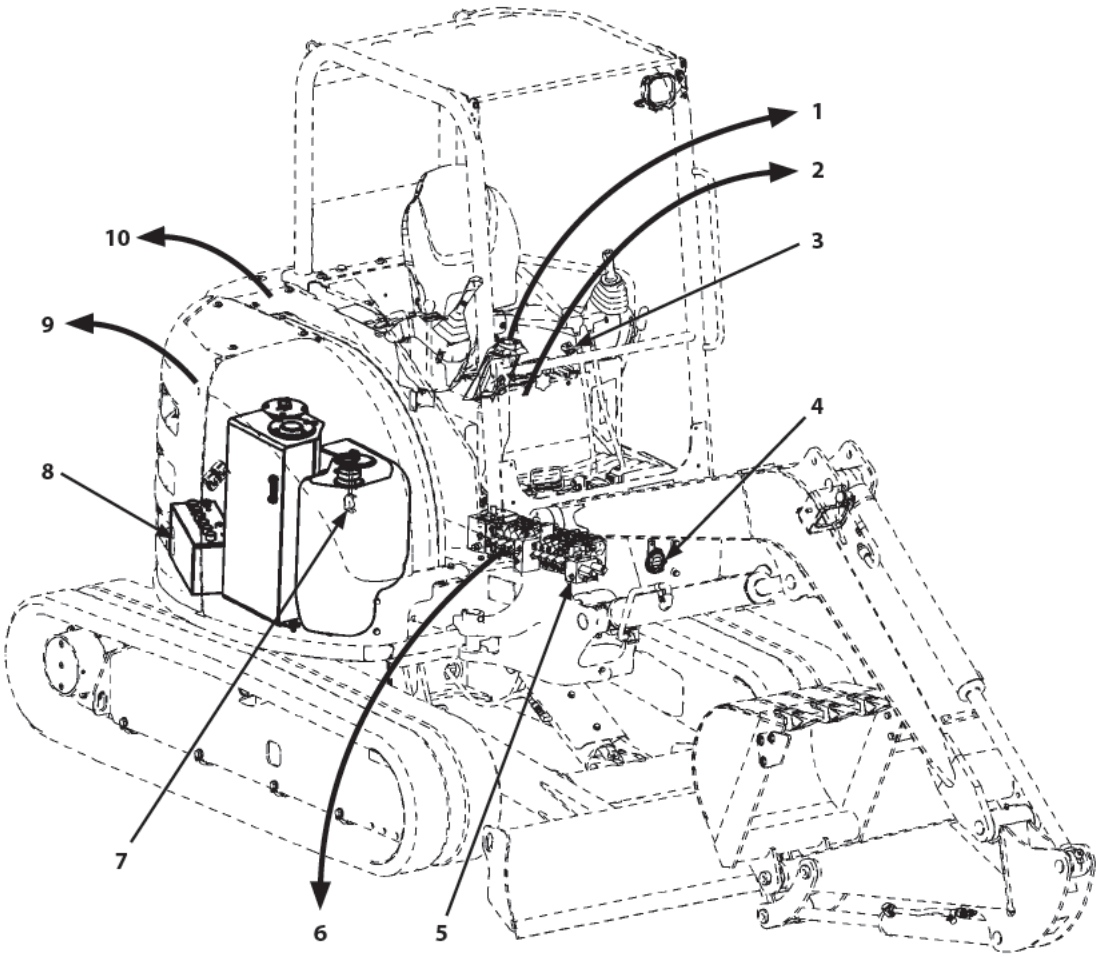
SECTION AND GROUP CONTENTS

TECHNICAL MANUAL

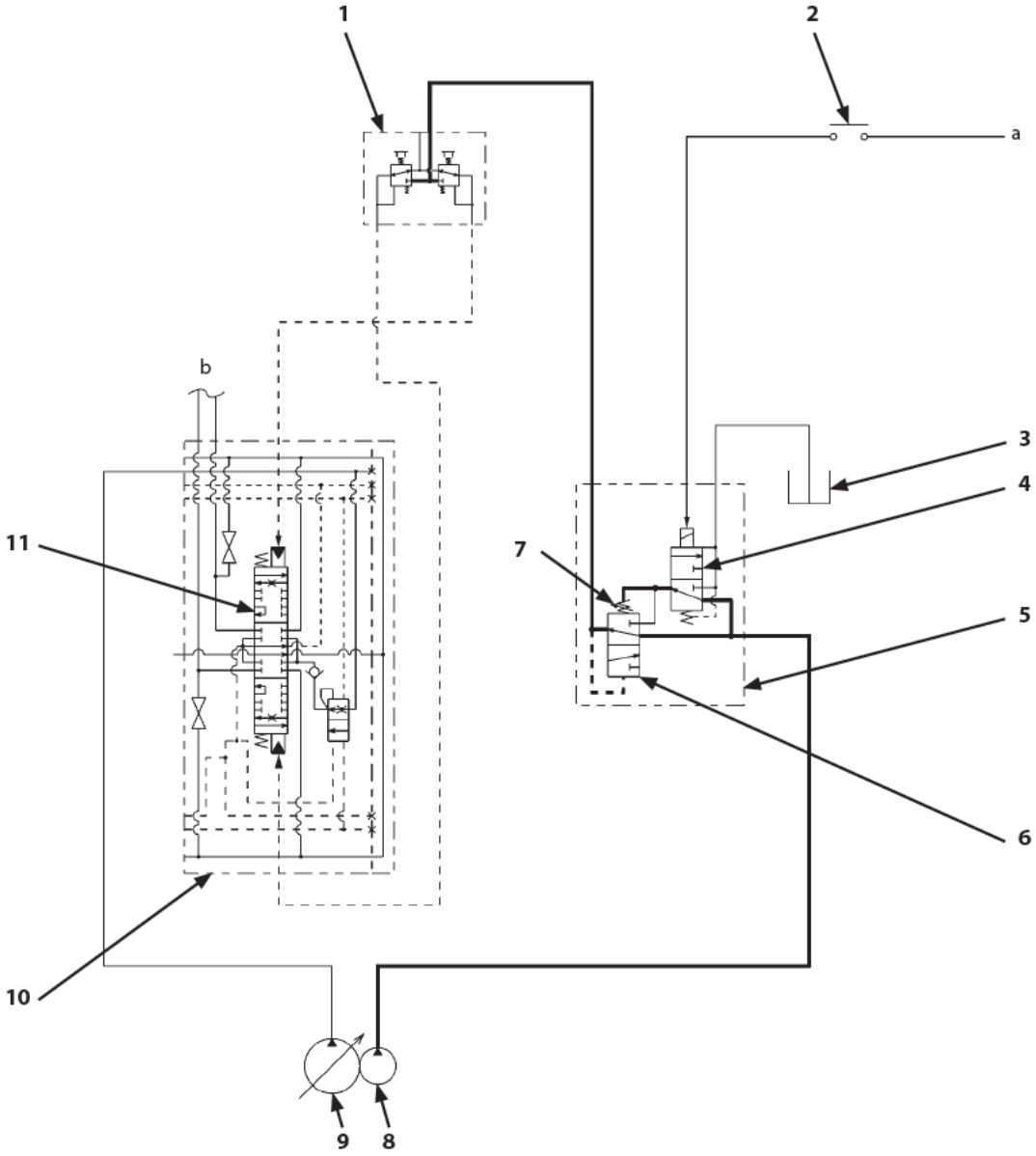
Electrical System (Overview)



TAEA-01-02-020

1- Electrical System (Monitor, Switches) (Refer to T1-2-5.)
2- Electrical System (Relays) (Refer to T1-2-3, 4.)
3- Pilot Shut-Off Switch
4- Horn
5- 2-Spool Solenoid Valve
6- Components Related with Control Valve (Refer to T1-2-9.)
7- Fuel Sensor
8- Battery
9- Electrical System (Battery Room) (Refer to T1-2-6.)
10- Components Related with Engine (Refer to T1-2-7.)

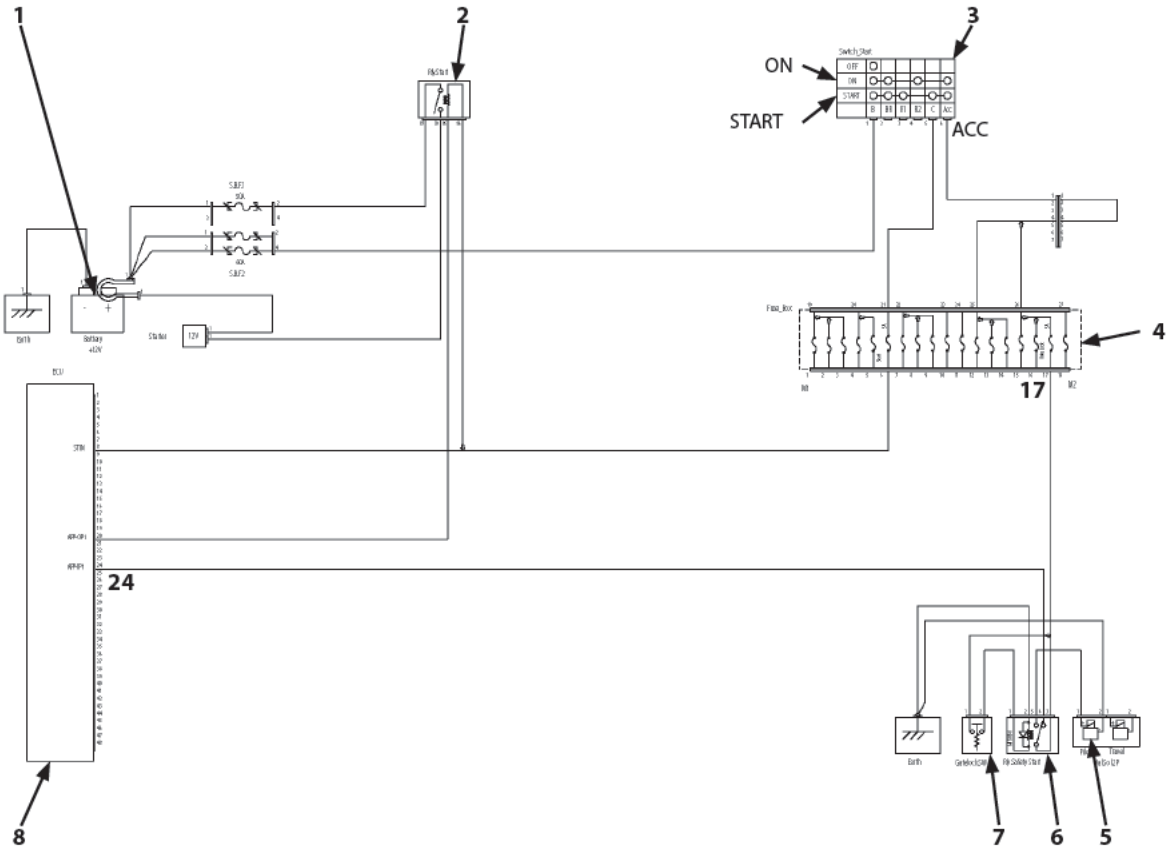
COOLING SYSTEM	Cooling Fan	Dia. 430 mm (16.9 in), 7 Blades, Draw-In Type
	Fan Pulley Ratio	Belt Driven Rotation Ratio : 0.958
	Thermostat	Cracking Temperature at Atmospheric Pressure: 71 °C (160 °F)
		Full Open : 85 °C (185 °F)
	Water Pump	Centrifugal Belt Driven Type
LUBRICATION SYSTEM	Lubrication Method	Pressure Lubrication Type
	Lubrication Pump Type	Trochoid Pump Type
	Oil Filter	Paper Element Type
STARTING SYSTEM	Motor	Magnetic Pinion Shift Reduction Type
	Voltage / Output	12 V/2.3 kW
PREHEAT SYSTEM	Preheating Method	Glow Plug
ENGINE STOP SYSTEM	Stop Method	Fuel Shut-Off (Electronic Control)
ALTERNATOR	Type	Alternating Current Type (with Built-In IC Regulator)
	Voltage / Output	12 V/55 A
FUEL SYSTEM	Type	Distributor Type YPD-MP2
	Governor	Electronic All Speed Control
	Oil Filter	Paper Element Type
	Injection Nozzle	Hole Valve Type



TADB-02-01-002

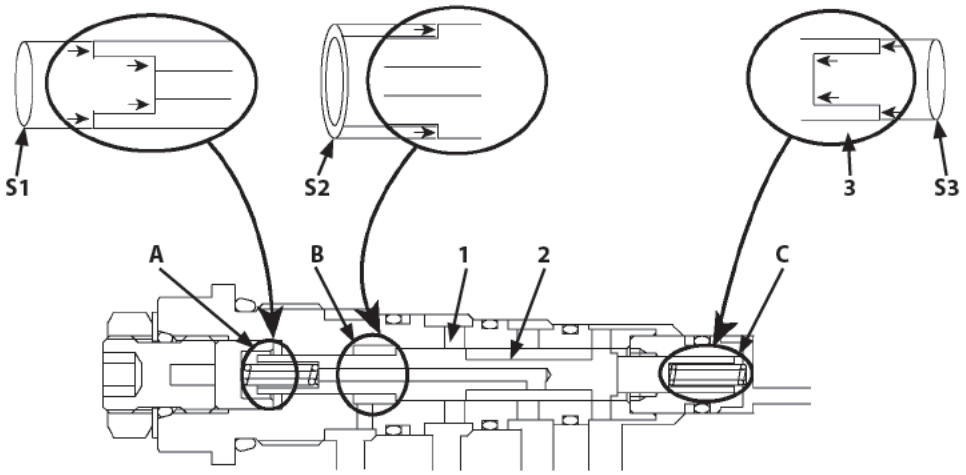
a- Current from Fuse #15
b- To Attachment

1- Auxiliary Pilot Valve
2- Auxiliary Flow Rate Selector Switch
3- Hydraulic Oil Tank
4- Flow Rate Selector Solenoid Valve
5- Auxiliary Flow Rate Selector Valve
6- Reducing Valve
7- Spring
8- Pilot Pump
9- Main Pump
10- Control Valve
11- Auxiliary Spool



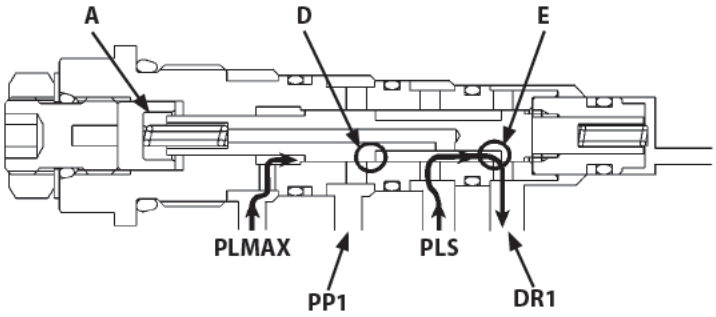
TADB-02-05-007

1- Battery
2- Starter Relay 1
3- Key Switch
4- Fuse Box
5- Pilot Shut-Off Solenoid Valve
6- Pilot Shut-Off Relay
7- Pilot Shut-Off Switch (Pilot Shut-Off Lever)
8- E-ECU



TAEA-03-04-027

When the force to push to the left is weaker (pressure P1 is lower):

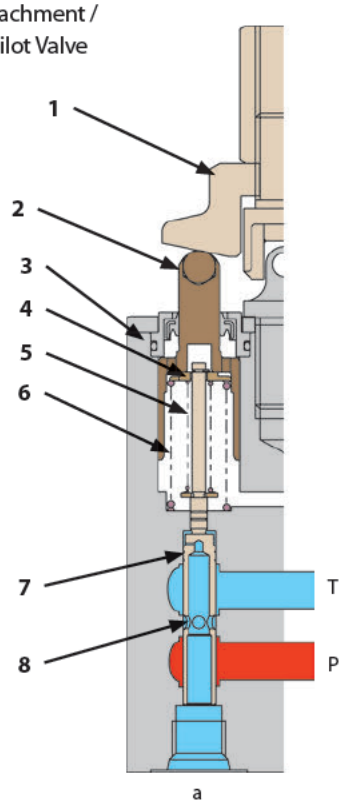


TAEA-03-04-031

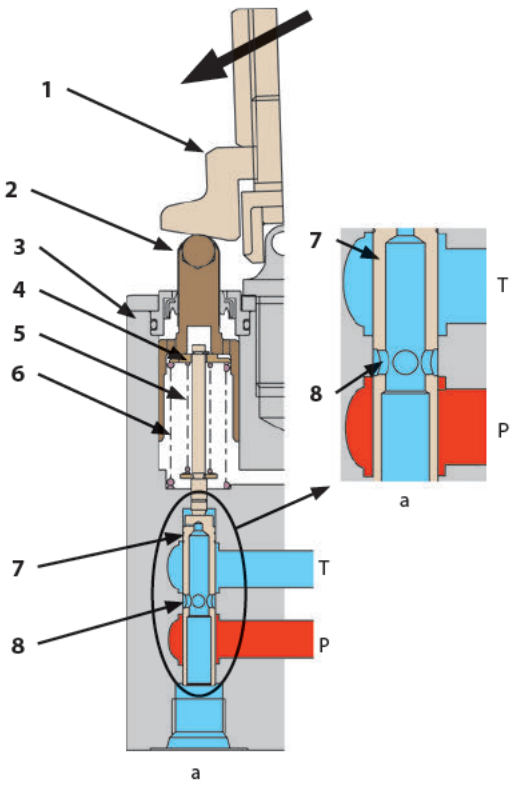
DR1- Port DR1 (Pressure DR1)
PLMAX- Port PLMAX (Pressure PLMAX)
PLS- Port PLS (Pressure PLS)
PP1- Port PP1 (Pressure PP1)

1- Sleeve
2- Spool
3- Piston

Front Attachment / Swing Pilot Valve

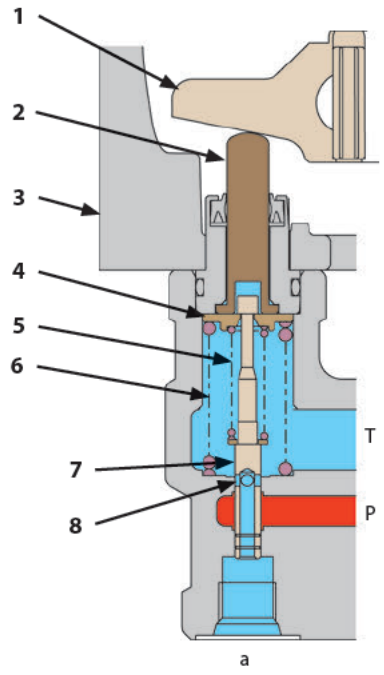


TPPP-03-04-015

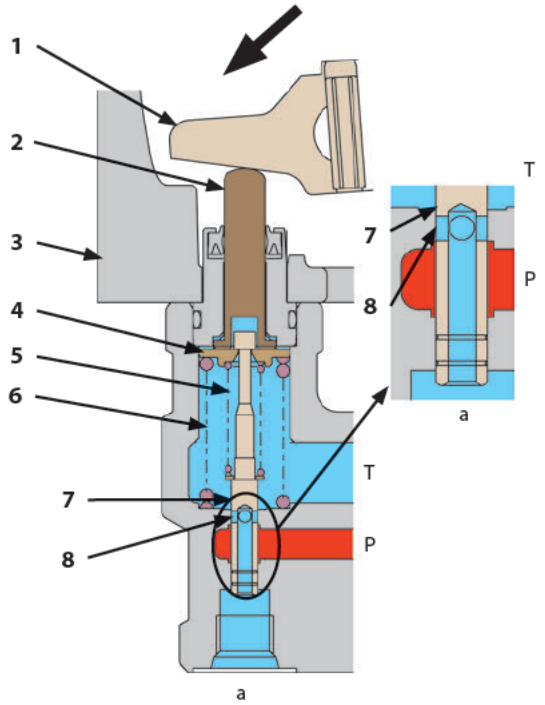


TPPP-03-04-006

Travel Pilot Valve



TPPP-03-04-016

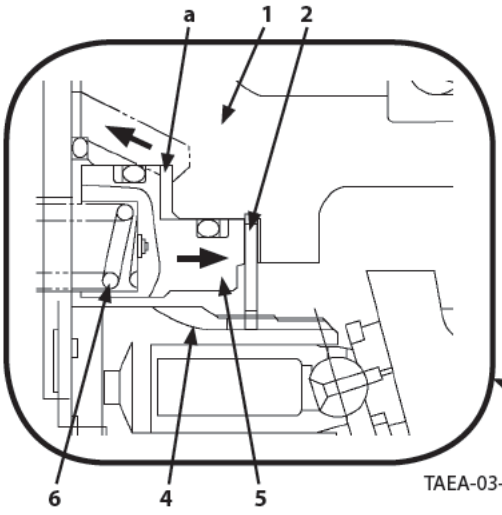


TPPP-03-04-011

P- Port P
T- Port T
a- Output Port

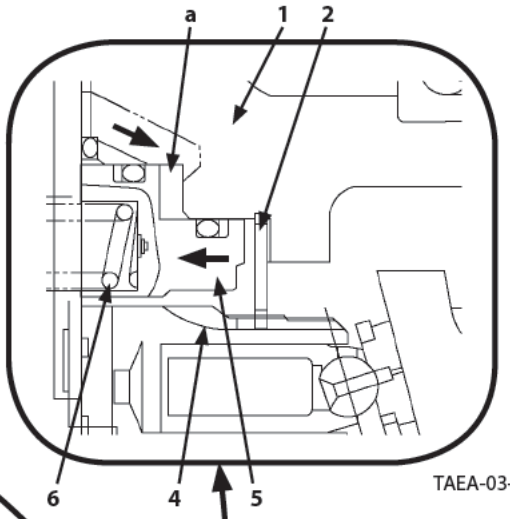
1- Cam
2- Pusher
3- Casing
4- Spring Guide
5- Balance Spring
6- Return Spring
7- Spool
8- Hole

When the brake is applied:



TAEA-03-06-005

When the brake is released:



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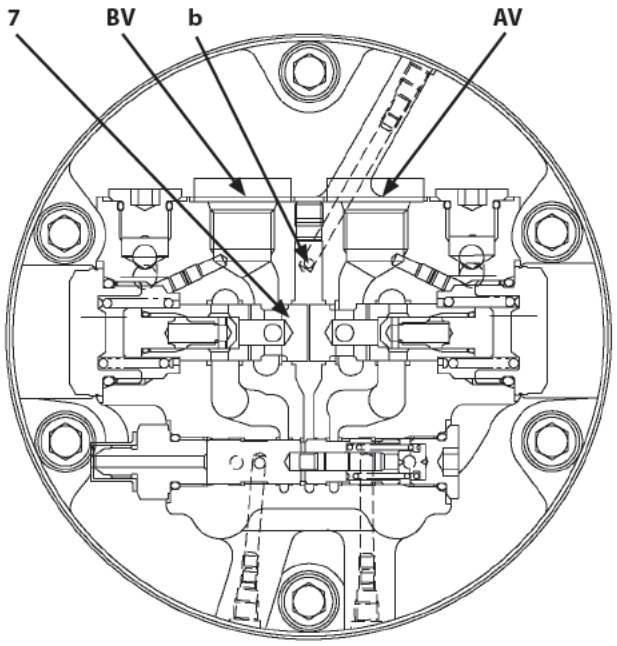

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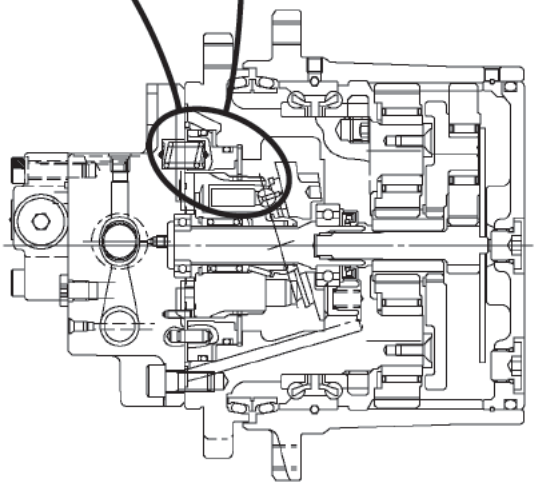


TAEA-03-06-004

AV- Port AV (Pressure oil from main pump)
BV- Port BV (Pressure oil from main pump)
a- Brake Piston Chamber
b- To Brake Piston

1- Housing
2- Friction Plate
4- Rotor
5- Brake Piston
6- Spring
7- Counterbalance Valve Spool

Auxiliary Flow Rate Selector Valve (Optional)

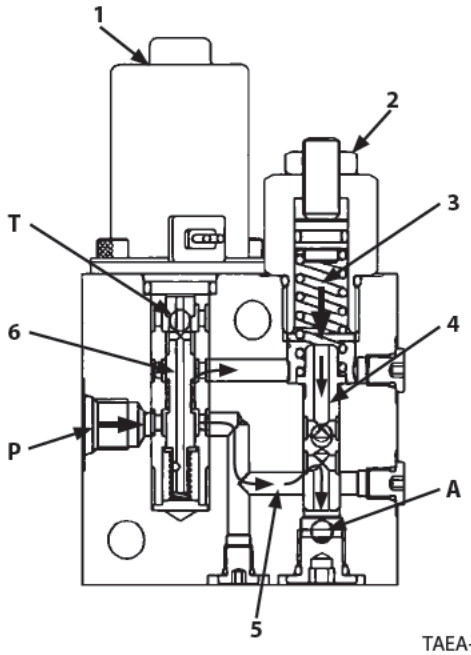
The auxiliary flow rate selector valve consists of flow rate selector solenoid valve (1) and reducing valve (2). When the auxiliary flow rate selector switch is turned ON, flow rate selector solenoid valve (1) is turned ON and supplies pilot pressure to the auxiliary pilot valve after reducing it to the set value.

Operation

- Flow Rate Selector Solenoid Valve: OFF

1. When flow rate selector solenoid valve (1) is OFF, the pilot pressure oil flows to port P, passage (5), and spring chamber (3).
2. At this time, the spring force and pilot pressure oil are routed to the upper end of spool (4) and only pilot pressure oil is routed to the lower end of it.
3. Therefore, as spool (4) is pushed down, the pilot pressure is kept unchanged and output through port A.

Flow Rate Selector Solenoid Valve: OFF



TAEA-03-07-001

A-	Port A	P-	Port P
T-	Port T		
1-	Flow Rate Selector Solenoid Valve	4-	Spool
		5-	Passage
2-	Reducing Valve	6-	Spool
3-	Spring Chamber		

Sensor Activating Range

1. Checking Method

- Hydraulic Oil Temperature: 50±5 °C (122±9 °F)
- Unless specified:

Engine Control Dial	Power Mode	Auto-Idle Switch
Fast Idle	PWR	OFF

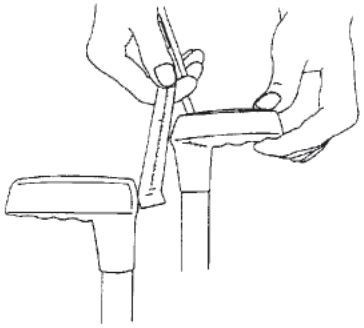
2. Sensor Activating Range

Item	Operation	Specification
Engine Control Dial	Slow Idle	0.6±0.1 V
	Fast Idle	4.0±0.1 V
Auto-Idle Pressure Sensor	Control Lever: Neutral Pilot Shut-Off Lever: LOCK	0.64 MPa (6.5 kgf/cm^2, 93 psi) or less
	Control Lever: Full Stroke Pilot Shut-Off Lever: UNLOCK	3.0 MPa (30.6 kgf/cm^2, 435 psi) or more

Control Lever Stroke

Summary:

1. Check play and operating condition and measure each control lever stroke.
2. Measure the lever stroke at the grip center of each control lever. As for the boom swing pedal, measure the stroke from the center position to the stopper.
3. In case lever stroke play is present in the neutral position, add half (1/2) the play present to both side lever strokes.



T107-06-03-005

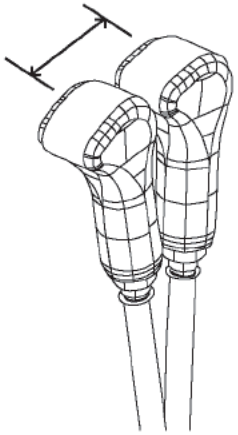
Preparation:

1. Maintain the hydraulic oil temperature at 50±5 °C (122±9 °F).

Measurement:

1. Stop the engine.
2. Measure each lever stroke from neutral to the stroke end of each control lever of boom, arm, bucket, swing, travel, and blade.
3. As for the boom swing pedal, measure the straight distance between the center and fully depressed positions at tip of the pedal.
4. Measure the chord length from neutral to the stroke end.
5. Repeat the measurement three times and calculate the mean values.

Blade Control Lever



TADB-04-04-017

Evaluation:

Refer to Operational Performance Standard.

Diagnosis Procedure

These six basic steps are essential for efficient troubleshooting:

1. Study the system

- Study the machine's technical manuals.
- Know the system and how it works, and what the construction, functions and specifications of the system components are.
  (Construction and functions)

2. Ask the operator
   Before inspecting, get the full story of malfunctions from the operator below.

- Operating condition: How is the machine being used? (Find out if the machine is being operated correctly.)
- Trouble identification: When was the trouble noticed, and what type of work was the machine doing at that time?
- Trouble symptom: What are the details of the trouble? Did the trouble slowly get worse, or did it appear suddenly for the first time?
- Trouble history: Did the machine have any other troubles previously? If so, which parts were repaired before?

3. Inspect the machine
   Before starting the troubleshooting procedure, check the machine's daily maintenance points, as shown in the operator's manual.
   Also, check the electrical system, including the batteries, as troubles in the electrical system such as low battery voltage, loose connections and blown fuses will result in malfunction of the controllers, causing total operational failure of the machine.
   If troubleshooting is started without checking for blown fuses, a wrong diagnosis may result, wasting time. Check for blown fuses before troubleshooting.
   Even if a fuse looks normal by visual inspection, a fine crack is difficult to find.
   Always use a circuit tester when checking the fuses.

4. Operate the machine yourself
   Reproduce the trouble on the machine and make sure the actual phenomenon.
   If the trouble cannot be confirmed, stop the engine and obtain further details of the malfunction from the operator. Also, check for any incomplete connections of the wire harnesses corresponding to the trouble.

T107-07-01-001

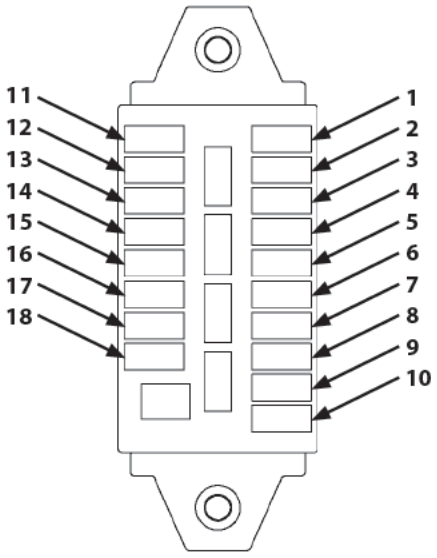
T107-07-01-002

T107-07-01-003

Fuse Inspection

Cracks in a fuse are so fine that it is very difficult or impossible to find by visual inspection. Use a circuit tester in order to correctly inspect fuse continuity. Use a circuit tester in order to correctly inspect fuse continuity by following the instructions described below.

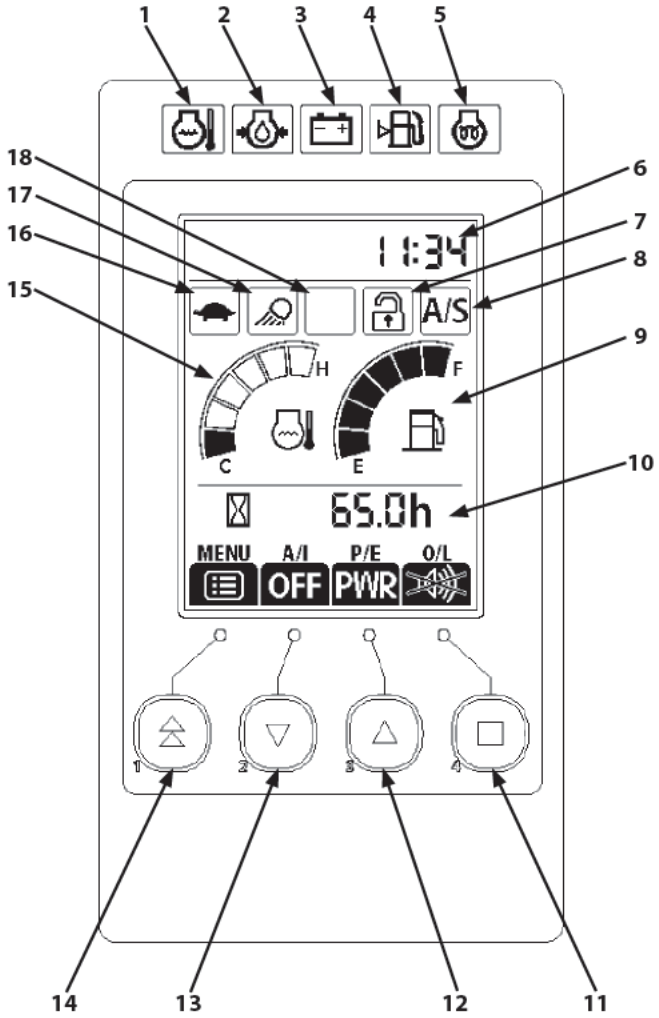
1. Set the key switch to the ON position. When the key switch is in the ON position, current from key switch terminal BR, R2, and ACC is supplied to all circuits except fuse #6. (Refer to the circuit diagram.)
2. Remove the fuse box cover. Set a circuit tester. (Measurement Range: 0 to 14.5 V)
3. Ground the negative probe of circuit tester to the body. Touch the terminals located away from center of the fuse box with the positive probe of circuit tester one at a time. When normal continuity of a fuse is intact, the circuit tester will indicate 12 V (battery voltage).



T1N0-05-05-001

Outline

Basic Screen



TADB-05-02-039EN

1- Overheat Indicator
2- Engine Oil Pressure Indicator
3- Alternator Indicator
4- Fuel Level Indicator
5- Preheat Indicator
6- Clock
7- Security State Display (OP)
8- Auto Shut-Down Display (OP)
9- Fuel Gauge
10- Hour Meter
11- Overload Alarm/Set Switch
12- ECO/PWR Mode/Selection Switch
13- Auto-Idle/Selection Switch
14- Menu/Back Switch
15- Coolant Temperature Gauge
16- Travel Mode Display
17- Work Light Display
18- Auxiliary

Fault Code List

Monitor ENG: xxxxx-xx	Engine Fault Code	Cause
0001D-02	P0224	Spare accelerator sensor intermittent failure
0001D-03	P0223	Spare accelerator sensor error (high voltage)
0001D-04	P0222	Spare accelerator sensor error (low voltage)
0001D-08	P1227	Spare accelerator sensor error (pulse communication)
0005B-02	P0124	Accelerator sensor intermittent failure
0005B-03	P0123	Accelerator sensor error (high voltage)
0005B-04	P0122	Accelerator sensor error (low voltage)
00064-01	P1198	Oil pressure descend error
00064-04	P1192	Oil pressure switch error
0006E-00	P0217	Cooling water temperature rise alarm
0006E-02	P0119	Cooling water temperature sensor intermittent failure
0006E-03	P0118	Cooling water temperature sensor error (high voltage)
0006E-04	P0117	Cooling water temperature sensor error (low voltage)
0009E-00	P0563	Power supply voltage error (high voltage)
0009E-01	P0562	Power supply voltage error (low voltage)
000A7-01	P1568	Charge alarm
000A7-04	P1562	Charge switch error
000BE-00	P0219	Overspeed error
00274-02	P1605	ECU internal flash ROM error (checksum B)
00274-02	P1606	ECU internal flash ROM error (checksum C)
00274-0C	P0605	ECU internal flash ROM error (checksum A)
00276-02	P1601	ECU internal EEPROM error (checksum)
00276-0C	P0601	ECU internal EEPROM error (read/write error)
0027E-02	P1214	Engine error
0027E-03	P1213	Rack actuator error (high current)
0027E-04	P1212	Rack actuator error (low current)
0027E-07	P1211	Rack actuator mechanical failure
0027F-0C	U0001	CAN communication error