115ZV-2 SHOP MANUAL General Information Function & Structure

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SHOP MANUAL

WHEEL LOADER

115ZV-2

General Information
Standard Measurement Values for Performance Check
Function & Structure
Check & Adjustment

Powered by CUMMINS QSK19 Engine

Serial No. 11C5-9001 and up

△ : First time replacement or cleaning only

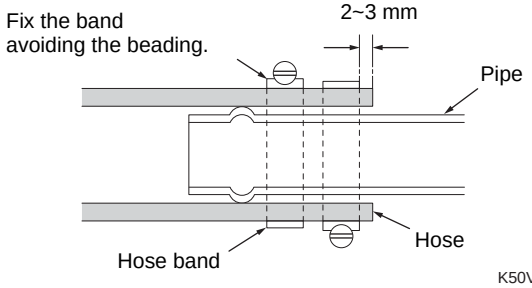
Section	Item for check	Operating hours						When Required
		10	50	250	500	1000	2000	
Transmission & Torque Converter	Check Transmission Oil Level	○						
	Replace Transmission Oil Filter			△	○			
	Replace Transmission Oil					○		
	Clean or Replace Transmission Breather					○		
Axle system	Check Tire for Damage, Air and Tread Depth	○						
	Greasing (Axle support)		○					
	Check Tire Air Pressure		○					
	Greasing (Pillow block bearing unit)			○				
	Check Differential Gear Oil			○				
	Check Planetary Gear Oil			○				
	Check Tightness of Wheel Bolts			○				
	Greasing (Differential seals)					○		
	Greasing (2nd Propeller Shaft Spline)						○	
	Replace Differential Gear Oil						○	
	Replace Planetary Gear Oil						○	
	Greasing (1st Propeller Shaft)	Every 12000 hours ○						
	Greasing (2nd Propeller Shaft)	Every 12000 hours ○						
	Greasing (3rd Propeller Shaft)	Every 12000 hours ○						
Steering system	Check Steering Wheel Operation	○						
	Greasing (Steering Cylinder)		○					
	Clean Filter for Orbitrol®			△			○	
Brake system	Check Service Brake Operation	○						
	Check Parking Brake Operation	○						
	Check Parking Brake Oil			○				
	Clean Filter for Brake Line			△			○	
	Replace Parking Brake Oil						○	
	Check Service Brake Disk Wear						○	
	Check Brake Accumulator						○	
Loading system	Check Hydraulic Oil Level	○						
	Greasing		○					
	Replace Hydraulic Oil Return Filter			△		○		
	Replace Hydraulic Oil, Clean Filter						○	
	Replace Filter in the Hydraulic Tank Cap (S/N ~9150)						○	
	Replace Filter in the Hydraulic Tank Breather Valve (S/N 9151~)						○	
	Replace Bucket Teeth (option)							○
	Replace Cutting Edge (option)							○

Hose band tightening torque

Low pressure hose (heat resisting hose)		Hose band	Tightening torque (N-m)	Tightening torque (kgf-cm)	Tightening torque (lb-ft)
Inner dia. (mm)	Outer dia. (mm)				
6.3	16.5	69002-02200	1.6	16	1.2
7.9	18.5				
9.5	20.5				
12.7	24.5	69002-02700	4	40	2.9
15.9	29.9	69002-03100			
19.0	30.0				
25.4	38.0	69002-04400			
31.8	45.8	69002-05200			
38.1	52.1	69002-05700			
50.8	67.8	69002-07100			
60.5	76.0	69002-08200			
75.5	93.0	69002-09500			

Low pressure hose		Hose band	Tightening torque (N-m)	Tightening torque (kgf-cm)	Tightening torque (lb-ft)
Inner dia. (mm)	Outer dia. (mm)				
6	16.5	69002-02200	1.6	16	1.2
8	18.5				
9	20.5				
9	22.0	69002-02300	4	40	2.9
12	24.5	69002-02700			
12	26.0				
15	29.0	69002-03100			
15	30.5				
19	32.0	69002-03800			
19	34.0				
25	39.5	69002-04400			
25	41.5				
32	46.0	69002-05200			
32	48.0				
38	54.0	69002-05700			
50	70.5	69002-07600			
50	73.0				

To connect the hose to the pipe, tighten the hose band at the following position:



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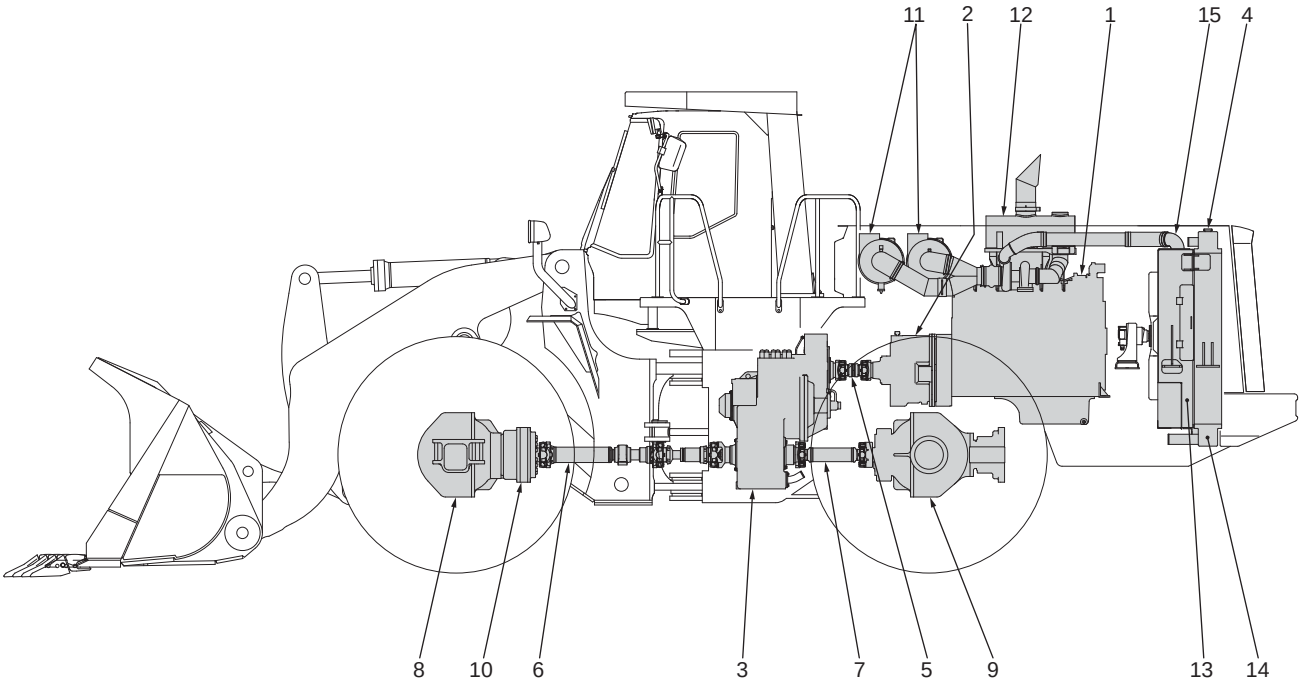
Power Line



115V2E22001

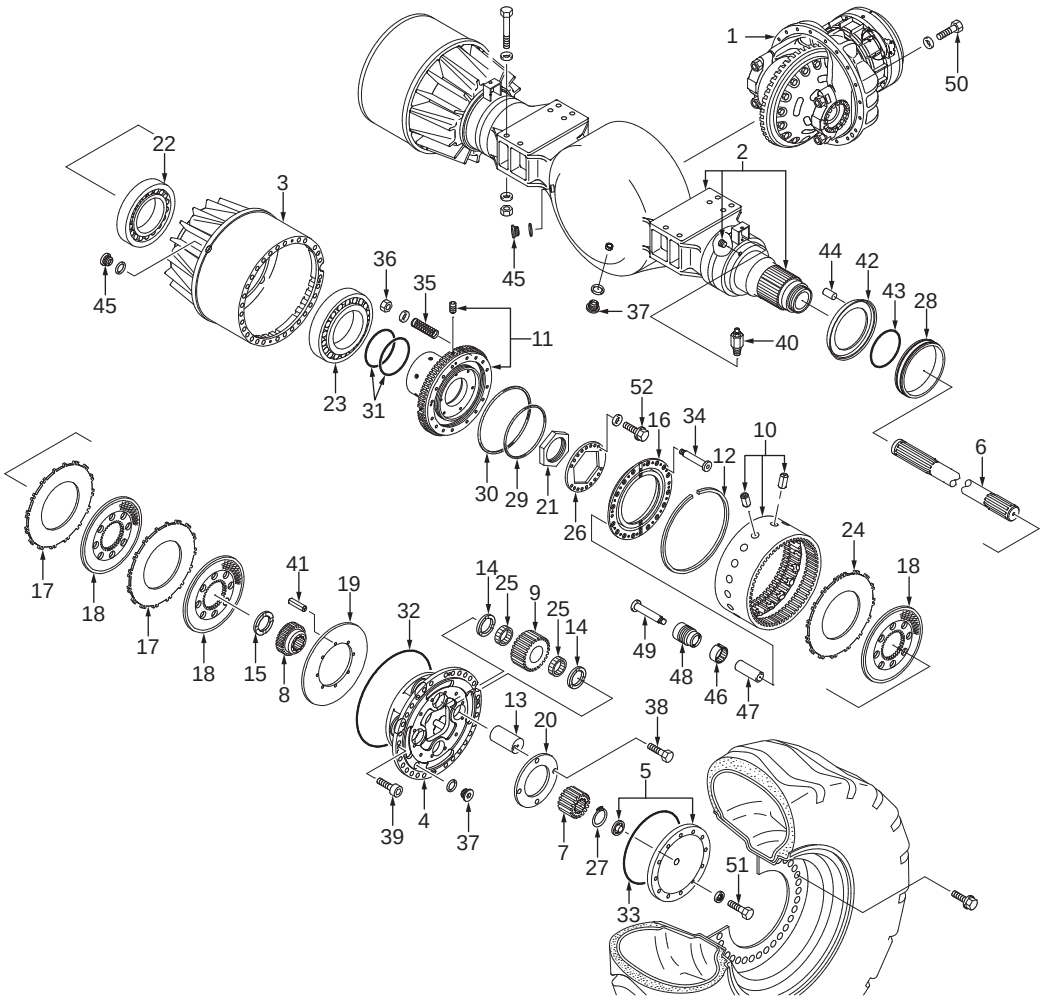
1. Engine
2. Torque converter
3. Transmission
4. Radiator
5. 1st propeller shaft
6. 2nd propeller shaft
7. 3rd propeller shaft
8. Front axle differential gear
9. Rear axle differential gear
10. Parking brake
11. Air cleaner
12. Muffler
13. Hydraulic oil cooler
14. Torque converter oil cooler (bottom tank of radiator)
15. Charge air cooler

The power output from the engine is transmitted to the transmission through the torque converter and the first propeller shaft. The speed and direction are changed according to the engagement of the transmission clutches. The power is then transmitted through the second and third propeller shafts to the differential gears of front and rear axles.

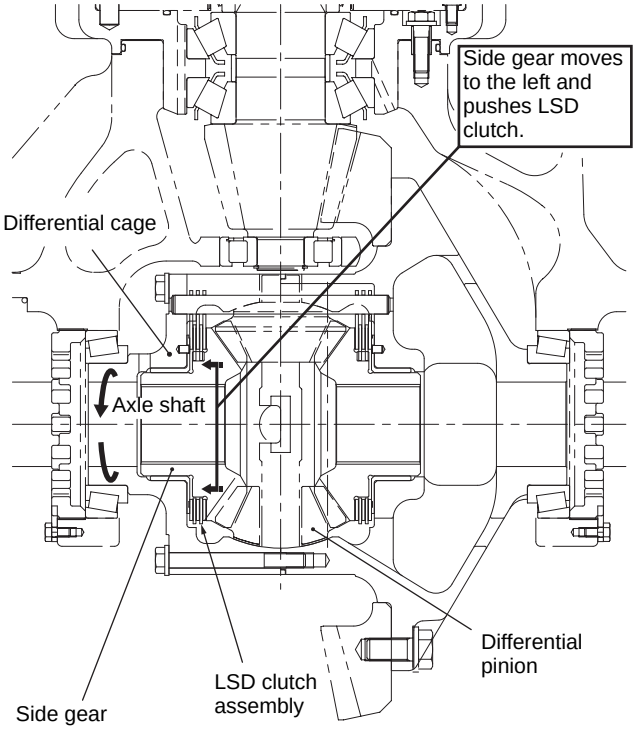
Finally the power is transmitted through the axles to the planetary gears, and tires to move the machine.

On the fan side of the engine, there is a radiator. The radiator incorporates engine coolant, torque converter oil cooler, charge air cooler and an external air type hydraulic oil cooler. A parking brake is installed on the front differential gear.

Axle Assembly



LSD function



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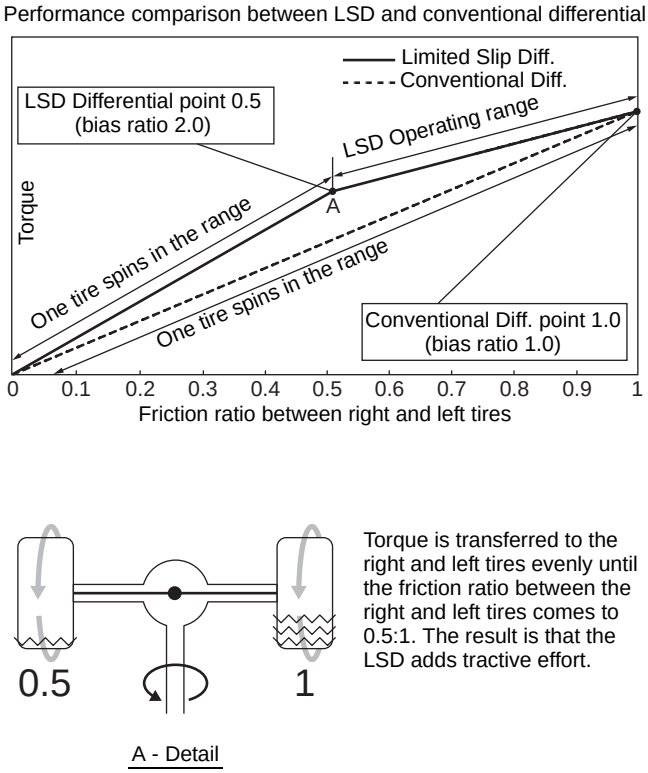
LSD (Limited-Slip Differential) is installed between the side gear and the differential cage, and increases tractive effort. If the surface traction of the right and left tires differ from each other during operation, LSD clutch engages and prevents traction loss.

The performance of LSD is shown by using the bias ratio. The bias ratio is the ratio between the driving force of the right and left tires while the differential pinion is turned. When the bias ratio is larger, it is easier to gain traction on the ground surface with less resistance.

LSD operation



Torque is transferred to the right and left tires evenly until the friction ratio between the right and left tires comes to 0.5:1. The result is that the LSD adds tractive effort.

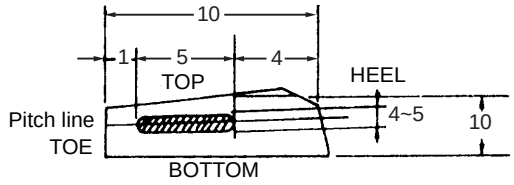
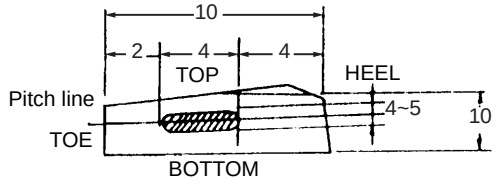
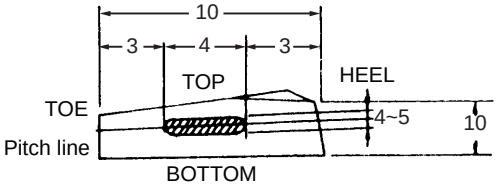
K115V2U22010

The following shows operation for the left tire.

A rotating driving force is transmitted from the differential cage via spider (cross shaft) to the differential pinion and the side gear.

When the ground surface resistance for the left tire lessens, the tapered interface between the differential pinion and the left side gear induces a side force. It pushes the left side gear to the left resulting in frictional engagement with the differential cage, thus impeding free left side gear rotation and gaining traction.

Three types of tooth contact shown below are acceptable as the best tooth contact.

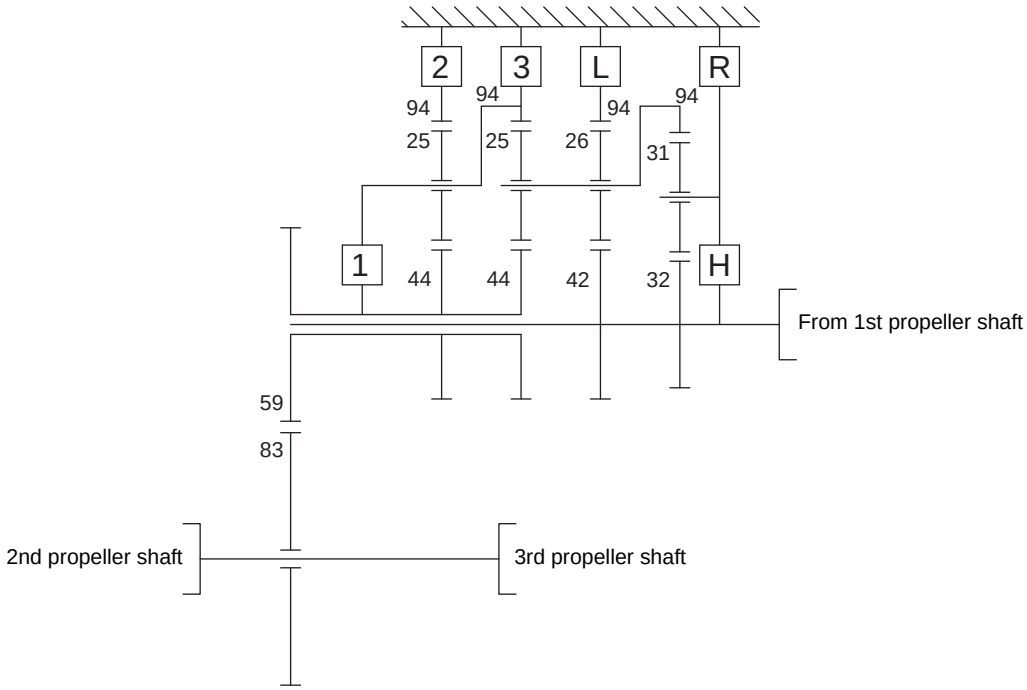
	Tooth contact position and length (rate)
Pattern A	
Pattern B	
Pattern C	

Service parts

After adjusting the tooth contact and backlash in our factory, we will wrap the bevel gear and drive pinion as a unit. Therefore, replace the bevel gear and drive pinion as a unit.

Note
Single sale of the bevel gear or the drive pinion is not possible.

Gear train and number of teeth



115V2E32008

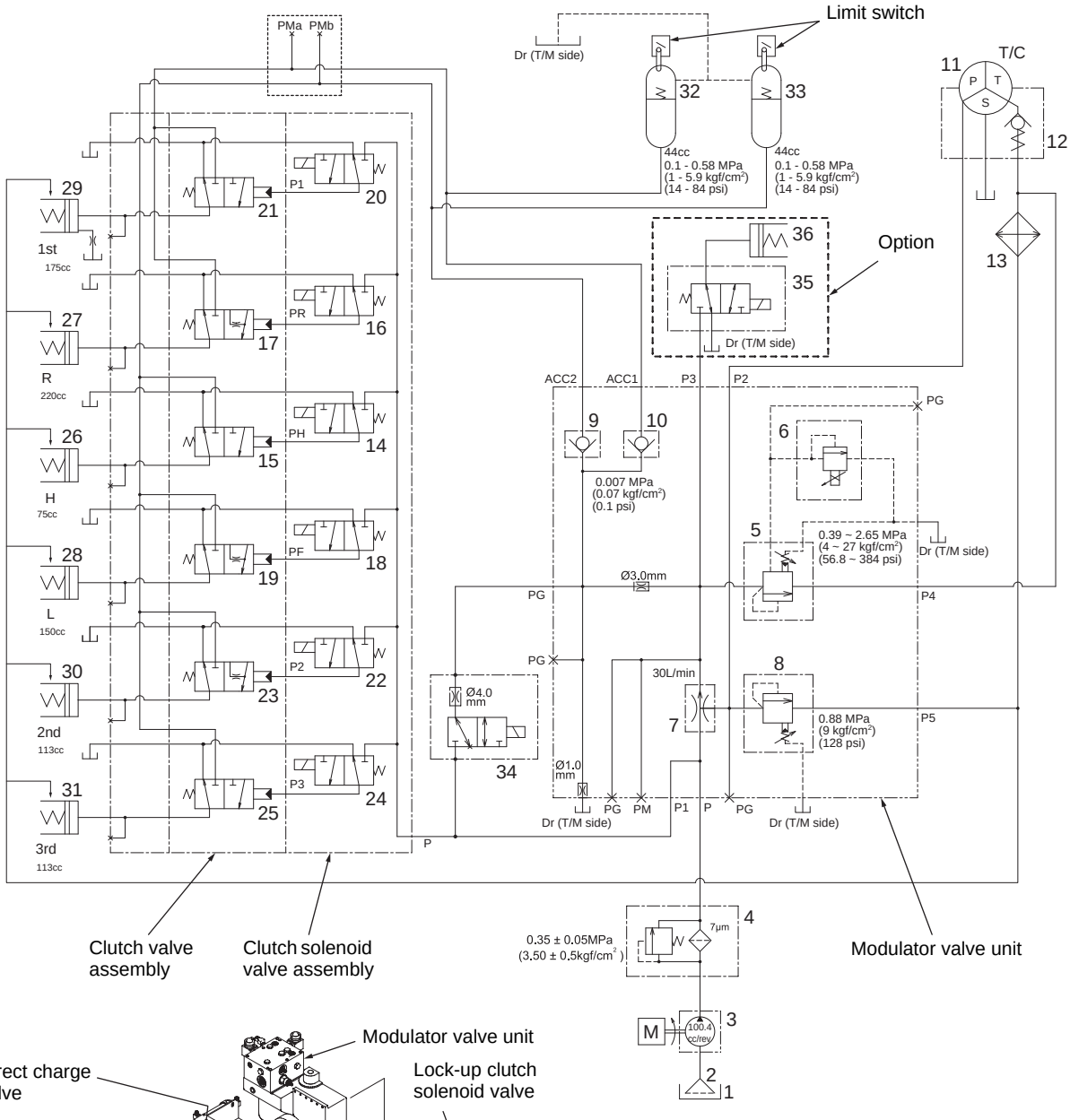
L: Low range clutch
H: High range clutch
R: Reverse clutch
1: 1st speed clutch
2: 2nd speed clutch
3: 3rd speed clutch

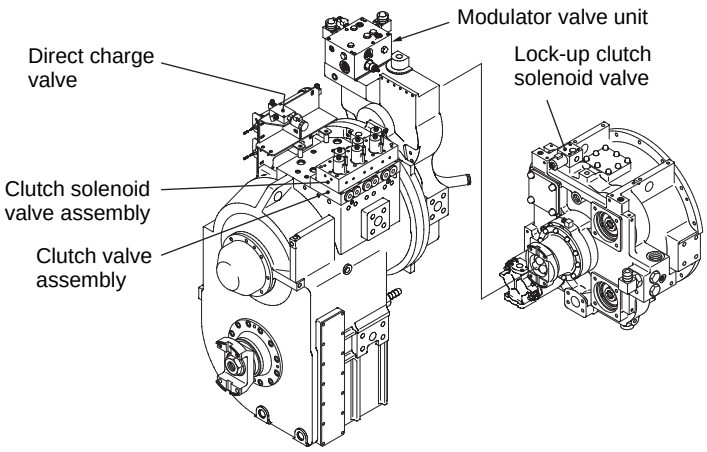
Clutch specifications

Name of clutch	Piston stroke (mm)	Friction plate				Steel plate				Number of return spring
		Number of plate	Outer diameter (mm)	Inner diameter (mm)	Thickness (mm) New/Wear limit	Number of plate	Outer diameter (mm)	Inner diameter (mm)	Thickness (mm) New/Wear limit	
Low range clutch	6.0±0.5	6	ø420	ø330	4±0.15 / 3.5 (Sintered)	6	ø482	ø350	3.2±0.1 / 3.0	9
Reverse clutch	7.0±0.5	7				7				12
High range clutch	3.0±0.5	3	ø260	ø171	4±0.15 / 3.8 (Paper)	3	ø276	ø187	3.2±0.1 / 3.0	12
1st speed clutch	5.0±0.5	7				7				12
2nd speed clutch	3.0±0.5	4	ø420	ø330	4±0.15 / 3.8 (Paper)	4	ø482	ø350	3.2±0.1 / 3.0	12
3rd speed clutch	4.0±0.5	4				4				12

Hydraulic Circuit Diagram

Neutral position





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Pressure rise (t_4)

Since the accumulator is completely accumulated at the start point of t_4, the limit switch is turned ON, sending the signal to the MCU. At that point, the clutch piston comes into contact with the clutch plate and the clutch plates start to transmit power. The MCU recognizes that the accumulator is at the full accumulation by this signal, and gradually increases the driving current to the modulator valve.

Then the hydraulic pressure for the clutch will consequently increases to complete the clutch engagement.

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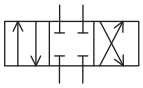
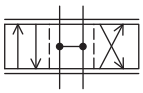
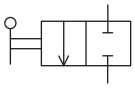
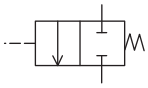
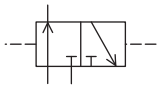
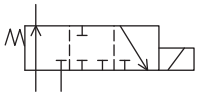
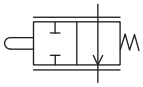
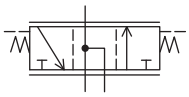
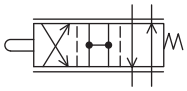
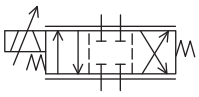
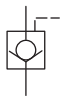
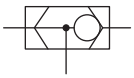
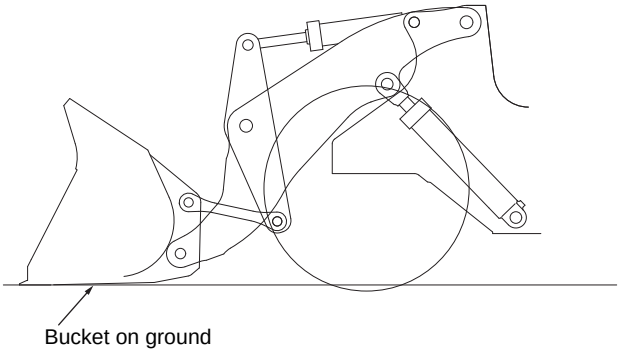
Directional control valve

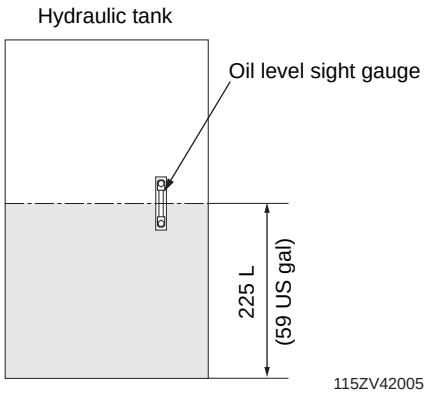
Two position Two ports	
Three position Four ports	
Four ports with restrictor	
Two position Two ports	
Mechanical control	
Spring offset Pressure control	
Two position Three ports	
Pressure control	
Spring offset Solenoid control	
Restrictor	
Two ports	
Three ports	
Four ports	
Servo valve	

Check valve

Check valve	
Check valve Pilot operated	
Shuttle valve	

Hydraulic oil level check





Before checking the hydraulic oil level, observe the following items:

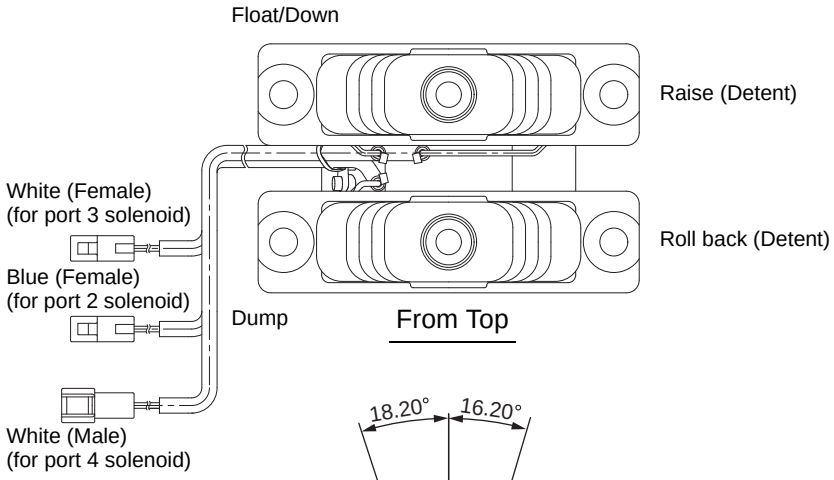
- Check that the machine is on level ground.
- Check the hydraulic oil level before operation (when oil is not warm).
- Lower the boom to the lowest limit, and set the bucket level on the ground.

Check that the oil level is at the center of the oil level sight gauge.

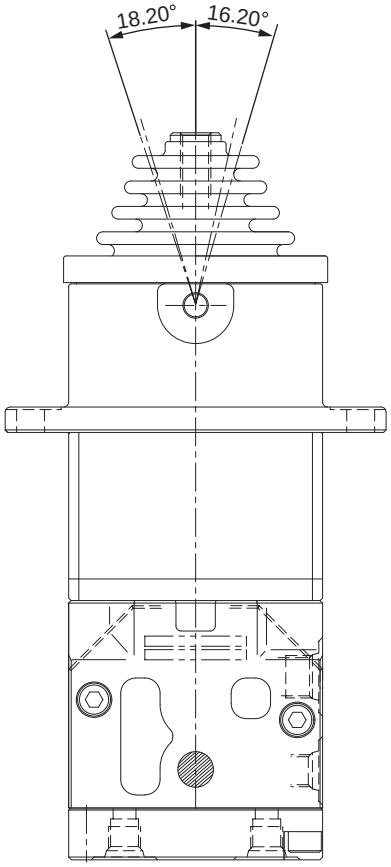
Oil amount
225 L (59 US gal)

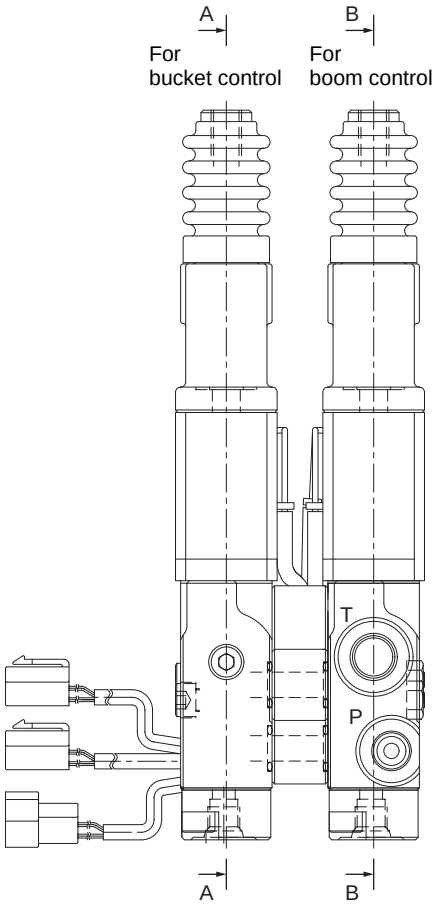
Note
If the oil is at operating temperature 60°C ~ 90°C (140°F ~ 200°F) the oil level may be at or near the top of the oil level sight gauge.

Pilot valve (S/N 9001~9100)

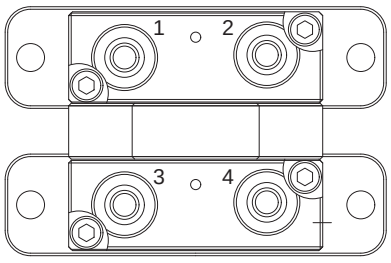


From Top





(Port 1, 2) (Port 3, 4)



From Bottom

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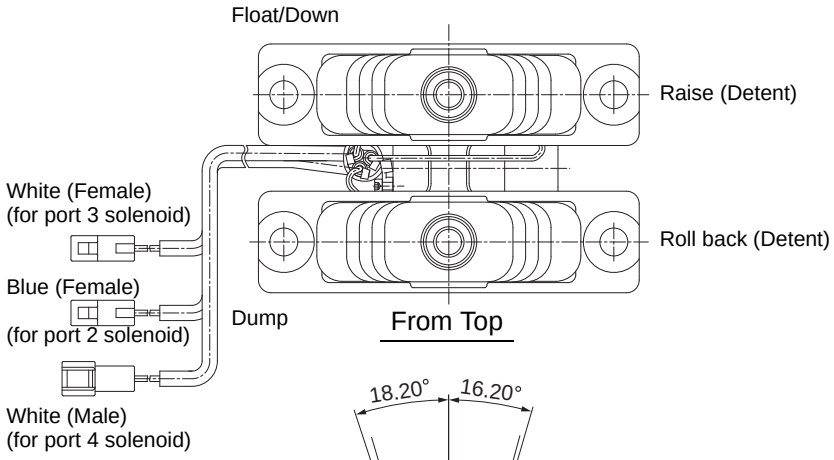
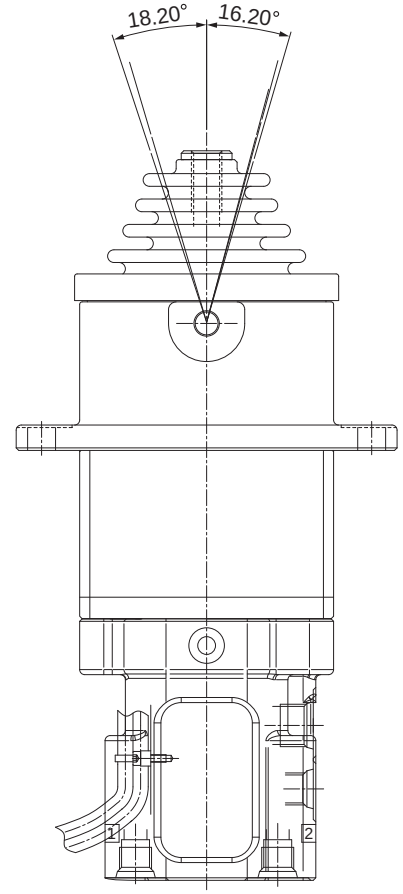
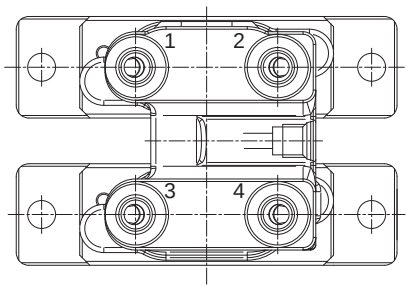
Pilot valve (S/N 9106~)

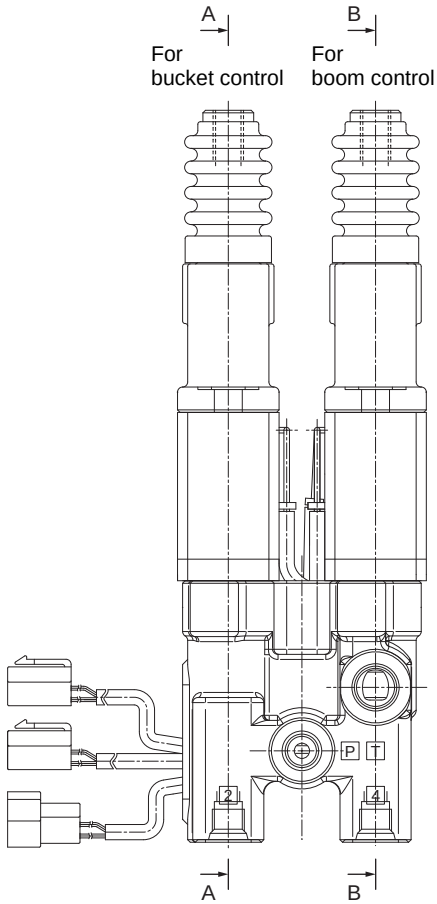


From Top





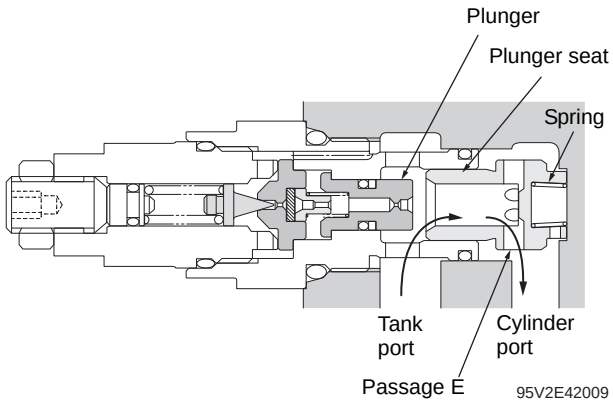
From Bottom



(Port 1, 2) (Port 3, 4)

90Z542003

Make-up valve operation

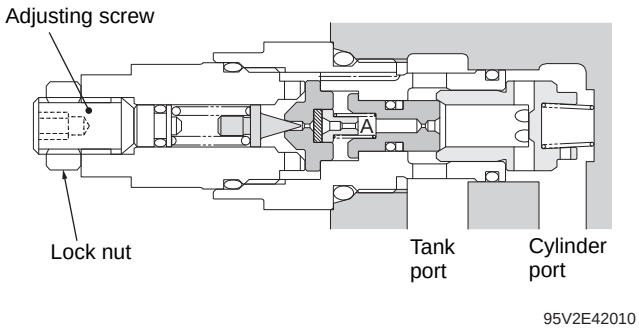


When the overload relief valve on one side of the cylinder port is actuated, the plunger in the control valve is in neutral. The port opposite to the one in which high pressure was produced has a greatly reduced pressure. When the pressure is reduced below the tank pressure, the make-up valve is opened.

When the pressure at the cylinder port becomes less than tank pressure, the plunger seat is moved to the right by the pressure area difference of the plunger seat between the right and left. The plunger seat opens the port and the oil flows to the cylinder port through passage E. It prevents a vacuum (negative pressure) in the cylinder.

Note
The make-up valve function is non-adjustable.

Adjusting set pressure



Loosen the lock nut and adjust the pressure by the adjusting screw. Turn clockwise the adjusting screw to raise the set pressure, or turn counterclockwise the adjusting screw to lower the set pressure.

After adjustment, be sure to tighten the lock nut.

Set pressure
23.5±0.5 MPa (240±5 kgf/cm^2) (3,413±71 psi)

Multiple control valve make-up valve

(Installed on the rod side of the boom circuit)

The make-up valve is installed in the circuit between the control spool and boom cylinder.

Extremely quick boom lowering may generate low pressure due to low oil supply speed compared with boom lowering speed. The low pressure could form a vacuum that may cause cavitation.

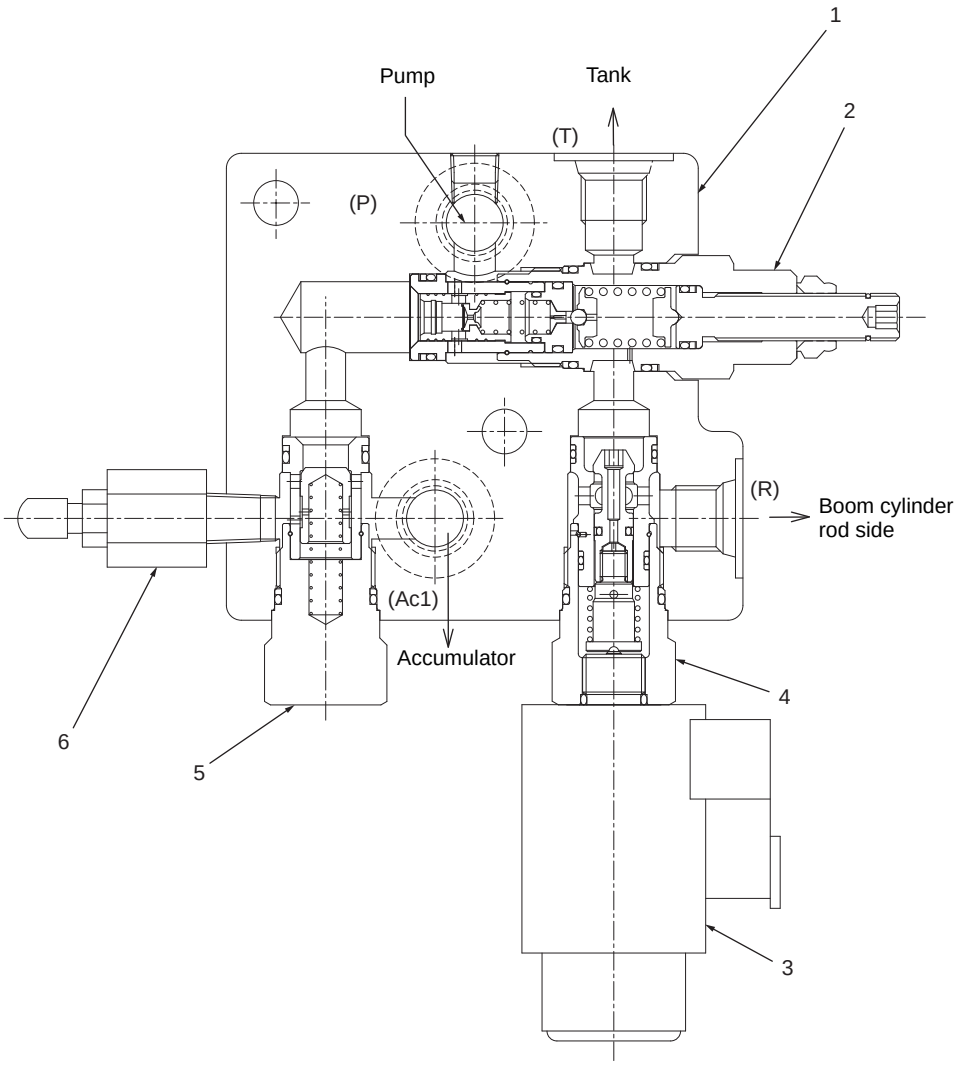
The purpose of the make-up valve is to prevent generation of such a vacuum. When the pressure in the rod side is lower than tank pressure, the make-up valve is opened to feed oil from the tank to the cylinder.

Make-up valve operation

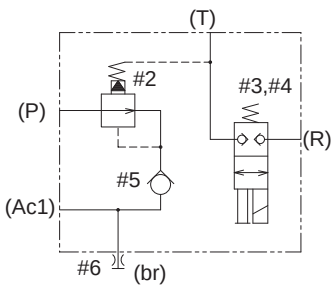
The make-up valve has the same structure as the overload relief valve with make-up valve does. Refer to the description on "overload relief valve" for the makeup valve operation.

Ride control valve assembly (Reducing valve circuit)

Outline drawing



1. Block
2. Reducing valve
3. Solenoid
4. Valve
5. Check valve
6. Bleeder valve

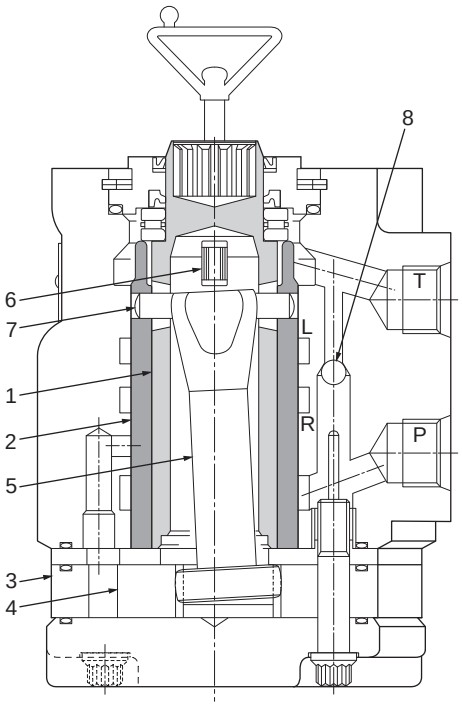


Hydraulic circuit

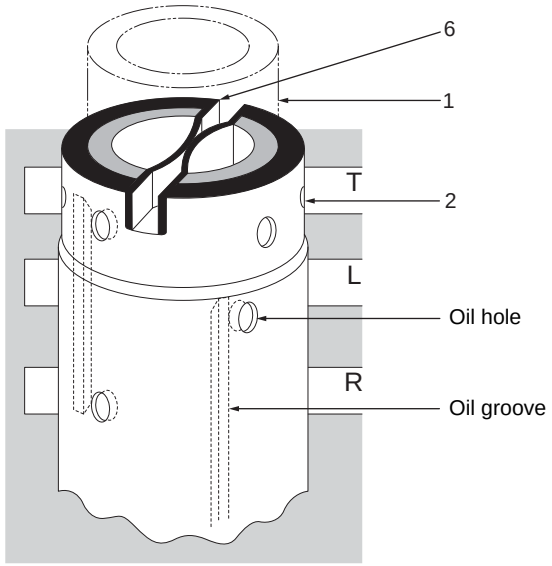
Orbitrol® operation

Neutral

(When the steering wheel is not being turned)



85V2E42019



70ZV42025

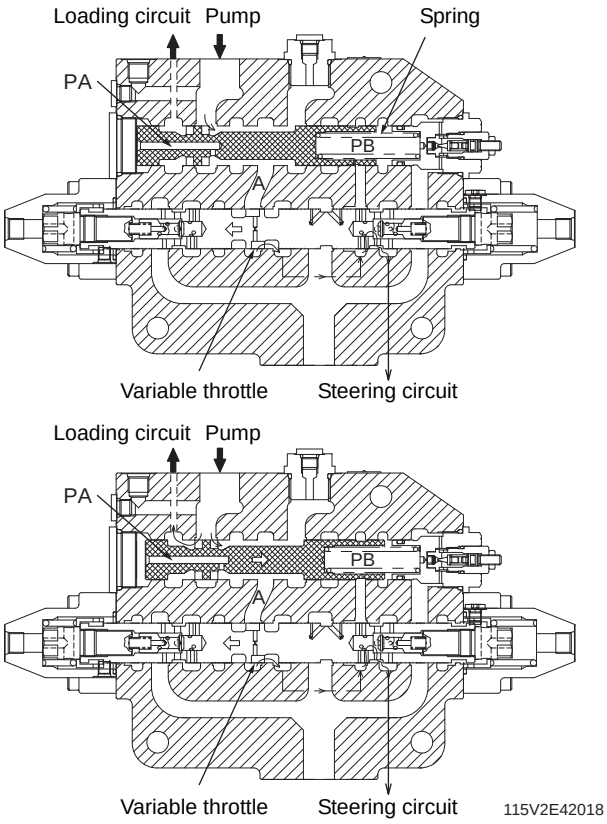
1. Spool
2. Sleeve
3. Stator
4. Rotor
5. Drive shaft
6. Centering spring
7. Cross pin
8. Check valve

- Spool (1) and sleeve (2) of the valve part each have a slit into which centering spring (6) consisting of plate springs is set.

- When the steering wheel is not being turned, spool (1) and sleeve (2) are kept in the neutral position by means of center spring (6).

- This Orbitrol® is the closed center and non-load reaction type.
  When in the neutral position, the oil groove of the spool does not match the oil hole of the sleeve, so the flow route of oil from the pump to the steering valve is totally closed.

Steering valve flow control spool



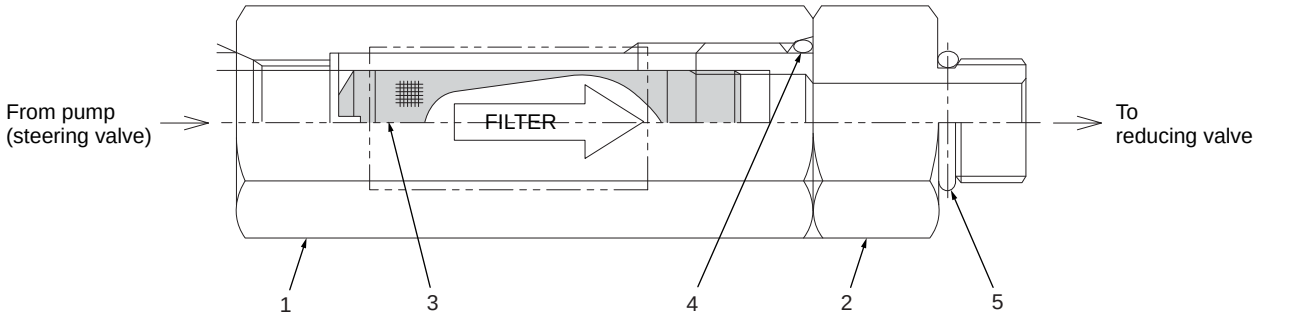
When the pump discharge amount is small, the pressure difference between the chambers A and B is small (pressure PA in chamber A ≒ pressure PB in chamber B), and the flow control spool is being pushed to the left by the spring. Accordingly, the oil sent from the pump flows into to the steering circuit.

When the pump discharge amount is increased and the pressure difference (PA-PB) is increased to 0.63 MPa (6.4 kgf/cm2) (91.4 psi) or more, the flow control spool starts to be shifted to the right and the excessive oil is bypassed to the loading circuit.

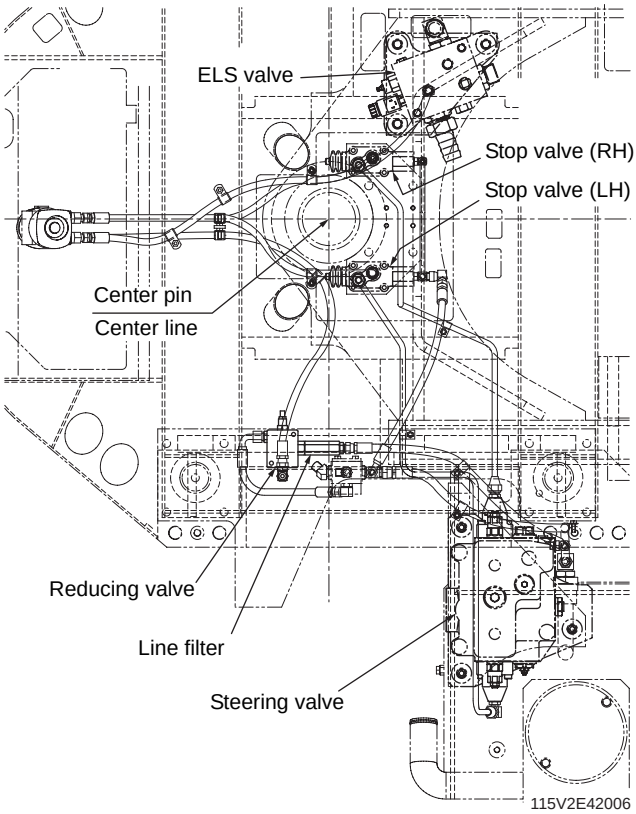
As described above, the steering circuit is given priority in receiving the pressurized oil from the pump.

However, when the number of rotations of the engine becomes larger and the oil flow rate exceeds the preset value, the flow control spool bypasses the excessive oil to the loading circuit. This keeps the oil flow rate constant in the steering circuit.

Steering Line Filter



1. Case
2. Nipple
3. Strainer
4. O-ring
5. O-ring



The line filter is integrated into the pilot line of the steering line, and prevents foreign objects from entering the pilot line.

Note
The line filter design shown above is also used for the brake line.
The filter prevents debris from entering the brake accumulator reducing valve assembly.
These filters must be removed, inspected and cleaned or replaced every 2,000 hours of operation.

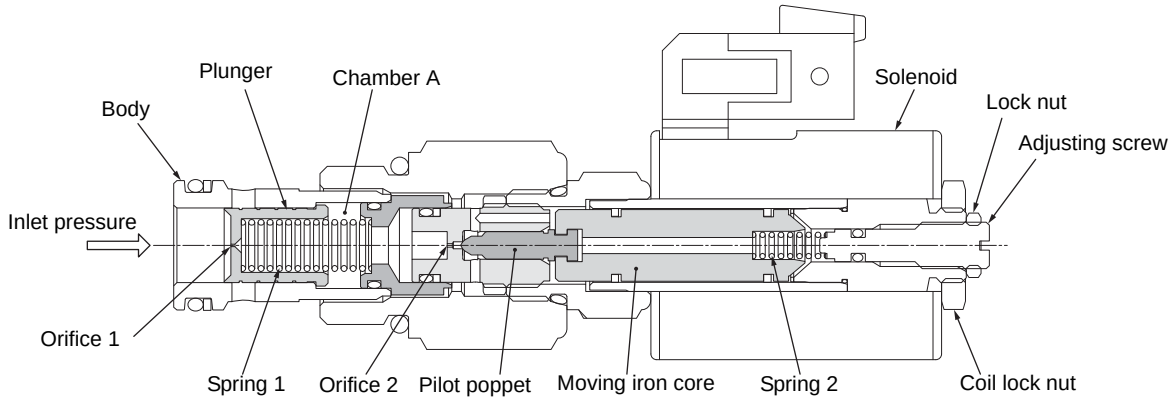
Proportional relief valve (S/N 9001~9050)

The proportional relief valve is installed between the unloader valve and the fan motor. This valve is the normally closed, pilot operated type.

The setting pressure of the proportional relief valve is changed in proportion as the engine revolution and electric current value from the MCU.

Proportional relief valve operation

When the oil pressure is at the preset value or less



95V2E42044

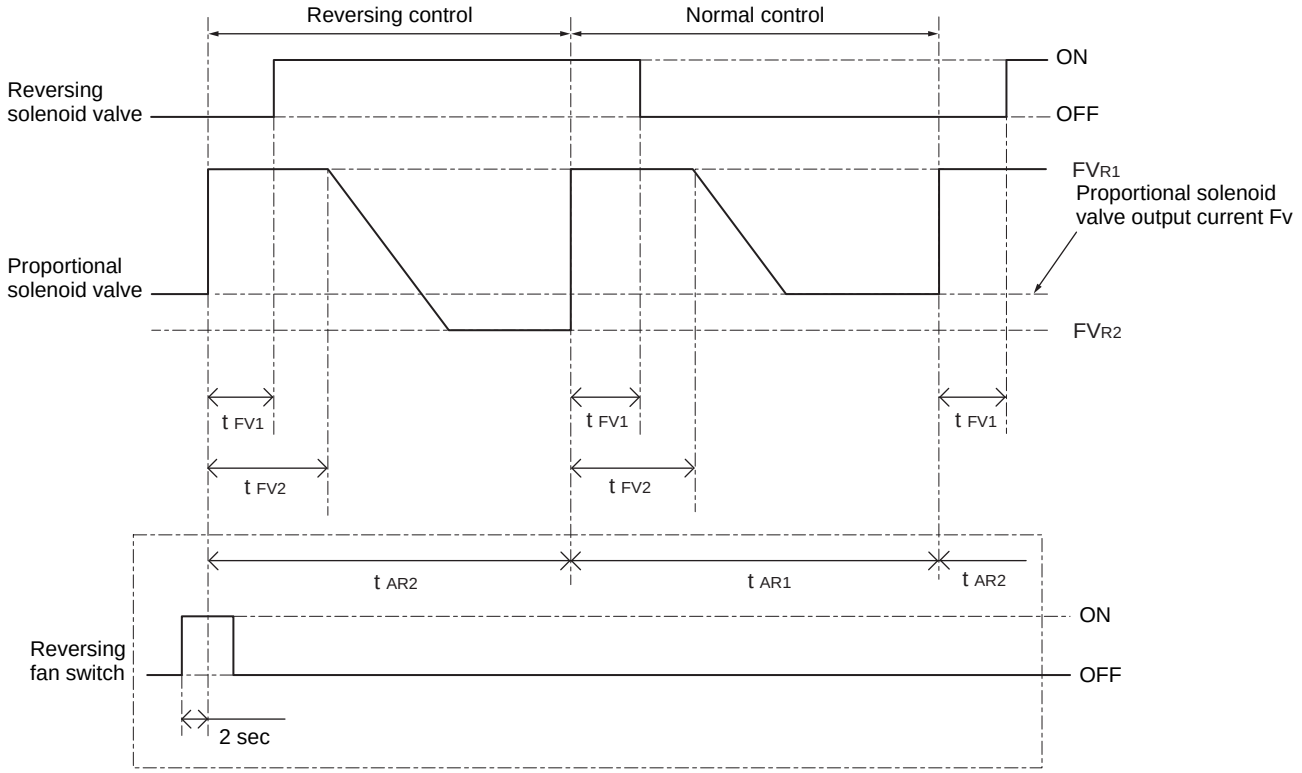
The pressurized oil from the pump (the unloader valve) flows into the chamber A through the orifice 1, and the plunger is pressed against the body by the spring 1 force.

When the solenoid coil is not energized, the setting pressure is regulated by the spring 2 force.

If the solenoid coil is energized by the signal of the MCU, the pressure setting is changed. As the electric current is applied to the coil, the movable iron core is pulled to the right and pushes the spring 2, so the spring 2 force is reduced with the increasing current, the setting pressure also decreases. Once a constant electronic signal is given, the pilot poppet is held in a given potion, holding the setting pressure.

This is maintained by the balance between the electronic spring 2 force and inlet pressure.

Reversing fan control chart



Switching timing chart of reversing fan

85V2E42047

t: sec
F: mA

t_{FV1}	16
t_{FV2}	18
t_{AR1}	1,800
t_{AR2}	60
F_{VR1}	approx. 340
F_{VR2}	0

Measuring pilot circuit reducing valve pressure

⚠ WARNING

Trapped pressure in brake circuit could cause serious injury when the plug is removed.
Fully release all residual accumulator pressure before servicing.

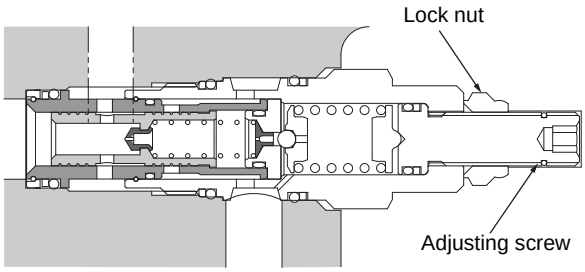
1. Attach the pressure gauge to port (4).

2. Place the shift lever to the forward position.

Note
Avoid “Hibernate mode” during the measurement.
In the “Hibernate mode”, the engine speed is decreased to 775 min^{-1} at idling under the following conditions:
- when the transmission shift lever is placed at “N” position,
- the engine coolant temperature is higher than 60ºC (140ºF), and
- the engine speed is held at 950 min^{-1} or less for 10 seconds.

3. Keep the engine speed at low idle (when the brake line pressure is normal) and then measure and record the pressure.

Adjusting pilot line pressure



Reducing valve

90ZVE43004

Loosen the lock nut and adjust the pressure by the adjusting screw.

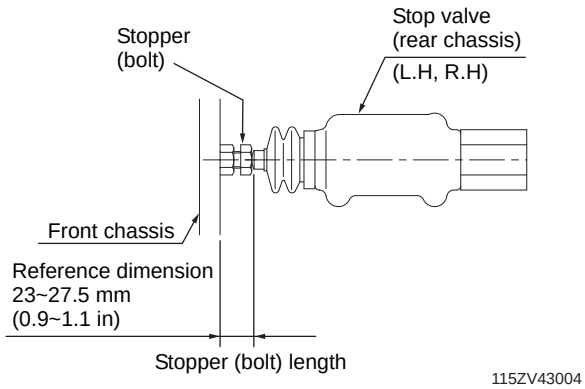
Turn clockwise the adjusting screw to raise the pilot line pressure.

IMPORTANT

After the completion of the adjustment of the pilot line pressure, be sure to tighten the lock nut.

Stop Valve

Stop valve adjustment procedure



⚠ WARNING

When the machine turns, the clearance in the articulation area closes. As a result, people may be caught, leading to a severe accident. To prevent such an accident, observe the following items strictly when adjusting the steering stopper.

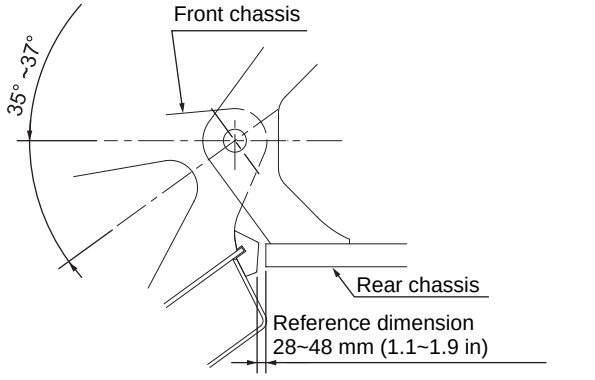
- Stop the engine before starting adjustment of the stopper bolt.
- When confirming the operation after setup, keep proper distance from the articulation area of the machine.

The stop valve works when the spool is pushed in 3 mm (0.118 in).

Adjust the stopper bolt by using the following procedure.

- Adjust the stopper (bolt) length so that the clearance between the machine body and the stopper becomes the reference dimension "28~48 mm (1.102~1.890 in)" shown in the table below.

Reference dimension



Articulation angle (º)	37	36	35
Clearance between machine body and stopper (mm) (in)	28 (1.102)	38 (1.496)	48 (1.890)
Stopper (bolt) length (mm) (in)	23 (0.906)	25 (0.984)	27.5 (1.083)

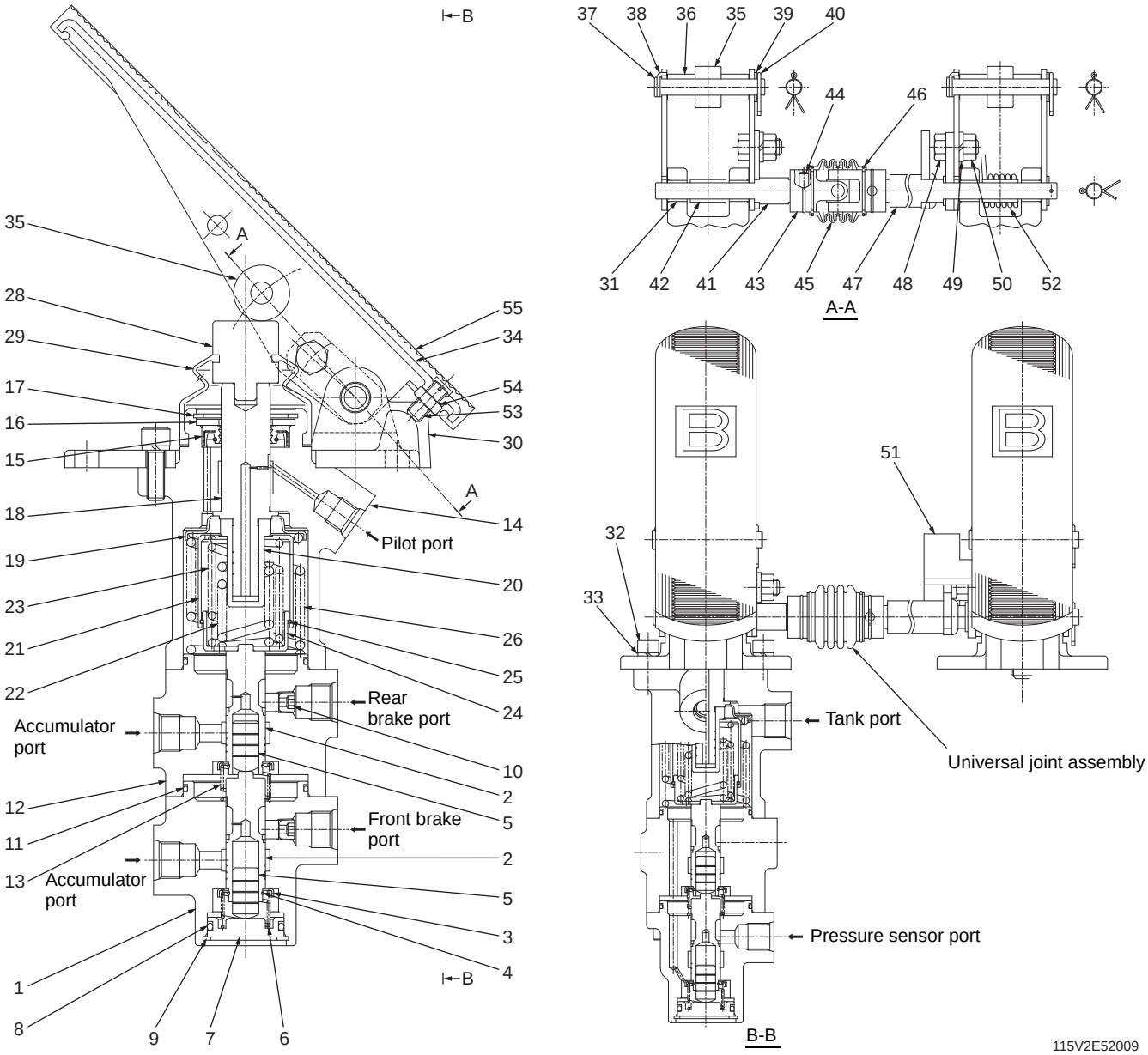
*The target value should be the articulation angle "36º", while not rolling machine.

- After adjustment, turn the steering wheel slowly at a rate of 5 sec or more per turn, and confirm the clearance between the machine body and the stopper.

- When adjustment is completed, tighten the lock nut of the stopper (bolt).

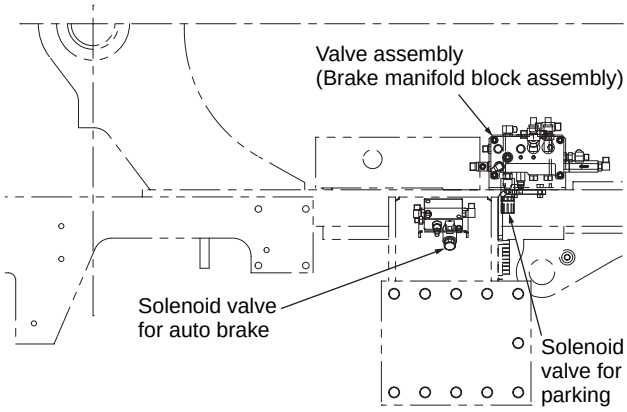
  : 90 N-m (9.2 kgf-m) (67 lb-ft)

Brake Valve

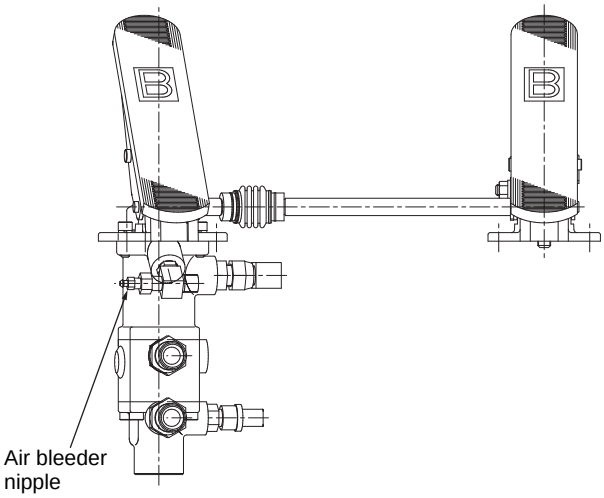


1. Body
2. Spool
3. Spring seat
4. Snap ring
5. Plunger
6. Spring
7. Plug
8. O-ring
9. C-ring
10. Orifice
11. O-ring
12. Body
13. Spring
14. Cover
15. Oil seal
16. Plate
17. C-ring
18. Spool input
19. Spring seat
20. Pilot piston
21. Case
22. Spring
23. Spring
24. Case
25. Snap ring
26. Spring
27. —
28. Seat
29. Dust cover
30. Mounting plate
31. Pedal bush
32. Bolt
33. Spring washer
34. Pedal
35. Roller
36. Spacer
37. Pedal pin
38. L-pin
39. Washer
40. Pin
41. Shaft
42. Spacer
43. Joint
44. Pin
45. Boot
46. Snap ring
47. Shaft
48. Bolt
49. Washer
50. Nut
51. Plate
52. Spring
53. Screw
54. Nut
55. Pedal cover

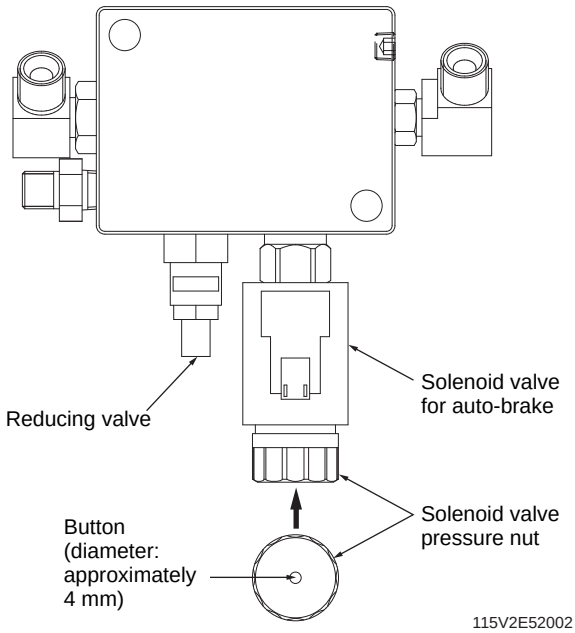
Brake circuit air bleeding procedure



Service brake valve



Auto brake solenoid valve



115V2E52002

⚠ WARNING

Unexpected movement of the machine may cause a severe accident. To prevent such an accident, take the following safety measures when performing air bleeding with the engine running.

- Park the machine on level ground.
- Apply the parking brake.
- Block the tires with chocks to prevent the wheel from moving.
- Determine the signals between the persons related to this work for engine starting to prevent an accident.
- When moving up the boom, install a safety column under the boom.
- Apply the articulate stopper.

IMPORTANT

Before bleeding the service brakes, it is important to remove all air from the brake valve manifold block, and all related valves.
These include the reducing valve and park brake valve. Failure to do this correctly will result in unsatisfactory brake modulation.

Perform the following to do this:

1. Verify that the wheels are securely blocked, and the articulation lock is in the "locked" position.

2. Charge the accumulator to full pressure, and then, shut off the engine.

3. Turn the parking brake solenoid valve release knob counterclockwise, then, back to neutral, five times at five-second intervals between each turn.
   Position the knob back to the normal position when finished.

4. Connect a clear vinyl tube [About 1.5 meters (5 ft.) long] to the brake pedal air bleeder nipple, and open the bleeder nipple.

5. Press the auto-brake solenoid valve release button five times at five-second intervals between each turn. Position the knob back to the normal position when finished.

6. Close the bleeder nipple and remove the vinyl tube from the brake valve.

Parking Brake Manual Release

If the park brake cannot be released due to an electrical problem, such as a failed park brake solenoid valve coil or electrical circuit, perform the following operation.

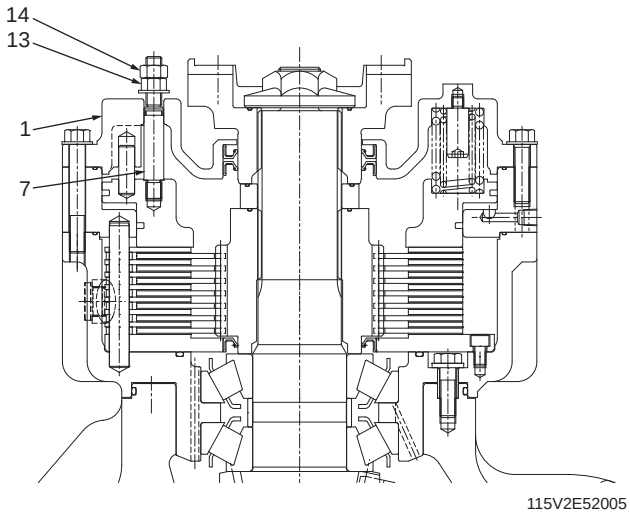
⚠ WARNING

Sudden accidental movement of the machine could result in serious injury or death.
Before manually operating the parking brake solenoid:
- Lower the boom and attachment to the ground.
- Place chocks on both sides of the tires.
- Be sure the machine is in neutral and engine is stopped.

⚠ WARNING

If the flange nuts are not returned to the original position, the parking brake is disabled and may result in a severe accident.
Make sure to return the flange nuts to the original position after manually releasing the parking brake.

(S/N 9001~9050)



1. Remove each of two places of lock nuts (14) from manual release bolt (7) and tighten flange nuts (13) until contacting with housing (1).
2. Furthermore tighten each of the two places of flange nuts (13) alternately and evenly.
   When flange nuts (13) are tightened until they feel rather tight, the brake is released.

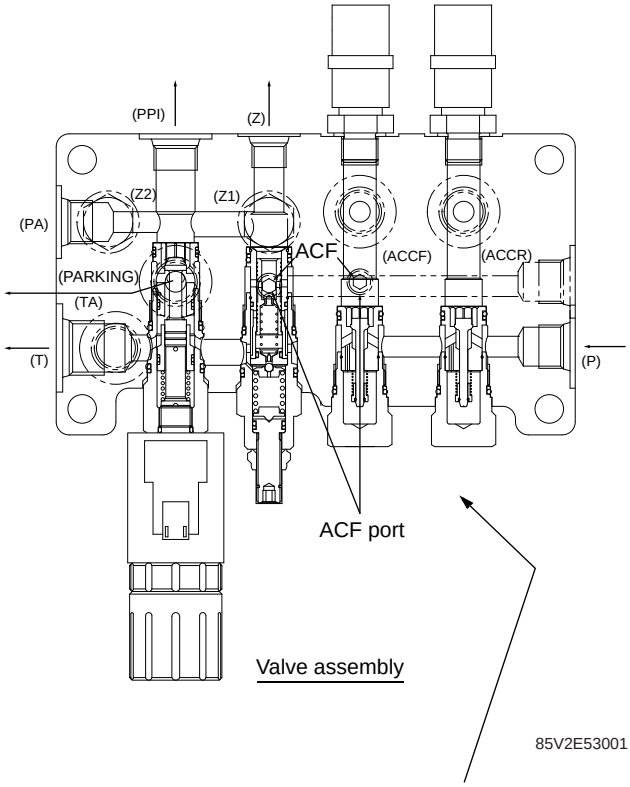
Reference:
After contacting with housing (1), approximately 3 or 4 additional turns of flange nuts (13) will release the parking brake.

Brake Circuit Oil Pressure

⚠ WARNING

Unexpected movement of the machine may cause an accident resulting in injury or death. Therefore, to provide repair service with the engine running, be sure to observe the following items:
- Park the machine on level ground.
- Apply the parking brake.
- Block the tires with chocks to prevent the tires from moving.
- Determine the signals between the service men.

Unloader valve setting pressure



85V2E53001

⚠WARNING

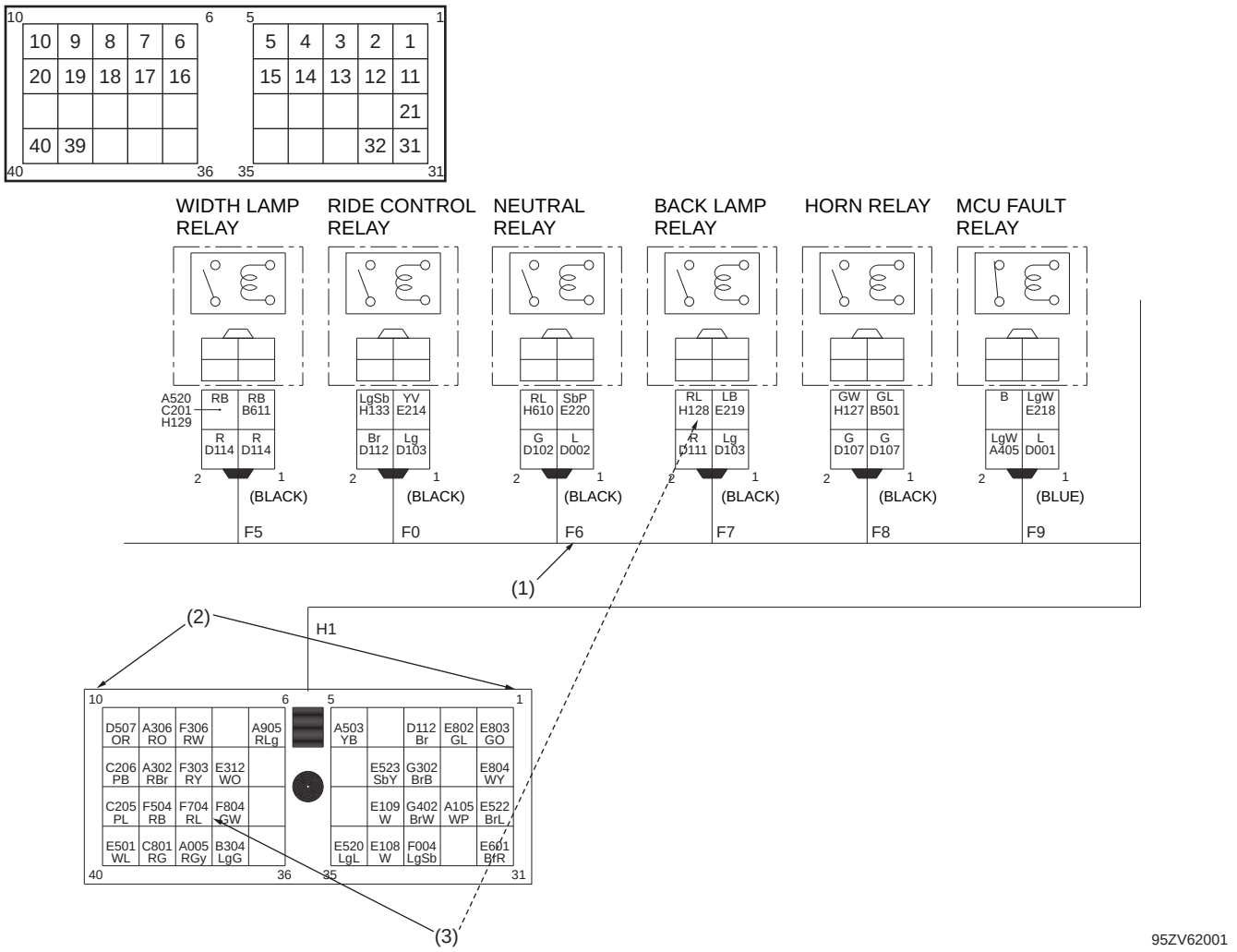
Injection Hazard
Depress brake pedal 80~100 times to completely discharge the brake accumulators prior to removing these test plugs.

135ZV52035

Brake line main pressure is regulated by the unloader valve.

How to Use Electrical Wiring Diagram

Example



The address method is used for electrical wiring diagrams. For this method, a symbol is attached to each connector and connector terminal in order to easily locate the other terminal where the other end of the cable is connected.

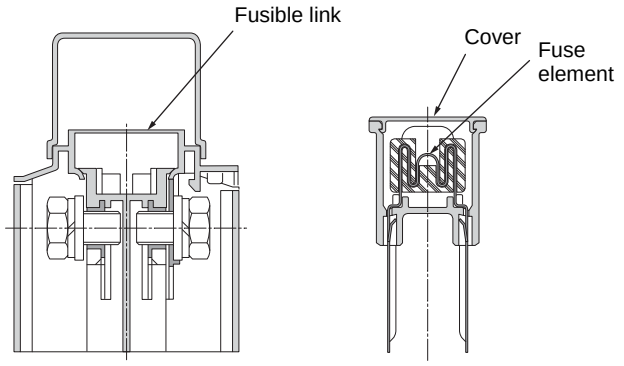
Example 1
Symbol under (or above) connector, such as F6:
Shows the address of the connector.

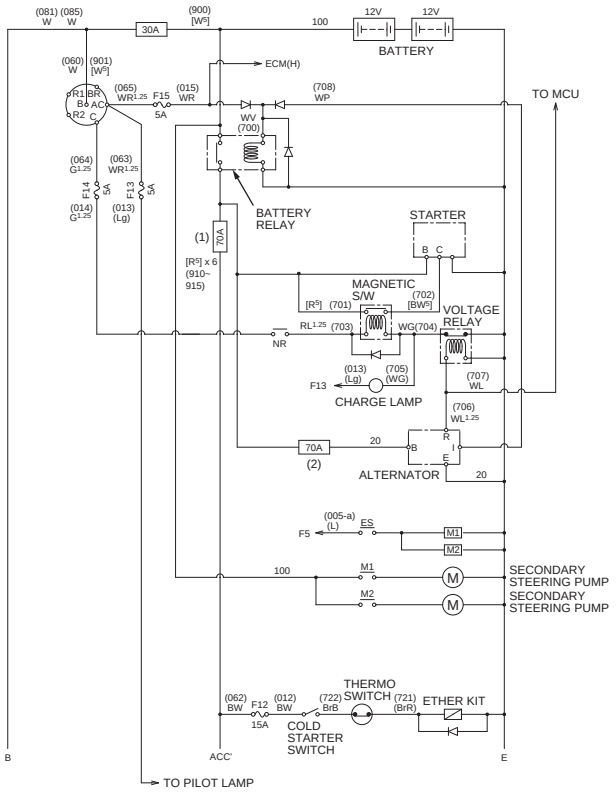
Example 2
Symbol at the multi-terminal connector, such as 1 and 10:
Shows the terminal number and the numbering direction.

Example 3
Checking the other connector terminal where F704 RL (item (3)) is connected:

1. F704
   Shows that the terminal is connected to the 4th terminal of the F7 connector.
   Check the description in the 4th terminal of the F7 connector (F704), it shows that the F704 terminal is connected to H128. This means that the 4th terminal of the F7 connector is connected to the 28th terminal of the H1 connector.
2. RL
   Shows the color of the wire "RL" represents that the insulation color is red, and "L" represents a blue stripe is on the red insulation.

Fusible link





The fusible link is located in the box as shown in the above figures. If excessive current flows through the starter switch or the electric line downstream of the starter switch due to shortcircuit, the fuse element will be blown to protect the circuit. The condition of the fuse element can be seen through the transparent cover. Determine the cause before replacing the fusible link.

For replacement of a fusible link, remove 2 bolts and pull it up.

Problems caused by blown fusible link

Fuse damaged	Problem (symptom)	
	During engine operation	During engine stop
30A	- Engine will stop automatically. - All the power for all electrical circuit will be OFF.	- All the electrical circuit will not function. - Engine can not be started.
70A (1)	- Horn [and opt. flasher] will operate. - All the others will not operate and the machine can not be operated. - Engine will not stop automatically but can be stopped with starter switch OFF.	- The same conditions as "During engine operation". - Engine can be started.
70A (2)	- The machine can be operated but the batteries can not be charged and the batteries will be discharged soon.	- The same conditions as "During engine operation".

IMPORTANT

When replacing fusible link, you may want to disconnect the battery negative terminal to avoid arcing out a circuit and damaging wire.
If so, after you reconnect battery, do following:

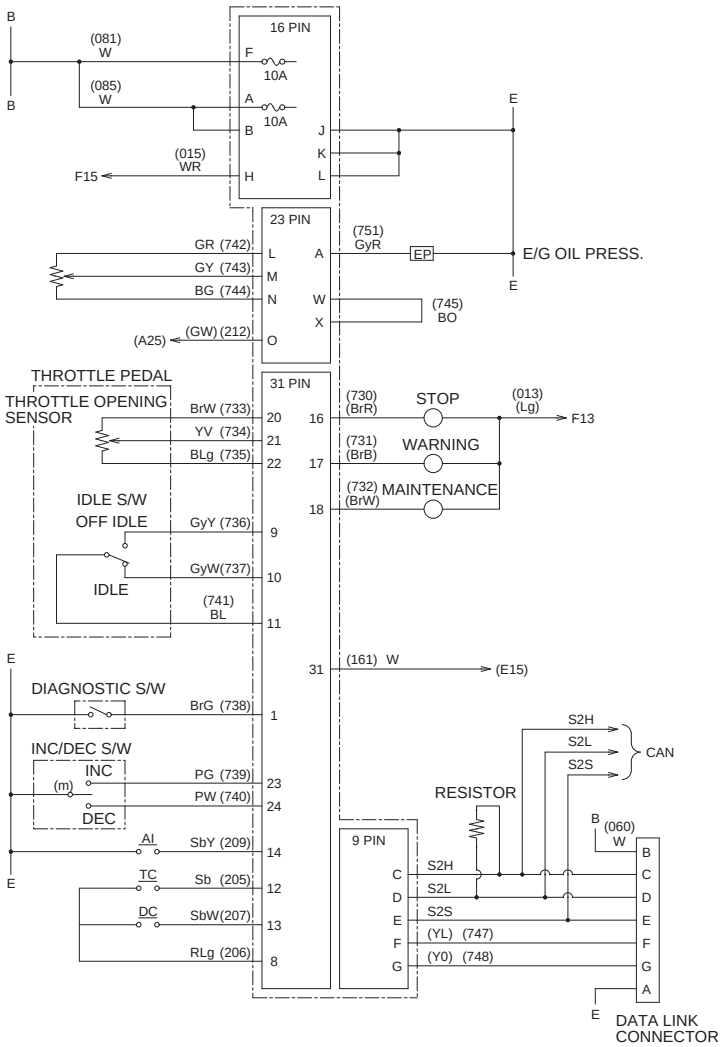
1. Turn on key
2. Press throttle pedal fully down and up 3 times in 5~6 seconds.
3. Turn off key switch.

ECM (Engine Controller)

Function of ECM

- Stops the engine.
- Operates the engine.
- Monitors the engine, and diagnoses it for faults.

Connection diagram



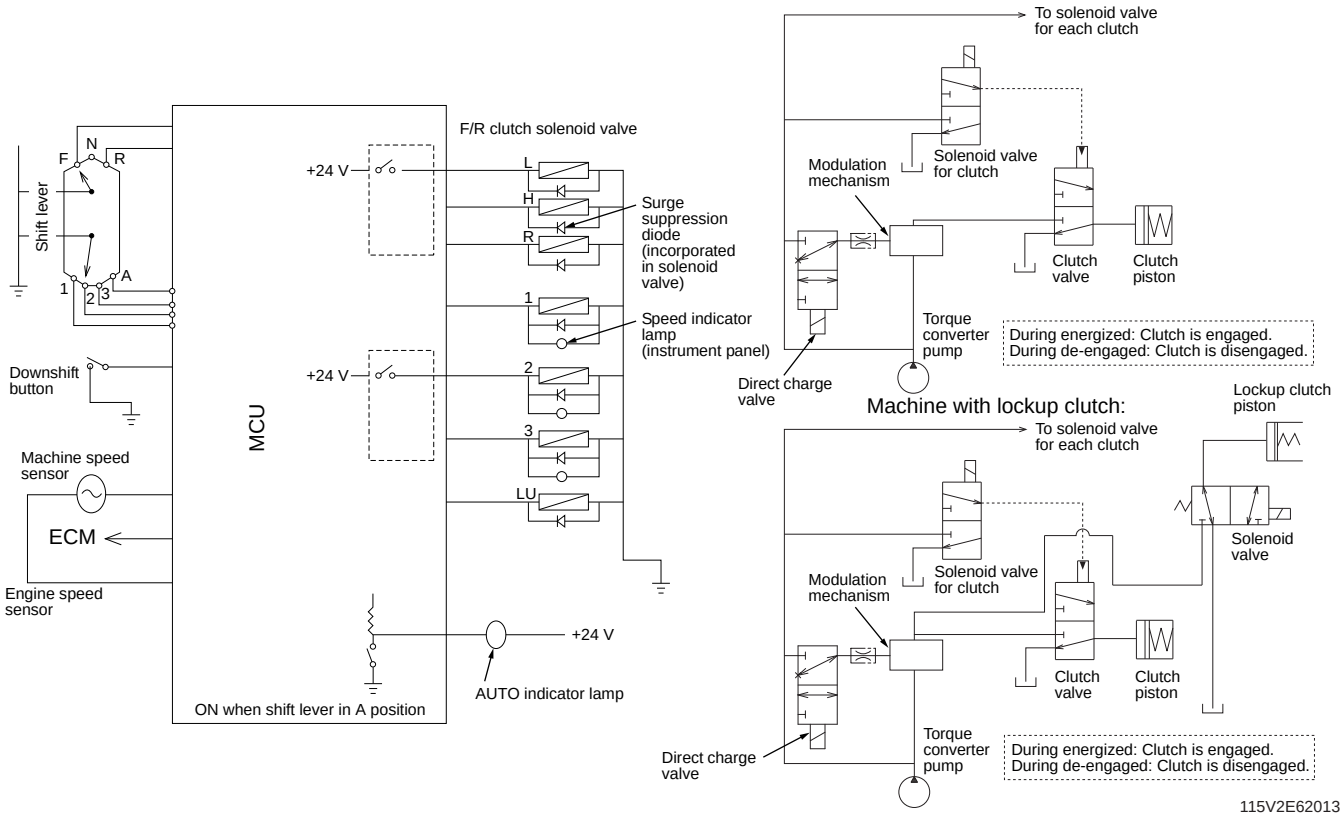
E/G ECM connection diagram

FAULT CODE/ LAMP	DESCRIPTION	QSB4.5 (60ZV-2)	QSB6.7 (70ZV-2) (70TMV-2)	QSC8.3 (80ZV-2)	QSC8.3 (85ZV-2)	QSM11 (90ZV-2)	QSM11 (92ZV-2)	QSX15 (95ZV-2)	QSK19 (115ZV-2)	QST30 (135ZV-2)
EG1117 None	Power Lost with Ignition ON - data erratic, intermittent, or incorrect.	○	○	○	○				○	
EG1358 Yellow	Accelerator Pedal Position Sensor 1 Circuit - voltage above normal or shorted high.								○	
EG1359 Yellow	Accelerator Pedal Position Sensor 1 Circuit - voltage below normal or shorted low.								○	
EG1361 Yellow	Remote Accelerator Pedal Position Sensor 1 Circuit - voltage below normal or shorted low.								○	
EG1376 Orange	Engine Camshaft Speed / Position Sensor - data erratic, intermittent, or incorrect.								○	
EG1595 Yellow	Remote Accelerator Pedal Position Sensor 1 Circuit - voltage above normal or shorted high.								○	
EG1597 Orange	Engine Control Module Critical Internal Failure - bad intelligent device or component.								○	
EG1845 Orange	Water in Fuel Indicator Sensor Circuit - voltage above normal or shorted to high source.								○	
EG1846 Orange	Water in Fuel Indicator Sensor Circuit - voltage below normal or shorted to low source.								○	
EG1852 Yellow	Water in Fuel Indicator - data valid but above normal operational range - moderately severe level.								○	
EG1911 Yellow	Injector Metering Rail 1 Pressure - above normal operating range.								○	
EG2185 Yellow	Sensor Supply Voltage #4 Circuit - shorted high.	○	○	○	○				○	
EG2186 Yellow	Sensor Supply Voltage #4 Circuit - shorted low.	○	○	○	○				○	
EG2215 Yellow	Fuel Pump Delivery Pressure - data valid but below normal operational range - moderately severe level.								○	
EG2249 Yellow	Fuel Pump Delivery Pressure Sensor Circuit - shorted low.	○	○	○	○				○	
EG2261 Orange	Fuel Pump Delivery Pressure - data valid but above normal operational range - least severe level.								○	
EG2262 Orange	Fuel Pump Delivery Pressure - data valid but below normal operational range - least severe level.								○	
EG2265 Yellow	Fuel Priming Pump Control Signal Circuit - shorted high.			○	○				○	
EG2266 Yellow	Fuel Priming Pump Control Signal Circuit - shorted low.			○	○				○	
EG2311 Yellow	Fueling Actuator #1 Circuit Error - condition exists.	○	○	○	○				○	
EG2321 None	Engine Speed Sensor #1 - data erratic, intermittent, or incorrect.	○	○	○	○					
EG2322 None	Engine Speed Sensor #2 - data erratic, intermittent, or incorrect.	○	○	○	○					
EG2697 Orange	Accelerator Pedal Position Sensor Circuit and Idling Position Detection Switch Circuit - data erratic, intermittent, or incorrect.								○	
EG2963 None	Engine Coolant Temperature High - warning.								○	
EG2964 None	Intake Manifold Temperature High - warning.								○	
EG2973 Yellow	Intake Manifold Pressure Sensor Circuit - data erratic, intermittent, or incorrect.	○	○	○	○					

(09D20E)

Machine control unit (MCU) function

Forward/reverse (F/R) shifting and speed change



115V2E62013

Each clutch has one solenoid valve for transmission control. When electric current flows through the solenoid valve, the clutch oil is fed into the clutch piston chamber through the modulation mechanism and the clutch valve. When the piston operates, the clutch is engaged. When the current stops flowing through the solenoid valve, the oil is drained from the clutch piston chamber through the clutch valve, and the clutch is disengaged.

Input detection

When the shift lever is set to the F (forward) position, electric current for input detection signal is sent from the MCU to the grounding circuit via shift lever contact F. The MCU, therefore, judges that the shift lever is set to the F (forward) position. There is no shift lever contact for the R (reverse) input circuit and electric current will not flow.

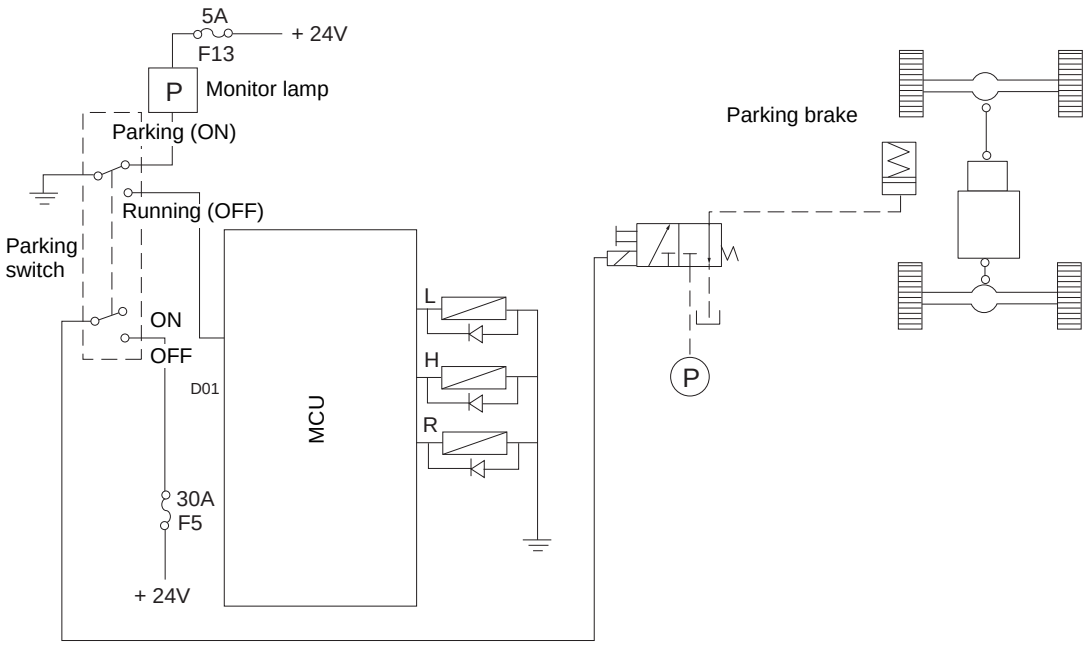
For the speed change by the shift-up/shift-down signal, the MCU judges the set speed in the same way as described above.

Operation error preventive function (Simultaneous input of two or more commands)

If both the forward and reverse commands are input at the same time due to a problem, the transmission is set to the neutral position. In addition, if two or more speed commands are input at the same time, the speed range previously engaged is selected.

When the starter switch is at OFF position, if both the forward and reverse commands are input at the same time due to a problem, the engine does not start even if the starter switch is placed in the start position. This is because the neutral relay does not work.

Parking brake



95V2E62014

The parking brake solenoid valve activates the parking brake.

Parking switch ON:

When the power of the solenoid valve is turned off, no oil will be fed to the piston chamber of the parking brake. The piston presses the brake disc with the spring force to actuate the parking brake. If the transmission shift lever is set to the forward or reverse (F or R) position, the buzzer will sound and the clutch will not be engaged.

Parking switch OFF:

When the power of the solenoid valve is turned on, oil will be fed into the piston chamber, the spring is compressed, and the parking brake is released.

Parking brake operation

	Parking switch	Monitor lamp	Buzzer	Parking brake solenoid valve
Parking *	"Parking" position (pulled up)	(P)	Sounds when shift lever is set to F or R	No electric power supply
Running	"Running" position (pushed in)	Off	No buzzer	Electric power supply

*When the parking switch is set to "parking", the forward or reverse clutch is disengaged and set to neutral.

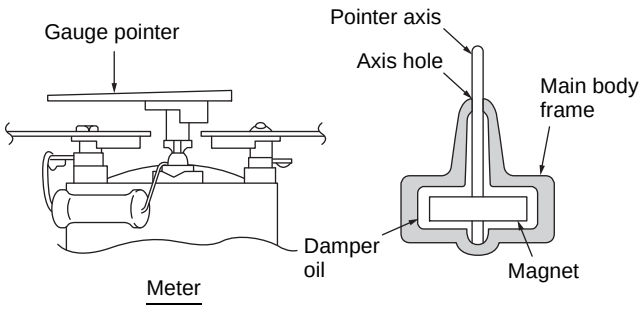
Operation monitor lamps

No.	Monitor item	Monitor lamp		Lighting condition	Remarks
		Lighting color	Symbol		
1	Parking	Red	(P)	When parking brake switch is set to ON	
2	Declutch	Green		When declutch switch is set to ON	
3	Working light	Green		When working light (rear) switch is set to ON	
4	K-Lever indicator	Green		When K-Lever system is ON.	
5	Turn signal indicator (left)	Green		When turn signal lever (left) is actuated	
6	Turn signal indicator (right)	Green		When turn signal lever (right) is actuated	
7	High beam	Blue	≡D	When head lamp is set to high beam	
8	Auto shift	Green	AUTO	When transmission shift lever is set to automatic position	
9	Neutral	Green	N	When transmission shift lever is set to neutral position	
10	Transmission status	Yellow	YELLOW LED	When transmission shift lever is set to corresponding gear (1~4)	
11	Reversal fan	Green		When the reversal fan switch is ON.	

Caution on storage of individual instrument panel

IMPORTANT

When storing the instrument panel individually, make sure that the panel face (transparent face) faces upward.
If the panel face faces below the vertical direction, the damper oil may leak from meter pointer axis holes.



70ZV62039

From Fault log monitor to Input/Output monitor:

Press both the [◁ (step back)] and [▷ (step forward)] buttons at the same time.

D		I	N	P	U	T		0	1	2	3	4	5	6	7
1								0	0	0	0	0	1	0	0

80V2U62004

With the shift lever in "Neutral" and "Automatic", the screen should appear as above.

This screen shows the "Input and Output" signal data.

From Input/Output monitor to Parameter setting monitor:

Press both the [◁ (step back)] and [▷ (step forward)] buttons at the same time.

D	E	C	E	L	E	R	A	T	I	O	N				
S	P	E	E	D					1	5	k	m	/	h	

80V2U62005

Display should appear similar to above.

This screen shows "Parameter settings" and may be used to make changes in an already validated parameter.

From Parameter setting monitor to Specification setting monitor:

Press both the [◁ (step back)] and [▷ (step forward)] buttons at the same time.

P	R	O	G	R	A	M		N	o	.					
X	X		X	X	X	X	X	X		X	X	X	X	X	X

70V2U62017

Display should appear similar to above.

This screen shows "Specification settings" and may be used to make changes in a MODM to validate or invalidate a given parameter; effectively turning ON or OFF the function of an option.

From Specification setting monitor to Information monitor:

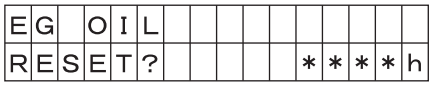
Press both the [◁ (step back)] and [▷ (step forward)] buttons at the same time.

O	U	T	S	I	D	E		T	E	M	P				
												9	8	°	F

80V2U62002

While in default temperature screen, the password input screen can be seen by simultaneously pressing the [◎] and [✕] buttons. When the password input is finished, fuel consumption can be seen. Pressing [◎] button toggles between metric and US values.

Example: Engine oil



90ZV-262037

For setting the replacement interval other than the standard replacement interval, follow the procedure below:

- [≫] **** +50
- [≫] **** +100 (2 seconds or more)
- [≪] **** –50
- [≪] **** –100 (2 seconds or more)

Press the [≫ (step forward)] button once to add "50" hours. Press the [≫ (step forward)] button twice to add "100" hours. Press the [≫ (step forward)] button three times to add "150" hours. "50" hours is added every time the [≫ (step forward)] button is pressed.

Every time the [≪ (step back)] button is pressed, "50" hours is subtracted.

When the [≫ (step forward)] button is pressed and held for 2 seconds or more, "100" hours is added continuously. It means that "100", "200", "300" hours ..... is added in 100 hour increments.

When the [≪ (step back)] button is pressed and held for 2 seconds or more, "100" hours is subtracted continuously in the same manner.

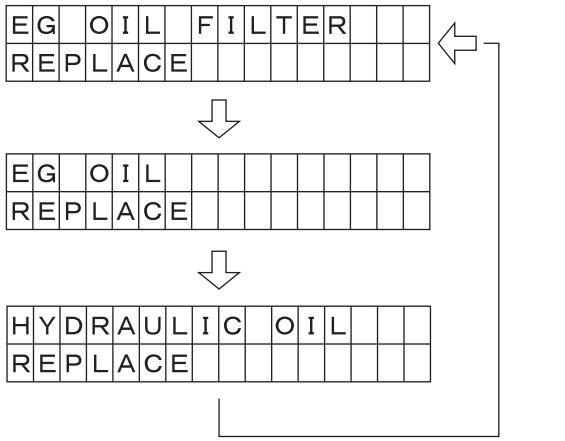
After setting the replacement interval, press and hold the [◎] button for 2 seconds or more.

The replacement interval is reset, and the display returns to the replacement monitor screen again.

Replacement interval pop-up

When the remaining time until the next replacement interval reaches " 0 " (or 0 hours), the replacement pop-up appears and flashes in the display window.

90ZV-262038



90ZV-262039

When two or more replacement pop-ups occur at the same time, the corresponding items flash in turn.

After the remaining time for the next replacement reaches " 0 ", the corresponding pop-up appears up to three times when the starter switch is ON.

(The MODM software version is displayed for 3 seconds, and then the replacement pop-up flashes.)

When the [≫ (step forward)] button, [≪ (step back)] button, [✕] button or [◎] button is pressed, it returns to the previous screen again.

After replacing the corresponding filter or oil, return to the timer reset screen and set the replacement interval. Refer to the replacement interval set (timer reset) procedure above.

Next, by pressing the [⩥ (step forward)] button, the following screen is seen.

B	R	K		M	A	I	N		P	R	E	S	S	2
							1	1	.	7	9	5	M	P	a

80V2U62035

Note
Brake main pressure 1 is accumulator oil pressure for rear accumulator which serves only the rear brake circuit. Brake main pressure 2 is accumulator oil pressure for front accumulator which serves the front brake circuit and all pilot derived pressures; these are pilot oil pressure for the pilot control valves, auto brake, park brake release, etc. The actual real-time pressures are shown in these fields.

Next, by pressing the [⩥ (step forward)] button, the following screen is seen.

B	R	K		P	E	D	A	L		P	R	E	S	S	
								1	.	6	2	5	M	P	a

90ZV-262019

You have now navigated through the entire "Current Output Monitor" part of the "Input and Output Monitor" section.

All of the aforementioned screens can be seen in reverse order by using the [⩤ (step back)] button. Holding this button in for longer than 2 seconds will take you to the input signal monitor screen section.

3. Output signal monitor (D1~D6)

This monitor displays the ON/OFF status of the transmission forward/backward solenoid valves, speed range solenoid valves, indicator lamps and warning lamps on the instrument panel, etc.

There are six output groups from OUTPUT 1 to OUTPUT 6.

Each group has eight items from item 0 to 7.

When output signal is ON, "1" is displayed under corresponding item number.

When output signal is OFF, "0" is displayed under corresponding item number.

Refer to "MODM: Input/Output Monitor - Input/Output Signal Correspondence Table" page 92-57.

Next, by pressing the [⩥ (step forward)] button for 2 seconds or longer will show the following screen.

D		O	U	T	P	U	T	0	1	2	3	4	5	6	7
1								0	1	0	0	1	0	0	0

80V2U62036

This shows the 2nd speed solenoid coil and the forward coil outputs have been applied, as the transmission is in forward and automatic.

1st, 3rd, 4th, reverse, high, and autobrake solenoid coils are not energized and show no application signal.

Next press the [⩥ (step forward)] button to show the following screen.

D		O	U	T	P	U	T	0	1	2	3	4	5	6	7
2								0	0	0	0	0	0	0	1

80V2U62037

Again, note that all values except the last are 0, and only the brake lamp output is in the "ON" position.

Parameter change

The parameter values can be changed when the both conditions below are satisfied:

The engine is stopped (starter switch is ON).
The parking switch is ON.

A parameter value can be changed, however, only when the corresponding item is set to "VALID" in the specification setting monitor. (Refer to page 92-54)

Ride control setting 1

R	I	D	E		C	O	N	T	R	O	L				
O	N							*	*	.	*	k	m	/	h

90ZV-262021

When the corresponding item is set to "INVALID", the parameter screen is not displayed. (It is skipped to the next screen.)

Calendar

D	A	T	E					Y	Y	/	M	M	/	D	D
T	I	M	E					h	h	:	m	m	:	s	s

90ZV-262022

Changing date and clock values:

These values can be changed by doing the following.

Press and hold the [◎] button for 2 seconds or more on the parameter setting screen to display the parameter change screen.

The cursor flashes in a 1-second cycle (flashes on for 0.5 second).

Press the [◎] button to move the cursor.

The cursor moves to the right. When the cursor reaches the right end in the upper line, pressing [◎] button will move it to the left end in the lower line. When the cursor reaches the right end in the lower line, pressing [◎] button will move it to the left end in the upper line. The cursor skips digits which cannot be changed.

Cursor movement:

Moving to the right → Right end in the upper line → Left end in the lower line → Right end in the lower line → Left end in the upper line

Press the [(step forward)] button to add "1" to a numerical value. The numerical value will increase as you press the [(step forward)] button as follows.

0 → 1 → 2 ..... 9 → 0

Press the [(step back)] button to subtract "1" from a numerical value. The number decreases as follows.

9 → 8 → 7..... 0 → 9

After changing parameter values, press and hold the [◎] button for 2 second or more to finalize the input values and return to the parameter setting screen.

Press the [✕] button to return to the parameter setting screen without changing parameter values.

The date & time sequence reads as shown.

DATE	YY / MM / DD
TIME	hh : mm : ss

Y=year
M=month
D=day

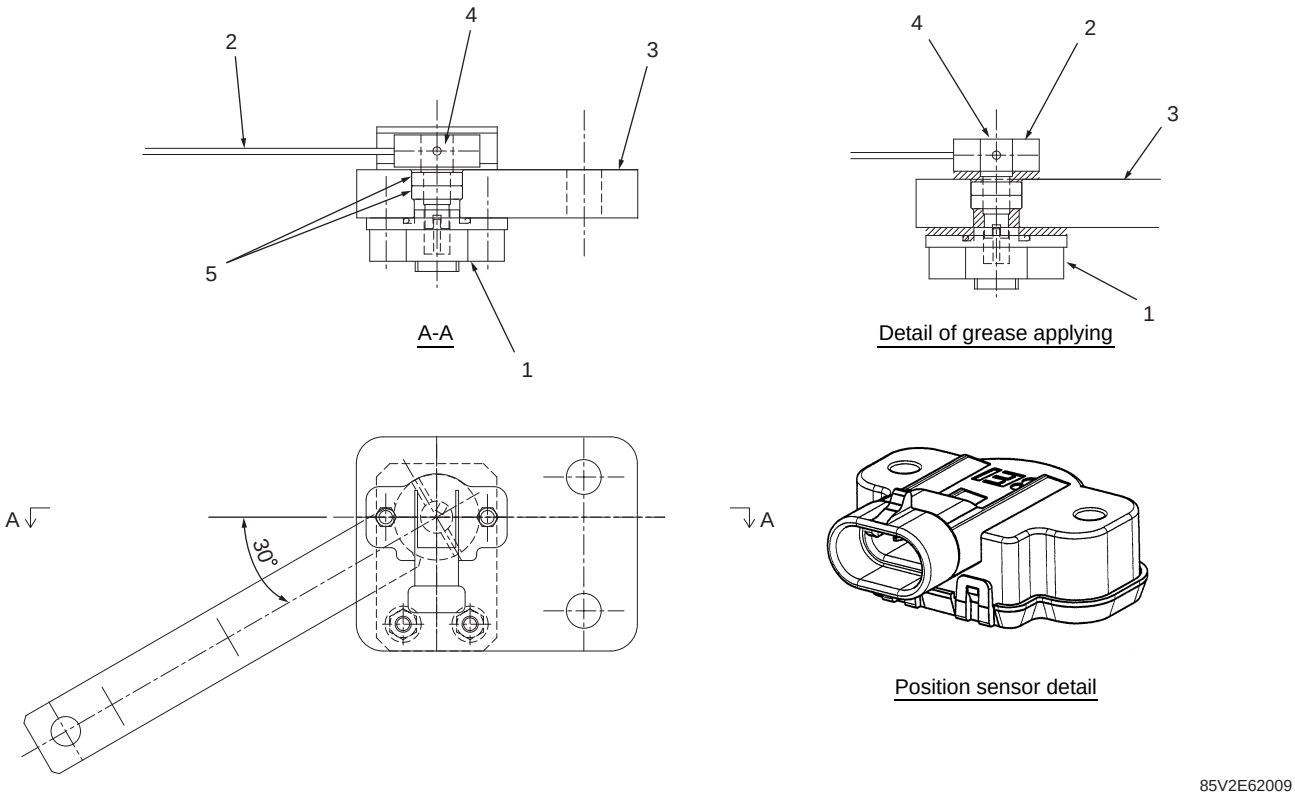
h=hour
m=minute
s=second

Example:

DATE	06 / 07 / 12 = July 12, 2006
TIME	20 : 15 : 11 = 8:15:11 pm

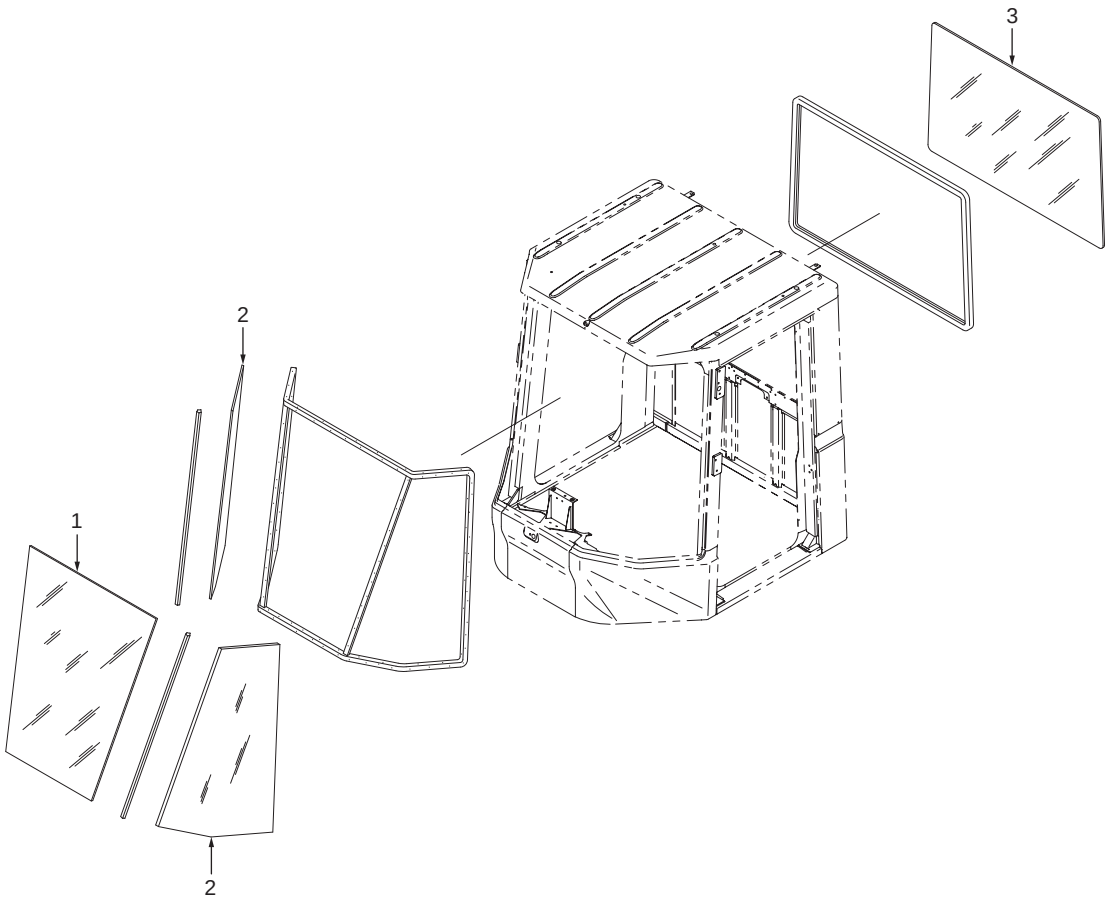
Note
Failure to enter the values correctly will make the clock give the wrong time, and the date to read incorrectly in all of the dependent functions, such as fault code messages, etc.

Sensor assy



1. Position sensor
2. Link
3. Plate
4. Shaft
5. Ball bearing

Glass

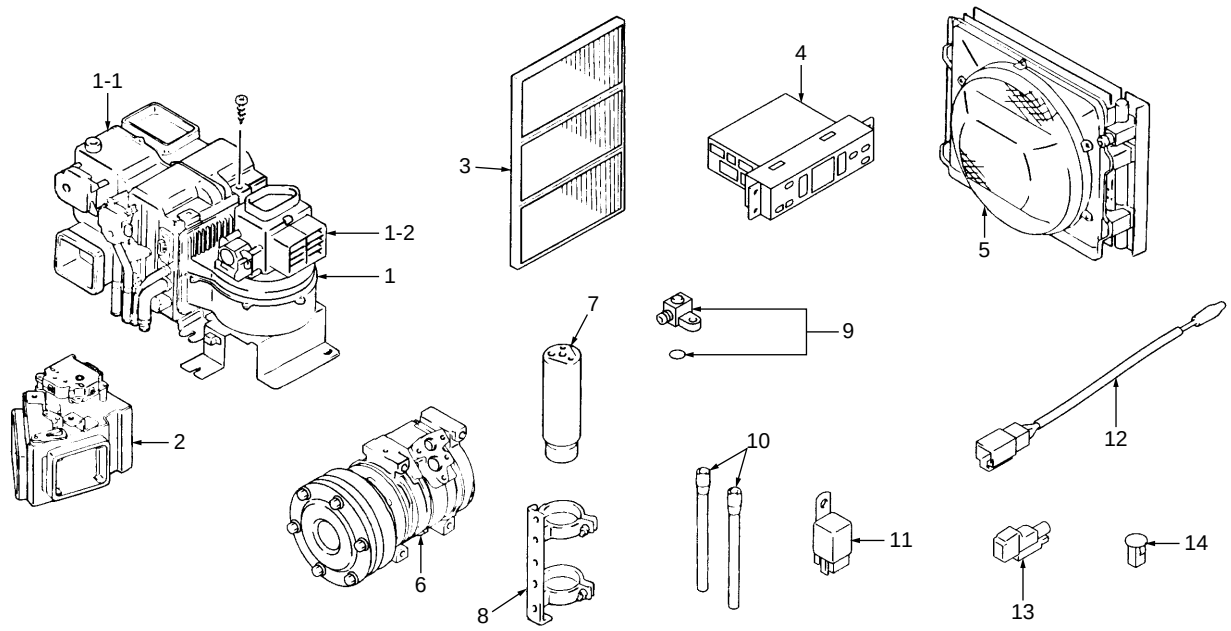


70V2E72001

1. Front glass
2. Front side glass
3. Rear glass

Air Conditioner

Air conditioner components



97ZV72020

1. Air conditioner assembly
   1-1 Cooling unit assembly
   1-2 Blower assembly
2. Air distributor assembly
3. Recirculating air filter
4. Control panel
5. Condenser assembly
6. Compressor assembly
7. Receiver drier
8. Receiver drier bracket
9. Joint
10. Drain hoses
11. Relay
12. Thermistor* (inside air sensor)
13. Thermistor* (outside air sensor)
14. Solar sensor (insolation sensor)

    * or thermal resistor

Air conditioner specifications (system performance)

Cooling system performance

Cooling capacity	4.65 kw (15,881 BTU) ± 10%
Air quantity	550 m^3/h (720 yd^3/h) ± 10%
Rated voltage	DC 24 V
Power consumption	345 W (14.4 amps) ± 10%

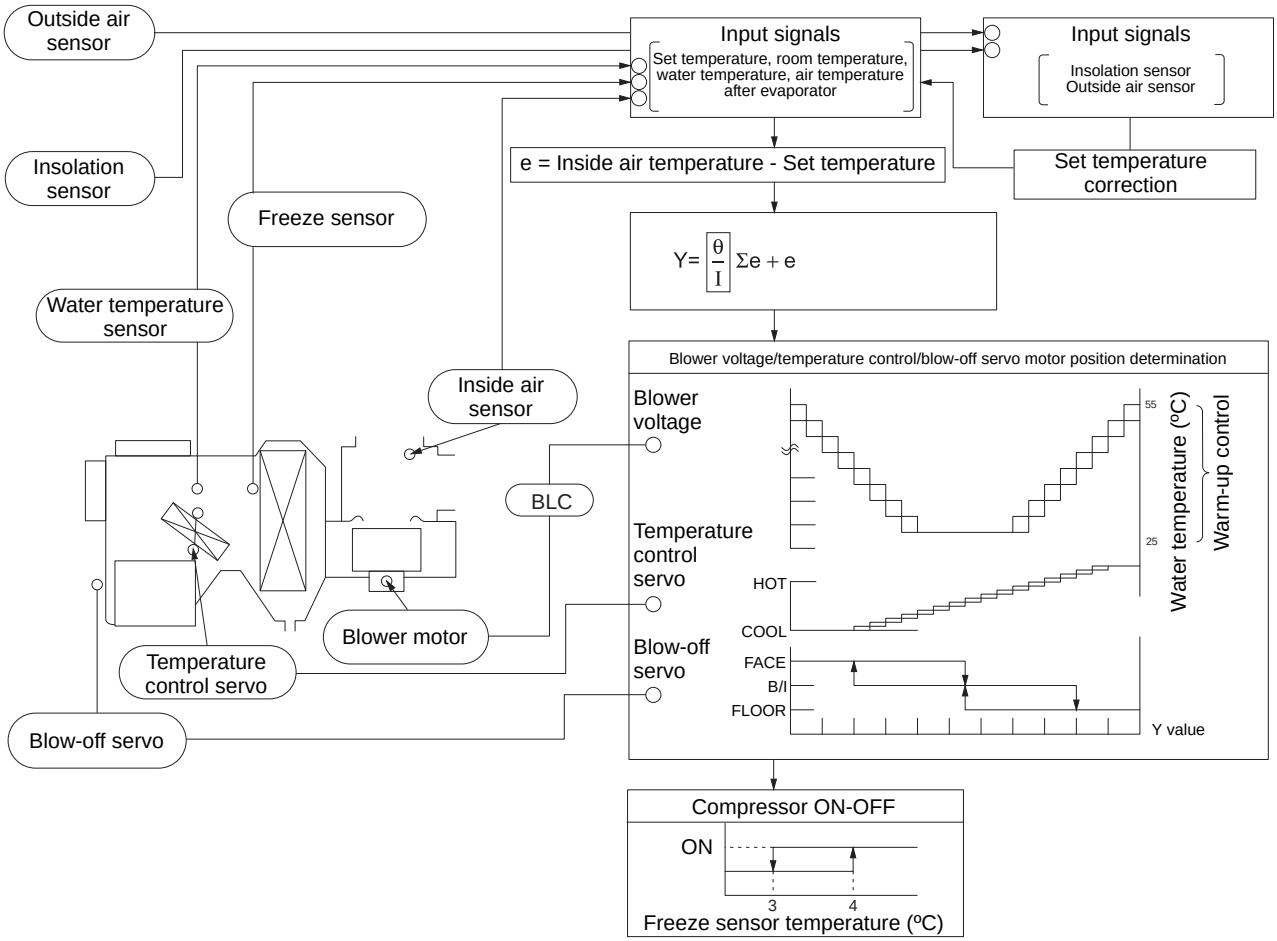
Heating system performance

Heat radiation quantity	5.2 kw (17,759 BTU) ± 10%
Air quantity	380 m^3/h (500 yd^3/h) ± 10%
Rated voltage	DC 24 V
Power consumption	170 W (7.1 amps) ± 10%

(Difference in temperature: 65ºC, water flow rate: 6 L/min)

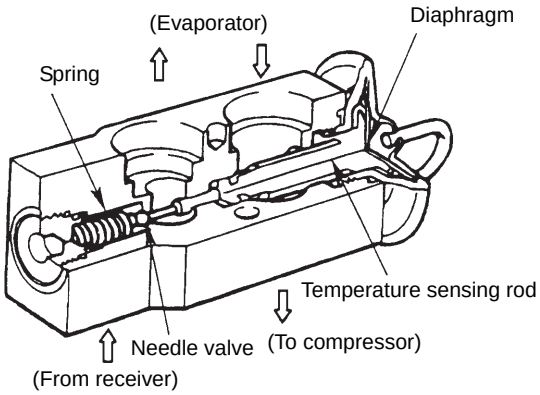
Electrical circuit

Control schematic drawing



95ZVE72018

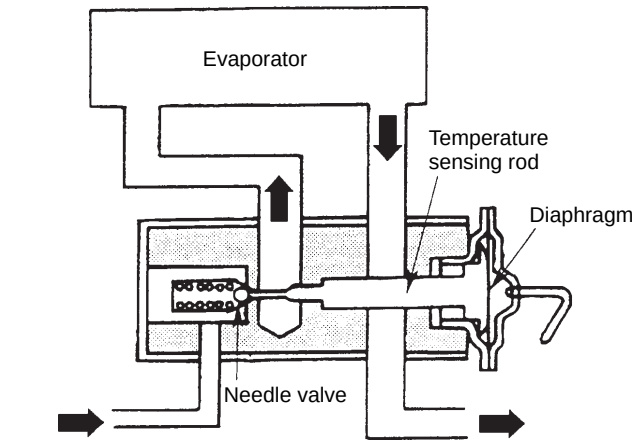
Expansion valve (box type)



Structural drawing of box type expansion valve

97ZV72049

Expansion valve operation



97ZV72050

The expansion valve offers the following two functions.

1. By injecting the liquid refrigerant at high temperature and high pressure which has gone through the receiver from a small hole, the expansion valve expands dramatically the liquid refrigerant into mist refrigerant at low temperature and low pressure.

2. Promptly in accordance with the vaporized status of the refrigerant inside the evaporator, the expansion valve adjusts the refrigerant quantity.
   In order to ensure that the evaporator offers its full performance, the liquid refrigerant should be kept in a state in which it deprives heat of the adjacent area and its evaporation is always completed at the exit of the evaporator.
   To realize this, the expansion valve automatically adjusts the refrigerant quantity in accordance with fluctuation of the temperature inside the cab (cooling load) and fluctuation of the rotation speed of the compressor.
   The expansion valve consists of a needle valve, a diaphragm and a temperature sensing rod.
   The temperature sensing rod detects the temperature of the refrigerant which has gone through the evaporator, and transfers the detected temperature to the refrigerant gas chamber located in the upper portion of the diaphragm chamber.

The temperature sensing rod detects the temperature of the refrigerant, and transfers the detected temperature to the refrigerant gas chamber.

The gas pressure changes in accordance with the detected temperature, the temperature sensing rod directly connected to the diaphragm is moved, then the needle valve opening is adjusted.

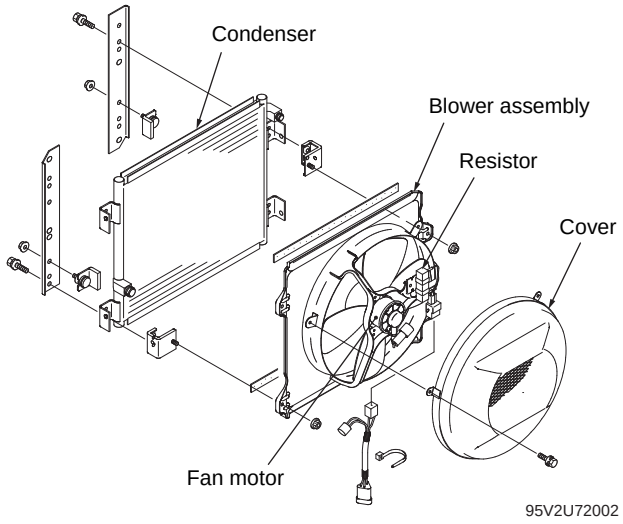
- When the temperature at the exit of the evaporator is low or when cooling load is small, following occurs.

The gas pressure inside the diaphragm chamber becomes low, the volume decreases, the temperature sensing rod moves to the right, and the needle valve is closed.

- When the temperature at the exit of the evaporator is high or when cooling load is great, following occurs.

The gas pressure inside the diaphragm chamber becomes high, the volume increases, the temperature sensing rod moves to the left, the needle valve is opened, and more quantity of refrigerant is supplied to the evaporator.

Condenser unit



Each condenser unit consists of a condenser, a condenser fan motor and a resistor. Two condenser units are arranged in series with the piping.

The condenser units cool down the gaseous refrigerant at high temperature and high pressure sent from the compressor, and change it into liquid refrigerant.

Condenser

The condenser consisting of tubes and fins cools down the gaseous refrigerant at high temperature and high pressure (70ºC, 1,618 kPa (16.5 kgf/cm^2)) (158ºF (235 psi)) sent from the compressor, and change it into liquid refrigerant during passing tubes.

Condenser fan motor

The condenser fan motor used to cool down the condenser is mounted on the condenser together with a fan shroud.

Condenser specifications

Voltage	DC 24 V
Power consumption	80 W (3.4 amps) x 10%
Air quantity	1,750±10 m^3/Hr (61,800"^{3}/Hr)
Number of rotations of motor	2,200 min^{-1} (rpm)

Work procedure

The refrigerant charging process is mainly divided into "refrigerant evacuation procedure" and "gas charging procedure" as shown below.

Refrigerant evacuation procedure

The "refrigerant evacuation process"* eliminates moisture present inside the cooling circuit. If the moisture remains inside the circuit, it may cause varied problems even if its quantity is extremely small: The moisture may freeze inside the expansion valve during operation, and may block the circuit or generate oxidation. To prevent such problems, the refrigerant containing air inside the cooling circuit should be evacuated, and the moisture inside the circuit should be boiled and evaporated so that all moisture is eliminated before pure refrigerant is recharged into the circuit.

*May be referred to as "air evacuation procedure" since it contains air which also contains water that can cause system damage as noted.

Gas charging procedure

The "gas charging procedure" charges the refrigerant as gas into the circuit while in a vacuum state. The gas charging process not only affects the cooling ability of the air conditioner but also affects the system component life.*

If the refrigerant is charged too quickly or in a liquid state, pressure inside the circuit may become extremely high and the cooling ability may deteriorate. If the refrigerant charging volume is too low, the lubricating oil for the compressor may not circulate smoothly and compressor pistons may seize and lock up the compressor.

Because the gas charging process involves high pressure gas, it is extremely dangerous if it is not done correctly.

Observe the work procedure shown below and the cautions, and charge the refrigerant correctly.

***Note**
Liquid charging destroys a compressor. Never permit entry of liquid refrigerant.

Charging procedure

1. Charge the system with the required amount of gas by weight, and check for leaks by letting the HVAC system sit static and permit pressure to equalize.
2. Check the system pressure in comparison to the ambient temperature. If acceptable, go to the next step (3).
3. Turn on the engine, run at 1,200~1,500 rpm.
4. Turn on the HVAC air condition system, making sure that the heat is off and A/C is set with fan on high.
5. Let the HVAC system run on coldest setting until all parts are cold saturated; this should take about 30 minutes or more.
6. Check the temperature that is coming from the vents of the HVAC system inside the cab. Check the performance in the operating pressure and temperature chart.
7. Either remove or install more refrigerant depending upon the findings.

Observe the work procedure and cautions shown below, and charge the refrigerant correctly.

The system should operate within about 5% of the parameters. Be sure that the condenser is clear, evaporator is clean and the fans are all working as they should with good airflow in the system.

Note
If the inside of the cab become cold during the charging process, the compressor magnetic clutch turns off and system charging is disabled.

When charging, completely open the cab doors.

This will keep the system from turning off and on.

4. Guidelines to determine quantities of refrigerant charge

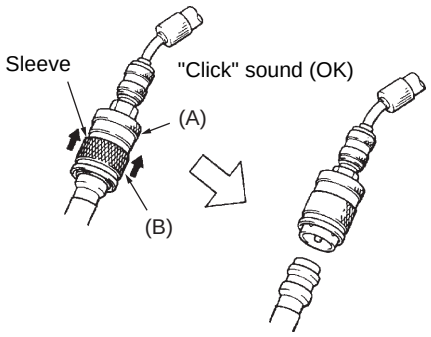
   Use the following table to determine the refrigerant charge quantity.

Item	Criteria
Doors	Completely open
Temperature control switches	Maximum cooling
Blower speed	High
Inside/outside air selection	Inside air
Number of rotations of engine	1,500 min^{-1}
Air conditioner switch	ON
Pressure on high pressure side	1,862 kPa (19 kgf/cm^2) (270 psi) or less

IMPORTANT

- If outside air temperature is high (40ºC/104ºF or more) or if the pressure on the high pressure side is 1,862 kPa (19 kgf/cm^2) (270 psi) or more when the judgement condition above is set, perform the following so that the pressure becomes 1,862 kPa (19 kgf/cm^2) (270 psi) or less, then check the refrigerant quantity.
  - Close the doors completely, and set the blower fan to the low speed (by pressing the Lo switch).
  - Use a shaded area or a place indoors away from sunlight.
- If you turn on the air conditioner while the refrigerant quantity is extremely low, lubricant in the compressor may be insufficient and a failure such as seizure of the compressor may occur. Never do this.
- If the refrigerant quantity is over charged, cooling may be insufficient or the pressure inside the circuit may become abnormally high (which is dangerous). Never do this.

5. Disconnecting the gauge manifold

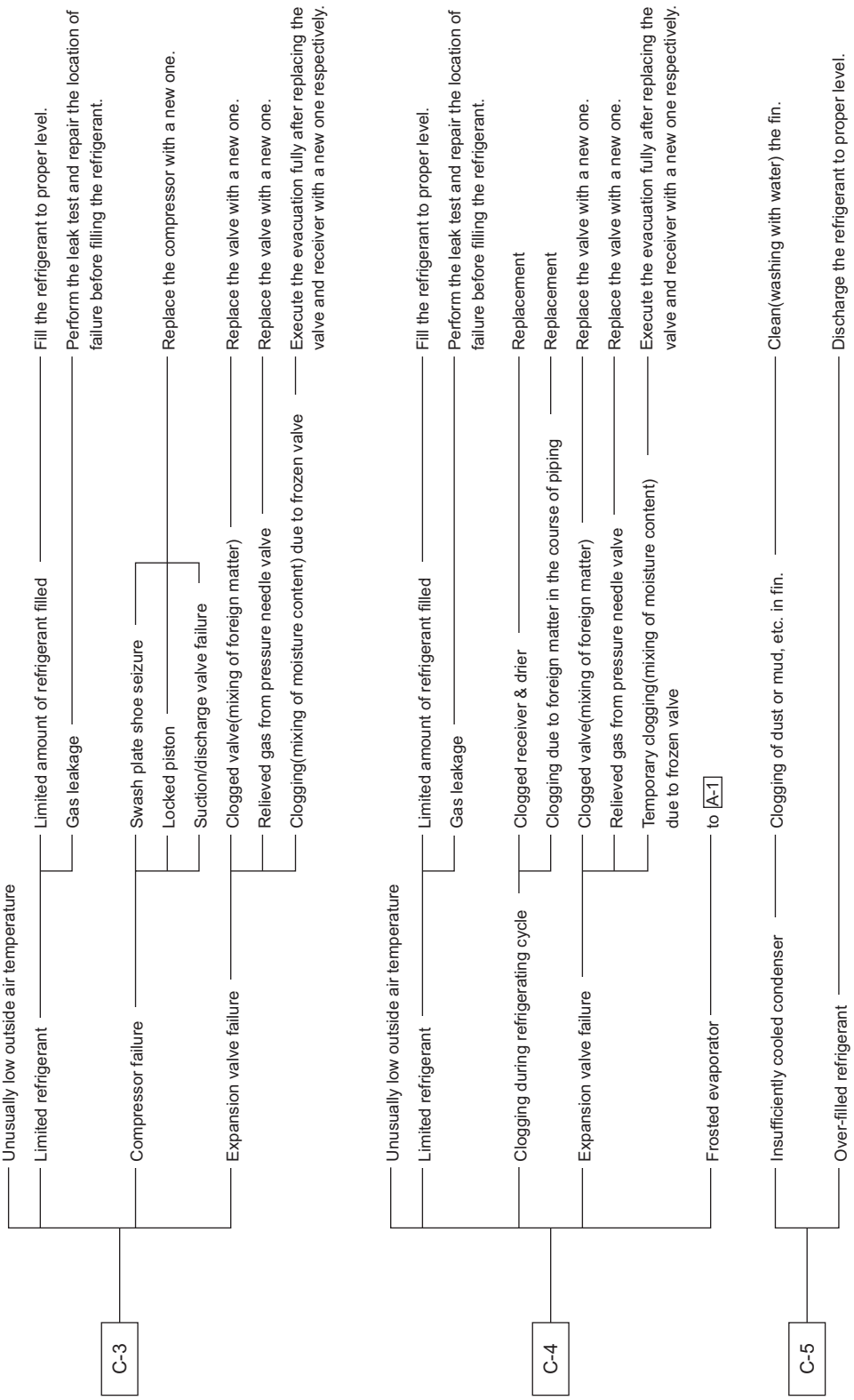


97ZV72081

After inspecting the refrigerant charge, disconnect the charging hose from the high and low pressure charging valves using the following procedure.

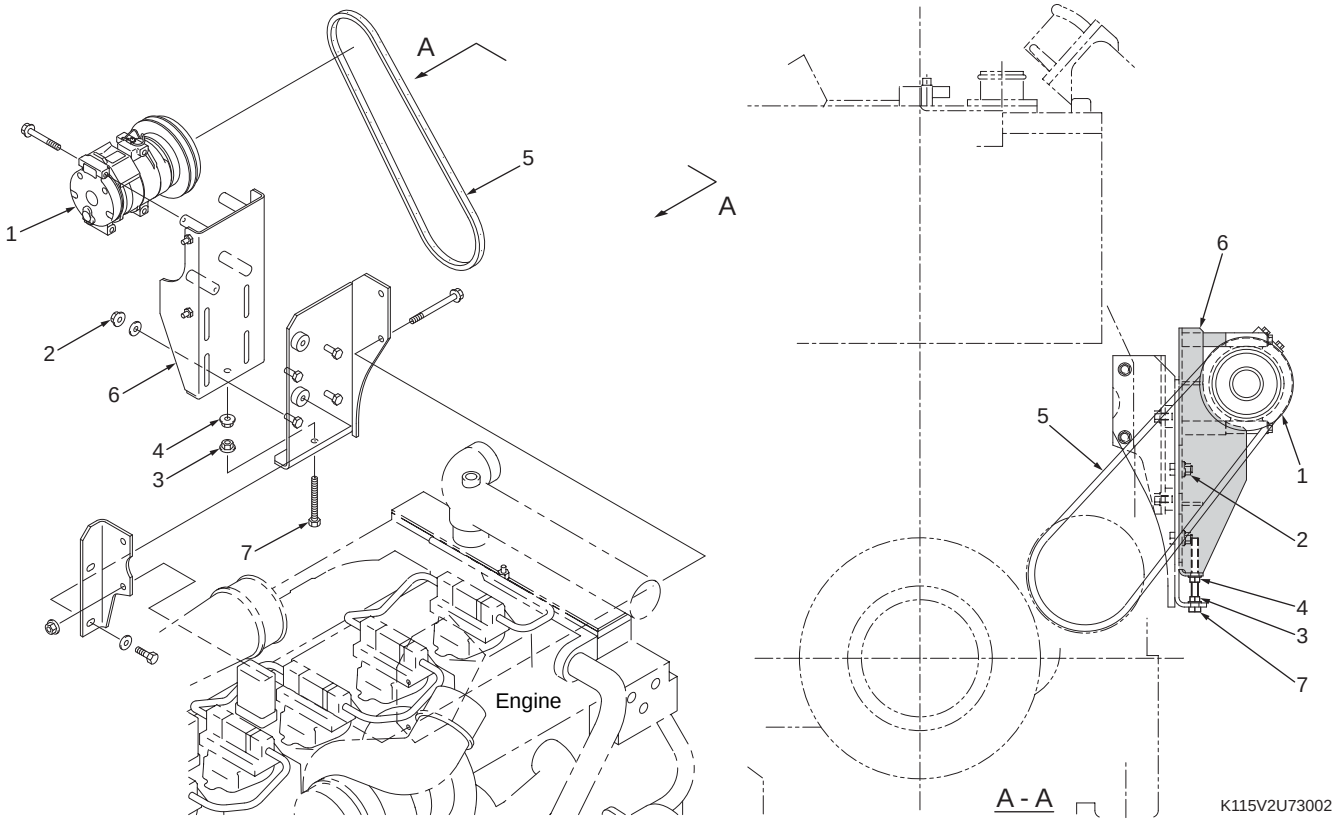
(a) While pressing and holding part (A) of the quick connector, slide sleeve upward and disconnect the quick connector.

(b) Attach a cap to each of the high and low pressure charging valves.


C-3
Unusually low outside air temperature
Limited refrigerant
Limited amount of refrigerant filled
Fill the refrigerant to proper level.
Gas leakage
Perform the leak test and repair the location of failure before filling the refrigerant.
Compressor failure
Swash plate shoe seizure
Locked piston
Suction/discharge valve failure
Replace the compressor with a new one.
Expansion valve failure
Clogged valve(mixing of foreign matter)
Replace the valve with a new one.
Relieved gas from pressure needle valve
Replace the valve with a new one.
Clogging(mixing of moisture content) due to frozen valve
Execute the evacuation fully after replacing the valve and receiver with a new one respectively.
C-4
Unusually low outside air temperature
Limited refrigerant
Limited amount of refrigerant filled
Fill the refrigerant to proper level.
Gas leakage
Perform the leak test and repair the location of failure before filling the refrigerant.
Clogging during refrigerating cycle
Clogged receiver & drier
Replacement
Clogging due to foreign matter in the course of piping
Replacement
Expansion valve failure
Clogged valve(mixing of foreign matter)
Replace the valve with a new one.
Relieved gas from pressure needle valve
Replace the valve with a new one.
Temporary clogging(mixing of moisture content) due to frozen valve
Execute the evacuation fully after replacing the valve and receiver with a new one respectively.
Frosted evaporator
to A-1
C-5
Insufficiently cooled condenser
Clogging of dust or mud, etc. in fin.
Clean(washing with water) the fin.
Over-filled refrigerant
Discharge the refrigerant to proper level.

80V2E01015

Compressor V-belt adjustment

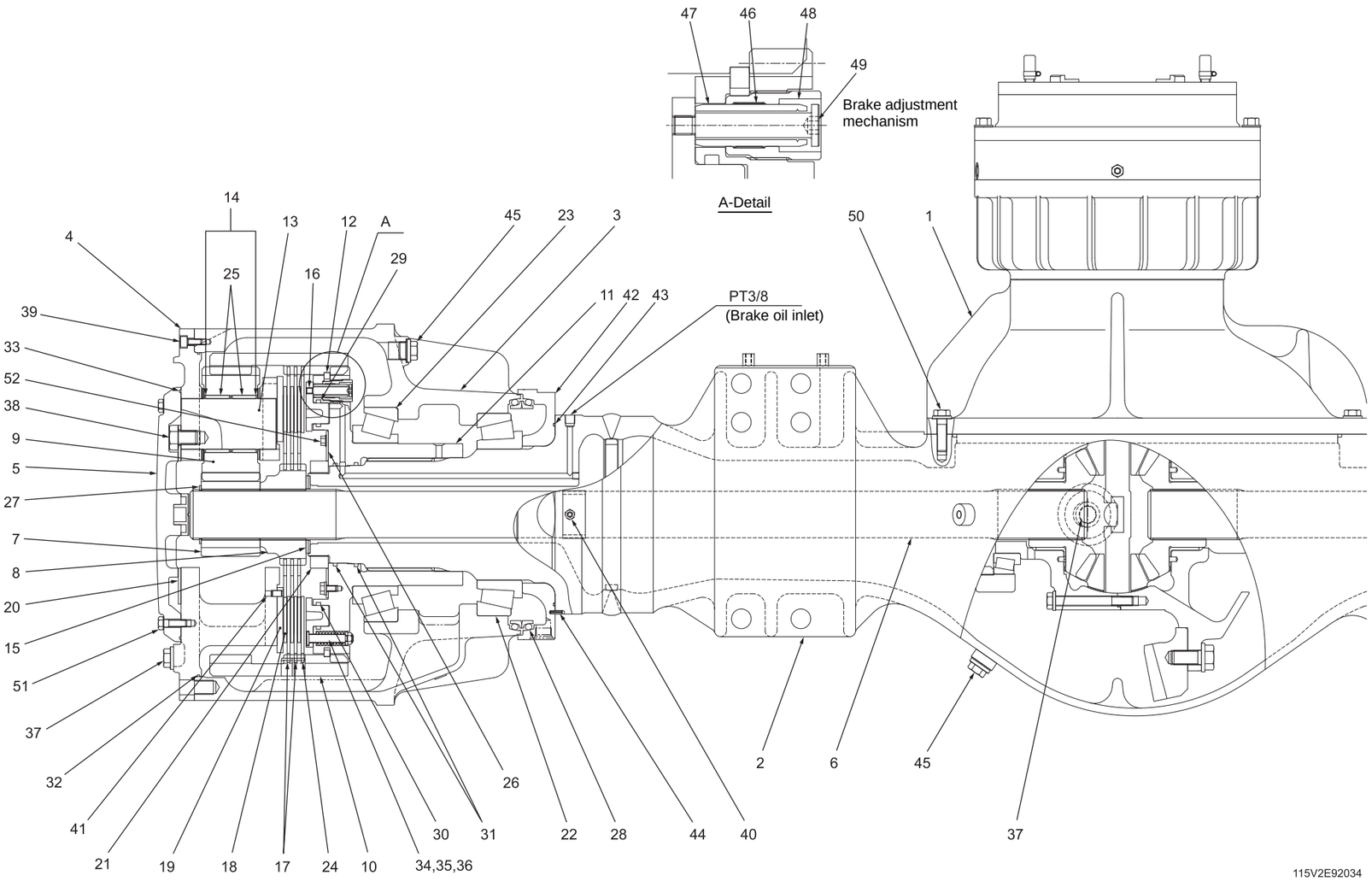


1. Compressor
2. Bracket mounting bolt
3. Lock nut
4. Adjusting nut
5. V-belt
6. Bracket
7. Bolt

Maintenance Log

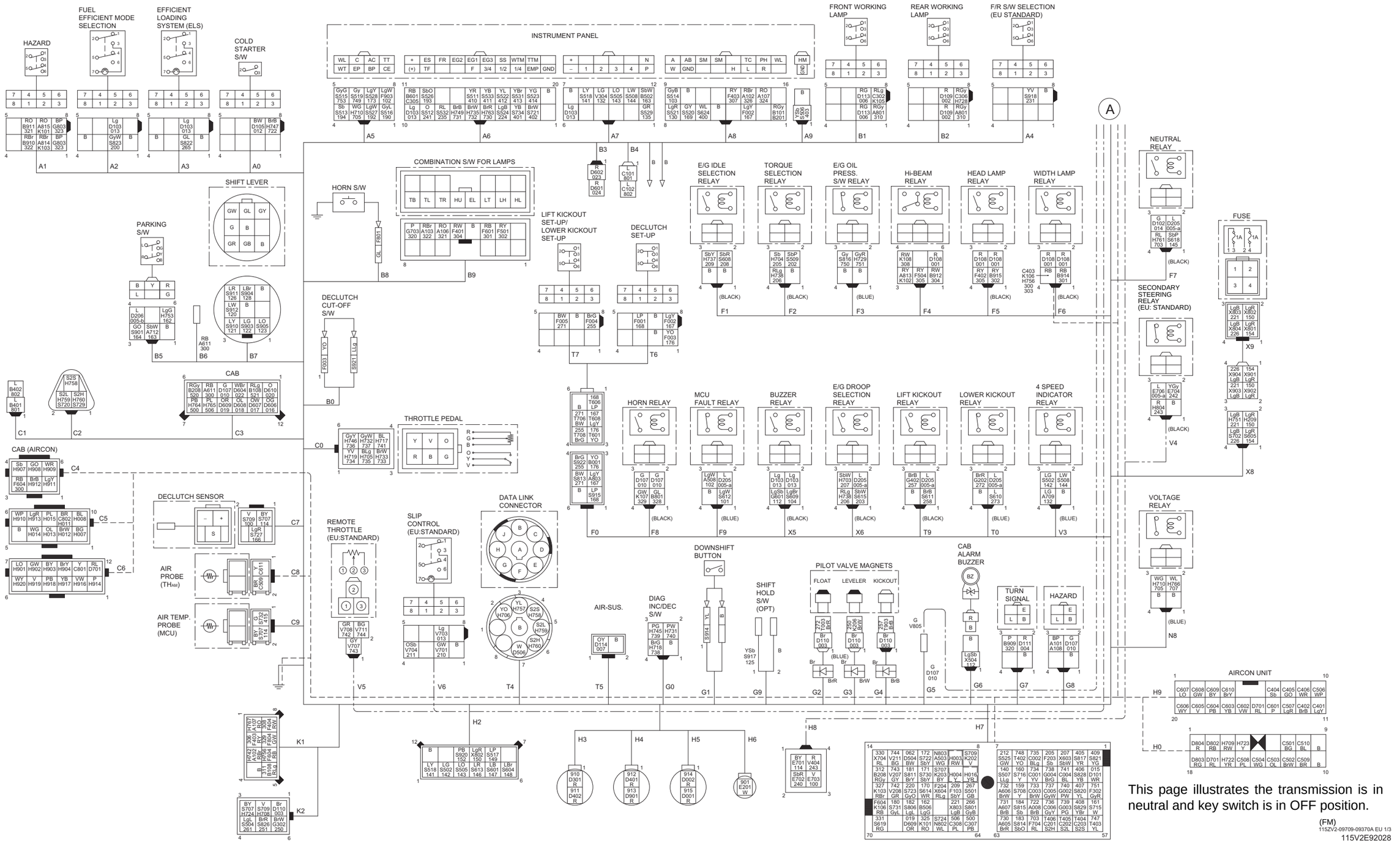
Date	Machine hours	Service performed

(S/N 9203~)
The only difference between the front and rear axles is the differential housing (1) and axle housing (2).
Other parts are the same as the rear axle assembly.



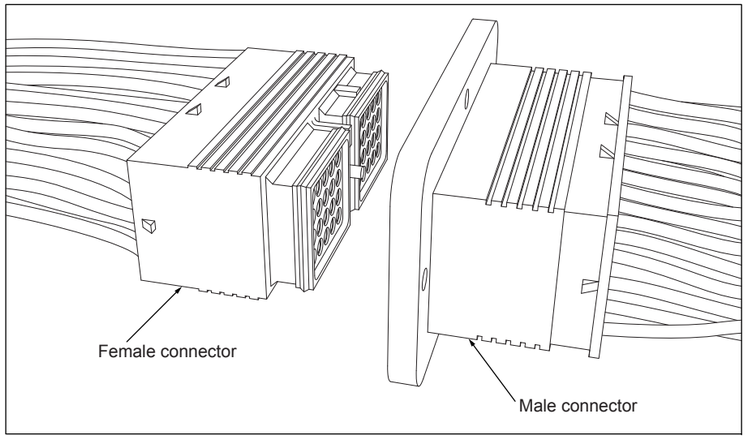
1. Differential assembly
2. Axle housing assembly
3. Wheel hub
4. Spider
5. Cover
6. Axle shaft
7. Sun gear
8. Disc gear
9. Planetary gear
10. Internal gear
11. Internal gear hub
12. Snap ring
13. Planetary pin
14. Wear ring
15. Wear ring
16. Brake piston
17. Separation disc
18. Friction disc
19. Brake backing plate
20. Plate
21. Axle nut
22. Taper roller bearing (inner)
23. Taper roller bearing (outer)
24. Separation disc
25. Needle cage
26. Axle lock plate
27. Snap ring
28. Floating seal
29. D-ring
30. D-ring
31. O-ring
32. O-ring
33. O-ring
34. Socket bolt
35. Spring
36. U-nut
37. Magnet plug (Square socket head)
38. Bolt
39. Socket bolt
40. Air bleeder screw
41. Spring pin
42. Ring
43. O-ring
44. Spring pin
45. Plug (Square socket head)
46. Spring
47. Sleeve
48. Bushing
49. Socket bolt
50. Bolt
51. Bolt
52. Flange bolt

Electrical Wiring Diagram (1/3) (S/N 9051~9100)

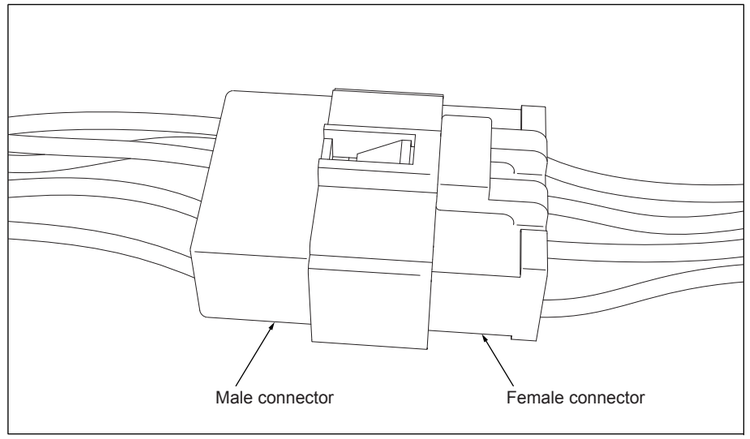


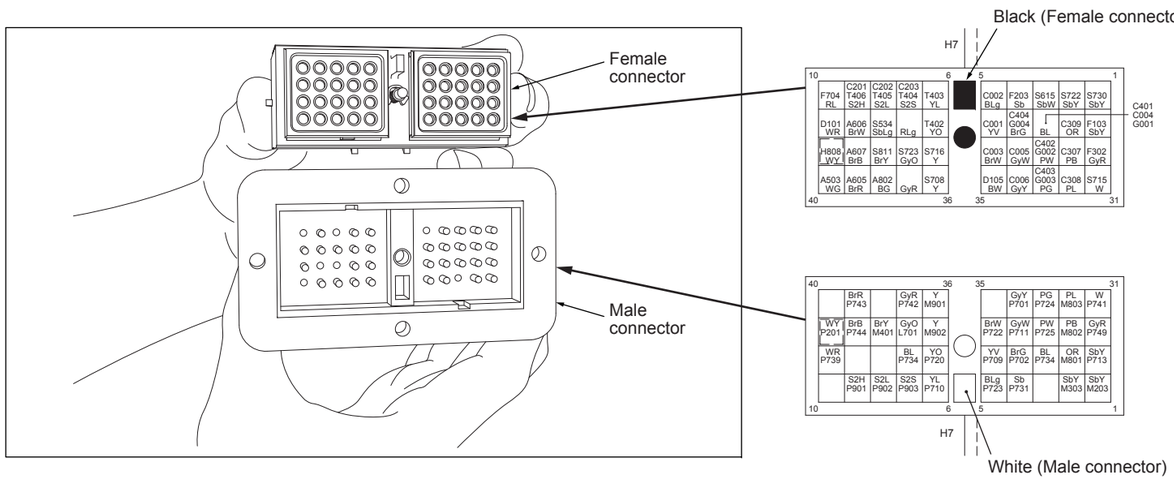
This page illustrates the transmission is in neutral and key switch is in OFF position.

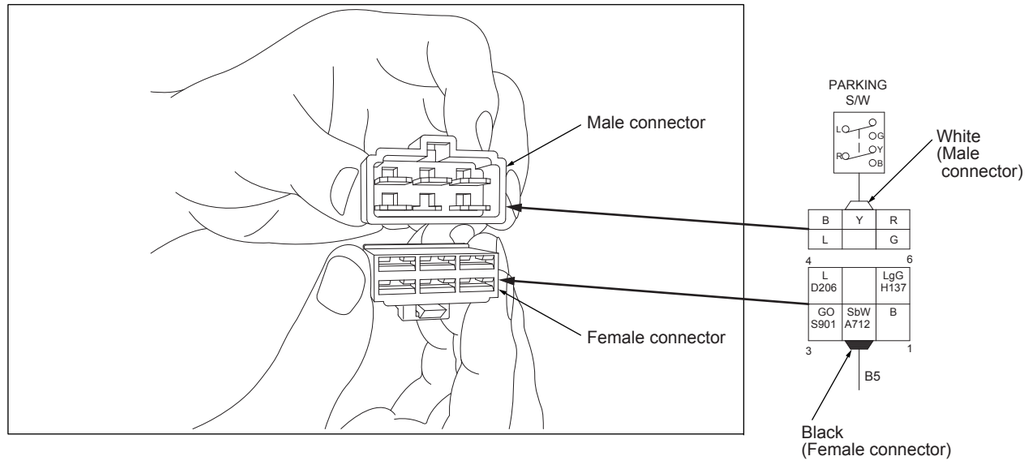
40 poles connector



6 poles connector







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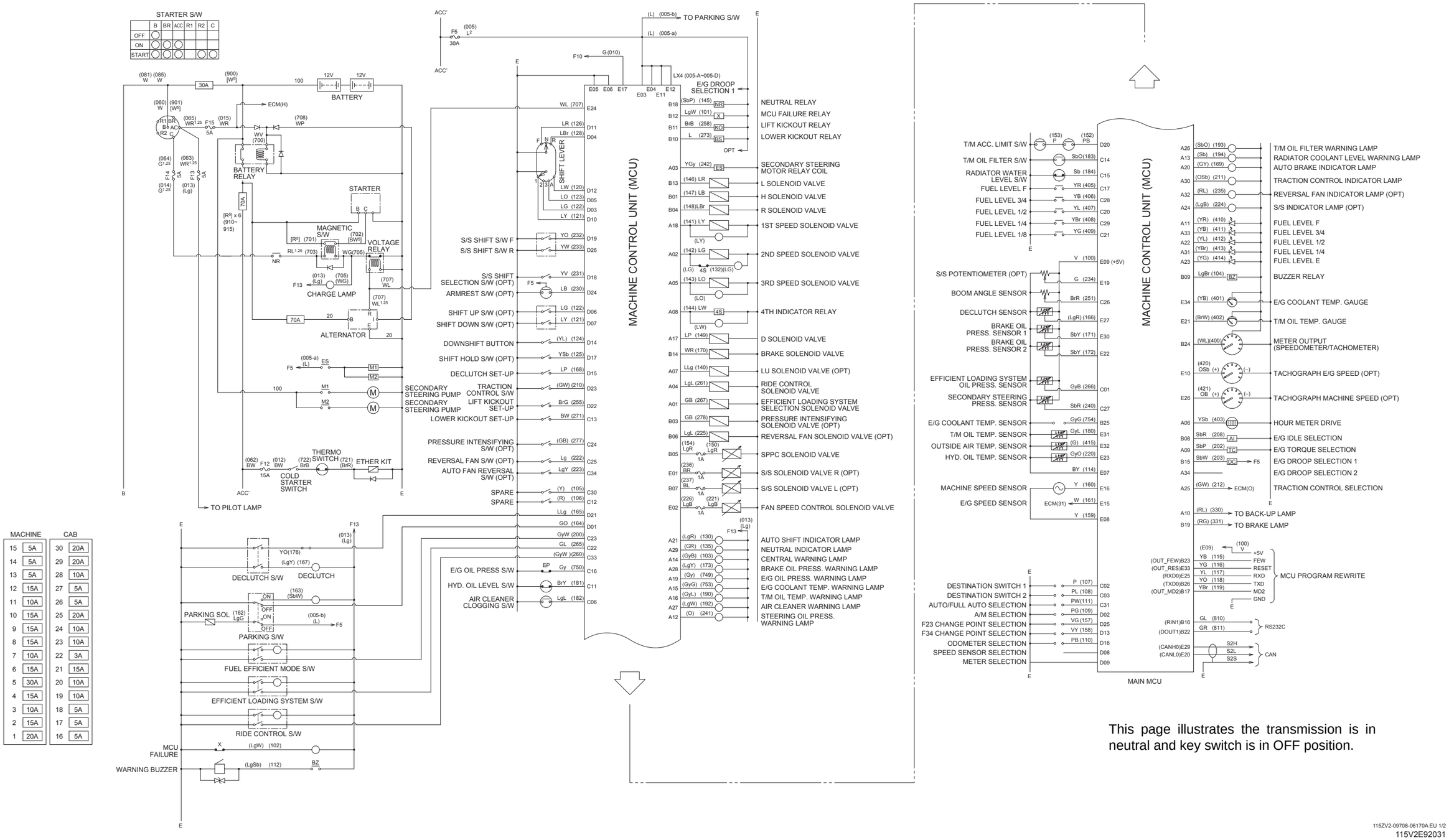
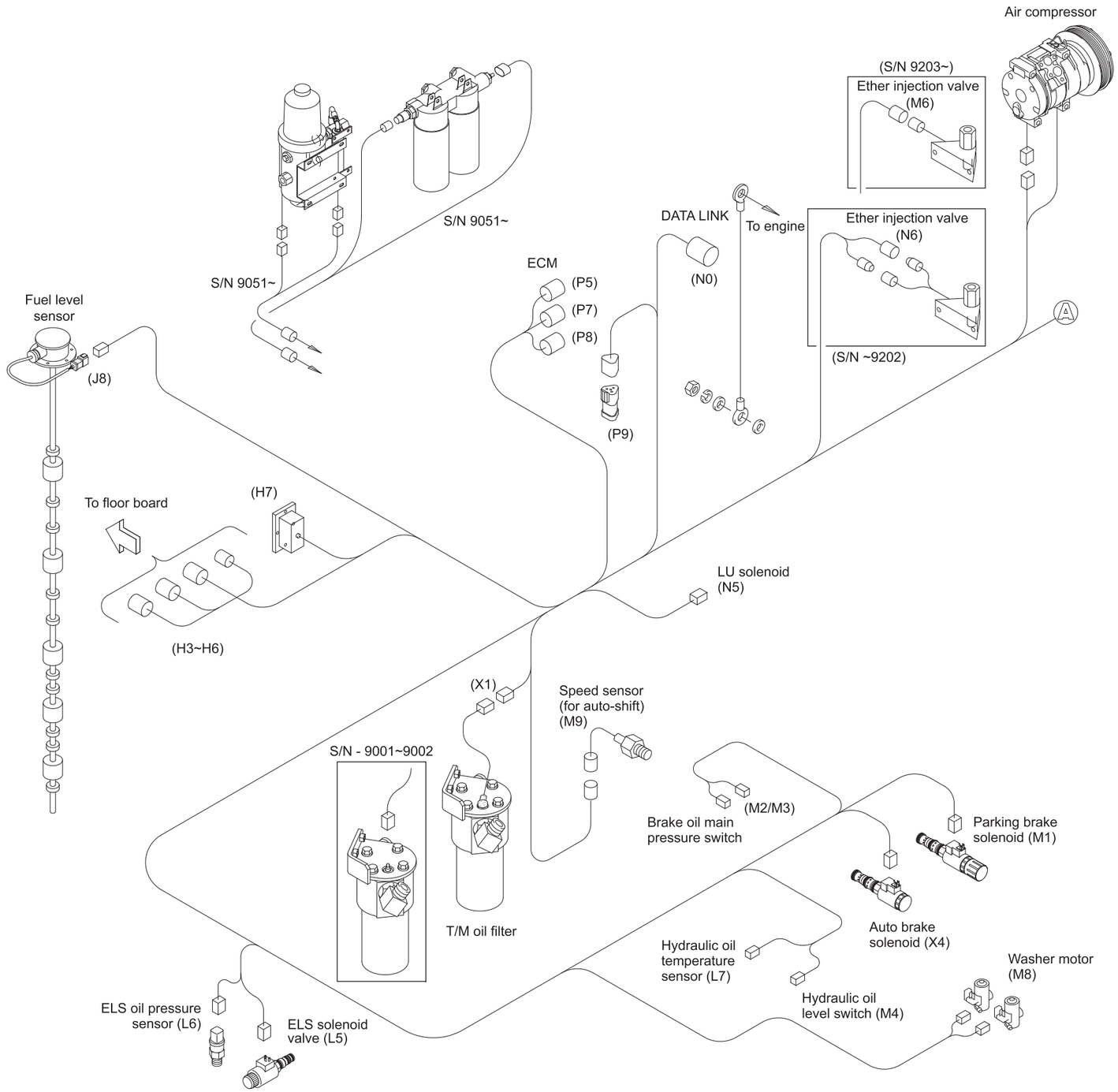
Electrical Connection Diagram (1/2) (S/N 9051~9100)



This page illustrates the transmission is in neutral and key switch is in OFF position.

Rear chassis



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