WSM

WORKSHOP MANUAL

UTILITY VEHICLE

RTV-X900,RTV-X1120D

Kubota

KiSC issued 01, 2014 A

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MECHANISM

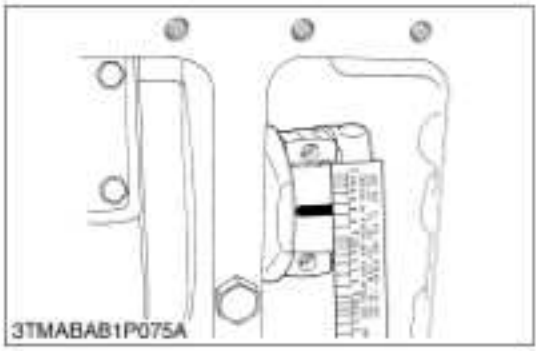
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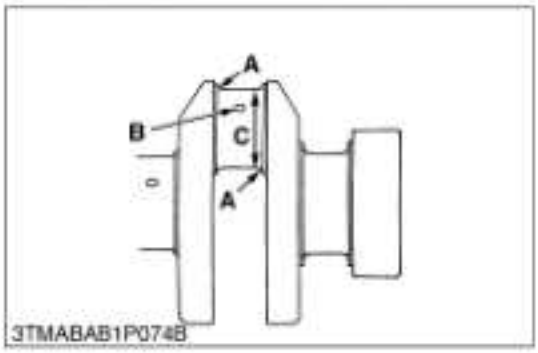
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Crankshaft Alignment

1. Support the crankshaft with V blocks on the surface plate at both end journals.
2. Set a dial indicator with its tip on the intermediate journal.
3. Measure the crankshaft alignment.
4. If the measurement exceeds the allowable limit, replace the crankshaft.

Crankshaft alignment	Allowable limit	0.02 mm 0.0008 in.

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Oil Clearance between Crankpin and Crankpin Bearing

1. Clean the crankpin and crankpin bearing.
2. Put a strip of plastigauge on the center of the crankpin.
3. Install the connecting rod cap and tighten the connecting rod screws to the specified torque, and remove the cap again.
4. Measure the amount of the flattening with the scale, and get the oil clearance.
5. If the oil clearance exceeds the allowable limit, replace the crankpin bearing.
6. If the same size bearing is useless because of the crankpin wear, replace it with an undersize one referring to the table and figure.

■ **NOTE**

- **Never insert the plastigauge into the crankpin oil hole.**
- **Be sure not to move the crankshaft while the connecting rod screws are tightened.**

Oil clearance between crankpin and crankpin bearing	Factory specification	0.020 to 0.051 mm 0.00079 to 0.0020 in.
	Allowable limit	0.15 mm 0.0059 in.

Crankpin O.D.	Factory specification	33.959 to 33.975 mm 1.3370 to 1.3375 in.
Crankpin bearing I.D.	Factory specification	33.995 to 34.010 mm 1.3384 to 1.3389 in.

(Reference)

- Undersize crankpin bearing

Undersize	Bearing	Code Number	Marking
0.20 mm 0.0079 in.	Crankpin bearing 02	15861-22970	020 US
0.40 mm 0.016 in.	Crankpin bearing 04	15861-22980	040 US

- Undersize dimensions of crankpin

Undersize	0.20 mm 0.0079 in.	0.40 mm 0.016 in.
Dimension **A**	2.3 to 2.7 mm radius 0.091 to 0.10 in.radius	2.3 to 2.7 mm radius 0.091 to 0.10 in.radius
*Dimension **B**	1.0 to 1.5 mm relief 0.040 to 0.059 in. relief	1.0 to 1.5 mm relief 0.040 to 0.059 in. relief
Dimension **C**	33.759 to 33.775 mm dia. 1.3291 to 1.3297 in. dia.	33.559 to 33.575 mm dia. 1.3213 to 1.3218 in. dia.
The crankpin must be fine-finished to higher than Rmax. = 0.8S *Holes to be de-burred and edges rounded with 1.0 to 1.5 mm (0.040 to 0.059 in.) relief.		

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1. TROUBLESHOOTING

Symptom	Probable Cause	Solution	Reference Page
Implement Does Not Rise (No Noise)	Control valve broken	Replace	2-S40
	Control valve improperly assembled	Repair	2-S40
	Relief valve spring damaged	Replace	7-S10
	Spool sticks	Repair	7-S10
	Piston O-ring or cylinder damaged	Replace	7-S10
(Noise)	Suction hose loosen or broken	Repair	7-S6
	Insufficient hydraulic lift oil	Repair or replace	G-43
	Relief valve setting pressure too low	Refill	7-S4
	Hydraulic pump broken	Adjust or replace	7-S6
Implement Does Not Lower	Control valve malfunctioning	Repair or replace	2-S40
Implement Drops by Its Weight	Hydraulic lift cylinder worn or damaged	Replace	7-S7
	Piston O-ring worn or damaged	Replace	7-S9
	Control valve malfunctioning	Replace	2-S40

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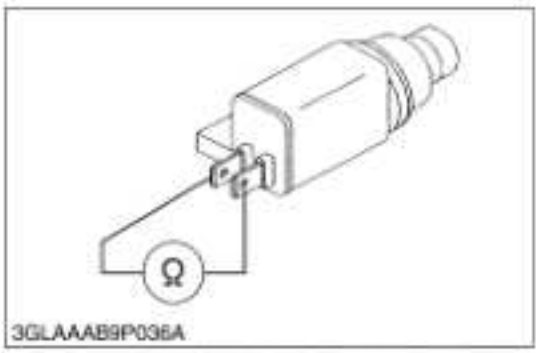
Brake Lamp Switch Continuity

1. Remove the brake lamp switch leads.
2. Connect the circuit tester to the brake lamp switch leads.
3. Measure the resistance between leads.
4. If the safety switch is problem, replace it.

Resistance	When switch is pushed	Infinity
	When switch is released	Continuity

(1) Brake Switch

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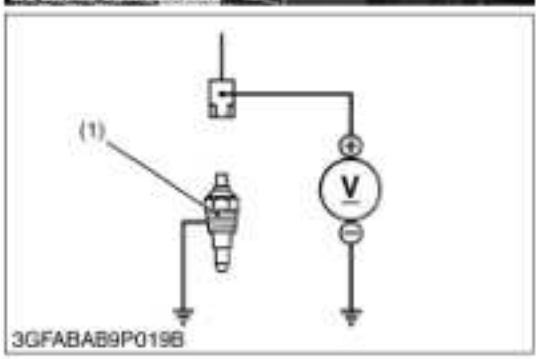
Oil Temperature Alarm Switch Connector Voltage

1. Disconnect the **1P** connector from the oil temperature alarm switch (1).
2. Turn the key switch to the **ON** position, and measure the voltage with a voltmeter between the connector terminal and the chassis.
3. If no voltage is indicated, the wiring harness id faulty.

Voltage (Connector terminal – Chassis)	Factory specification	Positive voltage

(1) Oil Temperature Alarm Switch

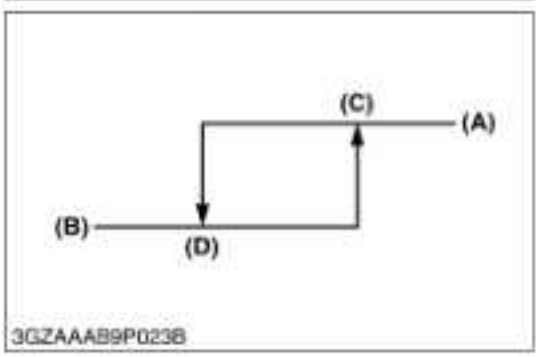
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Thermo Switch Continuity

1. Disconnect the **1P** connector, and remove the thermo switch.
2. Using an ohmmeter, check for continuity between the switch terminal and the chassis.
3. If infinity is indicated at temperature over between specifications, the switch is faulty.

Working temperature	Factory specification	120 to 126 °C 24.80 to 258.8 °F

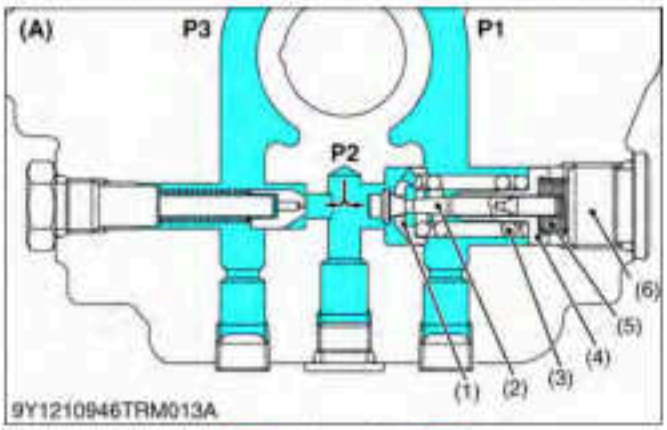


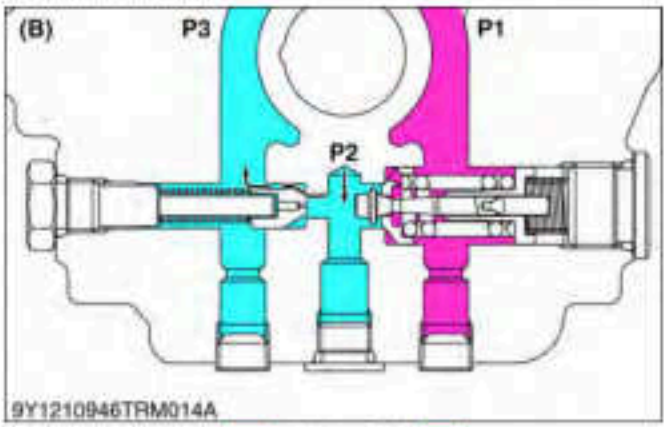
(A) ON
(B) OFF
(C) 120 to 126 °C (248.0 to 258.8 °F)
(D) 116 °C (240.8 °F) or more

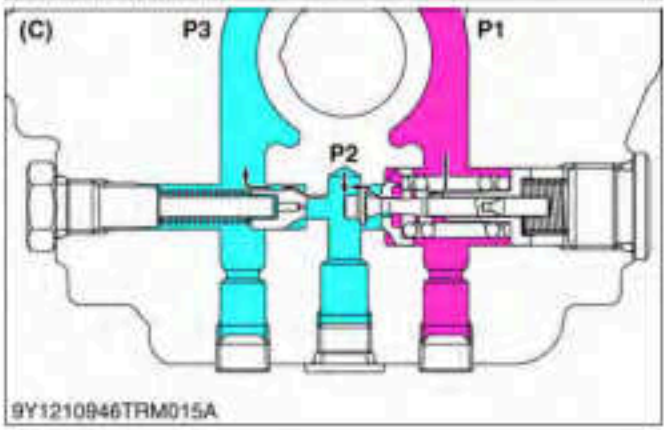
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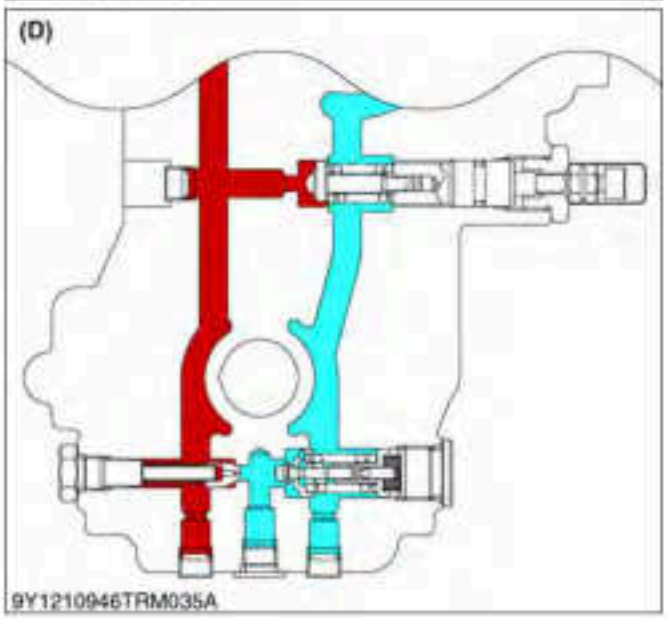
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[D] Check and High Pressure Relief Valve









The cartridge-type check and high-pressure relief valve consists of pressure poppet (2), check valve seat (1), relief valve spring (3), spring guide (4) and check valve spring (5). The spring guide (4) is provided with an anti-rotation, which keeps the threads tight after a pressure has been set.

The valve is used to prevent an overload that would happen at a quick start, sudden stop or even during usual running. This valve doubles as a check valve.

The check and high-pressure relief valves are laid out facing each other as shown in the figure.

When the pressure of both main oil circuit are below the pressure of **P2**, both valves are open and charging oil enters into the main oil circuit through the valves.

At normal operation, the check valve in the high-pressure side is closed and it pushes and opens the another one. An excessive charge flow goes through the charge relief valve into HST housing.

The check and high-pressure relief valve along the high-pressure line serves as a high-pressure relief valve. If the pressure exceeds a high-pressure limit level, the spring (3) force and opens the valve seat that is located between the check valve seat (1) and the pressure poppet (2). Now the flow goes from **P1** to **P2** and **P3**.

If the **P1** pressure drops, the relief valve spring forces the valve seat closed against the pressure. The high-pressure oil at **P1** does not flow to **P2** any longer.

As discussed above, the check and high-pressure relief valve protects engines, pumps, motors, gears and even the machine itself from overload.

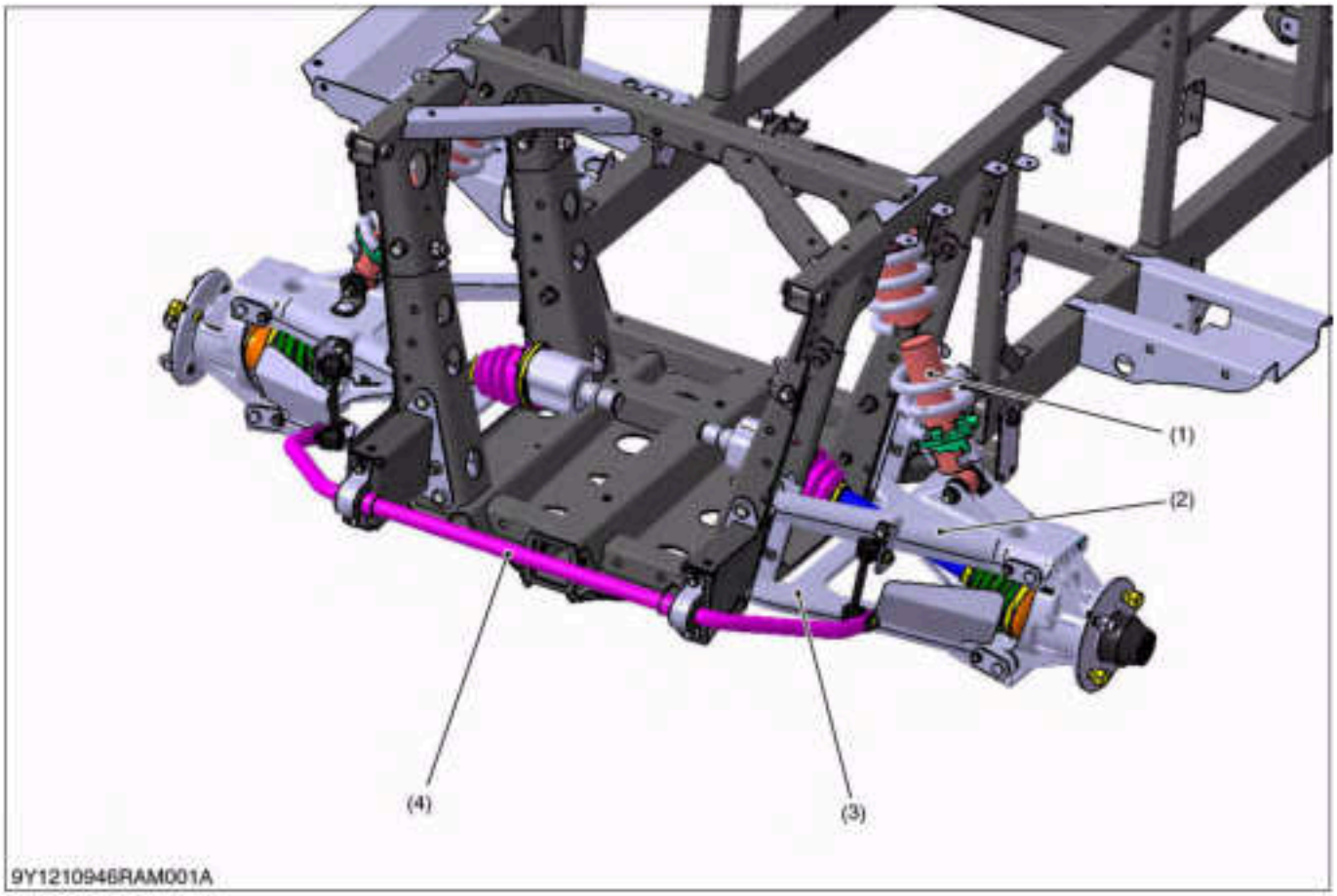
(1) Check Valve Seat
(2) Pressure Poppet
(3) Relief Valve Spring
(4) Spring Guide
(5) Check Valve Spring
(6) Valve Plug

(A) When both Check Valve Activating.
(B) When Check Valve Activating.
(C) When High Pressure Relief Valve Activating. (Travelling Side)
(D) When High Pressure Relief Valve Activating. (Dynamic Brake side)

(To be continued)

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1. STRUCTURE



(1) Shock Absorber (2) Upper Arm (3) Lower Arm (4) Stabilizer

The suspension is double wishbone type.

The suspension is made up of upper and lower arms (2), (3), a shock absorbers (1), and a stabilizer (4).

The stabilizer (4) performs the function of a torsion bar.

The stabilizer (4) is connected to the upper arm (2) by a link.

When the upper arm (2) moves up and down, the stabilizer (4) moves with it. When the arms on one side move, a differential is applied to the stabilizer link that is connected to the arms on the opposite side causing torsion on the stabilizer (4).

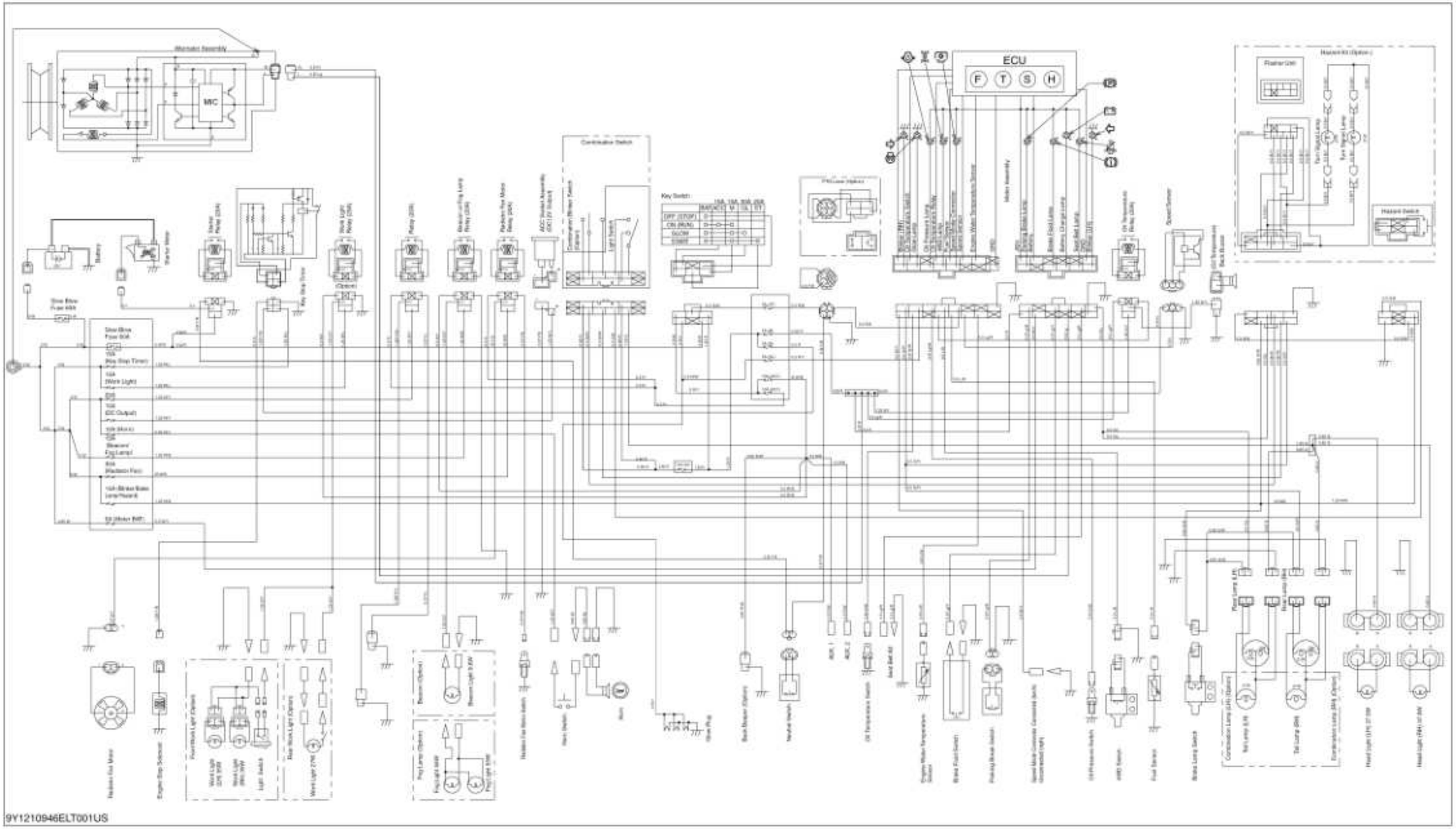
Based on torsion action of the stabilizer, a force is applied retaining its position so the arm connected is kept horizontally.

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1. WIRING DIAGRAM

[1] RTV-X900



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