UNIC

WORK SHOP MANUAL

URW295CUR
URW295CAR

FURUKAWA UNIC CORPORATION

Equipment and construction

Model	URW295CUR or URW295CAR
Boom telescoping	Boom: 5-section, Hexagonal box beam
	Telescoped by direct pushing of hydraulic cylinder and by wire rope (With hydraulic automatic locking device) (2nd & 3rd sections: sequential actuation, 4th & 5th sections: simultaneous actuation)
Boom derricking	Direct pushing by hydraulic cylinder (With hydraulic automatic locking device)
Hoisting	Hydraulic motor: Axial plunger type
	Reduction gears: Spur-gear reduction
	Brake: Automatic mechanical brake
Slewing	Hydraulic motor: Trochoid type (With hydraulic automatic locking device)
	Reduction gears: Worm-gear+Spur-gear reduction (Supported by ball bearings)
	Brake: Worm self-lock
Hydraulic pump	Variable delivery piston pump
Hooking capacity	6450 lbs (2930kg) Parts of hoist reeving: 4
Safety device	Pressure relief valve for hydraulic circuit
	Hydraulic automatic lock (Counterbalance valves and pilot-operated check valves)
	Automatic stop for overwinding
	Overwinding alarm
	Alarm buzzer
	Hook safety latch
	Interlock for crane-crawl lever and outriggers
	Turnover prevention device
	Level
Weight	Approx. 4100 lbs (1850kg)

7.6 Switching of "shockless" function (Operate it when it is not over-wound)

Turn ON winding-down switch with para-hook switch depressed.

"shockless"
(normal case)

No"shockless"
"[-]" appears on the left side of mode indicator.

Turn ON winding-up switch with para-hook switch depressed.

7.7 Switching of low-temperature operation mode

Depress the switch for storing hook with the switch for slewing C.C.W.turned ON.

Low-temperature
operation mode
OFF(normal case)

Low-temperature
operation mode ON

Mode indicator shows [06].

Voice message, "change control mode"is issued.

Depress the switch for storing hook with the switch for slewing C.W.turned ON.

8. 7 Zero point adjustment procedures when spool, differential transformer, or accelerator unit has been replaced

The adjustment is needed only when any of following components has been disassembled/ re-assembled or replaced: Differential transformer, Spool, Acceleration cylinder, and Control valve.

1. Engine start or ACC/ON key switch

2. Depress "Mode selector" switch and " slewing C.W." switch simultaneously until beep sound is heard, then depress "slewing C.C.W." switch within 2 second with"Mode selector" switch depressed. → Mode indication "－－" blinks.

3. Depress "Store Hook" switch within 5 seconds until beep sound is heard. → "Figures" blinks.
Blinking "figures" is for setting type code

Mode indicator

Specification	Figures	Figures
Normal	0	0
Automatic stop leaving minimam wire rope	0	1

When the figure had blinked, it had not fixed it yet.

4. A left display of "Mode indication" is displayed by operating "Boom up/down selector" SW, "0".
Afterwards,depress "Store Hook"switch

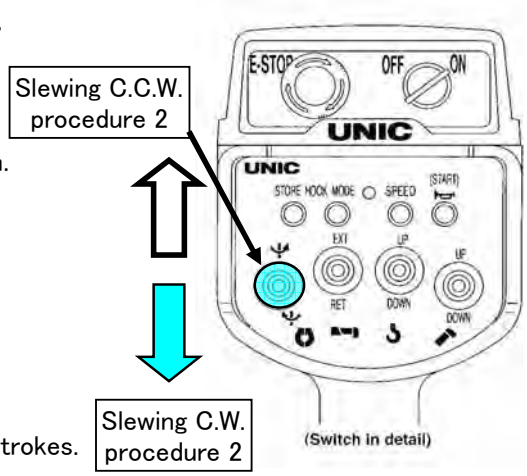
5. A right display of "Mode indication" is displayed by operating "Boom up/down selector" SW, "0" or"1"or"2".
Afterwards,depress "Store Hook"switch

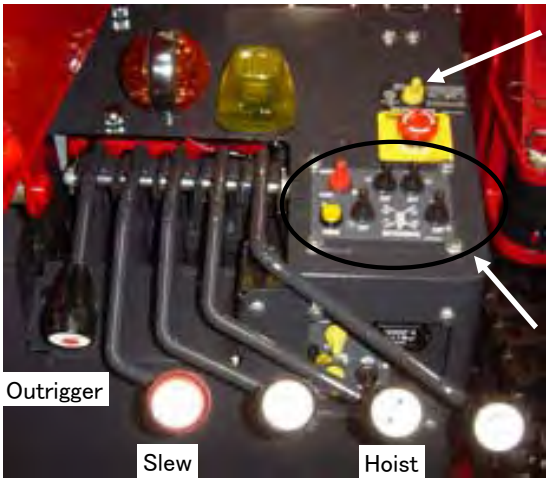
6. Depress "Store Hook"switch again until beep sound is heard. → "CC"blinks.

7. Check that each manual control lever stays at its neutral position.

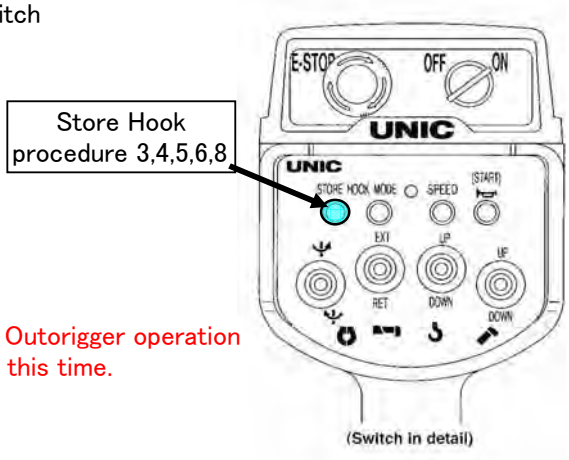
8. Depress "Store Hook" switch again until beep sound is heard. → "CF"blinks.

9. Shift manual levers for controlling boom derrick, hook Up/Down, telescoping, slewing, and outrigger in both directions to their full strokes.



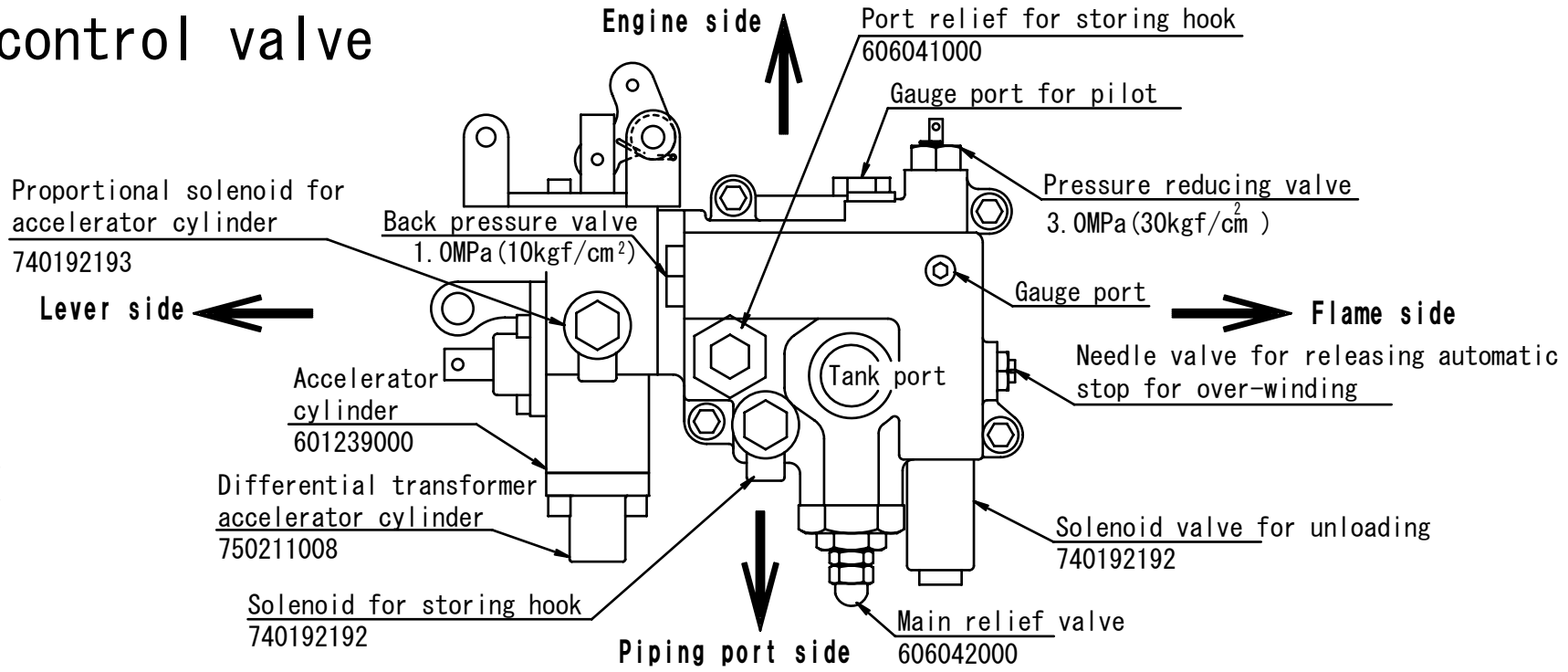


Mode selector switch



The switch of the Outorigger operation is not operated at this time.

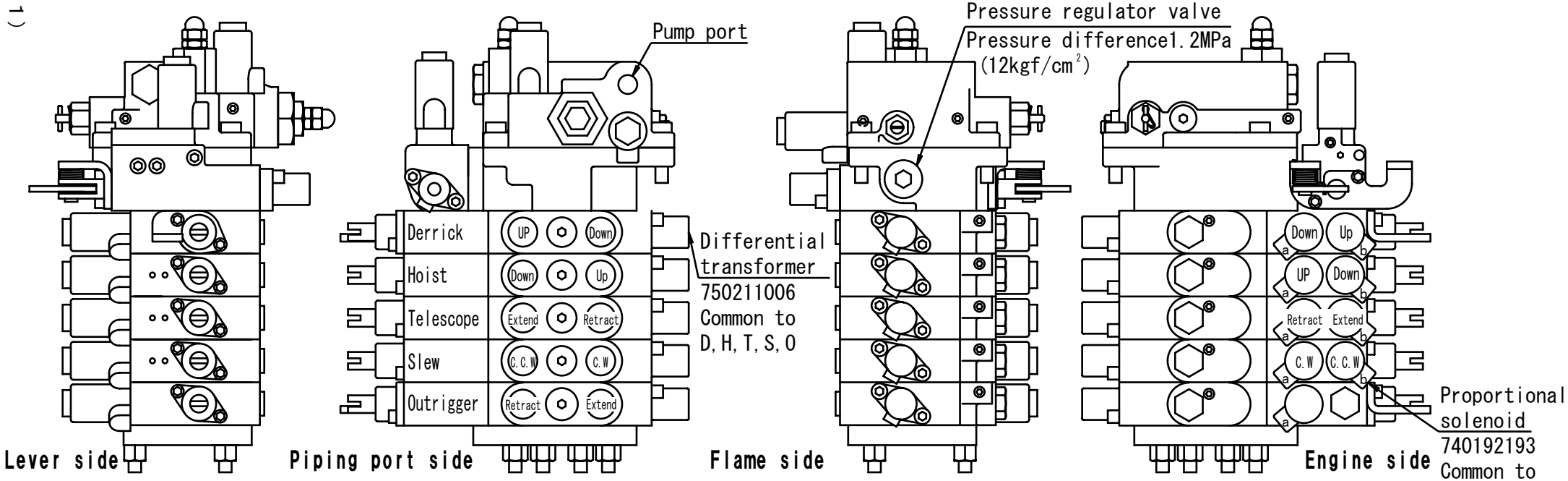
9.1 MRV-500 control valve



Main relief set pressure	Pump speed
20.6MPa (210kgf/cm2) at 38L/min	2000 rpm

Relief for storing hook set Pressure

3.9MPa (40kgf/cm2) at 17L/min



9.11 Spool assembly (types of D, H, T, S)

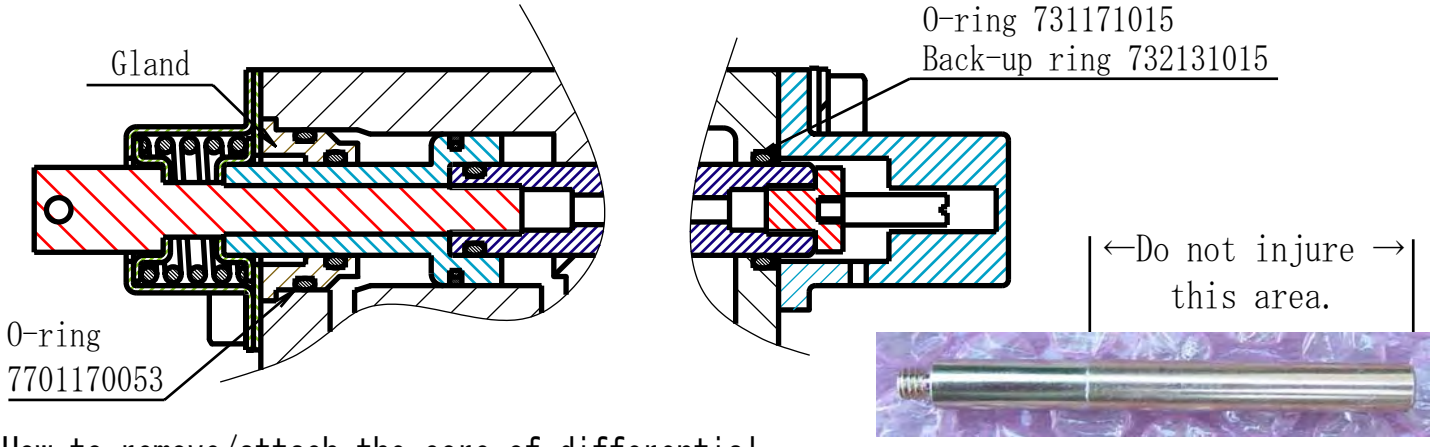
Zero point adjustment is needed when spool assembly has been replaced.

Designation		Part number	Application
Spool assembly	(D)	910000140	For derrick
Spool assembly	(H)	910000141	For hook-up/down
Spool assembly	(T)	910000142	For telescoping
Spool assembly	(S)	910000143	For slewing

It is recommended that the spool should be replaced as an assembly because following attension must be paid when removing the cap screw and the spool end to re-assemble.

1. Remove the sealing agent stuck to the screw threads on both ends of the spool.
2. Degrease the spool thoroughly and dry it.
   Pay special attention to screw threads to carry out this work.
   Oil remained will deteriorate its sealing property.
3. Since the thread of both cap screw and of spool end have been treated by specialist companies, replace the removed parts with new ones.
   Reuse of removed parts by covering then with a sealing tape will not provide good results as the threa is of M-type screw.
4. Apply grease to inside/outside of the gland and to the spring.
5. In order for the thread to become firm, do not circulate oil for at least 1 hour after the screws have been tightened up.

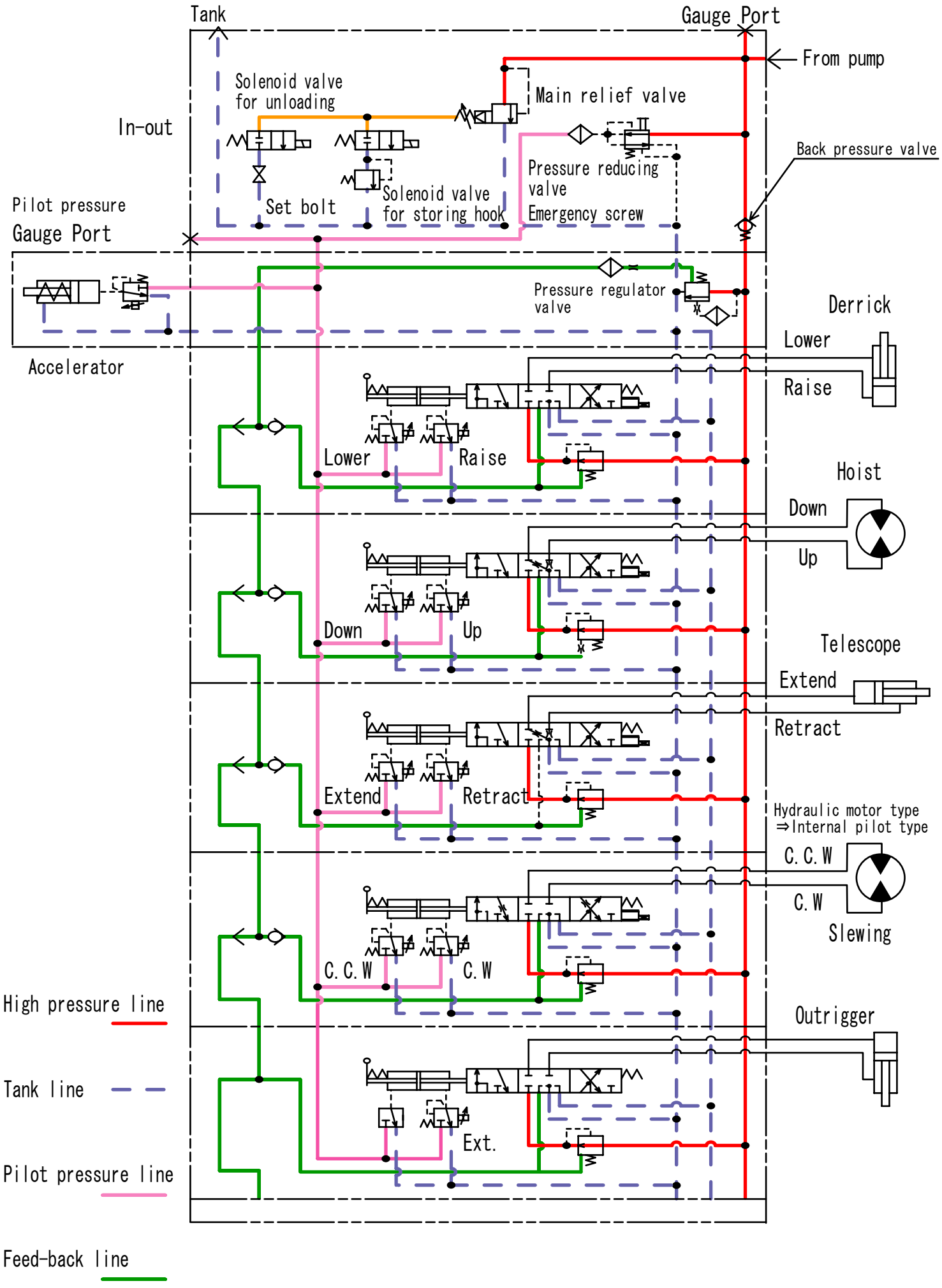
In many cases where oil leaks out of the spool, it may be due to damage in the O-rings in the gland and/or in the valve body while the spool is being inserted. Therefore, observe the O-rings carefully when the spool has been extracted.



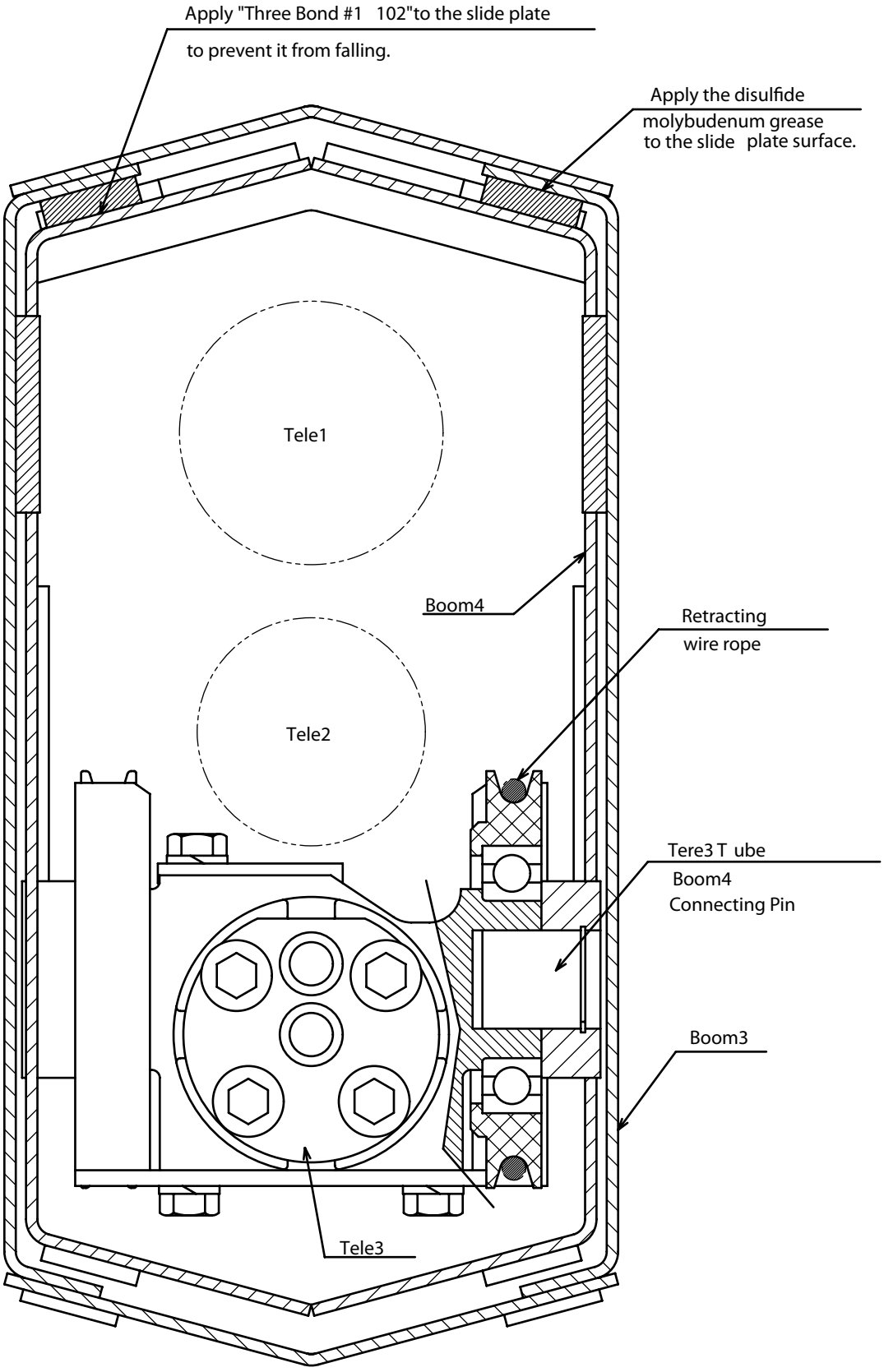
How to remove/attach the core of differential transformer (this part is to be ordered separately)

1. When removing it, fix the cap screw with a spanner and turn the core with pliers by gripping it at its base.
2. Apply Lock Tight #242 to the screw threads when the core is being tightened.

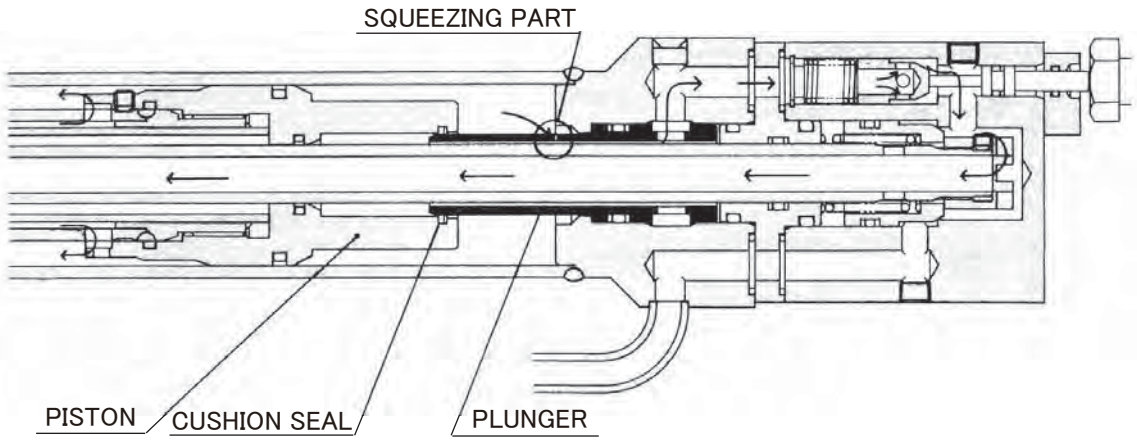
11.2 Hydraulic Circuit Diagram (control valve)



(3) Boom 3, 4 rear side section in detail

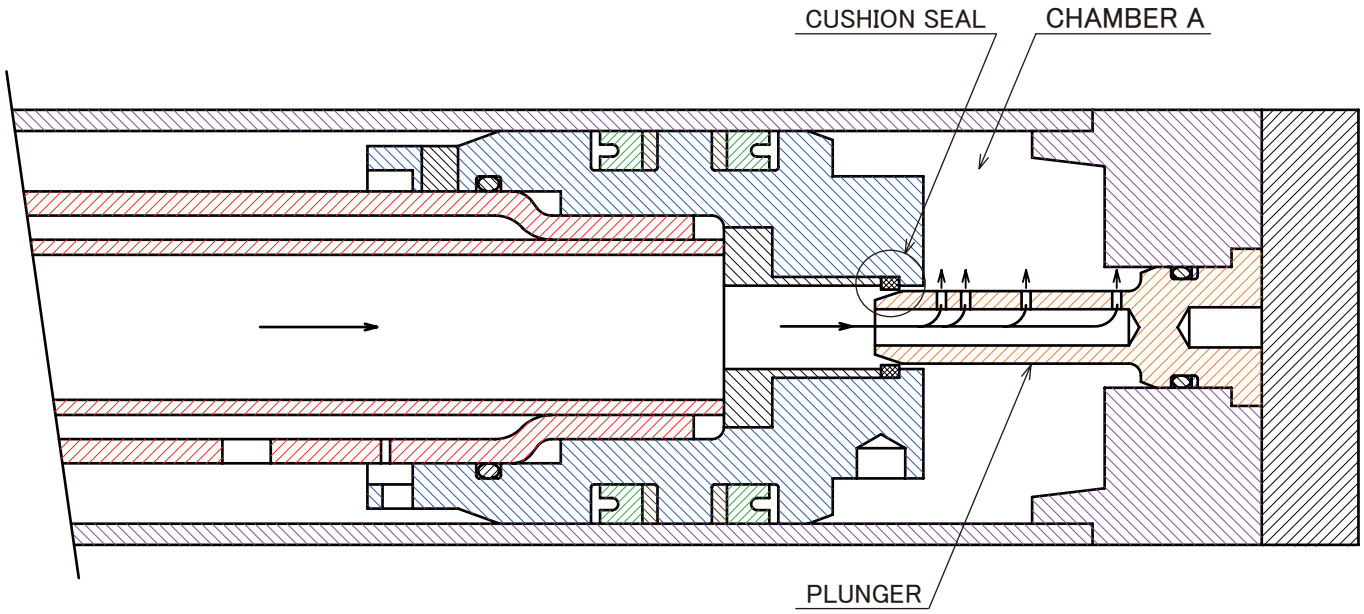


2. Cushion mechanism of the telescoping cylinder (2) for 5-section and 5-section boom.

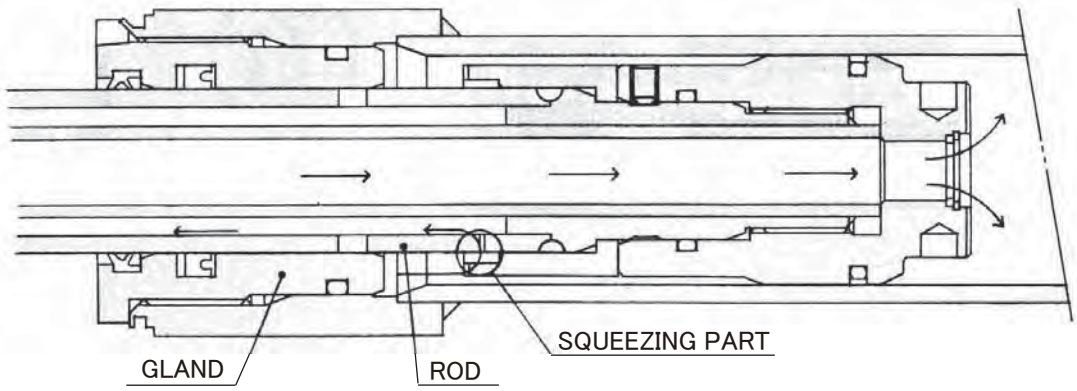


(2) Flow of Pressure Oil When Extending

① When extending, the pressure oil flows into the chamber A as shown in the illustration. In this way, the telescoping cylinder extends.



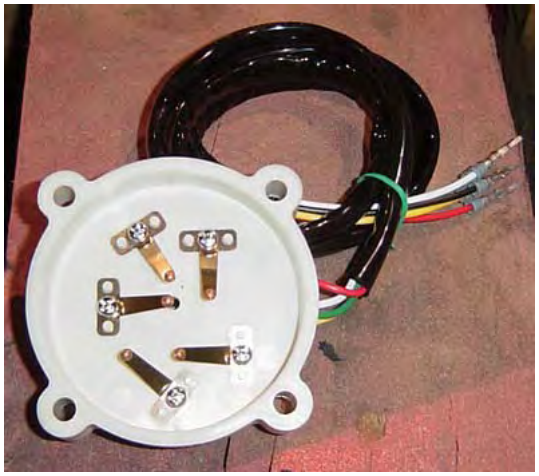
② Cushion mechanism of the telescoping cylinder for 5-section and 6-section booms is to squeeze the return pressure oil at the position just before the end of extension and absorb the piston shock to the stroke end.



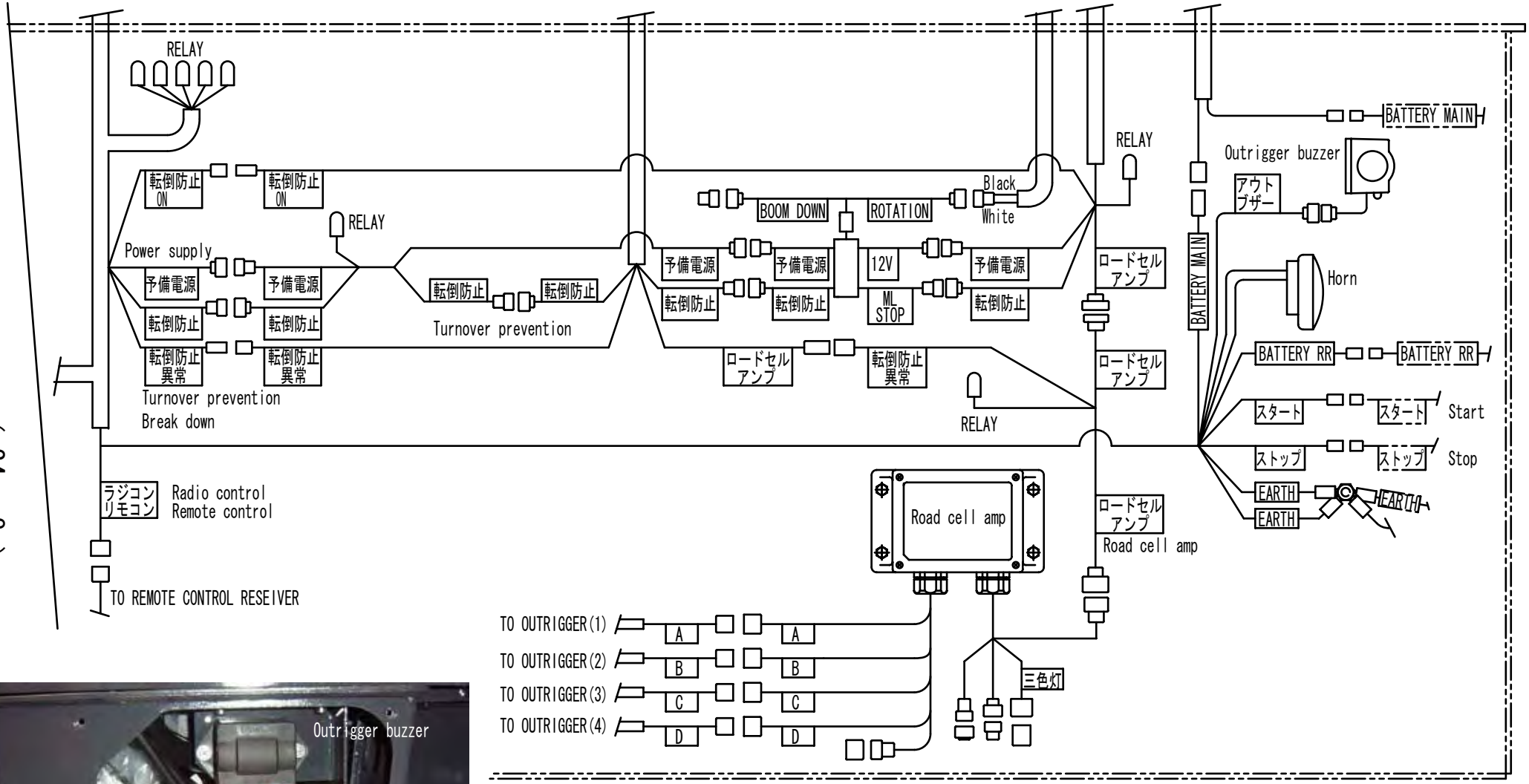
17. 3 Cause of Troubles and Measures to be Taken (Hoist winch)

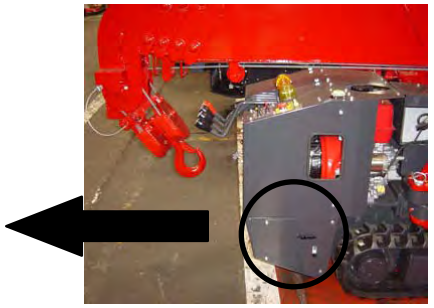
Problems	Possible cause	Measures to be taken
① Pressure does not rise.	Pump is faulty. (Pressure does not rise at idling speed.) (Total pressure required for operation is insufficient.)	Replace.
	Relief set of control valve is faulty. (Pressure rises but not enough.)	Adjust or replace.
	O-ring and other parts of relief valve of control valve are faulty. (Adjusting bolt of relief valve is tightened but unable to control pressure.)	Replace parts or replace relief ass' y with new one.
	Hoist motor is faulty. (Quantity of drain is larger than the specified.)	Replace.
② Pressure rises but hoisting up impossible.	Drum or internal mechanism of reduction gear is faulty.	Overhaul reduction gear. Inspect the drum
③ Pressure rises but lowering is impossible.	Brake shoe is over-tightened. Drum or reduction gear is defective.	Adjust tightening of brake shoe. Overhaul reduction gear. Check drum.
④ Unable to maintain suspended load.	Brake shoe is faulty. Pawl is faulty.	Replace brake shoe. Replace pawl.
⑤ When lowering, hunting occurs.	Brake shoe is faulty. Over-tightening of brake shoe. Internal mechanism of reduction gear is faulty.	Inspect brake shoe and check quantity of oil. Adjust tightening of nut. Disassemble reduction gear.
⑥ When hoisting up, clattering sound is heard.	Spring pressing the pawl against slide plate is faulty. Bushing the part of fitting pawl is worn out.	Replace spring. Replace bushing.

22.1 Construction of slipriing



24.8 Electric wiring under control valve for crane





26.3 How to judge differential transformer (750211003) for break or short-circuit of coil

In order to prevent the differential transformer from being broken, use a circuit tester with digital display when checking it.

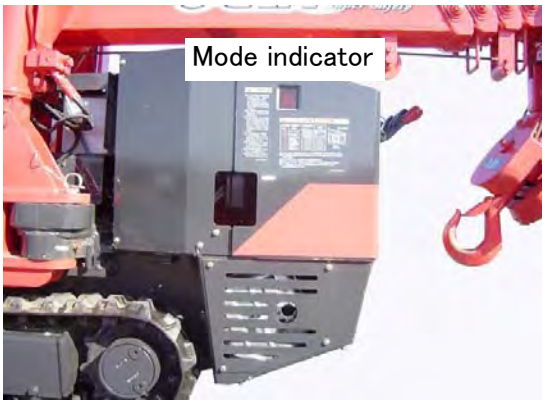
When differential transformer coil breaks or short-circuits:

No crane operation can be possible.

Voice message "Service remote control" sounds.

Mode indicator on the control box blinks to show where in trouble.

Mode indication	Area in trouble
80	Derrick
81	Hoist
82	Telescoping
83	Slewing
84	Outrigger
85	Accelerator

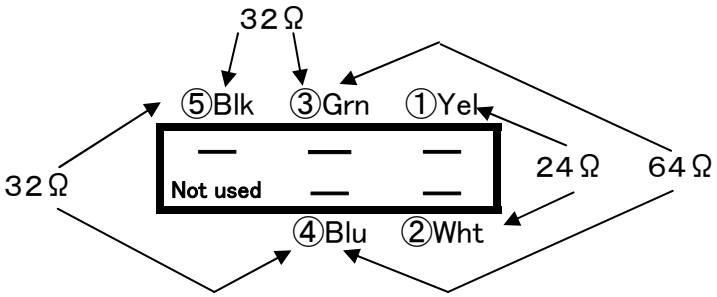


How to check differential transformer:

① Measure resistance between each combination of terminals.

If any of measured resistance shows a big difference, replace the transformer.

Terminals between	Resistance
1←→2	24Ω
3←→4	64Ω
3←→5	32Ω
4←→5	32Ω



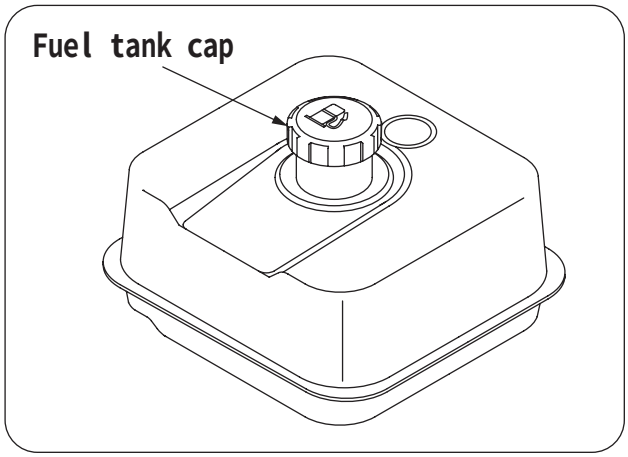
Terminal arrangement of connector of differential transformer

1. Check for remaining fuel quantity / Draining water

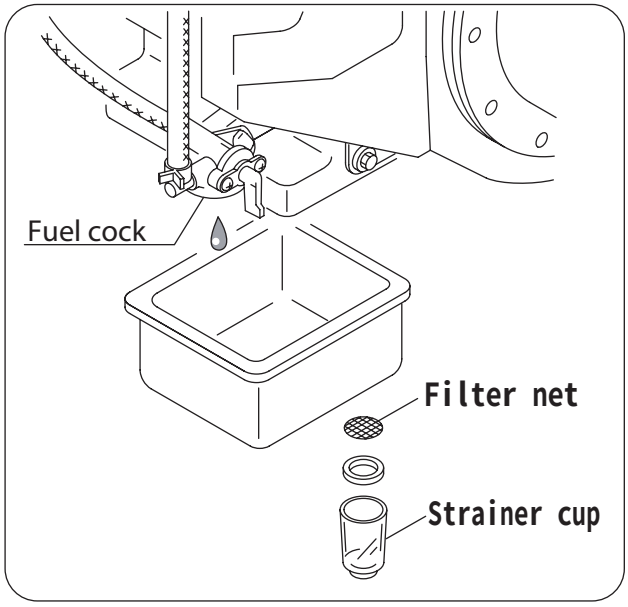
⚠ WARNING

★Fuel (gasoline) is highly inflammable.
Do not smoke and bring a fire source close to the fuel when refueling and draining sediment.

★Wipe up spilled fuel thoroughly after refueling as it may cause the fire.



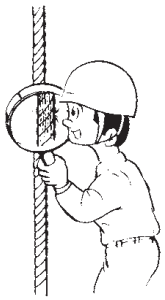
●When refueling, remove the cap and never fail to put the strainer of fuel tank in order to prevent water and dust from entering the tank.
Fuel tank capacity: 6 liters



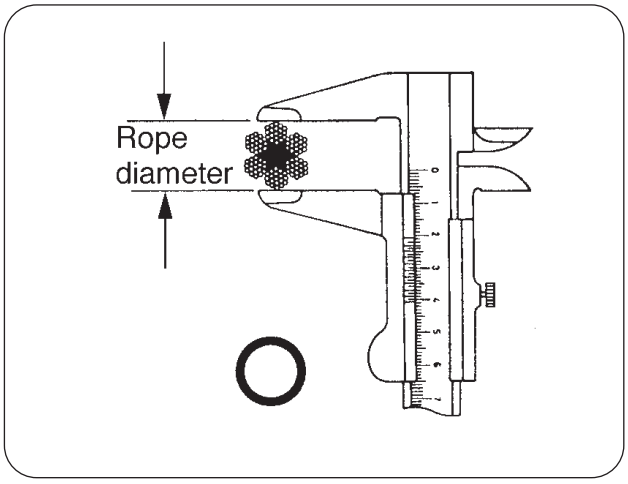
●When draining fuel in order to transport the crane and store it for long period of time, remove the strainer cup in the fuel cock to extract it.

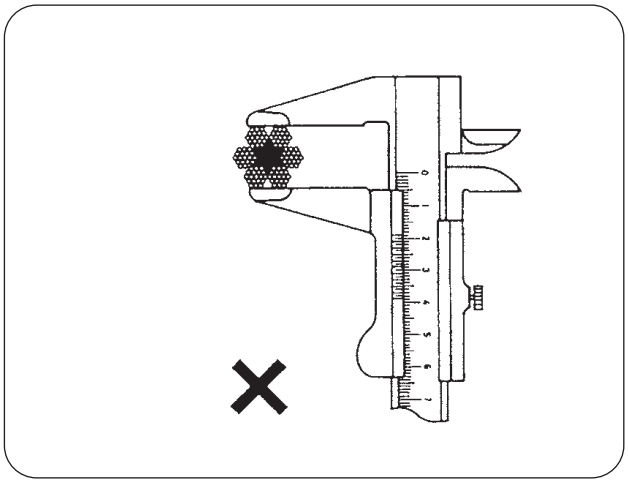
●In addition, clean up the filter net with the fuel strainer cup removed.

4. Replacement of wire rope (for winding-up)



Wire rope is active service should be visually inspected once every working day. A thorough inspection of such rope should be made at least once a month and dated records kept as to rope condition.
Replace the rope according to the following standard.





1. In running ropes, six randomly distributed broken wires in one rope lay, or three broken wires in one strand in one rope lay. (A rope lay is the length along the rope in which one strand makes a complete revolution around the rope.)

2. In pendants or standing ropes, evidence of more than one broken wire in one lay.

3. Abrasion, scrubbing, or peening causing loss of more than 1/3 of the original diameter of the outside wires.

4. Evidence of severe corrosion.

5. Severe kinking, severe crushing, or other damage resulting in distortion of the rope structure.

6. Evidence of any heat damage from a torch or arc caused by contact with electrical wires.

7. Reduction from nominal rope diameter of more than 1/64 in. (0.4 mm) for diameters 13/32 in. (10.0 mm);
Marked reduction in diameter indicates deterioration of the core, resulting in lack of proper support for the load carrying strands. Excessive rope stretch or elongation may also be an indication of internal deterioration.

8. Evidence of "bird caging" or other distortion resulting in some members of the rope structure carrying more load than others.

9. Noticeable rusting or development of broken wires in the vicinity of attachments.
(Note: If this condition is localized in an operating rope and the section in question can be eliminated by making a new attachment, this can be done rather than replacing the entire rope.)