KIOTI®

RX6020C(PC)
RX6620C(PC)
RX7320C(PC)
RX7620C(PC)

WORKSHOP MANUAL

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SAFETY FIRST

CHAPTER 1

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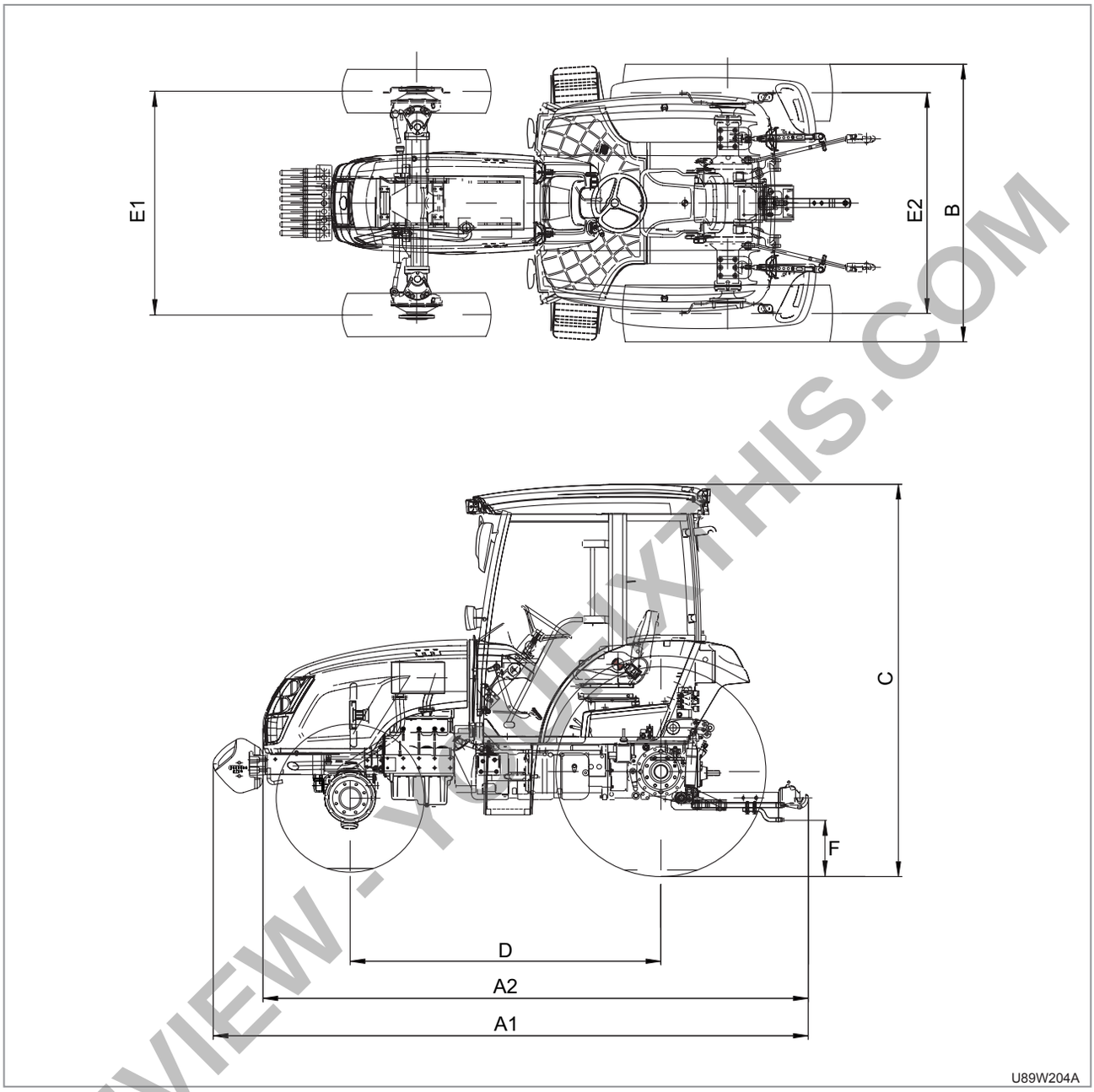
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4. DIMENSIONS



mm (in.)

ITEM		RX6020/6620-US				RX6020/6620-EU,AU		RX7320-US,EU / RX7620-AU		REMARKS
A1 : Overall length		4,020 (158.3)				←		4,050 (159.4)		Including front weight
A2 : Overall length		3,700 (145.7)				←		3,750 (147.6)		
B : Overall width		1,755 (69.1)		1,875 (73.8)		1,875 (73.8)		1,960 (77.2)		
C : Overall height		2,610 (102.8)		2,630 (103.5)		2,630 (103.5)		2,650 (104.3)		
D : Wheel base		2,100 (82.7)				←		2,130 (83.9)		
E : Tread	E1: Front Wheel	9.5-20	1,375 (54.1)	11.2-20	1,475 (58.1)	11.2-20	1,475 (58.1)	11.2-24	1,477 (58.1)	
	E2: Rear Wheel	14.9-28	1,375 (54.1)	14.9-30	1,490 (58.7)	14.9-30	1,490 (58.7)	16.9-30	1,515 (59.6)	
F : Min. ground clearance		400 (15.7)		420 (16.5)		420 (16.5)		440 (17.3)		

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5. SPECIFICATIONS

MODEL			RX6020C			RX6020PC		
			US	EU	AU	US	EU	AU
Engine	Model		4F243T-TMC4		4F243T-TMC3	4F243T-TPC4		4F243T-TPC3
	Type		Upright, 4-cylinder, watercooled 4-cycle, diesel					
	Max. power	HP(Kw)/rpm	60 (44.7) / 2600					
	Number of cylinders		4					
	Bore x Stroke	mm (in.)	87 X 102.4 (3.4 X 4.0)					
	Total displacement	cc(cu in.)	2,435 (148.6)					
	Rated revolution	(rpm)	2,600					
	Compression ratio		17.4 : 1					
	Injection sequence		1 - 3 - 4 - 2					
Capacity	Fuel tank	ℓ (U.S.gal)	95 (25.1)					
	Engine crankcase	ℓ (U.S.gal)	8.3 (2.2)					
	Engine coolant	ℓ (U.S.gal)	9.5 (2.5)					
	Transmission case	ℓ (U.S.gal)	60 (15.9)					
	Front axle support	ℓ (U.S.gal)	8.5 (2.2)					
Driving system	Clutch		Dry type single stage			Hydraulic, wet multi discs		
	Transmission system	Main shift	4-gear, synchromesh					
		Shuttle	Synchromesh			Power		
		Range shift	3-gear, constant-mesh	3X2 gear, constant-mesh		3-gear, constant-mesh	3X2 gear, constant-mesh	
		Number of gears	F12 X R12	F24 X R24		F12 X R12	F24 X R24	
	Brake system		Wet type, multiple plates					
	Four wheel drive		Hydro multi wet disc clutch					
	Differential lock		Pin shift					
	Tire size	Front wheel in.	9.5-20	11.2-20		9.5-20	11.2-20	
		Rear wheel in.	14.9-28	14.9-30		14.9-28	14.9-30	
Hydraulic system	Hydraulic lift control		Position, draft and mixed control					
	Steering		Full hydraulic power					
	Pump oil flow	Main ℓ/min (U.S.gal)	41.6 (10.98)					
		Steering ℓ/min (U.S.gal)	26.0 (6.86)					
	3-point hitch type		SAE category Ⅱ					
	Max. lifting capacity kgf (lbs)	From 24 in. behind	1,630 (3,954)					
		Under lower link	2,075 (4,575)					
	Number of remote hydraulic valve		1		2	1		2
PTO	Type		Independent PTO, hydraulic wet type multi-plate clutch					
	PTO shaft dimension	in.	SAE 1 3/8", 6 splines					
	PTO Speed (PTO rpm/ engine rpm)	1st rpm	540 / 2,444					
		2nd rpm	1,000 / 2,494	750 / 2,483		1,000 / 2,494	750 / 2,483	
Driving speed	Forward	Km/h (mile/h)	1.51~33.38 (0.93~20.74)	0.16 ~ 33.76 (0.10 ~ 20.98)		1.51~33.38 (0.93~20.74)	0.16 ~ 33.76 (0.10 ~ 20.98)	
	Reverse	Km/h (mile/h)	1.49~32.82 (0.93~20.39)	0.16 ~ 33.20 (0.10 ~ 20.63)		1.49~32.82 (0.93~20.39)	0.16 ~ 33.20 (0.10 ~ 20.63)	
Min. turning radius (when braking)		mm (in.)	3,020 (118.9)	3,110 (122.4)		3,020 (118.9)	3,110 (122.4)	

NOTES: The specifications are subject to change without notice.

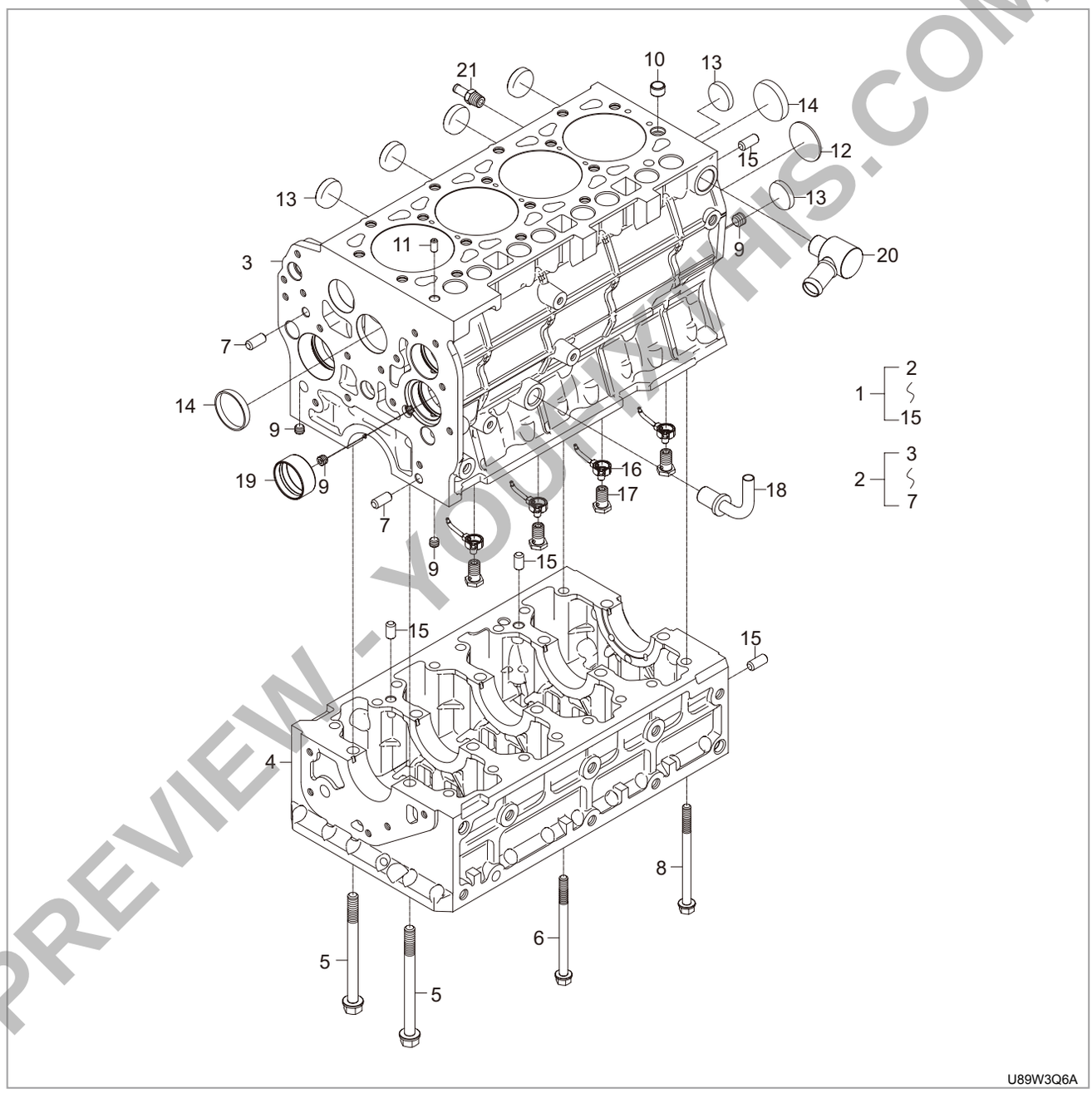
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6. EXPLODED VIEW

REMARK

- **The manufacturing parts are subject to change without notice. Therefore, check the parts catalog or electronic manual for latest information.**

6.1 G010A CYLINDER BLOCK



U89W3Q6A

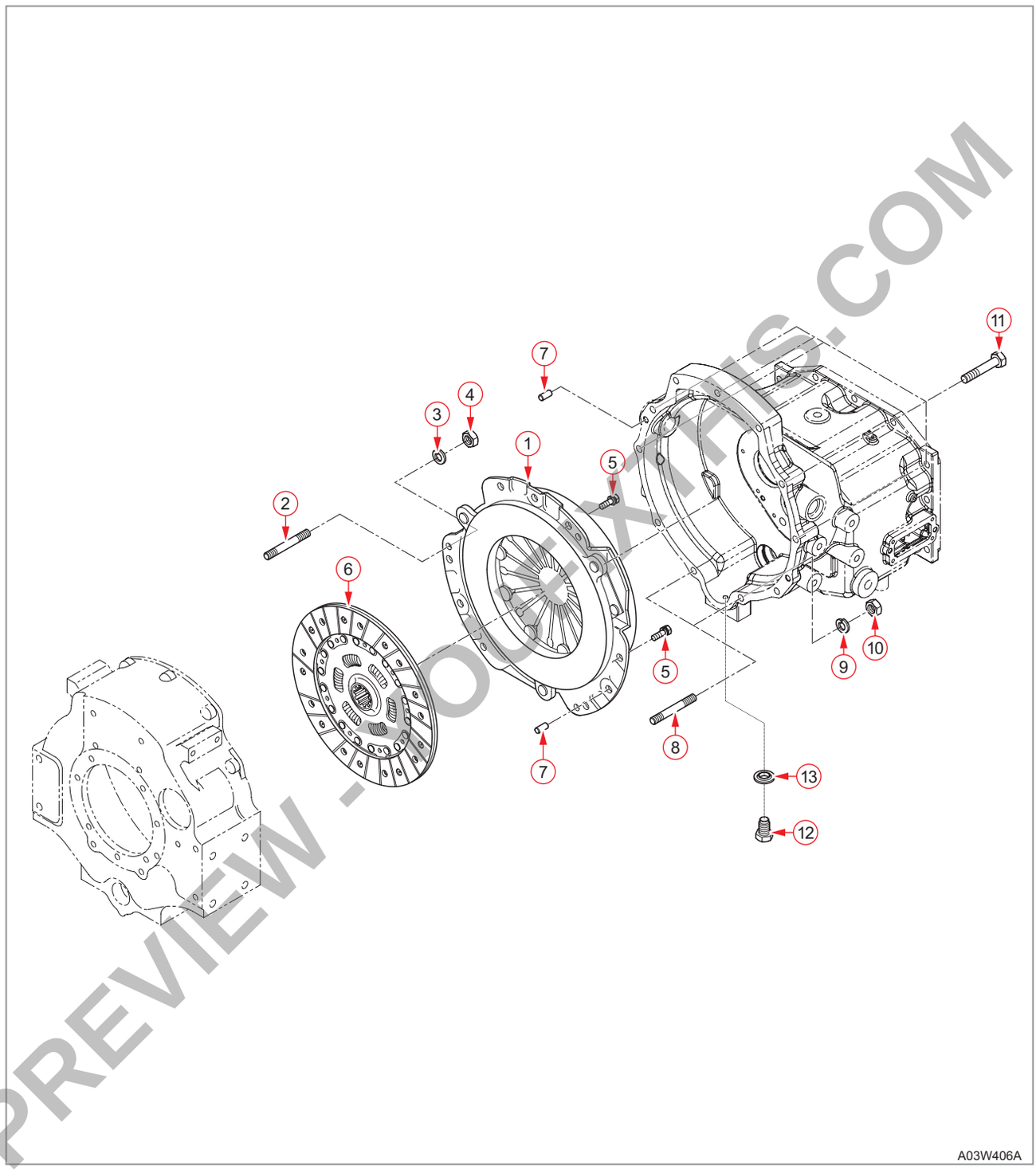
COMPONENTS

(1) Cylinder block assy
(2) Cylinder block sub assy
(3) Cylinder block
(4) Ladder frame
(5) Bolt, main bearing
(6) Bolt, ladder frame
(7) Pin, parallel
(8) Bolt, ladder frame
(9) Plug
(10) Pin, pipe
(11) Pin, pipe
(12) Plug, expansion
(13) Cap, sealing
(14) Cap, sealing
(15) Pin, parallel
(16) Body, piston cooling jet
(17) Valve, piston cooling jet
(18) Pipe 3, oil
(19) Bush, balance shaft
(20) Coolant connector assy
(21) Pipe, coolant return

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6. EXPLODED VIEW

6.1 T0100B CLUTCH



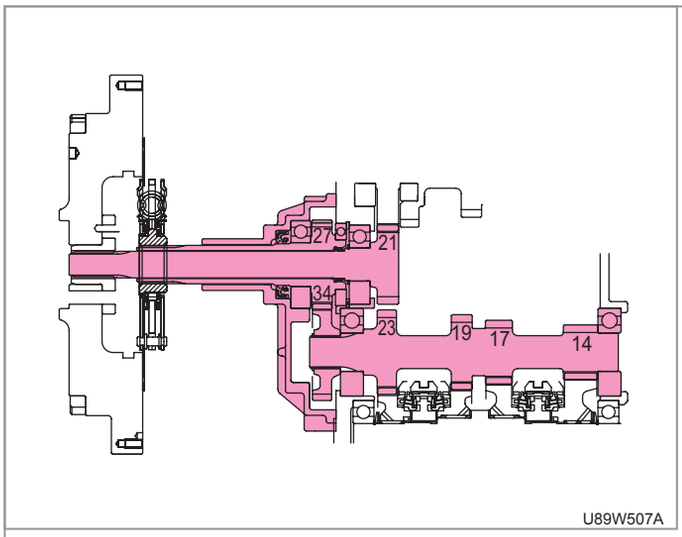
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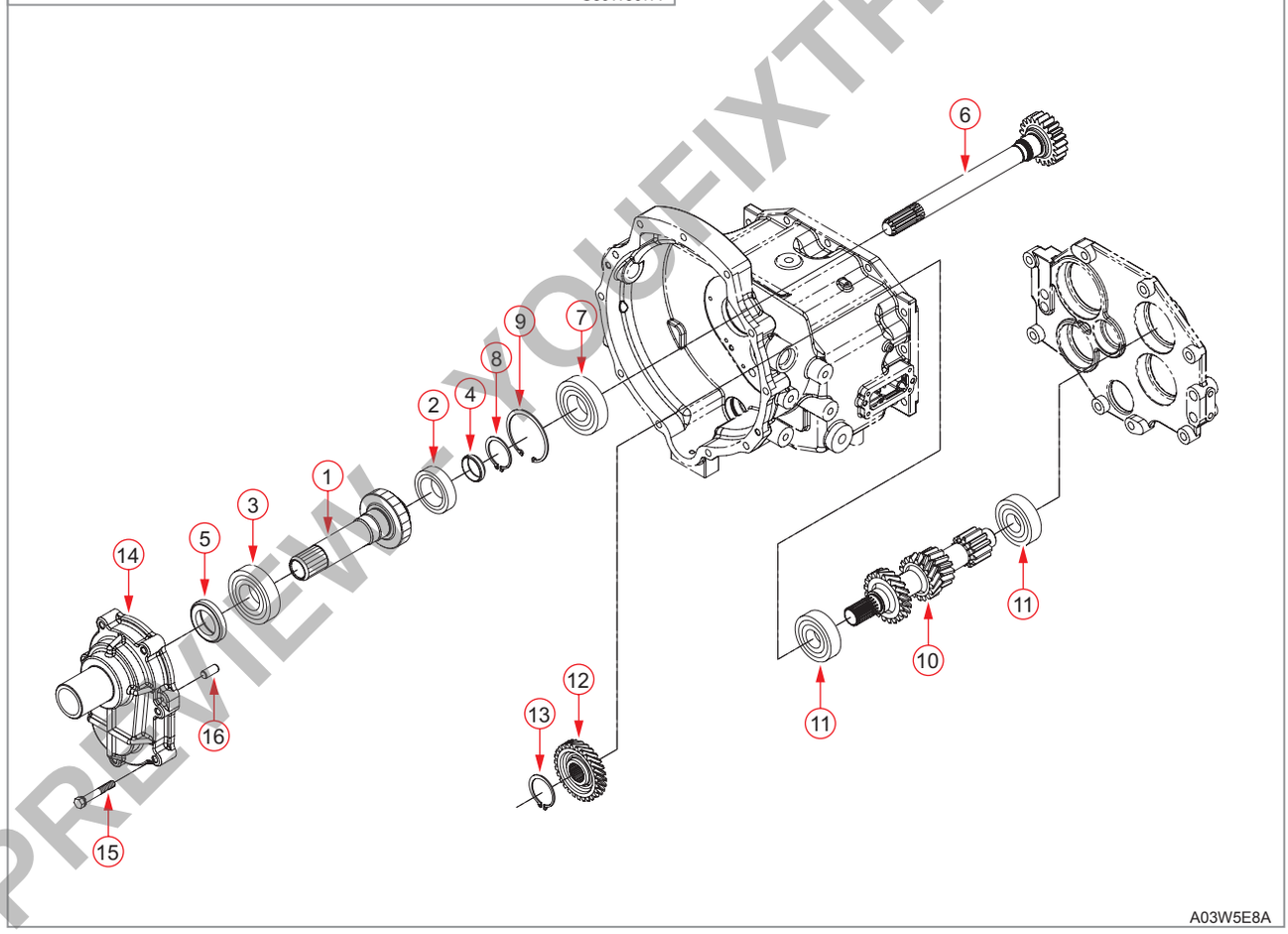
COMPONENTS

(1) Clutch cover assembly
(2) Stud bolt
(3) Spring washer
(4) Nut
(5) Bolt with captive washer
(6) Clutch disc assembly
(7) Dowel pin
(8) Stud bolt
(9) Spring washer
(10) Nut
(11) Bolt with captive washer
(12) Plug
(13) Seal washer

6. EXPLODED VIEW

6.1 T0140A MAIN SHAFT



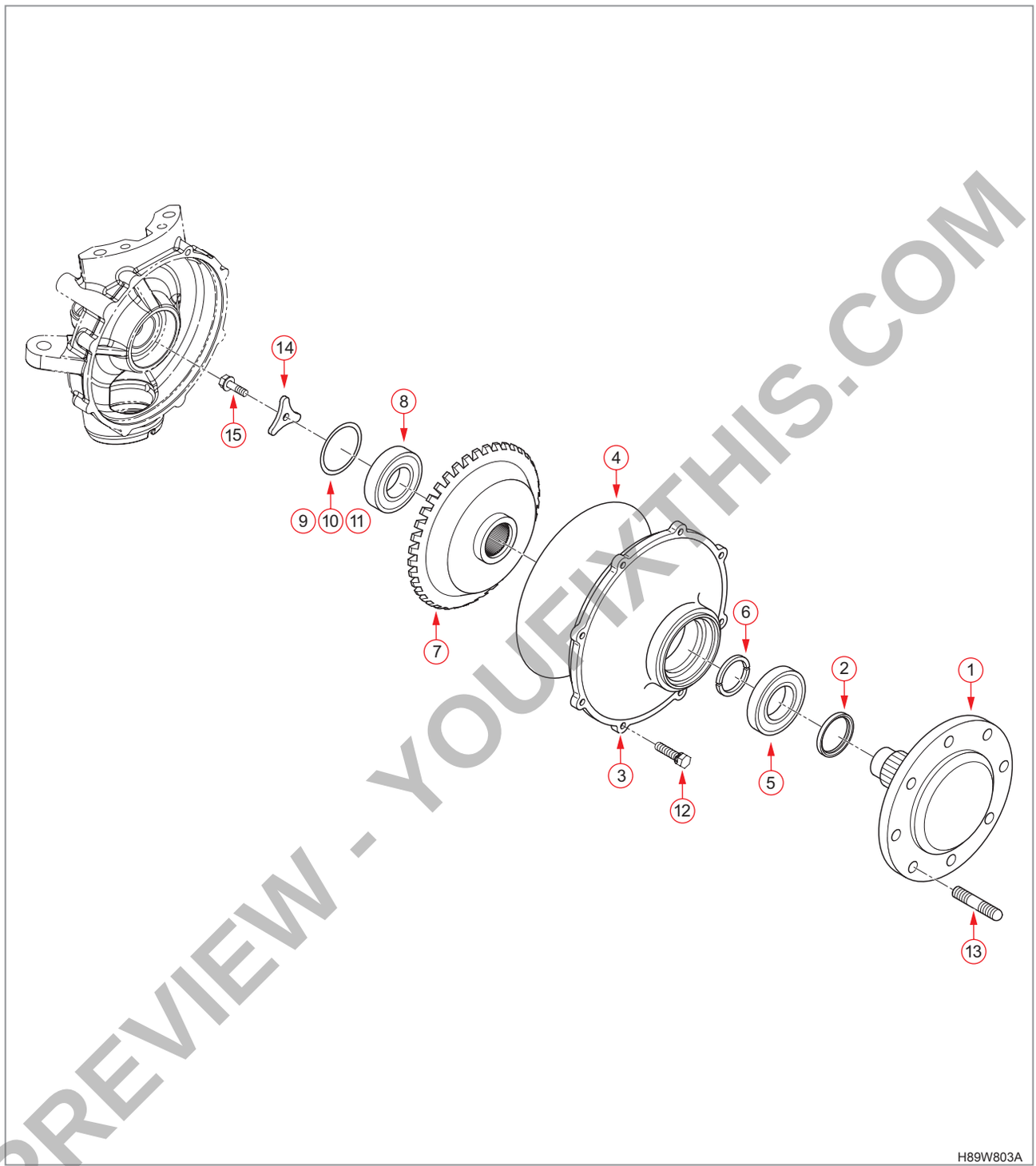


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COMPONENTS

(1) 27 gear shaft
(2) Ball bearing
(3) Ball bearing
(4) Oil seal
(5) Oil seal
(6) 21 gear shaft
(7) Ball bearing
(8) Snap ring
(9) Snap ring
(10) Main shaft gear
(11) Ball bearing
(12) 34 gear
(13) Snap ring
(14) Propeller shaft case
(15) Bolt with captive washer
(16) Dowel pin

6.5 T0480A FRONT AXLE



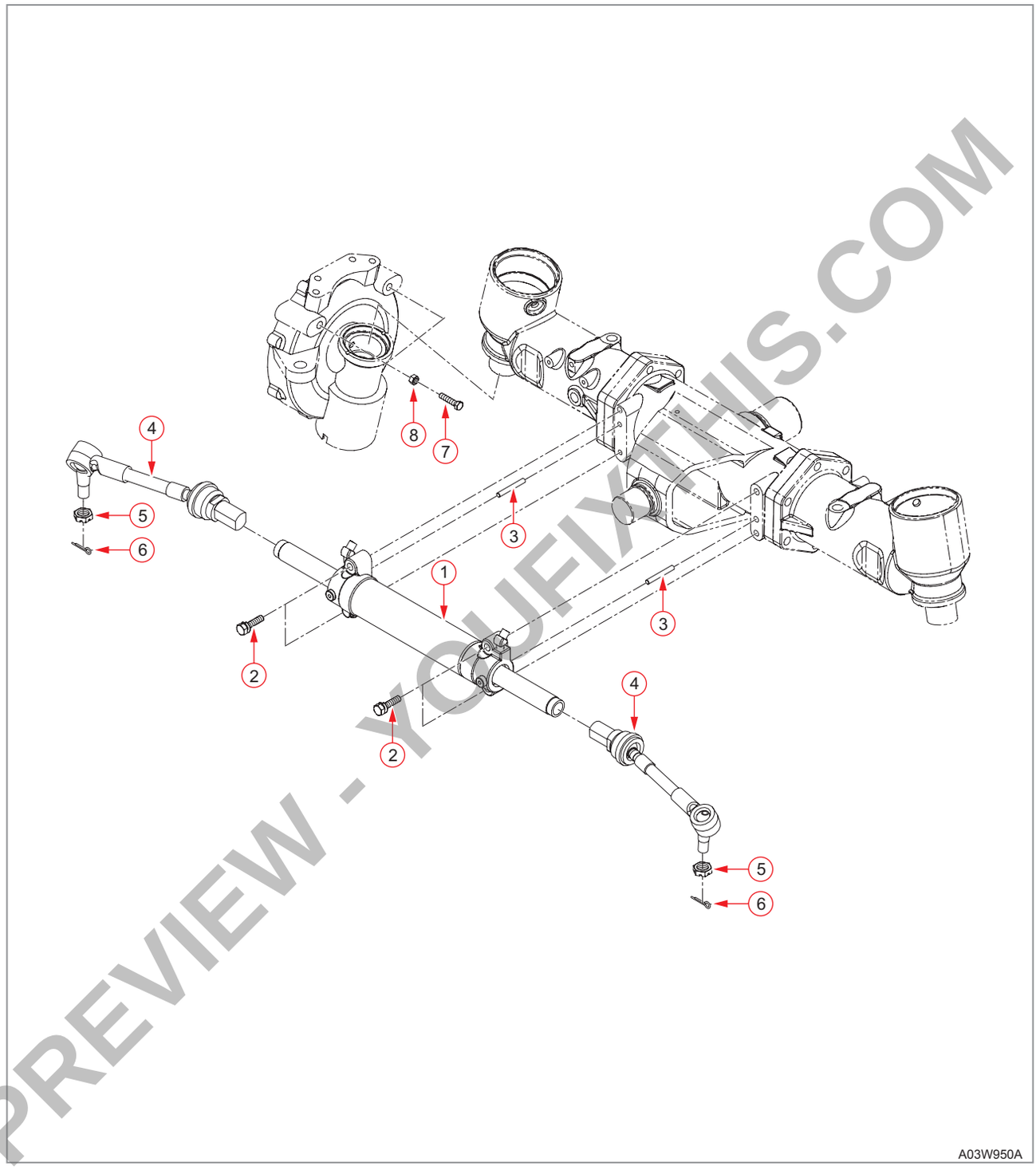
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COMPONENTS

(1) Front axle
(2) Oil seal
(3) Floating seal
(4) O-ring
(5) Ball bearing
(6) Snap ring
(7) 45 bevel gear
(8) Ball bearing
(9) Shim (0.1)
(10) Shim (0.2)
(11) Shim (0.4)
(12) Bolt with captive washer
(13) Stud bolt
(14) Fixing plate
(15) UBS bolt

6. EXPLODED VIEW

6.1 T0490A STEERING CYLINDER



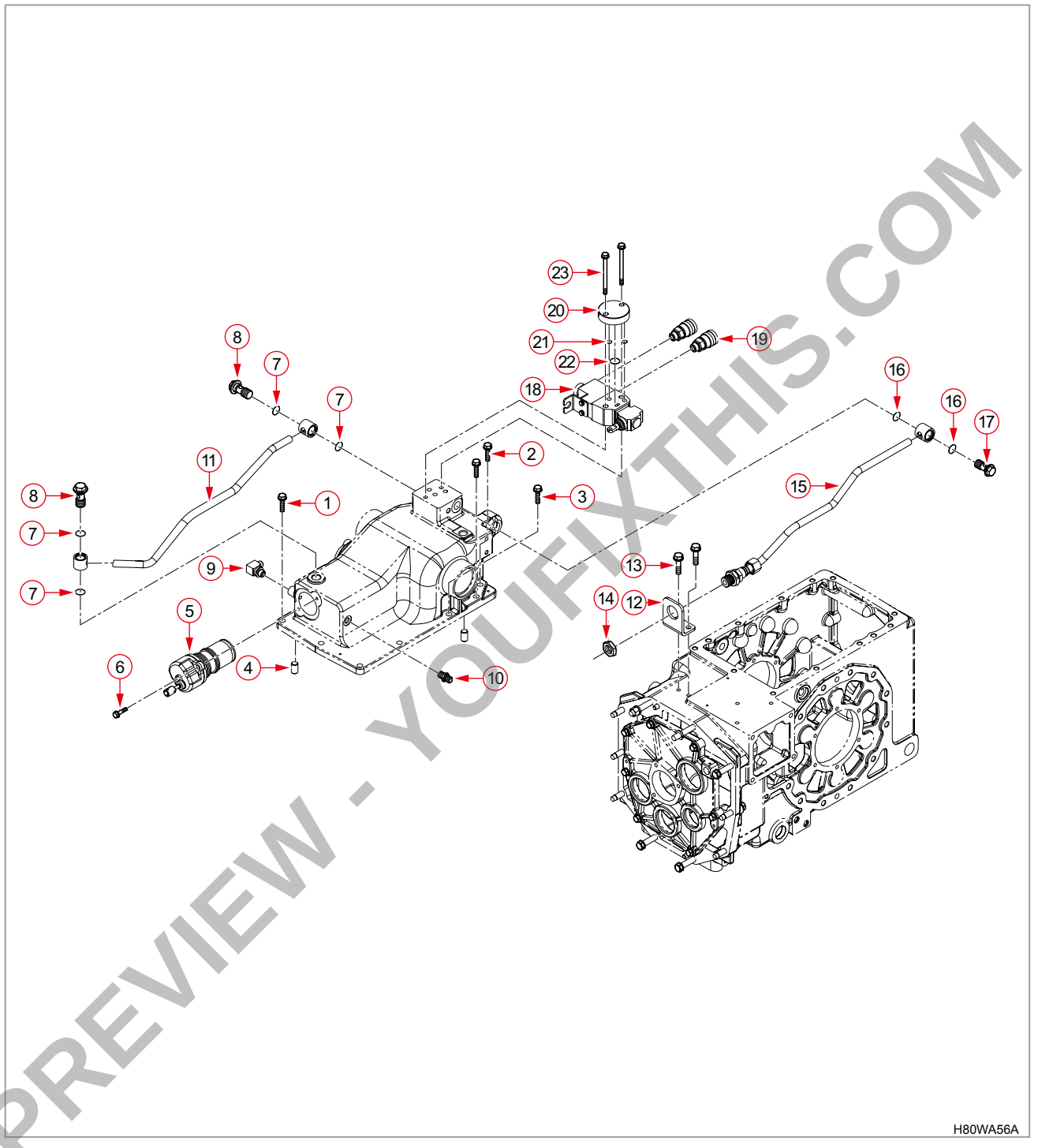
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COMPONENTS

(1) Steering cylinder
(2) Bolt with captive washer
(3) Dowel pin
(4) Ball joint assembly
(5) Slotted nut
(6) Split pin
(7) Mounting bolt
(8) Nut

6. EXPLODED VIEW

6.1 T0365A HYDRAULIC CYLINDER



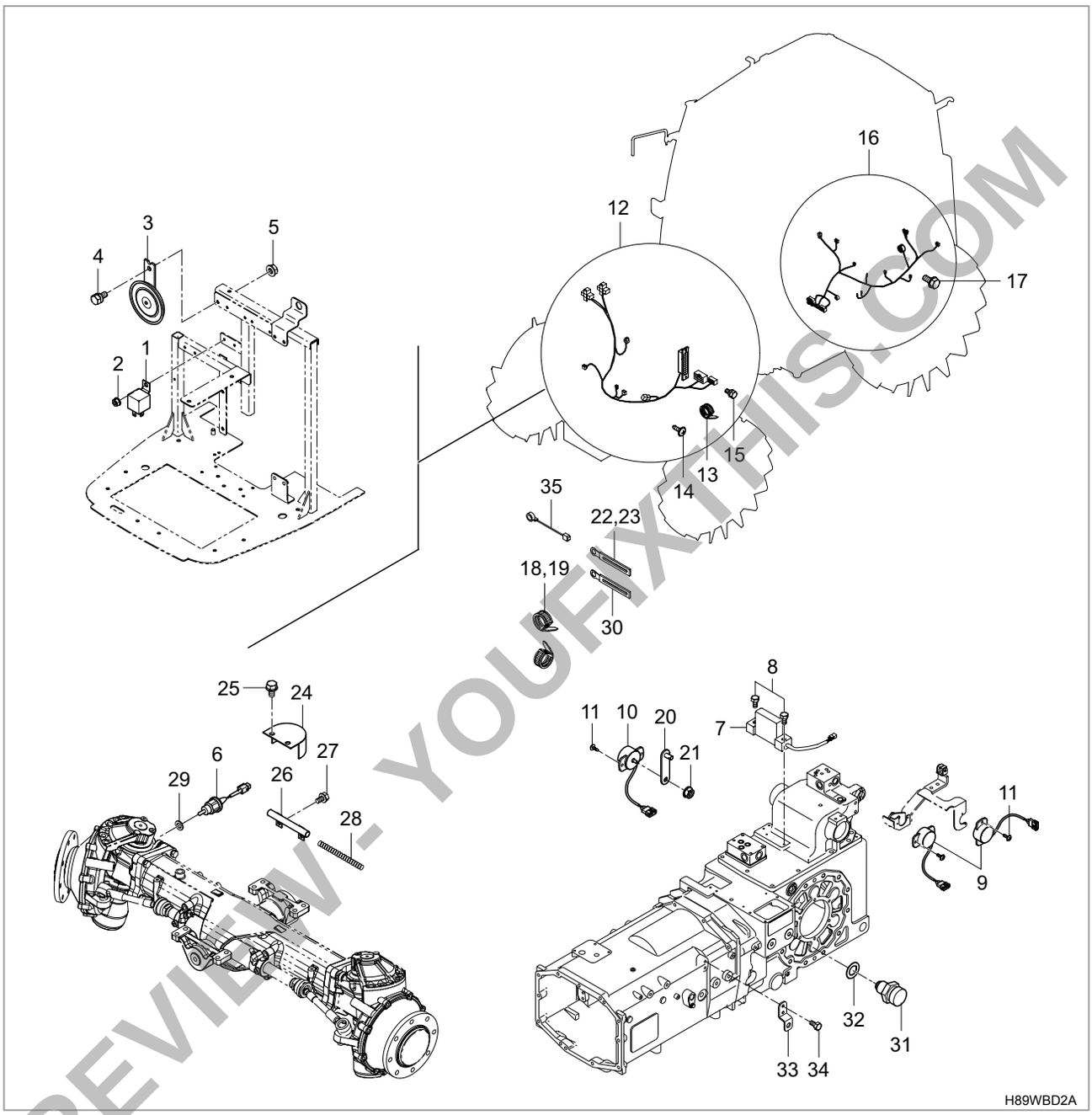
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COMPONENTS

(1) Washer bolt
(2) Washer bolt
(3) Washer bolt
(4) Dowel pin
(5) MLS valve (more steps)
(6) Washer bolt
(7) O-ring
(8) Joint bolt
(9) Elbow
(10) Connector
(11) Hydraulic tube
(12) Tube bracket
(13) Washer bolt
(14) Nut
(15) Hydraulic tube
(16) O-ring
(17) Joint bolt
(18) Double acting valve
(19) Self-sealing coupler, ac, 1-1/4
(20) Cover
(21) O-ring
(22) O-ring
(23) Washer bolt

8. EXPLODED VIEW

8.1 T0570A ELECTRIC SYSTEM 1



COMPONENTS

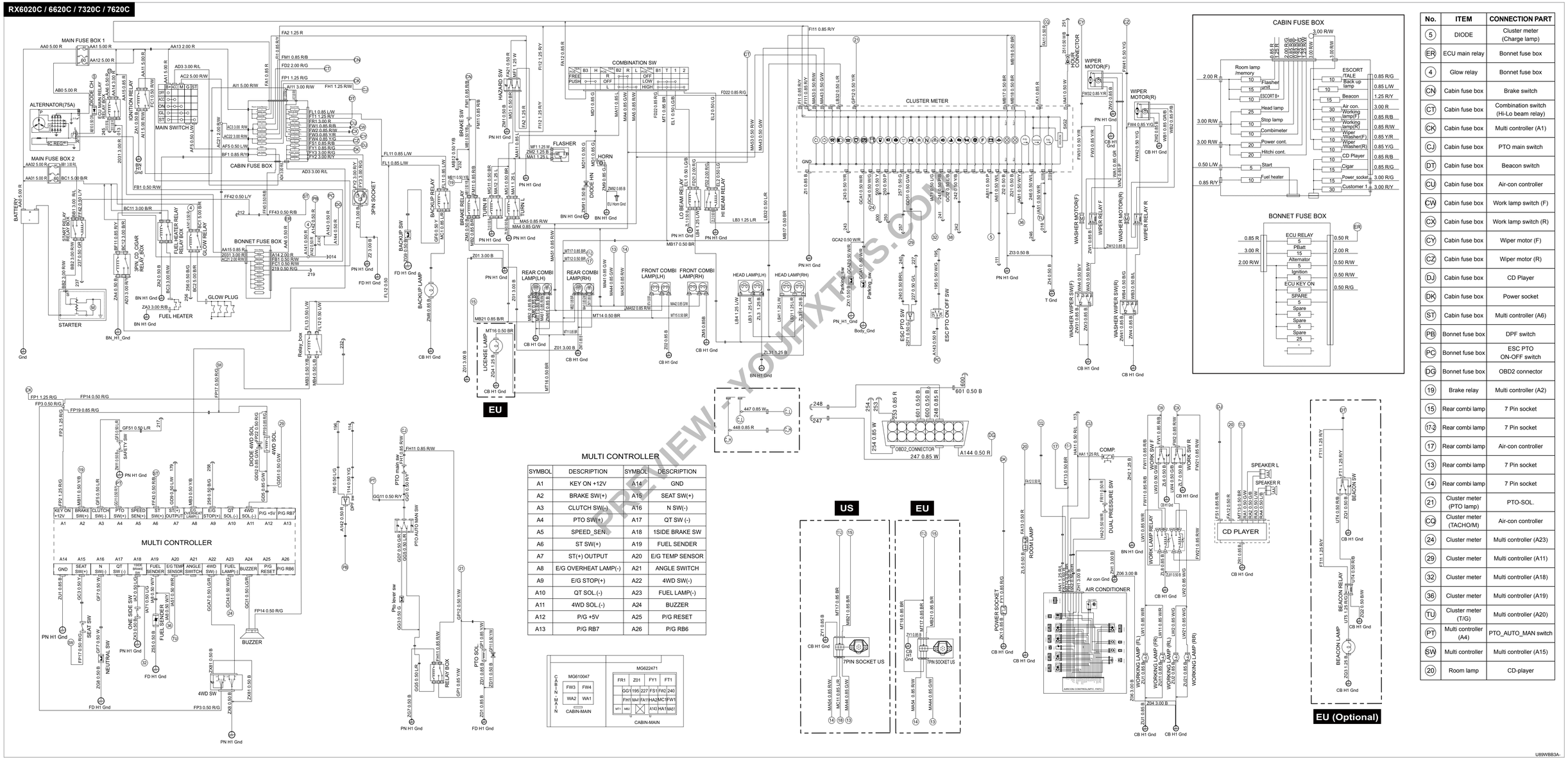
(1) Relay(4P)
(2) Flange nut
(3) Horn assy
(4) Bolt, washer
(5) Flange nut
(6) Assy switch safety
(7) Sensor, horizontal
(8) Bolt, washer
(9) Ass'y stroke sensor
(10) Potentiometer ass'y
(11) Screw, washer
(12) Ass'y wire harness bonnet
(13) Band
(14) Screw
(15) Bolt, washer
(16) Assy wire harness,fender
(17) Bolt, flange
(18) Band,cord
(19) Band,cord
(20) Plate, switch
(21) Flange nut
(22) Clamp,cord
(23) Clamp,cord
(24) Cover
(25) Bolt, flange
(26) Bracket
(27) Bolt, washer
(28) Spring
(29) Collar 1.0T, adjusting
(30) Clamp,cord
(31) Safe switch assy
(32) Collar 1.0T, adjusting
(33) Bracket,neutral switch
(34) Bolt, washer
(35) Wire harness

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2. CIRCUIT AND COMPONENT LOCATION

2.1 OVERALL CIRCUIT DIAGRAM

RX6020C / 6620C / 7320C / 7620C

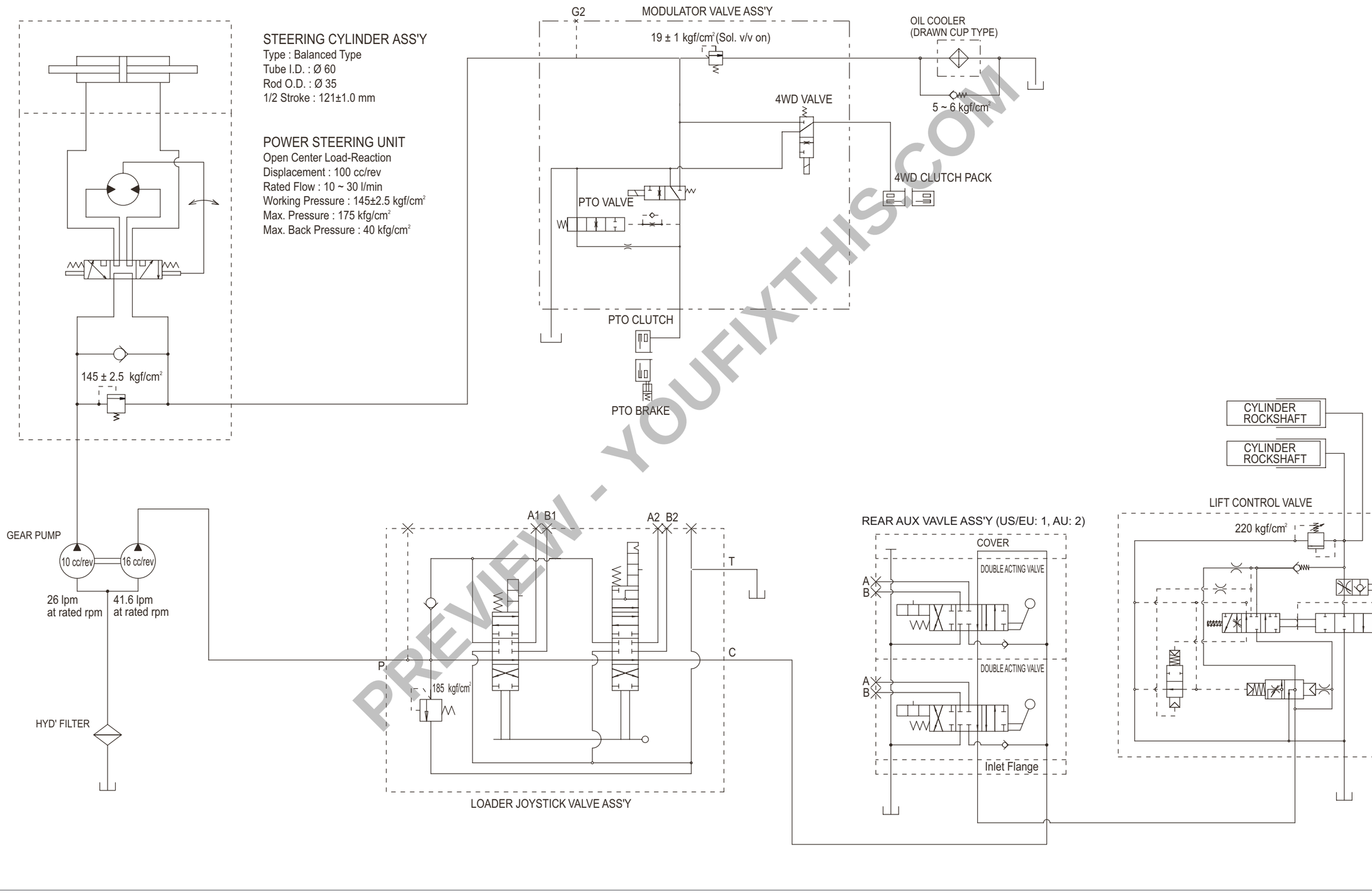


SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
A1	KEY ON +12V	A14	GND
A2	BRAKE SW(+)	A15	SEAT SW(+)
A3	CLUTCH SW(-)	A16	N SW(-)
A4	PTO SW(+)	A17	QT SW (-)
A5	SPEED_SEN	A18	1SIDE BRAKE SW
A6	ST SW(+)	A19	FUEL SENDER
A7	ST(+) OUTPUT	A20	E/G TEMP SENSOR
A8	E/G OVERHEAT LAMP(-)	A21	ANGLE SWITCH
A9	E/G STOP(+)	A22	4WD SW(-)
A10	QT SOL.(-)	A23	FUEL LAMP(-)
A11	4WD SOL.(-)	A24	BUZZER
A12	P/G +5V	A25	P/G RESET
A13	P/G RB7	A26	P/G RB6

No.	ITEM	CONNECTION PART
5	DIODE	Cluster meter (Charge lamp)
ER	ECU main relay	Bonnet fuse box
4	Glow relay	Bonnet fuse box
CN	Cabin fuse box	Brake switch
CT	Cabin fuse box	Combination switch (Hi-Lo beam relay)
CK	Cabin fuse box	Multi controller (A1)
CJ	Cabin fuse box	PTO main switch
DT	Cabin fuse box	Beacon switch
CU	Cabin fuse box	Air-con controller
CW	Cabin fuse box	Work lamp switch (F)
CX	Cabin fuse box	Work lamp switch (R)
CY	Cabin fuse box	Wiper motor (F)
CZ	Cabin fuse box	Wiper motor (R)
DJ	Cabin fuse box	CD Player
DK	Cabin fuse box	Power socket
ST	Cabin fuse box	Multi controller (A6)
PB	Bonnet fuse box	DPF switch
PC	Bonnet fuse box	ESC PTO ON-OFF switch
DG	Bonnet fuse box	OBD2 connector
19	Brake relay	Multi controller (A2)
15	Rear combi lamp	7 Pin socket
17-2	Rear combi lamp	7 Pin socket
17	Rear combi lamp	Air-con controller
13	Rear combi lamp	7 Pin socket
14	Rear combi lamp	7 Pin socket
21	Cluster meter (PTO lamp)	PTO-SOL.
CQ	Cluster meter (TACHO/M)	Air-con controller
24	Cluster meter	Multi controller (A23)
29	Cluster meter	Multi controller (A11)
32	Cluster meter	Multi controller (A18)
36	Cluster meter	Multi controller (A19)
TU	Cluster meter (T/G)	Multi controller (A20)
PT	Multi controller (A4)	PTO_AUTO_MAN switch
SW	Multi controller	Multi controller (A15)
20	Room lamp	CD-player

2.3 HYDRAULIC CIRCUIT

RX6020C / 6620C



H89WA16A

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10. TIGHTENING TORQUE

10.1 GENERAL USE SCREWS, BOLTS AND NUTS

Screws, bolts and nuts whose tightening torques are not specified in this workshop manual should be tightened according to the table below.

Mark on bolt head	4 No-grade or 4T						7 7T						9 9T		
Bolt material	SS400, S20C						S43C, S48C						SCr435, SCM435		
Material of component part	Steel or cast iron			Aluminum			Steel or cast iron			Aluminum			Steel or cast iron		
Type \ Unit	Nm	kgf-m	lbf-ft	Nm	kgf-m	lbf-ft	Nm	kgf-m	lbf-ft	Nm	kgf-m	lbf-ft	Nm	kgf-m	lbf-ft
M6 (6 mm, 0.24 in.)	7.85 ~ 9.31	0.80 ~ 0.95	5.79 ~ 6.87	7.85 ~ 8.82	0.80 ~ 0.90	5.79 ~ 6.50	9.81 ~ 11.2	1.00 ~ 1.15	7.24 ~ 8.31	7.85 ~ 8.82	0.80 ~ 0.90	5.79 ~ 6.50	12.3 ~ 14.2	1.25 ~ 1.45	9.05 ~ 10.4
M8 (8 mm, 0.31 in.)	17.7 ~ 20.5	1.8 ~ 2.1	13.1 ~ 15.1	16.7 ~ 19.6	1.7 ~ 2.0	12.3 ~ 14.4	23.6 ~ 27.4	2.4 ~ 2.8	17.4 ~ 20.2	17.7 ~ 20.5	1.8 ~ 2.1	13.1 ~ 15.1	29.5 ~ 34.3	3.0 ~ 3.5	21.7 ~ 25.3
M10 (10 mm, 0.39 in.)	39.3 ~ 45.1	4.0 ~ 4.6	29.0 ~ 33.2	31.4 ~ 34.3	3.2 ~ 3.5	23.2 ~ 25.3	48.1 ~ 55.8	4.9 ~ 5.7	35.5 ~ 41.2	39.3 ~ 44.1	4.0 ~ 4.5	29.0 ~ 32.5	60.9 ~ 70.6	6.2 ~ 7.2	44.9 ~ 52.0
M12 (12 mm, 0.47 in.)	62.8 ~ 72.5	6.4 ~ 7.4	46.3 ~ 53.5				77.5 ~ 90.2	7.9 ~ 9.2	57.2 ~ 66.5	62.8 ~ 72.5	6.4 ~ 7.4	46.3 ~ 53.5	103 ~ 117	10.5 ~ 12.0	76.0 ~ 86.7
M14 (14 mm, 0.55 in.)	108 ~ 125	11.0 ~ 12.8	79.6 ~ 92.5				124 ~ 147	12.6 ~ 15.0	91.2 ~ 108				167 ~ 704	17.0 ~ 20.0	123 ~ 144
M16 (16 mm, 0.63 in.)	167 ~ 191	17.0 ~ 19.5	123 ~ 141				197 ~ 225	20.0 ~ 23.0	145 ~ 166				260 ~ 304	26.5 ~ 31.0	192 ~ 224
M18 (18 mm, 0.71 in.)	246 ~ 284	25.0 ~ 29.0	181 ~ 209				275 ~ 318	28.0 ~ 32.5	203 ~ 235				344 ~ 402	35.0 ~ 41.0	254 ~ 296
M20 (20 mm, 0.79 in.)	334 ~ 392	34.0 ~ 40.0	246 ~ 289				368 ~ 431	37.5 ~ 44.0	272 ~ 318				491 ~ 568	50.0 ~ 58.0	362 ~ 419

10.2 STUD BOLTS

Material of component part	Steel or cast iron			Aluminum		
Diameter \ Unit	Nm	kgf-m	lbf-ft	Nm	kgf-m	lbf-ft
M8 (8 mm, 0.31 in.)	11.6 ~ 15.6	1.2 ~ 1.6	8.68 ~ 11.5	8.82 ~ 11.6	0.90 ~ 1.2	6.51 ~ 8.67
M10 (10 mm, 0.39 in.)	24.6 ~ 31.3	2.5 ~ 3.2	18.1 ~ 23.1	19.7 ~ 25.4	2.0 ~ 2.6	14.5 ~ 18.8
M12 (12 mm, 0.47 in.)	29.5 ~ 49.0	3.0 ~ 5.0	21.7 ~ 36.1	31.4	3.2	23.1

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9.5.2 ERORR CODE & ACTION

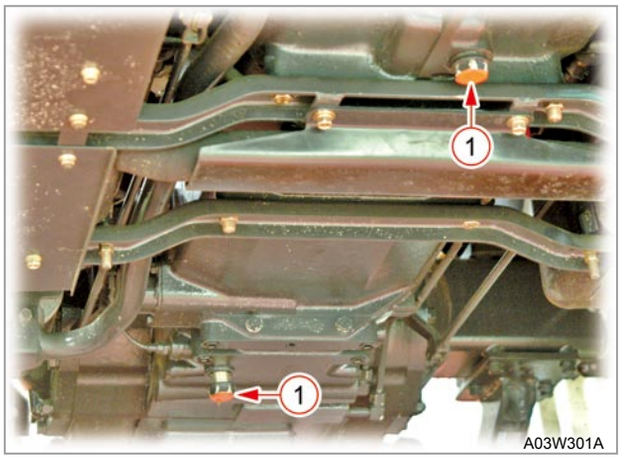
FAULT CODE			FAULT NAME	DESCRIPTION	ACTION								
DTC CODE	LB CODE	LAMP FLASH CODE			CEL "FLASH"	CEL "ON"	CCRT REGEN. DISABLE OR STOP	DISABLE EACH INJECTOR	INCREASED IDLE	LIMP HOME MODE	TORQUE REDUCTION (30%)	TORQUE REDUCTION (50%)	DELAYED ENGINE STOP
P0001	13	241	IMV driver signal open circuit fault	1. IMV driver signal open circuit fault is detected.	○							○	○
P0002	23	353	Rail pressure control error fault	1. Rail pressure control fault due to too much high (positive) or low (negative) IMV current trim.	○	○ (23)					○		○
	24	354											
	1A	222											
	1B	221											
P0003	11	242	IMV control fault 1	1. IMV driver short circuit to ground (SC2G) fault is detected. 2. Rail pressure control feedback is too low.	○ (11)	○							○
	18	224											
	23	235											
	24	234											
	7B	351											
P0004	3	231	Mv control fault 2	1. IMV driver signal short circuit to battery (SC2Vbatt) fault is detected. 2. Rail pressure control feedback is too high.	○	○ (03, 24)	○					○	○
	12	243											
	19	223											
	23	233											
	24	232											
	7B	352											
P0088	0	311/361	Over rail pressure fault	1. Rail pressure control error during IMV control (over max calibrated system pressure).	○	○ (00)						○	○
	4F	312											
P0089	23	355	Rail pressure control fault	1. Rail pressure control fault. 2. Discharge pressure and error negative or positive.	○	○ (23)					○		○
	24	356											
P0093	00	322	Rail pressure sensor fault	1. Rail pressure sensor electrical fault.	○						○		○
P0096	64	464	Intake manifold temp. Sensor temp. Plausibility fault	1. Intake manifold temperature sensor plausibility fault.		○							
P0097	23	462	Intake manifold temp. Sensor temp. Low fault	1. Intake manifold temperature sensor low fault.		○						○	

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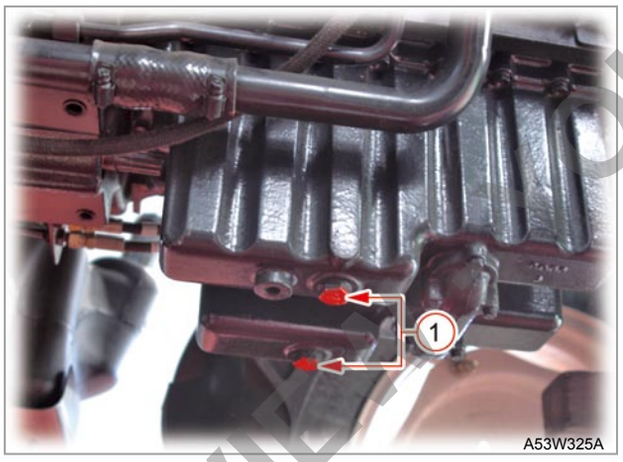
7. DISASSEMBLY, SERVICE AND ASSEMBLY

7.1 ENGINE REMOVAL

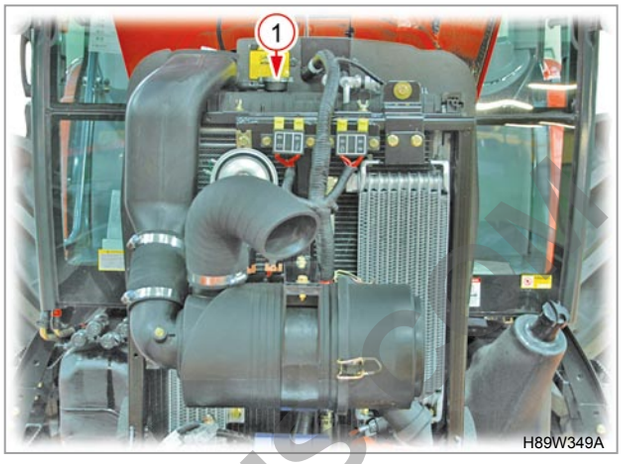
1. Park the tractor on level ground, stop the engine and apply the parking brake.

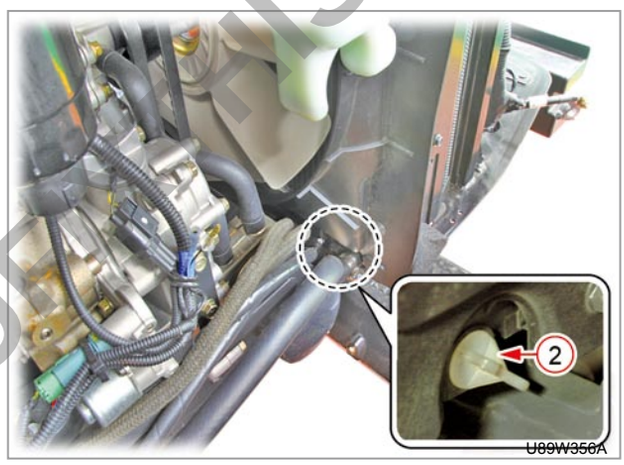


2. Unscrew the drain plug (1) under the transmission to drain transmission fluid.



3. If necessary, unscrew the drain plug (1) under the engine oil pan to drain engine oil.





4. Open the hood, open the radiator cap (1) and loosen the drain cock (2) to drain coolant.

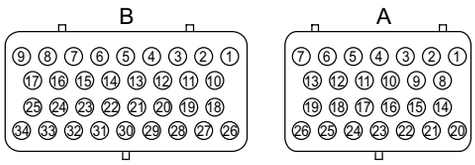
WARNING

- When opening the radiator cap, make sure to open it after the engine is sufficiently cooled down. Otherwise, you can get burnt by hot coolant. Also, unscrew the cap a little to release the internal pressure before removing the cap completely.

5. Disconnect the negative battery cable.

PREVIEW

CONNECTOR PIN ARRANGEMENT



Connector ID	Pin No.	Function description
A	1	Forward shuttle (prop. Sol) output (-)
A	2	Forward shuttle (prop. Sol) output (+)
A	3	RxD2
A	4	TxD2
A	5	MD2
A	6	FWE
A	7	RESET
A	8	+5V (Sensor power)
A	9	Engine temperature sensor input
A	10	Clutch sensor input
A	11	Fluid temperature sensor input (Oil)
A	12	Pressure sensor (forward) input
A	13	Pressure sensor (reverse) input
A	14	+5V(Download)
A	15	Clutch pedal switch (-)
A	16	PTO MAIN switch input (switch +)
A	17	Spare input (switch -)
A	18	Spare input (switch -)
A	19	Fuel sender signal input
A	20	Power +12V
A	21	-
A	22	Spare input (sensor)
A	23	Spare input (sensor)
A	24	Pickup sensor input
A	25	Speed power sensor input
A	26	GND
B	1	Shuttle reverse driving switch input
B	2	Shuttle forward driving switch input
B	3	QT switch input
B	4	Calibration switch (DEC) input
B	5	Range shift mid speed switch (NC) input
B	6	Brake (one side) switch input
B	7	Parking switch input
B	8	Neutral lamp output
B	9	Forward driving lamp output
B	10	Shuttle neutral switch input
B	11	4WD switch input
B	12	Calibration switch (INC) input
B	13	Range shift high speed switch (NC) input
B	14	Range shift low speed switch (NC) input
B	15	Front wheel turning angle switch input
B	16	Reverse driving lamp output
B	17	Low fuel level warning lamp output
B	18	CUT OFF SOL. output(-)
B	19	Hourmeter output(16Hz)
B	20	Ignition signal output(+)
B	21	Engine stop signal output(+)
B	22	E/G RPM increase signal output(-)
B	23	E/G RPM decrease signal output(-)
B	24	High coolant temperature warning lamp output
B	25	Parking brake lamp output
B	26	4WD solenoid output
B	27	QT solenoid output
B	28	Reverse shuttle solenoid (prop. Sol) output (+)
B	29	Reverse shuttle solenoid (prop. Sol) output (-)
B	30	SEAT switch input
B	31	Ignition switch input (+)
B	32	Brake switch
B	33	Buzzer output
B	34	GND

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3. OPERATING PRINCIPLE

3.1 CRDI (COMMON RAIL DIRECT INJECTION) SYSTEM

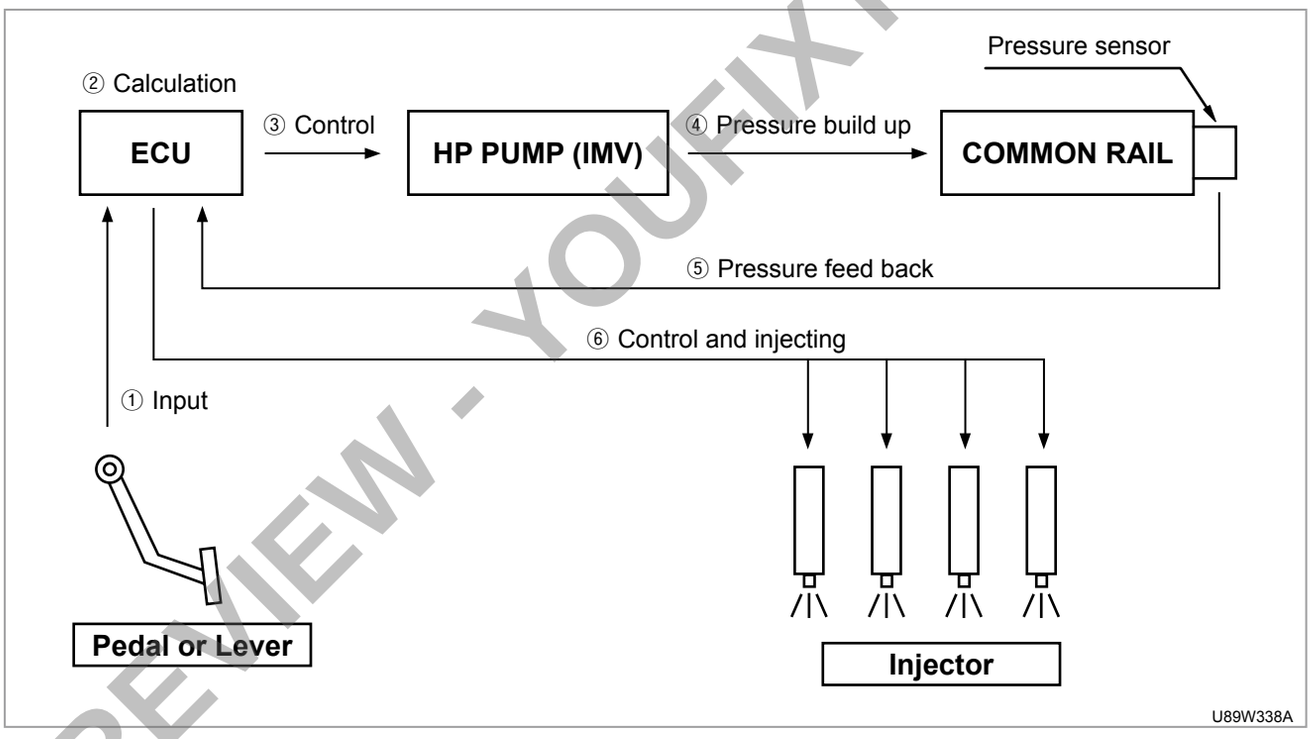
The CRDI (Common Rail Direct Injection) engine is a high performance engine, featuring superior emission, acceleration, vibration and noise functions. The old version of diesel engines simply delivers fuel into the combustion chamber through its mechanical structure. On the other hand, in the CRDI engine, fuel sent from the fuel tank is pressurized to the necessary level by the high-pressure fuel pump and it is stored in the common rail for use. Then, the ECU controls the injector according to the detected engine RPM, load and other factors to inject fuel into the combustion chamber in the optimum injection condition. It is hard to meet the optimum injection condition and achieve precise control on injection timing in a normal diesel engine of the cam injection type.

On the other hand, the common rail type engine stores highly pressurized fuel in the common rail to inject the necessary amount of fuel at the correct timing for optimal combustion, resulting in emission reduction and engine power increase.

The atomization level, injection timing and injection pressure of fuel have a huge impact on combustion performance. Therefore, in the CRDI engine, as the injector injects highly pressurized fuel (under 1,800 bars) into the combustion chamber according to control from the ECU, it injects fuel as fast as possible to make fuel almost gaseous condition (atomization) at a high pressure.

Also, as it is still possible to inject fuel at a high pressure while the engine is running at a low speed with high load, up to torque increase and power improvement can be achieved at a low speed.

The CRDI engine mainly consists of the high-pressure pump, pressure control valve, common rail, pressure sensor, injector, ECU and other sensors and actuators.



- The position information of the pedal intended by the driver (the amount of movement of the pedal or hand lever) is sent to the ECU as a signal.
- The ECU determines the required RPM according to this position information and calculates the correct injection pressure and injection timing (fuel injection amount) to achieve this target RPM.
- It controls the IMV of the HP pump to increase pressure in the common rail.
- It supplies high-pressure fuel to the common rail to increase the rail pressure to the pressure level demanded by the ECU.
- The pressure sensor in the common rail sends pressure information to the ECU to confirm whether the actual pressure matches the demanded pressure.
- When pressure in the rail is sufficiently built, the ECU controls the injector to inject fuel for a proper amount of time.

* The fundamental injection map is set by positions of the pedal or hand lever, and the rail pressure and injection timing are corrected, considering other several external factors, including the intake air temperature, coolant temperature and barometric pressure.

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4. TROUBLESHOOTING

SYMPTOM	CAUSES	REMEDY
Engine Does Not Start	• No fuel	Add fuel
	• Air in fuel system	Bleed air
	• Water in fuel system	Change fuel and repair or flush fuel system
	• Clogged fuel pipe	Clean
	• Clogged fuel filter	Clean or replace
	• Excessively high viscosity of fuel or engine oil at low temperature	Use the specified fuel or engine oil
	• Fuel with low cetane number	Use the specified fuel
	• Fuel leak due to loose injection pipe mounting nut	Tighten nut
	• Incorrect injection timing	Adjust
	• Defective fuel injection pump	Repair or replace
	• Defective fuel transfer pump	Repair or replace
	• Seizure of transfer pump, defective piston, cylinder bore or bearing	Repair or replace
	• Compression leak from cylinder	Replace head gasket, tighten cylinder head screws, glow plug and nozzle holder
	• Improper valve timing	Correct or replace timing gear
	• Worn piston ring and bore	Repair or replace
	• Excessive valve clearance	Adjust
Start motor Does Not Run	• Discharged battery	Charge
	• Defective start motor	Repair or replace
	• Defective key switch	Repair or replace
	• Disconnected wiring	Connect
Engine Running is Not Smooth	• Clogged or dirty fuel filter	Clean or replace
	• Clogged Air cleaner	Clean or replace
	• Fuel leak due to loose injection pipe mounting nut	Tighten nut
	• Defective fuel injection pump	Repair or replace
	• Seized or clogged nozzle	Repair or replace
	• Clogged fuel overflow pipe	Clean or replace
Either White or Blue Exhaust Smoke is Produced	• Excessive engine oil	Reduce to the specified level
	• Worn piston ring and bore or seized piston ring	Repair or replace
	• Insufficient compression pressure	Adjust valve clearance
Either Black or Dark Gray Exhaust Smoke is Produced	• Overheat or overload	Reduce load
	• Low grade fuel used	Use the specified fuel
	• Clogged fuel filter	Clean or replace
	• Clogged Air cleaner	Clean or replace
Insufficient Output	• Seized engine components	Repair or replace
	• Uneven fuel injection	Repair or replace the fuel injection pump
	• Insufficient nozzle injection	Repair or replace the nozzle
	• Compression pressure leak	Replace cylinder head gasket, check tightness of cylinder head screws and nuts, glow plug and nozzle holder
Excessive Engine Oil Consumption	• Aligned gaps of piston rings	Change the ring gap direction
	• Worn or seized oil ring	Replace
	• Worn piston ring groove	Replace piston
	• Worn valve stem and guide	Replace
	• Worn crankshaft bearings and crank pin bearings	Replace
Hydraulic Oil in Engine Oil (Increased oil amount)	• Damaged hydraulic pump seal	Replace or repair

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9. CALIBRATION, DIAGNOSIS AND UPGRADE

9.1 CALIBRATION

9.1.1 POWER SHUTTLE CALIBRATION(RX6020PC / 6620PC / 7320PC)

CLUTCH SENSOR POSITION SETUP

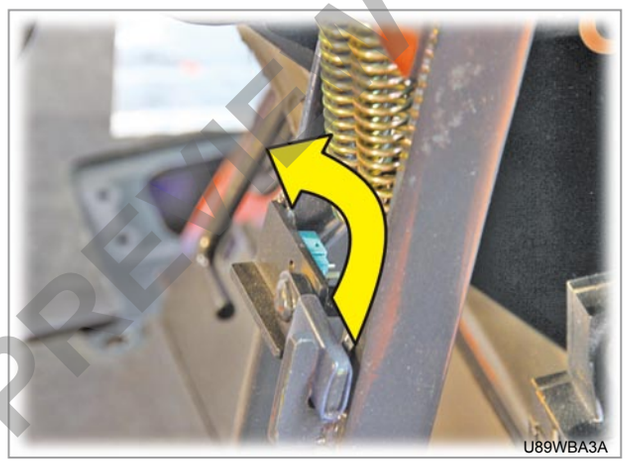
IMPORTANT

- **When the clutch pedal angle sensor is replaced or the power shuttle controller under the floor cover is replaced, they should be calibrated.**

1. Park the tractor on level ground and turn the ignition switch to the “OFF” position.



2. Place the shuttle lever (1) to the forward driving position.(Check “F” lamp lighting on the combimeter)



3. Undo the brake pedal engagement hook (1).

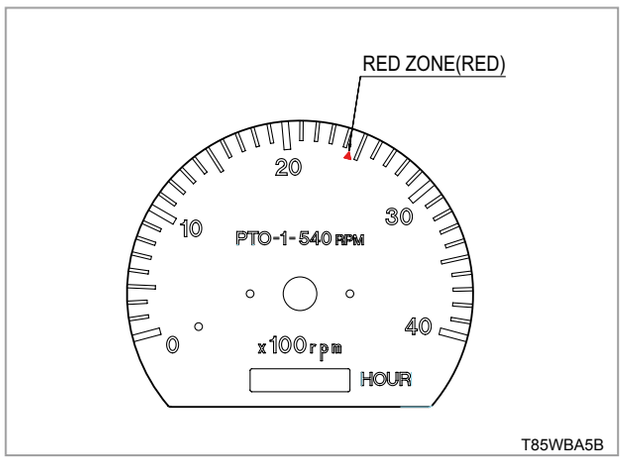


4. Turn the ignition switch to the "ON" position while pressing(more than 2 sec) the "INC (+)" position of the calibration switch on the pillar on the right side of the seat. When the "N" lamp blinks, the calibration mode is activated.
5. To set the displacement of the angle sensor, depress the clutch pedal fully and press and release the “DEC (-)” part of the calibration switch. Then, the “N” (neutral) lamp on the instrument cluster blinks once.
6. Release the clutch pedal completely, and press and release the “INC (+)” part of the calibration switch. Then, the “N” (neutral) lamp on the instrument cluster blinks once.
7. Turn the ignition switch to the “OFF” position to store the set values.

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GAUGES AND INDICATORS

▶ TACHOMETER

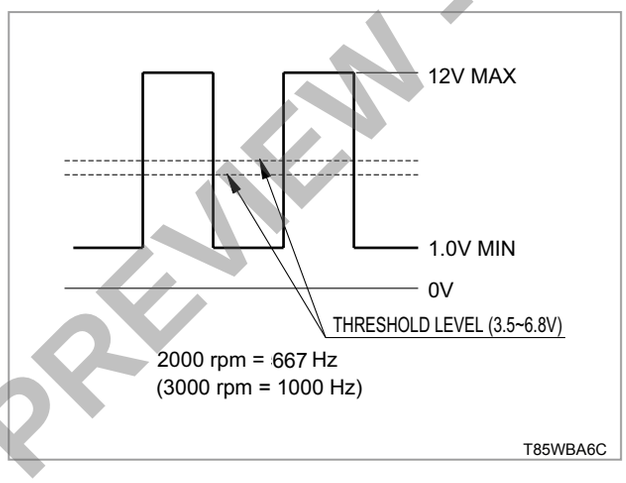


This indicates the engine rpm and the PTO rpm and is operated by the signal from the alternator.

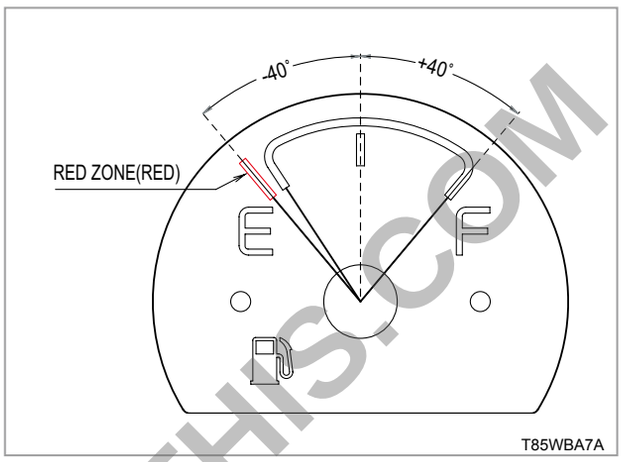
- Indication specification (unit: rpm)

STANDARD REVOLUTIONS	1000	2000	3000	4000
TOLERANCE	± 100	± 100	± 150	-

- Tachometer signal specification



▶ FUEL GAUGE



The fuel gauge's pointer indicates the resistance value corresponding to the float position which is received from the fuel sender in the fuel tank.

To inspect the fuel sender, it should be removed from the fuel tank beforehand. Also, the power supplied to it and the resistance should be checked referring to the electrical circuit diagram.

If the supplied power and the output resistance values are normal, the float measuring the amount of fuel may be malfunctioning. In this case, replace the fuel sender.

ITEM	LOCATION	TESTER CONNECTION		RESULT
		RED LEAD	BLACK LEAD	
DC Voltage	Key switch ON	Connector A No. 1 (RL)	Connector A No. 2 (YB)	DC 7.7 V (E) ~ 11.5 V (F)
Resistance	Fuel sender operation	Connector A No. 2 (YB)	Connector A No. 5 (B)	Resistance generated by location

- Tolerance and resistance value by indicating angle

ITEMS	FULL	1/2 POINT	EMPTY
Indicating angle (°)	+40	0	-40
Resistance (Ω)	Approx. 6	(Approx. 32.5)	Approx. 97
Tolerance (°)	± 2.5	-	± 2.5

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2.6 SERVICING SPECIFICATIONS

2.6.1 ENGINE BODY

ITEM			SPECIFICATION	ALLOWABLE LIMIT
A. Cylinder Head	Cylinder head surface flatness		-	0.05 mm / 100 mm (0.002 in. / 3.94 in.)
	T.D.C clearance		0.32 ~ 0.7 mm (0.01250 ~ 0.02755 in.)	-
	Gasket Thickness		Tightened 1.02 mm (0.040 in.)	-
	Compression Pressure (When cranking with starter motor) ※ Variance of compression pressure among cylinders should be 10% or less.		3.24 ~ 3.73 MPa 33 ~ 38 kgf/cm^2 470 ~ 541 psi	2.55 MPa 26 kgf/cm^2 370 psi
B. Valves	Valve Clearance (Cold)	IN.	0.20 mm (0.0079 in.)	-
		EX.	0.20 mm (0.0079 in.)	-
	Valve Seat Angle	IN.	60° (1.047 rad.)	-
		EX.	45° (0.785 rad.)	-
	Valve Face Angle	IN.	60° (1.047 rad.)	-
		EX.	45° (0.785 rad.)	-
	Valve recess	IN.	0.4 ~ 0.8 mm (0.0157 ~ 0.0314 in.)	1.0 mm (0.0393 in.)
		EX.	0.2 ~ 0.6 mm (0.0079 ~ 0.0236 in.)	0.8 mm (0.0315 in.)
	Clearance Between Valve Stem and Valve Guide		0.040 ~ 0.043 mm (0.0016 ~ 0.0017 in.)	0.1 mm (0.0039 in.)
	Valve Stem O.D.		7.960 ~ 7.975 mm (0.31339 ~ 0.31398 in.)	-
	Valve Stem I.D.		8.015 ~ 8.030 mm (0.3156 ~ 0.3161 in.)	-
C. Valve Timing	Intake Valve	Open	0.14 rad (8°) before T.D.C	-
		Close	0.611 rad (35°) after B.D.C	
	Exhaust Valve	Open	0.785 rad (45°) before B.D.C	-
		Close	0.140 rad (8°) after T.D.C	
D. Cylinder	Bore I.D.		87.000 ~ 87.022 mm (3.425 ~ 3.426 in.)	0.15 mm (0.0059 in.)
E. Valve spring	Free length		46.1 ~ 46.9 mm (1.8150 ~ 1.8465 in.)	45.6 mm (1.7955 in.)
	Load after assembled / Length after assembled		19.8 kgf / 35.15 mm (43.6 lbs / 1.3839 in.)	16.8 kgf / 35.15 mm (37.0 lbs / 1.3839 in.)
	Squareness		-	1.0 mm (0.0394 in.)

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8. MAINTENANCE

8.1 MAINTENANCE SCHEDULE CHART

No.	Inspection Items	Interval		Run hour								Run age		Remarks	
				50	100	200	400	600	800	1500	3000	1 year	2 years		
1	Engine oil & engine oil filter	Replace	Tier 3	⦿		●									
			Tier 4			●									
2	Transmission fluid filter	Replace		⦿		●									
3	Transmission fluid	Replace					●								
4	Front axle oil	Replace		⦿			●								
5	Front axle pivot	Adjust						●							
6	Engine ignition system	Check		●											
7	Greasing	Apply		●											
8	wheel bolt	Check		●											
9	Battery condition	Check			●									*3	
10	Air cleaner element	Clean			●									*1	#
		Replace										●		*2	
11	Fuel filter element	Replace				●									#
12	Fan belt	Adjust			●									*3	
13	Clutch pedal play	Adjust		⦿	●										
14	Brake pedal play	Adjust			●										
15	Radiator hose Clamp	Check				●									
		Replace											●		
16	Power steering hose and oil line	Check				●									
		Replace											●		
17	Fuel line	Check			●										#
		Replace											●		
18	Intake air hose	Check				●									
		Replace											●	*3	
19	Toe-in	Adjust				●									
20	Engine valve clearance	Adjust							●						

* Tier3: Without DPF, Tier4: With DPF

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