KIOTI TRACTOR

CK20

WORKSHOP MANUAL

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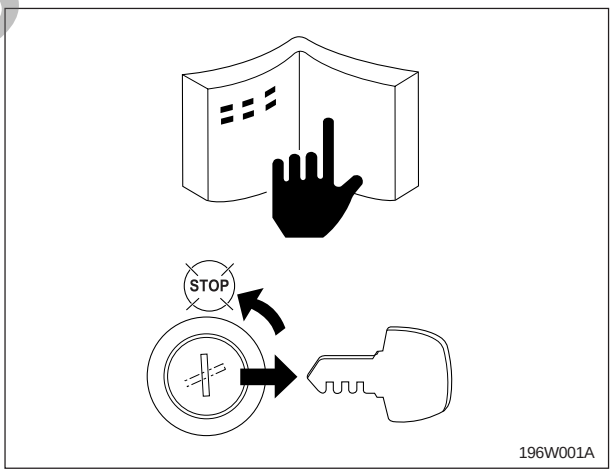
SAFETY FIRST

This symbol, the industry's "Safety Alert Symbol", is used throughout this manual and the decals on the machine itself to warn of the possibility of personal injury. It is essential that you read the instructions and safety regulations before you attempt to repair or operate this unit. Read these instructions carefully.

SIGNS		DESCRIPTION
⚠	DANGER	This mark indicates hazardous situation which, if not observed, may result in death or fatal injury. This mark should be indicated for most dangerous situations only.
⚠	WARNING	This mark indicates potentially hazardous situation which, if not observed, may result in death or moderate injury.
⚠	CAUTION	This mark indicates potentially hazardous situation which, if not observed, may result in minor or moderate injury. And this mark can be used as a warning against unsafe activities.
⊕	IMPORTANT	This mark indicates emphasis on notable characteristics in working procedures or information on working procedures and technology for convenient use.
NOTE		Gives helpful information.

BEFORE SERVICING AND REPAIRING

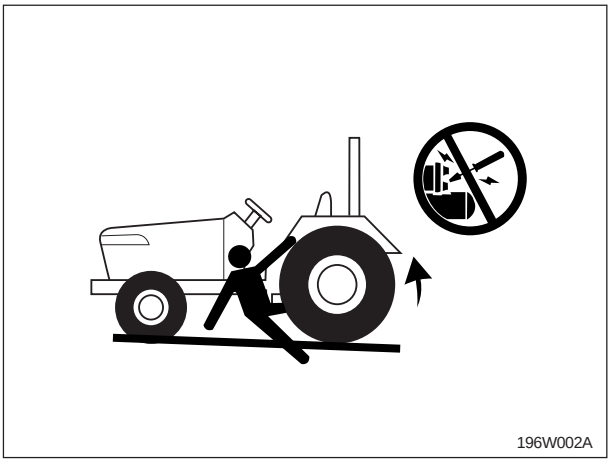
1. Read all safety instructions in this manual and be aware of the safety decals on your machine itself.
2. Thoroughly clean your work area and the machine.
3. Make sure the machine is on firm and level ground and that the parking brake is set.
4. Lower the implement to the ground.
5. Stop the engine and remove the key.
6. Disconnect the negative battery cable.
7. Place a "DO NOT OPERATE" tag in operator station.



196W001A

SAFETY STARTING

1. Always use the safety start switch to start the engine and never by any other means.
2. Do not alter or remove any part of machine safety system.
3. Before starting the engine, make sure that all shift levers are in neutral positions or in disengaged positions.
4. Never start the engine unless you are in the operator's seat.


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5. SPECIFICATIONS

Model			CK20	
			MECHANICAL	HST
Engine	Model		3C093	
	Type		Liquid-cooled, 3-cylinder diesel	
	Engine gross	HP (kW)	21 (15.7)	
	P.T.O	HP (kW)	16.5 (12.3)	15.5 (11.6)
	Displacement	cc (cu.in)	927 (56.6)	
	Rated revolution	r.p.m min-1	2,800	
	Fuel tank capacity	ℓ (gal.)	20 (5.28)	
Drive train	Clutch		Dry type single stage	
	Transmission		Synchro/constant	Hydrostatic
	Speeds		6F 2R	INF.2
	Differential lock		Standard	
	Brake		Wet disc type	
	P.T.O		Trans	Live continuous
	Rear	(rpm)	1 speed (540 rpm at 2,646 engine rpm)	
	Mid	(rpm)	1 speed (2,000 rpm at 2,706 engine rpm)	
Hydraulic system	Pump capacity (Max. flow rate)	ℓ/min (gpm)	29 (7.66)	
	3-point hitch		Cat.I	
	Maximum lifting capacity (24in. aft of hitch)	kgf (lbs.)	503 (1,109)	
	Hydraulic lift control system		Position control	
	Steering		Hydrostatic	
Standard tire size	Front (AG, TURF, INDUSTRIAL)		6 ~- 12 (23 x 8.50 ~ 12, 23 x 8.50 ~ 12)	
	Rear (AG, TURF, INDUSTRIAL)		9.5 ~ 16 (33 x 12.5 x 16.5, 12 ~ 16.5)	
Traveling speeds	Forward (At rated engine rpm)	km/h (mph)	1.10 ~ 16.24 (0.68 ~ 10.09)	0 ~ 14.97 (0 ~ 9.30)
	Reverse (At rated engine rpm)	km/h (mph)	1.36 ~ 6.31 (0.85 ~ 3.92)	0 ~ 9.37 (0 ~ 5.82)
Dimen-sions	Overall length (with 3p)	mm (in.)	2,684 (105.7)	
	Overall width (minimum tread)	mm (in.)	1,121 (44.1)	
	Overall height (Top of ROPS)	mm (in.)	1,970 (77.5)	
	Wheel base	mm (in.)	1,470 (57.9)	
	Min. ground clearance	mm (in.)	310 (12.2)	
	Tread – Front	mm (in.)	910 (35.8)	
	Tread – Rear	mm (in.)	890 ~ 935 (35.0 ~ 36.8)	
	Min. turning radius (with brake)	m (Ft.)	2.3 (7.5)	
	Weight (with ROPS)	kgf (lbs.)	890 (1,962)	904 (1,993)

NOTE: The specifications are subject to change for the purpose of improvement without any notice.

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6. LUBRICANTS, FUEL AND COOLANT

<table>
<tr><th rowspan="2">No.</th><th rowspan="2">Locations</th><th colspan="2">Capacities</th><th rowspan="2">Lubricants</th></tr>
<tr><th>CK20H</th><th>CK20</th></tr>
<tr><td>1</td><td>Fuel</td><td colspan="2">20 ℓ (5.28 U.S.gal.)</td><td>No.2-D diesel fuel
No.1-D diesel fuel if temperature is below -10°C (14°F)</td></tr>
<tr><td>2</td><td>Coolant</td><td colspan="2">5.7 ℓ (1.50 U.S.gal.)</td><td>Fresh clean water with anti-freeze</td></tr>
<tr><td>3</td><td>Engine crankcase</td><td colspan="2">2.6 ℓ (0.69 U.S.gal.)</td><td>Engine oil: API Service Classification CC or CD
<table><tr><td>Above 25°C (77°F)</td><td>SAE30, SAE10W-30 or 10W-40</td></tr><tr><td>0 to 25°C (32 to 77°F)</td><td>SAE20, SAE10W-30 or 10W-40</td></tr><tr><td>Below 0°C (32°F)</td><td>SAE10W, SAE10W-30 or 10W-40</td></tr></table></td></tr>
<tr><td>4</td><td>Transmission case</td><td>18.5 ℓ (4.89 U.S.gal.)</td><td>21.6 ℓ (5.71 U.S.gal.)</td><td>Multi-gradetransmission fluid the fluid listed below or equivalent are recommended.
<table><tr><td>Maker</td><td>Brand(Standard)</td></tr><tr><td>Shell</td><td>DONAX-TD,DONAX-TM</td></tr><tr><td>Mobil</td><td>Mobile Fluid 350</td></tr><tr><td>Exxon</td><td>Torque Fluid 56</td></tr></table></td></tr>
<tr><td>5</td><td>Front axle case (4WD only)</td><td colspan="2">3.1 ℓ (0.82 U.S.gal.)</td><td>SAE 90 gear oil</td></tr>
<tr><td rowspan="2">6</td><td>Greasing</td><td colspan="2">No. of greasing points</td><td>Capacity</td><td>Type of grease</td></tr>
<tr><td>Battery terminal</td><td colspan="2">2</td><td>Moderate amount</td><td>Multipurpose type grease</td></tr>
</table>

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7. TIGHTENING TORQUES

7.1 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.

Indication on top of bolt	⬡ ④ No-grade or 4T						⑦ 7T						⑨ 9T		
Material of bolt	SS400, S20C						S43C, S48C						SCr435, SCM435		
Material of opponent part	Ordinariness			Aluminum			Ordinariness			Aluminum			Ordinariness		
Unit / Diameter	N·m	kgf·m	lbf·ft	N·m	kgf·m	lbf·ft	N·m	kgf·m	lbf·ft	N·m	kgf·m	lbf·ft	N·m	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 ~ 196	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

7.2 STUD BOLTS

Material of opponent part	Ordinariness			Aluminum		
Unit / Diameter	N·m	kgf·m	lbf·ft	N·m	kgf·m	lbf·ft
M8 (8 mm, 0.31 in.)	11.8 ~ 15.6	1.2 ~ 1.6	8.68 ~ 11.5	8.82 ~ 11.8	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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8. MAINTENANCE CHECK LIST

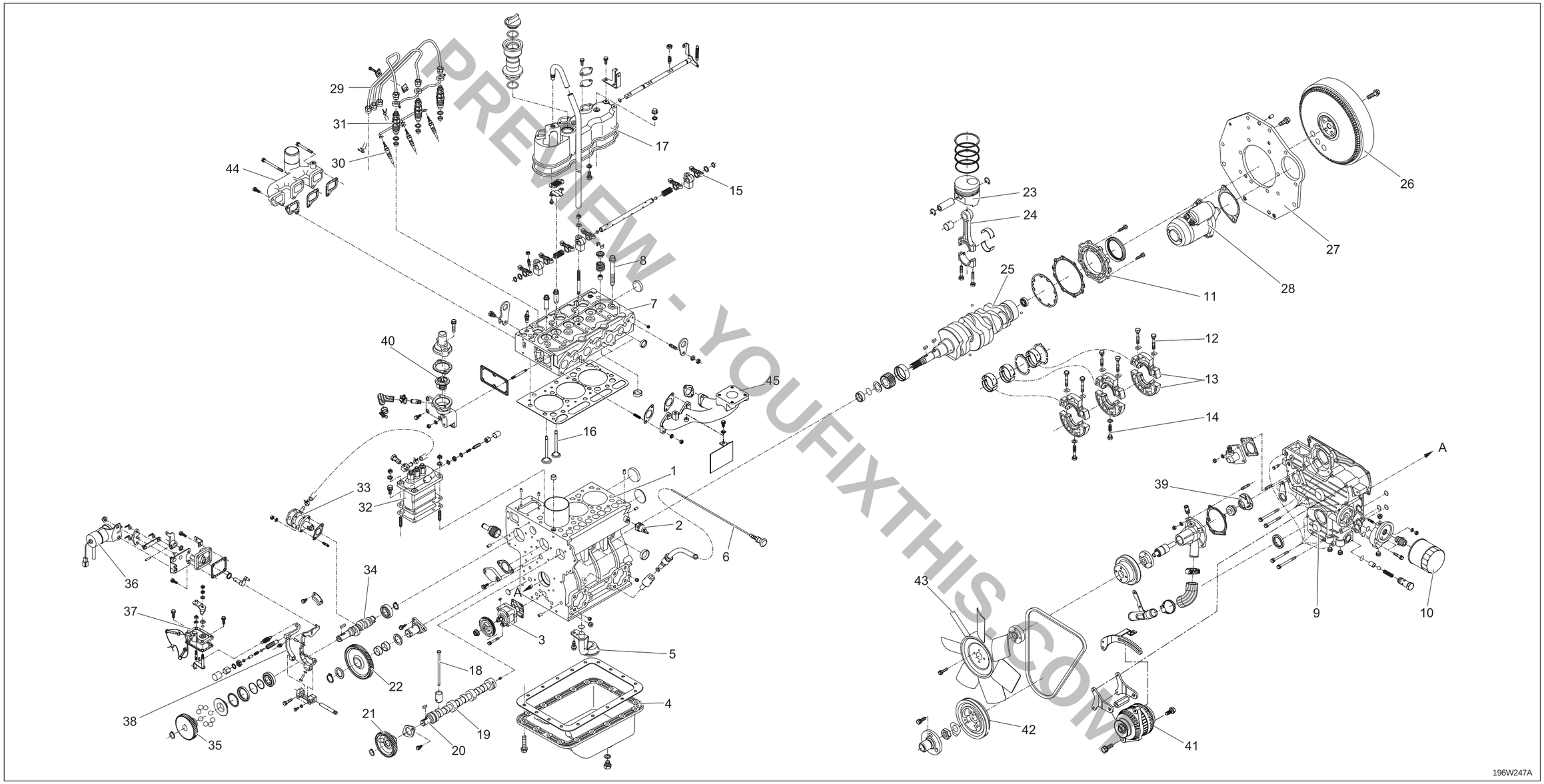
No.	Item \ Period		Indication On Hour Meter																		After Purchase		Important	
			50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	1500	3000	1 year	2 years		
1	Engine oil	Change	⦿	●		●		●		●		●		●		●		●						
2	Engine oil filter	Replace	⦿			●				●				●				●						
3	Transmission oil filter	Replace	⦿			●				●				●				●						
4	Hydraulic oil filter	Replace	⦿			●				●				●				●						
5	Transmission fluid	Change								●								●						
6	Front axle case oil	Change								●								●						
7	Front axle pivot	Adjust	●					●						●				●						
8	Engine start system	Check	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●						
9	Greasing	-	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●						
10	Wheel bolt torque	Check	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●						
11	Battery condition	Check		●		●		●		●		●		●		●		●					*4	
12	Air cleaner element	Clean		●		●		●		●		●		●		●		●					*1	@
		Replace																			●		*2	
13	Fuel filter element	Check		●		●		●		●		●		●		●		●						@
		Replace								●								●						
14	Fan belt	Adjust		●		●		●		●		●		●		●		●						
15	HST neutral spring	Adjust		●		●		●		●		●		●		●		●						
16	Brake	Adjust		●		●		●		●		●		●		●		●						
17	Radiator hose and clamp	Check				●				●				●				●						
		Replace																				●		
18	Power steering oil line	Check				●				●				●				●						
		Replace																				●		
19	Fuel line	Check		●		●		●		●		●		●		●		●						@
		Replace																				●		
20	Intake air line	Check				●				●				●				●						
		Replace																				●	*3	
21	Toe-in	Adjust				●				●				●				●						
22	Engine valve clearance	Adjust																●						
23	Fuel injection nozzle injection pressure	Check																	●	●				@
24	Injection pump	Check																		●				@
25	Cooling system	Flush																				●		
26	Coolant	Change																				●		
27	Fuel system	Bleed																			Service as required			
28	Fuse	Replace																						
29	Light bulb	Replace																						

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3.3 CHECKING, DISASSEMBLING AND SERVICING

A. ENGINE DISASSEMBLED VIEW



(1) Cylinder Block
(2) Oil Pressure Switch
(3) Oil Pump
(4) Oil Pan
(5) Oil Strainer
(6) Oil Gauge
(7) Cylinder Head
(8) Head Bolt
(9) Gearcase
(10) Oil Filter
(11) Mainbearing Case Cover
(12) Bearing Case Bolt 1
(13) Mainbearing Case
(14) Bearing Case Bolt 2
(15) Rocker Arm
(16) Inlet, Exhaust Valve
(17) Cylinder Hear Cover
(18) Push Rod
(19) Tappet
(20) Camshaft
(21) Camshaft Gear
(22) Idle Gear
(23) Piston
(24) Connecting Rod
(25) Crankshaft
(26) Flywheel
(27) Rear End Plate
(28) Starter
(29) Injection Pipe
(30) Glow Plug
(31) Nozzle
(32) Fuel Injection Pump
(33) Fuel Feed Pump
(34) Fuel Camshaft
(35) Fuel Camshaft Gear
(36) Engine Stop Solenoid
(37) Speed Control Plate
(38) Fork Lever (Governor)
(39) Impeller
(40) Thermostat
(41) Alternator
(42) Fan Drive Pulley
(43) Cooling Fan
(44) Inlet Manifold
(45) Exhaust Manifold

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3. DISASSEMBLY AND SERVICING OF ENGINE

3.1 TROUBLESHOOTING

ENGINE DOES NOT START.

- Crankshaft does not turn
  - Frictional resistance of moving parts is too much
    - Crankshaft and camshaft have seized up.
    - Piston and cylinder liner have seized up.
    - Bearings are oil-stuck.
    - Lubrication system not working property.
  - Starter faulty.
  - Battery capacity is low or terminal loose.
- Crankshaft turns
  - No or small fuel injection sounds.
    - Fuel supply to injection pump is insufficient.
      - Fuel pipe broken.
      - Air enters fuel pipe through connection.
      - Fuel filter clogged.
      - Fuel pump faulty.
    - Injection pump does not send on fuel.
      - Plunger has worn or seized up.
      - Delivery valve spring broken.
      - Delivery valve not completely oil-tight.
    - Fuel does not inject through injection nozzle.
      - Needle valve stuck.
      - Needle spring broken.
      - Injection pressure maladjusted.
      - Injection pipe mounting nut loose.
  - Regular fuel injection sounds.
    - Injection mistimed.
      - Injection timing maladjusted.
    - Compressed air leaks.
      - Contact between intake/exhaust valve and seat not tight.
      - Intake/exhaust valve spring broken.
      - Intake/exhaust valve stuck.
      - Gasket faulty.
      - Tightness torque of cylinder head not enough.
      - Piston ring stuck.
      - Piston ring worn.
      - Cylinder liner worn.
      - Tightness torque of injection nozzle and glow plug not enough.
    - Valve action timing improper.
      - Valve clearance excessive.

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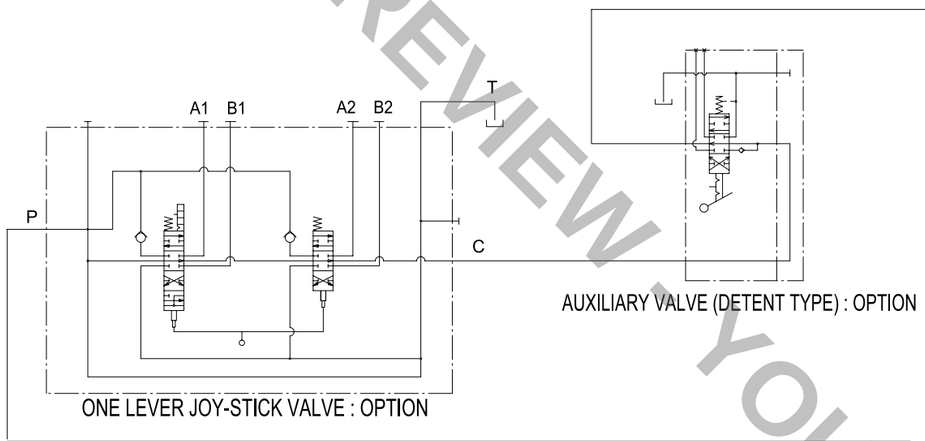
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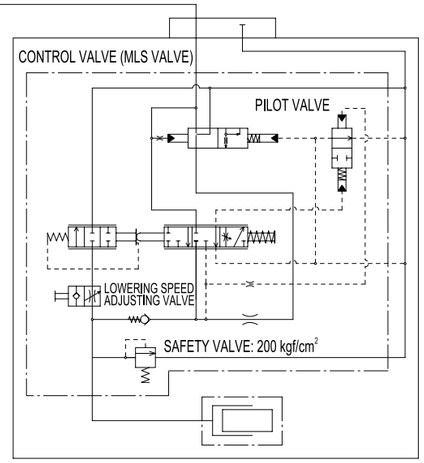
1. STRUCTURE

1.1 HYDRAULIC CIRCUIT DIAGRAM

A. CK20 (CK20H) HYDRAULIC CIRCUIT

CK20

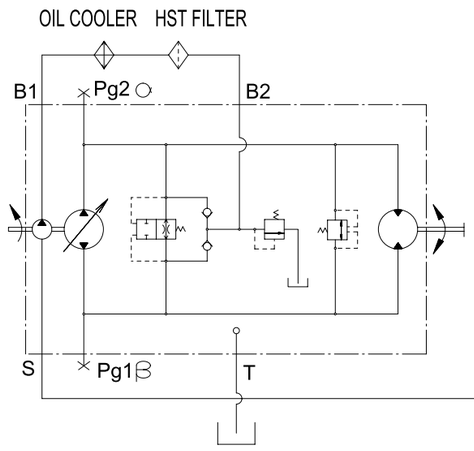


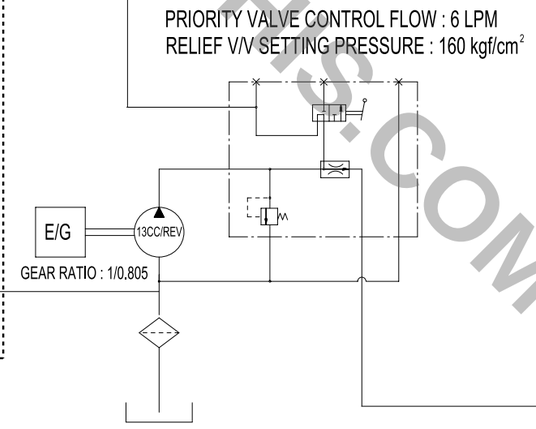


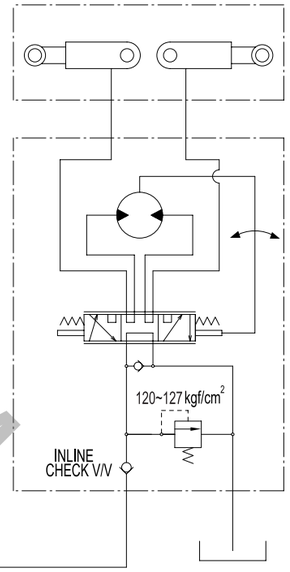
CK20H

HST SPECIFICATION

		SPECIFICATION
DISPALCEMENT	PUMP	0 ~ 16.4 cc/rev
	MOTOR	16.4 cc/rev
ANGLE. SWASH PLATE	PUMP	0 ~ ±16°
	MOTOR	16°
CHARGE PUMP DISPLACEMENT		4.1 cc/rev
MAX. WORKING PRE.(RELIEF SET PRE.)		250 kgf/㎠
CONTINUOUS MAX. PRESSURE		210 kgf/㎠
MAX. INPUT RPM		3200 rpm
OUTPUT RPM (THEORETICAL)		0 ~3200 rpm
MAX. OUTPUT TORQUE(THEORETICAL)		6.5 kgf·m
THEORETICAL CORNER OUTPUT		29.1 PS
CHARGE RELIEF PRESSURE		ABOUT 5 kgf/㎠
CASE INTERNAL PRESSURE		1 kgf/㎠ 이하







STEERING CYLINDER
ROD O.D : 32
TUBE : I.D 38 - O.D 49
STROKE : 161 mm

POWER STEERING UNIT
TYPE : OPEN CENTER LOAD REACTION
DISPLACEMENT : 40 CC/REV
RELIEF SETTING PRESSURE : 120~127 BAR
LOW SLIP TYPE
CENTERING SPRING : LOW INPUT TORQUE
INCLUDING IN LINE CHECK VALVE

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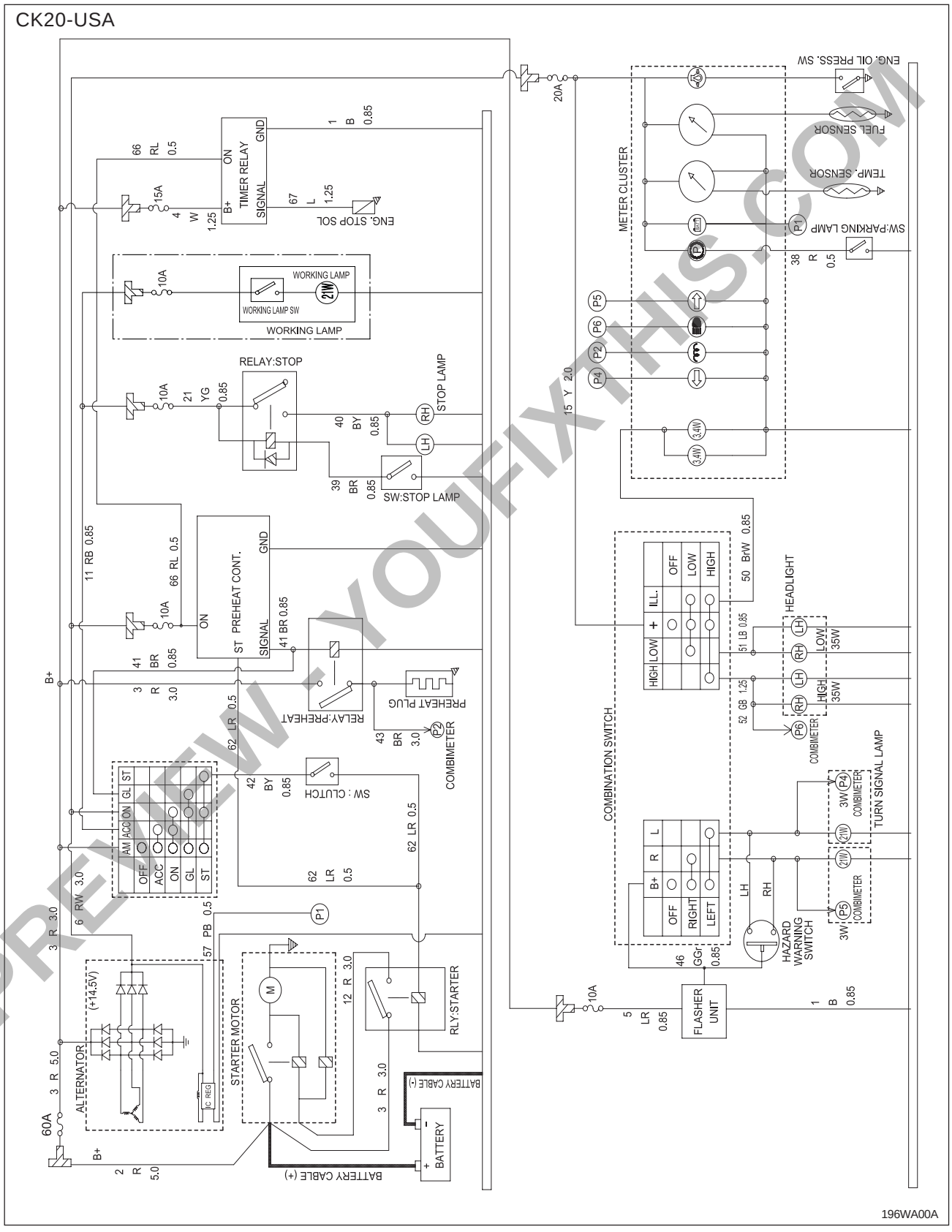
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1. ELECTRIC SYSTEM

1.1 WIRING DIAGRAM

CK20-USA



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11. IMPLEMENT LIMITATIONS

The **KIOTI** tractor has been thoroughly tested for proper performance with implements sold or approved by **KIOTI**. Use with implements which are not sold or approved by **KIOTI** and which exceed the maximum specifications listed below, or which are otherwise unfit for use with the **KIOTI** tractor may result in malfunctions or failures of the tractor, damage to other property and injury to the operator or others. [Any malfunctions or failures of the tractor resulting from use with improper implements are not covered by the warranty.]

Item / Model	Tread (max. width)		Lifting capacity max. loading weight (24 in. aft of hitch)
	Front	Rear	
CK20	910 mm (35.8 in.)	940 mm (37 in.)	1,109 lbs. (503 kg)
CK20H			

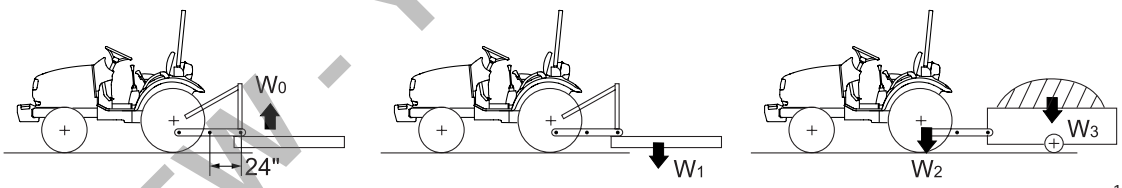
Item / Model	Actual figures		Trailer loading weight W_3 Max. capacity
	Implement weight W1 and / or size	Max. Drawbar Load W2	
CK20	As in the following list (shown on the next page)	250 kg (551 lbs.)	812 kg (1,792 lbs.)
CK20H			

Lifting capacity max. loading weight ..... The max. allowable load which can be put on the 24 in. aft of hitch : W_0

Implement weight ..... The implement's weight which can be put on the lower link : W_1

Max. drawbar load ..... W_2

Trailer loading weight ..... The max. loading weight for trailer (without trailer's weight) : W_3



196W165A

NOTE:
Implement size may very depending on soil operating conditions.

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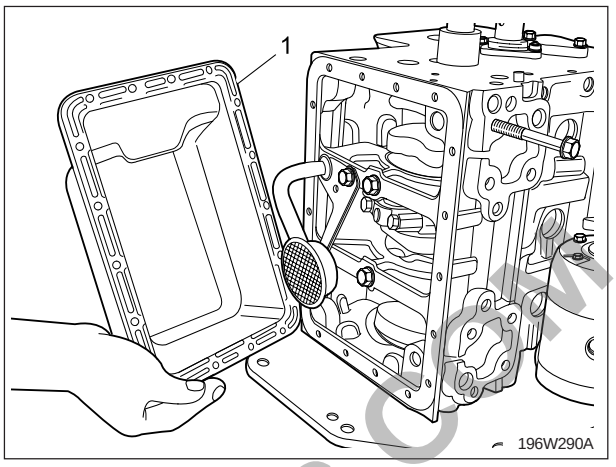
F. PISTON, CRANKSHAFT

a. Removing Oil Pan

1. Lay the engine on the engine cradle on its side.
2. Remove the eighteen oil pan mounting bolts.
3. Detach the oil pan by lightly tapping the groove of the pan with a wooden hammer.

(Note for reassembling)

- Wipe off oil on the oil pan mounting surface, apply a non-drying adhesive, and install the oil pan.
- To avoid uneven tightening, tighten mounting bolts in diagonal order from the center.
- Check to see that the drain plug is tight.



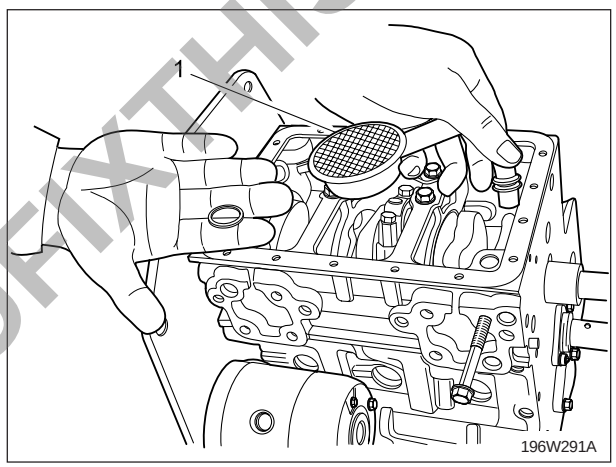
(1) Oil Pan

b. Removing Oil Filter 1

1. Remove the mounting bolt of oil filter 1.
2. Detach oil filter 1, being careful of the O-ring.

(Note for reassembling)

- After cleaning the oil filter, check to see that the filter mesh is clean, and install it.
- Visually check the O-ring, apply engine oil, and install it.
- After checking to see that the O-ring is securely installed, attach the oil filter.



(1) Oil Filter 1

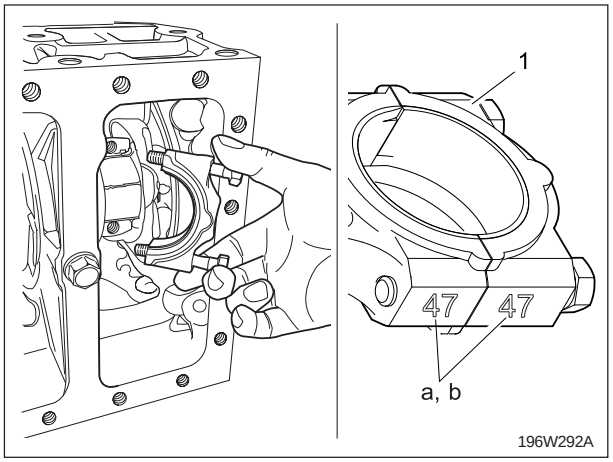
c. Removing Connecting Rod Cap

1. Remove the connecting rod bolts from connecting rod cap.
2. Detach the connecting rod caps.

IMPORTANT

- ***Apply engine oil to the connecting rod bolt.***
- ***Align the marks with each other.***
- ***Face the marks toward the injection pump.***

Item	Tightening torque
Connecting Rod	26 ~ 30 N·m 2.7 ~ 3.1 kgf·m 20 ~ 22 lbf·ft

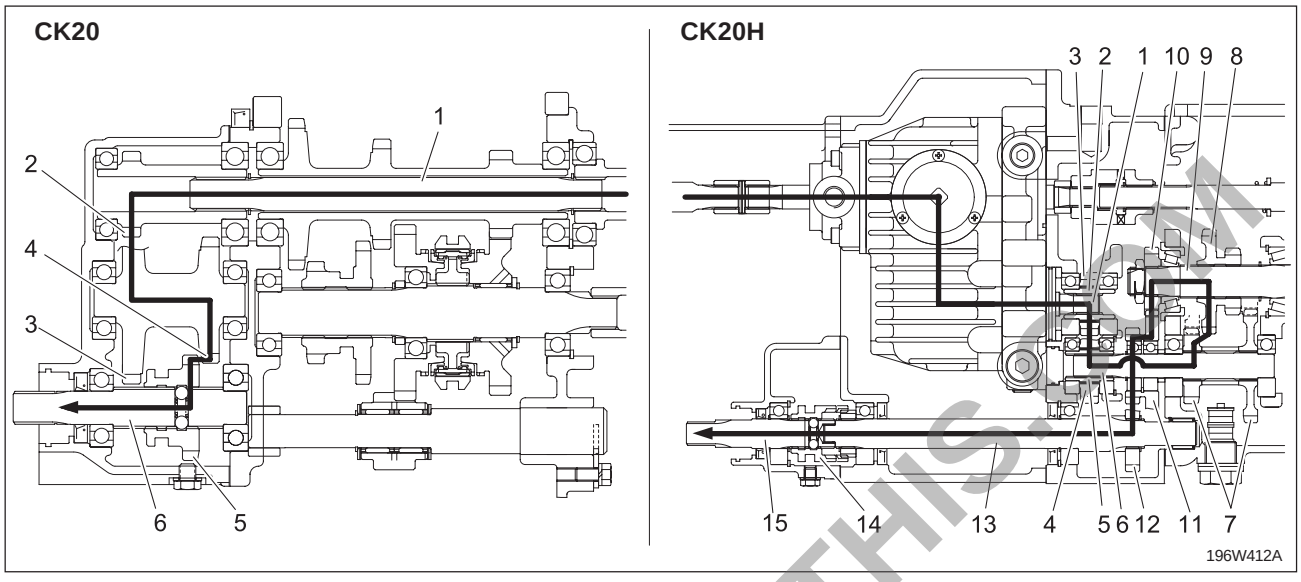


(1) Connecting Rod Cap
(a) Align The Marks With Each Other
(b) Face The Marks Toward The Injection Pump

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E. FRONT WHEEL DRIVE



(1) Front Wheel Drive Shaft1
(2) 18T Gear
(3) 38T Gear
(4) 28T Gear
(5) Front Wheel Shifter
(6) Front Weel Drive Shaft2

(1) HST Output Shaft
(2) Spline Boss
(3) 19T Gear
(4) 23 Gear
(5) Spline Boss
(6) Range Shaft
(7) 23T (36T) Gear
(8) 20-33T Gear
(9) Pinion Shaft
(10) 20T Gear
(11) 23-35T Gear
(12) 23T Gear
(13) Front Wheel Drive Shaft 1
(14) Front Wheel Shaft
(15) Front Wheel Drive Shaft 2

a. CK20

Four wheel drive or two wheel drive is selected by operating the front wheel drive lever to shift the front wheel shifter (5).

When the front wheel drive lever is set to disengaged, front wheel gear is in neutral and power is not transmitted to the front wheel drive shaft 2 (6).

When the front wheel drive lever is set to engaged, front wheel shift (5) splined with front wheel drive shaft 2 (6) slides to the right side to engage with 28T Gear (4).

Front wheel drive engagement

Front wheel drive shaft 1 (1) → 18T gear (2) → 38T gear (3) → 28T gear (4) → Front wheel shifter (5) → Front wheel drive shaft 2 (6).

b. CK20H

Four wheel drive or two wheel drive is selected by operating the front wheel drive lever to shift the front wheel shifter (14).

When the front wheel drive lever is set to disengaged, front wheel gear is in neutral and power is not transmitted to the front wheel drive shaft 2 (15).

When the front wheel drive lever is set to engaged, front wheel shift (14) splined with front wheel drive shaft 2 (15) slides to the right side to engage with spline Boss.

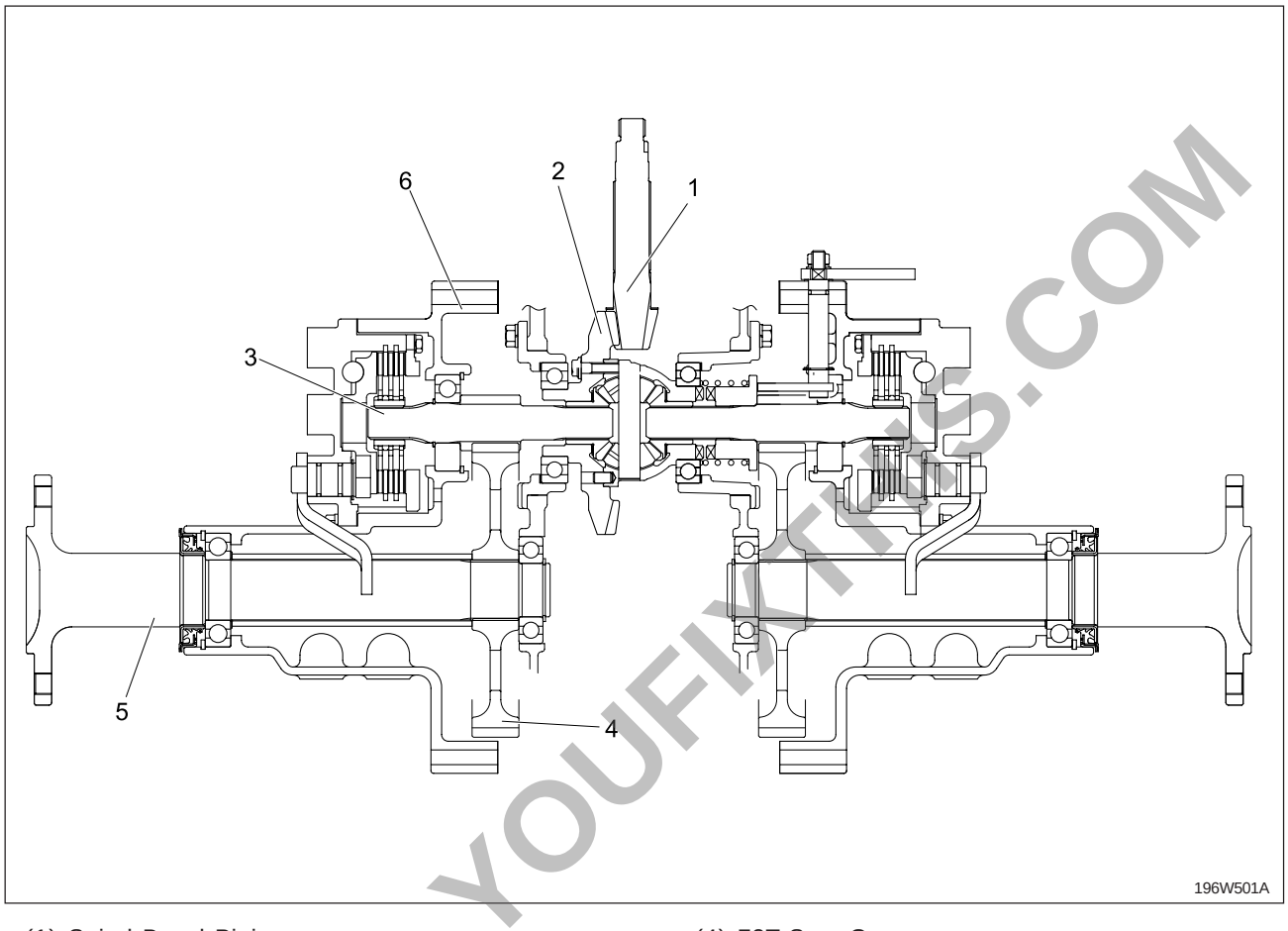
Front wheel drive engagement

HST output shaft (1) → Spline boss (2) → 19T gear (3) → 23 gear (4) → spline boss (5) → Range shaft (6) → 23T (36T) gear (7) → 20-33T gear (8) → Pinion shaft (9) → 20T gear (10) → 23-35T gear (11) → 23T gear (12) → Front wheel drive shaft 1 (13) → Front wheel shaft (14) → Front wheel drive shaft 2 (15).

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1. STRUCTURE



(1) Spiral Bevel Pinion
(2) Spiral Bevel Gear
(3) 11 Gear Shaft
(4) 72T Spur Gear
(5) Rear Axle
(6) Rear Axle Case

The rear axle is the final mechanism which transmits power from the transmission to the rear wheels. The shaft speed, controlled by the transmission, is further reduced to approx. 1/6.16 (6T/37T) by the spiral bevel pinion (1) and spiral bevel gear (2), and then reduced to 1/6.54 (11T/72T) by the 11 gear shaft (3) and 72T spur gear (4). As a result, its speed is reduced to approx. 1/40.3 before being transmitted to the rear wheels.

The rear axle is semifloating type will ball bearings between the rear axle (5) and rear axle case (6), which supports the rear wheel load as well as transmitting power to the rear wheels.

The differential automatically controls the revolution of right and left wheel when the rear wheels encounter unequal road resistance during turning.

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2.2 SPECIFICATION

Item		Reference Value
Hydraulic pump	Type	Gear
	Pump capacity	27.8 ℓ /min 7.34 GPM
	Pump gear ratio	1/0.8056
Power steering unit	Power steering unit volume	40 cc/rev
	Relief pressure	120 ~ 127 kgf/cm^2 11.8 ~12.5 MPa
Steering cylinder	Tube O.D	49 mm 1.93 in.
	Tube I.D	38 mm 1.50 in.
	Rod O.D	32 mm 1.26 in.
	Stroke	161 mm 6.34in.
Steering wheel	Operation force condition: (Engine speed approx. 2,800 rpm)	Less than 0.6 kgf 5.9 N 1.3 lbs.

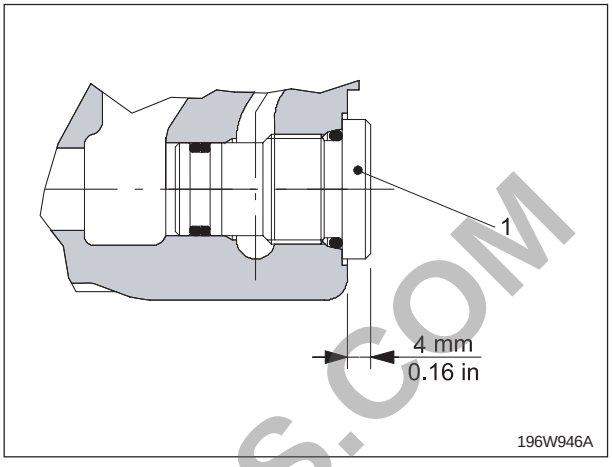
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c. Joy-stick Valve Assembly

1. Install the plug (19).

Item	Tightening torque
Blocking plug	42 N·m 4.3 kgf·m 31 lbf·ft



(1) Plug

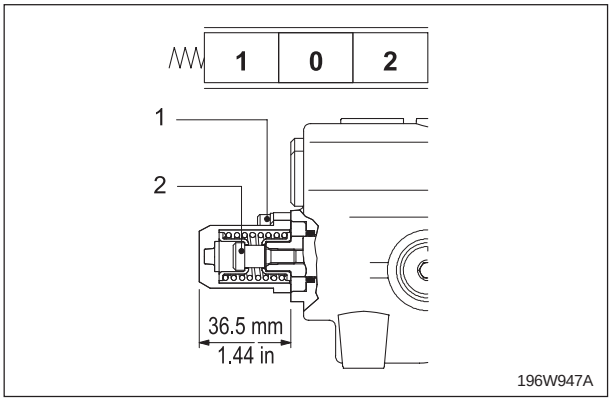
2. Install the load check poppets: with O-rings, springs and check plugs (17).

Item	Tightening torque
Check plugs	24 N·m 1.8 kgf·m 17.7 lbf·ft

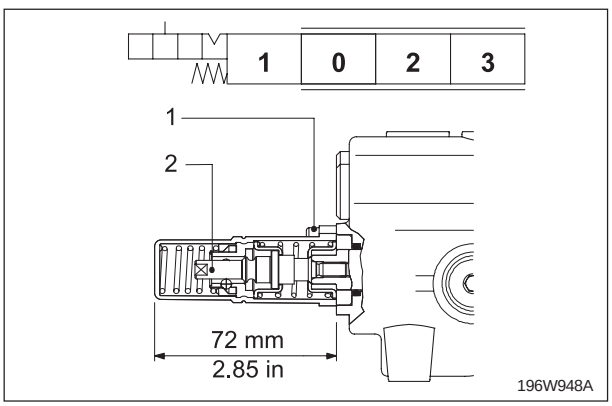
3. Install O-ring (15) in their grooves in the valve body and carefully slide the spool (25) into its bore.
4. Install the end cap (20) and secure the assembly with cap screws.

Item	Tightening torque
End cap mounting screw	6.6 N·m 0.7 kgf·m 4.9 lbf·ft

5. Assemble the float spool in the same manner using steps 4 through 5.



(1) Wrench Bolt (2) Spool Control Kit



(1) Wrench Bolt (2) Spool Control Kit

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