Section 10001

STANDARD INSTRUMENTATION

Programming and Fault Codes

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SYMPTOM BASED FAULTS - NO FAULT CODES
Instrumentation Display Will Not Illuminate When Key Is Turned On
No Fault Code

Meaning:
The INST controller (display) is not to be powered or has failed.

Possible failure mode:
1. Failed cab power relay - engine will run after starting.
2. Failed controller power relay - engine will stop after starting.
3. Failed key switch - engine will stop after starting.
4. Fuse #30 failed or circuit from fuse to controller pin 40 of connector 61 failed open.
5. Poor ground supply to Display pin 39 of connector 61.

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 cab power 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 C61-40<--->Fuse 30<--->243 (Controller relay) 241<--->138 (cab power relay)
240<--->unswitched power

Corrective action:

STEP 1 - Cycle Key switch - (20 times)
Turn the front wiper on.
Turn the key switch on and off while monitoring the display and the front wiper, the display and front wiper must turn on and off everytime when the key is cycled.
-- OK - The display and front wiper turned on every time when key switch was turned on.
-- NOT OK - The wiper turned on but the display did not turn on when the key was turned on, go to Step 4.
-- NOT OK - The display and the wiper did not turn on, go to Step 2.

STEP 2 - Check power to cab power relay
The cab power relay is located in the right hand fuse panel.
Turn the key on, the relay should make a clicking sound.
-- OK - Relay clicks, but wiper did not turn on - Replace relay (failed contacts).
-- NOT OK - Relay did not click - Check power supply to relay, go to Step 3.

STEP 3 - Check power and ground to the cab relay
Check relay ground - correct if needed.
Turn key on.
Check for relay coil power at pin 138 for switched power from the key switch.
-- OK - Replace relay
-- NOT OK - Failed key switch
No power to key switch
Failed wire from the key switch to relay

STEP 4 - Check fuse 30
With the key switch on the display will not illuminate.
Check fuse 30.
-- OK - go to Step 5.
-- NOT OK - Replace fuse, If fuse fails when key is turned on, go to Step 9.

FAULT CODE INST 10031

Meaning:
Controller memory error - loss of valid engine hours.

Possible failure modes:
Memory defect or intermittent controller.

Corrective action:
1. Make sure the controller has a good connection (C061) to the battery and is properly grounded.
2. Shut down the tractor and restart.
3. Calibrate the instrumentation controller.
4. When the valid engine hours are lost in the controller memory (EEPROM checksum), the controller will reset engine hour meter to 50000.0 hours to highlight the failure.
5. It will continue counting the hours from that point.
6. If the same fault appears again, replace the controller.

FAULT CODE INST 10032

Meaning:
Controller failure: vehicle configuration information lost.

Possible failure modes:
1. Memory defect or intermittent controller

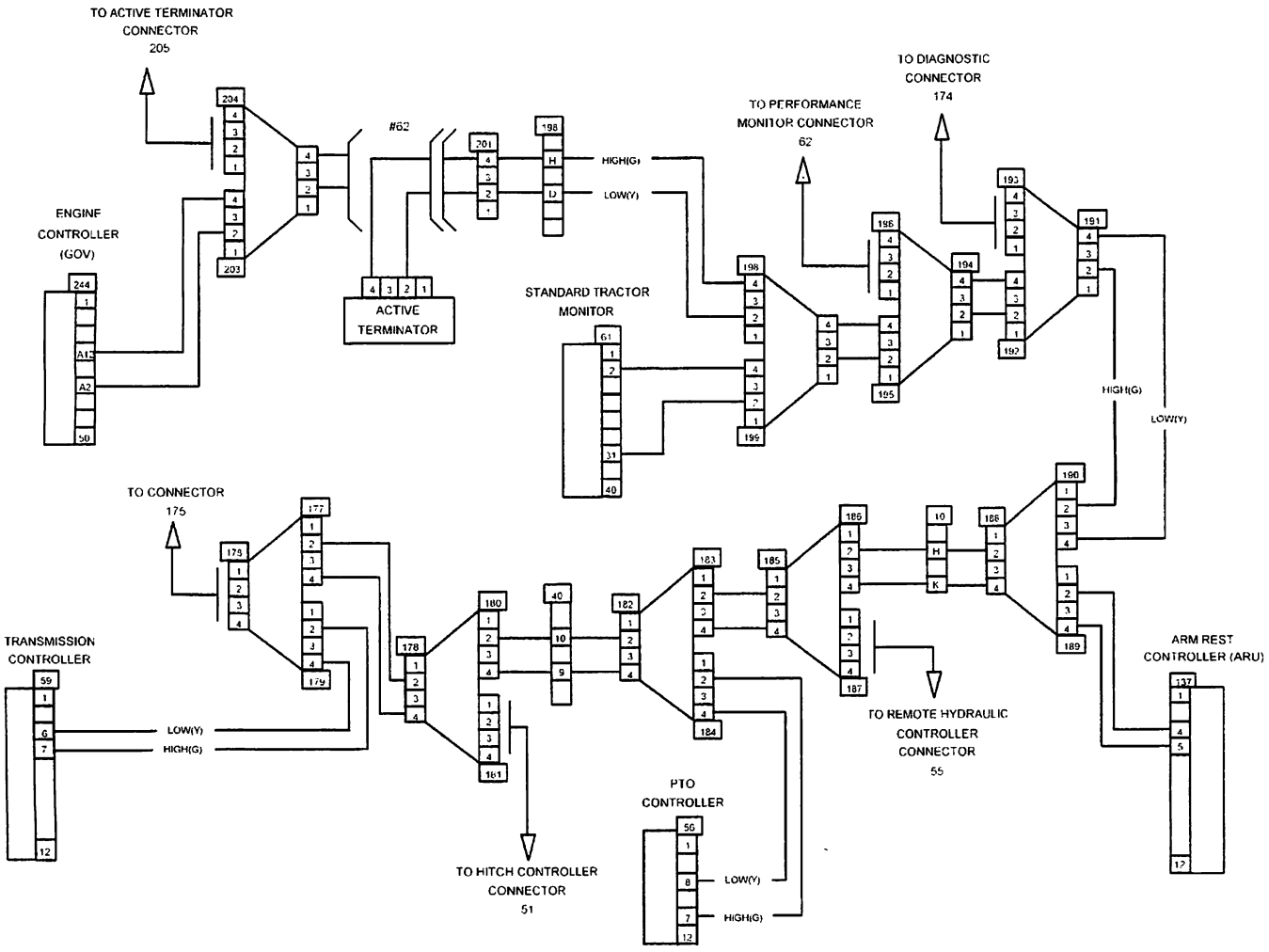
Corrective action:
1. Make sure the controller has a good connection (C061) to the battery and is properly grounded.
2. Shut down the tractor and restart.
3. Calibrate the instrumentation controller.
4. If the same fault code appears again, change the controller.

FAULT CODE INST 10033

Meaning:
Controller failure: customer configuration information lost. This is triggered once when either the tire or the English/ Metric setting is detected or lost.

Possible failure modes:
1. Memory defect or intermittent controller.

Corrective action:
1. Set English/metric setting to English mode and set the tire radius to 745 mm.
2. Make sure the controller has a good connection (C061) to the battery and is properly grounded.
3. Shut down the tractor and restart.
4. Calibrate the instrumentation controller.
5. If the same fault code appears again, change the controller.



RI98G121

FAULT CODE INST 13011

Meaning:
Engine coolant temperature sensor voltage out of range low.

Possible failure modes:
1. Engine coolant temperature sensor failed.
2. Engine coolant temperature sensor wiring harness problems.

Corrective action:
Check the engine coolant temperature sensor resistance and the wiring from the instrumentation controller to the engine coolant temperature sensor.

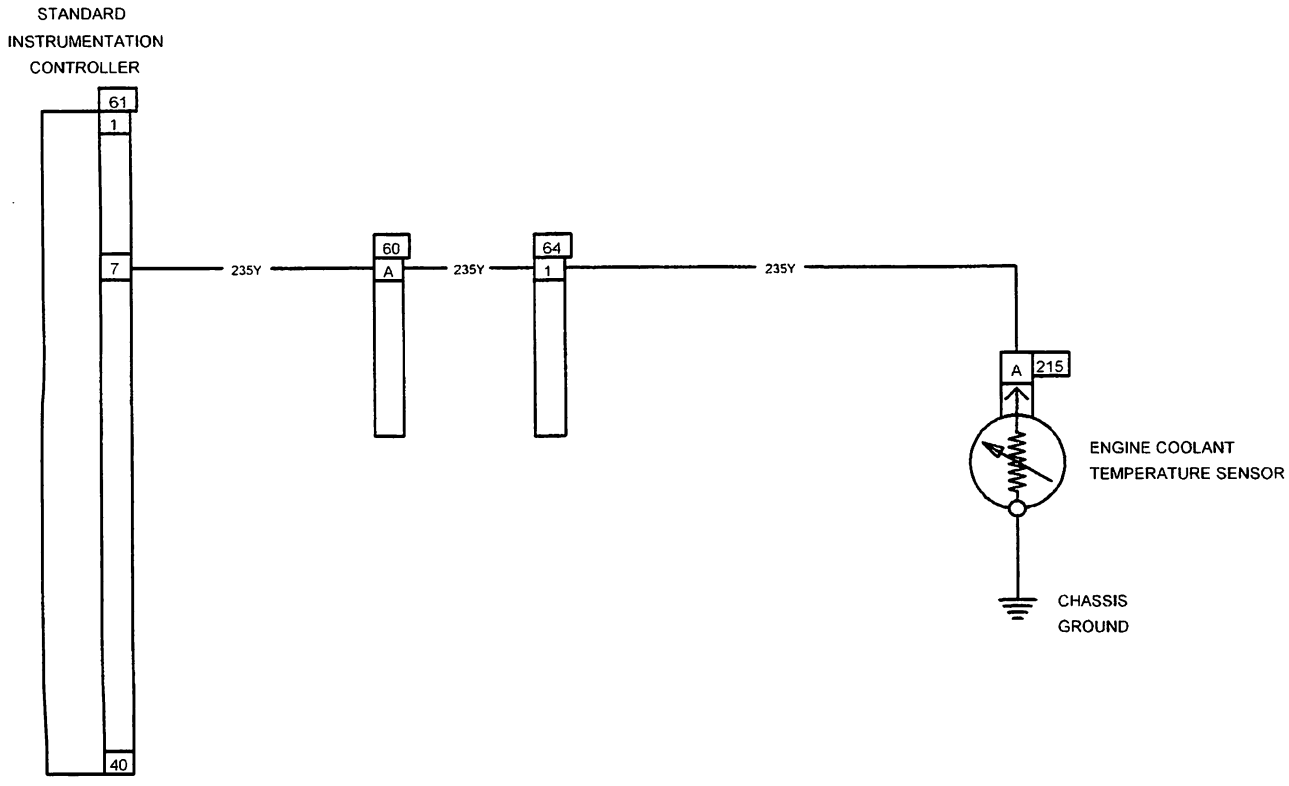
STEP 1 - Test the resistance of the engine coolant temperature sensor

Open up the tractor hood and locate the engine coolant temperature sensor.
Disconnect connector C215 from the engine coolant temperature sensor.
Inspect the connector
Clean the connection.
Measure the sensor resistance between the connection and the chassis ground.
The resistance should be around 24 k ohms at 0 degree Fahrenheit and 100 ohms at 250 degrees Fahrenheit.
If the resistance is not in the specified range, replace the engine coolant temperature sensor.
If it is as specified, go to the next Step.

STEP 2 - Check the wiring from the engine coolant temperature sensor to the connector C061 at the instrumentation controller

The power supply at the engine coolant temperature sensor connector should be about 5 VDC when the tractor key is in the 'Run' position.
There should be good continuity from the engine coolant temperature sensor connector to the cavity A of C060 and then to the cavity 7 of C061.
Check for an open circuit and shortage to the ground.

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



WITHOUT ENGINE CONTROLLER

RI98G123

TABLE OF CONTENTS

NOTE: Case Corporation reserves the right to make improvements in design or changes in specifications at any time without incurring any obligation to install them on units previously sold.

HITCH FAILURE MODES

There are failures and combination of failures that cause the hitch to be fully inoperable. These are as follows:

MEMORY FAILURES - If there is a memory failure, the hitch will not operate and the green LED on the controller (At the rear of the cab) will be ON. There will not be a fault code recorded in the memory.

HALT CONDITIONS - Halt failure conditions are shown in the diagnostic codes. Hitch motion is fully disabled. Also, if a failure is detected during calibration, the system will go to this mode and the actual failure will be recorded.

DOUBLE FAILURES INVOLVING THE UP/DOWN SWITCH - When the up/down switch and a second limp home failure occur, hitch motion is available only through the remote fender switches (When equipped).

FAILURES THAT RESULT IN NO FAULT BEING STORED

1. Hitch is above the upper limit.
2. Hitch will not go all the way down or up. Position or control potentiometers could be loose. Valve parameters may have shifted.
3. Hitch does not lower or raise. Possible hydraulic contaminant in the valve prevents the spool from opening.

Calibration Fault Codes

Hitch system problems that exists at start up will prevent entry into the calibration mode. These faults can be read through the diagnostic function of the instrumentation display. Faults that occur during the calibration process will cause calibration to stop.

Performance Fault Codes

There are four non - normal modes of operation: HALT, LIMP, DEGRADED 2 and DEGRADED 1. Different failures will generate different modes of operation as shown in the fault code listing. The following shows the differences between these modes.

HALT (H) - The hitch is totally disabled and no electrical actuation is possible.

LIMP (L) - The hitch can be recorded only up or down from the UP/DOWN switch or from the remote fender switch. Only momentary motion is allowed and the tractor must be stopped.

DEGRADED 2 (D2) - Due to a failure, the draft mode is not a valid mode.

DEGRADED 1 (D1) - The hitch is fully operational with default values for certain variables.

STEP 4 - Testing hitch raise coil and circuit

Disconnect connector C058 (Green) from the hitch controller.
Connect a ground wire to C058-03 (Lower solenoid ground supply).
Connect a power wire to C058-01 (Lower solenoid power supply).
Stand clear of the hitch and start the tractor. The hitch should lower.
-- OK - hitch lowered, go to Step 11.
-- NOT OK - hitch did not raise, go to Step 5.

STEP 5 - Is Lower solenoid coil installed correctly

Use CAS - 2577 Cab Lift Tool and lift the tractor cab.
Check that the hitch lower solenoid coil is installed correctly.
-- OK - go to Step 6.
-- NOT OK - install the solenoid coil correctly and test the hitch again.

STEP 6 - Lower solenoid spool movement check

Disconnect connectors C152 from the lower solenoid.
Remove and inspect hitch lower solenoid. Check o-rings and that the inner spool moves when power and ground is applied to coil.
-- OK - go to Step 7.
-- NOT OK - clean and or replace solenoid. Test the hitch again.

STEP 7 - Raise solenoid spool movement check

Disconnect connectors C151 from the raise solenoid.
Remove and inspect hitch raises solenoid. Check o-rings and that inner spool moves when power and ground is applied to coil.
-- OK - go to Step 8.
-- NOT OK - clean and or replace the solenoid. Test the hitch again.

STEP 8 - Manually raise hitch

Start the tractor. Carefully insert a small punch into the center of the lower solenoid.
-- OK - hitch lowered when punch was inserted, go to Step 9.
-- NOT OK - hitch did not lower. There is a hitch valve or hydraulic system problem. See Section 8000 or 8009.

STEP 9 - Install test wire to hitch raise coil

Install a jumper wire from C058-03 to the hitch Lower coil C152-2.
Install all connectors and test the hitch.
-- OK - hitch raised and lower correctly. Install a new wire.
-- NOT OK - hitch did not raise or lower, go to Step 10.

STEP 10 - Check hitch raise switch at connector C058

Turn the key on.
Pin C058-09 should only be powered when the hitch lower switch is depressed.
Check pin C058-09 for power.
-- OK - Pin C058-09 is only powered when the hitch lower switch is depressed. Hitch should would.
-- NOT OK - Pin C058-09 is powered when the hitch lower switch is not depressed, go to Step 11.

STEP 11 - Disconnect hitch remote switches

Disconnect the hitch remote hitch switch at the back of the tractor connector C80 or (C81 and C260 fender).
Turn the key on.
Pin C058-09 should not be powered.
Check pin C058-09 for power.
-- OK - Pin C058-09 is not powered, replace hitch switch.
-- NOT OK - Pin C058-09 is powered, key is turned on. Replace wire C058-09 from connector to hitch switch(s) connector C80 or (C81 and C260 fender).

STEP 12 - Replace hitch controller

Make sure the wire harness routing of the controllers is tight against the cab, not loose or draped in front of controllers.
Write the fault code on the failed controller.
Install and calibrate a new controller.

FAULT CODE HITCH 3020

Meaning:
(D1) Percent wheel slip fault code recorded by instrumentation (Display) controller.

Possible failure modes:
1. Failed ground speed radar gun.
2. Loose, dirty or damaged radar connector.
3. Failed wires between radar gun and instrument controller.
4. Failed transmission speed sensor (Tractor will stop when driving after approximately 5 seconds).
5. Instrument (Display) controller failed.

Background:
The hitch controller receives this information from the data bus from the instrumentation controller (Display). The instrumentation controller uses true ground speed (Radar) and the transmission speed sensor information to calculate wheel slippage. If there is a data bus problem many other fault codes will be recorded. If the problem is intermittent, the function is disabled until the next engine start up.

Transmission speed sensor information:
Cavity A - Signal
Cavity B - Ground
Resistance - 2700 to 3300 ohms

Corrective Action:
1. Check for fault code HITCH 3010 and ARM 1059 (Component failures) or HITCH 12041 and INST 12031 (Communication error). Follow corrective actions for these codes.
2. If none of the above, replace the instrumentation controller.

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STEP 8 - Replace Left hand draft pin, both if available

Replace the left hand draft pin and test again.

-- NOT OK - Fault code HITCH 04039 is still active, go to Step 9.

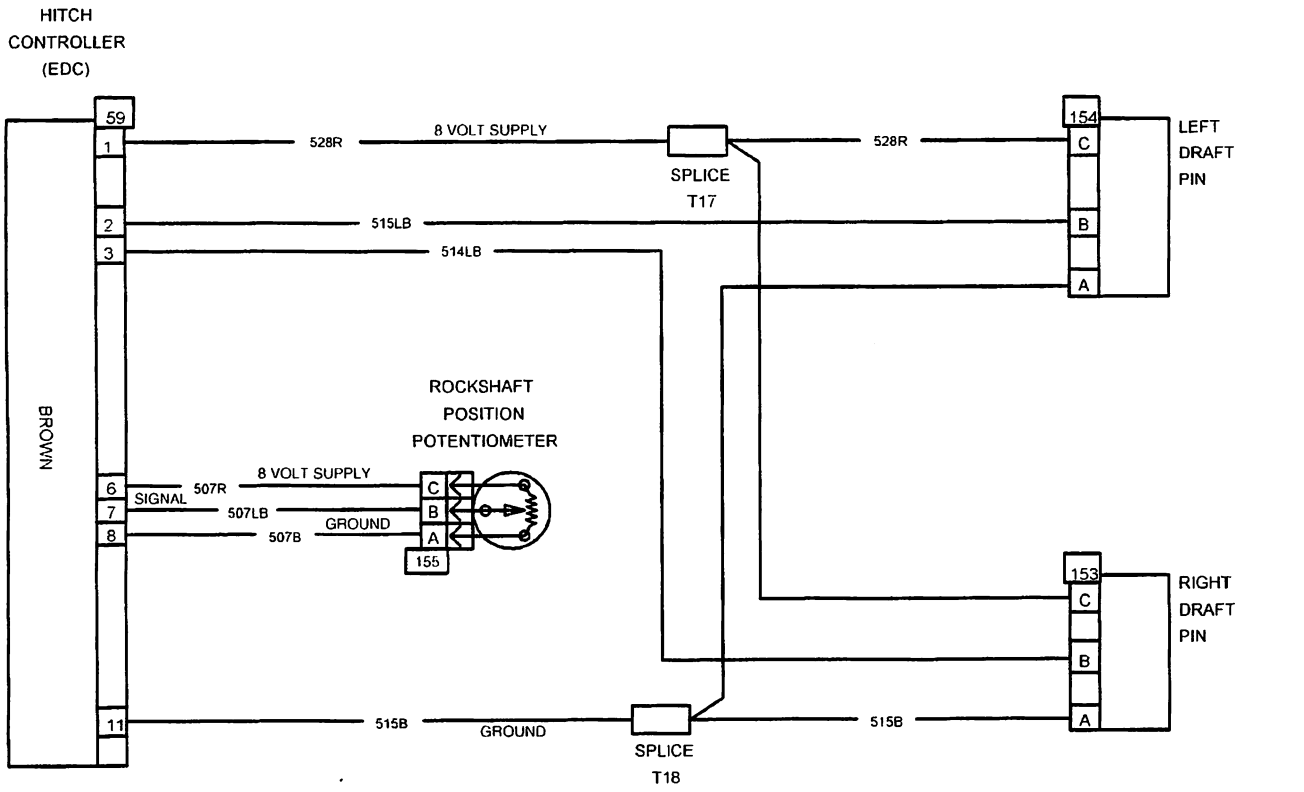
-- OK - No fault codes or a different fault code is recorded (HITCH 04039 no longer active) problem was corrected. Assemble the tractor.

STEP 9 - Replace hitch controller

Write fault code on failed hitch controller.

Install and calibrate a new controller.

Make sure that the controller harness is routed tight against the cab, not loose or draped in front of controllers.



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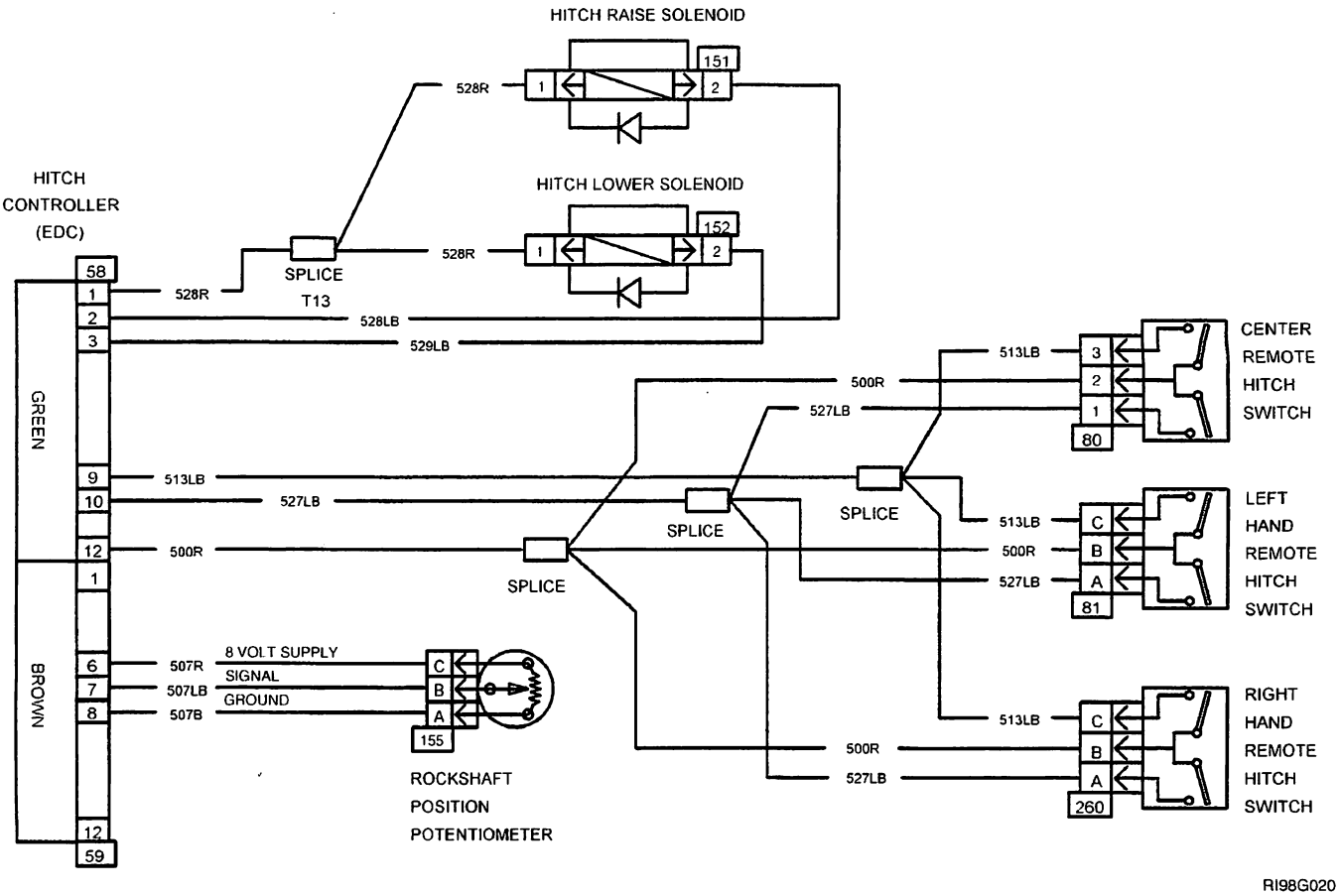
STEP 4 - Test controller

Remove the controller cover from the rear of the tractor.
Disconnect connectors C058 (Green) from the hitch controller.
Remove pin C058-2.
Connect C058 to hitch controller.
Start engine and test hitch again.
-- OK - Fault code HITCH 6024 is recorded again, go back to Step 2.
-- NOT OK - Fault code HITCH 6025 is recorded again, go to Step 5.

STEP 5 - Replace hitch controller

Write fault code on failed hitch controller.
Install and calibrate a new controller.
Make sure that the controller harness is routed tight against the cab, not loose or draped in front of controllers.



STEP 3 - Measure controller output voltage to rockshaft potentiometer

Disconnect connectors C154 from the rockshaft position sensor.
Turn ignition key to the on position.
Measure controller output voltage at C155-A. It must be approximately 8 volts.
Measure controller output voltage at C155-A to C155B. It must be approximately 8 volts.
Measure controller output voltage at C155-A to C155-C. It must be approximately 8 volts.
-- NOT OK - Go to Step 5.
-- OK - Go to Step 4.

STEP 4 - Install connector and rockshaft potentiometer and test hitch again

Connect C155 to the rockshaft position sensor and test tractor.
-- NOT OK - Fault code is recorded again (Hitch stops), replace and test again.
-- OK - Problem was corrected. Assemble the tractor.

STEP 5 - Inspect and clean hitch controller connector C059

Turn key off.
Remove the controller cover from the rear of the tractor.
Disconnect connectors C059 (Brown) from the hitch controller.
Inspect pins 6, 7 and 8 in connector C059. Clean the connection.
Clean the female pin by installing and removing connector C059 several times into the controller.
With the connector installer, start engine and check hitch for fault codes.
-- NOT OK - Fault code is recorded again (Hitch stops), go to Step 6.
-- OK - Problem was corrected. Assemble the tractor.

STEP 6 - Wire harness open circuit check

Disconnect the rockshaft position sensor C155 and controller harness connector C059.
Measure the resistance between C059-06 and C155-C. It must be less than 10 ohms.
Measure the resistance between C059-07 and C155-B. It must be less than 10 ohms.
Measure the resistance between C059-08 and C155-A. It must be less than 10 ohms.
-- OK - Go to Step 7.
-- NOT OK - Install new wire.

STEP 7 - Wire harness short to chassis ground check

Disconnect the rockshaft position sensor C155 and controller harness connector C059.
Measure the resistance between C059-06 and chassis ground. It must be more than 50k ohms.
Measure the resistance between C059-07 and chassis ground. It must be more than 50k ohms.
-- OK - Go to Step 8.
-- NOT OK - Install new wire.

STEP 8 - Replace hitch controller

Write fault code on failed hitch controller.
Install and calibrate a new controller.
Make sure that the controller harness is routed tight against the cab, not loose or draped in front of controllers.

FAULT CODE HITCH 9310

Meaning:
(H) During calibration, the rockshaft potentiometer signal difference between the fully lowered and the fully raised position is not within specification.

Possible failure modes:
1. Failed hitch position sensor.
2. Incorrect rockshaft sensor installed on the tractor.

Background:
The hitch controller measures the hitch height with the rockshaft potentiometer. If the current is not what the controller is expecting a fault code will be recorded.

Rockshaft position sensor information:
The high and low resistance valve measured is not that important, a open in the potentiometer is what will active this fault code.
Measured from pin A to C - Total resistance: 4000 ohms ± 15%.
Measured from pin A to B - Should change as potentiometer is turned clockwise from approximately 4200 ohms (Hitch up) down to approximately 150 ohms (Hitch down).
Measured from pin C to B - Should change as potentiometer is turned clockwise from approximately 150 ohms (Hitch up) to approximately 4200 ohms (Hitch down).

Wiring information:

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

C059-06 ----> C155-C (8 volt power supply from controller to rockshaft sensor).
C059-07 ----> C155-B (Signal to controller from rockshaft).
C059-08 ----> C155-A (Ground from controller to rockshaft sensor).

IMPORTANT: *To avoid pin and harness damage, use CAS - 2593-31 male test lead when taking measurements.*

IMPORTANT: *The hitch must be calibrated whenever a hitch component is replaced.*

Corrective action:

STEP 1 - Find out if fault code is still active
Check the position sensor linkage for problems.
-- OK - Go to Step 2.
-- NOT OK - Correct linkage problem.

STEP 2 - Check C154 connection and rockshaft sensor
Disconnect connectors C155 from the rockshaft position sensor.
Inspect pins A, B, and C in connector C155. Clean the connection.
Clean the female pin by connecting and disconnecting C155 several times.
The high and low resistance valve measured is not that important, a open in the potentiometer is what will activate this fault code.
Measure the resistance from pin A to C - Total resistance: 4000 ohms ± 15%.
Measure the resistance from pin A to B - Should change as potentiometer is turned clockwise from approximately 4100 ohms down to approximately 150 ohms (± 15%).
Measure the resistance from pin C to B - Should change as potentiometer is turned clockwise from approximately 150 ohms up to approximately 4100 ohms (± 15%).
-- NOT OK -This is a very reliable potentiometer, if you are not sure of the performance, do not replace potentiometer. If sure, replace potentiometer, calibrate hitch.
-- OK - No openings where found as the potentiometer was turned, go to Step 3.

STEP 5 - Cleaning and inspecting connection C059

Remove the controller cover from the rear of the tractor.
Disconnect connectors C059 (Brown) from the hitch controller.
Inspect pin 1, 2, 3 and 11 in connector C059, clean the connection.
Clean the female pin by installing and removing connector C059 several times from the controller.
Connect C059 and draft pin.
Test again.
-- NOT OK - Fault code is recorded again, go to Step 6.
-- OK - Problem was corrected. Assemble the tractor.

STEP 6 - Left and right hand draft pin wiring open circuit check

Disconnect connector C059.
Disconnect the left and right hand pins at connectors C0154 and C0153.
Measure the resistance between C059-01 and C154-C and C153-C. It must be less than 10 ohms.
Measure the resistance between C059-02 and C154-B. It must be less than 10 ohms.
Measure the resistance between C059-03 and C154-B. It must be less than 10 ohms.
Measure the resistance between C059-11 and C154-A and C153-A. It must be less than 10 ohms.
-- OK - Go to Step 7.
-- NOT OK - Install new wire (Problem was with wire from C154-A or C and new wire must be run to both draft pins).

STEP 7 - Left hand draft pin wiring short to chassis ground check

Disconnect the right hand draft pin at connector C153.
Disconnect the left hand draft pin at connector C154.
Measure the resistance between C059-01 and chassis ground. It must be more than 100k ohms.
Measure the resistance between C059-02 and chassis ground. It must be more than 100k ohms.
Measure the resistance between C05903 and chassis ground. It must be more than 100k ohms.
-- OK - Go to Step 8.
-- NOT OK - Install new wire. (Problem was with wire from C154-A or C and new wire must be run to both draft pins).

STEP 8 - Replace hitch controller

Write fault code on failed hitch controller.
Install and calibrate a new controller.
Make sure that the controller harness is routed tight against the cab, not loose or draped in front of controllers.

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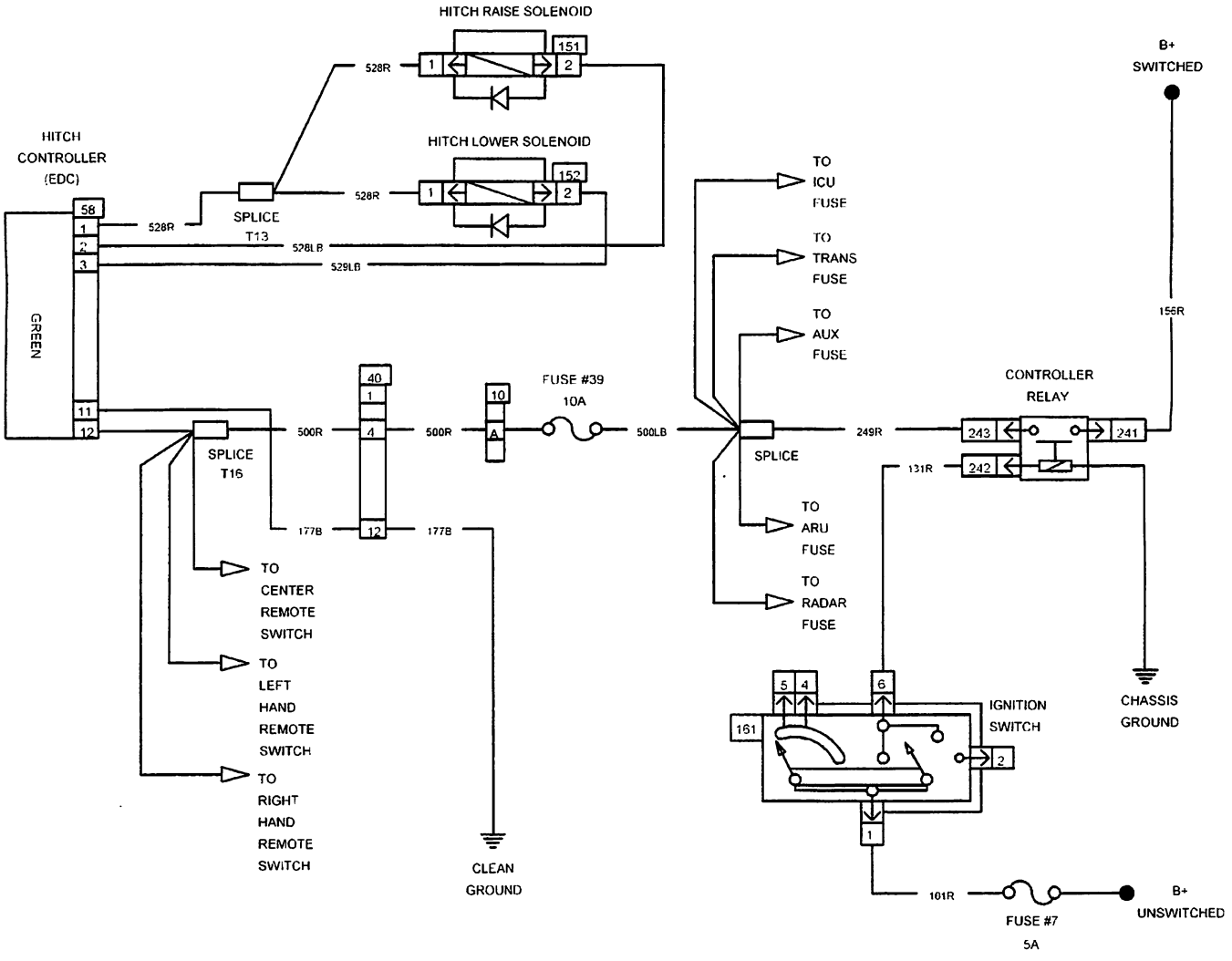
FAULT CODE HITCH 10072

Meaning:
(H) The raise hitch coil driver in the controller is shorted to 12 volts.

Corrective Action:
1. Make sure the controller has good power and ground connections. Start the tractor again. If the fault code is recorded again, replace and calibrate the controller.



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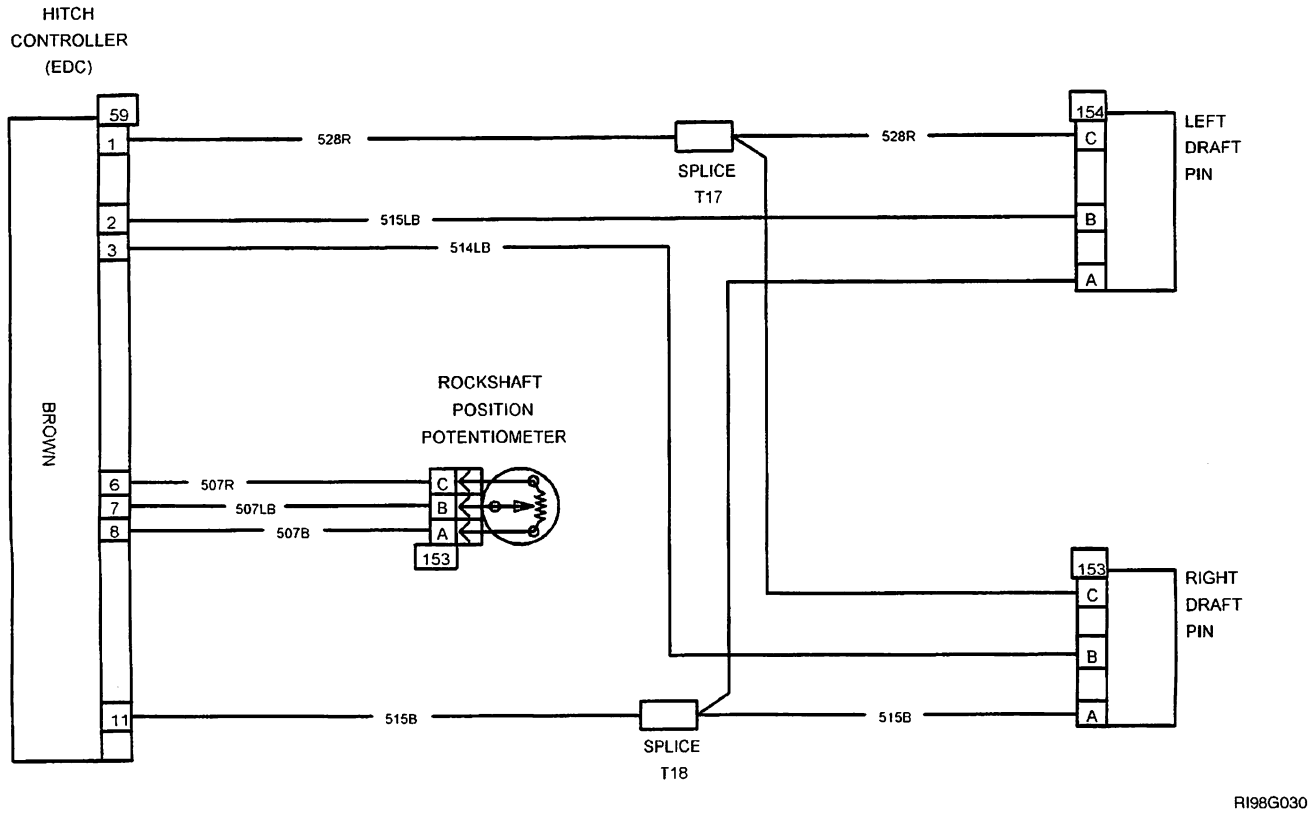

Section

10003

10003

TRANSMISSION CONTROLLER

Calibration and Fault Codes

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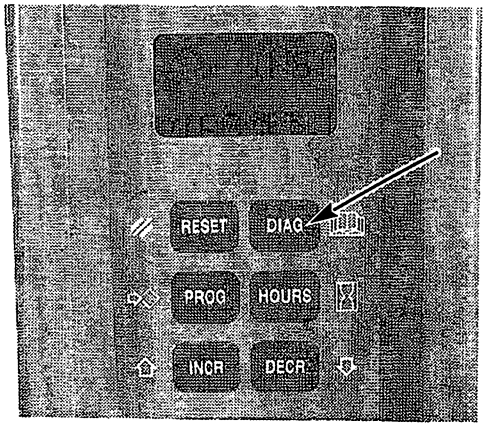
FAULT CODE RETRIEVAL

Controllers can be checked for fault codes at any time, unless in the calibration mode. Up to 10 fault codes can be stored in each controller.

STEP 30



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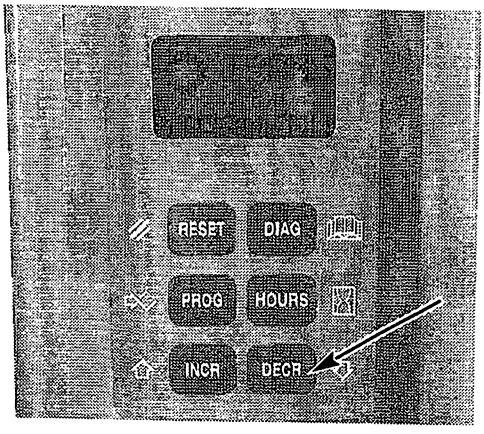
With the key switch in the ON or RUN position, press and hold the DIAG key on the programmable display key board to enter the controller selection screen. The display will read INST DIAG MENU.

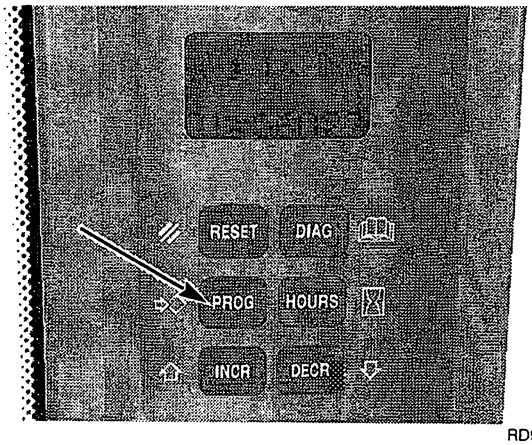
STEP 31



RD98F033

Use the DECR key to scroll through the different controllers: INST (standard instrumentation) - ENG (engine) - TRANS (transmission) - ARM (armrest) - HITCH - AUX (remote hydraulics) - PTO (power take off) - PERF (performance monitor).

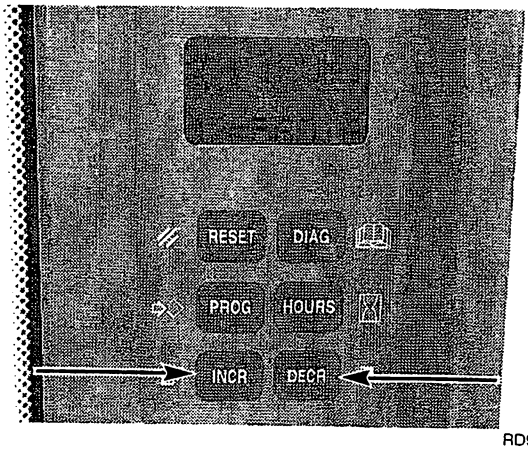
STEP 32



RD98F034

When the required controller is displayed, press the PROG key. If a controller is selected that is not on the Case Data Bus (does not exist), the display will read COMM ERR.

STEP 33



RD98F035

Use the INCR and DECR keys to scroll through the 10 possible fault codes. The controller name will be at the top of the display. The fault code and which number that fault is (01 to 10), will be at the bottom of the display.

"P" ON DISPLAY WILL NOT APPEAR WHEN SHIFTED INTO PARK

Possible failure modes:

1. Park switch failed.
2. Park relay contracts failed closed.
3. Circuit to transmission controller pin C028-7 is shorted to power. No fault codes (P on display will not turn on when in park) tractor drive correctly

Background:

The controller monitors the parking brake solenoid power supply. The parking brake solenoid must be powered for the park brake to be released. The park relay (R2-3) supplies power to the two brake pedal valve switches (under hood) and to the transmission controller pin C028-7.

Wiring information:

R2-3 -> C010-DD -> C042-6 -> splice -> C028-7

splice -> C043-9 -> splice -> C047-1 (Right brake W.) C047-2 -> C049-1 -> park sol. -> ground

splice -> C048-A (Left brake SW.) C048-A -> C049-1 -> park sol. -> ground

FNRP switch test at connector C051:

The FNRP switch function can be tested at connector C051 without removing it from the tractor. The switch must be replaced if it does not pass all of the following tests. Disconnect connector C051 at the bottom of the steering column.

STEP 1 - Starting Park and Neutral

Install test s wires into connector C051 pins and 1 and 2
The switch contacts must be closed when in park and neutral.
The switch contacts must open when the lever is lifted out of park and neutral.
-- OK - Go to step 2.
-- NOT OK - Replace FNRP switch.

STEP 2 - Park switch check

Install test s wires into connector C051 pins 3 and 4.
The switch contacts must be open when in park.
The switch contacts must close when the lever is lifted out of park.
-- OK - Go to Step 3.
-- NOT OK - Replace FNRP switch.

STEP 3 - Neutral switch check

Install test s wires into connector C051 pins 4 and 7.
The switch contacts must be open when in neutral.
The switch contacts must close when the lever is lifted out of neutral.
-- OK - Go to Step 4.
-- NOT OK - Replace FNRP switch.

STEP 4 - Forward switch check

Install test s wires into connector C051 pins 6 and 7.
The switch contacts must be closed when in forward.
The switch contacts must be open when the lever is lifted out of forward.
-- OK - Go to Step 5.
-- NOT OK - Replace FNRP switch.

STEP 5 - Reverse switch check

Install test s wires into connector C051 pins 5 and 7.
The switch contacts must be closed when in reverse.
The switch contacts must be open when the lever is lifted out of reverse.
-- OK - FNRP switch is OK.
-- NOT OK - Replace FNRP switch.

FAULT CODE TRANS 5011

Meaning:
The transmission controller has detected low hydraulic pressure (below 1344 kPa - 195 psi) in the "S" (speed clutch manifold) when shifted in to gear or the "S" manifold sensor has failed.

Possible failure modes:
1. Low regulated pressure.
2. Failed "S" pressure sensor, located next to the left-hand fuel tank.
3. Leaking clutch in transmission (Reverse, 1st, 3rd or 5th speed clutch).
4. Flow control spool in the "S" manifold valve sticking.
5. Wire between controller pin C028-4 and the "S" sensor is broken or shorted to ground. Fault codes TRANS 5011 recorded.
6. Wire between controller pin C028-5 and the "S" sensor is broken or shorted to ground. Fault codes TRANS 5011, 5021 and 5031 recorded.
7. Failed transmission controller.

Background:
The transmission controller measures the S manifold hydraulic pressure with a pressure sensor. The manifold distributes flow to four solenoids. The solenoids engage and disengage the 1st speed clutch, 3rd speed clutch, 5th speed clutch or Reverse clutch when ground is supplied to them by the transmission controller. The transmission controller monitors the circuit at pin C028-4. If the voltage (pressure) is lower than the controller is expecting a fault code will be recorded. If the problem is temperature sensitive or occurs when a certain gear is selected a transmission clutch may be leaking.

PIN C028-4 --Measures the "S" manifold pressure sensor signal --> C046-C (Pressure sensor)
-- If circuit is failed open or shorted to chassis ground before the tractor is started or during operation when shifted out of park, TRANS FAULT will appear on the display and fault code TRANS 5011 is recorded. The tractor will operate if there is hydraulic pressure from the pump. The "S" sensor reading in the TRANS VIEW menu will read "0" kPa.

PIN C028-5 -- "S", "R" and "O" manifold sensor power supply --> To pin "B" of C044, C045 and C046.
-- If circuit is failed open or shorted to chassis ground before starting the engine or during operation, TRANS FAULT will appear on the display when shifting out of park and fault codes TRANS 5031, 5021 and 5011 will be recorded. The tractor drives correctly. All three sensors read "0" kPa in TRANS VIEW.

Regulated pressure information:
Regulated pressure at 1500 engine RPM - 1930 to 2034 kPa (280 to 300 PSI).

Wiring information:

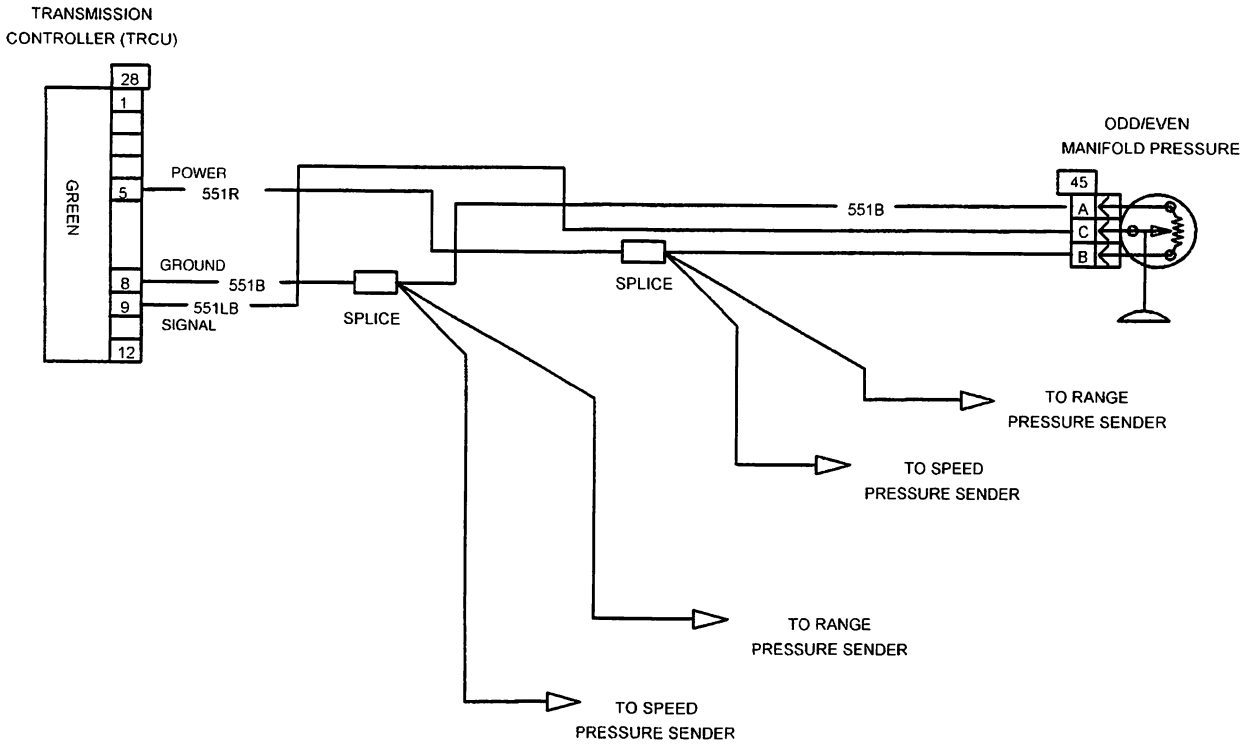
NOTE: *Always inspect connector ends for damaged, bent or dislocated pins when troubleshooting*
C028-8 ----> C046-A (Sensor ground)
C028-5 ----> C046-B (Sensor power)
C028-4 ----> C046-C (Sensor signal)

IMPORTANT: *To avoid pin and harness damage use CAS-2593-32 female test lead when taking measurements.*

Corrective action:

STEP 1 - Check fault codes

Check and record the display for fault codes.
-- If only 5011 is present, go to Step 2.
-- If TRANS 5011, 5021 and 5031 are recorded, measure the regulated system pressure see Section 8000 of service manual. Adjust if required. Then go to Step 2.



RI98G047

FAULT CODE TRANS 8011

Meaning:
The transmission controller has detected low voltage (less than 8 volts).

Possible failure mode:
1. Low battery voltage.
2. Poor power supply to transmission controller.
3. Poor ground supply to the transmission controller.
4. The controller is some how being powered while the engine is being cranked over (key switch in the start position.
5. Controller failed.

Background:
The transmission controller is powered at pin C027-1 and grounded at pin C027-12. It measures the circuit draw input. If the current draw is lower than the controller is expecting a fault code will be recorded.

If controller pin C027-1 failed open the display will read TRANS COMM ERROR. This fault is cause by low battery voltage or a poor connection in power supply circuit.

If controller pin C027-12 failed open the display will read TRANS COMM ERROR. This fault is cause by low battery voltage or a poor connection in clean ground supply circuit.

Wiring information:
Pin C027-1 <---> C041-12 <---> C010-F <--> Fuse 35
Pin C027-12 <---> C042-5 <---> C043-11 <--->Clean ground

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

IMPORTANT: *To avoid pin and harness damage use the CAS-2593-32 female test lead when taking measurements.*

Corrective action:

STEP 1 - Check battery voltage
Measure the battery voltage It must be approximately 12.8 volts.
-- OK - Go to step 2.
-- NOT OK - Charge or replace battery.

STEP 2 - Check battery connections
Clean and check all battery power and ground connection.
-- OK - Go to step 3.
-- NOT OK - Clean and replace damaged connections.

STEP 3 - Remove, clean and inspect connect C027
Remove the controller cover from the rear of the tractor.
Disconnect connector C027.
Inspect and clean pins 1 and 12.
Remove and install connector several times into controller to clean controller pins.
Test tractor
-- OK - Problem corrected.
-- NOT OK - Go to Step 4.

STEP 4 - Install new ground wire
Install a test wire from the battery ground to pin C027-12.
Test tractor.
-- OK - problem corrected.
-- NOT OK - go to step 5.

STEP 4 - Check wire between inching pedal potentiometer and controller

You are looking for a shorted to ground circuit.
Inching pedal potentiometer signal -- Controller C028-1 -->C040-5 -->C043-1 --> C008-AA --> C052-1 (clutch pedal potentiometer).
Inching pedal potentiometer B+ -- Controller C028-2 -->C040-6 -->C043-2 --> C008-BB --> C052-2 (clutch pedal potentiometer).
Inching pedal potentiometer ground -- Controller C028-3 -->C040-7 -->C043-3 --> C008-CC --> C052-3 (clutch pedal potentiometer).
Disconnect Inching pedal potentiometer.
Remove the controller cover.
Disconnect connect C028 (Green) from the transmission controller.
Measure the resistance at C028-1 to chassis ground.
Measure the resistance at C028-2 to chassis ground.
Measure the resistance at C028-3 to chassis ground.
-- OK - more than 100k ohm measured, go to step 5.
-- NOT OK - Look for pinch points and troubleshoot circuit for short to chassis, replace damage wire.

NOTE: *Test wires can be installed from controller to potentiometer to verify problem.*

STEP 5 - Replace inching pedal potentiometer

Replace the inching pedal potentiometer and go to Step 6.

STEP 6 - Calibrate clutch pedal

Calibrate the transmission controller. See information in this section.
-- OK - Problem corrected. Fault code TRANS 11011 is no longer active, go to Step 7.
-- NOT OK - A different transmission fault code now appears, follow the corresponding corrective action.
-- NOT OK - Calibration could be completed, but fault code TRANS 11011 is still active. Go to Step 10.

STEP 7 - Bottom of clutch pedal switch adjustment check

Turn the key to the ON position.
Enter TRANS VIEW menu in display to inspect the clutch pedal potentiometer function.
Shift the tractor out of park.
Slowly cycle the inching pedal while watching the display.
The display should read 100% when fully up and smoothly go down to 0% when fully depressed.
The bottom of clutch relay should turn OFF and ON at a value between 5% - 15% of clutch travel.
-- OK - Bottom of clutch relay turns OFF and ON at a value between 5% - 15% of clutch travel.
-- NOT OK - Bottom of clutch relay does not turn OFF and ON at a value between 5% - 15% of clutch travel. Go to Step 8.

STEP 8 - Adjust bottom of clutch pedal switch

Remove left hand steering column cover.
Adjust switch to activate relay at 7 to 14% of pedal travel.
-- NOT OK - New fault code appears. Follow the corresponding corrective action.
-- OK - Clutch pedal switch was failed and problem is now corrected.

STEP 9 - Check controller output voltage to clutch potentiometer.

Remove the controller cover from the rear of the tractor.
Disconnect connector C028 (green) from the transmission controller.
Remove pin 2 from connector C028.
Install test lead with female end into connector C028.
Install connector C028.
Turn key ON.
Measure controller output voltage at pin 2 (test lead) it must be about 8 volts.
-- OK - 8 volts measured at pin 2, go to Step 3.
-- NOT OK - 8 volts was not measured at pin 2, go to Step 10.

STEP 10 - Replace transmission controller

-- A new controller is needed if a new three wire potentiometer was installed and test wires connected between controller and potentiometer. TRANS 11011 is still active.
-- Write fault code on the failed controller.
-- Replace and calibrate the controller. See calibration procedure in this section.

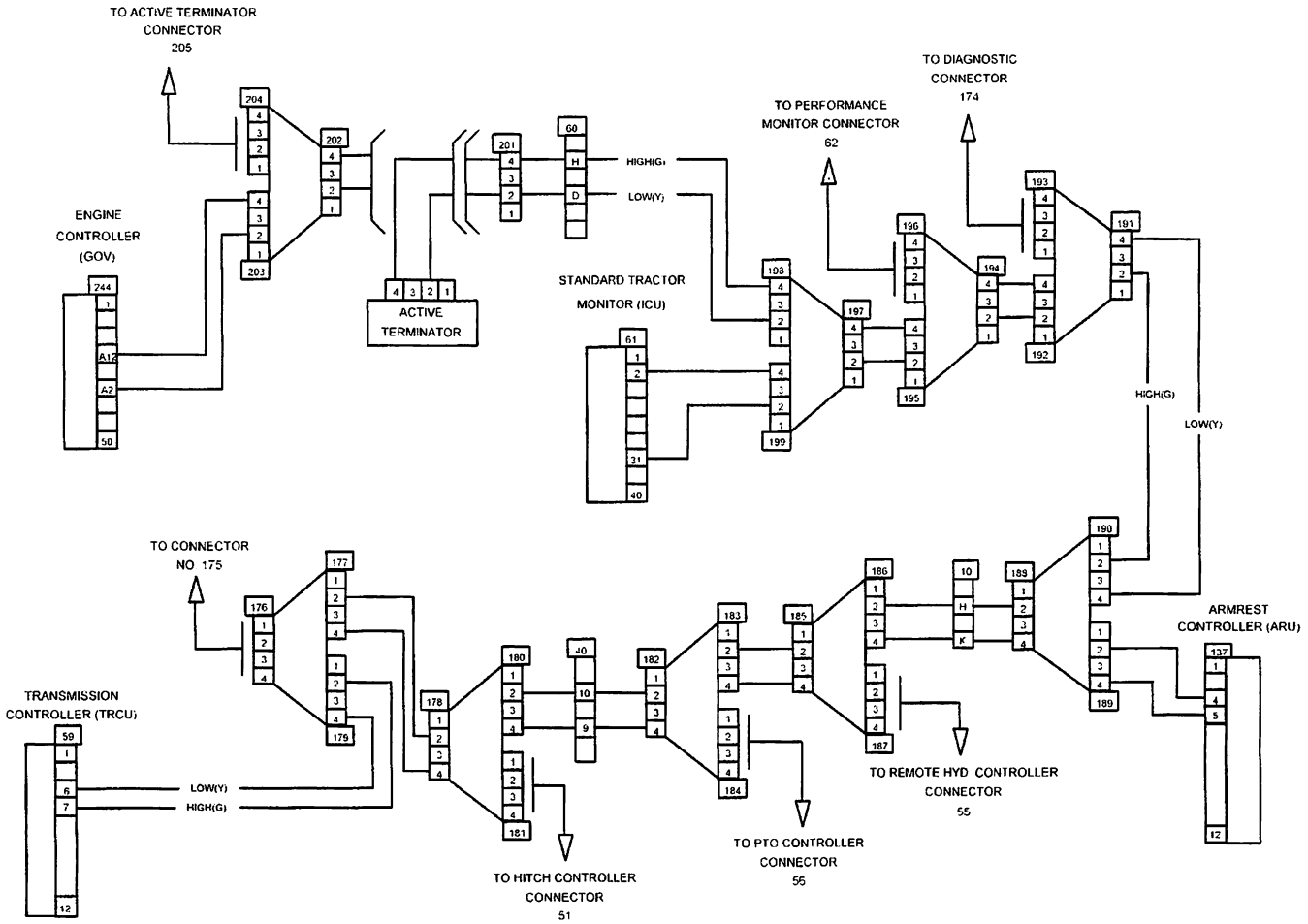
FAULT CODE TRANS 12091

Meaning:
Transmission controller si not receiving information from the engine controller.

Possible failure modes:
1. The engine controller has lost power or ground supply.
2. Damaged wiring, loose connector, or partially inserted pin.
3. Controller failure.

Wiring information:

Corrective Action:
1. If fault codes INST 12091, PTO 54160, and PERF 12091 exist along with TRANS 12091, the engine controller is lost from the system. Go to item 2.
2. Check the LED lamp and the connector for the engine controller.
   If the LED lamp is ON steadily, the controller has failed.
   If the LED lamp is flashing, the controller is working correctly.
   If the LED lamp is OFF, there is no power to the controller.
3. Check the LED lamp and the connector for the transmission controller as above.
4. If none of the above, check the continuity from TRANS C027-7 (Black) to DB wire (high) on engine controller and from TRANS C027-6 to DB wire (low) on engine controller.



RI98G039

FAULT CODE TRANS 56022

Meaning:
The transmission controller has detected low voltage (less than 9 volts).

Possible failure mode:
Low battery voltage.
Poor power supply to transmission controller.
Poor ground supply to the transmission controller.
The controller is some how being power while the engine is being cranked over (key switch in the start position).

Background:
The transmission controller is powered at pin C027-1 and grounded at pin C027-12. It measures the circuit draw input. If the current draw is lower than the controller is expecting a fault code will be recorded.
If controller pin C027-1 failed open the display will read TRANS COMM ERROR. This fault is cause by low battery voltage or a poor connection in power supply circuit.
If controller pin C027-12 failed open the display will read TRANS COMM ERROR. This fault is cause by low battery voltage or a poor connection in clean ground supply circuit.

Wiring information:
Pin C027-1 <---> C041-12 <---> C010-F <--> Fuse 35
Pin C027-12 <---> C042-5 <---> C043-11 <--->Clean ground

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

IMPORTANT: *To avoid pin and harness damage use CAS-2593-31 male test lead, when taking measurements.*

Corrective action:

STEP 1 - Check battery voltage
Measure the battery voltage It must be approximately 12.8 volts.
OK - go to step 2.
NOT OK - charge or replace battery.

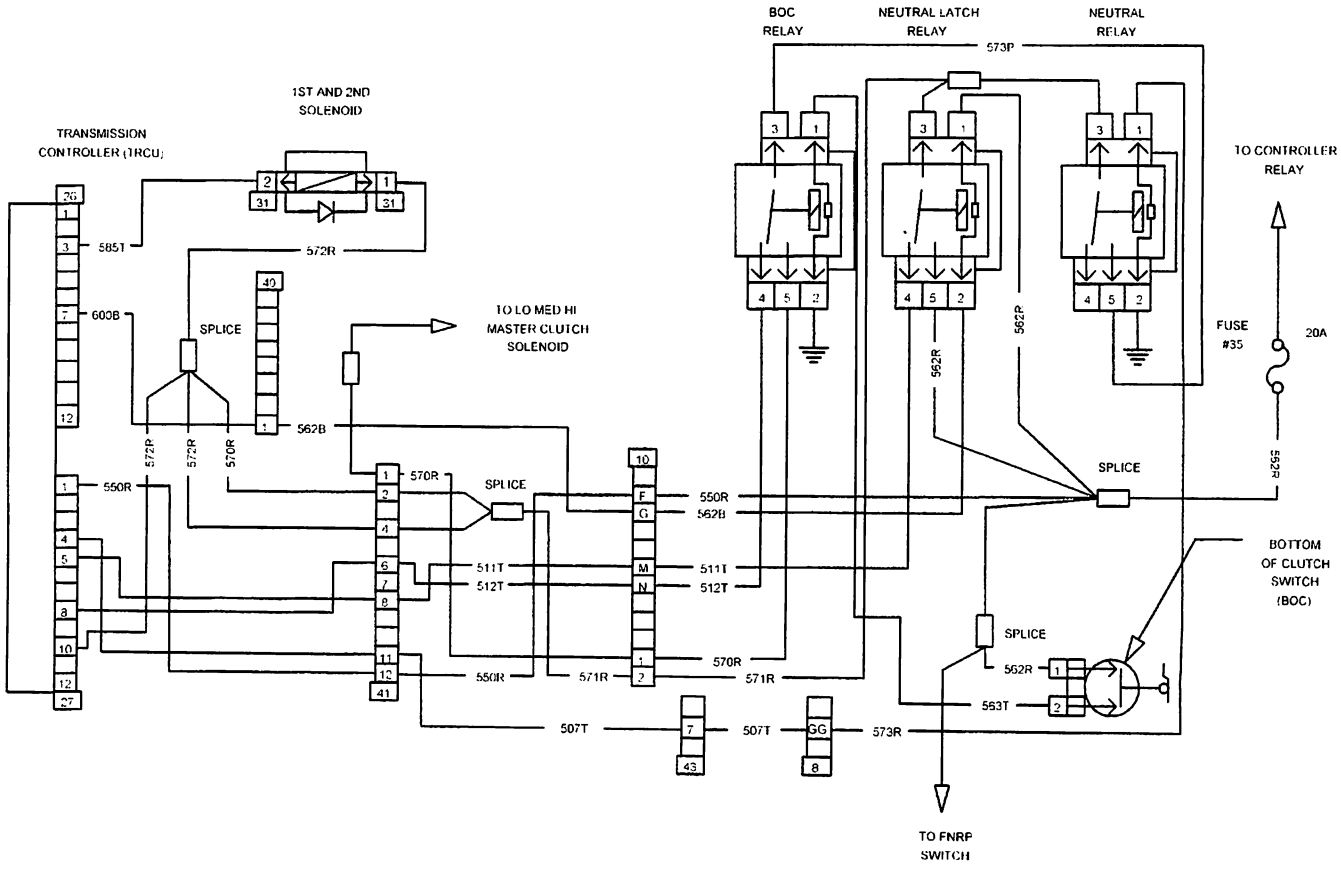
STEP 2 - Check battery connections
Clean and check all battery power and ground connection.
-- OK - go to step 3.
-- NOT OK - Clean and replace damaged connections.

STEP 3 - Remove clean and inspect connect C027
Remove the controller cover from the rear of the tractor.
Disconnect connector C027.
Inspect and clean pins 1 and 12.
Remove and install connector several times into controller to clean controller pins.
Test tractor.
-- OK - problem corrected.
-- NOT OK - go to step 4.

STEP 4 - Install new ground wire
Install a test wire from the battery ground to pin C027-12.
Test the tractor.
-- OK - problem corrected.
-- NOT OK - go to step 5

STEP 5 - Install new power supply wire
Install a test wire from a 12 volt source to the pin C027-1
Test the tractor.
-- OK - problem corrected.
-- NOT OK - go to step 6.

STEP 6 - Replace controller
Install and calibrate a new controller.
Write fault code on failed controller.
Make sure the controller wiring harness is routed against the cab and not hanging in front of the controllers.



RI98G064

STEP 2 - Solenoid coil resistance and wiring check

NOTE: *You are looking for a short to power, you may want to go to step 3 even if resistance check is OK.*

Turn key OFF.
Remove the controller cover from the rear of the tractor.
Disconnect connectors C026 (Gray) and C027 (Black) from the transmission controller.
Measure the resistance between pin C026-10 to C27-11 with CAS-2593 test leads.
-- OK - Solenoid resistance between 5.6 - 6.2 ohms at 25°C (77°F). Go to step 4.
-- NOT OK - Go to step 3.

STEP 3 - Solenoid coil resistance check

Use CAS-2577 Cab Lift Tool to lift tractor cab.
Disconnect mid range clutch solenoid at connector C037. (3rd solenoid from the front on the rear four solenoid valve group).
Measure solenoid resistance between pin 1 to pin 2 with CAS-2593-1 solenoid circuit tester.
-- OK - Go to step 4.
-- NOT OK - Solenoid resistance not between 5.6 - 6.2 ohms at 25°C (77°F). Replace solenoid.

STEP 4 - Install new wire to mid range clutch solenoid

Install a new wire from pin C026-10 to pin C037-2, (tape wire ends).
Connect mid range clutch solenoid.
Lower and attach cab to the tractor.
Start the engine.
Drive the tractor and shift through all the gears.
-- OK - Fault code TRANS 56029 no longer active.
-- NOT OK - Replace mid range clutch solenoid coil and test again. If fault code 56029 is still active go to step 5.

STEP 5 - Replace controller

Install and calibrate a new controller.
Write fault code on failed controller.
Make sure the controller wiring harness is routed against the cab and not hanging in front of the controllers.

NOTE: *If the above fault code occurs when other controls are being operated there is a harness problem with the wire between connector C026-10 and C037-2. Remove wire ends from the connector body and cap then install a new wire.*

If a new wire was installed and fault code 56029 is recorded, replace the mid range clutch solenoid.

FAULT CODE TRANS 56033

Meaning:
The wire to or the odd speed clutch solenoid valve coil has failed open or was shorted to ground while driving in a odd gear.

Corrective Action:
Go to and perform the corrective action detailed in fault code TRANS 56043.

FAULT CODE TRANS 56043

Meaning:
The wire to or the Odd clutch solenoid coil has failed open or is shorted to ground.

Possible failure mode:
1. Odd clutch solenoid failed.
2. Wiring between odd clutch solenoid and transmission controller failed open or shorted to chassis ground.
3. Wire between solenoid and transmission controller relay (R5-3) and Neutral relay (R6-3) failed open.
4. Transmission controller module failed.

Background:
The transmission controller measures the circuit draw at pin C026-1. If the current draw is lower than the controller is expecting a fault code will be recorded. If problem is temperature sensitive the solenoid coil may be starting to fail. Fault code TRANS 56033 is recorded if the problem occurs when driving in an odd gear and fault code TRANS 56043 is recorded if the problem occurs when driving in an even gear.
-- If circuit is failed open or shorted to chassis ground before turning key ON or when driving in an odd gear the tractor will stop and TRANS fault appears on the display. Fault code TRANS 56033 or TRANS 56043 will be recorded.

Solenoid information:
The POSITIVE (RED)) lead of the DVM must be attached to pin A.
The NEGATIVE (BLACK) lead of the DVM must be attached to pin B.
Approximately 5.3 - 5.6 ohms at - 40°C (-40°F)
Approximately 5.6 - 6.2 ohms at 25°C (77°F)
Approximately 7.3 - 7.7 ohms at 100°C (212°F)

Wiring information:

NOTE: *Always inspect connector ends for damaged, bent or dislocated pins when troubleshooting.*
C026-1----> C029-2 (Odd solenoid) C029-1 ----> splice ---> C027-10
splice ---> C041-2 and 4 ---> C010-2 ---> R5-3
(Transmission control relay)

IMPORTANT: *To avoid pin and harness damage use the CAS-2593-1 solenoid circuit tester and CAS-2593-31 male test lead when taking measurements.*

Corrective action:

STEP 1 - Check fault codes
Check and record the display for the fault codes. Erase all fault codes in display. Turn the key "OFF"
Turn the key "ON".
Drive and shift the tractor through all gears to try to reproduce the problem.
-- If fault code is recorded again, go to Step 2.
-- If fault code could be reproduced, the solenoid coil or the wiring harness may have an intermittent short. Go to Step 2.

STEP 2 - Solenoid coil resistance and wiring check

NOTE: *You are looking for an open or short to chassis ground. You may want to go to Step 3 even if resistance check is OK.*
Turn key "OFF".
Remove controller cover from the rear of the tractor.
Disconnect connector C026 (Gray) and C027 (Black) from the transmission controller.
Measure the resistance between pin C026-1 to C027-10 with CAS-4 test leads.
-- OK - Solenoid resistance between 5.6 - 6.2 ohms at 25 °C (77 °F). Go to Step 3.
-- NOT OK - Use Cas-2577 Cab Lift Tool to lift the tractor cab. Go to Step 7.

STEP 3 - Install test harness and solenoid. (Picture required)

Remove and tape pin 4 from connector C026 (Gray).
Install solenoid circuit tester CAS-2593-1 in to cavity C026-4.
Connect C026 to transmission controller.
Install transmission test harness CAS-2593-2 at connector C027 (Black).
Connect the solenoid circuit tester CAS-2593-1 to the long yellow lead of the test harness.
Go to Step 4.

STEP 4 - Test the controller

Turn key "ON" and clear all transmission fault codes.
Turn key "OFF".
Turn key "ON" and move the shift lever out of park.
-- OK - Fault code TRANS 56046 no longer recorded, problem with harness or solenoid. Go to Step 6.
-- NOT OK - Fault code TRANS 56046 was recorded, failed controller. Go to Step 5.

STEP 5 - Replace the controller

Write fault code on the failed controller.
Replace and calibrate controller. See calibration procedure in this section.

STEP 6 - Harness or solenoid check

Disconnect 3rd/4th speed clutch solenoid at connector C032. 2nd solenoid from the top behind left-hand fuel tank (front).
Connect the test harness CAS-2593-1 to the 3rd/4th speed clutch solenoid.
Turn the key "ON" and clear all transmission fault codes.
Turn key "OFF".
Turn key "ON" and move the shift lever out of park.
-- OK - Fault code TRANS 56046 no longer recorded, problem with harness. Go to Step 8.
-- NOT OK - Fault code TRANS 56046 was recorded, failed solenoid. Go to Step 7.

STEP 7 - Solenoid coil resistance check

Disconnect 3rd/4th speed clutch solenoid at connector C032. 2nd solenoid from the top behind left-hand fuel tank (front).
Measure solenoid resistance between pin 1 to pin 2 with CAS-2593-31 and 32 test leads.
-- OK - Solenoid resistance between 5.8 - 6.2 ohms at 25°C (77°F). Go to Step 8.
-- NOT OK - Solenoid resistance not between 5.8 - 6.2 ohms at 25 C (77°F). Replace solenoid.

STEP 8 - Open circuit check - power supply wire to solenoid

Measure the resistance from harness pin C027-10 to pin C032-1.
-- OK - If less than 10 ohms, go to step 9.
-- NOT OK - problem is harness, install new power feed wire to C032-1. Splice in to connector C027-10.

STEP 9 - Open circuit check - switched ground supply wire to solenoid

Measure the resistance from harness pin C026-4 to pin C032-2.
-- OK - If less than 10 ohms, go to step 10.
-- NOT OK - Look for harness pinch points. Install a new wire from pin C026-4 to pin C032-2, (tape shorted wire ends).

STEP 10 - Short to chassis ground check - switched ground supply to solenoid

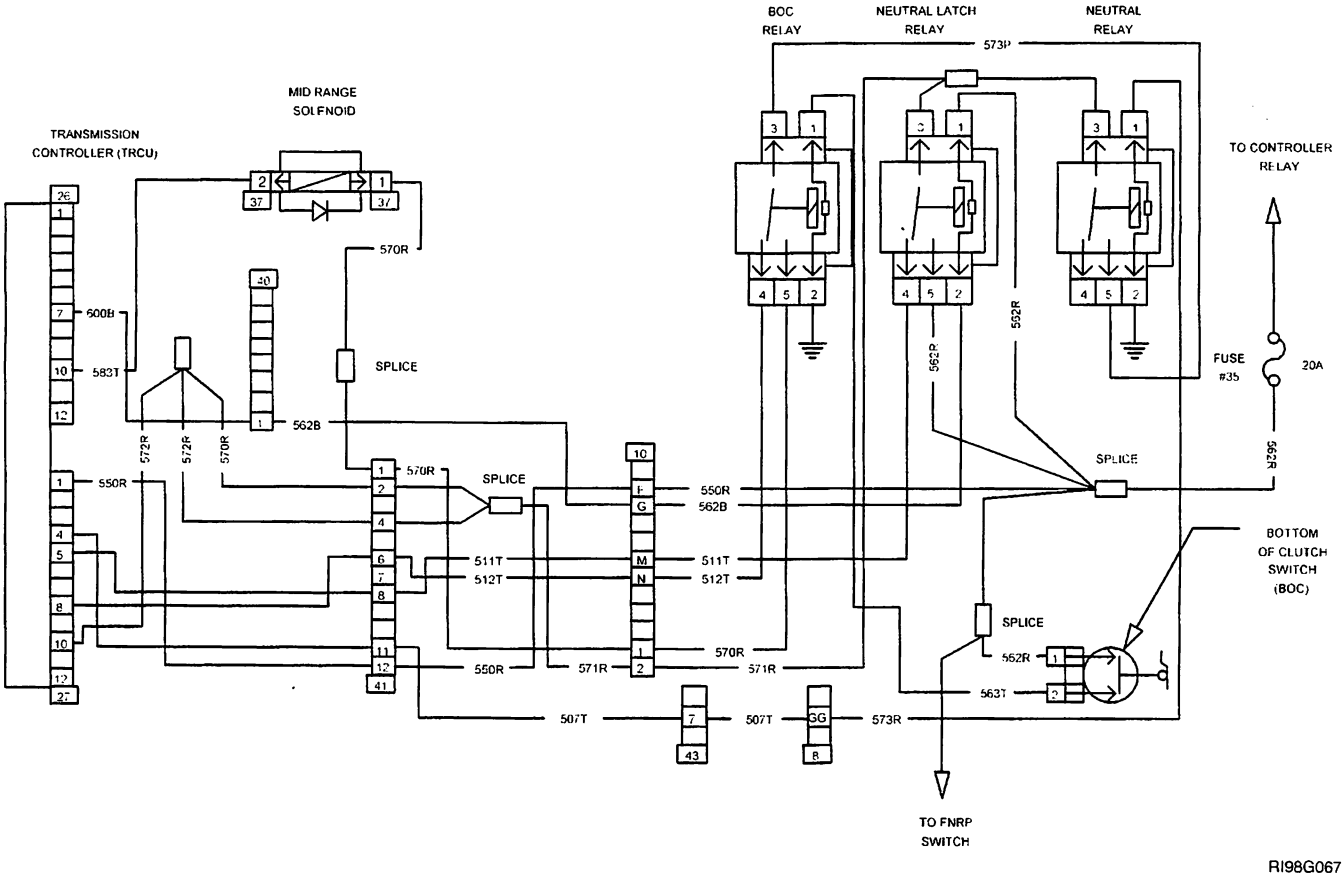
Measure the resistance from harness pin C026-4 to the chassis ground.
-- OK - if more than 100k ohms. The problem may have been a push back or dirty connector pin. Connect the harness and test again.
-- NOT OK - Look for harness pinch points. Go to Step 11.

STEP 11 - Install new wire to mid range clutch solenoid

Install a new wire from pin C026-10 to pin C037-2, (tape wire ends).
Connect mid range clutch solenoid.
Turn the key "ON" and move the shift lever out of park.
-- OK - Fault code TRANS 56049 no longer is recorded.
-- NOT OK - Replace mid range clutch solenoid coil and test again. Go back to Step 1 if fault code is recorded again.

NOTE: *If the above fault code occurs when other controls are being operated there is a harness problem with the wire between connector C026-10 and C037-2. Remove wire ends from the connector body and cap then install a new wire.*

If a new wire was installed and fault code 56049 is recorded, replace the mid range clutch solenoid.



RI98G067

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FAULT CODE TRANS 56064

Meaning:
The transmission controller has detected that the neutral switch and either the Forward or Reverse switch is ON at the same time.

Possible failure mode:
1. Loose or poor connection in neutral circuit.
2. Neutral switch in the transmission control pod is failed open.
3. Forward switch in the transmission control pod is failed closed.
4. Reverse switch in the transmission control pod is failed closed.
5. Circuit to transmission controller C027-4 is failed open.
6. Circuit to transmission controller C027-4 shorted to chassis ground and causing the neutral switch to fail (burn open).
7. Circuit between the transmission controller C027-2 and the Forward switch (C219-6) is shorted to power.
8. Circuit between the transmission controller C027-3 and the Reverse switch (C219-1) is shorted to power.

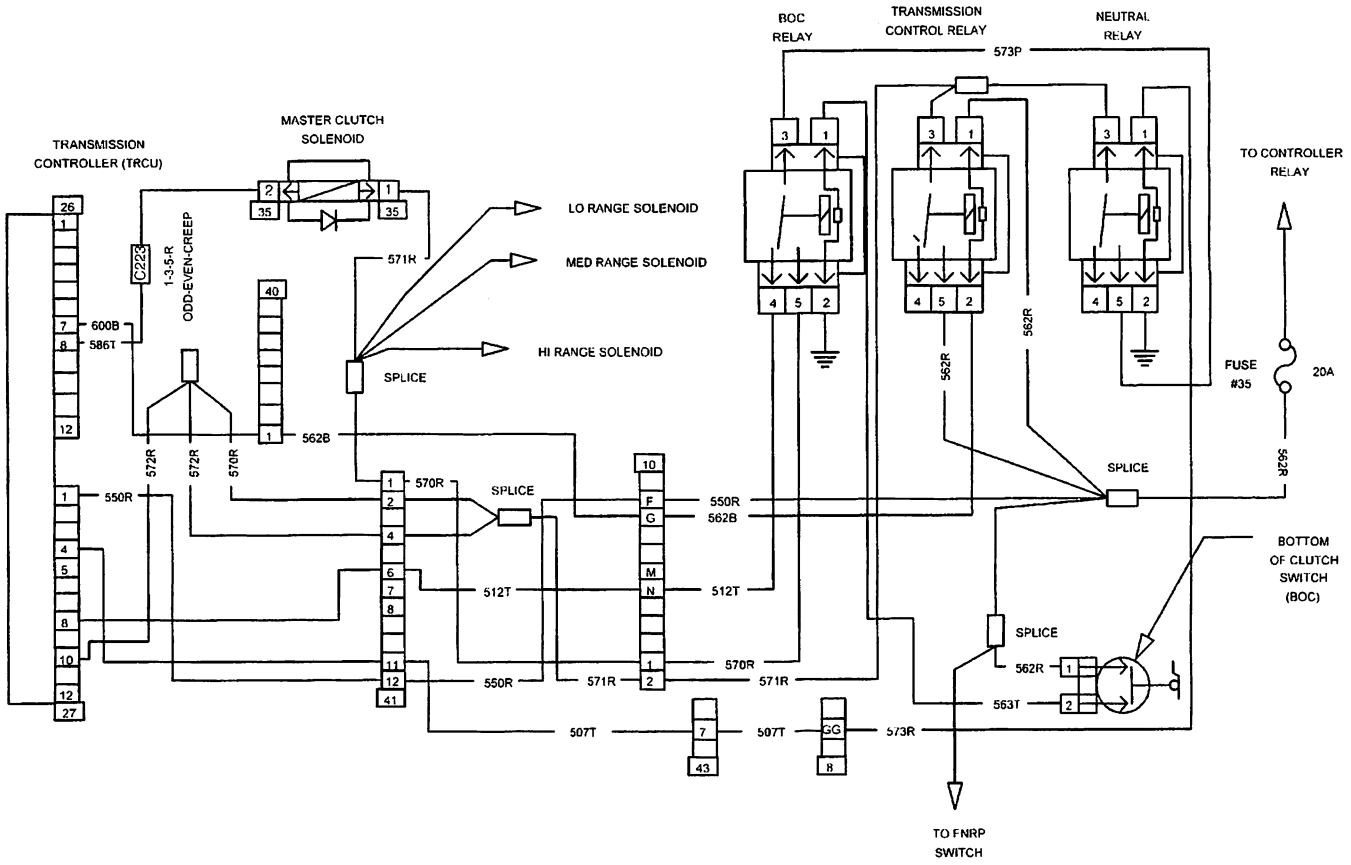
Background:
The transmission controller monitors the input from the transmission control pod at pins C027-2, C027-3 and C027-4. It then uses the information to select forward or reverse. The transmission controller also sends the information to the display for the operator. Problems with the shift lever (FNRP) can be detected by viewing the display while shifting the FNRP. If incorrect inputs are received by the transmission controller, the tractor will stop and Fault code TRANS 56064 will be actuated.

NOTE: *A correctly functioning transmission control system can be determined by watching the display.*
KEY ON.
-- Park - The neutral icon turns on and a letter "P" must appear on the display.
-- Forward - The forward icon must turn on and the neutral icon must be flashing.
-- Neutral - The neutral icon must turn on.
-- Reverse - The reverse icon must turn on and the neutral icon must be flashing.

Forward switch failed closed or circuit shorted to power - pin C027-2 -
-- Shorted to power when turning key "ON". In park "TRANS FAULT" appears on the display. Fault code TRANS 56064 is recorded. (Forward icon lit on display when in park and neutral).
-- Shorted to power when in forward gear --Forward gears work correctly-- when shifting out of forward TRANS FAULT appears on the display. Fault code TRANS 56064 (reverse) and 56065 (park or neutral) was recorded and the tractor stopped moving. (Forward icon lit on display when in park and neutral).

Reverse switch failed close or circuit shorted to power - pin C027-3 -
-- Shorted to power when turning key "ON"-- In park "TRANS FAULT" appears on the display--Fault code TRANS 56064 is recorded (Reverse icon lit on display when in park and neutral).
-- Shorted to power when reverse gear--Reverse gears worked correctly--when shifting out of reverse. TRANS FAULT appears on the display. Fault code TRANS 56064 (park or neutral) and TRANS 56065 (forward) was recorded and the tractor stopped moving (reverse icon lit on display when in park and neutral).

Neutral switch fails open or circuit between neutral relay and controller pin C027-4 failed open -
-- If failed open when turning key "ON" -- TRANS FAULT appears on the display when shift lever is moved out of park and fault code TRANS 56064 is recorded. Forward or reverse can be selected but the neutral icon on the display will remain on steady. Fault code TRANS 56073 indicates the failure is between the neutral relay and the controller.
-- If the circuit fails opened when driving in forward or reverse -- tractor stops -- Fault codes TRANS 56064 and 56073 is recorded.



10003-172

Background:
The transmission controller checks at pin (C027-11) that there is no voltage when the key is turned ON or when the tractor is started. The controller (Pin C026-7) will then provide a ground to the transmission control relay pin 2, if no voltage is detected on pin C027-11. If the circuit is shorted or relay is failed closed the transmission controller will record fault code TRANS 56074.

NOTE: *TO FIND A PROBLEM START TRACTOR AND SHIFT (DRIVE) TRACTOR WITH OUT DEPRESSING INCHING PEDAL. If a clutch solenoid circuit is shorted to power the fault code is activated until the effected clutch circuit is selected or the inching pedal is fully depressed. Fault code TRANS 56073 is recorded when the inching pedal is fully depressed and TRANS 56074 is recorded when the inching pedal is released.*

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

IMPORTANT: *To avoid pin and harness damage use CAS-2593-31 and 32 test leads when taking the measurement:*

Corrective action:

STEP 1 - Check fault codes
Record all TRANS fault codes
Clear all fault codes.
Do not depress inching pedal.
Drive tractor and shift through all gears.
Stop and check fault codes, if TRANS FAULT appears on display.
-- NOT OK - TRANS FAULT 56073 and 56074 plus others, go to the troubleshoot new fault code.
-- NOT OK - TRANS FAULT appeared when tractor is started and only fault code TRANS 56073 is active. Go to Step 2.
-- NOT OK - TRANS FAULT appeared when tractor is started and only fault code TRANS 56073 and 56074 are active. Go to Step 2.

STEP 2 - Check bottom of clutch relay
Turn the tractor key to the ON position.
Unplug the BOC relay.
Check voltage at the cavity where pin 5 of BOC relay goes in. There should be no voltage.
If there is 12 VDC, the BOC valve group wire harness shorted to system power.
Check the wiring harness from the BOC relay to the connector C027 and connector C026.

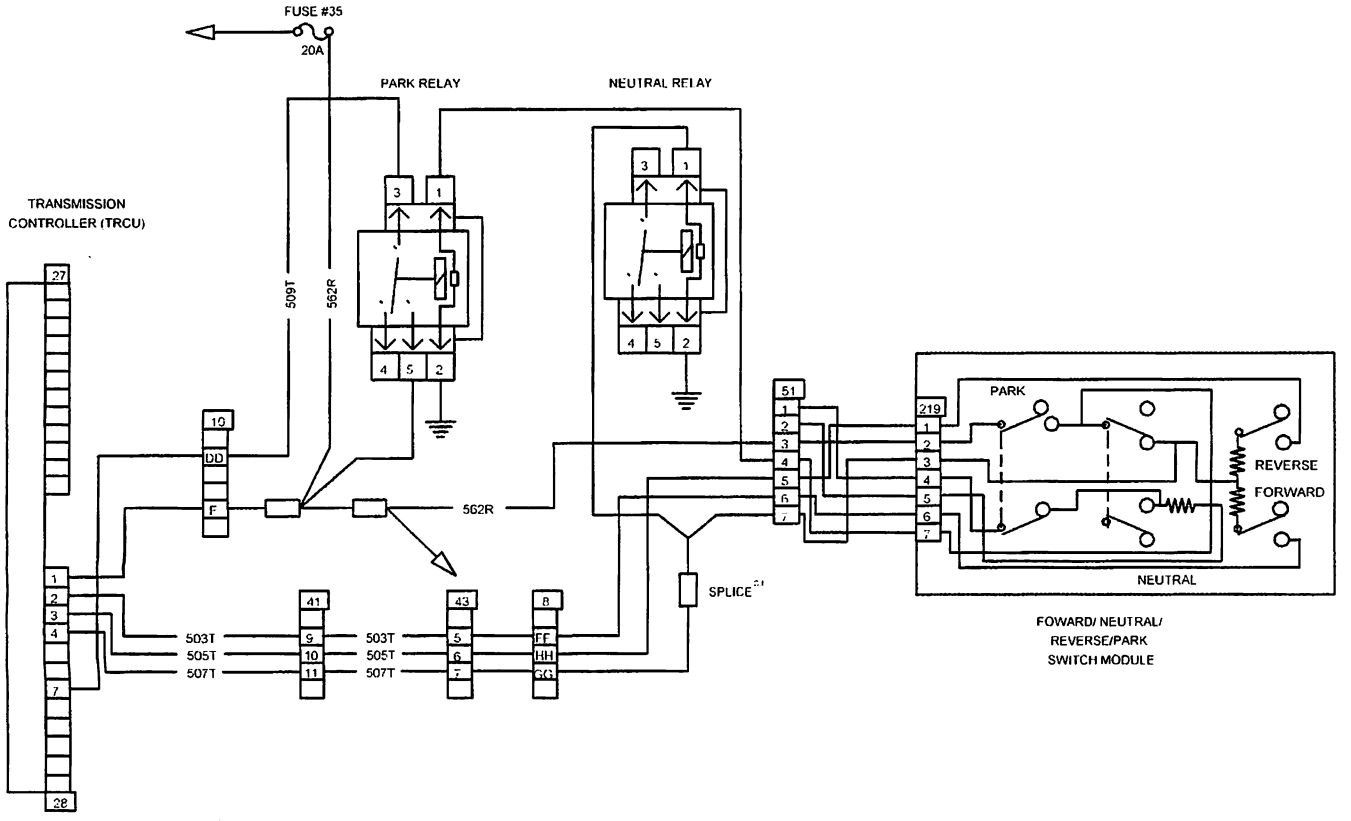
NOTE: *Pay attention to wire damage, bent pin, and loose terminal to the relay seat. Pay extreme attention to the shortage between pin 1 and F of connector C010. Pay extreme attention to the shortage between pin 1 and 12 of connector C041.*

If there is no 12 VDC, go to Step 3.

STEP 3 - Put transmission control lever (FNRP) pod in park
Turn tractor key to "ON".
Unplug the BOC relay.
Check voltage at the cavity where pin 3 of BOC relay goes in. There should be no voltage.
If there is 12 VDC, neutral relay or its wiring failed. Go to Step 4.
Check voltage at the cavity where pin 1 of BOC relay goes in. There should be no voltage when the inching pedal is fully depressed and there should be 12 VDC when the inching pedal is released.
If it is not as specified above, there is a problem with the BOC switch or its wires. Go to Step 5.
If both above checks are OK, the BOC relay is likely failed. Go to Step 6.

STEP 4 - Check the neutral relay and its function
Check the continuity between pin 3 and pin 5 of the neutral relay when it is unplugged.
When the neutral relay is not powered, it should be normal open between pin 3 and pin 5.
If there is continuity between pin 3 and pin 5, the relay has failed. Replace the relay.
Replace the neutral relay with a new relay. Clear fault code TRANS 56073 and start the tractor again.
If fault code TRANS 56073 is recorded again, go to Step 5.
If no fault code, problem was fixed.

10003-182



RI98G074

FAULT CODE TRANS 56106

Meaning:
Creep speed clutch solenoid valve coil or circuit shorted to power.

Possible failure mode:
1. Creep clutch solenoid coil has failed. (3rd solenoid from the right on the front solenoid valve bank).
2. The wire between the creep clutch solenoid and the transmission controller is shorted to power.
3. Transmission controller failed.

Background:
The transmission controller measures the circuit draw at pin C026-12. If the current draw is higher than the controller is expecting a fault code will be recorded. If problem is temperature sensitive, the solenoid coil may be starting to fail.
-- Shorted to power and then key is turned ON, TRANS FAULT will appear on the display. Fault code TRANS 56074 is recorded.
-- Shorted to power when driving in creeper gear, tractor stops when shifted in to forward or reverse creeper gears and TRANS FAULT will appear on the display and fault code TRANS 56106, 56074 and 56073 are recorded if clutch is up. Tractor can be driven in non creep gears.
-- Shorted to power when driving in non creep gear. Tractor stops when shifted in to forward or reverse gears. TRANS FAULT will appear on the display when shifted to an forward or reverse gear. Fault code TRANS 56106, 56074 and 56073 are recorded. Tractor can be driven in non creep gears.

Solenoid information:
Approximately 5.3 - 5.6 ohms at - 40°C (-40°F)
Approximately 5.8 - 6.2 ohms at 25°C (77°F)
Approximately 7.3 - 7.7 ohm at 100°C (212°F)

Wiring information:

NOTE: *Always inspect connector ends for damaged, bent or dislocated pins when troubleshooting.*
C026-12---->C039-2 (Creep solenoid) C039-1 ----> splice ---> C027-10
splice --->C041-2 and 4 --->C010-2 --->R5-3
(Transmission control relay)

IMPORTANT: *To avoid pin and harness damage use the CAS-2593-1 solenoid circuit tester and CAS-2593-31 male test lead when taking measurements.*

Corrective action:

STEP 1 - Check fault codes

This fault code occurs when the circuit is shorted to power when driving and or shifting. If the circuit is shorted to power when the key is turned ON only fault code TRANS 56074 is recorded. If fault code TRANS 56106 was recorded and now only TRANS 56074 is recorded, this circuit may be shorted to power.
Check and record the display for the fault codes. Erase all fault codes in display. Turn the key OFF. Start the tractor.
Drive and shift the tractor through all gears to try to reproduce problem.
-- If fault code is recorded go to Step 2.
-- If fault code could not be reproduced the solenoid coil or the wiring harness may have an intermittent short, go to Step 2.
-- If fault code TRANS 56074 is recorded, there may be a short in the circuit when the key is turned ON. Go to Step 2.

FAULT CODE TRANS 56118

Meaning:
The transmission controller has detected a internal short in the controller in the High clutch circuit.

Background:
The transmission controller measures the circuit draw at pin C026-11. If the current draw is higher than the controller is expecting an fault code will be recorded.

Corrective action:

STEP 1 - Replace controller

Turn key OFF.
Install and calibrate a new controller.
Write the fault code on the failed controller.

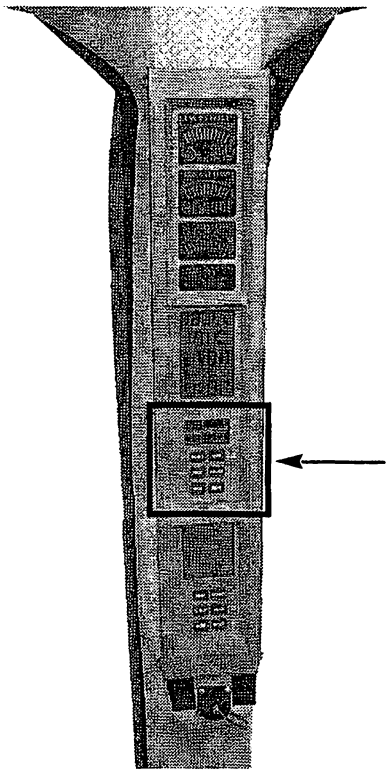
ARMREST CONTROLLER CALIBRATION

General Information

NOTE: *The standard instrumentation controller must be calibrated before the armrest controller is calibrated.*

The armrest controller is located in the right hand armrest of the operators seat. The controller monitors the switches and potentiometers which are located in the armrest and then broadcasts their status over the CDB (Case Data Bus). The other controllers on the tractor obtain this information from the CDB.

Armrest controller calibration is performed through the programmable display on the standard instrumentation.



RD97H050

There are a seven possible main menus that can be cycled through. Only those menus that the standard instrumentation controller is configured for will appear on the display. The menus are:

1. HITCH - This menu is for the calibration of the hitch position command potentiometer and to choose the draft option.
2. THROTTLE - (Electronically controlled engines only) This menu calibrates the hand throttle lever potentiometer voltage for high and low idle.
3. AUX - (Remote hydraulic valve) This menu is used to tell the controller how many remote hydraulic valves are present on the tractor, and to record the voltage for the extend and retract position for each of the valve control levers.
4. MFD - This menu is used to let the controller know of the presence of MFD on the tractor.
5. TRANS - This menu is used to tell the controller if there is a creeper option.
6. VIEW - This menu is used to see what version of software is currently being used.
7. EXIT - Used to exit armrest controller calibration.

The INCR and DECR keys are used to toggle between these menus.

ARMREST CONTROLLER FAULT CODES

FAULT CODE ARM 19

Meaning:
Throttle potentiometer has failed. (Electronically controlled engines)

Possible failure modes:
1. Potentiometer failed shorted or open.
2. External wire damage.
3. Loose connector, bent or partially inserted pin.
4. Controller failure.

Remote valve potentiometer information:
Total resistance - 1.87 to 3.12 k ohms
Rotation - 41 degrees CCW
Low Idle - 5 Degrees of rotation approximately 500 ohms
High Idle - 35.5 Degrees approximately 2000 ohms
Pins A, B, F, and H - Not used
Pin C - High side supply for potentiometer
Pin D - Low side supply for potentiometer
Pin E - Sense line for potentiometer
Pin G - Throttle switch number 2
Pin J - Throttle switch number 1
Pin K - Switch power

Connector to the ARM controller: J208
Pin 1 - High side supply for potentiometer
Pin 2 - Sense line for potentiometer
Pin 3 - Low side supply for potentiometer
Pin 4 - Throttle switch number 1
Pin 5 - Switch power
Pin 6 - Throttle switch number 2

Corrective action:

STEP 1 - Test the potentiometer
At connector J208, measure the continuity between pin 1 and pin 3. The resistance must be as specified above. Measure between pin 2 and 1 when moving the throttle from hi to low idle. The resistance should change continuously from below 500 ohms to approximately 2.5 k ohms.

STEP 2 - Check the wiring
Check the continuity between pins 1 and C, pins 2 and E and pin 3 and D. Check for wire damage, loose connector and bent pins.

STEP 3 - Power supply check
Turn the key to the ON position. Check the switch power supply from the armrest controller at pin 1 or pin C. It must be approximately 8 volts. Check the continuity between pin D or 3 and the clean ground C137.

STEP 4 - Replace controller
Connect the potentiometer to the controller and check the function again. If the throttle still does not function well and the fault code is recorded again, replace and calibrate the armrest controller.

FAULT CODE ARM 69

Meaning:
Hitch position potentiometer has failed.

Possible failure modes:
1. Potentiometer failed shorted or open.
2. External wire damage.
3. Loose connector, bent or partially inserted pin.
4. Controller failure.

Hitch command potentiometer information:
Rotation - 120 degrees increasing with cw rotation.
Potentiometer size -1K ohms ± 10%
Terminal 1 = High side for potentiometer
Terminal 2 = Sensor line for potentiometer
Terminal 3 = Low side for potentiometer

Corrective action:

STEP 1 - Open the armrest controller housing and disconnect connector J206 for Hitch position control

STEP 2 - Test the parameters of the Hitch position control lever potentiometer and its wiring

NOTE: *Pay attention to wiring damage, loose connector, or bent pin.*

A. Measure the continuity between pin 1 and pin 3. The resistance should be about 1 k ohms.
B. Measure between pin 2 and pin 3 when moving the control lever up and down. The resistance should change continuously and smoothly. If there is any problem with the potentiometer function, replace the hitch position control.

STEP 3 - Check the power supply

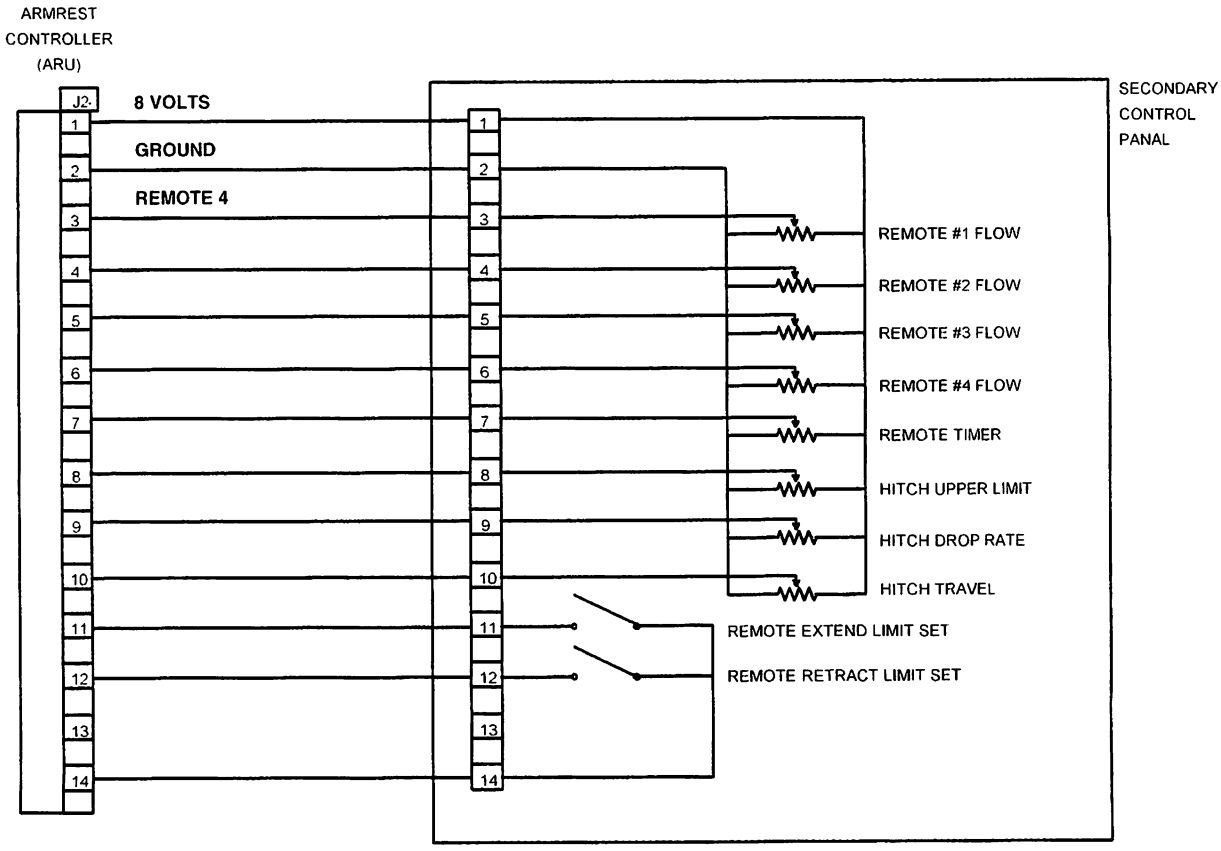
A. Turn the tractor key to the ACC position.
B. Test the switch power supply from the armrest controller at pin 1. It should be approximately 8 volts.

If not problem is found in the above test, go to the next Step.

STEP 4 - Connect the potentiometer from the hitch load control or 5th remote flow control (J205 or J207) to the J206 in the controller.

Turn the control knob back and forth and monitor the hitch position control in the monitor screen. If the potentiometer functions OK now, replace the hitch position control. If the lever still does not function well and the fault code can be recorded again, replace the armrest controller.

NOTE: *You can directly use the test procedure in Step 4 to troubleshoot. Connect the potentiometer from the hitch load control or 5th remote flow control (J205 or J207) to the J206 in the controller. Turn the control know back and forth and monitor the hitch position control in the monitor screen. If the pot functions OK now, replace the hitch position control. If the lever still does not function well and the fault code can be recorded again, replace the armrest controller, or connect the potentiometer from the hitch position control lever (J206) to the J205 or J207 in the controller. Move the hitch position lever up and down and monitor the hitch load control or 5th remote flow control in the monitor screen. If the lever still does not function well and the fault code can be recorded again, replace the hitch position control. If the lever functions OK now, replace the armrest controller.*



RI98G103

FAULT CODE ARM 1019

Meaning:
Throttle handle transmission gear selection switch failure.

Possible failure modes:
1. Switch Failed (shorted or open).
2. External wiring damage (shorted or open).
3. Bad connection (loose connector or bent pin).
4. Armrest controller has failed.

Switch information:
J211-1 = Switch power (+12v)
J211-2 = Switch input (UP)
J211-3 = Switch input (DOWN)

Corrective action:

STEP 1 - Check wiring
Check for wiring damage, loose connector or bent pin.

STEP 2 - Check switch function
A. When the switch is in SHIFT UP position, there should be continuity between J211-1 and J211-2. No continuity between J211-1 and J211-3.

B. When the switch is in SHIFT DOWN position, there should be continuity between J211-1 and J211-3. No continuity between J211-1 and J211-2.

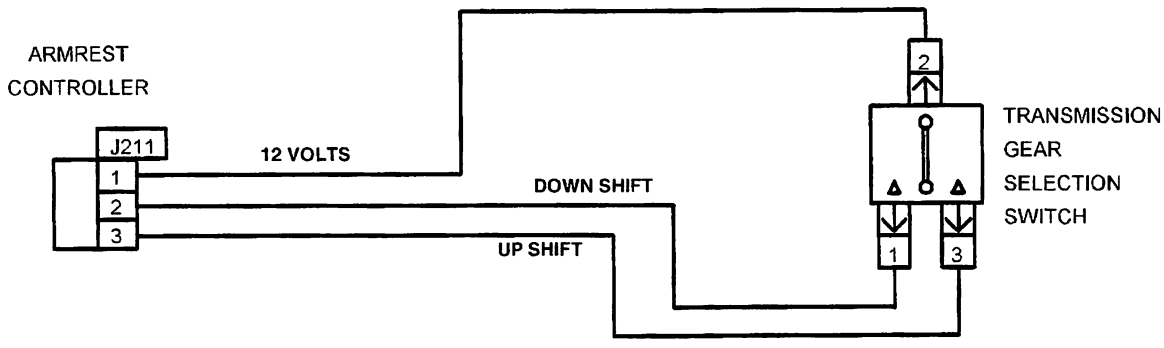
C. When the switch is in OFF position, there should be no continuity between J211-1, J211-2 and J211-3.

D. If the switch does not function as specified above, replace the switch.

STEP 3 - Check controller function
A. Measure the voltage output from the controller at pin J211-1. It should be +12v.

B. Short wire pin J211-2 to J211-1 and then J211-3 to J211-1 to simulate the SHIFT UP and SHIFT DOWN function. If the controller does not function properly, replace the armrest controller.

NOTE: *Do not cold solder wires together.*



RI98G105

FAULT CODE ARM 1109

Meaning:
Hand Throttle idle validation switch failure.

Possible failure modes:
1. Switch Failed (shorted or open).
2. External wiring damage (shorted or open).
3. Bad connection (loose connector or bent pin).
4. Armrest controller has failed.

Throttle switch information:
Pin G = Throttle switch number 2
Pin J = Throttle switch number 1
Pin K = Switch power

Connector to the armrest controller:
J208-4 = Throttle switch number 1
J208-5 = Switch power
J208-6 = Throttle switch number 2

Corrective action:

STEP 1 - Check wiring
Check for wiring damage, loose connector or bent pin.

STEP 2 - Check switch function
A. Push Hand Throttle to LOW IDLE position, there should be continuity between J208-5 and J208-6. No continuity between J208-5 and J208-4.

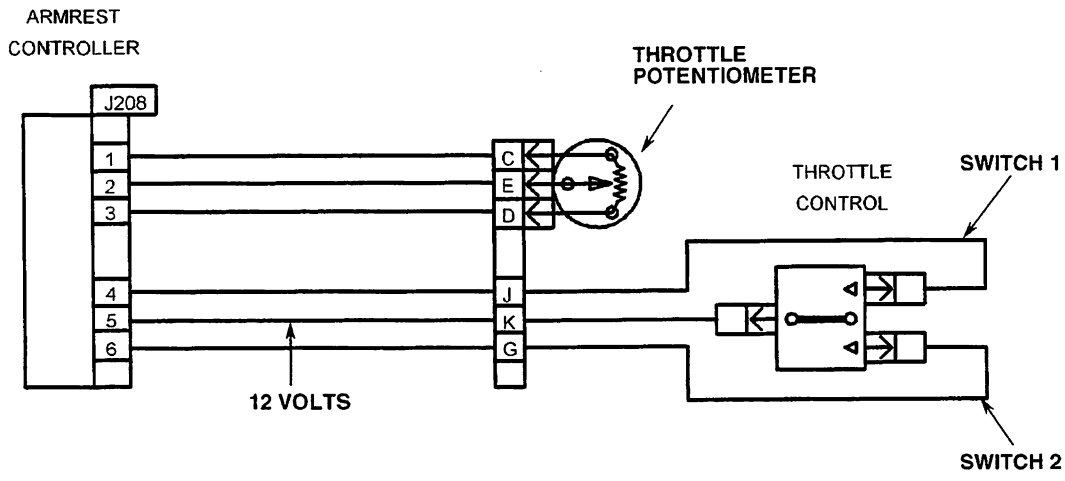
B. Push Hand Throttle to HIGH IDLE position, there should be continuity between J208-5 and J208-4. No continuity between J208-5 and J208-6.

C. When the switch is in OFF position, there should be no continuity between J208-4, J208-5 and J208-6.

D. If the switch does not function as specified, replace the switch.

STEP 3 - Check controller function
A. Measure the voltage output from the controller at pin J208-5. It should be +12v.

B. Short wire J208-5 to J208-6 and then J208-5 to J208-4 to simulate the LOW IDLE and HIGH IDLE function. If the controller does not function properly, replace and calibrate the armrest controller.



RI98G096

FAULT CODE ARM 12013

Meaning:
Communication lost between the Case Data Bus and armrest controller.

Possible failure mode:
1. Case Data Bus failure.
2. Bad connection between the Case Data Bus and the armrest controller.

Corrective action:
Make sure the armrest controller functions OK. Check the Case Data Bus connections.

STEP 1 - Check the function of the armrest controller

Make sure connector C137 is plugged into the armrest controller.
Check the LED lamp on the armrest controller.
LED lamp on - failed controller, replace the controller.
LED lamp flashing - the controller is OK.
LED off - no power to the controller, check the power supply and its fuse.

STEP 2 - Check for Case Data Bus connections problems

When there is a bad connection along the Case Data Bus wiring, the fault code will be accompanied by multiple fault codes such as TRANS 12011 and 12031, PTO 54120 and 54140, INST 12011 and 12031, AUX 12011, PERF 12031.

NOTE: *Pay good attention to loose connectors, bent pins in the connector, and wire damage.*

FAULT CODE AUX 1060

Meaning:
Disable Timer 4 Switch.
Timer switch 4 for the 1st remote valve flow has failed or is not available to the AUX controller.

NOTE: *Currently, the armrest controller has no mechanism to detect Disable Timer Switch failure. The appearance of such codes on the AUX indicates a mismatch between AUX and INST configurations. System recalibration is needed.*

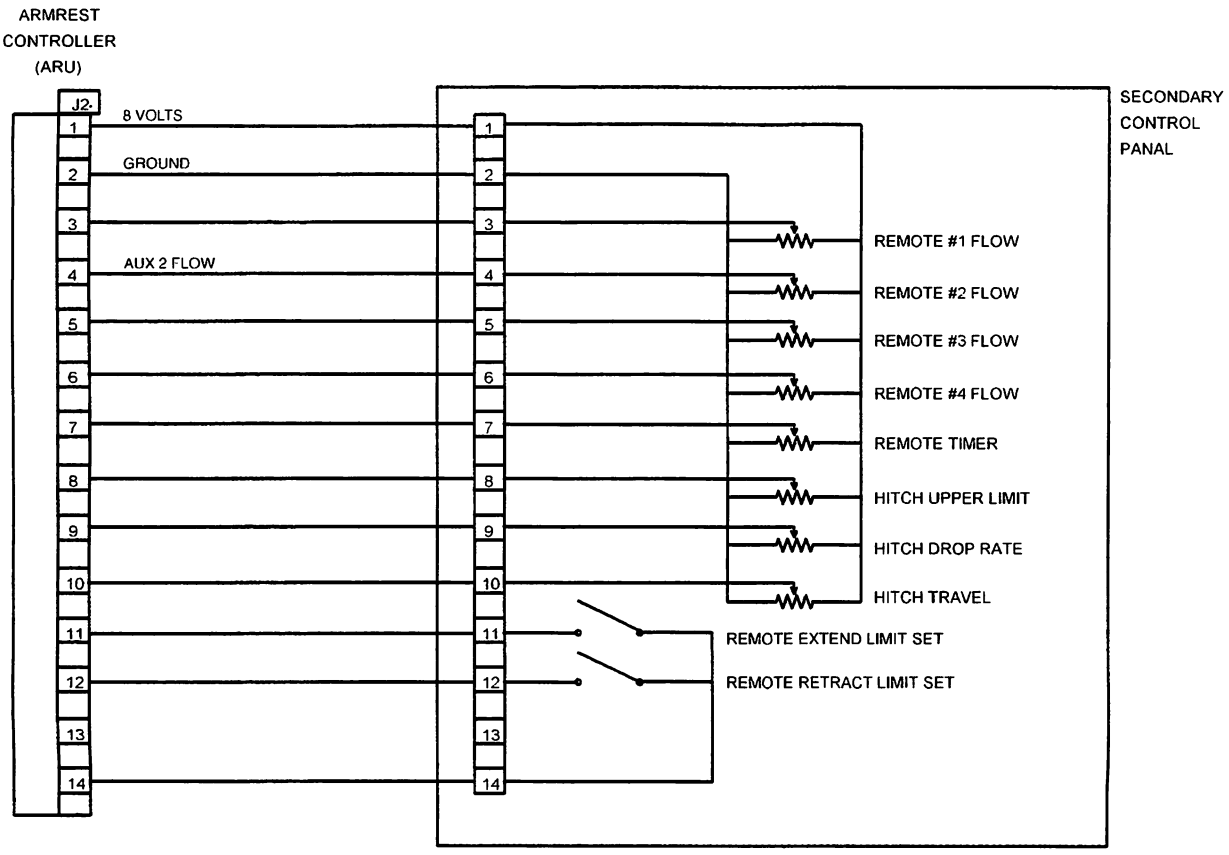
Corrective action:
1. Recalibrate the AUX, instrument and armrest controllers.
2. Check for abnormal controller function. Make sure all connectors on above controllers are firmly connected.

FAULT CODE AUX 11070

Meaning:
AUX 2 flow limit potentiometer the 2nd remote valve flow control, has failed or is not available to the AUX controller.

Possible failure modes:
1. AUX 2 flow limit potentiometer has failed in the armrest.

Corrective action:
1. Check for fault code ARM 99 at the armrest controller. If ARM 99 exists, follow its corresponding corrective action.
2. Check for fault code ARM 99 at the armrest controller. If ARM 99 exists, test the function of the 2nd variable flow control. If the service tool is connected to the tractor Case Data Bus, do the following:
   Go to the parameter screen by clicking the PARAMETER Icon.
   Click the CHANGE PARAMETER SELECTIONS Icon.
   Click the AUX FLOW CONTROL POT 2 and then ADD. You will be able to monitor the 2nd variable flow control status on the screen.
   Turn the flow control up and down, and watch the status change.
   If the status display matches the potentiometer changes, the flow control is working OK.
   If the service tool is not connected to the tractor Case Data Bus or the status display does not match the potentiometer changes, inspect the potentiometer.
   The flow control potentiometer is an integrated part of the second panel of the armrest console. If it is suspected that the potentiometer failed, replace the panel.
3. If ARM 99 does not exist or the 2nd variable flow control is working OK, check the function of the armrest controller.



RI98G128

10005-30

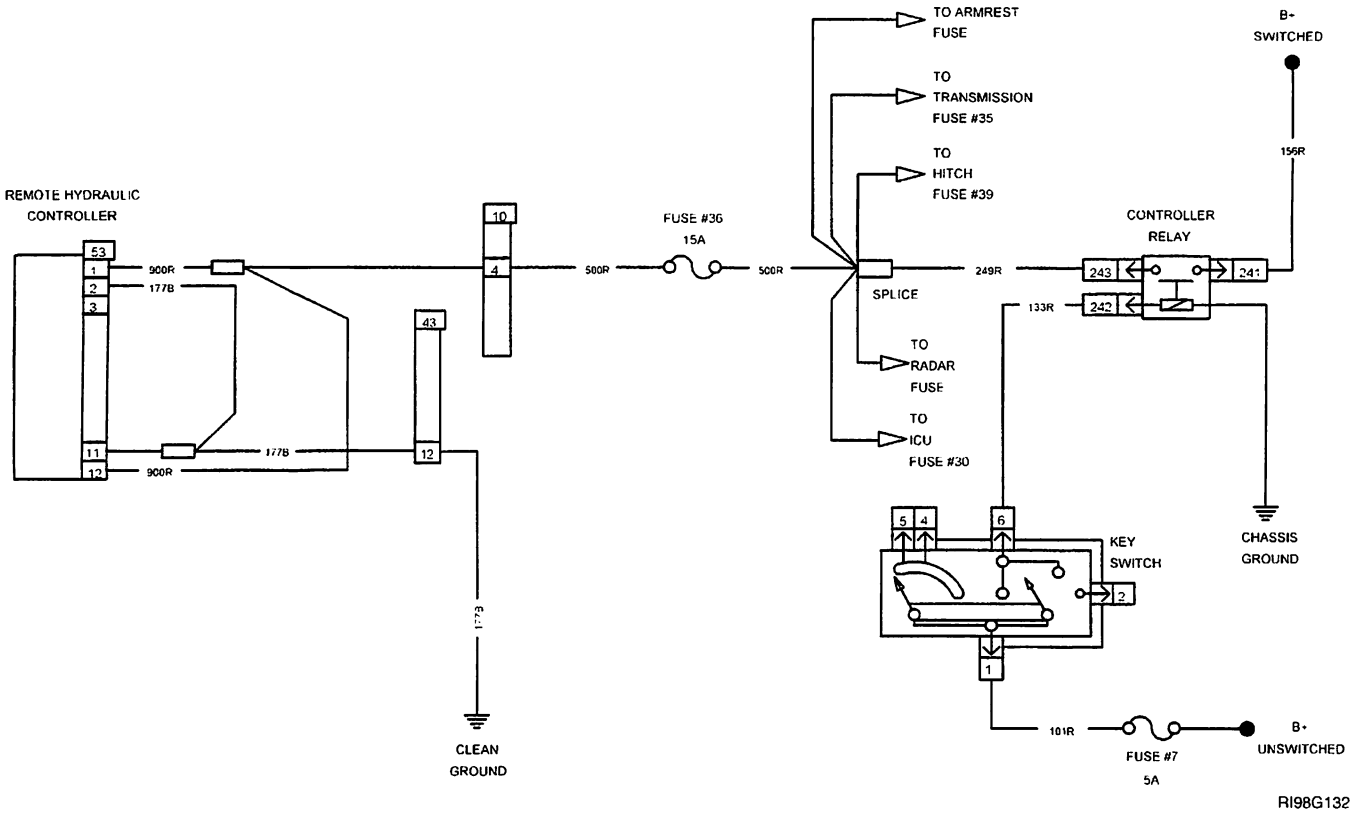
FAULT CODE AUX 51011

Meaning:
Remote valve supply voltage out of range low.

Possible failure modes:
1. Control supply voltage being near or at the 9.8 Volt range.
2. Control internal relay failure.

Corrective action:
Check the power supply and ground of the remote hydraulic controller. Check the controller function.

1. Verify system voltage at cavity 1 and 12 of connector C053.
   There should be 12 DVC at both cavities.
   If the voltage is lower than 9.8 volts, check the battery and the alternator regulator.
2. Check the controller ground at cavity 2 and 11 at the same connector. There should be good connections from the two cavities to the clean ground.
3. Clear the fault codes. Shut down the tractor and start again. If the fault code records again and the controller does not function properly, replace the remote hydraulic controller.



10005-40

FAULT CODE AUX 51052

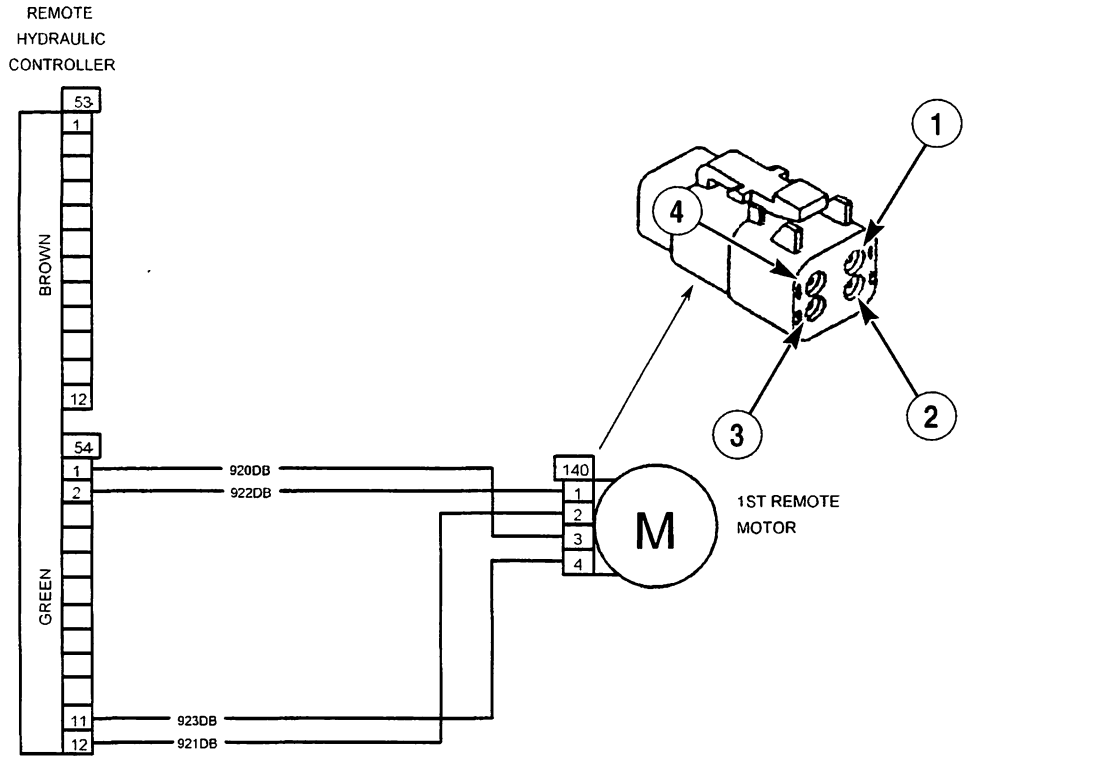
Meaning:
The CD motor coil on the 1st remote valve has an open or shorted circuit.

Possible failure modes:
1. Motor coil failed.
2. Damaged wiring.
3. Loose connector or bent pin.
4. Controller internal failure.

Corrective action:
1. Check the resistance of the motor coil at the remote valve. Disconnect connector C140. Measure across pin 1 and pin 4 at the remote valve side.
   The resistance should be in the range of 4 to 7 ohms.
   If the resistance is higher than 10 ohms, there is an open circuit in the motor coil.
   If the resistance is less than 3 ohms, there is a shortage in the motor coil.
   In either case, replace the stepper motor in the 1st remote valve.
2. If the resistance across pin 1 and pin 4 of C140 is within the range of 4 to 7 ohms, check the wiring from the remote hydraulic controller to the remote valve.
   There should be good continuity (less than 1 ohms) from cavity 1 of C140 to cavity 2 of C054.
   There should be good continuity (less than 1 ohms) from cavity 4 of C140 to cavity 11 of C054.
   There should be no continuity from any of the cavities to the clean ground.

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

3. If none of above, replace the controller.



RH98J008 / RI98G135

FAULT CODE AUX 51102

Meaning:
AUX 1 Type 2nd instance. Invalid software instruction executed.

Possible failure modes:
1. Software problem.
2. Hardware problem.

Corrective action:
1. Reprogram with a newer software if available. If not regress one or more compatible levels.
2. If error goes away, stay with latest software that does not exhibit this problem.
3. If error stays, internal failure is possible. Write fault code on failed controller. Replace the controller.

FAULT CODE AUX 51113

Meaning:
AUX 2 Type 3rd instance. Invalid software instruction executed.

Possible failure modes:
1. Software problem.
2. Hardware problem.

Corrective action:
1. Reprogram with a newer software if available. If not regress one or more compatible levels.
2. If error goes away, stay with latest software that does not exhibit this problem.
3. If error stays, internal failure is possible. Write fault code on failed controller. Replace the controller.

FAULT CODE AUX 51124

Meaning:
AUX 3 Type 4th instance. Invalid software instruction executed.

Possible failure modes:
1. Software problem.
2. Hardware problem.

Corrective action:
1. Reprogram with a newer software if available. If not regress one or more compatible levels.
2. If error goes away, stay with latest software that does not exhibit this problem.
3. If error stays, internal failure is possible. Write fault code on failed controller. Replace the controller.

FAULT CODE AUX 51136

Meaning:
AUX 4 Type 6th instance. Invalid software instruction executed.

Possible failure modes:
1. Software problem.
2. Hardware problem.

Corrective action:
1. Reprogram with a newer software if available. If not regress one or more compatible levels.
2. If error goes away, stay with latest software that does not exhibit this problem.
3. If error stays, internal failure is possible. Write fault code on failed controller. Replace the controller.

FAULT CODE AUX 51147

Meaning:
AUX 5 Type 7th instance. Invalid software instruction executed.

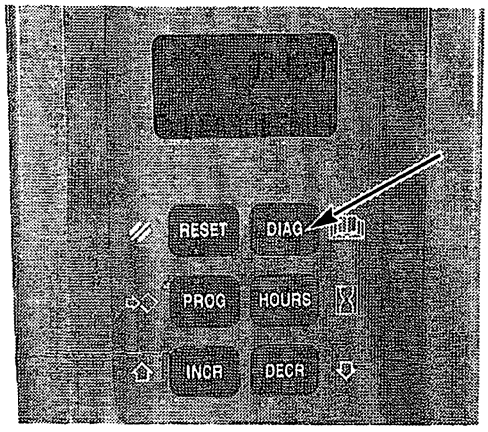
Possible failure modes:
1. Software problem.
2. Hardware problem.

Corrective action:
1. Reprogram with a newer software if available. If not regress one or more compatible levels.
2. If error goes away, stay with latest software that does not exhibit this problem.
3. If error stays, internal failure is possible. Write fault code on failed controller. Replace the controller.

FAULT CODE RETRIEVAL

Controllers can be checked for fault codes at any time, unless in the calibration mode. Up to 10 fault codes can be stored in each controller.

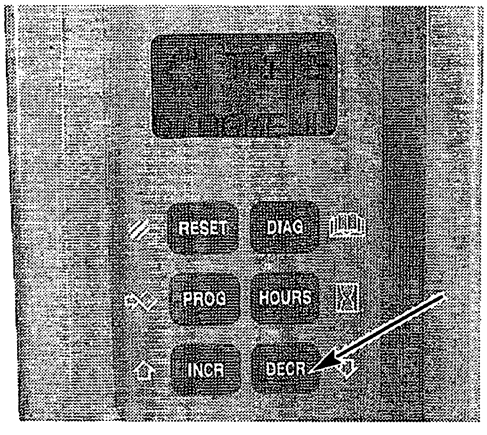
STEP 10



RD98F032

With the key switch in the ON or RUN position, press and hold the DIAG key on the programmable display key board to enter the controller selection screen. The display will read INST DIAG MENU.

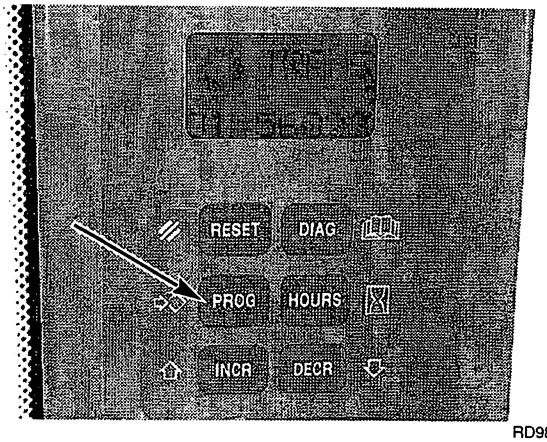
STEP 11



RD98F033

Use the DECR key to scroll through the different controllers: INST (standard instrumentation) - ENG (engine) - TRANS (transmission) - ARM (armrest) - HITCH - AUX (remote hydraulics) - PTO (power take off) - STEER (steering) - PERF (performance monitor).

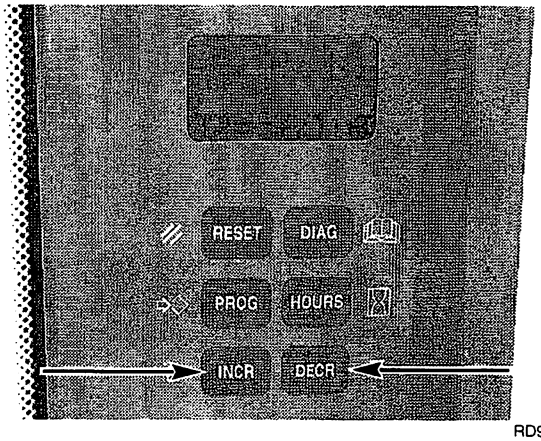
STEP 12



RD98F034

When the required controller is displayed, press the PROG key. If a controller is selected that is not on the Case Data Bus (does not exist), the display will read COMM ERR.

STEP 13



RD98F035

Use the INCR and DECR keys to scroll through the 10 possible fault codes. The controller name will be at the top of the display. The fault code and which number that fault is (01 to 10), will be at the bottom of the display.

STEP 4 - Disconnect brake pedal wires at the controller

Remove the controller cover from the rear of the tractor.
Remove connector C056 (gray) from the PTO controller.
Remove pins 2 and 3 from connector C056.
Install connector C056 and turn key on.
Watch the Diff lock icon on display and turn on and off the Diff lock switch in the armrest.
-- OK - diff lock icon now turns on and off when armrest switch is actuated. (Look at icon on the display) go to Step 5.
-- NOT OK - Diff lock icon does not turn on and off when armrest switch is actuated. (Look at icon on display) go to Step 9.
-- NOT OK - Fault code appears when Diff lock is switched on and off, troubleshoot new fault code.

STEP 5 - Check wiring

One of the wires from the brake pedal switches is shorted to power.
Turn key on and check pins 2 and 3 for 12 volts. (0 volts should be measured unless brake pedal is depressed)
-- OK - Check brake pedal switch adjustment.
-- NOT OK - Replace shorted wire between switch and PTO controller.

STEP 6 - Drive tractor

Drive the tractor and test Diff lock (turn off and on Diff lock when turning).
Engage Diff lock and depress left brake (Diff lock should turn off).
Engage Diff lock and depress right brake (Diff lock should turn off).
-- OK - Diff lock turned off and on correctly.
-- NOT OK - Icon on display turn on and of but Diff lock did not mechanically engage. Go to Step 7.
-- NOT OK - Icon on display did not turn off when left or right brake was depressed. Go to Step 9.

STEP 7 - Check controller

Remove the Diff lock power supply wire Pin 9 from connector C057.
Install solenoid circuit tester CAS 2593-1 with a Diff lock test solenoid (9.0 - 10.2 ohms) in to cavity C057-9.
Attach connector C057 to the PTO controller.
Attach the loose lead of CAS 2593-1 to chassis ground.
Turn key on and engage and disengage the Diff lock.
-- OK - Diff lock test solenoid turned off and on when switch was actuated the controller is OK. Go to Step 8.
-- NOT OK - Diff lock test solenoid did not turn off and on when switch was actuated and no fault code was recorded, controller failed go to Step 14.

STEP 8 - Check tractor solenoid

Remove, clean and test Diff lock solenoid.
Attach test harness to Diff lock solenoid installed on tractor.
Lower cab.
Drive tractor and test Diff lock (turn off and on Diff lock when turning).
-- OK - Diff lock turned off and on correctly, problem corrected.
-- NOT OK - Icon on display turn on and off but Diff lock did not mechanically engage. Internal transmission problem.

STEP 9 - Check brake pedal switches circuit

Check the brake pedal switch function.
-- OK - Both switches are in place and function correctly (open and close), go to Step 10.
-- NOT OK - Replace failed switch.

STEP 10 - 12 volt power check

Turn key on.
Check right and left hand brake switch for 12 volt power.
-- OK - Go to Step 11.
-- NOT OK - Failed wire between fuse 38 and brake switch.

FAULT CODE PTO 1050

Meaning:
The PTO controller received information that the MFD switch in the armrest controller has failed (NO position). Fault code ARM 1069 will also be recorded in the armrest controller.

Possible failure mode:
1. MFD switch connector contact not contacting switch pin correctly.
2. MFD switch (NO position) failed in armrest.

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

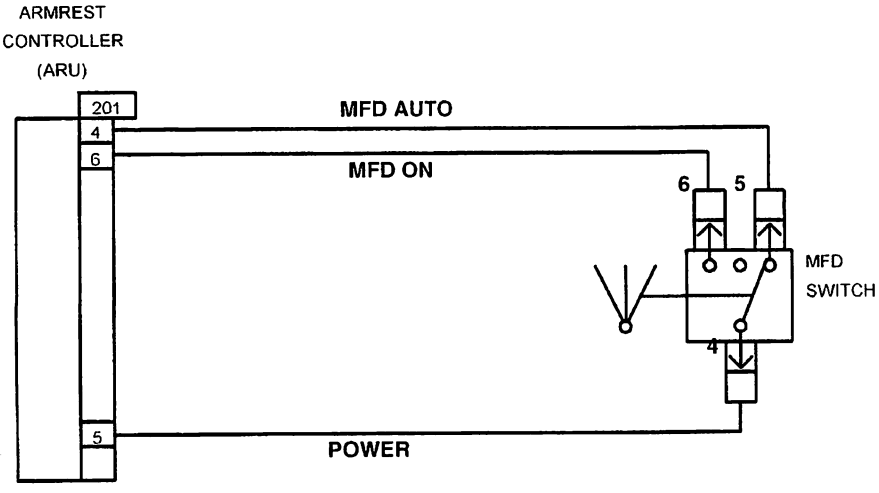
IMPORTANT: *To avoid pin and harness damage, use test leads when taking measurements.*

MFD switch information:
Position A = Auto MFD active
Position B = Center position = OFF
Position C = ON
SW201-4 = Auto MFD signal
SW201-5 = Switch power 12 volt
SW201-6 = MFD ON signal

Corrective Action:

STEP 1 - Find out if fault code ARM 1069 was recorded.

-- See if ARM 1069 was recorded in the armrest controller. If it was, follow the corresponding corrective action.



RI98G046

FAULT CODE PTO 6019

Meaning:
The wire to or the PTO solenoid is shorted to power or the PTO solenoid coil is shorted.

Possible failure mode:
1. The PTO solenoid coil shorted.
2. The wire from PTO controller C057-4 to PTO solenoid is shorted to power.
3. The wire from PTO controller C057-5 to PTO solenoid is shorted to power.

Background:
The PTO controller measures the circuit draw at pin C076-04 and C076-05. If the current draw is not what the PTO controller is expecting, a fault code will be recorded. If the problem is temperature sensitive, the solenoid coil may be starting to fail.
-- If the wire between the PTO controller C057-4 or C057-5 and the PTO solenoid is shorted to power, turn PTO off will appear on the display and the PTO will not engage when the switch is turned on. -- Fault code PTO 6019 and 10061 will be recorded.

Solenoid information:
6.0 - 7.0 ohms at 25 degrees C.

Wiring information:

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

C057-4 ---> C042-2 ---> C159-1 (PTO solenoid) C159-2 ---> C042-1 ---> C057-5

IMPORTANT: *To avoid pin and harness damage use CAS-2593-4 Master clutch test harness (Master clutch and PTO solenoid are the same) and CAS-2593-3 #2 test lead with female end when taking measurements:*

Corrective Action:

STEP 1 - Check fault codes
Check and record the fault codes on the display. Erase all the fault codes and turn the key to the off position.
Start the tractor and engage the PTO.
-- NOT OK - Fault code PTO 6019 is recorded, go to Step 2.
-- OK - No fault code, the solenoid or wiring may have an intermittent short, go to Step 2.

STEP 2 - Solenoid and circuit test
Remove the controller cover from the rear of the tractor.
Disconnect connector C057 (Black) from the PTO controller.
Clean and inspect pin make sure pin 4 and 5 are fully seated.
Measure the resistance between C057-4 and C057-5.
-- OK - Resistance is between 6.0 - 7.0 ohms, go to Step 3.
-- NOT OK - Go to Step 5.

STEP 3 - Controller check
Remove the PTO power supply wire pin 4 and ground supply wire pin 5 from connector C057.
Install Master clutch circuit tester CAS 2593-4 with test solenoid into cavity C057-4.
Attach the loose lead of CAS 2593-4 to cavity 5 with the female jumper wire CAS 2593-3 #2.
Attach connector C057 to the PTO controller.
Turn key on and engage and disengage the PTO.
-- OK - PTO test solenoid turned off and on when switch was actuated and fault code PTO 6019 was no recorded, go to Step4.
-- NOT OK - PTO test solenoid did not turn off and on when switch was actuated and fault code PTO 6019 was recorded, go to Step 8.

NOTE: *PTO fault code (no shaft spin) may be recorded if switch is left on.*

FAULT CODE PTO 9071

Meaning:
The PTO controller is not reading the shaft size sensor located at the PTO shaft. (Two speed PTO)

Possible failure mode:
1. PTO controller not configured correctly (PTO controller on a single speed tractor is configured as a two speed)
2. Shaft size sensor unplugged.
3. Loosen or damaged connector.
4. Failed PTO shaft size sensor.
5. Incorrect PTO sensor installed.
6. Wire between PTO controller and shaft size sensor has failed.

Background:
The shaft size sensor is only used on tractors equipped with a speed PTO. The sensor is used to by the PTO controller to control modulation at start up, it also lets the display know what shaft is to install so the correct PTO RPM is displayed when the PTO is turned on.
-- If the shaft size sensors unplugged when the engine is started PTO fault appeared on display and fault code PTO 9071 will be recorded.
-- The following will happen if the wire between the PTO controller and the shaft size sensor is failed open or shorted to chassis ground when the tractor is started and the PTO switch is turned on.
-- PTO RPM will not be displayed. The PTO will turn when the switch is turned on for 10 seconds then the PTO fault will appear on display and the PTO will stop turning. Fault code PTO 9071 will be recorded.
-- The following will happen if the wire between the PTO controller and the shaft size sensor is shorted to power. The PTO will engage and continue to turn. PTO fault will appear on the display and fault code PTO 9071 will be recorded.
-- If the wire is grounded when the PTO is running a PTO speed sensor, PTO fault will appear on the display and PTO stops turning. Fault codes PTO 54221 and 9071 will be recorded.

Sensor information:
approximately 3000 ohms

Wiring information:

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

C056-10 ---> C146-A ---> (PTO shaft size sensor) C146-B ---> splice ---> Chassis ground

IMPORTANT: *To avoid pin and harness damage, use test leads when taking measurements.*

Corrective Action:

STEP 1 - Is the tractor equipped with a two speed PTO

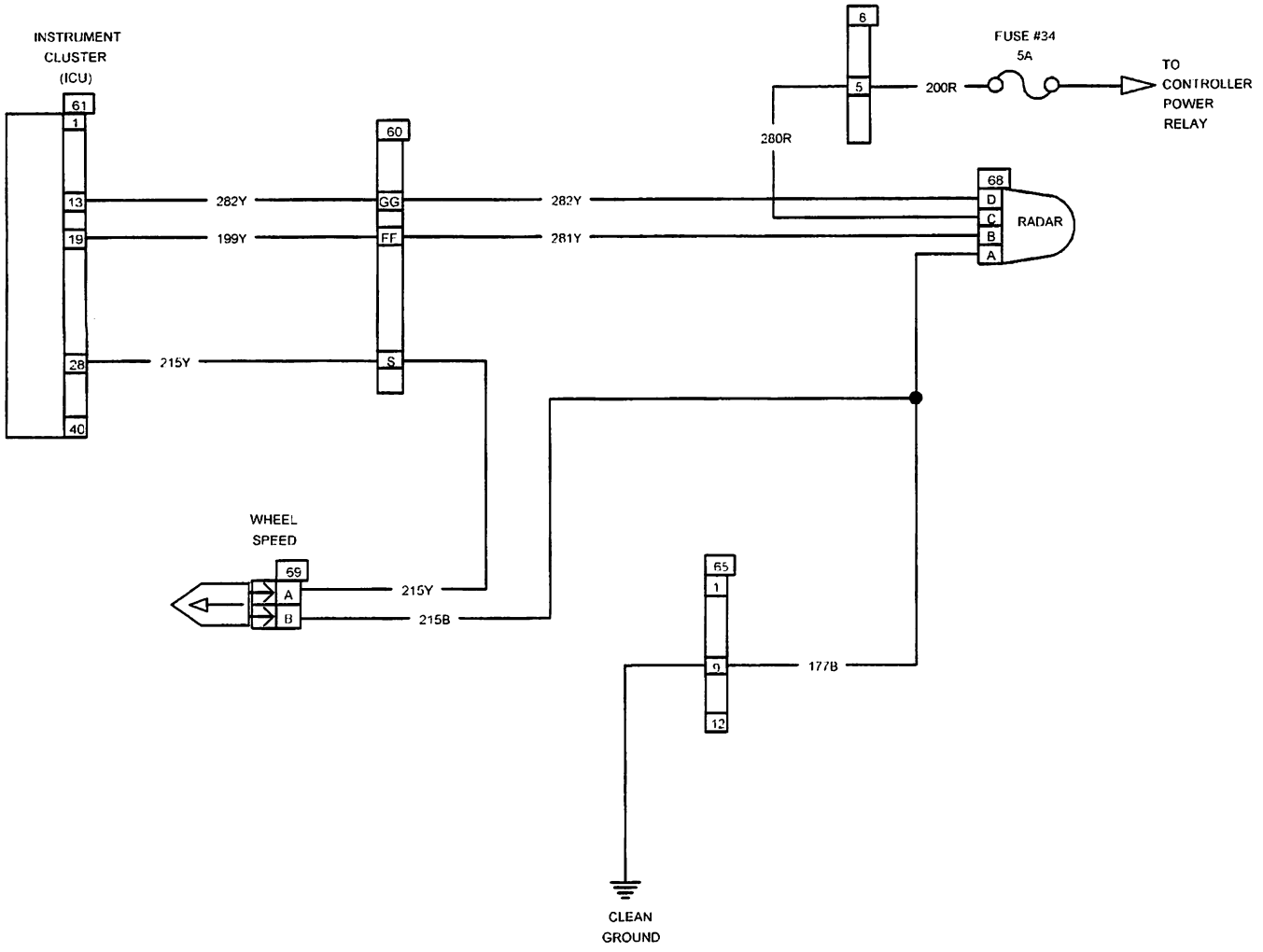
Check that the tractor is equipped with a two speed PTO (look for shaft size sensor, located on the out put shaft).
If the tractor is single speed only, reconfigure PTO controller.
Check that shaft size sensor harness is connected to the shift size sensor.
Check that the shaft size sensor has not been damaged by gear teeth.
Go to Step 2.

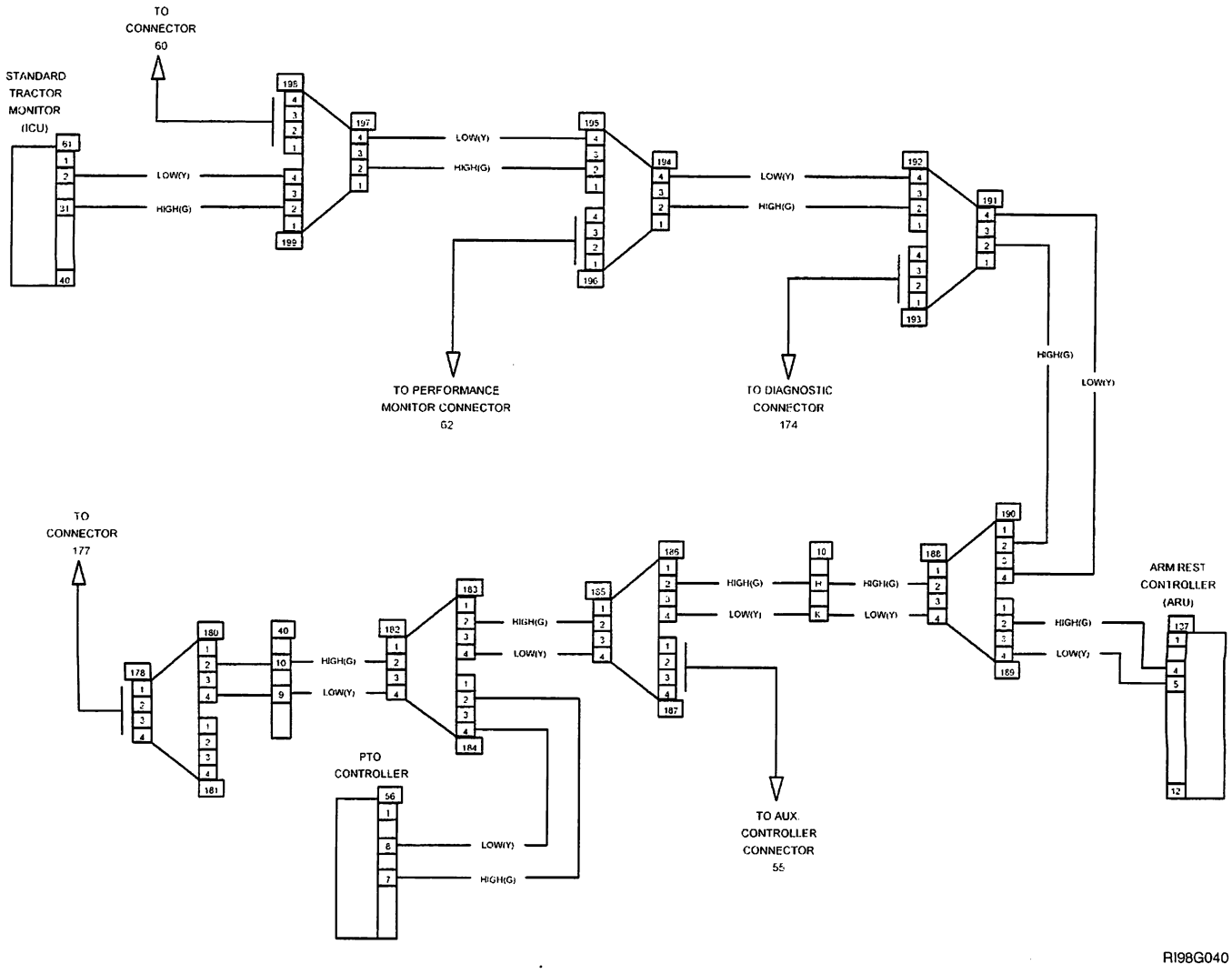
STEP 2 - Check PTO shaft size sensor

Disconnect the PTO speed sensor (Top of housing) at connector C146.
Measure the resistance of the shaft size sensor.
-- OK - Resistance measure is about 3000 ohms, go to Step 3.
-- NOT OK - Replace speed sensor.

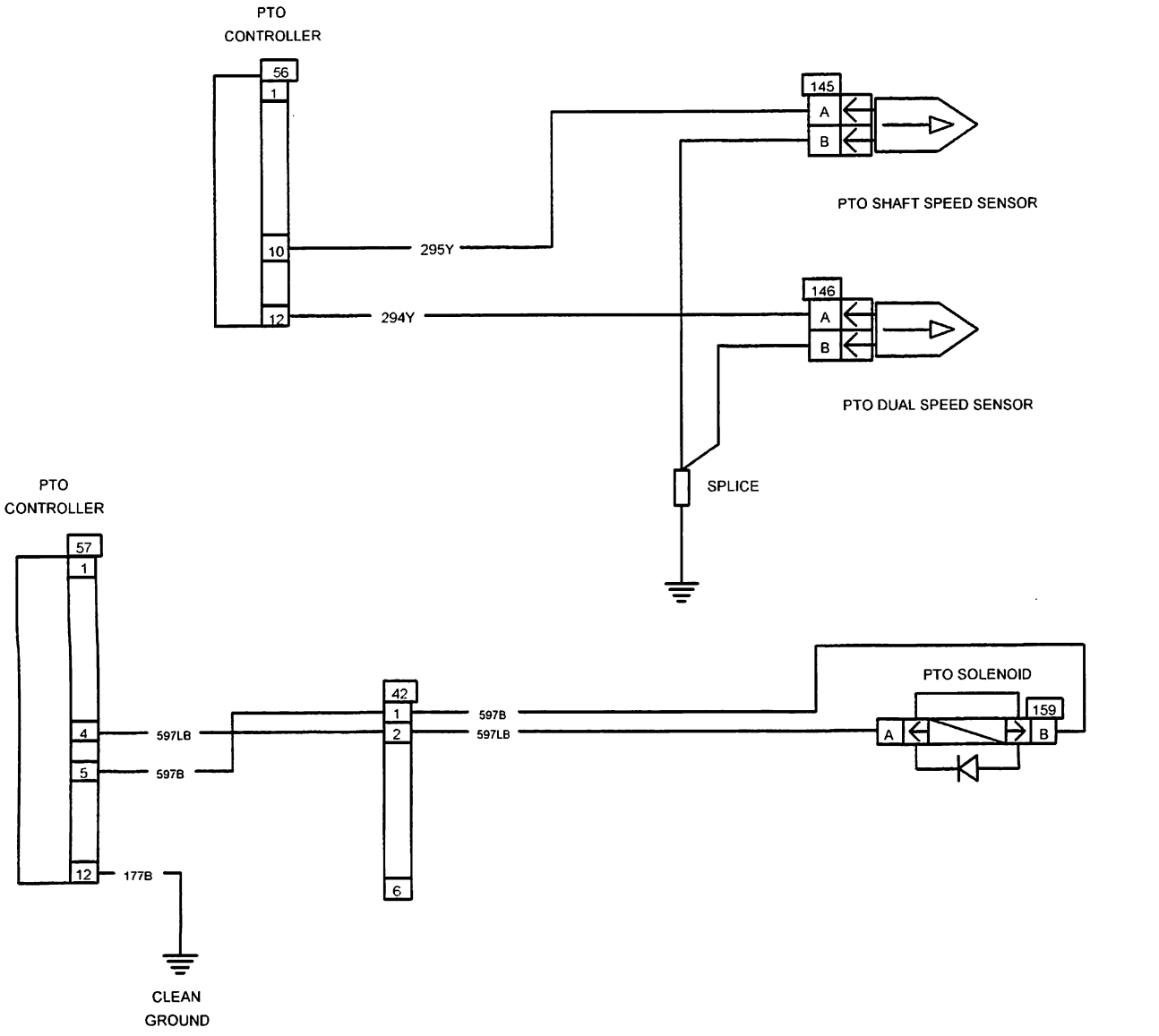
STEP 3 - Check wiring

Remove the controller cover from the rear of the tractor.
Disconnect connector C056.
Measure the resistance between pin C056-12 and C146-A, it must be less than 10 ohms.
-- OK - Resistance is less than 10 ohms, go to Step 4.
-- NOT OK - Resistance is not less than 10 ohms, replace wire.





10006-76



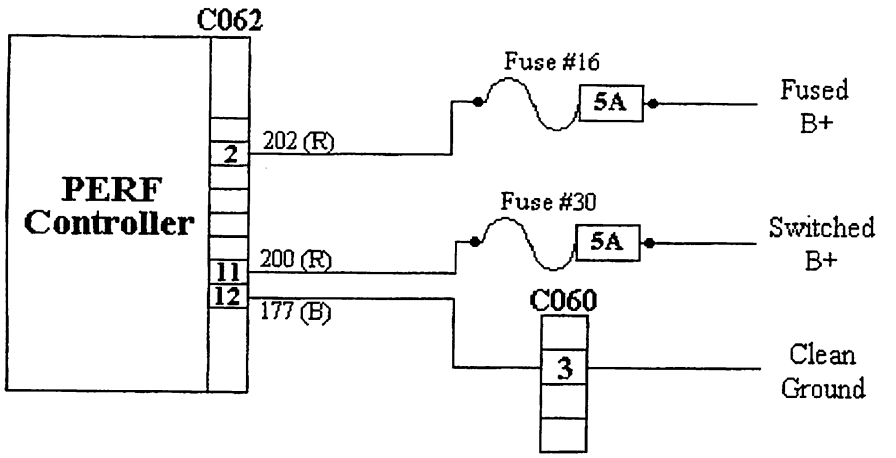
RI98G080

FAULT CODE PERF 10032

Meaning:
Controller memory error.

Possible failure modes:
Memory defect or intermittent controller.

Corrective action:
Make sure the controller has a good connection (C062) to the battery and is properly grounded.
Shut down the tractor and restart.
Calibrate the performance controller.
If the same fault code appears again, change the controller.



RH98H057

Section

10009

AUTOMATIC TEMPERATURE CONTROL

Fault Codes

10009

CASE CORPORATION
700 State Street
Racine, WI 53404 U.S.A.

CASE CANADA CORPORATION
450 Sherman Avenue
Hamilton, ON L8N 4C4 CANADA

Rac 7-88650

Printed in U.S.A.
July, 1998

Section

1001

SAFETY, GENERAL INFORMATION / MAINTENANCE SCHEDULE

CASE CORPORATION
700 State Street
Racine, WI 53404 U.S.A.

CASE CANADA CORPORATION
450 Sherman Avenue
Hamilton, ON L8N 4C4 CANADA

Rac 7-85750

Printed in U.S.A.
July, 1998

Introduction

The Case Service Tool is a laptop computer based service and diagnostic tool that communicates with the tractor data bus. The Case Service Tool will:

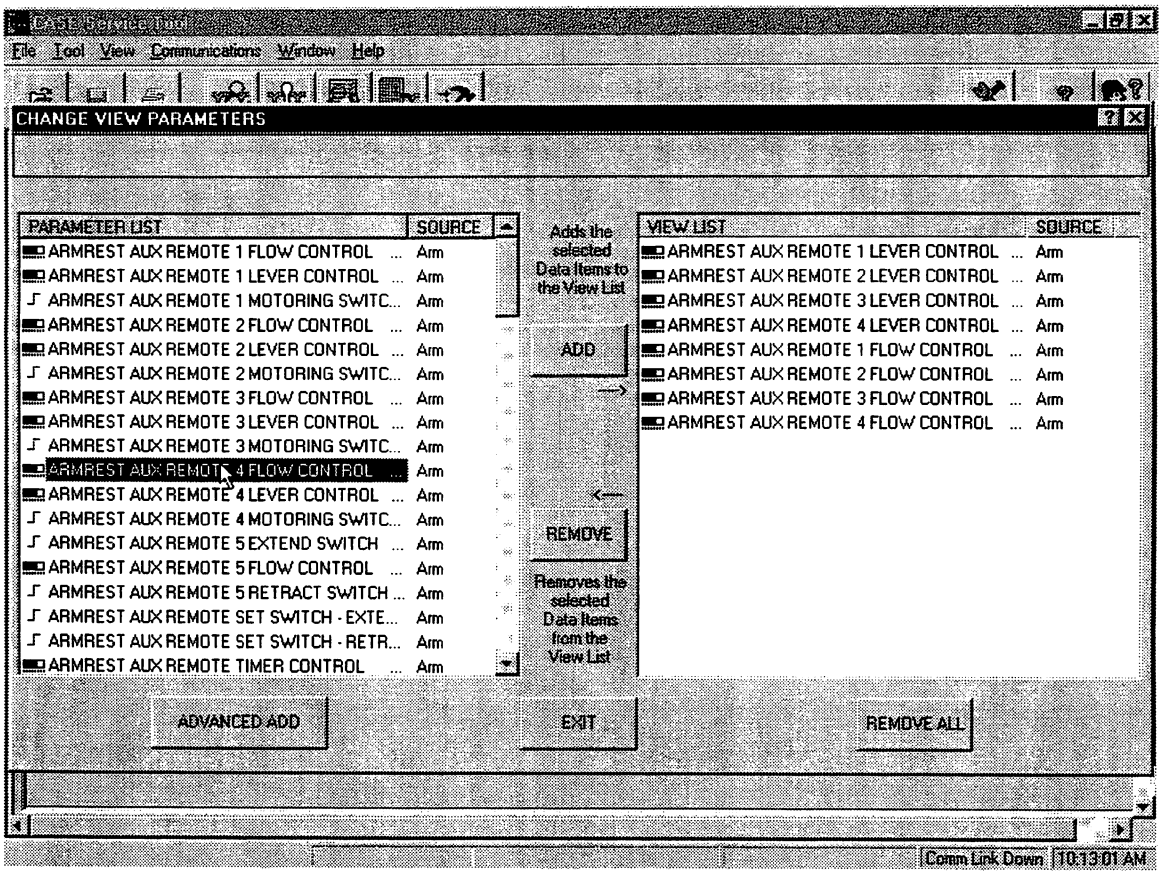
- Display the controller software version installed
- Retrieve fault codes stored within controllers
- Monitor data bus switch and sensor data parameters
- Download software into controllers
- Provide troubleshooting diagnostic information

To change between each of these functions, simply point to the appropriate icon on the toolbar near the top of the screen.

Changing View Parameters

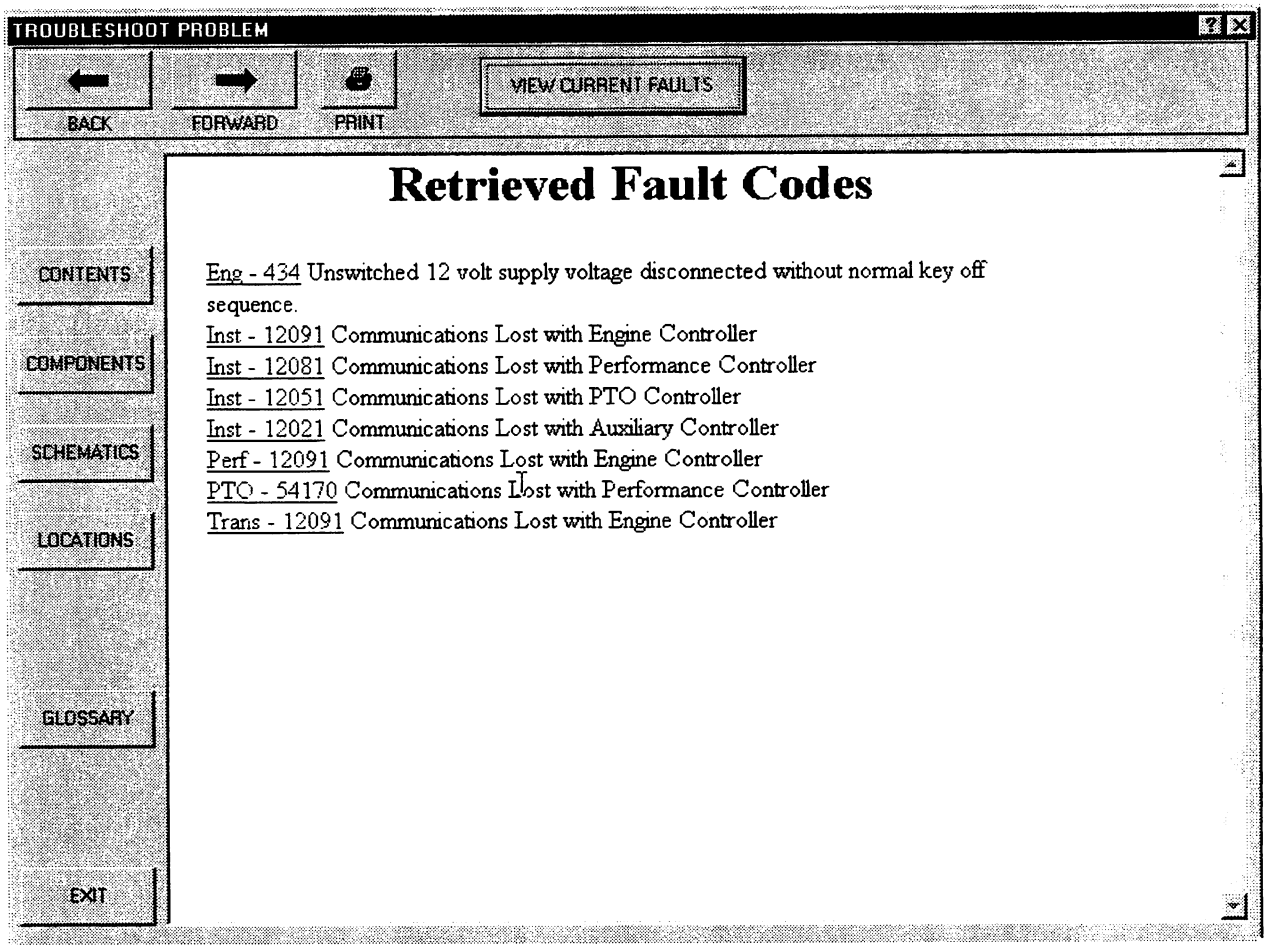
The CHANGE VIEW PARAMETERS screen allows adding or removing switch and sensor data to be monitored.

- To add a sensor or switch, select (highlight) the desired switch or sensor and then click the ADD button.
- To REMOVE a sensor or switch, select (highlight) the desired switch or sensor and then click the remove button.
- Click EXIT once the list is as desired. This will take you to the PARAMETERS MONITOR screen.



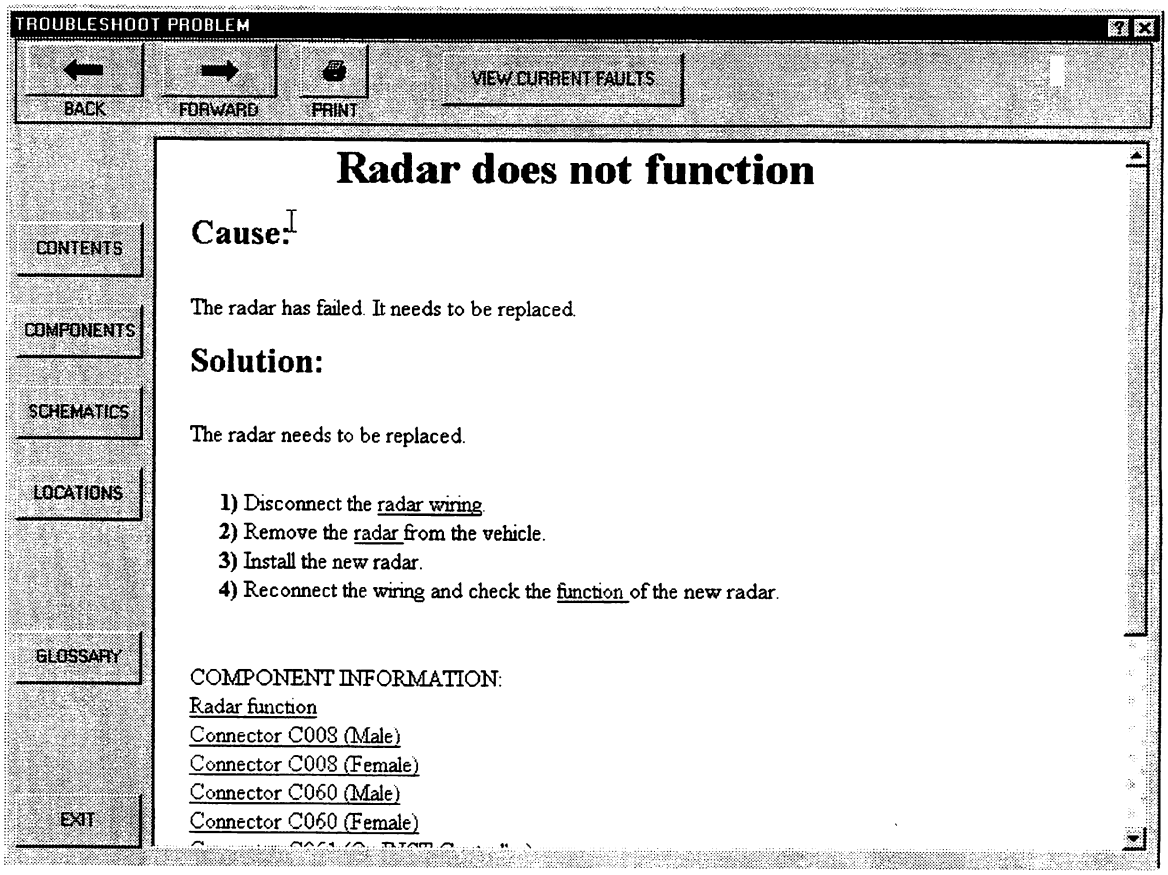
Retrieved Fault Codes

- Stored fault codes will be displayed after clicking on VIEW CURRENT FAULTS.



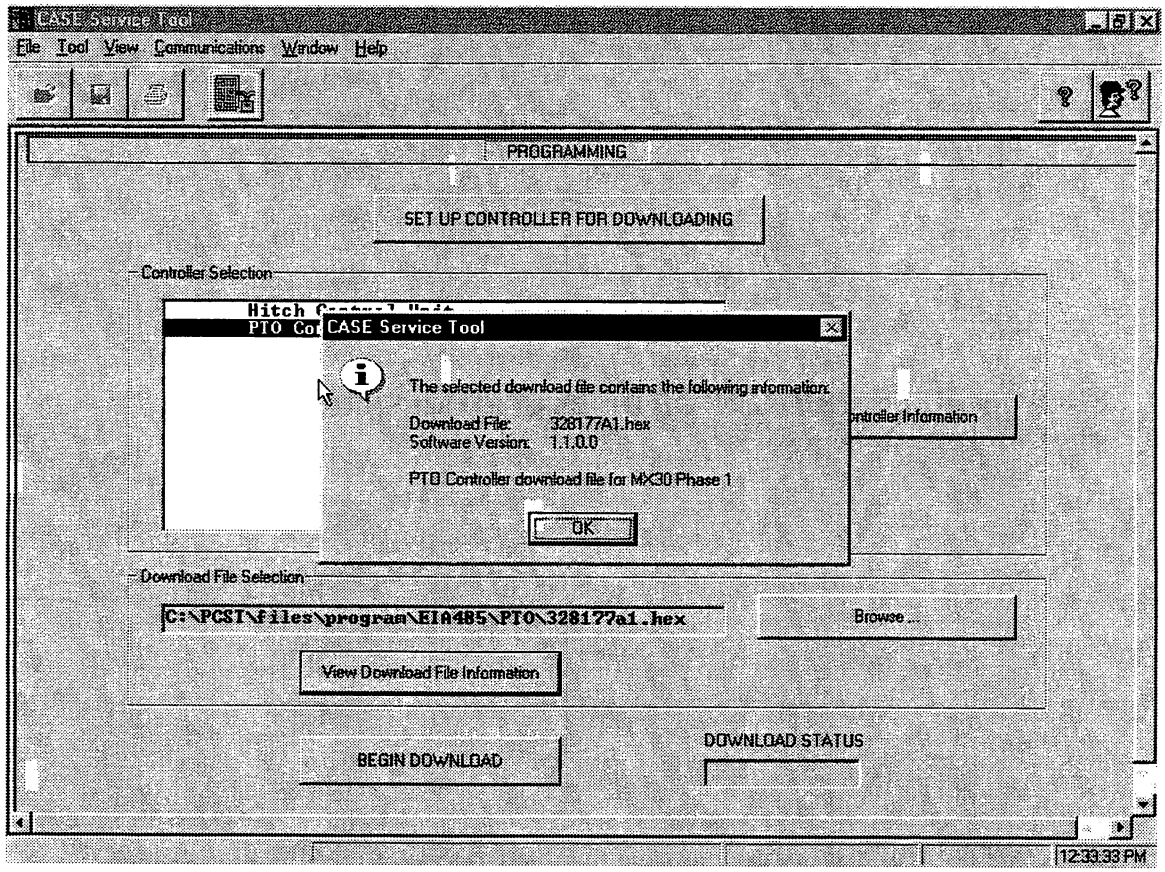
Fault Code HITCH 3010 "No, the radar does not function"

- Additional diagnostics are then available based on the response entered.
- Click on the RADAR hypertext to view the actual radar unit.
- Click on RADAR WIRING hypertext to view the radar circuit wiring schematic drawing.
- Click BACK OR FORWARD BUTTON to change screen.

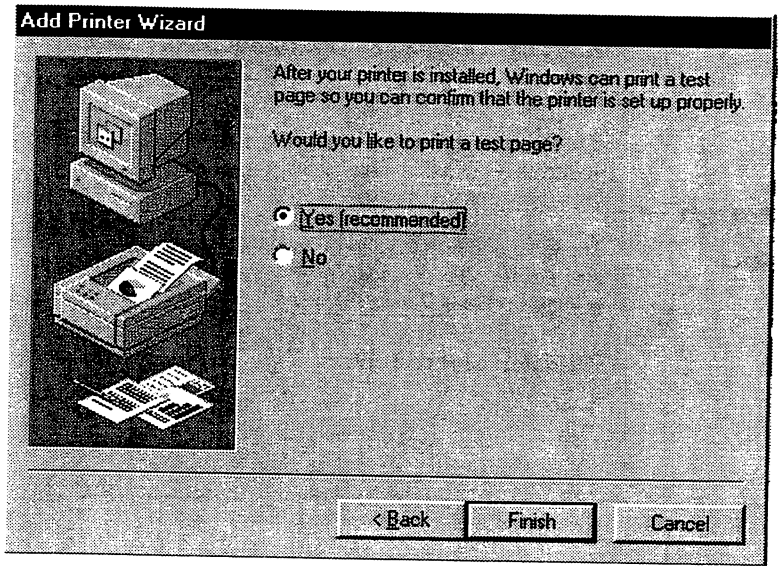


View Download File Information

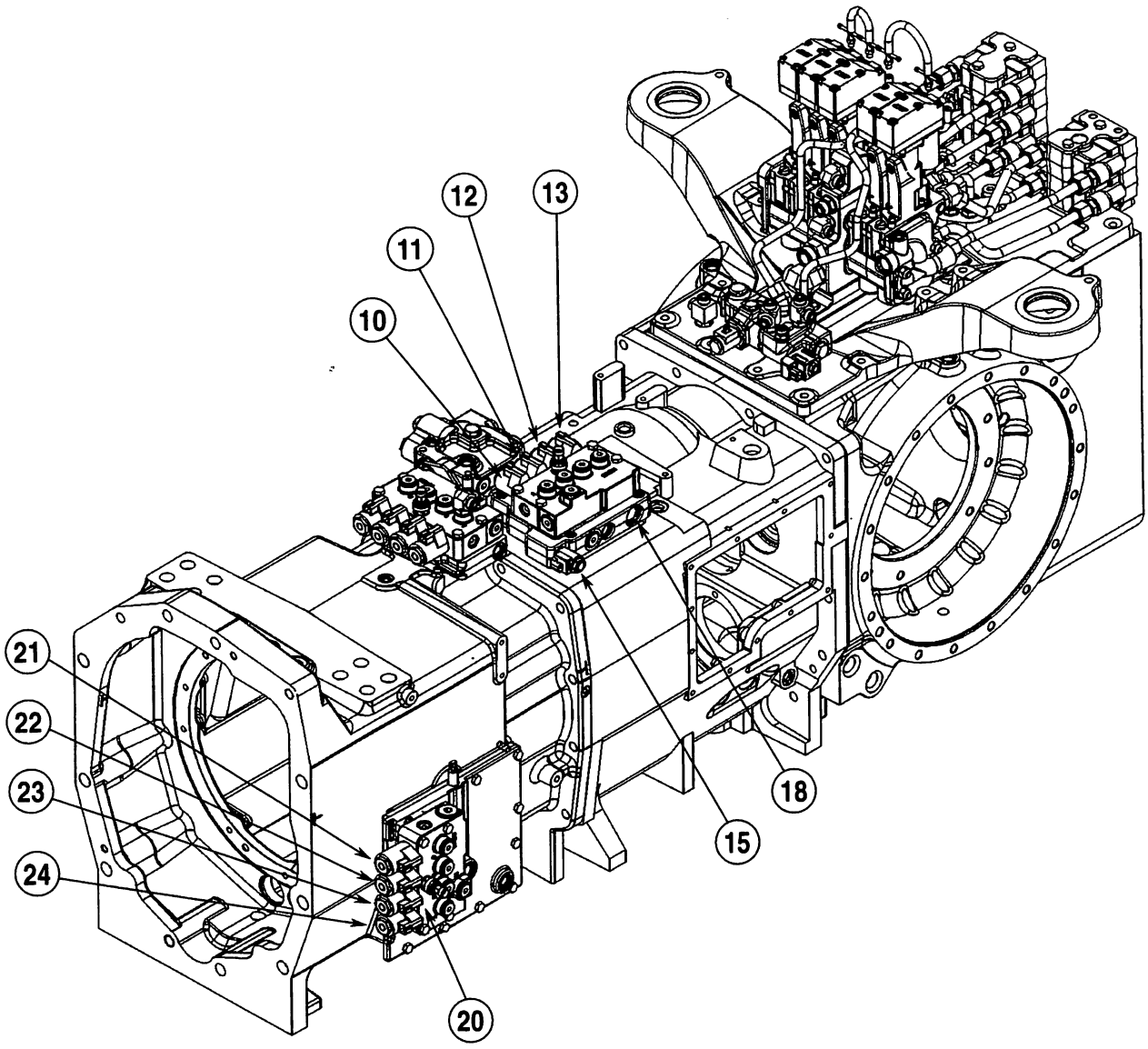
At the PROGRAMMING screen, you may get more information about the software file that you are about to download.



- Click on the BEGIN DOWNLOAD button to load the selected software.



This is the last dialogue box. It is recommended that you do print a test page. Simply click the <Finish> button. After a few moments, if everything was done correctly and the printer is hooked up correctly, you should get a page out of the printer which has a Windows logo and says "If you can read this you installed the printer correctly."



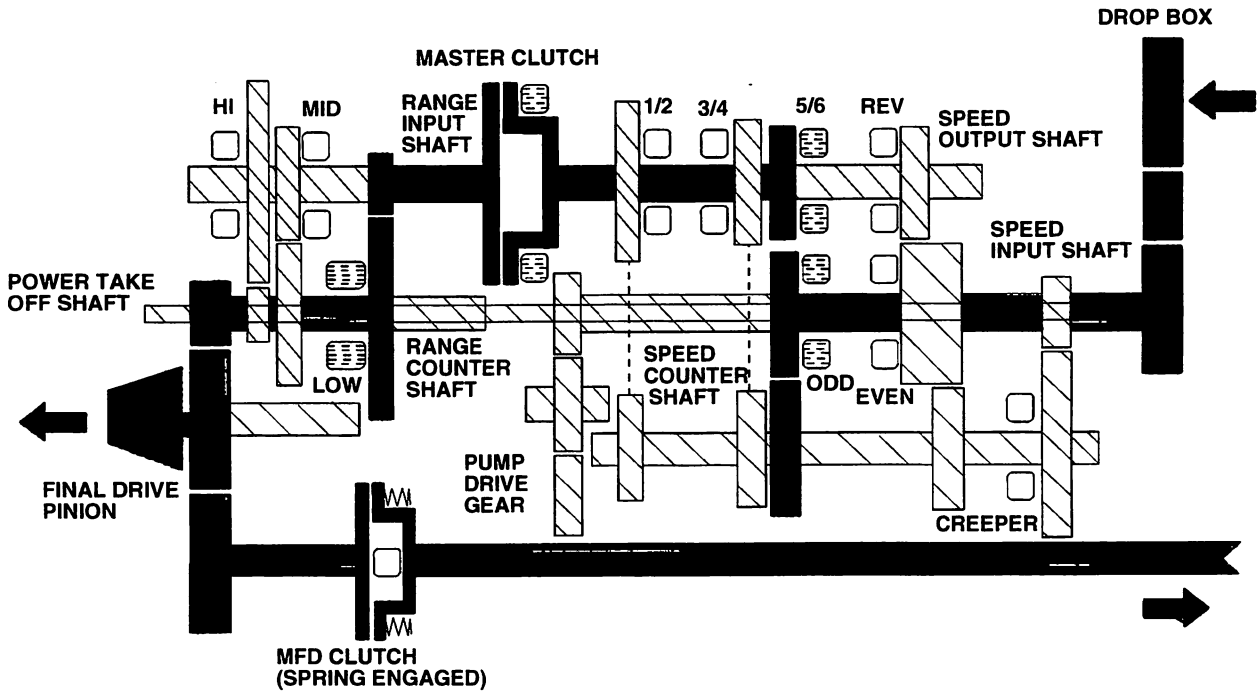
RH98F160

1. POWERSHIFT VALVE ODD/EVEN
2. EVEN CLUTCH SOLENOID
3. ODD CLUTCH SOLENOID
4. CREEP CLUTCH SOLENOID
5. PARK BRAKE SOLENOID
6. ODD/EVEN TRANSDUCER
7. PRIORITY REGULATOR VALVE
8. REGULATED PRESSURE TO POWERSHIFT VALVES
9. POWERSHIFT VALVE RANGE
10. MFD SOLENOID
11. LOW CLUTCH SOLENOID
12. MID CLUTCH SOLENOID
13. HIGH CLUTCH SOLENOID
14. RANGE TRANSDUCER
15. MASTER CLUTCH SOLENOID
16. INCHING VALVE
17. REGULATED PRESSURE INLET
18. MASTER CLUTCH LUBE INLET
19. MASTER CLUTCH TEST PORT
20. POWERSHIFT VALVE SPEED
21. C1 CLUTCH SOLENOID
22. C3 CLUTCH SOLENOID
23. C5 CLUTCH SOLENOID
24. REVERSE SOLENOID
25. SPEED TRANSDUCER
26. TO PARK BRAKE
27. PARK BRAKE PUMP
28. PTO/DIFF LOCK VALVE
29. PTO SOLENOID
30. DIFF LOCK SOLENOID

MX MAGNUM

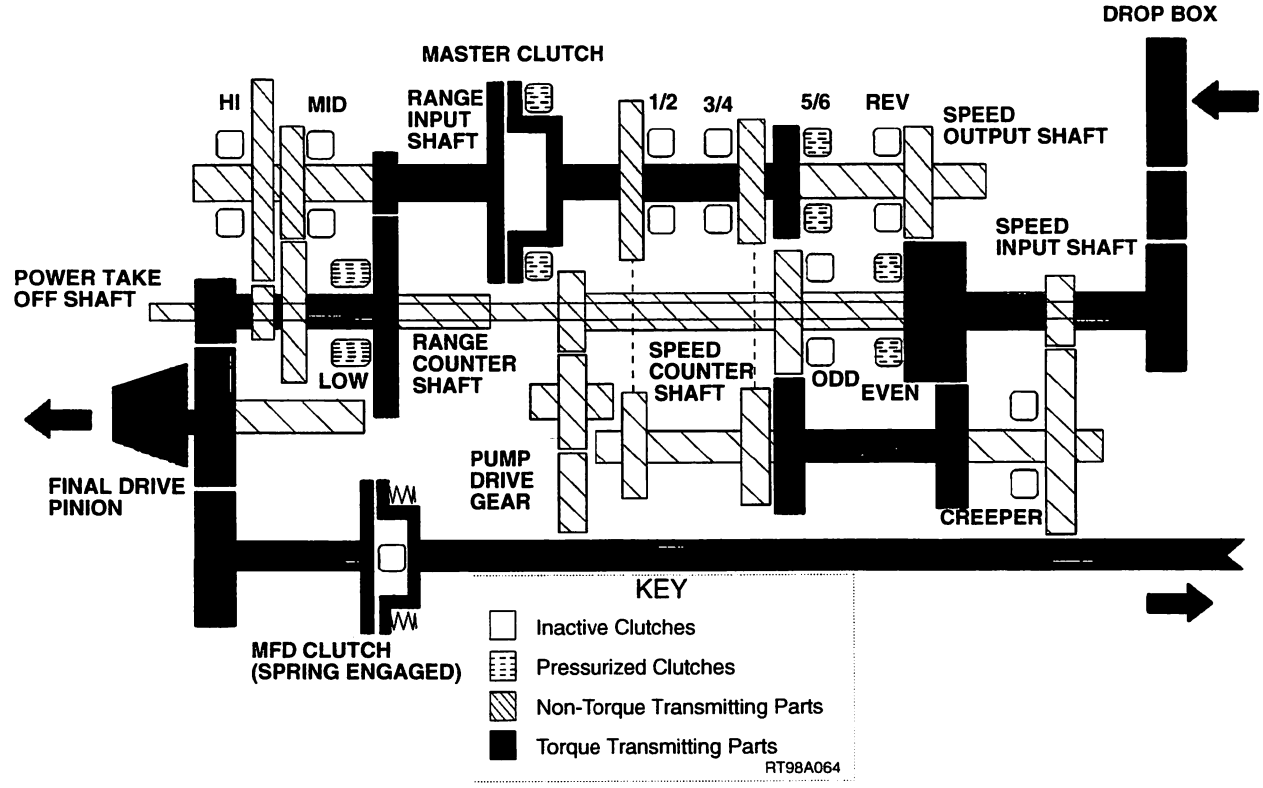
Powershift Transmission Clutch Layout with Pump Drive, PTO, MFD, and Creeper Drive

Gear No. 5



RT98A028

Gear No. 6

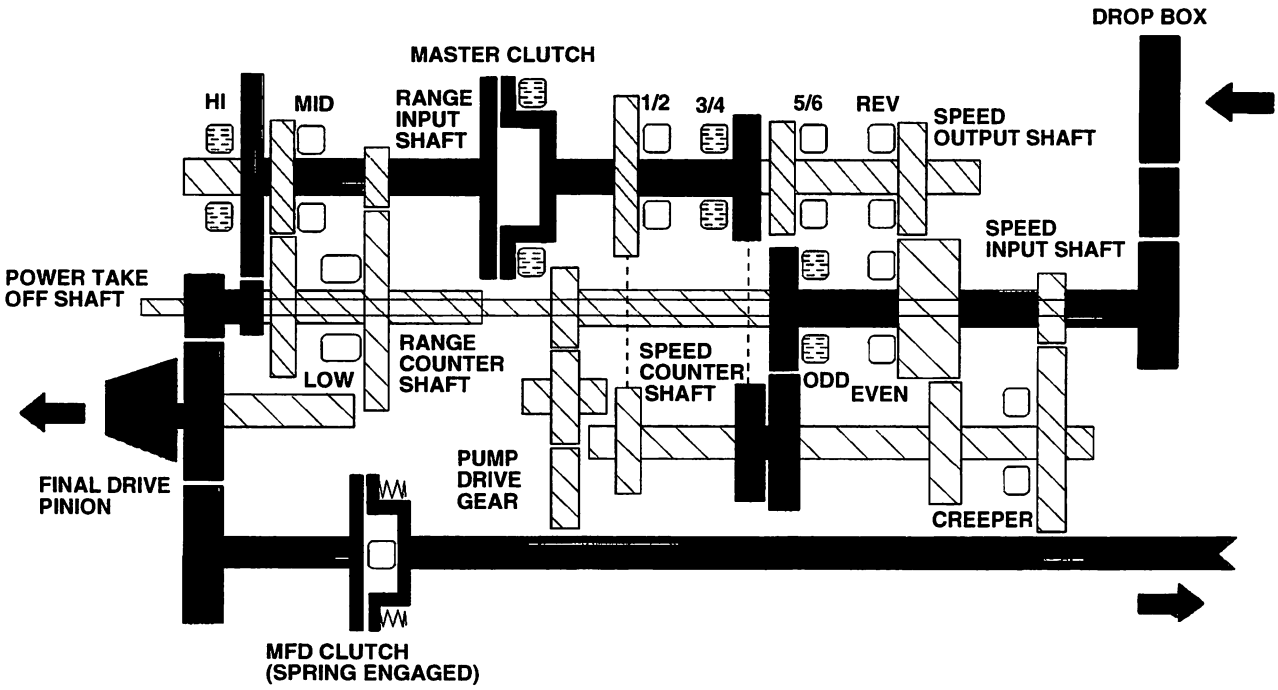


RT98A029

MX MAGNUM

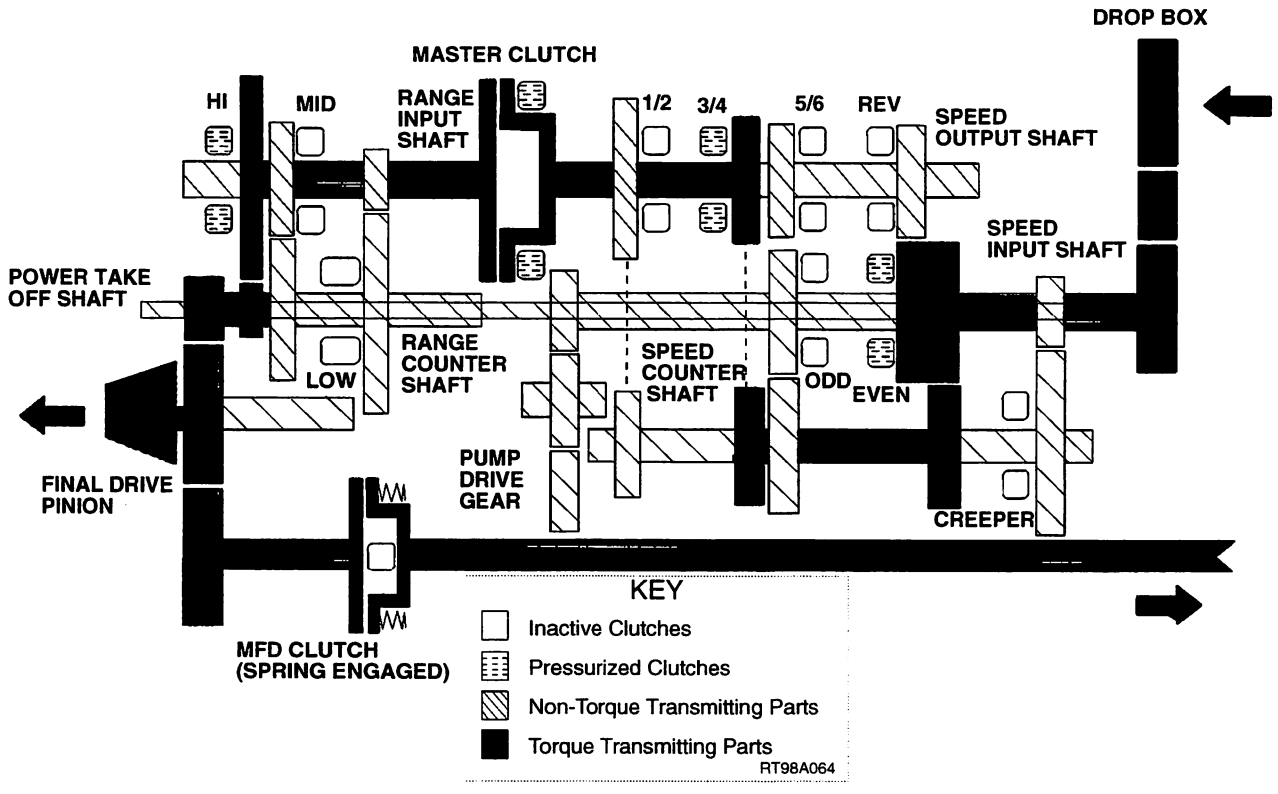
Powershift Transmission Clutch Layout with Pump Drive, PTO, MFD, and Creeper Drive

Gear No. 15



RT98A045

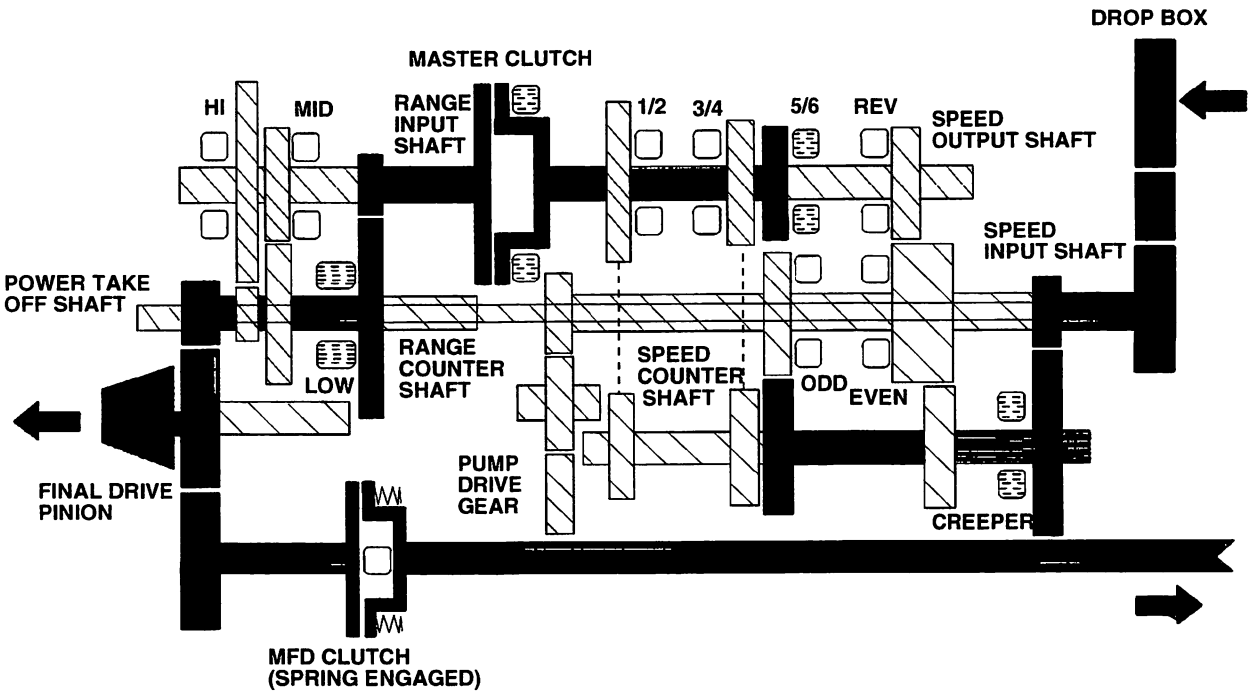
Gear No. 16



RT98A046

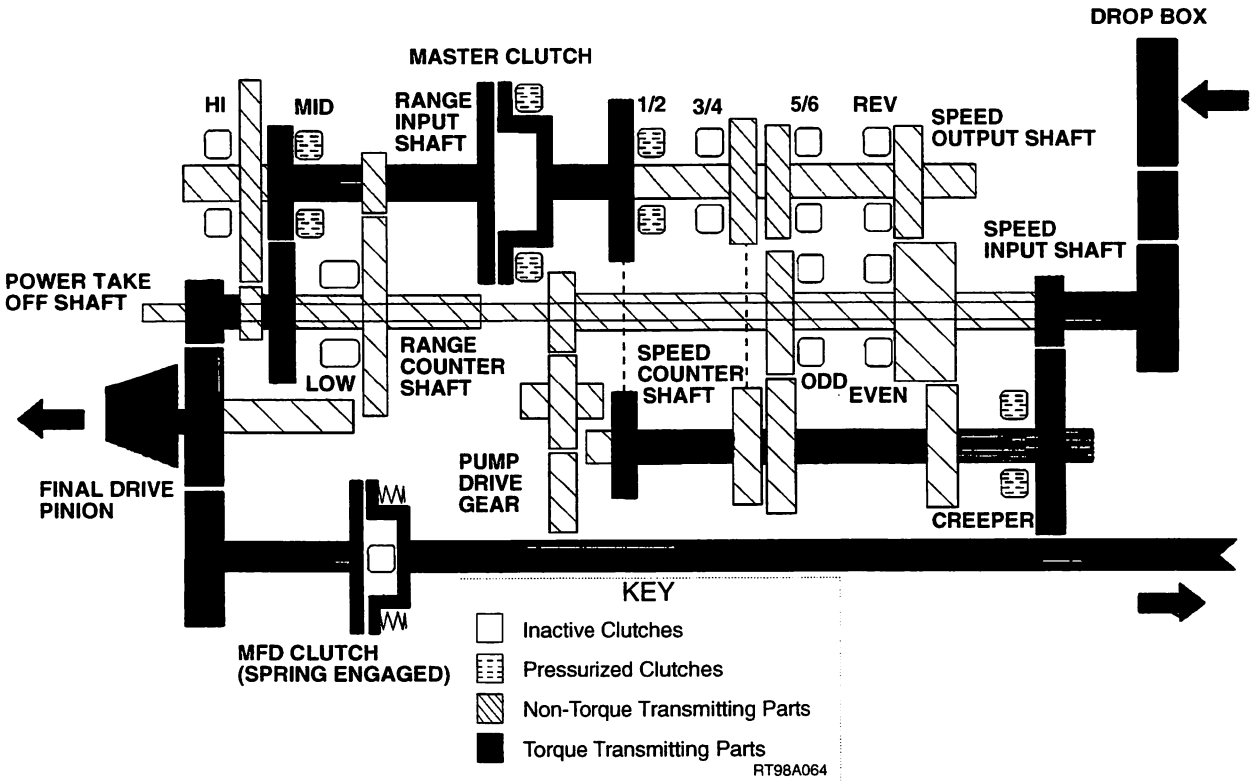
MX MAGNUM
Powershift Transmission Clutch Layout with Pump Drive, PTO, MFD, and Creeper Drive

Creeper Gear No. 3

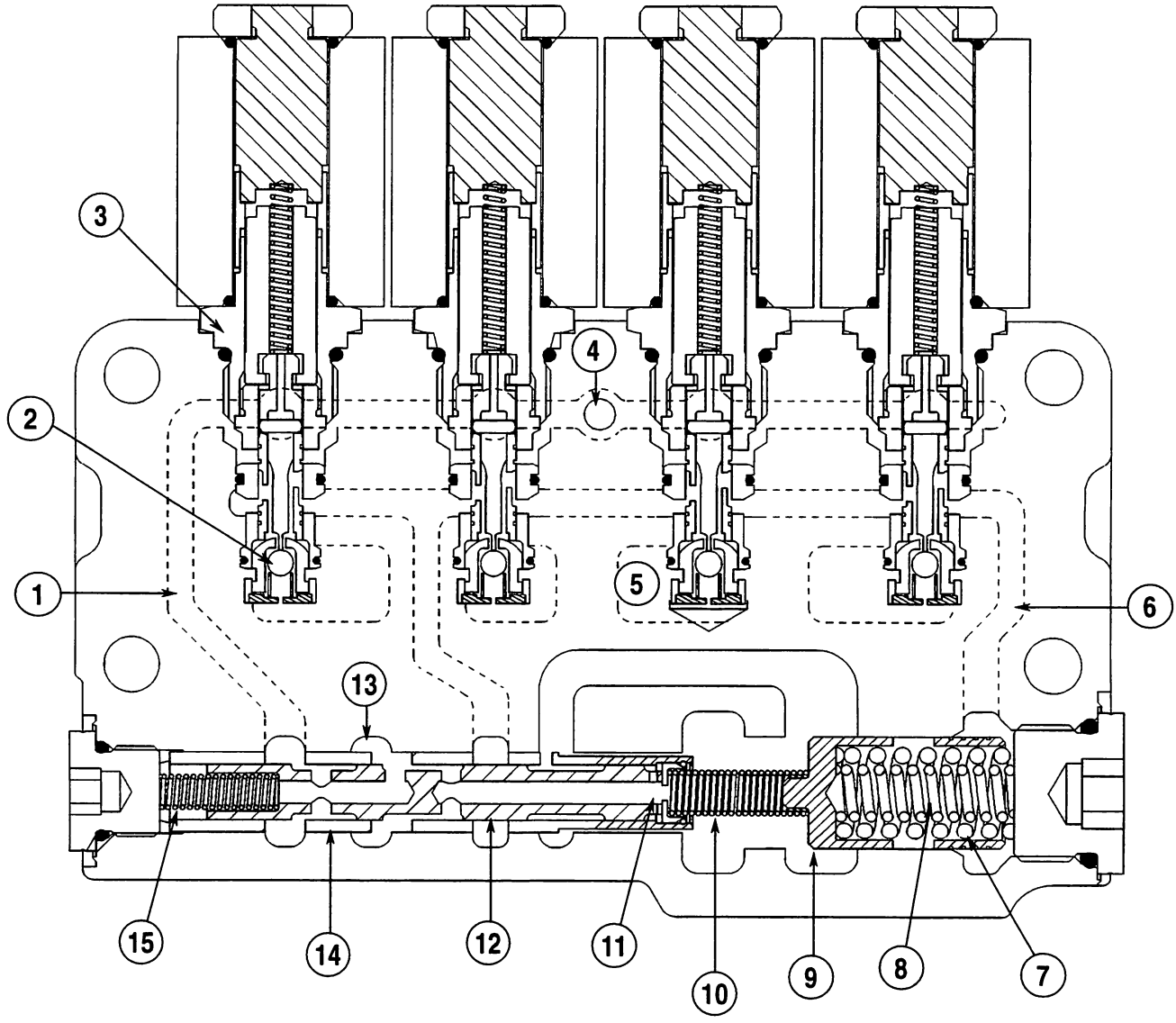


RT98A055

Creeper Gear No. 4



RT98A056



RT98F030

Transmission Control Valve (Engine Running)

1. SOLENOID SUPPLY PASSAGE
2. SOLENOID CHECK VALVE
3. SOLENOID VALVE ASSEMBLY
4. TRANSDUCER PORT
5. SUPPLY TO CLUTCH PACK
6. TANK/SUMP OIL PASSAGE
7. MODULATOR OUTER SPRING
8. MODULATOR INNER SPRING
9. MODULATOR PISTON
10. MODULATOR SPRING
11. ORIFICE
12. UNLOADING SPOOL
13. POWERSHIFT SUPPLY OIL
14. MODULATOR SPOOL
15. UNLOADING SPRING

NOTE: *Normally as one solenoid is energized another is deenergized. These instructions depict only a solenoid being energized to illustrate general valve operation.*

Regulated pressure applied on the modulator piston (9) has moved the piston to the right, compressing the inner and outer modulator springs (7 and 8). There is no flow through the valve in this condition.

GEAR 1 _____	GEAR 7 _____	GEAR 13 _____
GEAR 2 _____	GEAR 8 _____	GEAR 14 _____
GEAR 3 _____	GEAR 9 _____	GEAR 15 _____
GEAR 4 _____	GEAR 10 _____	GEAR 16 _____
GEAR 5 _____	GEAR 11 _____	GEAR 17 _____
GEAR 6 _____	GEAR 12 _____	GEAR 18 _____

IMPORTANT: *Be prepared for tractor movement as it is shifted into reverse.*

Shift back to 1st gear and move the transmission control lever to reverse. Shift through the reverse speeds and record the pressures.

NEUTRAL _____
REVERSE 1 _____
REVERSE 2 _____
REVERSE 3 _____
REVERSE 4 _____

Engage the creep option if equipped and record pressures.

CREEP 1 _____	CREEP 4_____
CREEP 2 _____	CREEP 5_____
CREEP 3 _____	CREEP 6_____

The "PresO" valve manifold pressure will be noticeably lower in the following gears if there is significant clutch leakage:

Low pressure when shift lever is out of Park---------- Indicates Park Clutch Leakage.

Low pressure for Speeds 1, 3, 5, 7, 9, 11, 13, 15, 17, R1 and R3 ---------- Indicates Odd Clutch Leakage.

Low pressure for Speeds 2, 4, 6, 8, 10, 12, 14, 16, 18, R2 and R4 ----------Indicates Even Clutch Leakage.

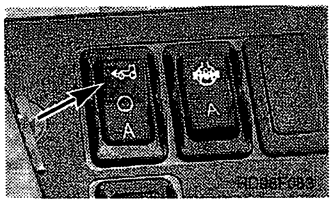
Low pressure in all creep gears ----------Indicates Creep Clutch Leakage.

If the "PresO" valve manifold pressure is low in all gears, the Odd/Even Powershift Valve modulator and unloading spools are sticking. See Powershift valve service section 8005.

IMPORTANT: *Complete Step 7 before disassembling powershift valves or transmission.*

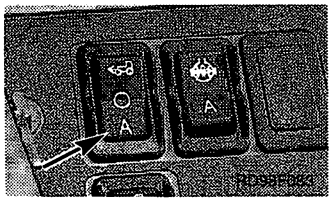
MFD CONTROL MODES

OFF – When the MFD switch is placed in the OFF position, the MFD clutch will be deactivated (coil energized) unless both brakes are applied. The MFD clutch is applied as both brake pedals are applied to allow four wheel braking.



Manual MFD Control (ON) – When the MFD switch is placed in the ON position the MFD will be activated (solenoid deactivated) at all times.

IMPORTANT: *To activate the MFD clutch pack, the solenoid valve is de-energized. The clutch pack is applied mechanically by means of Belleville springs.*



Automatic MFD Control – When the MFD switch is placed in the Automatic position the MFD will be activated (solenoid deactivated) unless the following conditions are applicable.

1. Operating with the hitch position control lever down and the hitch is raised with the UP/DOWN switch (End of Row Feature deactivates MFD).
2. One of the brake pedals is depressed and slip is below 15%.
3. Ground speed is in excess of 10 MPH and slip is below 15%.

NOTE: *If the MFD disengages due to ground speed it will automatically re-engage when ground speed decreases below 8 MPH. To operate the MFD at speeds in excess of 10 MPH, place the switch in the ON position.*

WARNING

These tractors are equipped with a spring applied mechanical front wheel drive (MFD) clutch and a limited slip differential. Even with the engaging switch in the OFF position the MFD clutch can propel both front wheels if any of the following conditions exist.

1. The engine is shut off (regulated supply pressure will drain).
2. The engine is stopped when the rear wheels are still coasting.
3. Any interruption in the clutch operating pressure (hydraulically released clutch).
4. Any interruption in the electrical control power (coil energized to release clutch).
5. Both brakes are applied (automatic MFD operation).

For these reasons the following service procedures must be utilized:

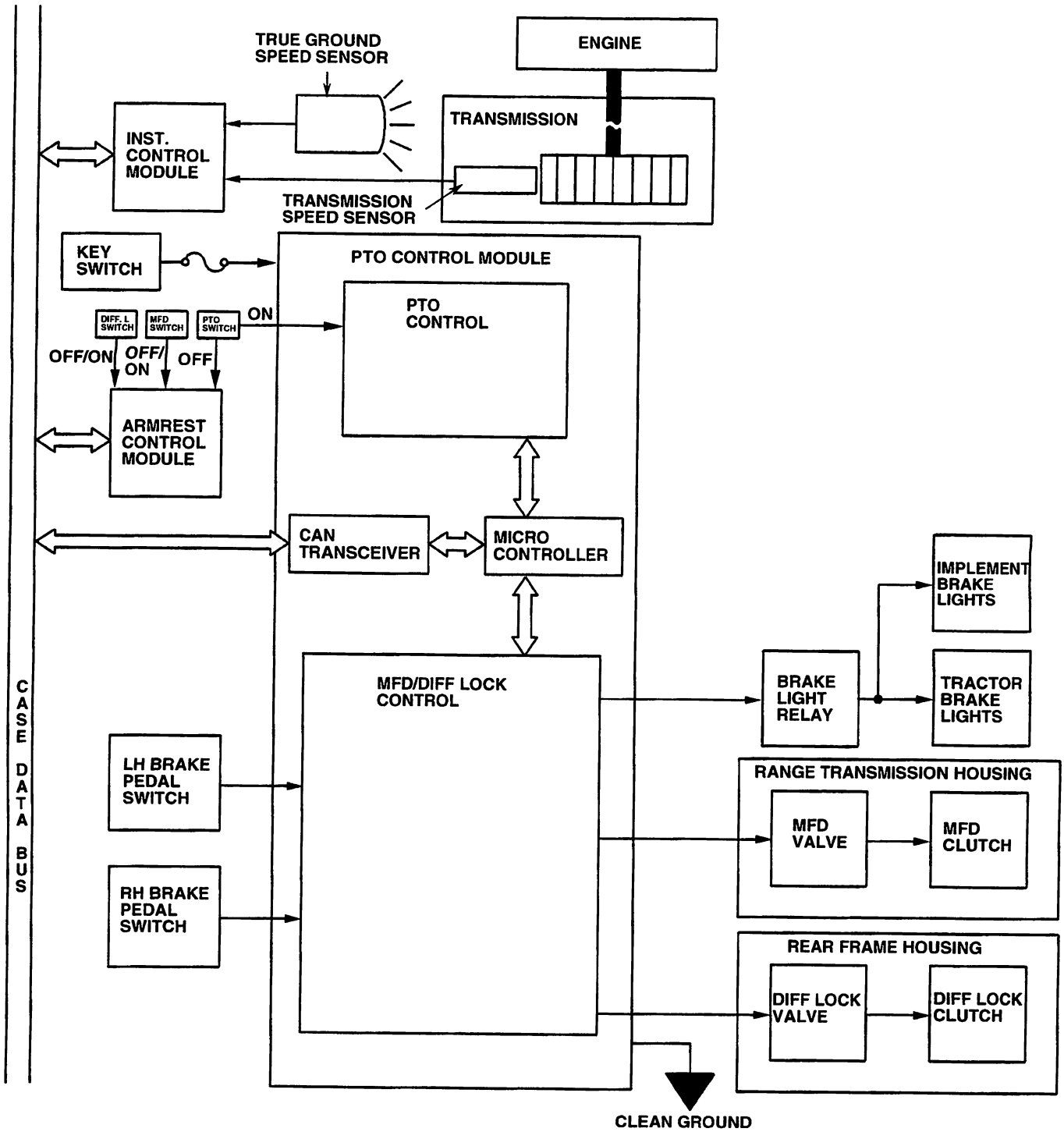
Before rotating the rear wheels of an MFD equipped tractor (when using engine power with the rear wheels raised off the ground) one of the following must be done to prevent accidental tractor movement.

- Jack up and support both front wheels completely off the ground.

- Disconnect the front wheel drive shaft (transmission end).

Observing one of these options will insure that engagement of the MFD clutch will not result in tractor movement.

DIFFERENTIAL LOCK CONTROL



RI98G146

Issued 7-98 Printed in U.S.A.

TABLE OF CONTENTS

NOTE: Case Corporation reserves the right to make improvements in design or changes in specifications at any time without incurring any obligation to install them on units previously sold.

PTO Valve Oil Supply

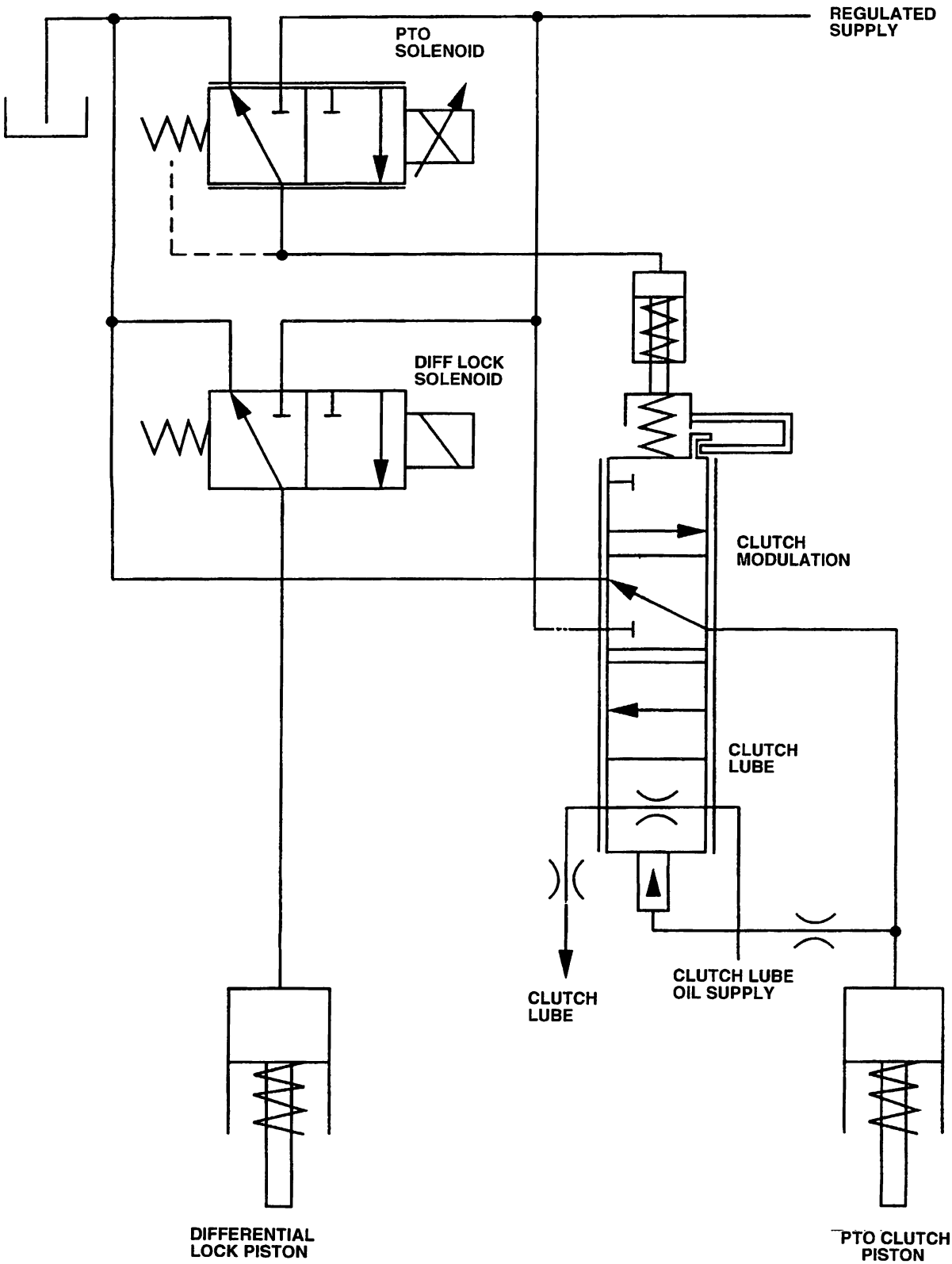
The PTO/differential lock valve is a closed center valve supplying regulated circuit pressure to the PTO and differential lock control circuits. Regulated circuit oil is supplied to the PTO valve regulator spool from the 26 GPM gear pump through the priority/regulator valve. Pressure is regulated to approximately 280- 300 PSI and can be adjusted if required.

PTO Proportional Current Control Solenoid Cartridge Valve

The PTO solenoid is controlled by an arm rest mounted rocker switch. The rocker switch communicates directly with the PTO controller (PTO switch is hard wire to PTO controller) to supply current to the PTO 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 applied with hydraulic pressure.

PTO Clutch Disengaged

When the PTO switch is moved to the disengaged position, the PTO solenoid 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.



RH98H048

Brake Valve Operation – Brakes Released

As the brakes are released, the modulator return spring pushes the modulator outward to the released position. This in turn, pushes the brake control spool outward to the released position. Regulated oil at 280 to 300 psi is supplied to the inlet. The modulator spool blocks this oil supply to the brake ports. With the modulator piston in the released position, brake port oil is connected to the tank port through the inside of the modulator spool and cross-drilled holes. This connection of the brake ports to tank allows the brakes to release.

NOTE

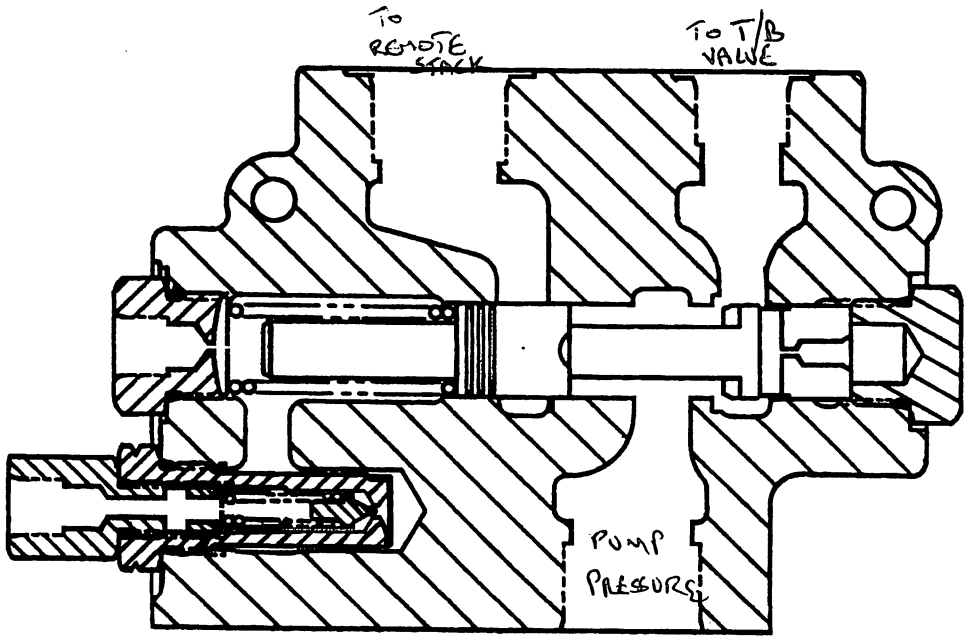
During power braking, it is only necessary to push the pedal enough to port the pressurized oil supply to the wheel cylinder. Pedal force is not required to pressurize oil the within the valve. The regulated pressure supply is sufficient to stop the wheel from turning.

Emergency Braking – When the engine is not running, regulated supply pressure is not available for power braking. As the brake pedals are pushed, the brake valve spools operate a pair of brake valve switches. During emergency braking, both normally closed brake valve switches open, stopping the electrical supply to the parking brake solenoid. As the parking brake engages the tractor stops. Both pedals must be operated to activate the emergency braking action of the parking brake. The transmission control module also monitors the brake valve switches to prevent transmission actuation when the parking brake is applied (solenoid off).

NOTE

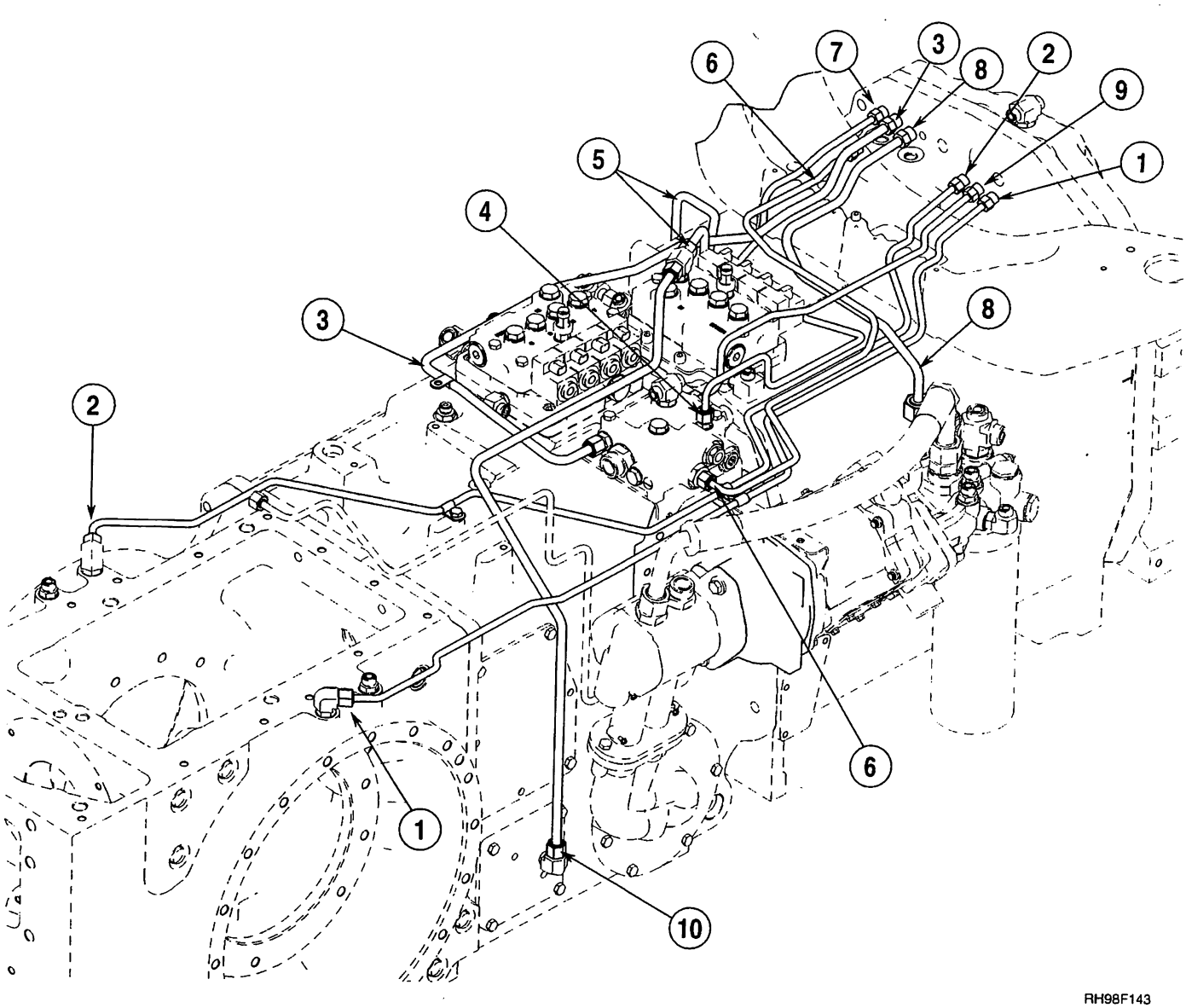
These switches are located on the brake valve assembly and should not be confused with the pedal operated switches located inside the cab used for MFD, differential lock, and brake light relay operations.

BRAKES DO NOT WORK WITH ENGINE STOPPED



TRAILER BRAKE PRIORITY VALVE.

STEERING AND BRAKE TUBE LAYOUT

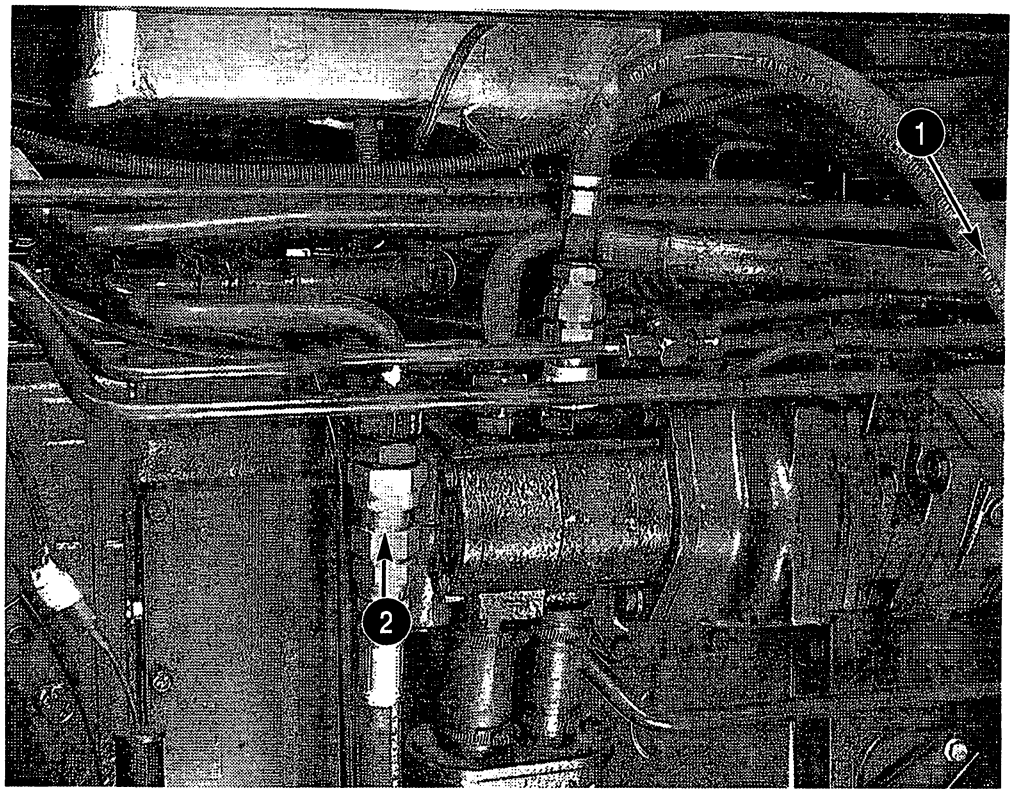


RH98F143

1. R.H. BRAKE SUPPLY
2. L.H. BRAKE SUPPLY
3. STEERING HAND PUMP SUPPLY
4. PRIORITY RETURN TO SUMP
5. FROM PARK BRAKE PUMP
6. STEERING SENSOR
7. BRAKE RETURN TO SUMP
8. STEERING RETURN TO FILTER
9. BRAKE VALVE SUPPLY
10. PARK BRAKE SUPPLY

FRONT /REGULATED SYSTEM PUMP FLOW TEST

Always perform the Regulated System Pressure Test and adjustment procedure before this test.



RD98E088

1. OUT OF FRONT PUMP SECTION TO FLOWMETER INLET
2. FROM OUTLET OF FLOWMETER TO PRIORITY/REGULATOR VALVE

NOTE: *Right hand side view, tire removed for photographic purposes*

The front section of the tandem gear pump supplies oil flow to the steering priority/regulator valve. The steering system has priority for this oil flow. Once the steering system is satisfied the regulated circuits are supplied (MFD, PTO, Park Brake, Diff Lock, Transmission Control Valves, Service Brakes along with the Hitch and Remote valve pilot circuits). When the demand for all these regulated circuits is met all the remaining front pump flow is directed through the oil cooler and then to the filter base.

Test Fitting and Tool Requirements:

- CAS 10280 Flowmeter with 3/4 inch hoses.
- 1-1/2, 1-5/8 and 1-7/8 inch wrenches
- Male ORFS 1-7/16 straight connector to male 1-5/16 JIC (test fitting No. 220162 - CAS 2553)
- Female ORFS 1-7/16 to male 1-5/16 JIC (test fitting No. 215069 - CAS 2553)

STEP 1 - Preparation

- Disconnect the front and rear pump outlet hoses from the pump.
- Move the front section outlet hose assembly to the rear of the pump.
- Connect the rear section outlet hose back onto the open rear port. As the tube nut of the hose assembly is being tightened pull the hose out to make room for the test hose connection.
- Connect test fittings and hoses. Pump outlet to inlet of flowmeter and the outlet of flowmeter to the open front section outlet hose assembly.
- **Be sure the flowmeter load valve is fully open (turned counterclockwise).**

PFC AXIAL PISTON PUMP - OPERATION

Low Pressure Standby

When there is no demand for flow, there is no pressure signal feed back to the pump and the pump will go to the low pressure standby mode. As there is no place for the oil from the pump to flow, the pump will build pressure in the pump outlet passage. This pressure is directed through internal passages in the piston pump back plate to the end of the pump compensator spool opposite the spring.

The spring acting on the flow compensator spool, is set to allow the spool to move at a 340 to 390 psi (23.5 to 27 bar) differential pressure. The flow compensator spool will then move down to allow the oil to flow into the passage leading to the pump control piston.

The pressure acting on the pump control piston tilts the pump swash plate against the swash plate control spring, to a near neutral position. In this condition, the pump will provide just enough flow to make up for internal leakage, thus maintaining a minimum system pressure of 340 to 390 psi (23.5 to 27 bar).

The pump will remain in the low pressure standby position as long as there is no pressure or flow demand from the hydraulic system. In this mode, the pump produces very little heat and absorbs very little horsepower from the engine. This is one of the outstanding features of the PFC axial piston pump.

Engine Start Up

Before the engine is started, the pump swash plate angle will be at its maximum of 17°. Therefore, as soon as the engine is cranked by the starter the PFC axial piston pump will produce flow and, as explained above, pressure will build in the pump delivery passage. As soon as this pressure reaches 340 to 390 psi (23.5 to 27 bar) the pump will be put into its low pressure standby mode. This occurs almost instantly and makes engine starting much easier.

1. SIGNAL LINE PRESSURE
2. PUMP CASE DRAIN
3. CONTROL PISTON PRESSURE
4. PISTON PUMP OUTLET PRESSURE
5. CONTROL PISTON
6. CONTROL SPRING
7. DRIVE SHAFT
8. PUMP HOUSING
9. SWASH PLATE
10. PISTON
11. PISTON BLOCK LOADING SPRING
12. PISTON BLOCK
13. BACK PLATE
14. OUTLET PORT
15. FLOW COMPENSATOR SPOOL
16. HIGH PRESSURE COMPENSATOR SPOOL
17. HIGH PRESSURE SPRING
18. COMPENSATOR ASSEMBLY
19. FLOW CONTROL SPRING
20. CONTROL PISTON GUIDE
21. DRAIN ORIFICE PLUG

PFC PUMP OPERATIONAL PROBLEMS

POOR OVERALL HYDRAULIC PERFORMANCE - LOW FLOW TO HITCH AND ALL REMOTE VALVE CIRCUITS

A. Low hydraulic oil level in transmission.

B. Low charge/lube pressure. Perform rear charge/lube pump pressure test in this section. Complete the entire test procedure

C. Perform the PFC pump high pressure standby test.

D. Perform the PFC piston pump flow test.

- If the pump does not meet specification for standard flow pump, perform Standard Pump Compensator and Swash Plate Inspection in this section.

- If the pump does not meet specification for optional high flow pump, see section 8007. Disassemble compensator, clean and inspect.

E. After completing items A,B,C and D from above:

- If the pump performance is now okay troubleshooting is completed.

- If poor overall hydraulic performance continues, remove PFC pump for repair or replacement. See section 8007.

POOR HYDRAULIC PERFORMANCE - LOW FLOW TO HITCH AND ALL BUT ONE REMOTE VALVE CIRCUIT

A. Go to section 8004 and perform remote valve signal check and hitch signal check test.

POOR HYDRAULIC PERFORMANCE - HITCH OPERATING OKAY, BUT LOW FLOW FROM ALL REMOTE CIRCUITS

A. Go to section 10005 and check for remote system fault codes

- If there are fault codes continue with fault code troubleshooting.

- If there no fault codes go to section 8004 and perform remote valve signal check and hitch signal check test.

- If the signal checks are okay go to section 8004.

POOR HYDRAULIC PERFORMANCE - LOW FLOW OR ERRATIC HITCH OPERATION, BUT ALL REMOTE VALVE CIRCUITS ARE OPERATING OKAY

A. Go to section 10002 and check for hitch system fault codes

- If there are fault codes continue with fault code troubleshooting.

- If there no fault codes go to section 8006.

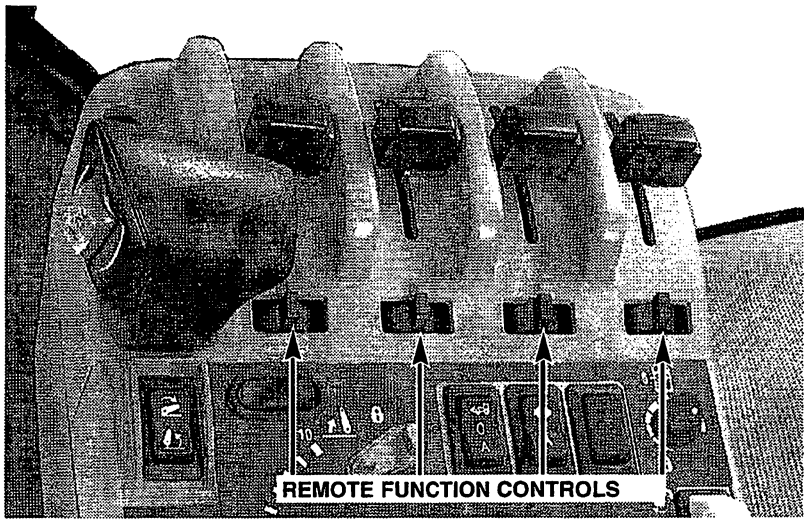
PFC SYSTEM REMAINS ON HIGH PRESSURE STANDBY, OR IS SLOW TO COME OFF HIGH PRESSURE STANDBY

A. Pump compensator bleed down orifice is blocked, or partially blocked.

Remote Function Control

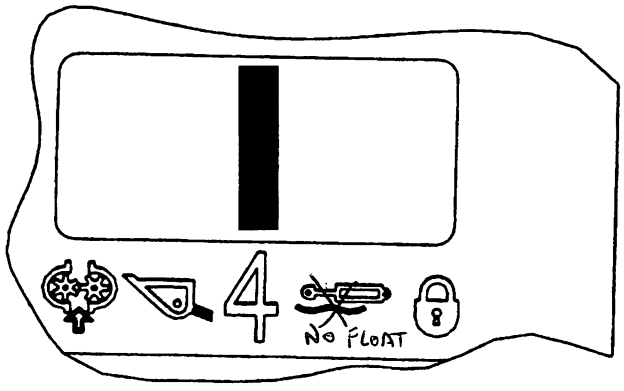
There are three or four remote function controls on the armrest control console depending on the number of remote circuits on your tractor. There is no remote function control for the optional 5th remote section.

There are five remote function control positions for special remote system conditions.



RR97J027

Full Function Position



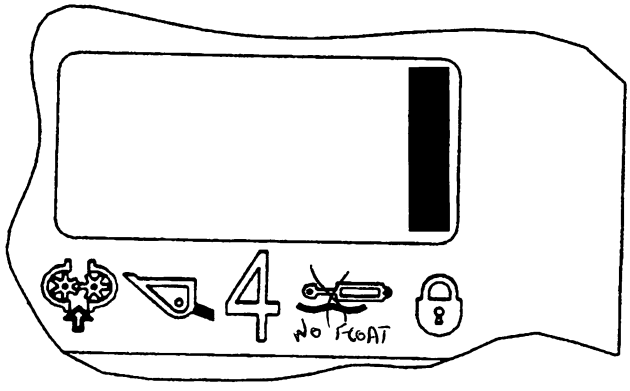
RH97J002

CLOSE UP REMOTE FUNCTION CONTROL

In the full function position the remote control lever will have full function including the float position.

To operate the remote hydraulics in a float condition, make sure the remote function control is in the full function position and push the remote control lever fully forward.

Neutral Lock Position



RH97J002

CLOSE UP REMOTE FUNCTION CONTROL

The remote hydraulic control levers can be locked in the neutral position. This prevents a remote lever from being accidentally operated during transport. This can be done by moving the remote control lever to the neutral position and rotating the remote function control to the right lock position.

NOTE: *This must be done for each remote control lever that you intend to be locked out.*

REMOTE VALVE OPERATION

General

MAIN VALVE SPOOL - The main valve spool is spring centered in neutral and is positioned by the stepper motor assembly. The spool position determines the flow rate and the flow path of the supply flow.

PRESSURE COMPENSATED FLOW CONTROL SPOOL - Each valve section contains a pressure compensated flow control spool which functions to maintain a constant pressure drop across the main valve spool. This constant pressure drop results in a constant flow rate across the main valve spool.

LOAD CHECK AND PLUNGER - The load check is installed in the "B" extend port to prevent the settling of a load (in neutral) because of control spool leakage. It also serves as a check valve to prevent a drop in a partially raised cylinder when the remote valve is operated.

When lowering, oil is fed to the left hand side of the plunger. The plunger will be forced up against the load check pilot poppet to relief trapped pressure. The plunger then contacts the main poppet moving it to the left allowing flow back to tank.

SIGNAL CHECK - The signal check isolates each remote valve's operating pressure from the other valves in the system. When more then one remote valve section is in operation, the valve operating at the higher pressure will signal the compensator on the PFC pump.

Neutral

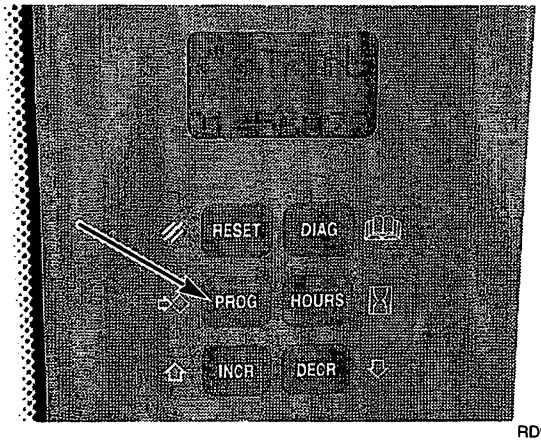
All the remote valve sections function in the same way. In neutral the position of the main valve spool is spring centered. Pump supply is available to the inlet ports of all the remote valve sections.

Pump pressure from the inlet is available to the left end of the pressure compensated flow control spool by way of an orifice in the center of the hollow pressure compensated flow control spool. This will force the spool against the spring. The flow control spool spring force tries to open up supply flow to the main valve spool and the intermediate pressure on the left hand side of the flow control spool tries to close flow down. Once the intermediate pressure is high enough to overcome the flow control spring force the flow control spool blocks the flow path to the main valve spool. In neutral the intermediate pressure is blocked from the work ports by the main valve spool lands.

A load check valve is installed into the extend port, which will prevent the settling of a load (in neutral) due to main valve spool land leakage. It also serves as a check valve to prevent a drop in a partially raised cylinder when that valve is operated.

A signal check valve is installed into the signal port, which will isolate the highest system signal pressure from each individual remote valve's operating pressure.

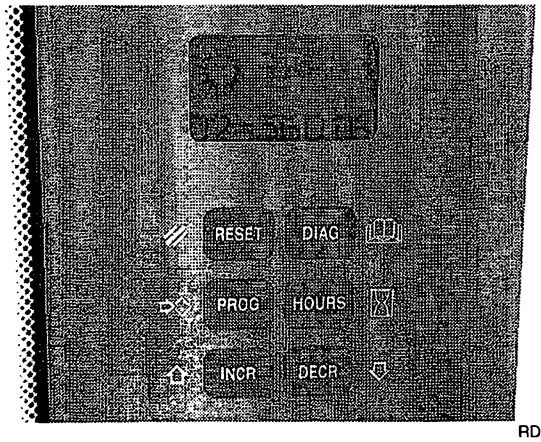
STEP 3



RD98F034

When the required controller is displayed, press the PROG key. If a controller is selected that is not on the bus (does not exist), the display will read COMM ERR.

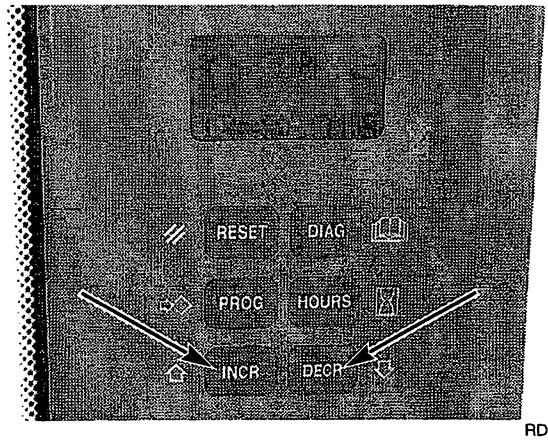
STEP 4



RD98F035

Use the INCR and DECR keys to scroll through the 10 possible fault codes. The controller name will be at the top of the display. The fault code and which number that fault is (01 to 10), will be at the bottom of the display.

STEP 5

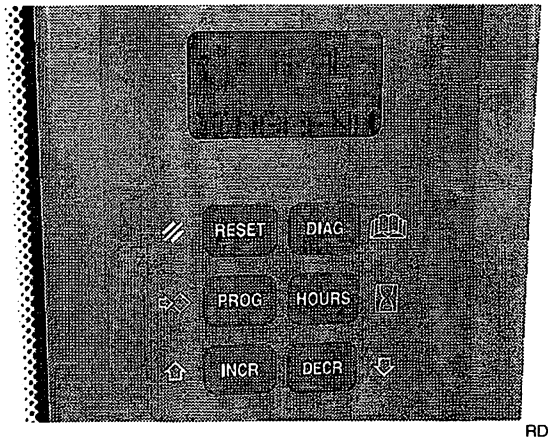


RD98F035

To erase the fault codes from a controller, press and hold both the INCR and DECR keys for 10 seconds.

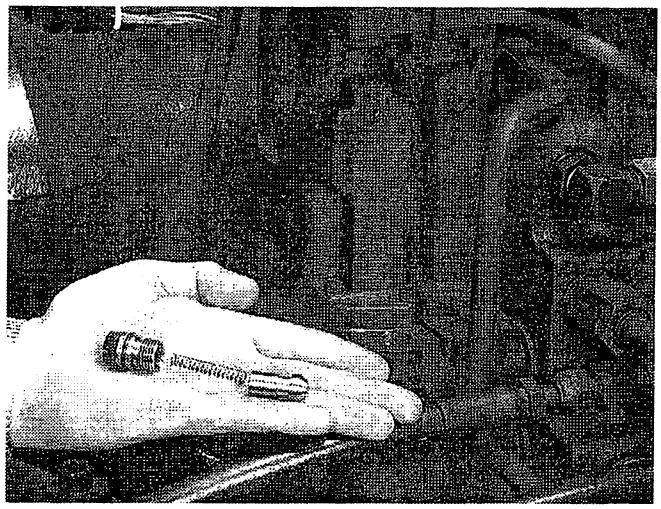
NOTE: ***All*** *the fault codes for that controller will be erased.*

STEP 6



RD98F036

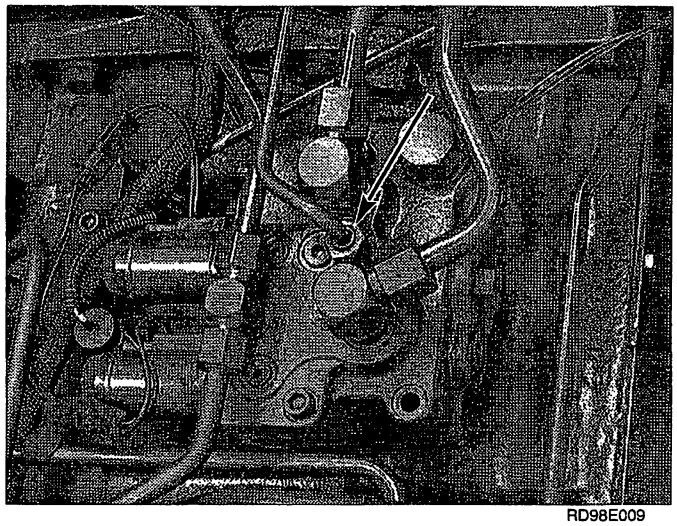
When the fault codes are erased, the display will return to main screen for that controller.



RD98E122

REMOTE VALVE SIGNAL CHECK

C. If the trapped oil pressure in the signal line quickly drops at the same rate as each remote valve section is placed into float then the hitch signal check is leaking.



RD98E009

HITCH VALVE SIGNAL CHECK REMOVE THIS TUBE

ELECTRONIC HITCH CONTROL

Operator Controls and Settings