2	582A (BK)	C1 CLUTCH SOLENOID LO	



82012083 2

CONNECTOR X-032

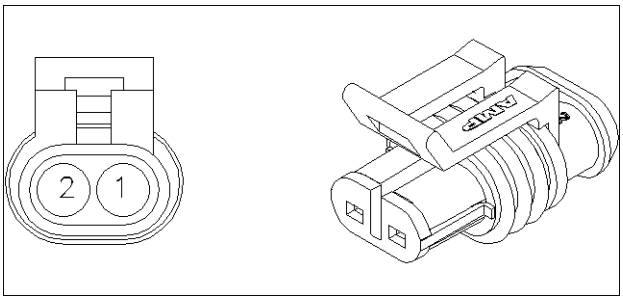
CONNECTOR X-032 - 3/4 SOL			
PIN NUMBER	**WIRE NUMBER**	**CIRCUIT REFERENCE**	**ELECTRICAL SCHEMATIC FRAME**
1	2011A (RD)	C3 CLUTCH SOLENOID HI	
2	582B (BK)	C3 CLUTCH SOLENOID LO	



82012083 3

CONNECTOR X-104

CONNECTOR X-104 - RH REAR TURN SIGNAL			
PIN NUMBER	**WIRE NUMBER**	**CIRCUIT REFERENCE**	**ELECTRICAL SCHEMATIC FRAME**
1	752E (PK)	RH REAR TURN SIG (B+)	
2	178X (BK)	GROUND (RT TURN SIGNAL)	



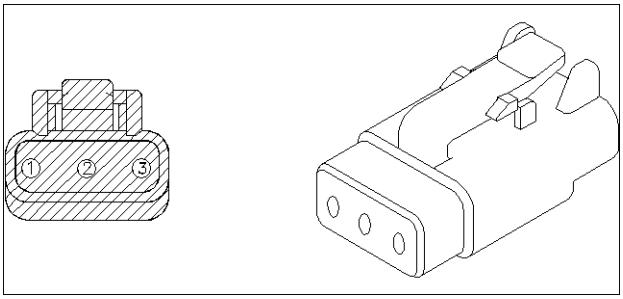
82012083 4

CONNECTOR X-104A

CONNECTOR X-104A - B+			
PIN NUMBER	**WIRE NUMBER**	**CIRCUIT REFERENCE**	**ELECTRICAL SCHEMATIC FRAME**
1	752E (PK)	RH REAR TURN SIG (B+)	

CONNECTOR X-105

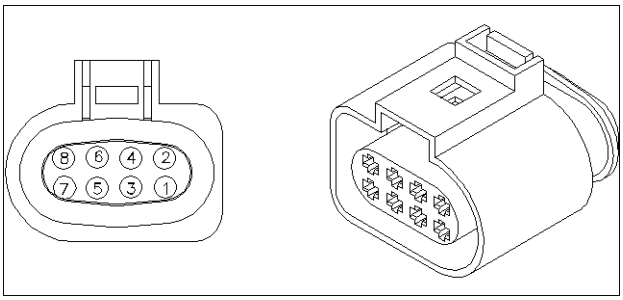
CONNECTOR X-105 - RH FRONT TURN SIGNAL			
PIN NUMBER	**WIRE NUMBER**	**CIRCUIT REFERENCE**	**ELECTRICAL SCHEMATIC FRAME**
1	752D (PK)	LH POSITION B+	
2	178V (BK)	LICENSE PLATE LIGHT #2 GND	
3	753D (PK)	RH POSITION B+	



87696551 5

CONNECTOR X-164

CONNECTOR X-164 - FOOT THROTTLE			
PIN NUMBER	**WIRE NUMBER**	**CIRCUIT REFERENCE**	**ELECTRICAL SCHEMATIC FRAME**
1	-	-	
2	944A (TN)	FOOT THROTTLE SIGNAL	
3	142M (RD)	FOOT THROTTLE B+ (12V)	
4	942A (RD)	FOOT THROTTLE B+	
5	-	-	
6	945A (TN)	FOOT THROTTLE SW #1 (NO)	
7	557N (BK)	FOOT THROTTLE CLEAN GND	
8	557L (BK)	FOOT THROTTLE GROUND	



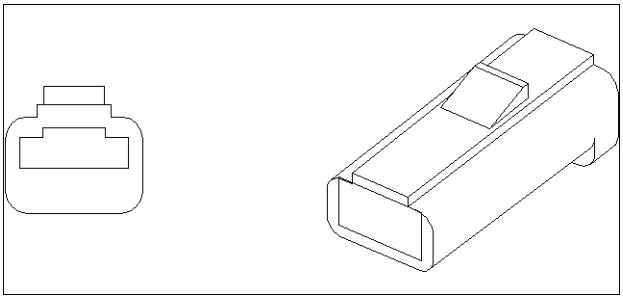
87702265 5

CONNECTOR X-165

CONNECTOR X-165 - BUSINESS BAND RADIO			
PIN NUMBER	**WIRE NUMBER**	**CIRCUIT REFERENCE**	**ELECTRICAL SCHEMATIC FRAME**
A	870E (OR)	BUSINESS BAND B+	
B	178T (BK)	BUSINESS BAND RADIO GND	

CONNECTOR X-267B

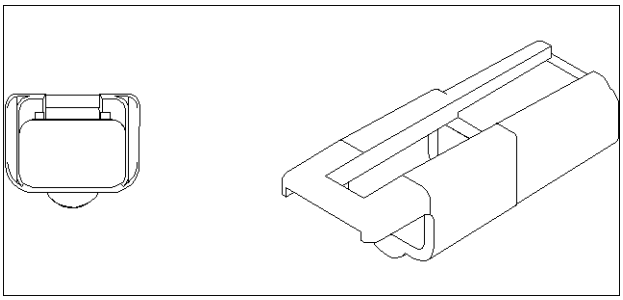
CONNECTOR X-267B - X-267B			
PIN NUMBER	**WIRE NUMBER**	**CIRCUIT REFERENCE**	**ELECTRICAL SCHEMATIC FRAME**
1	724A (PK) 724B (PK)	HIGH BEAM INDICATOR HIGH BEAM	



87688695 9

CONNECTOR X-268A

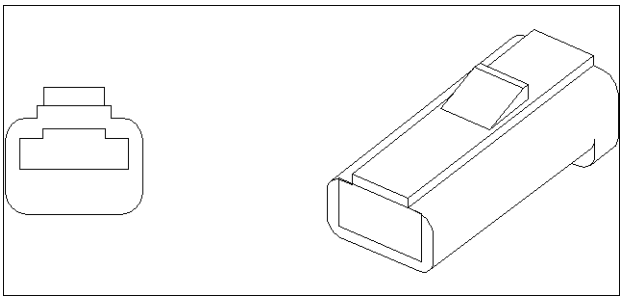
CONNECTOR X-268A - X-268A			
PIN NUMBER	**WIRE NUMBER**	**CIRCUIT REFERENCE**	**ELECTRICAL SCHEMATIC FRAME**
1	727C (PK)	LOW BEAM DIMMING	



87693717 10

CONNECTOR X-268B

CONNECTOR X-268B - X-268B			
PIN NUMBER	**WIRE NUMBER**	**CIRCUIT REFERENCE**	**ELECTRICAL SCHEMATIC FRAME**
1	728A (PK) 728B (PK)	LOW BEAM LOW BEAM B+	

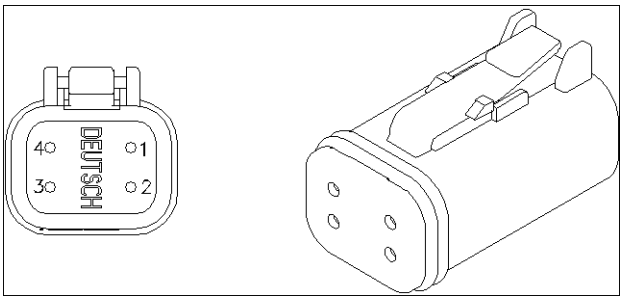


87688695 11

Connector - Component diagram 34

CONNECTOR X-340

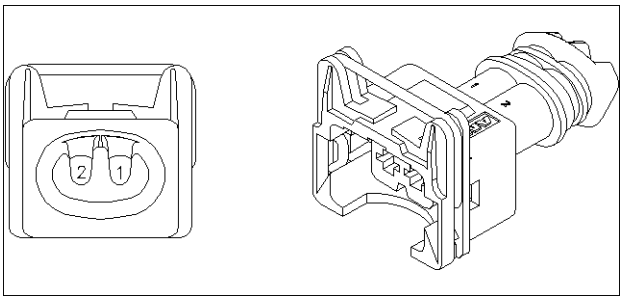
CONNECTOR X-340 - REMOTE VALVE #6			
PIN NUMBER	**WIRE NUMBER**	**CIRCUIT REFERENCE**	**ELECTRICAL SCHEMATIC FRAME**
1	900P (RD)	SW B+	
2	111A (GN)	CAN LO (SEC)	
3	110A (YE)	CAN HI (SEC)	
4	179FH (BK)	CLEAN GROUND	



87694153 1

CONNECTOR X-436

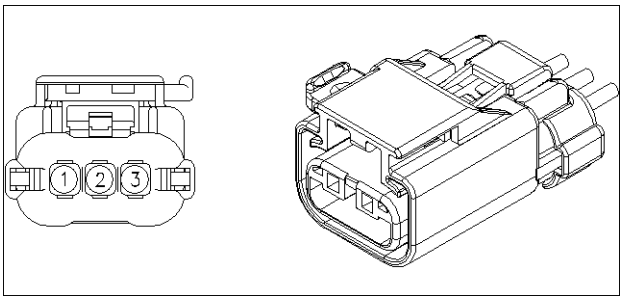
CONNECTOR X-436 - SYSTEM PRESSURE			
PIN NUMBER	**WIRE NUMBER**	**CIRCUIT REFERENCE**	**ELECTRICAL SCHEMATIC FRAME**
1	854A (TN)	SYSTEM PRESSURE HIGH	
2	855A (BK)	SYSTEM PRESSURE LOW	



84607243 7

CONNECTOR X-439

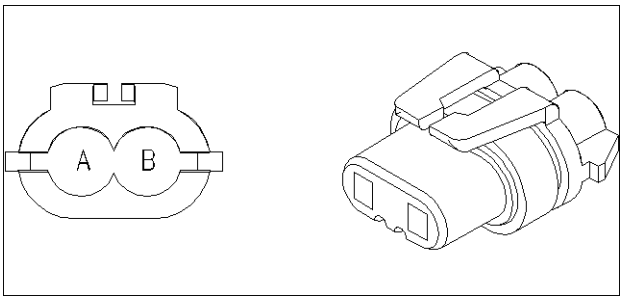
CONNECTOR X-439 - TO STEER ANGLE SEN HARNESS			
PIN NUMBER	**WIRE NUMBER**	**CIRCUIT REFERENCE**	**ELECTRICAL SCHEMATIC FRAME**
1	919C (RD) 919D (RD)	+5V REF OUT +5V REF STEER (TERRA)	
2	181G (BK) 517E (BK)	SENSOR GROUND CLEAN GROUND (TERRA)	
3	417L (BL) 417M (BL)	STEER ANGLE SENSOR SIG STEER SEN SIG (TERRA)	



87382910 8

CONNECTOR X-1234

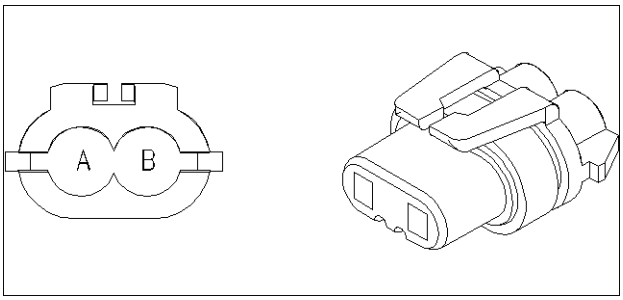
CONNECTOR X-1234 - RIGHT HAND HIGH BEAM			
PIN NUMBER	**WIRE NUMBER**	**CIRCUIT REFERENCE**	**ELECTRICAL SCHEMATIC FRAME**
A	743A (BL)	LEFT HIGH BEAM B+	
B	170DC (BK)	CHASSIS GROUND	



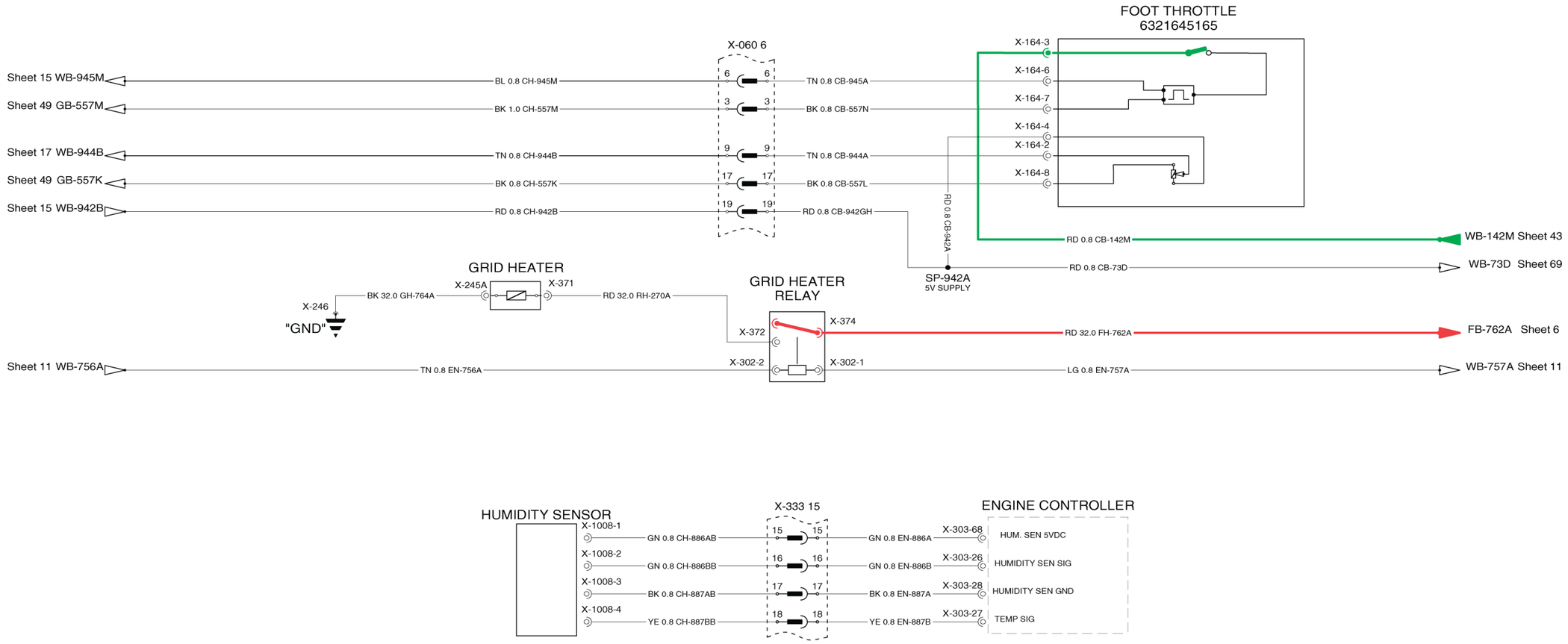
87686685 17

CONNECTOR X-1235

CONNECTOR X-1235 - LEFT HAND HIGH BEAM			
PIN NUMBER	**WIRE NUMBER**	**CIRCUIT REFERENCE**	**ELECTRICAL SCHEMATIC FRAME**
A	741A (BL)	RIGHT HIGH BEAM B+	
B	170DE (BK)	CHASSIS GROUND	



87686685 18



ELECTRONIC ENGINE

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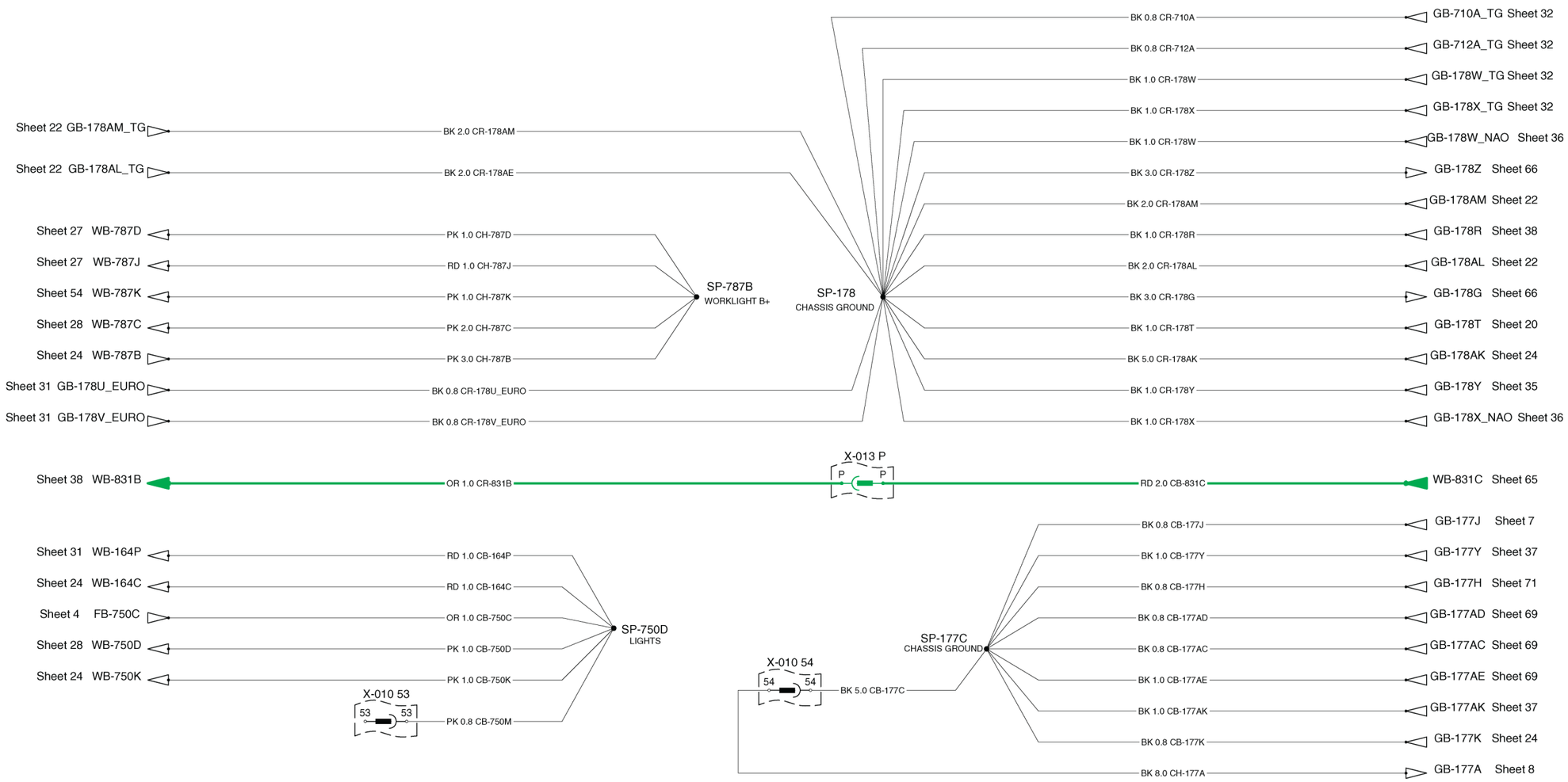
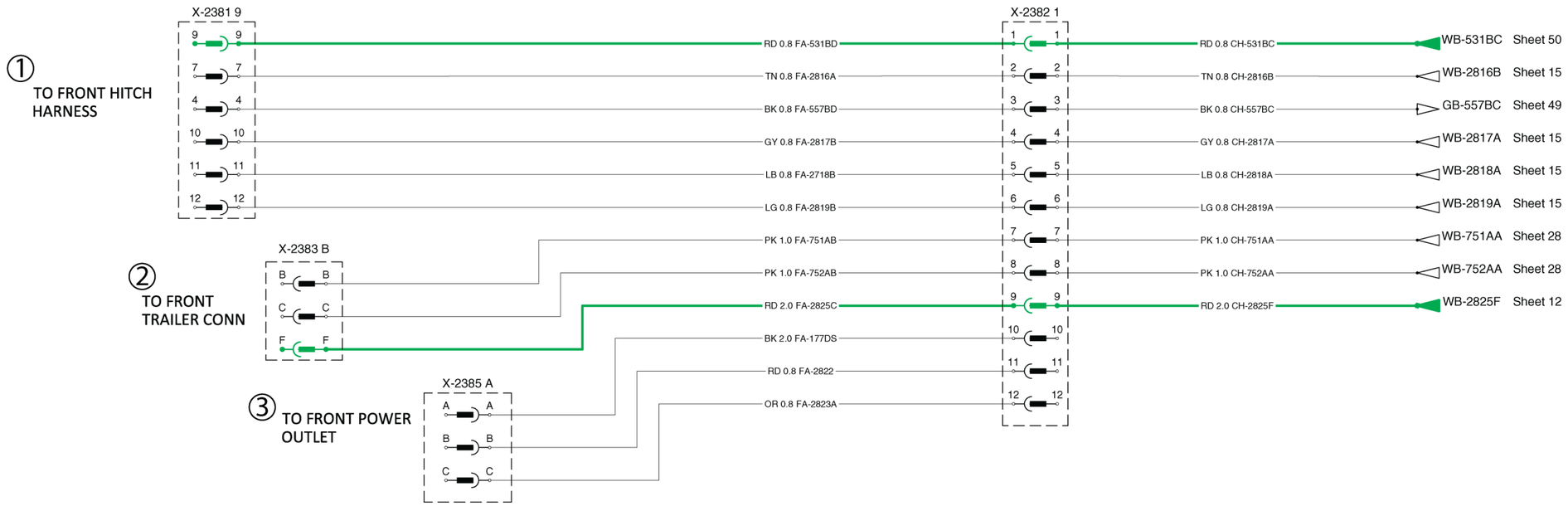


ROOF WARNING LIGHTS

26

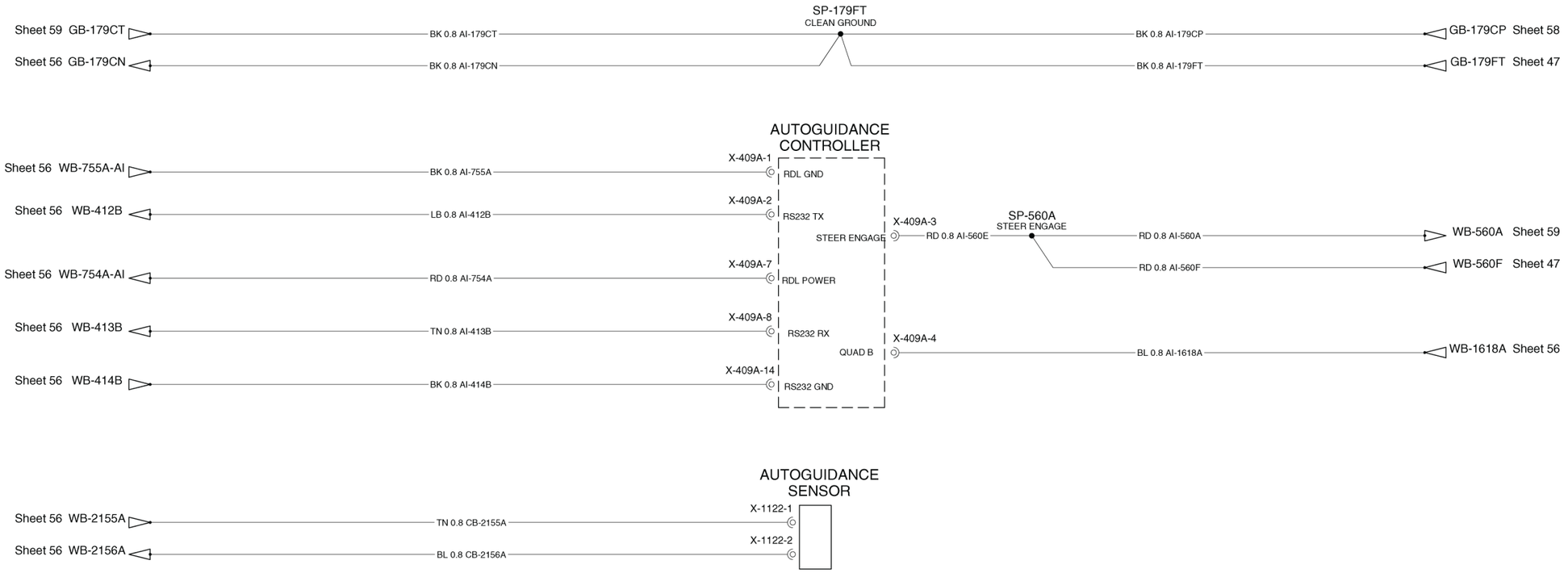
RCIL11CCH026JAA 1



FRONT AUX

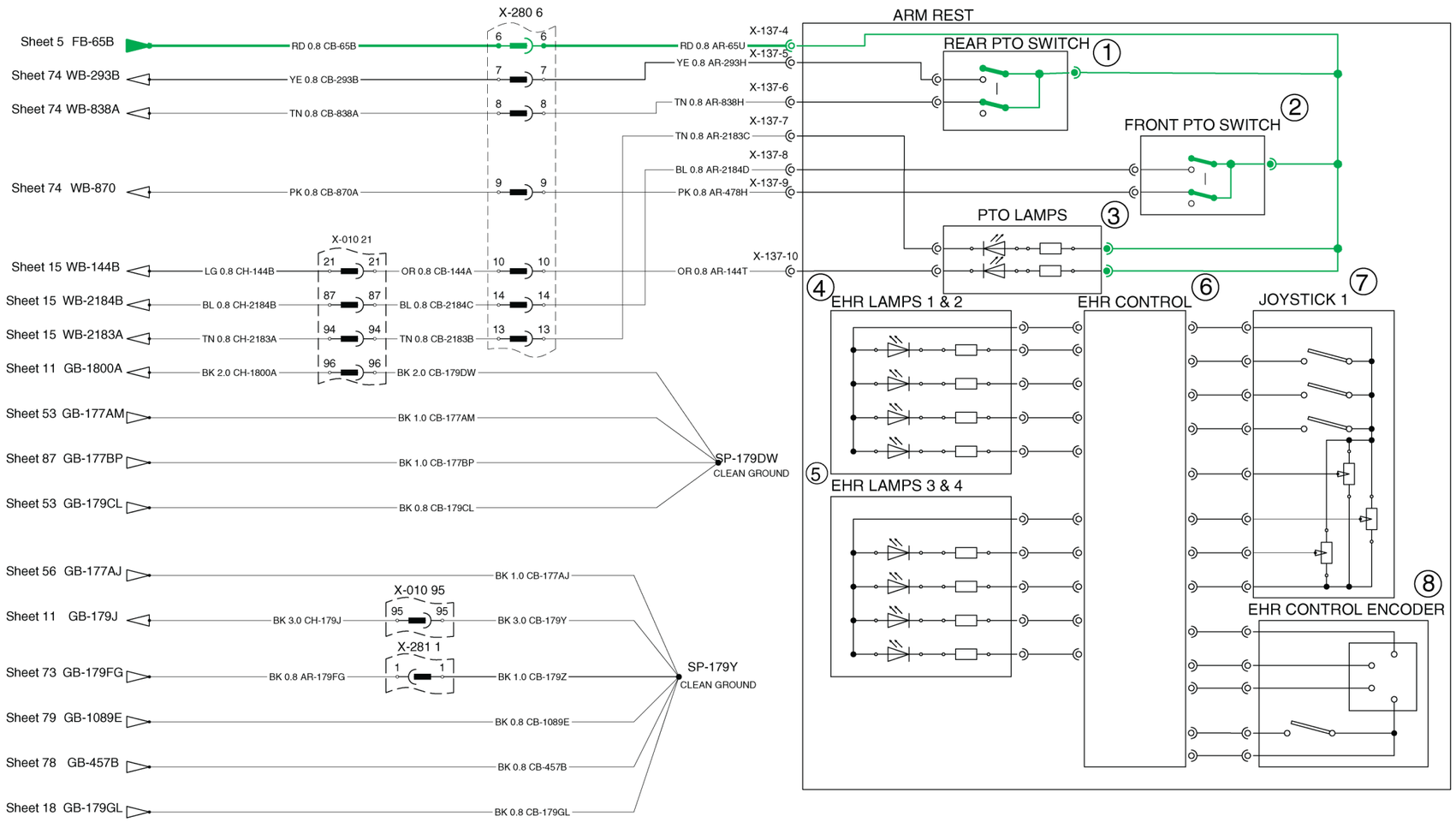
42

RCIL11CCH042JAA 1



INSIDE AUTOGUIDANCE 57

RCIL11CCH057JAA 1



ARMREST

72

RCIL11CCH072JAA 1

Wiring harness - Electrical schematic frame 94 - Harness/cable index

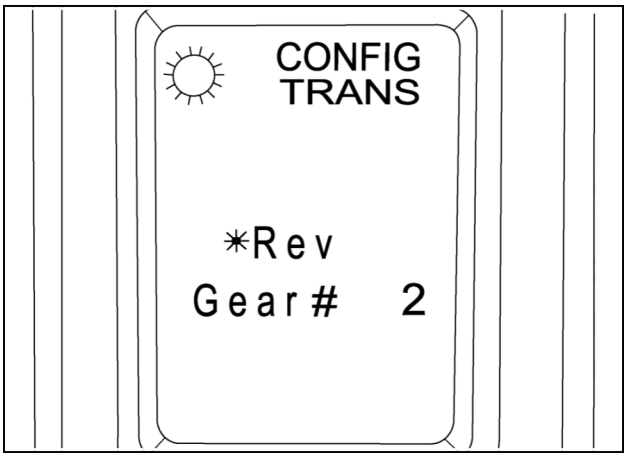
Harness description	Part number	Revision level
Chassis	84395680	A
Cab — Magnum series NAO/EURO	84395681	A
Cab — T8. series NAO/EURO	84395682	A
Flasher	84268097	A
Engine main — Magnum/T8. series	84395683	A
Alternator — Magnum/T8. series	84277469	A
Clutch ground — Magnum/T8. series	87709006	A
Aux — Magnum/T8. series	84345143	B
Headlight — Magnum series	84276563	A
Head lamp— T8. series NAO	84275443	A
Head lamp — T8. series EURO	84275444	A
Secondary can bus	87550664	A
Second can diagnostic	87597892	A
Can Terminator	84127542	A
SWCD	87485778	A
Autoguidance outside	84354221	A
ISO outside	84345147	B
Adapter, 7-pin — NAO (trailer)	84275748	A
Adapter, 7-pin — EURO (trailer)	84275750	A
Backup alarm	87525466	A
Inside autoguidance	84291797	C
Terminal (CODI)	87671834	A
Shelf	87414960	A
Cab roof — Magnum series NAO	87657275	A
Cab roof — Magnum series EURO	87657276	A
Cab roof — T8. series NAO & EURO	84395689	A
Front aux	84345144	A
Front pto	84395692	A
Suspended axle scissor	84354222	A
Suspended axle saddle	84354223	A
Right fender — EURO	84296561	A
Left fender — EURO	84296563	A
Left fender — NAO	84296562	A
Autoguidance antenna (GPS)	84345145	A
Armrest without motor	84350566	A
Armrest with motor	84368485	A
EDC link	84296631	A
Steer sensor class 5	84354317	A
Steer sensor non class 5	84354318	A
Aux headlight	84350131	A
Fuse box	84395703	A
Aux power negative cable	84277834	A
Aux power positive cable	84277835	A
Battery positive cable — Magnum/T8. series	84345146	B
Battery negative cable — Magnum/T8. series	8435227	B
Battery pos to cuttoff sw — Magnum/T8. series	84395697	A
Battery cutoff to starter — Magnum/T8. series	84355762	B
Starter to int start relay cable — Magnum/T8. series	87527710	A
Grid heater ground cable — Magnum/T8. series	84345148	A
Relay to heater cable — Magnum/T8. series	84345149	B
Fuse to heater relay cable — Magnum/T8. series	84345151	A
Alternator cable	84355737	B

7. The *Rev (reverse) Gear # screen displays, indicating the current setting for the default reverse gear.

Press the INCR key (INCR) to select a new higher default reverse gear. Gears 1-4 may be selected as the default reverse gear.
OR

Press the DECR key (DECR) to select a new lower default reverse gear.

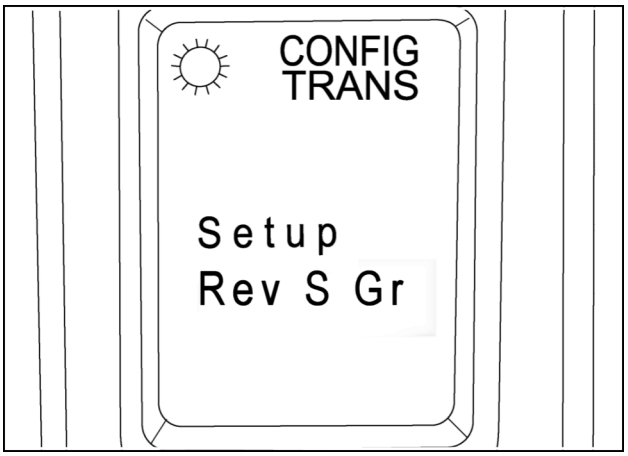
Press the PROG key (PROG) to save the new selection and advance to the next menu.



RCPH08CCH050BAA 29

8. The Setup Rev S Gr (reverse shuttle gear) screen displays.

Press the PROG key (PROG) to view current default gear setting for reverse shuttle shifting

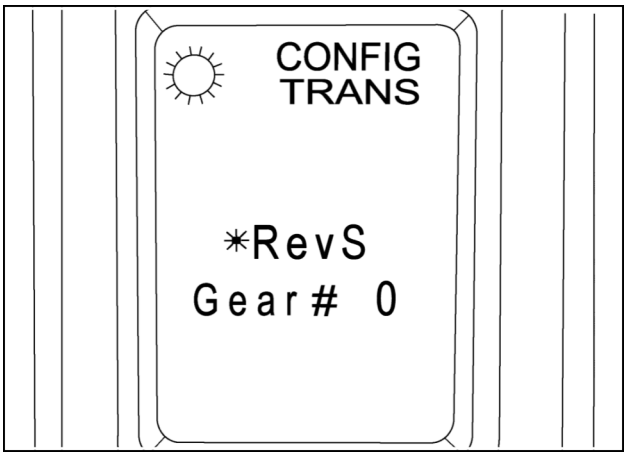


RCPH08CCH055BAA 30

9. The *RevS Gear # screen displays, indicating the current setting for the default reverse shuttle gear. The 0 (zero) setting indicates that the default reverse shuttle gear is the last reverse gear used.

Press the INCR key (INCR) to select a different default reverse shuttle gear. Gears 1-4 or 0 (zero) for the last gear used may be selected as the default reverse shuttle gear.

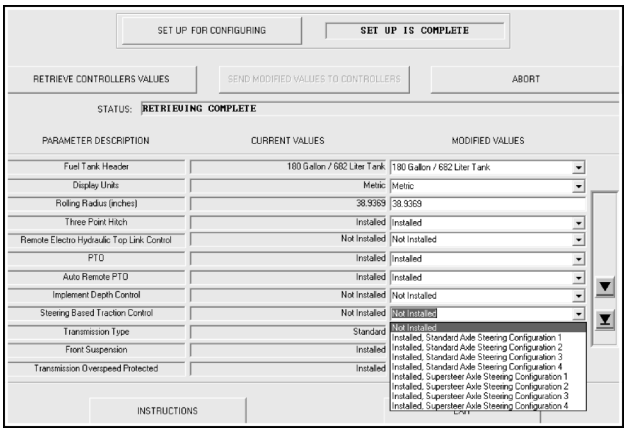
Press the PROG key (PROG) to save the new selection and advance to the next menu.



RCPH08CCH056BAA 31

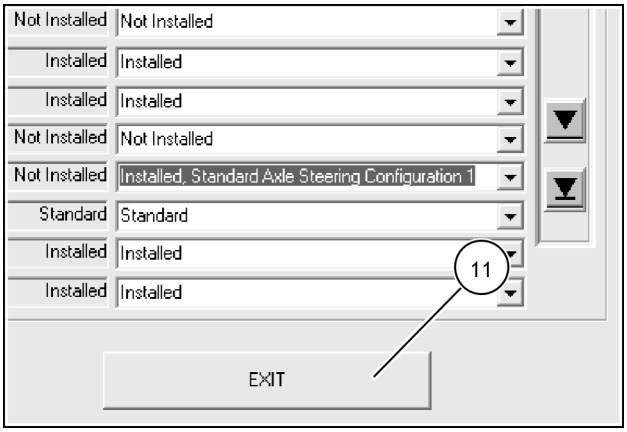
9. A drop down list displays.

10. Select a steering angle configuration for the correct front axle on the vehicle. Consult the tables below for the angle values associated with the settings. Selecting an option on the Steering active differential lock table selects the corresponding option on the steering active MFD table.



RCPH08CCH108FBC 13

11. Press the EXIT **(11)** button to save the setting.



RCPH08CCH109ABC 14

Automatic MFD steering angle limit				
Tractor speed	**0 - 15 km/h (0 - 9.0 mph)**		**15 - 20 km/h (9 - 12 mph)**	
MFD steering angle limit	**Degrees left**	**Degrees right**	**Degrees left**	**Degrees right**
Option 0	30	26.25	25	22.5
Option 1	45	37.5	40	34
Option 2	20	18.5	15	14.25
Option 3	15	14.25	15	14.25

Automatic differential lock steering angle limits				
Tractor speed	**0 - 10 km/h (0 - 6 mph)**		**10 - 15 km/h (6 - 9 mph)**	
Differential lock steering angle limit	**Degrees left**	**Degrees right**	**Degrees left**	**Degrees right**
Option 0	20	18.5	10	9.5
Option 1	20	18.5	10	9.5
Option 2	15	14.25	10	9.5
Option 3	10	9.5	10	9.5

10002-Front suspension rod-side solenoid valve open circuit or short to ground

Cause:
The front suspension rod solenoid or the wiring to the solenoid has an open circuit or is shorted to ground.

Possible failure modes:

1. Front suspension rod solenoid has an internal open circuit.
2. Wiring from the tractor control unit (TCU) to the front suspension rod solenoid has an open circuit or is shorted to ground.

Solution:

1. Check connector **X-486** to the rod solenoid and connector **X-350** to the tractor control unit (TCU).

   Check that the connectors are not damaged, the pins are in the correct position and that the fit is tight.

   A. Connectors are damaged or loose. Repair or replace as required. Return unit to field operation.

   B. Connectors are okay. Continue to step **2**.
2. Check the rod solenoid.

   Disconnect connector **X-486** from the rod solenoid.

   Measure resistance through the solenoid between the terminals 1 and 2.

   Expected reading is about **8.0 Ω**.

   A. Resistance reading incorrect. Remove and replace the pump/not tank solenoid. Return unit to field operation.

   B. Resistance reading correct. Continue to step **3**.
3. Check for an open circuit.

   Disconnect connector **X-350** from the tractor control unit (TCU).

   Measure resistance between connector **X-486** pin 1 at the solenoid and connector **X-350** pin 24.

   Measure resistance between connector **X-486** pin 2 and ground.

   Expected resistance is less than **1 Ω**: infinite resistance or overload indicate an open circuit.

   Check for an open circuit.

   A. Open circuit found. Repair or replace the harness as required. Return unit to field operation.

   B. Open circuit not found. Continue to step **4**.
4. Check for a short circuit in harness.

   Measure resistance between connector **X-486** pins 1 and 2 at the solenoid.

   Expected reading is no continuity.

   A. Continuity found. Repair or replace the harness as required. Return unit to field operation.

   B. Continuity not found. Continue to step **5**.
5. Check for a short to ground.

   Measure resistance between connector **X-486** pin 1 and ground.

B. Expected reading found. Download the correct level of software. If the fault reoccurs, submit a concern to ASIST.

Wiring harness - Electrical schematic frame 13 (A.30.A.88-C.20.E.13)
Wiring harness - Electrical schematic frame 44 (A.30.A.88-C.20.E.44)

1036-The armrest control module indicates the inching up switch is faulty or not available

Cause:
The data bus signaled that the hitch inching up switch has failed. The tractor control unit (TCU) received the signal from the armrest control module.

Possible failure modes:

1. The inching up switch has failed.
2. Software execution error in armrest controller.

Solution:

1. Use the electronic service tool (EST) monitor capabilities to check the armrest inching up switch status.
   A. Electronic service tool (EST) monitor confirms switch failure. Replace switch.
   B. Electronic service tool (EST) monitor does not confirms switch failure. Erase fault code. Switch fault may be intermittent. If fault reoccurs replace switch.

1104-12VU1 voltage supply to the Electronic draft control lift link raise and lower coils is below 8 volts

Cause:
The 12VU voltage is monitored and is consistently less than **8 V**.

Possible failure modes:

1. Battery voltage is lower than **8.0 V**.
2. Controller 12VU1 power or ground problem.
3. Alternator regulator is malfunctioning.

Solution:

1. Tractor running, use the tractor display to check the battery voltage.
   A. Battery voltage is below **11.0 V**. See alternator testing and battery testing in service manual.
   B. Battery voltage is **12 - 14 V**, continue to step **2**
2. Check tractor control unit (TCU) fuse 28.
   A. Blown fuse located and replaced, continue field operation.
   B. Fuse is appear okay, display battery voltage is still **12 - 14 V**continue field operation and monitor fault code activity.

Wiring harness - Electrical schematic frame 77 (A.30.A.88-C.20.E.77)

14015-Engine intake air temperature sensor error

Cause:
Engine intake manifold temperature data is “ERROR” or “NOT AVAILABLE” state from GOV for 5 seconds.

Possible failure modes:

1. Controller communication error
2. Faulty engine intake air temperature sensor

Solution:

1. Check for other active codes related to CAN communication problems with the tractor control unit (TCU).

   A. Other active CAN related errors found. Resolve those faults first.

   B. Other active CAN related errors not found. Continue to step **2**.

2. Ensure the engine intake air temperature sensor connector is secured properly. Check for damage, loose connections or broken can bus wires.

   Check the engine intake air temperature sensor connector.

   Check if the connector is damaged, if the pins are in the correct position and that the fit is tight.

   A. Loose or damaged connector found.Tighten, repair or replace as required.

   B. Loose or damaged connector not found. Contact ASIST before replacing any components.

18023-Rear hitch sensitivity control potentiometer - voltage too high

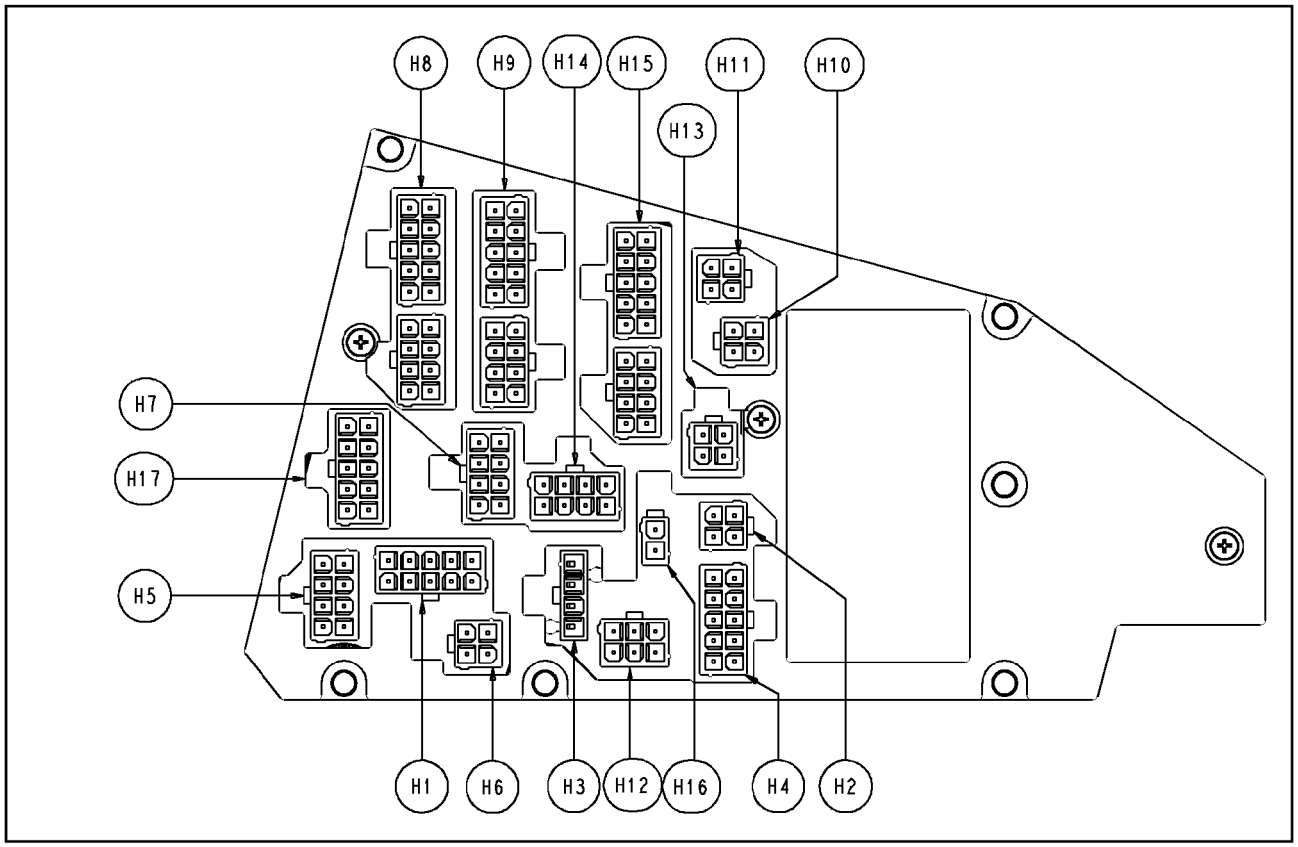
Cause:
Voltage from sensor too high (above **4.8 V**) as measured at armrest controller.

Possible failure modes:

1. Faulty connector
2. Faulty draft sensitivity control potentiometer
3. Faulty harness
4. Faulty controller

Solution:

1. Check if the fault code is still active. Clear all fault codes. Operate the tractor under normal conditions.
   A. Fault code does not redisplay. Return unit to field operation and monitor for continuing problems.
   B. Fault code redisplays. Continue to step **2**.
2. Use the monitor screen function on the electronic service tool (EST) to check operation of the draft sensitivity control potentiometer. Refer to the EST user guide.
   A. Draft sensitivity control potentiometer not operating correctly. Continue with step **3**.
   B. Draft sensitivity control potentiometer operating correctly. Return unit to field operation and monitor operation.
3. Check the draft sensitivity control potentiometer.



RCIL09CCH021FAE 1

Remove the four screws to remove the hitch control panel in the armrest compartment and access the armrest controller.

18049-Joystick 1 X-axis position - voltage too low

NOTE: *When the cause of the error code has been rectified, clear the error code and test the system for normal operation.*

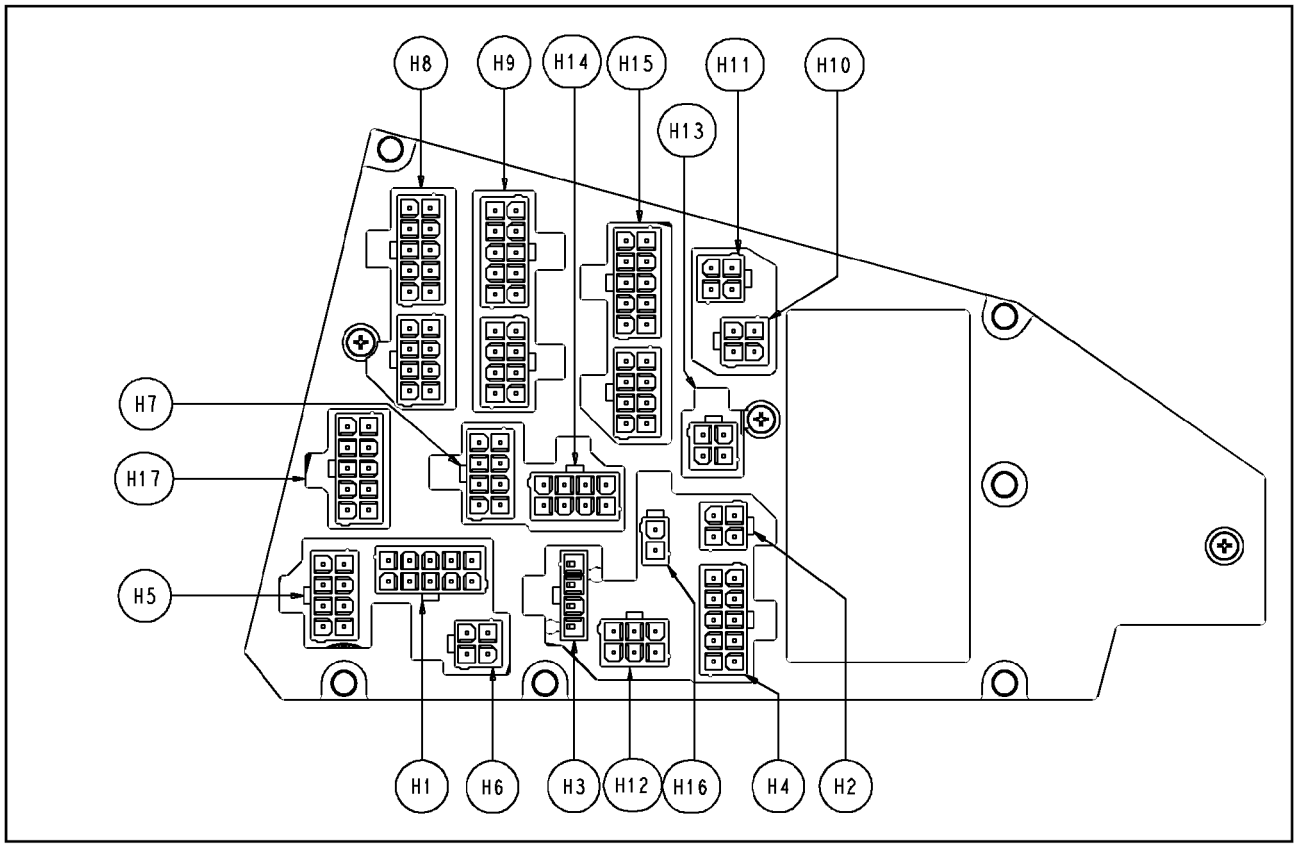
Cause:
Voltage from sensor too low (below **0.2 V**) as measured inside the armrest by the control module

Possible failure modes:

1. Faulty joystick 1
2. Incorrect armrest configuration
3. Faulty connector
4. Swapped connectors
5. Faulty armrest controller

Solution:

1. Check if the fault code is still active. Clear all fault codes. Operate the tractor under normal conditions.
   A. Fault code does not redisplay. Return unit to field operation and monitor for continuing problems.
   B. Fault code redisplays. Continue to step **2**.
2. Use the monitor screen function on the electronic service tool (EST) to check the joystick X-axis operation. Refer to the EST user guide.
   A. Joystick X-axis not operating correctly. Continue with step **3**.
   B. Joystick X-axis operating correctly. Return unit to field operation and monitor for problem.
3. Check the armrest controller connectors.



RCIL09CCH021FAE 1

Remove the four screws to remove the hitch control panel in the armrest compartment and access the armrest controller.

Check connector H8 for remote levers 1 and 2.

Check that the connector is not damaged, the pins are in the correct position and that the fit is tight.

Check the harness wires for damage.

A. Connection or damage problem found. Tighten, repair or replace as required. Return unit to field operation.

B. Connection or damage problem not found. Continue with step **4**.

4. Check the armrest controller configuration.

   Check the armrest controller has been configured correctly with the EST. The controller must be configured for the options installed on the tractor.

   A. Controller not configured correctly. Configure the armrest controller correctly. Return unit to field operation.

   B. Controller configured correctly. Continue to step **5**.

5. Check if other armrest related error codes are active.

   A. Other 18000 series fault codes are active. Replace the armrest controller. Configure the armrest controller. Return unit to field operation.

   B. Other 18000 series fault codes are not active. Continue with step **6**.

6. Replace the remote lever assembly.

   Test system operation.

   A. Fault code does not redisplay. Return unit to field operation.

   B. Fault code redisplays. Replace the armrest controller. Configure the armrest controller. Return unit to field operation.

19091-Monitoring VDD11/VDD25 voltage - dosing valve/pump motor - supply voltage VD11 low - P0659 12 volt supply for dosing module - below lower limit

Possible failure modes:

1. Problem with battery or charging system.
2. Denox module/supply module internal failure.

Solution:

1. Tractor running, use the tractor display to check the battery voltage.
   A. Battery voltage is below **11 V**. Test the alternator and the battery.
   B. Battery voltage is **12 - 14 V**, continue to step **2**
2. Delete fault code. If the fault code continually reoccurs replace the denox module/supply module.

19344-Coolant control valve mechanically - mechanical defective blocked closed - P20A0 vent valve (reductant purge control valve) - open circuit

Context:
The dosing control unit (DCU) has detected a open circuit. If at normal operating speed the AdBlue™/DEF pressure is greater than **450 kPa**, and the cooling valve is open from **0 - 100 %**, the AdBlue™/DEF pressure must drop at least **15 kPa** within **2 s**. Ensure all connections and connectors are secured to the DCU properly. If error is still present, there is an internal failure of the box. Replace the DCU.

19721-EEPROM / checksum failures - EEPROM write error - P062F internal control module EEPROM error

Context:
The denox module/supply module has suffered a detection error. This error indicates a defect in the dataset that is presently loaded in the denox module/supply module. If this error is present and active, reload the software dataset. If this error then reoccurs, replace the denox module/supply module.

2012-Clutch potentiometer short to 12 volts or short to 5 volt reference

Cause:
Voltage at the potentiometer wiper is greater than **4.83 V**.

Possible failure modes:

1. Faulty connector
2. Faulty clutch pedal potentiometer
3. Faulty harness
4. Faulty tractor control unit (TCU)

Solution:

1. Check the clutch pedal potentiometer function using the electronic service tool (EST) system monitor screen.
   A. Operate the clutch pedal. If the pedal percentage values and voltage displayed do not change continuously as pedal is depressed, continue to step **2**
   B. If the values displayed are okay, while in monitor mode wiggle the harness and the connectors to check for an intermittent circuit. Values will change if an intermittent circuit is detected, repair or replace as required.
2. Check the clutch pedal potentiometer connector **X-052** and the tractor control unit (TCU) connector **X-350** and **X-355**.
   A. Ensure the connectors are connected, not damaged, the pins are in the correct position and that the fit is tight. Repair or replace as required.
   B. If the connectors are okay, continue to step **3**
3. Check the clutch pedal potentiometer.
   A. Disconnect connector **X-052**. While operating the clutch pedal, measure the resistance between the component side of connector:
   X-052 pin A and **X-052** pin C should indicate approximately **4.0K Ohms** at all pedal positions
   X-052 pin A and **X-052** pin B should indicate a steady resistance increase from between approximately **1.3K Ohms** with the pedal released to **3.5 K Ohms** with the pedal depressed.
   If the resistances indicated are not okay, remove and replace the clutch pedal potentiometer.
   B. If the clutch pedal potentiometer is okay, continue to step **4**
4. Check for **5 V**.
   A. Turn the ignition switch ON. Measure the voltage between connector **X-052** pin C and ground. If the voltage indicated is not approximately **5 V**, repair or replace the harness as required.
   B. If the voltage indicated is approximately **5 V**, continue to step **5**
5. Check for an open circuit.
   A. Turn the ignition switch OFF. Disconnect the tractor control unit (TCU) connector **X-355**. Check between connector:
   X-052 pin B and **X-355** pin 23
   X-052 pin C and ground
   If an open circuit is indicated, repair or replace the harness as required
   B. If an open circuit is not indicated, continue to step **6**
6. Check for a short to +Ve voltage. Disconnect connector **X-052** from clutch potentiometer.
   A. Turn the ignition switch ON. Measure the voltage between connector **X-052** pin B and ground. If a voltage is indicated, repair or replace the harness as required.

2347-Low range clutch solenoid - open circuit or short circuit to ground

NOTE: *When the cause of the error code has been rectified, clear the error code and test the system for normal operation.*

Cause:
The high side driver PWM duty cycle is above **20 %** AND the current is less than 9.8 milliamps for 100 milliseconds.

Possible failure modes:

1. Faulty connector
2. Faulty solenoid
3. Faulty harness
4. Faulty tractor control unit (TCU)

Solution:

1. Check low clutch solenoid connector **X-036** and tractor control unit (TCU) connector **X-490**.
   A. Ensure the connectors are connected, not damaged, the pins are in the correct position and that the fit is tight. Repair or replace as required.
   B. If the connectors are okay, continue to step **2**
2. Check the low clutch solenoid.
   A. Disconnect connector **X-036** . Measure the resistance between the solenoid terminals:
   Terminal 1 and terminal 2
   If the resistance indicated is not between **9 - 11 Ohms** remove and replace the low clutch solenoid.
   B. If low clutch solenoid is okay, continue to step **3**
3. Check for an open circuit.
   A. Disconnect connector **X-490** from the tractor control unit (TCU). Check between connector:
   X-036 pin 1 and **X-490** pin 5
   X-036 pin 2 and ground
   If an open circuit is indicated, repair or replace the harness as required.
   B. If an open circuit is not indicated, continue to step **4**
4. Check for a short circuit in harness.
   A. Check between harness end connector:
   X-036 pin 1 and **X-036** pin 2
   If a short circuit is indicated, repair or replace the harness as required
   B. If a short circuit is not indicated continue to step **5**
5. Check for a short to ground.
   A. Check between connector:
   X-036 pin 1 and ground
   If a short to ground is indicated, repair or replace the harness as required.
   B. If the harness is okay, download the correct level of software. If the fault re-occurs, remove and replace the tractor control unit (TCU).

Wiring harness - Electrical schematic frame 16 (A.30.A.88-C.20.E.16)

2811-Transmission oil temperature hot

Cause:
The transmission oil temperature was above **122 °C** (**251.6 °F**) for 2 seconds.

Possible failure modes:

1. Air flow through radiator/oil cooler is blocked.
2. Low coolant level.

Solution:

1. Clear all debris from the radiator/oil cooler intake. Check the coolant level.
   A. Fault code re-diplays. Refer to appropriate repair manual for cooling system and fan diagnostics.
   B. Fault code does not re-display. Return unit to field operation.

3004-Engine hand throttle error received over the CAN bus

Cause:
Hand throttle position received over the CAN bus >250 or the hand throttle message has not been received from the armrest for 2.5 seconds.

Possible failure modes:

1. Faulty connector
2. Faulty foot throttle pedal
3. Faulty harness
4. Faulty controller

Solution:

1. Use the electronic service tool (EST) monitor screen function to check the foot throttle potentiometer (accelerator pedal position-ECM). Refer to the electronic service tool (EST) user guide.

   A. Operate the foot throttle pedal. If the values displayed do not change continuously, continue to step **2**

   B. If the values displayed are okay, while in monitor mode wiggle the harness, the foot throttle connector **X-164** and the controller connector **X-442** to check for an intermittent circuit. If an intermittent circuit is detected, repair or replace as required.
2. Check the foot throttle connector **X-164** and the controller connector **X-442**.

   A. Ensure the connectors are connected, not damaged, the pins are in the correct position and that the fit is tight. Repair or replace as required.

   B. If the connectors are okay, continue to step **3**
3. Check for **5 Volts**.

   A. Disconnect connector **X-164**. Turn the ignition switch ON. Measure the voltage between connector **X-164** pin 4 and ground. If the voltage indicated is not approximately **5 Volts**, repair or replace the harness as required.

   B. If the voltage indicated is approximately **5 Volts**, continue to step **4**
4. Check for an open circuit ground circuit.

   A. Turn the ignition switch OFF. Check between connector **X-164** pin 8 and ground. If an open circuit is indicated, repair or replace the harness as required

   B. If an open circuit is not indicated, continue to step **5**
5. Check for an open circuit.

   A. Disconnect the tractor control unit (TCU) connector X-442. Check between connector **X-442** pin 24 and **X-164** pin 2 . If an open circuit is indicated, repair or replace the harness as required

   B. If an open circuit is not indicated, continue to step **6**
6. Check for a short to ground.

   A. Check between connector **X-164** pin 2 and ground. If a short to ground is indicated, repair or replace the harness as required.

   B. If a short to ground is not indicated, continue to step **7**
7. Check for a short to Ve Voltage.

   A. Turn the ignition switch ON. Measure the voltage between connector **X-164** pin 2 and ground. If a voltage greater than **4.5 V** is indicated, repair or replace the harness as required.

Wiring harness - Electrical schematic frame 11 (A.30.A.88-C.20.E.11)

3075-Cylinder 6 - Injector Cable Short Circuit (High Side To Ground)

NOTE: *This diagnostic procedure requires a good quality Digital Multi-meter (DMM) to be able to take accurate resistance measurements. The meter should be able to measure to a resolution of* ***0.1 ohms****. Some of the measurements required to be taken, could be as low as* ***0.4 ohms*** *(typical injector solenoid coil resistance is* ***0.4 - 0.5 Ω****) and any inaccuracies in the DMM could cause a technician to take the wrong diagnostic path.*

NOTE: *Make sure that the multi-meter's test lead resistance is taken into account when resistance measurements are taken. Record the multi-meter's test lead resistance by touching the leads together on the lowest Ohms scale and mentally recording the resistance value. Subtract this value from the actual resistance measurement taken.*

Context:
The engine control unit (ECU) has determined that a short circuit exists in the high side injector circuit for cylinder 6. A power stage component energizes the injection system transistors and simultaneously observes the current flow in the high-side and low-side switching branch by sensing resistors. If there is a deviation from the expected current flow the component detects specific errors and reports them to the ECU. This error message is then rearranged so it holds information on performed injections, errors of cylinders on the same bank, bank specific errors and cylinder specific errors. The rearranged error message is then compared to applicable error patterns and if there is a match the failure corresponding to the matched pattern is output. If an error message doesn't match any pattern the defect is treated as an unclassifiable error. Monitoring is performed once per camshaft revolution. This error is the result of a short circuit of the high side to the low side or ground over 3 camshaft revolutions. As a result of this error an individual cylinder or bank is shut off, based on parameters established in the ECU. Certain parameters, as currently applied, are permanent (without a healing possibility, once tested by switching on the component to see if the defect is still present). and others evoke an irreversible or reversible shut off of the engine to be executed.

Cause:
The Engine Control Unit (ECU) has determined that there is a fault associated with the current monitoring of the injector output power driver stage.

Possible failure modes:

1. Faulty injection valve or shorted solenoid windings.
2. Faulty electrical wiring, short high side to low side or ground (damaged wiring harness).
3. Faulty ECU, hardware or software.

Solution:

1. Verify this error code is still present and in an active state.
   A. If the error is still present and active, continue with step **2**.
   B. If the error is no longer present or is in an inactive state, continue with step **8**.
2. Carefully disconnect the engine cylinder harness from the ECU at ECU cylinder harness connector. Use a multi-meter to check the resistance, on the cylinder harness side of connector. There should be **0.4 - 0.5 Ω**.
   A. If the resistance was within range, leave ECU cylinder connector disconnected and continue with step **3**
   B. If the resistance was lower than range minimum, continue with step **6**.
3. Use a multi-meter to check for continuity, on the ECU cylinder harness side of connector to chassis ground. There should not be continuity.
   A. If there was continuity on either or both pins to chassis ground, continue with step **4**
   B. If there was no continuity on either pin to chassis ground, the ECU may have failed. Try reloading the ECU software and if the fault reoccurs, replace the ECU .
4. Disconnect the engine cylinder harness from the injector (valve) cover at connector . Use a multi-meter to check for continuity, on the injector (valve) cover side of connector, from pin A to chassis ground and pin B to chassis ground. There should not be continuity.

3104-Rail Pressure Relief Valve - Open

Context:
The engine control unit (ECU) has determined that the Pressure Relief Valve (PRV) is open. Normally the fuel pressure in the rail is regulated by the metering unit of the high pressure pump. However, if this component is malfunctioning the rail pressure can rise to critical levels. For this reason the common rail has a Pressure Relief Valve (PRV) which is a mechanical safety valve (no electrical connectors) that opens at a certain pressure level. An opening of the PRV is detected by evaluating the gradient of the rail pressure (calculated by the ECU). If the PRV does not open on its own after exceeding the pressure threshold it can also be forced open by a so-called 'kickoff' or pressure shock when the metering valve of the high pressure fuel pump is set to maximum possible quantity. Once the PRV has been opened it will remain open as long as the engine is running. A defective common rail pressure sensor, as judged by the ECU, which evokes a kickoff (pressure shock) or a defect in an injection relevant component (small leak) can cause this error to occur. This fault will only be cleared after an ECU reset.

Possible failure modes:

1. Faulty Rail Pressure sensor, signal not plausible.
2. Faulty common rail fuel system, small leak.
3. Faulty ECU, hardware or software.

Solution:

1. Use electronic service tool (EST) to check for other Rail Pressure sensor and injector (cylinder or bank) errors.
   A. If Rail Pressure sensor or injector errors exist, follow troubleshooting procedure for existing Rail Pressure sensor or injector error.
   B. If no Rail Pressure sensor or injector errors exist, continue with step **2**
2. Check common rail fuel system for leaks.
   A. If common rail fuel system leak is found, repair as required.
   B. If no common rail fuel system leak is found, continue with step **3**
3. Visually inspect sensor connector and ECU connector for electrical integrity.
   A. If damage or connectivity issues are discovered, repair, clean or replace as required.
   B. If no damage or connectivity issues are discovered, replace Rail Pressure sensor and restart engine. If error reoccurs continue with step **4**
4. Visually inspect injector connectors for electrical integrity.
   A. If damage or connectivity issues are discovered, repair, clean or replace as required.
   B. If no damage or connectivity issues are discovered, continue with step **5**
5. Reload ECU software.
   A. If error reoccurs after trying to reload software, replace ECU.
   B. If error has been resolved, continue with normal operation of machine.

A. If damage is found or other than normal display readings are indicated, repair the damage discovered during the inspection or locate and repair the other than normal display condition and verify that the error has been resolved.

B. If no damage or other than normal display readings are indicated, erase the fault code and continue operation.

3265-Overrun Monitoring - Injection Time Too Long

Context:
The engine control unit (ECU) has detected that injection time is too long. The sum of all torque-forming energizing times of an individual cylinder exceeds the limit, calculated from the map (depending on the engine speed and the time since the overrun monitoring is active) for more than 100 test events (test frequency every **10 ms**). When the engine is in overrun operation the monitoring becomes active and the current injection energizing time is compared with a maximum permissible time limit. If the limit is exceeded an ECU recovery (reset) is triggered and if the error reoccurs in the same driving cycle, the torque-determining power stages are irreversibly shut off. The basic idea is that the operator reacts to an unintentional torque increase, caused by a malfunction of the ECU, by releasing the accelerator pedal (reducing engine speed) which causes the engine to enter the overrun operation mode. Overrun monitoring is only released if various conditions are met, such as no accelerator pedal activation, no activated cruise control, no intervention of the vehicle dynamic control or gearbox control is present, etc. This failure could be the result of electronic disturbances, a requested torque increase via tester, the wrong application of injection relevant parameters, or a defective ECU. If this failure persists, the ECU may need to be replaced.

3528-NOx sensor plausibility failure - signal not plausible

Context:
The engine control unit (ECU) has detected a fault with the NOx sensor. This fault is a result of an issue with the NOx sensor concentration value which is transmitted over a dedicated CAN to the ECU. This CAN network is made up of the NOx sensor, the ECU and a CAN terminator resistor.
Error detection and healing is disabled during following conditions: **6 s** after start of ECU initialization, during engine start and **6 s** after end of start state, if battery voltage is below **10.1 V** including **1 s** waiting time after voltage is above threshold, at least one CAN controller (CAN A, CAN B, CAN C) is in the bus-off state including a waiting time of **1 s** after bus is on again, the ECU is in the afterrun state. Monitoring is only active after the dew point detection has been sent.

4116-Rear remote no. 2 - EEPROM error

NOTE: *When the cause of the error code has been rectified, clear the error code and test the system for normal operation.*

Cause:
See above

Possible failure modes:

1. EEPROM error
2. Faulty EHR valve section

Solution:

1. Check for other active EHR error code(s).

   Make a note of the error code(s), clear the error code(s) and test the system for normal operation.

   A. Fault code does not re-display. Return unit to field operation and monitor.

   B. Fault codes re-displays. Continue to step **2**.
2. Download the correct level of software and configure the EHR valve.

   A. System operates normally: no fault codes display. Return unit to field operation.

   B. Fault codes re-displays. Install and configure a new EHR valve section.

4148-Rear remote no. 4 - spool movement too low

NOTE: *When the cause of the error code has been rectified, clear the error code and test the system for normal operation.*

Cause:
See above.

Possible failure modes:

1. Incorrect hydraulic pressure
2. Faulty EHR valve

Solution:

1. Check for other active EHR error code(s).

   Make a note of the error code(s), clear the error code(s) and test the system for normal operation.

   A. Fault code does not re-display. Return unit to field operation and monitor.

   B. Fault codes re-displays. Continue to step **2**.
2. Check the regulated circuit hydraulic pressures, for further information refer to hydraulic testing in service manual.

   A. If the pressures are incorrect, repair or replace component(s) as required.

   B. If the pressures are correct, continue to step **3**.
3. Download the correct level of software into the EHR valve and configure the EHR valve.

   Test valve operation.

   A. Fault code does not re-display. Return unit to field operation.

   B. Fault code re-displays. Install and configure a new EHR valve section.

4218-Rear remote no. 3 - spool not calibrated

NOTE: *When the cause of the error code has been rectified, clear the error code and test the system for normal operation.*

Possible failure modes:

1. EHR valve not calibrated
2. Faulty controller

Solution:

1. Calibrate the remote valve.

   Test valve operation.

   A. Fault code does not re-display. Return unit to field operation.

   B. Fault code re-displays. Continue with step **2**.
2. Repeat EHR valve calibration and test valve operation.

   A. Fault code does not re-display. Return unit to field operation.

   B. Fault code re-displays. Continue with step **3**.
3. Download the correct level of software.

   Repeat EHR valve and test valve operation.

   A. Fault code does not re-display. Return unit to field operation.

   B. Fault code re-displays. Continue with step **4**.
4. Replace the tractor control unit (TCU).

   Test valve operation.

   A. Fault code does not re-display. Return unit to field operation.

   B. Fault code re-displays. Reinstall the original controller. Submit a concern to ASIST.

5007-PTO remote fender switch stuck on

Cause:
See below.

Possible failure modes:

1. This fault occurs when the remote PTO fender switch is on for more than **10 s**.

Solution:

1. Use the monitor screen function in the electronic service tool (EST) to check the PTO fender switch and PTO system status. Refer to the EST user guide.

   A. PTO fender switch not operating correctly. Replace the PTO fender switch. Return unit to field operation.

   B. PTO fender switch operating correctly.Return unit to field operation and monitor for recurring fault. If the fault code reoccurs, submit a concern to ASIST.

6004-Rear diff lock switch failure

Cause:
CAN-bus indicates switch failure for ten milliseconds.

Possible failure modes:

1. Faulty rear differential switch
2. Faulty harness/wiring
3. Faulty tractor control unit (TCU)

Solution:

1. Check if the fault code is still active. Clear all fault codes. Operate the tractor under normal conditions.

   A. Fault code does not redisplay. Return unit to field operation and monitor for continuing problems.

   B. Fault code redisplays. Continue to step **2**.

2. Use the monitor function in the electronic service tool (EST) to check operation of both the auto and manual differential lock buttons on the control panel. Refer to the EST user guide.

   A. Switches are not operating correctly. Replace the control panel. Return unit to field operation.

   B. Switches are operating correctly. Continue to step **3**.

3. Check for an open circuit between connector **X-355** at the tractor control unit (TCU) and connector **X-158** for the rear differential lock solenoid.

   Measure resistance between connector **X-355** pin 17 and connector **X-158** pin 1.

   Expected reading is less than **1 Ω**: infinite resistance or overload indicate an open circuit.

   A. Open circuit found. Replace or repair harness as required. Return unit to field operation.

   B. Open circuit not found. Contact ASIST before replacing tractor control unit (TCU). Return unit to field operation.

Wiring harness - Electrical schematic frame 15 (A.30.A.88-C.20.E.15)
Wiring harness - Electrical schematic frame 74 (A.30.A.88-C.20.E.74)

3063-Cylinder 1 - Injector Cable Short Circuit (High Side To Ground)

Control Module : EDC

NOTE: *This diagnostic procedure requires a good quality multi-meter to be able to take accurate resistance measurements. The meter should be able to measure to a resolution of* ***0.1 ohms****. Some of the measurements required to be taken, could be as low as* ***0.4 ohms*** *(typical injector solenoid coil resistance is* ***0.4 - 0.5 Ω****) and any inaccuracies in the DMM could cause a technician to take the wrong diagnostic path.*

NOTE: *Make sure that the multi-meter's test lead resistance is taken into account when resistance measurements are taken. Record the multi-meter's test lead resistance by touching the leads together on the lowest Ohms scale and mentally recording the resistance value. Subtract this value from the actual resistance measurement taken.*

Context:
The engine control unit (ECU) has determined that a short circuit exists in the high side injector circuit for cylinder 1. A power stage component energizes the unit injection system transistors and simultaneously observes the current flow in the high-side and low-side switching branch by sensing resistors. If there is a deviation from the expected current flow the component detects specific errors and reports them to the ECU . This error message is then rearranged so it holds information on performed injections, errors of cylinders on the same bank, bank specific errors and cylinder specific errors. The rearranged error message is then compared to applicable error patterns and if there is a match the failure corresponding to the matched pattern is output. If an error message doesn't match any pattern the defect is treated as an unclassified error. Monitoring is performed once per camshaft revolution. This error is the result of a short circuit of the high side to the low side or ground over 3 camshaft revolutions. As a result of this error an individual cylinder or bank is shut off, based on parameters established in the ECU . Certain parameters, as currently applied, are permanent (without a healing possibility, once tested by switching on the component to see if the defect is still present). and others evoke an irreversible or reversible shut off of the engine to be executed.

Cause:
The Engine Control Unit (ECU) has determined that there is a fault associated with the current monitoring of the injector output power driver stage.

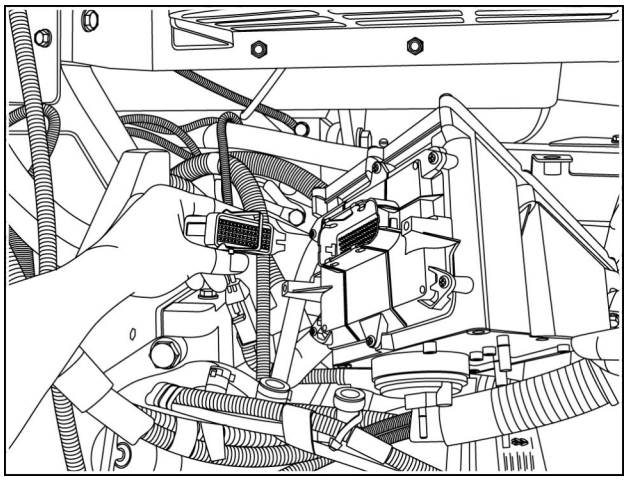
Possible failure modes:

1. Faulty cylinder 1 solenoid windings.
2. Faulty electrical wiring, short high side to low side or ground (damaged wiring harness).
3. Faulty ECU, ECU hardware or software.

Solution:

1. Verify this error code is still present and in an active state.
   A. If the error is still present and active, continue with step **2**.
   B. If the error is no longer present or is in an inactive state, continue with step **8**.
2. Carefully disconnect the engine cylinder harness from the ECU at ECU cylinder harness connector. Use a multi-meter to check the resistance, on the cylinder harness side of connector, between pins 4 and 13. There should be **0.4 - 0.5 Ω**.
   A. If the resistance was within range, leave ECU cylinder connector disconnected and continue with step **3**
   B. If the resistance was lower than range minimum, continue with step **6**.
3. Use a multi-meter to check for continuity, on the ECU cylinder harness side of connector , from pin 4 to chassis ground and pin 13 to chassis ground. There should not be continuity.
   A. If there was continuity on either or both pins to chassis ground, continue with step **4**
   B. If there was no continuity on either pin to chassis ground, the ECU may have failed. Try reloading the ECU software and if the fault reoccurs, replace the ECU .

4. Disconnect the electrical connector to the module.



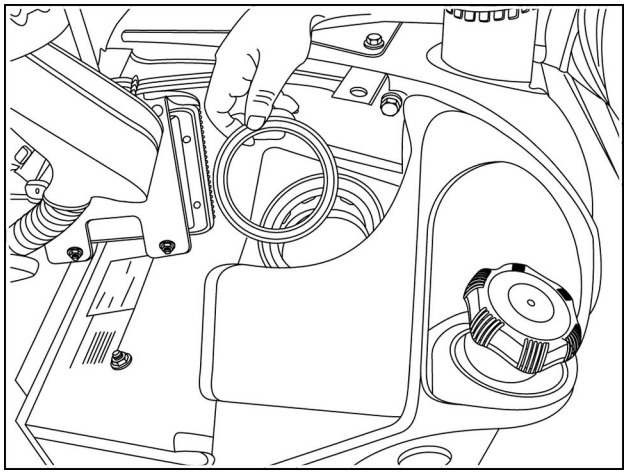
RCPH10CCH324BAO 4

Next operation:
Selective Catalytic Reduction (SCR) Supply Module - Install (B.40.B)

Selective Catalytic Reduction (SCR) Heater/sensor assembly - Install

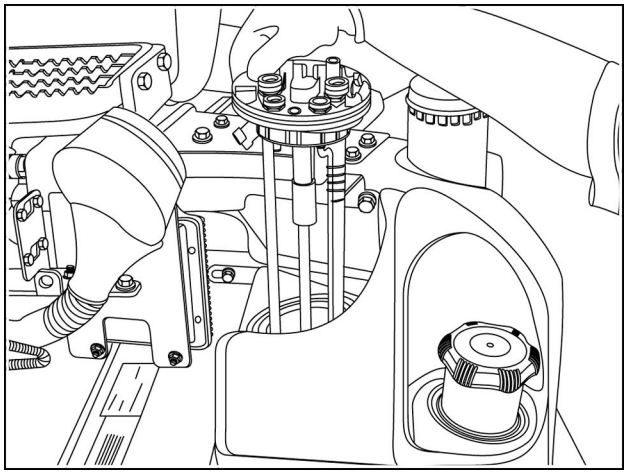
Prior operation:
Selective Catalytic Reduction (SCR) Heater/sensor assembly - Remove (B.40.B)

1. Rest the heater/sensor assembly rubber seal on the opening of the diesel exhaust fluid (DEF) tank.



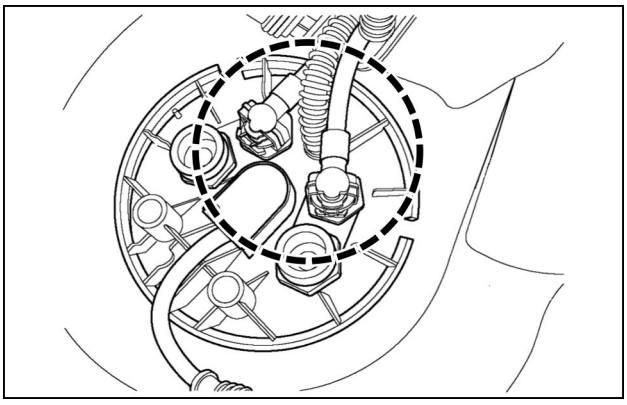
RCPH10CCH515BAO 1

2. Insert the heater/sensor assembly into the tank. Turn the heater/sensor assembly clockwise to engage the locking tabs.



RCPH10CCH514BAO 2

3. Connect the DEF hoses.



RCPH10CCH309BAO 3

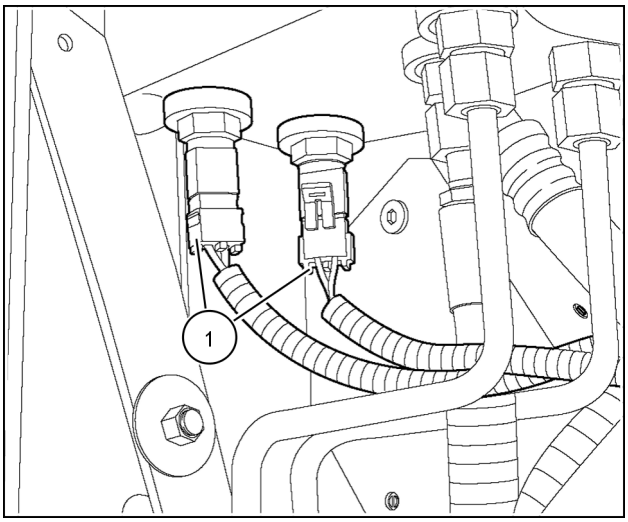
Index

ENGINE AND PTO IN - B

ENGINE COOLANT SYSTEM - 50.A

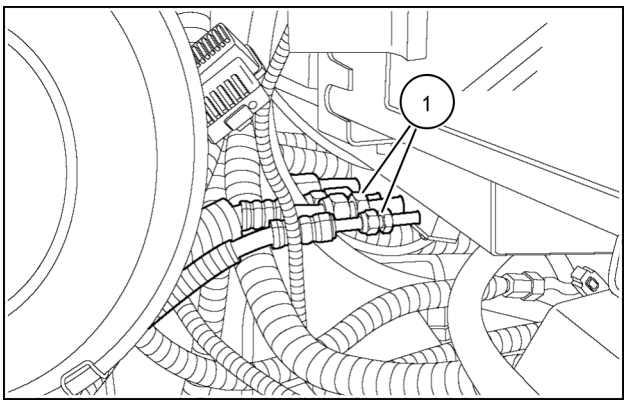
19. Reconnect the harness connectors **(1)** to the switches on the brake valve.

NOTICE: *Make sure that the right and left connectors are connected to the proper switches.*



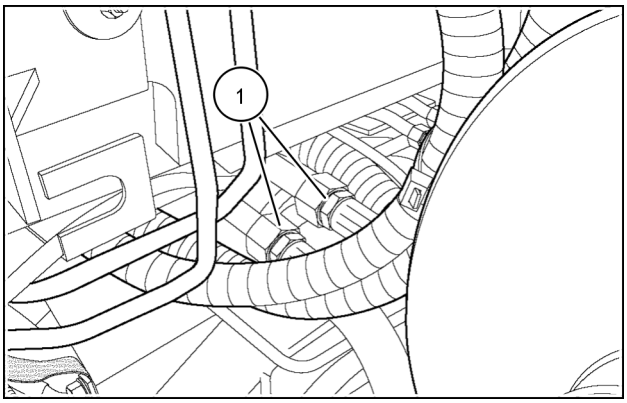
RCPH07CCH046BAB 19

20. Lubricate new O-rings with mineral oil and install on the air conditioning line fittings. Reconnect the fittings **(1)** at the cab and tighten.



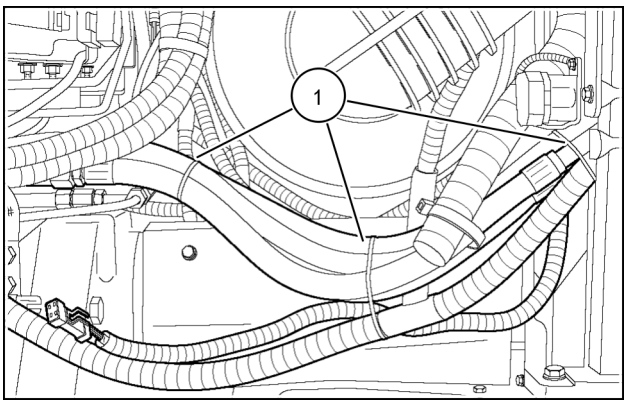
RCPH07CCH225AAB 20

21. Install new O-rings and reconnect the hydraulic cooling hoses **(1)** at the cab.



RCPH07CCH240AAB 21

22. Install plastic tie straps **(1)** to secure the lines.

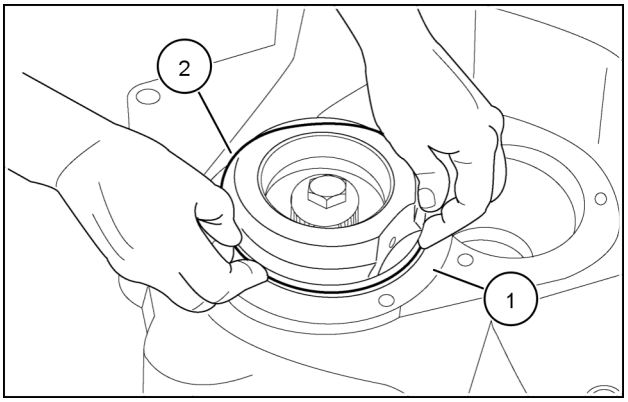


RCPH07CCH239AAB 22

Average of all three	**1.143 mm** (**0.045 in**)
Additional shims to add	**0.10 mm** (**0.004 in**)
Total thickness required	**1.243 mm** (**0.049 in**)

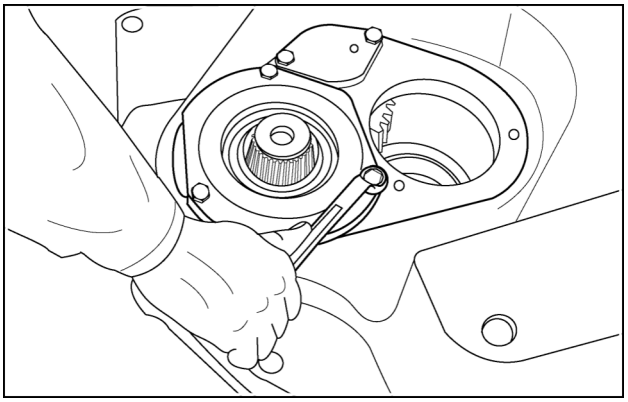
6. Select shims from the shim pack to equal the required thickness, within **0.025 mm** (**0.001 in**).

7. Install the required shims **(1)**. Install an O-ring **(2)** on the bearing cage.



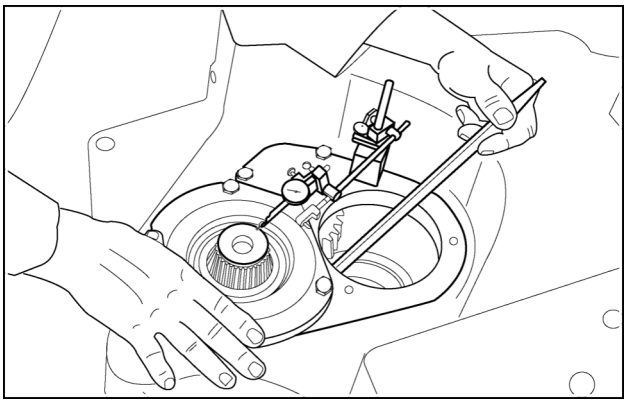
RCPH07CCH091AAB 4

8. Install the bearing cage with shims and O-ring. Install the three retaining bolts and torque to **51 - 57 Nm** (**38 - 42 lb ft**).



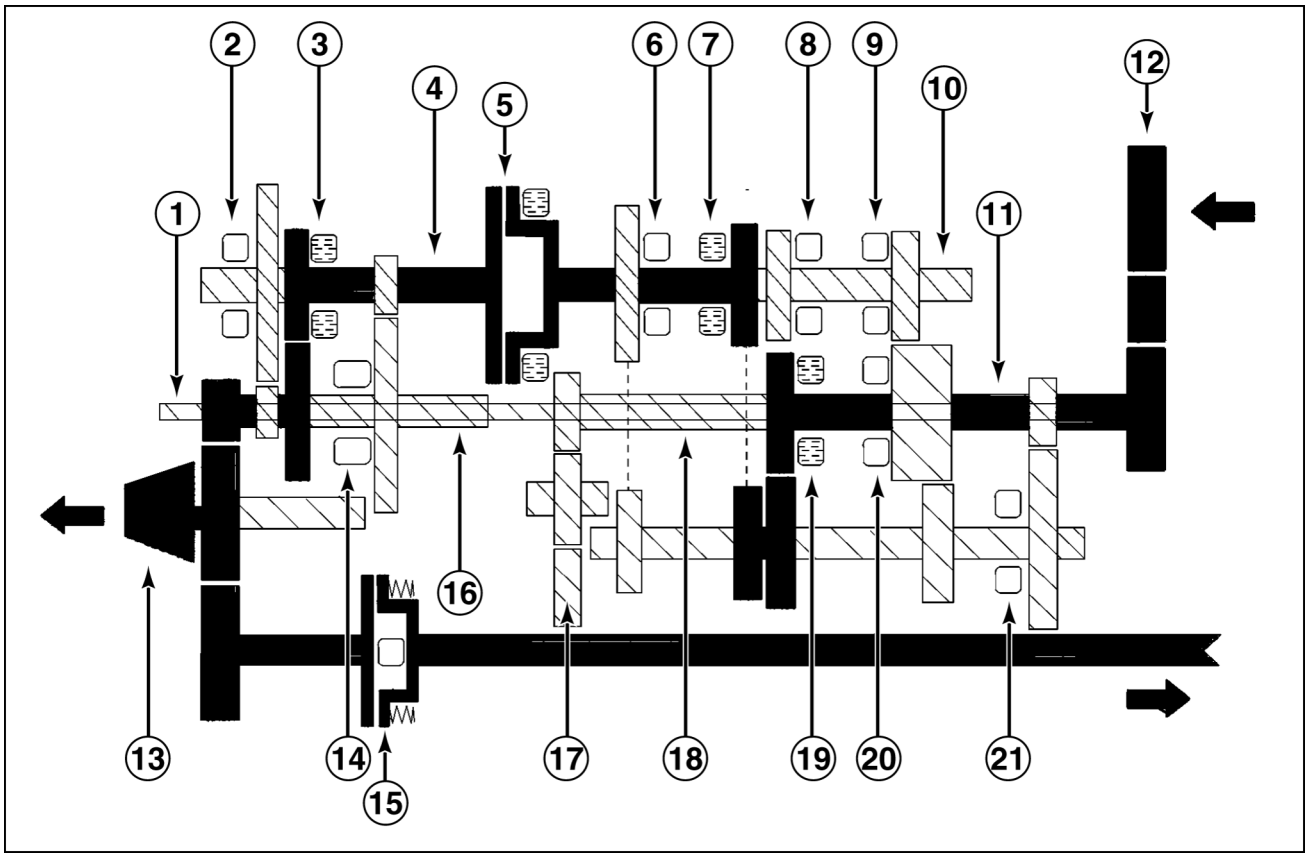
RCPH07CCH092AAB 5

9. Install a dial indicator. Measure the end play to confirm that the proper shim pack was selected. The end play must be between **0.04 - 0.08 mm** (**0.0015 - 0.003 in**). Add or subtract shims from the shim pack to obtain the correct end play.



RCPH07CCH093AAB 6

Ninth gear



RCPH07CCH021FAA 9

Inactive clutch		Non-torque transmitting components	
Pressurized clutch		Torque transmitting components	
1. PTO shaft	7. 3-4 clutch	12. Drop box, if equipped	17. Pump drive gear
2. High range clutch	8. 5-6 clutch	13. Final drive pinion	18. Speed counter shaft
3. Mid range clutch	9. Reverse clutch	14. Low range clutch	19. Odd clutch
4. Range input shaft	10. Speed Output shaft	15. MFD clutch	20. Even clutch
5. Master clutch	11.Speed input shaft	16. Range counter shaft	21. Creeper/overdrive clutch
6. 1-2 clutch			

When ninth gear is selected, the transmission controller simultaneously disengages the even clutch and disengages the odd clutch, and disengages the first speed clutch and engages the third speed clutch. Power flows from the speed transmission input shaft through the odd speed clutch, the counter shaft, the third speed clutch, and across the output shaft to the master clutch. Power flow through the range transmission is the same for gears 7-12. With the master clutch engaged, power is transmitted across the range transmission input shaft to the medium range clutch. Power flows to the range counter shaft driven gear across the counter shaft to the constant mesh gear set. Power flow is delivered to the pinion shaft by the constant mesh gear set in all speeds.

1. Port to master clutch	Preload spring
2. Inching valve body	6. Inner modulation spring
3. Modulator spool	7. Piston center pin
4. Regulated pressure supply	8. Modulator piston assembly
5. Proportional flow control solenoid	10. Check valve

NOTE: *The transmission controller has to be run through the “Trans Setup” procedure whenever the inching valve is replaced. Setup includes “Cal Pedal” which calibrates the operating range of the clutch pedal and “Cal Valve” which calibrates the fill current for the master clutch. The fill current is the current required to just fill the clutch with oil without conducting torque through the clutch.*

TRANSMISSION Powershift - Join - Range transmission to rear frame

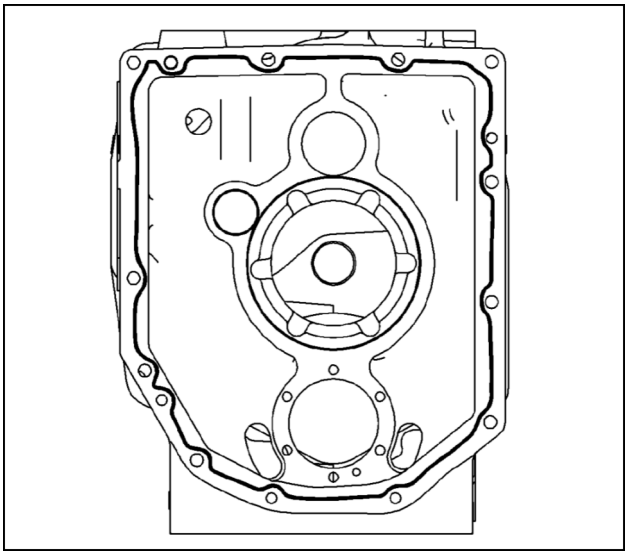
Prior operation:
Clutch and gear Master clutch - Install (C.20.E)
Prior operation:
Differential - Install (C.60.A)
Prior operation:
TRANSMISSION Powershift - Split - Range transmission to rear frame (C.20.E)

1. To prepare the mating surfaces of the range transmission and rear frame:
   - A. Clean the sealing surfaces with Loctite® Chisel (Loctite® part **34663** or **79040**), removing any residue from gasket or cured **LOCTITE® 515** gasket eliminator.
   - B. Clean the sealing surfaces with acetone or Loctite® parts cleaner (Loctite® part **34548** or **30545**), removing all Chisel, gasket material and oil. Apply a second coat of cleaner if required.
   - C. Gather new bolts at the workstation so they are ready to join the components.
   - D. Install alignment dowels.

NOTICE: *The range and rear frame housings must be free of oil to insure a good seal; any oil which runs down a mounting surface will contaminate the* ***LOCTITE® 515*** *and reduce its effectiveness.*

2. Apply a **3.0 mm** (**0.118 in**) bead of **LOCTITE® 515** gasket eliminator to the mounting face as shown. Spread the bead across the machined surfaces.

NOTICE: *Final torque must be applied to the bolts within 15 minutes from the time the gasket eliminator is applied.*

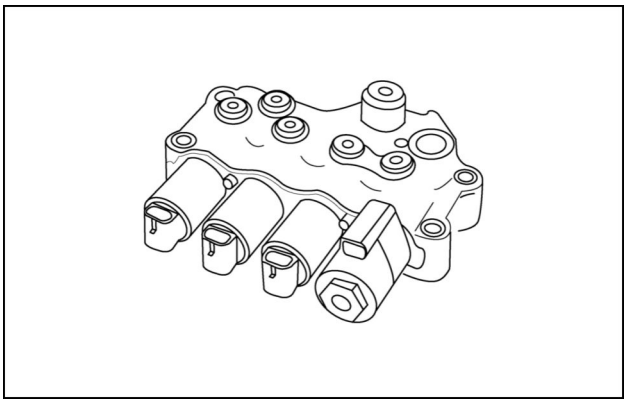


RCPH07CCH120BAA 1

Control valve Range control valve - Disassemble

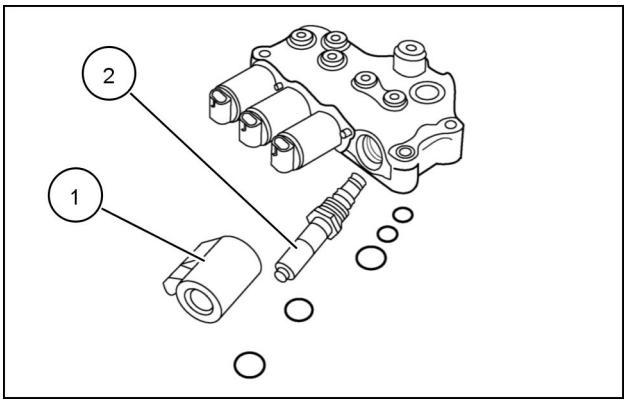
Prior operation:
Control valve Range control valve - Remove (C.20.E)

1. Place the valve body on a clean work surface.



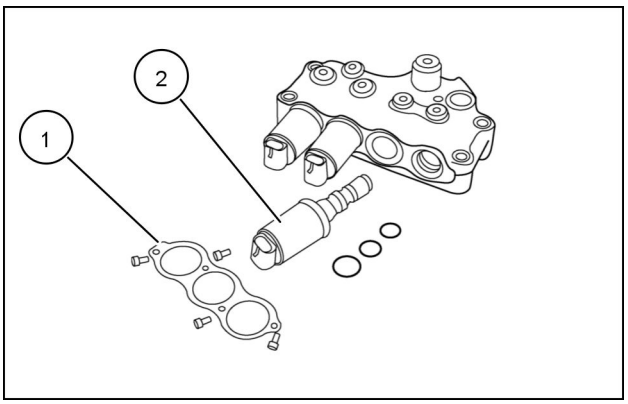
RCPH07CCH239AAA 1

2. Remove the park solenoid nut, coil **(1)** and cartridge **(2)**. Remove and discard the O-rings.



RCPH07CCH240AAA 2

3. Remove the solenoid cover plate **(1)**. Remove the solenoid assembly **(2)** and discard the O-rings.

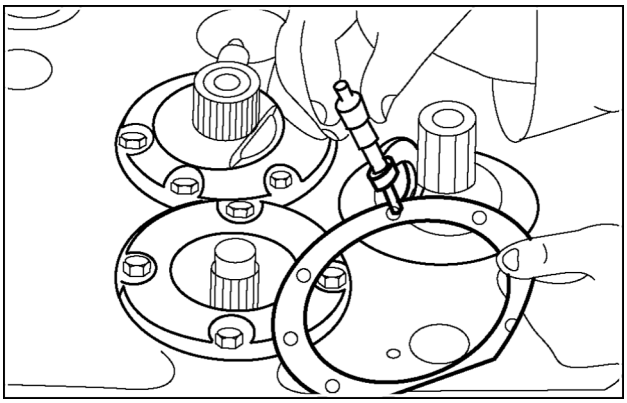


RCPH07CCH241AAA 3

4. Repeat Step 3 for the remaining solenoids.

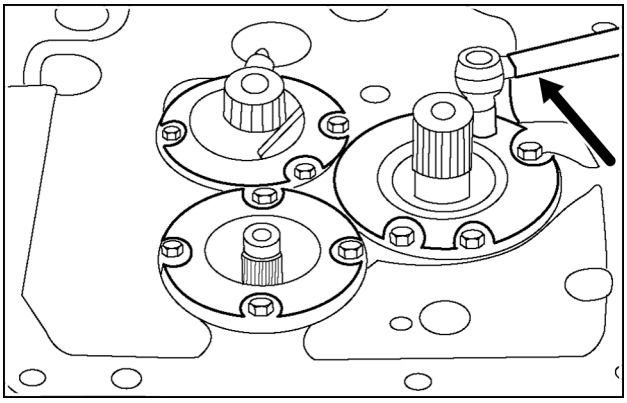
Next operation:
Control valve Range control valve - Assemble (C.20.E)

4. Remove the rear bearing cage. Add the following shim thickness to the average reading from the previous Step:
   - Input shaft without creep drive: **0.229 mm** (**0.009 in**).
   - Input shaft with creep drive: **0.203 mm** (**0.008 in**).
   - Counter shaft without creep drive: **0.356 mm** (**0.014 in**).
   - Counter shaft with creep drive: **0.203 mm** (**0.008 in**)
   - Output shaft: **0.356 mm** (**0.014 in**)



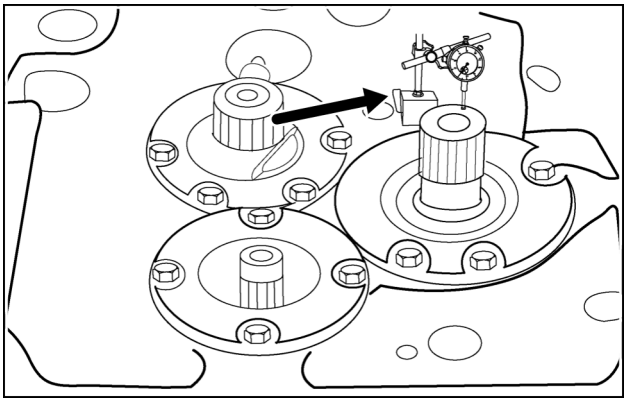
RCPH07CCH405AAB 4

5. Install the measured shim pack and the rear bearing cage. Reinstall the mounting bolts and tighten to a torque of **54 - 61 Nm** (**40 - 45 lb ft**).



RCPH07CCH406AAB 5

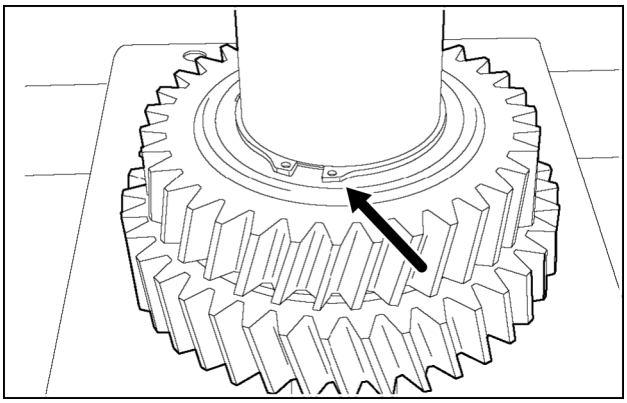
6. After the bearing cage bolts have been torqued:
   - Rotate the shaft a minimum of twelve revolutions.
   - Place a dial indicator to measure shaft end play.
   - Using a pry bar inside the housing, pry upward against a gear on the shaft being checked.
   - The end play must be between **0.030 - 0.13 mm** (**0.001 - 0.005 in**).
   - Add or remove shims to obtain a correct reading.



RCPH07CCH407AAB 6

Next operation:
TRANSMISSION Powershift - Join - Front frame to speed transmission (C.20.E)

7. Remove the retainer ring for the 34 tooth driving and 39 tooth driven pinion gear.

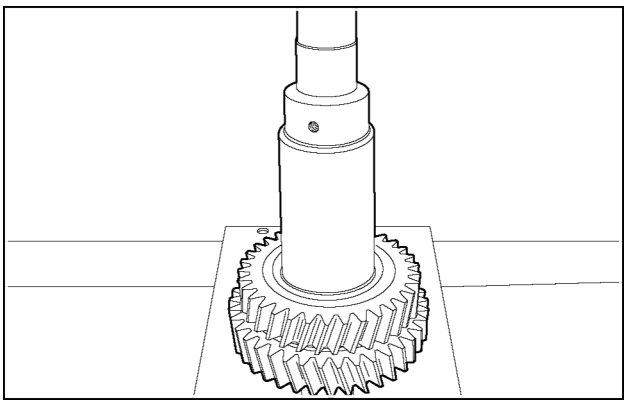


RCPH08CCH022AAB 7

8. Place supports under the gears. Press on the shaft to remove the gears and two steel balls from the shaft.

NOTE: *To prevent damage to the shaft assembly when the gear is removed, catch or place padding under the shaft.*

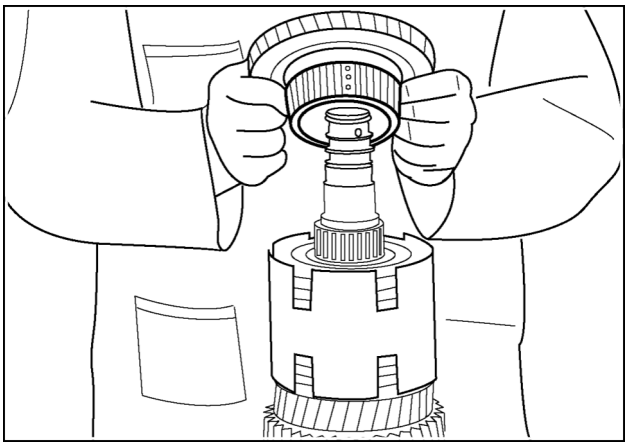
NOTE: *The pressure required to remove the gears from the shaft is approximately* ***344.8 bar*** *(****5000 psi****)*



RCPH08CCH023AAB 8

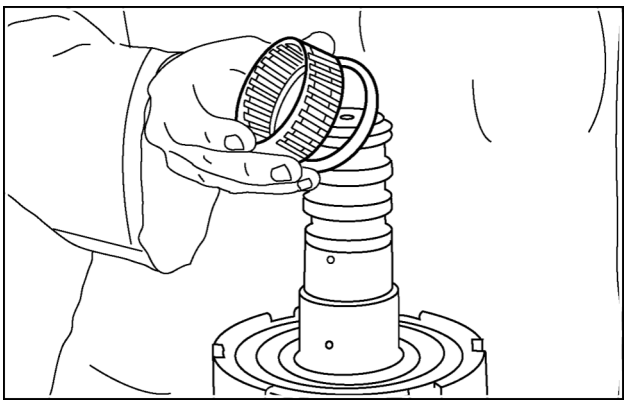
Next operation:
Shaft Speed countershaft - Assemble (C.20.E)

4. Remove the reverse driven gear.



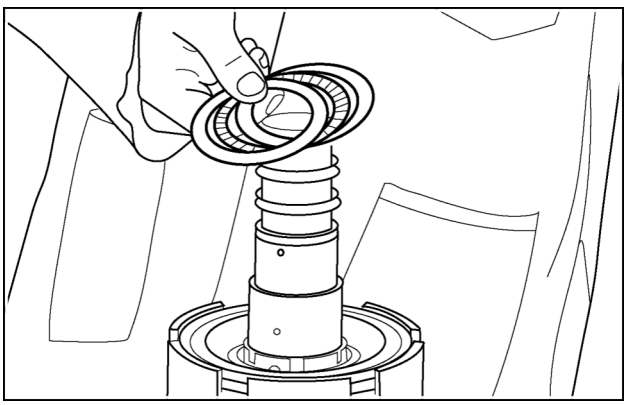
RCPH07CCH183BAB 4

5. Remove the caged needle bearing and the nylon spacer.



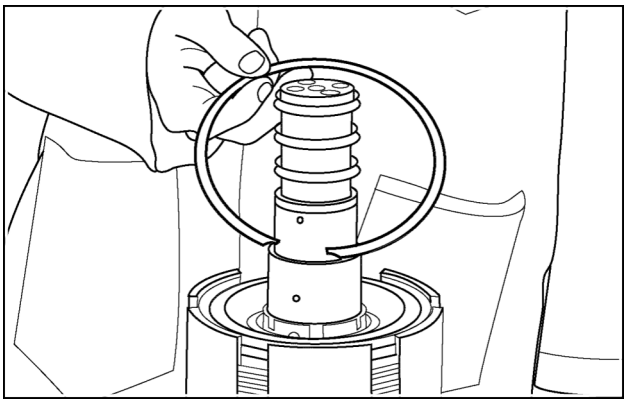
RCPH07CCH312AAB 5

6. Remove the two bearing thrust washers and the needle thrust bearing.



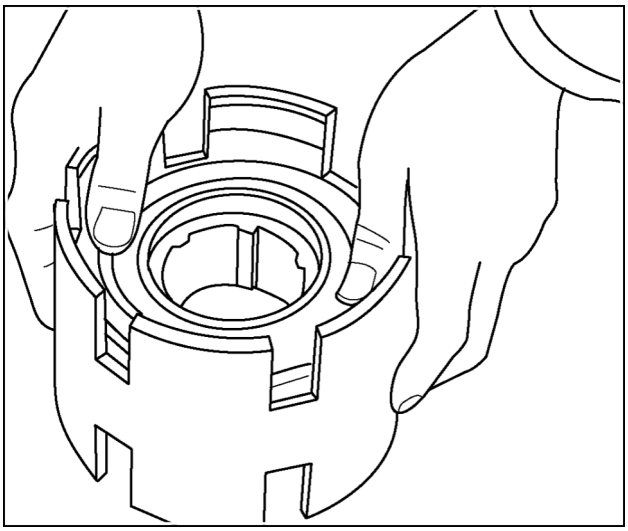
RCPH07CCH313AAB 6

7. Remove the retaining ring from the clutch plate carrier.



RCPH07CCH314AAB 7

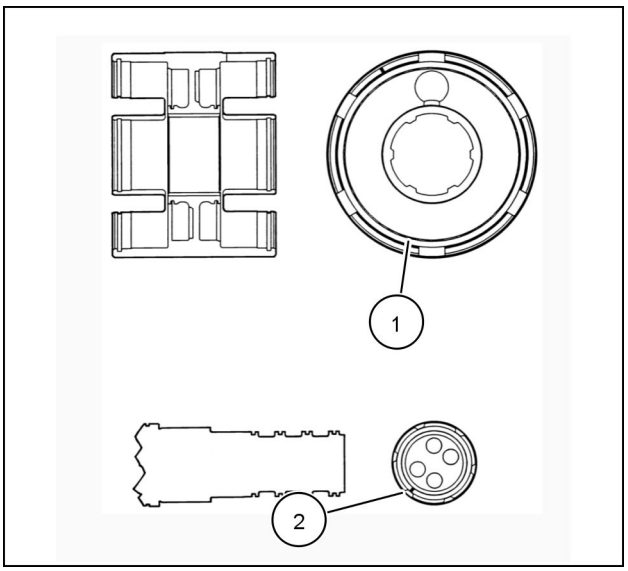
60. Reinstall the fifth clutch piston into the clutch carrier. The flat side must face the center of the carrier.



RCPH07CCH209BAB 60

61. Using the alignment marks made during disassembly, align the clutch carrier **(1)** with the shaft **(2)**.

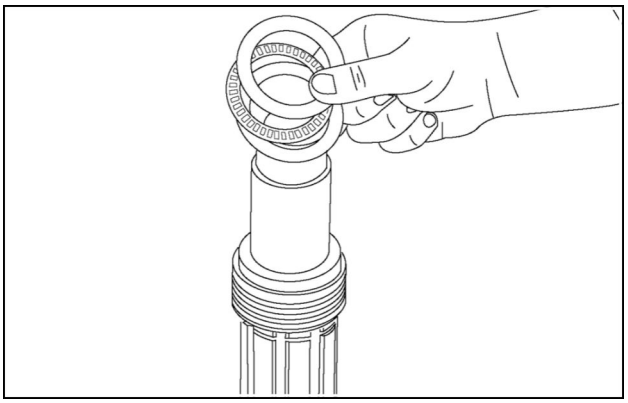
NOTE: *If a new part replaces an old part, transfer the alignment mark to the new part.*



RCPH07CCH208BAB 61

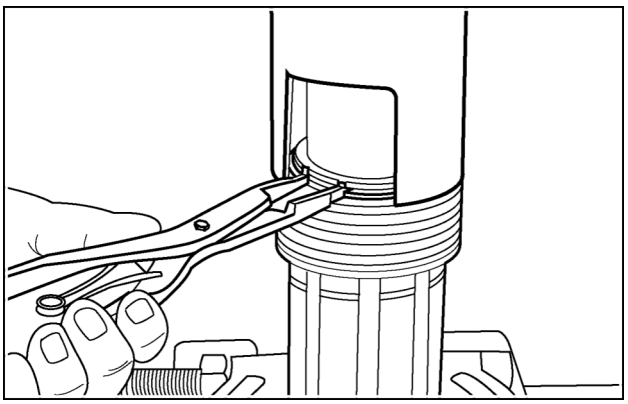
62. Reinstall the clutch carrier:
    - A. Align the marks on the carrier and the shaft.
    - B. Slide the rear of the carrier over the front end (sealing ring) of the shaft.
    - C. Align the separator plate tabs with the slots in the carrier.
    - D. Carefully press the carrier down over the clutch plate assembly. Do not force the carrier down to prevent any damage to the separator plate tabs.
    - E. Check that the oil holes are properly aligned.

16. Remove the two bearing thrust washers and the needle thrust bearing.



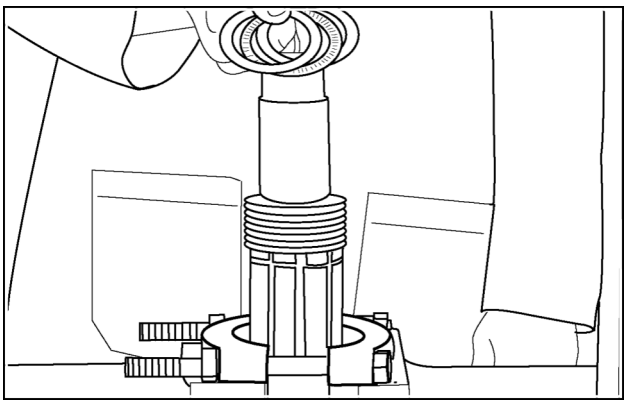
RCPH07CCH117AAA 16

17. Remove the snap ring as follows:
    A. Install special tool **CAS1903-3** – compression sleeve with notch – over the shaft and on top of the piston return belleville springs.
    B. Position the notch in the compression sleeve over the ends of the snap ring.
    C. Compress the belleville springs with a hydraulic press and remove the snap ring.



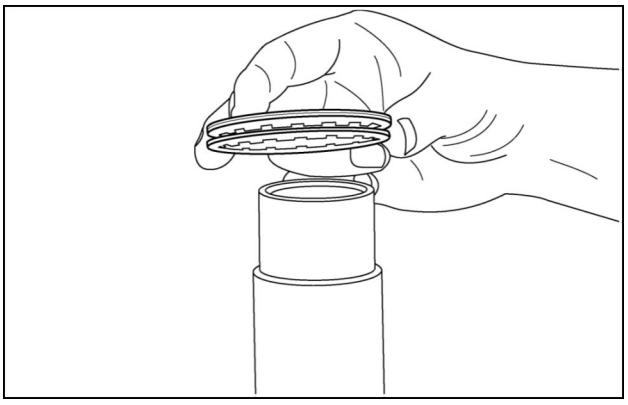
RCPH07CCH118AAA 17

18. Remove the two bearing thrust washers and the needle thrust bearing.



RCPH07CCH119AAA 18

19. Remove three piston return belleville springs.



RCPH07CCH120AAA 19

PTO control valve

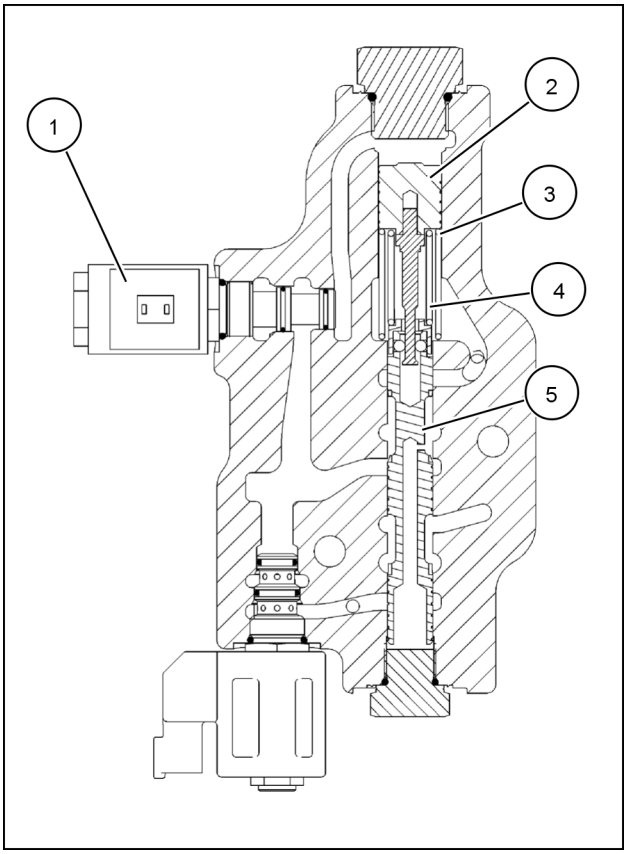
The PTO/differential lock valve is a closed center valve supplying regulated circuit pressure to the PTO and differential lock control circuits. Regulated circuit oil is supplied to the PTO valve through the priority/regulator valve. Pressure is regulated to approximately **2240 - 2450 kPa** (**325 - 355 psi**) and can be adjusted if required.

The PTO solenoid **(1)** is controlled by a switch located on the armrest console. The switch communicates directly with the tractor multi function controller to supply current to the solenoid cartridge valve. The valve supplies regulated pressure to the PTO clutch based on commands from the operator (PTO switch) and signals supplied to it from the engine RPM circuit, PTO shaft speed sensor, and dual shaft speed sensor. The PTO clutch is energized by hydraulic pressure.

When the PTO switch is turned Off, the PTO cartridge valve is de-energized and is shifted to a neutral position. This blocks the regulated supply to the top of the modulation piston and drains this area to tank. Regulated supply is also lost at the bottom of the modulator spool. The outer modulator spring pushes the modulator piston back up against the plug as the inner modulator spool lifts the modulator spool.

When the PTO switch is turned On, the tractor multi function controller sends a fixed current signal to the PTO valve solenoid. The valve spool shifts, metering oil to the top of the modulator piston **(2)**. As pressure builds the piston moves down against the force of both the inner and outer modulator springs **(3) (4)**. As the piston moves down, the center stem of the piston moves into the bore of the modulator spool **(5)**. The piston assembly does not directly shift the modulator spool. The inner modulator spring force begins to shift the modulator spool. As the modulator spool begins to move, the metered lubrication oil supply to the PTO clutch is increased to prevent clutch wear as the clutch is gradually engaged.

As the modulator spool shifts down, it simultaneously blocks the PTO clutch return and begins increasing the clutch supply pressure. Pressure available to the clutch is also ported through cross drilled and end drilled holes to the bottom of the modulator spool. The balance between the increasing inner modulator spring force against the increasing clutch pressure causes pressure to gradually increase. The engagement time for the PTO can range from approximately 2-6 seconds and is completely controlled by the controller based on monitored conditions (load, engine RPM, PTO shaft RPM).



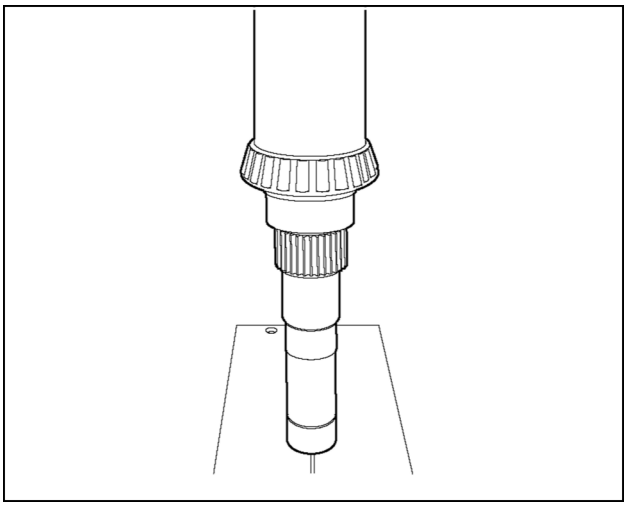
RCPH07CCH085BAA 2

Shaft assembly Output shaft - Assemble - Dual speed

Prior operation:
Shaft assembly Output shaft - Disassemble - Dual speed (C.40.C)

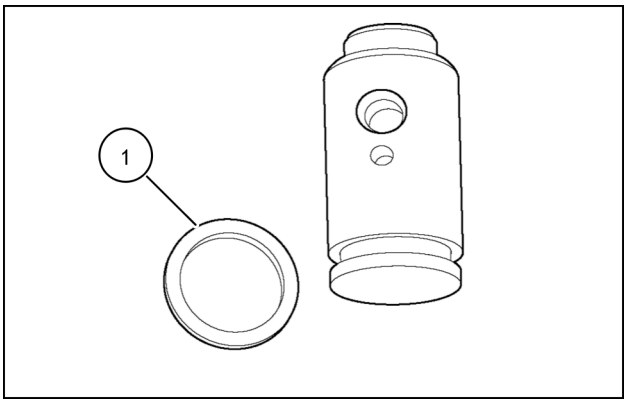
1. Place the shaft in a hydraulic press. The bearing, with the large outer diameter, must face downward on the shaft. Use an appropriate sleeve to press the bearing cone until it seats against the flange.

NOTICE: *Do not press on the outer race of the bearing.*



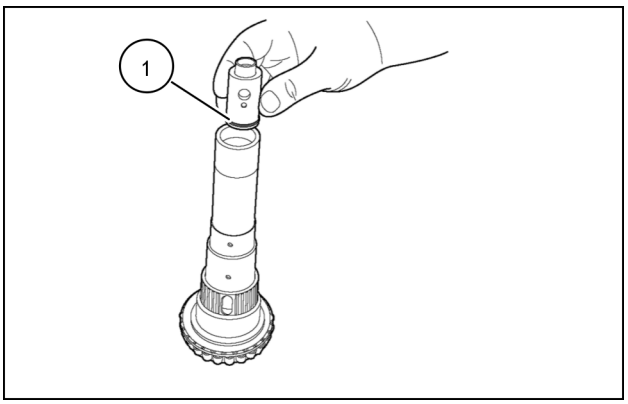
RCPH08CCH062BAB 1

2. Lubricate a new seal **(1)** with petroleum jelly, and install the seal on the piston.



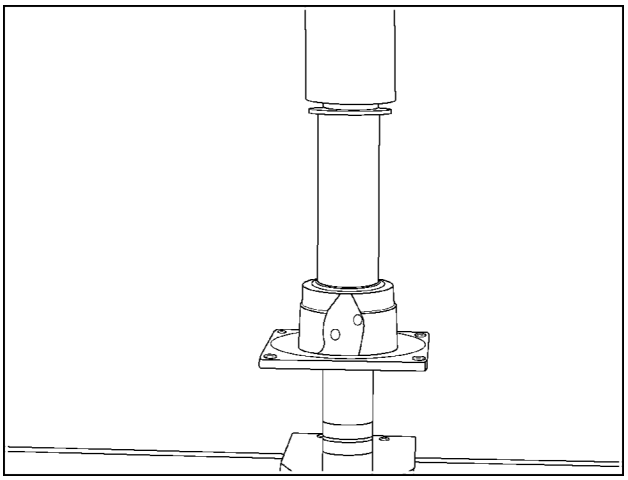
RCPH08CCH394AAB 2

3. Install the piston into the shaft with the seal end **(1)** down.



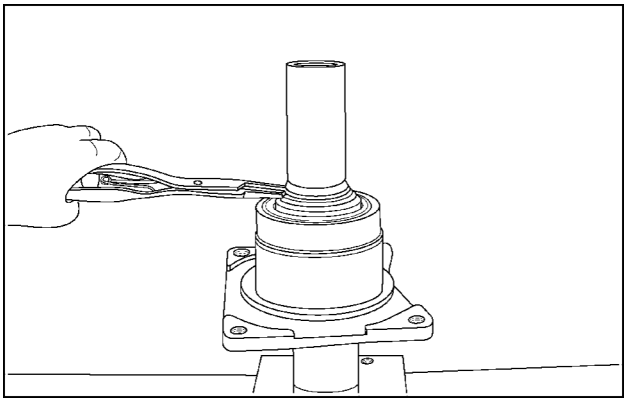
RCPH08CCH393AAB 3

27. Place the drive shaft assembly in a press as shown and press down on the inner race of the bearing. Press only far enough to remove tension on the snap ring.



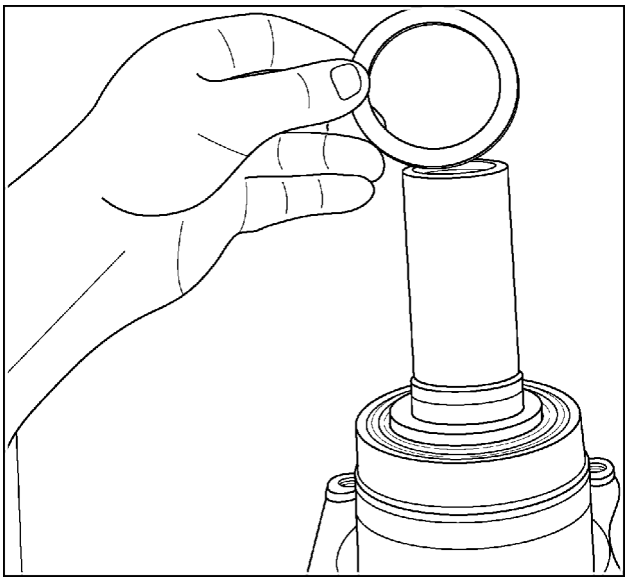
RCPH07CCH705BBC 27

28. Remove the snap ring.



RCPH07CCH704ABC 28

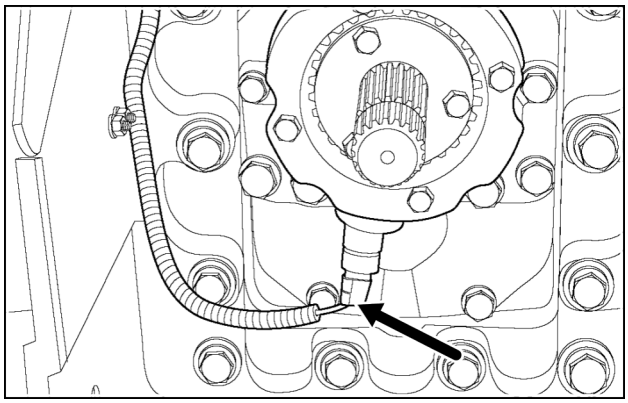
29. Remove the bearing spacer.



RCPH07CCH703BBC 29

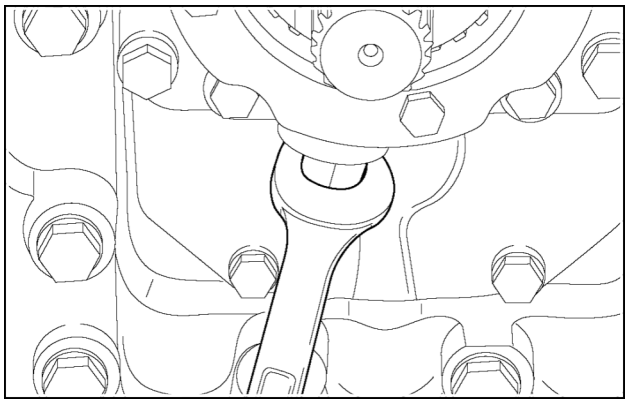
Cover - Remove - Dual speed

1. Disconnect the harness connector to the PTO shaft speed sensor.



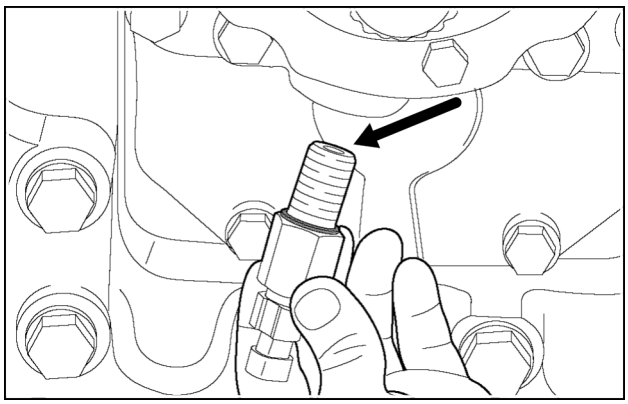
RCPH08CCH349AAB 1

2. Loosen the sensor and remove.



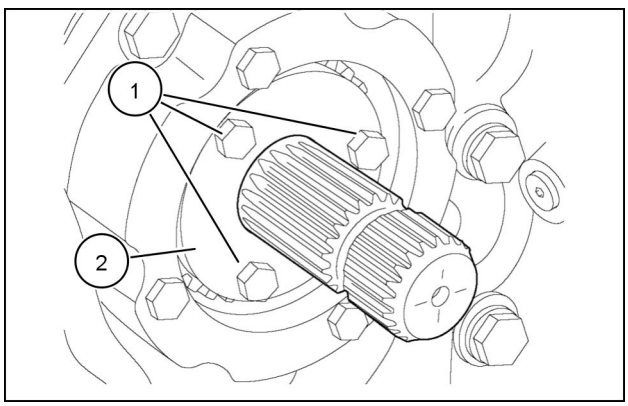
RCPH08CCH350AAB 2

3. Clean the end of the sensor and inspect for damage. Replace as necessary.



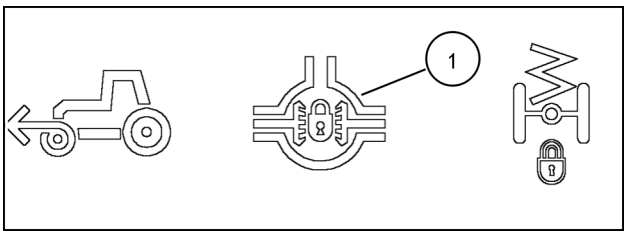
RCPH08CCH351AAB 3

4. Remove the three bolts **(1)** securing the shaft retaining plate **(2)** to the output shaft.



RCPH08CCH352AAB 4

The differential lock icon **(1)** illuminates on the tractor instrumentation whenever differential lock is engaged. To disengage differential lock, push one or both brake pedals down. The icon no longer displays on the instrumentation.



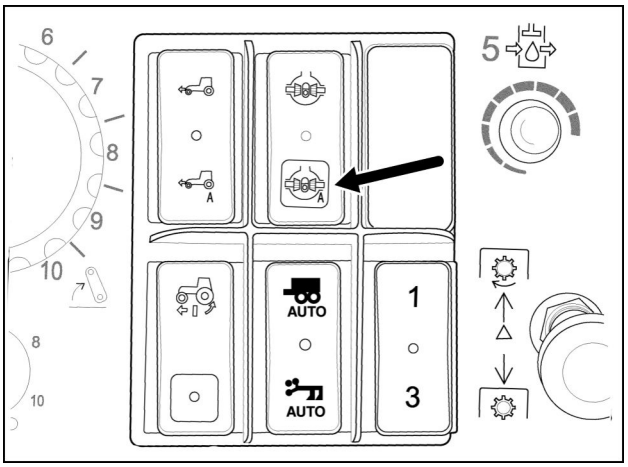
RCPH07CCH069AAE 4

Automatic mode

For automatic operation, press the switch bottom. The lamp in the switch illuminates, and the icon displays on the tractor instrumentation

Automatic mode controls differential lock engagement and disengagement. Automatic operation is determined by hitch position, brake application, travel speed, tractor steering angle (if equipped with terra lock) and wheel slip (true ground speed equipped tractors only) .

Automatic mode is turned Off when the keyswitch is turned Off. To return to automatic operation, move the switch to the center position and then press the switch bottom.

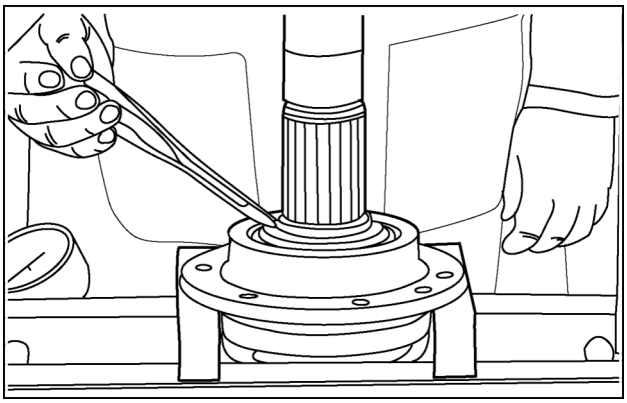


RCPH07CCH112BAE 5

Differential - Disassemble - Standard pinion shaft

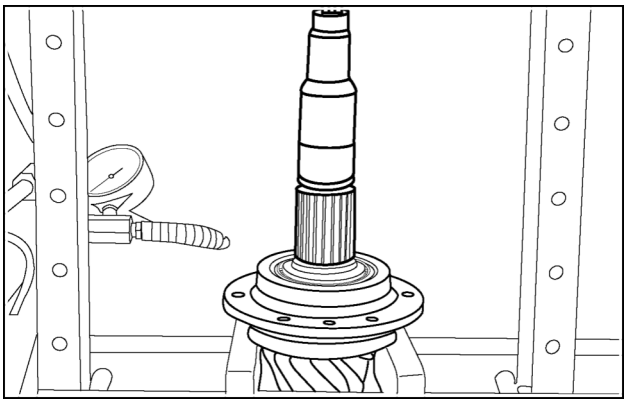
Prior operation:
Differential - Remove - Standard pinion shaft (C.60.A)

1. Remove the front pinion shaft snap ring. Press on the bearing cone race if it blocks removal of the snap ring.



RCPH07CCH286AAA 1

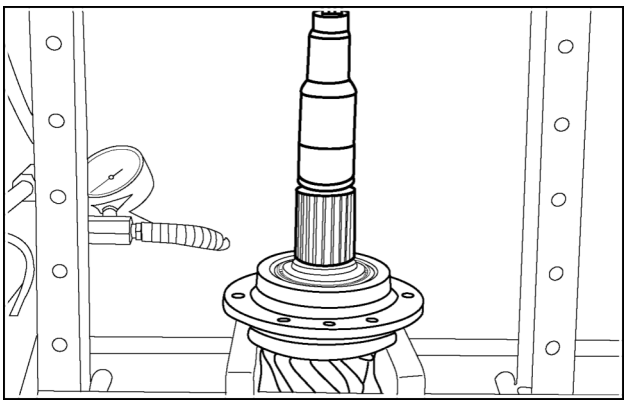
2. Mount pinion shaft in a press with pinion gear facing down. Position support plates under bearing carrier.



RCPH07CCH287AAA 2

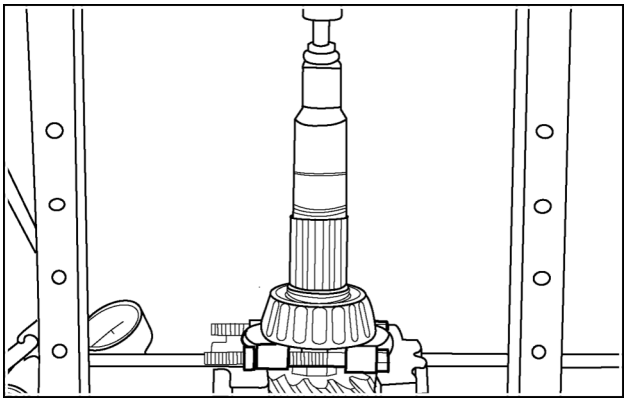
3. Press the pinion shaft and bearings out of the bearing cage. Press the pinion shaft and bearings out of the bearing cage.

NOTE: *The rear bearing (against the gear) must clear the press or the component will be damaged.*



RCPH07CCH287AAA 3

4. Press the bearing cone from the pinion shaft.

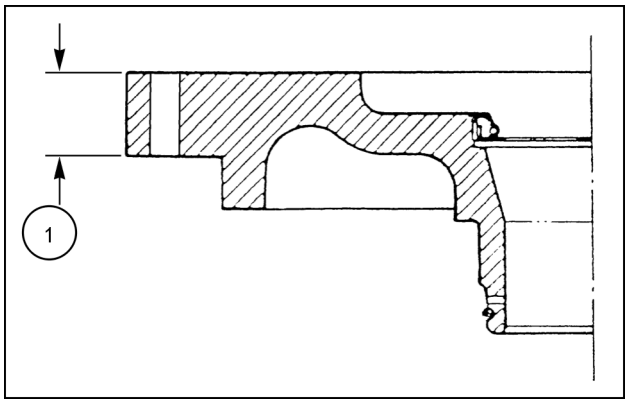


RCPH07CCH288AAA 4

Differential - Backlash

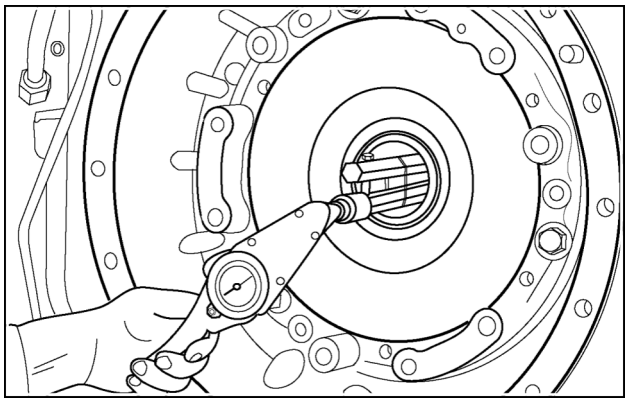
Prior operation:
Differential - Preload (C.60.A)

1. Determine required shim pack thickness for the bearing retainers:
   - A. Measure the thickness of the right hand bearing retainer at the machined surfaces **(1)**.
   - B. Subtract this dimension from the average dimension obtained when measuring the retainer face to the rear frame.
   - C. The difference between the two values is the thickness for the shim pack.
   - D. Remove the bearing retainers, and split the shim pack equally between the two bearing retainers.



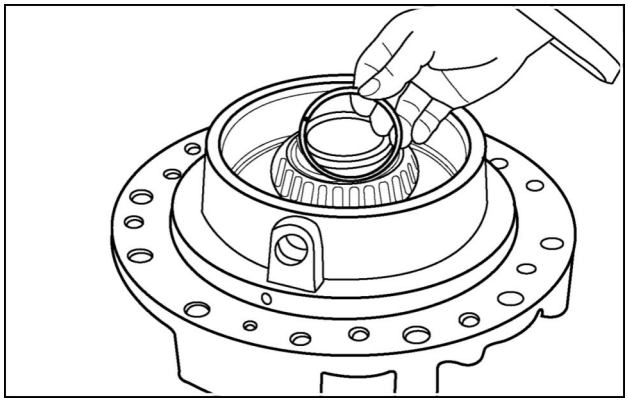
RCPH07CCH332AAA 1

2. Reinstall the bearing retainers as follows:
   - A. After installing the new shim pack, install the bearing carriers.
   - B. Tighten and then torque the bearing carrier bolts to **255 - 260 Nm** (**130 - 144 lb ft**) while rotating the differential.
   - C. Rolling torque of the differential must be **4.5 - 8.0 Nm** (**40 - 70 lb in**) for new bearings and **2.0 - 4.0 Nm** (**20 - 35 lb in**) for old bearings (used for more than 200 hours). The desired setting is in the upper half of the ranges.
   - D. To increase rolling torque, remove approximately **0.05 mm** (**0.002 in**) of shim material from the right-hand bearing retainer.
   - E. To decrease rolling torque, add approximately **0.05 mm** (**0.002 in**) of shim material from the right-hand bearing retainer.



RCPH07CCH330AAA 2

3. Install the seal rings on both the left hand and right hand bearing retainer. The ends of the ring must lock together.

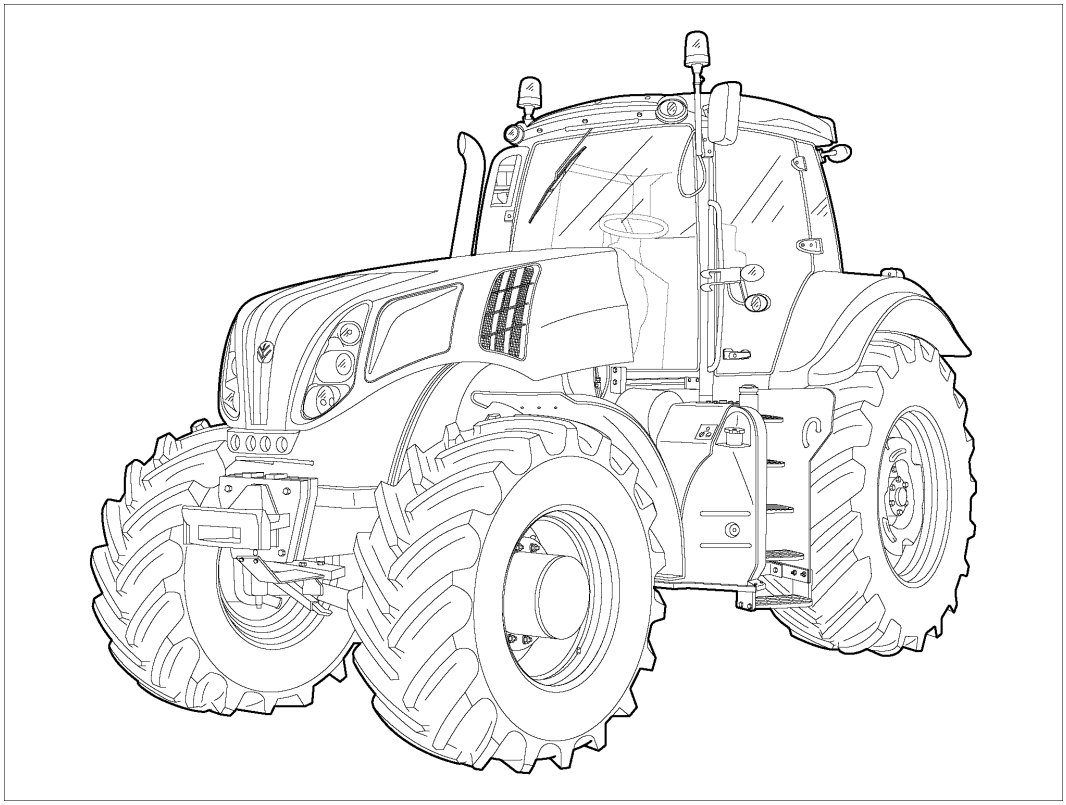


RCPH07CCH307AAA 3

NEW HOLLAND AGRICULTURE

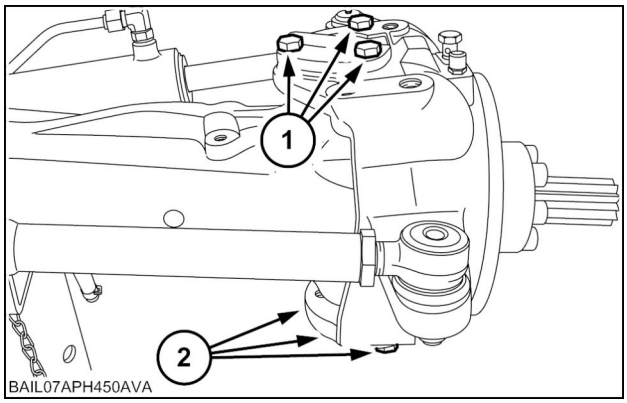
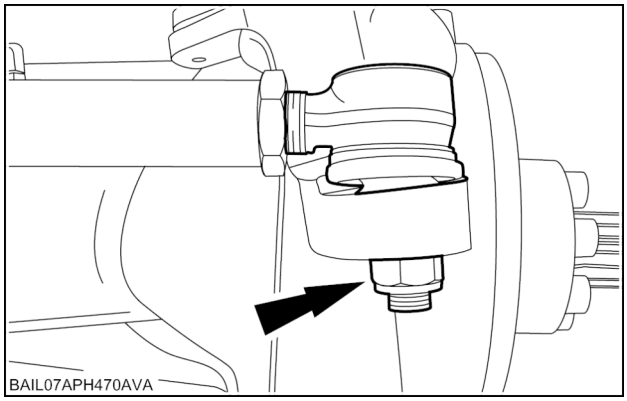
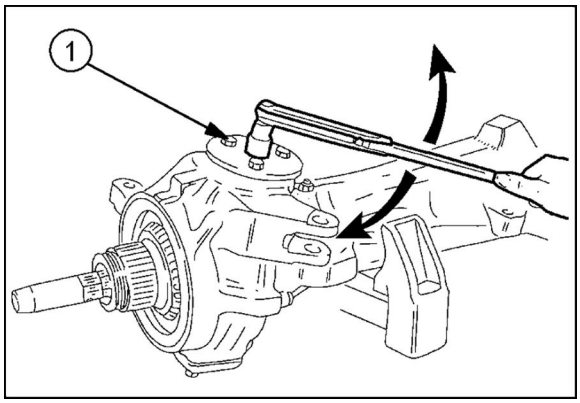
SERVICE MANUAL

AXLES, BRAKES AND STEERING

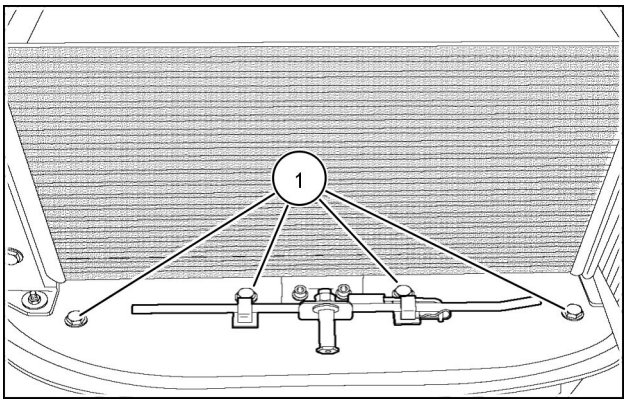


T8.275
T8.300
T8.330
T8.360
T8.390

Steering knuckle and King pin - Torque - 12 bolt standard axle

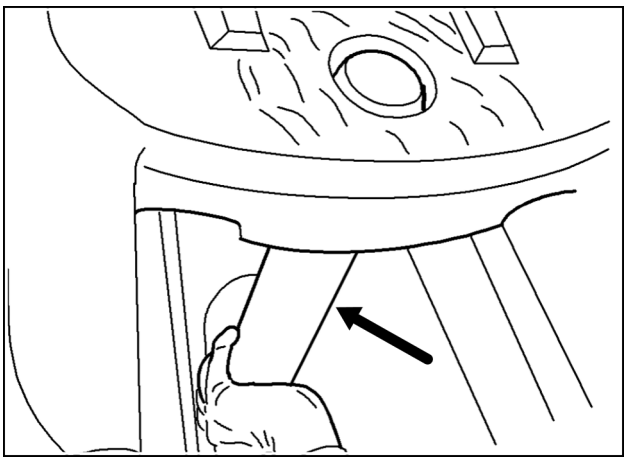
Component	N·m	Identification	lb-ft/lb-in
King pin bearing cap bolt, Upper **(1)** and lower **(2)**	**188 N·m**	 BAIL07APH450AVA 1	**139 lb ft**
Tie rod end nut	**113 N·m**	 BAIL07APH470AVA 2	**83 lb ft**
Rolling torque of king pin bearings	**118 - 147 Nm**	 RCPH10CCH249AAB 3	**87 - 108 lb in**

11. To remove the axle support pin from the front frame, remove the cooling assembly mounting bolts **(1)**. Pry the bottom of the cooling assembly forward to allow the pin to clear the fan shroud.



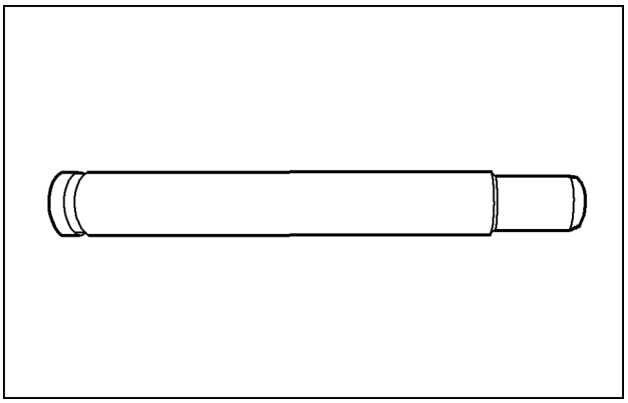
RCPH07CCH237AAB 11

12. Remove the support pin from the frame.



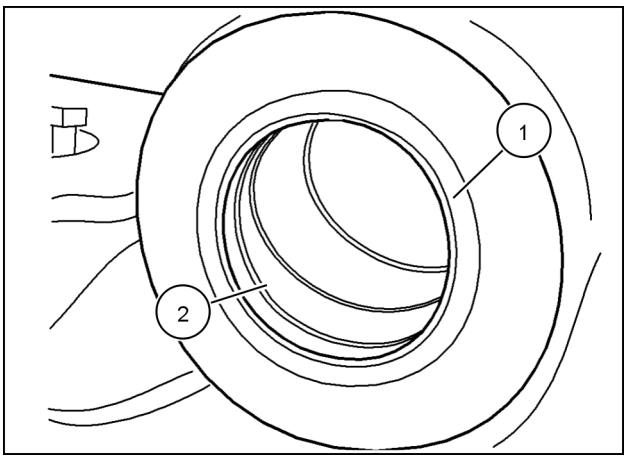
RCPH07CCH280BAB 12

13. Inspect the support pin for wear or damage. Replace as required.



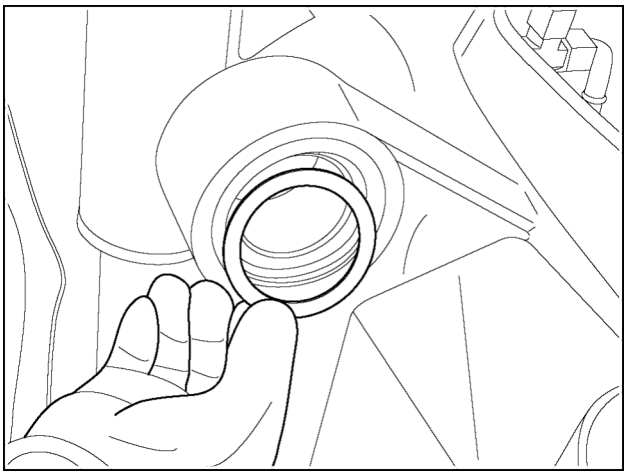
RCPH07CCH477AAB 13

14. Inspect the axle support housing seals **(1)** and bushings **(2)** for wear or damage. Replace as required.



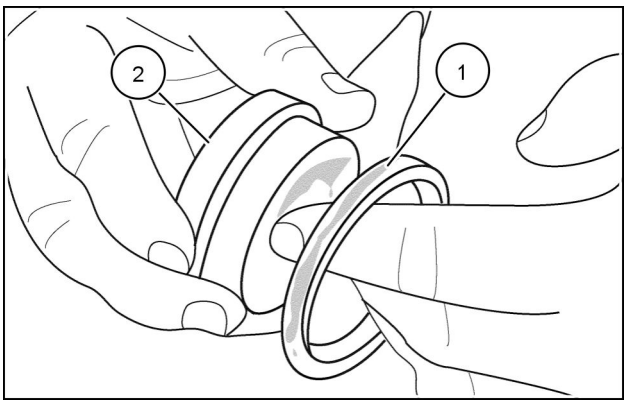
RCPH07CCH279BAB 14

5. Apply grease to the counter bore and install the thrust washer **(1)** on the opposite side.



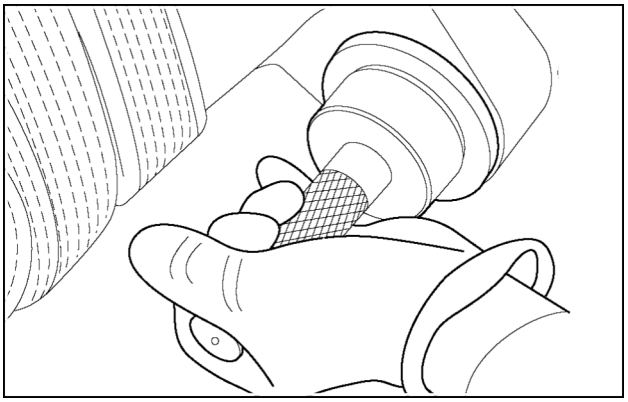
RCPH08CCH034BAB 5

6. Apply **LOCTITE® 609** to the outer diameter of the new seal **(1)**. Place the seal on an appropriate driver **(2)**.



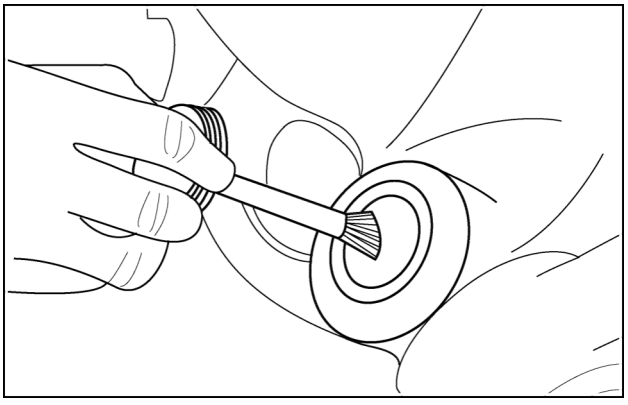
RCPH07CCH634AAA 6

7. Install the seal into the bore. Be sure that the thrust washer does not obstruct the seal during installation.



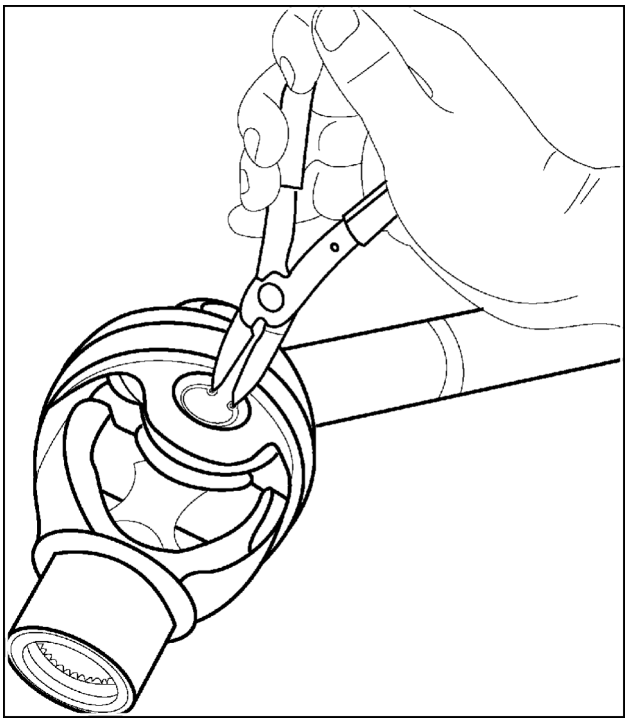
RCPH08CCH168AAB 7

8. Apply grease to the pin housing for the hydraulic lift cylinder.



RCPH07CCH636AAA 8

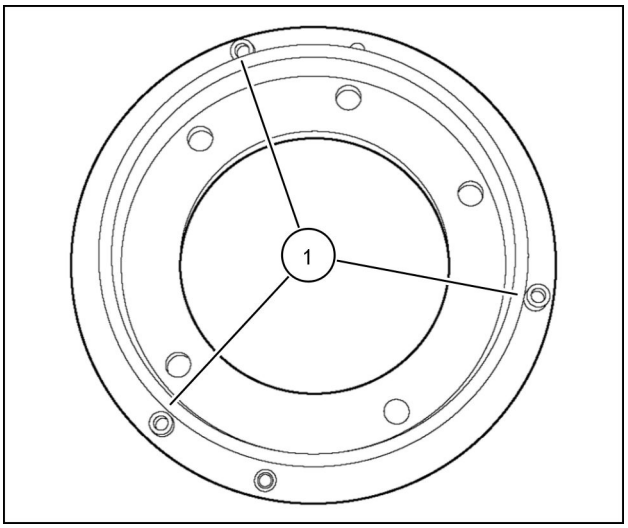
4. Press the universal joint cap below the retaining ring groove and install the retaining ring. Repeat this procedure for each universal joint cap.



RCPH07CCH985BBC 4

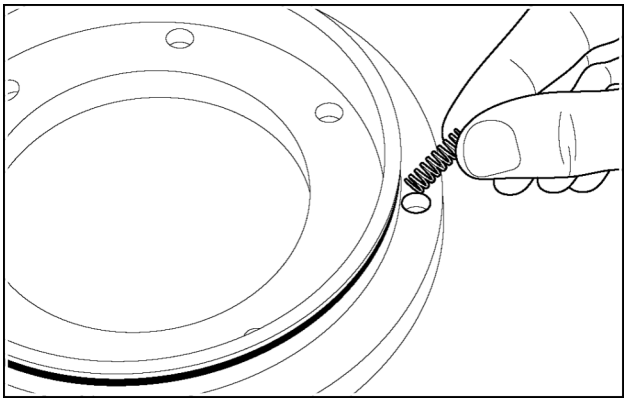
5. Repeat the assembly procedure for the opposite MFD axle drive shaft, if removed.

15. Note the three springs.



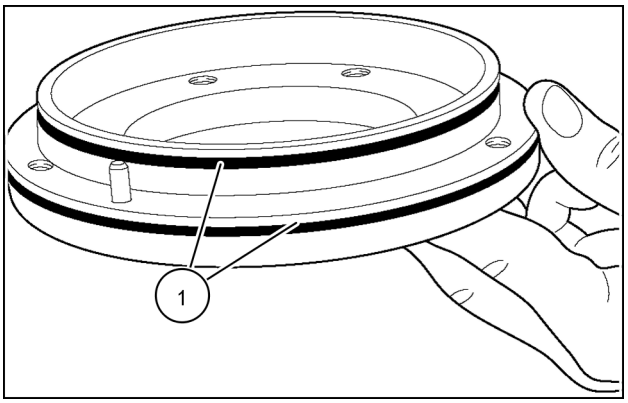
RCPH10CCH008BAB 15

16. Remove the springs and set aside.



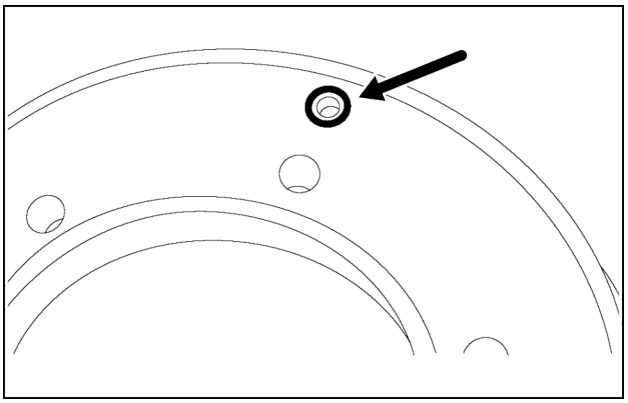
RCPH10CCH276AAB 16

17. Remove and discard the two seal rings **(1)**.



RCPH10CCH277AAB 17

18. Remove and discard the O-ring seal for the oil supply.

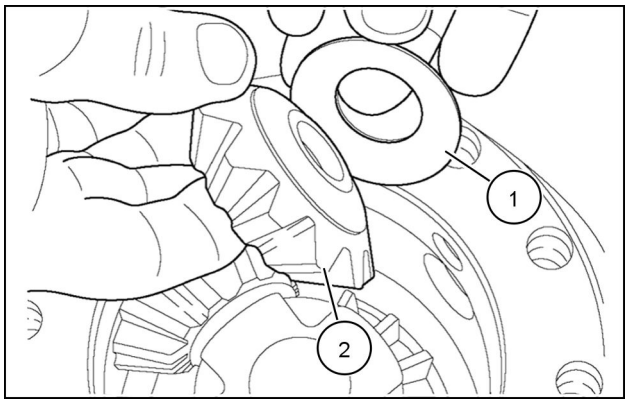


RCPH10CCH279AAB 18

Differential Locking - Assemble Class V

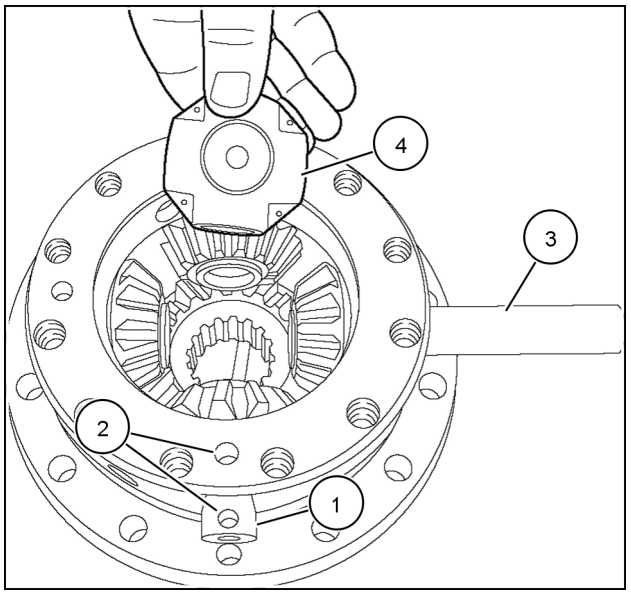
Prior operation:
Differential Locking - Disassemble Class V (D.10.A)

1. Reinstall the four beveled washers **(1)** and planetary gears **(2)** removed earlier.



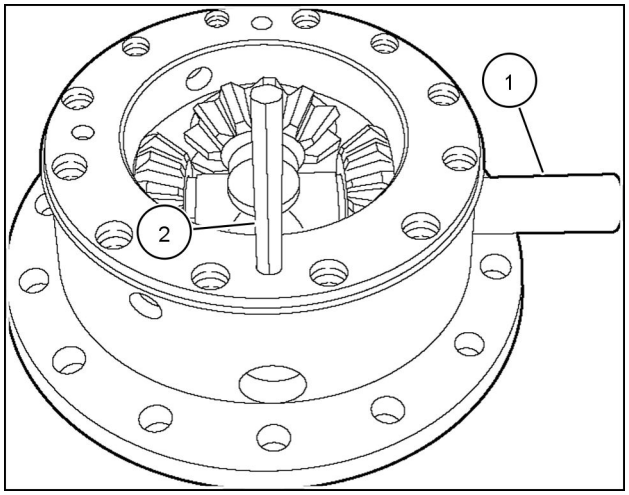
RCPH07CCH462AAB 1

2. Reinstall the two short gear shafts **(1)** just far enough to hold the washer and gear in place. Make sure that the roll pin holes **(2)** are aligned. Start the longer gear shaft **(3)** into the housing. Make sure that the roll pin hole is in the proper location. Reinstall the shaft cross **(4)**.



RCPH07CCH255BAB 2

3. Drive the shafts **(1)** in until the roll pin holes are aligned. Use a punch **(2)** to align the holes.

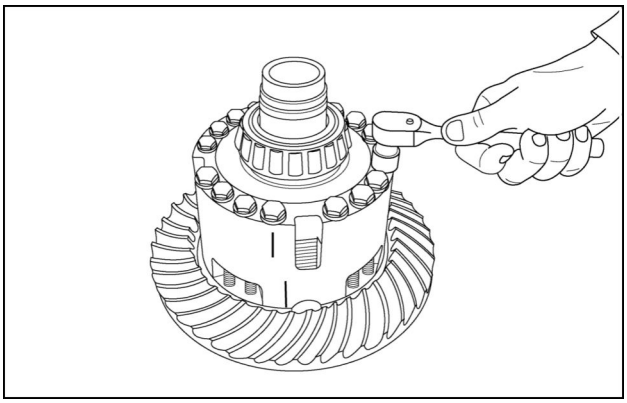


RCPH07CCH256BAB 3

Differential Locking - Disassemble - Standard

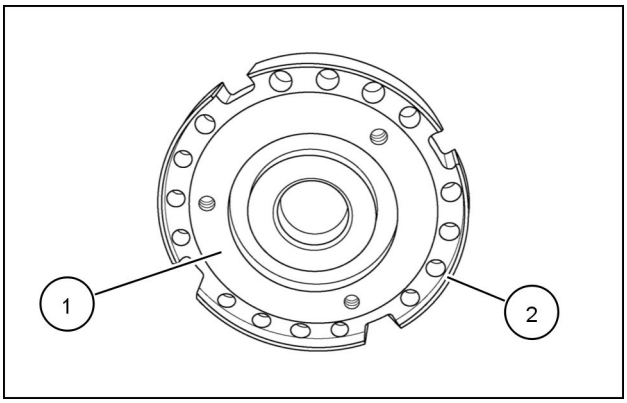
Prior operation:
Differential Locking - Remove - Standard (D.10.A)

1. Mark the housing halves (two places) for reassembly and remove the bolts.



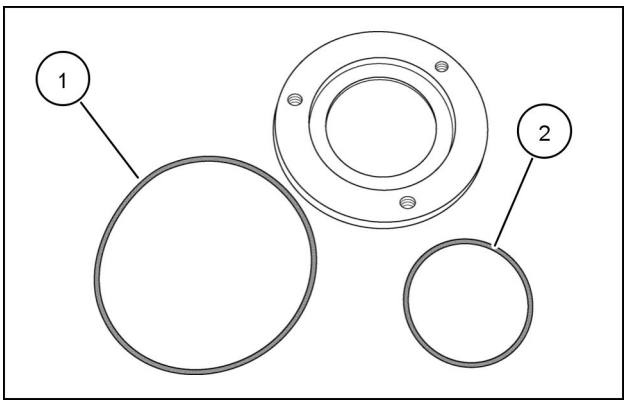
RCPH07CCH451AAA 1

2. Remove the piston **(1)** from the cap half of the housing **(2)**.



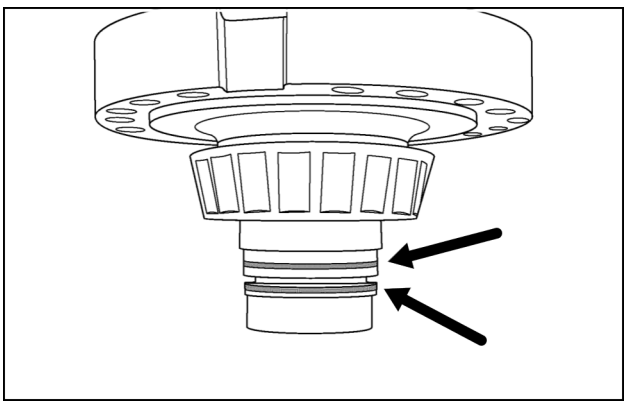
RCPH07CCH452AAA 2

3. Remove the outer (1) and inner (2) seal rings from the piston and discard the seals.



RCPH07CCH453AAA 3

4. Remove the seal rings from the shaft.

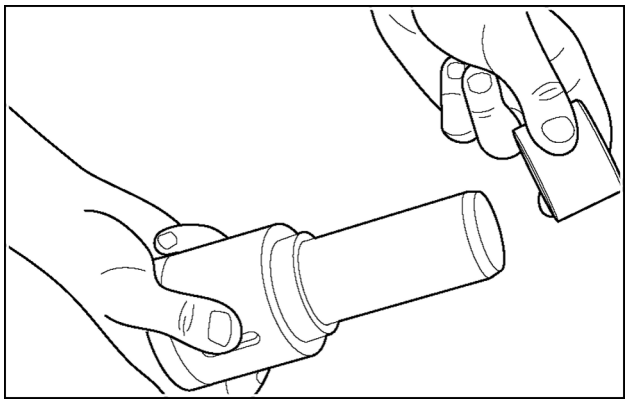


RCPH07CCH454AAA 4

Steering knuckle and King pin - Assemble - Class V MFD

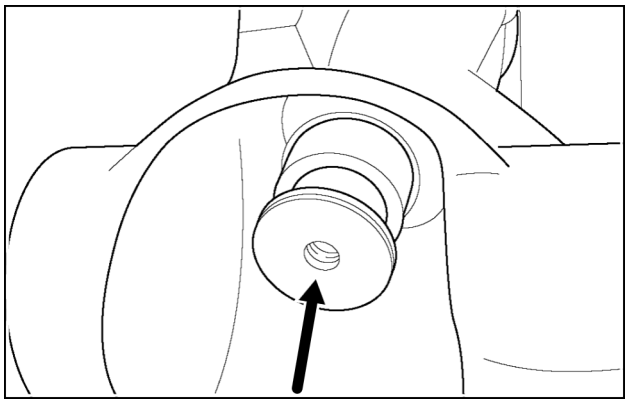
Prior operation:
Steering knuckle and King pin - Disassemble - Class V MFD (D.10.A)

1. Place a new axle shaft bushing over special tool **380002857**.



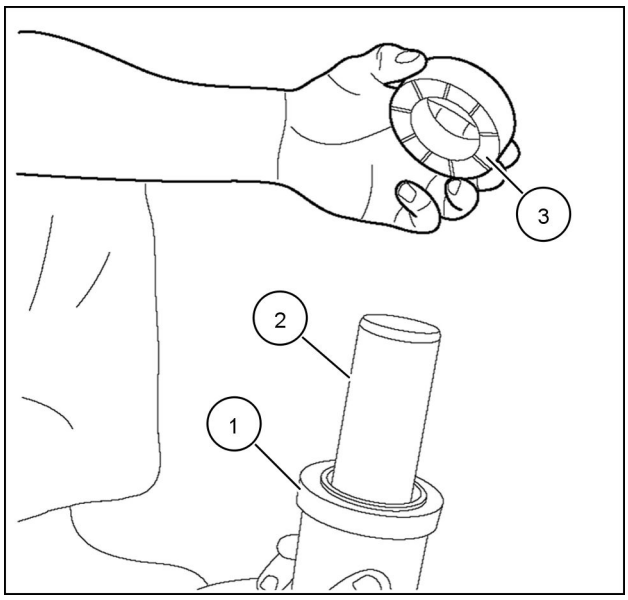
RCPH07CCH478AAB 1

2. Place the tool with the bushing into the axle housing. Drive the tool inward until it stops. This sets the bushing to the proper depth.



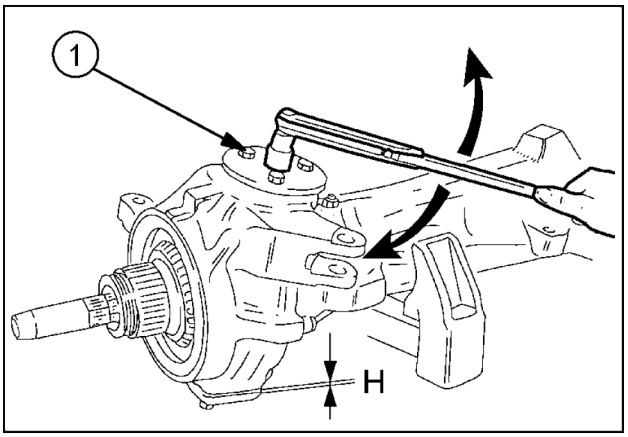
RCPH07CCH479AAB 2

3. Place axle shaft seal installer **380002859 (1)** over installation tool **380002857 (2)**. Apply a light coating of grease to the seal lip of a new axle shaft seal. Place the seal **(3)** on the installation tools (with the flat side against the seal installer) .



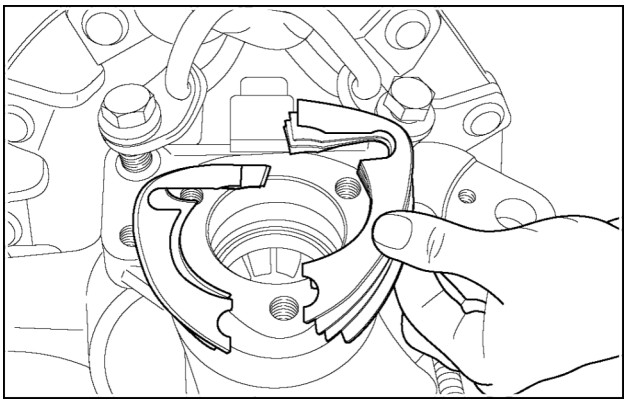
RCPH07CCH282BAB 3

4. Determine the proper thickness for the shim pack:
   - Measure the gap **(H)** between the lower cover and the housing in three places. Average the three measurements.
   - Correct shim thickness = H - **0.20 mm** (**0.008 in**).
   - If necessary, round up the total thickness to the next **0.05 mm** (**0.002 in**).



1b0o2004061041 4

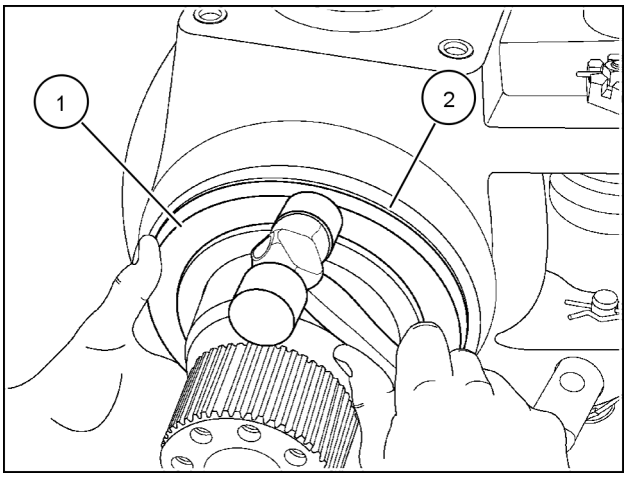
5. Place the shim pack between the upper cover and housing. Torque the bolts to **113 N·m** (**83 lb ft**). Swivel the hub back and forth a few times to seat the bearings. Check the torque required to swivel the hub back and forth. The correct torque range is **118 - 147 N·m** (**87.0 - 108 lb ft**). If the measured value is low, remove shim(s); if the value is high, add shim(s).



RCPH10CCH264AAB 5

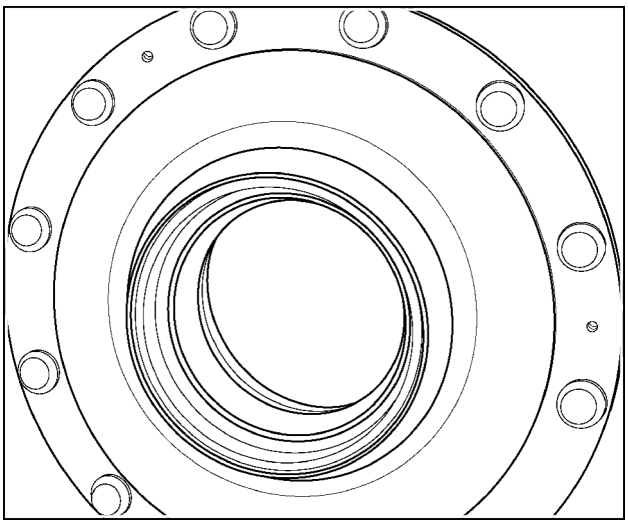
Next operation:
Steering knuckle and King pin - Assemble - Class 4 and 4.5 axles (D.10.A)

28. Place the dust seal installation ring **(1)** against the seal **(2)** and lightly tap around the ring to set the seal against the machined surface.



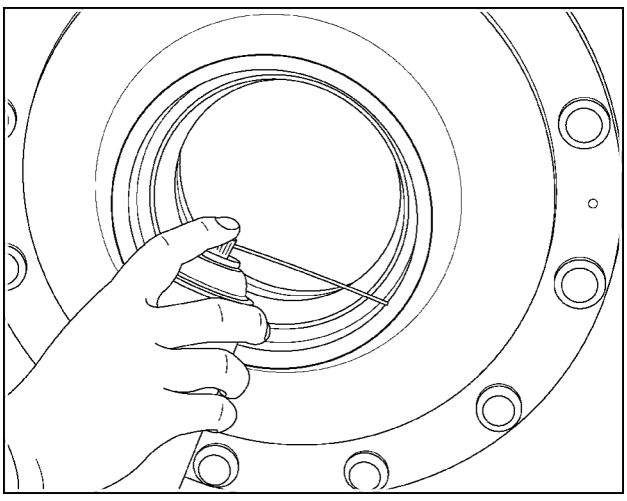
RCPH07CCH961BBC 28

29. Place the hub in a suitable vise.



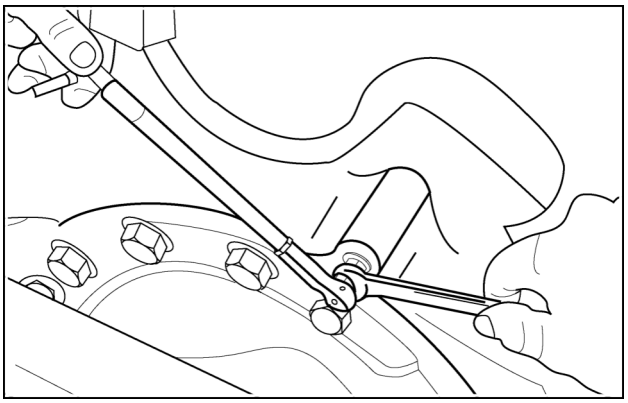
RCPH07CCH956BBC 29

30. Thoroughly clean and dry the seal counterbore.



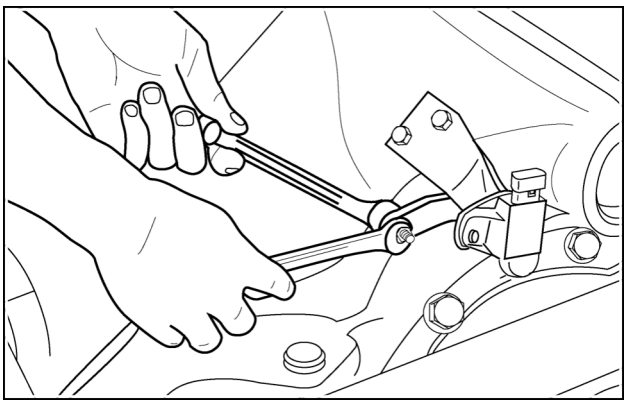
RCPH07CCH957BBC 30

8. Apply Loctite 243 to the male threads of the ball joint. Install the ball joint onto the axle and tighten to a torque of **19 - 20 Nm** (**165 - 180 lb in**).



RCPH07CCH687AAA 8

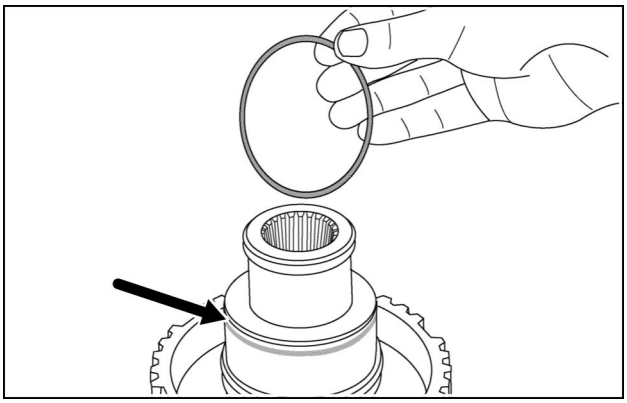
9. With the unit in the collapsed position, install remaining ball joint onto the sensor arm. Tighten the nut to a torque of **20 - 22.5 Nm** (**180 - 200 lb in**).



RCPH07CCH688AAA 9

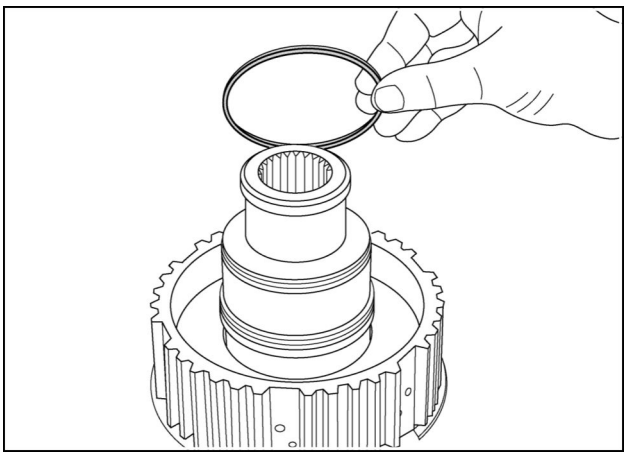
Next operation:
Sensing system - Adjust - Steering angle sensor (D.10.A)

22. Lubricate a new backup O-ring with petroleum jelly, and install the O-ring in the seal ring groove.



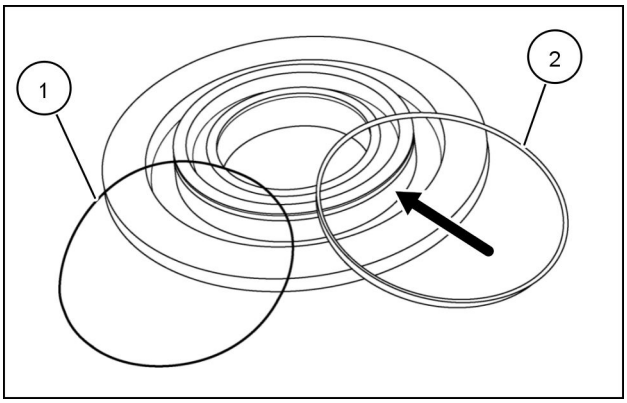
RCPH07CCH155AAA 21

23. Lubricate a new seal with petroleum jelly and install the seal in the groove. Do not overstretch the seal during installation.



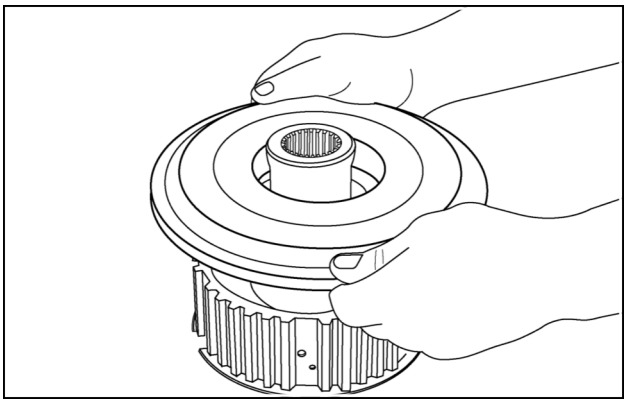
RCPH07CCH044BAA 22

24. Lubricate a new backup O-ring **(1)** and seal **(2)** with petroleum jelly, and install in the piston seal grove. Do not overstretch the seals during installation.



RCPH07CCH182AAA 23

25. Hand press the piston onto the hub to “size” the seal rings. Remove the piston and set aside.



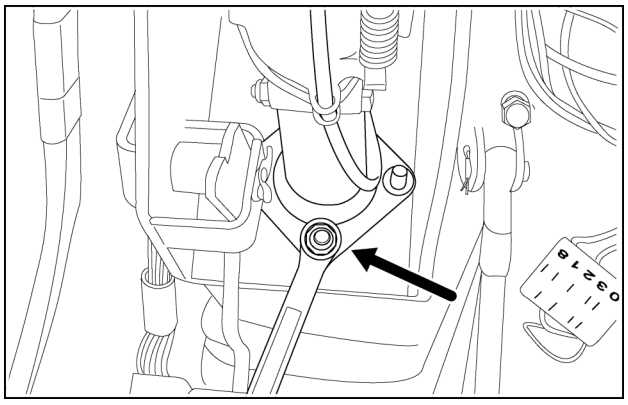
RCPH07CCH183AAA 24

AXLES, BRAKES AND STEERING - D

STEERING Hydraulic - 20.C

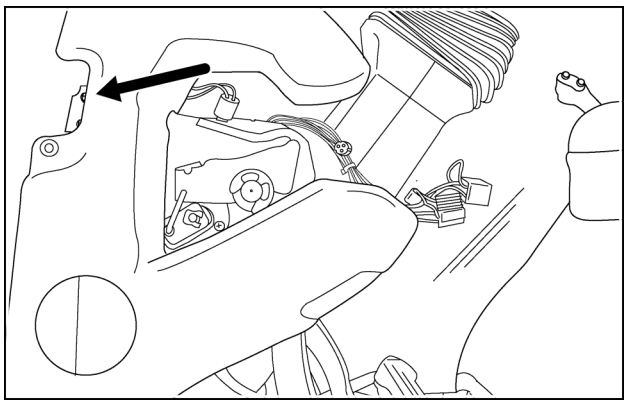
T8.275
T8.300
T8.330
T8.360
T8.390

9. Torque the steering column base lock nuts to **29 - 32 Nm** (**21 - 24 lb ft**).



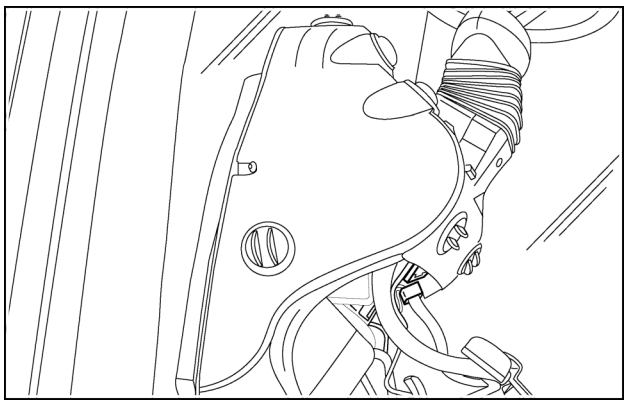
RCIL07CCH022AAA 8

10. Pull up on the cab floor mat, and install the left console heat duct into the cab floor duct. Install the retaining screw. Position the right console heat duct and install the retaining screw.



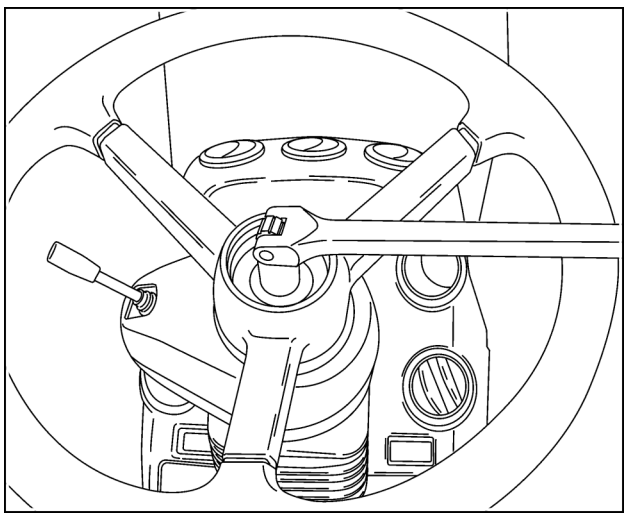
RCIL07CCH016AAA 9

11. Install the front console panels. Refer to **Console Front console - Install (E.32.A)**.



RCIL07CCH015AAA 10

12. Install the steering wheel. Refer to **Command - Install (D.20.C)**.



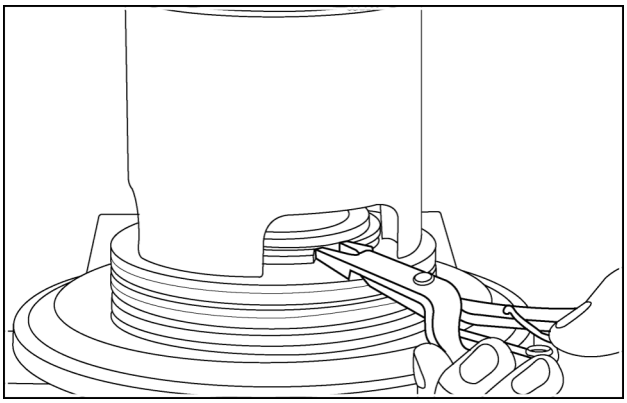
RCPH07CCH044BAB 11

AXLES, BRAKES AND STEERING - D

PARKING BRAKE Hydraulic - 32.C

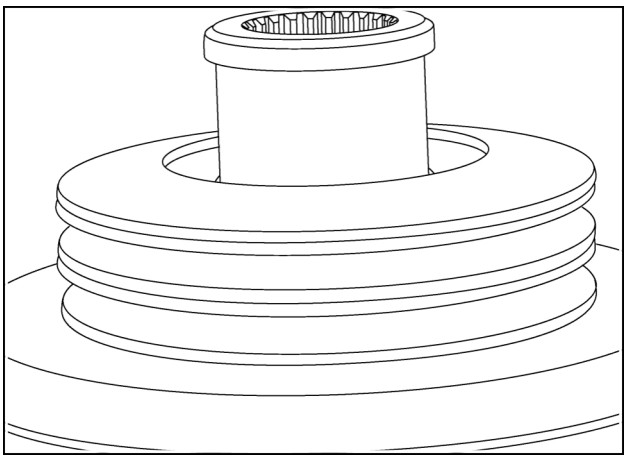
T8.275
T8.300
T8.330
T8.360
T8.390

4. To remove the retaining ring:
   A. Install special tool **380002454** – compression sleeve with notches – over the shaft and retaining ring.
   B. Align the notch on the tool with the ends of the retaining ring.
   C. Compress the belleville springs with a hydraulic press.
   D. Move the retaining ring out of the groove.
   E. Release the tool and remove retaining ring and locking ring.



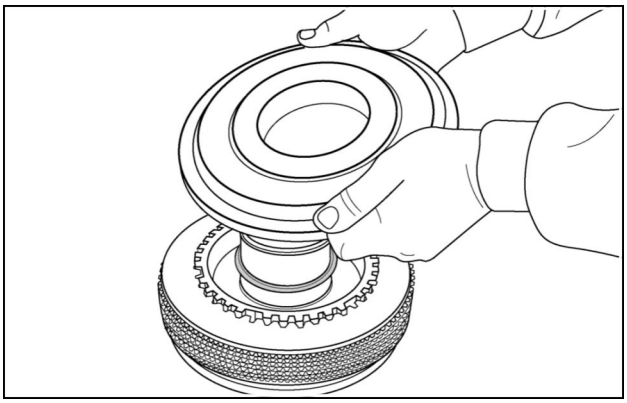
RCPH07CCH149AAA 4

5. Note the orientation of the belleville springs, and remove the belleville springs.



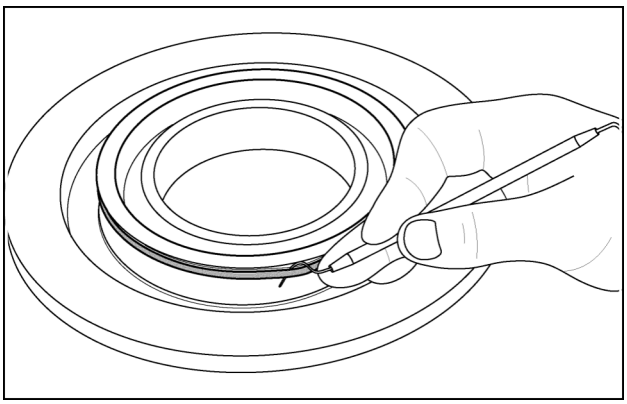
RCPH07CCH042BAA 5

6. Remove the piston.



RCPH07CCH150AAA 6

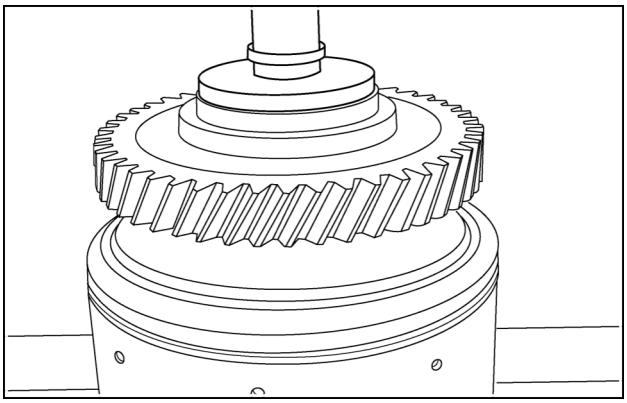
7. Remove the piston seal and discard.



RCPH07CCH151AAA 7

4. Press the second bearing cup into the carrier.

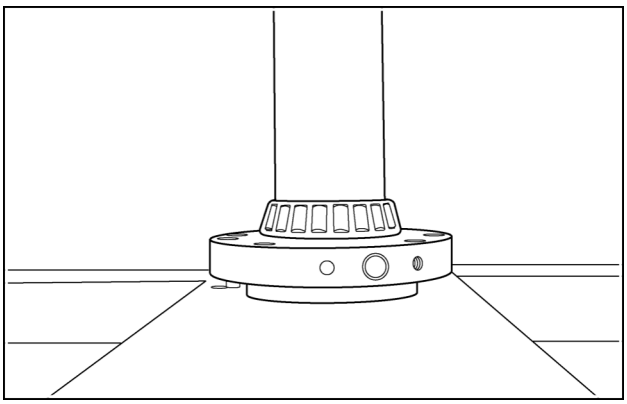
NOTICE: *Do not over press the cup against the snap ring.*



RCPH07CCH172AAA 4

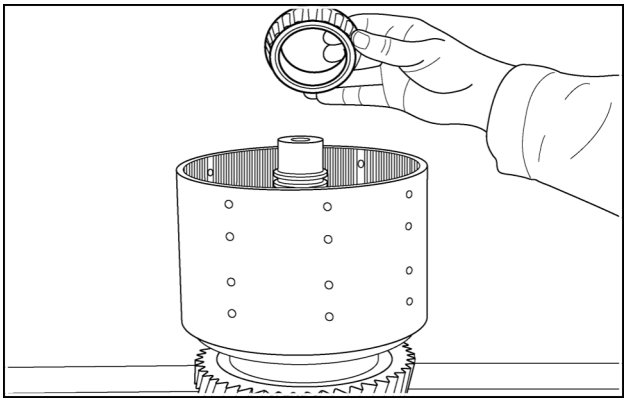
5. Using an appropriate tool, press the bearing onto the shaft.

NOTICE: *Do not press on the bearing cage.*



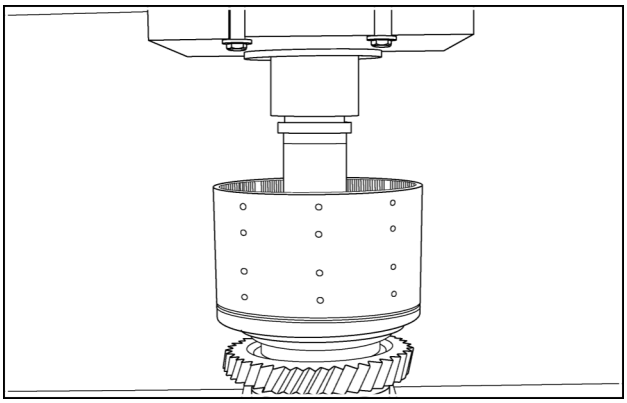
RCPH07CCH173AAA 5

6. Place the carrier over the shaft and place the second bearing on the shaft.



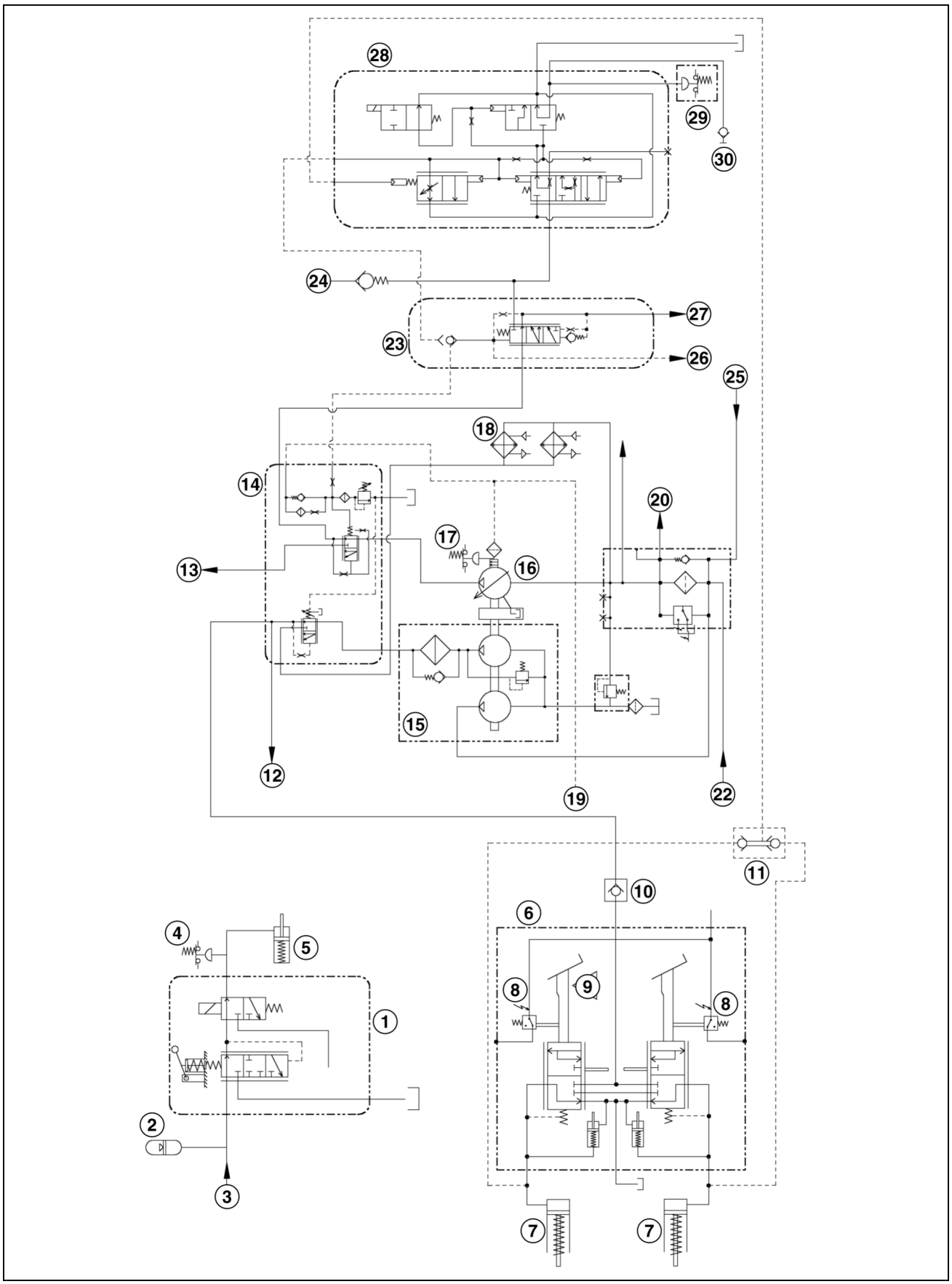
RCPH07CCH174AAA 6

7. To set the bearing preload:
   - A. Attach a spring scale to one of the holes in the carrier.
   - B. As the bearing is pressed onto the shaft, rotate the carrier until a rolling torque of **2.1 - 3.2 Nm** (**18 - 28 lb in**) is obtained.

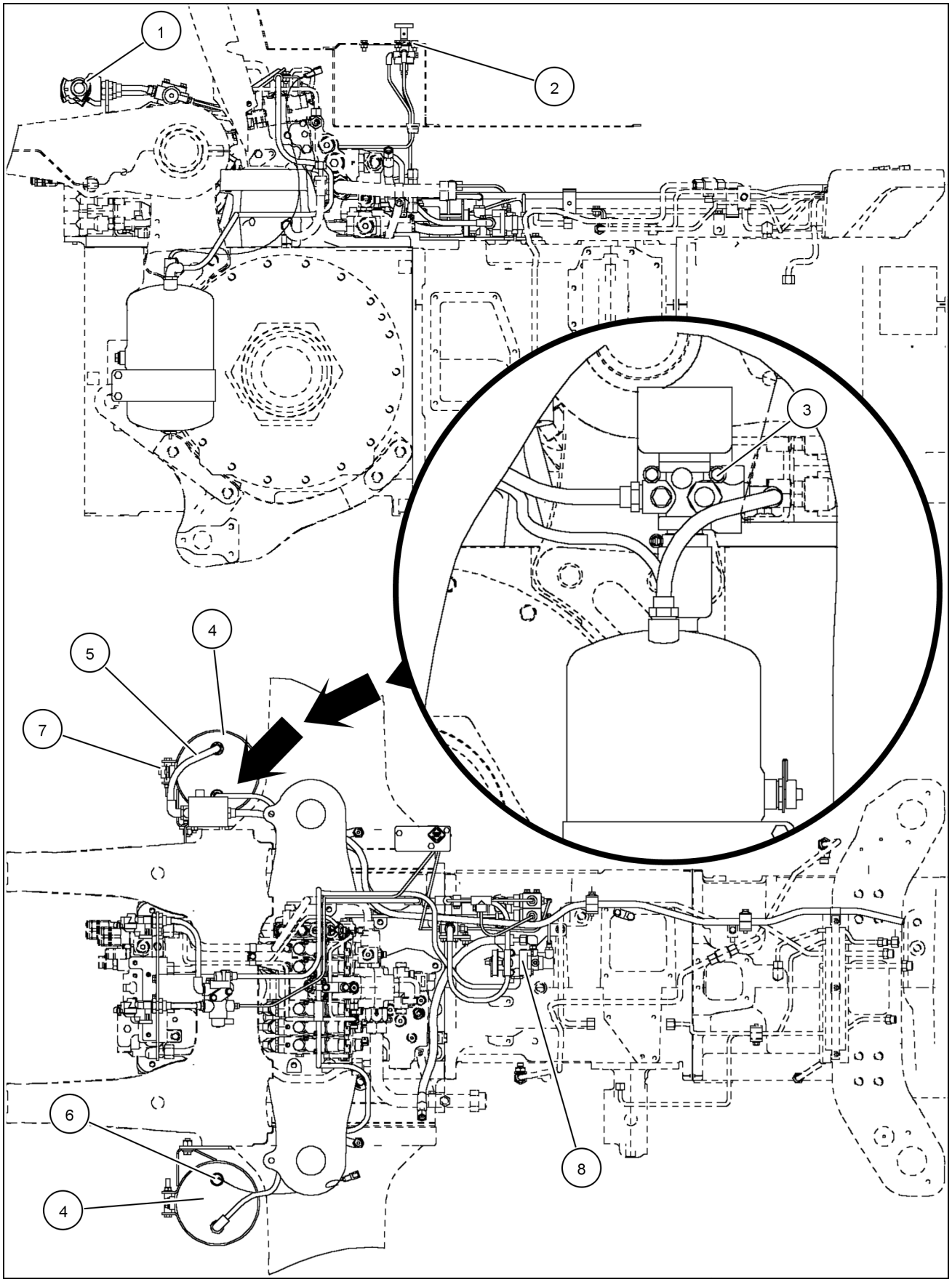


RCPH07CCH175AAA 7

Next operation:
MFD input shaft and clutch - Pressure test (D.14.C)
Next operation:
Brake - Pressure test - Park brake clutch (D.32.C)
Next operation:
Connect the range housing to speed housing. Refer to: **TRANSMISSION Powershift - Join - Speed to range transmission (C.20.E)**.
Next operation:
Connect the final drive to the range housing. Refer to: **TRANSMISSION Powershift - Join - Range transmission to rear frame (C.20.E)**.
Next operation:
Suction screen - Install (A.10.A)



RCPH08CCH002HAA 1

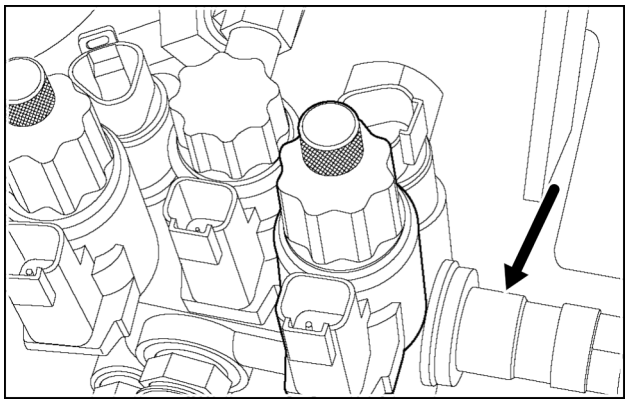


RCPH08CCH007HAA 1

1. Air brake couplers	5. Unloader valve to reservoir
2. Manual control valve	6. Pressure switch
3. Unloader/regulator valve	7. Air brake test port

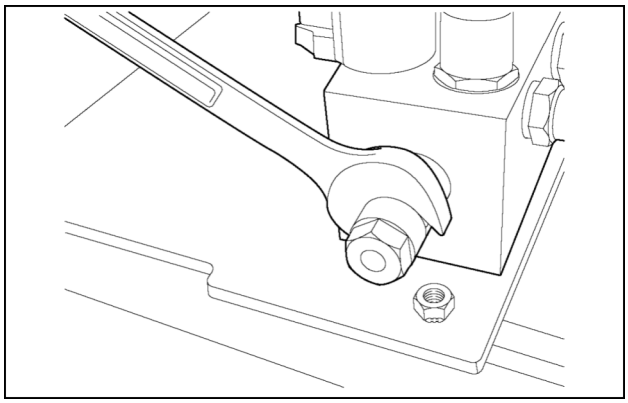
Relief valve

16. The valve block contains one pressure relief valve. Use this procedure to remove the valve.



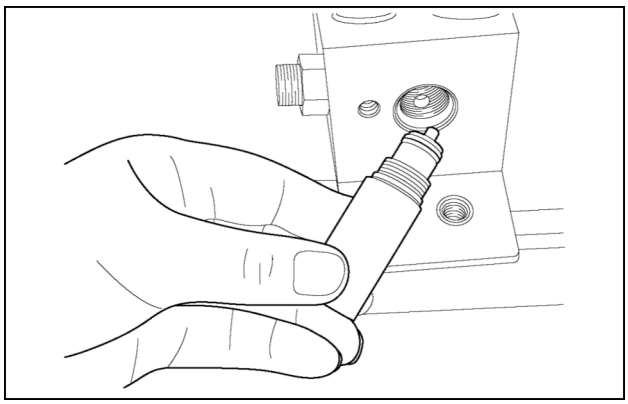
RCPH08CCH087AAB 16

17. Loosen the valve body.



RCPH08CCH321AAB 17

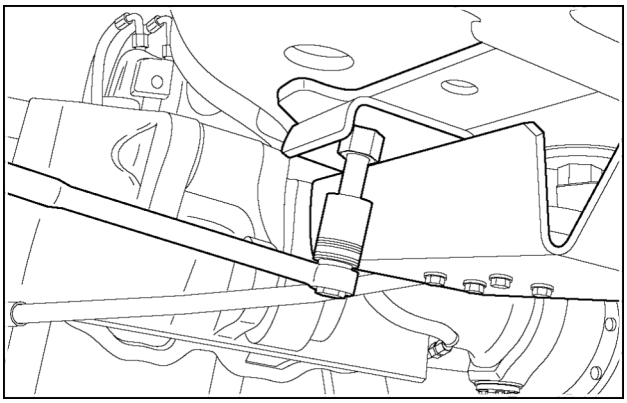
18. Remove the valve.



RCPH08CCH322AAB 18

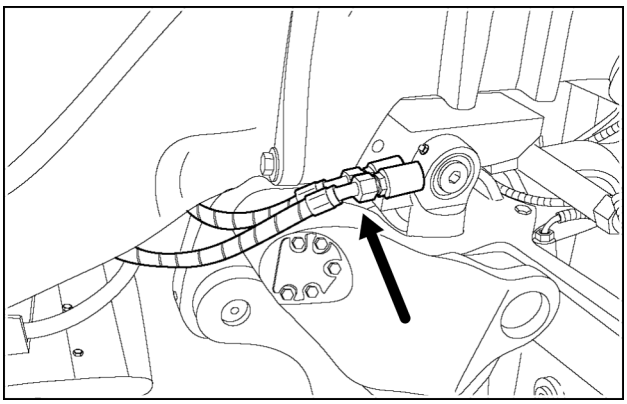
Next operation:
Control valve - Assemble - Suspended axle (D.40.C)

4. Tighten the mounting bolts to a torque of **300 Nm** (**221 lb ft**).



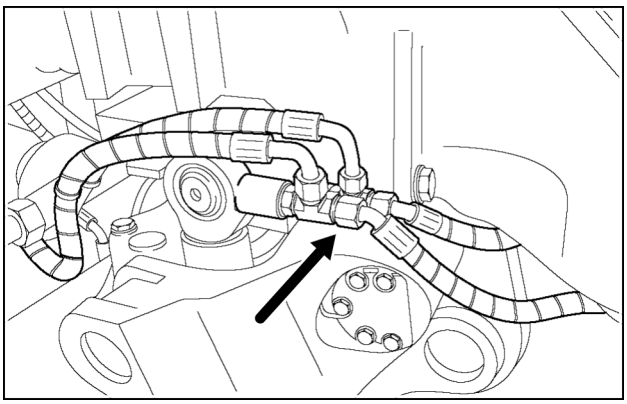
RCPH08CCH096AAB 4

5. Install a new O-ring, and reconnect the hydraulic hose from the accumulator to the left lift cylinder. Tighten the fittings.



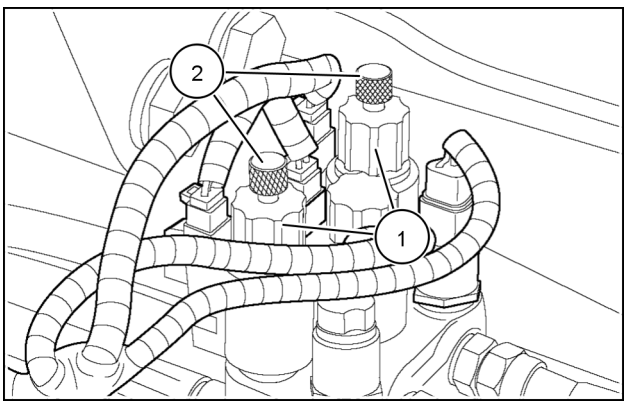
RCPH08CCH103AAB 5

6. Install a new O-ring, and reconnect the hydraulic hose from the accumulator to the right lift cylinder. Tighten the fittings.



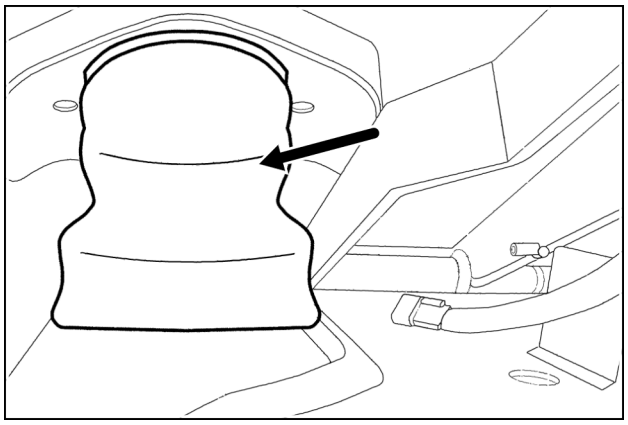
RCPH08CCH102AAB 6

7. Unlock the two control valves **(1)** by turning the thumb screws **(2)** in a fully counterclockwise direction.



RCPH08CCH076AAB 7

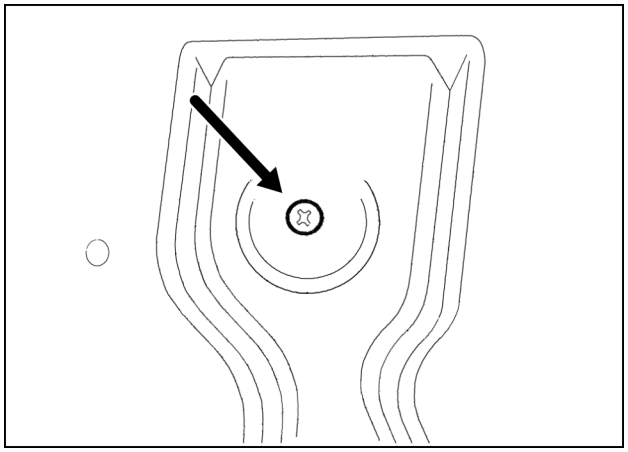
4. Install the air bag between the bottom housing and the suspension.



RCPH10CCH562BAO 4

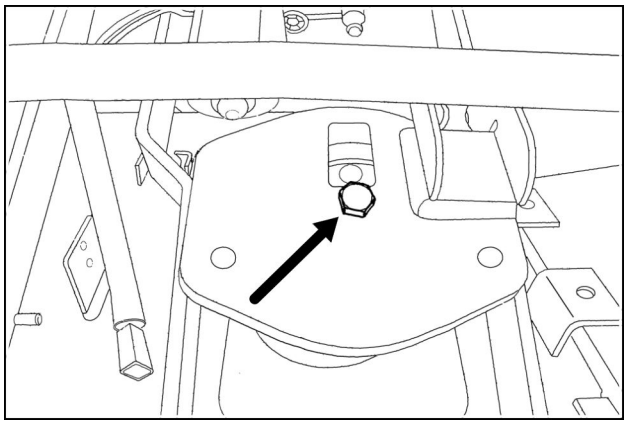
5. Install and tighten the bottom mounting screws for the air bag.

NOTE: *Make sure that the air inlet is lined up with the hole in the suspension.*



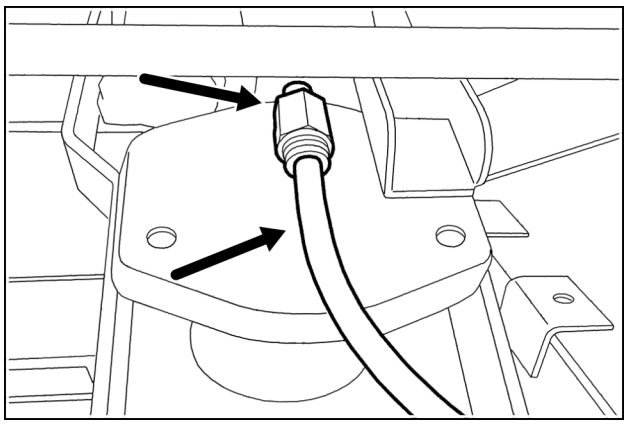
RCPH10CCH561BAO 5

6. Install and tighten the top mounting bolt for the air bag.



RCPH10CCH560BAO 6

7. Install the tee fitting in the air bag. Install the tank line in the air bag fitting.



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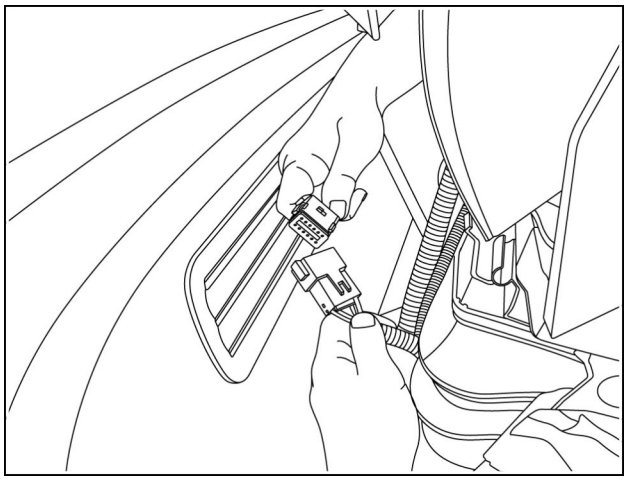
3. Connect the harness connector to the armrest.



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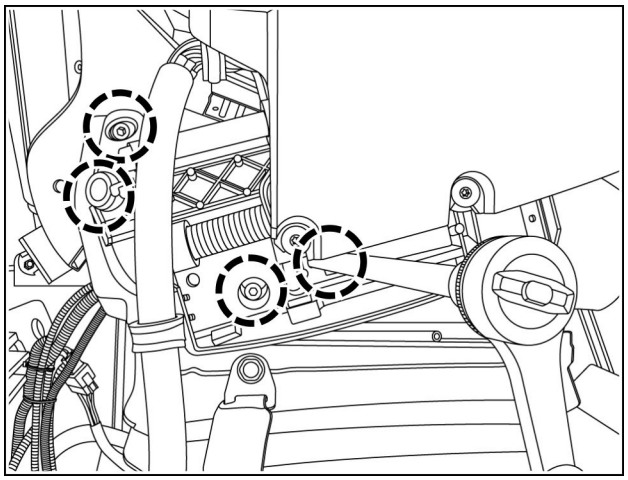
4. Install the armrest console. Torque the four hex bolts to **39 - 43 N·m** (**29 - 32 lb ft**).



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Precautions

A/C flushing solvent is a hazardous material. Read all warnings on the flushing solvent container prior to use and observe these safety precautions:

1. The flushing solvent is combustible. Avoid heat, sparks and open flame.
2. Use only in a well ventilated area. Mechanical exhaust and an appropriate respirator may be needed in warm and confined areas to protect your safety.
3. Avoid breathing mist and vapor.
4. Wear chemical splash safety goggles.
5. Wear rubber gloves and a rubber apron when handling the solvent or flushing components.
6. Observe all local, state and federal regulations regarding the safe disposal of used flushing solvent.

The goal of flushing is to remove contaminants from the A/C system. Your shop air must be properly filtered and dried with coalescing filter, or you will simply replace one source of contamination with another using dirty, moisture saturated air.

The compressor, receiver-drier and thermal expansion valve must be bypassed (removed) when performing circuit flushing. The compressor and receiver-drier may never be flushed; the thermal expansion valve can be back flushed.

Keep the lid on the flushing recovery bucket closed when flushing to minimize the circulation of solvent vapors.

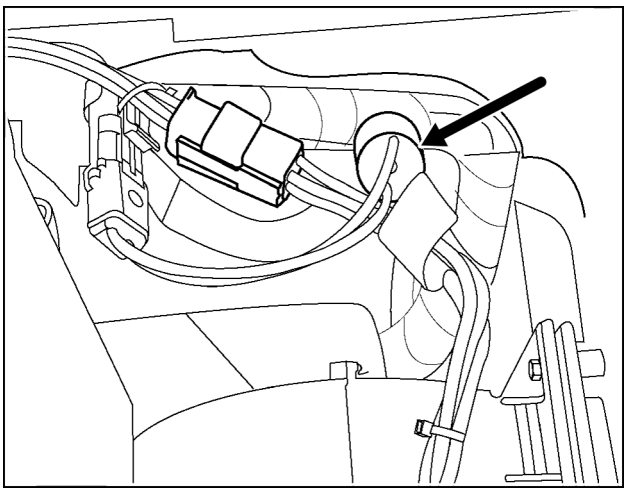
Never allow the flushing solvent to remain in or on the hoses for an extended period of time. Overexposure of the hoses to the solvent, especially the exterior, may cause hose swelling.

Do not open the fill cap on the flush reservoir when the reservoir is under pressure. Release pressure before removing cap.

Sensing system Low pressure switch - Dynamic description

Low pressure switch activation is generally caused by low refrigerant level resulting from a leak(s). Sometime low pressure switch activation, however, is caused by a restriction, where because of the location either pressure switch may activate first. For example, a restriction at the output of the receiver-drier could cause either high or low pressure switch activation.

NOTE: *Your A/C systems are designed to prevent A/C compressor failure due to low pressure or low refrigerant charge. Operation on days below* ***4 °C*** *(****40 °F****) may actuate the low pressure sensing system and shut down the A/C system. The system is not malfunctioning if this occurs. Toggle the A/C switch Off and then On to reset the system.*



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When the pressure switch opens within the smart pressure counting conditions, the pressure warning lamp flashes on the A/C switch, and the compressor clutch is latched Off by the controller.

Although system pressures may return to normal, the clutch remains latched Off until the key switch or A/C switch is toggled Off and then On.

The controller disables the clutch by denying ground to the clutch relay.

Cycling the power switch does not resolve the pressure problem, however, install the pressure test gauges and performance test the system.

Switch testing

When disconnected from the system, the low pressure switch will test normally open.

When installed in the A/C system under normal operating pressures, the pressure switch should test closed.

Power and ground

The controller feeds **5 V** from pin B of controller connector **CCU2** to pin B of connector **B MOT C** on the low pressure switch. The switch is grounded from pin A to HVAC ring terminal ground **E22**.

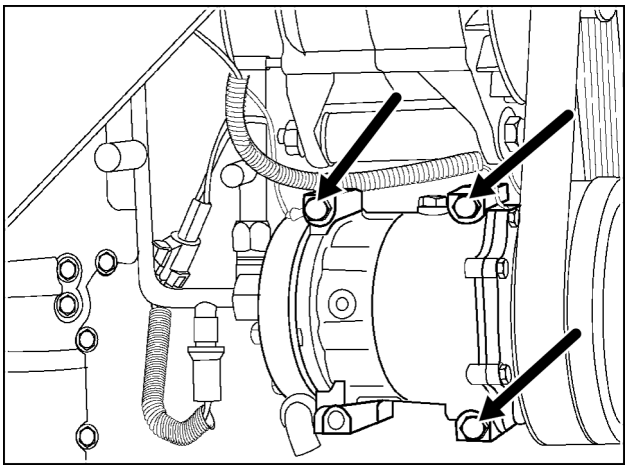
Electrical Test

Refer to **Sensing system Low pressure switch - Testing (E.40.D)** and electrical schematic frames:

- **Wiring harness - Electrical schematic frame 58 (A.30.A)**
- **Wiring harness - Electrical schematic frame 59 (A.30.A)**
- **Wiring harness - Electrical schematic frame 60 (A.30.A)**
- **Wiring harness - Electrical schematic frame 61 (A.30.A)**

7. Check for loose mounting bolts for the compressor. Tighten the bolts to the correct torque.

NOTE: *Loose mounting can cause a "knocking" sound at the compressor. A refrigerant overcharge also causes a knocking sound at the compressor.*



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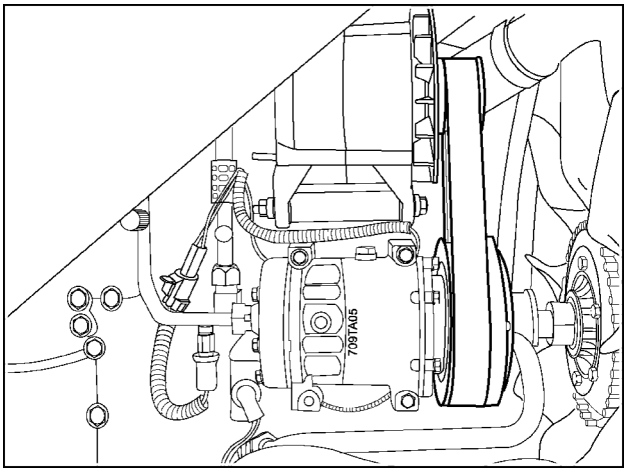
8. Clutch drive belt should be running smooth and straight. Clutch pulley and the drive pulley must be aligned within **1.6 mm** (**0.063 in**) of each other.
   - Use a straight edge to check pulley alignment. Adjust the compressor on the mounting bracket if required.
   - The drive belt should be firmly seated in the clutch grooves.
   - Check for too much belt wear: cracking, cord wear, piling, chunking, glazing or separated layers. Replace a worn or deteriorated belt.



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Next operation:
Compressor - Remove (E.40.D)

6. If there is little or no change at the low pressure gauge, the thermal expansion valve must be replaced.

NOTE: *No repair or adjustment is recommended for the valve.*

Next operation:
Expansion valve - Remove (E.40.D)

N°	Test Point	Expected Result	Other Result (Possible Cause)
3	**Condition** • Reconnect the switch to the air conditioning line. • Do not reconnect the switch to the harness. • Keyswitch On and ATC switch to Auto. **Check** Measure voltage between pin B of harness connector **ATC-J16** at the sensor and chassis ground.	**Result** **5 V**. **Action** Go to Step 4.	**Result** No voltage. **Action** Go to Step 5.
4	**Condition** Keyswitch Off. **Check** Measure resistance between pin A of harness connector **ATC-J16** at the sensor and chassis ground.	**Result** Less than **1 Ω**. **Action** Go to Step 5.	**Result** Infinite resistance or overload. **Action** Locate and repair the open circuit between pin A of harness connector **ATC-J16** at the sensor and pin 36 of connector **ATC-J8** at the controller.
5	**Condition** Keyswitch On and ATC switch to Auto. **Check** Measure voltage between pin 36 of connector **ATC-J8** at the controller and chassis ground.	**Result** **5 V**. **Action** Locate and repair the open condition between pin B of connector **ATC-J16** at the sensor and pin 36 of connector **ATC-J8** at the controller.	**Result** No voltage. **Action** Perform the controller replacement test. See **Electronic HVAC control - Testing - Controller replacement (E.40.D)**.

Sensing system Low pressure switch - Testing

N°	Test Point	Expected Result	Other Result (Possible Cause)
1	**Check** Install high and low pressure gauge test set to the ports at the compressor. See **ENVIRONMENT CONTROL Heating, ventilation and air-conditioning - Problem solving (E.40.D)**, and follow the conditions for performance testing.	**Result** **28 kPa** (**4 psi**) ± **14 kPa** (**2 psi**). **Action** Perform the corrective actions in **ENVIRONMENT CONTROL Heating, ventilation and air-conditioning - Problem solving (E.40.D)** for this pressure condition.	**Result** System pressures are normal. **Action** Go to Step 2.
2	**Condition** Keyswitch Off. Disconnect the low pressure sensor from the harness and from the air conditioning line. **Check** Measure resistance between pins A and B on the sensor connector.	**Result** Infinite resistance or overload. **Action** Go to Step 3.	**Result** Less than **10 Ω**. **Action** Replace the switch.
3	**Condition** • Reconnect the switch to the air conditioning line. • Do not reconnect the switch to the harness. • Keyswitch On and A/C switch to On. **Check** Measure voltage between pin B of harness connector **B MOT C** at the sensor and chassis ground.	**Result** **5 V**. **Action** Go to Step 4.	**Result** No voltage. **Action** Go to Step 5.