9040B Excavator
Troubleshooting and Schematic Set No. 7-63132

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

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Section

1002

1002

SPECIFICATIONS

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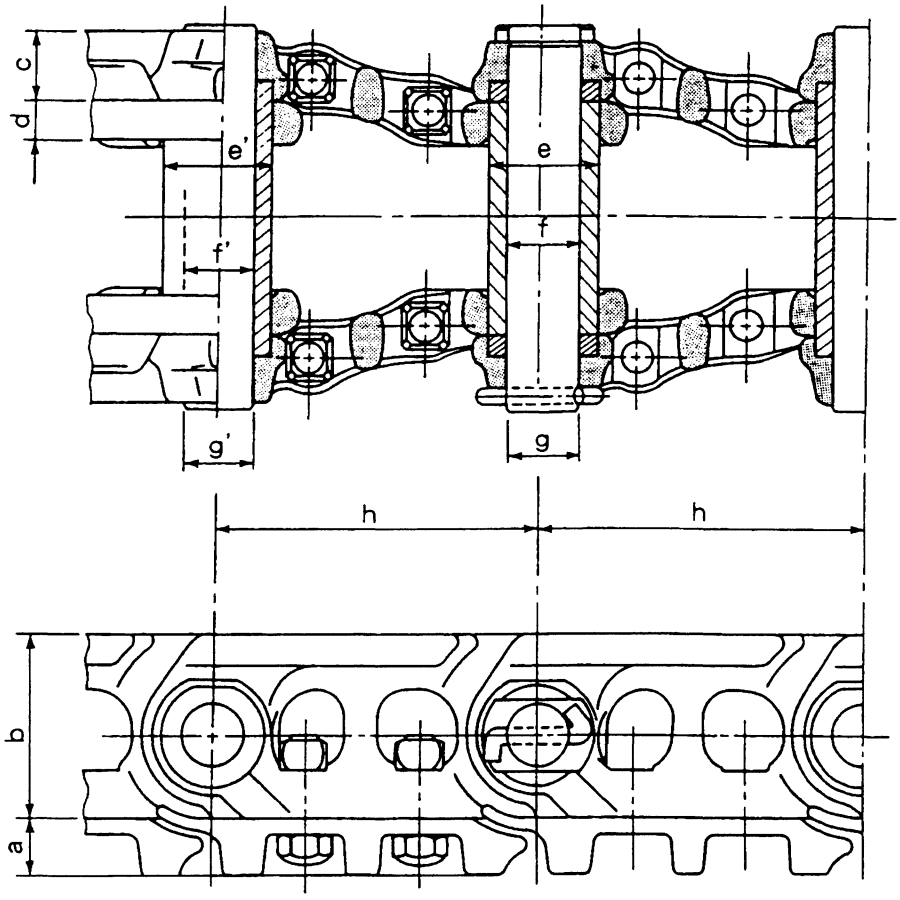
Track Shoe (Grouser Shoe)

Shoe Plate:	a	standard value	37 mm	1.46 in.
		service limit	26 mm	1.02 in.
Link:	b	standard value	116.4 mm	4.58 in.
		service limit	112 mm	4.41 in.
	c	standard value	43 mm	1.69 in.
		service limit	41 mm	1.61 in.
	d	standard value	24 mm	0.94 in.
		service limit	23 mm	0.90 in.
Master Bushing:	e	standard value	66.6 mm	2.62 in.
		service limit	63 mm	2.48 in.
	f	standard value	44.7 mm	1.76 in.
		service limit	47 mm	1.85 in.
Master Pin:	g	standard value	44.1 mm	1.74 in.
		service limit	42 mm	1.65 in.
Link Pitch:	h	standard value	203 mm	7.99 in.
		service limit	207 mm	8.15 in.
Track Bushing:	e'	standard value	66.6 mm	2.62 in.
		service limit	63 mm	2.48 in.
	f'	standard value	44.8 mm	1.76 in.
		service limit	47 mm	1.85 in.
Track Pin:	g'	standard value	44.4 mm	1.75 in.
		service limit	42 mm	1.65 in.



Track Shoe (Grouser Shoe)

NOTE: *Refer to Gauge Table for measurement gauges to be used.*

Camshaft

Type	Hardened Iron
Bushing (Front Only)	7, Replaceable
Bushing Lubrication:	
Front Bushing	Pressure Lubricated
Intermediate	Pressure Lubricated
Rear	Pressure Lubricated
Oil Clearance	0.045 to 0.123 mm
ID of Bushings (Installed)	60.058 to 60.110 mm
Maximum Service Limit	60.122 mm
Camshaft Bushing Journal OD	59.987 to 60.013 mm
Minimum Serviceable Limit	59.962 mm
Camshaft Thrust Thickness	9.42 to 9.58 mm
Minimum Service Limit	9.34 mm
Camshaft Thrust Clearance	0.120 to 0.340 mm
Maximum Service Limit	0.470 mm

Turbocharger

Horizontal Travel of Turbine Shaft	0.03 to 0.08 mm

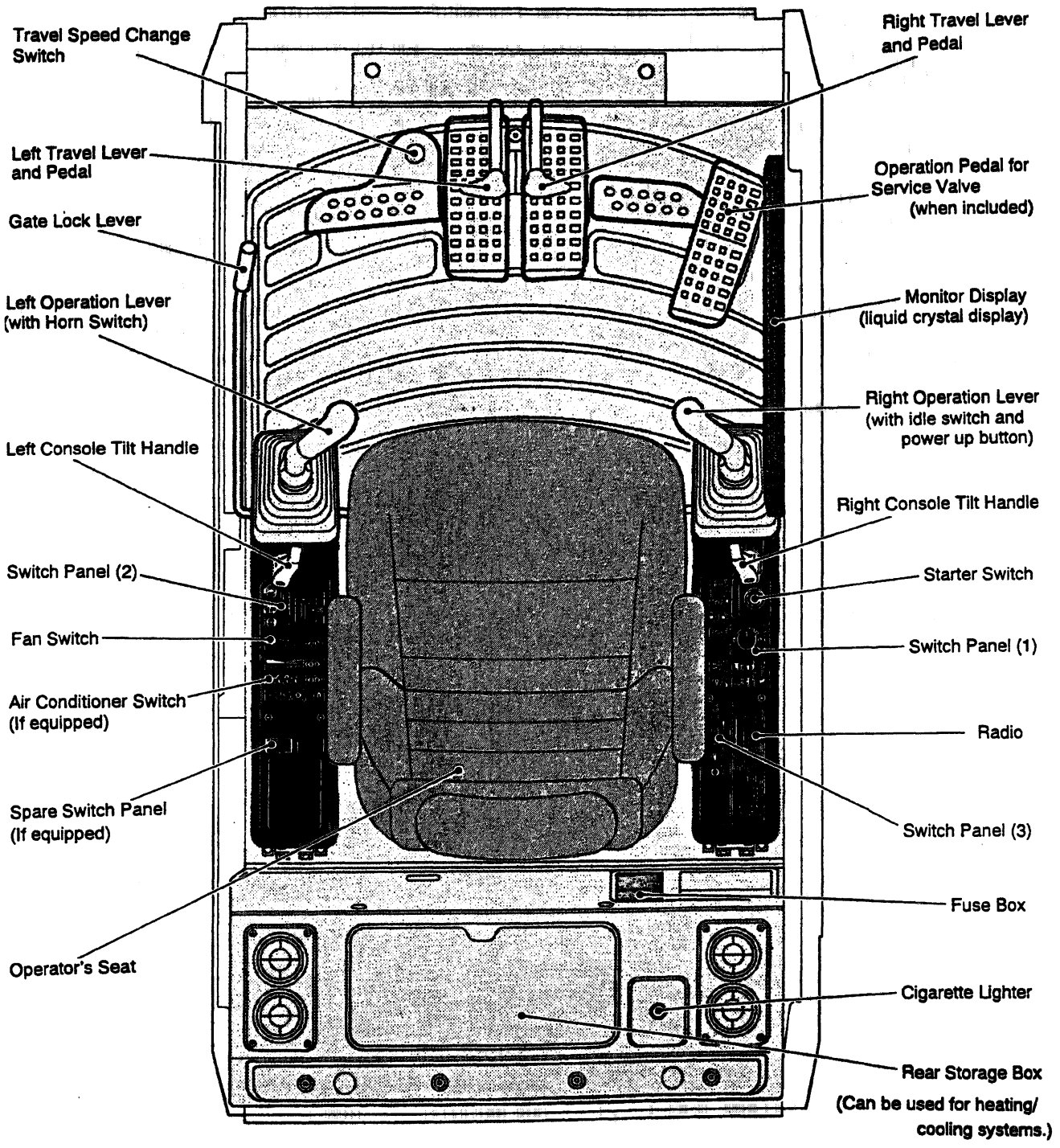
Gear Train

Backlash:	
Crankshaft Gear to Camshaft Gear	0.152 to 0.254 mm
Crankshaft Gear to Idler Gear	0.08 to 0.33 mm
Camshaft to Fuel Pump Gear	0.152 to 0.254 mm
Idler Gear to Oil Pump	0.152 to 0.254 mm
Camshaft to Auxiliary	0.152 to 0.254 mm
Maximum Service Limit (All Gears)	0.45 mm

Rocker Arm Assembly

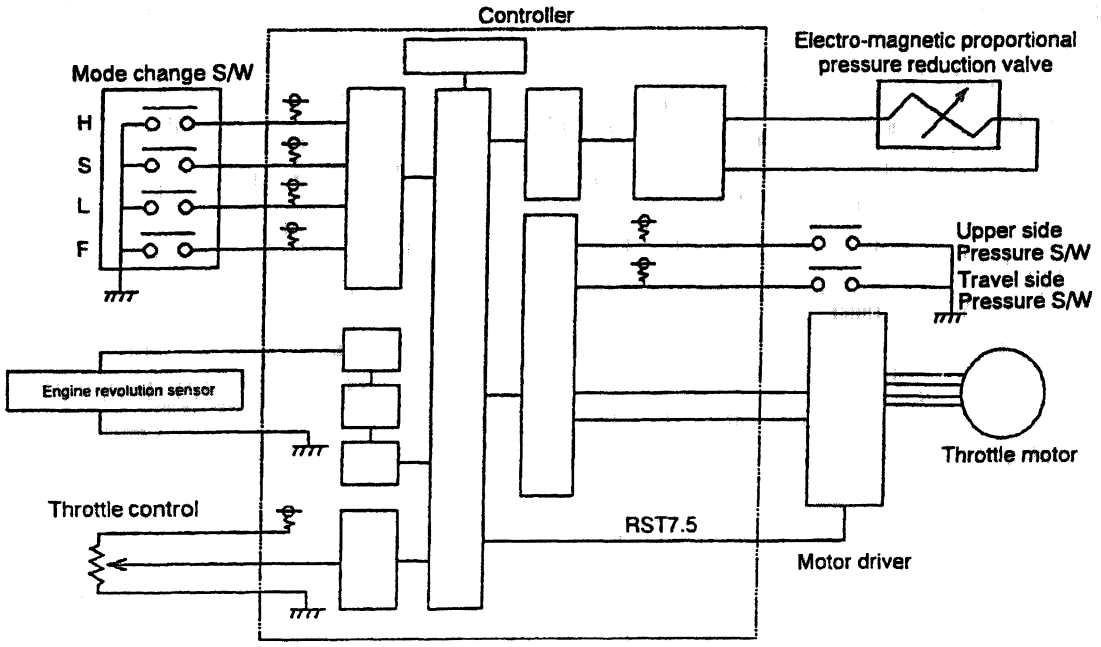
OD of Shaft	22.219 to 22.231 mm
Minimum Service Limit	22.199 mm
ID of Arm Bore	22.256 to 22.282 mm
Maximum Service Limit	22.301 mm
Lubrication	Pressure From Oil Gallery

OPERATORS CAB



WARNING: *Construction equipment can be dangerous if improperly operated or maintained. This machine should be operated and maintained only by trained and experienced people who have read, understood and complied with the operators manual.*

PUMP CONTROL



BS98F163

In S and H modes, supply current to the electromagnetic proportional pressure reducing valve built into the pump controls the HP requirement of hydraulic pumps P1 and P2.

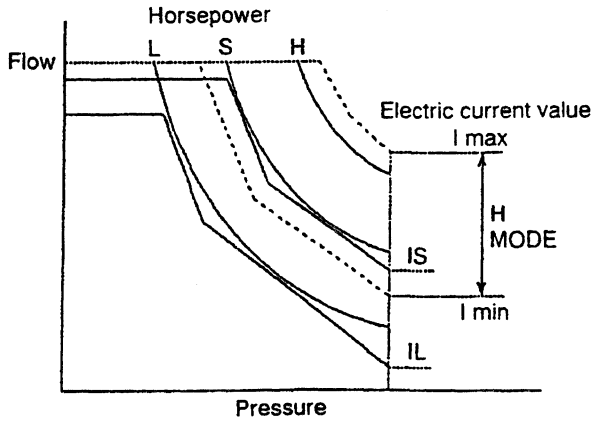
S MODE: When pump torque amounts to 90% of engine target torque, the supply current (IS) routed to the valve by the controller is a fixed value.

L MODE: When pump torque amounts to 70% of engine target torque, the supply current (IL) routed to the valve by the controller is a fixed value. (Same for F MODE.)

If engine speed drops to 1200 rpm, the system will default to L MODE.

When in L and F MODE travel (upper side pressure SW OFF, travel pressure SW ON): it is same as S MODE. (Purpose: smoother travel.)

Current is sent to the electromagnetic proportional pressure reducing valve of the pump in each mode. Pump flow rate is controlled by the current value.



BS98F164

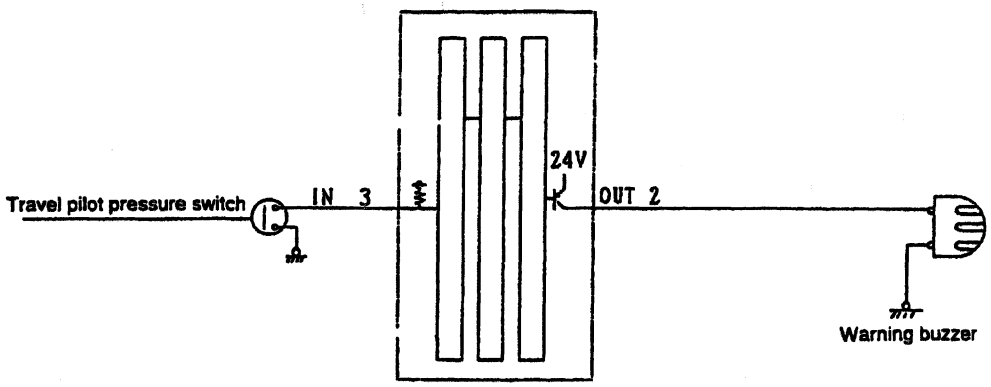
In H MODE, RPM of the engine is loaded and current value is changed to utilize maximum output of the engine. At maximum, if engine RPM starts to drop because of load, the proportional valve will detect the RPM change and adjust pump flow. In the H MODE if the throttle knob is turned to reduce engine RPM, the current value will also decrease.

In S, L, F MODE, the current value is fixed.

Current value (mA) of each mode. Values in the following chart are average.

Machine Type	H Mode		S Mode	L, F Mode
	Max	Min		
9030B	495	300	305 ±20	0
9040B, 9045B	520	325	330 ±20	0

MOTION ALARM



BS98F193

If the motion alarm warning switch is ON, the alarm will sound continuously when the travel pressure switch is ON.

If the motion alarm switch is OFF, the alarm will sound for approximately 10 seconds after the travel pressure switch is activated.

A travel pressure switch is turned on by travel lever operation and 24V is sent to the buzzer for 10 seconds.

POWER TRANSISTOR PROTECTION

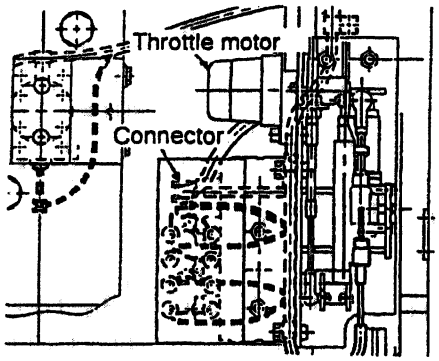
Controller

Circuit Number	Circuit Description
8	Spare
7	Spare
6	Spare
5	Swing shut off solenoid valve
4	Pilot pressure solenoid valve
3	Motion alarm
2	Power boost solenoid valve
1	Free swing solenoid valve
16	Negative flow control solenoid valve
15	Spare
14	Spare
13	Cushion off solenoid valve
12	Flow reduction control solenoid valve
11	Swing lock 100% brake solenoid valve
10	Warning lamp
9	Boom speed restriction solenoid valve
20	Travel speed selector solenoid valve
19	50% swing brake solenoid valve
18	Heating relay
17	Battery relay

If a solenoid valve or relay is shorted, it stops the output of a power transistor which protects the controller. "Elec. Problem" is indicated at this time in the message display. By performing a self check, the location of the shorted circuit is indicated.

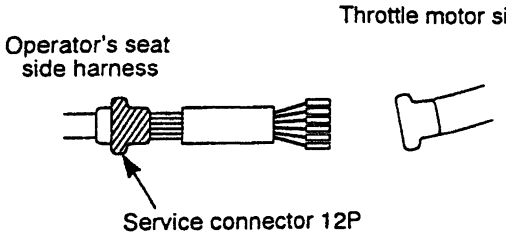
Based on the shorted circuit location, check the wiring and components.

Throttle Motor



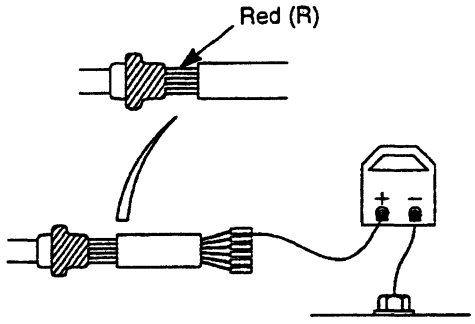
BS98F238

1. Remove the connector from the throttle motor.



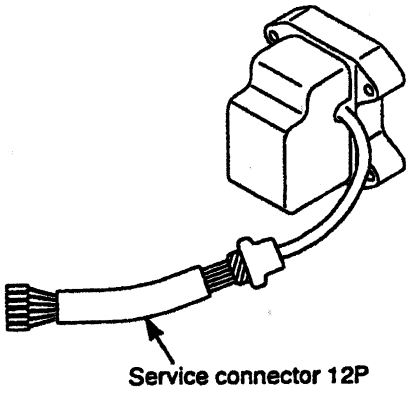
BS98F241

2. Connect the service connector 12P between the removed connectors. (Operator seat side only.)



BS98F242

3. Confirm that the tester connection harness from the drivers seat side is blue/red (service connector side is the same color). Then connect the red terminal of a voltmeter to the harness on the side of the driver's seat, and the black terminal to ground.



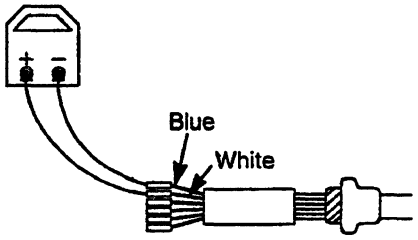
BS98F243

4. Turn on the key switch after completing the connection and confirm the voltage.

   Voltage 24V

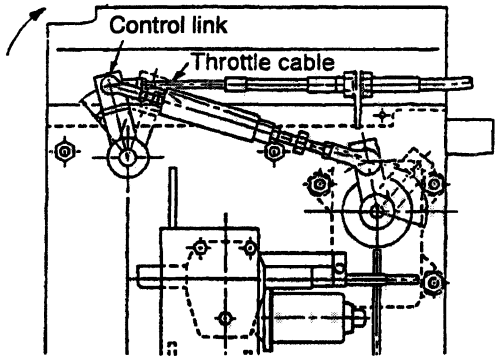
5. Confirm throttle motor itself (limit switch excitation coil) when input voltage is O.K.

6. Connect the service connector 12P on the side of the throttle motor.



BS98F244

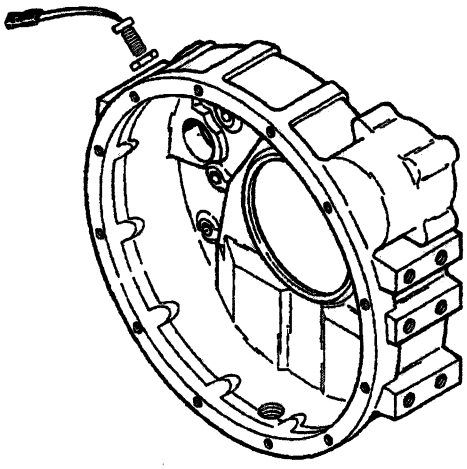
7. Two separate limit switches are built in. In connect-ing a tester, first of all, connect the red and black terminal to the blue and the white harness of the service connector.



BS98F245

8. After completing the connection, remove the throttle cable on the side of the control link. Then, move the throttle motor clockwise. In this case, if the current alarm sounds, it is normal.

ENGINE SPEED SENSOR INSTALLATION



BS98F279

In 9030B, 9040B, and 9045B Models, since the flywheel housing surface is machined, clearance is obtained by screwing in and fixing the speed sensor.

1. Install the speed sensor into the flywheel housing until it touches the ring gear tooth. Mark the sensor position.
2. Back-out the sensor 1 complete turn from its marked position.
3. While holding the sensor, tighten the locking nut.

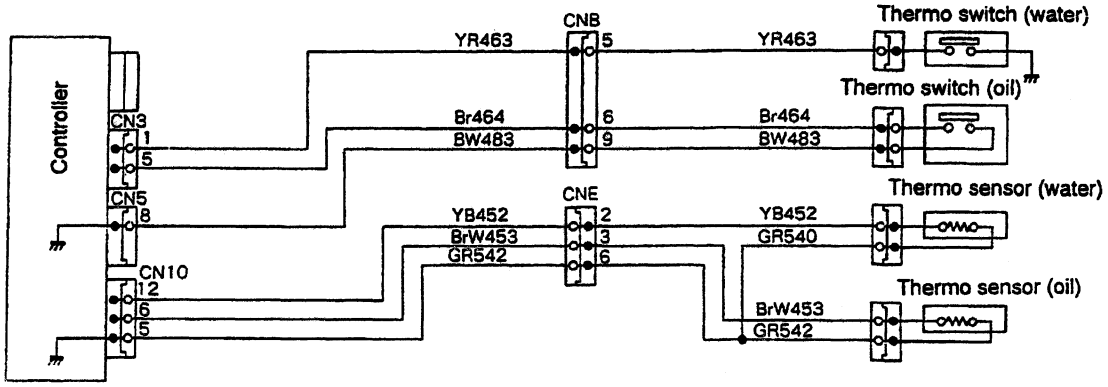
Overheat

Problem Description (No. 7)

- Message does not go out even if the actual temperature is below the following:
  Hydraulic Oil Temperature 84° C Engine Coolant Temperature 92° C

Prior Confirmation Items:

1. The "MODE" of the mode display is not flashing.
2. Each bar graph displays more than one graduation.
3. Confirm that the water and oil temperature bar graph is lit at 8 graduations.



BS98F305

Troubleshoot	Cause	Remedy
1) Water temperature bar graph lit at 8 graduations. Key switch ON Is thermo sensor (water) temperature abnormal at self-check? (Comparison of actual and indicated temperature.) NO → When thermo switch (water) connector is removed, does message go out? YES → Thermo switch (water) defect.	Thermo switch (water) defect.	Replace switch.
• Display water temperature with self-check. • Measure actual temperature. YES NO → When CNB connector is removed, does message go out? YES → Short circuit in YR wiring between CNB and thermo switch (water).	Short circuit in YR wiring between CNB and thermo switch (water).	Repair YR wiring.
NO → When CN3 connector is removed, does message go out? YES → Short circuit in YR wiring between CN3 and CNB.	Short circuit in YR wiring between CN3 and CNB.	Repair YR wiring.
Key switch OFF Remove thermo sensor (water) connector and measure resistance of sensor side. Is it within the range of values in separate chart*? NO	Controller defect.	Replace controller.
YES → Remove CNE connector and measure resistance between male side terminal YB and GR. Is it within the range of values in separate chart*? NO	Thermo sensor (water) defect.	Replace sensor.
YES → Remove CN10 connector and measure resistance between female side terminal YB and GR. Is it within the range of values in separate chart*? NO	Bad connection of thermo sensor (water) connector.	Clean sensor connector terminal.
YES	Bad connection of CNE.	Clean CNE connector terminal.
NOTES: *Refer to resistance values in separate chart. When there is an open circuit in the wiring, the bar graph goes out completely	Controller defect or bad connection of CN10.	Replace controller or clean CN10 connector terminal.

SPECIFICATIONS

TRACK
- Track Deflection ..... 11 to 11.8 inches (280 to 300 mm)
  - Track Shoe
    - Minimum Thickness ..... 1.024 inch (26 mm)
  - Link
    - Minimum Height ..... 4.41 inches (112 mm)
    - Minimum Width
      - Outer Link ..... 1.614 inches (41 mm)
      - Inner Link ..... 0.905 inch (23 mm)
  - Maximum Pitch (Mounting Pin Holes Center to Center) ..... 8.15 inches (207 mm)
  - Master Bushing
    - Minimum Outer Diameter ..... 2.48 inches (63 mm)
    - Maximum Inside Diameter ..... 1.85 inches (47 mm)
  - Master Pin
    - Minimum Outside Diameter ..... 1.653 inches (42 mm)
  - Track Bushings
    - Minimum Outside Diameter ..... 2.48 inches (63 mm)
    - Maximum Inside Diameter ..... 1.85 inches (47 mm)
  - Track Pins
    - Minimum Outside Diameter ..... 1.65 inches (42 mm)

SPROCKET
- Weight ..... 245 pounds (111 kg)
- Minimum Thickness at Gear Tooth ..... 2.756 inches (70 mm)
- Minimum Overall Diameter at Top of Gear Tooth ..... 29.921 inches (760 mm)
- Minimum Diameter at Gear Tooth Valley ..... 26.693 inches (678 mm)

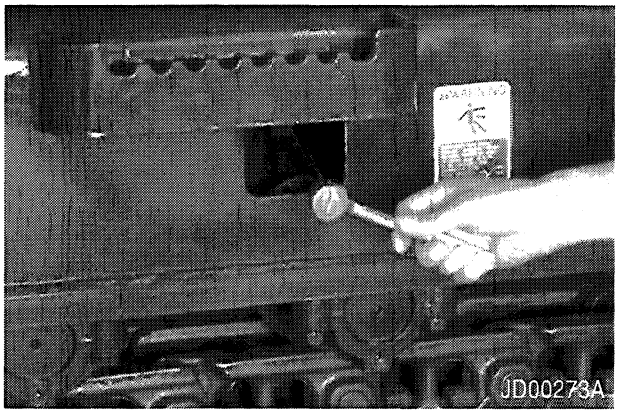
TRACK ROLLER
- Weight
  - Inner Track Roller ..... 53 pounds (24 kg)
  - Outer Track Roller ..... 53 pounds (24 kg)
- Lubrication
  - Type ..... Synthetic Oil, EP type
  - Capacity ..... 11.9 to 12.2 ounces (360 to 370 cc)
- Shaft
  - Minimum Diameter ..... 2.716 inches (69 mm)
- Bushing
  - Maximum Inside Diameter ..... 2.815 inches (71.5 mm)
  - Minimum Width ..... 3.209 inches (81.5 mm)
- End Cap
  - Minimum Ring Bore Depth ..... 0.787 inches (20 mm)
- Wear Limit
  - Inner Track Roller ..... See page 21
  - Outer Track Roller ..... See page 21

STEP 4

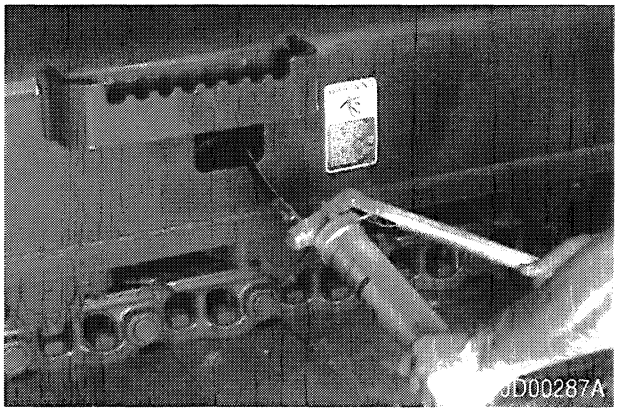
WARNING: *High pressure grease. Grease injected into your skin can cause severe injury or death. Wear heavy gloves and face protection when working in this area. If grease is injected into your skin, see a doctor immediately and have the grease removed.* SA132

Do the following procedure to increase the track tension:

1. Clean the grease fitting for the track adjustment cylinder.



2. Check that the check valve is tight.

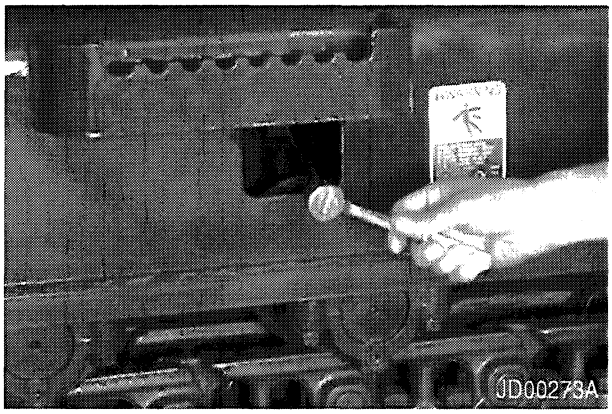


3. Inject Case No. 2 lithium grease into the track adjustment cylinder until the track tension is correct.

STEP 5

WARNING: *The check valve can come out of the adjustment cylinder with extreme force and you can be injured. To loosen the track chain, loosen the check valve slowly a small amount to allow grease to flow from the adjustment cylinder.* SA133

Do the following procedure to decrease the track tension:



1. DO NOT remove the check valve. The grease in the track adjustment cylinder is under high pressure. Slowly loosen the check valve until the grease flows from the adjustment cylinder (approximately two turns). Grease will flow from a groove in the check valve.

WARNING: *Grease is under heavy spring pressure. Disassembly without releasing pressure may result in serious injury or death. Do not disassemble the track compensating system before completely releasing the grease pressure. Release grease pressure by loosening check valve. Do not remove the check valve or retaining bracket.* CSM121

2. When the track tension is correct, tighten the check valve.

3. Clean the grease from the check valve.

Inspection

NOTE: *Numbers in parentheses in the following steps refer to numbers shown in illustration on page 25.*

STEP 1

Clean all parts in cleaning solvent.

STEP 2

Inspect the bushing surfaces on the shaft (6) for scoring, pitting, and other damage. Measure the diameter of the shaft in four places opposite of each other. If the diameter of the shaft is 2.716 inches (69 mm) or less, replace the shaft.

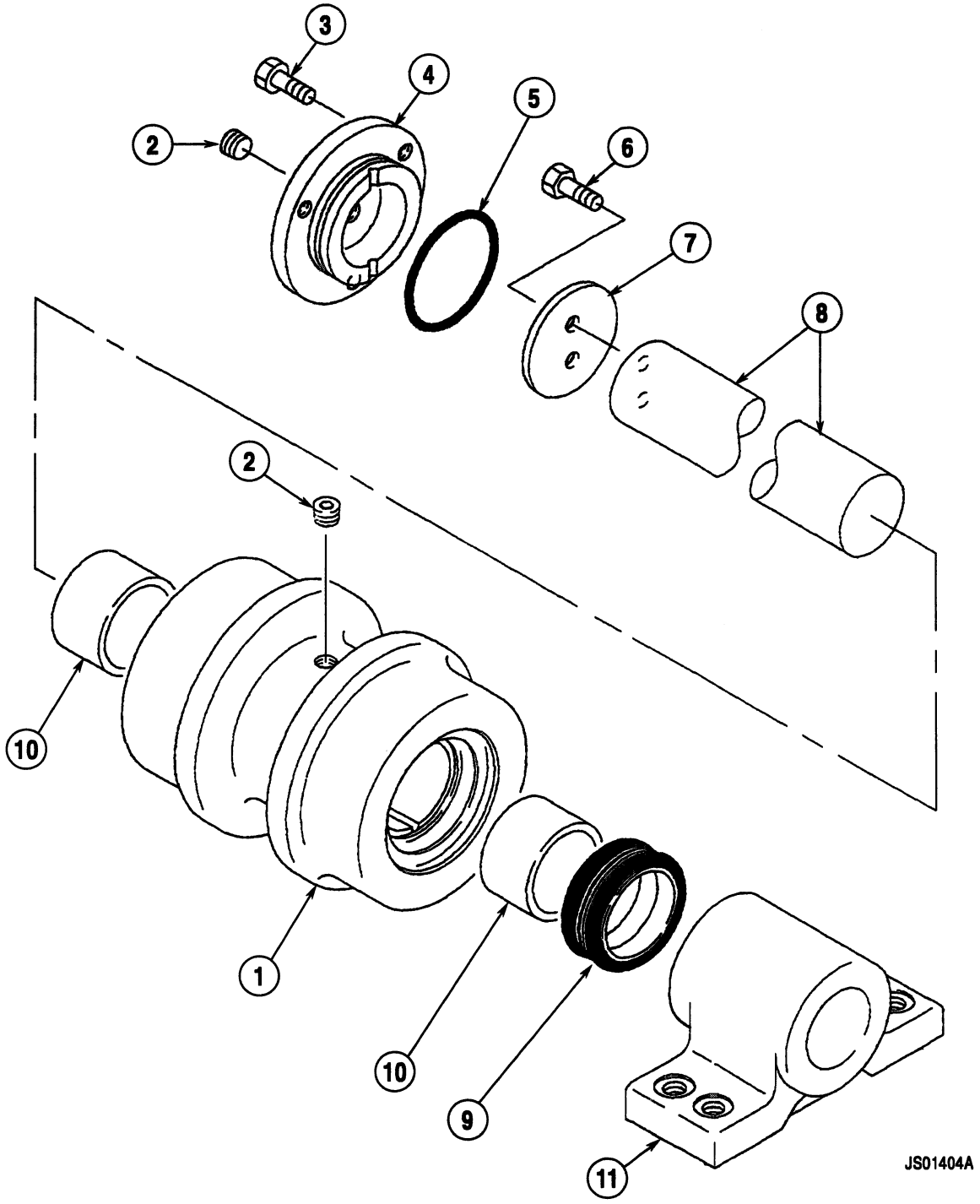
STEP 3

Inspect bushings (8) for wear and damage. Measure the ID of the bushing. If the ID of the bushing is 2.815 inches (71.5 mm) or more, replace the bushing. Measure the width of the bushing. If the width of the bushing is 3.209 inches (81.5 mm) or less, replace the bushing (Disassembly, step 6).

STEP 4

Inspect the bore in each bracket and in the track roller for damage that will result in leakage. Use new parts as required.

Assembly



Carrier Roller

1. *Carrier Roller*
2. *Drain Plug*
3. *Cap Screw*
4. *End Cover*
5. *O-ring*
6. *Cap Screw*
7. *Thrust Plate*
8. *Shaft*
9. *Face Seal*
10. *Bushing*
11. *Bracket*

Inspection

STEP 1

Clean all parts in cleaning solvent. Make sure that the cavity in the idler wheel is clean. Dry all parts using low-pressure compressed air, then apply clean oil to all parts.

STEP 2

Inspect the bushing surfaces on the shaft for scoring, pitting, and other damage. Measure the diameter of the shaft in four places opposite of each other. If the diameter of the shaft is 3.11 inches (79 mm) or less, replace the shaft.

STEP 3

Inspect the bushings for wear and damage. Measure the ID of the bushing. If the ID of the bushing is 3.209 inches (81.5 mm) or more, replace the bushing. Measure the width of the bushing. If the width of the bushing is 3.15 inches (80 mm) or less, replace the bushing.

STEP 4

Inspect the seal bore in the hubs and idler wheel for damage that will result in leakage. Replace the parts with new parts as required. Measure the seal bore depth of the hubs. If the seal bore depth is 0.65 inch (16.5 mm) or less, replace the hub.

Disassembly

STEP 1

Using suitable cleaning solvent and clean cloths, remove all dirt and grease from the exterior of the track adjustment cylinder.

NOTE: *Numbers in parentheses in the following steps refer to numbers shown in illustration on page 57.*

STEP 2

Remove two cap screws (3) and lock washers (4). Remove the bracket (5).

STEP 3

Remove the grease fitting (6) from the check valve (7 through 10).

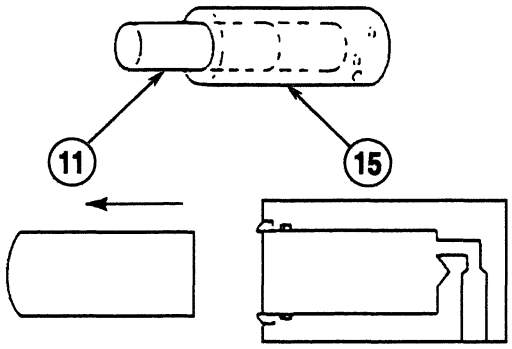
STEP 4

Remove the check valve (7 through 10) from the cylinder tube (15).

STEP 5

If necessary, disassemble the check valve by removing the poppet (7), spring (8), and ball (9) from the check valve body (10).

STEP 6



JS01083A

Pull the piston rod (11) from the cylinder tube (15).

STEP 7

Using a prybar, remove the wiper (12) from the cylinder tube (15). Discard the wiper.

STEP 8

Remove and discard the back-up ring (13) and O-ring (14).

BOOM CYLINDER (LH and RH)

Inside Diameter

9030B.....4.87 inch (125 mm)
9040B.....5.07 inch (130 mm)

Rod Diameter

9030B..... 3.32 inch (85 mm))
9040B.....3.51 inch (90 mm)

Stroke

9030B.....50.5 inch (1295 mm)
9040B.....49.84 inch (1278 mm)

ARM CYLINDER

Inside Diameter

9030B.....5.26 inch (135 mm)
9040B.....5.85 inch (150 mm)

Rod Diameter

9030B.....3.9 inch (100 mm)
9040B.....4.09 inch (105 mm)

Stroke

9030B.....61.62 inch (1580 mm)
9040B.....63.64 inch (1632 mm)

BUCKET CYLINDER

Inside Diameter

9030B.....4.68 inch (120 mm)
9040B.....5.26 inch (135 mm)

Rod Diameter

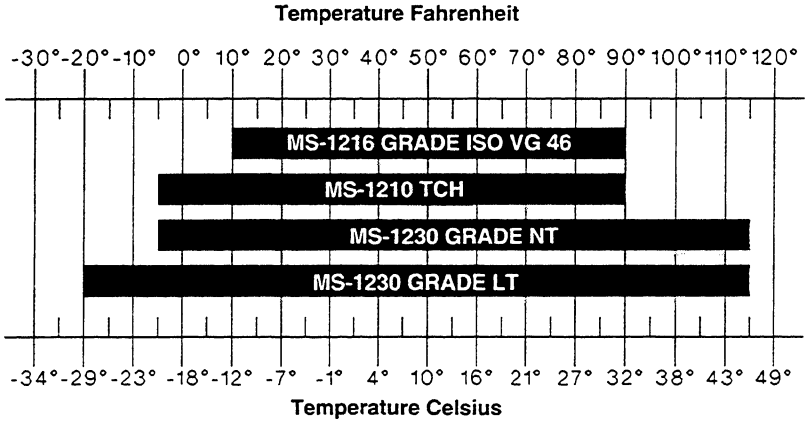
9030B.....3.12 inch (80 mm)
9040B.....3.51 inch (90 mm)

Stroke

9030B.....39.46 inch (1012 mm)
9040B.....41.84 inch (1073 mm)

HYDRAULIC FLUID SPECIFICATIONS

Use only hydraulic oils meeting Case specifications or equivalent AW (anti-wear) hydraulic oils.



NOTE: Case specification MS-1210 TCH Fluid is used in place of ISO VG 32 (-5 to +65 F) and ISO VG 46 (+10 to +90 F).

Case specifications MS-1230 Grade NT or Grade LT is used in place of ISO VG 32 (-5 to +65 F), ISO VG 46 (+10 to +90 F), ISO VG 100 (+30 to +115 F), and MS-1210 TCH.

HYDRAULIC RESERVOIR

Reservoir Refill Capacity .....31.7 U.S. gallons (120 Litres)
Total System Capacity ..... 54 U.S. gallons (203 Litres)

MIDDLE SPEED TRAVEL

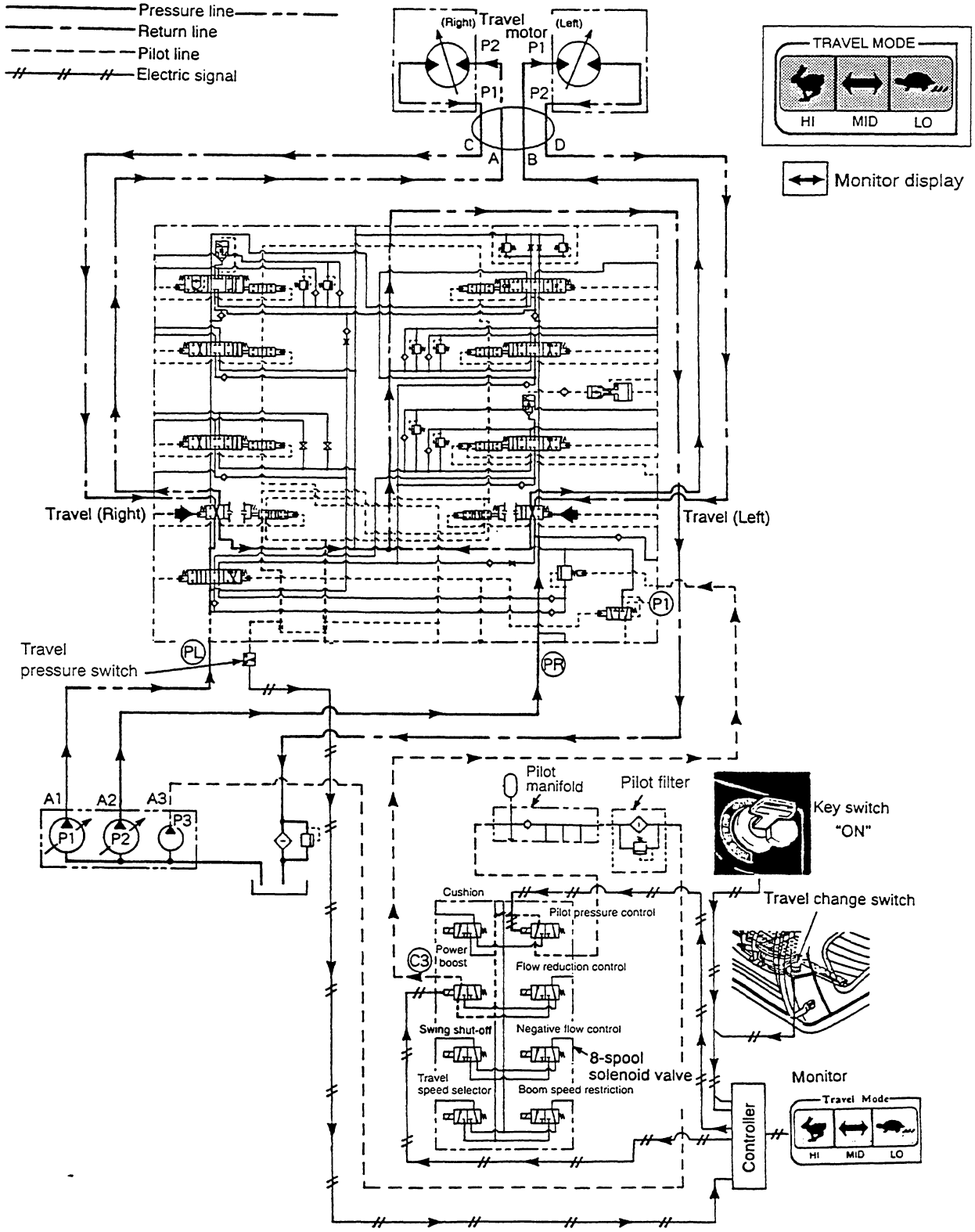


Figure 6:

This mode (middle speed) is the normal travel pattern. When the key switch is set to OFF and then set to ON again, travel mode is always returned to middle speed even from a low or high speed setting. When the travel spool is switched during one side travel, power boost status is maintained and the main relief valve is kept on power boost status. Refer to relief valve operation.

The operating method is as follows. Pressurized oil from P1 (front pump) enter the PL port of the control valve. Pressurized oil from P2 (rear pump) enters the PR port of the control valve. When right and left travel spools are operated, pressurized oil goes to each travel motor and forward or reverse travel operation is performed.

BOOM LOWERING STROKE REGULATION

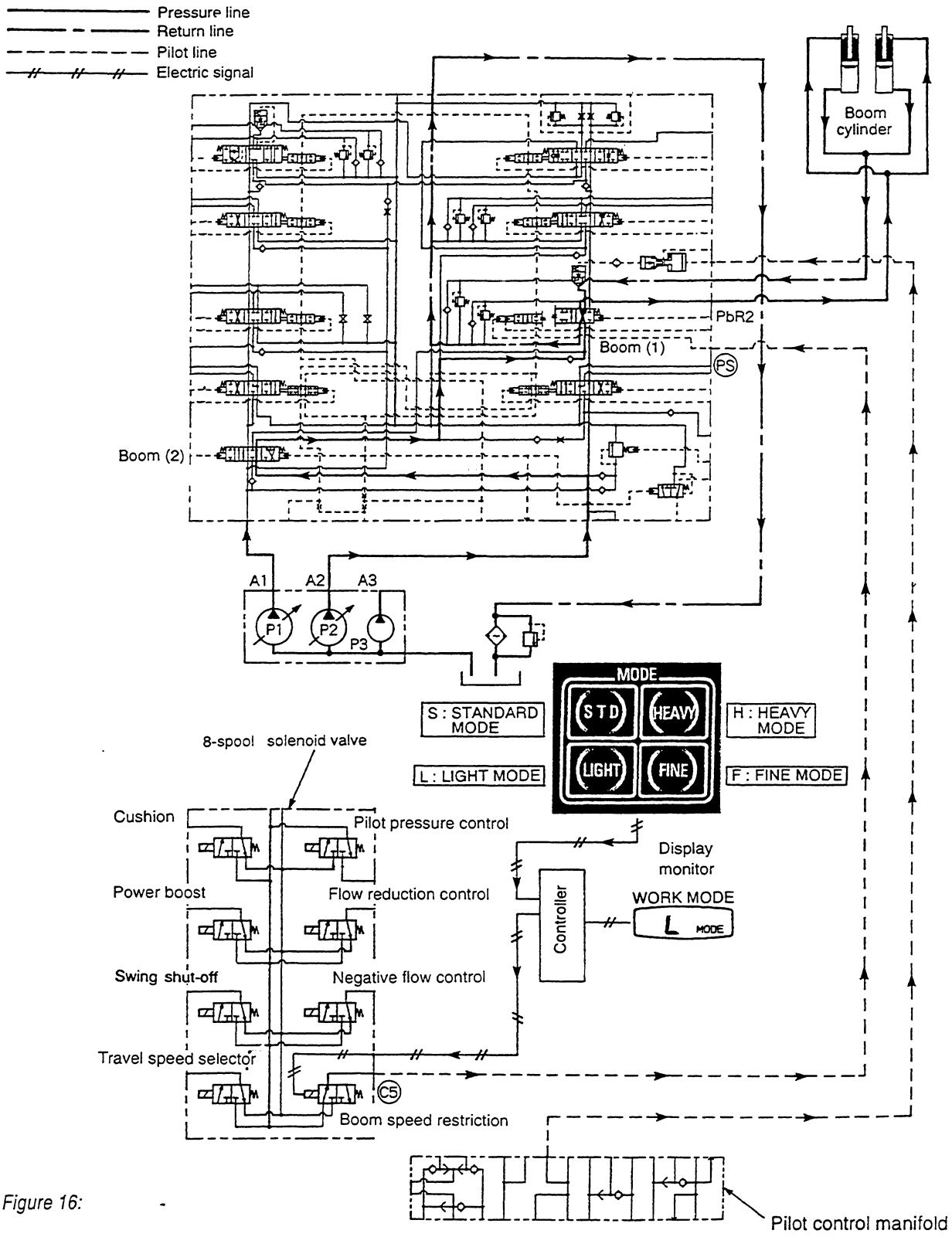


Figure 16: -

Boom lowering control valve spool stroke regulation is performed only in the L and F modes. Maximum flow rate reduction control also works in the F mode, lowering speed in the F mode is even slower.

The operating method is as follows. When L or F mode is selected, an electrical signal is sent from the controller to the solenoid valve for speed restriction. When the solenoid valve is shifted, pilot pressure flows into the PS port of the control valve from the C5 port of the 8-solenoid valve bank. A piston for stroke regulation is shifted to 3 mm, and regulates spool stroke at the time of boom lowering. In this way, boom lowering speed is decreased.

MAX. FLOW REDUCTION

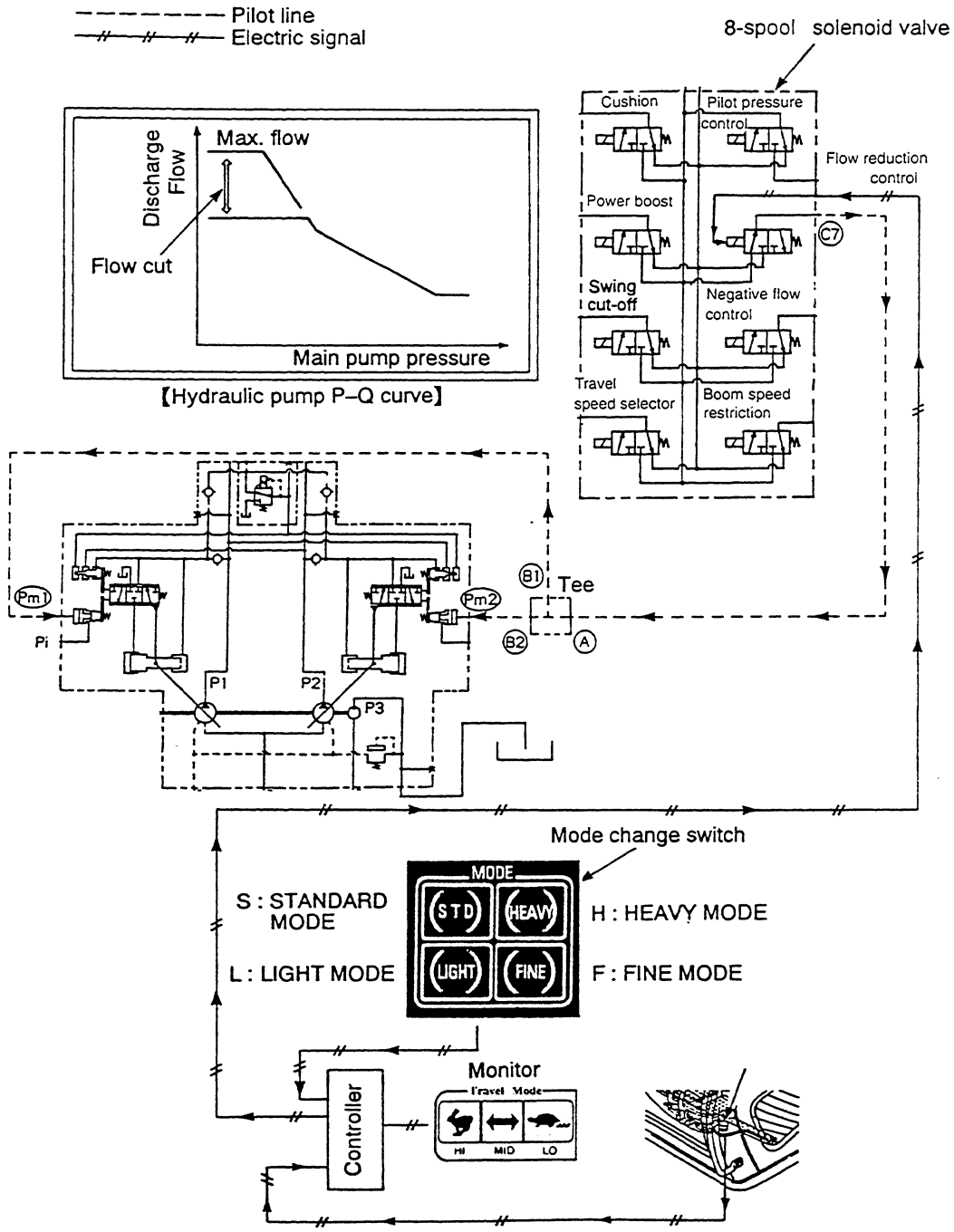


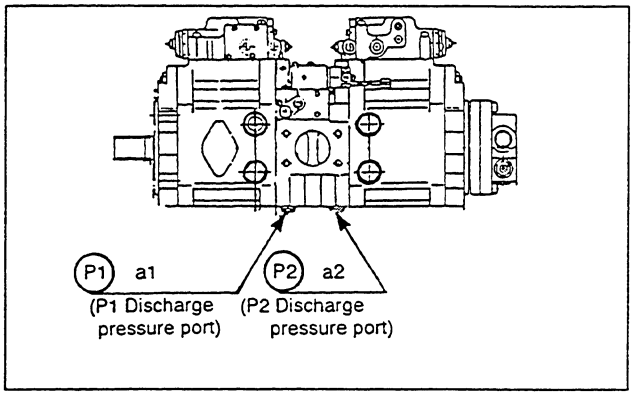
Figure 26:

The maximum flow rate of the pump is reduced in the following situations.

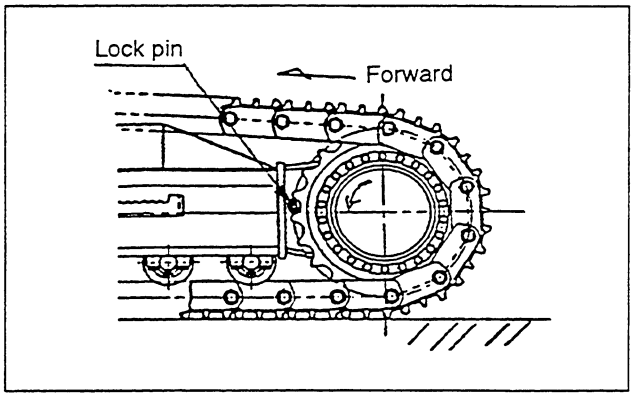
- Low speed travel in H.S.L.F. mode
- Low speed travel in H.S.L.F. mode + attachment or swing operation
- Middle speed or high speed travel in F mode + attachment or swing operation.

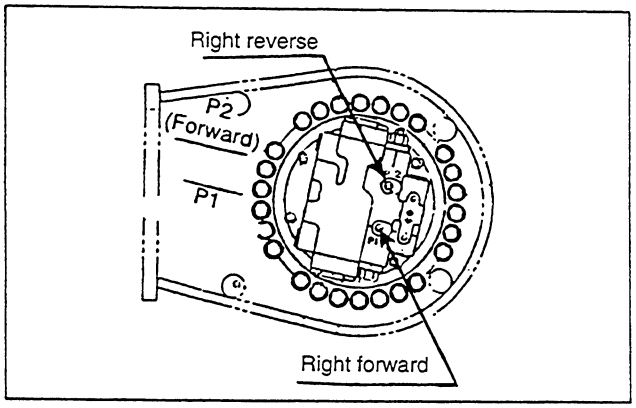
As an example, when low speed travel is selected an electrical signal is sent from the controller to the solenoid valve. When the solenoid valve is shifted, pilot pressure is directed from the C7 port of the solenoid valve through a tee to the Pm1 port of the P1 (front pump) andPm2 port of the P2 (rear pump). The pressure sets pump swash plate angle in the mid-position which in turn creates hydraulic balance and flow rate reduction.

TRAVEL MOTOR RELIEF PRESSURE



Engine Revolutions	Max.
Lever operation	Travel relief
Test port	P1 (Left travel) P2 (Right travel)
Pressure gauge	10,000 PSI
Set pressure	5 830PSI +70 -70 PSI
Tools	Lock pin (68 x 70 x 250)

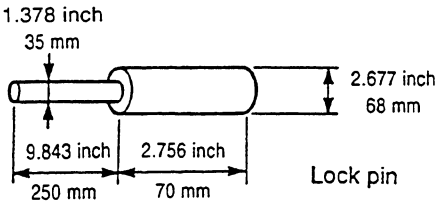


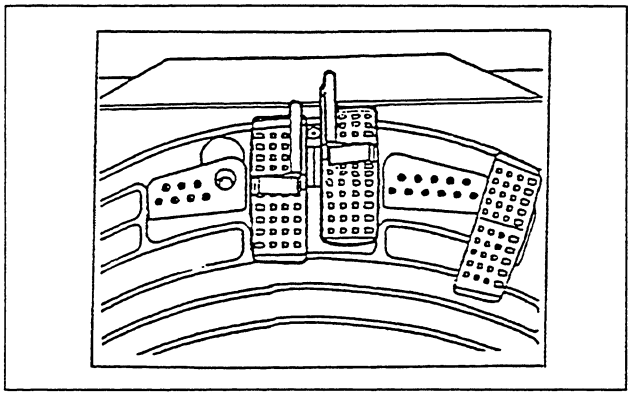


Pressure measurement is also possible at the end of the travel motor.

To verify the port relief pressure is equal to or greater than the setting of the power boost relief, engage the power boost button when the attachment is in the stalled position.

1. Fabricate a drive sprocket lock pin to the dimensions shown in the following drawing to lock the travel motor of the side to be tested.





NOTE: *When locking a travel motor, be sure to use the correct travel lever. Set the engine speed at low idle and engage the lever slowly when using the lock pin.*