Engine Noise Excessive Turbocharger

This is symptom Tree T052.

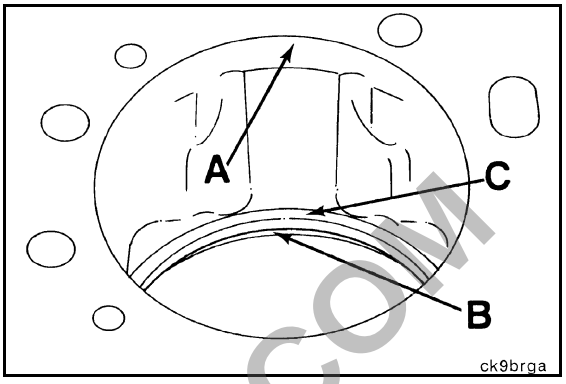
NOTE: Refer to “Engine Noise Diagnostic Procedures General Information” on page 104 before using this symptom tree.

Cause	Correction
Air intake system restriction is above specification	Check the air intake system for restriction. Clean or replace the air filter and inlet piping as necessary. Refer to Procedure 010-031.
OK ⇩	
Air intake or exhaust piping is contacting the chassis or cab	Inspect the air piping, chassis, and cab for contact points.
OK ⇩	
Exhaust system restriction is above specification	Check the exhaust system for restrictions. Refer to Procedure 011-009.
OK ⇩	
Turbocharger is **not** correct	Check the turbocharger part number. Replace the turbocharger if necessary. Refer to Procedure 010-033.
OK ⇩	
Turbocharger is worn or damaged	Check the turbocharger for damage. Measure the turbine and compressor wheel clearances. Refer to Procedure 010-038.

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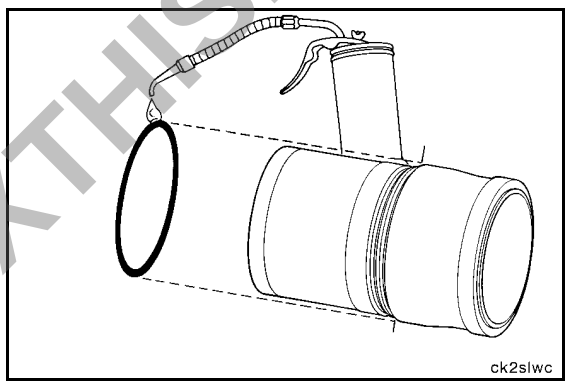
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Lubricate surfaces A and B with clean 15W-40 engine oil.

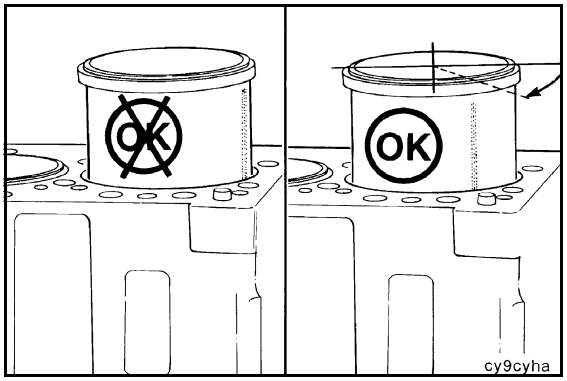


Use clean 15W-40 oil to coat the liner o-ring seals.

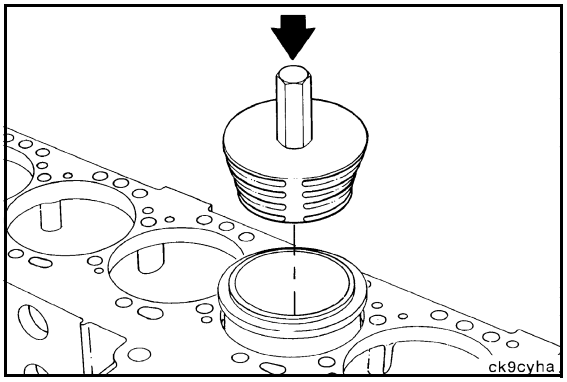
Install new o-ring seals on the liners.



When reusing liners, install them in the same cylinder from which they were removed and rotate them 45 degrees (1/8 turn) from their original position. When correctly installed, any liner pitting should be positioned as illustrated so the pitted surface is rotated away from the location where pitting occurs.

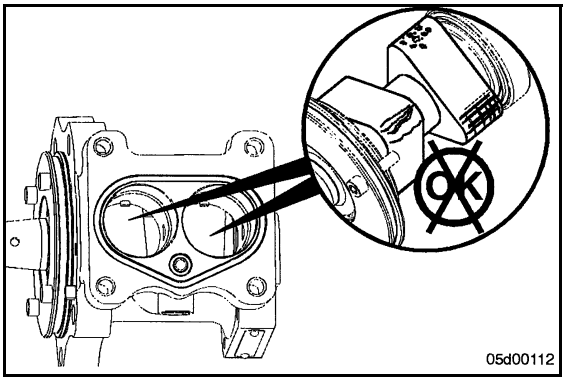


Install the liner into the bore of the cylinder block.



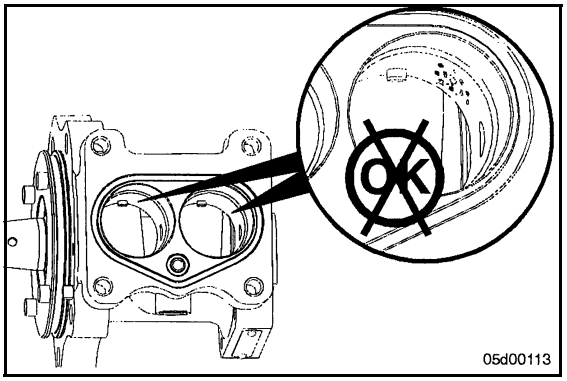
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Inspect the camshaft lobes for pitting and wear.

Replace the cam housing if there is any pitting or wear.

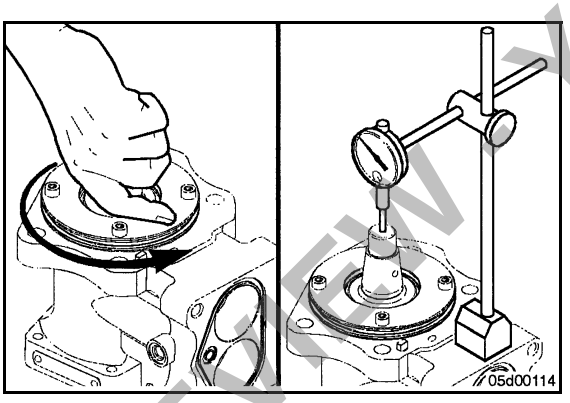


Inspect the tappet bores for scuffing or wear to the housing.

Polishing will occur in vertical bands at many places around the inside of the bores.

Polish of the bores is acceptable.

Replace the cam housing if there is any scuffing or wear on the bores, or damage to the guide pins.

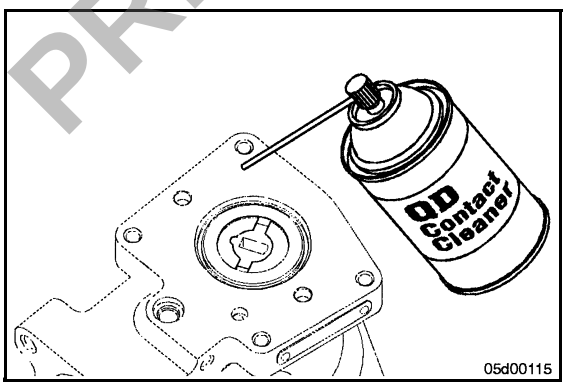


Using fingers, make sure the camshaft turns freely. The bearings must turn smoothly and free during rotation.

Replace the cam housing if the bearings are tight or rough.

Check the camshaft for end play. If any end play can be felt, use a dial indicator to check it.

If there is more than 0.05 mm [0.002 in] of end play, replace the cam housing assembly.



Clean (005-088-006)

Clean the mounting surfaces of the cam housing.

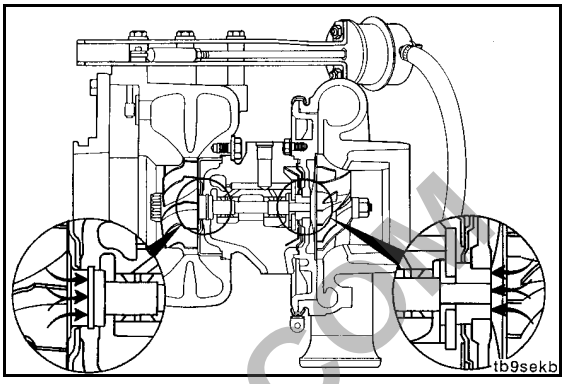
Use QD contact cleaner, Part No. 3824510.

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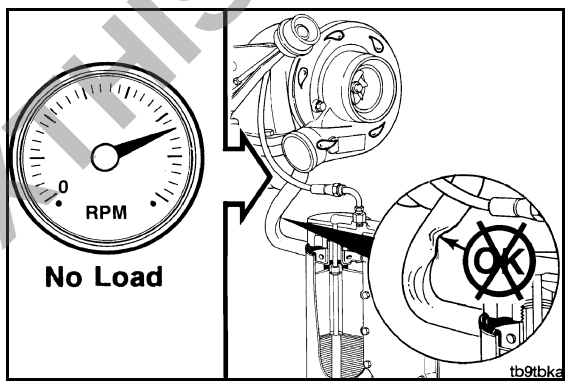
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Seal rings are used on each end of the rotor assembly. The primary function of the seals is to prevent exhaust gases and compressed air from entering the turbocharger housing. Lubricating oil leakage from the seals is rare, but it can occur.

NOTE: Excessive crankcase pressure will **not** allow the oil to drain from the turbocharger. This will load the bearing housing and allow lubricating oil to leak past the compressor seals and into the engine.

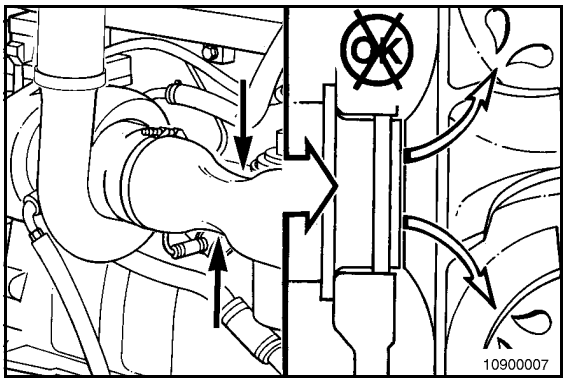


A restricted or damaged lubricating oil return line will cause the turbocharger housing to be pressurized, causing lubricating oil to migrate past the seals.



Additionally, high intake or exhaust restrictions can cause a vacuum between the compressor and the turbocharger housing resulting in oil leaking past the seals.

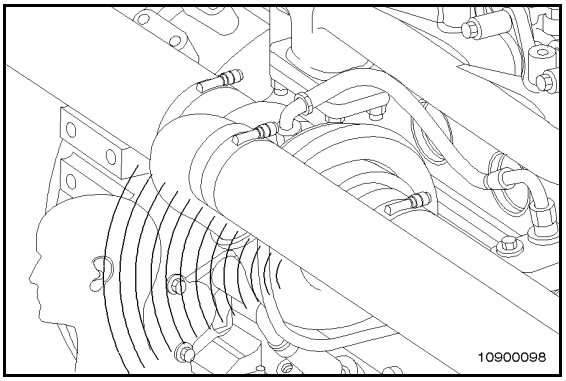
NOTE: If this occurs, it is necessary to flush the charge air cooler to clean oil from the intake system. Refer to Procedures 010-027 and 010-033.



Turbocharger Noise

It is normal for the turbocharger to emit a whine sound that varies in intensity depending on engine speed and load. The sound is caused by the very high rotational speed of the rotor assembly and the method used to balance the rotor assembly during manufacturing. Consequently, the sound will be more audible at full speed.

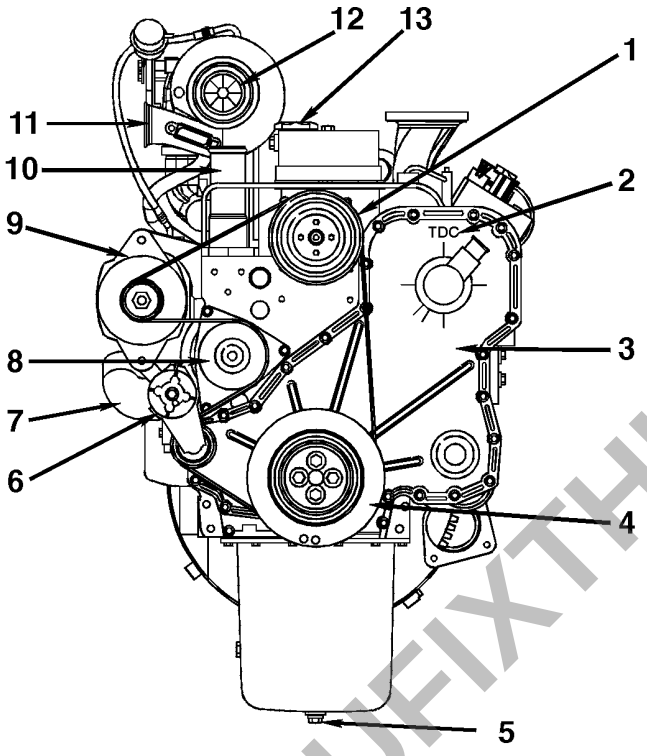
If possible, operate the engine at full speed to verify the noise level.



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Engine Views



Front View

1. Fan Pulley
2. Top Dead Center Mark
3. Front Gear Cover
4. Vibration Damper
5. Engine Oil Pan Drain Plug
6. Automatic Belt Tensioner
7. Water Inlet
8. Water Pump
9. Alternator
10. Water Outlet
11. Turbocharger Air Outlet
12. Turbocharger Air Inlet
13. Engine Rocker Housing Oil Fill

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STEP 4B: Clear the inactive fault codes.

Condition: • Connect all the components. • Key switch in the “ON” position.		
Action	**Specifications/Repair**	**Next Step**
Clear the inactive fault codes. • Erase the inactive fault code using an electronic service tool.	**OK** **All faults cleared**	Repair complete
	NOT OK Troubleshoot any remaining active fault codes.	Appropriate troubleshooting chart

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STEP 1B: Inspect the engine harness and the sensor connectors.

Condition: • Key switch in the "OFF" position. • Disconnect the engine harness from the intake manifold pressure sensor.		
Action	**Specifications/Repair**	**Next Step**
Inspect the harness and the sensor connectors for: • bent or broken pins • pushed back or expanded pins • corroded pins • moisture in or on the connector • missing or damaged seals.	**OK** **No damaged pins**	2A
	NOT OK **Repair the damaged pins** Repair or replace the engine harness or sensor, whichever has the damaged pins. • Repair the engine harness. • Replace the engine harness. Refer to Procedure 019-043. • Replace the intake manifold pressure sensor. Refer to Procedure 019-061.	3A

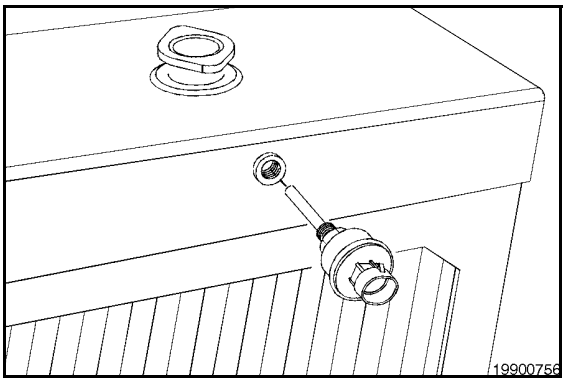
STEP 2: Check the engine harness.

STEP 2A: Inspect the harness and the ECM connectors.

∆ CAUTION ∆ **To avoid damaging a new ECM, all other active fault codes must be investigated prior to replacing the ECM.**		
Condition: • Key switch in the "OFF" position. • Disconnect the engine harness from the ECM.		
Inspect the harness and the ECM connectors for: • bent or broken pins • pushed back or expanded pins • corroded pins • moisture in or on the connector • missing or damaged seals.	**OK** **No damaged pins**	2B
	NOT OK **Repair the damaged pins** Repair or replace the engine harness or ECM, whichever has the damaged pins. • Repair the engine harness. • Replace the engine harness. Refer to Procedure 019-043. • Replace the ECM. Refer to Procedure 019-031.	3A

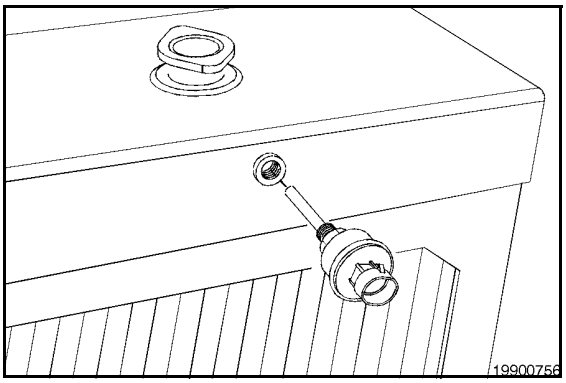
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Install (019-017-026)

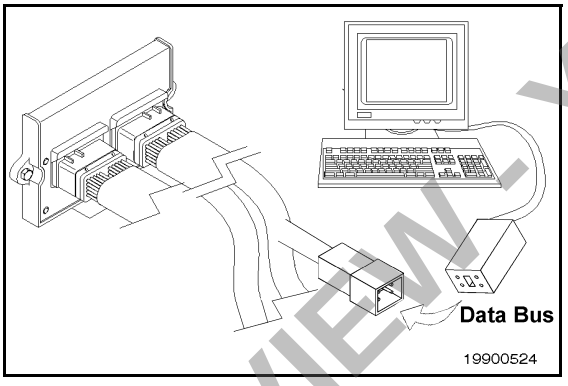
Install and tighten the new sensor according to the vehicle manufacturer's instructions.



Push the electrical connectors together until they lock.

Fill the cooling system and check for leaks. Refer to Procedure 008-018 in the Troubleshooting and Repair Manual for CDC 24 Valve 8.3 Liter Engine.

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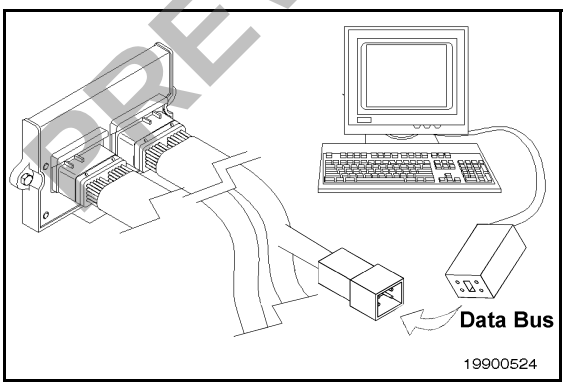
Coolant Temperature Sensor (019-019)

Initial Check (019-019-001)

Cold Engine

Connect an electronic service tool to the vehicle data bus.

Turn the key switch to the “ON” position.



Monitor the coolant temperature with the electronic service tool.

Compare the coolant temperature value with the water temperature gauge in the vehicle dash.

If the coolant temperature on the electronic service tool is excessively higher than the water temperature, replace the coolant temperature sensor.

If the coolant temperature on the electronic service tool does **not** increase with the water temperature, replace the coolant temperature sensor.

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STEP 169



47S24A

Install two caged needle bearings.

STEP 170



47S15A

Place output drive gear on output sleeve.

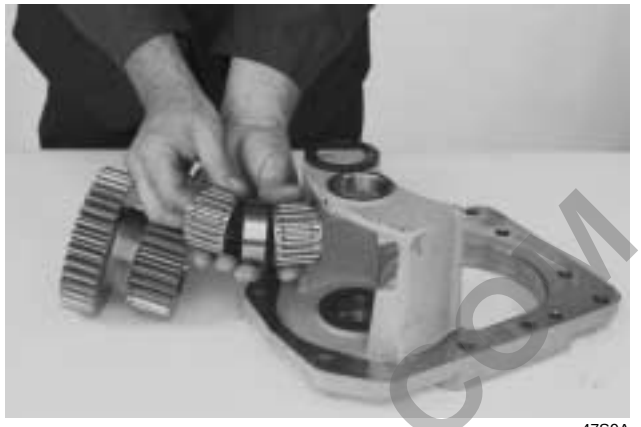
STEP 171



47121821

Install thrust bearing spacer, two thrust washers, and one thrust bearing between the thrust washers.

STEP 172



47S9A

Place a spacer between the two inner caged needle bearings and place the bearing into the cluster gear bore.

STEP 173



47S6A

Place one thrust washer on each end of the cluster gear.

STEP 174



47S3A

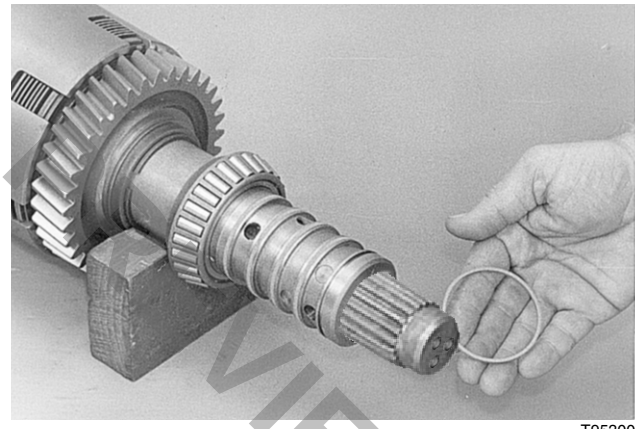
Slide the cluster gear into the cover housing.

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Disassembling the Speed Input Shaft

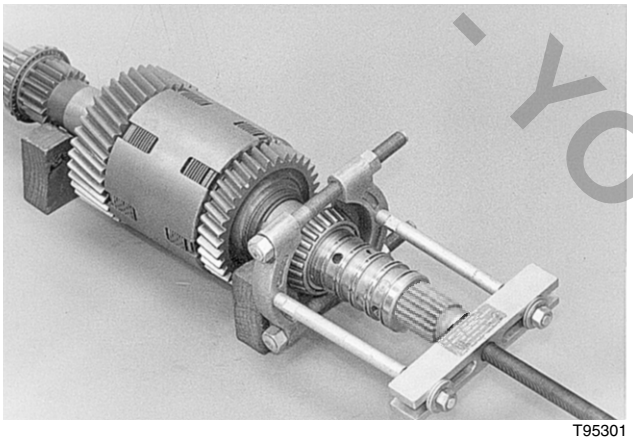
STEP 59



T95300

Remove the five seal rings from the speed input shaft.

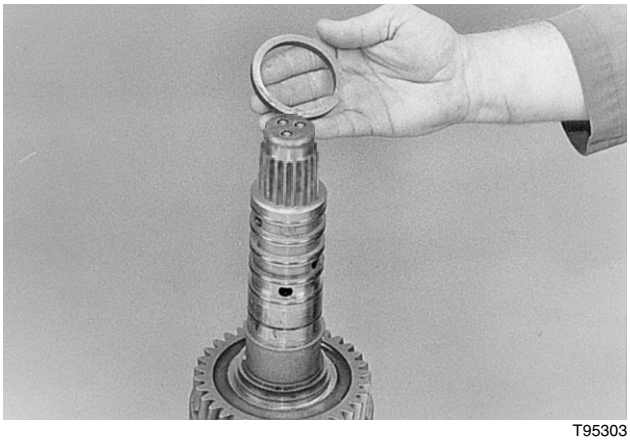
STEP 60



T95301

Use a bearing puller to remove the rear bearing cone.

STEP 61



T95303

Remove the spacer.

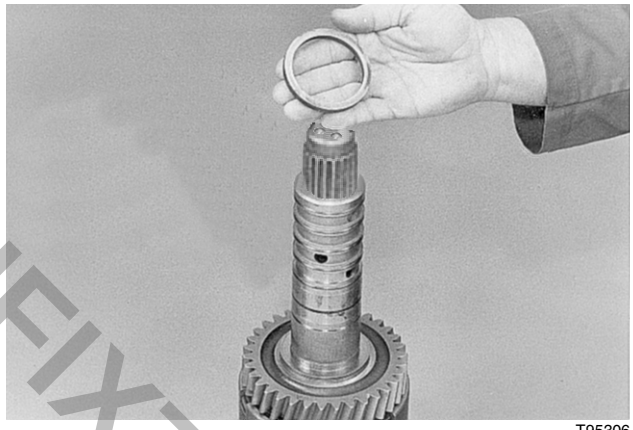
STEP 62



T95305

Remove the two snap rings.

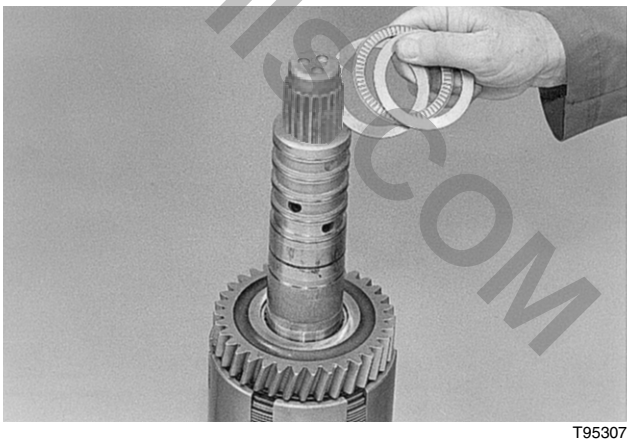
STEP 63



T95306

Remove the spacer.

STEP 64



T95307

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

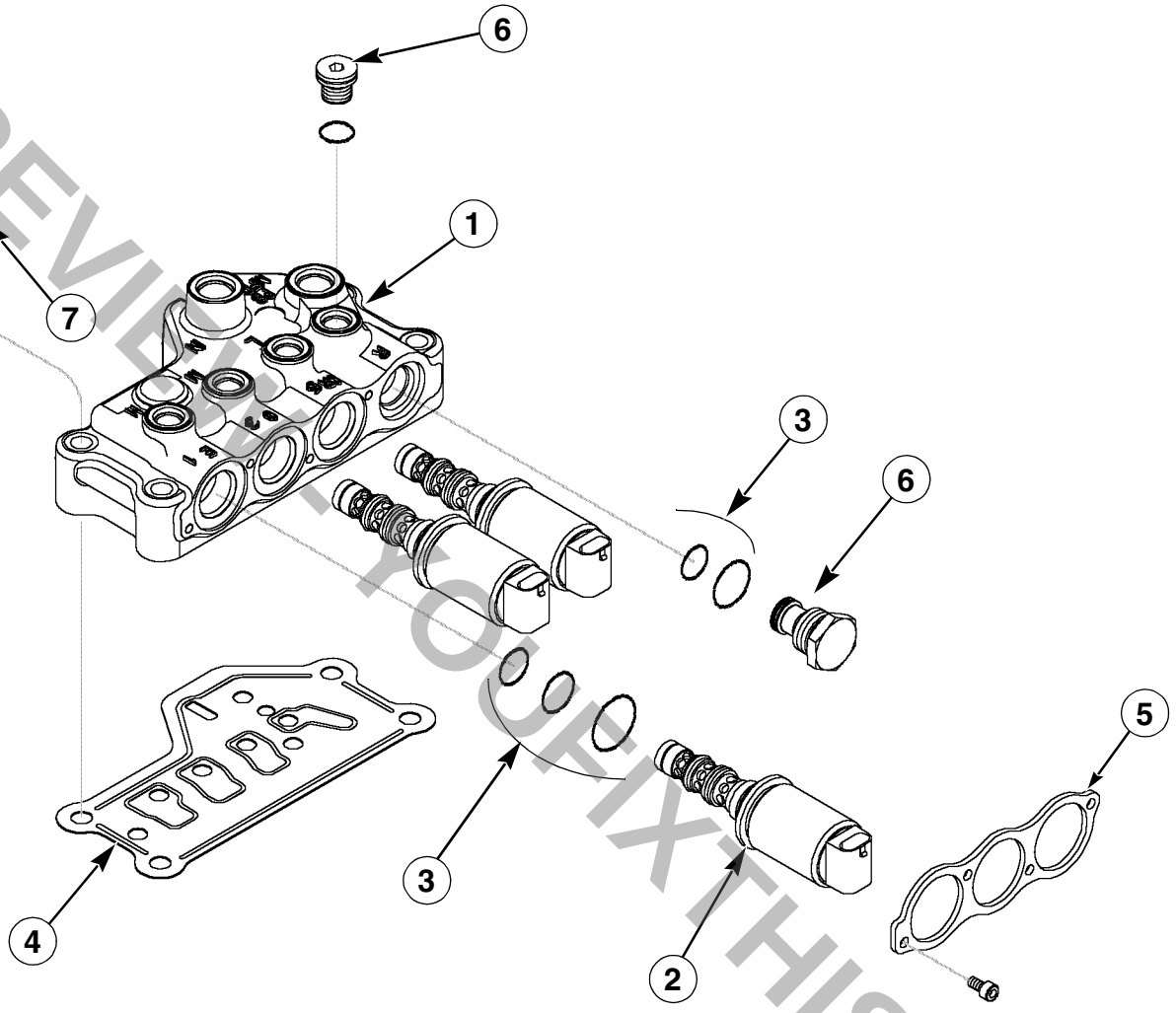
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Figure 3 - Transmission Control Valve with Three Solenoids and Plug

This type of control valve is used with these transmission configurations:

- Range control valve without MFD.



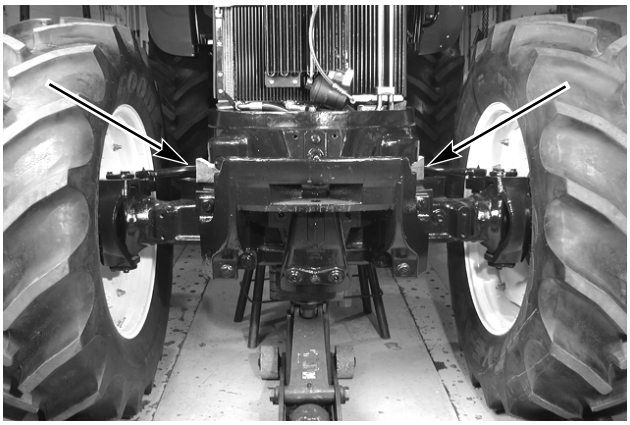
RI02E096

1. VALVE BODY
2. PWM SOLENOID
3. O-RINGS
4. GASKET
5. COVER PLATE
6. PLUG
7. MOUNTING BOLT

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STEP 23



RD02B155

Remove the axle supports and lower the front axle. Remove the wedges (arrows).

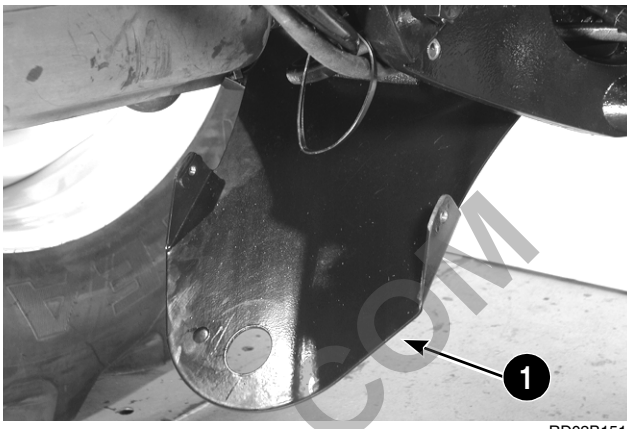
STEP 24



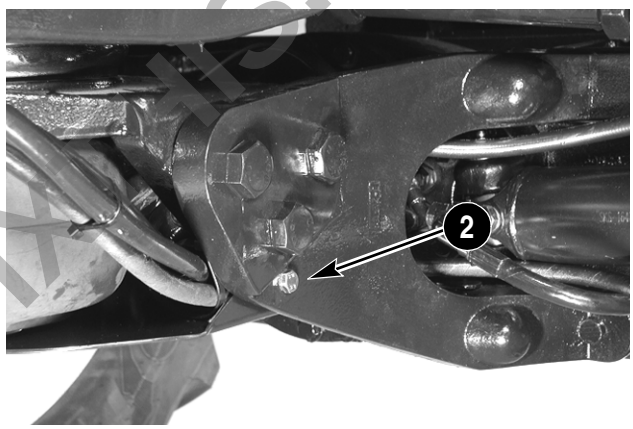
RD02B153

Install the drive shaft at the transmission output flange, using the alignment marks made during disassembly. Slide the drive shaft protector on the drive shaft and install a new plastic pin. Install the drive shaft at the front axle pinion flange, using the alignment marks. Tighten the drive shaft bolts to a torque of 58 to 64 Nm (43 to 47 lb ft).

STEP 25



RD02B151



RD02B150

Install the axle shield (1). Install and tighten the two shield retaining bolts (2). Properly support and install the tractor front weights. Check the hydraulic fluid level and add if necessary. Remove rear axle wheel blocks. Start the tractor. Check for leaks. Check front axle operation and front fender to wheel clearance, if equipped. Place the tractor in Park, turn the ignition off, and remove the key.

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STEP 31



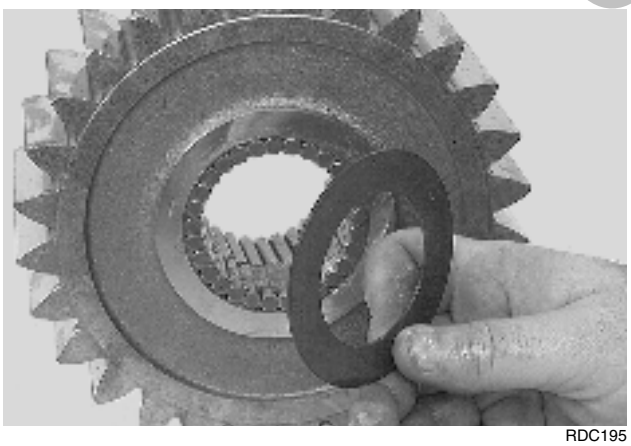
RD98C0194

Lubricate the needle bearings with petroleum jelly to keep them in place and install the bearings on one side. Turn the planet gear around and install the thrust ring. Install the remaining needle bearings lubricated with petroleum jelly.

Models 210, 230 and 255 will have two rows of 29 bearings in each gear.

Model 285 will have two rows of 33 bearings in each gear.

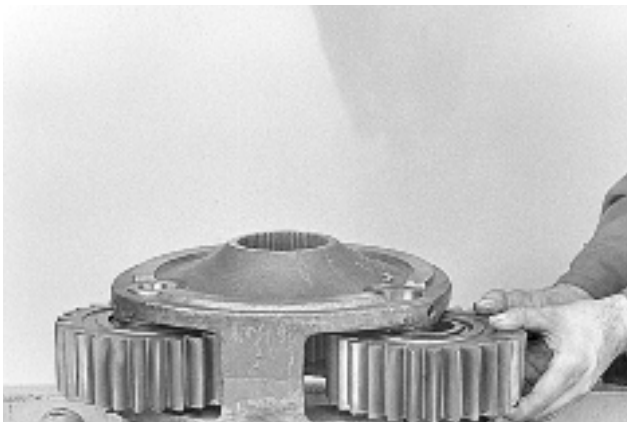
STEP 32



RDC195

Install the thrust washer on both sides of the planet gear.

STEP 33

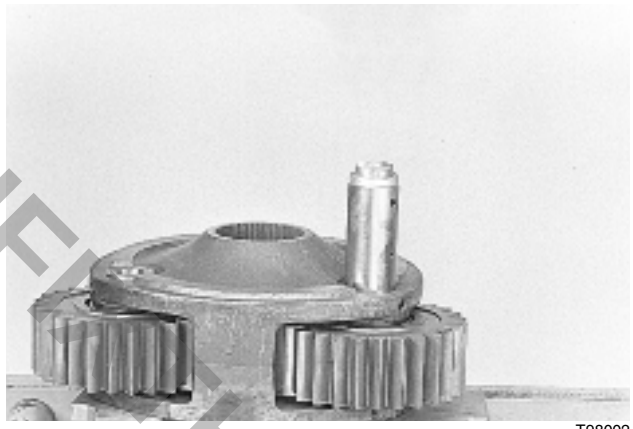


T98003

Put the planet gear assembly into position in the gear carrier. Make sure that the assemblies are installed in their original locations.

NOTE: *Three-gear planetary shown.*

STEP 34



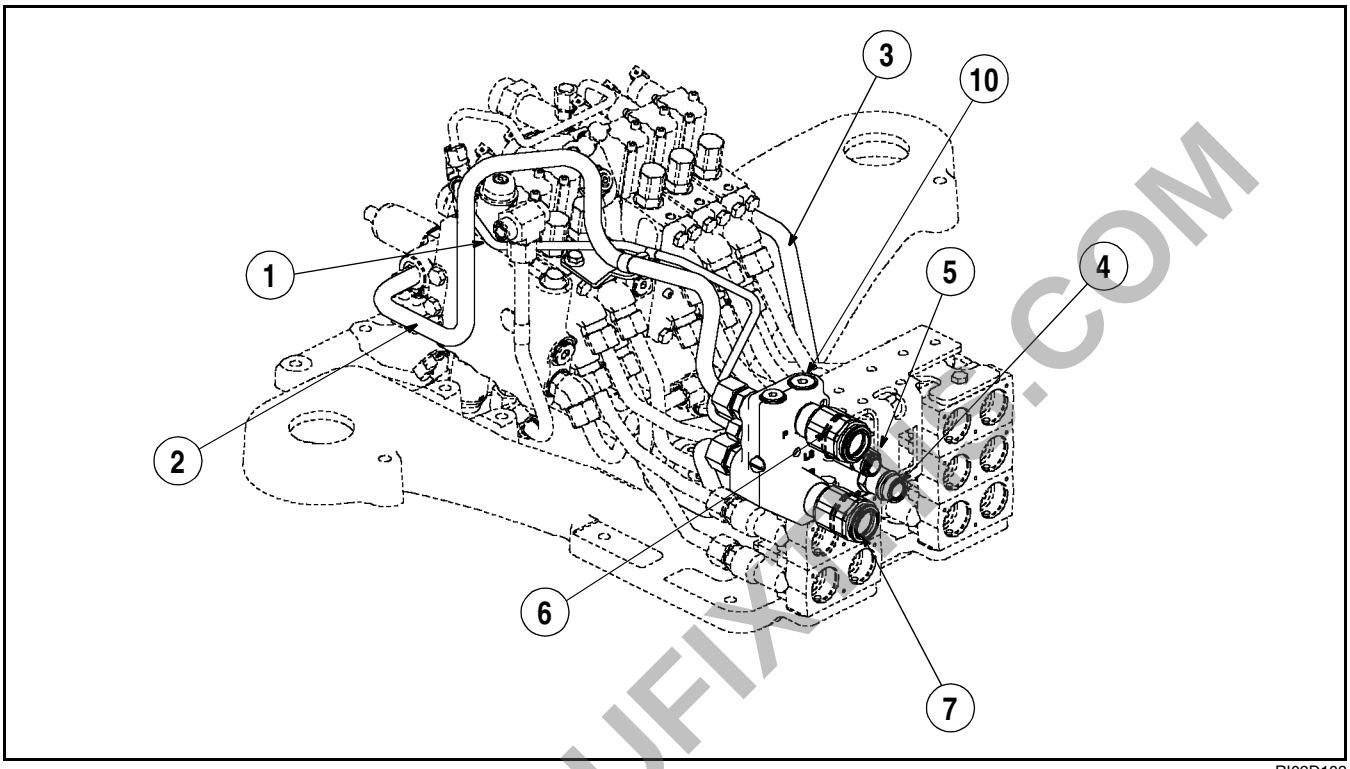
T98002

Align the holes in the bearing shaft with the roll pin hole in the planetary gear carrier.

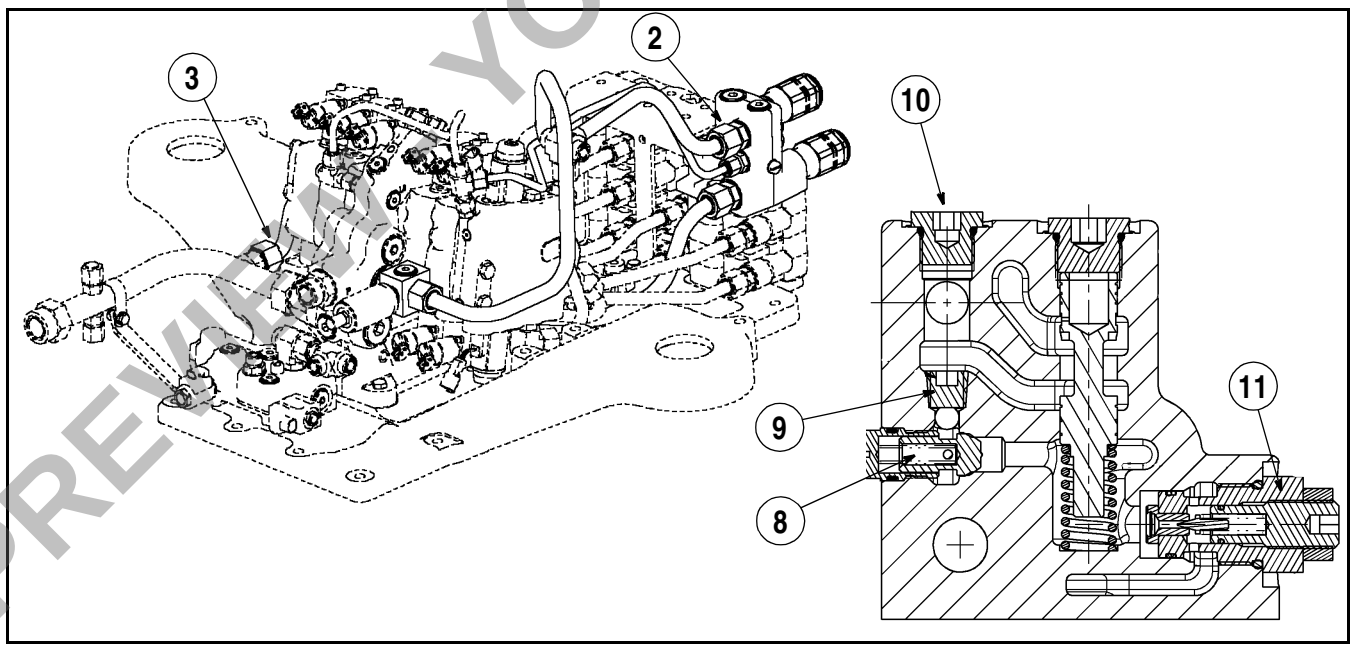
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Power Beyond Layout



RI02D103



RI02D105 AND RH02J002

1. POWER BEYOND LOAD SENSE TUBE
2. POWER BEYOND SUPPLY TUBE
3. POWER BEYOND RETURN TUBE
4. CASE DRAIN
5. LOAD SENSE COUPLER
6. POWER BEYOND COUPLER (SUPPLY)
7. POWER BEYOND RETURN FLOW COUPLER
8. CHECK VALVE
9. INTERNAL PLUG
10. EXTERNAL PLUG
11. VALVE ASSEMBLY PILOT RELIEF

NOTE: *Remove internal plug (9) to maintain high pressure standby condition.*

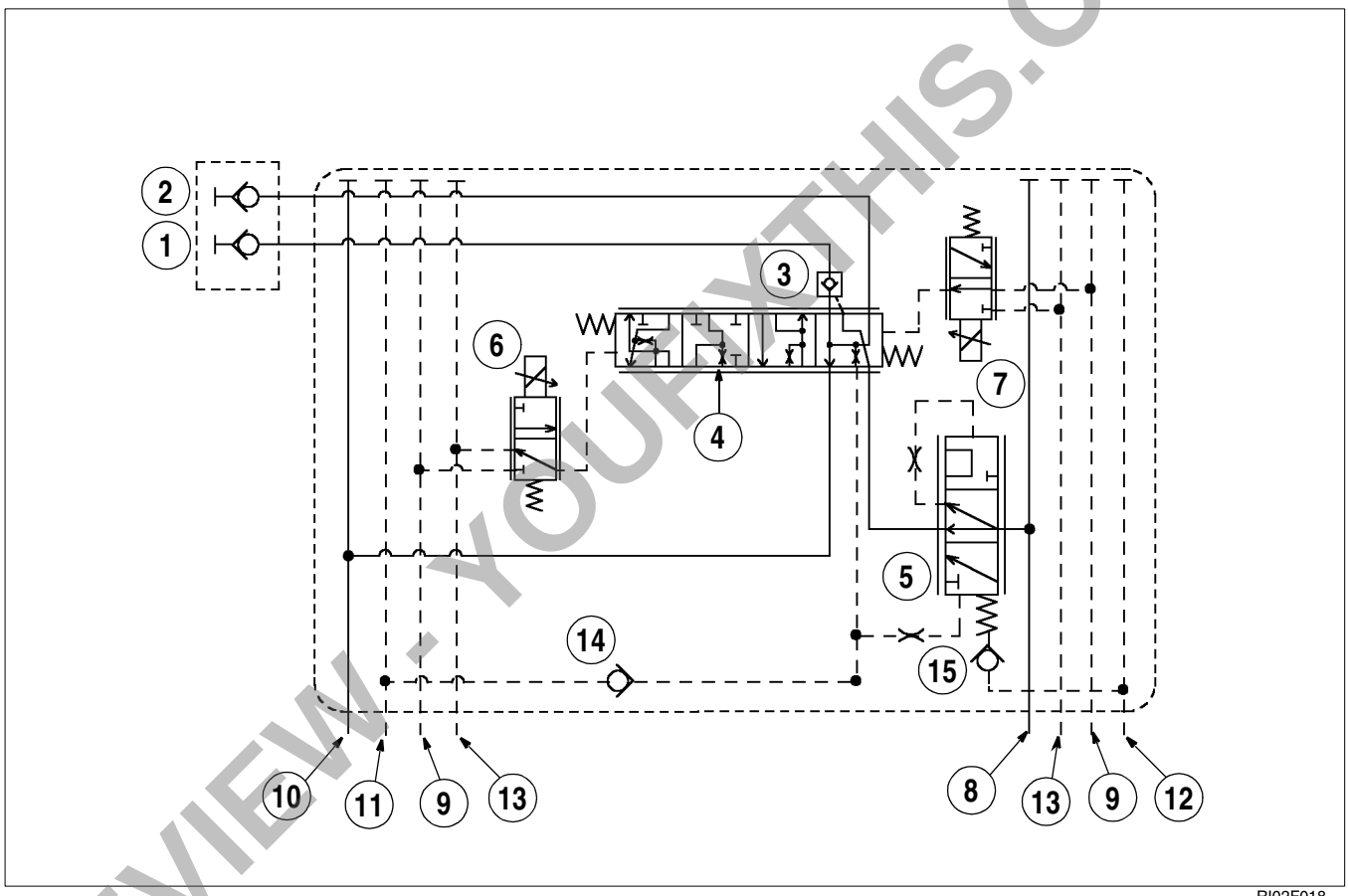
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Float

When the remote hydraulic control lever is moved to the float position, the main valve spool is moved to the far right position by the proportional solenoid pressure supply.

The main valve spool lands block flow to the extend and retract ports. At the same time the main valve spool opens the work ports to the return to filter inlet. To unseat the load check on the raise port low pressure standby pressure is directed to the backside of the load check plunger. The plunger moves to the right unseating the load check main poppet.

When the extend and retract work ports are connected to the return to filter inlet it allows the implement to float and follow the contour of the ground. The valve will now float a double acting or single acting cylinder.



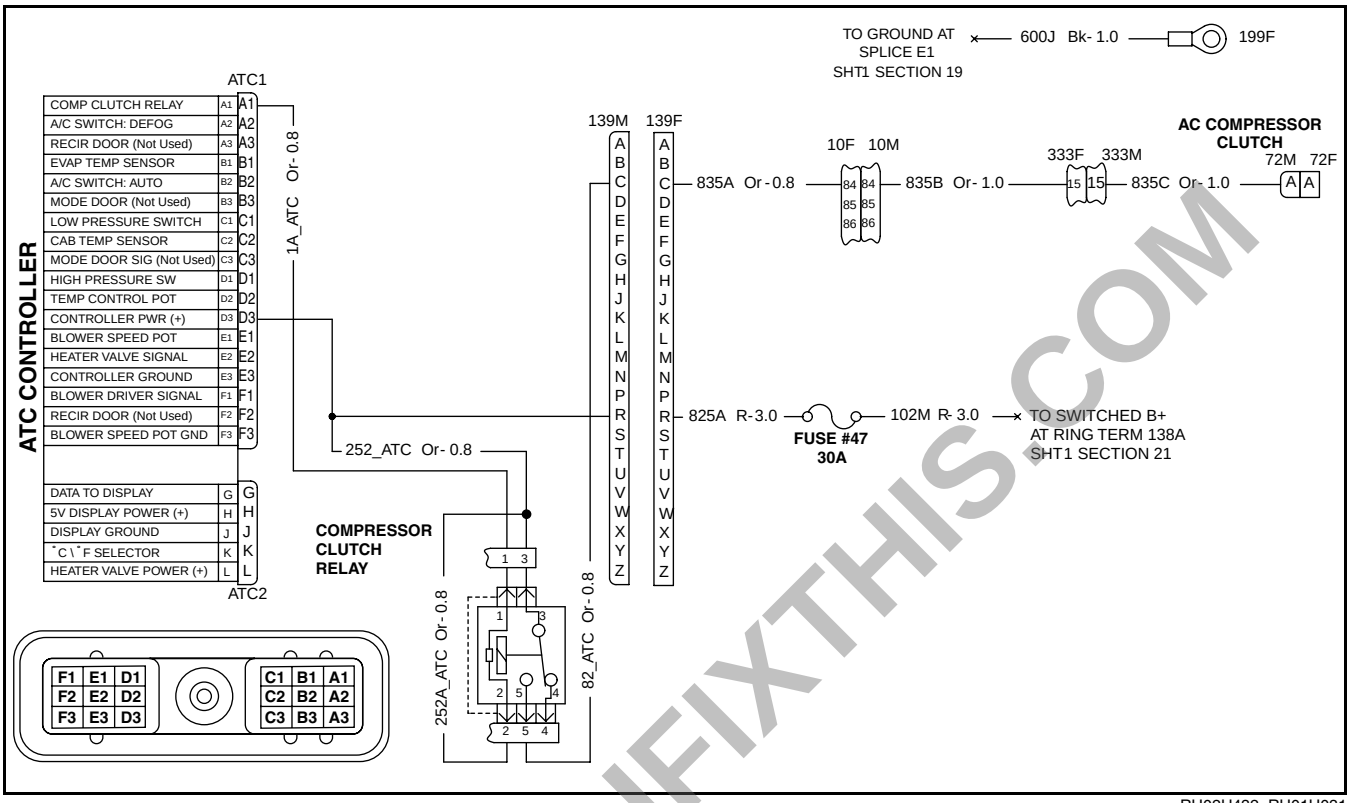
RI02F018

1. EXTEND PORT
2. RETRACT PORT
3. LOAD CHECK PLUNGER
4. MAIN VALVE SPOOL
5. PRESSURE COMPENSATED FLOW CONTROL SPOOL
6. PROPORTIONAL SOLENOID (EXTEND)
7. PROPORTIONAL SOLENOID (RETRACT)
8. PFC PUMP SUPPLY
9. REGULATED PRESSURE SUPPLY
10. BACK TO TANK
11. SIGNAL LINE TO COMPENSATOR
12. TO REMOTE SIGNAL RELIEF VALVE
13. PILOT DRAIN
14. SIGNAL CHECK TO PUMP COMPENSATOR
15. SIGNAL CHECK PILOT RELIEF

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Electrical Test - Compressor Clutch



RH02H432, RH01H031

Background

The compressor clutch is cycled On or Off by the controller based on the difference between the selected cab temperature setpoint and the temperature sensed at the cab temperature sensor.

When functioning normally, the clutch is always grounded to the chassis through ring terminal 199F at the compressor mounting bolt.

The controller grounds the compressor clutch relay to provide 12V from fuse 47 to energize the clutch coil and engage the compressor.

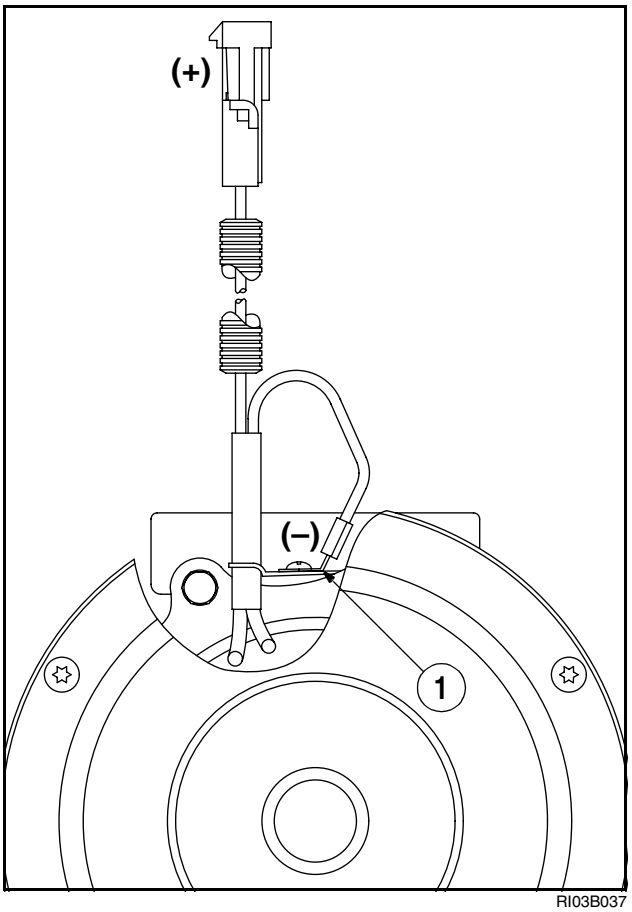
Power and Ground Circuit

Switched 12V is fed to the compressor clutch relay on pins 3 and 2 from fuse 47.

The controller energizes the relay by supplying switched ground from A1 to pin 1 on the relay.

12V is fed from pin 5 on the relay - through C139-C, C10-84, and C333-15 - to energize the clutch coil at C72-A.

The clutch is grounded from clutch ground screw (1) through the compressor body and ring terminal 199F to chassis ground at Splice E1.

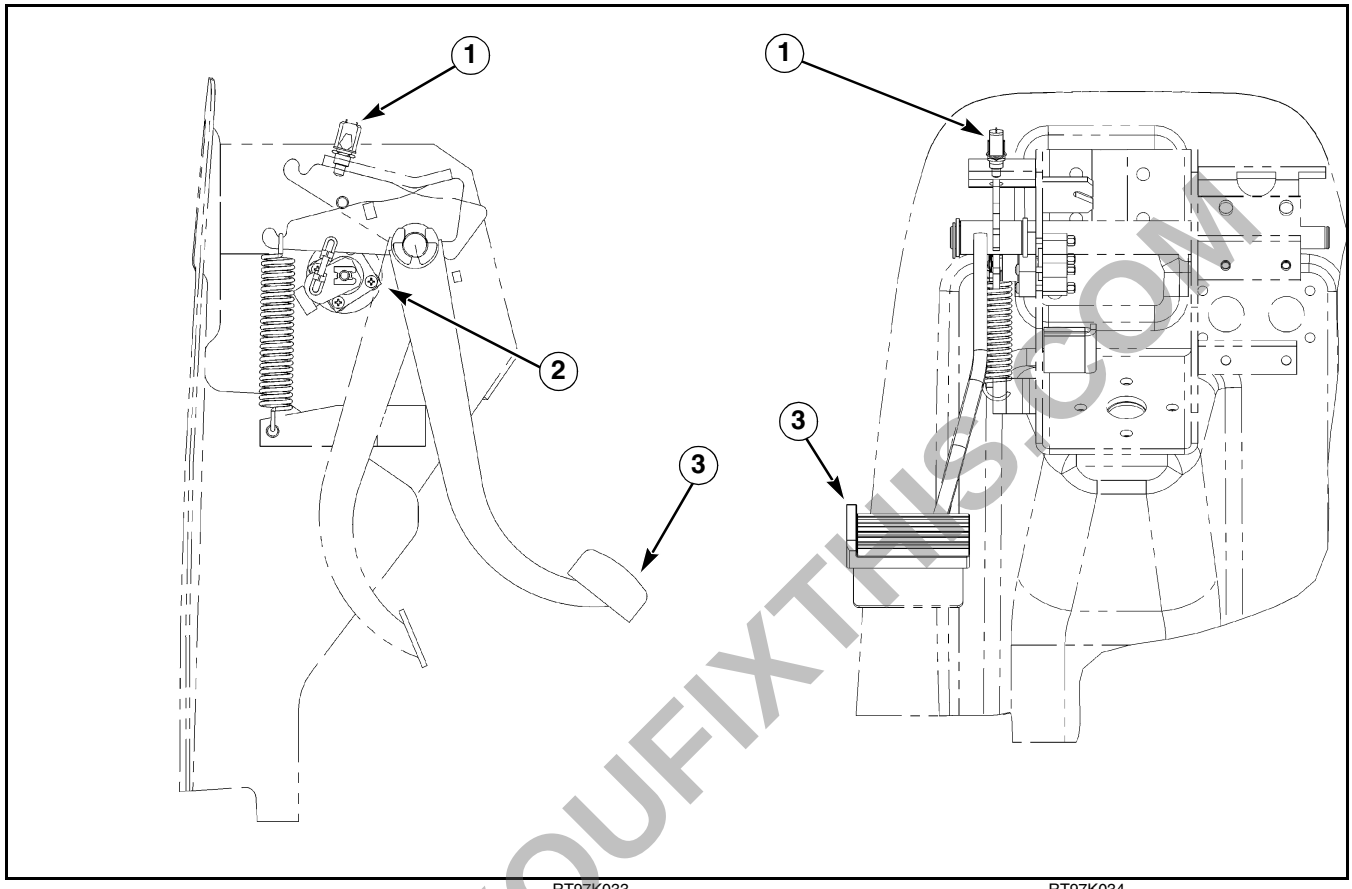


RI03B037

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RI99G002



RT97K033 RT97K034

INCHING PEDAL

1. CONNECTOR NO. 50 - BOC SWITCH
2. CONNECTOR NO. 52 - CLUTCH POSITION POTENTIOMETER
3. INCHING PEDAL

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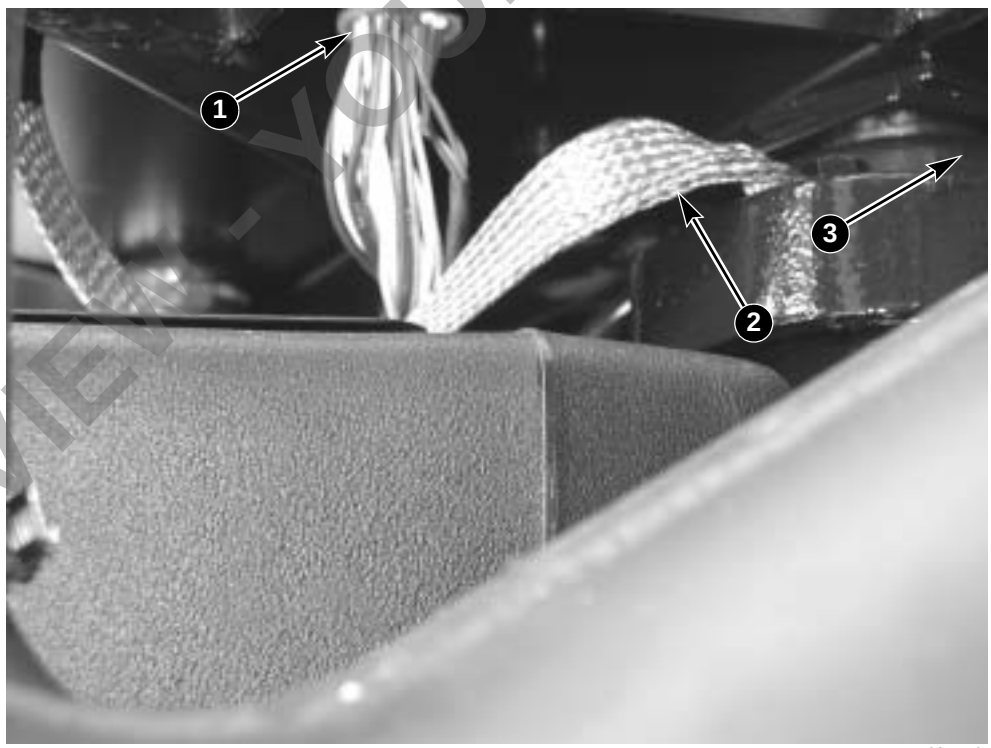
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RD98H143

LOWER FRONT CONSOLE

1. TO TRANSMISSION CONTROL LEVER



RD02H179

BOTTOM RH FRONT CORNER OF CAB

1. CONNECTOR NO. 60 - IN-LINE CONNECTOR (FRONT TO REAR HARNESS
2. BRAIDED GROUND STRAP
3. CAB MOUNT GROUNDS (NOT SHOWN, SEE CAB MOUNT)

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FAULT CODE INST 5011 Engine Oil Pressure Sensor Signal Too Low

Cause:
The engine oil pressure sensor signal voltage is out of range low (the signal was below 0.25 volts for 1 second).

Possible failure modes:
1. Engine oil pressure sensor failed.
2. Engine oil pressure sensor wiring harness problems (open circuit, short to ground).
3. Instrument controller failure.

Solution
Check the engine oil pressure sensor resistance and the wiring from the instrumentation controller to the engine oil pressure sensor.

1. Validate the pressure sensor power supply.
   Open up the tractor hood and locate the engine oil pressure sensor.
   Disconnect connector C216 from the engine oil pressure sensor.
   Clean the connection. Clean the mating pin and connector. Inspect pin A, B, and C in the connector.
   Measure the voltage at the supply input, pin B. It must be 5 volts.
   If it is as specified, go to the next Step.
   If not, then check for 5 volts out of the instrument controller pin 18 at connector 61.
   If there is not 5 volts at the controller, then pull pin 18 terminal out to determine if 5 volts is present on the controller pin when pin 18 wire is not connected.

NOTE: *Use the correct tool to remove pins from connectors.*

2. Check the sensor ground.
   Measure the continuity between pin A of connector C216 to the chassis ground.
   If there is good continuity (less than 1 ohm), go to the next step.
   If there is not good continuity, go to step 4.
3. Check the function of the engine oil pressure sensor.
   Validate that the sensor output voltage is greater than 0.25 volts at pin C of connector C216.
   If not, then replace the engine oil pressure sensor.
   If yes, then validate that output voltage is present at the instrument controller input pin 27 at connector 61. If there is no voltage at the controller, then locate and repair an open circuit in the wire harness signal line.
4. Check the wiring from the engine oil pressure sensor connector C216 to the connector C061 at the instrument controller.
   There should be good continuity between pin A of C216 and the clean ground.
   There should be good continuity between pin B of C216 and pin 18 of C061.
   There should be good continuity between pin C of C216 and pin 27 of C061.
   If there is any open circuit, check the continuity from C216 to C061 to locate the problem.

NOTE: *Always inspect connector ends for damaged, bent or dislocated pins when troubleshooting.*

NOTE: *See schematic sections 24, 25 and 26 at the rear of this section.*

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STEP 70



RD02J149

The display will read TRANS SETUP. Press The PROG key to enter the Transmission Setup Menus.

STEP 71



RD02J106

The display will read CLTCH CAL. Push the DECR key.

STEP 72



RD02J131

The display will read GEAR DEFAULT. Push the PROG key.

STEP 73



RD02J131

The display will read SETUP FWD GEAR. Push the PROG key

STEP 74



RD02J131

The display will read *FWD GEAR# 7. Press the INCR key to increase the gear number, or press the DECR key to decrease the gear number. If no change is desired leave gear number as it is. Press the PROG key when desired gear number is set.

STEP 75

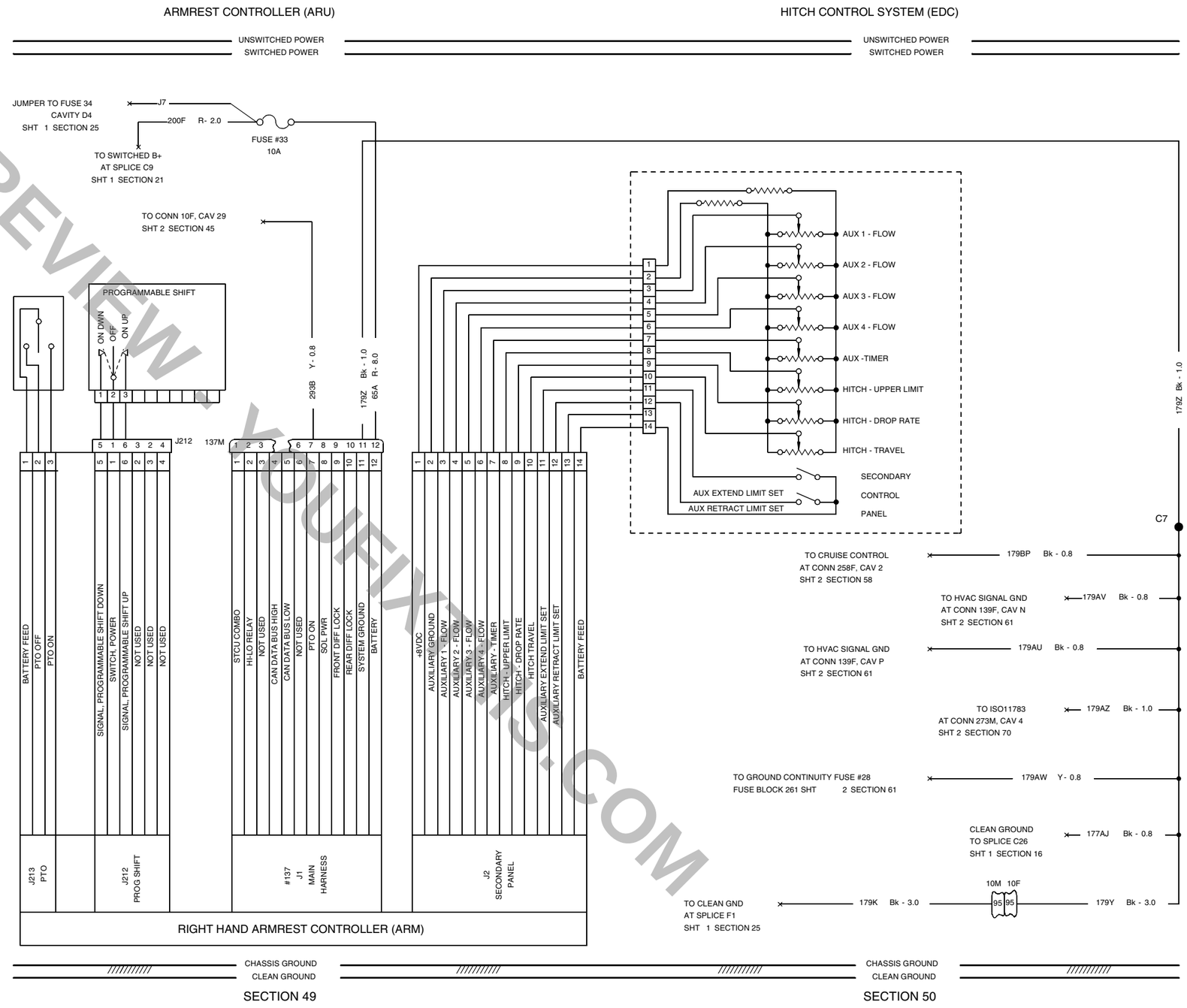


RD02J131

The display will read SETUP REV GEAR. Push the PROG key

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FAULT CODE PTO 9071 No PTO Shaft Size Signal When Configured For It

Cause:
The module is receiving no frequency from the shaft size sensor when configured as a two speed PTO tractor.

Possible failure mode:
1. The PTO system is equipped with only shaft speed sensor but configures as two speed system.
2. PTO shaft size sensor is not well connected or failed.
3. Wiring problem between PTO controller and the PTO shaft size sensor.

PTO SHAFT SPEED SIGNAL
The PTO shaft speed frequency is derived from a variable reluctance speed sensor in the transmission. The clutch speed sensor is connected directly to the PTO control module in all versions of the PTO control system. The sensor output is directly proportional to PTO clutch output speed, and is a quasi-sinusoidal wave form the amplitude of which is non-linearly proportional to speed. The amplitude range of the signal is from 3 volts peak-to-peak to 80 volts peak-to-peak centered around chassis ground. Frequency range is from zero to 3,200 Hz worst case.

PTO SHAFT SIZE SPEED SIGNAL
The PTO shaft size speed frequency is derived from a variable reluctance speed sensor in the transmission. The sensor is connected directly to the PTO control module and its output is proportional to PTO clutch output speed, but scaled differently from the PTO clutch speed signal depending upon which PTO shaft is in use. i.e. 1-3/4" 1000 RPM, 1-3/8" 1000 RPM or 1-3/8" 540 RPM. The signal is a quasi-sinusoidal waveform the amplitude of which is non-linearly proportional to speed. The amplitude range of the signal is from 3 volts peak-to-peak to 80 volts peak-to-peak centered around chassis ground. Frequency range is from zero to 760 Hz worst case.

Solution:
Make sure the tractor has the PTO dual speed (shaft size) sensor installed and properly connected.
Check the wiring from the PTO controller to the shaft size sensor.
Test the function of the sensor.

1. Make sure the tractor has the PTO dual speed (shaft size) sensor installed and properly connected. If not, either reconfigure as a single speed sensor PTO system or add the shaft size sensor to the tractor.
2. Check the wiring harness to the PTO dual speed (shaft size) sensor.
   Check the continuity from Pin 12 of connector C056 to Pin A of connector C336.
   Check the continuity from Pin B of connector C336 to the chassis ground.
3. Check the function of the shaft size sensor. It should have resistance of about 3 K ohms.

NOTE: *Always inspect connector ends for damaged, bent or dislocated pins when troubleshooting.*

NOTE: *See schematic sections 44, 45 at the rear of this section.*

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The Tractor Will Start But The Display Does Not Illuminate No Fault Code

Meaning:
The instrumentation controller (display) is not powered or has failed.

Possible failure mode:
1. Failed controller power relay - Engine will stop after starting.
2. Fuse #37 failed or circuit from fuse to controller pin 2 of connector CN2 failed open.
3. Poor ground supply to Display pin 4 of connector CN2.

Background:
The key switch activates the cab power relay and the controller relay when the key is placed in the start and run position. The cab power relay supplies battery power (switched power) to the controller relay. Both relays must be powered for the controllers to be powered.

NOTE: *Both the cab power relay and the controller relay must make a clicking sound when the key is turned on.*

Wiring information:
Instrumentation controller connector CN2, pin 2<-->fuse 37<--> 241 (Controller relay) 241 <--> 138 (cab power relay) 240 <--> unswitched power

Corrective action:

STEP 1 - Check fuse 37
With the key switch on and the display not illuminated.
Check fuse 37.
-- OK - Go to Step 4.
- -NOT OK - Replace fuse, If fuse fails when replaced go to Step 6.

STEP 2 - Check power at fuse 37
With the key switch on and the display not lit.
Check fuse 37.
-- OK - Go to Step 4.
-- NOT OK - Go to Step 3.

STEP 3 - Check controller relay
The controller relay is located in the fuse compartment behind the operator seat.
Check relay ground supply wire.
Turn key on.
Check for relay coil power at pin 85 at the controller relay.
-- OK - Replace relay.
-- NOT OK - Failed wire from the controller relay to fuse 30.

STEP 4 - Check the power supply to the instrumentation controller
Install fuse 37.
Remove the instrumentation controller.
Turn the key on.
Check connector CN2, pin 2 for 12 volts.
-- NOT OK - Replace the wire between fuse 37 and the instrumentation controller connector CN2, pin 2.
-- OK - Go to Step 5.

STEP 5 - Check the ground supply at connector CN2, pin 4
Check the ground supply at connector CN2, pin 4.
-- OK - Replace the instrumentation controller.
-- NOT OK - Correct grounding problem.

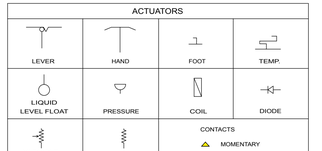
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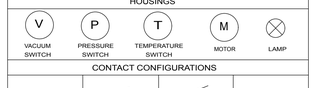
CIRCUIT DESCRIPTION	SECTION
AIR CONDITIONING	59-62
ARMREST CONTROLLER	46-50
AUXILIARY CONTROL SYSTEM	53-54
AUTOMATIC TEMPERATURE CONTROL UNIT	60
AUXILIARY POWER CONN. (IMPLEMENT)	69
AUXILIARY POWER (7-PIN TRAILER)	33
BLOWER MOTOR (ATCU OR CCU)	61
BRAKE PEDAL SWITCHES	45
CHARGING SYSTEM	19
CAB/CONTROLLER POWER	20
CAN DATA BUS	12-18
CIGAR LIGHTER	67
CLIMATE CONTROL UNIT	59
CRUISE CONTROL	58
DIFFERENTIAL LOCK	46
ELECTRONIC ENGINE CONTROLLER	55-56
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ETHER START	36
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FORWARD/NEUTRAL/REVERSE/PARK	35
HITCH CONTROL SYSTEM	51-52, 54
HEADLIGHT SWITCH	29
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- BEACON	67
- BRAKE	32-33
- DOME/CONSOLE	64
- LICENSE PLATE	30

CIRCUIT DESCRIPTION	SECTION
- OPTIONAL FRONT HITCH	27
- OPTIONAL FRONT BELTLINE	28
- OPTIONAL HIGH INTENSITY LAMP	31
- OPTIONAL REAR FENDER WORK	32-33
- OPTIONAL ROOF WORK CAB	28
- STANDARD CAB FRONDT	32-33
- STANDARD FENDER WARNING LAMPS	32-33
- STANDARD BELTLINE WARNING LAMPS	N/A
MECHANICAL FRONT DRIVE (MFD)	46
PERFORMANCE MONITOR	27
POWER MIRRORS	65
PTO CONTROLLER SYSTEM	44-45
RADIO ANTENNA	63
RADIO SOUND SYSTEM	63
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SCHEMATIC - LEGEND	1-10
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TRAILER CONNECTOR (7-PIN)	33
TRANSMISSION CONTROL SYSTEM	37-38
WINDSHIELD WIPER/WASHER - FRONT	66
WINDSHIELD WIPER/WASHER - REAR	66

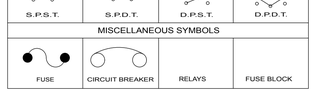
ACTUATORS



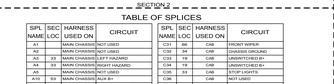
HOUSINGS



CONTACT CONFIGURATIONS



MISCELLANEOUS SYMBOLS



COLOR ABBREVIATIONS

ABBREVIATION	COLOR
R	RED
T	TAN
W	WHITE
Y	YELLOW
Bk	BLACK
BN	BROWN
S	GREY
O	ORANGE
K	PINK
P	VIOLET (PURPLE)
DU	DARK BLUE
LU	LIGHT BLUE
DG	DARK GREEN
LG	LIGHT GREEN

CIRCUIT DIAGRAM LEGENDS



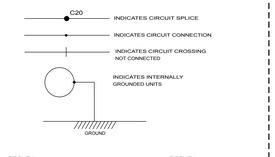


TABLE OF FUSES

FUSE (SPX)	SECTION LOCATION	CIRCUIT IDENTIFICATION	FUSE (SPX)	SECTION LOCATION	CIRCUIT IDENTIFICATION
1	20	GOV KEY SWITCH	29	68	SEAT HEATER
2	NOT USED		30	NOT USED	
3	28	REAR FENDER WORKLIGHTS	31	71	GPS SWITCHED B+
4	28	BELT LINE WORKLIGHTS	32	39	TRCU UNSWITCHED B+
5	28	ROOF WORKLIGHTS	33	59	ARM-REST CONTROL SW
6	28	WORKLIGHT INTERLOCK	34	25	RADAR
7	20	KEY SWITCH B+	35	NOT USED	
8	69	SHELF AUX. UNSW POWER	36	53	AUX
9	68	SEAT CPS	37	24	ICU/PMU SW
10	62	BLOWER CAB PRESSURE	38	45	BRAKE SWITCH
11	67	CIGAR LIGHTER	39	67	IDC
12	33	TRAILER AUX (SW)	40	71	ECU B+
13	69	UNSW FRONT REAR AUX B+	41	16	CDB TRACTOR B+
14	NOT USED		42	16	CDB DAS CONN POWER
15	56	GOVERNOR	43	16	TRANSMISSION CONTROLLER
16	24	ICU/PMU (UNSW)	44	39	TRANSMISSION CONTROLLER
17	36	HORN	45	NOT USED	
18	29	HIGH BEAM RELAY	46	69	FRONT/REAR AUX SW
19	64	DOME LIGHT, MAP, RADIO	47	61	HVAC CONTROLLER
20	34	FLASHER	48	69	SHELF AUX POWER SW
21	29	LH & RH TAIL LIGHTS	49	61	HVAC BLOWER
22	34	STOP LIGHTS	50	NOT USED	
23	67	BEACON/STROBE	51	66	FRONT WIPER/WASHER
24	64	MIRROR/RADIO	52	66	REAR WIPER/WASHER
25	36	ETHER	53	NOT USED	
26	43	AXLE SW B+	54	NOT USED	
27	NOT USED		55	NOT USED	
28	61	C/F DISPLAY GND	56	42	ITALIAN BRAKE

TABLE OF RELAYS

RELAY NUMBER	SECTION LOCATION	REF. DES.	FUNCTION
1	34	263F	BRAKE LIGHT RELAY
2	40	263F	SPARE
3	28	263F	REAR WORK LIGHTS
4	29	263F	WORK LAMP INTERLOCK RELAY
5	40	263F	PARK RELAY
6	40	263F	NEUTRAL RELAY
7	42	264F	SPARE
8	28	264F	OPTIONAL BELTLINE WORK LAMPS
9	29	264F	FRONT ROOF WORK LIGHTS
10	62	264F	CAB PRESSURE BLOWER RELAY
11	20	264F	ENGINE
12	29	264F	STD AND OPT FENDER WORK LAMPS

GPS FUSES
FUSE 327 30 AMPS HIGH POWER RELAY SECTION 72
FUSE 328 20 AMPS LOW POWER RELAY SECTION 72

TABLE OF CONNECTOR LOCATIONS

REF. DES.	SECTION LOCATION	HARNESS
1		
2		
3	31	HEADLIGHT
4	31	HEADLIGHT
5	31	HEADLIGHT
6	23	CAB
7	23	CHASSIS
8	23	ROOF
9	23	CAB
10	29 33 39 43 44 45 52	CAB TO CHASSIS
11	29	CAB
12	29	CAB
13	29 30 64 66 67 69	CAB TO ROOF
14	28	ROOF
15	28	ROOF
16	28	ROOF
17	28	ROOF
18	29	ROOF
19	29	ROOF
20	32	CHASSIS TO FENDER
21	32	CHASSIS TO FENDER
22		
23		
24		
25		
26		
27		
28		
29	38	CHASSIS
30	38	CHASSIS
31	37	CHASSIS
32	38	CHASSIS
33	38	CHASSIS
34	38	CHASSIS
35	38	CHASSIS
36	38	CHASSIS
37	37	CHASSIS
38	38	CHASSIS
39	38	CHASSIS
40	32	CHASSIS TO FENDER
41	32	CHASSIS TO FENDER
42		
43		
44	39	CHASSIS
45		
46		
47	41	ENGINE
48	41	ENGINE
49	41	CHASSIS
50	38	CAB

REF. DES.	SECTION LOCATION	HARNESS
51	40	CAB
52	40	CAB
53	53	CHASSIS
54	53	CHASSIS
55	14-44	CHASSIS
56	14-44	CHASSIS
57	44	CHASSIS
58	51	CHASSIS
59	13 51	CHASSIS
60	17 24 25 38 58	CAB TO CHASSIS
61	17 24	CAB
62	17 27	CAB
63	58	ENGINE TO CHASSIS
64	23	ENGINE
65	23	ENGINE
66	23	CHASSIS
67	41	CHASSIS
68	26	CHASSIS
69	26	CHASSIS
70	41	CHASSIS
71	62	ENGINE
72	61	ENGINE
73	36	ENGINE
74	36	ENGINE
75	26	NON ELECT ENGINE
76	26	ENGINE
77	19	ENGINE
78	19	SOLENOID/STARTER
79	19	SOLENOID/STARTER
80	19	SOLENOID/STARTER
81	19	ENGINE
82	19	ENGINE
83	19	ENGINE
84	19	SOLENOID/STARTER
85	19	ENGINE
86	19	ENGINE
87	22	ENGINE
88	26	CHASSIS
89	26	CHASSIS
90	41	CHASSIS
91	69	ROOF TO SHELF
92	63	ROOF
93	63	ROOF
94	64	ROOF
95	63	ROOF
96	63	ROOF
97	63	ROOF
98	48	ROOF
99	66	ROOF
100	64	ROOF

REF. DES.	SECTION LOCATION	HARNESS
101	64	ROOF
102	64	ROOF
103	64	ROOF
104	30	ROOF
105	30	ROOF
106	30	ROOF
107	30	ROOF
108	33	ENGINE
109	23	HEADLIGHT
110	35	CAB
111	65	CAB TO ROOF
112	65	CAB
113	65	ROOF
114	67	ROOF
115	66	ROOF
116	66	ROOF
117		
118		
119	52	CAB
120		
121	23	AUX POWER
122	66	ROOF
123	52	AC SWITCH
124	52	AC SWITCH
125	61	CAB
126	62	AC SWITCH
127	66	CAB
128	62	AC SWITCH
129	67	CAB
130	67	CAB
131	67	CAB
132	62	AC SWITCH
133	68	CAB
134	19	CHASSIS
135	34	CAB
136		
137	10 49	CAB
138	21	CAB
139	59 60 61	CAB TO HVAC
140	54	AUX VALVE
141	54	AUX VALVE
142	54	AUX VALVE
143	54	AUX VALVE
144	54	AUX VALVE
145	44	CHASSIS
146	44	CHASSIS
147	33	CHASSIS TO 7 PIN
148		
149		
150	53	CHASSIS

REF. DES.	SECTION LOCATION	HARNESS
151		AUX VALVE
152	54	AUX VALVE
153	51	CHASSIS
154	51	CHASSIS
155	52	CHASSIS
156	52	CHASSIS
157	69	AUX POWER
158	45	CHASSIS
159	45	CHASSIS
160	45	CHASSIS
161	20	CAB
162	45	CAB
163	45	CAB
164	23	ENGINE
165	69	CAB
166	69	ROOF
167	69	CAB
168	69	CAB
169	69	SHELF
170	69	SHELF
171	25	CAB
172	23	CAB
173	21	CAB
174	16	CAB
175	12 13	CHASSIS
176	63	ROOF
177	63	ROOF
178	66	CAB
179	35	CAB
180		
181	43	CAB
182		
183	43	AXLE SOLENOID
184	43	AXLE SOLENOID
185	43	CHASSIS TO SENSOR
186	43	AXLE SOLENOID
187	43	AXLE SOLENOID
188	23	END TO HITCH
189	57	CHASSIS
190		
191	35	TURN/SENSOR
192	43	CHASSIS TO AXLE
193	43	AXLE SENSOR
194	70	ISO11783 CAB
195	29	ROOF
196	44	CHASSIS
197		
198	19	NON ELECT ENGINE
199	61	ENGINE
200	57	ENGINE

REF. DES.	SECTION LOCATION	HARNESS
201	26	
202	19	ENGINE
203	56	ENGINE
204	56	ENGINE
205		
206	18	ELECT ENGINE
207	57	ELECT ENGINE
208	55	ELECT ENGINE
209	56	ELECT ENGINE
210		
211	27	CHASSIS
212	66	ENGINE
213	66	ENGINE
214	18	NON ELECT ENGINE
215	26	NON ELECT ENGINE
216	26	NON ELECT ENGINE
217	19	NON ELECT ENGINE
218	53	CAB
219	26	ENGINE
220	35	CAB
221	35	CAB
222	63	ROOF
223	63	ROOF
224		
225		
226	12	ISO11783
227		
228	52	FENDER
229	52	FENDER
230	52	FENDER
231		
232	33	NOT USED
233	52	FENDER
234	52	FENDER
235	33	FENDER
236	32	FENDER
237	33	WIDE MARKER
238	19	CHASSIS
239	20	CAB
240		
241	20	CAB
242		
243		
244	18 55	ENGINE BLOCK
245	56	ENGINE BLOCK
246	56	ENGINE BLOCK
247	56	ENGINE BLOCK
248	56	ENGINE BLOCK
249	56	ENGINE BLOCK
250	56	ENGINE BLOCK

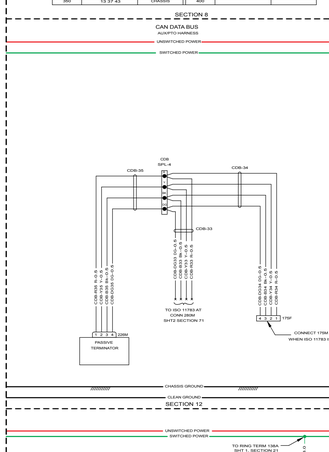
REF. DES.	SECTION LOCATION	HARNESS
251	56	ENGINE BLOCK
252	19	ENGINE
253	56	ENGINE BLOCK
254	56	ENGINE BLOCK
255		
256	18	ENGINE CONTL
257	58	CAB
258	58	CAB
259	39	CHASSIS
260		
261	SEE SECTION 4	CAB
262	SEE SECTION 4	CAB
263	SEE SECTION 4	CAB
264	SEE SECTION 4	CAB
265		
266	20	CAB
267	22	CAB
268		
269	69	CAB
270	73	CAB TO ISO11783
271		
272		
273	72	CAB TO ISO11783
274		
275		
276		
277		
278	76	
279	20	CAB
280	72	ISO11783 TO ISO11783
281	70	ISO11783 CAB
282	72	ISO11783 CHASSIS
283	72	ISO11783 CHASSIS
284		
285	71	ISO11783 CHASSIS
286	70	ISO11783 CAB
287		
288	72	ISO11783 CHASSIS
289		
290		
291	72	ISO11783 CHASSIS
292	72	ISO11783 CHASSIS
293	72	ISO11783 CHASSIS
294		
295		
296		
297	72	ISO11783 CHASSIS
298		
299		
300		

TABLE OF SPLICES

SPL NAME	SEC LOC	HARNESS USED ON	CIRCUIT
A1		MAIN CHASSIS	NOT USED
A2		MAIN CHASSIS	NOT USED
A3	33	MAIN CHASSIS	LEFT HAZARD
A4	33	MAIN CHASSIS	RIGHT HAZARD
A5		MAIN CHASSIS	NOT USED
A10	53	MAIN CHASSIS	AUX B+
A11	44	MAIN CHASSIS	CLEAN GROUND
A12		MAIN CHASSIS	NOT USED
A13	32	MAIN CHASSIS	CHASSIS GROUND
A14		MAIN CHASSIS	NOT USED
A15		MAIN CHASSIS	NOT USED
A16		MAIN CHASSIS	NOT USED
A17	32	MAIN CHASSIS	TAIL LAMPS
A18	29	MAIN CHASSIS	WORKLIGHT B+
A19		MAIN CHASSIS	NOT USED
A20		MAIN CHASSIS	NOT USED
C1	25	CAB	NOT USED
C2	25	CAB	SPARE
C3	29	CAB	UNSWITCHED LIGHT B+
C4	25	CAB	NEUTRAL
C5	29	CAB	HAZARD
C6	65	CAB	MIRROR COMMON
C7	65	CAB	CLEAN GROUND
C8	45	CAB	BRAKE SWITCH
C9	21	CAB	CONTROLLER B+
C10		CAB	NOT USED
C11		CAB	NOT USED
C12	40	CAB	BOTTOM OF CLUTCH
C13	24	CAB	LIGHTS
C14	65	CAB	CHASSIS GROUND
C15	68	CAB	SEAT POWER
C16	61	CAB	HVAC BLOWER
C17	34	CAB	LEFT HAZARD
C18	34	CAB	RIGHT HAZARD
C19	29	CAB	SALOPS/STICH B+
C20	24	CAB	INSTRUMENT B+
C21	20	CAB	SWITCHED B+
C22	31	CAB	CHASSIS GROUND
C23	24	CAB	ICU B+
C24	65	CAB	SWITCHED B+
C25	69	CAB	UNSWITCHED B+
C26	16	CAB	CDB CLEAN GROUND
C27	16	CAB	CDB SWITCHED B+
C28		CAB	NOT USED
C29	34	CAB	FLASHER
C30	43	CAB	SUSPENDED AXLE B+

SPL NAME	SEC LOC	HARNESS USED ON	CIRCUIT
C31	66	CAB	FRONT WIPER
C32	24	CAB	CHASSIS GROUND
C33	19	CAB	UNSWITCHED B+
C34	20	CAB	SWITCHED B+
C35	33	CAB	STOP LIGHTS
C36	28	CAB	NOT USED
C37		CAB	NOT USED
C38	66	CAB	WIPER SPEED
C39		CAB	NOT USED
C40	34	CAB	STOP LIGHTS
C41		CAB	NOT USED
C42		CAB	NOT USED
C43	67	CAB	STROBE B+
E1	19	ENGINE	CHASSIS GROUND
E2	19	ENGINE	ECU SENSOR GND
E3	58	ENGINE	CONTROLLER B+
E4	57	ENGINE	CLEAN GROUND
E5	61	ENGINE	ECU SWITCHED B+
E6	41	ENGINE	RIGHT PARK BRAKE
F1	25	MAIN CHASSIS	CLEAN GROUND
F2		MAIN CHASSIS	NOT USED
F3	57	MAIN CHASSIS	CLEAN GROUND
F4		MAIN CHASSIS	NOT USED
F5		MAIN CHASSIS	NOT USED
F6	25	MAIN CHASSIS	ENGINE RPM
F7	57	MAIN CHASSIS	GOVERNOR GROUND
F8		MAIN CHASSIS	NOT USED
F9	25	MAIN CHASSIS	ICU SENSOR GND
FL1		FENDER	NOT USED
FL2	52	FENDER	CHASSIS GROUND
FR1		FENDER	NOT USED
FR2	33	FENDER	CHASSIS GROUND
H1	31	HEADLIGHT	CHASSIS GROUND
H2	31	HEADLIGHT	WORKLIGHT B+
H3			
P1	43	PARK SOLENOID	PARK SOLENOID
P2	41	PARK SOLENOID	PARK SOLENOID
R1	30	ROOF	CHASSIS GND
R2	29	ROOF	CHASSIS GND
R3	29	ROOF	WORK LIGHT B+

SPL NAME	SEC LOC	HARNESS USED ON	CIRCUIT
SH1	69	SHELF	CHASSIS GROUND
SH2	69	SHELF	SWITCHED B+
SH3	69	SHELF	UNSWITCHED B+
T1	37	MAIN CHASSIS	BI-COMMON
T2	37	MAIN CHASSIS	AUX B+
T3	38	MAIN CHASSIS	CLEAN GROUND
T4	38	MAIN CHASSIS	WHEEL SPEED
T5	41	MAIN CHASSIS	PARK BRAKE SOLENOID
T6	38	MAIN CHASSIS	RANGE PRESSURE
T7	38	MAIN CHASSIS	NOT USED
T8		MAIN CHASSIS	NOT USED
T9		MAIN CHASSIS	NOT USED
T10		MAIN CHASSIS	NOT USED
T11		MAIN CHASSIS	NOT USED
T12		MAIN CHASSIS	ECU SENSOR GND
T13		MAIN CHASSIS	NOT USED
T14	61	MAIN CHASSIS	CLEAN GROUND
T15	61	MAIN CHASSIS	SWITCHED B+
T16	61	MAIN CHASSIS	REMOTE B+ COMMON
T17	61	MAIN CHASSIS	DRAFT PIN A
T18	61	MAIN CHASSIS	DRAFT PIN D/G
T19		MAIN CHASSIS	NOT USED
T20		MAIN CHASSIS	NOT USED
T30	38	MAIN CHASSIS	CLEAN GROUND
V1	54	AUX VALVE	AUX VALVE B+
AG1	76	AUTOGUIDANCE	STEER VALVE SOURCE
AG2	77	AUTOGUIDANCE	GROUND
AG3	75	AUTOGUIDANCE	WHEEL SPEED
AG4	77	AUTOGUIDANCE	+5V REF
AG5	75	AUTOGUIDANCE	SWITCHED B+
AG6	74	AUTOGUIDANCE	GROUND
AG7	73	AUTOGUIDANCE	REVERSE
AG8	73	AUTOGUIDANCE	SEAT SW OPS
AG9	73	AUTOGUIDANCE	REVERSE
AF51	70	RHINE ISO11783	SWITCHED B+
AF52	70	RHINE ISO11783	CLEAN GROUND
AF53	72	OUTSIDE ISO11783	UNSWITCHED B+
AF54	72	OUTSIDE ISO11783	UNSWITCHED B+
AF55	72	OUTSIDE ISO11783	SWITCHED B+
AF56	72	OUTSIDE ISO11783	ECU GROUND



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LEGEND

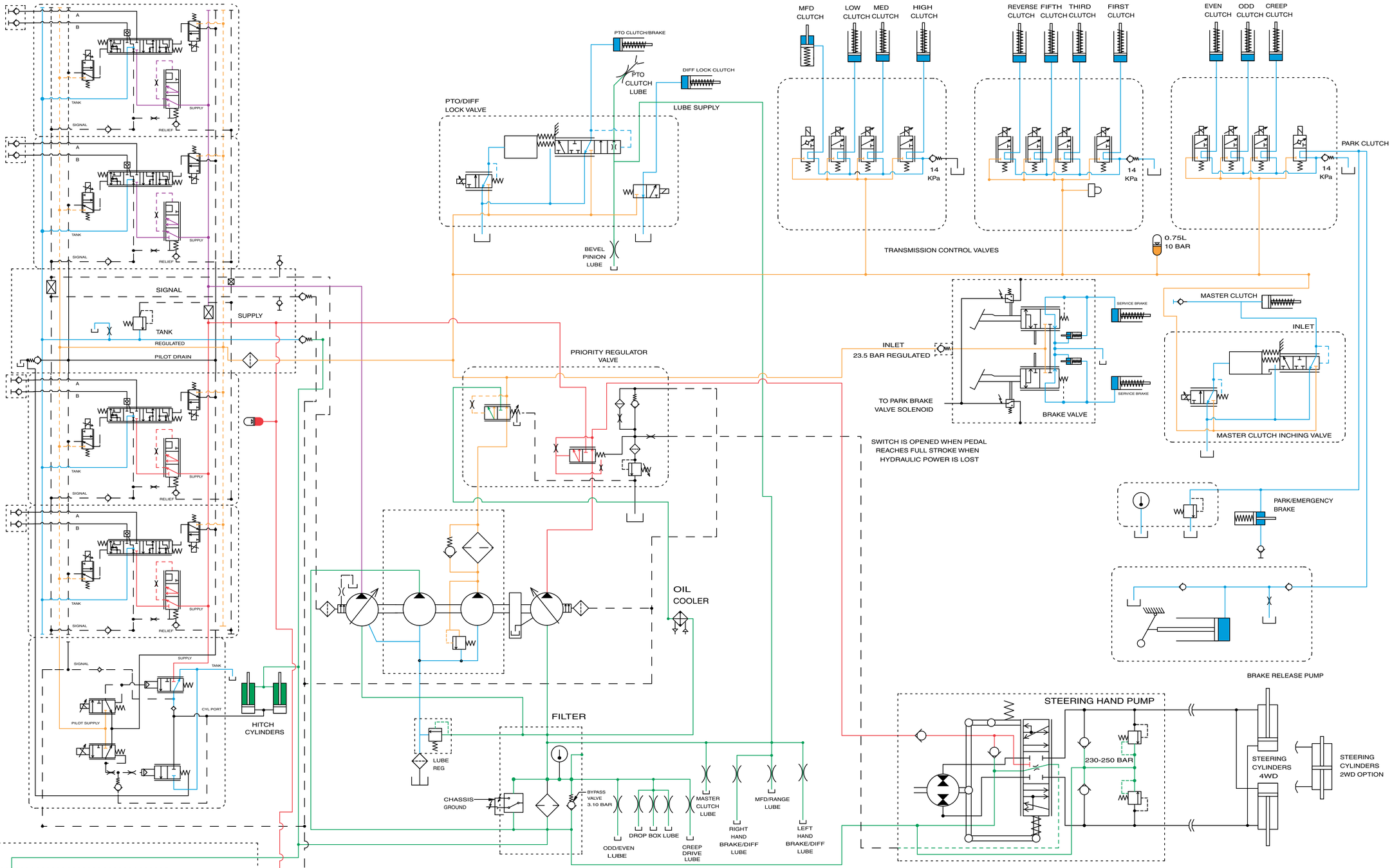
INDICATES CONSTANT POWER

INDICATES POWER WHEN KEY SWITCH IS ON

TRANSMISSION CONTROL IN PARK
MFD IS OFF

RI04K012

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TG SERIES TRACTORS
TG210, TG230, TG255, AND TG285
NAO HYDRAULIC SCHEMATIC EQUIPPED with MEGAFLOW

RAC. 87025178

LEGEND

- PFC PISTON PUMP
- MEGA FLOW PUMP
- REGULATED CIRCUIT PUMP FLOW
- CHARGE LUBE/LUBE PUMP FLOW
- RETURN TO TANK/SUMP

RI02K062

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