

**160GLC
Excavator
Operation and Test
(PIN: 1FF160GX_ _F055671—)**

**OPERATION & TEST TECHNICAL
MANUAL**

**160GLC Excavator (PIN: 1FF160GX_
_F055671—)**

TM13345X19 23APR18 (ENGLISH)

**Worldwide Construction
And Forestry Division**
PRINTED IN U.S.A.

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Inspect Machine

Inspect machine carefully each day by walking around it before starting.

Keep all guards and shields in good condition and properly installed. Fix damage and replace worn or broken parts immediately. Pay special attention to hydraulic hoses and electrical wiring.



T6607AQ —UN—15APR13

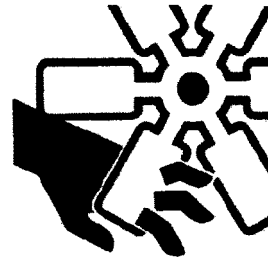
TX,INSPECT -19-08SEP10-1/1

Stay Clear of Moving Parts

Entanglements in moving parts can cause serious injury.

Stop engine before examining, adjusting, or maintaining any part of machine with moving parts.

Keep guards and shields in place. Replace any guard or shield that has been removed for access as soon as service or repair is complete.



T133592 —UN—15APR13

TX,MOVING,PARTS -19-20JAN11-1/1

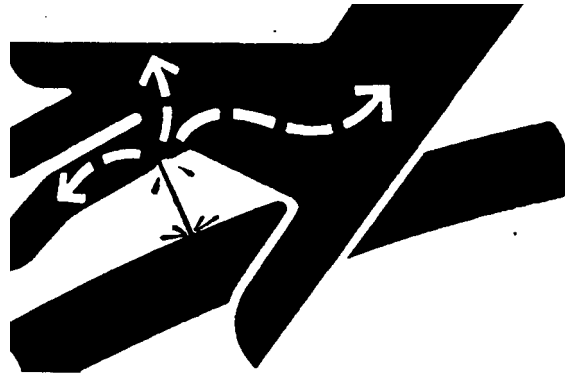
Avoid High-Pressure Fluids

Escaping fluid under pressure can penetrate the skin causing serious injury.

Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure.

Search for leaks with a piece of cardboard. Protect hands and body from high-pressure fluids.

If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable medical source. Such information is available from Deere & Company Medical Department in Moline, Illinois, U.S.A.



X9811 —UN—23AUG88

DX,FLUID -19-06OCT16-1/1

Remove Paint Before Welding or Heating

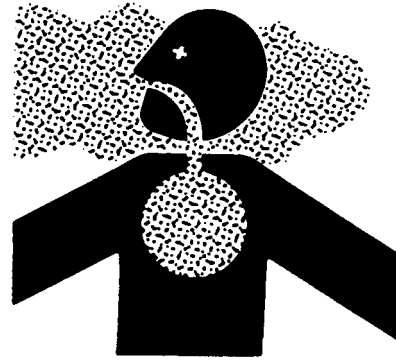
Avoid potentially toxic fumes and dust.

Hazardous fumes can be generated when paint is heated by welding, soldering, or using a torch.

Remove paint before heating:

- Remove paint a minimum of 100 mm (4 in.) from area to be affected by heating. If paint cannot be removed, wear an approved respirator before heating or welding.
- If you sand or grind paint, avoid breathing the dust. Wear an approved respirator.
- If you use solvent or paint stripper, remove stripper with soap and water before welding. Remove solvent or paint stripper containers and other flammable material from area. Allow fumes to disperse at least 15 minutes before welding or heating.

Do not use a chlorinated solvent in areas where welding will take place.



Do all work in an area that is well ventilated to carry toxic fumes and dust away.

Dispose of paint and solvent properly.

DX,PAINT -19-24JUL02-1/1

TS220 —UN—15APR13

Make Welding Repairs Safely

IMPORTANT: Disable electrical power before welding.
Turn off main battery switch and disconnect positive (+) and negative (-) battery cables.

Do not weld or apply heat on any part of a reservoir or tank that has contained oil or fuel. Heat from welding and cutting can cause oil, fuel, or cleaning solution to create gases which are explosive, flammable, or toxic.

Avoid welding or heating near pressurized fluid lines. Flammable spray may result and cause severe burns if pressurized lines malfunction as a result of heating. Do not let heat go beyond work area to nearby pressurized lines.

Remove paint properly. Do not inhale paint dust or fumes. Use a qualified welding technician for structural repairs.



Heating Near Pressurized Fluid Lines

Make sure there is good ventilation. Wear eye protection and protective equipment when welding.

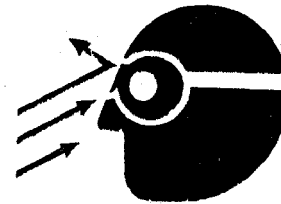
MB60223,0000212 -19-02JUL15-1/1

T133547 —UN—15APR13

Drive Metal Pins Safely

Always wear protective goggles or safety glasses and other protective equipment before striking hardened parts. Hammering hardened metal parts such as pins and bucket teeth could dislodge chips at high velocity.

Use a soft hammer or a brass bar between hammer and object to prevent chipping.



TX,PINS -19-20JAN11-1/1

T133738 —UN—15APR13

Main Controller (MCZ) Diagnostic Trouble Codes

2 Machine Function Check

Is operation of machine normal? [See Operational Checkout.](#) (Group 9005-05.)

YES: Machine may be operated, but it is recommended that the main controller (MCZ) be replaced.

NO: Main controller (MCZ) malfunction. Replace main controller (MCZ). [See Main Controller \(MCZ\) Remove and Install.](#) (Group 9015-20.)

DF89619,00B57E5 -19-28JAN16-4/4

011002.02 — Abnormal A/D Converter

DF89619,00B57E6 -19-28JAN16-1/4

Abnormal A/D Converter Diagnostic Procedure

DF89619,00B57E6 -19-28JAN16-2/4

1 Code Check

Clear and check again for diagnostic trouble codes (DTCs).

Is DTC 011002.02 still present?

YES: Code is still present and machine does not operate. Replace main controller (MCZ). [See Main Controller \(MCZ\) Remove and Install.](#) (Group 9015-20.)

YES: Code is still present, but machine is still operable. Go to Machine Function Check.

NO: Main controller (MCZ) is OK.

DF89619,00B57E6 -19-28JAN16-3/4

2 Machine Function Check

Is operation of machine normal? [See Operational Checkout.](#) (Group 9005-05.)

YES: Machine may be operated but it is recommended that the main controller (MCZ) be replaced.

NO: Main controller (MCZ) malfunction. Replace main controller (MCZ). [See Main Controller \(MCZ\) Remove and Install.](#) (Group 9015-20.)

DF89619,00B57E6 -19-28JAN16-4/4

011003.03 — Abnormal Sensor Voltage

Individual sensor or component diagnostic trouble code (DTC) may also be present within this code. Engine speed dial may not function correctly when this code is present.

DF89619,00B57E7 -19-28JAN16-1/4

Abnormal Sensor Voltage Diagnostic Procedure

Continued on next page

DF89619,00B57E7 -19-28JAN16-2/4

Main Controller (MCZ) Diagnostic Trouble Codes

2 Component Check	Key switch in OFF position. Disconnect pump 2 delivery pressure sensor (marked PP2) (B37). Disconnect pump 1 delivery pressure sensor (marked PP1) (B35). Connect pump 2 delivery pressure sensor (marked PP2) connector (B37) to pump 1 delivery pressure sensor (marked PP1) (B35). Clear MCZ diagnostic trouble codes (DTCs). Operate machine. Check for active MCZ diagnostic trouble code 011202.04—Pump 2 Delivery Pressure Sensor Circuit Low Input. Is code active? Return connectors to appropriate sensors after check is complete.	YES: Go to Voltage Check. NO: Pump 2 delivery pressure sensor (marked PP2) (B37) malfunction. Replace sensor. DF89619,00B57F5 -19-28JAN16-4/7
3 Voltage Check	Key switch in OFF position. Disconnect pump 2 delivery pressure sensor (marked PP2) (B37). Turn key switch to ON position. Check voltage between pin 1 and pin 3 of pump 2 delivery pressure sensor (marked PP2) connector (B37) for approximately 5 V. Is correct voltage indicated?	YES: Go to Open Circuit Check. NO: Repair or replace harness. See appropriate harness. DF89619,00B57F5 -19-28JAN16-5/7
4 Open Circuit Check	Key switch in OFF position. Pump 2 delivery pressure sensor (marked PP2) (B37) disconnected. Disconnect cab harness-to-main controller 17-pin connector C (X33). Check for continuity between pin 2 of pump 2 delivery pressure sensor (marked PP2) connector (B37) and pin 15 of cab harness-to-main controller 17-pin connector C (X33). Is continuity indicated?	YES: Go to Short Circuit Check. NO: Repair or replace harness. See appropriate harness. DF89619,00B57F5 -19-28JAN16-6/7
5 Short Circuit Check	Key switch in OFF position. Pump 2 delivery pressure sensor (marked PP2) (B37) disconnected. Check for continuity between pin 2 of pump 2 delivery pressure sensor (marked PP2) connector (B37) and machine ground. Is continuity indicated?	YES: Repair or replace harness. See appropriate harness. NO: Checks complete. DF89619,00B57F5 -19-28JAN16-7/7

Main Controller (MCZ) Diagnostic Trouble Codes

2 Component Check

Switch boom up pressure sensor connector (B30) to another properly working pressure sensor.

Clear MCZ diagnostic trouble codes.

Operate machine.

Check for active MCZ diagnostic trouble code 011302.04—Boom Up Pilot Pressure Sensor Circuit Low Input.

Is code active?

Return connectors to appropriate sensors after check is completed.

YES: Go to Voltage Check.

NO: Boom up pressure sensor (B30) malfunction. Replace sensor.

DF89619,00B57FD -19-03FEB17-4/7

3 Voltage Check

Key switch in OFF position.

Disconnect boom up pressure sensor (B30).

Turn key switch to ON position.

Check voltage between pin 1 and pin 3 of boom up pressure sensor connector (B30) for approximately 5 V.

Is correct voltage indicated?

YES: Go to Open Circuit Check.

NO: Repair or replace harness. See appropriate harness.

DF89619,00B57FD -19-03FEB17-5/7

4 Open Circuit Check

Key switch in OFF position.

Boom up pressure sensor (B30) disconnected.

Disconnect cab harness-to-main controller 30-pin connector D (X34).

Check for continuity between pin 2 of boom up pressure sensor connector (B30) and pin 6 of cab harness-to-main controller 30-pin connector D (X34).

Is continuity indicated?

YES: Go to Short Circuit Check.

NO: Repair or replace harness. See appropriate harness.

DF89619,00B57FD -19-03FEB17-6/7

5 Short Circuit Check

Key switch in OFF position.

Boom up pressure sensor (B30) disconnected.

Check for continuity between pin 2 of boom up pressure sensor connector (B30) and machine ground.

Is continuity indicated?

YES: Repair or replace harness. See appropriate harness.

NO: Checks complete.

DF89619,00B57FD -19-03FEB17-7/7

011303.03 — Arm In Pressure Sensor Circuit High Input

Arm in pressure sensor (B31) signal voltage is high. (Above 4.5 V)

IMPORTANT: Avoid connector damage. Do not install connector with impact wrench or power tools.

Over torquing will result in permanent damage to connector. Torque only to specification.

Specification

100-Pin Connector	
(X3)—Torque.....	10 N·m
	89 lb.-in.

Continued on next page

DF89619,00B57FE -19-12JUN14-1/6

4 Open Circuit Check**Key switch in OFF position.**

Bucket curl pressure sensor (marked BKC) (B56) disconnected.

Disconnect cab harness-to-main controller 30-pin connector D (X34).

Check for continuity between pin 2 of bucket curl pressure sensor (marked BKC) (B56) connector and pin 8 of cab harness-to-main controller 30-pin connector D (X34).

Is continuity indicated?

YES: Go to Short Circuit Check.**NO:** Repair or replace harness. See appropriate harness.

DF89619,00B68BF -19-05DEC17-6/7

5 Short Circuit Check**Key switch in OFF position.**

Bucket curl pressure sensor (marked BKC) (B56) disconnected.

Check for continuity between pin 2 of bucket curl pressure sensor (marked BKC) (B56) connector and machine ground.

Is continuity indicated?

YES: Repair or replace harness. See appropriate harness.**NO:** Checks complete.

DF89619,00B68BF -19-05DEC17-7/7

011400.02 — Pump 2 Flow Rate Limit Solenoid Valve Feedback Abnormal**Over torquing will result in permanent damage to connector. Torque only to specification.***Pump 2 flow rate limit solenoid (marked SB) (Y20) current above 920 mA and below 70 mA.***Specification**

100-Pin Connector

(X3)—Torque..... 10 N·m

89 lb·ft

IMPORTANT: Avoid connector damage. Do not install connector with impact wrench or power tools.

DF89619,00B5804 -19-28JAN16-1/8

Pump 2 Flow Rate Limit Solenoid Valve Feedback Abnormal Diagnostic Procedure

DF89619,00B5804 -19-28JAN16-2/8

1 Connector Check**Key switch in OFF position.**

Check the following connectors for damage, corrosion, or debris:

- Pump 2 flow rate limit solenoid (marked SB) (Y20) and pump harness-to-machine harness connector (X40). See Pump Harness (W8) Component Location. (Group 9015-10.)
- Cab harness-to-machine harness 100-pin connector (X3) and cab harness-to-main controller 31-pin connector A (X31). See Cab Harness (W1) Component Location. (Group 9015-10.)

Are connectors in good condition and free of corrosion and debris?

YES: Go to Component Check.**NO:** Repair or replace connectors. See appropriate harness.

Continued on next page

DF89619,00B5804 -19-28JAN16-3/8

Main Controller (MCZ) Diagnostic Trouble Codes

4 Short Circuit Check

Key switch in OFF position.

Dig regenerative solenoid (marked SF) (Y22) disconnected.

Cab harness-to-main controller 31-pin connector A (X31) disconnected.

Check for continuity between:

- Pin 1 of dig regenerative solenoid connector (marked SF) (Y22) to machine ground.
- Pin 14 of cab harness-to-main controller 31-pin connector A (X31) to machine ground.

Is continuity indicated?

YES: Short to ground.
Repair or replace harness.
See appropriate harness.
NO: Go to Harness Check.

DF89619,00B580A -19-28JAN16-6/8

5 Harness Check

Key switch in OFF position.

Cab harness-to-main controller 31-pin connector A (X31) disconnected.

Check for continuity between pin 14 of cab harness-to-main controller 31-pin connector A (X31) to all other pins on connector.

Is continuity indicated between any pins?

YES: Short to power.
Repair or replace harness.
See appropriate harness.
NO: Go to Solenoid Check.

DF89619,00B580A -19-28JAN16-7/8

6 Solenoid Check

Key switch in OFF position.

Disconnect dig regenerative solenoid (marked SF) (Y22).

Test dig regenerative solenoid (marked SF) (Y22) and compare to specification. [See Electrical Component Specifications](#). (Group 9015-20.)

Is dig regenerative solenoid (marked SF) (Y22) within specification?

YES: Checks complete.

NO: Dig regenerative solenoid (marked SF) (Y22) malfunction. Replace solenoid.

DF89619,00B580A -19-28JAN16-8/8

011402.03 — Dig Regenerative Solenoid Valve Feedback Current High

Dig regenerative solenoid (marked SF) (Y22) current above 920 mA.

IMPORTANT: Avoid connector damage. Do not install connector with impact wrench or power tools.

Over torquing will result in permanent damage to connector. Torque only to specification.

Specification

100-Pin Connector

(X3)—Torque..... 10 N·m
89 lb·in

DF89619,00B580B -19-28JAN16-1/7

Dig Regenerative Solenoid Valve Feedback Current High Diagnostic Procedure

Continued on next page

DF89619,00B580B -19-28JAN16-2/7

5 Solenoid Check

Key switch in OFF position.

Power dig/travel speed solenoid (marked SG) (Y24) disconnected.

Test power dig/travel speed solenoid (marked SG) (Y24) and compare to specification. See Electrical Component Specifications. (Group 9015-20.)

Is power dig/travel speed solenoid (marked SG) (Y24) within specification?

YES: Checks complete.**NO:** Power dig/travel speed solenoid (marked SG) (Y24) malfunction. Replace solenoid.

DF89619,00B58AB -19-28JAN16-7/7

011407.04 — Power Dig/Travel Speed Solenoid Valve Feedback Current Low**Over torquing will result in permanent damage to connector. Torque only to specification.***Power dig/travel speed solenoid (marked SG) (Y24) current below 70 mA.*

100-Pin Connector

(X3)—Torque..... 10 N·m
89 lb·in**Specification****IMPORTANT: Avoid connector damage. Do not install connector with impact wrench or power tools.**

DF89619,00B58AC -19-28JAN16-1/7

Power Dig/Travel Speed Solenoid Valve Feedback Current Low Diagnostic Procedure

DF89619,00B58AC -19-28JAN16-2/7

1 Connector Check

Key switch in OFF position.

Check the following connectors for damage, corrosion, or debris:

- Power dig/travel speed solenoid (marked SG) (Y24) and cab harness-to-machine harness 100-pin connector (X3). See Machine Harness (W2) Component Location. (Group 9015-10.)
- Cab harness-to-main controller 31-pin connector A (X31). See Cab Harness (W1) Component Location. (Group 9015-10.)

Are connectors in good condition and free of corrosion and debris?

YES: Go to Component Check.**NO:** Repair or replace connectors. See appropriate harness.

DF89619,00B58AC -19-28JAN16-3/7

2 Component Check

Key switch in OFF position.

Disconnect power dig/travel speed solenoid (marked SG) (Y24).

Switch connectors of power dig/travel speed solenoid (marked SG) (Y24) with another solenoid in solenoid valve manifold.

Clear MCZ diagnostic trouble codes (DTCs).

Operate machine.

Check for active MCZ diagnostic trouble code 011407.04—Power Dig/Travel Speed Solenoid Feedback Current Low.

Is code active?

Return connectors to appropriate solenoids after check is complete.

YES: Go to Continuity Check.**NO:** Power dig/travel speed solenoid (marked SG) (Y24) malfunction. Replace solenoid.

Continued on next page

DF89619,00B58AC -19-28JAN16-4/7

Main Controller (MCZ) Diagnostic Trouble Codes

6 Solenoid Check

Test selector valve solenoid valve (Y40) and compare to specification. [See Electrical Component Specifications](#). (Group 9015-20.)

Is selector valve solenoid valve (Y40) within specification?

YES: Checks complete.

NO: Selector valve solenoid valve (Y40) malfunction. Replace solenoid valve.

DF89619,00B581A -19-28JAN16-8/8

011459.02 — Idle Stop Relay Circuit Malfunction

DF89619,00B581B -19-03FEB17-1/6

Idle Stop Relay Circuit Malfunction Diagnostic Procedure

DF89619,00B581B -19-03FEB17-2/6

1 Fuse Check

Key switch in OFF position.

Remove idle stop 5 A fuse (marked IDLE STOP) (F18) from fuse box (F50). [See Fuse and Relay Specifications](#). (Group 9015-10.)

Test idle stop 5 A fuse (marked IDLE STOP) (F18) for continuity.

Is continuity indicated?

YES: Go to Voltage Check.

NO: Replace fuse.

DF89619,00B581B -19-03FEB17-3/6

2 Voltage Check

Install idle stop 5 A fuse (marked IDLE STOP) (F18) in fuse box (F50).

Key switch in ON position.

Remove idle stop relay (K11). [See Cab Harness \(W1\) Component Location](#). (Group 9015-10.)

Check voltage at idle stop relay (K11) connector pin 1.

Are approximately 24 volts present?

YES: Go to Relay Check.

NO: Open circuit in cab harness (W1) between idle stop relay (K11) and idle stop 5 A fuse (marked IDLE STOP) (F18). Repair or replace harness.

DF89619,00B581B -19-03FEB17-4/6

3 Relay Check

Key switch in OFF position.

Test idle stop relay (K11). [See Electrical Component Checks](#). (Group 9015-20.)

Is idle stop relay (K11) within specification?

YES: Go to Cab Harness (W1) Continuity Check.

NO: Replace idle stop relay (K11).

Continued on next page

DF89619,00B581B -19-03FEB17-5/6

5 Solenoid Check**Key switch in OFF position.**

AFL solenoid A (marked 1A) (Y61) disconnected.

Test AFL solenoid A (marked 1A) (Y61) and compare to specification. See Electrical Component Specifications. (Group 9015-20.)

Is AFL solenoid A (marked 1A) (Y61) within specification?

YES: Checks complete.**NO:** AFL solenoid A (marked 1A) (Y61) malfunction. Replace solenoid.

RH60123,00022D6 -19-01SEP15-7/7

011817.02 — OPT Solenoid 2 Feedback Abnormal*Auxiliary function lever (AFL) solenoid B (marked 1B) (Y62) current above 920 mA and below 70 mA.*

RH60123,00022D7 -19-01SEP15-1/8

Auxiliary Function Lever (AFL) Solenoid B (marked 1B) (Y62) Abnormal Feedback Diagnostic Procedure

RH60123,00022D7 -19-01SEP15-2/8

1 Connector Check**Key switch in OFF position.**

Check the following connectors for damage, corrosion, or debris:

- See Cab Harness (W1) Component Location. (Group 9015-10.)
- Cab harness-to-main controller 31-pin connector A (X31).
- See Auxiliary Function Lever (AFL) Harness (W75) Component Location. (Group 9015-10.)
- Auxiliary function lever (AFL) connector 1 (X574).
- See Auxiliary Function Lever (AFL) Solenoid Harness (W76) Component Location. (Group 9015-10.)
- Auxiliary function lever (AFL) solenoid B (marked 1B) (Y62).
- Auxiliary function lever (AFL) harness-to-auxiliary function lever (AFL) solenoid harness connector (X577).

Are connectors in good condition and free of corrosion and debris?

YES: Go to Component Check.**NO:** Repair or replace connectors. See appropriate harness.

RH60123,00022D7 -19-01SEP15-3/8

2 Component Check**Key switch in OFF position.**

Disconnect AFL solenoid B (marked 1B) (Y62).

Disconnect AFL solenoid A (marked 1A) (Y61).

Connect AFL solenoid B (marked 1B) (Y62) connector to AFL solenoid A (marked 1A) (Y61).

Clear MCZ diagnostic trouble codes.

Operate machine.

Check for active MCZ diagnostic trouble code 011817.02—OPT Solenoid 2 Feedback Abnormal.

Is code active?

Return connectors to appropriate solenoids after check is complete.

YES: Go to Continuity Check.**NO:** AFL solenoid B (marked 1B) (Y62) malfunction. Replace solenoid.

Continued on next page

RH60123,00022D7 -19-01SEP15-4/8

❶ Connector Check	Key switch in OFF position. Check the following connectors for damage, corrosion, or debris: • Cab harness (W1). <u>See Cab Harness (W1) Component Location.</u> (Group 9015-10.) - Cab harness-to-machine harness 100-pin connector (X3). - Cab harness-to-main controller 30-pin connector D (X34). - Cab harness-to-main controller 26-pin connector F (X36). • Machine harness (W2). <u>See Machine Harness (W2) Component Location.</u> (Group 9015-10.) - Arm out pressure sensor (marked AMD) (B61). - Cab harness-to-machine harness 100-pin connector (X3). - Machine harness power splice (X98). - Machine harness ground splice (X104). Are connectors in good condition and free of corrosion and debris?	YES: Go to Component Check. NO: Repair or replace connectors. See appropriate harness. DF89619,00B68C4 -19-05DEC17-3/7
❷ Component Check	Key switch in OFF position. Switch arm out pressure sensor (marked AMD) (B61) to another properly working pressure sensor. Turn key switch to ON position. Clear main controller (MCZ) diagnostic trouble codes (DTCs). Operate machine. Check for active MCZ diagnostic trouble code 011995.04—Arm Roll-Out Pilot Pressure Sensor Circuit Low Input. Is code active? Return connectors to appropriate sensors after check is complete.	YES: Go to Voltage Check. NO: Arm out pressure sensor (marked AMD) (B61) malfunction. Replace sensor. DF89619,00B68C4 -19-05DEC17-4/7
❸ Voltage Check	Key switch in OFF position. Disconnect arm out pressure sensor (marked AMD) (B61). Turn key switch to ON position. Check voltage between pin 1 and pin 3 of arm out pressure sensor (marked AMD) (B61) connector for approximately 5 V. Is correct voltage indicated?	YES: Go to Open Circuit Check. NO: Repair or replace harness. See appropriate harness. Continued on next page DF89619,00B68C4 -19-05DEC17-5/7

3 Open Circuit Check

Disconnect the following connectors:

- Variable speed fan solenoid (Y5014).
- Engine control unit (ECU) connector 1 (X5501).
- Engine control unit (ECU) connector 2 (X5502).

Check for continuity between:

- Pin 1 of variable speed fan solenoid (Y5014) connector and pin 32 of engine control unit (ECU) connector 2 (X5502).
- Pin 2 of variable speed fan solenoid (Y5014) connector and pin 21 of engine control unit (ECU) connector 1 (X5501).

Is continuity indicated?

YES: Program controller.

NO: Repair or replace harness as necessary.

JL58967,00002E8 -19-07MAR18-5/5

000647.06 — Variable Speed Fan Solenoid High Current

Variable speed fan solenoid (Y5014) high current.

JL58967,00002E9 -19-13OCT15-1/6

Variable Speed Fan Solenoid High Current Diagnostic Procedure

Alarm Level:

Warning Alarm Illuminated—Highlighted Yellow (warning)

JL58967,00002E9 -19-13OCT15-2/6

1 Connector Check

Check the following connectors for damage, corrosion, or debris:

- Fan harness (W57). [See Fan Harness \(W57\) Component Location.](#) (Group 9015-10.)
- Variable speed fan solenoid (Y5014).
- Engine interface harness (W5). [See Engine Interface Harness \(W5\) Component Location.](#) (Group 9015-10.)
- Engine control unit (ECU) connector 1 (X5501).
- Engine control unit (ECU) connector 2 (X5502).
- Fan harness connector (X5005).

Are connectors in good condition and free of corrosion and debris?

YES: Go to Component Check.

NO: Repair or replace connectors or pins.

[See Engine Interface Harness \(W5\) Wiring Diagram.](#) (Group 9015-10.)

[See Fan Harness \(W57\) Wiring Diagram.](#) (Group 9015-10.)

JL58967,00002E9 -19-13OCT15-3/6

2 Component Check

Disconnect and test variable speed fan solenoid (Y5014). [See Electrical Component Specifications.](#) (Group 9015-20.)

Does variable speed fan solenoid (Y5014) meet specification?

YES: Go to Continuity Check.

NO: Variable speed fan solenoid (Y5014) malfunction. Replace solenoid.

Continued on next page

JL58967,00002E9 -19-13OCT15-4/6

Engine Control Unit (ECU) Diagnostic Trouble Codes

5 Short to Voltage Check

Connect engine interface harness-to-DEF harness connector 1 (X5037).

Ignition ON, engine OFF.

Using a multimeter, measure voltage between coolant control valve (Y5019) connector pin 1 and ground.

Using a multimeter, measure voltage between coolant control valve (Y5019) connector pin 4 and ground.

Are both measurements less than 0.5 V?

YES: Go to next check.

NO: Repair short to voltage in harness. [See Engine Interface Harness \(W5\) Wiring Diagram](#) and [see Diesel Exhaust Fluid \(DEF\) Harness \(W54\) Wiring Diagram](#). (Group 9015-10.)

JR05199,0000E9C -19-18OCT17-7/11

6 Continuity Check

Ignition OFF, engine OFF.

Using a multimeter, measure the resistance between engine control unit (ECU) connector 2 (X5502) pin 20 and coolant control valve (Y5019) pin 1.

Using a multimeter, measure the resistance between engine control unit (ECU) connector 2 (X5502) pin 51 and coolant control valve (Y5019) pin 4.

Are both resistance measurements less than 5 ohms?

YES: Go to next check.

NO: Repair open or high resistance in harness. [See Engine Interface Harness \(W5\) Wiring Diagram](#) and [see Diesel Exhaust Fluid \(DEF\) Harness \(W54\) Wiring Diagram](#). (Group 9015-10.)

JR05199,0000E9C -19-18OCT17-8/11

7 Short to Ground Check

Connect engine interface harness-to-DEF harness connector 1 (X5037).

Disconnect ECU connector 2 (X5502).

Ignition OFF, engine OFF.

Using a multimeter, measure resistance between coolant control valve (Y5019) connector pin 1 and ground.

Using a multimeter, measure resistance between coolant control valve (Y5019) connector pin 4 and ground.

Is either measurement less than 100 kilo-ohms?

YES: Repair short to ground in harness. [See Engine Interface Harness \(W5\) Wiring Diagram](#) and [see Diesel Exhaust Fluid \(DEF\) Harness \(W54\) Wiring Diagram](#). (Group 9015-10.)

NO: Go to next check.

Continued on next page

JR05199,0000E9C -19-18OCT17-9/11

7 DEF Tank Temperature Check

Ignition ON, engine speed at high idle.

In Service ADVISOR™, perform DEF header coolant purge test.

Using Service ADVISOR™, monitor DEF tank fluid temperature.

Operate engine for 20 minutes.

Does the DEF tank fluid temperature increase by more than 5°C (9°F) in 20 minutes?

YES: Checks complete.

NO: Replace coolant control valve (Y5019). [See Diesel Exhaust Fluid \(DEF\) Harness \(W54\) Component Location.](#) (Group 9015-10.)

JR05199,0000E9F -19-16OCT17-10/10

005484.05 — Reversing Fan Solenoid Open Circuit

Reversing fan solenoid (Y5015) open circuit.

JL58967,00002EE -19-13OCT15-1/5

Reversing Fan Solenoid Open Circuit Diagnostic Procedure

Alarm Level:

Warning Alarm Illuminated—Highlighted Yellow (warning)

JL58967,00002EE -19-13OCT15-2/5

1 Connector Check

Check the following connectors for damage, corrosion, or debris:

- Fan harness (W57). [See Fan Harness \(W57\) Component Location.](#) (Group 9015-10.)
 - Reversing fan solenoid (Y5015).
- Engine interface harness (W5). [See Engine Interface Harness \(W5\) Component Location.](#) (Group 9015-10.)
 - Engine control unit (ECU) connector 1 (X5501).
 - Engine control unit (ECU) connector 2 (X5502).
 - Fan harness connector (X5005).

Are connectors in good condition and free of corrosion and debris?

YES: Go to Component Check.

NO: Repair or replace connectors or pins.
[See Engine Interface Harness \(W5\) Wiring Diagram.](#) (Group 9015-10.)
[See Fan Harness \(W57\) Wiring Diagram.](#) (Group 9015-10.)

JL58967,00002EE -19-13OCT15-3/5

2 Component Check

Disconnect and test reversing fan solenoid (Y5015). [See Electrical Component Specifications.](#) (Group 9015-20.)

Does reversing fan solenoid (Y5015) test OK?

YES: Go to Open Circuit Check.

NO: Reversing fan solenoid (Y5015) malfunction. Replace solenoid.

Continued on next page

JL58967,00002EE -19-13OCT15-4/5

014021.02 — Communication Terminal Security Error

Security failure of mobile communication equipment.

For more information:

- See [Controller Area Network 0 \(CAN 0\) Circuit Diagnostics](#). (Group 9001-10.)

- See [Controller Area Network 1 \(CAN 1\) Circuit Diagnostics](#). (Group 9001-10.)
- See [Interface Controller Area Network \(N-CAN\) Diagnostics](#). (Group 9001-10.)
- See [Engine Controller Area Network \(Engine CAN\) Diagnostics](#). (Group 9001-10.)

DF89619,00B5858 -19-16MAY14-1/1

014022.02 — SIM Card Error

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For more information, see JDLink™ / (MTG) Technical Manual. (TM114519.) If (MTG) is 4G see JDLink™ (MTG) 4G LTE Technical Manual. (TM143019).

DF89619,00B5859 -19-26OCT17-1/1

014023.02 — Security Error

Communication error with the main controller (MCZ).

For more information:

- See [Controller Area Network 0 \(CAN 0\) Circuit Diagnostics](#). (Group 9001-10.)

- See [Controller Area Network 1 \(CAN 1\) Circuit Diagnostics](#). (Group 9001-10.)
- See [Interface Controller Area Network \(N-CAN\) Diagnostics](#). (Group 9001-10.)
- See [Engine Controller Area Network \(Engine CAN\) Diagnostics](#). (Group 9001-10.)

DF89619,00B585A -19-16MAY14-1/1

020100.02 — Overheat Alarm

Not applicable to this machine.

DF89619,00B585B -19-27MAY14-1/1

020101.02 — Engine Warning Alarm

Diagnose the diagnostic trouble codes (DTCs) of the engine control unit (ECU).

See [Engine Control Unit \(ECU\) Diagnostic Trouble Codes](#). (Group 9001-20.)

DF89619,00B585C -19-16MAY14-1/1

020102.02 — Engine Oil Pressure Alarm

Diagnose the diagnostic trouble codes (DTCs) of the engine control unit (ECU).

See [Engine Control Unit \(ECU\) Diagnostic Trouble Codes](#). (Group 9001-20.)

DF89619,00B585D -19-16MAY14-1/1

020103.02 — Alternator Alarm

Alternator output above 33.5 volts.

DF89619,00B585E -19-27MAY14-1/3

Alternator Alarm Diagnostic Procedure

Continued on next page

DF89619,00B585E -19-27MAY14-2/3

5 Short to Ground Check

Turn key switch to OFF position.

Ambient air temperature sensor (B22) disconnected.

Air conditioner controller (ACF) (A7) disconnected.

Check continuity between pin 2 of sensor and machine ground.

Is continuity indicated?

YES: Repair or replace harness. See appropriate wiring diagram or schematic.

NO: Checks complete.

DF89619,00B587C -19-16JUN14-7/7

18 — Short-Circuited Solar Radiation Sensor

Solar sensor (B21) circuit is open.

Additional References:

- See Air Conditioning System Cycle of Operation. (Group 9031-05.)
- See System Functional Schematic. (Group 9015-10.)

DF89619,00B587D -19-16JUN14-1/6

Short-Circuited Solar Radiation Sensor Diagnostic Procedure

DF89619,00B587D -19-16JUN14-2/6

1 Connector Check

Turn key switch to OFF position.

Check the following connectors for damage, corrosion, or debris:

- Solar sensor (B21) and cab harness-to-monitor harness connector (X17). See Monitor Harness (W3) Component Location. (Group 9015-10.)
- Air conditioner controller (ACF) (A7) and air conditioner 10-pin connector (X52). See Heater and Air Conditioner Harness (W41) Component Location. (Group 9015-10.)

Are connectors in good condition and free of corrosion and debris?

YES: Go to Voltage Check.

NO: Repair or replace harness. See appropriate wiring diagram or schematic.

DF89619,00B587D -19-16JUN14-3/6

2 Voltage Check

Turn key switch to OFF position.

Solar sensor (B21) disconnected.

Turn key switch to ON position.

Check for voltage at:

- Pin 1 of sensor for approximately 5 V.
- Pin 2 of sensor for 0.0 V.

Is correct voltage indicated?

YES: Go to Continuity Check.

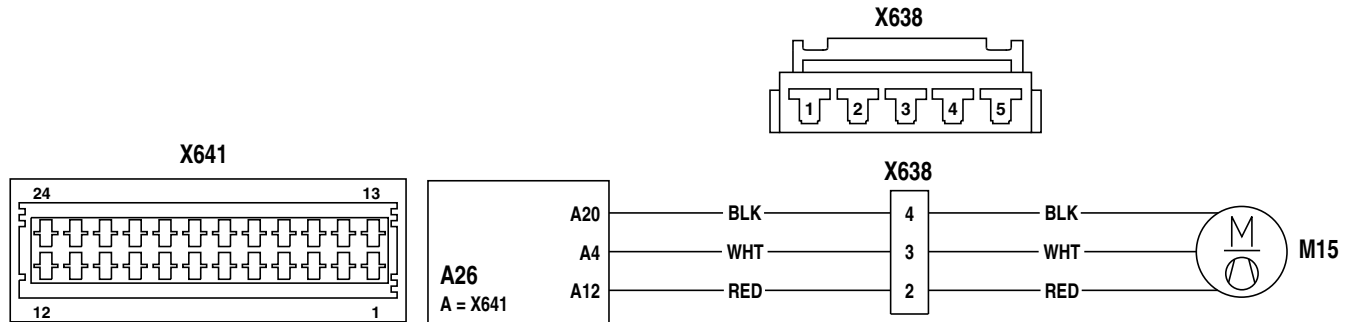
NO: Repair or replace harness. See appropriate wiring diagram or schematic.

Continued on next page

DF89619,00B587D -19-16JUN14-4/6

2 — Cushion Blower Short to Power

Battery voltage detected from premium seat blower (M15) at pin A4 of premium seat controller (PSC) (A26).



TX1252186

Premium Seat Blower Circuit Schematic

A26— Premium Seat Controller (PSC) X638— Premium Seat Blower Connector
M15— Premium Seat Blower X641— Premium Seat Controller (PSC) Connector A

Code-Induced Condition:

- Seat Heating and Cooling Operations Inoperable

Circuit Information:

- See System Functional Schematic. (Group 9015-15.)

Component Location:

- See Premium Seat Harness (W87) Component Location. (Group 9015-15.)

Diagnostic Test Box Information:

- Not Applicable

Additional References:

- None

Possible Causes:

1. Circuit is shorted to power.
2. Component malfunction.
3. Software malfunction. Replace controller.

DF89619,00B690C -19-19FEB18-1/1

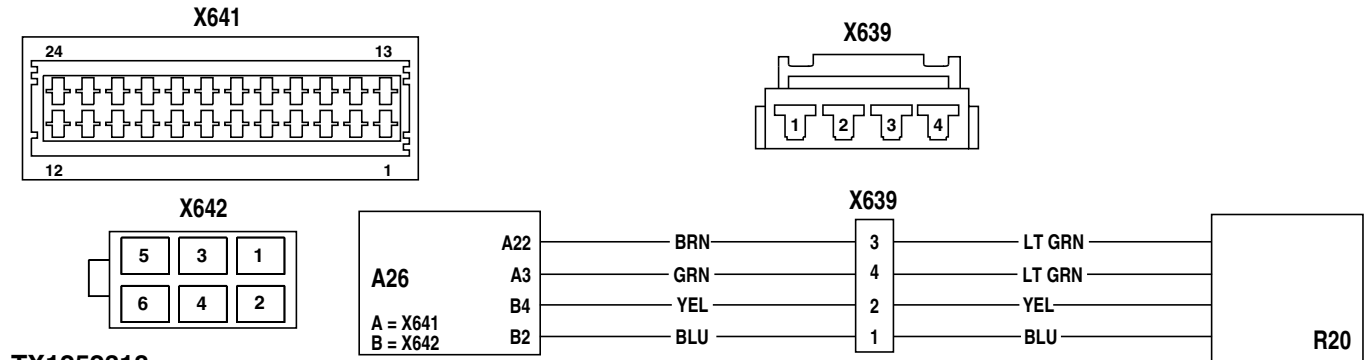
3 — Back Blower Short to Power

Not applicable to machine.

DF89619,00B690D -19-07FEB18-1/1

17 — Upper Thermal Duct Module Over Temperature

Premium seat controller (PSC) (A26) detects upper thermal duct module (R20) is over temperature.



TX1252318 —UN—13FEB18

TX1252318

Upper Thermal Duct Module Circuit Schematic

A26— Premium Seat Controller (PSC)

R20— Upper Thermal Duct Module

X639— Upper Thermal Module Connector
X641— Premium Seat Controller (PSC) Connector A

X642— Premium Seat Controller (PSC) Connector B

Code-Induced Condition:

- Seat Heating and Cooling Operations Inoperable

Circuit Information:

- See System Functional Schematic. (Group 9015-15.)

Component Location:

- See Premium Seat Harness (W87) Component Location. (Group 9015-15.)

Diagnostic Test Box Information:

- Not Applicable

Additional References:

- None

Possible Causes:

1. Circuit is shorted to power.
2. Component malfunction.
3. Software malfunction. Replace controller.

DF89619,00B691C -19-19FEB18-1/1

CAUTION: To avoid possible injury or death to operator or others, the rear view camera image is designed to supplement other safety practices and is not intended to be the sole method of collision avoidance. Always be alert and aware of the surroundings when operating this machine.

Turn key to ON position.

When the default screen (5) is displayed, press monitor dial (2) on the switch panel.

LOOK: Does main menu screen (1) display?

Rotate monitor dial to highlight settings menu.

Press monitor dial.

LOOK: Does settings menu display?

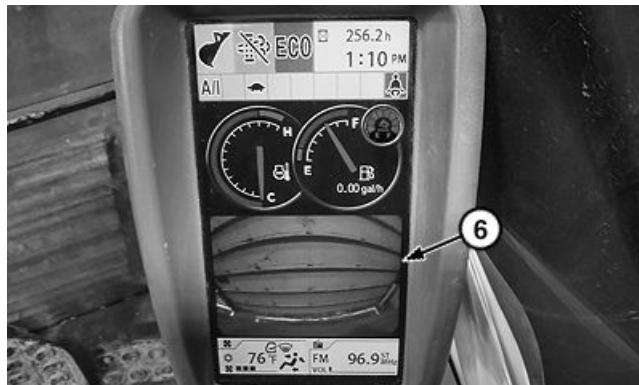
At settings menu, rotate monitor dial to highlight rear view camera monitor.

Press monitor dial to display rear view camera monitor menu.

LOOK: Does rear view camera monitor menu display?

Press monitor dial to turn camera ON (enable).

Press home button (4).



TX1160752A —UN—15MAY14

Rear View Image

6—Rear View Image

LOOK: Does rear view image (6) display on default screen?

Repeat above steps.

At rear view camera monitor menu, press monitor dial to turn camera OFF (disable).

Press home button.

LOOK: Does default screen appear without rear view image?

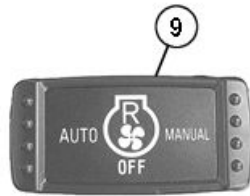
YES: Go to next check.

NO: See [Rear Camera Harness \(W19\) Component Location](#) and see [Rear Camera Harness \(W19\) Wiring Diagram](#). (Group 9015-10.)

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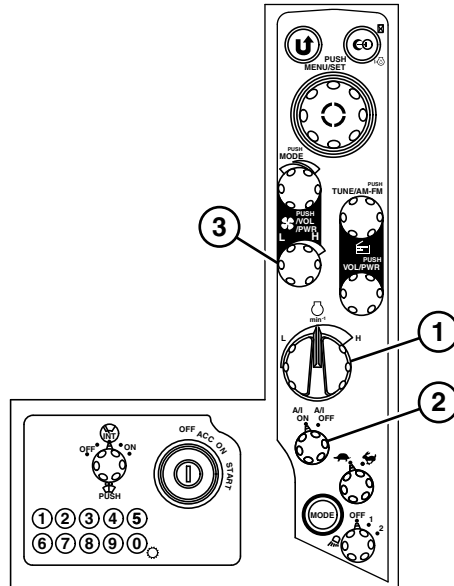
JJ03229,0001128 -19-23JAN18-13/55

**Reversing Fan System
(if equipped)**



TX1015264A —UN—09JAN07

Reversing Fan Switch



TX1088406 —UN—21FEB11

Switch Panel

- 1—Engine Speed Dial**
- 2—Auto-Idle Switch**
- 3—Blower Speed Switch**
- 9—Reversing Fan Switch**

Place pilot shutoff lever in unlocked (DOWN) position.

Turn engine speed dial (1) to H (fast idle) position.

Warm hydraulic oil to greater than 12°C (54°F).

Turn auto-idle switch (2) to A/I OFF position.

Press blower speed switch (3) OFF.

Press reversing fan switch (9) to MANUAL position.

***LISTEN:** Does fan speed slow down?*

***LOOK/LISTEN:** After approximately 20 seconds, does the fan speed increase and rotate in reverse direction for approximately 30 seconds?*

***LISTEN/LOOK:** Does the fan speed slow for approximately 20 seconds? Does fan direction return to normal?*

***LISTEN:** Does fan speed increase?*

IMPORTANT: Avoid connector damage. Do not install connector with impact wrench or power tools. Over torquing will result in permanent damage to connector. Torque only to specification.

Specification

100-Pin Connector (X3)—Torque.....10 N·m
89 lb·in

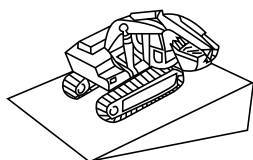
YES: Go to next check.

NO: See [Reversing Fan Switch Harness \(W23\) Wiring Diagram](#), see [Reversing Fan Switch Harness \(W23\) Component Location](#), and see [Cab Harness \(W1\) Wiring Diagram](#). (Group 9015-10.)

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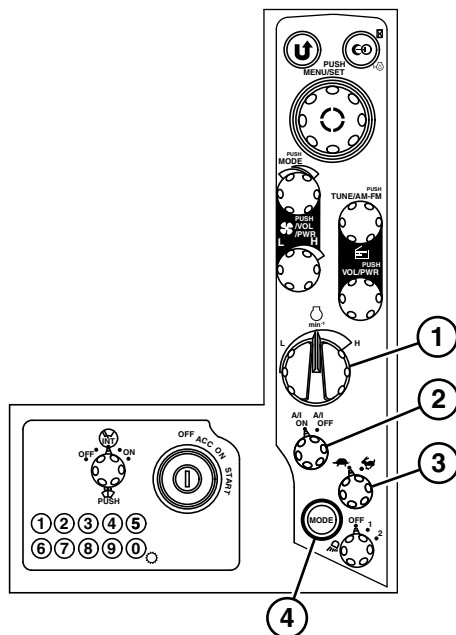
JJ03229,0001128 -19-23JAN18-26/55

Swing Power Check



TX1093770 —UN—28JUN13

Machine Position



TX1086753 —UN—11JAN11

Switch Panel

- 1— Engine Speed Dial
- 2— Auto-Idle Switch
- 3— Travel Speed Switch
- 4— Power Mode Button

Fill the bucket with dirt.

Position machine on a hillside with a slope of approximately 25%. If a hill is not available, raise one side of machine approximately 300 mm (1 ft) with the boom and insert a block under the track.

Move arm to the fully extended position. Raise boom so arm-to-bucket pivot pin is the same height as boom-to-frame pivot pin.

Swing upperstructure clockwise so it is 90 degrees to the slope.

Turn engine speed dial (1) to H (fast idle) position.

Press and release power mode button (4) until H/P (high power) mode is displayed on monitor.

Actuate the swing function to swing uphill.

LOOK: Does upperstructure swing uphill?

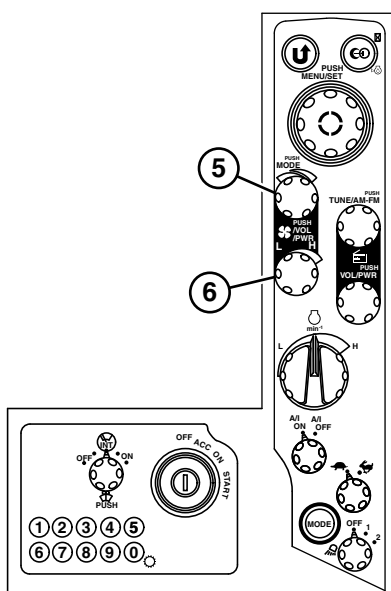
Swing upperstructure 180 degrees counterclockwise and repeat procedure.

YES: Go to next check.

NO: Perform Swing Motor Crossover Relief Valve Test and Adjustment. (Group 9025-25.)

Continued on next page

JJ03229,0001128 -19-23JAN18-39/55



Switch Panel

5—Temperature Control/Mode Switch

6—Blower Speed Switch

Start engine and warm to normal operating temperature.

Turn temperature control/mode switch (5) clockwise to maximum heat position.

FEEL: Does warm air come from the vents?

Turn temperature control/mode switch counterclockwise to maximum cold position.

LISTEN: Does air conditioner compressor clutch solenoid “click”?

FEEL: Does cool air come from the vents?

IMPORTANT: Avoid connector damage. Do not install connector with impact wrench or power tools. Over torquing will result in permanent damage to connector. Torque only to specification.

Specification

100-Pin Connector (X3)—Torque.....	10 N·m
	89 lb·in

YES: Checks complete.

NO: Heater does not operate. Check air conditioner and heater 20 A fuse (F3) (marked HEATER). See Fuse and Relay Specifications. (Group 9015-10.)

NO: Check wiring harnesses. See Cab Harness (W1) Wiring Diagram and see Heater and Air Conditioner Harness (W41) Wiring Diagram. (Group 9015-10.)

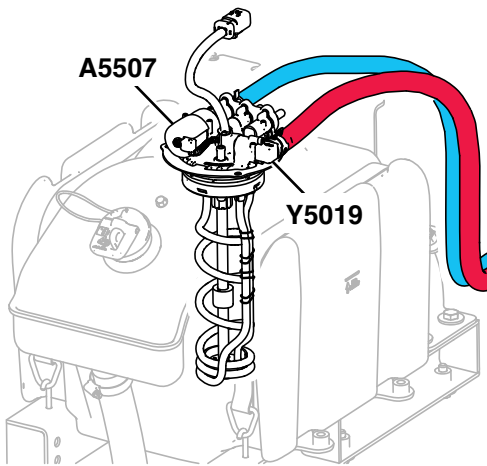
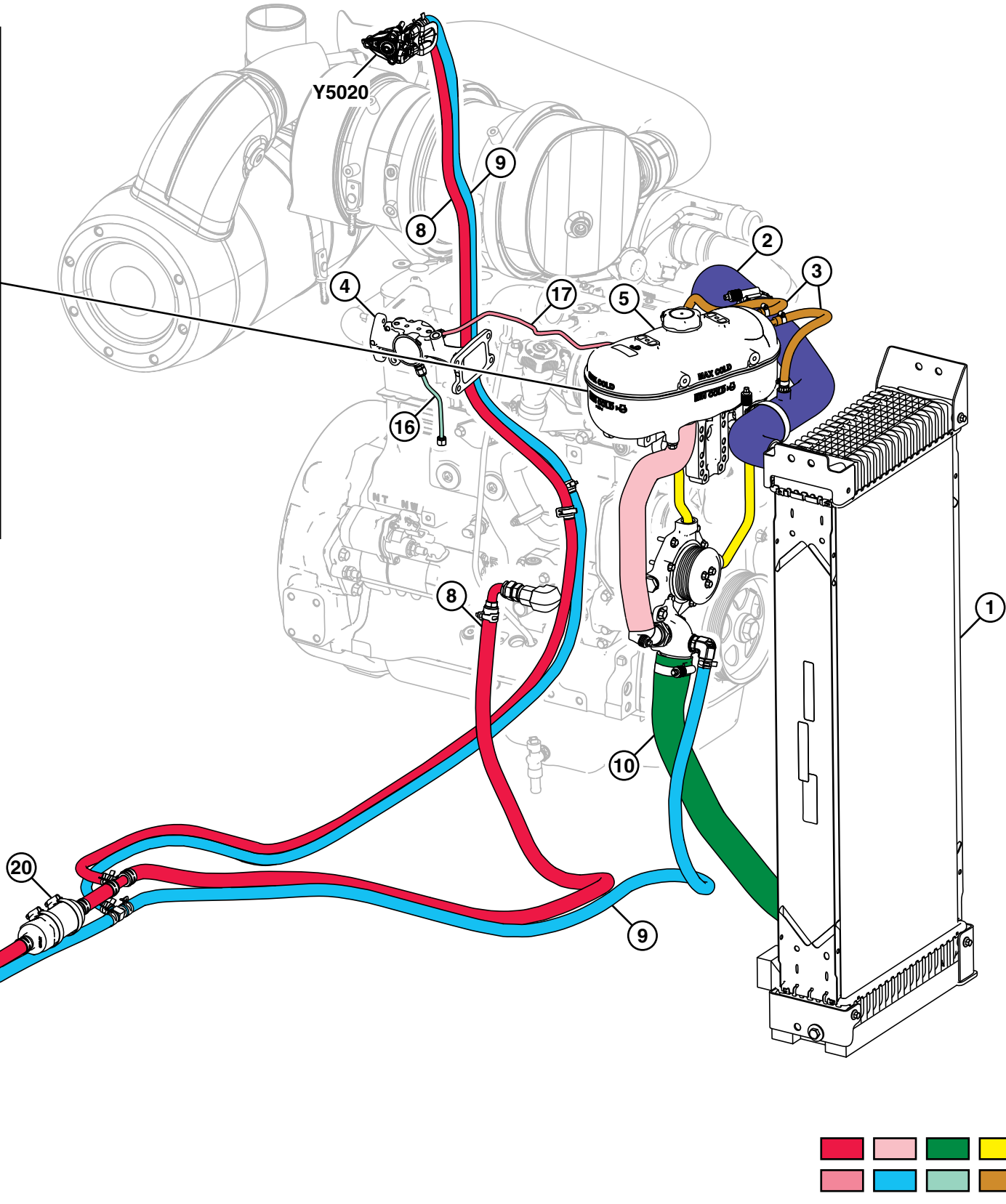
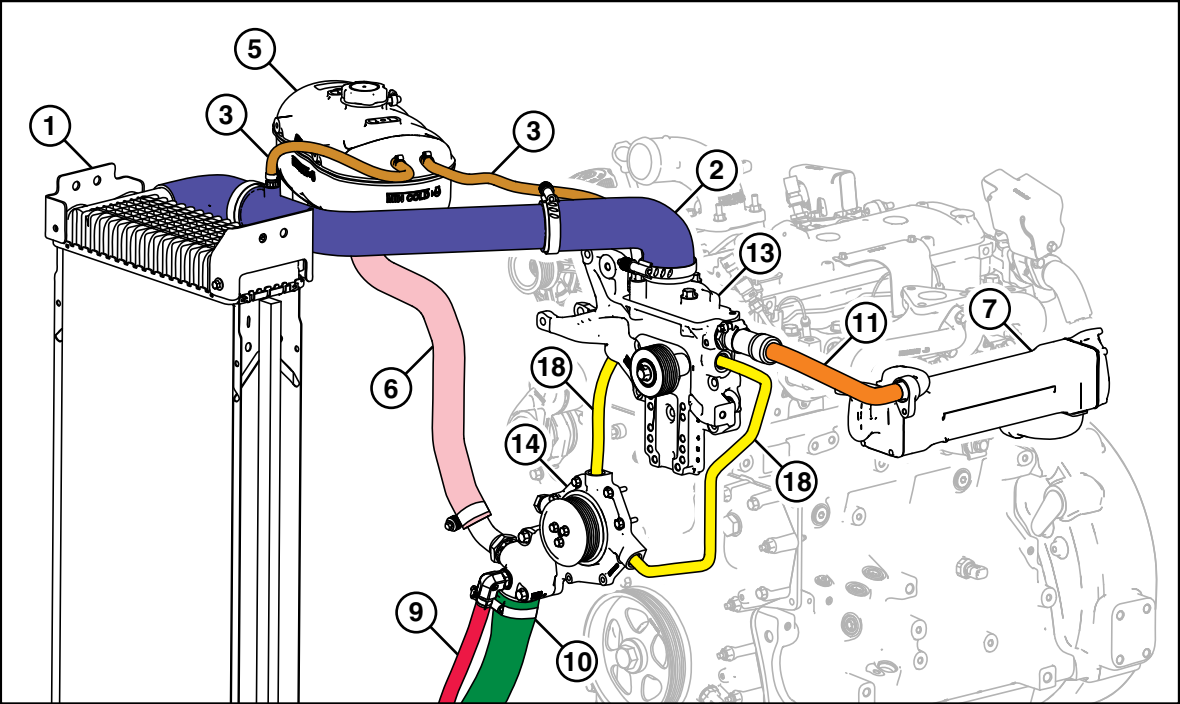
NO: Check system operation. See Heater and Air Conditioner Operational Checks. (Group 9031-25.)

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JJ03229,0001128 -19-23JAN18-53/55

Engine Cooling System Component Location
Engine Cooling System Component Location (S.N. —056599)

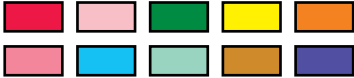
TX1231003 —UN—20DEC16



TX1231003

Continued on next page

Engine Cooling System Component Location (S.N. —056599)



JL58967,0000737 -19-19DEC16-1/4

The engine speed is controlled by the following items:

- Engine speed dial (1)
- Power mode
 - H/P (high power)
 - PWR (power)
 - ECO (economy)
- Work mode
- Travel HP (high power) mode control
- Heater control
- Auto-idle control
- Auto warm-up control
- Engine coolant temperature management
- Idle speed-up control
- ECO control
- Cold fluid component protection (CFCP) system

Engine Speed Dial

The purpose of the engine speed dial is to control the engine speed via operator input.

The main controller (MCZ) uses input signals from the engine speed dial, hydraulic pressure sensors, and temperature sensors to determine appropriate engine speed. The main controller then sends a signal via controller area network (CAN) to the engine control unit (ECU). The ECU then sets engine rpm.

H/P (High Power) Mode

The purpose of H/P mode is to increase engine speed using certain hydraulic functions.

The main controller sends a signal to the ECU via CAN to raise engine rpm when the following conditions are met:

- Power mode: H/P.
- Work mode: Bucket.
- Engine speed dial set to fast idle.
- Arm in, boom up, or a combination of both functions actuated.
- Pump delivery pressure high.

PWR (Power) Mode

The function of PWR mode is to control the engine speed from slow idle to fast idle in response to the position of the engine speed dial.

ECO (Economy) Mode

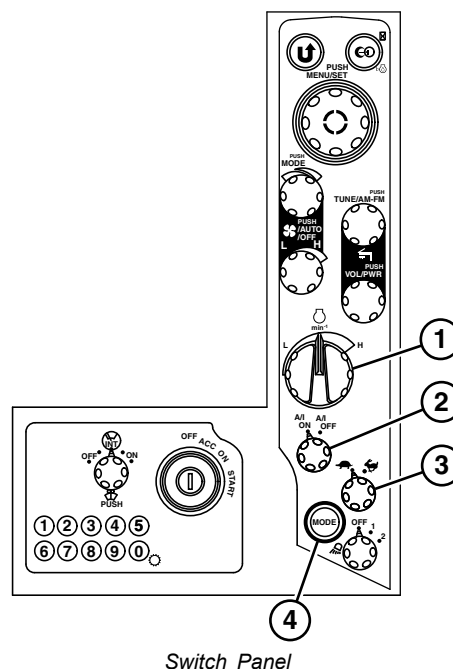
The purpose of ECO mode is to lower engine speed to reduce fuel consumption and noise level.

The main controller receives input signals from the engine speed dial, power mode button (4), and pump delivery pressure sensors, and then sends a signal via CAN to the ECU to reduce engine rpm when the following conditions are met:

- Engine speed dial set to greater than ECO mode speed.
- Power mode: ECO.

Travel HP (High Power) Mode Control

The purpose of travel HP mode control is to increase engine speed for faster travel.



1— Engine Speed Dial
2— Auto-Idle Switch

3— Travel Mode Switch
4— Power Mode Button

The main controller uses input signals from the travel pressure sensor, engine speed dial, travel mode switch (3), and delivery pressure sensors to determine appropriate engine speed. The main controller then sends a signal via CAN to the ECU to increase engine speed when the following conditions are met:

- Engine speed dial set to fast idle.
- Travel mode switch is at fast (rabbit) speed position.
- Travel pressure sensor is on.
- Either pump 1 or pump 2 delivery pressure sensor must indicate high pressure.

Heater Control

NOTE: Heater control engine mode is independent of heating and air conditioning system operation. Operation of heating and air conditioning system will not change engine speeds.

The purpose of the heater control selection is to accelerate the warm-up speed of the cab heater by increasing the engine speed at low engine coolant temperature.

The main controller sends a signal via CAN to the ECU to increase the engine rpm when the following conditions are met:

- Engine speed dial set to fast idle.
- Engine coolant temperature is 5°C (41°F) or lower.
- Pilot shutoff lever in the locked (UP) position.

Heater control selection is activated when the key switch is turned ON and is deactivated if any other engine speed controls are activated.

TX1131978—UN—28JUN13

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Fuse Box 2

Additional fuses located inside left front service door:

- F6001—JDLINK™ Unswitched Power 7.5 A Fuse
- F6003—JDLINK™ Switched Power 7.5 A Fuse

Additional fuses located near engine control unit (ECU):

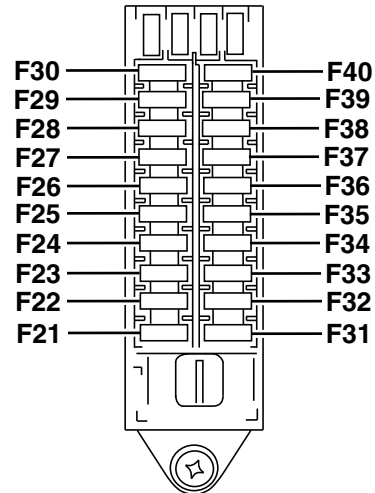
- F5004—Flex Power Controller (FPC) In-Line 10 A Fuse

Additional fuses located in the engine compartment:

- F45—Starter In-Line 30 A Fuse
- F63—Glow Plug 50 A Fuse

Additional fuses located under cover behind cooling package door:

- F46—Engine Light In-Line 7.5 A Fuse
- F60—Alternator 65 A Fuse
- F61—Battery 45 A Fuse



Fuse Box 2

F21— Heated Air Seat 10 A Fuse (marked SEAT HEATER)	F31— Seat Compressor 10 A Fuse (marked SEAT COMPR)
F22— Front Cab Light 1 10 A Fuse (marked CAB LAMP FRONT)	F32— Front Cab Light 2 10 A Fuse (marked CAB LAMP FRONT +2)
F23— Rear Cab Light 10 A Fuse (marked CAB LAMP REAR)	F33— Warning Lamp 10 A Fuse (marked WARNING LAMP)
F24— IMMOBI 5 A Fuse (marked IMOB)	F34— Cab Auxiliary Power Connector 2 10 A Fuse (marked AUX_2)
F25— Quick Hitch 5 A Fuse (marked QUICK HITCH)	F35— Service ADVISOR™ Diagnostic Connector 5 A Fuse (marked DIAG)
F26— Cab Auxiliary Power Connector 3 5 A Fuse (marked AUX_3)	F36— Engine Control Unit (ECU) 20 A Fuse (marked ECU P2)
F27— Not Used (S.N. —057099)	F37— Engine Control Unit (ECU) 20 A Fuse (marked ECU P3)
F27— Seat Heat/Cool 20 A Fuse (marked SEAT_HEAT/COOL) (S.N. 057100—)	F38— Fuel Transfer Pump and Controllers 20 A Fuse (marked ECU P4)
F28— Not Used	F39— Not Used
F29— Not Used	F40— Not Used
F30— Not Used	

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DP27668,00009DF -19-14FEB18-3/4

TX1086712—UN—28JUN13

E22— Battery Disconnect Indicator Light	K2—Pilot Shutoff Solenoid Relay	V3—Load Dump Relay Diode	X65— Cab Harness-to-Pilot Shutoff Switch Harness Connector
F4— Solenoid 20 A Fuse (marked SOLENOID)	K4—Starter Cut Relay	V4—Security Diode	
F7— Start Position Signal 5 A Fuse (marked START)	K5—Security Relay	V5— Starter Cut Relay Diode	X67— Machine Harness Auxiliary Power Connector
F18— Idle Stop 5 A Fuse (marked IDLE STOP)	K11— Idle Stop Relay	V7— Start Relay Diode	
F45— Starter In-Line 30 A Fuse	K12— Accessory Cut Relay	V9—Pilot Shutoff Diode	X75— Cab Harness-to-Pilot Shutoff Valve Harness Connector
F60— Alternator 65 A Fuse	K13— Key Cut Relay	V10— Starter Protection Diode	
F61— Battery 45 A Fuse	K19— Battery Relay	V11— Accessory Cut Diode	X175— Machine Harness-to-Engine Interface Harness Connector 1
G1—Battery	K34— Starter Relay	V12— Starter Cut Diode	
G2—Battery	M1—Starter Motor	V20— Pilot Shutoff Switch Diode	Y10— Pilot Shutoff Solenoid
G3—Alternator	S1— Key Switch	V44— Starter Relay Diode	
K1—Load Dump Relay	S3— Pilot Shutoff Switch 1	X47— Cab Harness-to-Key Switch Harness Connector	
	S4— Pilot Shutoff Switch 2		
	S91— Battery Disconnect Switch		
	V1— Battery Relay Diode		

Continued on next page

JJ03229,000116D -19-06APR18-2/34

A3—Main Controller (MCZ)	B57— Bucket Dump Pressure Sensor	V43— 2-Speed Activation Solenoid Valve Diode	X46— Attachment Connector
B30— Boom Up Pressure Sensor (marked PI1)	B60— Attachment Pressure Sensor	X3— Cab Harness-to-Machine Harness 100-Pin Connector	X86— Machine Harness-to-Travel Alarm Harness Connector
B31— Arm In Pressure Sensor (marked PI2)	B61— Arm Out Pressure Sensor	X29— Cab Harness-to-Switch Panel Connector 3	Y20— Pump 2 Flow Rate Limit Solenoid (marked SB)
B32— Front Attachment Pressure Sensor (marked FRT)	F5— Optional and Attachment Connector 5 A Fuse (marked OPT. 1 ALT)	X31— Cab Harness-to-Main Controller 31-Pin Connector A	Y21— Torque Control Solenoid (marked ST)
B33— Swing Pressure Sensor (marked S3)	F10— Data Converter and Main Controller Battery Power 5 A Fuse (marked CONTROLLER)	X32— Cab Harness-to-Main Controller 24-Pin Connector B	Y22— Dig Regenerative Solenoid (marked SF)
B34— Travel Pressure Sensor (marked TR)	F11— Travel Alarm 5 A Fuse (marked TRAVEL ALARM)	X33— Cab Harness-to-Main Controller 17-Pin Connector C	Y23— Arm Regenerative Solenoid (marked SC)
B35— Pump 1 Delivery Pressure Sensor (marked PP1)	H4— Travel Alarm	X34— Cab Harness-to-Main Controller 30-Pin Connector D	Y24— Power Dig/Travel Speed Solenoid (marked SG)
B36— Pump 1 Control Pressure Sensor (marked PC1)	R15— Engine Speed Dial	X35— Cab Harness-to-Main Controller 24-Pin Connector E	Y26— Pump 1 Flow Rate Limit Solenoid (marked SA)
B37— Pump 2 Delivery Pressure Sensor (marked PP2)	S8— Auto-Idle Switch	X36— Cab Harness-to-Main Controller 26-Pin Connector F	Y40— Selector Valve Solenoid Valve
B38— Pump 2 Control Pressure Sensor (marked PC2)	S11— Travel Mode Switch		Y41— Secondary Relief Solenoid Valve
B40— Hydraulic Oil Temperature Sensor	S12— Power Mode Button		Y43— 2-Speed Activation Solenoid Valve
B56— Bucket Curl Pressure Sensor (marked BKC)	S13— Travel Alarm Cancel Switch		Y44— Flow Rate Adjustment Solenoid Valve
	V40— Selector Valve Solenoid Valve Diode		
	V41— Secondary Relief Solenoid Valve Diode	X40— Pump Harness-to-Machine Harness Connector	

Continued on next page

JJ03229,000116D -19-06APR18-8/34

A1—Engine Control Unit (ECU)	B5301—Crankshaft Position Sensor	R5605—Aftertreatment CAN Termination Resistor	X5503—Engine Control Unit (ECU)-to-Engine Interface Harness Connector 3
A5507—Diesel Exhaust Fluid (DEF) Tank Header Assembly	B5302—Camshaft Position Sensor	X5000—Engine Harness-to-Fuel Injector Harness Connector	Y1—Electronic Injector (cylinder 1)
B5105—Crankcase Pressure Sensor	B5500—Intake Air Sensor	X5016—Engine Interface Harness-to-Engine Harness Connector 2	Y2—Electronic Injector (cylinder 2)
B5113—Fuel Rail Pressure Sensor	B5501—Diesel Exhaust Fluid (DEF) Dosing Unit	X5018—Machine Harness-to-Engine Interface Harness Connector 2	Y3—Electronic Injector (cylinder 3)
B5205—Charge Air Cooler Outlet Temperature Sensor	B5502—Selective Catalytic Reduction (SCR) Inlet NOx Sensor	X5068—Engine Interface Harness-to-Engine Harness Connector 3	Y4—Electronic Injector (cylinder 4)
B5206—Manifold Air Temperature (MAT) Sensor	B5503—Selective Catalytic Reduction (SCR) Outlet NOx Sensor	X5501—Engine Control Unit (ECU)-to-Engine Interface Harness Connector 1	Y5019—Coolant Control Valve
B5211—Diesel Exhaust Fluid (DEF) Tank Temperature Sensor	B5601—Diesel Exhaust Fluid (DEF) Tank Level Sensor	X5502—Engine Control Unit (ECU)-to-Engine Interface Harness Connector 2	Y5024—Fuel Rail Pressure Relief Valve (PRV)
B5217—Aftertreatment Inlet NOx Sensor	F38— Fuel Transfer Pump and Controllers 20 A Fuse (marked ECU P4)		
B5218—Aftertreatment Outlet NOx Sensor	R5603—Engine CAN Termination Resistor		

Continued on next page

JJ03229,000116D -19-06APR18-14/34

A1—Engine Control Unit (ECU)	E5601—Diesel Exhaust Fluid (DEF) Dosing Unit Pressure Line Heater	R4—Glow Plug 4	X5503—Engine Control Unit (ECU)-to-Engine Interface Harness Connector 3
B5109—Exhaust Filter Delta Pressure Sensor	E5602—Diesel Exhaust Fluid (DEF) Dosing Unit Supply Line Heater	R19— Glow Plug Resistor	X5604—Engine Harness-to-Glow Plug Harness Connector
B5201—Diesel Oxidation Catalyst (DOC) Inlet Temperature Sensor	E5603—Diesel Exhaust Fluid (DEF) Dosing Unit Return Line Heater	S15— Reversing Fan Switch	Y5002—Suction Control Valve (SCR)
B5202—Diesel Oxidation Catalyst (DOC) Outlet Temperature Sensor	F36— Engine Control Unit (ECU) 20 A Fuse (marked ECU P2)	S16— Exhaust Filter Parked Cleaning Switch	Y5014—Variable Speed Fan Solenoid
B5204—Exhaust Filter Temperature Module	F37— Engine Control Unit (ECU) 20 A Fuse (marked ECU P3)	X83— Cab Harness-to-Reversing Fan Switch Harness (marked VSF-SW)	Y5015—Reversing Fan Solenoid
B5213—Diesel Particulate Filter (DPF) Outlet Pressure Sensor	F63— Glow Plug 50 A Fuse	X5016—Engine Interface Harness-to-Engine Harness Connector 2	Y5020—Diesel Exhaust Fluid (DEF) Dosing Injector
B5214—Diesel Particulate Filter (DPF) Inlet Pressure Sensor	K16— Glow Plug Relay	X5018—Machine Harness-to-Engine Interface Harness Connector 2	Y5501—Fuel Transfer Pump
B5216—Selective Catalytic Reduction (SCR) Inlet Temperature Sensor	R1—Glow Plug 1	X5501—Engine Control Unit (ECU)-to-Engine Interface Harness Connector 1	
	R2—Glow Plug 2	X5502—Engine Control Unit (ECU)-to-Engine Interface Harness Connector 2	
	R3—Glow Plug 3		

Continued on next page

JJ03229,000116D -19-06APR18-20/34

System Diagrams

A5—Data Converter	E10— Switch Panel Back Light 5	S14— Door Switch	X6007— JDLink™ Harness Ground 1
A11— Machine Controller (BCZ)	F6001—JDLink™ Unswitched Power 7.5 A Fuse	V13— Work Light 1 Diode	X6014—Modular Telematics Gateway (MTG) Control Unit 48-Pin Connector
A6000—Modular Telematics Gateway (MTG) Controller	F6003—JDLink™ Switched Power 7.5 A Fuse	V14— Work Light 2 Diode	X6015—Satellite (SAT) Module Control Unit 48-Pin Connector
A6001—GPS/Cellular Antenna	R10— Interface CAN Resistor 1	X10— Machine Controller 8-Pin Connector A	X6016—Engine Interface Harness-to-Satellite (SAT) Harness Connector
A6002—Satellite (SAT) Module Control Unit (if equipped)	R11— Interface CAN Resistor 2	X11— Machine Controller 20-Pin Connector B	
A6003—Satellite (SAT) Antenna	S2— Cab Dome Light Switch	X27— Cab Harness-to-Switch Panel Connector 1	
E3— Cab Dome Light	S9— Windshield Wiper and Washer Switch	X5018—Machine Harness-to-Engine Interface Harness Connector 2	
E9— Key Switch Light			

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B68— Secondary Hydraulic Oil Temperature Sensor	S31— Right Pilot Control Lever Switch A	X535— Left Auxiliary Solenoid Connector (marked SL/H)	Y61— Auxiliary Function Lever (AFL) Solenoid A (marked 1A)
B85— Auxiliary Function Lever (AFL) Solenoid Pressure Sensor (marked PS1)	S32— Left Pilot Control Lever Switch B	X536— Right Auxiliary Function Lever (AFL) Connector (marked R_GRIP)	Y62— Auxiliary Function Lever (AFL) Solenoid B (marked 1B)
K31— Right Solenoid Relay A (marked RSW1)	S33— Left Pilot Control Lever Switch A	X537— Left Auxiliary Function Lever (AFL) Connector (marked L_GRIP)	Y66— Secondary Pilot Shutoff Solenoid Valve (marked PiC)
K32— Left Solenoid Relay B (marked LSW1)	S34— Right Enable Switch (marked ON/OFF)	X543— Horn Switch Connector	
K33— Left Solenoid Relay A (marked LSW3)	S35— Left Enable Switch (marked ON/OFF)	X544— Power Dig Switch Connector	
S5— Horn Switch	S45— Auxiliary Function Enable Switch (marked AFL_SW)	X574— Auxiliary Function Lever (AFL) Connector 1	
S7— Power Dig Switch	V22— Pilot Shutoff Solenoid Diode	X577— Auxiliary Function Lever (AFL) Harness-to-Auxiliary Function Lever (AFL) Solenoid Harness Connector	
S29— Auxiliary Function Lever (AFL) Proportional Control Switch	X26— Optional Connector		
	X534— Right Auxiliary Solenoid Connector (marked SR/H)		

Continued on next page

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A3—Main Controller (MCZ)	V1—Battery Relay Diode	X25—Cab Harness Auxiliary Power Connector 1 (marked AUX +/-)	X59—Satellite Communication Connector (marked IMMOBI)
A4—Monitor Controller (DSZ)	V2—Not Used	X26—Optional Connector	X61—Quick Hitch Connector (marked QUICK HITCH)
A5—Data Converter	V3—Load Dump Relay Diode	X27—Cab Harness-to-Switch Panel Connector 1	X62—Cab Auxiliary Power Connector 2 (marked AUX_2)
A6—Radio	V4—Security Diode	X28—Cab Harness-to-Switch Panel Connector 2	X63—Cab Auxiliary Power Connector 3 (marked AUX_3)
A8—12-Volt Power Converter	V5—Starter Cut Relay Diode	X29—Cab Harness-to-Switch Panel Connector 3	X65—Cab Harness-to-Pilot Shutoff Switch Harness Connector
A11—Machine Controller (BCZ)	V6—Auxiliary Power Connector Diode	X30—Cab Harness-to-Switch Panel Connector 4	X73—Cab Harness-to-Speakers Connector
E3—Cab Dome Light	V7—Start Relay Diode	X31—Cab Harness-to-Main Controller 31-Pin Connector A	X74—Cab Harness-to-Service ADVISOR™ Remote (SAR) Switch Harness Connector (marked ADV-SW)
F50—Fuse Box 1	V8—Air Conditioner Clutch Diode	X32—Cab Harness-to-Main Controller 24-Pin Connector B	X75—Cab Harness-to-Pilot Shutoff Valve Harness Connector
F51—Fuse Box 2	V9—Pilot Shutoff Diode	X33—Cab Harness-to-Main Controller 17-Pin Connector C	X76—Cab Harness Connector 1 (marked HMST) (not used)
G5—12-Volt Power Outlet	V10—Starter Protection Diode	X34—Cab Harness-to-Main Controller 30-Pin Connector D	X77—Radio Auxiliary Connector
G6—USB Connector	V11—Accessory Cut Diode	X35—Cab Harness-to-Main Controller 24-Pin Connector E	X78—Optional Switch Connector
H2—Security Alarm	V12—Starter Cut Diode	X36—Cab Harness-to-Main Controller 26-Pin Connector F	X81—Multi-Function Pilot Control Lever Harness-to-Auxiliary 3-Button Cancel Switch Harness Connector
K1—Load Dump Relay	V13—Work Light 1 Diode	X37—Cab Harness-to-Exhaust Filter Switch Harness Connector	X83—Cab Harness-to-Reversing Fan Switch Harness Connector (marked VSF-SW)
K2—Pilot Shutoff Solenoid Relay	V14—Work Light 2 Diode	X39—Cab Harness-to-Window Switch Connector	X99—Cab Ground Splice
K3—Security Alarm Relay	W1—Cab Harness	X42—CAN 1 Connector	X543—Horn Switch Connector
K4—Starter Cut Relay	W3—Monitor Harness	X45—Option 2 12-Pin Connector (not used)	X544—Power Dig Switch Connector
K5—Security Relay	W9—Exhaust Filter Parked Cleaning Switch Harness	X47—Cab Harness-to-Key Switch Harness Connector	X573—Exhaust Solenoid Harness Connector (not used)
K6—Windshield Wiper Relay	W10—Service ADVISOR™ Remote (SAR) Switch Harness	X50—Cab Harness-to-Travel Alarm Cancel Switch Harness Connector	X574—Auxiliary Function Lever (AFL) Connector 1
K7—Work Light Relay	W16—Travel Alarm Cancel Switch Harness	X51—Air Conditioner 4-Pin Connector	X575—Auxiliary Function Lever (AFL) Connector 2
K8—Boom Light Relay	W22—Auxiliary 3-Button Cancel Switch Harness	X52—Air Conditioner 10-Pin Connector	X603—Not Used
K9—Windshield Washer Relay	W23—Reversing Fan Switch Harness	X54—Heated Air Seat Harness 3-Pin Connector (marked SEAT HEATER)	X623—Cab Harness CAN Connector
K10—Horn Relay	W29—Starter Switch Harness	X55—Front Cab Light 1 Connector (marked CAB LAMP FRONT)	X630—Premium Seat Harness Connector (marked 24V POWER)
K11—Idle Stop Relay	W35—Cab Harness Ground 1	X56—Front Cab Light 2 Connector (marked CAB LAMP FRONT +2)	X631—USB Harness Connector (marked USB)
K12—Accessory Cut Relay	W36—Cab Harness Ground 2	X57—Rear Cab Light Connector (marked CAB LAMP REAR)	
K13—Key Cut Relay	W37—Cab Harness Ground 3	X58—Warning Light Connector (marked WARNING LAMP)	
R9—Lighter	W82—USB Harness		
R10—Interface CAN Resistor 1	W83—USB Jumper Harness		
R15—Engine Speed Dial	X1—Service ADVISOR™ Diagnostic Connector		
S1—Key Switch	X2—MPDr 6-Pin Connector		
S5—Horn Switch	X3—Cab Harness-to-Machine Harness 100-Pin Connector		
S7—Power Dig Switch	X10—Machine Controller (BCZ) 8-Pin Connector A		
S8—Auto-Idle Switch	X11—Machine Controller (BCZ) 20-Pin Connector B		
S9—Windshield Wiper and Washer Switch	X17—Cab Harness-to-Monitor Harness Connector		
S10—Work Light Switch	X20—Monitor Controller 28-Pin Connector A		
S11—Travel Speed Switch	X21—Monitor Controller 36-Pin Connector B		
S12—Power Mode Button	X22—Monitor Controller 16-Pin Connector D		
S13—Travel Alarm Cancel Switch	X23—Monitor Controller 12-Pin Connector C		
S14—Door Switch	X24—Monitor Controller 2-Pin Connector G		
S15—Reversing Fan Switch			
S16—Exhaust Filter Parked Cleaning Switch			
S18—Service ADVISOR™ Remote (SAR) Switch			
S21—Blower Motor Speed Switch			
S22—Temperature Control/Mode Switch			
S23—Radio Volume and Power Switch			
S24—Radio Tuning Switch			
S25—Monitor Dial			
S26—Back Button			
S27—Home Button			
S34—Right Enable Switch (marked ON/OFF)			
S60—Keypad			

JA92389,000015D -19-13FEB18-5/5

Cab Harness (W1) Wiring Diagram

IMPORTANT: Avoid connector damage. Do not install connector with impact wrench or power tools. Over torquing will result in permanent damage to connector. Torque only to specification.

Specification

Cab Harness-to-Machine Harness	
100-Pin Connector	
(X3)—Torque.....	10 N·m
	89 lb·in

Continued on next page

JA92389,000015E -19-14FEB18-1/19

System Diagrams

2—Continued on Sheet 3	K8—Boom Light Relay	V10—Starter Protection Diode	X42—CAN 1 Connector
3—Continued on Sheet 5	K9—Windshield Washer Relay	V13—Work Light 1 Diode	X78—Optional Switch
K1—Load Dump Relay	K10—Horn Relay	V14—Work Light 2 Diode	X574—Auxiliary Function Lever (AFL) Connector 1
K2—Pilot Shutoff Solenoid Relay	K11—Idle Stop Relay	W36—Cab Harness Ground 2	X575—Auxiliary Function Lever (AFL) Connector 2 (not used)
K3—Security Alarm Relay	K12—Accessory Cut Relay	X10—Machine Controller 8-Pin Connector A	
K4—Starter Cut Relay	K13—Key Cut Relay	X11—Machine Controller 20-Pin Connector B	
K5—Security Relay	V1—Battery Relay Diode	X17—Cab Harness-to-Monitor Harness Connector	
K6—Windshield Wiper Relay	V4—Security Diode		
K7—Work Light Relay	V7—Start Relay Diode		
	V8—Air Conditioner Clutch Diode		

Continued on next page

JA92389,000015E -19-14FEB18-8/19

System Diagrams

1—Continued on Sheet 2
2—Continued on Sheet 4
A5—Data Converter
E3—Cab Dome Light
H2—Security Alarm
R10—N CAN Resistor 1
V2—Alternator Excitation Diode
V3—Load Dump Relay Diode

V5—Starter Cut Relay Diode
V9—Pilot Shutoff Diode
V11—Accessory Cut Diode
V12—Starter Cut Diode
X3—Cab Harness-to-Machine
Harness 100-Pin Connector
X31—Cab Harness-to-Main
Controller 31-Pin
Connector A

X32—Cab Harness-to-Main
Controller 24-Pin
Connector B
X33—Cab Harness-to-Main
Controller 17-Pin
Connector C
X51—Air Conditioner 4-Pin
Connector
X52—Air Conditioner 10-Pin
Connector

X73—Cab Harness-to-Speakers
Connector
X99—Cab Ground Splice
X573—Exhaust Solenoid
Harness Connector (not
used)

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JA92389,000015E -19-14FEB18-15/19

A12— Rear Camera	B56— Bucket Curl Pressure Sensor (marked BKC) (S.N. 057100—)	X40— Pump Harness-to-Machine Harness Connector	X590— Exhaust Solenoid Harness Connector (not used)
B18— Fuel Level Sensor	B57— Bucket Dump Pressure Sensor (S.N. 057100—)	X46— Attachment Connector	X5018—Machine Harness-to-Engine Interface Harness Connector 2
B20— Air Conditioner High/Low-Pressure Switch	B61— Arm Out Pressure Sensor (S.N. 057100—)	X64— Machine Harness-to-Rear Camera Harness Connector	Y11— Air Conditioner Compressor Clutch Solenoid
B22— Ambient Air Temperature Sensor	E1— Work Light	X67— Machine Harness Auxiliary Power Connector	Y22— Dig Regenerative Solenoid (marked SF)
B23— High Note Horn	E2— Boom Light	X86— Machine Harness-to-Travel Alarm Harness Connector	Y23— Arm Regenerative Solenoid (marked SC)
B24— Low Note Horn	F60— Alternator 65 A Fuse	X90— Machine Harness-to-Hydraulic Oil Temperature Switch Connector	Y24— Power Dig/Travel Speed Solenoid (marked SG)
B27— Hydraulic Oil Filter Restriction Switch (if equipped)	F61— Battery 45 A Fuse	X98— Machine Harness Power Splice	
B30— Boom Up Pressure Sensor (marked PI1)	G3—Alternator	X104— Machine Harness Ground Splice	
B31— Arm In Pressure Sensor (marked PI2)	K19— Battery Relay	X175— Machine Harness-to-Engine Interface Harness Connector 1	
B32— Front Attachment Pressure Sensor (marked FRT)	M6—Windshield Washer Motor		
B33— Swing Pressure Sensor (marked S3)	S40— Hydraulic Oil Temperature Switch (if equipped)		
B34— Travel Pressure Sensor (marked TR)	W2—Machine Harness		
	W19—Rear Camera Harness		
	X3— Cab Harness-to-Machine Harness 100-Pin Connector		

JA92389,0000169 -19-31JAN18-3/3

Machine Harness (W2) Wiring Diagram

IMPORTANT: Avoid connector damage. Do not install connector with impact wrench or power tools. Over torquing will result in permanent damage to connector. Torque only to specification.

Specification

Cab Harness-to-Machine Harness 100-Pin Connector (X3)—Torque.....	10 N·m
	89 lb·in

Continued on next page

JA92389,0000157 -19-14FEB18-1/9

System Diagrams

1— Continued on Sheet 2	B33— Swing Pressure Sensor (marked S3)	X67— Machine Harness Auxiliary Power Connector	X5018—Machine Harness-to- Engine Interface Harness Connector 2
B18— Fuel Level Sensor	B34— Travel Pressure Sensor (marked TR)	X90— Machine Harness-to- Hydraulic Oil Temperature Switch Connector	
B23— High Note Horn	E1— Work Light	X590— Exhaust Solenoid Harness Connector (not used)	
B24— Low Note Horn	E2— Boom Light		
B32— Front Attachment Pressure Sensor (marked FRT)	X3— Cab Harness-to-Machine Harness 100-Pin Connector		

Continued on next page

JA92389,0000157 -19-14FEB18-7/9

System Diagrams

B5101—Engine Oil Pressure Sensor	B5205—Charge Air Cooler Outlet Temperature Sensor	X5015—Engine Interface Harness-to-Engine Harness Connector 1	X5141—Engine Harness-to-Front Engine Harness Connector 2
B5102—Exhaust Manifold Pressure Sensor	B5206—Manifold Air Temperature (MAT) Sensor	X5016—Engine Interface Harness-to-Engine Harness Connector 2	X5604—Engine Harness-to-Glow Plug Interface Harness Connector
B5103—Exhaust Gas Recirculation (EGR) Delta Pressure Sensor	B5207—Exhaust Gas Recirculation (EGR) Temperature Sensor	X5021—Fuel Injector Harness Connector	Y5400—Exhaust Gas Recirculation (EGR) Valve
B5104—Intake Manifold Pressure Sensor	B5209—Fuel Temperature Sensor	X5040—Engine Harness-to-Front Engine Harness Connector 1	
B5105—Crankcase Pressure Sensor	G3—Alternator	X5068—Engine Interface Harness-to-Engine Harness Connector 3	
B5107—Inlet Fuel Pressure Sensor	W4—Engine Harness		
	X5001—Static Ground		

JA92389,0000163 -19-04SEP15-2/2

A1—Engine Control Unit (ECU)	F6003—JDLINK™ Switched Power 7.5 A Fuse	W6003—Satellite (SAT) Harness	X5501—Engine Control Unit (ECU) Connector 1
A15— Flex Power Controller (FPC)	K19— Battery Relay	X175— Machine Harness-to-Engine Interface Harness Connector 1	X5502—Engine Control Unit (ECU) Connector 2
A6000—Modular Telematics Gateway (MTG) Controller	K34— Starter Relay	X5005—Fan Harness Connector	X5503—Engine Control Unit (ECU) Connector 3
A6001—GPS/Cellular Antenna	M1—Starter Motor	X5015—Engine Interface Harness-to-Engine Harness Connector 1	X6014—Modular Telematics Gateway (MTG) Control Unit 48-Pin Connector
A6002—Satellite (SAT) Module Control Unit (if equipped)	R11— Interface CAN Resistor 2	X5016—Engine Interface Harness-to-Engine Harness Connector 2	X6015—Satellite (SAT) Module Control Unit 48-Pin Connector
A6003—Satellite (SAT) Antenna	R90— Diesel Particulate Filter (DPF) Regen Active Lamp Resistor	X5018—Machine Harness-to-Engine Interface Harness Connector 2	X6016—Engine Interface Harness-to-Satellite (SAT) Harness Connector
B5600—Water-in-Fuel (WIF) Sensor	R92— Service ADVISOR™ Remote (SAR) Switch Accept LED Resistor	X5037—Engine Interface Harness-to-Diesel Exhaust Fluid (DEF) Harness Connector 1	Y5501—Fuel Transfer Pump
E22— Battery Disconnect Indicator Light	R93— Service ADVISOR™ Remote (SAR) Switch Decline LED Resistor	X5039—Engine Interface Harness-to-Exhaust Aftertreatment Harness Connector	
F45— Starter In-Line 30 A Fuse	R5601—CAN 0 Termination Resistor	X5068—Engine Interface Harness-to-Engine Harness Connector 3	
F46— Engine Light In-Line 7.5 A Fuse	V44— Starter Relay Diode		
F5004—Flex Power Controller (FPC) In-Line 10 A Fuse	W5—Engine Interface Harness		
F6001—JDLINK™ Unswitched Power 7.5 A Fuse	W39—Engine Interface Harness Ground		

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JL58967,0000733 -19-22FEB17-4/4

Engine Interface Harness (W5) Wiring Diagram (S.N. 056600—)

TX1230666 —UN—17JAN17

END #1	NUMBER	COLOR	END #2
X5018	1356A	YEL	X152
A15	1356B	YEL	X152
X152	1356C	YEL	X168
X168	1356D	YEL	X6014
X168	1356E	YEL	R11
X5018	1357A	GRN	X153
A15	1357B	GRN	X153
X153	1357C	GRN	X167
X167	1357D	GRN	X6014
X167	1357E	GRN	R11
Y5501	5003	ORG	X5501
X5502	5010	BLK	X5016
X5502	5014	YEL	X5005
X5501	5015	GRN	X5005
X5501	5016	BLU	X5015
X5501	5018	GRY	X5015
X5018	5022A	RED	X176
X176	5022B	RED	X5503
X176	5022C	RED	X5503
X5502	5023	ORG	X5005
X140	5030A	CLR	X156
X140	5030B	CLR	X156
X5016	5030C	CLR	X140
X5501	5030E	BLK	X140
X156	5030F	BLK	X5015
X5502	5051	BRN	X5016
X5016	5053	ORG	X5502
X5018	5122A	RED	X177
X177	5122B	RED	X5503
X177	5122C	RED	X5503
X5005	5125	GRN	X5502
X5502	5126	BLU	X5005
X5502	5141	BRN	X5037
X5502	5146	BLU	X5037
X5018	5222A	RED	X178
X178	5222B	RED	X5503
X178	5222C	RED	X5503
X5502	5246	BLU	X5016
X5037	5301	BRN	X5502
X5502	5303	ORG	X5037
X5037	5304	YEL	X5502
X5037	5305	GRN	X5502
X5037	5306	BLU	X5502
X5037	5307	VLT	X5502
X5037	5308	GRY	X5502
X5037	5309	WHT	X5502
X5037	5311	BRN	X5502
X5037	5313	ORG	X5502
X5037	5314	YEL	X5502
X5037	5315	GRN	X5502
X5037	5317	VLT	X5502
X5037	5318	GRY	X5502
X5037	5321	BRN	X5502
X5037	5324	YEL	X5502
X5037	5329	WHT	X5502
X5039	5331	BRN	X5502
X5039	5333	ORG	X5502
X181	5410A	CLR	X195
X181	5410B	CLR	X195
X5501	5410C	BLK	X181

TX1230666

END #1	NUMBER	COLOR	END #2
X195	5410D	BLK	X5068
X5501	5415	GRN	X5015
X5501	5419	WHT	X5068
X5501	5421	BRN	X5015
X5501	5423	ORG	X5015
X5501	5425	GRN	X5015
X5015	5427	VLT	X5501
X5016	5429	WHT	X5501
X5501	5443	YEL	X5015
X5501	5445	GRN	X5015
X5501	5447	YEL	X5015
X5501	5448	GRN	X5015
B5600	5453	ORG	X5501
X5502	5455	GRN	X5016
X5502	5456	BLU	X5016
X5501	5461	BRN	X5015
X5502	5463	ORG	X5016
X5501	5465	GRN	X5015
X5501	5467	VLT	X5015
X5502	5468	GRY	X5016
X5015	5469	WHT	X5501
X5068	5491	RED	X5501
X5068	5493	BRN	X5501
X5068	5495	GRN	X5501
X5068	5496	ORG	X5501
X5068	5498	YEL	X5501
X5068	5499	BLU	X5501
X5015	5509	WHT	X5501
X5501	5611	BRN	X5015
X5501	5613	ORG	X5015
X5501	5614	YEL	X5015
X5502	5621	BRN	X5016
X5502	5623	ORG	X5016
X5502	5624A	YEL	X143
X5016	5624B	YEL	X143
X5005	5624C	YEL	X143
X5502	5625A	GRN	X147
X147	5625B	GRN	X5016
X147	5625C	GRN	X5039
X5037	5625D	GRN	X147
X5501	5626	BLU	X5015
X5502	5628	GRY	X5016
X5501	5631	BRN	X5015
X5501	5633	ORG	X5015
X5039	5634	YEL	X5502
X5039	5636	BLU	X5502
X5501	5646	BLK	X5016
X5502	5647	VLT	X5005
X5501	5658A	GRY	X145
X5015	5658B	GRY	X145
X5005	5658C	GRY	X145
X5501	5671	BRN	X5016
X5068	5756	RED	X5501
X5501	5761	YEL	X5068
X5068	5767	BLK	X5501
X5502	5783A	ORG	X160
X5016	5783B	ORG	X160
X5039	5783C	ORG	X160
X5039	5785	GRN	X5502
X5039	5786	BLU	X5502

END #1	NUMBER	COLOR	END #2
X5018	5796A	BLU	X169
R90	5796B	BLU	X169
X5503	5796C	BLU	X169
X5501	5804	YEL	X5016
X5501	5805	GRN	X5016
X5501	5817	VLT	Y5501
X5501	5821	BRN	X5015
X5501	5826A	BLU	X266
X5015	5826B	BLU	X266
B5600	5826C	BLU	X266
X5503	5947	VLT	X5018
K19	B022A	RED	F46
X5005	B022B	RED	F46
K34	E003A	WHT	X149
M1	E003B	WHT	X149
V44	E003C	WHT	X149
K34	E013	WHT	X175
X5018	E305	GRN	X5503
X5503	E330	WHT	E22
X5018	E332	BRN	X5503
W39	G001A	BLK	X150
X5018	G001B	BLK	X150
X5005	G001C	BLK	X150
X150	G001E	BLK	X179
A15	G001F	BLK	X150
A15	G001G	BLK	X150
X150	G001H	BLK	X6014
X150	G001K	BLK	X6014
X150	G001L	BLK	X6016
X179	G001M	BLK	X5503
X179	G001N	BLK	X5503
X179	G001P	BLK	X5503
X179	G001R	BLK	X5503
X179	G001S	BLK	X5503
M1	G002A	BLK	X148
K34	G002B	BLK	X148
E22	G002C	BLK	X148
M1	G002D	BLK	V44
X5018	J050	TAN	X5503
X5018	J051	TAN	X5503
A15	L055	BRN	X5005
X6016	M001	VLT	X6014
X6016	M002	VLT	X6014
X6014	M003	TAN	X6016
X5018	M012A	YEL	X164
A15	M012B	YEL	X164
X174	M012C	YEL	X164
X5503	M012D	YEL	X174
X187	M012E	YEL	X174
X187	M012F	YEL	X6014
X187	M012G	YEL	R5601
X5018	M013A	GRN	X165
A15	M013B	GRN	X165
X173	M013C	GRN	X165
X5503	M013D	GRN	X173
X173	M013E	GRN	X188
X188	M013F	GRN	X6014
X188	M013G	GRN	R5601
X5018	M042	VLT	A15
X5018	M043	VLT	A15

END #1	NUMBER	COLOR	END #2
X5018	P004A	RED	X163
X163	P004B	RED	F5004
X163	P004C	RED	F6001
F5004	P004D	RED	X190
F6001	P004E	RED	X183
X183	P004F	RED	X6014
X6016	P004G	RED	X183
X190	P004H	RED	A15
X190	P004J	RED	A15
K19	P022A	RED	F45
F45	P022B	RED	K34
A15	P023	RED	X5005
X5018	P307A	RED	X162
R90	P307B	RED	X162
R92	P307C	RED	X162
R93	P307D	RED	X162
A15	P307E	RED	X162
X162	P307F	RED	X5503
X162	P307G	RED	F6003
X6014	P307H	RED	F6003
X5018	R002A	BLK	X166
A15	R002B	BLK	X166
X166	R002C	BLK	X172
X5503	R002D	BLK	X172
X172	R002E	BLK	X189
X189	R002F	BLK	X6014
X189	R002G	BLK	R5601
X5018	W042A	BLU	X171
R92	W042B	BLU	X171
A15	W042C	BLU	X171
X5018	W043A	BLU	X170
R93	W043B	BLU	X170
A15	W043C	BLU	X170

SHEET 1 OF 3

JL58967,0000721 -19-11JAN17-6/10

Continued on next page

Engine Interface Harness (W5) Wiring Diagram (S.N. 056600—) (1 of 3)

B5113—Fuel Rail Pressure Sensor	B5302—Camshaft Position Sensor	X5141—Engine Harness-to-Front Engine Harness Connector 2
B5208—Engine Coolant Temperature Sensor	B5500—Intake Air Sensor	Y5002—Suction Control Valve (SCV)
B5301—Crankshaft Position Sensor	W7—Front Engine Harness	Y5024—Fuel Rail Pressure Relief Valve (PRV)
	X5040—Engine Harness-to-Front Engine Harness Connector 1	

JA92389,000016A -19-18SEP15-2/2

B35— Pump 1 Delivery Pressure Sensor (marked PP1) B38— Pump 2 Control Pressure Sensor (marked PC2) Y20— Pump 2 Flow Rate Limit Solenoid (marked SB)
 B36— Pump 1 Control Pressure Sensor (marked PC1) B40— Hydraulic Oil Temperature Sensor Y21— Torque Control Solenoid (marked ST)
 B37— Pump 2 Delivery Pressure Sensor (marked PP2) X40— Pump Harness-to-Machine Harness Connector Y26— Pump 1 Flow Rate Limit Solenoid (marked SA)

JA92389,0000153 -19-06AUG15-2/2

Exhaust Filter Parked Cleaning Switch Harness (W9) Component Location

See Cab Harness (W1) Component Location. (Group 9015-10.)

JN86345,00002DA -19-08SEP14-1/1

Exhaust Filter Parked Cleaning Switch Harness (W9) Wiring Diagram

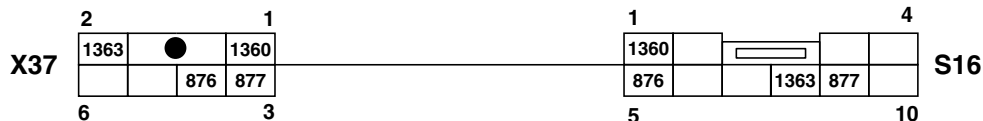
NUMBER	COLOR	END #1	END #2
876	ORG/BLK	S16	X37
877	ORG/GRN	S16	X37
1360	RED/BLK	S16	X37
1363	BLK	S16	X37

X37

1	(1360)	RED/BLK	S16
2	(1363)	BLK	S16
3	(877)	ORG/GRN	S16
4	(876)	ORG/BLK	S16
5	—		
6	—		

S16

1	(1360)	RED/BLK	X37
2	—		
3	—		
4	—		
5	(876)	ORG/BLK	X37
6	—		
7	—		
8	(1363)	BLK	X37
9	(877)	ORG/GRN	X37
10	—		



TX1187554

Exhaust Filter Parked Cleaning Switch Harness (W9) Wiring Diagram

S16— Exhaust Filter Parked Cleaning Switch

X37— Cab Harness-to-Exhaust Filter Switch Harness Connector

DP27668,00009E8 -19-10MAR15-1/1

Service ADVISOR™ Remote (SAR) Switch Harness (W10) Component Location

See Cab Harness (W1) Component Location. (Group 9015.)

CW0833,0000AA9 -19-27JAN15-1/1

Multi-Function Pilot Control Lever Harness (W15) Wiring Diagram

TX1185822 —UN—23FEB15

NUMBER	COLOR	END #1	END #2
1	RED	(611)	K31
2	RED	(8)	X82
3	RED	(1)	X81
4	BLU	X82	S33
5	BLU	S32	(4)
6	WHT	S33	K33
7	YEL	S32	K32
8	RED	(1)	K33
9	RED/WHT	K33	X535
10	RED/YEL	K32	X535
11	BLK	K31	(615)
12	GRN	K30	X534
13	BLK	K32	(11)
14	BLK	K33	(11)
15	RED	(1)	K30
16	RED	(8)	K32
17	BLK	K30	(11)
18	BLK	(11)	X534
19	BLK	(11)	X535
20	BLU/YEL	X81	S31
21	BLU/YEL	(20)	S30
22	LT GRN/YEL	S30	K30
23	YEL/RED	S31	K31
24	RED/BLU	K31	X534
610	BLU/YEL	X26	X26
611	RED	X26	X26
612	LT GRN/RED	X26	X26
615	BLK	X26	X26
616	RED	X26	X26
617	RED/BLU	X26	X26

X26			
1	(610)	BLU/YEL	
2	(611)	RED	
3	(612)	LT GRN/RED	
4	(616)	BLK	
5	(617)	RED	
6	(615)	RED/BLU	

K30			
1	(22)	LT GRN/YEL	S30
2	(17)	BLK	(11)
3	(15)	RED	(1)
4	—		
5	(12)	GRN	X534

K31			
1	(23)	YEL/RED	S31
2	(11)	BLK	(615)
3	(1)	RED	(611)
4	—		
5	(24)	RED/BLU	X534

K32			
1	(7)	YEL	S32
2	(13)	BLK	(11)
3	(16)	RED	(8)
4	—		
5	(10)	RED/YEL	X535

K33			
1	(6)	WHT	S33
2	(14)	BLK	(11)
3	(8)	RED	(1)
4	—		
5	(9)	RED/WHT	X535

S30			
1	(22)	LT GRN/YEL	K30
2	(21)	BLU/YEL	(20)

S32			
1	(7)	YEL	K32
2	(5)	BLU	(4)

S32			
2		1	
5		7	

S33			
2		1	
4		6	

S33			
1	(6)	WHT	K33
2	(4)	BLU	X82

S30			
2		1	
21		22	

S31			
2		1	
20		23	

S31			
1	(23)	YEL/RED	K31
2	(20)	BLU/YEL	X81

2		1
3		20

X81			
1	(20)	BLU/YEL	S31
2	(3)	RED	(1)

24	12	18
1	2	3

X534			
1	(24)	RED/BLU	K31
2	(12)	GRN	K30
3	(18)	BLK	(11)

9	10	19
1	2	3

X535			
1	(9)	RED/WHT	K33
2	(10)	RED/YEL	K32
3	(19)	BLK	(11)

TX1185822

Continued on next page

Multi-Function Pilot Control Lever Harness (W15) Wiring Diagram

DP27668,00009E3 -19-19FEB15-1/2

Auxiliary 3-Button Cancel Switch Harness (W22) Wiring Diagram

NUMBER	COLOR	END #1	END #2
2		S34/S35	X81/X82
3		S34/S35	S34/S35
4		S34/S35	X81/X82



TX1115340

Auxiliary 3-Button Cancel Switch Harness (W22) Wiring Diagram

S34— Right Enable Switch
 S35— Left Enable Switch
 X81— Multi-Function
 Pilot Control Lever
 Harness-to-Auxiliary
 3-Button Cancel Switch
 Harness Connector

X82— Multi-Function
 Pilot Control Lever
 Harness-to-Auxiliary
 3-Button Cancel Switch
 Harness Connector

BG71862,0000C0E -19-20MAR13-1/1

Reversing Fan Switch Harness (W23) Component Location

See Cab Harness (W1) Component Location. (Group 9015.)

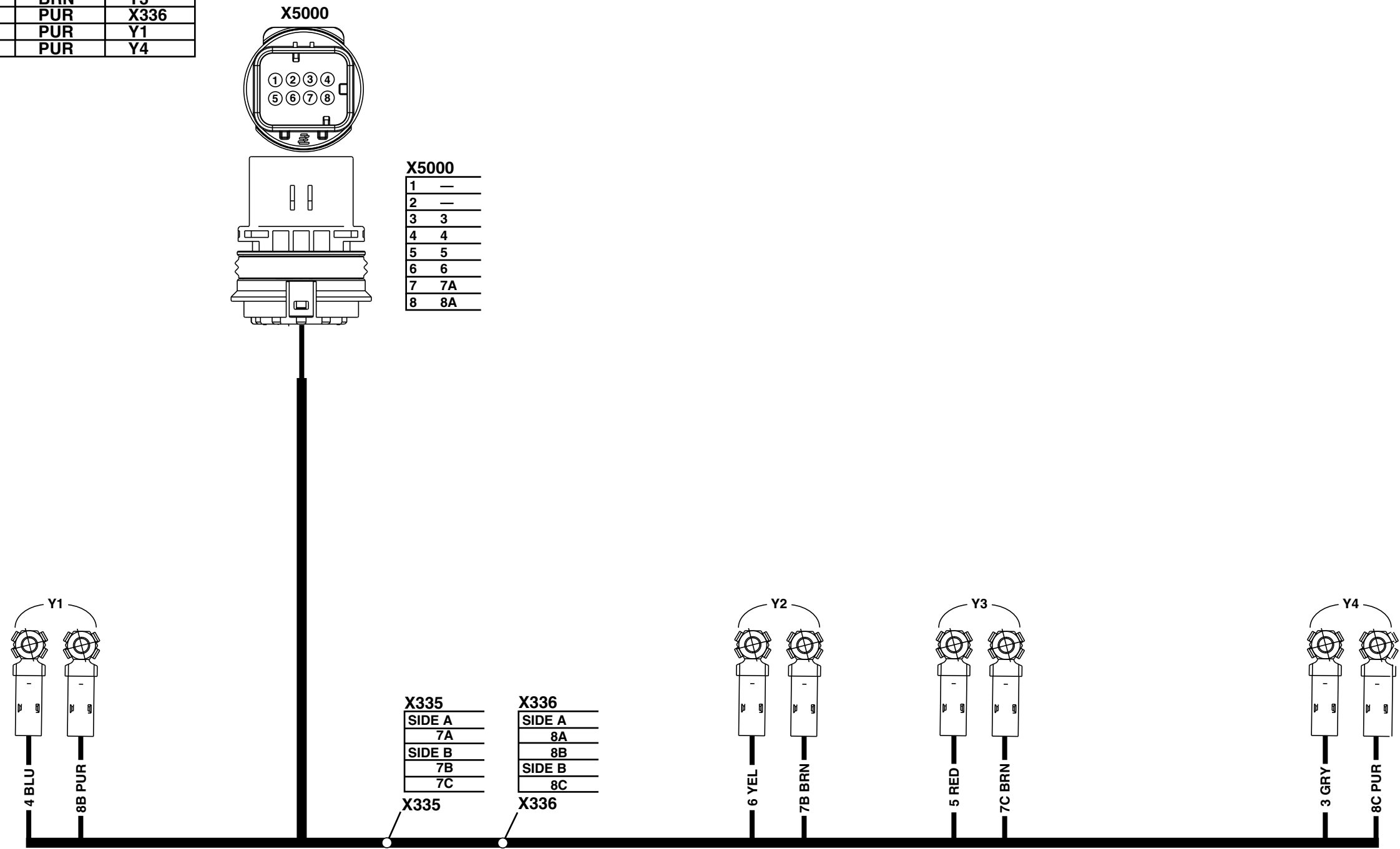
DS35042,000005B -19-10MAR11-1/1

TX1115340 —UN—19JUL12

Fuel Injector Harness (W38) Wiring Diagram

TX1199191 —UN—06AUG15

END #1	NUMBER	COLOR	END #2
X5000	3	GRY	Y4
X5000	4	BLU	Y1
X5000	5	RED	Y3
X5000	6	YEL	Y2
X5000	7A	BRN	X335
X335	7B	BRN	Y2
X335	7C	BRN	Y3
X5000	8A	PUR	X336
X336	8B	PUR	Y1
X336	8C	PUR	Y4



TX1199191

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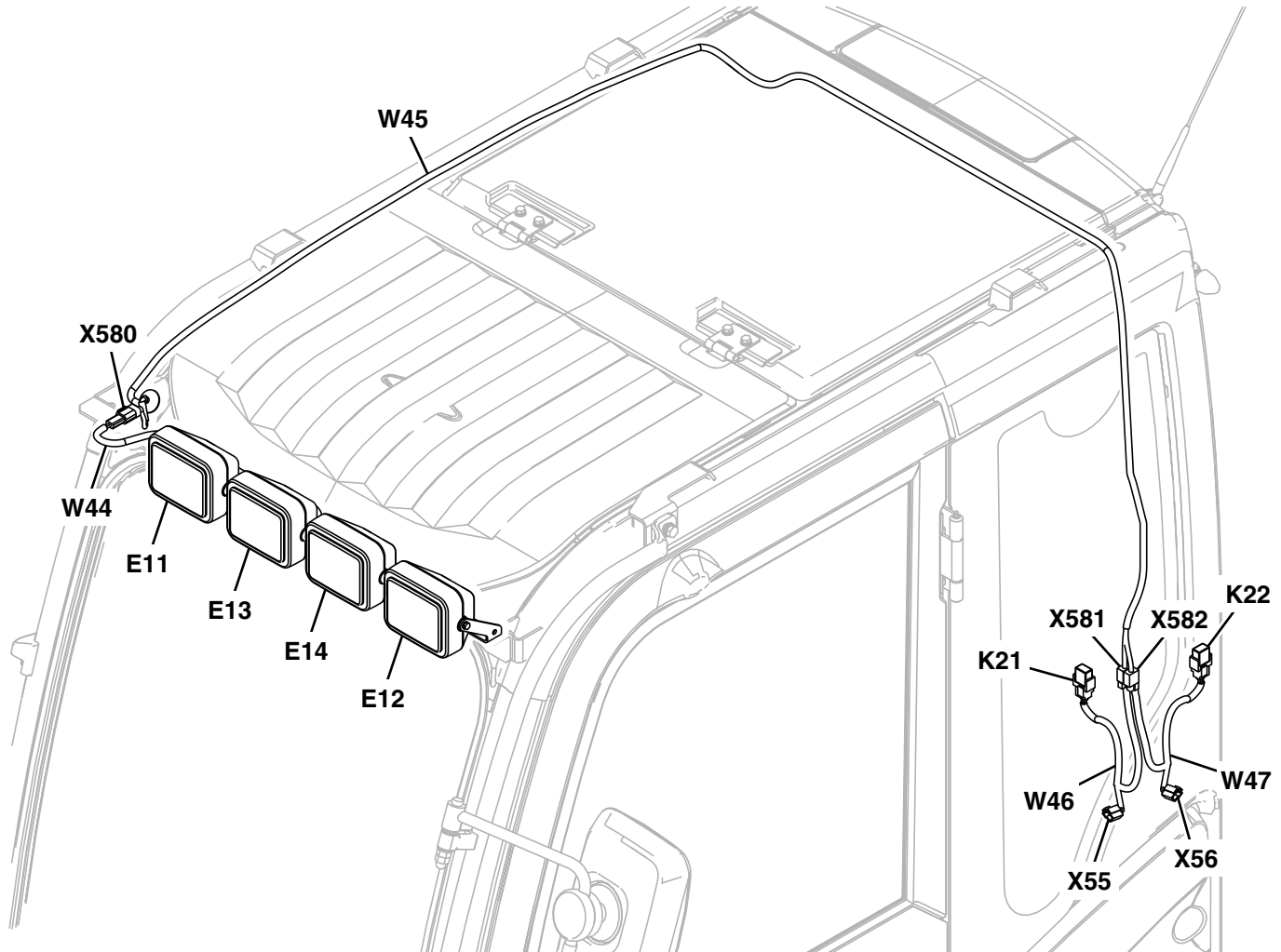
Fuel Injector Harness (W38) Wiring Diagram

JA92389,000015A -19-06AUG15-1/2

A7—Air Conditioner Controller (ACF)	M9—Air Conditioner and Heater Internal and External Servomotor	R16— Blower Motor Transistor	X419— BLK/RED Splice
B41— Air Conditioner Freeze Control Switch	M10— Air Conditioner and Heater Blower Port Change Servomotor	R17— Blower Motor Resistor	X420— BLK/YEL Splice
B55— Air Recirculation Sensor	M11— Air Conditioner and Heater Mixer Servomotor	X51— Air Conditioner 4-Pin Connector	X421— 979 RED Splice
M7—Air Conditioner and Heater Blower Motor		X52— Air Conditioner 10-Pin Connector	X422— RED/BLK Splice
		X418— 978 BLK Splice	

BG71631,00007C7 -19-16JUN14-2/2

Cab Roof Light Harness (W44) Component Location



TX1173924

Cab Roof Light Harness (W44) Component Location

E11— Cab Roof Light 1	W44—Cab Roof Light Harness	X55— Front Cab Light 1 Connector (marked CAB LAMP FRONT)	X581— Cab Roof Light Jumper Harness Connector 1
E12— Cab Roof Light 2	W45—Cab Roof Light Jumper Harness	X56— Front Cab Light 2 Connector (marked CAB LAMP FRONT+2)	X582— Cab Roof Light Jumper Harness Connector 2
E13— Cab Roof Light 3	W46—Cab Roof Light 1 Relay Harness		
E14— Cab Roof Light 4	W47—Cab Roof Light 2 Relay Harness		
K21— Cab Roof Light 1 Relay		X580— Cab Roof Light Harness Connector	
K22— Cab Roof Light 2 Relay			

JN86345,00002E5 -19-03MAR15-1/1

TX1173924 —UN—06NOV14

B5503—Selective Catalytic
Reduction (SCR) Outlet
NOx Sensor
W53—Exhaust Aftertreatment
Harness

X5039—Engine Interface
Harness-to-Exhaust
Aftertreatment Harness
Connector
X5070—Exhaust Aftertreatment
Harness-to-Diesel
Particulate Filter (DPF)
Harness Connector

Y5020—Diesel Exhaust Fluid
(DEF) Dosing Injector

JA92389,0000174 -19-19OCT15-2/2

System Diagrams

A5507B—Diesel Exhaust Fluid (DEF) Tank Header B	B5601—Diesel Exhaust Fluid (DEF) Tank Level Sensor	E5603—Diesel Exhaust Fluid (DEF) Dosing Unit Return Line Heater	Y5019—Coolant Control Valve
B5211—Diesel Exhaust Fluid (DEF) Tank Temperature Sensor	E5601—Diesel Exhaust Fluid (DEF) Dosing Unit Pressure Line Heater	W54—Diesel Exhaust Fluid (DEF) Harness	
B5501—Diesel Exhaust Fluid (DEF) Dosing Unit	E5602—Diesel Exhaust Fluid (DEF) Dosing Unit Supply Line Heater	X5037—Engine Interface Harness-to-Diesel Exhaust Fluid (DEF) Harness Connector 1	
B5506—Diesel Exhaust Fluid (DEF) Tank Concentration Sensor			

JL58967,0000730 -19-15DEC16-4/4

System Diagrams

B5009—Engine Coolant Loss Level Sensor	S90— Engine Compartment Light Switch	X5005—Fan Harness Connector	Y5015—Reversing Fan Solenoid
B5303—Fan Speed Sensor	W5—Engine Interface Harness	X5041—Fan Harness-to-Engine Light Harness Connector	
E15— Engine Compartment Light	W57—Fan Harness	Y5014—Variable Speed Fan Solenoid	
	W58—Engine Light Harness		

JA92389,0000177 -19-19OCT15-2/2

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System Diagrams

B5109—Exhaust Filter Delta Pressure Sensor	R5605—Aftertreatment CAN Termination Resistor	X200— 5604 YEL Splice 1	X210— 5634 YEL Splice
B5204—Exhaust Filter Temperature Module	X110— Machine Harness-to- Exhaust Aftertreatment	X201— 5605 GRN Splice 1	
B5502—Aftertreatment Inlet NOx Sensor	Harness Connector	X202— 5030 BLK Splice	
		X203— 5636 BLU Splice	
		X208— 5625 GRN Splice	

Continued on next page

JL58967,0000723 -19-12DEC16-2/4

B68— Secondary Hydraulic Oil Temperature Sensor	W76—Auxiliary Function Lever (AFL) Solenoid Harness	Y61— Auxiliary Function Lever (AFL) Solenoid A (marked 1A)	Y66— Secondary Pilot Shutoff Solenoid Valve (marked PiC)
B85— Auxiliary Function Lever (AFL) Solenoid Pressure Sensor (marked PS1)	X577— Auxiliary Function Lever (AFL) Harness-to-Auxiliary Function Lever (AFL) Solenoid Harness Connector	Y62— Auxiliary Function Lever (AFL) Solenoid B (marked 1B)	

JA92389,0000180 -19-22OCT15-2/2

M12— Seat Air Compressor Motor	X630B—Premium Seat Harness Jumper Connector B	X637— Heat Cool Lumbar Connector (marked HEAT/COOL LUMBAR)	X641— Premium Seat Controller (PSC) Connector A
S61— Seat Compressor Switch	X634— Premium Seat Compressor Harness Connector (marked COMPRESSOR)	X638— Premium Seat Blower Connector	X642— Premium Seat Controller (PSC) Connector B
X630— Premium Seat Harness Connector (marked 24V POWER)	X635— Heated/Cooled Seat Switch Connector	X639— Upper Thermal Module Connector	
X630A—Premium Seat Harness Jumper Connector A	X636— Premium Seat Power Converter Connector (marked INVERTER)	X640— Lower Thermal Module Connector	

DF89619,00B68F4 -19-29JAN18-2/2

Satellite (SAT) Harness (W6003) Component Location

See Engine Interface Harness (W5) Component Location.
(Group 9015-10.)

RH60123,0000109 -19-10MAR11-1/1

Satellite (SAT) Harness (W6003) Wiring Diagram

END #1	NUMBER	COLOR	END #2
X6015	G01	BLK	X6016
X6015	M01	PUR	X6016
X6015	M02	PUR	X6016
X6015	M03	PUR	X6016
X6015	P01	RED	X6016



X6015

A1 M01	D1 PLUG	G1 PLUG	K1 PLUG
A2 M02	D2 PLUG	G2 PLUG	K2 PLUG
A3 PLUG	D3 PLUG	G3 PLUG	K3 PLUG
A4 PLUG	D4 PLUG	G4 PLUG	K4 PLUG
B1 PLUG	E1 PLUG	H1 PLUG	L1 PLUG
B2 PLUG	E2 PLUG	H2 PLUG	L2 PLUG
B3 PLUG	E3 PLUG	H3 PLUG	L3 PLUG
B4 PLUG	E4 PLUG	H4 PLUG	L4 PLUG
C1 PLUG	F1 PLUG	J1 PLUG	M1 G01
C2 PLUG	F2 PLUG	J2 PLUG	M2 P01
C3 PLUG	F3 PLUG	J3 M03	M3 PLUG
C4 PLUG	F4 PLUG	J4 PLUG	M4 PLUG

X6016

1	M01
2	M02
3	M03
4	G01
5	P01
6	PLUG

TX1111520

Satellite (SAT) Harness (W6003) Wiring Diagram

X6015—Satellite (SAT) Module Control Unit 48-Pin Connector

X6016—Engine Interface Harness-to-Satellite (SAT) Harness Connector

DP27668,00009DC -19-31MAR15-1/1

TX1111520 —UN—09APR12

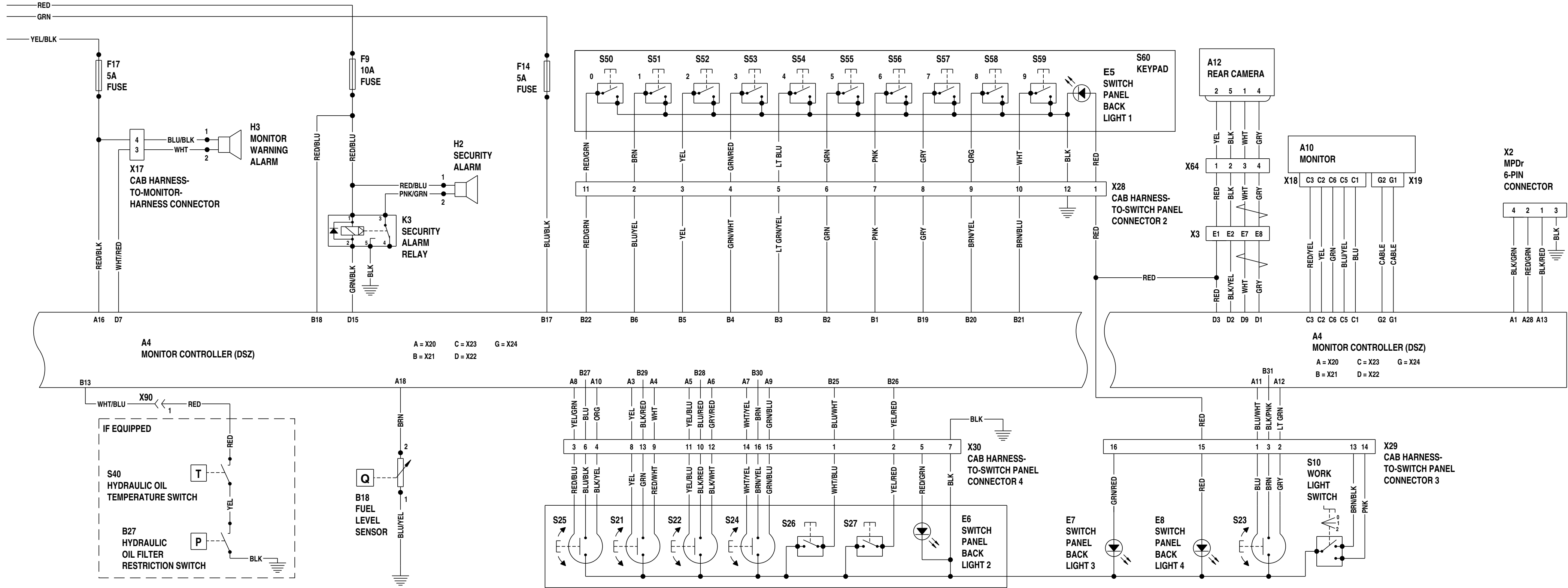
Sub-System Diagnostics

E22— Battery Disconnect Indicator Light	G1—Battery	S91— Battery Disconnect Switch	V20— Pilot Shutoff Switch Diode
F4— Solenoid 20 A Fuse (marked SOLENOID)	G2—Battery	V1— Battery Relay Diode	V44— Starter Relay Diode
F7— Start Position Signal 5 A Fuse (marked START)	G3—Alternator	V3— Load Dump Relay Diode	X47— Cab Harness-to-Key Switch Harness Connector
F18— Idle Stop 5 A Fuse (marked IDLE STOP)	K1—Load Dump Relay	V4— Security Diode	X65— Cab Harness-to-Pilot Shutoff Switch Harness Connector
F45— Starter In-Line 30 A Fuse	K4—Starter Cut Relay	V5— Starter Cut Relay Diode	X175— Machine Harness-to-Engine Interface Harness Connector 1
F60— Alternator 65 A Fuse	K11— Idle Stop Relay	V7— Start Relay Diode	
F61— Battery 45 A Fuse	K12— Accessory Cut Relay	V9— Pilot Shutoff Diode	
	K13— Key Cut Relay	V10— Starter Protection Diode	
	K19— Battery Relay	V11— Accessory Cut Diode	
	K34— Starter Relay	V12— Starter Cut Diode	
	M1—Starter Motor		
	S1— Key Switch		
	S3— Pilot Shutoff Switch 1		
	S4— Pilot Shutoff Switch 2		

Continued on next page

JJ03229,0001173 -19-06APR18-2/6

TX1191176 —UN—22APR15



TX1191176

Continued on next page

Monitor Controller (DSZ) Circuit Schematic (2 of 2)

JJ03229,0000ED1 -19-06APR18-3/6

A1—Engine Control Unit (ECU)	B5208—Engine Coolant Temperature Sensor	R5601—CAN 0 Termination Resistor	X5501—Engine Control Unit (ECU) Connector 1
A15—Flex Power Controller (FPC)	B5209—Fuel Temperature Sensor	S16—Exhaust Filter Parked Cleaning Switch	X5502—Engine Control Unit (ECU) Connector 2
B5009—Engine Coolant Loss Level Sensor	B5303—Fan Speed Sensor	S18—Service ADVISOR™ Remote (SAR) Switch	X5503—Engine Control Unit (ECU) Connector 3
B5101—Engine Oil Pressure Sensor	B5600—Water-in-Fuel (WIF) Sensor	X1—Service ADVISOR™ Diagnostic Connector	Y5400—Exhaust Gas Recirculation (EGR) Valve
B5102—Exhaust Manifold Pressure Sensor	F8—Engine Control Unit (ECU) 20 A Fuse (marked ECU P1)	X5015—Engine Interface Harness-to-Engine Harness Connector 1	Y5402—Exhaust Throttle Actuator
B5103—Exhaust Gas Recirculation (EGR) Delta Pressure Sensor	F37—Engine Control Unit (ECU) 20 A Fuse (marked ECU P2)	X5016—Engine Interface Harness-to-Engine Harness Connector 2	
B5104—Intake Manifold Pressure Sensor	F5004—Flex Power Controller (FPC) In-Line 10 A Fuse	X5018—Machine Harness-to-Engine Interface Harness Connector 2	
B5107—Inlet Fuel Pressure Sensor			
B5207—Exhaust Gas Recirculation (EGR) Temperature Sensor			

Service ADVISOR™ Remote (SAR) Switch (S18)—The Service ADVISOR™ Remote (SAR) switch (S18) allows the operator to accept or decline available updates. The flex power controller (FPC) (A15) will create DTCs under certain trigger conditions, which will send a message via CAN to the monitor controller (DSZ) (A4) to prompt the vehicle to display operator instructions on the monitor.

When key switch (S1) is in the ON position, current flows from pin M of key switch to pin 3 of key cut relay (K13) and through idle stop 5 A fuse (F18) to pin 1 of key cut relay. Utilizing the normally closed contacts of the key cut relay, current is passed through power on 5 A fuse (F17) to pins 1, 7, and 10 of Service ADVISOR™ Remote (SAR) switch (S18). When the SAR switch is pressed to the ACCEPT position, current is sent through pin 3 of the SAR switch to pin C1 of FPC. Pin E3 of FPC, is then grounded, completing the circuit to pin 5 of the SAR switch, activating the ACCEPT (green) light emitting diode (LED). When the SAR switch is pressed to the DECLINE position, current is sent through pin 2 of the SAR switch to pin F2 of FPC. Pin F3 of FPC, is then grounded, completing the circuit to pin 4 of the SAR switch, activating the DECLINE (red) light emitting diode (LED).

Cold Weather Starting Aid—Power is available to pin 3 of glow plug relay (K16) from glow plug 50 A fuse (F63). Ground is provided at pin 1 of glow plug relay and to glow plugs (R1—R4).

When key switch (S1) is in the ON position, current flows from pin M of key switch to pin 3 of key cut relay (K13) and through idle stop 5 A fuse (F18) to pin 1 of key cut relay. Utilizing the normally closed contacts of the key cut relay, current is passed to pin 7 of engine control unit (ECU) connector 3 (X5503) through power on 5 A fuse (F17), causing the ECU to power up. The ECU now determines if the glow plugs need to be activated. If the ECU determines the glow plugs are necessary, power is

sent out pin 32 via engine control unit (ECU) connector 1 (X5501) to pin 2 of glow plug relay, energizing the relay. Power is sent to glow plugs and through glow plug resistor (R19) to engine control unit (ECU) connector 1 (X5501) pin 54. For more information on cold start aid, [see Cold Weather Starting Aid](#). (Group 9010-05.)

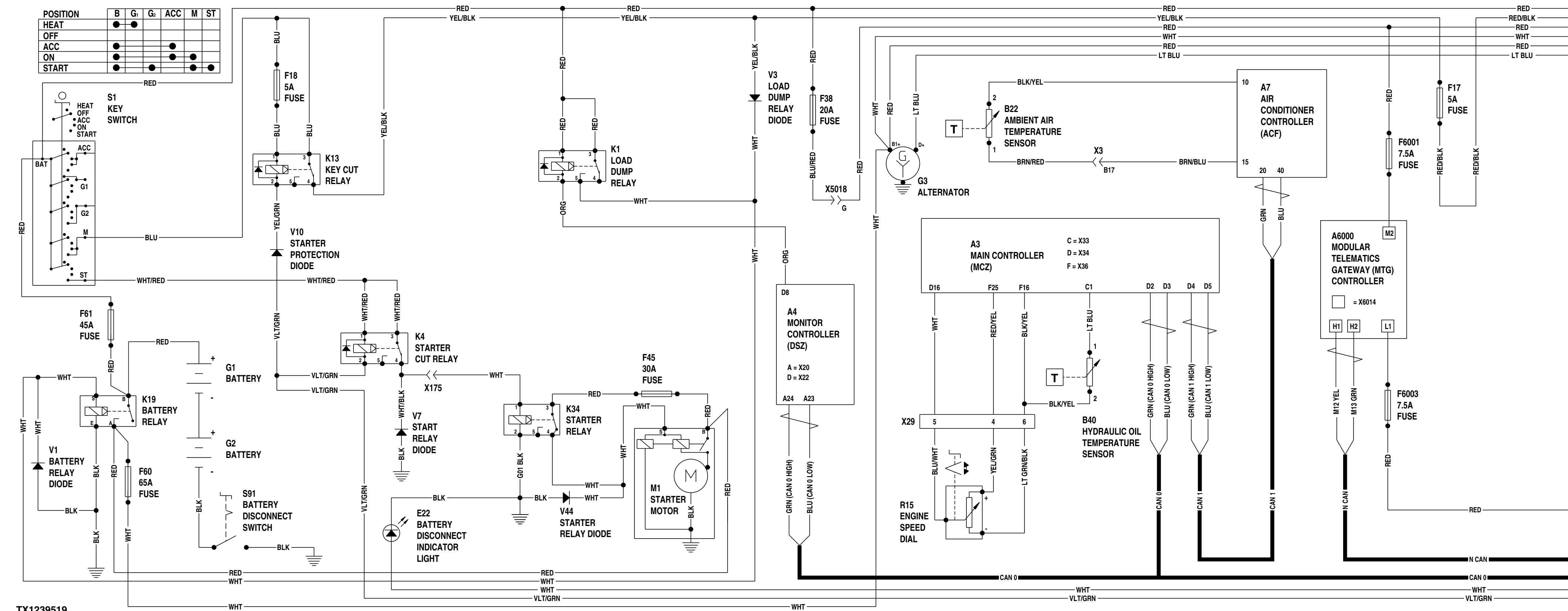
Hydraulic Variable Speed Fan—The variable speed fan cools the machine's systems by a hydraulic pump and motor controlled by a variable speed fan solenoid, providing machine efficiency and reducing fan noise levels by only operating the fan at the minimum speed necessary to cool the machine systems. The engine control unit (ECU) uses the following inputs to determine the proper fan speed:

- B22—Ambient air temperature sensor if air conditioner is ON via CAN.
- B40—Hydraulic oil temperature sensor via controller area network (CAN).
- B5205—Charge air cooler outlet temperature sensor at pin 29 of engine control unit (ECU) connector 2 (X5502).
- B5208—Engine coolant temperature sensor at pin 16 of engine control unit (ECU) connector 1 (X5501).
- B5209—Fuel temperature sensor at pin 48 of engine control unit (ECU) connector 1 (X5501).

The input that requires the most cooling takes precedence over the other inputs and the fan is run at a speed sufficient to cool the warmest input. If any of the three temperature sensor inputs are invalid, the fan will run at maximum speed to ensure proper cooling. The maximum fan speed is limited to engine speed. Temperature thresholds and variable speed fan solenoid duty cycles (fan speeds) are preprogrammed into the ECU and cannot be changed. The variable speed fan solenoid (Y5014) is driven from engine control unit (ECU) pin 32 of engine control unit (ECU) connector 2 (X5502).

Engine Control Unit (ECU) Circuit Theory of Operation (S.N. 056600—)

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A1—Engine Control Unit (ECU)	F63— Glow Plug 50 A Fuse	X5015—Engine Interface	Y2—Electronic Injector 2
B5105—Crankcase Pressure Sensor	K16— Glow Plug Relay	Harness-to-Engine	(cylinder 2)
B5113—Fuel Rail Pressure Sensor	R1—Glow Plug 1	Harness Connector 1	Y3—Electronic Injector 3
B5205—Charge Air Cooler Outlet Temperature Sensor	R2—Glow Plug 2	X5016—Engine Interface	(cylinder 3)
B5206—Manifold Air Temperature (MAT) Sensor	R3—Glow Plug 3	Harness-to-Engine	Y4—Electronic Injector 4
B5301—Crankshaft Position Sensor	R4—Glow Plug 4	Harness Connector 2	(cylinder 4)
B5302—Camshaft Position Sensor	R19— Glow Plug Resistor	X5501—Engine Control Unit (ECU) Connector 1	Y5002—Suction Control Valve
B5500—Intake Air Sensor	R5603—Engine CAN Termination Resistor	X5502—Engine Control Unit (ECU) Connector 2	Y5014—Variable Speed Fan Solenoid
F6— Optional Connector and Reversing Fan 20 A Fuse (marked OPT. 2 ALT)	S15— Reversing Fan Switch	X5503—Engine Control Unit (ECU) Connector 3	Y5015—Reversing Fan Solenoid
	X83— Cab Harness-to-Reversing Fan Switch Harness Connector	X5604—Engine Harness-to-Glow Plug Harness Connector	Y5024—Fuel Rail Pressure Relief Valve (PRV)
	X5000—Engine Harness-to-Fuel Injector Harness Connector	Y1— Electronic Injector 1 (cylinder 1)	Y5501—Fuel Transfer Pump
	X5068—Engine Interface Harness-to-Engine Harness Connector 3		

Fuel Rail Pressure Sensor (B5113)—The fuel rail pressure sensor (B5113) sends a pressure equivalent signal to the engine control unit (ECU). The ECU monitors fuel pressure to control the amount and timing of fuel being transferred from the high-pressure fuel pump to the high-pressure common rail (HPCR). The ECU uses this signal input to determine if fuel rail pressure is adequate for the current operating condition. The ECU will command more or less fuel from the high-pressure fuel pump by altering the signal to the high-pressure fuel pump pressure control valve (PCV) 1 (Y5022) and high-pressure fuel pump pressure control valve (PCV) 2 (Y5023). The ECU also uses this sensor to determine if there is an electronic injector problem by measuring the drop of pressure in the HPCR during each injection. The fuel rail pressure sensor is used for engine protection.

The fuel rail pressure sensor uses pin 37 for supply voltage, pin 09 for ground, and pin 51 for signal on engine control unit (ECU) connector 1 (X5501).

NOTE: For component location, see [Engine Harness \(W4\) Component Location](#). (Group 9015-10.)

For information on how pressure sensors operate, see [Measuring Pressure](#). (CTM120119.)

For information on engine protection and derate programs, see [Engine Derate and Shutdown Protection](#). (CTM120119.)

Engine Oil Pressure Sensor (B5101)—The engine oil pressure sensor (B5101) sends an oil pressure equivalent signal to the engine control unit (ECU). The ECU uses this signal to determine if engine oil pressure is adequate for the current operating conditions. The ECU monitors oil pressure for engine protection purposes.

The engine oil pressure sensor uses pin 17 for supply voltage, pin 26 for signal, and pin 41 for ground on engine control unit (ECU) connector 1 (X5501).

NOTE: For component location, see [Engine Harness \(W4\) Component Location](#). (Group 9015-10.)

For information on how pressure sensors operate, see [Measuring Pressure](#). (CTM120119.)

For information on engine protection and derate programs, see [Engine Derate and Shutdown Protection](#). (CTM120119.)

Exhaust Manifold Pressure Sensor (B5102)—The exhaust manifold pressure sensor (B5102) provides feedback to the control systems for the exhaust throttle actuator (Y5402) and exhaust gas recirculation (EGR) valve (Y5400) in order to maximize engine performance while meeting the applicable emissions regulations. The ECU uses the exhaust manifold pressure for the volumetric efficiency calculation.

The exhaust manifold pressure sensor uses pin 27 for supply voltage, pin 11 for signal, and pin 25 for ground on engine control unit (ECU) connector 1 (X5501).

NOTE: For component location, see [Engine Harness \(W4\) Component Location](#). (Group 9015-10.)

For information on how pressure sensors operate, see [Measuring Pressure](#). (CTM120119.)

For information on engine protection and derate programs, see [Engine Derate and Shutdown Protection](#). (CTM120119.)

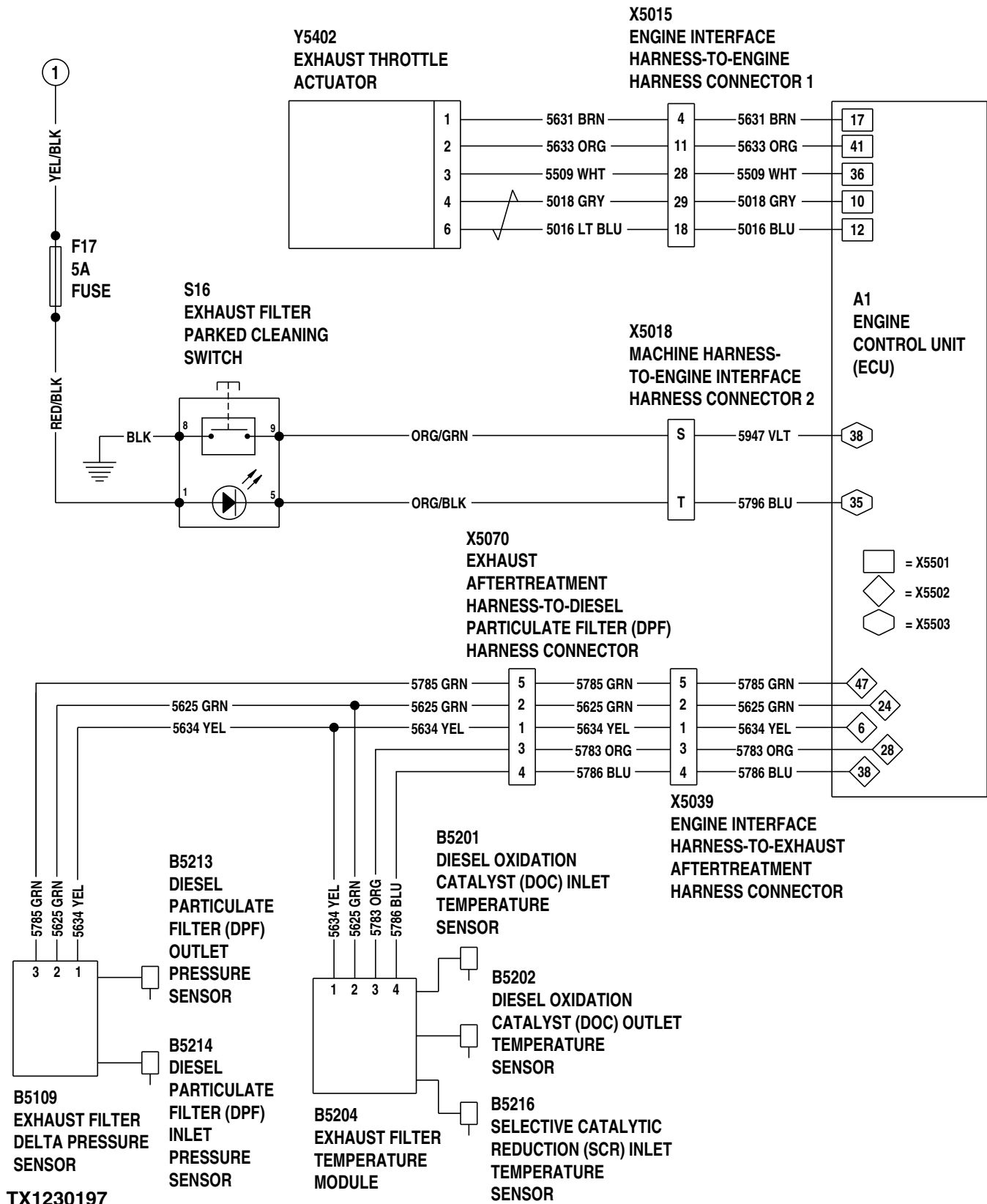
Exhaust Gas Recirculation (EGR) Delta Pressure Sensor (B5103)—The exhaust gas recirculation (EGR) delta pressure sensor (B5103) measures the pressure drop across the EGR venturi tube. The ECU calculates the amount of the recirculated exhaust gas using this measurement and the venturi tube physical dimensions. The ECU controls the EGR valve (Y5400) and turbocharger actuator (Y5500) to recirculate the ideal amount of exhaust gas for the operating condition.

The EGR delta pressure sensor uses pin 36 for supply voltage, pin 05 for signal, and pin 24 for ground on engine control unit (ECU) connector 2 (X5502).

NOTE: For component location, see [Engine Harness \(W4\) Component Location](#). (Group 9015-10.)

For information on engine protection and derate programs, see [Engine Derate and Shutdown Protection](#). (CTM120119.)

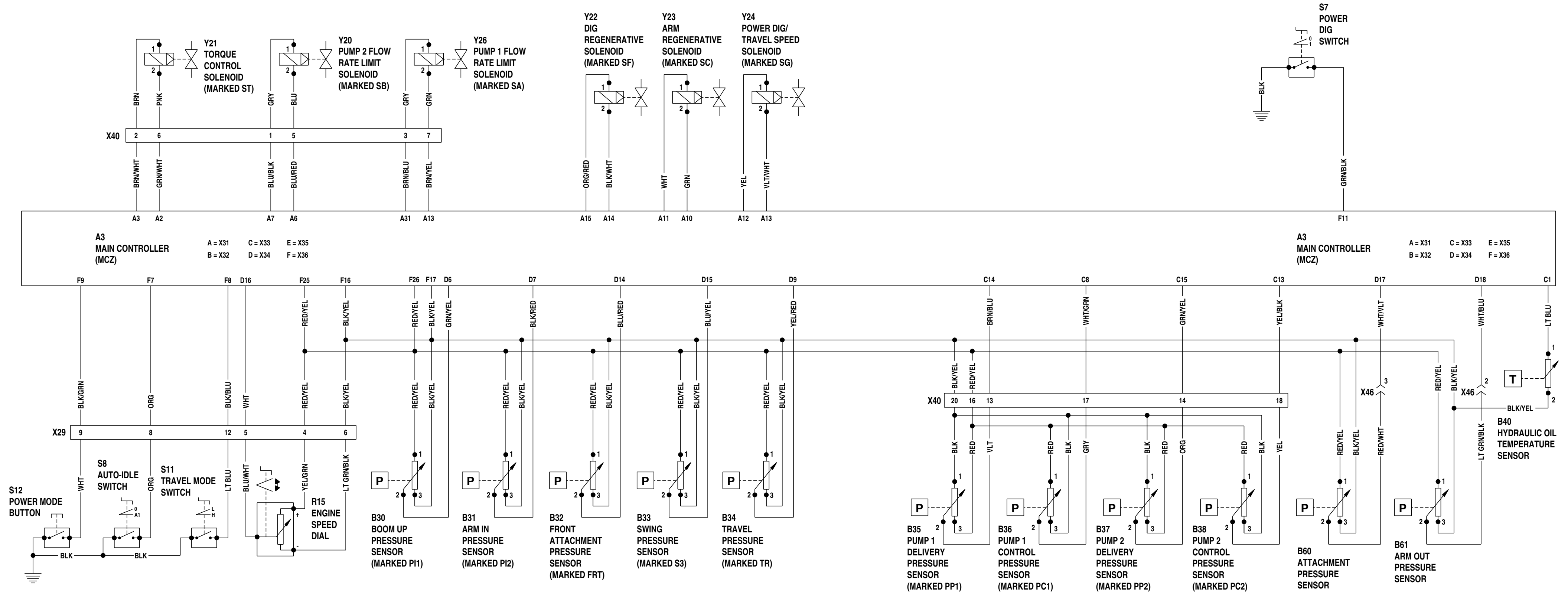
Exhaust Aftertreatment Circuit Theory of Operation (S.N. 056600—)



Diesel Oxidation Catalyst (DOC) and Diesel Particulate Filter (DPF) Circuit Schematic (S.N. 056600—)

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A3—Main Controller (MCZ)	S31— Right Pilot Control Lever Switch	X33— Cab Harness-to-Main Controller 17-Pin Connector C	Y61— Auxiliary Function Lever (AFL) Solenoid A (marked 1A)
B68— Secondary Hydraulic Oil Temperature Sensor	S45— Auxiliary Function Enable Switch (marked AFL_SW)	X36— Cab Harness-to-Main Controller 26-Pin Connector F	Y62— Auxiliary Function Lever (AFL) Solenoid B (marked 1B)
B85— Auxiliary Function Lever (AFL) Solenoid Pressure Sensor (marked PS1)	V22— Pilot Shutoff Solenoid Diode	X536— Right Auxiliary Function Lever (AFL) Connector (marked R_GRIP)	Y66— Secondary Pilot Shutoff Solenoid Valve (marked PiC)
F5— Optional and Attachment Connector 5 A Fuse (marked OPT. 1 ALT)	W36— Cab Harness Ground 2	X574— Auxiliary Function Lever (AFL) Connector 1	
K31— Right Solenoid Relay A (marked RSW1)	W37— Cab Harness Ground 3	X577— Auxiliary Function Lever (AFL) Harness-to-Auxiliary Function Lever (AFL) Solenoid Harness Connector	
S7— Power Dig Switch	X31— Cab Harness-to-Main Controller 31-Pin Connector A		
S29— Auxiliary Function Lever (AFL) Proportional Control Switch	X32— Cab Harness-to-Main Controller 24-Pin Connector B		

Auxiliary Function Lever (AFL)— The main controller (MCZ) provides control for AFL control. For more information on MCZ, [see Main Controller \(MCZ\) Circuit Theory of Operation](#). (Group 9015-15.)

Auxiliary hydraulic functions are controlled by the MCZ with inputs from the following components:

- B68—Secondary hydraulic oil temperature sensor
- B85—Auxiliary function lever (AFL) solenoid pressure sensor (marked PS1)
- S29—Auxiliary function lever (AFL) proportional control switch
- S45—Auxiliary function enable switch (marked AFL_SW)

After the MCZ processes received input signals, output signals are sent to the solenoids to control hydraulic speed and volume with the following components:

- Y61—Auxiliary function lever (AFL) solenoid A (marked 1A)
- Y62—Auxiliary function lever (AFL) solenoid B (marked 1B)
- Y66—Secondary pilot shutoff solenoid valve (marked PiC)

NOTE: AFL will work only when pilot control shutoff lever is in the (DOWN) unlocked position. If a

cycle of the pilot control shutoff lever is done, AFL will need to be activated again.

By pressing the auxiliary function enable switch (S45), ground is supplied at pin F22. The MCZ provides ground at pin C6, activating the secondary pilot shutoff solenoid valve (marked PiC) (Y66) which is a normally closed solenoid. When the operator actuates AFL proportional control switch (S29) on the right pilot control lever, a proportional signal is sent to the MCZ. The MCZ converts this signal and energizes the appropriate AFL solenoid to allow flow to the attachment in the requested speed and volume.

The MCZ monitors secondary hydraulic oil temperature utilizing secondary hydraulic oil temperature sensor (B68) through pin C7 of the MCZ and grounded through pins F16 and F17 of the MCZ. When hydraulic oil temperature increases or decreases and remains past a predefined point, the MCZ sends the signal to the monitor controller (DSZ) (A4) via the controller area network (CAN).

The MCZ monitors hydraulic oil pressure utilizing AFL solenoid pressure sensor through pin B2 of the MCZ and grounded through pins F25 and F26 of the MCZ. When hydraulic oil pressure increases and remains past a predefined point, the MCZ sends the signal to the monitor controller (DSZ) (A4) via the controller area network (CAN).

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Machine Controller (BCZ) Circuit Theory of Operation

The machine controller (BCZ) controls lighting, windshield wiper, and windshield washer circuits.

For more information on windshield wiper and washer circuit theory of operation, [see Windshield Wiper and Washer Circuit Theory of Operation](#). (Group 9015-15.)

For more information on lighting circuit theory of operation, [see Lighting Circuit Theory of Operation](#). (Group 9015-15.)

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A4—Monitor Controller (DSZ)	F22— Front Cab Light 1 10 A Fuse (marked CAB LAMP FRONT)	S10— Work Light Switch	X29— Cab Harness-to-Switch Panel Connector 3
A10— Monitor	F23— Rear Cab Light 10 A Fuse (marked CAB LAMP REAR)	S14— Door Switch	X55— Front Cab Light 1 Connector (marked CAB LAMP FRONT)
A11— Machine Controller (BCZ)	F32— Front Cab Light 2 10 A Fuse (marked CAB LAMP FRONT +2)	S36— Rear Cab Light Switch	X56— Front Cab Light 2 Connector (marked CAB LAMP FRONT +2)
A15— Flex Power Controller (FPC)	F46— Engine Light In-Line 7.5 A Fuse	S90— Engine Compartment Light Switch	X57— Rear Cab Light Connector (marked CAB LAMP REAR)
E1—Work Light	F60— Alternator 65 A Fuse	S91— Battery Disconnect Switch	X580— Cab Roof Light Harness Connector
E2—Boom Light	F61— Battery 45 A Fuse	V3—Load Dump Relay Diode	X581— Cab Roof Light Jumper Harness Connector 1
E3—Cab Dome Light	G1—Battery	V11— Accessory Cut Diode	X582— Cab Roof Light Jumper Harness Connector 2
E9—Key Switch Light	G2—Battery	V12— Starter Cut Diode	X632— Rear Cab Light Harness Connector
E11— Cab Roof Light 1	G3—Alternator	V13— Work Light 1 Diode	X633— Rear Cab Light Switch Harness Connector (marked CAB LAMP REAR)
E12— Cab Roof Light 2	K1—Load Dump Relay	V14— Work Light 2 Diode	
E13— Cab Roof Light 3	K7—Work Light Relay	X3—Cab Harness-to-Machine Harness 100-Pin Connector	
E14— Cab Roof Light 4	K8—Boom Light Relay	X10— Machine Controller 8-Pin Connector A	
E15— Engine Compartment Light	K12— Accessory Cut Relay	X11— Machine Controller 20-Pin Connector B	
E18— Rear Cab Light	K13— Key Cut Relay	X18— Monitor 12-Pin Connector C	
F1—Work and Boom Lights 20 A Fuse (marked LAMP)	K19— Battery Relay	X20— Monitor Controller 28-Pin Connector A	
F9— Radio Backup 10 A Fuse (marked BACK UP)	K21— Cab Roof Light 1 Relay	X23— Monitor Controller 12-Pin Connector C	
F10— Data Converter and Main Controller Battery Power 5 A Fuse (marked CONTROLLER)	K22— Cab Roof Light 2 Relay	X26— Optional Connector	
F12— Radio and Dome 5 A Fuse (marked RADIO)	K23— Rear Cab Light Relay	X27— Cab Harness-to-Switch Panel Connector 1	
F17— Power On 5 A Fuse (marked POWER ON)	S1—Key Switch		
	S2—Cab Dome Light Switch		

The machine controller (BCZ) (A11) receives unswitched power at pin A4 of machine controller 8-pin connector A (X10) from data converter and main controller battery power 5 A fuse (F10). Switched battery power is supplied to pin B19 of the BCZ through key cut relay (K13) with the key switch (S1) in the ON position. The BCZ is grounded at pin A8 of machine controller 8-pin connector A.

Work Light Operation—Turning the work light switch (S10) to position 1 activates the work light (E1).

When key switch (S1) is in the ON position, current from pin M of the key switch is passed to pin 3 of key cut relay (K13). Utilizing the normally closed contacts of key cut relay, power is passed through power on 5 A fuse (F17) to pin 1 of work light relay (K7). When work light switch is in position 1, ground is supplied to pin A6 through work light 1 diode (V13) and to pin B7 of machine controller 20-pin connector B (X11). When work light relay is energized, the work light will illuminate.

The BCZ communicates the work light switch position to the monitor controller (DSZ) (A4) via the controller area network (CAN). The DSZ then updates the monitor (A10) with the current work light operation. For more information on CAN theory of operation, [see Controller Area Network \(CAN\) Theory of Operation](#). (Group 9015-15.)

Boom Light Operation—Turning the work light switch (S10) to position 2 will activate the work light and boom light (E2).

NOTE: When work light switch is in position 2, the monitor screen will change to nighttime mode screen. Daytime mode screen can be returned by pressing 0 on the keypad.

When key switch (S1) is in the ON position, current from pin M of the key switch is passed to pin 3 of key cut relay (K13). Utilizing the normally closed contacts of key cut

relay, power is passed through load dump relay diode (V3) to energize the battery relay (K19) through pin S. The battery relay allows current to travel to the alternator B terminal through the alternator 65 A fuse (F60). At the B terminal of the alternator, current is then passed through the work and boom lights 20 A fuse (F1). Current then passes to boom light relay (K8) pins 1 and 3 and to work light relay (K7) pin 3. When work light switch is in position 2, ground is supplied to pins A2 and A6 of machine controller 8-pin connector A (X10) through work light 2 diode (V14) and to pin B17 of machine controller 20-pin connector B (X11). This energizes work light relay, boom light relay, cab roof light 1 relay, and cab roof light 2 relay and illuminates the work light, boom light, and cab roof lights 1—4.

When key switch is turned to the OFF position, ground through pin A6 to work light relay is disconnected and work light turns off. With work light switch in position 2 and no ground detected from the key cut relay (K13), BCZ provides ground to pins A2 and A7, illuminating the boom light and key switch light for 30 seconds. After 30 seconds, the MCZ provides ground for the key cut relay through pin 5 cab harness-to-main controller 17-pin connector C. When current passes through key cut relay, power is removed from battery relay and current is removed from lights.

The BCZ communicates the work light switch position to the monitor controller (DSZ) (A4) via the controller area network (CAN). The DSZ then updates the monitor (A10) with the current work light operation. For more information on CAN theory of operation, [see Controller Area Network \(CAN\) Theory of Operation](#). (Group 9015-15.)

Engine Compartment Light Operation (S.N.

—056599)—Turning the engine compartment light switch (S90) to position 1 activates the engine compartment light (E15).

Attachment Number—Each attachment can be assigned a number from 1 through 5.

Each attachment also has a dynamic number that is user defined to help differentiate attachments with the same name. For example, ATT 1 (attachment 1) and ATT 2 (attachment 2) could both be set up as breaker 1. The number associated with the attachment name can be changed to any number from 1 through 5. ATT 2 (attachment 2) breaker 1 could be changed to ATT 2 (attachment 2) breaker 2 (3, 4, or 5) to distinguish between the breakers for ATT 1 (attachment 1) and ATT 2 (attachment 2).

8— ATT 1 Type (attachment 1)



Attachment Type

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Machine Setting

NOTE: Due to different controller versions, items listed in the monitoring section may not appear on or be in the same order as the monitor on the machine.

1. Access service menu. See Service Menu. (Group 9015-16.)

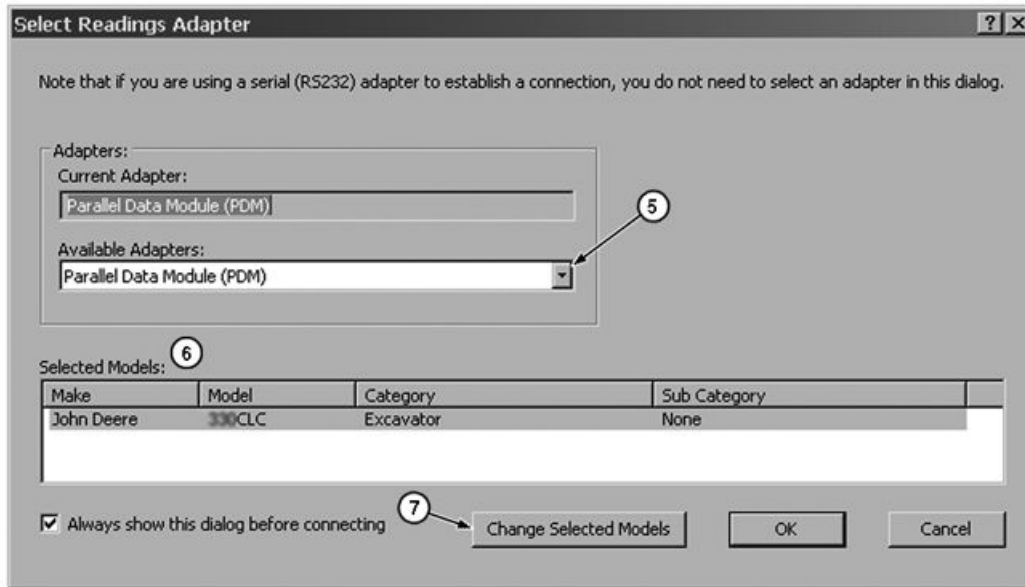
2. Rotate monitor dial to highlight MACHINE SETTING. Press monitor dial to enter machine setting menu.
3. Rotate monitor dial to highlight a setting in the machine setting selections. Press monitor dial to change machine setting.

List of Machine Setting Items (Constant Change)

Item	Unit	Data
Li Speed	min ⁻¹	Adjustment of slow idle speed.
AI Speed	min ⁻¹	Adjustment of auto-idle engine speed.
Power Mode Memory Selection	0, 1	Setting of power mode with key switch on: 0: OFF (When power mode is H/P mode with the key switch OFF, PWR mode is selected when turning the key switch on. When power mode is ECO or PWR mode with the key switch OFF, ECO or PWR mode is kept when turning the key switch on.) 1: On (The power mode when turning the key switch OFF is kept.)
Heater Control Selection	0, 1	ON/OFF status of heater control: 0: OFF 1: ON
Work Mode Memory Selection	0, 1	ON/OFF status of attachment mode: 0: OFF 1: ON
Power Mode Selection	0—4	Setting of power mode selection: 0: ECO, PWR mode: Selected 1: ECO mode: Fixed 2: PWR mode: Fixed 3: ECO, PWR, H/P mode: Selected 4: H/P mode: Fixed
Auto Shut-Down Control	0—2	Setting of auto-shutdown control with the key switch ON: 0: OFF when starting 1: ON when starting 2: Previous setting is held
Auto Shut-Down Set Time Holding	0, 1	The time until starting shutdown control is held: 0: Settable 1: Unsettable
Air Conditioner Control Mode	0—10	Selection of air conditioner specification: 0: Unused (without an air conditioner) 1: STD Cab (middle) (with an air conditioner) 2: STD Cab (middle) (without an air conditioner) 3: STD Cab (large) (with an air conditioner) 4: STD Cab (large) (without an air conditioner) 5: US Cab (7 t class) (with an air conditioner) 6: US Cab (7 t class) (without an air conditioner) 7: US Cab (10 t class) (with an air conditioner) 8: US Cab (10 t class) (without an air conditioner) 9: US Cab (20 t class) (with an air conditioner) 10: US Cab (20 t class) (without an air conditioner)
ATT Speed Deceleration Waiting Time	ms	The time when the increased engine speed is held at attachment operation speed increased control.
Breaker Relief Hard Setting	0, 1	Selection of secondary pilot relief valve or breaker relief solenoid valve specification: 0: Fixed 1: Variable

Continued on next page

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Select Readings Adapter Dialog Box

5— Available Adapters
Drop-Down List

6— Selected Models List

7— Change Selected Models
Button

7. On the Select Readings Adapter dialog box, make sure the appropriate adapter is displayed. If not, select correct adapter from drop-down list (5). Options include:

- Electronic Data Link (EDL) Stand-alone USB Device
- Electronic Data Link (EDL) Using Bluetooth®
- Parallel Data Module (PDM)
- Parallel Data Module (PDM) With USB Adapter

8. Make sure to select the correct machine to connect to, shown in the Selected Models list (6) display list. If not, click the Change Selected Models button (7).

9. Click OK to connect to machine.

10. After Service ADVISOR™ connects to machine, both the Readings tab (3) and Connected Diagnostic Trouble Codes tab (4) display.

11. Double-click an underlined code on the Connected Diagnostic Trouble Codes tab to display a detailed description for servicing that diagnostic trouble code.

NOTE: Use the lock topic feature within Service ADVISOR™ to open multiple windows if machine is transmitting more than one diagnostic trouble code. Refer to Service ADVISOR™ system instructions for using this feature.

12. Click the Connected Diagnostic Trouble Codes tab (4) to select and view details for additional diagnostic trouble codes.

Bluetooth is a trademark of Bluetooth SIG

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MPDr Application

MPDr is an application that helps technicians diagnose and troubleshoot machines. MPDr provides access to machine diagnostic trouble codes, their descriptions and limited troubleshooting procedures. MPDr can also display and record live readings for the different controllers on the machine. Special functions in certain controllers may

also be manipulated with MPDr. The special functions available to manipulate vary by controller and by machine model. MPDr is also used to set up some controllers after a controller has been replaced or after other work has been performed on the machine regarding a controller.

For more information, see MPDr Operation Manual.

DP09616,000057A -19-15MAY14-1/1

Electrical Component Specifications

NOTE: Resistance values for pump 1 delivery pressure sensor (B35) and pump 2 delivery pressure sensor (B37) may vary widely. To verify the sensor's functionality, use the monitor or check for diagnostic trouble codes (DTCs).

NOTE: For more information on engine electrical components, see engine related component technical manual (CTM).

Item	Measurement	Specification
Sensor Specifications		
B18—Fuel Level Sensor	Resistance	6—10 ohms @ 100% Fill (full) 26 ohms @ 75% Fill 33—43 ohms @ 50% Fill 53 ohms @ 25% Fill 82—88 ohms @ Low Fuel Alarm 90—100 ohms @ 0% Fill (empty)
B22—Ambient Air Temperature Sensor	Resistance	9.9 kilo-ohms @ 0°C (32°F) 1.6 kilo-ohms @ 40°C (104°F)
B30—Boom Up Pressure Sensor (marked PI1)	Resistance	5—15 kilo-ohms (Pins 1—2) 30—50 kilo-ohms (Pins 2—3)
B31—Arm In Pressure Sensor (marked PI2)	Resistance	5—15 kilo-ohms (Pins 1—2) 30—50 kilo-ohms (Pins 2—3)
B32—Front Attachment Pressure Sensor (marked FRT)	Resistance	5—15 kilo-ohms (Pins 1—2) 30—50 kilo-ohms (Pins 2—3)
B33—Swing Pressure Sensor (marked S3)	Resistance	5—15 kilo-ohms (Pins 1—2) 30—50 kilo-ohms (Pins 2—3)
B34—Travel Pressure Sensor (marked TR)	Resistance	5—15 kilo-ohms (Pins 1—2) 30—50 kilo-ohms (Pins 2—3)
B36—Pump 1 Control Pressure Sensor (marked PC1)	Resistance	5—15 kilo-ohms (Pins 1—2) 30—50 kilo-ohms (Pins 2—3)
B38—Pump 2 Control Pressure Sensor (marked PC2)	Resistance	5—15 kilo-ohms (Pins 1—2) 30—50 kilo-ohms (Pins 2—3)
B40—Hydraulic Oil Temperature Sensor	Resistance	13.8—16.3 kilo-ohms @ -20°C (-4°F) 5.7 kilo-ohms @ 0°C (32°F) 2.3—2.6 kilo-ohms @ 20°C (68°F) 1.2 kilo-ohms @ 40°C (104°F) 584 ohms @ 60°C (140°F) 310—326 ohms @ 80°C (176°F)
B55—Air Recirculation Sensor	Resistance	9.9 kilo-ohms @ 0°C (32°F) 1.6 kilo-ohms @ 40°C (104°F)
B56—Bucket Curl Pressure Sensor (marked BKC)	Resistance	5—15 kilo-ohms (Pins 1—2) 30—50 kilo-ohms (Pins 2—3)
B57—Bucket Dump Pressure Sensor	Resistance	5—15 kilo-ohms (Pins 1—2) 30—50 kilo-ohms (Pins 2—3)
B60—Attachment Pressure Sensor	Resistance	5—15 kilo-ohms (Pins 1—2) 30—50 kilo-ohms (Pins 2—3)
B61—Arm Out Pressure Sensor (marked AMD)	Resistance	5—15 kilo-ohms (Pins 1—2) 30—50 kilo-ohms (Pins 2—3)
B85—Auxiliary Function Lever (AFL) Solenoid Pressure Sensor (marked PS1)	Resistance	5—15 kilo-ohms (Pins 1—2) 30—50 kilo-ohms (Pins 2—3)

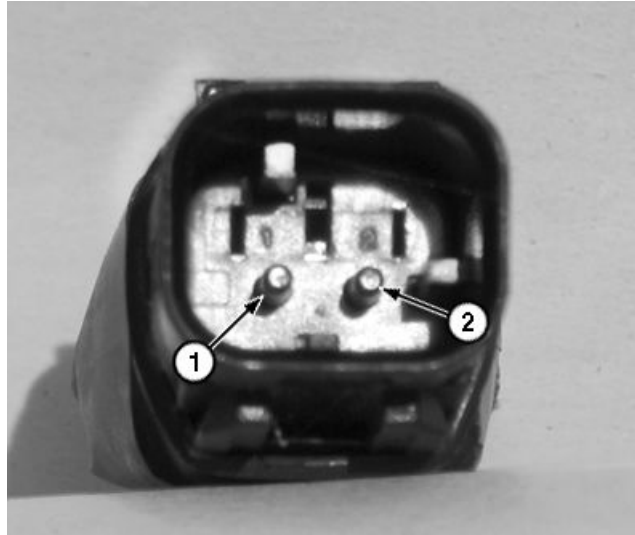
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MM16284,0001E6D -19-10APR18-1/3

Alternator Resistor Check

Turn key switch OFF.

Disconnect harness from alternator resistor (R13).



TX1095684A —UN—08AUG11

Alternator Resistor

1— Terminal 1

2— Terminal 2

Measure resistance across resistor terminals 1 and 2.

LOOK: Does the multimeter read 900—1100 ohms?

YES: Alternator resistor is OK.

NO: Alternator resistor malfunctioned. Replace the alternator resistor.

JA66566,0003389 -19-18FEB15-13/13

The travel motor driveshaft is connected to the first stage sun gear (input shaft) (12) by a spline coupler. Travel motion is transferred from the first stage sun gear to the sprocket (18) by the three planetary gear sets that mesh with the ring gear (6). As the first stage sun gear is rotated, it rotates the first stage planetary gears (14), causing the first stage carrier (11) to rotate.

The first stage carrier is connected to the second stage sun gear (10). The second stage sun gear meshes with the second stage planetary gears (15). Second stage

planetary gears are connected to the second stage carrier (9). The second stage carrier is connected to the third stage sun gear (8). The third stage sun gear rotate the third stage planetary gears (16). The third stage planetary gears are fastened to the gear case housing and do not rotate. The rotation is transferred to the ring gear. The ring gear, drum (17) and sprocket are fastened together and turn as one unit which rotates the track to move the machine. A replaceable thrust pad (13) is used in the gear case cover to keep the first stage sun gear in position.

MM16284,0001652 -19-24FEB12-2/2

Hydraulic System Operation

See Hydraulic System Schematic as a reference for hydraulic system operation. (Group 9025-15.)

Main hydraulic system is an open-center hydraulic system.

Main pump housing contains a pilot pump (28), pump 1 (15), and pump 2 (16). Pump 1 is on the right side as you are looking at the pump compartment (toward front of machine), pump 2 is on the left side (toward rear of machine) and the pilot pump is mounted adjacent to pump 2 (toward the rear of machine). The engine drives the pumps through a coupler and a gear case.

Hydraulic oil flows from hydraulic oil tank (31) through suction screen (35) to pump 1 and pump 2. Pump 1 delivers high pressure oil to right control valve (4-spool) (73), and pump 2 delivers high pressure oil to left control

valve (5-spool) (74). High pressure oil is routed to motor(s) (52, 61, and 63) and cylinder(s) (125, 126, and 127) by valve spool(s) of their respective valve section (75—110). Hydraulic oil tank is pressurized to ensure oil flows from hydraulic oil tank, through suction line, and into pumps.

Return oil from motor(s) and cylinder(s) is routed into return passages in control valve by valve spools. From return passages, return oil flows out of control valve, through hydraulic oil cooler (36), and then to hydraulic oil tank.

Oil cooler bypass valve (124) opens to route return oil around oil cooler and directly to hydraulic oil tank when resistance to flow through oil cooler becomes high because oil is cold (high viscosity), there is surge of return oil, or oil cooler becomes plugged. Back pressure in the return passage provides makeup oil to swing motor.

JA66566,000263D -19-03AUG12-1/1

- | | |
|---------------------|--|
| 1— Spool | 7— Sleeve |
| 2— Washer | 8— Balance Spring |
| 3— Spring Guide | 9— Return Spring |
| 4— Plunger | 10— Port T to Hydraulic Oil Tank |
| 5— Adjustment Screw | 11— Port P From Pilot Shutoff Solenoid Valve |
| 6— Cam and Pedal | |

- | | |
|---|-----------------|
| 12— Port 1, 2, 3, or 4 to Control Valve Pilot Cap | 604— Return Oil |
| 13— Travel Pilot Control Valve—Full Stroke | 609— Pilot Oil |

The travel pilot control valve regulates the pilot oil (609) pressure to actuate the pilot valves in the pilot signal manifold and to shift the control valve spools to actuate the travel functions.

See Pilot Signal Manifold Operation for pilot valve operation. (Group 9025-05.)

See Pilot Operation of Control Valve Operation for control valve operation. (Group 9025-05.)

One pilot control valve is used to control the travel functions. The pilot control valve contains four valve assemblies, one for each direction of travel for each track. The valves are pressure-reducing valves controlled by movement of the cams and pedals (6), against the plunger (4). The ports (10, 11, and 12) in housing are identified by numbers and letters next to each port.

In neutral, the spool is pushed up by the return spring (9) pushing the plunger up. The return springs hold the pedal in the neutral position. With the spool up, ports 1, 2, 3, and 4 to control valve pilot cap (12) are open to port T to the hydraulic oil tank (10) through the passage and holes in spool. Port P for pilot oil from the pilot shutoff solenoid valve (11) is blocked by the spool.

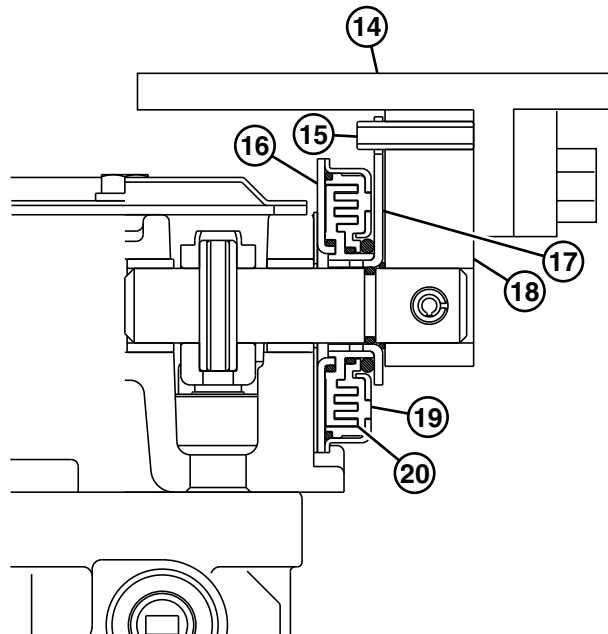
When the pedal is pushed to move the machine, the cam pushes the plunger and spring guide down against the return spring and balance spring. The balance spring pushes the spool down. As the spool is pushed down and the holes move through the deadband area, the passage from control valve pilot cap to the hydraulic oil tank is closed and then opened to the pilot oil from pilot shutoff solenoid valve. Pilot oil pressure increases until it is equal to the force applied by the balance spring pushing the spool up until the oil flow through the holes is blocked in the deadband area. With the oil flow blocked, the control valve spool is held stationary until the pedal is again actuated.

When the pedal and cam is pushed to full stroke, the plunger is pushed down farther by the balance spring opening the passage through the spool to pilot oil pressure. When pressure to the control valve pilot cap is equal to the force applied by the balance spring, the spool moves up until it contacts the plunger. The plunger holds the spool down so the passage through the spool remains open to pilot oil pressure. Oil pressure to the control valve pilot cap now approximately equals pilot oil pressure.

JA66566,0002642 -19-03AUG12-2/3

The travel pedal is equipped with a shockless function. The shockless function consists of a bracket (18) connected to the travel pedal (14) and a support (17) connected to the bracket with a spring pin (15). Gear 1 (20) is connected to the support. When the travel pedal is released while traveling, the spring forces the travel pedal to the neutral position. At this time gear 1 and gear 2 (19) inside the damper (16) receive resistance due to friction. The travel pedal gradually returns to neutral preventing a sudden stop due to sudden release of the travel pedal.

- | | |
|------------------|-------------|
| 14— Travel Pedal | 18— Bracket |
| 15— Spring Pin | 19— Gear 2 |
| 16— Damper | 20— Gear 1 |
| 17— Support | |



Travel Pilot Pedal (shockless function)

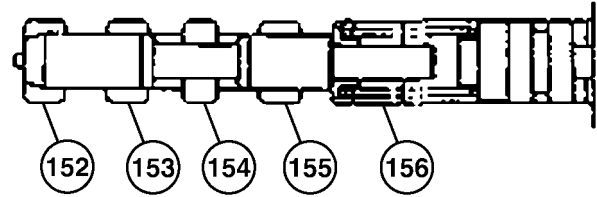
TX1033296 —UN—02JAN08

JA66566,0002642 -19-03AUG12-3/3

Bucket Flow Rate Pilot Valve (SK)

TX1086703 —UN—10JAN11

Bucket flow rate pilot valve is shifted by the pilot oil pressure (152) from arm in to port D and through the shuttle valves. The pilot valve routes pilot oil pressure from boom up (Port A) (155) to the bucket flow rate valve in the control valve. The bucket flow rate valve restricts the flow of supply oil to the bucket spool during arm in and boom up operation to ensure a flow of supply oil to the boom 1 spool.

*Bucket Flow Rate Pilot Valve*

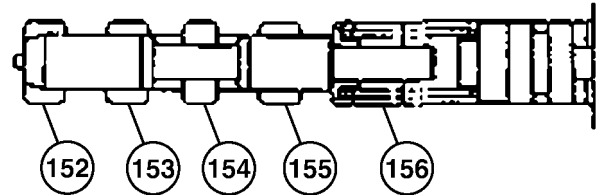
- | | |
|--------------------------------|--------------------------------------|
| 152— Pilot Oil Pressure | 155— Pilot Oil Pressure from Boom Up |
| 153— To Hydraulic Oil Tank | 156— Spring |
| 154— To Bucket Flow Rate Valve | |

MM16284,0000FD2 -19-17DEC11-6/11

Travel Flow Combiner Pilot Valve (SL)

TX1086703 —UN—10JAN11

Travel flow combiner pilot valve is shifted by pilot oil pressure (152) from right travel to port L (right reverse) or port K (right forward) and through the shuttle valves. The pilot valve then routes control pressure pilot oil (155) from the swing park brake release pilot valve to the travel flow combiner valve in the control valve. The control pressure pilot oil is from the pilot shutoff solenoid valve port A4 to the pilot signal manifold through port PI. See Travel Flow Combiner Valve Operation. (Group 9025-05.)

*Travel Flow Combiner Pilot Valve*

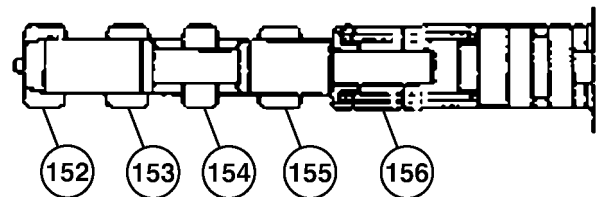
- | | |
|------------------------------------|---------------------------------|
| 152— Pilot Oil Pressure | 155— Control Pressure Pilot Oil |
| 153— To Hydraulic Oil Tank | 156— Spring |
| 154— To Travel Flow Combiner Valve | |

MM16284,0000FD2 -19-17DEC11-7/11

Swing Park Brake Release Pilot Valve (SH)

TX1086703 —UN—10JAN11

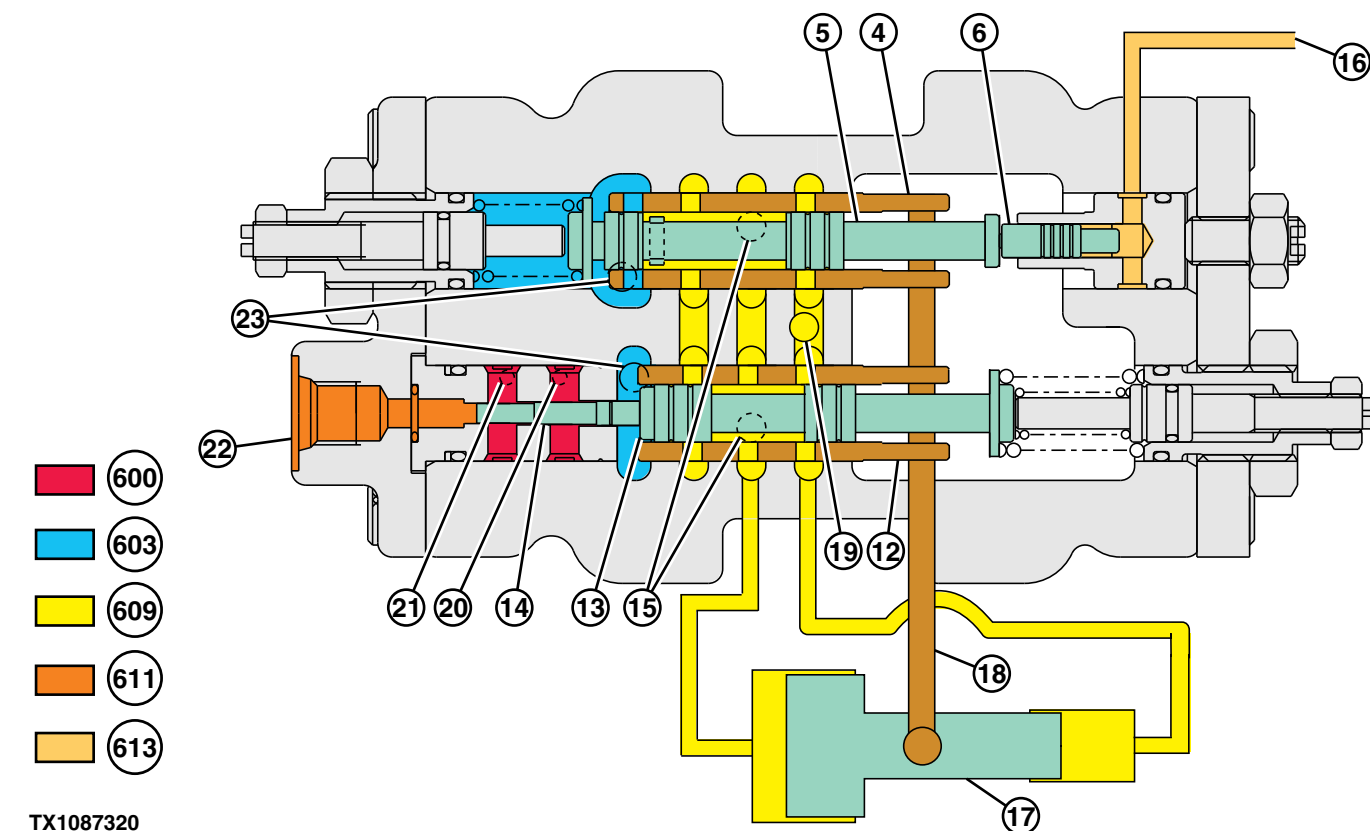
Swing park brake release pilot valve is shifted by pilot oil pressure (152) from boom up to port A, boom down to port B, arm out to port C, arm in to port D, bucket curl to port G, bucket dump to port H, or auxiliary to port M or N and through the shuttle valves. The pilot valve routes control pressure pilot oil (155) out port SH to the swing motor park brake piston through port SH. The control pressure pilot oil is from the pilot shutoff solenoid valve port A4 to the pilot signal manifold through port PI. See Swing Motor Park Brake Release Circuit Operation. (Group 9025-05.)

*Swing Park Brake Release Pilot Valve*

- | | |
|------------------------------------|---------------------------------|
| 152— Pilot Oil Pressure | 155— Control Pressure Pilot Oil |
| 153— To Hydraulic Oil Tank | 156— Spring |
| 154— To Travel Flow Combiner Valve | |

Continued on next page

MM16284,0000FD2 -19-17DEC11-8/11



Pump Regulator Control by Speed Sensing Pilot Oil—Decreasing

- 4— Remote Control Sleeve
- 5— Remote Control Spool
- 6— Piston
- 12— Load Sleeve
- 13— Load Spool
- 14— Load Piston
- 15— To Large End of Servo Piston

- 16— From Pump 1 or Pump 2 Flow Rate Pilot Valve (SA or SB)
- 17— Servo Piston
- 18— Feedback Link
- 19— Pilot Oil Inlet
- 20— Pump 1 Pressure Inlet

- 21— Pump 2 Pressure Inlet
- 22— Torque Sensing Port
- 23— Return to Pump Housing
- 600— Supply Oil
- 603— Return or Pressure-Free Oil

- 609— Pilot Oil
- 611— Torque Sensing Pilot Oil
- 613— Flow Rate Valve Pilot Oil

Pump Regulator Control by Speed Sensing Pilot Oil

Oil—As engine speed changes, the main controller calculates speed difference between target and actual engine speed. Main controller then actuates torque control solenoid valve to increase or decrease torque sensing pilot oil (611) pressure to torque sensing port (22) and load piston (14).

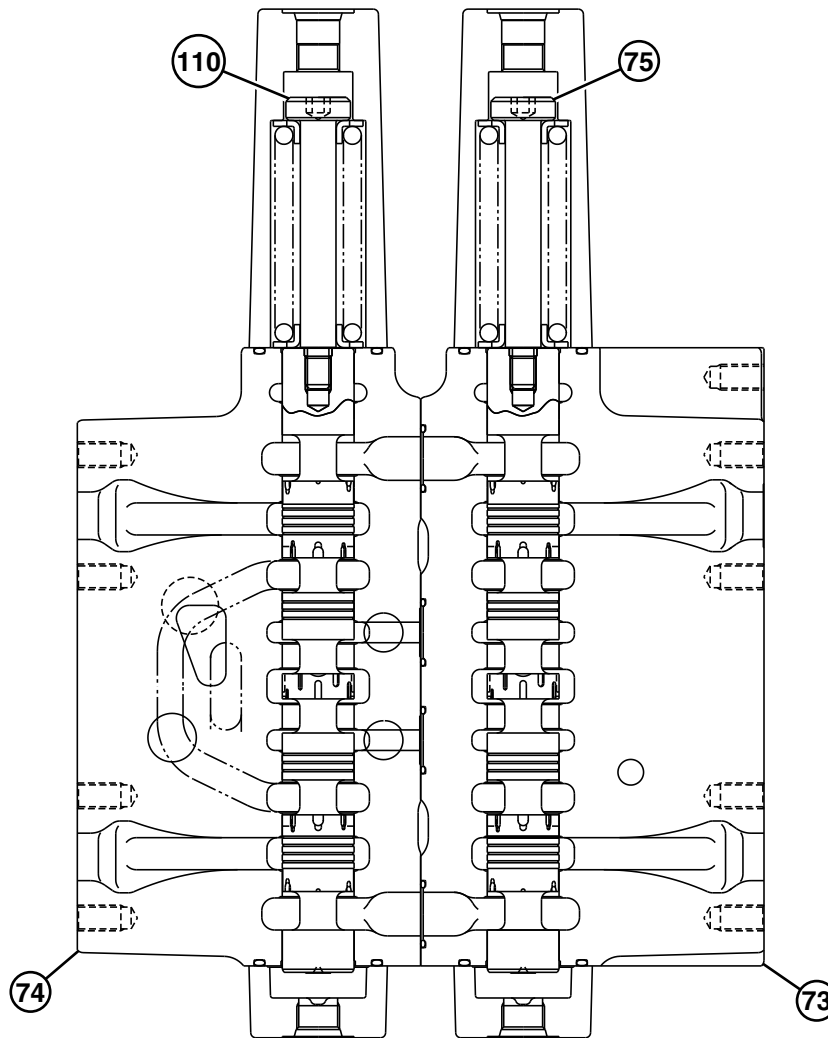
As load on engine increases, speed difference between target and actual engine speed increases. Main controller decreases voltage to torque control solenoid valve, which increases torque sensing pilot oil pressure to load piston. Torque sensing pilot oil along with supply oil pressure shifts load spool so pilot oil (609) flows to large end of servo piston (15), decreasing flow rate (displacement). As flow rate of both pumps decreases, load on engine also decreases allowing actual engine speed to increase.

As load on engine decreases, speed difference between target and actual engine speed decreases. Main controller increases voltage to torque control solenoid valve, which decreases torque sensing pilot oil pressure to load piston. Spring shifts load spool in response to decreasing torque

sensing pilot oil pressure, releasing oil from large end of servo piston to return in pump housing (23) allowing pump displacement to increase. As pump flow rate increases engine output is used more efficiently.

Also, actuating travel function at slow engine speed causes pump flow rate to increase. Flow rate is increased to prevent mistracking, which may occur at lower flow rate if there are any differences between pump 1 and pump 2 flow rates. Main controller processes voltage signals from engine speed dial, travel pressure sensor, and pump 1 and pump 2 pressure sensors. Main controller sends an increasing voltage to torque control solenoid valve, which decreases torque sensing pilot oil pressure to load piston. Springs shift load spool in response to decreasing torque sensing pilot oil pressure, releasing oil from large end of servo piston allowing pump flow rate (displacement) to increase. At increased flow rate, machine does not mistrack at slow engine speed. Increased flow rate continues even if dig function is actuated while traveling at slow engine speed. See Engine Speed Sensing Control Circuit Operation. (Group 9025-05.)

MM16284,0000FD4 -19-13MAR18-5/5



TX1156513

Left and Right Travel Valve Cross Section From Rear

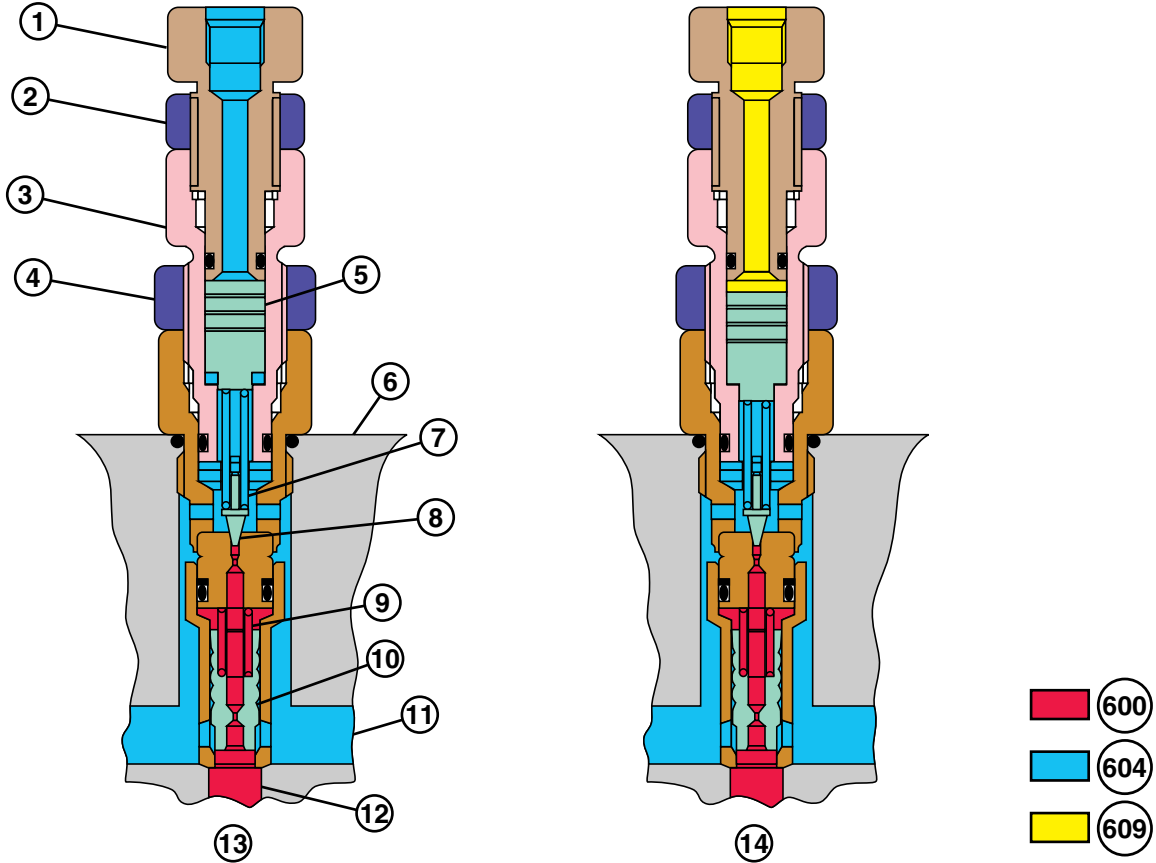
**73— Right Control Valve (4-spool) 74— Left Control Valve (5-spool) 75— Right Travel Spool
110— Left Travel Spool**

Continued on next page

DF89619,00B5748 -19-08AUG16-9/16

TX1156513—UN—20MAR14

Main Relief Valve Circuit Operation



TX1087551

Main Relief and Power Dig Valve

- 1—First Adjusting Plug
- 2—27 mm Nut
- 3—Second Adjusting Plug
- 4—32 mm Nut
- 5—Piston

- 6—Left Control Valve Housing
- 7—Pilot Poppet Spring
- 8—Pilot Poppet
- 9—Main Poppet Spring

- 10—Main Poppet
- 11—Return Passage
- 12—Power Passage
- 13—Normal Operation
- 14—Power Dig Operation

- 600— High-Pressure Oil
- 604— Return Oil
- 609— Pilot Oil

Main Relief and Power Dig Valve (117)—The function of the main relief and power dig valve is to limit the main hydraulic system operating pressure. Main relief and power dig valve is pilot operated, poppet type relief valve with a piston (5).

When the high-pressure oil (600) in the power passage (12) exceeds the relief valve pressure setting, pilot poppet (8) is pushed off its seat letting oil behind main poppet (10) flow to the return passage (11). A pressure difference is created across main poppet because oil flows out faster than oil can flow through orifice in the poppet. The main poppet is pushed open to relieve pressure oil to return passage.

For power dig operation (14), pilot oil (609) from the power dig/travel speed solenoid pushes the piston down

to the bottom of its bore, increasing the pressure setting of pilot poppet spring (7). The main hydraulic system now operates at a higher operating pressure for approximately 8 seconds.

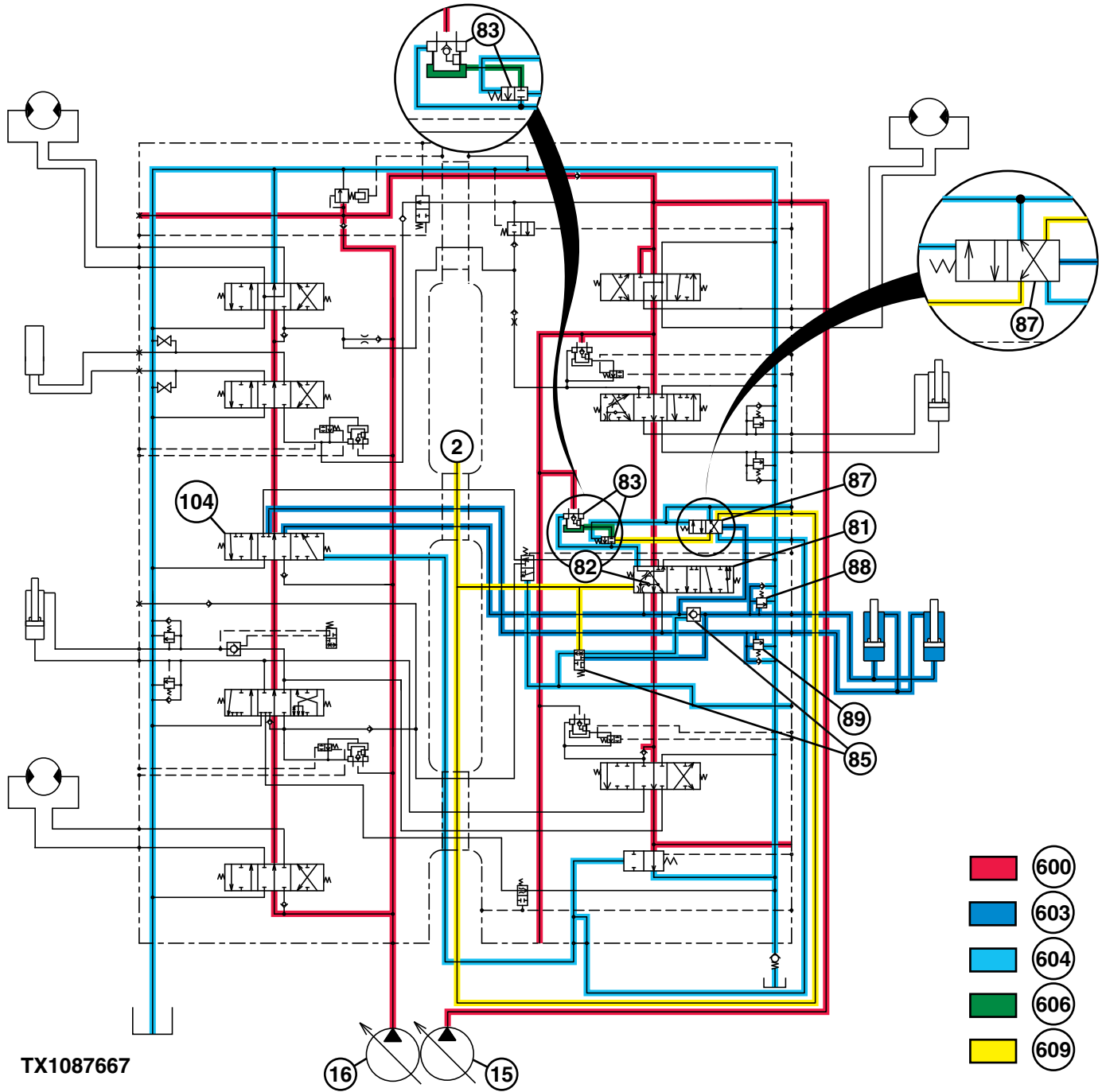
Main relief valve isolation check valves are used in the left and right control valve to route the higher high-pressure oil to the main relief and power dig valve. The higher pressure closes an isolation check valve against the lower pressure so it cannot flow to the lower pressure side. The higher pressure is then sensed by the main relief and power dig valve. For main relief valve isolation check valves, see Control Valve Check Valves Identification and Operation (Group 9025-05.)

Continued on next page

DF89619,00B58AD -19-19JAN16-1/4

TX1087551 —UN—03FEB11

Boom Lower Meter-In Cut Valve Operation



Boom Lower Meter-In Cut Valve Circuit Operation Schematic

2— Boom Down (pilot)
 15— Pump 1
 16— Pump 2
 81— Boom 1 Spool
 82— Boom Regenerative Valve
 83— Boom Flow Rate Control Valve (switch valve and poppet)

85— Boom Reduced Leakage Valve
 87— Boom Lower Meter-In Cut Valve
 88— Boom Up Circuit Relief and Anticavitation Valve

89— Boom Down Circuit Relief and Anticavitation Valve
 104— Boom 2 Spool
 600— Supply Oil
 603— Regenerative Oil

604— Return Oil
 606— Trapped Oil
 609— Control Pilot Oil

The boom lower meter-in cut valve (87), located in the boom lower circuit, controls the boom flow rate control

valve (83) and control pilot oil (609) to the boom 2 spool (104).

Continued on next page

MM16284.0000FDA -19-10FEB11-1/3

1— Boom Up (pilot)	91— Arm 2 Flow Rate Control Valve (valve and poppet)	117— Main Relief and Power Dig Valve	B33— Swing Pressure Sensor (marked S3)
3— Arm Out (pilot)	94— Arm Regenerative Valve	127— Arm Cylinder	B35— Pump 1 Delivery Pressure Sensor (marked PP1)
4— Arm In (pilot)	95— Swing Spool	600— High-Pressure Oil	B37— Pump 2 Delivery Pressure Sensor (marked PP2)
5— Swing Left (pilot)	97— Arm 1 Spool	602— Low-Pressure Oil	DD—To Solenoid Valve Manifold Port DD
6— Swing Right (pilot)	98— Arm 1 Flow Rate Control Valve (valve and poppet)	604— Return Oil	DE—To Solenoid Valve Manifold Port DE
15— Pump 1 (4-spool)	99— Check Valve (lift check)—Arm 1 Regenerative Circuit	606— Trapped Oil	Y23— Arm Regenerative Solenoid (marked SC)
16— Pump 2 (5-spool)	104— Boom 2 Spool	609— Pilot Oil	
43— From Arm 1 Flow Rate Pilot Valve (port SE)	107— Auxiliary Spool	610— Regenerative Oil	
52— Swing Motor	110— Left Travel Spool	650— Voltage Signal	
75— Right Travel Spool		A3— Main Controller (MCZ)	
76— Bucket Spool		B30— Boom Up Pressure Sensor (marked P11)	
81— Boom 1 Spool		B31— Arm In Pressure Sensor (marked P12)	
90— Arm 2 Spool			

The arm regenerative valve (94) improves arm control and prevents arm cylinder (127) cavitation during arm in operation by combining return oil from arm cylinder rod end with the pump supply oil to the arm cylinder.

The main controller (MCZ) (A3) sends a voltage signal (650) to arm regenerative solenoid (Y23) to energize the coil under the following conditions:

- Low-pressure at pump 1 delivery pressure sensor (B35) or pump 2 delivery pressure sensor (B37)
- High-pressure (arm in fully actuated) at arm in pressure sensor (B31)
- Pressure at swing pressure sensor (B33) or boom up pressure sensor (B30)

See Main Controller (MCZ) Circuit Theory of Operation. (Group 9015-15.)

The solenoid valve then routes pilot oil (609) to shift the arm regenerative valve and arm 2 flow rate control valve (91) switch valve. The return oil (604) route from arm cylinder (127) rod end to tank is blocked while arm regenerative valve is shifted, causing pressure to rise. Return oil pressure opens check valve (99) and is combined with supply oil from pump 2 (16). Regenerative oil (610) and supply oil flows through arm 1 spool (97) and is routed to arm cylinder head end increasing cylinder speed and preventing cavitation.

For more information on arm 2 flow rate control valve, see Arm 2 Flow Rate Control Valve Circuit Operation. (Group 9025-05.)

Continued on next page

DF89619,00B5728 -19-08DEC15-2/5

4— Arm In Pilot
5— Swing Left Pilot
15— Pump 1
16— Pump 2
52— Swing Motor
90— Arm 2 Spool
95— Swing Spool

97— Arm 1 Spool
98— Arm 1 Flow Rate Control
Valve (switch valve and
poppet)
102— Arm In Circuit Relief and
Anticavitation Valve

103— Arm Out Circuit Relief and
Anticavitation Valve
600— Supply Oil
602— Restricted Supply Oil
604— Return Oil

606— Trapped Oil
609— Pilot Oil
SE—From Pilot Signal Manifold
(port SE)

The function of arm 1 flow rate control valve (switch valve and poppet) (98) is to restrict the flow of supply oil (600) from pump 2 (16) to the arm 1 spool (97) to ensure a

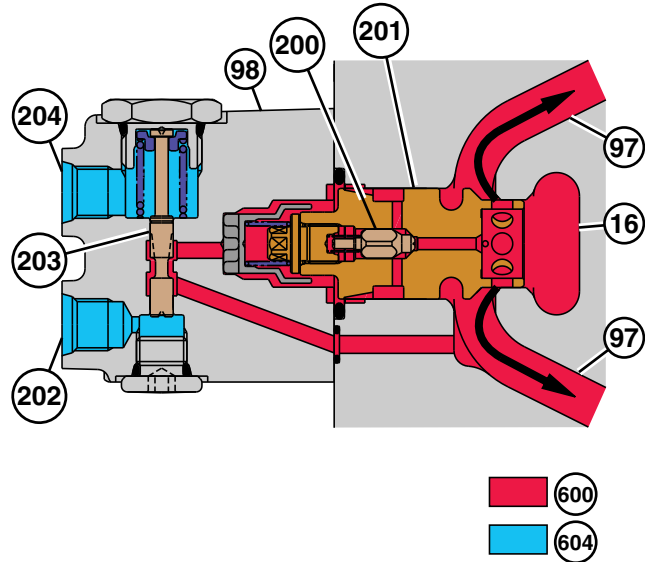
priority flow of supply oil to the swing spool (95) during combined operation.

MM16284,0000FE0 -19-18JAN16-2/4

Normal Operation—Supply oil (600) from pump 2 opens the check valve (200) in the poppet (201) of arm 1 flow rate control valve because the switch valve (203) is open. Supply oil flows through the check valve and switch valve to the arm 1 spool (97). As the load increases, the pressure increases pushing the poppet open and supply oil flows through the poppet to arm 1 spool.

16— From Pump 2
97— To Arm 1 Spool
98— Arm 1 Flow Rate Control
Valve
200— Check Valve
201— Poppet

202— To Solenoid Valve
Manifold (port DE)
203— Switch Valve
204— From Arm 1 Flow Rate
Pilot Valve (port SE)
600— Supply Oil
604— Return Oil



TX1088030 —UN—07MAR11

Arm 1 Flow Rate Control Valve Normal Operation

Continued on next page

MM16284,0000FE0 -19-18JAN16-3/4

- | | | | |
|-----------------------------------|--|--------------------------------------|---------------------------------------|
| 1— Boom Up (pilot) | 82— Boom Regenerative Valve | 93— Bypass Shutoff Valve | 600— High-Pressure Oil |
| 2— Boom Down (pilot) | 83— Boom Flow Rate Control Valve (valve and poppet) | 95— Swing Spool | 602— Low-Pressure Oil |
| 3— Arm Out (pilot) | 84— Dig Regenerative Valve | 97— Arm 1 Spool | 604— Return Oil |
| 4— Arm In (pilot) | 85— Boom Reduced Leakage Valve (valve and check valve) | 104— Boom 2 Spool | 606— Trapped Oil |
| 15— Pump 1 | 86— Orifice | 107— Auxiliary Spool | 609— Pilot Oil |
| 16— Pump 2 | 87— Boom Lower Meter-In Cut Valve | 110— Left Travel Spool | 610— Regenerative Oil |
| 36— Hydraulic Oil Cooler | 90— Arm 2 Spool | 117— Main Relief and Power Dig Valve | B30— Boom Up Pressure Sensor |
| 73— Right Control Valve (4-spool) | 91— Arm 2 Flow Rate Control Valve (valve and poppet) | 124— Oil Cooler Bypass Valve | B31— Arm In Pressure Sensor |
| 74— Left Control Valve (5-spool) | | 125— Boom Cylinder (2 used) | DD—To Solenoid Valve Manifold Port DD |
| 75— Right Travel Spool | | 127— Arm Cylinder | |
| 76— Bucket Spool | | 128— Check Valve | |
| 81— Boom 1 Spool | | | |

The purpose of the boom flow rate control valve (valve and poppet) (83) is to restrict supply oil in the circuit to ensure that there is sufficient supply oil for other functions during boom down and to restrict supply oil through boom 1 spool (81) during boom down so that boom regenerative valve (82) in boom 1 spool works properly.

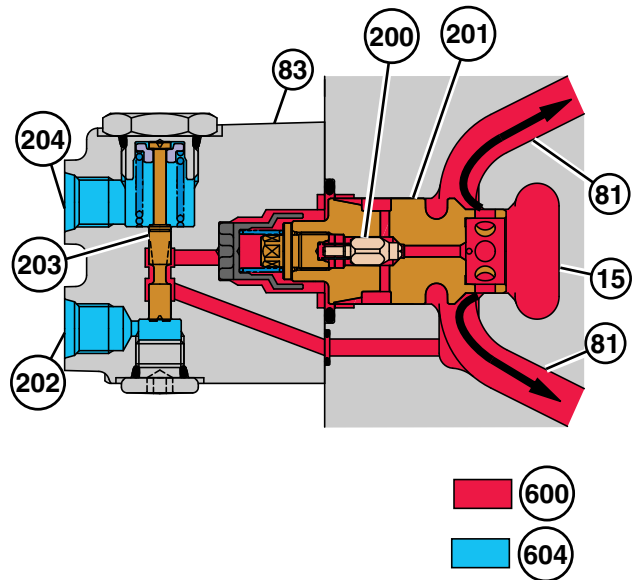
During boom down, the boom flow rate control valve restricts supply oil flow to the boom 1 spool from pump 1 (15).

During boom down and other functions, the boom lowers due to its own weight by the boom regenerative circuit and uses supply oil from the pump for other functions. This ensures that other functions maintain normal operation. See Boom Regenerative Valve Circuit Operation. (Group 9025-05.)

DF89619,00B574B -19-20JAN16-2/4

Normal Operation—When boom down is actuated, supply oil flows to the 4-spool side of the control valve from pump 1 (15). Supply oil opens the check valve (200) in the poppet (201) of the boom flow rate control valve (83) because the switch valve (203) is open due to no pilot oil pressure. Supply oil flows through boom flow rate control valve without any restriction and continues on to the boom 1 spool (81).

- | | |
|----------------------------------|---|
| 15— From Pump 1 | 202— To Solenoid Valve Manifold Port DD |
| 81— To Boom 1 Spool | 203— Switch Valve |
| 83— Boom Flow Rate Control Valve | 204— From Boom Lower Meter-In Cut Valve |
| 200— Check Valve | 600— High-Pressure Oil |
| 201— Poppet | 604— Return Oil |



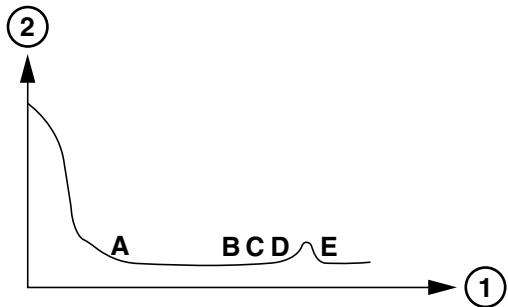
TX1088058

Boom Flow Rate Control Valve Normal Operation

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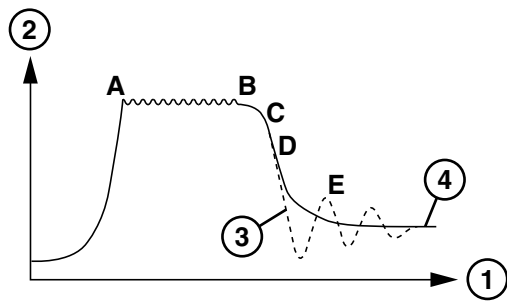
DF89619,00B574B -19-20JAN16-3/4

TX1088058 —UN—15FEB11



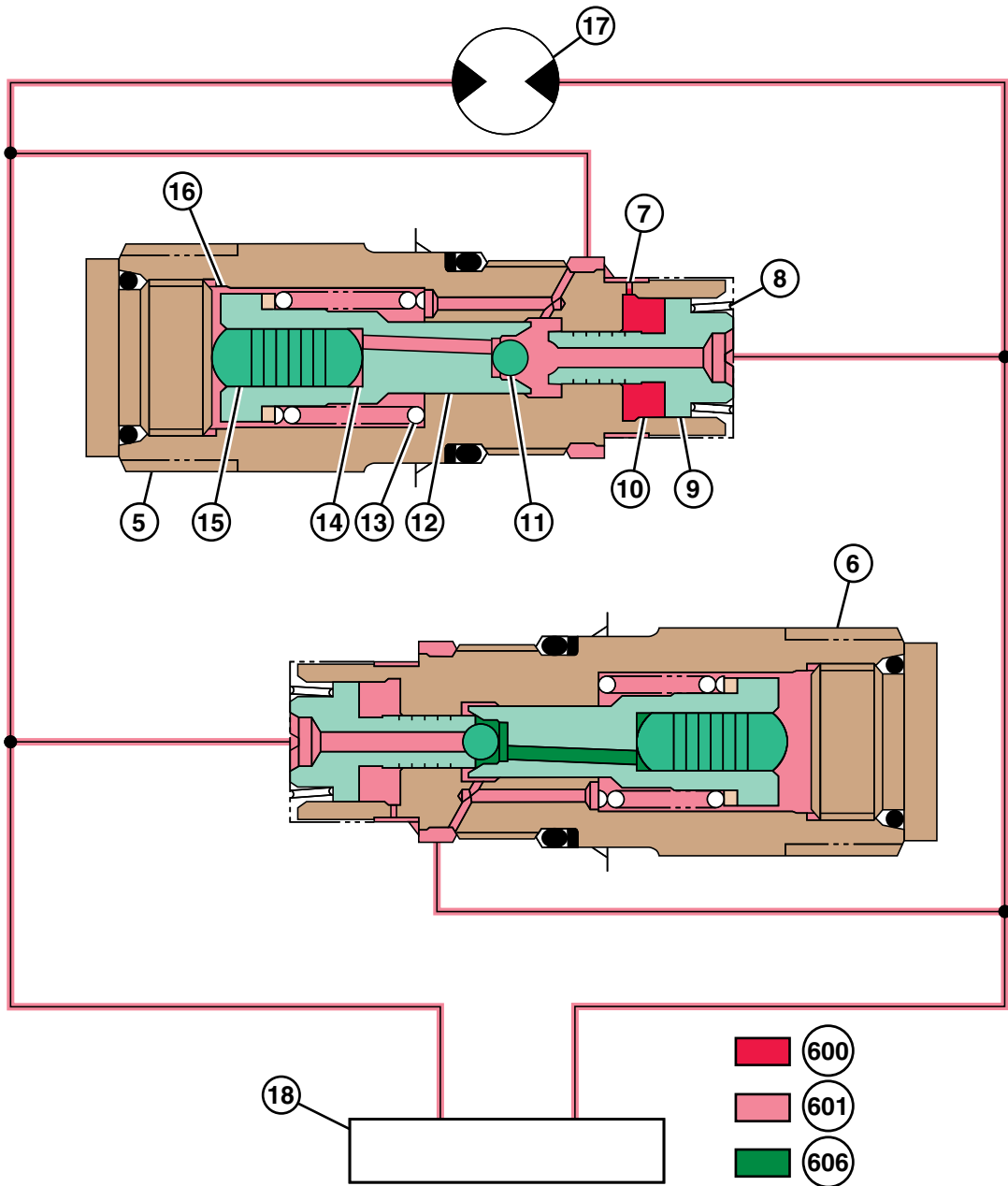
Time to Pressure Output Curve for Inlet Side

TX1014236 —UN—20NOV06



Time to Pressure Output Curve for Return Side

TX1014237 —UN—20NOV06



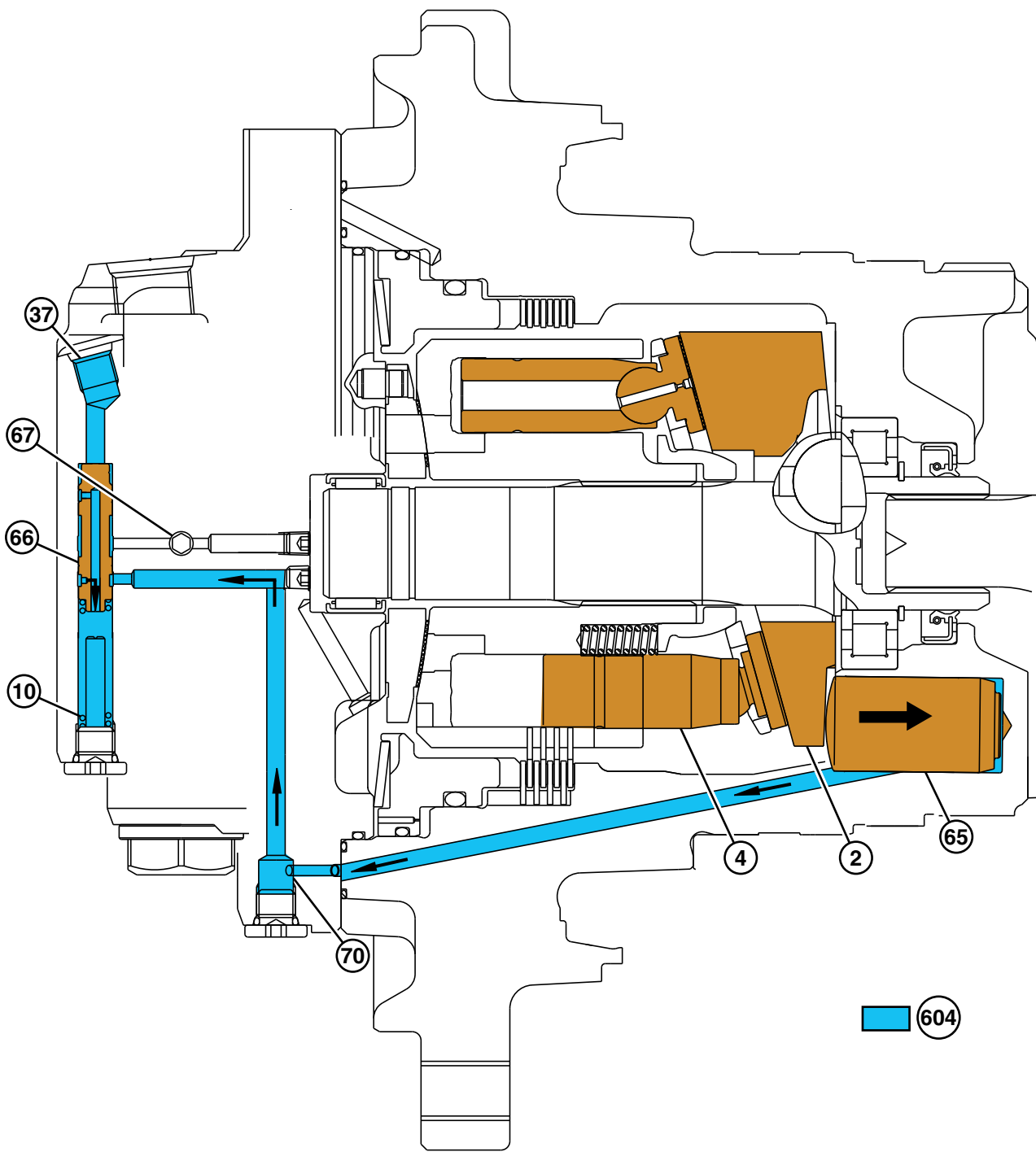
Swing Damper Valves—Pressure Begins to Decrease

TX1088167 —UN—18FEB11

TX1088167

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MM16284,0000FE7 -19-19JAN16-3/8



TX1088188

Travel Motor Slow Speed Operation

TX1088188 —UN—17FEB11

Continued on next page

MM16284.0000FEA - 19-08MAR11-4/9

Auxiliary System Operation

NOTE: For auxiliary attachments to work properly multiple kits may be required.

The auxiliary system consist of a pilot control system to shift the auxiliary control valve spool. The shifted auxiliary control valve spool allows high pressure oil flow to work port of the auxiliary attachment depending on attachment and kits installed.

The following kits are available for auxiliary attachments:

- Auxiliary High Flow Line Kit, for more information, [see Auxiliary High Flow Line Kit Operation](#). (Group 9025-05.)
- Two Pump Combined Flow Kit, for more information, [see Two Pump Combined Flow Kit Operation](#). (Group 9025-05.)

- Low Flow Kit, for more information, [see Low Flow Kit Operation](#). (Group 9025-05.)
- Secondary Auxiliary Relief Kit, for more information, [see Secondary Auxiliary Relief Kit Operation](#). (Group 9025-05.)
- Two Way Solenoid Kit Operation, for more information, [see Two Way Solenoid Kit Operation](#). (Group 9025-05.)
- Two Way Foot Pedal Kit.
- One Way Foot Switch.

For more information on attachment and required kits to operate go to info to go at www.dealernet.deere.com.

JJ03229,0000AE2 -19-19JUN14-1/1

Auxiliary Pilot Control Valve Operation

The auxiliary pilot control valve regulates the pilot oil pressure to actuate the pilot valve in the pilot signal manifold and to shift the auxiliary control valve spool to actuate the auxiliary functions.

[See Pilot Signal Manifold Operation](#) for pilot valve operation. (Group 9025-05.)

[See Pilot Operation of Control Valve Operation](#) for control valve operation. (Group 9025-05.)

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DF89619,00B572D -19-16OCT15-1/9

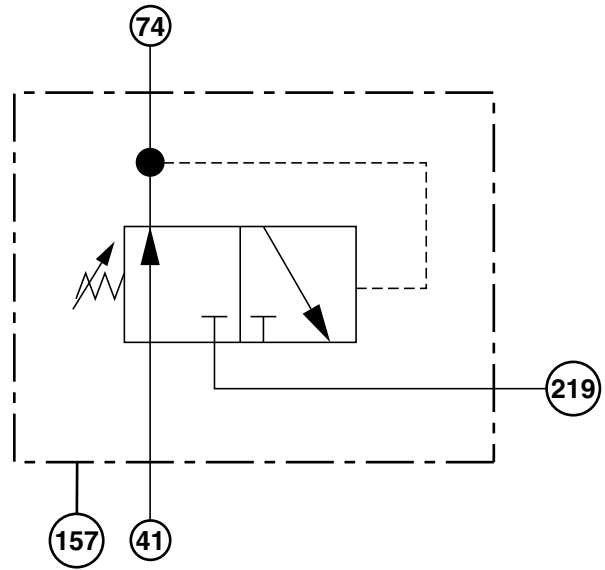
Flow Rate Pressure Reducing Valve Operation

The function of the flow rate reducing valve (157) is to control the amount of pump 1 flow that is directed to the auxiliary spool when combining auxiliary with a pump 1 function.

Pilot pressure is sent from pilot signal manifold port SN (41) when a pump 1 function is activated. The pilot oil is then routed through the flow rate pressure reducing valve (157) to control valve port SN (74). This shifts the auxiliary flow combiner valve to stop the flow of pump 1 high-pressure oil to the auxiliary spool, “de-combining” the flow. Flow rate reducing valve is adjustable, turn counterclockwise to give auxiliary priority flow over pump 1 functions or clockwise to give pump 1 functions priority over auxiliary.

When pilot oil pressure to control valve port SN exceeds set pressure of flow rate reducing valve, the valve shifts allowing pilot oil to control valve port SN to flow to hydraulic oil tank (219) allowing the auxiliary flow combiner valve to shift combining pump 1 and pump 2 high-pressure oil flow.

For more information, see [Two Pump Combined Flow Kit Operation](#). (Group 9025-05.)



Flow Rate Pressure Reducing Valve Schematic

- | | |
|--|-------------------------------|
| 41— From Pilot Signal Manifold Port SN | 157— Flow Rate Reducing Valve |
| 74— To Control Valve Port SN | 219— To Hydraulic Oil Tank |

JJ03229,0000AE5 -19-19JUN14-1/1

TX1135893 —UN—22MAY13

Secondary Auxiliary Relief Valve Solenoid Valve Operation

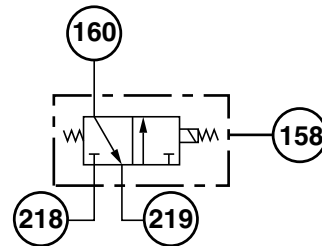
The function of the secondary auxiliary relief valve solenoid valve (158) is to shift secondary auxiliary relief control valve to open or close high-pressure oil flow to secondary auxiliary relief valve.

The secondary auxiliary relief valve solenoid valve is controlled by settings in MP Dr and Service ADVISOR™. See [Attachment Control Circuit Theory of Operation](#). (Group 9015-15.)

When the secondary auxiliary relief valve solenoid valve (158) is activated, valve is shifted and pilot oil from solenoid valve manifold port PE (218) is sent to secondary auxiliary relief control valve (160). This shifts the secondary auxiliary relief control valve to route high-pressure oil to the secondary auxiliary relief valve.

When the secondary auxiliary relief valve solenoid valve is deactivated, spring tension shifts the valve. Pilot oil to secondary auxiliary relief control valve is sent to hydraulic oil tank (219). This shifts the secondary auxiliary relief control valve to stop routing high-pressure oil to the secondary auxiliary relief valve.

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Secondary Relief Valve Solenoid Valve

- | | |
|--|---|
| 158— Secondary Auxiliary Relief Valve Solenoid Valve | 218— From Solenoid Valve Manifold Port PE |
| 160— To Secondary Auxiliary Relief Control Valve | 219— To Hydraulic Oil Tank |

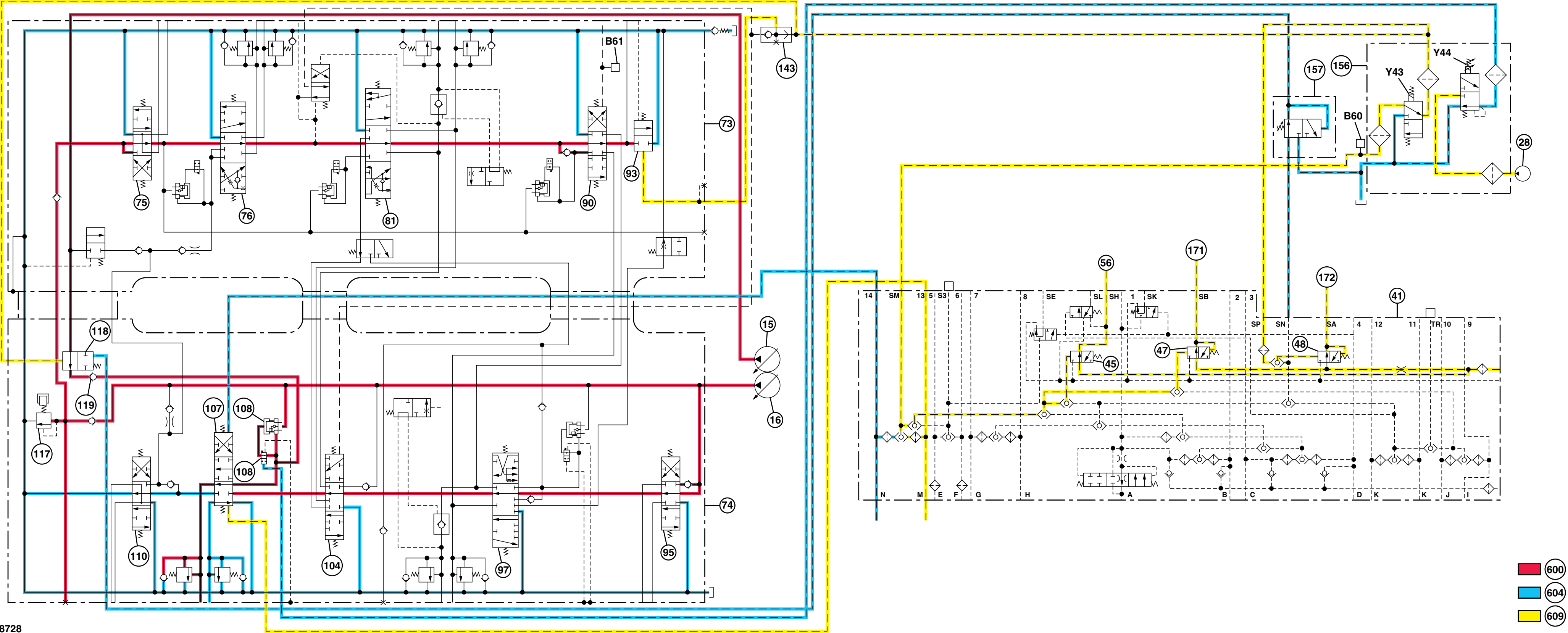
For more information, see [Secondary Auxiliary Relief Kit Operation](#). (Group 9015-15.)

JJ03229,0000AE6 -19-19JUN14-1/1

TX1136497 —UN—16MAY13

Two Pump Combined Flow Kit Operation

TX1148728 —UN—04DEC13

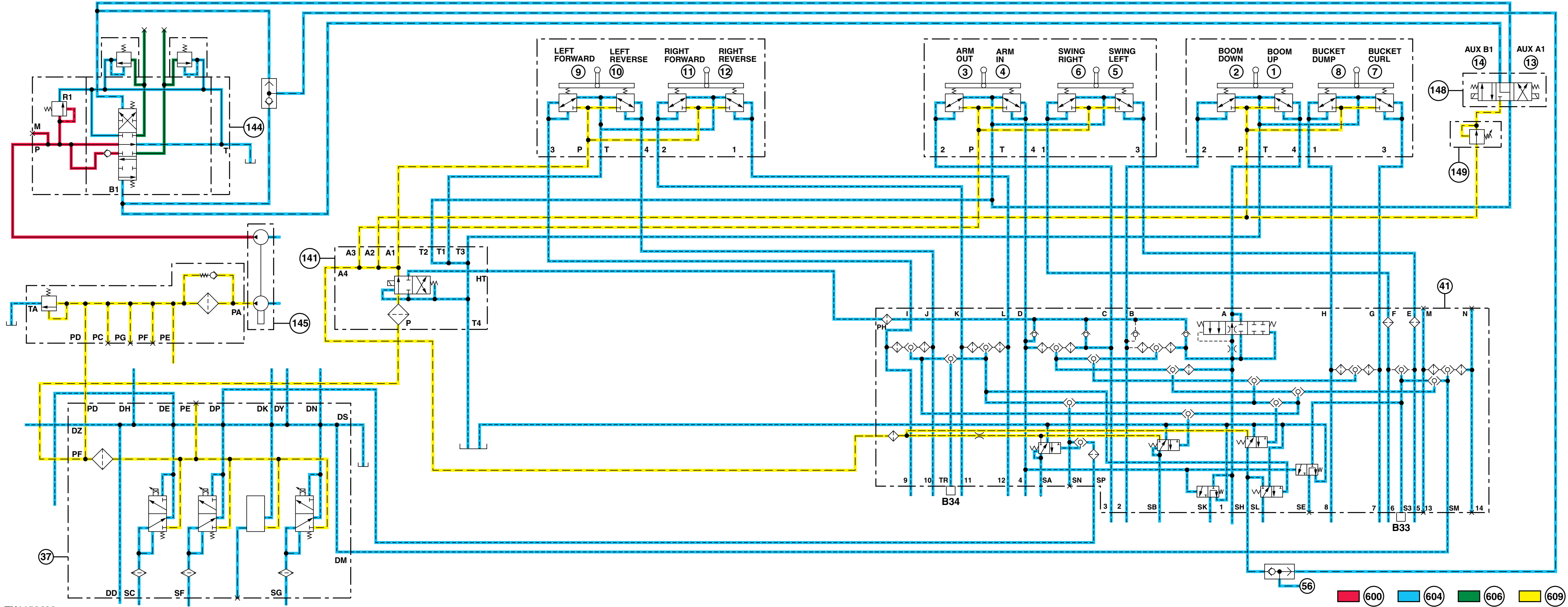


TX1148728

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Two Pump Combined Flow Kit Schematic (Y43 energized and Y44 de-energized)

JA66566,000339F -19-06FEB17-1/7



TX1156400

Continued on next page

Low Flow Kit Schematic (solenoid operated)

Diagnostic Information

1 Cylinder Drift	Verify proper operation of machine cylinders. <u>See Cylinder Drift Test—Boom, Arm, and Bucket.</u> (Group 9025-25.) Does cylinder drift meet specification?	YES: Checks complete. NO: Go to Boom Manual Lower Screw Loose. DF89619,00B57A6 -19-06AUG14-3/8
2 Boom Manual Lower Screw Loose	Inspect boom manual lower screw. <u>See Lower Boom With Engine Stopped.</u> (Operator's Manual.) Is boom manual lower screw tightened to specification?	YES: Go to Circuit Relief Valve Setting Too Low or Malfunctioning. NO: Tighten boom manual lower screw to specification. DF89619,00B57A6 -19-06AUG14-4/8
3 Circuit Relief Valve Setting Too Low or Malfunctioning	Check circuit relief valve drifting function. Swap circuit relief valves for a particular function. Does cylinder drift continue on same function?	YES: Go to Reduced Leakage Valve. NO: Adjust, repair, or replace circuit relief valve. <u>See Circuit Relief Valve Test and Adjustment.</u> (Group 9025-25.) <u>See Control Valve (5-Spool) Disassemble and Assemble</u> and <u>see Control Valve (4-Spool) Disassemble and Assemble.</u> (Group 3360.) DF89619,00B57A6 -19-06AUG14-5/8
4 Reduced Leakage Valve	<i>NOTE: Reduced leakage valve check should only be completed on machines showing symptoms of arm in or boom down cylinder drift.</i> Inspect reduced leakage valve pilot valve and poppet. For component identification, <u>see Control Valve Operation.</u> (Group 9025-05.) <u>See Control Valve (5-Spool) Disassemble and Assemble</u> and <u>see Control Valve (4-Spool) Disassemble and Assemble.</u> (Group 3360.) Is reduced leakage valve pilot valve or poppet scored or sticking?	YES: Replace reduced leakage valve pilot valve or poppet. NO: Go to Control Valve Leakage. DF89619,00B57A6 -19-06AUG14-6/8
5 Control Valve Leakage	Inspect control valve for leakage. <u>See Hydraulic System Component Location.</u> (Group 9025-15.) Is control valve free of leaks?	YES: Go to Cylinder Leakage. NO: Repair or replace control valve components. <u>See Control Valve (5-Spool) Disassemble and Assemble</u> and <u>see Control Valve (4-Spool) Disassemble and Assemble.</u> (Group 3360.) Continued on next page DF89619,00B57A6 -19-06AUG14-7/8

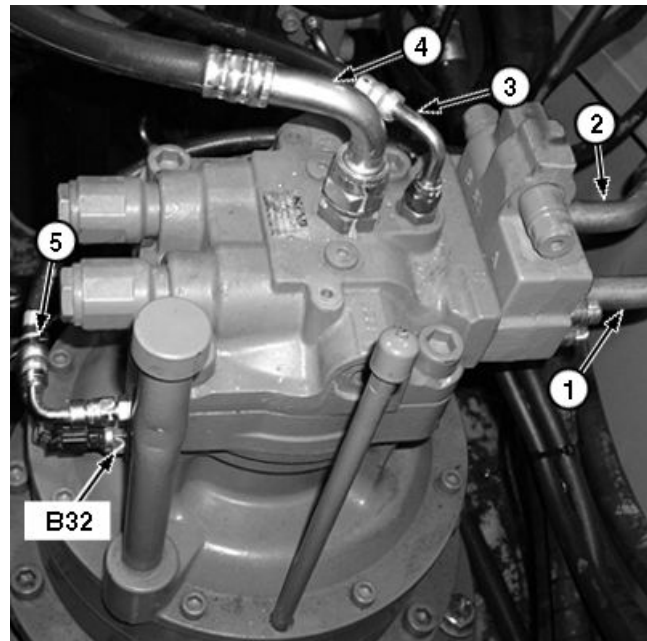
Diagnostic Information

3 Drift Direction	Operate machine and check for drift in both directions. Does drift occur in both directions?	YES: Go to Case Drain Leakage. NO: Go to Swing Motor Make-Up Check Valve Leakage. DF89619,00B57AA -19-12JUN14-5/11
4 Case Drain Leakage	Inspect swing motor for leakage. See Swing Motor Leakage Test. (Group 9025-25.) Does observed leakage meet specification?	YES: Go to Damper Valve Malfunction. NO: Repair or replace swing motor and park brake. See Swing Motor and Park Brake Remove and Install. (Group 4360.) DF89619,00B57AA -19-12JUN14-6/11
5 Damper Valve Malfunction	Inspect swing motor dampener valves. See Swing Motor Damper Valve. (Group 9025-05.) Are damper valves OK?	YES: Checks complete. NO: Repair or replace damper valves. See Crossover Relief Valve and Make-Up Check Valve Remove and Install. (Group 4360.) DF89619,00B57AA -19-12JUN14-7/11
6 Swing Motor Make-Up Check Valve Leakage	Inspect swing motor make-up check valves. See Swing Motor, Crossover Relief Valve, and Make-Up Check Valve Operation. (Group 9025-05.) Are swing motor make-up check valves OK?	YES: Go to Swing Motor Crossover Relief Valve Malfunction. NO: Repair or replace swing motor make-up check valves. See Crossover Relief Valve and Make-Up Check Valve Remove and Install. (Group 4360.) DF89619,00B57AA -19-12JUN14-8/11
7 Swing Motor Crossover Relief Valve Malfunction	Remove crossover relief valves and install in opposite ports in park brake housing. See Crossover Relief Valve and Make-Up Check Valve Remove and Install. (Group 4360.) Does swing drift change directions?	YES: Repair or replace crossover relief valves. See Crossover Relief Valve and Make-Up Check Valve Remove and Install. (Group 4360.) NO: Checks complete. DF89619,00B57AA -19-12JUN14-9/11

Continued on next page

Swing Motor Line Identification

- | | |
|-----------------------------------|---|
| 1— From Control Valve Swing Left | 4— To Control Valve |
| 2— From Control Valve Swing Right | 5— From Pilot Signal Manifold (port SH) |
| 3— To Hydraulic Oil Tank | B32— Front Attachment Pressure Sensor |



TX1107074A —UN—31JAN12

Swing Motor Line Identification

MM16284,00011FF -19-19DEC13-1/1

Diagnostic Information

1—Port 1 to Boom Up Pilot Cap	9—Port 9 to Left Travel Forward Pilot Cap	74—Control Valve (bottom)	TR—Travel Pressure Sensor Port
3—Port 3 to Arm Out Pilot Cap		B33—Swing Pressure Sensor	
5—Port 5 to Swing Left Pilot Cap	11—Port 11 to Right Travel Forward Pilot Cap	B34—Travel Pressure Sensor	
8—Port 8 to Bucket Dump Pilot Cap	41—Control Valve Side of Pilot Signal Manifold	S3—Swing Pressure Sensor Port	
		SL—Port (SL) to Travel Flow Combiner Valve	

JA66566,0002681 -19-03AUG12-4/4

Diagnostic Information

28— Pilot Pump	56— To Swing Park Brake	110— Left Travel Spool	B34— Travel Pressure Sensor (marked TR)
37— Solenoid Valve Manifold	73— Right Control Valve (4-spool)	117— Main Relief	B60— Attachment Pressure Sensor
41— Pilot Signal Manifold	74— Left Control Valve (5-spool)	118— Auxiliary Function Flow Combiner Valve	Y22— Dig Regenerative Solenoid (marked SF)
42— Boom Down Shockless Valve	75— Right Travel Spool	120— Travel Flow Combiner Valve	Y23— Arm Regenerative Solenoid (marked SC)
44— Travel Flow Combiner Pilot Valve (port SL)	76— Bucket Spool	164— Auxiliary Pilot Control Valve	Y24— Power Dig/Travel Speed Solenoid (marked SG)
45— Swing Park Brake Release Pilot Valve (port SH)	81— Boom 1 Spool	171— To Pump 2 Flow Rate Solenoid Valve	
46— Bucket Flow Rate Pilot Valve (port SK)	90— Arm 2 Spool	604— Return Oil	
47— Pump 2 Flow Rate Pilot Valve (port SB)	93— Bypass Shutoff Valve	609— Pilot Oil	
	95— Swing Spool	B33— Swing Pressure Sensor (marked S3)	
	97— Arm 1 Spool		
	104— Boom 2 Spool		
	107— Auxiliary Spool		

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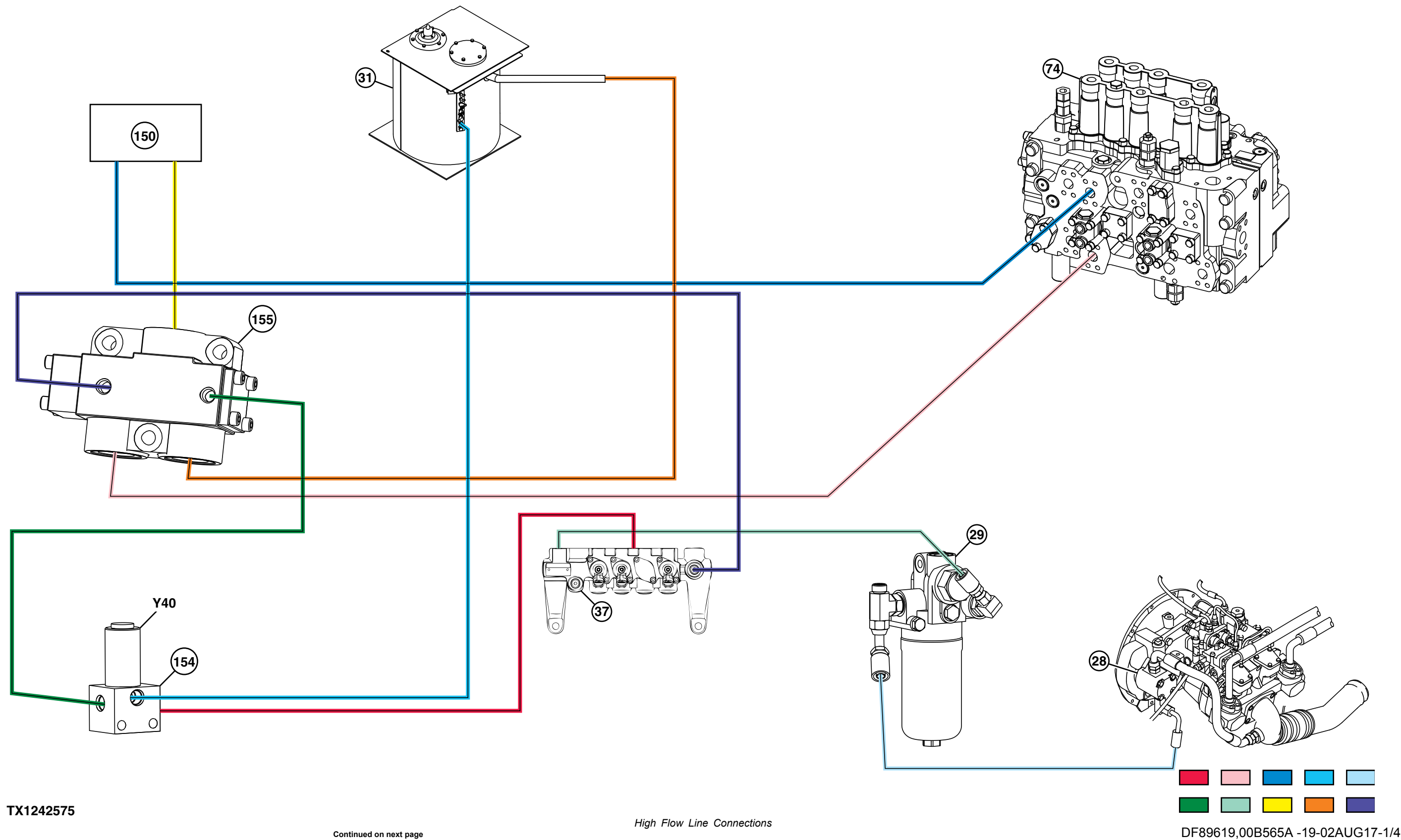
15— Pump 1	75— Right Travel Spool	118— Auxiliary Function Flow	600— High-Pressure Oil
16— Pump 2	76— Bucket Spool	Combiner Valve	604— Return Oil
28— Pilot Pump	81— Boom 1 Spool	119— Check Valve—Auxiliary	609— Pilot Oil
41— Pilot Signal Manifold	90— Arm 2 Spool	Flow Combiner Valve	B60— Attachment Pressure
45— Swing Park Brake Release	93— Bypass Shutoff Valve	Circuit	Sensor
Pilot Valve	95— Swing Spool	143— Auxiliary Shuttle Valve	B61— Arm Out Pressure Sensor
47— Pump 2 Flow Rate Pilot Valve	97— Arm 1 Spool	156— Flow Rate Select Solenoid	Y43— 2-Speed Activation
48— Pump 1 Flow Rate Pilot Valve	104— Boom 2 Spool	Valve	Solenoid Valve
56— To Swing Park Brake	107— Auxiliary Spool	157— Flow Rate Select Reducing	Y44— Flow Rate Adjustment
73— Right Control Valve (4-spool)	108— Auxiliary Flow Rate	Valve	Solenoid Valve
74— Left Control Valve (5-spool)	Control Valve (valve and	171— To Pump 2 Flow Rate	
	poppet)	Solenoid Valve	
	110— Left Travel Spool	172— To Torque Control	
	117— Main Relief and Power Dig	Solenoid Valve	
	Valve		

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DF89619,00B5752 -19-19JUN14-8/14

Auxiliary System Line Connections

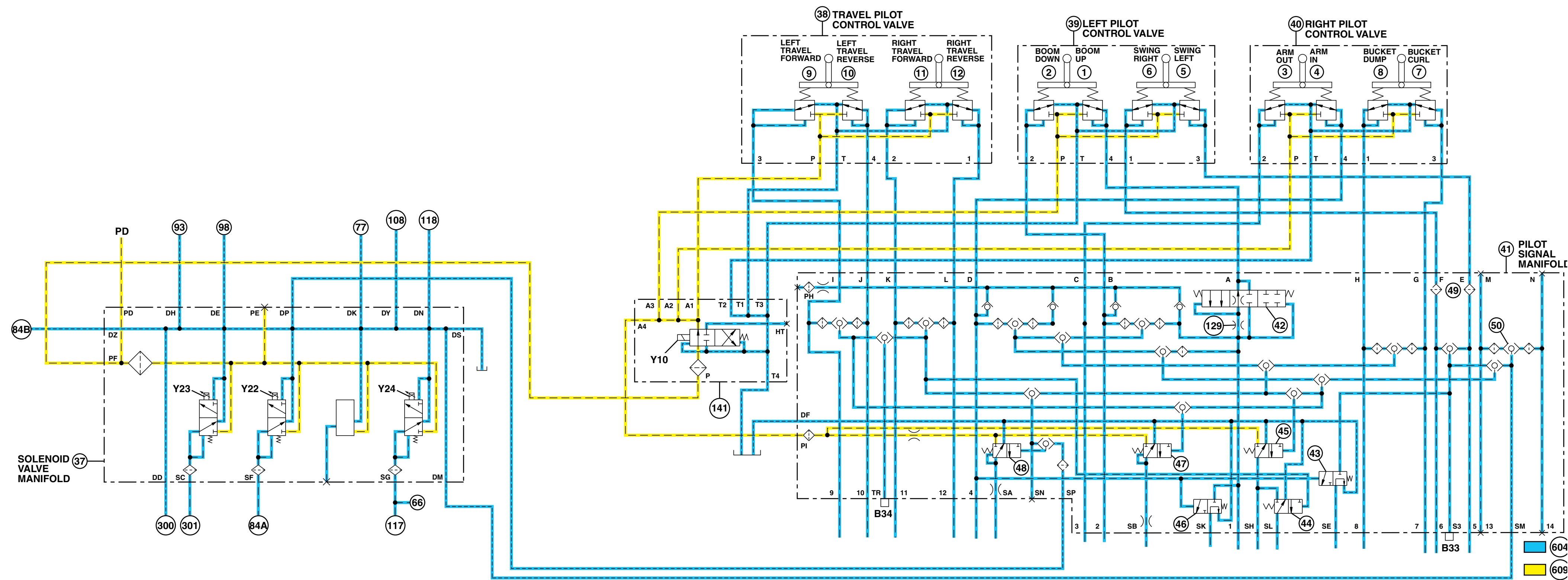
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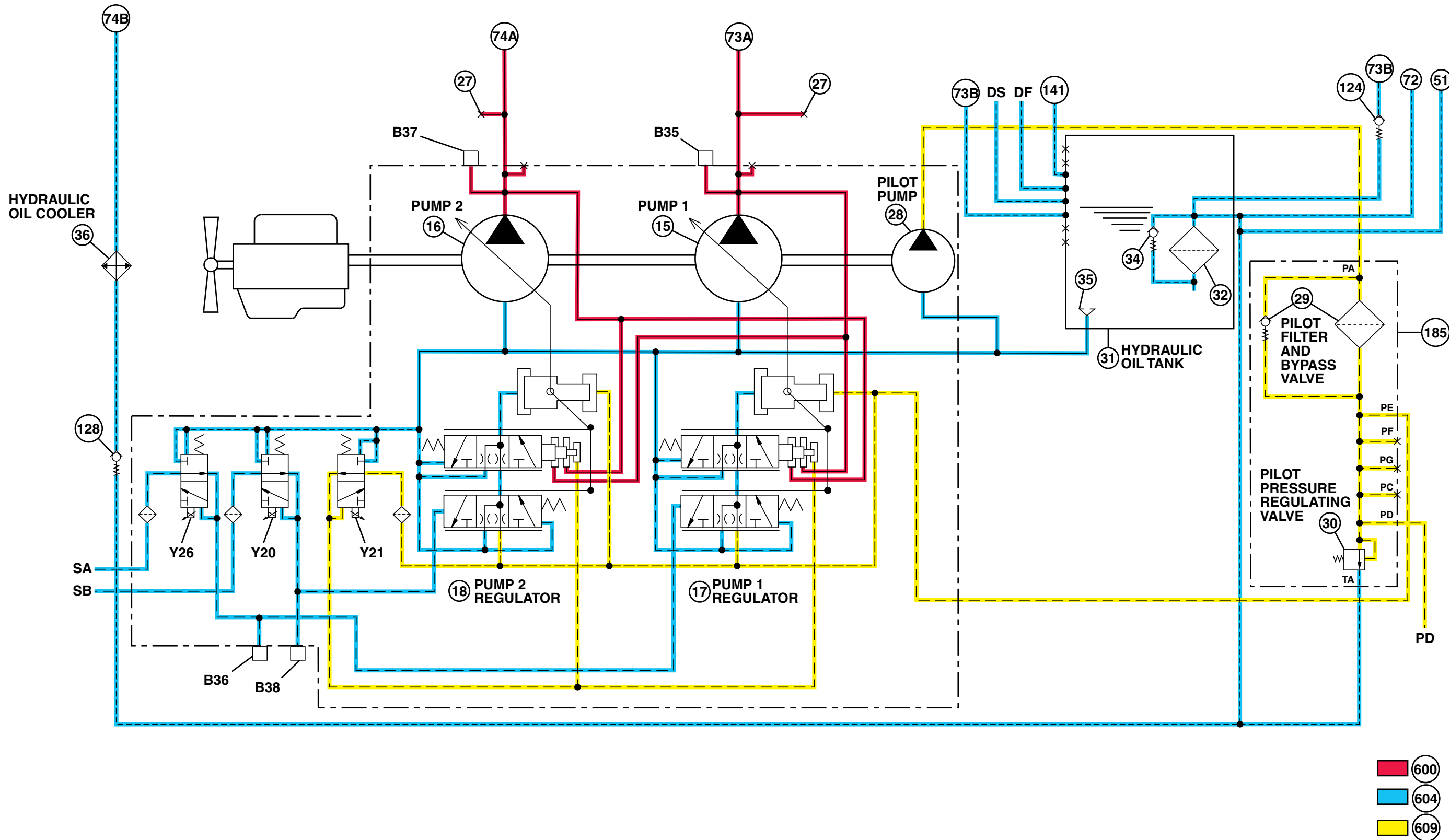
TX1242575

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High Flow Line Connections



TX1248219 —UN—14DEC17

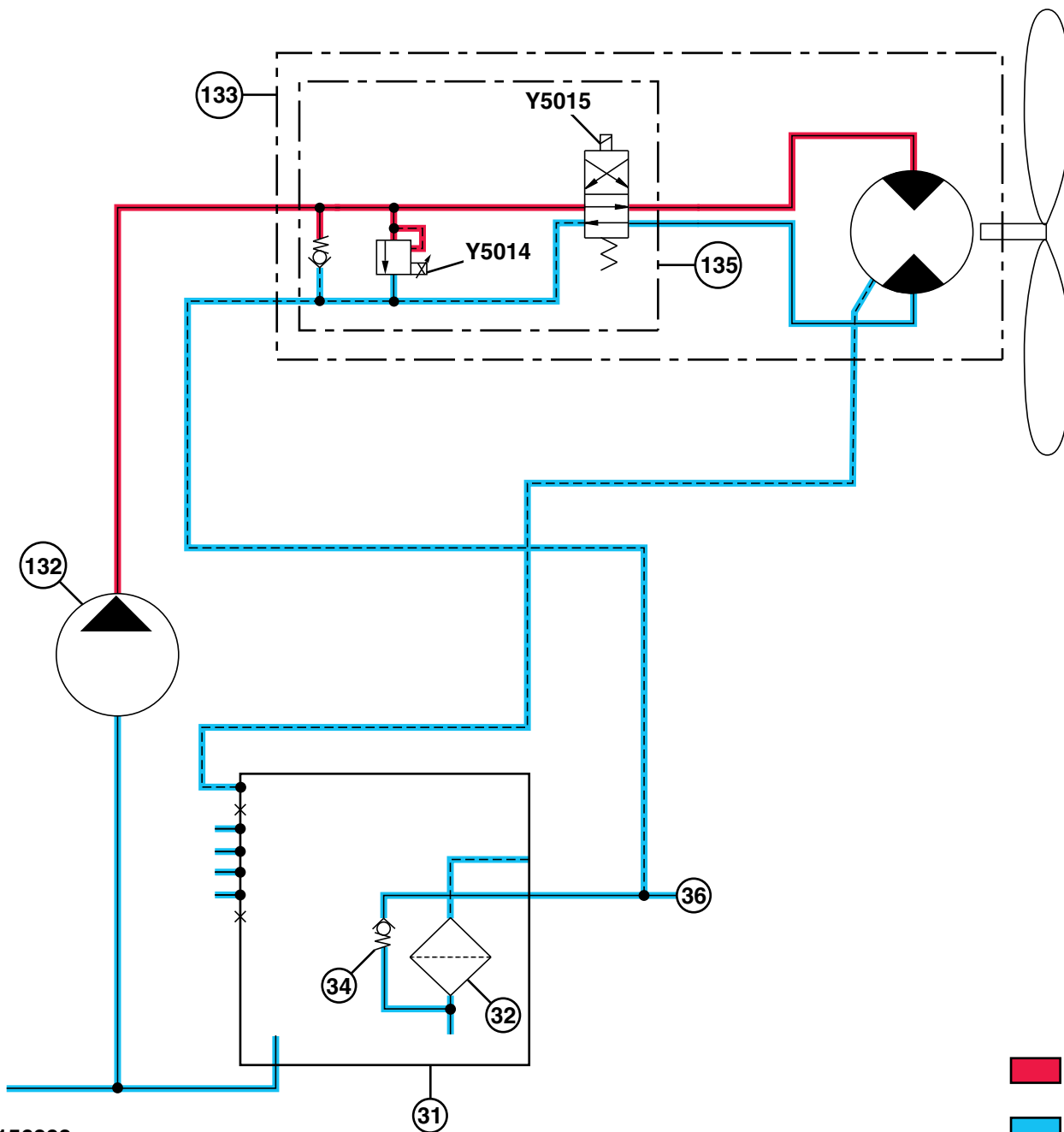


TX1248219

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Hydraulic Oil Pumps and Regulators Schematic

DF89619,00B68D2 -19-14FEB18-11/12



TX1156893

31— Hydraulic Oil Tank
32— Return Filter
34— Filter Bypass
36— From Hydraulic Oil Cooler

Fan Drive Hydraulic System Schematic—Reversing (if equipped)

132— Fan Drive Pump
133— Fan Drive Motor
135— Fan Speed and Reversing
Control Valve—If Equipped

600— High-Pressure Oil
604— Return Oil
Y9—Reversing Fan Solenoid Valve
Y5005—Proportional Fan Speed Solenoid Valve

TX1156893 —UN—21MAY14

DF89619,00B57C8 -19-07MAY14-2/2

Tests

If valve spool actuating pressure is not to specification check pilot system pressure. See Pilot Pressure Regulating Valve Test and Adjustment. (Group 9025-25.)

If pilot system pressure is to specification then check pressure at the solenoid valve manifold, pilot control shutoff solenoid valve, pilot controllers, and pilot signal manifold.

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DF89619,00B58B9 -19-29JUL15-2/2

Tests

7. Run machine at specification.

Specification

Hydraulic
Oil—Temperature.....45—55°C
110—130°F
Engine—Speed..... Fast Idle
Work Mode
Switch—Position..... Bucket Mode
Power Mode
Button—Position.....PWR (power) Mode

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Auto-Idle

Switch—Position..... OFF

8. Actuate arm out function over relief. Record main relief pressure reading.
9. Actuate arm out function over relief while pressing power dig switch. Record power dig pressure reading.

Continued on next page

DF89619,00B58BB -19-06APR18-2/3

Pump Regulator Test and Adjustment—Maximum Flow

SPECIFICATIONS	
Hydraulic Oil Temperature	45—55°C 113—131°F
Hydraulic Oil	
End of Maximum Flow Adjusting Screw to 13 mm Nut Distance	3 mm
End of Maximum Flow Adjusting Screw to 13 mm Nut	0.125 in (1/8 in.)
Engine Speed	Fast Idle
Work Mode Switch Position	Bucket Mode
Power Mode Button Position	PWR (power) Mode
Auto-Idle Switch Position	OFF
Travel Speed Switch Position	Fast (rabbit)
Track Raised—3 Revolutions From a Running Start Cycle Time	24.7—28.7 s

SERVICE EQUIPMENT AND TOOLS	
13 mm Combination Wrench	
Flat Blade Screwdriver	
Stop Watch	
30 mm Combination Wrench	

Purpose of test is to check and adjust the maximum flow rate of pump 1 and 2 using the cycle time for travel are approximately the same. Maximum flow rate cannot be significantly increased by turning out the flow adjusting cartridge.

1. Check and adjust track sag. See Maintenance—Check Track Sag in operator's manual.
2. Connect one of the following test equipment to monitor hydraulic oil temperature and actual engine speed.
 - Monitor application. See [Service Menu](#) for instruction to actuate the service menu on monitor in cab. (Group 9015-16.)
Select the following items from monitoring list:
 - Hydraulic Oil Temperature
 - Actual Engine Speed
 - Service ADVISOR™ application. See [Service ADVISOR™ Connection Procedure](#) for instruction. (Group 9015-20.)
Select the following items from the menu:
 - Hydraulic Oil Temperature
 - Actual Engine Speed
 - MPDr application. See [MPDr Application](#) for instruction. (Group 9015-20.)
Select the following items from the monitor display:
 - Hydraulic Oil Temperature

- Actual Engine Speed

3. Warm hydraulic oil to specification. See [Hydraulic Oil Warm-Up Procedure](#). (Group 9025-25.)

Specification

Hydraulic Oil—Temperature.....45—55°C
110—130°F

4. Check the distance from the end of maximum flow adjusting screw (2) to the 13 mm nut (3) for both pump 1 and pump 2 regulators. Adjust screw to specification as needed.

Specification

End of Maximum Flow Adjusting Screw to 13 mm Nut—Distance..... 3 mm
0.125 in (1/8 in)

5. Run machine at specifications:

Specification

Engine—Speed..... Fast Idle
Work Mode
Switch—Position..... Bucket Mode
Power Mode
Button—Position.....PWR (power) Mode
Auto-Idle
Switch—Position..... OFF
Travel Speed
Switch—Position..... Fast (rabbit)

6. Raise the left track off ground for pump 2 or the right track for pump 1.
7. Actuate travel function to full speed for the raised track. Record track cycle time for three revolutions.
Repeat procedure for the other pump.
8. Adjust flow adjusting cartridge (track cycle time) (4) on pump 1 and pump 2 regulators so track cycle times are within the specification and approximately the same.

Specification

Track Raised—3 Revolutions From a Running Start—Cycle Time.....24.7—28.7 s

Loosen 30 mm nut (5). Turn flow adjusting cartridge in for a slower track cycle time (decrease flow rate); turn flow adjusting cartridge out for a faster track cycle time (increase flow rate). Tighten 30 mm nut after adjustment.

Travel Motor Leakage Test

SPECIFICATIONS

Hydraulic Oil Temperature	45—55°C 110—130°F
Engine Speed	Fast Idle
Work Mode Switch Position	Bucket Mode
Power Mode Button Position	PWR (power) Mode
Auto-Idle Position	OFF
Travel Speed Switch Position	Fast (rabbit)
Travel Motor with Track Raised Leakage (maximum)	10.0 L/min 2.6 gpm
Travel Motor Stalled Leakage (maximum)	15.0 L/min 4.0 gpm

SERVICE EQUIPMENT AND TOOLS

JT03025 (3/4-16 F 37°) (Parker No. 06CP—8) Cap
Calibrated Container
76.2 mm (3 in.) OD Pin or Round Bar Stock (2 used)
JT03221 (3/4-16 M 37°) (Parker No. 03CP—8) Plug

1. Warm hydraulic oil to specification. See Hydraulic Oil Warm-Up Procedure. (Group 9025-25.)

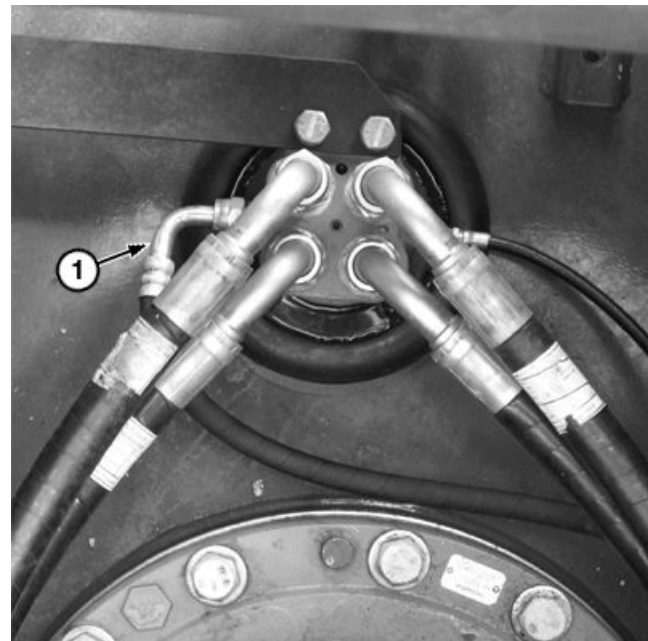
Specification

Hydraulic
Oil—Temperature.....45—55°C
110—130°F

2. Release hydraulic oil tank pressure by pressing pressure release button on top of hydraulic oil tank. See Hydraulic Oil Tank Pressure Release Procedure. (Group 9025-25.)
3. Disconnect travel motor drain line (1) at return manifold. Put line in a calibrated container. Install cap on return manifold fitting.
4. Raise track off the ground for side being checked.
5. Run machine at specification.

Specification

Engine—Speed..... Fast Idle
Work Mode
Switch—Position..... Bucket Mode



Center Joint

1— Travel Motor Drain Line

Power Mode
Button—Position.....PWR (power) Mode
Auto-Idle—Position..... OFF
Travel Speed
Switch—Position..... Fast (rabbit)

6. For travel motor being checked, actuate travel forward function at full speed for 1 minute. Record amount of leakage. Repeat procedure for reverse.

Compare leakage to specification. Repair or replace travel motor as necessary.

Specification

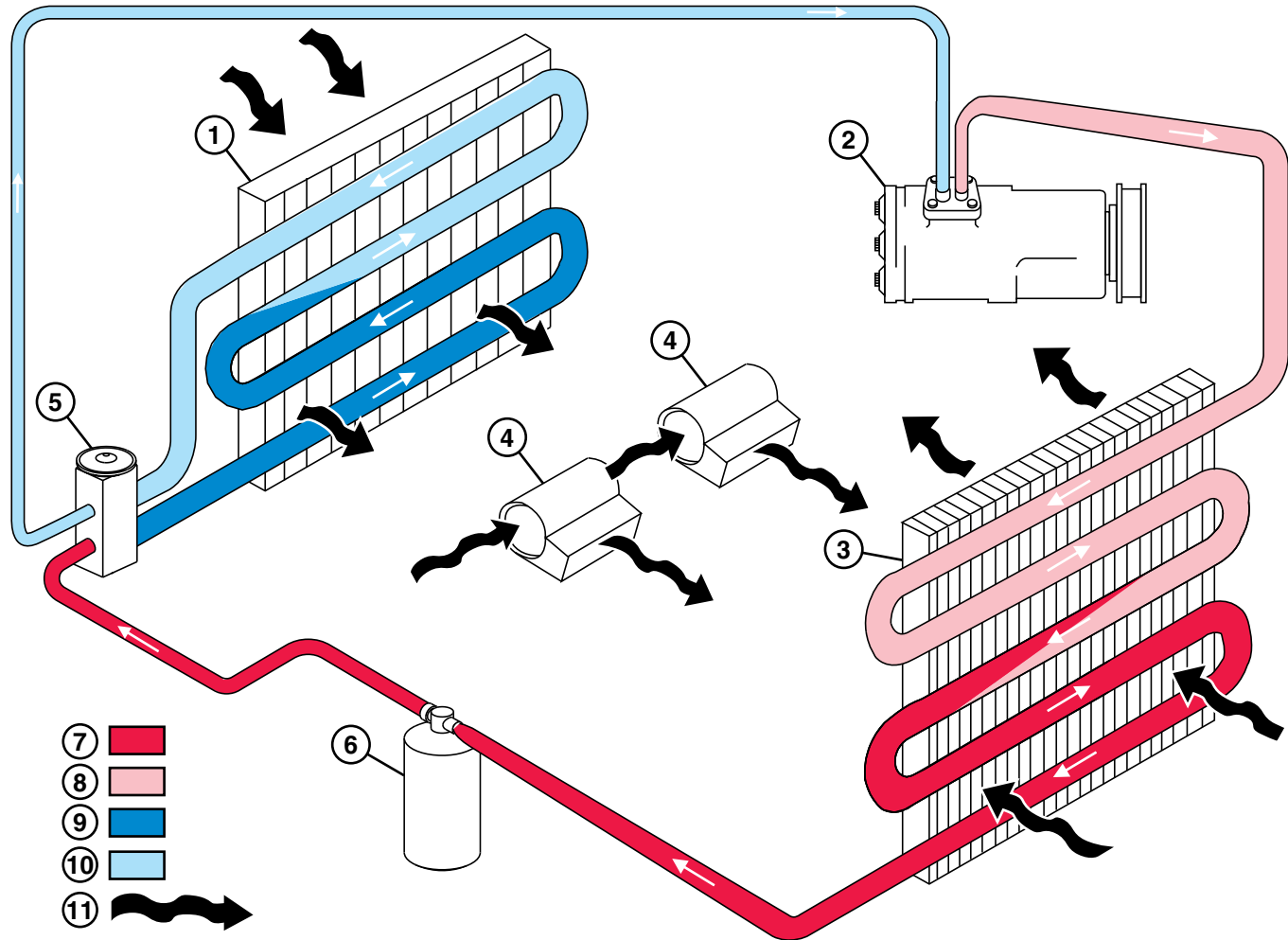
Travel Motor with Track
Raised—Leakage..... 10.0 L/min or less
2.6 gpm or less

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DF89619,00B58C1 -19-15MAR16-1/3

TX1089572A —UN—16MAR11

Air Conditioning System Cycle of Operation



TX1153371

Refrigerant System Cycle of Operation

- | | | | |
|-----------------------------|-------------------------|------------------------|--------------|
| 1— Evaporator | 5— Expansion Valve | 8— High-Pressure Gas | 11— Air Flow |
| 2— Compressor | 6— Receiver-Dryer | 9— Low-Pressure Liquid | |
| 3— Condenser | 7— High-Pressure Liquid | 10— Low-Pressure Gas | |
| 4— Circulation Blower Motor | | | |

The compressor (2) is belt driven and engaged by an electromagnetic clutch. The air conditioner circuit automatically controls compressor engagement or disengagement when system is in operation.

The compressor draws low-pressure gas (10) from evaporator (1) and compresses it into high-pressure gas (8). High-pressure gas causes temperature of refrigerant to rise higher than outside air temperature.

High-pressure gas leaves compressor and flows through condenser (3). Inside condenser, heat is removed and transferred to outside air that is drawn through condenser core by the fan. Cooling refrigerant causes it to condense, and refrigerant leaves condenser as high-pressure liquid (7).

High-pressure liquid flows into receiver-dryer (6), where moisture and contaminants (acid, solids, etc.) are removed. The receiver-dryer contains a color moisture indicator. (Blue) indicates no moisture is present. (Pink) indicates moisture is present. Should moisture be combined with refrigerant, hydrofluoric and hydrochloric acids are formed. These acids are corrosive to metal surfaces, and leakage will eventually develop. The receiver-dryer also stores refrigerant, allowing a longer period of time before additional refrigerant is needed. Refrigerant hoses allow a small amount of refrigerant to migrate through their walls.

TX1153371 —UN—11FEB14

Continued on next page

DF89619.00B5732 -19-16APR15-1/2

Diagnostic Information

1— Heater and Air Conditioner Unit	5— Condenser	9— Evaporator-to-Receiver-Dryer Line	M7—Air Conditioner and Heater Blower Motor
2— Heater Return Line	6— Receiver-Dryer	A7—Air Conditioner Controller (ACF)	Y11— Air Conditioner Compressor
3— Heater Supply Line	7— Condenser-to-Receiver-Dryer High Pressure Line	B20— Air Conditioner High/Low Pressure Switch	
4— Evaporator-to-Compressor Low Pressure Line	8— Compressor-to-Condenser Line		

JA66566,00016ED -19-20FEB12-2/2

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