



TADANO

Publication No. GR-600XXL-1/S1(U)-1E

Service Manual

01

Rough Terrain Crane

Model **TR-600XXL-4**

Applicable Serial No. 545610 ~

TADANO LTD.

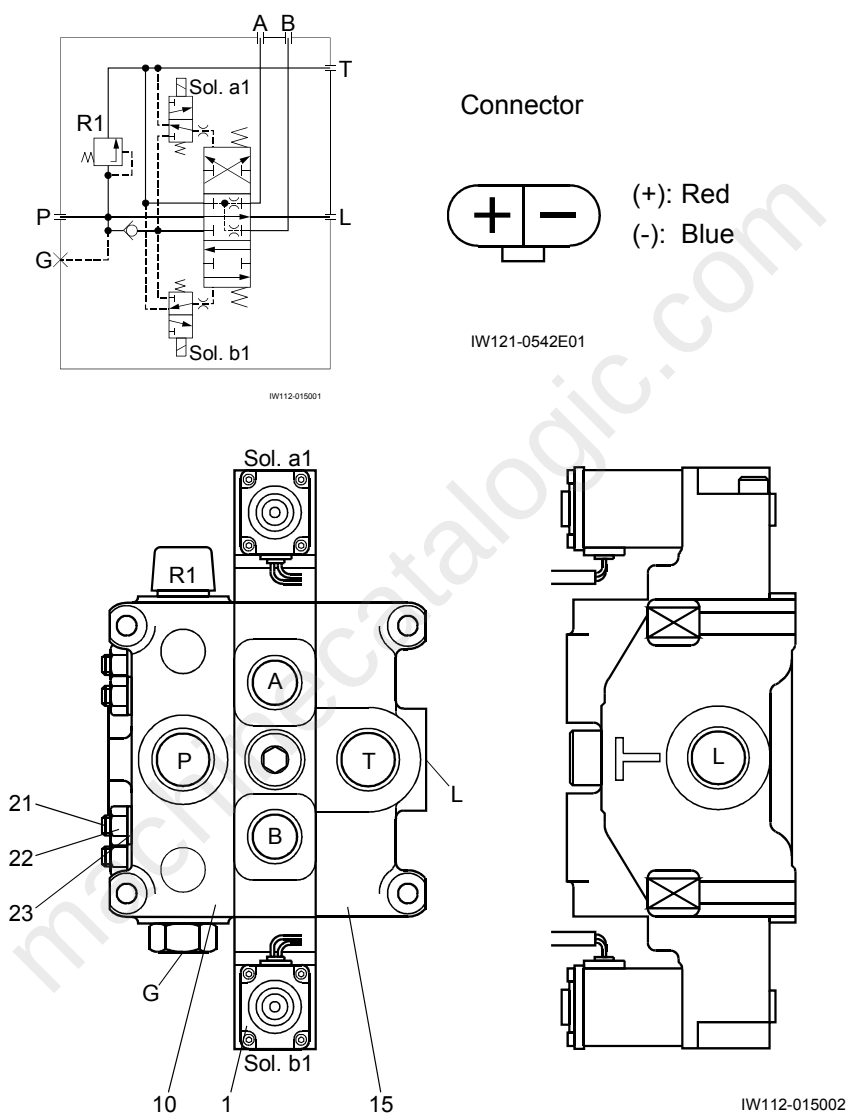
Solenoid Control Valve (Outrigger)

B-8 Solenoid Control Valve (Outrigger)

[NOTICE]

◆ There is a case that the appearance and so on differ from the parts for this machine. Although there is not so much difference in functions and disassembly procedures, make sure of the serial number of this machine and the part sales unit described in the parts catalog before starting disassembling operations.

1. Structure



1. Body assy
10. P cover assy

15. T cover assy
21. Stud bolt

22. Nut
23. Spring washer

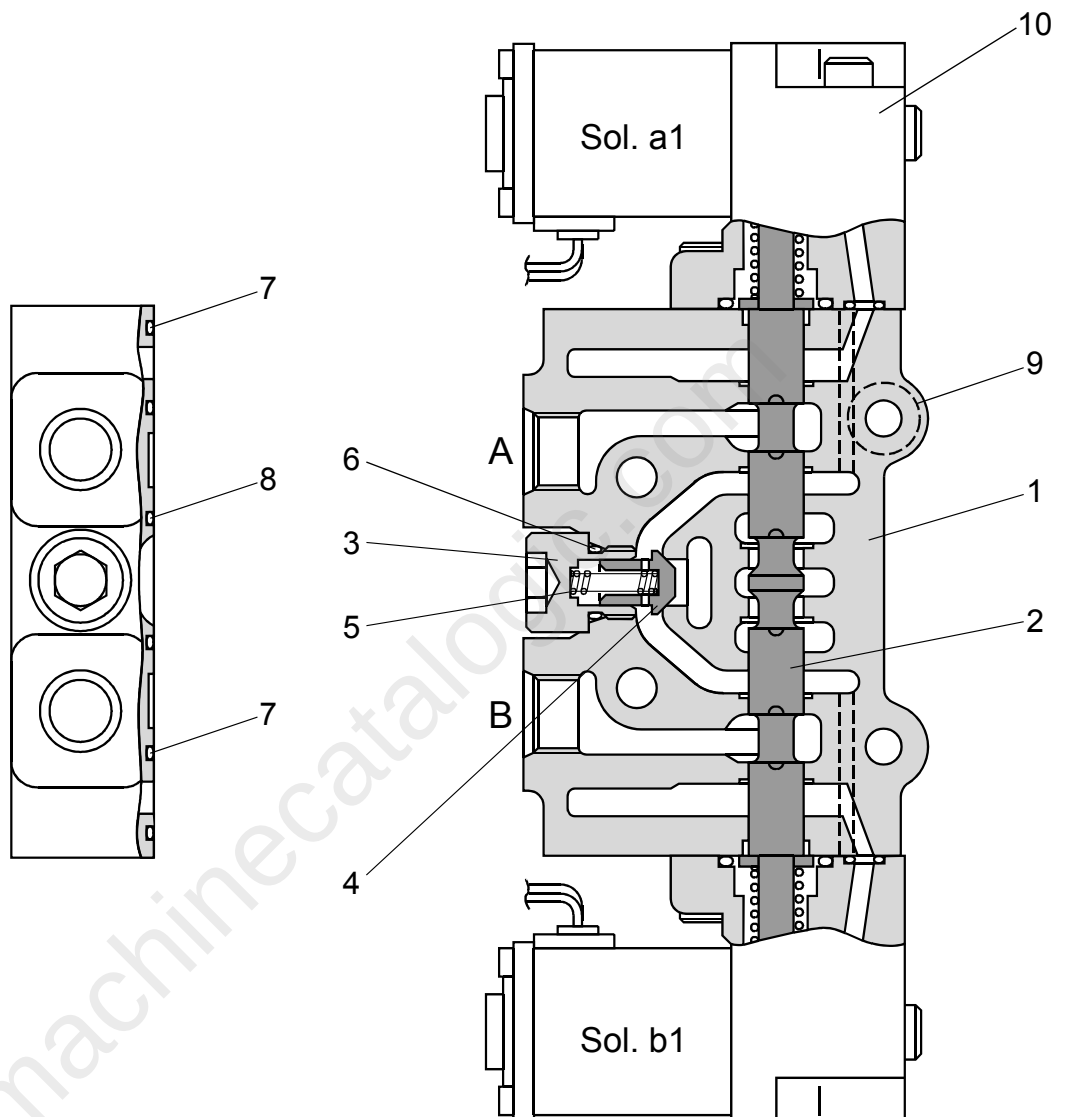
Thread size and tightening torque

Thread	Thread size	Tightening torque	
		N-m	ft-lbf
P, T, L	G1	196	145
A, B	G3/4	167	123
G	G1/4	29.4	22

Solenoid Control Valve (Outrigger)

Body assy (1/2)
(illustrated as 1 on page 21)

- 1.Body
- 2.Spool
- 3.Plug
- 4.Plunger
- 5.Spring
- 6.O-ring
- 7.O-ring
- 8.O-ring
- 9.Shim
- 10.Pilot cover assy



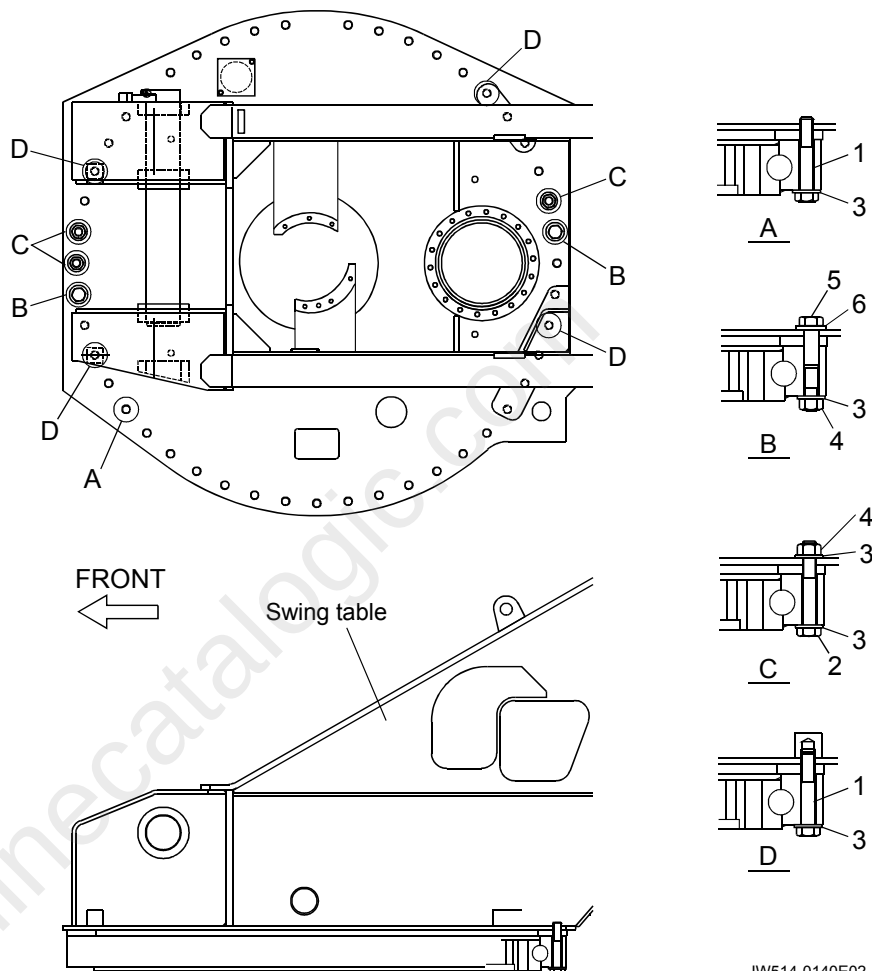
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Body assy (2/2)
Pilot cover assy (illustrated as 10 on page 21)

Swing Assembly

2.2 Bearing outer ring bolts

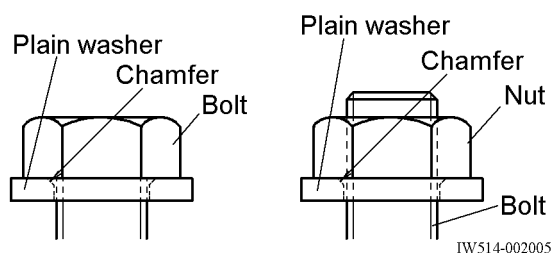
1. Bolt (L=152mm)
2. Bolt (L=175mm)
3. Plain washer (50points)
4. Nut (5points)
5. Reamer bolt (L=172mm)
6. Plain washer (2points)



IW514-0140E02

[NOTICE]

- ◆ Apply torque control agent to the threaded sections of the bolts.
- ◆ Install the plain washer, orienting its chamfer on the internal periphery as shown below.



IW514-002005

Thread size and tightening torque

Thread	Thread size	Tightening torque	
		N-m	ft-lbf
1 (42 points)	M27	1177 - 1275	868 - 940
2 (3 points)			
5 (2 points)			

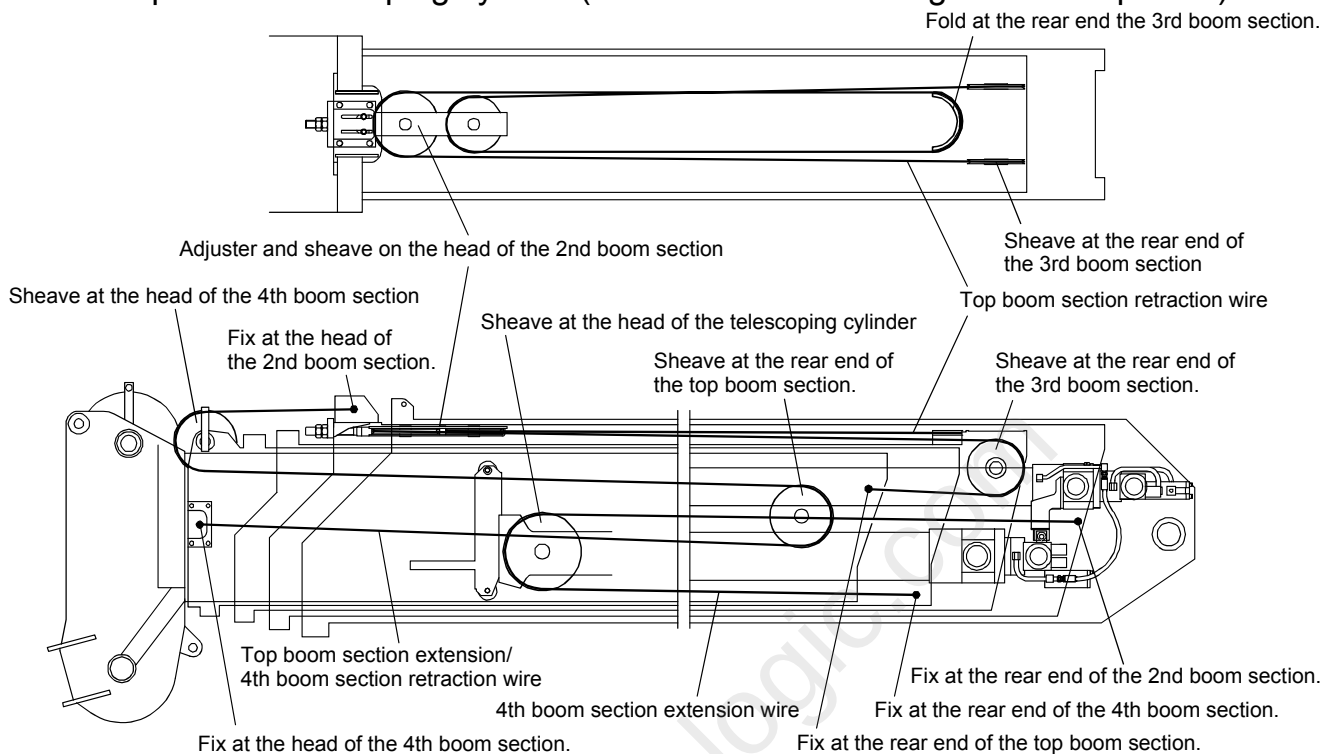
343-006-70000

347-620-62000

342-310-30000

Telescoping System

2. Description of telescoping system (Refer to the circuit diagram in Chapter Z.)



2.1 Extension circuit

1. When the boom telescoping lever (linked to the remote control valve) is operated to the extension side, pilot pressure is led to the hydraulic pilot control valve, shifting the telescoping control valve to extension side and delivering the pressurized oil from the hydraulic pump to the selector valve.
2. The pressurized oil is sent to the No. 1 telescoping cylinder, making the 2nd boom section extend.
3. After the 2nd boom section is fully extended, press the next section extension switch while keeping the boom telescoping lever operated. The hydraulic valve will be energized, the pressurized oil will be sent to the No. 2 telescoping cylinder and the 3rd boom section will extend.
4. In this case, you need not keep pressing the next section extension switch when the No. 2 telescoping cylinder extends slightly because the boom full retraction switch is shifted and the solenoid self-holding circuit for the hydraulic valve is established.

5. The 4th and top boom sections are extended by the wire-rope mechanism linked to the No. 2 telescoping cylinder.

2.2 Retraction circuit

1. Pressurized oil for boom retraction is delivered from the hydraulic pilot control valve to the No. 1 and No. 2 telescoping cylinder directly.
2. While the No. 2 telescoping cylinder is extended, the solenoid of the selector valve is energized due to the boom full retraction detector switch. Consequently the return circuit of the No. 1 telescoping cylinder is closed and only the No. 2 telescoping cylinder retracts, resulting in retraction of the 3rd boom section.
3. At the same time, the 4th and top boom sections retract by the wire-rope mechanism.
4. When the No. 2 telescoping cylinder is almost fully retracted, the boom full retraction detector switch is activated and disestablishes the solenoid self-holding circuit for the hydraulic valve. Consequently the selector valve automatically shifts, the No. 1 telescoping cylinder retracts and the 2nd boom section retracts.

Safety System

H-1 Safety System

1. General

1.1 Pressure sensor

1. A retraction pressure sensor and an extension pressure sensor are incorporated in the elevating cylinders.
2. They convert the elevation pressure into the electric signal and transmit it to AML (Load moment indicator) main body, making the limiter calculate the total moment created by the lifted load and the mass of the boom.

1.2 Boom length and angle detector

The Boom length and angle detector is installed on the boom side, and uses the potentiometer inside the detector to convert the extended boom length and the angle of the boom relative to the ground into an electric signal that is transmitted to AML main body.

1.3 Outrigger extension width detector

It is installed on the rear end of the outrigger outer case. The potentiometer in the detector converts the outrigger extension width into the electric signal and transmits it to AML main body.

1.4 Other detectors and switches

The outer detectors and switches convert the crane operation modes and working conditions into an electric signal that is transmitted to AML main body.

1.5 AML (Load moment indicator) main body

1. AML main body calculates the moment being generated on the crane based on signals from the pressure sensor and the Boom length and angle detector.
2. The calculation result is compared with the rated moment and, when it reaches 90% and 100% of the rating, AML sends alarm and auto. stop signals, respectively, to prevent the crane from being overloaded.

1.6 Overwind cutout (Anti-twoblock) device

The anti-twoblock device prevents damage to the crane that would be caused by pulling the hook block into the boom head. When the hook block approaches the boom head, single top or jib, the overwind cutout device sends a signal to AML, which then stops any further crane action toward the critical condition.

1.7 Solenoid valve

1. If AML malfunctions or if the actual moment reaches 100% of the rated moment or the hook block is over-hoisted, an electric signal (auto. stop) is sent from AML main body to this valve.
2. When the solenoid valve is deenergized, this solenoid valve contents the vent line of the relief valve mounted on the hydraulic pilot control valve to the tank. The solenoid valve by allowing the pressurized oil from the pump to escape through the relief valve to the tank, therefore the crane operation stops.

2. Description of system

Refer to the repair manual of AML-LK.

Air Conditioner

9.3 Check for gas leakage and amount of refrigerant charge

[NOTICE]

◆ Never check using a halide-torch type leak detector.

1. Insert refrigerant in gas form until the gauge pressure reads 98.1 kPa (14.2 psi). Then use a leak tester and check for leaks.

[NOTICE]

◆ An excess or insufficient amount of refrigerant can result in the following trouble.

Excess amount: Cooling trouble resulting from operation of the pressure switch

Insufficient amount: Cooling trouble or malfunction resulting from compressor lubrication failure

2. When the sight glass bubbles disappear, control the refrigerant to +100 - 200 g.

(Conditions)

Doors : Open
 Blower : Hi
 Engine speed : Idle
 A/C switch : ON
 Temp. control : Max. cool

9.4 Heated water circuit

1. When connecting the heated water piping, be careful not to incorrectly assemble the IN and OUT piping.
2. In order to prevent damage resulting from freezing of the water inside the heated water circuit, in the wintertime use antifreeze in a concentration appropriate for the outside temperature.
3. The pressure which is applied to the heated water circuit heater core is 196 kPa (28.4 psi) or less when the circuit is in use. However the usual pressure is 98 kPa (14.2 psi) or less.

9.5 Run-in operation

Operate the A/C for 5 minutes or more under the conditions below to perform the initial run-in operation.

Engine speed : Idle

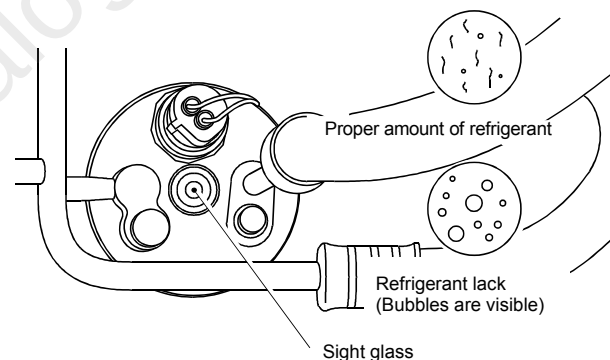
(High-speed starting is especially prohibited.)

Temp. control : Max. cool

Blower : Hi

9.6 Bolt size and tightening torque

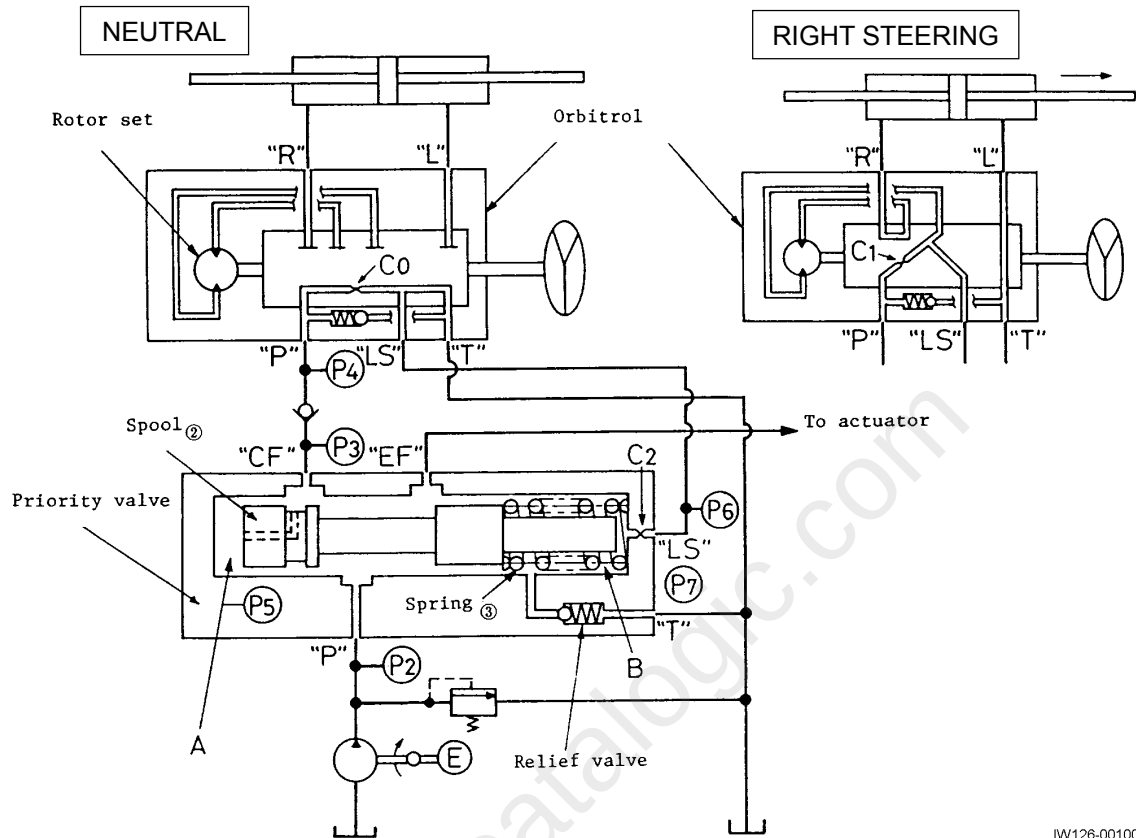
Bolt	Tightening torque	
	N•m	ft•lbf
Compressor installation	24.5 - 29.4	18.1 - 21.7
Idle pulley center bolt	31.4 - 47.1	23.2 - 34.7



IW701-0160E12

Priority Valve

3. Principle of operation



IW126-001003

The above figure is for illustrating the principle. The construction of the actual machine may differ from the figure.

3.1 Neutral state

While the engine is standing still, spool 2 in the priority valve is pushed to the left end by spring 3, fully opening port CF and fully closing port EF. When the engine is started, the hydraulic oil delivered from the hydraulic pump flows through port P and port CF of the priority valve to port P of the Orbitrol. As the hydraulic pressure in circuit CF rises in this way, pressure P5 in pressure chamber A of the priority valve also rises. At this time, pressure chamber B is connected to the tank line via port LS and port T of the Orbitrol, and when the pressure difference (P5 - P6) between chamber A and chamber B rises to overcome the force of spring 3, the spool moves towards right until port EF becomes almost fully opened, and port CF becomes slightly open. The spool remains stable in this position, and the pump delivery oil mostly flows through port EF.

3.2 Right steering

When the steering wheel is turned clockwise, the hydraulic oil routes inside the Orbitrol are switched over, causing the oil entering through port P of the Orbitrol to flow through orifice C1. Then, the pressures across orifice C1 are transferred to pressure chambers A and B. The spool is moved until the pressure difference (P5 - P6) becomes balanced by spring 3.

3.3 Right steering to the end

When the steering cylinder piston is moved to the stroke end, the relief valve in the priority valve actuates, producing oil flow through orifice C2 in line LS of the priority valve. The pressure difference across C2 is transferred to pressure chambers A and B and the spool is further moved towards right until it becomes stable with port CF slightly open, and route EF almost fully open.

366-103-80000 △

Booster (Brake)

2. Function

This booster receives pressurized air from the relay valve into the air cylinder, and outputs hydraulic pressure in proportion to the pneumatic pressure to the wheel cylinders and other members of the brake system. It comprises the following three major components.

1. Air cylinder

The air cylinder incorporates air piston assy 8, return spring 11. The return spring side is always open to the atmosphere, and the opposite side is subject to the output pressure of the relay valve.

2. Oil cylinder

Oil piston 14-1 is connected to air piston assy 8 by piston pin 16, via valve 15, and pin holder 17 prevents the pin from coming off. The pressurized oil in the oil cylinder is sealed by a tight fit between the valve in valve 15 and oil piston 14-1.

3. Relay valve

This valve serves to make the brake applied and released quickly.

Full Version Available

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