KIOTI

CK25/27/30/35
(CK25H/27H/30H/35H)

WORKSHOP MANUAL

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daedong

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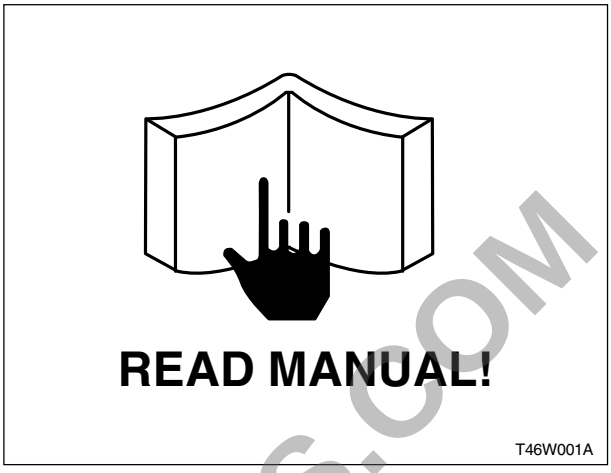
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1. FOR SAFETY

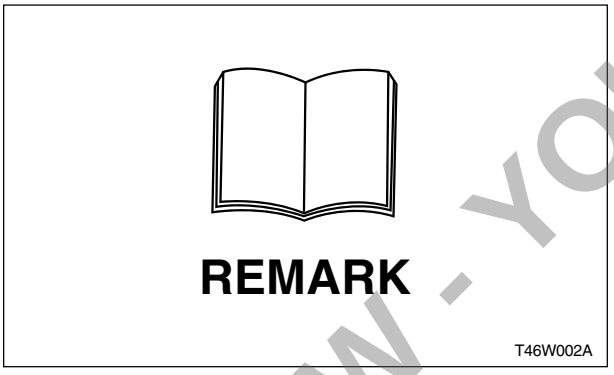
- Most accidents can be avoided if basic safety instructions and regulations are followed. Always follow the safety regulations and avoid any dangerous situation to prevent an accident.
- You can be unexpectedly injured if inspecting or servicing the tractor without full knowledge of it. Read the service manual carefully before starting servicing and follow the instructions for servicing, maintenance and inspection to prevent any injury.



1.1 ALERT SYMBOLS

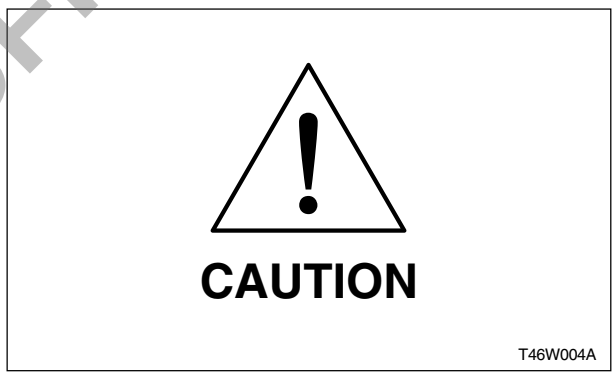
In this manual, the following safety-alert symbols are used. Their meanings are as follows:

A. REMARK



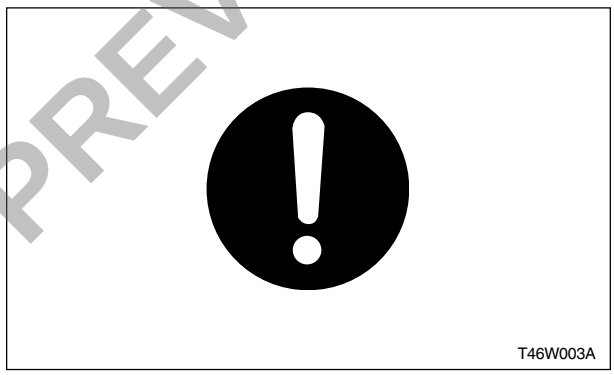
- Broaden your knowledge with additionally supplied service information for optimal service.

B. CAUTION



- This mark indicates potentially hazardous situation which, if not observed, may result in serious injury.

C. IMPORTANT



- This mark indicates emphasis on information which can be confused when servicing. If this information is not carefully read and observed, the tractor cannot fully function or may be damaged.

D. WARNING



- This mark indicates hazardous situation which, if not observed, may result in death or injury.

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3. SPECIFICATIONS

MODEL:CK25/CK27

Model			CK25		CK27	
			MANUAL	HST	MANUAL	HST
Engine	Model		TD1300LXA	TD1300LXE	3A139LWM	3A139LWH
	Type		Vertical, water-cooled, 3-cylinder diesel			
	Engine gross	HP (kW)	25 (18.7)		28 (20.7)	
	P.T.O	HP (kW)	19 (14.2)	18 (13.4)	21.7 (16.2)	20.5 (15.3)
	Displacement	cc (cu.in)	1,299 (79.3)		1,393 (85.0)	
	Rated revolution	r.p.m min-1	2,600			
	Fuel tank capacity	ℓ (gal.)	30 (7.9)			
Drive train	Clutch		Dry dual	Dry single	Dry dual	Dry single
	Transmission		Synchro shuttle	Hydrostatic Drive	Synchro shuttle	Hydrostatic Drive
	Speeds		8F 8R (EU-option:16F16R)	INF.3	8F 8R (EU-option:16F16R)	INF.3
	Differential lock		Standard			
	Brake		Wet disc type			
	P.T.O		Transmission	Live	Transmission	Live
	Rear	(rpm)	540 rpm at 2,520 engine rpm / (Option 1,000 rpm)			
	Mid	(rpm)	(Option 2,000 rpm at 2,499 engine rpm)			
Hydraulic system	Pump		Gear (Tandem)			
	Pump capacity	ℓ/min (gpm)	50.1 (13.24) / 1st : 32.9 (8.7), 2nd : 17.2 (4.54)			
	3-point hitch		Cat.I			
	Maximum lifting capacity (24in. aft of hitch)	kg (lbs)	800 (1,764)			
	Hydraulic lift control system		Position control (Option : Draft, Mixed control)			
	Steering		Hydrostatic Power Steering			
Standard tire size	Front AG.(TURF,INDUSTRIAL)		6-14, 6PR (25 x 8.50-14, 25 x 8.50-14) [Only USA : 7-14 (4PR), 27 x 8.50-15 (4PR), 25 x 8.50-14 (6PR)			
	Rear AG.(TURF,INDUSTRIAL)		9.5-24, 4PR (13.6-16, 15-19.5) [Only USA : 11.2-24 (4PR), 41 x 14.0-20 (4PR), 15 x 19.5 (6PR)			
	Forward(At rated engine rpm)	km/h (mph)	1.5-22.9 (0.93-14.22)	0-21.1 (0-13.11)	1.5-22.9 (0.93-14.22)	0-21.1 (0-13.11)
	Reverse(At rated engine rpm)	km/h (mph)	1.32-20.18 (0.82-12.53)	0-14.0 (0-8.69)	1.32-20.18 (0.82-12.53)	0-14.0 (0-8.69)
Traveling speeds	Overall length (includes 3p)	mm (in.)	3,103 (122.2)			
	Overall width (minimum tread)	mm (in.)	1,387 (54.6)			
	Overall height (from top of ROPS)	mm (in.)	2,460 (96.8)			
Dimensions	Wheel base	mm (in.)	1,680 (66.1)			
	Min. ground clearance	mm (in.)	351 (13.82)			
	Tread Front	mm (in.)	1,105 (43.5)			
	Rear	mm (in.)	970-1,302 (38.2-51.3)			
Other spec.	Min. turning radius (without brake)	m (Ft.)	2.9 (9.5)			
	Weight (with rops)	kg (lbs.)	1,380 (3,042)	1,386 (3,055)	1,380 (3,042)	1,386 (3,055)
	Max. Drawbar load	kg (lbs.)	500 (1,102)			
	Max. Trailer loading weight	kg (lbs.)	1,000 (2,204)		1,000 (2,204)	

NOTE) 1. USA-only USA, EU-only Europe, AU-Australia, New zealand, etc.
2. The specifications are subject to change for the purpose of improvement without any notice.

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4. LUBRICANTS, FUEL AND COOLANT

To prevent serious equipment damage, use only genuine DAEDONG fluids, oils and greases, or equivalents.

No.	Locations	Capacities		Lubricants	
		MANUAL	HST		
1	Fuel	30ℓ (7.9 U.S.gal.)		No.2-D diesel fuel No.1-D diesel fuel if temperature is below -10°C (14°F)	
2	Coolant	CK25/CK27/CK35 : 7.4ℓ (2.0 U.S.gal.) CK30 : 7.8ℓ (2.1 U.S.gal.)		Fresh clean water with anti-freeze	
3	Engine crankcase	5.8ℓ (1.53 U.S.gal.)		Engine oil: API Service Classification CC or CD Above 25°C (77°F) : SAE30, SAE10W-30 or 10W-40 0 to 25°C (32 to 77°F) : SAE20, SAE10W-30 or 10W-40 Below 0°C (32°F) : SAE10W, SAE10W-30 or 10W-40	
4	Transmission case	27ℓ (7.13 U.S.gal.)	30ℓ (7.93 U.S.gal.)	Exxonmobil : Mobilfluid 423 or 424, Exxon Hydraul 560 Shell : DONAX-TD/TD Plus BP : Tractran UTH	
5	Front axle case	4.5ℓ (1.19 U.S.gal.)		SAE 90 gear oil or transmission case oil	
6	Greasing	No. of greasing points		Capacity	Type of grease
	Battery terminal	2		Moderate amount	Multipurpose type grease

⚠ *WARNING*

- ***Check the oil level regularly.***
- ***Correct the oil level, if needed, before operating.***
- ***Always check and add oil with the tractor on a flat, level surface.***
- ***To prevent personal injury, always stop the engine and set the parking brake before performing any kind of service.***

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5.1 GENERAL USE SCREWS, BOLTS AND NUTS

If the tightening torques are not specified for some screws, bolts and nuts in this manual, tighten them 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	Nm	kgf-m	lb-ft	Nm	kgf-m	lb-ft	Nm	kgf-m	lb-ft	Nm	kgf-m	lb-ft	Nm	kgf-m	lb-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

5.2 STUD BOLTS

Material of opponent part	Ordinariness			Aluminum		
Unit / Diameter	Nm	kgf-m	lb-ft	Nm	kgf-m	lb-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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7. MAINTENANCE SCHEDULE CHART

No.	Item \ Maintenance interval		Run hour								Run age		Remarks	
			50	100	200	400	600	800	1500	3000	1 year	2 year		
1	Engine oil	Change	◉	●										
2	Engine oil filter	Replace	◉		●									
3	Transmission oil filter	Replace	◉		●									
4	HST oil filter	Replace	◉		●									
5	Transmission fluid	Change	◉			●								
6	Front axle oil	Change	◉			●								
7	Front axle pivot	Adjust					●							
8	Engine start system	Check	●											
9	Greasing	Apply	●											
10	Wheel bolt torque	Check	●											
11	Battery condition	Check		●									*3	
12	Air cleaner element	Clean		●									*1	#
		Replace									●		*2	
13	Fuel filter element	Replace			●									#
14	Fan belt	Adjust		●									*3	
15	Clutch pedal free play	Adjust	◉	●										
16	Brake pedal free play	Adjust		●										
17	Radiator hose and clamp	Check			●									
		Replace										●		
18	Power steering hose and oil line	Check			●									
		Replace										●		
19	Fuel line	Check		●										#
		Replace										●		
20	Intake air hose	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	Clean										●		
26	Coolant	Replace										●		
27	Fuel system	Check											*3	
28	Fuse	Replace											*3	
29	Light bulb	Replace											*3	
30	Tire pressure	Check											*3	

IMPORTANT FOR INTERVAL

- ***◉ must be performed after the initial 50 hours of operation.***

  ****1 The air cleaner should be cleaned more frequently a in dusty condition than in a normal condition.***

  ****2 Every year or every 5 times of cleaning.***

  ****3 Replace only if necessary.***

- ***The items listed above (# marked) are registered as emission related critical parts by DAEDONG in the U. S.EPA exhaust emission standards non-road emission regulation. As the engine owner, you are responsible for the performance of the required maintenance on the engine according to the above instruction.***

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3. TROUBLESHOOTING

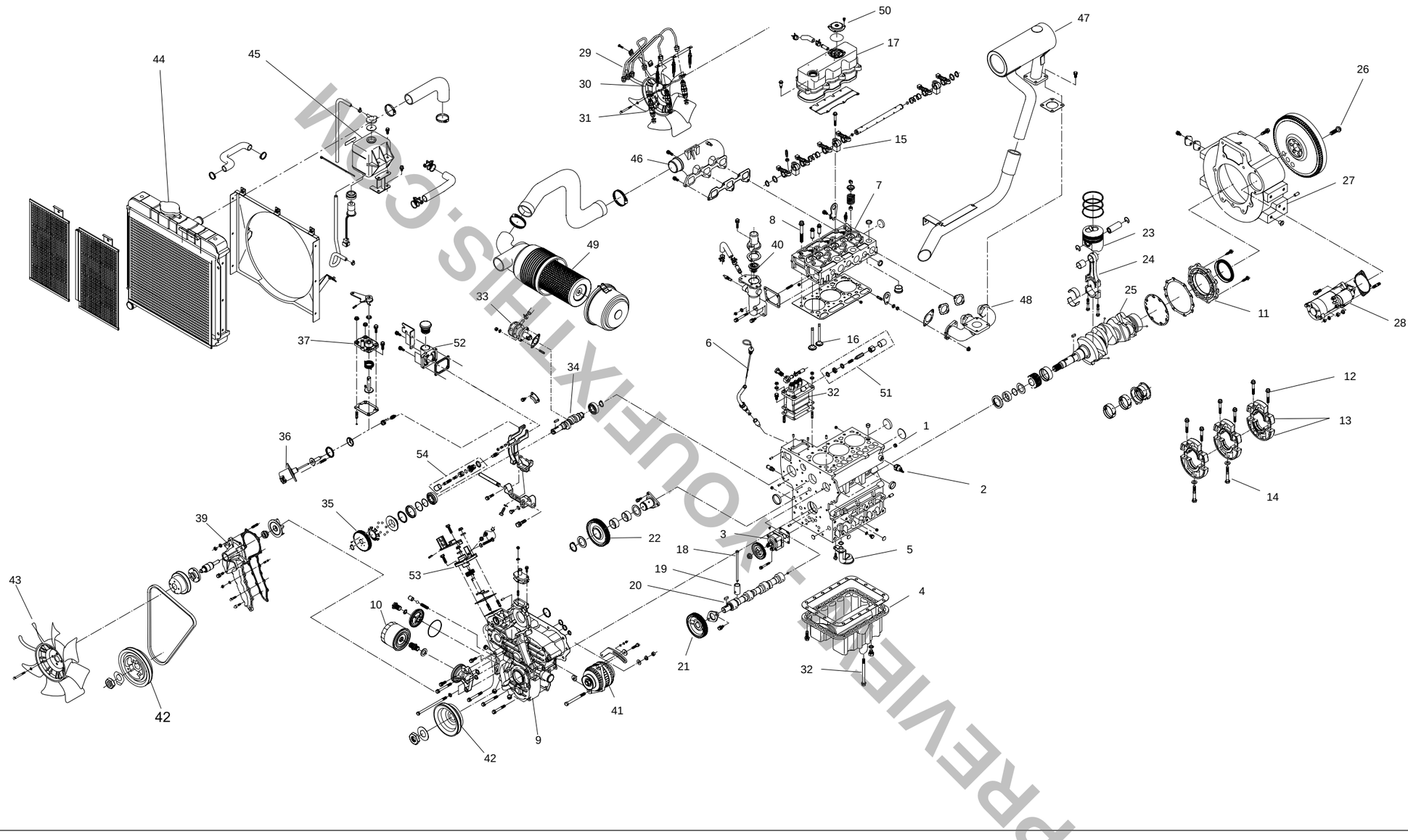
ENGINE DOES NOT START.

- 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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5. EXPLODED VIEW (CK25/27/30/35)



704W243C

(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) Flywheel Housing
(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) Manual Stop Lever
(38) Fork Lever (Governor)
(39) Water pump
(40) Thermostat
(41) Alternator
(42) Fan Drive Pulley
(43) Cooling Fan
(44) Radiator
(45) Reserve Tank Ass'y
(46) Inlet Manifold
(47) Muffler
(48) Exhaust Manifold
(49) Air Cleaner
(50) PCV V/v
(51) Idle Limit System
(52) Oil Filter
(53) Speed Control
(54) Fuel Control Limit

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8.4 EVERY 200 HOURS

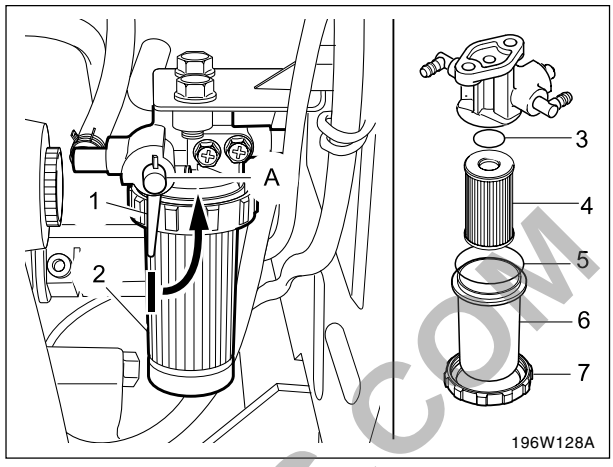
8.4.1 REPLACING FUEL FILTER

IMPORTANT

- ***If dust and dirt enters the fuel system, the fuel pump and injection nozzles are subject to premature wear. To prevent this, be sure to clean the fuel filter bowl and element periodically.***

This job should not be done in the field, but in a clean place.

1. Close the fuel cock.
2. Unscrew the screw ring and remove the filter bowl.
3. Replace the element with new one.
4. Bleed the fuel system as needed.
   (See “8.10 Bleeding Fuel System” in service as required)



(1) Fuel Cock
(2) Fuel Filter Bowl
(3) O-ring
(4) Filter Element
(5) Spring
(6) Filter Bowl
(7) Screw Ring
(A) Close

8.4.2 REPLACING ENGINE OIL FILTER

IMPORTANT

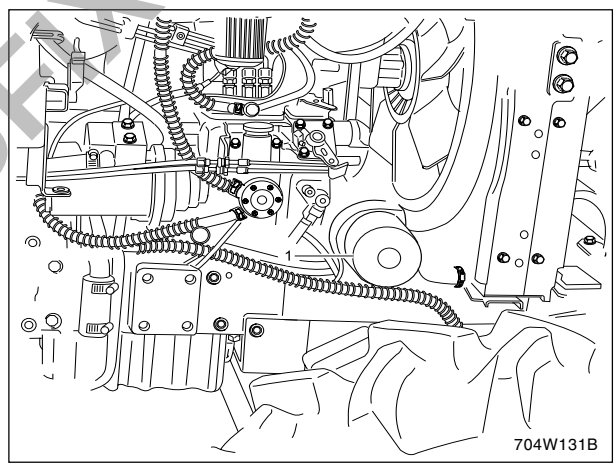
- ***To prevent serious damage to the engine, use only a DAEDONG genuine filter.***

CAUTION

To avoid personal injury:

- ***Be sure to sop the engine before changing oil filter cartridge.***
- ***Allow engine to cool down sufficiently, oil can be hot and can burn.***

1. Remove the oil filter.
2. Put a film of clean engine oil on the rubber seal of the new filter.
3. Tighten the filter quickly until it contacts the mounting surface.
   Tighten filter by hand an additional half turn only.
4. After the new filter has been replaced, the engine oil normally decreases a little. Make sure that the engine oil does not leak through the seal and be sure to check the oil level on the dipstick. Then, replenish the engine oil up to the prescribed level.



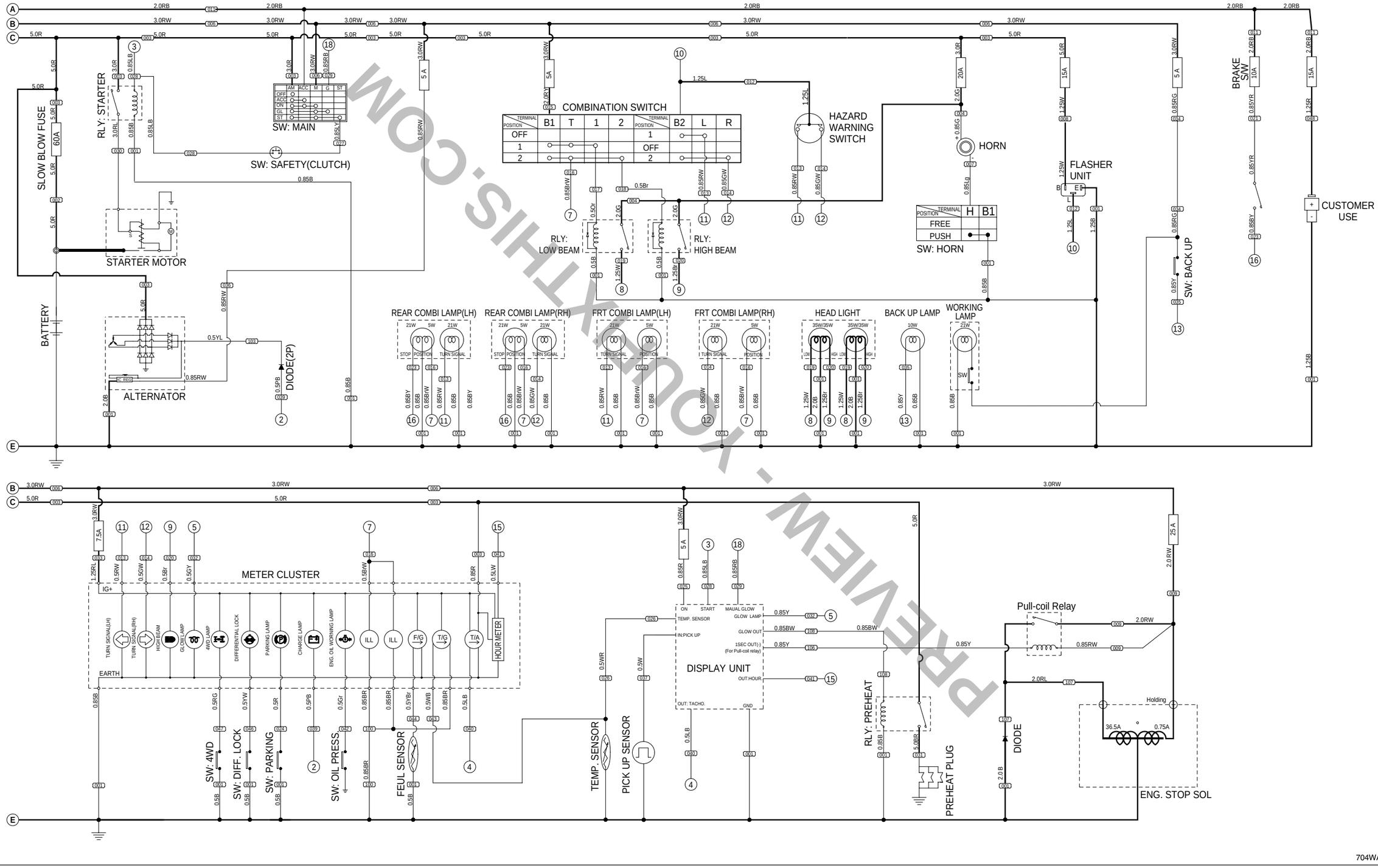
(1) Engine Oil Filter

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1. CIRCUIT AND COMPONENT LOCATION

1.1 CIRCUIT DIAGRAM (CK25/27/30/35 SINCE 2007)



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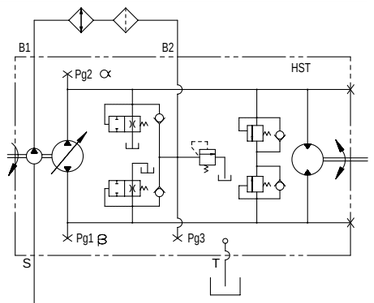
2.2 HYDRAULIC CIRCUIT DIAGRAM

FOR HST TYPE

CK25H/30H

SPECIFICATION

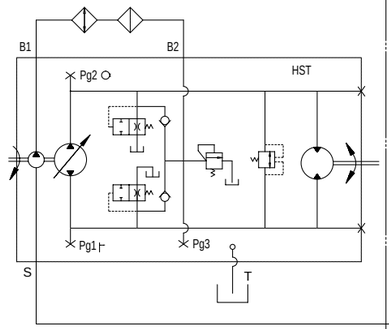
PUMP DISPLACEMENT	0 ~ 23.3 cc/rev
MOTOR DISPLACEMENT	23.3 cc/rev
MAX. INPUT SPEED	3000 rpm
MAX. OUTPUT SPEED	0 ~ 3000 rpm
MAX. WORKING PRESSURE	280 kgf/cm^2
CHARGE PUMP DISPLACEMENT	6.2 cc/rev
ANGLE SWASH PLATE	0 – 18
COLOR	GRAY

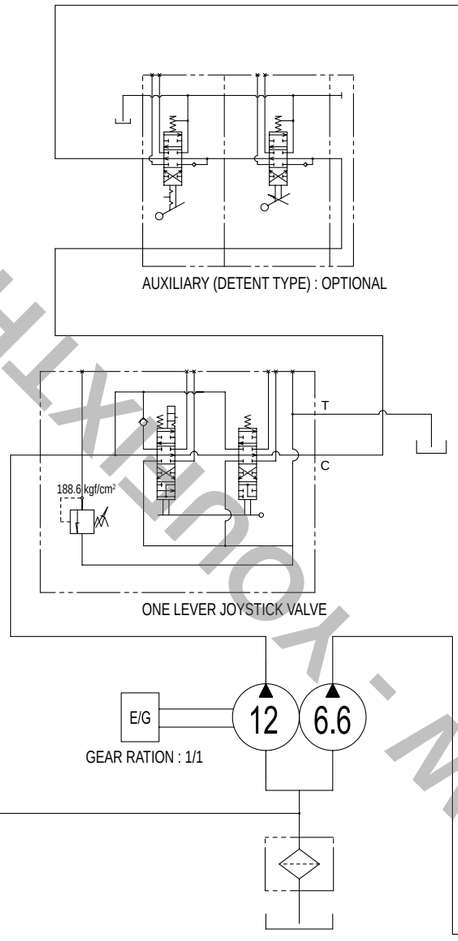


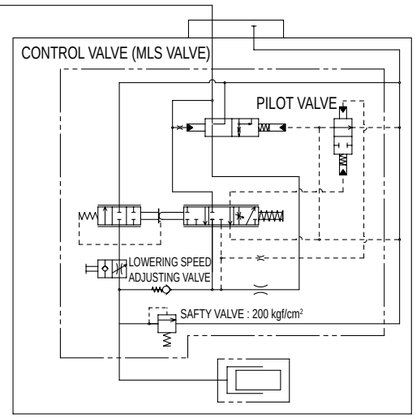
CK35H

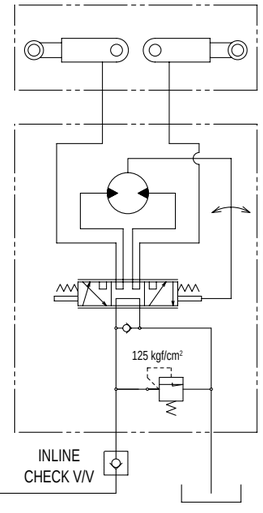
SPECIFICATION

PUMP DISPLACEMENT	0 ~ 28.1 cc/rev
MOTOR DISPLACEMENT	28.1 cc/rev
MAX. INPUT SPEED	3000 rpm
MAX. OUTPUT SPEED	0 ~ 3000 rpm
MAX. WORKING PRESSURE	300 kgf/cm^2
CHARGE PUMP DISPLACEMENT	6.2 cc/rev
ANGLE SWASH PLATE	0 ~ – 18
COLOR	GRAY









ROD O.D :35
TUBE : I.D 43.8 - O.D 50.8
STROKE : 185 mm

TYPE : OPEN CENTER LOAD REACTION
DISPLACEMENT : 51 CC/REV
RELIEF SETTING PRESSURE : 123 BAR
LOW SLIP TYPE
CENTERING SPRING : LOW INPUT TORQUE
INCLUDING IN LINE CHECK VALVE

704W901C

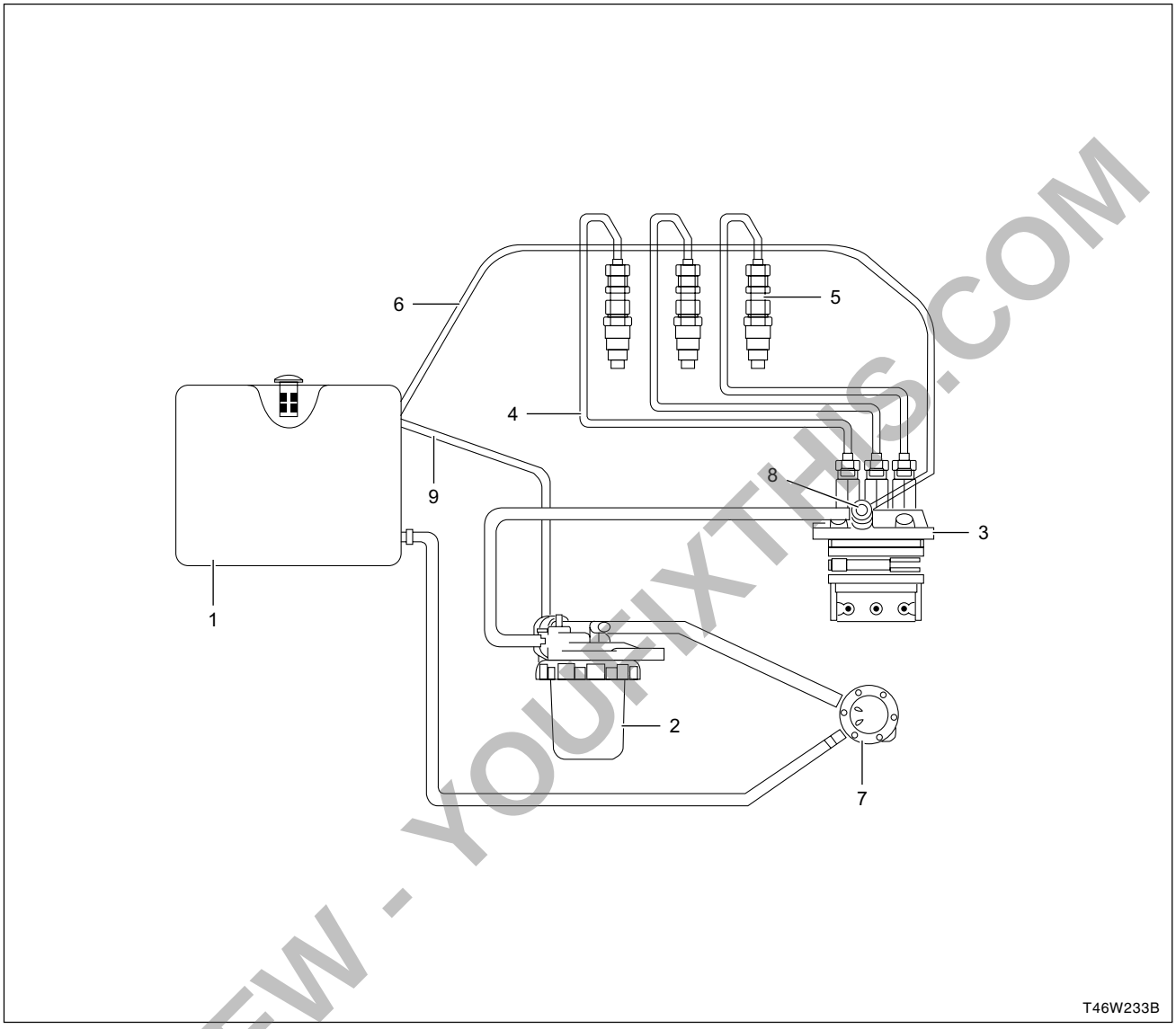
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2.3 FUEL SYSTEM

2.3.1 FUEL FLOW ROUTE



(1) Fuel Tank
(2) Fuel Filter
(3) Fuel Injection Pump
(4) Injection Pipe
(5) Injection Nozzle
(6) Fuel Overflow Pipe (Hose)
(7) Fuel Feed Pump
(8) Bleeding Bolt
(9) Bleeding Hose

The fuel in the fuel tank (1) is drawn to the fuel feed pump (7) and then is supplied to the fuel injection pump (3) passed through the fuel filter (2). Then, the fuel injection pump feeds the fuel to the injection nozzles (5) which then inject the fuel into the cylinders for combustion. The excessive fuel from the fuel injection pump to the injection nozzles is collected in the fuel overflow pipes (6) and returns to the fuel tank.

NOTE:

- *For air bleeding, see the next page.*

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3. TROUBLESHOOTING

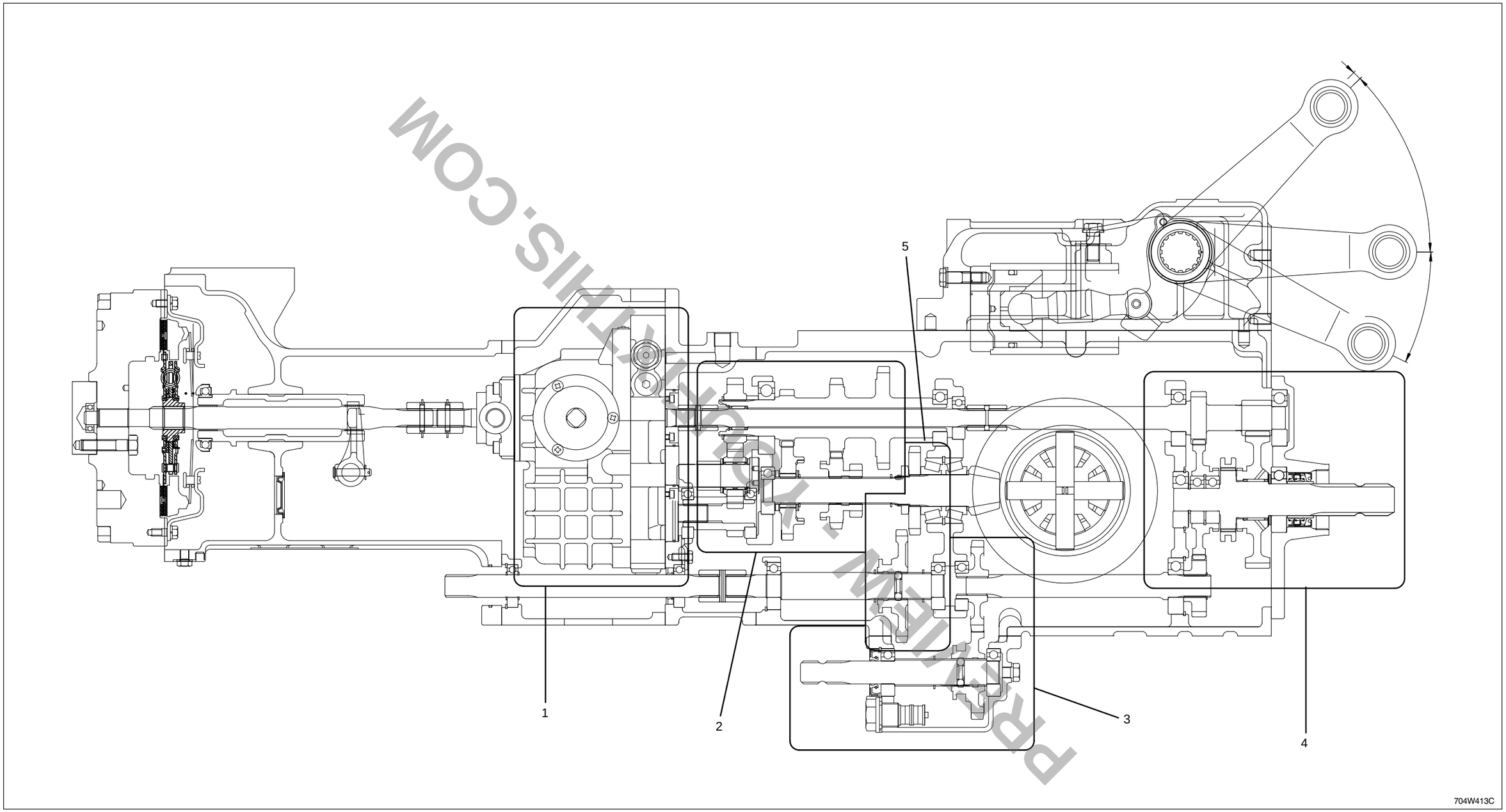
Symptom	Probable Cause	Solution
Clutch drags	• Clutch pedal free play excessive	Adjust
	• Clutch release lever improperly adjusted	Adjust
	• Clutch disc boss spline sticking or rusted	Replace or remove rust
	• Dust on clutch disc generated from clutch disc facing	Remove rust
	• Grease or oil on clutch disc facing	Replace
	• Clutch disc or pressure plate warped	Replace
	• Pilot bearing sticking or worn	Replace
Clutch slips	• Clutch pedal free play too small	Adjust
	• Clutch release lever improperly adjusted	Adjust
	• Clutch disc excessively worn	Replace
	• Grease or oil on clutch disc facing	Replace
	• Clutch disc or pressure plate warped	Replace
	• Clutch spring weaken or broken	Replace
	• Diaphragm spring weaken or broken (CK25/27/30/35)	Replace
Chattering	• Grease or oil on clutch disc facing	Replace
	• Clutch disc or pressure plate warped	Replace
	• Clutch disc boss spline worn or sticking or rusted	Replace or remove rust
	• Main shaft bent	Replace
	• Pressure plate or flywheel face cracked or scored	Replace
	• Clutch disc boss spline and main shaft spline worn	Replace
	• Diaphragm spring strength uneven or broken (CK25/27/30/35)	Replace
Rattle during running	• Clutch disc boss spline worn	Replace
	• Release bearing worn or sticking	Replace
	• Pilot bearing worn or sticking	Replace
	• Torsion spring on clutch disc weaken or broken	Replace
Clutch squeaks	• Release bearing sticking or dry	Replace/Lubricate
	• Pilot bearing worn or sticking	Replace
	• Clutch disc excessively worn	Replace
Vibration	• Main shaft bent	Replace
	• Clutch disc rivet worn or broken	Replace
	• Clutch parts broken	Replace

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2. OPERATING PRINCIPLE

2.1 POWER TRAIN DIAGRAM



(1) Hydraulic Transmission Section
(2) Range Gear Shift Section
(3) Mid PTO Drive Section
(4) Rear PTO Shift Section
(5) Front Wheel Drive Section

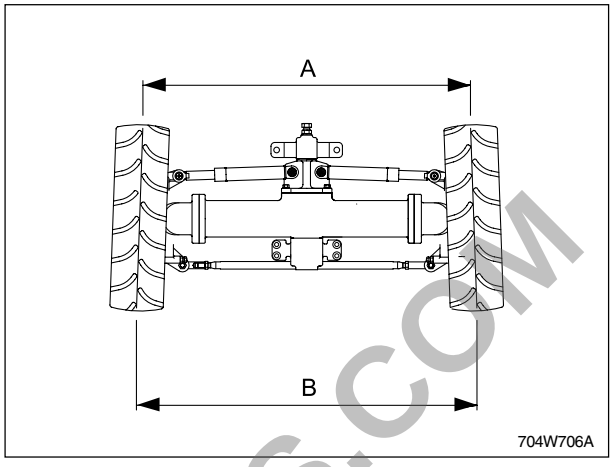
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4. MEASUREMENT AND ADJUSTMENT

4.1 TOE-IN

1. Apply specified air pressure to the tires.
2. Measure the front width (A) and the rear width (B) between the front wheels while straightened to obtain the difference (toe-in).
3. If the toe-in value is outside the spec, adjust it.

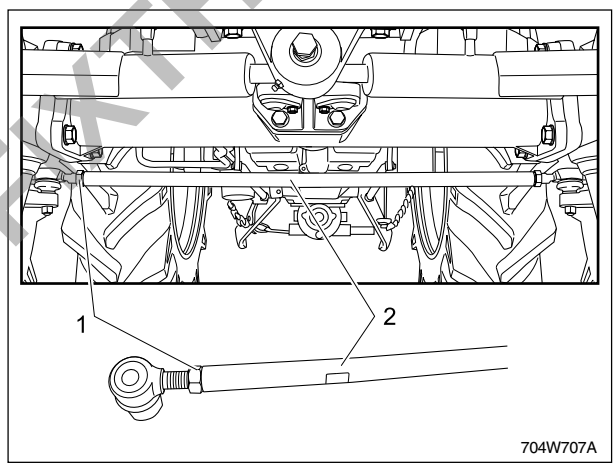
Item	Factory spec.
Toe-in (B-A)	2 ~ 8 mm 0.08 ~ 0.31 in.



(A) Front Width (B) Rear Width

4.2 TOE-IN ADJUSTMENT

1. Loosen the lock nuts (1).
2. Turn the tie-rod (2) until to be factory specification.
3. Tighten the lock nuts (1).

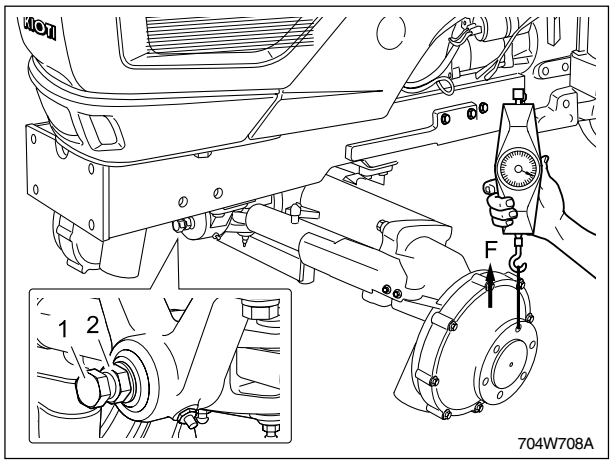


(1) Lock Nut (2) Tie-Rod

4.3 ROCKING FORCE OF FRONT AXLE

1. Jack up the front side of tractor and remove the front wheel.
2. Set a spring balance onto the front axle.
3. Measure the front axle rocking force.
4. If the measurement is not within the factory specifications, adjust with the adjusting screw (1).
5. Tighten the lock nut (2) firmly.

Item	Factory spec.
Front axle rocking force	49.0 ~ 117.7 N 5.0 ~ 12.0 kgf 11.0 ~ 26.5 lbs

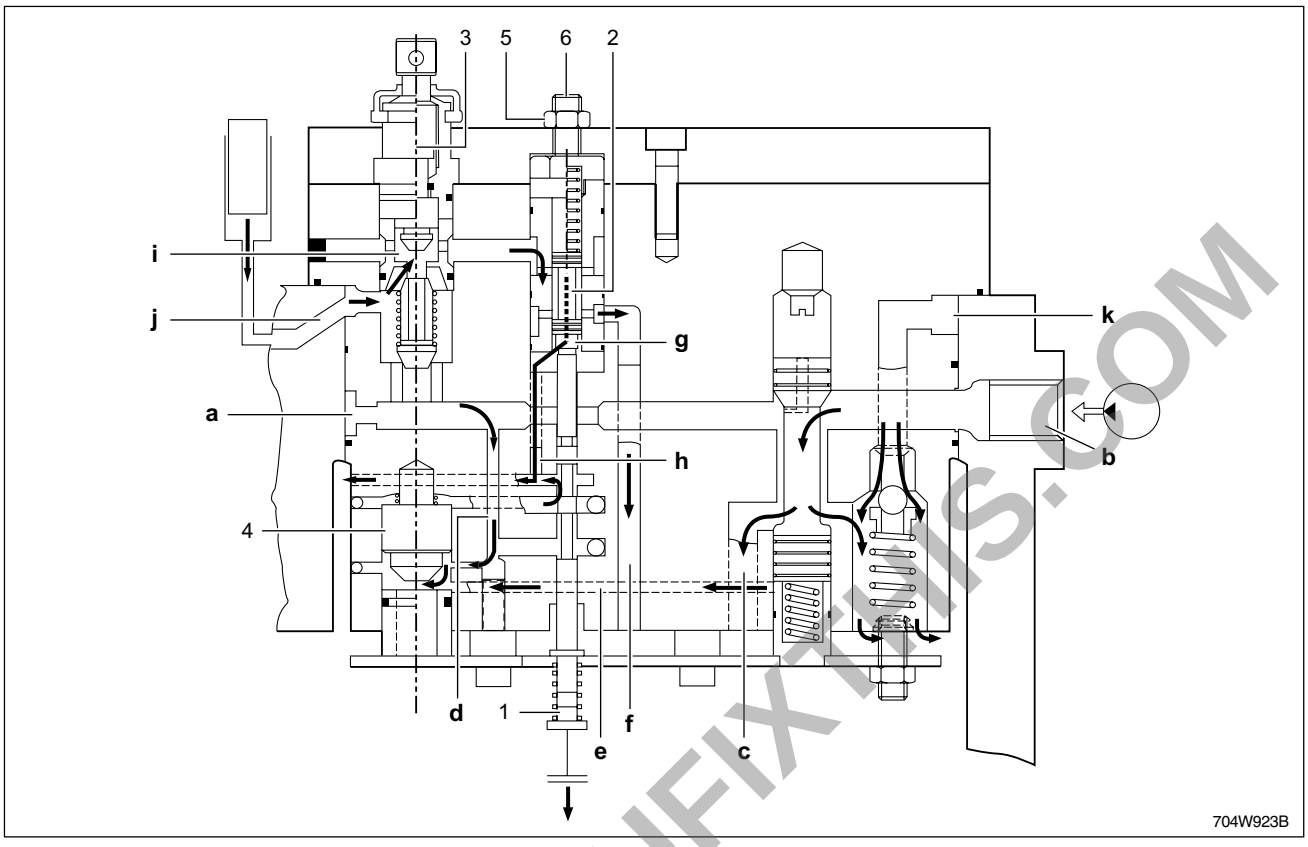


(1) Adjusting Screw (2) Lock Nut

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C. LOWERING



▶ LOWERING:

When the control spool (1) moves downward, the fluid passage between (a) and (b) ports are blocked as same as when the valve is in the neutral position.

The hydraulic fluid drawn through the (b) port is drained through the drain hole (c) on the bottom of the regulator piston. The hydraulic fluid drawn through the (a) port is supplied to the bottom of the pilot through the passage (d) to lift the pilot valve. Then, this fluid is drained as the fluid on the bottom of the regulator piston is drained through the passage (e).

As the control spool moves downward, the discharge valve (2) moves downward by the upper spring to open the drain passage. Therefore, the lifting arm is lowered as the fluid in the lifting cylinder is drained through the drain passage (f).

The small oil hole (g) on the bottom of the discharge valve is to drain the fluid from the top of the discharge valve when the exhaust valve is closed again.

The fluid on the top of the discharge valve is drained through this hole and the fluid passage (h).

Lowering speed adjust valve:

When turning the handle of the lowering speed adjust valve (3) from outside, the size of the fluid passage (i) is adjusted and, therefore, the lowering speed of the lifting arm can be adjusted. When turning the handle clockwise to its end, passage is completely blocked and the lifting arm can be locked at a certain position.

Pilot valve (12):

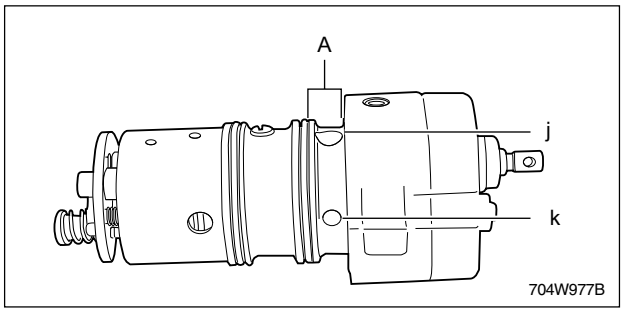
The pilot valve (4) delays the initial fluid flow by opening or closing the control spool to help the smooth lifting arm operation.

▶ CONTROL SENSITIVITY ADJUSTMENT:

The opening timing of the spool (1) can be adjusted by adjusting the position of the spool with unscrewing the lock nut (5) and then adjusting the bolt (6). It means that the sensitivity of the control spool can be adjusted.

Refer to “Measurement and adjustment” in this chapter for detailed information.

▶ SAFETY VALVE:



The section (A) in the figure is the chamber that supplies the cylinder with oil. The hole (j) in the sectional view is connected to the hole (k) which is connected to the safety valve.

If the hydraulic lifting arm is applied with abnormal impact or excessive load, the MLS valve can be damaged. However, the hydraulic fluid in the lifting cylinder is drawn to the (k) port through the port (j) by the outer force. Then, it opens the safety valve, which is set to 200 kgf/cm^2, is drained to the outside.

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