PREFACE

Generally, rollers tend to come large-sized and find their applications in dangerous fields such as rough terrain, steep slopes or slippery areas. Faulty rollers may risk a grave accident.

For purpose-built rollers to negotiate problem terrain with the ultimate in performance maintained free from failure over the longest possible period of time, adequate handling and regular preventive maintenance recommended are of prime importance. If a trouble developes, it should be effectively corrected with proper safety measures taken.

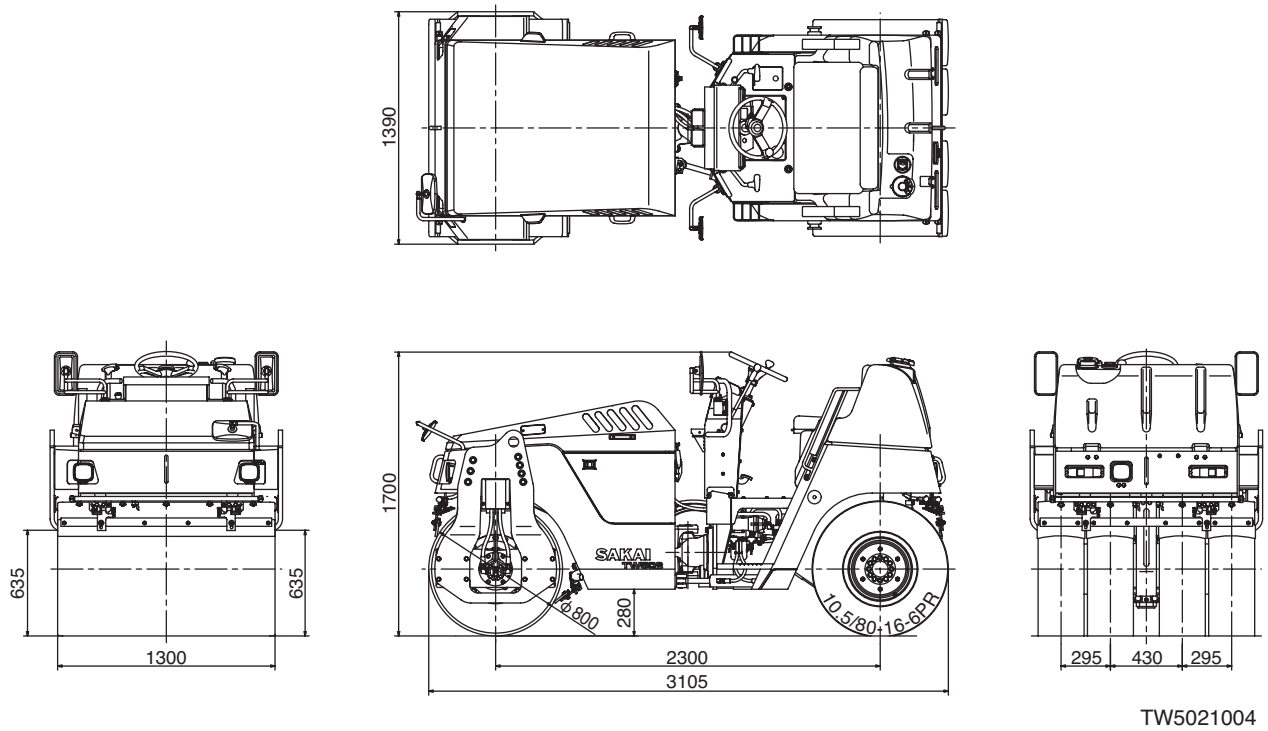
This service manual is intended to serve as a guide particularly for maintenance personnel to perform quality service by gaining working knowledge of and reliable maintenance techniques for machines in question.

Included in this literature are descriptions of SPECIFICATIONS, STRUCTURE & OPERATION, INSPECTION & ADJUSTEMNT, FAULT DIAGNOSIS and DISASSEMBLY & ASSEMBLY. Systematic explanations are being given to each of these five cathegories in this sequence.

Rollers principally concern qualitative factors as represented by ‘compaction density’, to say nothing of quantitative elements like ‘productivity’. SPECIFICATIONS section includes performance data of major significance e.g. ‘vibratory frequency’ to be checked when servicing machines in question.

For reasonable maintenance services, it is a precondition to know the vital portions of machines in question and how they work. Referring to relevant electric wiring and hydraulic circuit diagrams, STRUCTURE & OPERATION instructs location of key units and function of systems into which the key units are assembled.

1-4. TW502



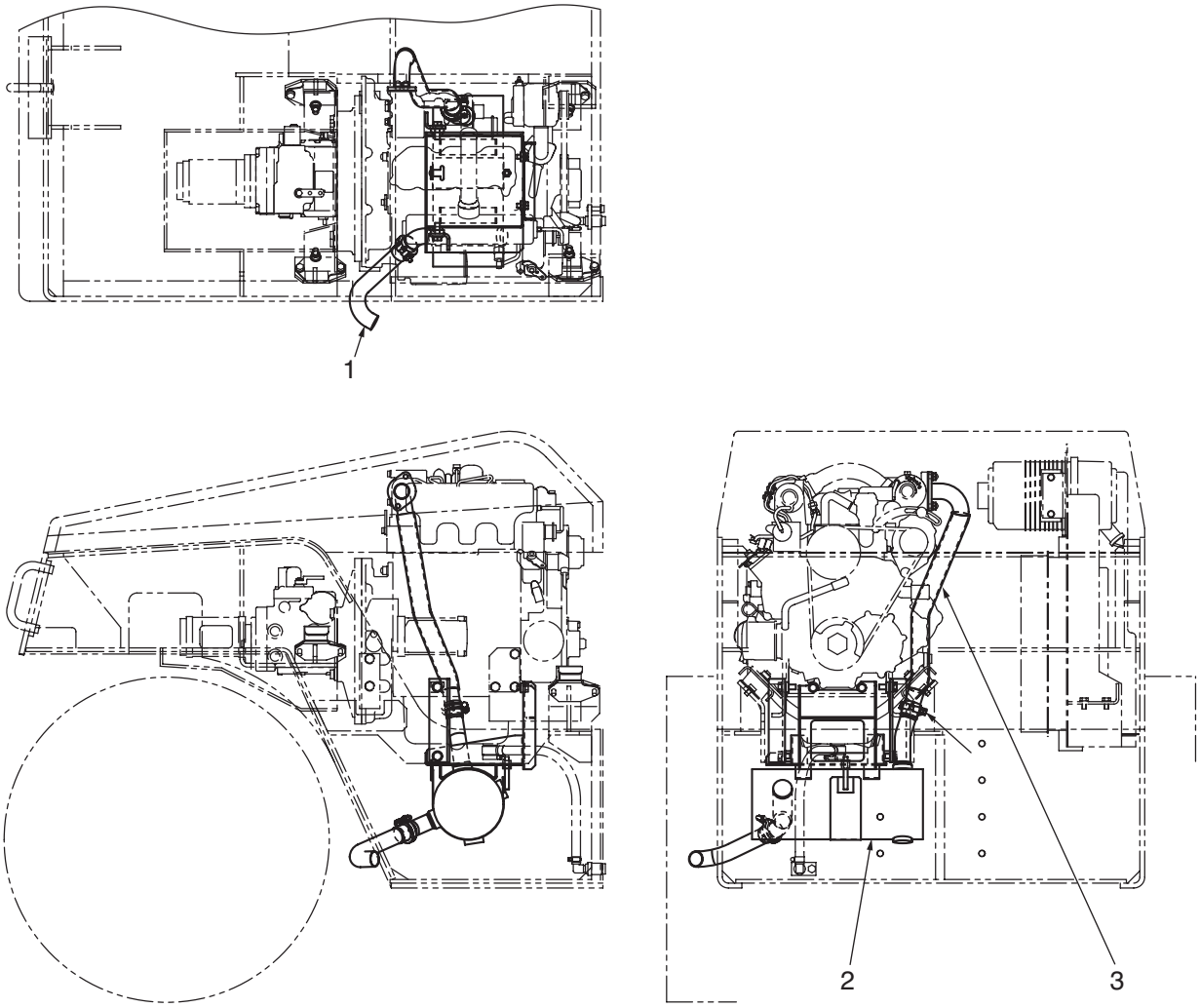
TW5021004

Model	TW502
Weight:	
Gross weight	3,540 kg (7,800 lbs)
Empty weight	3,230 kg (7,120 lbs)
Dimension:	
Overall length	3,105 mm (122”)
Overall width	1,390 mm (55”)
Overall height	1,700 mm (67”)
Wheelbase	2,300 mm (91”)
Wheel	
Front	Roll (dia. x width) 800 x 1,300 mm (31” x 51”)
Rear	Tire 10.5/80–16–6PR (OR)
Performance:	
Travel speed (forward/reverse)	
Low	0 ~ 9.0 km/h (0 ~ 5.6 mile/h)
High	0 ~ 12.0 km/h (0 ~ 7.5 mile/h)

Vibrating power:	Low	High
Frequency	55 Hz	55 Hz
Centrifugal force	26.5 kN (5,955 lbs)	34.3 kN (7,710 lbs)
Gradability	21 degrees	
Rolling width	1,300 mm (51”)	
Minimum turning radius	4.3 m (169”)	
Engine:		
Model	KUBOTA “D1503-T-K2A” Diesel Engine (With turbo charger)	
Total displacement	1.499 liters (91 cu.in)	
Rated output	25.7 kW/2,300 min^{-1} (34 HP/2,300 min^{-1})	
Max. torque	122 N·m/1,600 min^{-1} (90 ft-lb/1,600 rpm)	
Tank capacity:		
Fuel tank	50 liters (13 gal)	
Hydraulic tank	49 liters (12.9 gal)	
Sprinkler tank	310 liters (82 gal)	
Liquid tank	10 liters (2.6 gal)	

NOTE: Gradability is the calculated value. It may vary with ground surface conditions.

1-5. Exhaust system

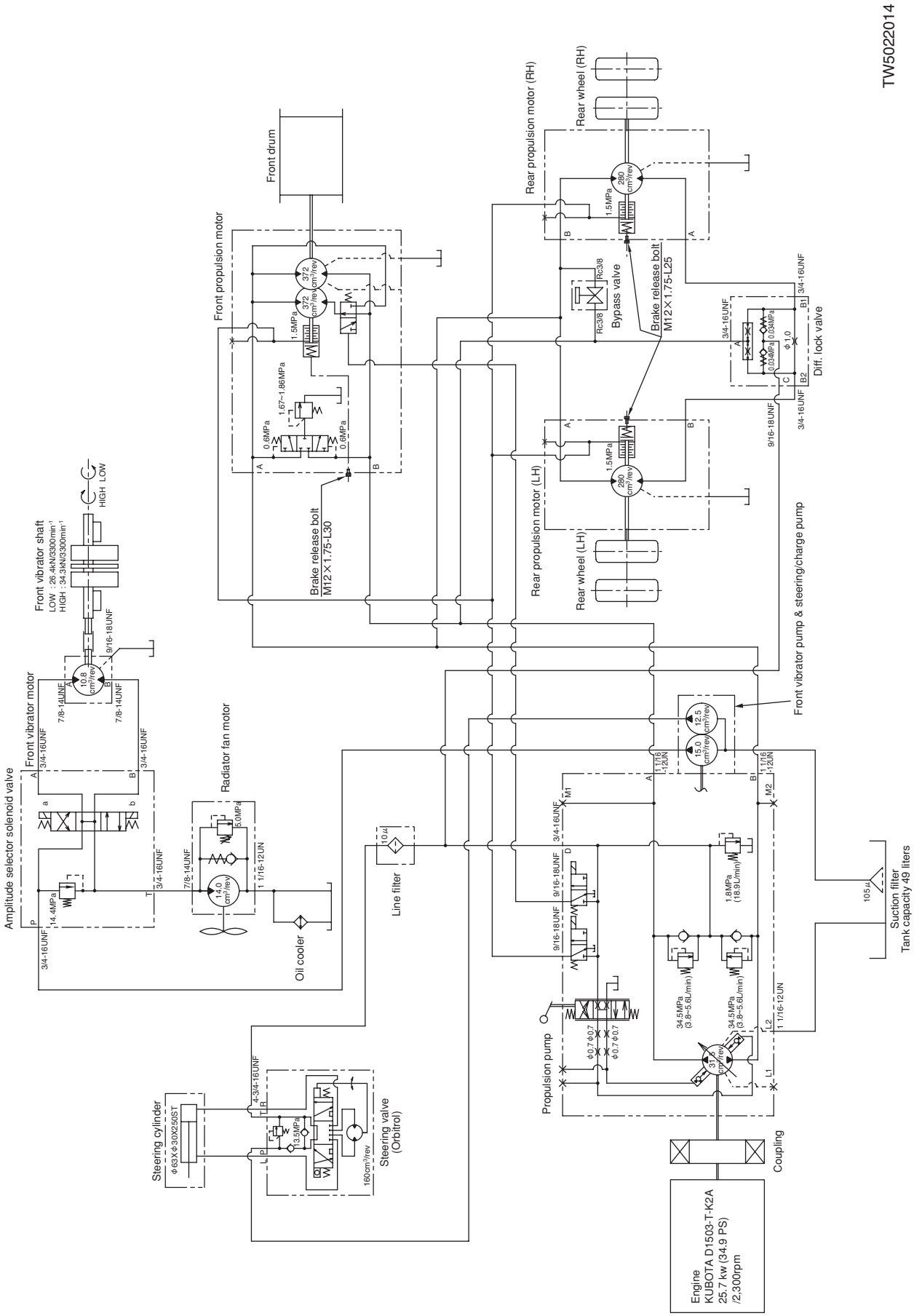


TW5022004

1. Exhaust pipe
2. Muffler
3. Exhaust pipe

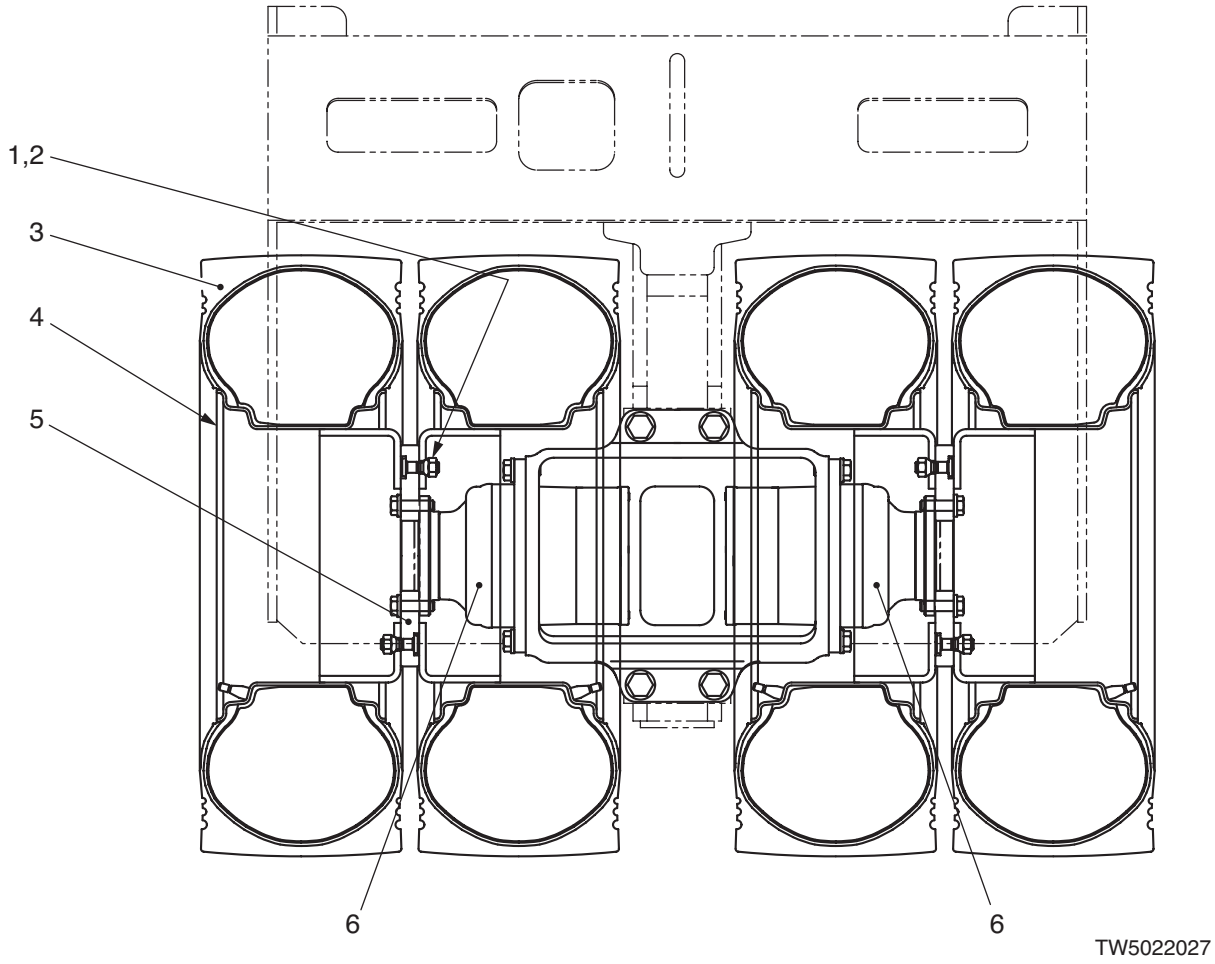
★ Above figures represent the exhaust items of TW502.

2-1-7. Hydraulic circuit diagram (TW502)



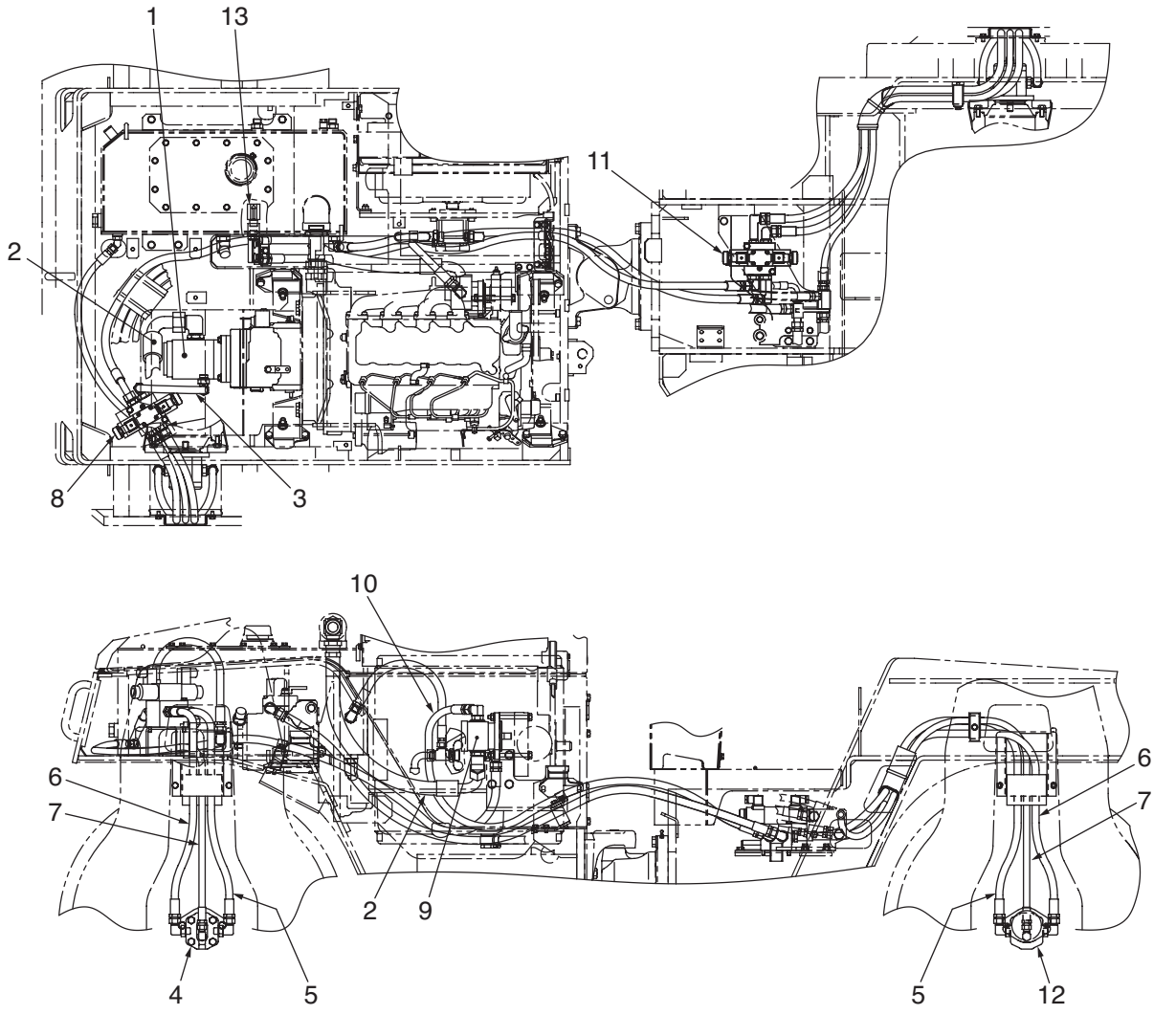
2-2-7. Rear axle assembly (TW352, TW502)

★ Wide tire version



1. Hub bolt
2. Hub nut
3. Tire
4. Disc wheel
5. Disc
6. Propulsion motor

2-3-2. Hydraulic piping (SW502)



TW5022034

1. Front vibrator pump & steering/charge pump
2. Suction hose
3. Front pump outlet hose
4. Front vibrator motor
5. High pressure hose (high amp.)
6. High pressure hose (low amp.)
7. Drain hose
8. Front amplitude selector solenoid valve
9. Rear vibrator pump
10. Rear pump outlet hose
11. Rear amplitude selector solenoid valve
12. Rear vibrator motor
13. Check valve

SW352 (rear vibrator)

*** See hydraulic circuit diagrams on page 2-044.**

- Being a gear pump, rear vibrator pmp (2) discharges oil as long as it is driven. When the vibrator is not in use, it is unloaded by vibrator on-off solenoid valve (11).
- With the vibrator on-off switch ON, vibrator on-off solenoid valve (11) closes the unload circuit, making the vibrator circuit energize. The oil under pressure drives vibrator motor (gear motor) (12), and then flows back to the tank.

SW502, TW502 (front vibrator)

*** See hydraulic circuit diagrams on page 2-045.**

- Because vibrator pump (2) is a gear pump, it continues discharging oil as long as it is driven. With amplitude selector solenoid valve (4) in the neutral position (all ports open), the pump is put under no load. Oil in the unload circuit or oil displaced from vibrator motor (5) is fed into radiator fan motor (7) circuit to drive radiator fan motor (7). Then oil is drained to the tank either directly or via oil cooler (8).
- Energizing of amplitude selector solenoid (a) or (b) selects Low amplitude or High amplitude respectively by reversing rotating direction of gear motor (5).

★ A choice of amplitude is made as follows:

- Oil drawn from port B of gear motor (5) → High amplitude
- Oil drawn from port A of gear motor (5) → Low amplitude

SW502 (rear vibrator)

*** See hydraulic circuit diagrams on page 2-045.**

- Operation is same as the front vibrator except for the return line. Oil displaced from vibrator motor (11) returns to the tank through check valve (13).

Protection of vibrator circuit from excessive pressure

SW352, TW352

*** See hydraulic circuit diagrams on page 2-044.**

- Pressure relief valves (a) built in vibrator on-off solenoid valves (4) and (11) vent the pressure to the tank if it exceeds the preselected setting of the valve.

SW502, TW502

*** See hydraulic circuit diagrams on page 2-045.**

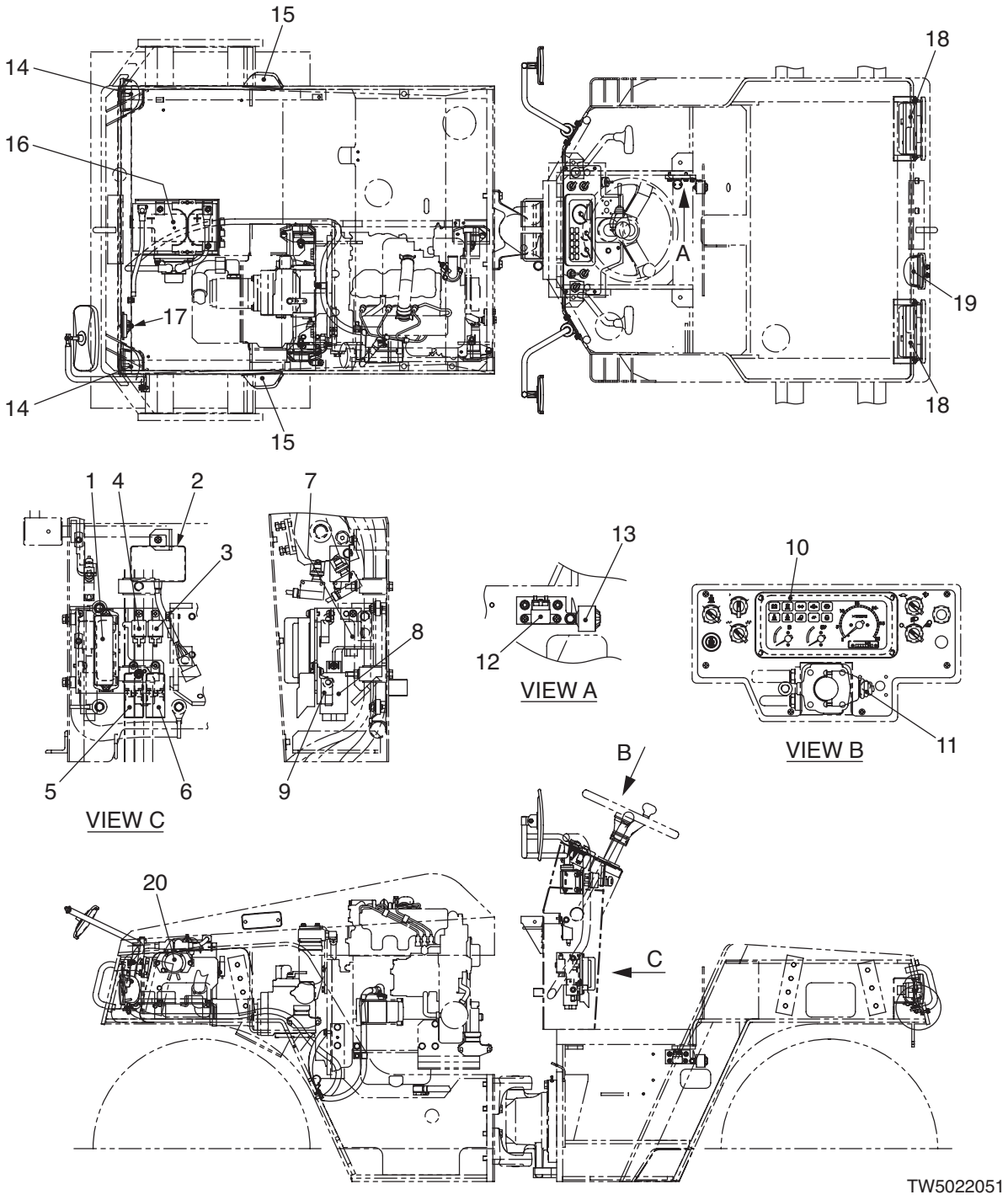
- Pressure relief valves (c) built in amplitude selector solenoid valves (4) and (10) relieve the pressure if it exceeds the setting of the valve.

Protection of radiator fan motor circuit from excessive pressure

- Pressure relief valve (e) in the radiator fan motor relieves the pressure in this line if it exceeds the setting of the valve.

6. Electric System

6-1. Location of instrument panel and key units

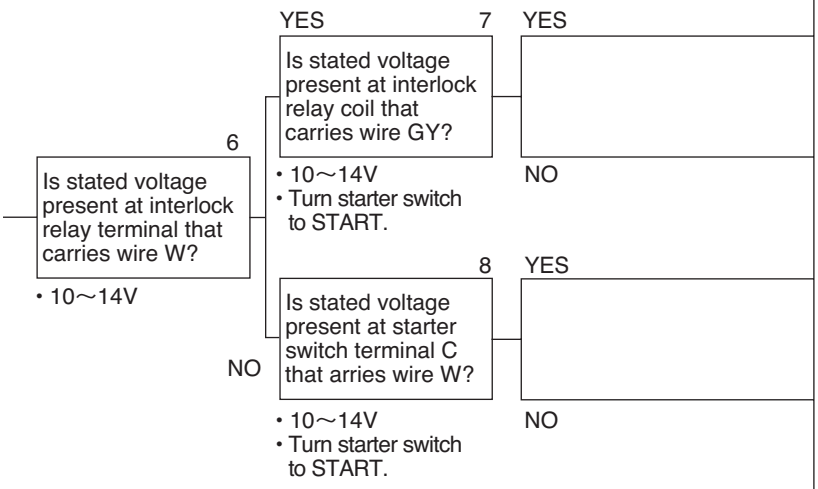


1. Fuse box
2. Control box
3. Horn relay
4. Vibrator lamp relay
5. Interlock relay
6. Brake lamp relay
7. Flasher unit
8. Vibrator relay
9. Glow lamp timer
10. Combination meter
11. Turn signal switch
12. Sprinkler relay
13. Reverse alarm
14. Head lamp
15. Turn signal lamp
16. Battery
17. Horn
18. Combination lamp
19. Work lamp
20. Battery relay

1-2. SW502, TW502

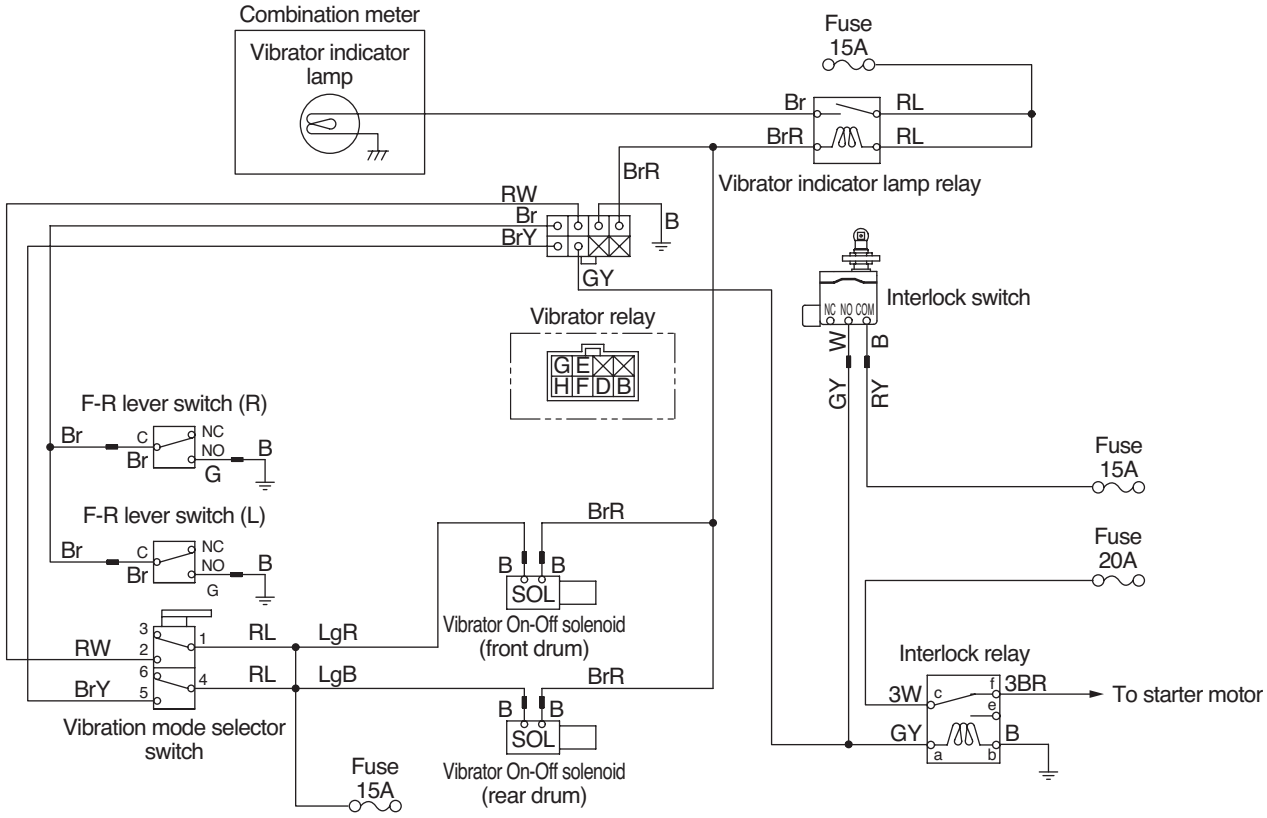
Item				Measuring conditions	Unit	Standard value for new machine	Permissible range
Engine	Speed	Low idle		• Coolant temp. : Displayed on gauge • Hydraulic oil working temperature : 50±5 °C	min^{-1} (rpm)	950±25	←
		High idle				2450±50	←
		Rated speed				2300	←
Travel speed	SW502	Forward	Lo	• Engine: full throttle • Coolant temp. : Displayed on gauge • Hydraulic oil working temperature : 50±5 °C	km/h	0~7.5±1.0	←
			Hi			0~10.0±1.0	←
		Reverse	Lo			0~7.5±1.0	←
			Hi			0~10.0±1.0	←
	TW502	Forward	Lo			0~9.0±1.0	←
			Hi			0~12.0±1.0	←
		Reverse	Lo			0~9.0±1.0	←
			Hi			0~12.0±1.0	←
Hydraulic Oil pressure	Propulsion	Main circuit		• Engine at full throttle • Hydraulic oil working temperature : 50±5 °C • See measurement procedure of pressure in each circuit.	MPa (kgf/cm^2)	34.5±1 (350±10)	31.7 (323)
		Charge circuit				1.8±0.2 (18.4±2)	1.6 (16.3)
	Vibrator circuit		SW502			14.4±0.5 (147±5)	13.2 (135)
			TW502			14.4±0.5 (147±5)	13.2 (135)
	Steering circuit					13.5±0.5 (138±5)	12.4 (127)
	Speed selector circuit					1.8±0.2 (18.4±2)	1.6 (16.3)
	Brake release circuit					1.8±0.2 (18.4±2)	1.6 (16.3)

FAULT DIAGNOSIS



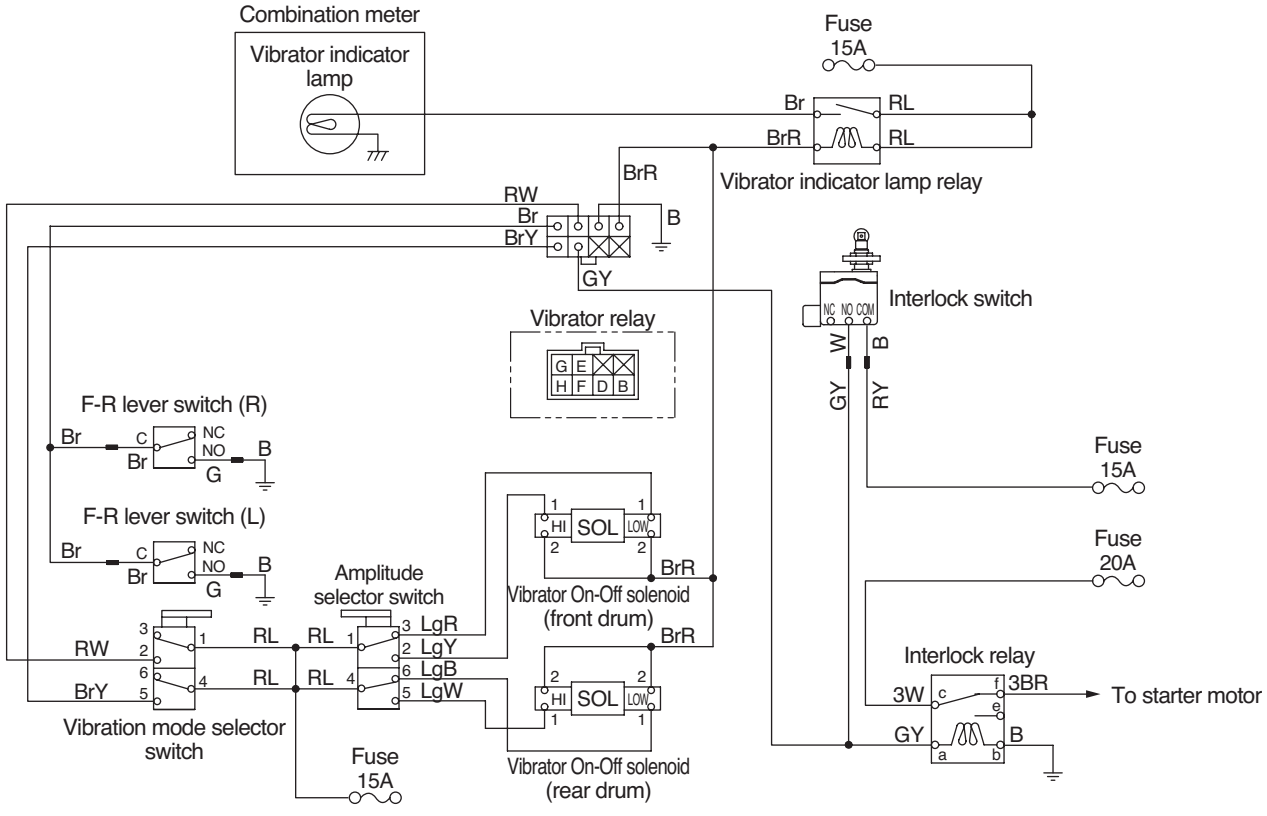
Possible cause	Remedy
Starter faulty.	Renew.
Wire from interlock relay terminal to starter terminal S not connected or incorrectly connected.	Repair or renew wire.
Interlock relay faulty.	Renew.
F-R lever interlock switch faulty.	Renew.
Wire W from starter switch terminal C to interlock relay termianl not connected or incorrectly connected. (including fuse)	Repair or renew wire.
Starter switch faulty. (between B and C)	Renew.
Cable from battery relay terminal NO to starter not connected or incorrectly connected.	Repair or renew wire.
Battery relay contact faulty.	Renew.
Battery relay coil faulty.	Renew.
Wire LgR or LgW from starter switch terminal BR to battery relay terminal BR not connected or incorrectly connected.	Repair or renew wire.
To A on next page	
Battery capacity lowered.	Charge or renew battery.

Electric wiring diagram for mode E-6 (SW352, TW352)



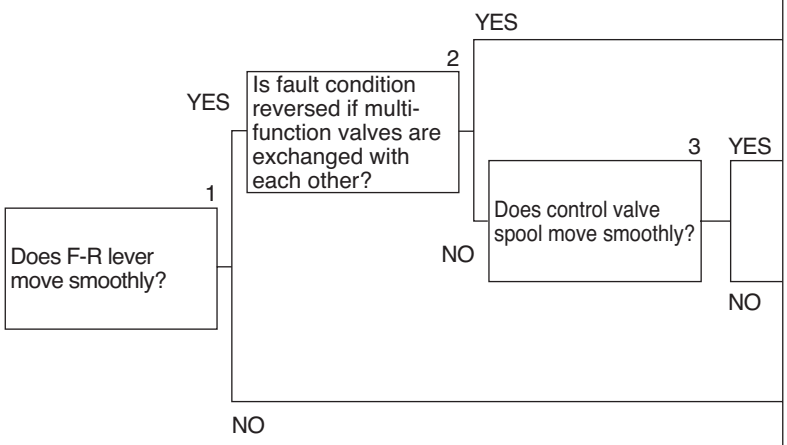
* Above figure illustrates diagram of SW352. TW352 has front vibrating unit only.

Electric wiring diagram for mode E-6 (SW502, TW502)



* Above figure illustrates diagram of SW502. TW502 has front vibrating unit only.

b) Machine travels in one direction alone, either forward or in reverse.



Possible cause	Remedy
Multi-function valve faulty. (Foreign matter is present or valve is defective.)	Renew.
Servo piston is malfunctioning.	Renew propulsion pump.
Control valve is malfunctioning.	Repair or renew.
F-R lever linkage incorrectly adjusted.	Adjust.

Precautions for Work

★ When removing, disassemblig, assembling and installing the units, follow the general precautions as described below:

1. Precautions for removal

- The coolant which contains an untifreeze should be treated carefully and must not be drained carelessly on the ground.
- Plug open end of disconnected hoses and pipes to prevent entry of dust.
- When draining oil, use a container of sufficient capacity to receive it.
- When disassembling parts, scribe match marks for correct reinstallation.
- When disconnecting wire connectors, pull connector, not wire, to avoid undue stress on the wire.
- Label wires and hoses for correct reconnection.
- When removing shims, note their number and thickness.
- When lifting parts or units, use a lifting gear of sufficent capacity.
- When separating parts by using pull bolts, screw in them alternately.
- When removing units, clean around them. After removal, cover them to prevent engress of dust.

2. Precautions for installation

- Torque tighten bolts and nuts to specification.
- Install hoses exercising caution not to distort them or not to allow them to interfere with other parts.
- If once removed, discard gaskets, O-rings, cotter pins and lock plates.
- When installing, bend cotter pins and lock plates positively.
- If a sealant is coated, clean and remove residual oil or grease from thread portions. Apply two or three drops of bond to the threaded portions.
- When applying a sealant, clean and remove residual oil or grease from the mating surfaces. Spread the sealnat smoothly after making sure that the surfce is free from dust or not damaged.
- Clean parts. Correct scores, remove burrs and rusts etc.
- Apply a coat of engine oil to rotating and sliding portions.
- Apply a coat of grease to surfaces of press-fit parts.
- Make sure that lock rings are correctly seated in grooves.
- Connect wire connectors positively after removing oil, dust and water.
- Use liftng bolts not fatigued and not distorted. Screw in fully.
- When tightening parts such as split flange, tighten screws alternately to prevent one-sided tightening.

3. Precautions when service work is complete

- If coolant has been drained, refit the drain cock, fill coolant to the specified level. Start the engine, allow the coolant to circulate through the cooling system piping. Then add coolant to the specifed level.
- If hydralic units have been reinstalled or renewed, fill the hydraulic tank to the specified level. Start the engine, and allow the oil to circulate through the piping. Then add oil to the specified level.

6. Removal and Installation of Front Drum Assembly

6-1. Removal of front drum assembly

★ **Remove the rear drum of SW352 and SW502 using the same procedure.**

1. Scraper blade

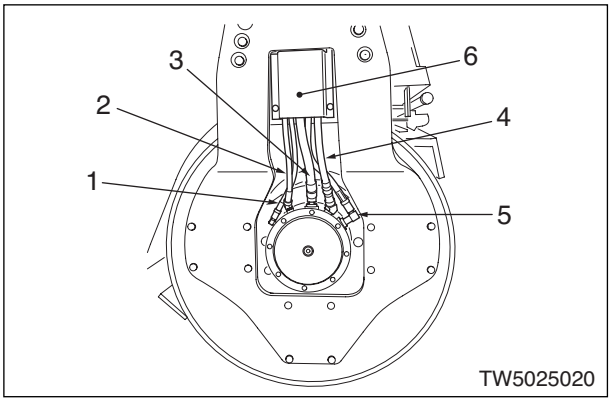
Latch the scraper blades off the drum.

2. Propulsion motor piping

1) Disconnect hoses (1)–(5) at the propulsion motor.

★ **Plug the open ends of hoses and openings of motors.**

2) Remove hose clamps (6) and disconnect hoses from the machine.

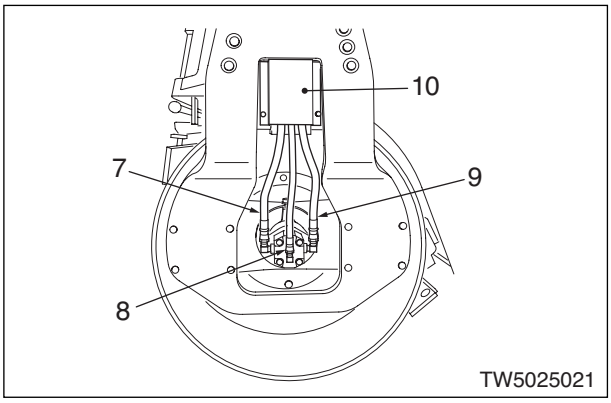


3. Vibrator motor piping

1) Disconnect hoses (7)–(9) at the vibrator motor.

★ **Plug the open ends of hoses and openings of motors.**

2) Remove hose clamps (10) and detach hoses from the machine.



4. Front drum assembly

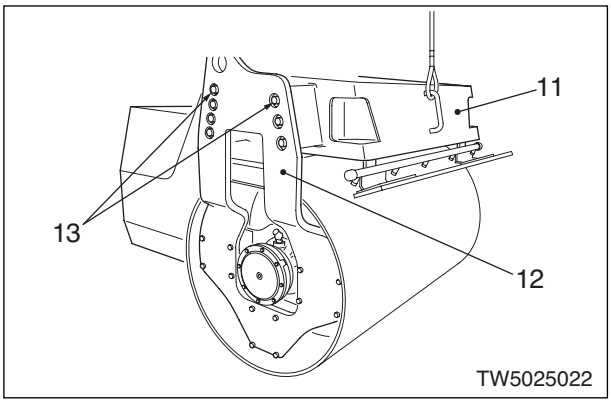
1) Using a hoist, lift and hold front frame (11).

2) Remove seven securing bolts (13) at side plate (12) and let the plate fall forward. [*2]

★ **Release the negative brake by removing the plug at the center of the front propulsion motor first and then screwing the brake release bolt into the plug hole.**

⚠ **Take care when removing the plate. It will fall free the moment the whole bolts are taken off.**

★ **Remove the plate on the opposite side by using the same procedure.**



8. Removal and Installation of Center Pin Assembly

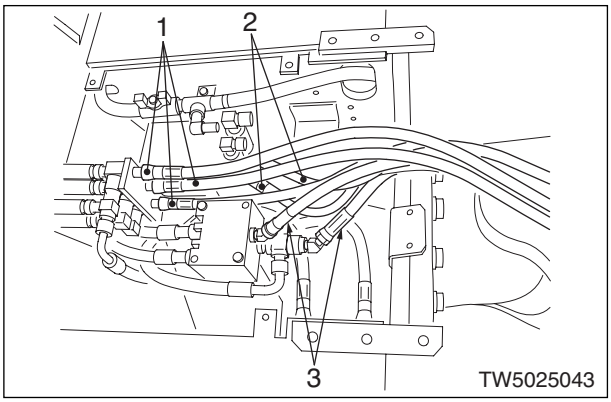
8-1. Removal of center pin assembly

⚠ Disconnect battery negative (–) cable.

1. Hydraulic hose

1) Remove the floor board by the operator's seat.

2) Remove seven hoses (1)–(3).
★Blank the open ends of hoses and adapters.

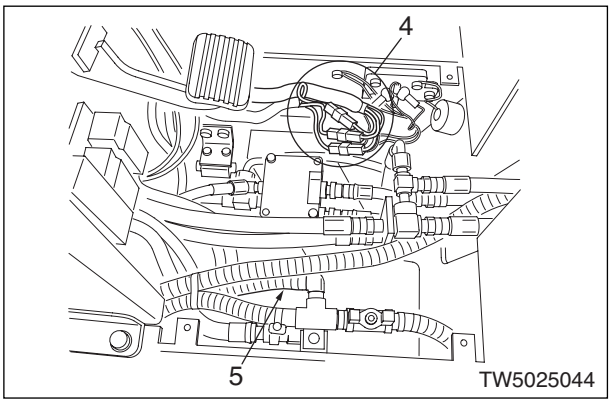


2. Electric wiring

Detach connectors (4) and place the hoses close to the front frame so that they may not interfere with the work.

3. Sprinkler

Disconnect hoses (5) and put them close to the front frame.

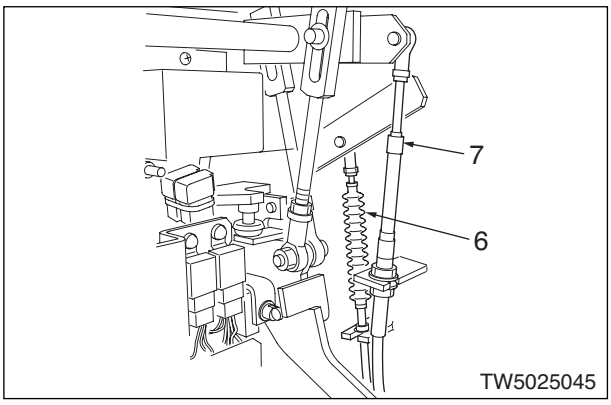


4. Throttle cable & F-R cable

1) Take off Orbitrol cover.

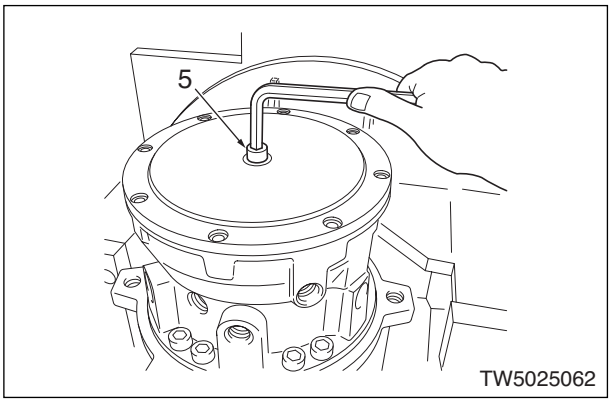
2) Remove throttle cable (6) and position it close to the front frame.

3) Remove F-R cable (7) and position it close to the front frame.



4. Brake piston

Brake piston will be lifted with the forced brake release screw (5) (socket head cap screw) screwed into the brake release port.



Screw and washer for forced brake releasing

	DCM0280	DCM0560
Screw	M10X25L	M12X30L
(Pitch)	(1.5 mm)	(1.75 mm)
Washer	For M10 screw	For M12 screw
Outer diameter	19~23 mm	22~27 mm
Thickness	2.5~3.5 mm	2.5~3.5 mm

⚠ **Use the washer without fail to protect the O-ring.**

5. Brake piston removal

After fully screwing in the brake release screw, loosen it once and place block (6) between the brake housing and brake cover to lift the brake piston further. Increase the thickness of the block until the brake piston is separated.