

# SHOP MANUAL

## KOMATSU

### *avance* **LOADER**

# WA300L-3

MACHINE MODEL

SERIAL NUMBER

**WA300L-3**

**53001 and up**

- This shop manual may contain attachments and optional equipment that are not available in your area. Please consult your local Komatsu distributor for those items you may require. Materials and specifications are subject to change without notice.
- WA300L-3 mount the SA6D102E engine.  
For details of the engine, see the 102 Series Engine Shop Manual.

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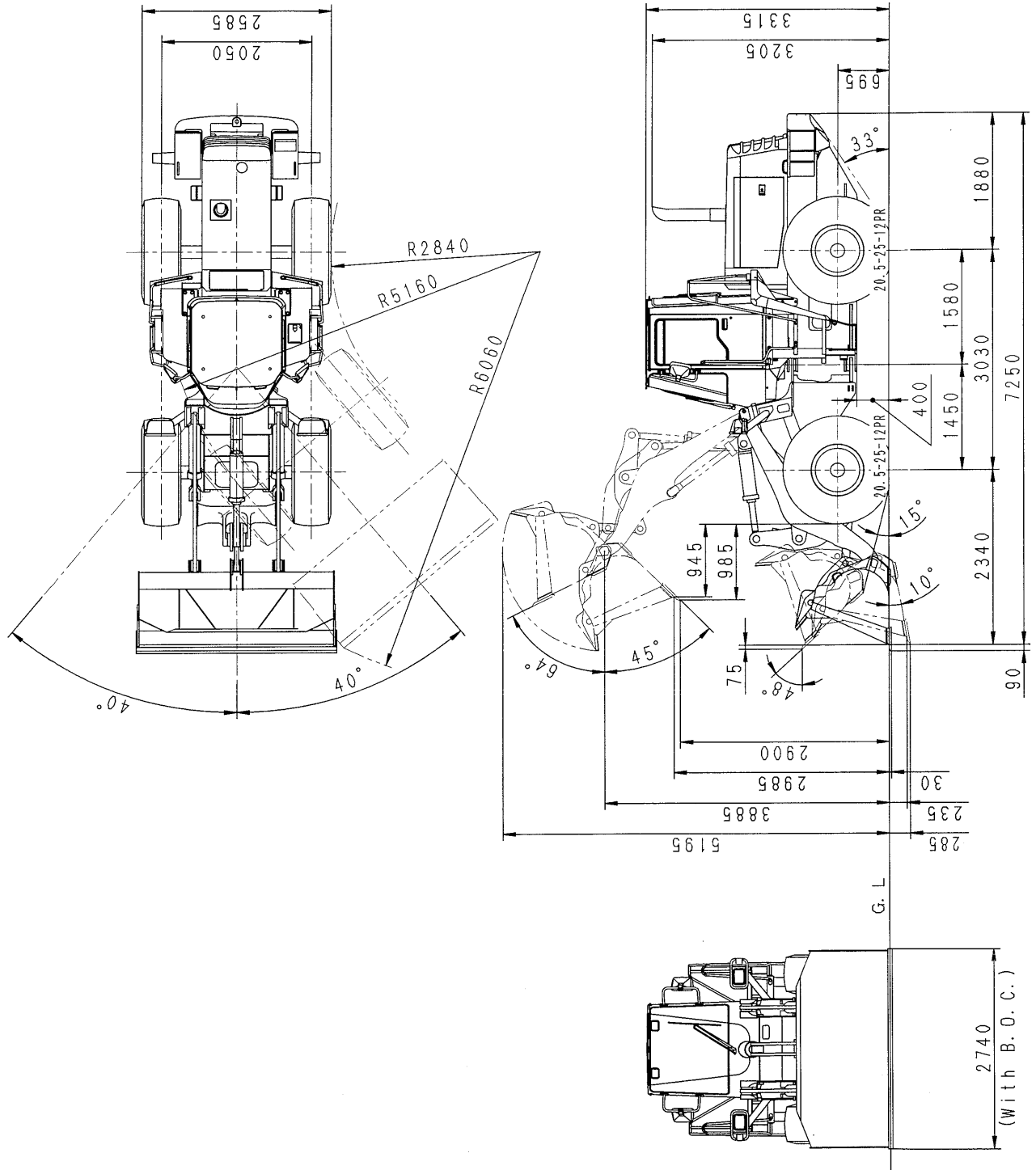
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# **01 GENERAL**

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# GENERAL ASSEMBLY DRAWING



SWW04351


## SPECIFICATIONS

Machine model			WA300L-3	
Serial No.			53001 and up	
Weight	Operating weight	kg	13,240	
	Distribution (front)	kg	5,815	
	Distribution (rear)	kg	7,425	
Performance	Bucket capacity (piled)	m <sup>3</sup>	2.5 (with BOC)	
	Rated load	N {kg}	39,230 {4,000}	
	Travel speed	FORWARD 1st	km/h	7.5
		FORWARD 2nd	km/h	12.0
		FORWARD 3rd	km/h	21.0
		FORWARD 4th	km/h	34.0
		REVERSE 1st	km/h	7.8
		REVERSE 2nd	km/h	12.5
		REVERSE 3rd	km/h	22.0
		REVERSE 4th	km/h	35.0
	Max. rimpull	N {kg}	119,560 {12,200}	
Gradeability	deg	25		
Min. turning radius	Center of outside wheel	mm	5,160	
	Outside portion of chassis	mm	6,060 (with BOC)	
Dimensions	Overall length (with BOC)	mm	7,340 (with BOC)	
	Overall width (chassis)	mm	2,585	
	Bucket width (with BOC)	mm	2,740	
	Overall height (top of cab)		mm	3,315
		(Bucket raised)	mm	5,195
	Wheelbase	mm	3,030	
	Tread	mm	2,050	
	Min. ground clearance	mm	400	
	Height of bucket hinge pin	mm	3,885	
	Dumping clearance (tip of BOC)	mm	2,900	
	Dumping reach (tip of BOC)	mm	985	
	Bucket dump angle (fully raised)	deg	45	
	Bucket tilt angle (SAE carrying position)	deg	48	
Digging depth (10° dump) (with BOC)	mm	285		

Machine model			WA300L-3
Serial No.			53001 and up
Engine	Model		Komatsu SA6D102E
	Type		4-cycle, water-cooled, in-line, 6-cylinder, direct injection, with turbocharger
	No. of cylinders – bore x stroke	mm	6 – 102 x 120
	Piston displacement	cc	5,880
	Flywheel horsepower	kW {HP}/rpm	114 {153}/2,350
	Maximum torque	Nm {kgm}/rpm	607 {62}/1,600
	Fuel consumption ratio	g/kWh {g/HPh}	224 {165}
	High idling speed	rpm	2,585
	Low idling speed	rpm	1,000
	Starting motor		24 V 5.5 kW
Alternator		24 V 35 A	
Battery		12 V 140 Ah x 2	
Power train	Torque converter		3-element, 1-stage, single-phase (Komatsu TCA32-8Z)
	Transmission		Spur gear, constant-mesh multiple-disc, hydraulically actuated, modulation type
	Reduction gear		Spiral bevel gear
	Differential		Torque proportioning
	Final drive		Planetary gear, single reduction
Axle, wheel	Drive type		Front/rear-wheel drive
	Front axle		Fixed-frame, semi-floating
	Rear axle		Center pin support type, semi-floating
	Tire		20.5-25-12PR (L-3)
	Wheel rim		17.00 x 25-1.7
	Inflation pressure	Front tire Rear tire	KPa {kg/cm <sup>2</sup> } KPa {kg/cm <sup>2</sup> }
Brakes	Main brake		Front/rear wheel independent braking wet-type sealed disc brakes with hydraulic power-doubling device
	Parking brake		Thrust shaft (transmission shaft) braking, wet-type disc brake

		Machine model	WA300L-3	
		Serial No.	53001 and up	
Steering system	Type		Articulated type	
	Structure		Orbit-roll type, fully hydraulically power steering	
Hydraulic system	Hydraulic pump type (Steering+Hydraulic+brake charge)		Gear type (SAL(2)50+(2)40+(2)8)	
	Delivery	ℓ/min.	121+98+19	
	Control valve	Set pressure for work equipment	MPa {kg/cm <sup>2</sup> }	Spool type 20.6 {210}
		Set pressure for steering	MPa {kg/cm <sup>2</sup> }	Orbit-roll valve type 20.6 {210}
	Cylinder	Boom cylinder No. – bore x stroke	mm	Reciprocating piston 2 – 140 x 703
Bucket cylinder No. – bore x stroke		mm	Reciprocating piston 1 – 160 x 489	
Steering cylinder No. – bore x stroke		mm	Reciprocating piston 2 – 70 x 460	
Work equipment	Link type		Single link	
	Bucket edge type		Flat edge with BOC	

## WEIGHT TABLE

 This weight table is a guide for use when transporting or handling components.

Unit: kg

Machine model	WA300L-3	Machine model	WA300L-3
Serial No.	53001 and up	Serial No.	53001 and up
Engine	570	Main control valve	57
Radiator	81	Boom cylinder (each)	108
Torque converter	35	Bucket cylinder	110
Transmission (with torque converter)	610	Engine hood (with side panel)	165
Center drive shaft	18	Front frame	1,100
Front drive shaft	19	Rear frame	935
Rear drive shaft	7	Bucket link	35
Front axle	640	Bellcrank	230
Rear axle	635	Boom (including bushing)	880
Axle pivot	74	Bucket (with BOC)	1,210
Wheel (each)	120	Counterweight	1,700
Tire (each)	173	Fuel tank	123
Orbit-roll valve	8	Battery (each)	40
Priority valve	5.5	Floor frame	220
Steering cylinder (each)	20	Cab, ROPS	515
Hydraulic tank	134	Air conditioner unit	14
Steering, Hydraulic, Brake charge pump	19	Operator's seat	38



### LIST OF LUBRICANT AND WATER

RESERVOIR	KIND OF FLUID	AMBIENT TEMPERATURE									CAPACITY	
		-22 -30	-4 -20	14 -10	32 0	50 10	68 20	86 30	104 40	122 50	°F	Specified
Engine oil pan	Engine oil				SAE 30						22 ℓ	20 ℓ
		SAE 10W										
		SAE 10W-30										
		SAE 15W-40										
Transmission case		SAE 10W									29.5 ℓ	28.0 ℓ
Hydraulic system		SAE 10W									165 ℓ	116 ℓ
Axle (Front and rear) (Each)		See Note 1									24 ℓ	24 ℓ
Pins	Grease	NLGI No. 2									-	-
Pins (with auto- greasing system)		★	NLGI No. 2									-
Fuel tank	Diesel fuel				ASTM D975 No.2						188 ℓ	-
		※										
Cooling system	Water	Add antifreeze									33 ℓ	-

※ ASTM D975 No. 1

★: NLGI No. 0

When operating a machine with the auto-greasing system (if equipped) at temperatures below -20°C, set the greasing time to 20 minutes. See the Operation & Maintenance Manual.

Note 1: For axle oil, use only recommended oil as follows.

- SHELL: DONAX TT or TD
- CALTEX: RPM TRACTOR HYDRAULIC FLUID
- CHEVRON: TRACTOR HYDRAULIC FLUID
- TEXACO: TDH OIL
- MOBIL: MOBILAND SUPER UNIVERSAL

It is possible to substitute engine oil CLASS-CD SAE30 for axle oil.  
If noise comes from the brake, it is no problem of durability.

## REMARK

- When fuel sulphur content is less than 0.5%, change oil in the oil pan every periodic maintenance hours described in this manual.  
Change oil according to the following table if fuel sulphur content is above 0.5%.

Fuel sulphur content	Change interval of oil in engine oil pan
0.5 to 1.0%	1/2 of regular interval
Above 1.0%	1/4 of regular interval

- When starting the engine in an atmospheric temperature of lower than 0°C, be sure to use engine oil of SAE10W, SAE10W-30 and SAE15W-40, even though an atmospheric temperature goes up to 10°C more or less in the day time.
- Use API classification CD as engine oil and if API classification CC, reduce the engine oil change interval to half.
- There is no problem if single grade oil is mixed with multigrade oil (SAE10W-30, 15W-40), but be sure to add single grade oil that matches the temperature in the table.
- We recommend Komatsu genuine oil which has been specifically formulated and approved for use in engine and hydraulic work equipment applications.

Specified capacity: Total amount of oil including oil for components and oil in piping.

Refill capacity: Amount of oil needed to refill system during normal inspection and maintenance.

ASTM: American Society of Testing and Material

SAE: Society of Automotive Engineers

API: American Petroleum Institute

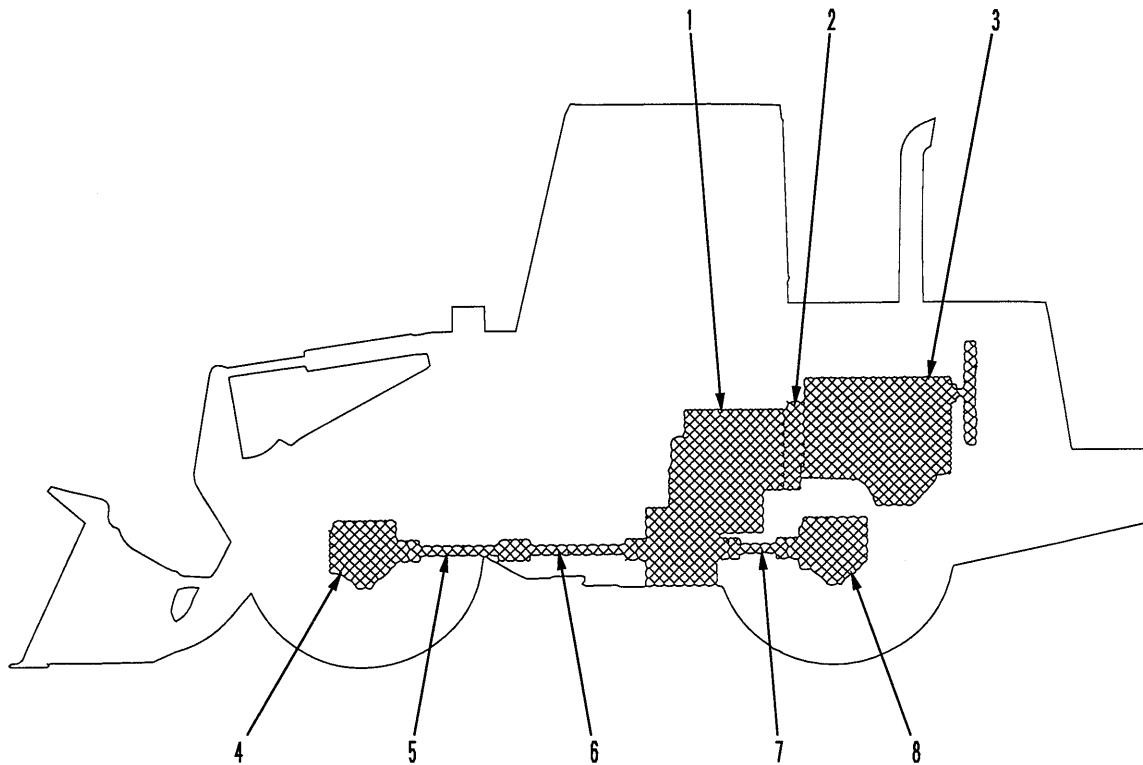
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# 10 STRUCTURE AND FUNCTION

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## POWER TRAIN



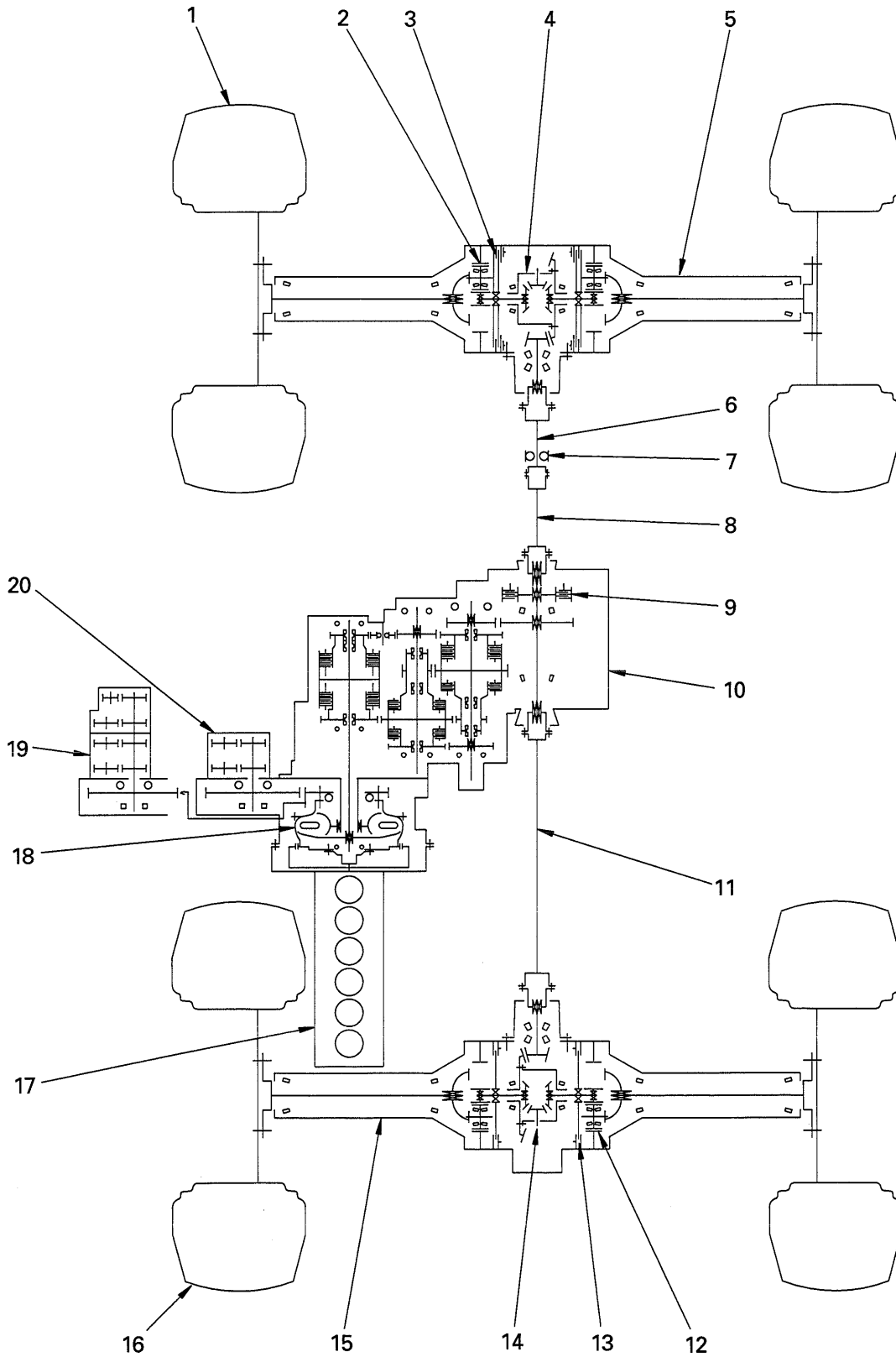
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- |                     |                       |                     |
|---------------------|-----------------------|---------------------|
| 1. Transmission     | 4. Front axle         | 7. Rear drive shaft |
| 2. Torque converter | 5. Front drive shaft  | 8. Rear axle        |
| 3. Engine           | 6. Center drive shaft |                     |

### Outline

- The motive force from engine (3) passes through the engine flywheel and is transmitted to torque converter (2), which is connected to the input shaft of transmission (1).
- The transmission has six hydraulically actuated clutches, and these provide four speed ranges for both FORWARD and REVERSE. The transmission speed ranges are selected manually.
- The motive force from the output shaft of the transmission passes through center drive shaft (6), front drive shaft (5) and rear drive shaft (7), and is then transmitted to front axle (4) and rear axle (8) to drive the wheels.

# POWER TRAIN SYSTEM



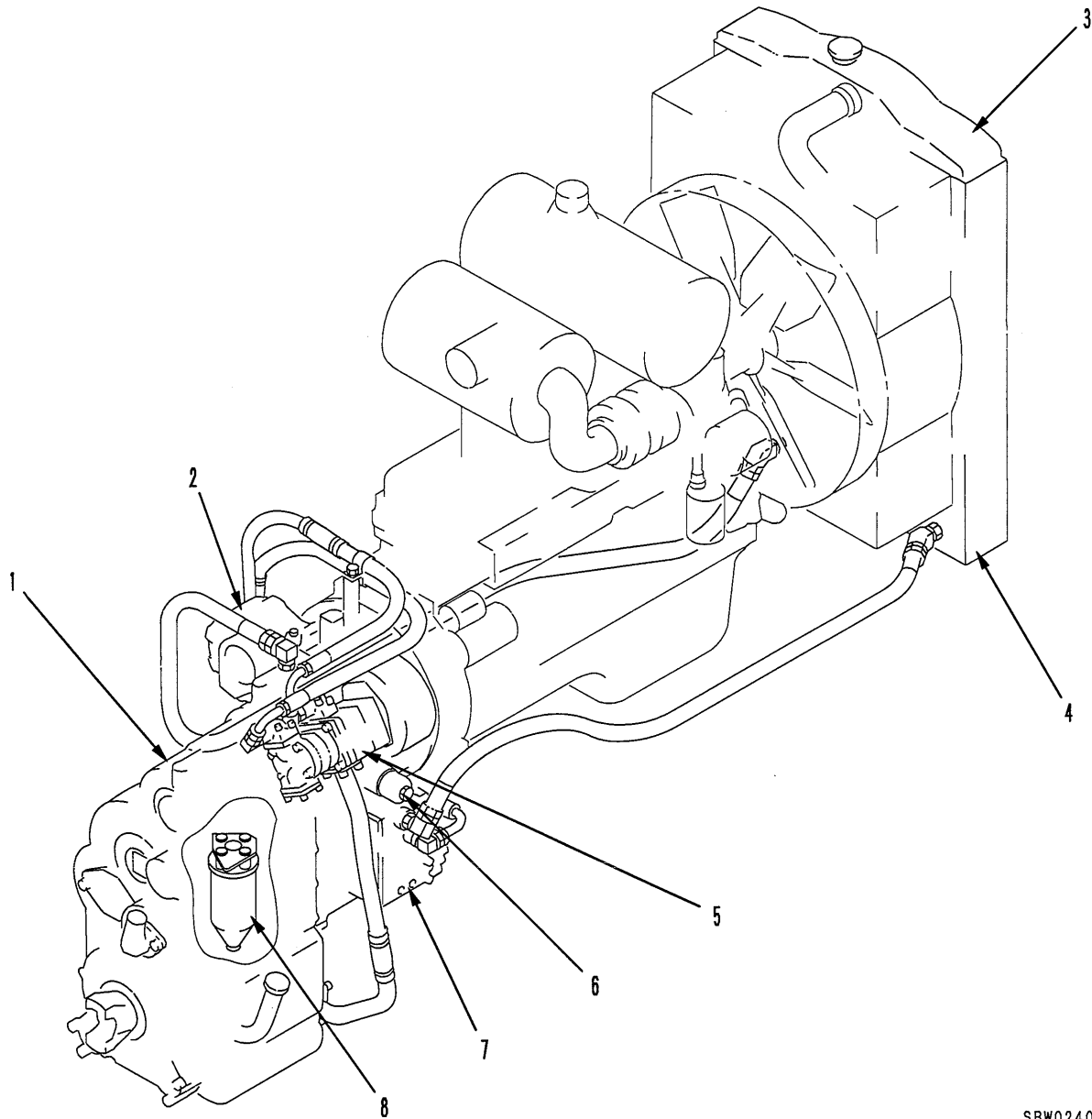
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1. Front tire
2. Final drive
3. Wet type disc brake
4. Differential
5. Front axle
6. Front drive shaft
7. Flange bearing
8. Center drive shaft
9. Parking brake
10. Transmission
11. Rear drive shaft
12. Final drive
13. Wet type disc brake
14. Differential
15. Rear axle
16. Rear tire
17. Engine
18. Torque converter
19. Steering, hydraulic, brake charge pump
20. Torque converter charging pump

### Outline

- The motive force from engine (17) passes through the flywheel and is transmitted to torque converter (18).  
The torque converter uses oil as a medium. It converts the transmitted torque in accordance with the change in the load, and transmits the motive force to the input shaft of the transmission.  
In addition, the motive force of the engine passes through the pump drive gear of the torque converter, and is transmitted to hydraulic, steering, brake charge pump (19) and torque converter charging pump (20) to drive each pump.
- Transmission (10) operates the directional spool and speed spool of the transmission valve through the solenoid valves, and actuates the six hydraulically actuated clutches to select one of the four FORWARD or REVERSE speeds.  
The transmission speed range is selected manually.
- The output shaft of transmission (10) transmits the power to the front and rear axles. At the front, the power is transmitted to front axle (5) through center drive shaft (8), flange bearing (7), and front drive shaft (6). At the rear, the power is transmitted to rear axle (15) through rear drive shaft (11).
- The motive force transmitted to front axle (5) and rear axle (15) has its speed reduced by the bevel gear and pinion gear of differentials (4) and (14), and is then transmitted to the sun gear shaft through the differential mechanism.
- The motive force of the sun gear is reduced further by the planetary mechanism and is transmitted to the wheels through the axle shaft.

# TORQUE CONVERTER, TRANSMISSION PIPING

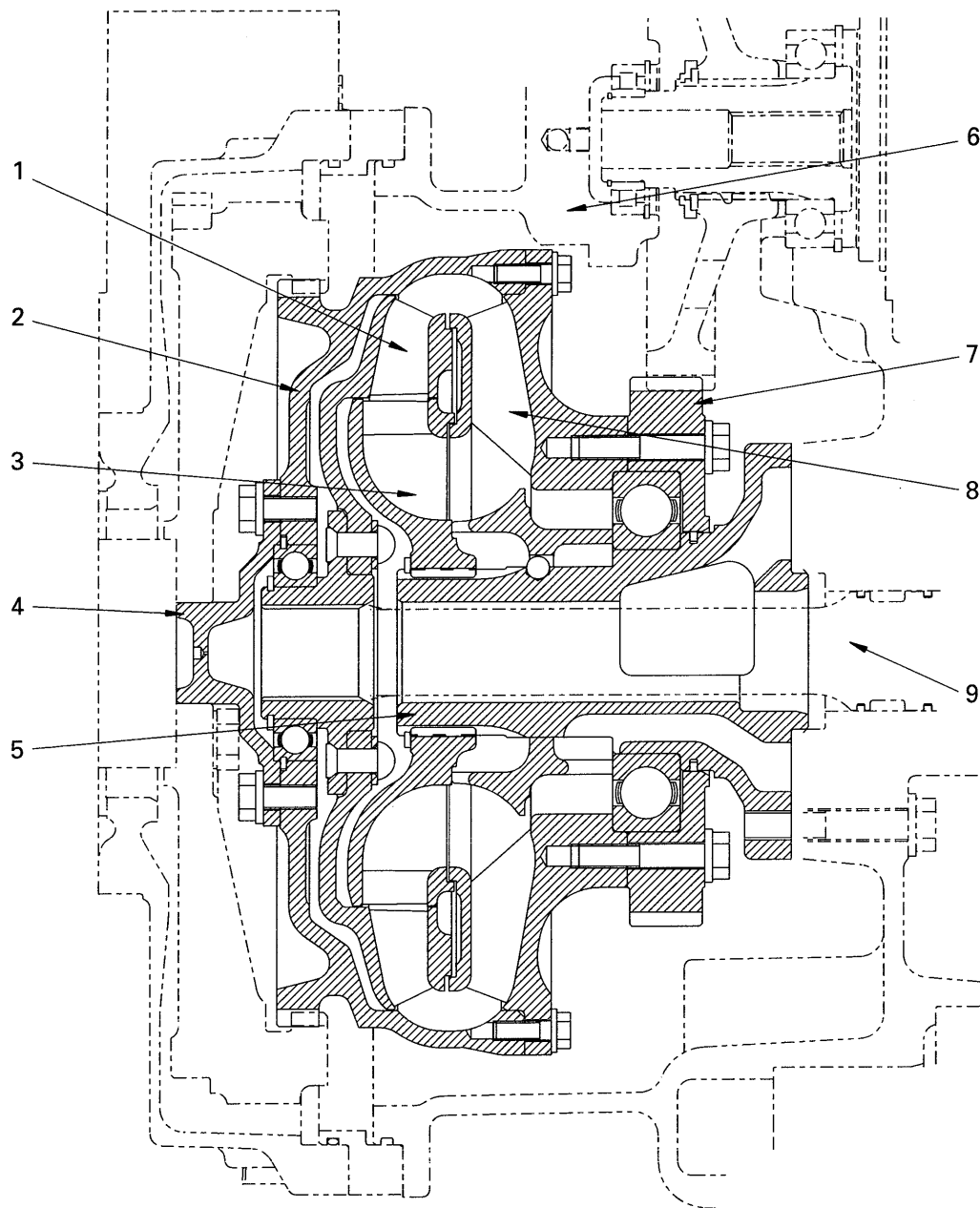


SBW02406

- 1. Transmission
- 2. Torque converter
- 3. Radiator
- 4. Oil cooler

- 5. Torque converter charging pump
- 6. Pilot oil filter
- 7. Transmission control valve
- 8. Oil filter

# TORQUE CONVERTER



SMW01107

- 1. Turbine
- 2. Drive case
- 3. Stator
- 4. Pilot
- 5. Stator shaft

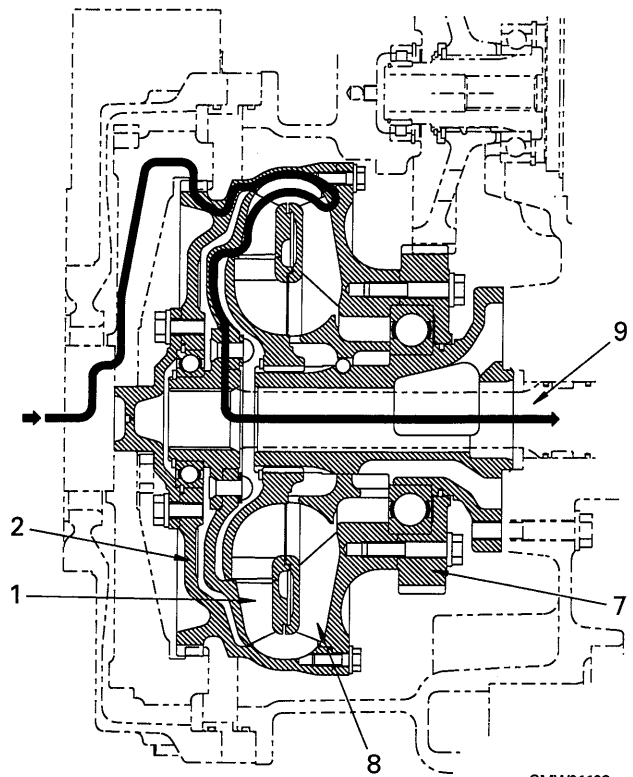
- 6. Housing
- 7. PTO gear (drive)
- 8. Pump
- 9. Output shaft (Transmission input shaft)

**Specifications**  
 Model: TCA32-8Z  
 Type: 3-element, 1-stage, 1-phase  
 Stall torque ratio: 2.7



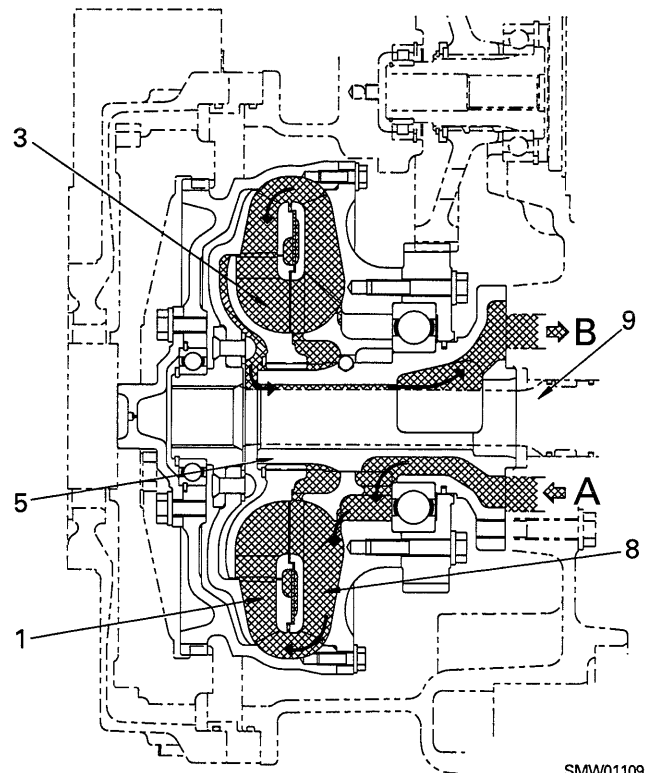
**Path of motive force**

- The torque converter is installed between the engine and the transmission.  
The motive force from the engine enters drive case (2) from flywheel.  
Drive case (2), pump (8), and PTO gear (drive) (7) are each secured by bolts and are rotated directly by the rotation of the engine.  
The motive force of pump (8) uses oil as a medium to rotate turbine (1) and transmit the motive force to transmission input shaft (9).
- The motive force of drive case (2) is used as the motive force to drive the gear pump through PTO gear (drive) (7).

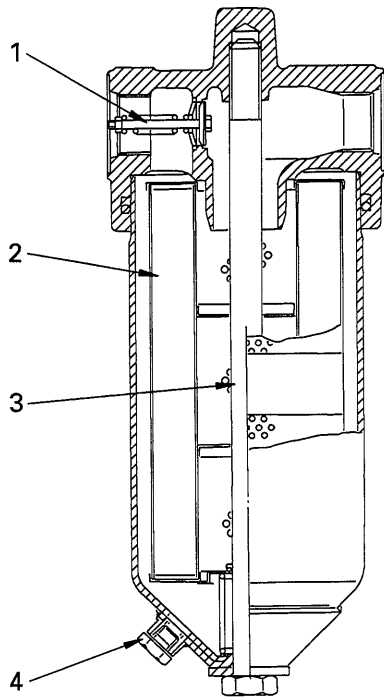


**Flow of oil**

- The oil supplied from the torque converter charging pump enters inlet port **A**, passes through the oil passage of stator shaft (5), and flows to pump (8).  
The oil is given centrifugal force by pump (8), enters turbine (1), and transmits the energy of the oil to the turbine. Turbine (1) is fixed to transmission input shaft (9), so the motive force is transmitted to the transmission input shaft.  
The oil from turbine (1) is sent to stator (3), and enters the pump again. However, part of the oil is sent from the stator through outlet port **B** to the cooler.



# TORQUE CONVERTER OIL FILTER



- 1. Relief valve
- 2. Element
- 3. Center bolt
- 4. Drain plug

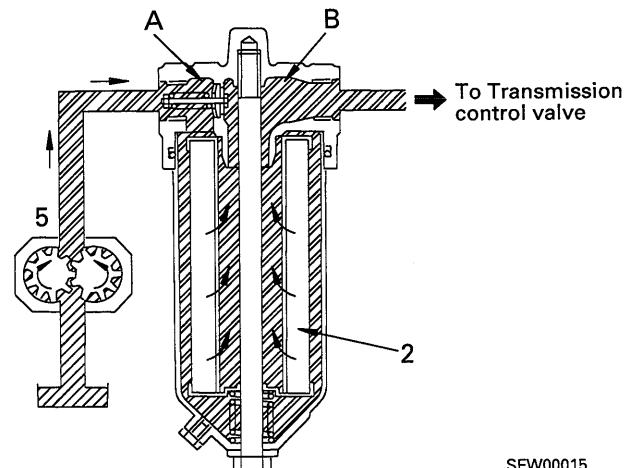
**Specifications**

Filter mesh size: 10 microns  
 Filtering area: 8900 cm<sup>2</sup>  
 Relief pressure: 0.34 MPa {3.5 kg/cm<sup>2</sup>}

SEW00014

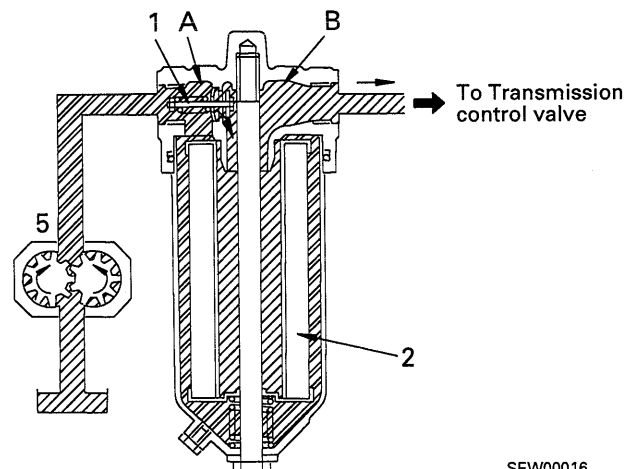
**Operation**

- The oil from the torque converter charging pump enters filter inlet port **A**. It is filtered from the outside of element (2) to the inside, and flows to outlet port **B**.



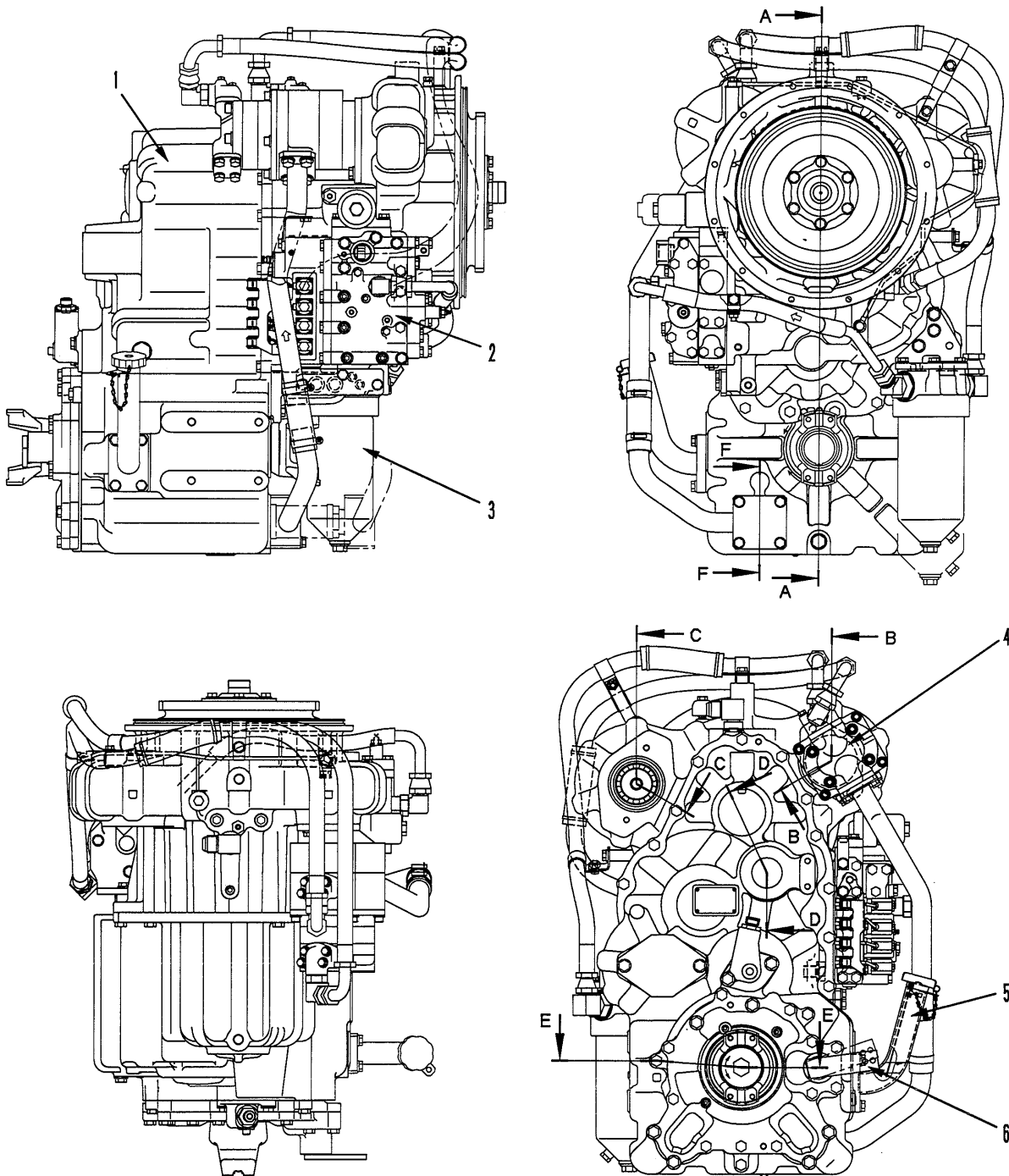
SEW00015

- If element (2) becomes clogged with dirt, or the oil temperature is low and the pressure rises at inlet port **A**, the oil from inlet port **A** opens relief valve (1) and flows directly to outlet port **B** in order to prevent damage to the pump or element (2).



SEW00016

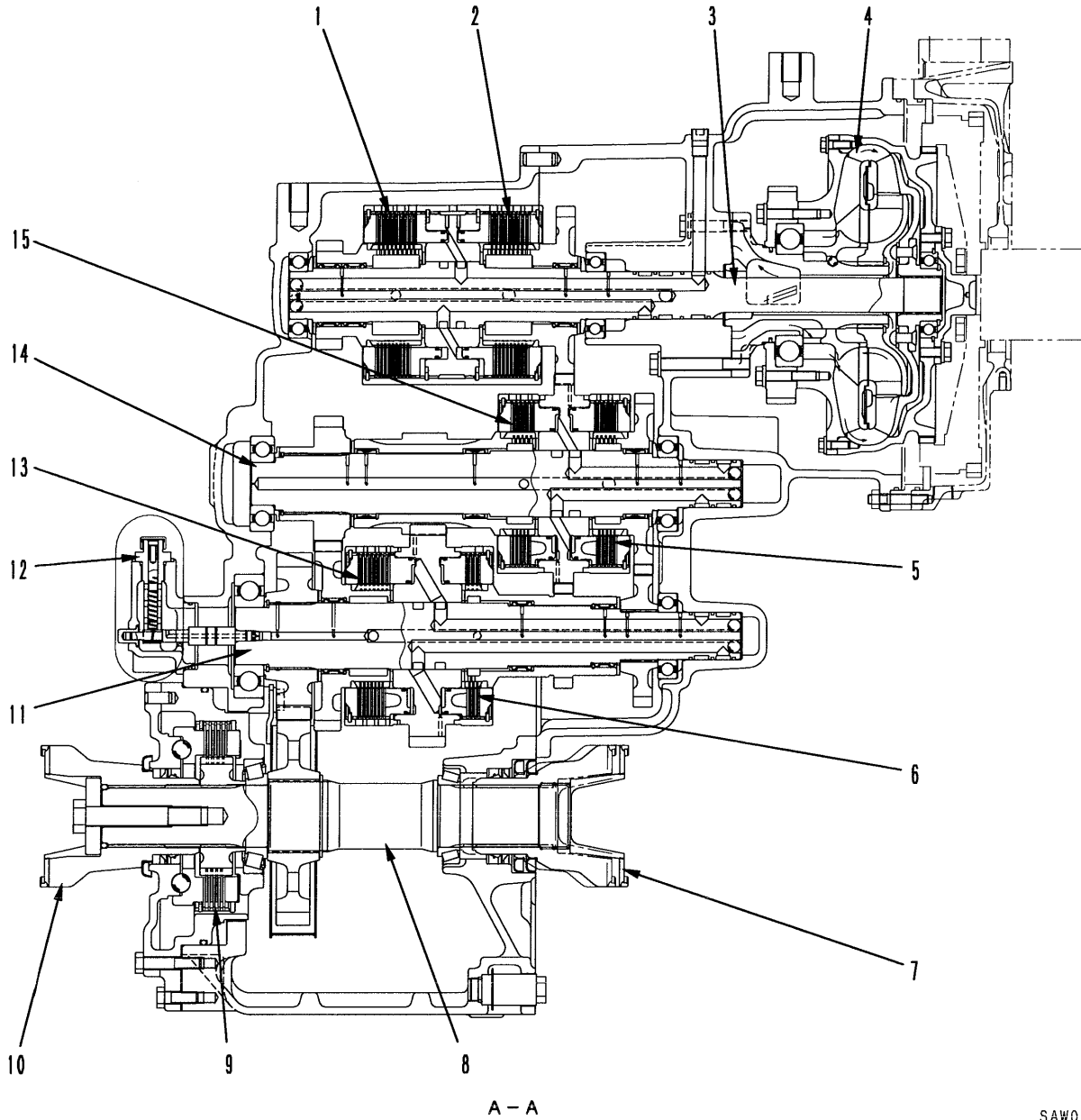
TRANSMISSION



- 1. Transmission
- 2. Transmission control valve
- 3. Torque converter oil filter
- 4. Torque converter charging pump (SAL(2)40+20)

- 5. Oil filler port
- 6. Parking brake lever

SAW02409



- |                     |                                   |
|---------------------|-----------------------------------|
| 1. REVERSE clutch   | 9. Parking brake                  |
| 2. FORWARD clutch   | 10. Front coupling                |
| 3. Input shaft      | 11. 2nd, 4th shaft                |
| 4. Torque converter | 12. Speedometer mounting position |
| 5. 3rd clutch       | 13. 2nd clutch                    |
| 6. 4th clutch       | 14. 1st, 3rd shaft                |
| 7. Rear coupling    | 15. 1st clutch                    |
| 8. Output shaft     |                                   |

SAW02410