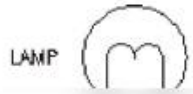
# Alternator - Electrical schema

SC180 Variable Drive, SC230 Variable Drive, SC260 Variable Drive, SC380 Variable Drive, SC430 Variable Drive




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# PRIMARY HYDRAULIC POWER SYSTEM - Hydraulic schema

SC180, SC230, SC260

Oil is supplied from one tractor remote to operate three cart functions; the fan circuit, the auger circuit, and the variable drive meter circuit.

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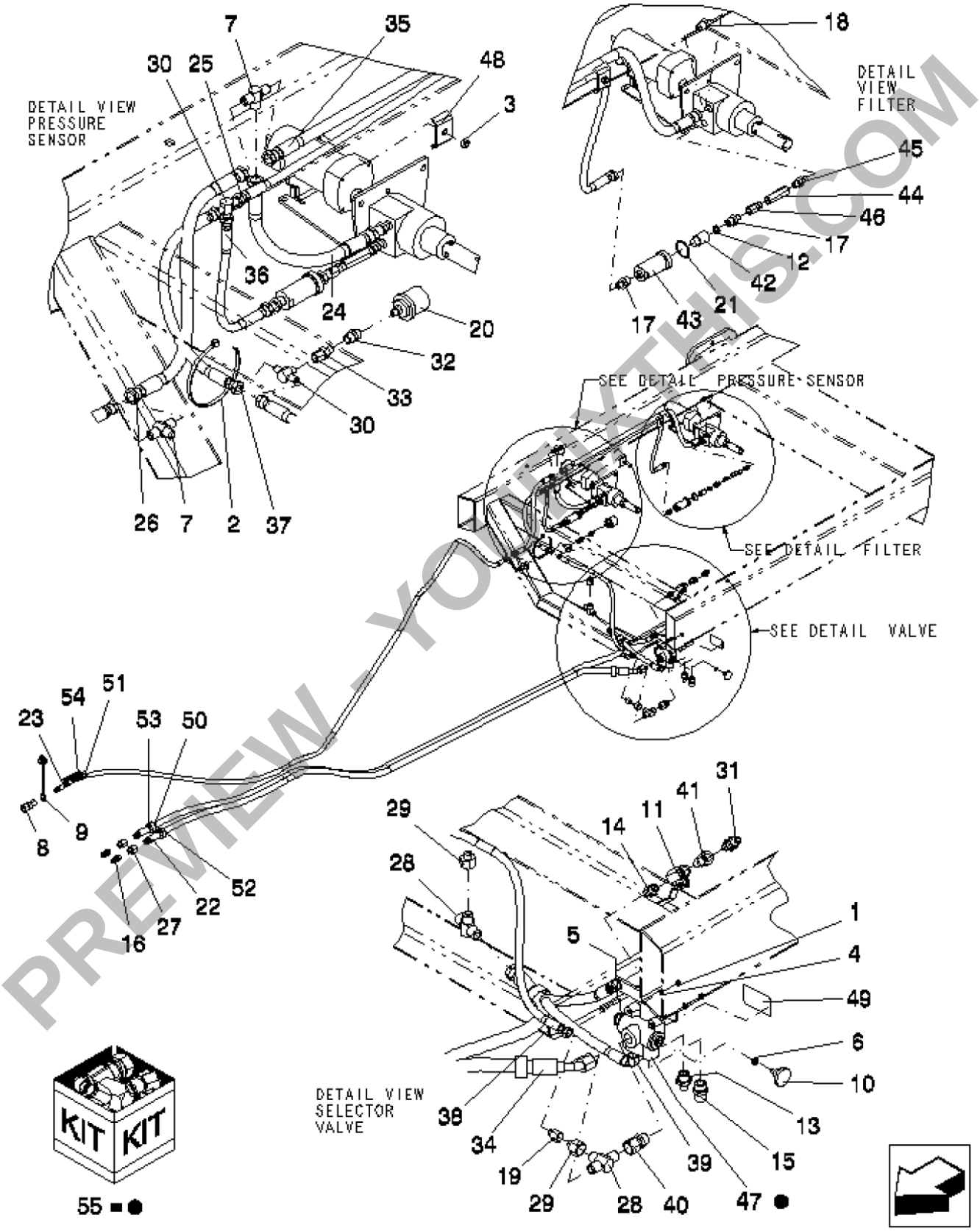
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# PRIMARY HYDRAULIC POWER SYSTEM - Exploded view

SC180 Variable Drive, SC230 Variable Drive, SC260 Variable Drive

Main Frame Variable Drive Hydraulics




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**Variable Drive Hydraulics**



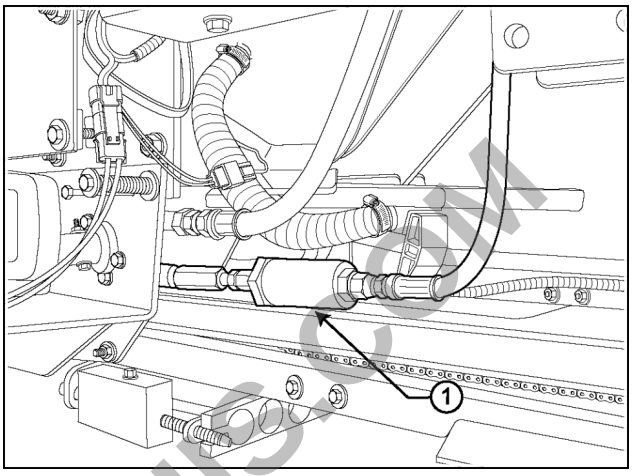
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# Filter - Replace

SC180 Variable Drive, SC230 Variable Drive, SC260 Variable Drive, SC380 Variable Drive, SC430 Variable Drive

1. Clean the hydraulic oil filter. (Filters **(1)** are mounted on the lines leading to the variable rate drives.) First, remove the filter from the housing. Clean the element **(1)** with solvent. Blow out with air at low pressure. Allow to dry. Replace the filter on the air cart.

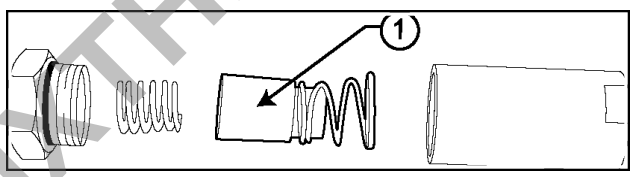
***NOTE:*** *Clean the filter every 100 hours.*




198763M1 1

2. Replace filter every 300 hours or if damaged.

***IMPORTANT:*** *The filter must be changed after the first ten hours of use.*

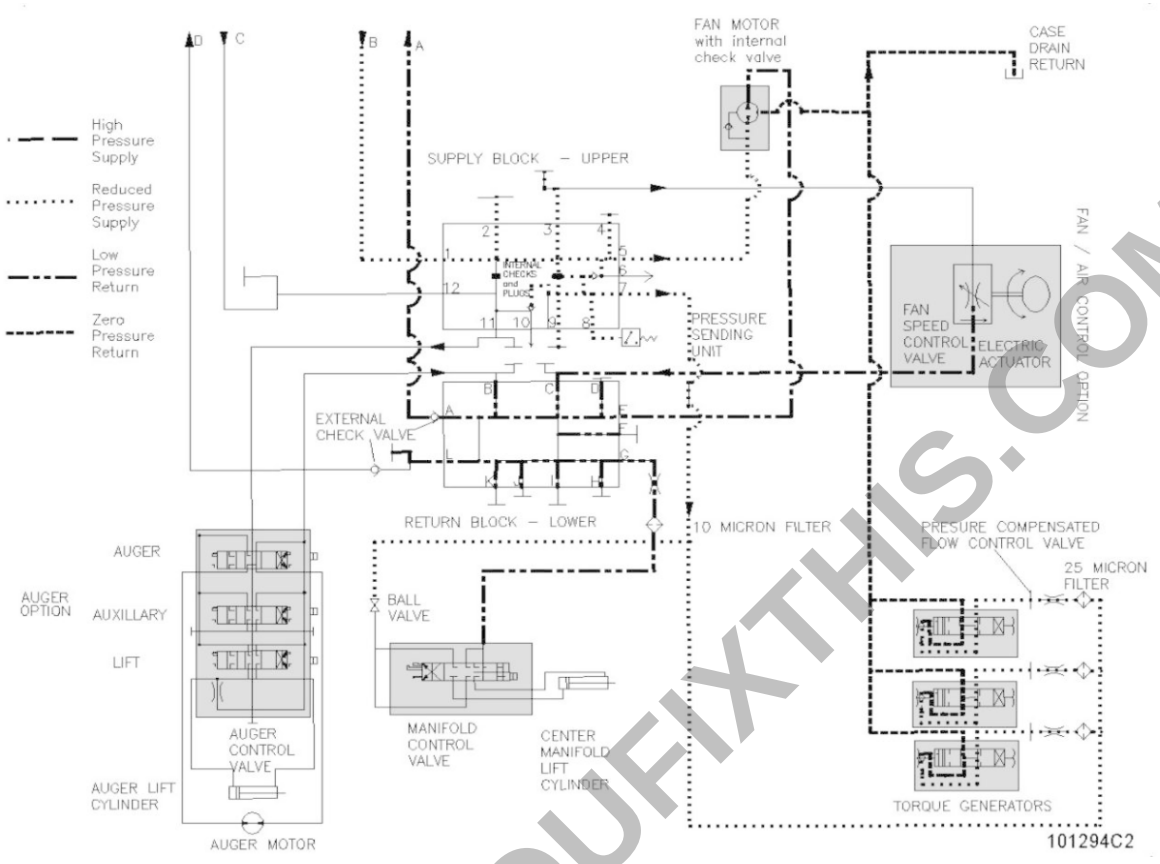



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Fan / Air Control Option Circuit Hydraulics




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**Fan / Air Control Option Circuit Hydraulics.**

This schematic identifies the function of the fan/air control option as it affects the fan circuit. This option allows the fan circuit hydraulic flow to be adjusted on the go by using an electric actuator and the fan speed control valve. Both of these components are installed between the supply and return circuit of the fan.

- The operator must first ensure the fan speed control valve is fully closed before the maximum required fan speed for a given seeding application is set. By adjusting the tractor's hydraulic flow control, the maximum fan speed can be set. Then, the operator will use the display monitor to adjust fan speed by pushing the increase or decrease keys on the console. This action changes the fan speed by regulating bleed-off oil from the supply circuit to the return circuit. This option is not intended to be used to set initial fan speed.

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# PRIMARY HYDRAULIC POWER SYSTEM - Testing

| N° | Test Point | Expected Result | Other Result (Possible Cause) |
|---|---|---|---|
| 1 | **Condition**<br>Check that the fan is not turning backwards.<br>**Check**<br>Ensure that the check valve is plumbed correctly. | **Result**<br>The low hydraulic pressure message is not displayed. | **Action**<br>Make sure the fan is operating at a high enough RPM and the hydraulic pressure is greater than **3100 kPa** (**450 psi**).<br>Go to the next test point. |
| 2 | **Condition**<br>Unplug the hydraulic pressure switch from its harness connection when the fan is operating.<br>**Check**<br>Measure resistance between contact 2 and contact 1 of the pressure switch connector. | **Result**<br>The resistance is less than **10 ohms**.<br>**Action**<br>The remote unit to which the switch is connected may be faulty. | **Action**<br>The resistance is not less than **10 ohms**.<br>Replace the pressure senor wit an air flow sensor and repower the system. If the low pressure message is still displayed replace the original pressure switch and go to the next test point. |
| 3 | **Condition**<br>The remote unite to which the switch is connected may be faulty.<br>**Check**<br>Replace the remote unit. | **Result**<br>The low hydraulic pressure message is no longer displayed. | **Action**<br>If the low hydraulic pressure message is still displayed, reconnect the original remote.<br>Go to the next test point. |
| 4 | **Condition**<br>For air carts with steel tanks, inspect the hydraulic pressure switch connections to the air cart harness.<br>**Check**<br>Replace the pressure switch cable if faulty. | **Result**<br>The low pressure message is not displayed | **Action**<br>If the low hydraulic pressure message is still displayed, reconnect the original cable.<br>Enter the problem in the ASIST program. |

# PRIMARY HYDRAULIC POWER SYSTEM - Troubleshooting

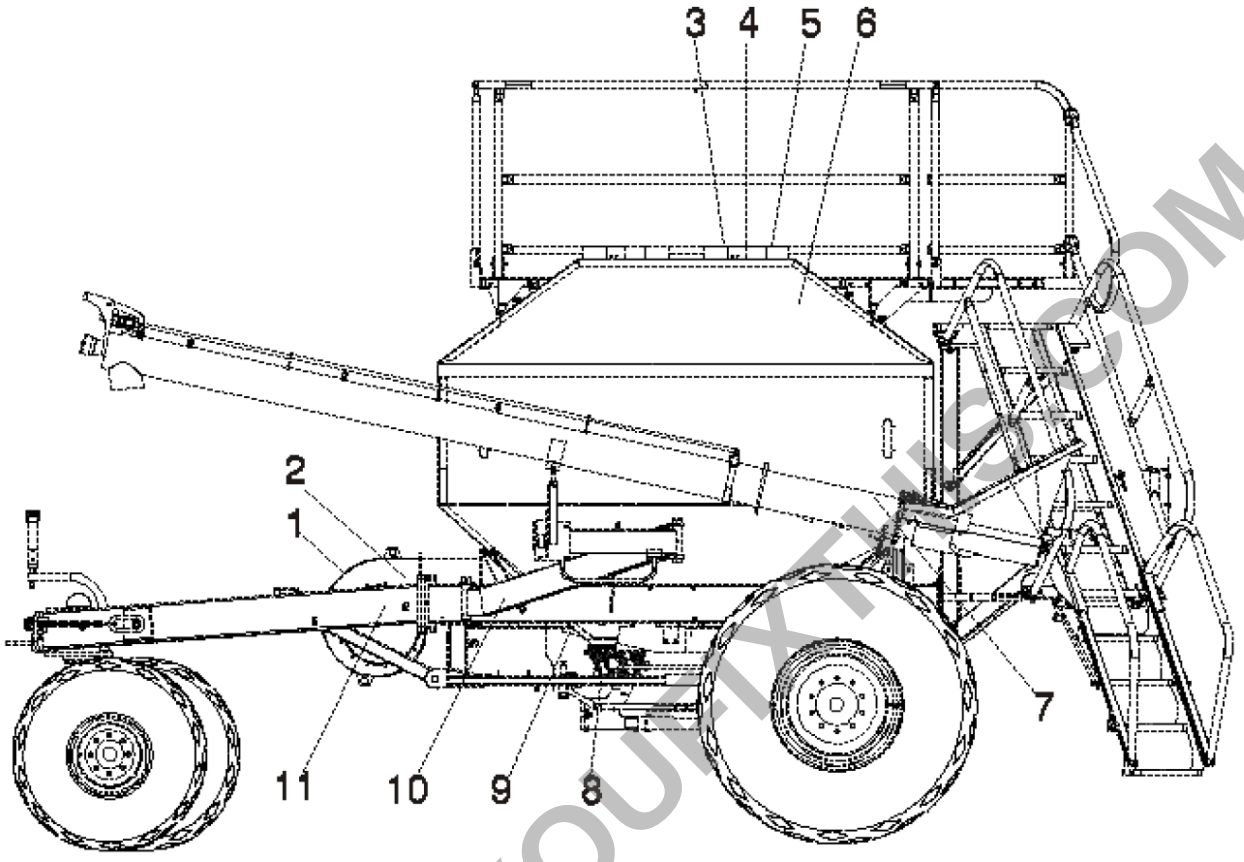
| Problem | Possible Cause | Correction |
|---|---|---|
| **FC110 - Low Hydraulic Pressure** | The tractor hydraulics are not engaged. | The monitor will not permit motors to run as long as there is no hydraulic pressure. |
| | Fan speed is too low. | Increase the fan **RPM** to increase the hydraulic flow. |
| | The fan may be rotating in the wrong direction. | Check the fan for proper rotation. |
| | The pressure sensor may have failed. | Unplug the pressure sensor and plug in an air flow sensor. If the alarm disappears the pressure sensor is faulty. |
| | There some other problem with the electrical or hydraulic system. | Refer to the hydraulic testing procedure. **PRIMARY HYDRAULIC POWER SYSTEM - Testing (A.10.A)** |
| **Hydraulic oil is too hot** | Insufficient oil cooling. | Review fan drive requirements. |
| | Cooling radiator is too small. | Increase cooling capacity. |
| | No cooling radiator. | Add cooling capacity. |
| | Oil reservoir is too small. | Increase reservoir size. |
| | Oil bypass rate is very high. | Reduce bypass rate. Increase fan speed. |
| | Low hydraulic fluid level in the tractor. | Maintain adequate oil levels. |
| **Hydraulic control lever in tractor not holding detent position.** | Hydraulic line pressure exceeds the detent setting. | Adjust detent setting. |
| | Pressure spikes in the hydraulic system. | Operate selector and spool valves. |
| | Faulty detent mechanism | Service as required. |

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# Decals

SC180, SC230




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**Safety Decal Locations - Tow Behind Cart**

Refer to the description of the decals.

1. DANGER - Danger Fan




GD50073 2

2. DANGER - Danger, Keep Shields in Place.




gl70052 3



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# Abbreviation

## Units of Measure

| SYMBOL | UNIT |
|---|---|
| **ac** | Acres |
| **Bu** | Bushel |
| **cm** | Centimeters |
| **m³** | Cubic Meters |
| **ft³** | Cubic Feet |
| **°F** | Degrees Fahrenheit |
| **°C** | Degrees Celcius |
| **ft** | Feet |
| **oz** | Fluid ounces |
| **UK gpm**, **US gpm** | Gallons/minute |
| **gal/ac** | Gallons per acre |
| **UK gal**, **US gal** | Gallons |
| **ha** | Hectares |
| **Hp** | Horsepower |
| **in** | Inch |
| **kg/ha** | Kilograms per hectare |
| **kg** | Kilograms |
| **km** | Kilometer |
| **km/h** | Kilometers per hour |
| **kN** | Kilonewtons |
| **kPa** | Kilopascal |
| **kW** | Kilowatt |
| **L/ha** | Liters per hectare |
| **L/min** | Liters/minute |
| **L** | Liter |
| **m** | Meters |
| **mph** | Miles per hour |
| **mm** | Millimeters |
| **Nm** | Newton Meters |
| **lb in** | Pound force inches |
| **lb ft** | Pound force feet |
| **psi** | Pounds per square inch |
| **lb** | Pounds |
| **lbs/ac** | Pounds per acre |
| **amps** | Amperes |

## ELECTRONIC SYSTEM ABBREVIATIONS

| ABBREVIATION | DEFINITION |
|---|---|
| 485 | Standard for communication interface between electronic units. |
| AUX | Auxiliary |
| CAL | Calibrate |
| CAN | Controller area network |
| CAN L | Low voltage level signal for CAN communications. |
| CAN H | High voltage level signal for CAN communications. |
| DTM Series | Model of deustch connector |
| ECU BAT | ECU power connection, same as ECU PWR |
| ECU | Electronic control unit |
| EEPROM | Electrically erasable programmable read only memory |
| GND | Ground (electrical) |
| IC | Integrated circuit |
| LCD | Liquid crystal display |

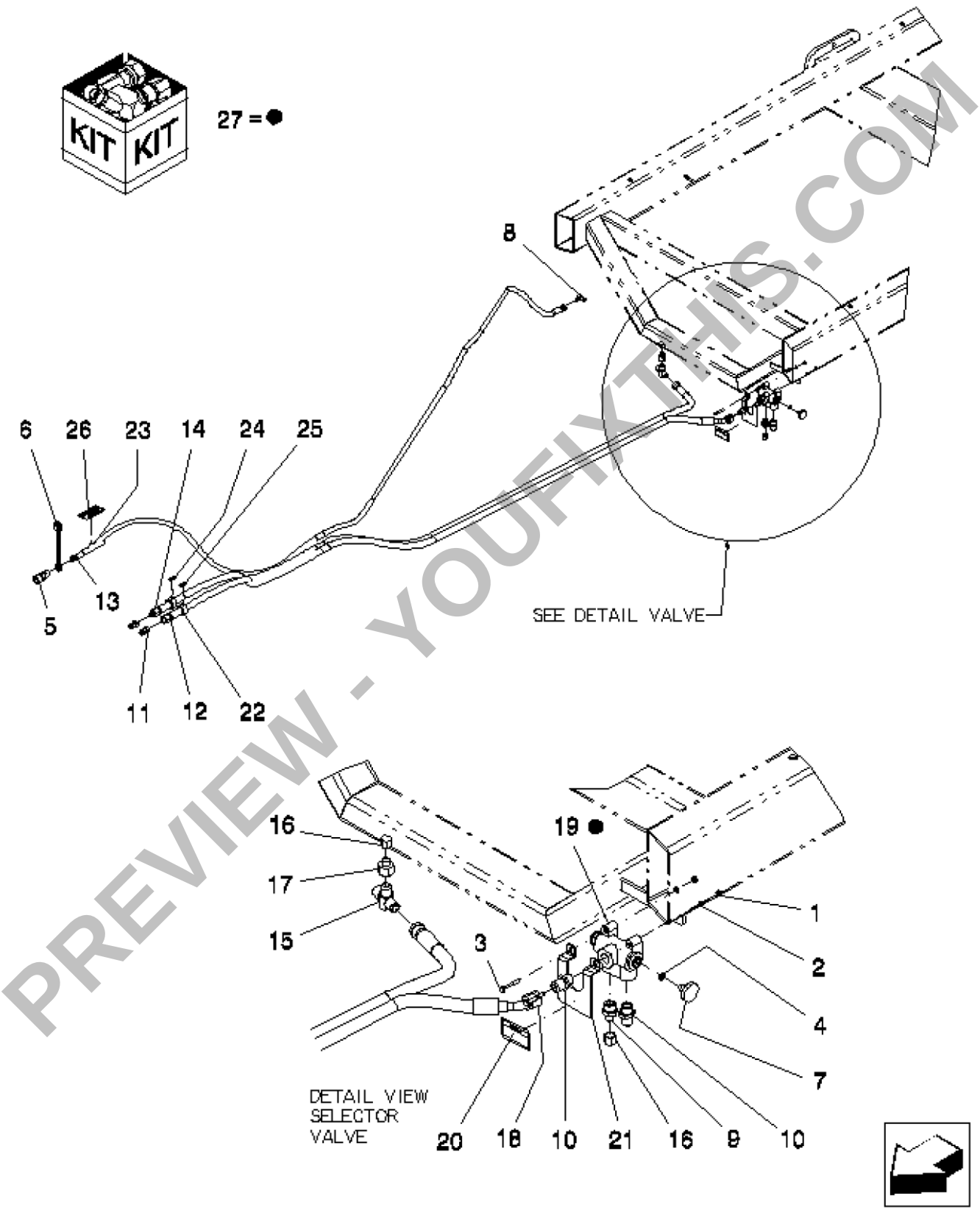
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# PRIMARY HYDRAULIC POWER SYSTEM - Exploded view

SC180 Tow Between, SC180 Mechanical Drive, SC230 Tow Between, SC230 Mechanical Drive, SC260 Tow Between, SC260 Mechanical Drive

Tow Between Mechanical Drive Main Frame Hoses




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**Tow Between Mechanical Drive**

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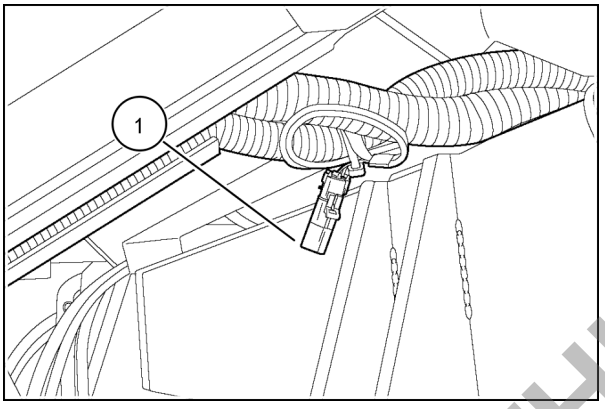
Tow Between Variable Drive

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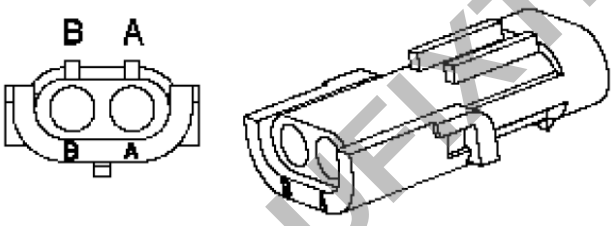

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| Cavity / Pin | Circuit Description |
|---|---|
| 1 | SW12V_GROUND |
| 2 | AIR_A |
| 3 | SW12V_POWER |

***P11 - Connector to Master Clutch Jumper***



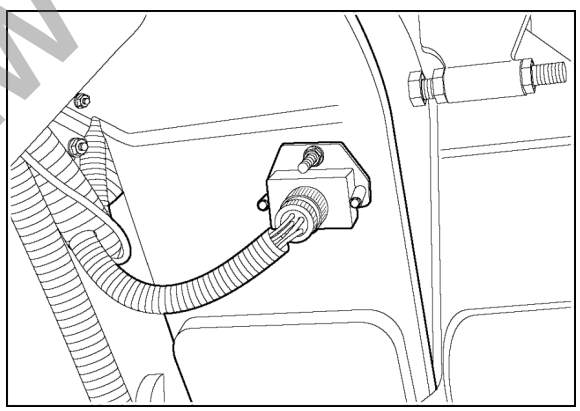

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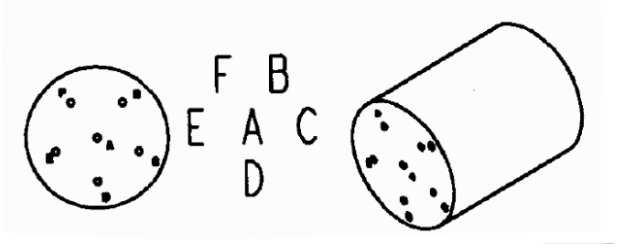

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| Cavity / Pin | Circuit Description |
|---|---|
| A | SW12V_POWER |
| B | SW12V_GROUND |

***P12 - Connector to Black (unpowered) Terminator***



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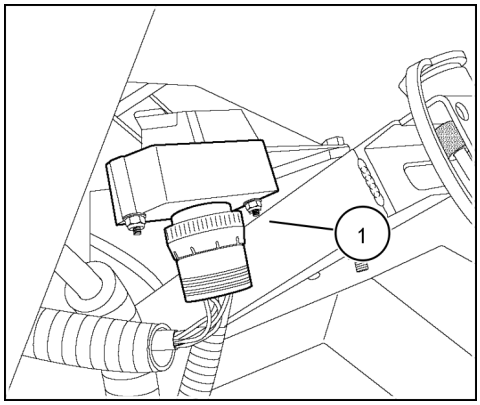



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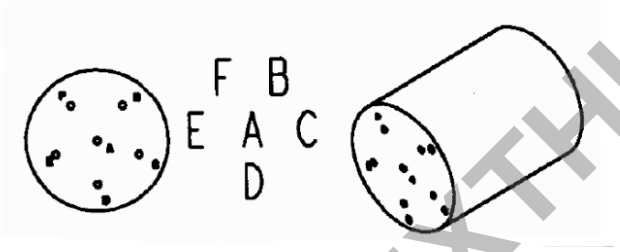


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***P33 - Connector to Terminator***



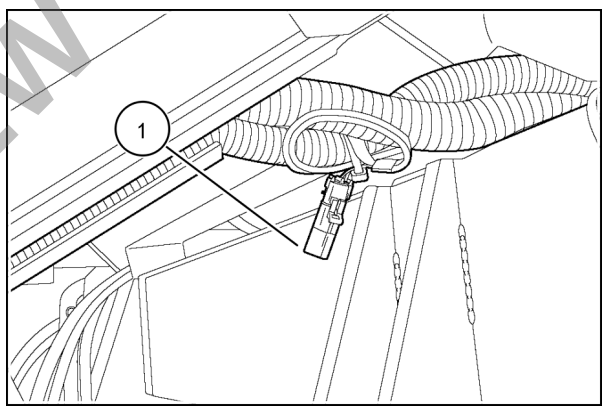

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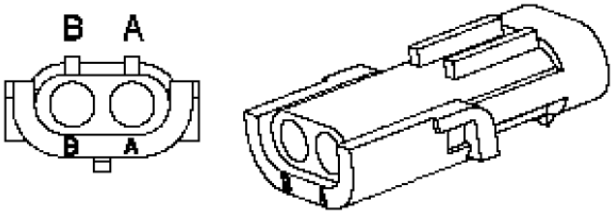

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| Cavity / Pin | Circuit Description |
|---|---|
| A | ECU_GND |
| B | TBC_RTN |
| C | TBC_PWR |
| D | ECU PWR |
| E | CAN_H |
| F | CAN_L |

***P35 - Connector to Clutch Jumper***



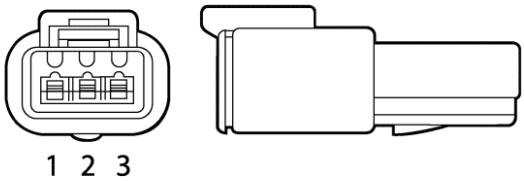

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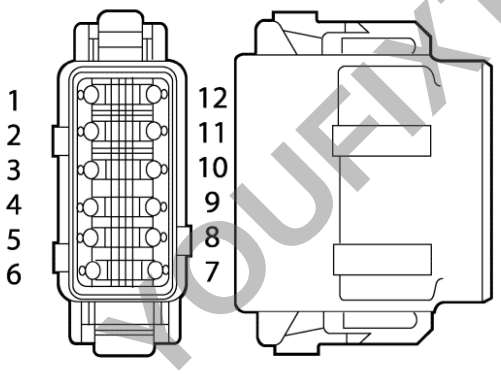

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DEU_DTM04-3P 22

| Cavity / Pin | Circuit Description |
|---|---|
| 1 | SW12V_GROUND |
| 2 | AIR_A |
| 3 | SW12V_POWER |

***P19 - Connector to Air Cart Auxiliary Remote***




DEU_DTM06-12S 23

| Cavity / Pin | Circuit Description |
|---|---|
| 1 | SWITCH 12 VOLT POWER |
| 2 | SWITCH 12 VOLT POWER |
| 3 | SWITCH 12 VOLT POWER |
| 4 | SWITCH 12 VOLT POWER |
| 5 | ECU_GROUND |
| 6 | CAN_L |
| 7 | CAN_H |
| 8 | ECU_POWER |
| 9 | SWITCH 12 VOLT GROUND |
| 10 | SWITCH 12 VOLT GROUND |
| 11 | SWITCH 12 VOLT GROUND |
| 12 | SWITCH 12 VOLT GROUND |

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# Data bus - Testing

| N° | Test Point | Expected Result | Other Result (Possible Cause) |
|---|---|---|---|
| 1 | **Condition**<br>Is the powered terminator (grey) plugged in?<br>**Check**<br>Plug in the powered terminator into the tractor harness at the connector labelled "Terminator". Ensure there are no bent pins. Make sure the connector is properly locked. | **Result**<br>The console displays implement information. | **Action**<br>The console does not display implement information.<br>Go to the next test point. |
| 2 | **Condition**<br>Is the active terminator (black) plugged in?<br>**Check**<br>Plug in the active terminator into the end of the implement harness at the connector labelled "terminator". Enusre there are no bent pins. Make sure the connector is properly locked. | **Result**<br>The console displays implement information. | **Action**<br>The console does not display implement information.<br>Go to the next test point. |
| 3 | **Condition**<br>Ensure the powered terminator is functioning.<br>**Check**<br>At the diagnostic connector, measure the voltage between Pin A and Pin C and Pin A and Pin D. | **Result**<br>The voltage at Pin C is greater than or equal to **2.5 volts** and the voltage at Pin D must be less than or equal to **2.5 volts** measured to Pin A.<br>**Action**<br>If the volage reading is greater than **4 volts** or less than **1 volts** the terminator may be faulty.<br>Replace the terminator. | **Action**<br>Go to the next test point. |
| 4 | **Check**<br>Measure the voltage between sockets B and A on the diagnostic connector on the tractor harness. | **Result**<br>The voltage is between **11 - 14.5 volts**<br>**Action**<br>Inspect the tractor, air cart and seedtool (if installed) harnesses for opens or shorts of ECU_PWR or ECU_GND leads.<br>Disconnect rear most harness and repeat measurement. Then disconnect the next rearmost harness and repeat the measurement. Repair or replace the harness that causes the incorrect voltage reading. | **Action**<br>The console does not display implement information.<br>Go to the next test point. |
| 5 | **Check**<br>Measure the voltage between sockets C and A, and D and A on the diagnostic connector on the tractor harness. | **Result**<br>The voltage at C is greater than or equal to **2.5 volts** and the voltage at D must be less than or equal to **2.5 volts** measured to A.<br>**Action**<br>Inspect the tractor, air cart and seedtool (if installed) harnesses for open of shorts of CAN_H or CAN_L leads.<br>Disconnect rear most harness and repeat measurement. Then disconnect the next rearmost harness and repeat the measurement. Repair or replace the harness that causes the incorrect voltage reading. | **Action**<br>The console does not display implement information.<br>Go to the next test point. |

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C. If sensor Y incorrectly indicates "no flow" and the sensor it was exchanged with correctly indicates "flowing" replace sensor Y. (Cause = pin sensor internal fault.)

D. If sensor Y correctly indicates "flowing" and the sensor it was exchanged with incorrectly indicates "no flow", then go to **4**

4. Verify the sensor power source.

A. Disconnect the sensor from the cable it is connected to.

B. Measure the voltage across contacts 1 and 2 on the connector**P1** the sensor was connected to.

C. If the voltage is between **6.5 - 8.0 volts** dc the sensor has an acceptable power source, replace the sensor . (Cause = flow sensor internal failure.)

D. If the voltage is not between **6.5 - 8.0 volts** dc the remote is not providing an acceptable power source. Go to **5**

5. Verify the sensor power source extension cable wires.

A. If the sensor is not connected to any extension cable go to **6**

B. Locate and disconnect connector P1 on the extension cable for sensor Y.

C. Measure the voltage at contact 1 with respect to contact 2 on the connector that P1 of the extension cable was connected to.

D. If the voltage is between **6.5 - 8.0 volts** dc repair or replace the extension cable for sensor Y. (Cause = sensor harness wiring fault.)

E. If the voltage is not between **6.5 - 8.0 volts** dc the remote is not providing an acceptable power source. Go to **6**

6. Verify the sensor power source wires from the flow remote.

A. Disconnect the connector at the remote that supplies power to sensor Y. Sensors numbered 1 to 9 are on one 30 conductor connector and sensors numbered 10 to 24 are on the other 30 conductor connector. Refer to the flow gateway harness, flow remote harness and 15 input harness diagrams.

B. Verify electrical continuity **Basic instructions** on wires SENY- and SENY+ for sensor Y.

C. Verify electrical isolation between wires SENY- and SENY+ for sensor Y.

D. If the sensor power source wired have correct electrical continuity and electrical isolation, replace the remote. (Cause = flow gateway remote internal failure or flow remote internal failure.)

E. If the sensor power source does not have correct electrical continuity, repair or replace the associated harness. (Cause = sensor harness wiring fault.)

**Flow monitoring - Electrical schema (L.10.C.91 - C.20.A.40)**

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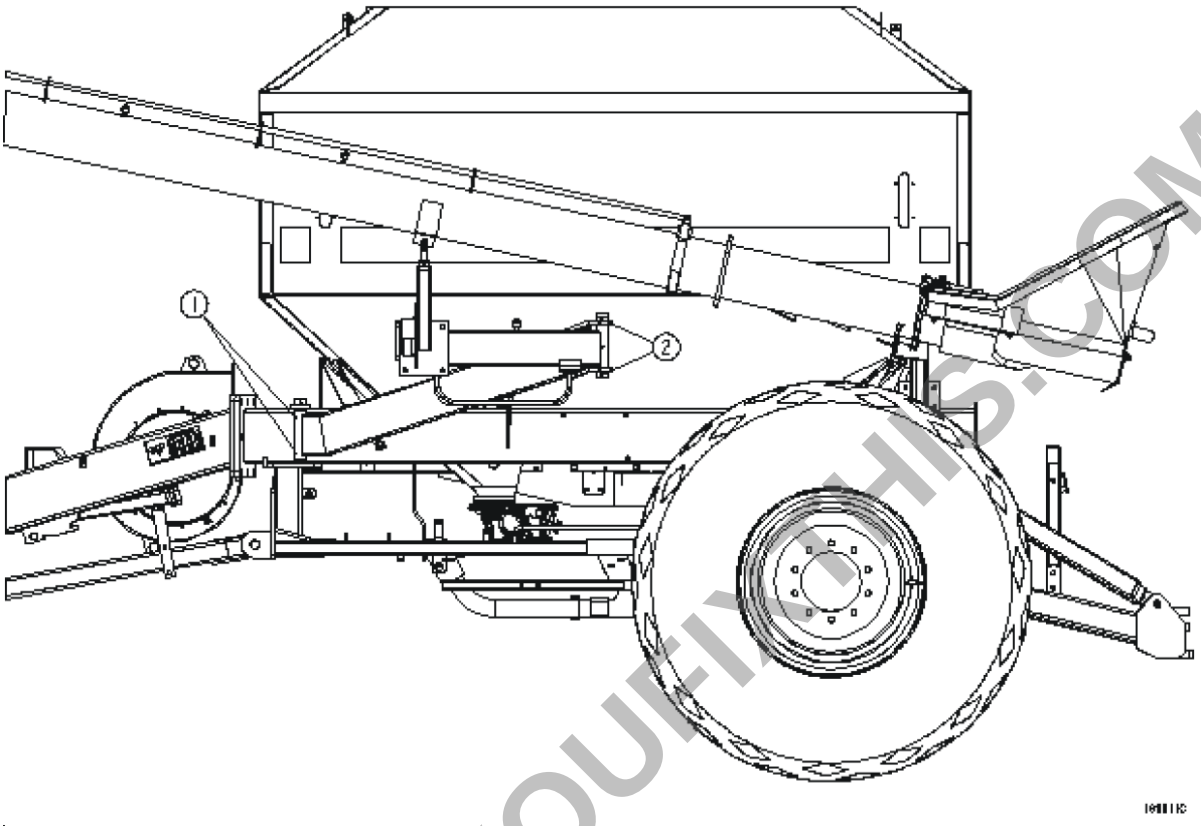

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# Auger - Grease

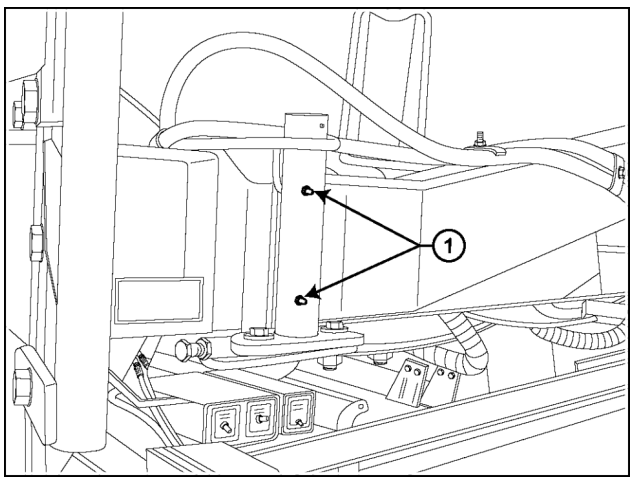
SC180, SC230, SC260




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**Auger Grease Locations**

1. Grease the lower auger arm in two locations **(1)**.

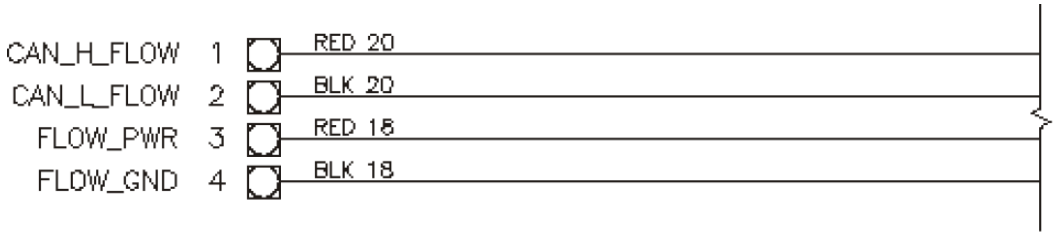


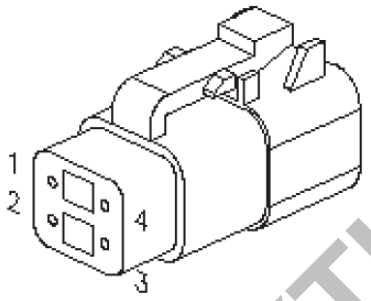

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202642C

202642C 7

**Flow Bus Connector**




202633C

202633c 8

**2 - Conductor Shorting Plug**

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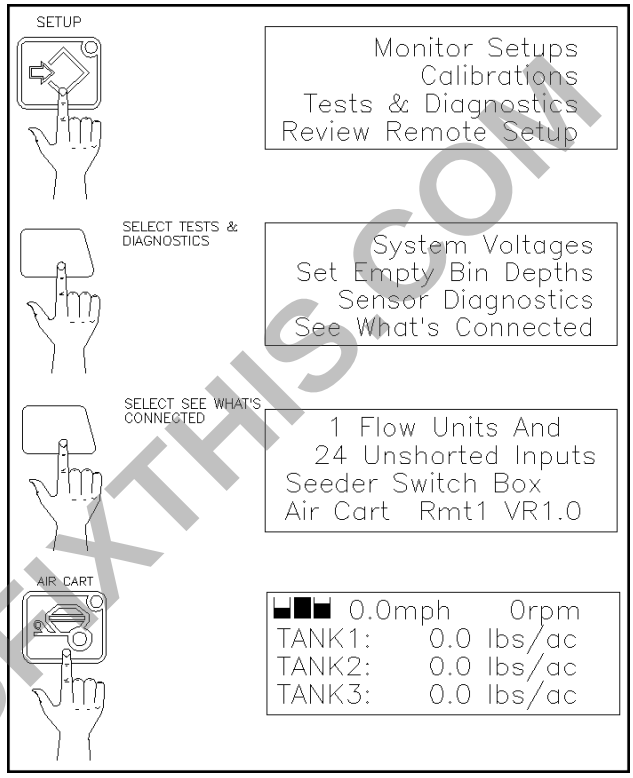
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# Flow monitoring - Check

SC180 Contact (Pin) Sensor, SC230 Contact (Pin) Sensor, SC260 Contact (Pin) Sensor, SC380 Contact (Pin) Sensor, SC430 Contact (Pin) Sensor

Upon power up the total number of flow remotes and the total number of unshorted sensor inputs will be displayed. The flow system summary can also be viewed using See What's Connected.

1. Press the SETUP key.




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2. Select Tests & Diagnostics.
3. Select See What's Connected

***NOTE:*** *The first screen will display the number of flow remotes and the number of unshorted sensor inputs. In the figure, 1 Flow Remote and 24 Unshorted Inputs are detected.*

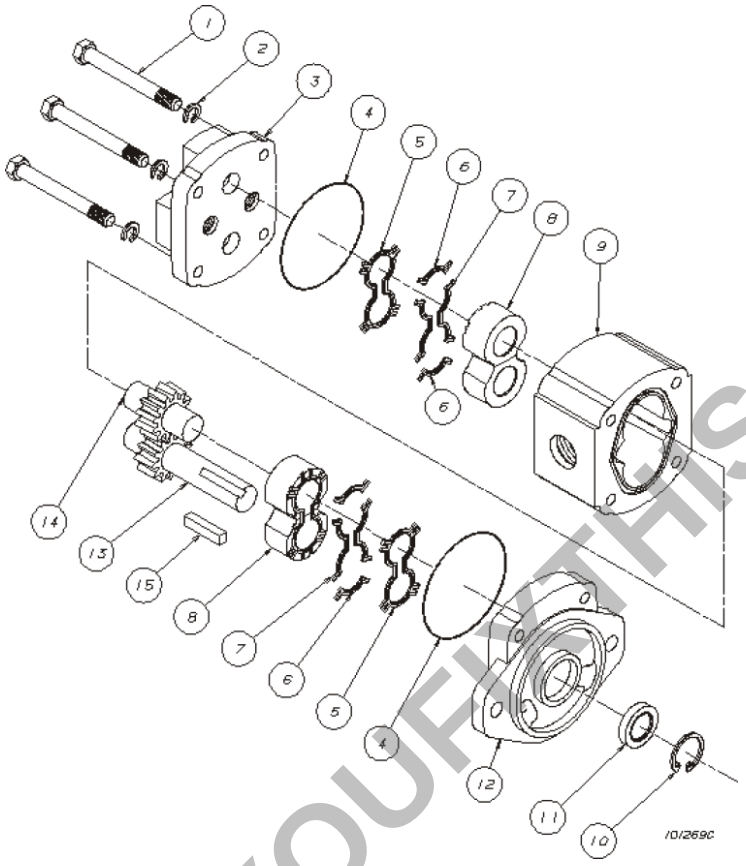
4. Press the PAGE DOWN key to more forward through the list of the PAGE UP key to move back through the list. Press the AIR CART key to return to normal operating mode.

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# Motor - Overhaul

SC180 Single Fan, SC230 Single Fan, SC260 Single Fan, SC380 Single Fan, SC430 Single Fan




101269C 1

**Ultra Motor Assembly**

| REF | DESCRIPTION | REF | DESCRIPTION |
|---|---|---|---|
| 1 | BOLT | 9 | MOTOR BODY |
| 2 | LOCKWASHER | 10 | SNAP RING |
| 3 | END COVER | 11 | SHAFT SEAL |
| 4 | O-RING | 12 | MOUNTING FLANGE |
| 5 | BACK-UP SEAL | 13 | DRIVE SHAFT (SPLINED) |
| 6 | BUSHING SEAL | 14 | DRIVE SHAFT |
| 7 | BUSHING SEAL | 15 | KEY FOR SPLINED SHAFT |
| 8 | BUSHING | | |

***NOTE:*** *Do not dismantle the motor further than indicated by the instructions. The gears and bushings will have custom fit themselves into the motor body and must not be disturbed.*

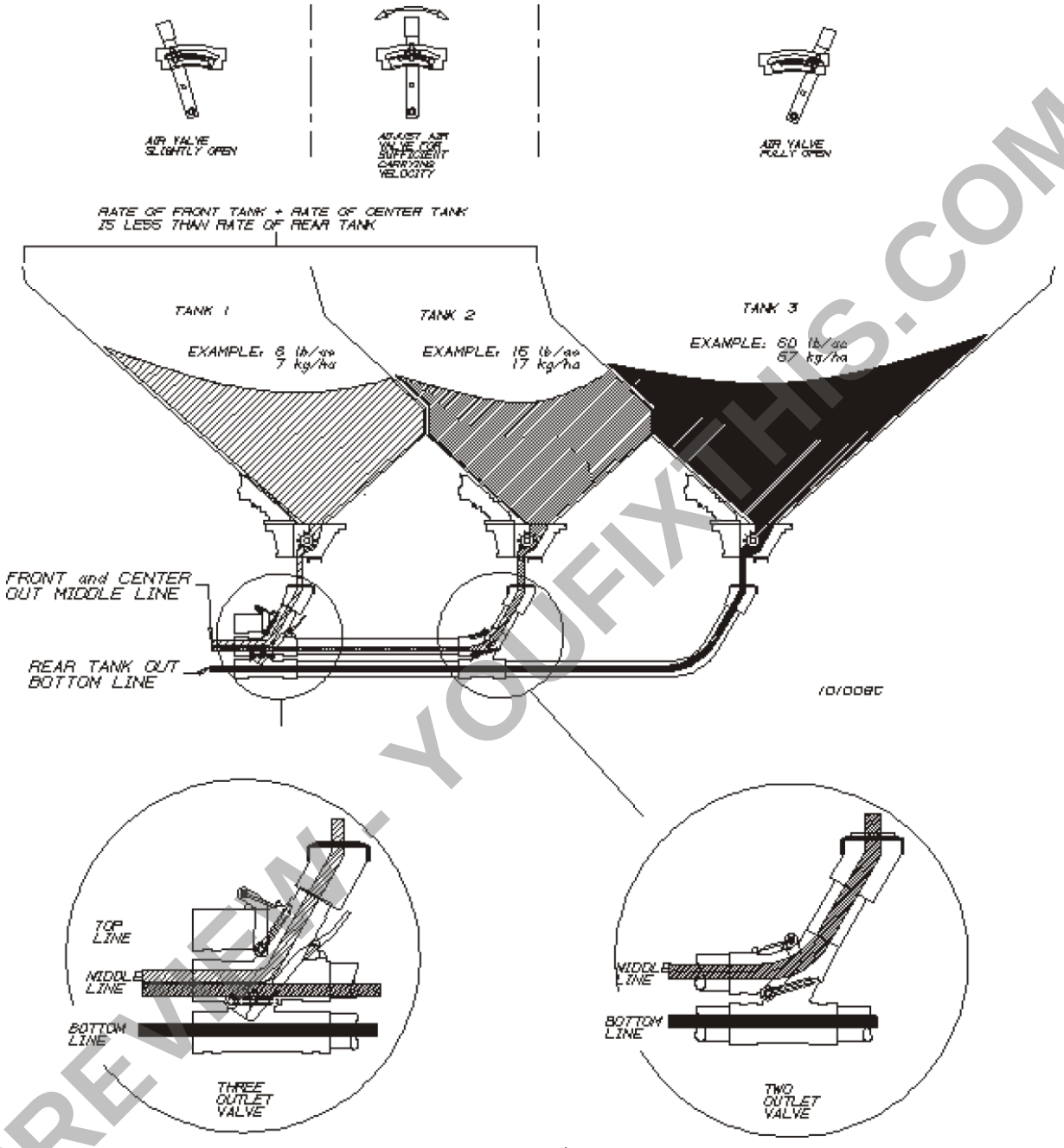
1. Lightly mark the end cover **(3)**, body **(9)**, and mounting flange **(12)** to ensure re-assembly in the correct position.
2. Remove bolts **(1)** and lockwashers **(2)** but keep the unit together. Stand it on its end cover **(3)** with the drive shaft uppermost.
3. Remove the mounting flange **(12)** by lightly tapping to disengage from internal dowels.
4. Remove body O-ring **(4)**, back-up seal **(5)**, and bushing seals**(6)(7)**.

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DOUBLE SHOOT (Combining Tank 1 and Tank 2 out of Middle Line and Tank 3 out of Bottom Line)

The damper positions shown are for where the rate of product from Tank 1 is less than the rate of product combined from the other two tanks.




101008c 4

**Examples of Damper and Valve Handle Positions for Double Shooting**

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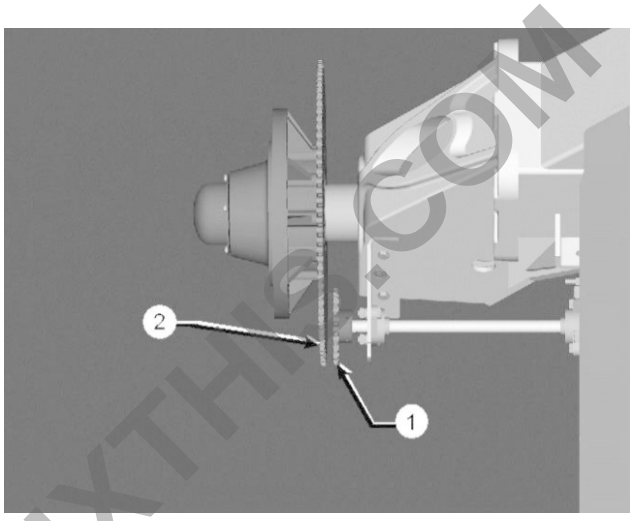


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# Mechanical drive - Visual inspection

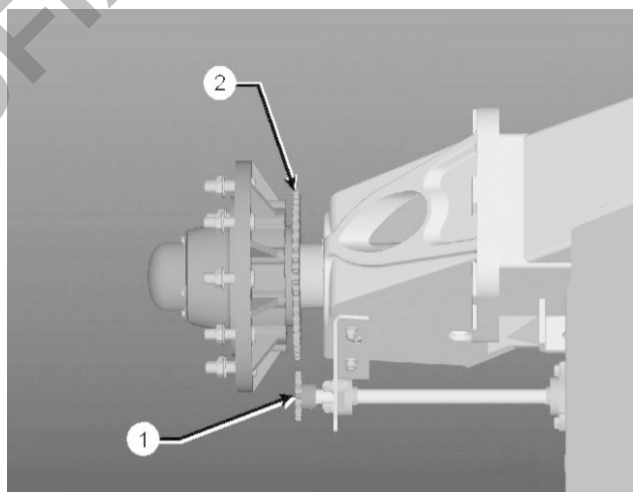
1. Check alignment of Drive 1 and Driven 1 sprockets. If the sprockets are not in alignment, premature master clutch failure may result. To align the sprockets, loosen the locking collars and slide along the drive shaft. Once the alignment has been achieved, re-tighten the locking collars.

2. For dual chain only: position the drive shaft sprocket **(1)** against the wheel drive sprocket **(2)** so it will engage the drive chain.



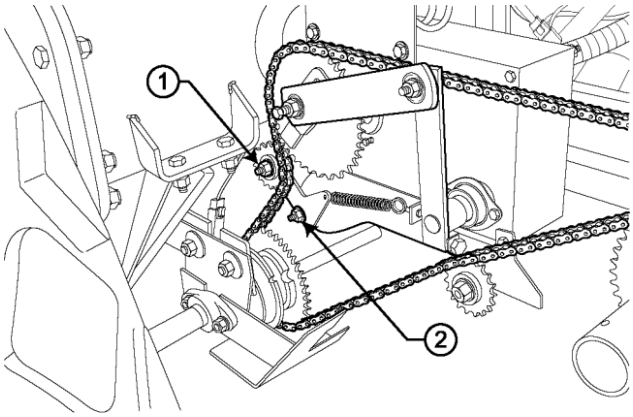

100303M1 1

3. For single chain only: position the drive shaft sprocket **(1)** so that it aligns with the wheel drive sprocket **(2)**.




100305M1 2

4. Check that the tension sprocket **(1)** has free movement, and is not corroded or bent. A damaged or misaligned tension arm and sprocket will also cause unnecessary stress on the drive system. If the tension sprocket is not in line with the drive chain, use washers on the main mount bolt **(2)** to position it correctly.




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