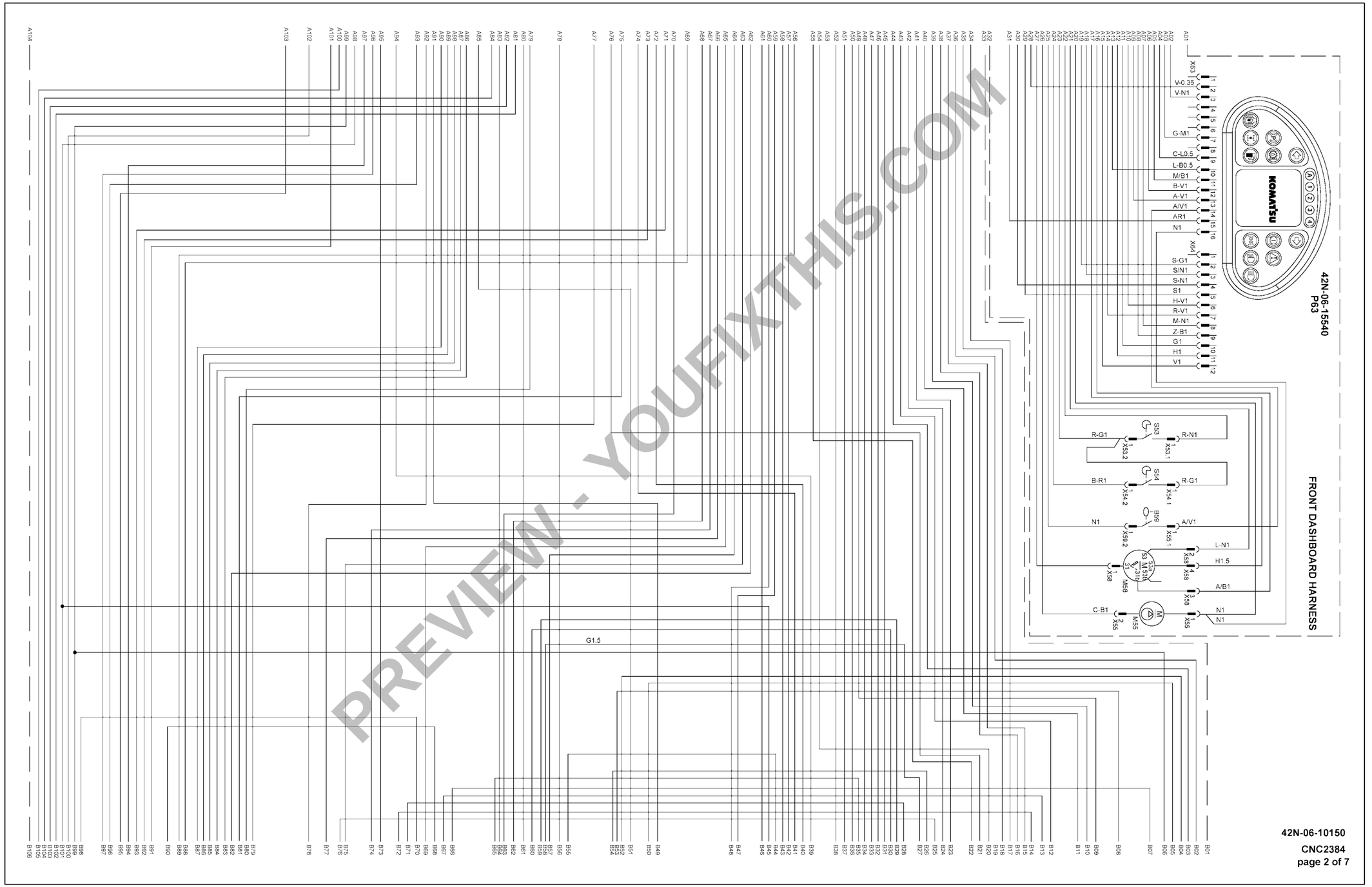
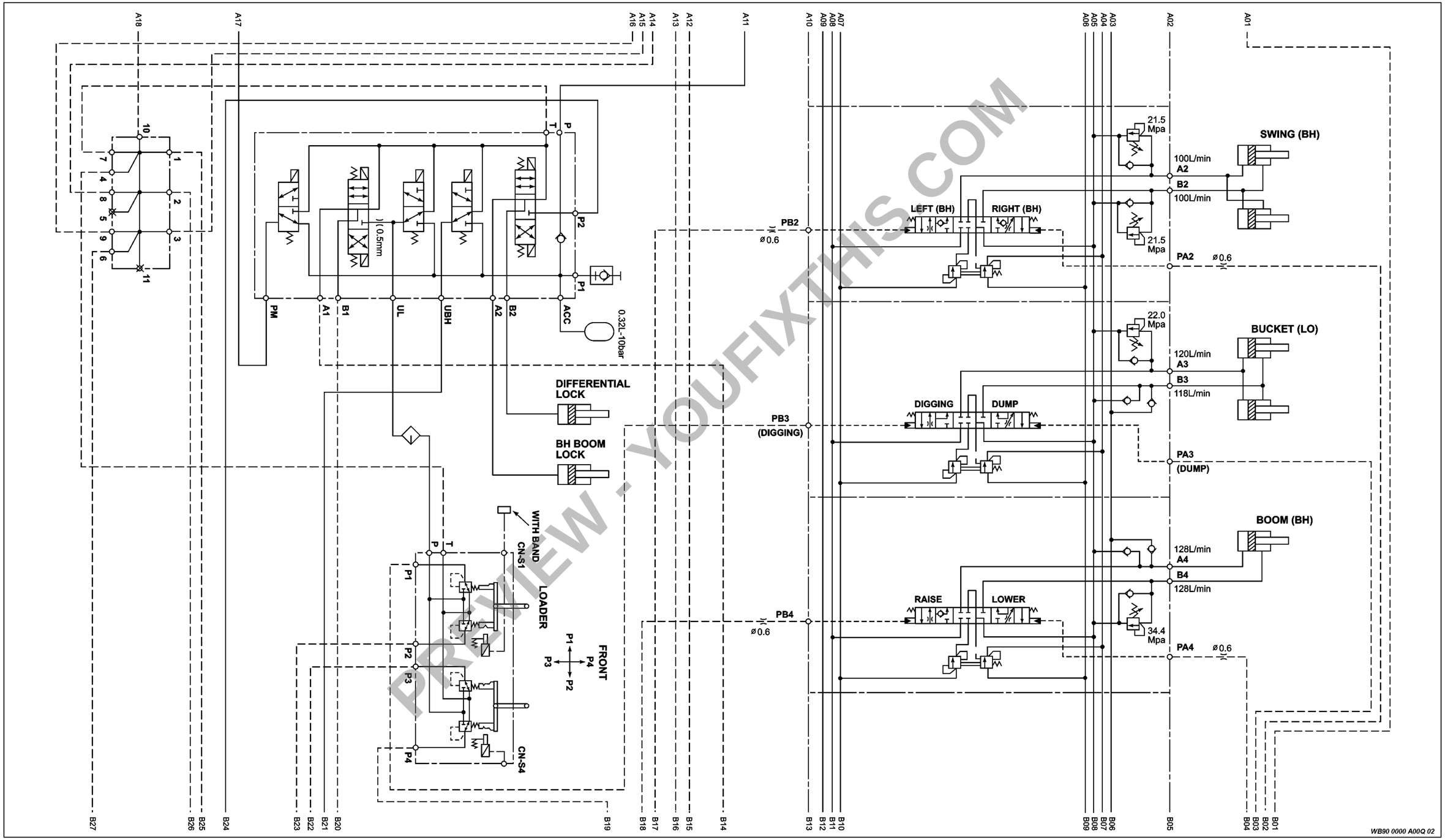
WIRING - 2 OF 7



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2 OF 4



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STANDARD TIGHTENING TORQUE

STANDARD TIGHTENING TORQUE OF BOLTS AND NUTS

The following charts give the standard tightening torques of bolts and nuts. Exceptions are given in DISASSEMBLY AND ASSEMBLY.

Thread diameter of bolt	Width across flats		
mm	mm	Nm	lbf ft
6	10	11.8 - 14.7	8.70 - 10.84
8	13	27 - 34	19.91 - 25.07
10	17	59 - 74	43.51 - 54.57
12	19	98 - 123	72.28 - 90.72
14	22	153 - 190	112.84 - 140.13
16	24	235 - 285	173.32 - 210.20
18	27	320 - 400	236.02 - 295.02
20	30	455 - 565	335.59 - 416.72
22	32	610 - 765	449.91 - 564.23
24	36	785 - 980	578.98 - 722.81
27	41	1150 - 1440	848.19 - 1062.09
30	46	1520 - 1910	1121.09 - 1408.74
33	50	1960 - 2450	1445.62 - 1807.02
36	55	2450 - 3040	1807.02 - 2242.19
39	60	2890 - 3630	2131.55 - 2677.35

Thread diameter of bolt	Width across flats	
mm	mm	Nm	lbf ft
6	10	5.9 - 9.8	4.35 - 7.22
8	13	13.7 - 23.5	10.10 - 17.33
10	14	34.3 - 46.1	25.29 - 34.00
12	27	74.5 - 90.2	54.94 - 66.52

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ENGINE HOOD

REMOVAL

WARNING! Before any disassembly procedures are started, be sure the machine is sitting on a smooth level surface. Lower all work equipment to the ground, set the parking brake, chock the wheels and disconnect the battery.

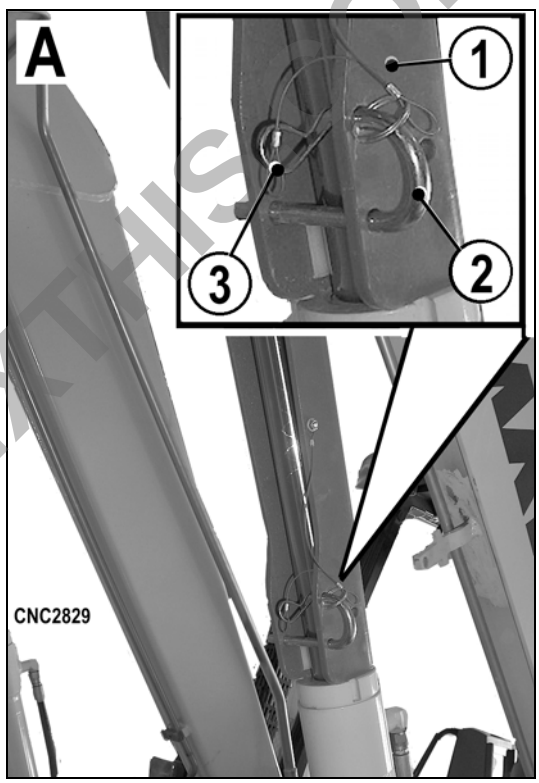
1. Raise the front loader arms fully up and set the lock as shown in (A).

   A. Raise the front end loader unit completely in the air extending the lifting cylinders rods completely.

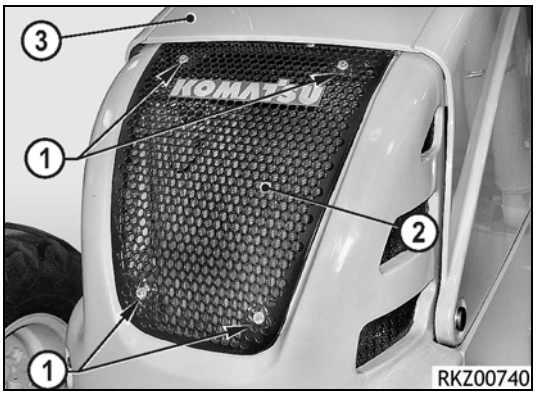
   B. Remove the cylinder lock assembly small pin (3). Holding on to the lock unit (1), pull out lock pin (2).

   C. Using both hands lower the lock unit (1) down from its storage position onto the extended lift arm cylinder rod.

   D. Once on the cylinder rod, install lock pin (2) and small pin (3) and slowly lower the loader arms until it rests on the loader lock (1).



2. Remove the four grill mounting screws (1) and remove the front grill assembly (2).



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TROUBLESHOOTING GUIDE

FRONT AXLE

Wheel vibration; front tire resistance; half shaft breakage.	
CAUSES	**REMEDY**
Incorrect installation	Correct installation
Defective axle	Replace the differential in case it does not survive any of the test phases
Overloading incorrect weight distribution	Remove excessive weight and redistribute load following instructions related to the vehicle
Different rotation radius of the tires	Replace the tire or adjust pressure to have the same radius on both tires
Bent half shaft	Replace half shaft

No differential action; jamming while steering.	
CAUSES	**REMEDY**
Incorrect installation	Correct installation
Defective axle	Replace the differential in case it does not survive any of the test phases
Overloading incorrect weight distribution	Remove excessive weight and redistribute load following instructions related to the vehicle

Steering is difficult; vehicle goes straight while trying to turn it.	
CAUSES	**REMEDY**
Incorrect installation	Correct installation
Defective axle	Replace the differential in case it does not survive any of the test phases
Overloading/incorrect weight distribution	Remove excessive weight and redistribute load following instructions related to the vehicle
Different rotation radius of the tires	Replace the tire or adjust pressure to have the same radius on both tires
Broken half shaft	Replace half shaft

Excess noise	
CAUSES	**REMEDY**
Incorrect installation	Correct installation
Defective axle	Replace the differential in case it does not survive any of the test phases
Overloading/incorrect weight distribution	Remove excessive weight and redistribute load following instructions related to the vehicle
Different rotation radius of the tires	Replace the tire or adjust pressure to have the same radius on both tires
Bent or broken half shaft	Replace half shaft
Incorrect wheel adjustment	Verify group integrity and wheel side bearings
Contamination in the axle box or incorrect assembly of parts	Look for foreign particles. Check for proper assembly of the various parts of the axle.

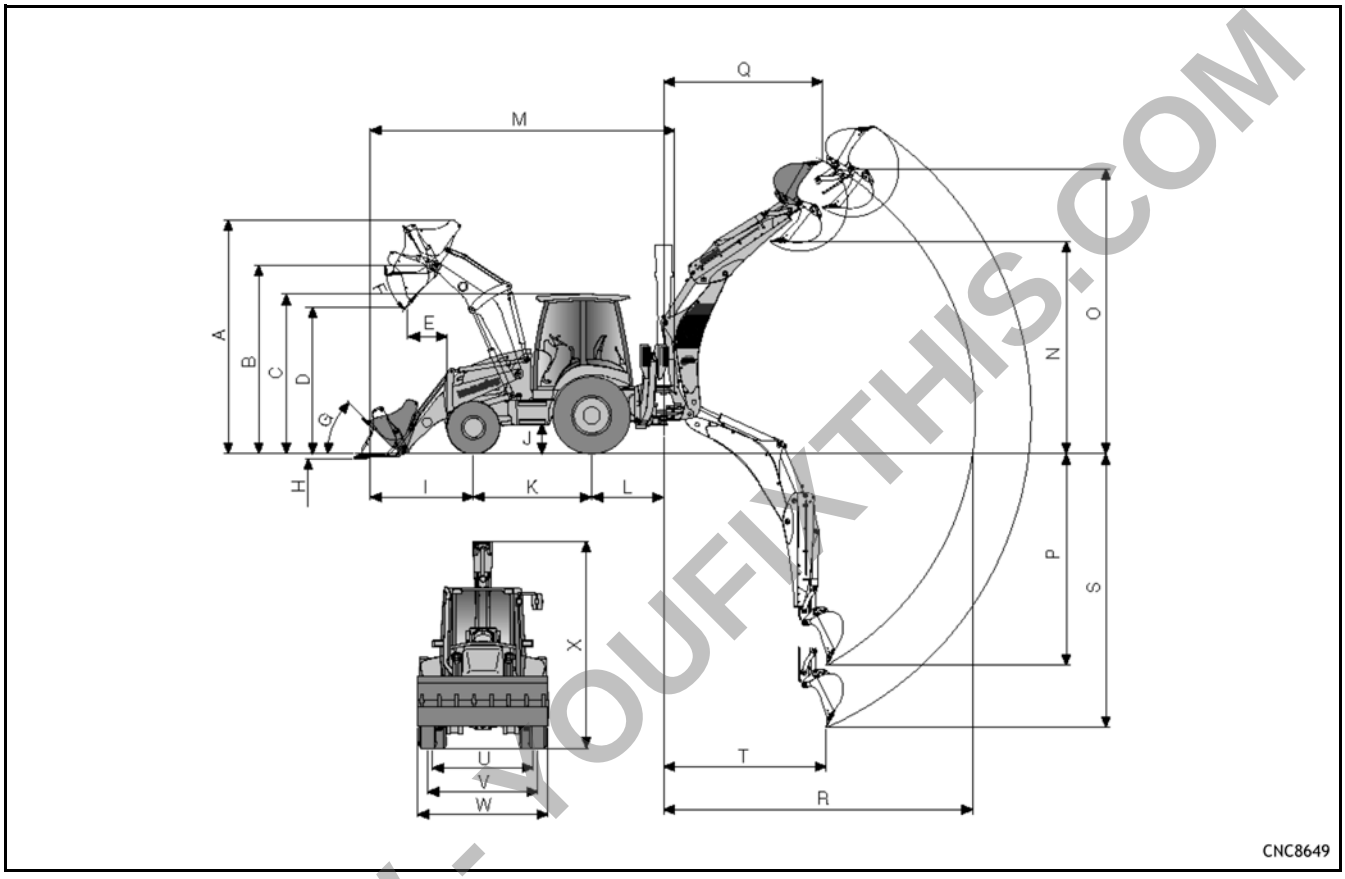
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SPECIFICATION DRAWING

SPECIFICATIONS

MACHINE DIMENSIONS AND WEIGHTS



A	Maximum height	4230mm (13’11”)	**O**	Maximum digging height -with extendable arm	5319mm (17’5”) 5885mm (19’4")
B	Hinge pin height	3367mm (11’1”)			
C	Overall height, ROPS Cab	2935mm (9’8”)	**P**	Digging depth (2’ level bottom) -with extendable arm	4370mm (14’4”) 5479mm (18’0")
D	Maximum dumping height	2622mm (8’7”)			
E	Reach at maximum height and 45° dump angle	750mm (2’5”)	**Q**	Reach at maximum height -with extendable arm	2828mm (9’3”) 3877mm (12’9")
F	Dumping angle	45°	**R**	Maximum reach from swing center -with extendable arm	5742mm (18’10”) 6755mm (22’2")
G	Rollback angle	45°			
H	Digging depth	138mm (5’4”)	**S**	Maximum digging depth -with extendable arm	4423mm (14’6”) 5533mm (18’2")
I	Bucket reach (transport)	2023mm (6’8”)			
J	Ground clearance	430mm (1’5”)	**T**	Digging reach	2320mm (7’7”)
K	Wheel base	2175mm (7’2”)	**U**	Rear tread	1800mm (5’11”)
L	Backhoe swing center distance	1175mm (3’10”)	**V**	Front tread	1874mm (6’2”)
M	Transport length	7432mm (24’5”)	**W**	Overall width (with bucket)	2356mm (7’9”)
N	Dumping height (SAE) -arm retracted -arm extended	3676mm (12’1") 3658mm (12’0’’) 4369mm (14’4")	**X**	Backhoe transport height -with extendable arm	3676mm (12’1”) 3746mm (12’4")

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Unit: mm (inch)

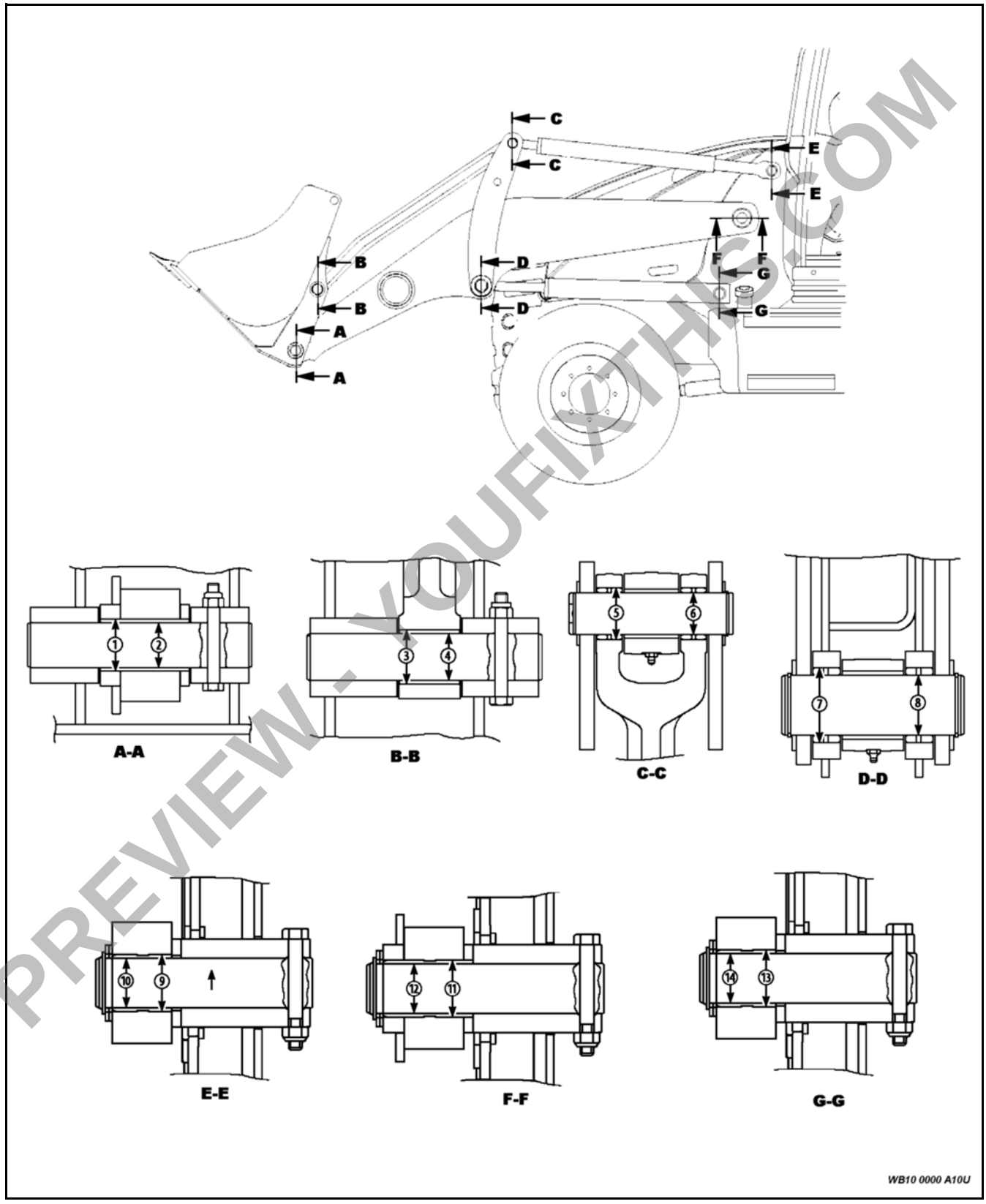
	Check Item	Criteria					Remedy
		Standard Size	Tolerance		Standard Clearance	Clearance Limit	
			OD	ID			
27.	Pin to Boom Rod Bushing	60 mm (2.362 in)	59.894 mm (2.358 in) to 59.94 mm (2.360 in)	60.10 mm (2.366 in) to 60.174 mm (2.369 in)	0.16 mm (0.006 in) to 0.28 mm (0.011 in)		
28.	Pin to Boom & Arm Head Bushing	60 mm (2.362 in)	59.894 mm (2.358 in) to 59.94 mm (2.360 in)	60.10 mm (2.366 in) to 60.174 mm (2.369 in)	0.16 mm (0.006 in) to 0.28 mm (0.011 in)		
29.	Pin to Arm Rod Bushing	50 mm (1.969 in)	49.911 mm (1.965 in) to 49.95 mm (1.967 in)	50.08 mm (1.972 in) to 50.142 mm (1.974 in)	0.13 mm (0.005 in) to 0.231 mm (0.009 in)		
30.	Pin to Bucket Head Bushing	45 mm (1.772in)	44.911 mm (1.768 in) to 44.95 mm (1.770 in)	45.08 mm (1.775 in) to 45.142 mm (1.777 in)	0.13 mm (0.005 in) to 0.231 mm (0.009 in)		
31.	Pin to Jig Head Bushing	40 mm (1.575 in)	39.911 mm (1.571in) to 39.95 mm (1.573 in)	40.05 mm (1.577 in) to 40.10 mm (1.579 in)	0.10 mm (0.004 in) to 0.189 mm (0.007 in)		
32.	Pin to Jig Rod Bushing	40 mm (1.575 in)	39.911 mm (1.571in) to 39.95 mm (1.573 in)	40.05 mm (1.577 in) to 40.10 mm (1.579 in)	0.10 mm (0.004 in) to 0.189 mm (0.007 in)		

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WORK EQUIPMENT

LOADER



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TIGHTENING TORQUE OF HOSE NUTS

Use these torques for hose nuts.

Nominal No.	Thread diameter	Width across flat	Tightening torque	
	mm	mm	Nm	lbf ft
02	14	19	19.6 - 29.4	14.5 - 21.7
03	18	24	29.4 - 68.6	21.7 - 50.6
04	22	27	58.9 - 98.1	44.4 - 72.4
05	24	32	107.9 - 166.7	79.6 - 123.0
06	30	36	147.1 - 205.9	108.5 - 151.9
10	33	41	147.1 - 245.1	108.5 - 180.8
12	36	46	196.2 - 294.2	144.7 - 217.0
14	42	55	245.2 - 343.2	180.9 - 253.1

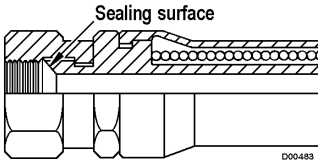
TIGHTENING TORQUE OF SPLIT FLANGE BOLTS

Use these torques for split flange bolts.

Thread diameter	Width across flat	Tightening torque	
mm	mm	Nm	kgm
10	14	59 - 74	43.51 - 54.57
12	17	98 - 123	72.28 - 90.72
16	22	235 - 285	173.32 - 210.20

TIGHTENING TORQUE FOR FLARED NUTS

Use these torques for flared part of nut.



Thread diameter	Width across flat	Tightening torque	
mm	mm	Nm	lbf ft
14	19	24.5 ± 4.9	18.0 ± 3.6
18	24	49 ± 19.6	36.1 ± 14.4
22	27	78.5 ± 19.6	57.8 ± 14.4
24	32	137.3 ± 29.4	101.2 ± 21.6
30	36	176.5 ± 29.4	130.1 ± 21.6
33	41	196.1 ± 49	144.6 ± 36.1
36	46	245.2 ± 49	180.8 ± 36.1
42	55	294.2 ± 49	216.9 ± 36.1

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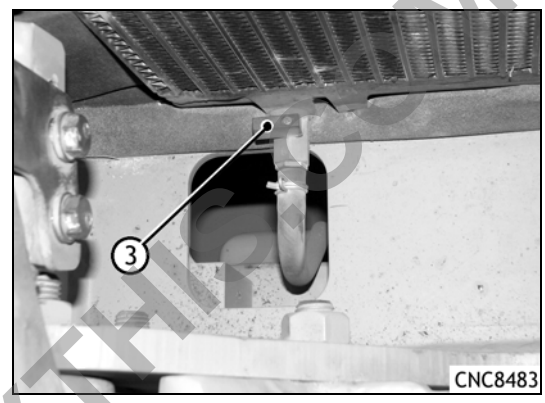
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RADIATOR

REMOVAL

★ Before removing the radiator, the grill, hood and front guard assembly must be removed first. See "ENGINE HOOD" and "FRONT GUARD."

1. Open the drain valve (3) and drain the engine coolant at the front of the radiator.



WARNING! Slowly loosen the radiator cap to release the pressure inside the cooling system.

A. Set a suitable size container under the engine coolant drain to catch the coolant that is drained from the cooling system.

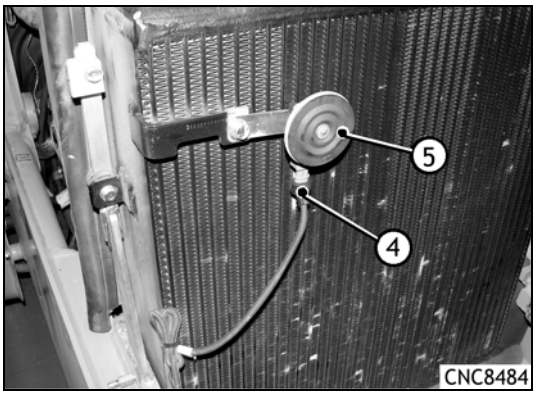
B. Place the drain hose into the container and open the drain valve two to three turns to drain the engine coolant.

Remark

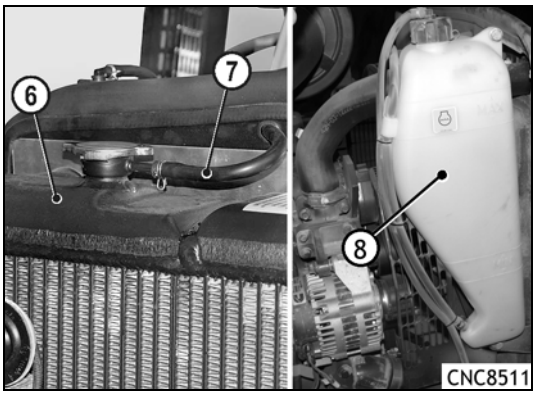
Do not drain coolant on the ground, in rivers or lakes or in a city sewer system. Coolant must be captured and recycled.

Engine coolant: Approximately 15 liters (4 gal)

2. Disconnect the connector (4) and remove the horn (5).



3. Disconnect hose (7) from radiator (6) and remove surge tank (8).



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Uneven wear of tires	
CAUSES	**REMEDY**
Incorrect installation	Correct installation
Defective axle	Replace the differential in case it does not survive any of the test phases
Overloading/incorrect weight distribution	Remove excessive weight and redistribute load following instructions related to the vehicle
Different rotation radius of the tires	Replace the tire or adjust pressure to have the same radius on both tires
Bent or broken half shaft	Replace half shaft
Blocked half shaft: ● Abnormal functioning of the differential or breakage/blockage of control device ● Vehicles with wide steering angle may proceed with kicks, have steering difficulty or cause pneumatic wear on sharp turns.	● Verify assembly of all components ● Reduce the steering angle to minimum and decelerate when the vehicle begins to kick.
Incorrect wheel adjustment	Verify group integrity and wheel side bearings

Friction noise	
CAUSES	**REMEDY**
Incorrect installation	Correct installation
Defective axle	Replace the differential in case it does not survive any of the test phases
Bent or broken half shaft	Replace half shaft
Damaged or worn out axle parts	Check the condition of the ring gear, pinion gear, bearings, etc. Replace when necessary.
Contamination in the axle box or incorrect assembly of parts	Look for foreign particles. Check for proper assembly of the various parts of the axle.
Incorrect adjustment of bevel gear set. Parts of the trans worn out transmission gears, U joint, etc.	Replace or adjust as required.

Vibration during forward drive, intermittent noise	
CAUSES	**REMEDY**
Incorrect installation	Correct installation
Defective axle	Replace the differential in case it does not survive any of the test phases
Overloading/incorrect weight distribution	Remove excessive weight and redistribute load following instructions related to the vehicle
Bent half shaft	Replace half shaft
Different rotation radius of the tires	Replace the tire or adjust pressure to have the same radius on both tires

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MACHINE SYSTEMS SPECIFICATIONS

ENGINE

Model . . . . . Komatsu S4D102LE-2
Type . . . . . Vertical, 4-cycle water-cooled diesel engine
Aspiration . . . . . Turbocharged
Number of cylinders 4
Bore x stroke . . . . . 114 x 135 mm (4.49 x 5.31 inches)
Piston displacement . . . . . 4.5 ltr (275 in^3)
Compression ratio 18:1
Horsepower rating
- Gross horsepower @ 2200 rpm . . . . . 69 kW 92 HP
- Net horsepower (SAE J 1349) . . . . . 66kW 88 HP
- Max. torque @ 1500 rpm . . . . . 407 Nm (300 ft/lbs)

Fuel system . . . . . Direct injection
Air cleaner . . . . . Dry-type with double elements and dust evacuator, condition indicator
Lubrication system
- Method . . . . . Gear pump, force-lubrication
- Filter . . . . . Full-flow

Cooling system . . . . . Radiator water cooled system
Starting system . . . . . Electric motor with air pre-heating system for cold climate

ELECTRICAL SYSTEM

Voltage 12V
Battery . . . . . 100 Ah (860 CCA)
Alternator 95A
Starter motor 3.2kw

SERVICE REFILL CAPACITIES

Engine oil . . . . . 9 ℓ (2.4 US.gal)
Cooling system . . . . . 14 ℓ (3.7 US. gal)
Fuel tank . . . . . 150 ℓ (39.3 US. gal)
Hydraulic tank . . . . . 41 ℓ (10.8 US. gal)
Hydraulic system capacities . . . . . 97 ℓ (25.6 US. gal)
Front axle oil . . . . . 7.5 ℓ (2.0 US. gal)
Rear axle oil . . . . . 14.5 ℓ (3.8 US. gal)
Gearbox oil, Power Shuttle . . . . . 20.2 ℓ (5.3 US. gal)

TIRE PRESSURE

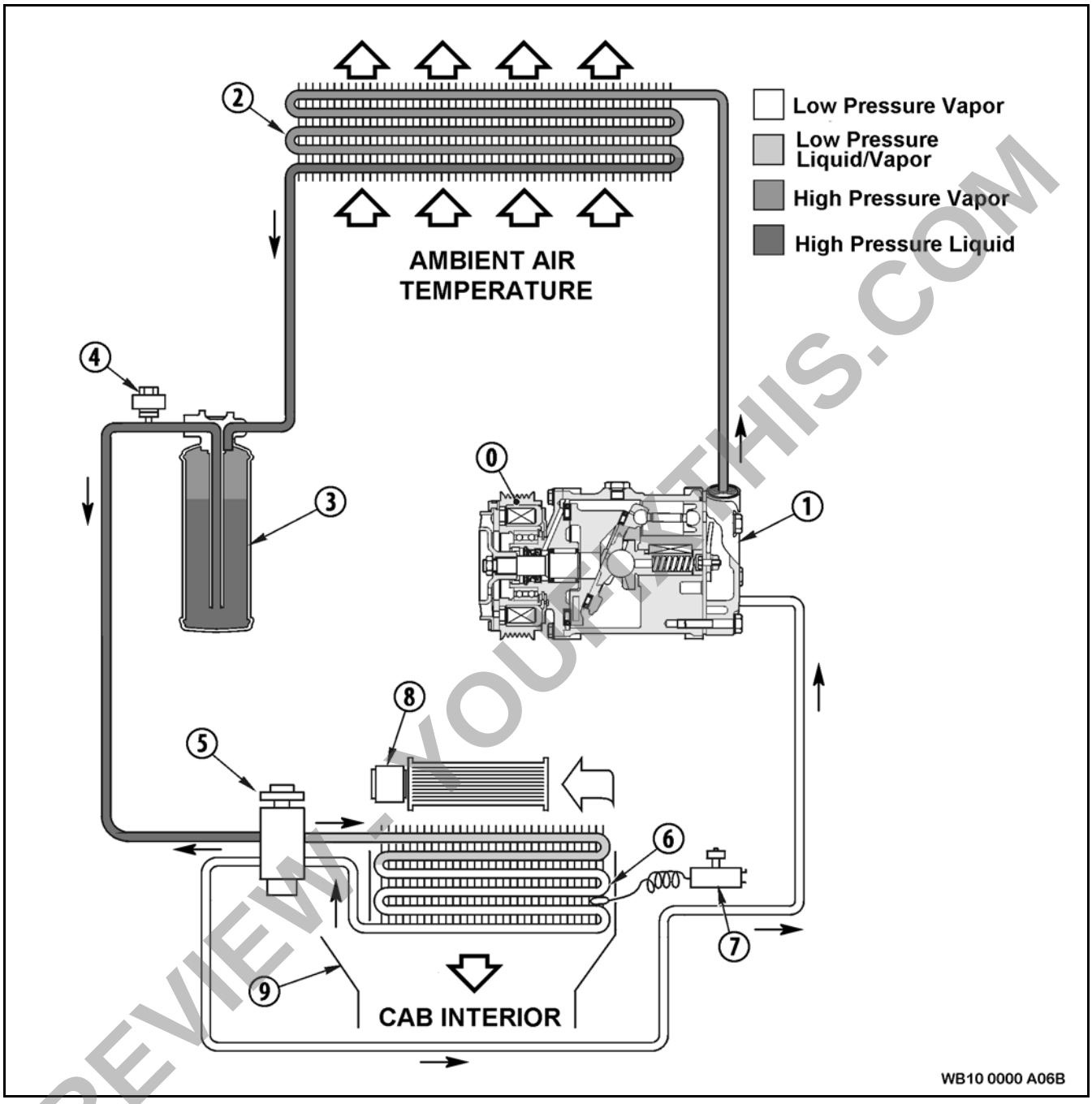
Standard Front Tire
Size . . . . . 14 x 17.5
Pressure . . . . . 3.31 ± 5 kg/cm^2 (47±1 psi)

Standard Rear Tire
Size . . . . . 19.5L x 24
Pressure . . . . . 1.88 ± 5 kg/cm^2 (27±1 psi)

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AIR CONDITIONING



0. Magnetic Clutch
1. Compressor
2. Condenser
3. Dryer Filter Tank
4. Safety Pressure Switch
5. Expansion Valve
6. Evaporator
7. Clutch Control Sensor
8. Cab Air Circulation Fan
9. Air Conveyor

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	Check Item	Criteria					Remedy
		Standard Size	Tolerance		Standard Clearance	Clearance Limit	
			OD	ID			
12.	Pin to Bushing	50 mm (1.969 in)	49.911 mm (1.965 in) to 49.95 mm (1.967 in)	50.08 mm (1.972 in) to 50.24 mm (1.978 in)	0.13 mm (0.005 in) to 0.329 mm (0.013 in)		Replace
13.	Bushing in Cylinder	67 mm (2.638 in)	67.10 mm (2.642 in) to 67.40 mm (2.654 in)	67.2 mm (2.646 in) to 67.2 mm (2.646 in)	-0.20 mm (-0.001 in) to 0.10 mm (0.0004 in)		
14.	Pin to Bushing	60 mm (2.362 in)	59.894 mm (2.358 in) to 59.94 mm (2.360 in)	60.13 mm (2.367 in) to 60.29 mm (2.374 in)	0.19 mm (0.008 in) to 0.396 mm (0.016 in)		

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TABLE OF TIGHTENING TORQUES FOR O-RING BOSS PIPING JOINTS

★ Unless there are special instructions, tighten the O-ring boss piping joints to the torque below.

Norminal No.	Thread diameter	Width across flat	Tightening torque (Nm {lbf ft})	
	mm	mm	Range	Target
02	14	Varies depending on type of connector.	35 - 63 {25.81 - 46.46}	44 {32.45}
03, 04	20		84 - 132 {61.95 - 97.35}	103 {75.96}
05, 06	24		128 - 186 {94.40 - 137.18}	157 {115.79}
10, 12	33		363 - 480 {267.73 - 354.02}	422 {311.25}
14	42		746 - 1010 {550.22 - 744.93}	883 {651.26}

TABLE OF TIGHTENING TORQUES FOR O-RING BOSS PLUGS

★ Unless there are special instructions, tighten the O-ring boss plugs to the torque below.

Norminal No.	Thread diameter	Width across flat	Tightening torque (Nm {lbf lb})	
	mm	mm	Range	Target
08	08	14	5.88 - 8.82 {4.33 - 6.50}	7.35 {5.42}
10	10	17	9.8 - 12.74 {7.22 - 9.39}	11.27 {8.31}
12	12	19	14.7 - 19.6 {10.84 - 14.45}	17.64 {13.01}
14	14	22	19.6 - 24.5 {14.45 - 18.07}	22.54 {16.62}
16	16	24	24.5 - 34.3 {18.07 - 25.29}	29.4 {21.68}
18	18	27	34.3 - 44.1 {25.29 - 32.52}	39.2 {28.91}
20	20	30	44.1 - 53.9 {32.52 - 39.75}	49.0 {36.14}
24	24	32	58.8 - 78.4 {43.36 - 57.82}	68.6 {50.59}
30	30	32	93.1 - 122.5 {68.66 - 90.35}	107.8 {79.50}
33	33	_	107.8 - 147.0 {79.50 - 108.42}	124.4 {91.75}
36	36	36	127.4 - 176.4 {93.96 - 130.10}	151.9 {112.03}
42	42	_	181.3 - 240.1 {133.72 - 177.08}	210.7 {155.40}
52	52	_	274.4 - 367.5 {202.38 - 271.05}	323.4 {238.52}

TIGHTENING TORQUE TABLE FOR HOSES (TAPER SEAL TYPE AND FACE SEAL TYPE)

★ Tighten the hoses (taper seal type and face seal type) to the following torque, unless otherwise specified.

★ Apply the following torque when the threads are coated (wet) with engine oil.

Nominal size of hose	Width across flats	Tightening torque (Nm {lbf ft})		Taper seal type	Face seal type	
		Range	Target	Thread size (mm)	Nominal thread size - Threads per inch, Thread series	Root diameter (mm) (Reference)
02	19	34 - 54 {25.0 - 39.8}	44 {32.4}	-	9/16 - 18UN	14.3
		34 - 63 {25.0 - 46.4}	44 {32.4}	14	-	-
03	22	54 - 93 {39.8 - 68.5}	74 {54.5}	-	11/16 -16UN	17.5
	24	59 - 98 {43.5 - 72.2}	78 57.5}	18	-	-
04	27	84 - 132 {61.9 - 97.3}	103 {75.9}	22	13/16 - 16UN	20.6
05	32	128 - 186 {94.4 - 137.1}	157 {115.7}	24	1 - 14UNS	25.4
06	36	177 - 245 {130.5 - 180.7}	216 {159.3}	30	1 3/16 - 12UN	30.2
(10)	41	177 - 245 {130.5 - 180.7}	216 {159.3}	33	-	-
(12)	46	197 - 294 {145.3 - 216.8}	245 {180.7}	36	-	-
(14)	55	246 - 343 {181.4 - 252.9}	294 {216.8}	42	-	-

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TURBOCHARGER

WARNING! Be sure the engine and exhaust system have fully cooled down before removing any exhaust components. Failure to do so may result in a burn injury.

REMOVAL

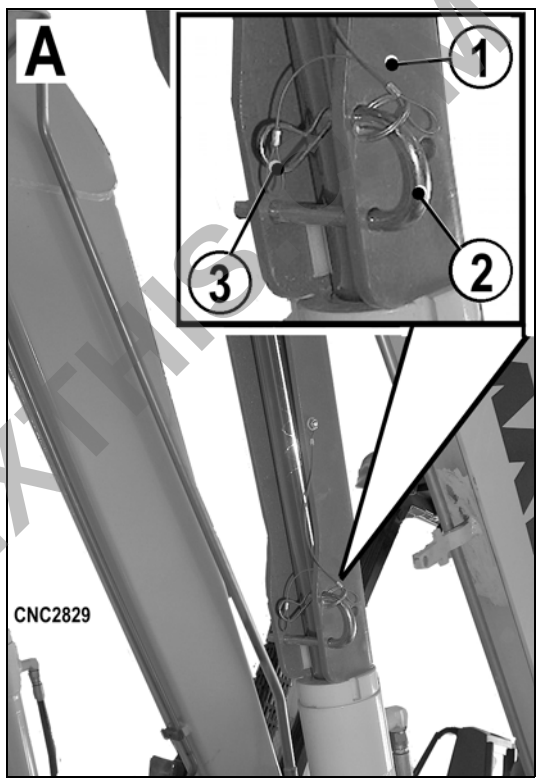
1. Raise the front loader arms fully up and set the lock as shown in (A).

   A. Raise the front end loader unit completely in the air extending the lifting cylinders rods completely.

   B. Remove the cylinder lock assembly small pin (3). Holding on to the lock unit (1), pull out lock pin (2).

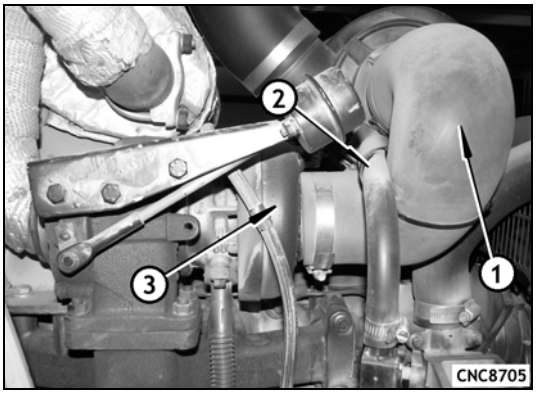
   C. Using both hands lower the lock unit (1) down from its storage position on to the extended lift arm cylinder rod.

   D. Once on the cylinder rod, install lock pin (2) and small pin (3) and slowly lower the loader arms until it rests on the loader lock (1).



2. Disconnect the coolant tube (2) from around suction pipe (1).

3. Disconnect the suction pipe (1) from the turbocharger (3).



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Noise while driving	
CAUSES	**REMEDY**
Excessive backlash between pinion and ring gear	Adjust
Worn out pinion and ring gear	Replace
Worn out pinion bearings	Replace
Pinion bearings loose	Adjust
Excessive axial pinion backlash	Adjust
Worn out differential bearings	Replace
Differential bearings loose	Adjust
Ring gear out of round	Replace
Low oil level	Oil level
Poor or worn oil	Replace
Bent half shaft	Replace

Noise while driving in neutral	
CAUSES	**REMEDY**
Noises coming from axle are usually heard but not loud when vehicle moves in neutral gear.	Replace or adjust (see above)
Incorrect backlash between pinion and ring, sound heard while decelerating, disappears while increasing speed	Replace
Pinion or input flange worn out	Adjust

Intermittent noise	
CAUSES	**REMEDY**
Ring gear damaged	Replace bevel gear set
Differential box bolts loosened	Tighten to torque

Constant noise	
CAUSES	**REMEDY**
Ring gear teeth or pinion damaged	Replace bevel gear set
Worn out bearings	Replace
Pinion spline worn out	Replace
Bent half shaft	Replace

Noise while steering	
CAUSES	**REMEDY**
Worn out differential gears	Replace
Worn out differential box or spider	Replace
Differential thrust washers worn out	Replace
Half shaft spline worn out	Replace

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TRANSMISSION

Shifting between 2WD and 4WD is achieved through an electrohydraulic system. The transmission is operated through a torque converter and a power shift reversing shuttle; the mechanical 4-speed gearbox is synchronized.

FORWARD					REVERSE			
Gears	**1st**	**2nd**	**3rd**	**4th**	**1st**	**2nd**	**3rd**	**4th**
km/h	6.3	11.4	21.3	37.8	6.3	11.4	21.3	37.8
m/h	3.9	7.1	13.2	23.5	3.9	7.1	13.2	23.5

TOTAL MASS

Maximum total mass . . . . . 7,298 - 8,328 kg (16,090 - 18,360 lb)

LOADER

- The design of the front loader allows for better tensile strength distribution and parallel movement when raising and lowering the bucket. Due to the linkage geometry, the number of greasing points has been dramatically reduced.

Standard bucket width . . . . . 2,356 mm (7ft 9in)
Front bucket capacity . . . . . (SAE) 0.95 m^3 (1.25 yd^3)
Standard bucket weight . . . . . 454 kg (1,000 lb)
Lifting capacity at maximum height . . . . . 3,900 kg (8,598 lb)
Lifting capacity at ground level . . . . . 5,000 kg (11,020 lb)
Breakout force . . . . . 6,000 kg (13,224 lb)

BACKHOE

- The boom has a rounded profile and reinforced structure built with cast ends allowing for 180° rotation while maintaining high rotation torque.

Bucket breakout force (ISO 6015) . . . . . 5,936 kg (13,087 lb)
Arm breakout force (ISO 6015) . . . . . 4,005 kg (8,830 lb)
Backhoe bucket capacity . . . . . (SAE) 0.20 m (3 0.24 yd^3)

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The affected pages are indicated by using the following marks. It is requested that necessary actions be taken to these pages according to the table below.

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( )	Page to be deleted	Discard

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SAFETY

SAFETY NOTICE

IMPORTANT SAFETY NOTICE

Proper service and repair is extremely important for the safe operation of your machine. The service and repair techniques recommended and described in this manual are both effective and safe methods of operation. Some of these operations require the use of tools specially designed for the purpose.

To prevent injury to workers, the symbol ⚠ is used to mark safety precautions in this manual. The cautions accompanying this symbol should always be followed carefully. If any dangerous situation arises or may possibly arise, first consider safety, and take the necessary actions to deal with the situation.

GENERAL PRECAUTIONS

Mistakes in operation are extremely dangerous. Read the OPERATION & MAINTENANCE MANUAL carefully BEFORE operating the machine.

1. Before carrying out any greasing or repairs, read all the precautions given on the decals which are fixed to the machine.

2. When carrying out any operation, always wear safety shoes and helmet. Do not wear loose work clothes, or clothes with buttons missing.
- Always wear safety glasses when hitting parts with a hammer.
- Always wear safety glasses when grinding parts with a grinder, etc.

3. If welding repairs are needed, always have a trained, experienced welder carry out the work. When carrying out welding work, always wear welding gloves, apron, glasses, cap and other clothes suited for welding work..

⚠ **WARNING!** Never modify, weld, cut, or drill on any part of a ROPS structure. Doing so may weaken the structure which could lead to possible failure in a rollover situation

4. When carrying out any operation with two or more workers, always agree on the operating procedure before starting. Always inform your fellow workers before starting any step of the operation. Before starting work, hang UNDER REPAIR signs on the controls in the operator's compartment.

5. Keep all tools in good condition and learn the correct way to use them.

6. Decide a place in the repair workshop to keep tools and removed parts. Always keep the tools and parts in their correct places. Always keep the work area clean and make sure that there is no dirt or oil on the floor. Smoke only in the areas provided for smoking. Never smoke while working.

PREPARATIONS FOR WORK

1. Before adding oil or making repairs, park the machine on hard, level ground, and block the wheels or tracks to prevent the machine from moving.

2. Before starting work, lower blade, ripper, bucket or any other work equipment to the ground. If this is not possible, insert the safety pin or use blocks to prevent the work equipment from falling. In addition, be sure to lock all the control levers and hang warning signs on them.

3. When disassembling or assembling, support the machine with blocks, jacks or stands before starting work.

4. Remove all mud and oil from the steps or other places used to get on and off the machine. Always use the handrails, ladders or steps when getting on or off the machine. Never jump on or off the machine. If it is impossible to use the handrails, ladders or steps, use a stand to provide safe footing.

PRECAUTIONS DURING WORK

1. When removing the oil filler cap, drain plug or hydraulic pressure measuring plugs, loosen them slowly to prevent the oil from spurting out. Before disconnecting or removing components of the oil, water or air circuits, first remove the pressure completely from the circuit.

2. The water and oil in the circuits are hot when the engine is stopped, so be careful not to get burned. Wait for the oil and water to cool before carrying out any work on the oil or water circuits.

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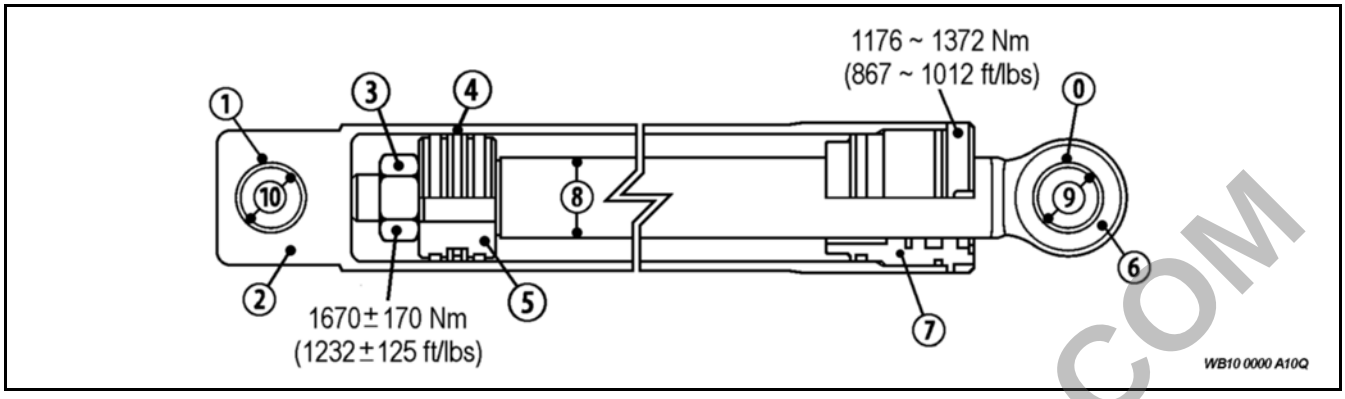
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BUCKET



0. Piston Rod Bushing
1. Barrel Bushing
2. Cylinder Barrel
3. Piston Retaining Nut
4. Four Piece Piston Seal
5. Cylinder Piston
6. Cylinder Rod
7. Cylinder Head

Unit: mm (inch)

	Check Item	Criteria					Remedy
		Standard Size	Tolerance		Standard Clearance	Clearance Limit	
			OD	ID			
8.	Piston Rod to Head	55 mm (2.165 in)					Replace
9.	Bushing in Piston Rod	55 mm (2.165 in)					
10.	Bushing in Barrel	55 mm (2.165 in)					

CHARACTERISTICS

Unit: mm (inch)

Piston Rod Diameter ..... 55 mm (2.165 in)
Max Cylinder Length ..... 1850 mm (72.834 in)
Min Cylinder Length ..... 1085 mm (42.716 in)
Cylinder Barrel Bore ..... 110 mm (4.331 in)
Piston Stroke ..... 765 mm (30.118 in)
Rod Thread for Piston Nut M36

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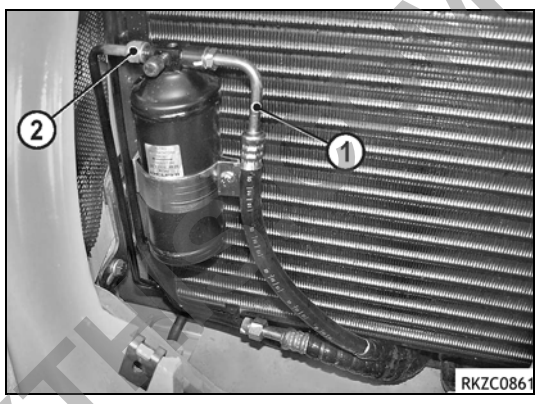
AIR CONDITIONING CONDENSER

WARNING! Do not release refrigerants into the atmosphere. All refrigerants must be captured and recycled.

REMOVAL

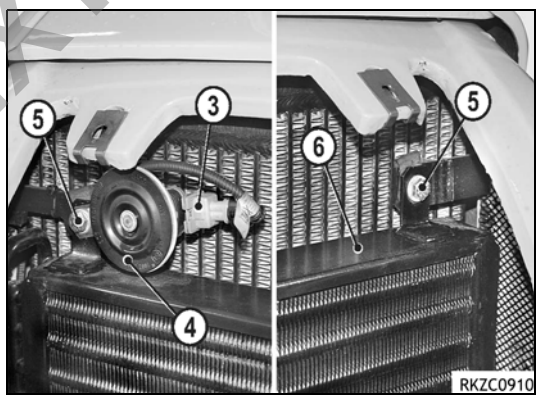
1. Remove the front grille and the front guard. For details see "FRONT GUARD."

2. After capturing refrigerants, remove hoses (1) and (2).
   ★ Plug all hoses, lines and connections to prevent contamination.



3. Disconnect the connector (3) and remove the horn (4).

4. Remove four bolts (5) and washers then remove condenser (6) together with receiver-dryer.



INSTALLATION

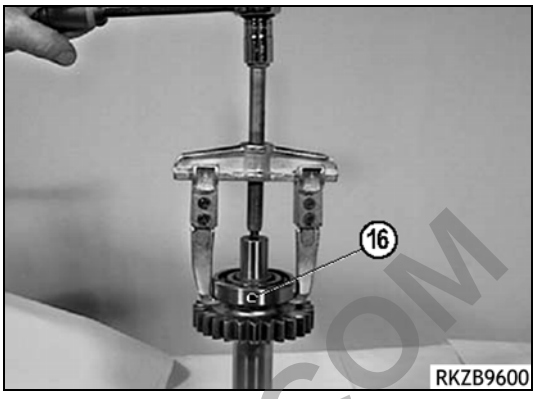
★ To install, reverse removal procedure.
★ Refill the air-conditioning unit.

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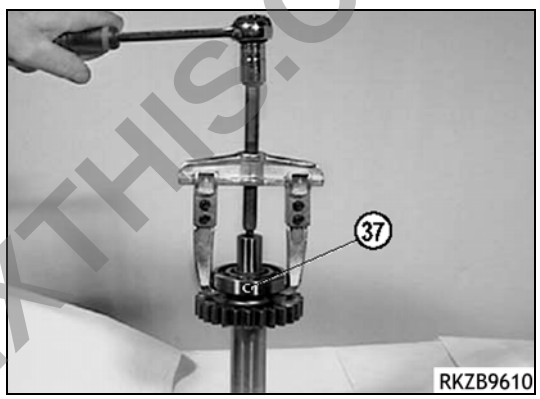
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Gear Shaft D

1. Remove bearing (16) of shaft **D** by means of a two jaw puller.



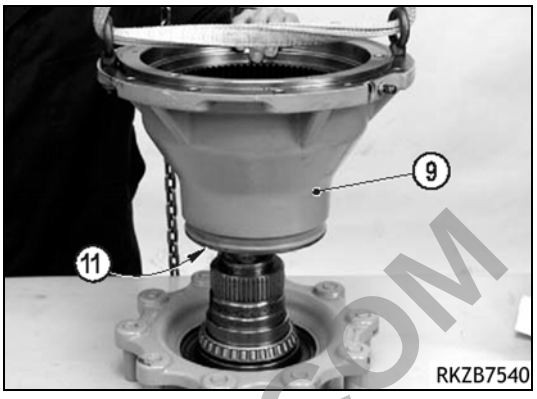
2. Remove bearing (37) of shaft **D** by means of a two jaw puller.



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10. Sling the hub housing (9) and remove it from the wheel flange (10).
    ★ Collect the bearing cone (11).



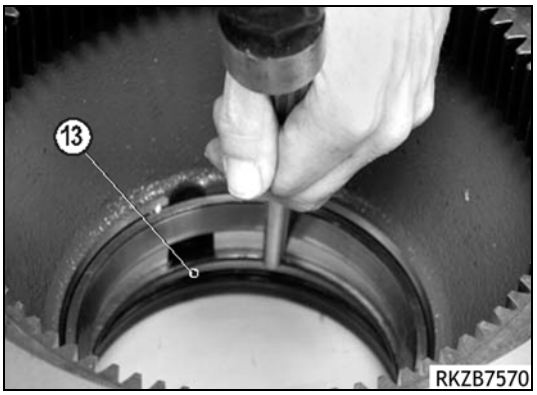
11. Remove from hub housing (9) the outer race of the bearing (11).



12. Remove from hub housing (9) the outer race of the bearing (12).
    ★ This is a destructive operation for the seal ring.



13. Remove from hub housing (9) the outer race of the bearing (13).



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