

Product: 2009 Kubota WSM M135X-S(SUPPLEMENT) Tractor Service Repair Workshop Manual
Full Download: <https://www.arepairmanual.com/downloads/2009-kubota-wsm-m135x-ssupplement-tractor-service-repair-workshop-manual/>

WSM

**WORKSHOP MANUAL
TRACTOR**

**M135X-S
(SUPPLEMENT)**

Kubota

Sample of manual. Download All 126 pages at:

<https://www.arepairmanual.com/downloads/2009-kubota-wsm-m135x-ssupplement-tractor-service-repair-workshop-manual/>

TO THE READER

In this section, the main additional function and altered position of M135X-S tractor from M135X tractor.

As for the items which are not explained in this section, refer to M100X, M110X, M126X and M135X workshop manual (9Y021-02691).

This Workshop Manual tells the servicing personnel about the mechanism, servicing and maintenance of the M135X-S. It contains 4 parts: "**Information**", "**General**", "**Mechanism**" and "**Servicing**".

■ Information

This section contains information below.

- Safety First
- Safety Decal
- Specification
- Dimension

■ General

This section contains information below.

- Maintenance Check List
- Check and Maintenance
- Special Tools

■ Mechanism

This section contains information on the structure and the function of the unit. Before you continue with the subsequent sections, make sure that you read this section.

Refer to the latest version of Workshop Manual (Code No. 9Y021-01870 / 9Y021-18200) for the diesel engine / tractor mechanism that this workshop manual does not include.

■ Servicing

This section contains information below.

- Troubleshooting
- Servicing Specifications
- Tightening Torques
- Checking, Disassembling and Servicing

All illustrations, photographs and specifications contained in this manual are of the newest information available at the time of publication.

KUBOTA reserves the right to change all information at any time without notice.

Since this manual includes many models, information or illustrations and photographs can show more than one model.

SI INFORMATION

INFORMATION

CONTENTS

1. SAFETY FIRST	SI-1
2. SAFETY DECALS	SI-4
3. SPECIFICATIONS	SI-5
4. DIMENSIONS	SI-6

1. SAFETY FIRST

SAFETY FIRST

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

DANGER

- Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

- Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

- Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

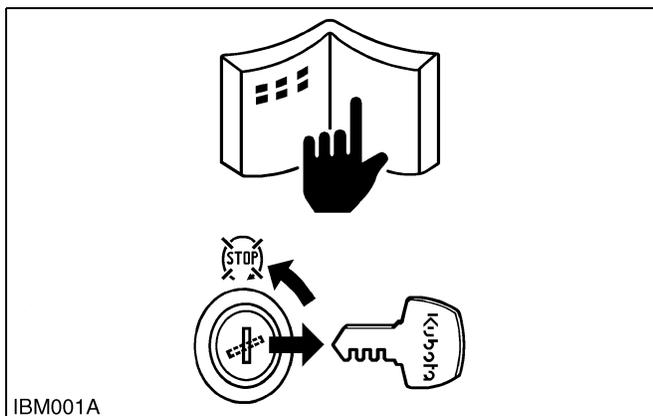
■ IMPORTANT

- Indicates that equipment or property damage could result if instructions are not followed.

■ NOTE

- Gives helpful information.

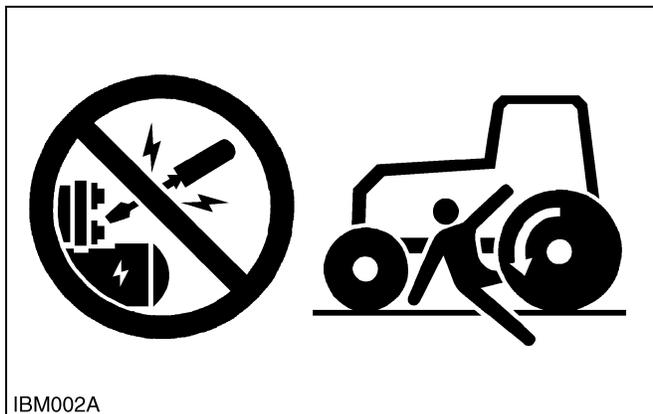
WSM000001INI0001US1



BEFORE YOU START SERVICE

- Read all instructions and safety instructions in this manual and on your machine safety decals.
- Clean the work area and machine.
- Park the machine on a stable and level ground, and set the parking brake.
- Lower the implement to the ground.
- Stop the engine, then remove the key.
- Disconnect the battery negative cable.
- Hang a "**DO NOT OPERATE**" tag in the operator station.

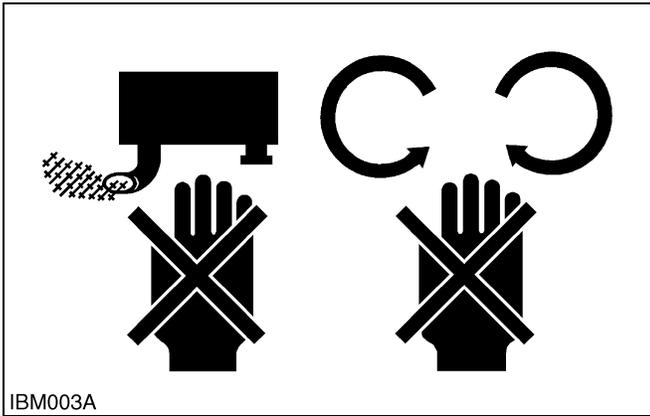
WSM000001INI0010US1



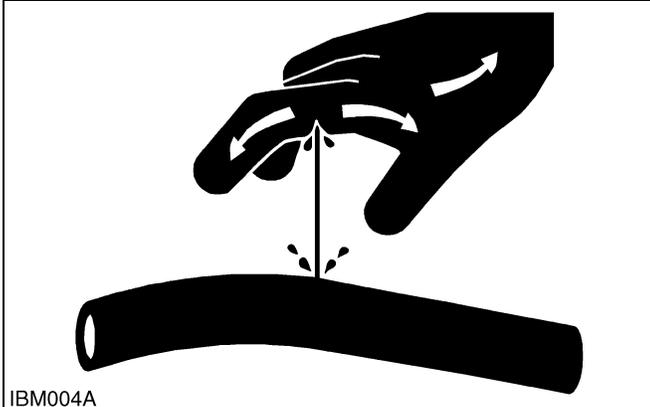
START SAFELY

- Do not do the procedures below when you start the engine.
 - short across starter terminals
 - bypass the safety start switch
- Do not alter or remove any part of machine safety system.
- Before you start the engine, make sure that all shift levers are in neutral positions or in disengaged positions.
- Do not start the engine when you stay on the ground. Start the engine only from operator's seat.

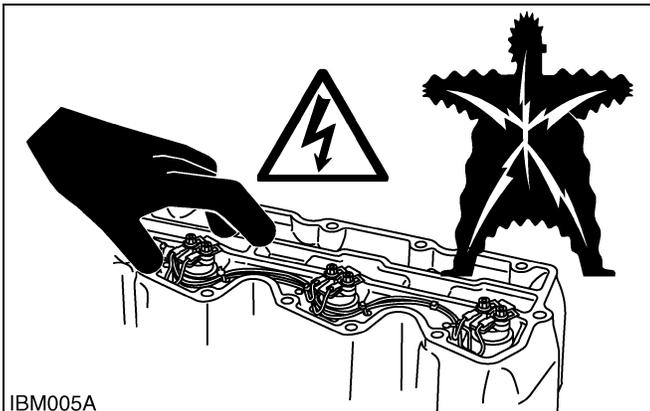
WSM000001INI0015US0



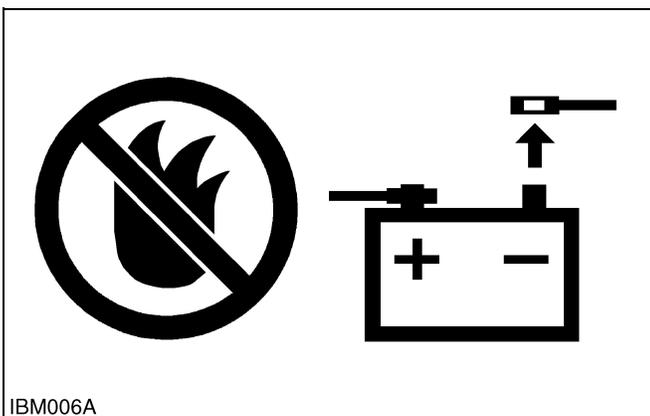
IBM003A



IBM004A



IBM005A



IBM006A

OPERATE SAFELY

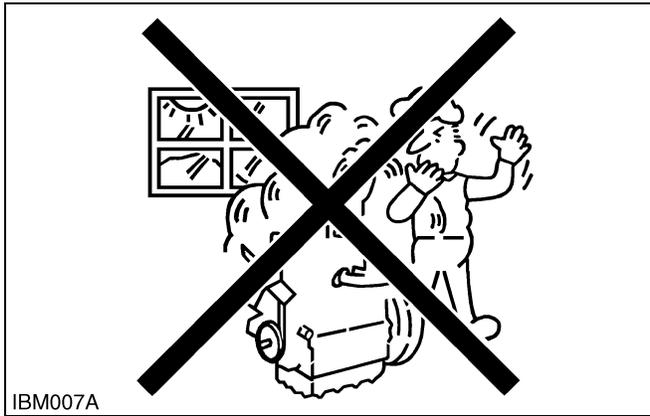
- Do not use the machine after you consume alcohol or medication or when you are tired.
- Put on applicable clothing and safety equipment.
- Use applicable tools only. Do not use alternative tools or parts.
- When 2 or more persons do servicing, make sure that you do it safely.
- Do not operate below the machine that only a jack holds. Always use a safety stand to hold the machine.
- Do not touch the hot parts or parts that turn when the engine operates.
- Do not remove the radiator cap when the engine operates, or immediately after it stops. If not, hot water can spout out from the radiator. Only remove the radiator cap when it is at a sufficiently low temperature to touch with bare hands. Slowly loosen the cap to release the pressure before you remove it fully.
- Released fluid (fuel or hydraulic oil) under pressure can cause damage to the skin and cause serious injury. Release the pressure before you disconnect hydraulic or fuel lines. Tighten all connections before you apply the pressure.
- Do not open a fuel system under high pressure. The fluid under high pressure that stays in fuel lines can cause serious injury. Do not disconnect or repair the fuel lines, sensors, or any other components between the fuel pump and injectors on engines with a common rail fuel system under high pressure.
- Put on an applicable ear protective device (earmuffs or earplugs) to prevent injury against loud noises.
- Be careful about electric shock. The engine generates a high voltage of more than DC100 V in the ECU and is applied to the injector.

WSM000001INI0012US1

PREVENT A FIRE

- Fuel is very flammable and explosive under some conditions. Do not smoke or let flames or sparks in your work area.
- To prevent sparks from an accidental short circuit, always disconnect the battery negative cable first and connect it last.
- The battery gas can cause an explosion. Keep the sparks and open flame away from the top of battery, especially when you charge the battery.
- Make sure that you do not spill fuel on the engine.

WSM000001INI0005US1



IBM007A

KEEP A GOOD AIRFLOW IN THE WORK AREA

- If the engine is in operation, make sure that the area has good airflow. Do not operate the engine in a closed area. The exhaust gas contains poisonous carbon monoxide.

WSM000001INI0006US1

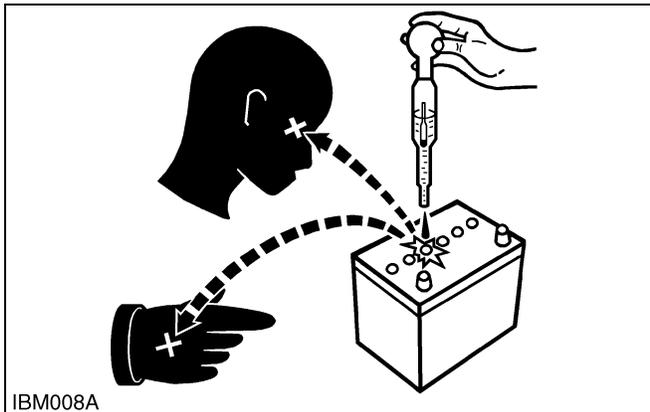


IBM009A

DISCARD FLUIDS CORRECTLY

- Do not discard fluids on the ground, down the drain, into a stream, pond, or lake. Obey related environmental protection regulations when you discard oil, fuel, coolant, electrolyte and other dangerous waste.

WSM000001INI0007US1



IBM008A

PREVENT ACID BURNS

- Keep electrolyte away from your eyes, hands and clothing. Sulfuric acid in battery electrolyte is poisonous and it can burn your skin and clothing and cause blindness. If you spill electrolyte on yourself, clean yourself with water, and get medical aid immediately.

WSM000001INI0008US1



IBM010A

PREPARE FOR EMERGENCIES

- Keep a first aid kit and fire extinguisher ready at all times.
- Keep the emergency contact telephone numbers near your telephone at all times.

WSM000001INI0009US1

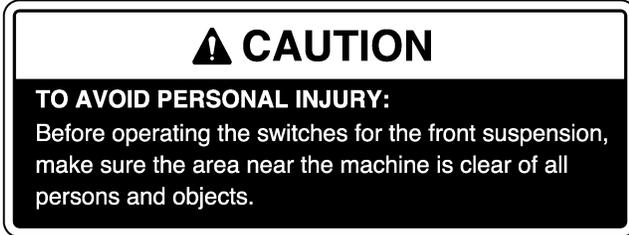
2. SAFETY DECALS

The following safety decals (pictorial safety labels) are installed on the machine. If a decal becomes damaged, illegible or is not on the machine, replace it. The decal part number is listed in the parts list.

WSM000001INI0014US0

(1) Part No. 3T565-9855-2 [Front suspension type]

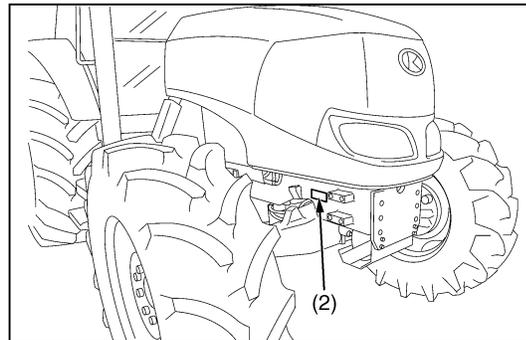
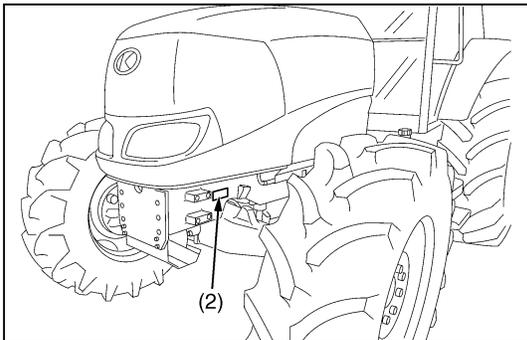
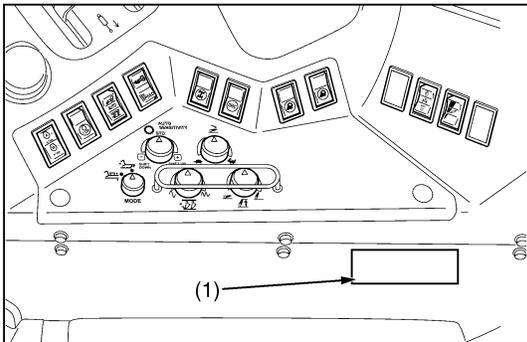
(2) Part No. 3T565-9859-2 [Front suspension type]



1AGAIHFAP086A



1AGAIHFAP087A



9Y1210410ICI001A

9Y1210410INI0001US0

3. SPECIFICATIONS

Model		M135X-S		
Engine	Model	V6108-TIE3		
	Type	Direct injection, W/turbocharger, water-cooled, 4-cycle diesel		
	Number of cylinder	4		
	Total displacement	6124 cm ³ (374 cu.in.)		
	Bore and stroke	118 × 140 mm (4.65 × 5.51 in.)		
	Net power	100.7 kW (135 HP)*		
	PTO power (factory observe)	88.0 kW (118 HP)* / 2200 min ⁻¹ (rpm)		
	Maximum torque	323 N·m (33.0 kgf·m, 238 lbf·ft) / 1500 min ⁻¹ (rpm)		
	Battery capacity	12 V, 160 Ah at 20 hours, 1090CCA		
	Fuel	Diesel fuel No. 1 [below -10 °C (14 °F)], Diesel fuel No. 2-D [above -10 °C (14 °F)]		
	Fuel tank capacity	190 L (50.2 U.S.gal, 41.8 Imp.gals)		
	Engine oil capacity	14.6 L (15.4 U.S.qts, 12.8 Imp.qts)		
	Coolant capacity	14.6 L (15.4 U.S.qts, 12.8 Imp.qts)		
Dimensions	Overall length	4350 mm (171.3 in.)		
	Overall width (min. tread)	2180 mm (85.8 in.)		
	Overall height	2725 mm (107.3 in.)		
	Wheel base	2680 mm (105.5 in.)		
	Tread	Front	1775 to 1875 mm (69.9 to 73.8 in.)	
		Rear	1590 to 2085 mm (62.6 to 82.1 in.)	
Crop clearance	615 mm (24.2 in.)			
Weight		4860 kg (10714 lbs)		
Traveling system	Standard tire size	Front	14.9R24	
		Rear	18.4R38	
	Clutch	Multiple wet disc, Electronic Hydraulically operated		
	Steering	Hydrostatic power steering		
	Braking system	Hydraulically operated wet disk		
Differential	Bevel gears with differential gear lock (Front, Rear)			
Hydraulic system	Hydraulic control system	Electronic draft control		
	Pump capacity	77.2 L (20.4 U.S.gals, 17.0 Imp.gals) / min.		
	Three point hitch	SAE Category 2		
	Max. lifting force	At lift points**	2635 kg (5809 lbs) at lower link end with links horizontal	
		24 in. behind lift points	2360 kg (5203 lbs)	
	Remote hydraulic control	Two remote valve with detent and self-canceling		
	System pressure	19.7 MPa (201 kgf/cm ² , 2857 psi)		
Traction system	Swinging drawbar, adjustable in direction			
PTO system	Live PTO (Independent)	Direction of turning	Clockwise, viewed from tractor rear	
		Standard PTO	6 splines : 540 min ⁻¹ / 1994 min ⁻¹ 21 splines : 1000 min ⁻¹ / 2050 min ⁻¹	

■ **NOTE**

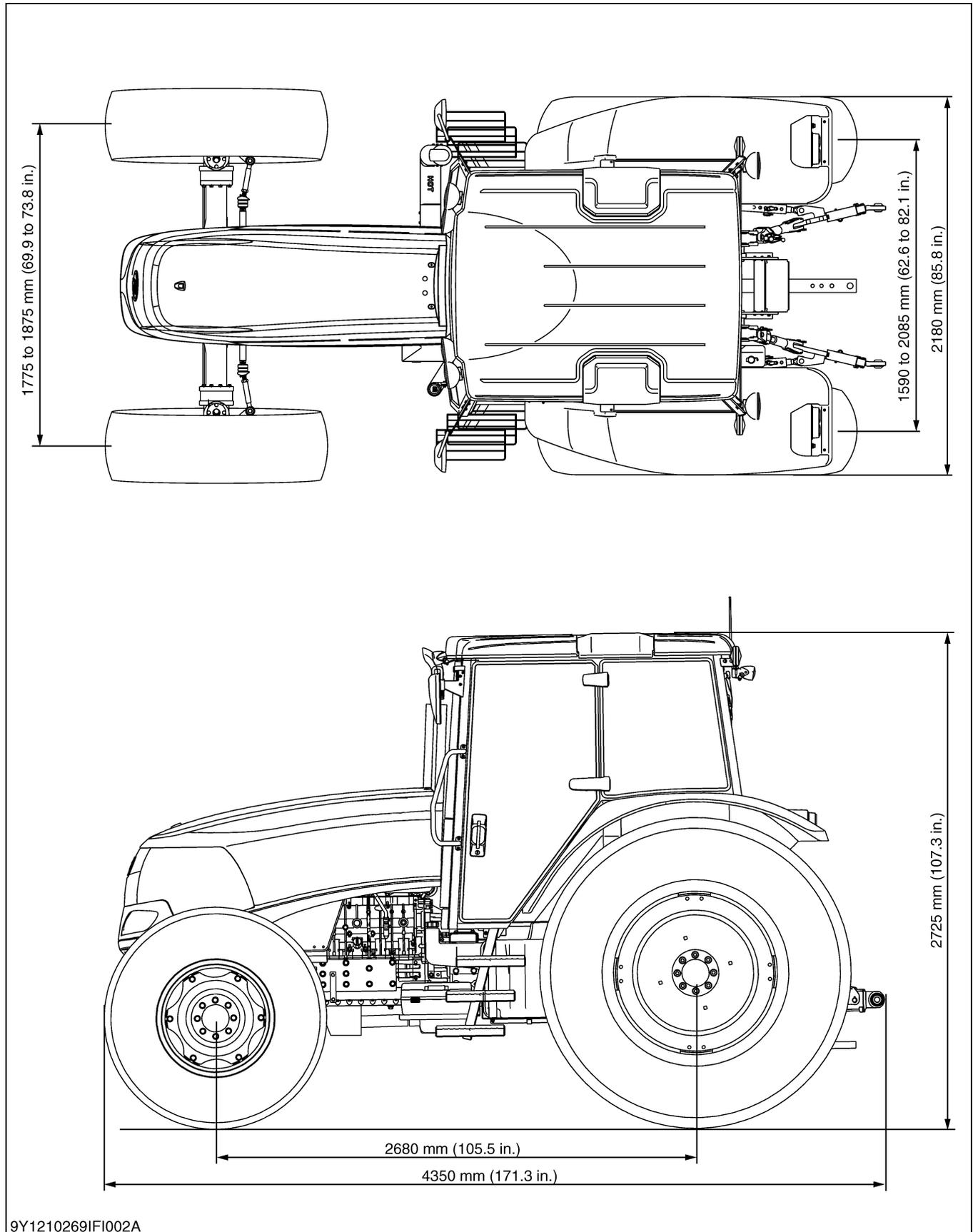
- *Manufacture's estimate

** At lower link and with links horizontal.

The company reserves the right to change the specifications without notice.

9Y1210410INI0002US0

4. DIMENSIONS



9Y1210269IFI002A

9Y1210410INI0003US0

SG GENERAL

GENERAL

CONTENTS

1. LUBRICANTS, FUEL AND COOLANT	SG-1
2. MAINTENANCE.....	SG-4
3. CHECK AND MAINTENANCE	SG-5
[1] CHECK POINT OF EVERY 100 HOURS	SG-5
[2] CHECK POINT OF EVERY 1500 HOURS	SG-6
[3] CHECK POINT OF EVERY 2 YEARS.....	SG-7
4. SPECIAL TOOLS	SG-8
[1] SPECIAL TOOLS FOR TRACTOR	SG-8

1. LUBRICANTS, FUEL AND COOLANT

No.	Place	Capacity	Lubricants, fuel and coolant
		M135X-S	
1	Fuel	190 L 50.2 U.S.gals 41.8 Imp.gals	<ul style="list-style-type: none"> No. 2-D diesel fuel No. 1-D diesel fuel if temperature is below $-10\text{ }^{\circ}\text{C}$ ($14\text{ }^{\circ}\text{F}$)
2	Cooling system	14.6 L 15.4 U.S.qts 12.8 Imp.qts	Fresh clean soft water with anti-freeze
	Recovery tank	1.5 L 1.6 U.S.qts 1.4 Imp.qts	
3	Washer liquid	1.3 L 1.4 U.S.qts 1.1 Imp.qts	Automobile washer liquid
4	Engine crankcase (with filter)	14.6 L 15.4 U.S.qts 12.8 Imp.qts	Engine oil API Service Classification: CF or CI-4 [External EGR type engine] <ul style="list-style-type: none"> Above $25\text{ }^{\circ}\text{C}$ ($77\text{ }^{\circ}\text{F}$) SAE30, SAE10W-30 or 15W-40 0 to $25\text{ }^{\circ}\text{C}$ (32 to $77\text{ }^{\circ}\text{F}$) SAE20, SAE10W-30 or 15W-40 Below $0\text{ }^{\circ}\text{C}$ ($32\text{ }^{\circ}\text{F}$) SAE10W, SAE10W-30 or 15W-40
5	Transmission case	60 L 63.4 U.S.qts 52.8 Imp.qts	KUBOTA UDT or SUPER UDT fluid*
6	Brake oil (reservoir and lines)	0.3 L 0.3 U.S.qts 0.3 Imp.qts	KUBOTA UDT or SUPER UDT fluid* or Turbine oil 32 (See below) regular type, multipurpose straight mineral oil Mobil DTE Oil #32 TEXACO Regal Oil #32 CHEVRON -GST Oil #32 TERESSO OIL #32 Never use automotive brake oil.
7	Front differential case oil	13.0 L 13.7 U.S.qts 11.4 Imp.qts	KUBOTA UDT or SUPER UDT fluid* or SAE80, SAE90 gear oil
	Front axle gear case oil	4.5 L 4.8 U.S.qts 4.0 Imp.qts	

■ **NOTE**

- *KUBOTA original transmission hydraulic fluid.

Greasing				
No.	Place	No. of greasing point	Capacity	Type of grease
8	Top link	2	Until grease overflows	Multipurpose type grease
	Lift rod	3		
	Front wheel case support	2		
	Front axle support	2		
	Steering joint shaft	1		
	Assist cylinder (if equipped)	2		
	Suspension cylinder	2		
	Suspension arm	2		
	Universal joint	4		
	Battery terminal	2	A small amount	

■ **NOTE**

- ***KUBOTA original transmission hydraulic fluid.**

9Y1210410GEG0001US0

■ NOTE

Engine Oil

- Oil used in the engine should have an American Petroleum Institute (API) service classification and Proper SAE Engine Oil according to the ambient temperatures as shown above :
- With the emission control now in effect, the CF-4 and CG-4 lubricating oils have been developed for use of a low-sulfur fuel on on-road vehicle engines. When an off-road vehicle engine runs on a high-sulfur fuel, it is advisable to employ the "CF or better" lubricating oil with a high Total Base Number (TBN of 10 minimum).
- Refer to the following table for the suitable API classification engine oil according to the engine type (with internal EGR, external EGR or non-EGR) and the fuel (low-sulfur or high-sulfur fuel).

Fuel used	Engine oil classification (API classification)	
	Oil class of engines except external EGR	Oil class of engines with external EGR
High Sulfur Fuel (≥ 500 ppm)	CF (If the "CF-4, CG-4, CH-4, or CI-4" lubricating oil is used with a high-sulfur fuel, change the lubricating oil at shorter intervals. (approximately half))	—
Low Sulfur Fuel (< 500 ppm) or Ultra Low Sulfur Fuel (< 15 ppm)	CF, CF-4, CG-4, CH-4 or CI-4	CF or CI-4 (Class CF-4, CG-4 and CH-4 engine oils cannot be used on EGR type engines)

EGR : Exhaust Gas Re-circulation

- The **CJ-4** engine oil is intended for DPF (Diesel Particulate Filter) type engines, and cannot be used on this tractor.

Fuel

- Cetane number of 45 minimum. Cetane number greater than 50 is preferred, especially for temperatures below -20 °C (-4 °F) or elevations above 1500 m (5000 ft).
- If diesel fuel with sulfur content greater than 0.5 % sulfur content is used, reduce the service interval for engine oil and filter by 50%.
- DO NOT use diesel fuel with sulfur content greater than 1.0 %.
- Diesel fuels specified to EN 590 or ASTM D975 are recommended.
- No.2-D is a distillate fuel of lower volatility for engine in industrial and heavy mobile service. (SAE J313 JUB87)
- Since this engine adopts EPA Tier 4 and Interim Tier 4 standards, the use of low sulfur fuel or ultra low sulfur fuel is mandatory in EPA regulated area (North America). Therefore, please use No.2-D S500 or S15 diesel fuel as an alternative to No.2-D, or use No.1-D S500 or S15 diesel fuel as an alternative to No.1-D if outside air temperature is below -10 °C (14 °F).

Transmission oil

- The oil used to lubricate the transmission is also used as hydraulic fluid. To insure proper operation of the hydraulic system and to complete lubrication of the transmission, it is important that a multi-grade transmission fluid is used in this system. We recommend the use of KUBOTA UDT or SUPER UDT fluid for optimum protection and performance.

Do not mix different brands together.

- Indicated capacities of water and oil are manufacturer's estimate.

9Y1210269GEG0003US0

2. MAINTENANCE

No.	Item		Service Interval													Since then	Important		Reference page	
			50	100	150	200	250	300	350	400	450	500	550	600	650					700
1	Greasing	Check		☆		☆		☆		☆		☆		☆		☆	every 100 Hr			SG-5
2	Accumulator	Check															every 1500 Hr			SG-6
3	Front suspension hose	Replace															every 2 years			SG-7

9Y1210410GEG0002US0

3. CHECK AND MAINTENANCE

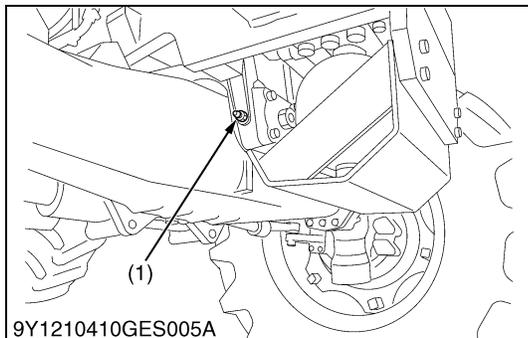


CAUTION

- Be sure to check and service the tractor on a flat place with engine shut off, the parking brake on and chock the wheels.

9Y1210269GEG0005US0

[1] CHECK POINT OF EVERY 100 HOURS

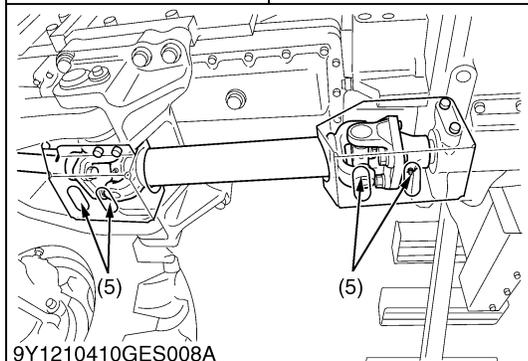
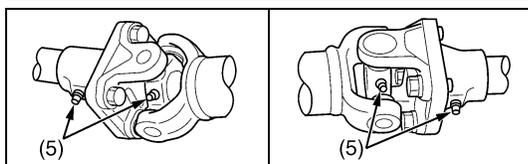
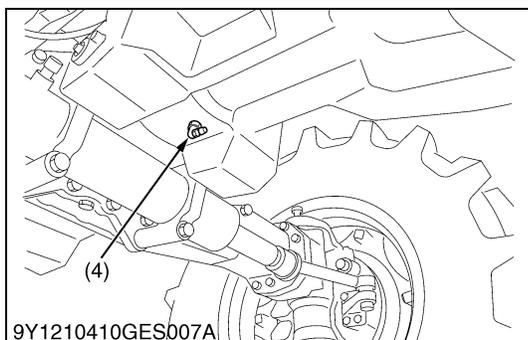
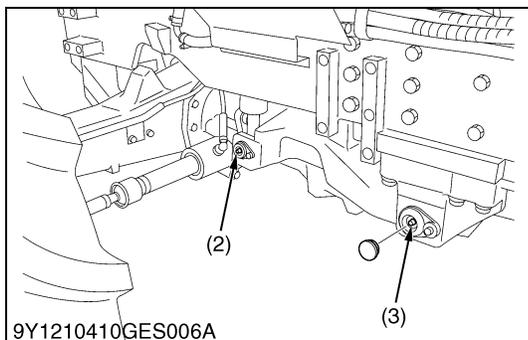


Lubricating Grease Fitting

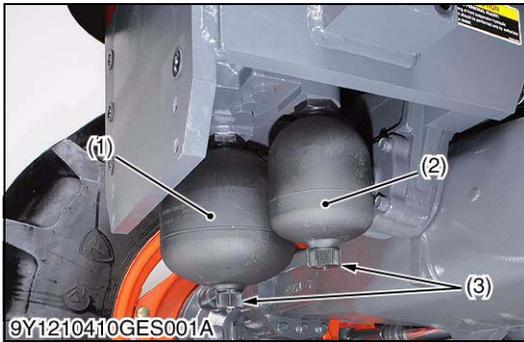
1. Apply a small amount of multipurpose grease to the following points every 100 hours.

- | | |
|---|---|
| (1) Grease Fitting (Front Axle Support) | (4) Grease Fitting (Front Axle Support) |
| (2) Grease Fitting (Suspension Cylinder) (RH, LH) | (5) Grease Fitting (Universal Joint) |
| (3) Grease Fitting (Suspension Arm) (RH, LH) | |

9Y1210410GEG0006US0



[2] CHECK POINT OF EVERY 1500 HOURS



Checking Accumulator Gas Pressure

1. Remove the accumulator cap (3).
2. Set the accumulator pressure reducer (4) to the accumulator (1).

Condition : Temperature 20 °C (68 °F)

Accumulator for cylinder extension gas pressure	Factory spec.	2.90 to 3.00 MPa 29.6 to 30.5 kgf/cm ² 421 to 435 psi
Accumulator for cylinder descent gas pressure		1.60 to 1.70 MPa 16.4 to 17.3 kgf/cm ² 232 to 246 psi

- In order that the recommended pre-charge pressure are maintained even at relatively high operating temperatures, the pre-charge pressure $P_{0 \text{ charge}}$ for charging and testing a cold accumulator must be selected as follows :

$$P_c = P_r \times [(T_1 + 273) \div (T_2 + 273)]$$

T_1 = Precharge Temperature (°C)

T_2 = Operating Temperature (°C)

$$P_c = P_r \times [(T_1 + 459.67) \div (T_2 + 459.67)]$$

T_1 = Precharge Temperature (°F)

T_2 = Operating Temperature (°F)

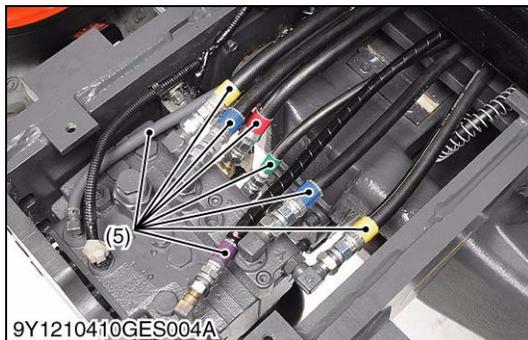
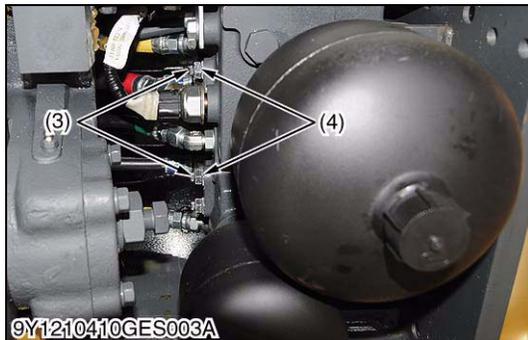
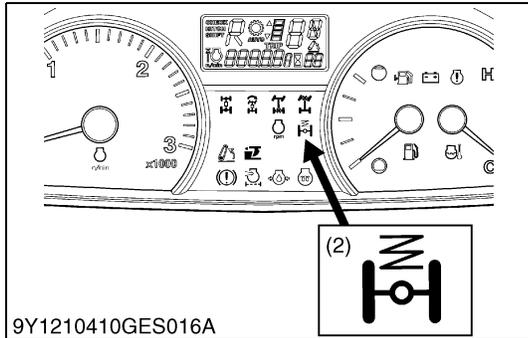
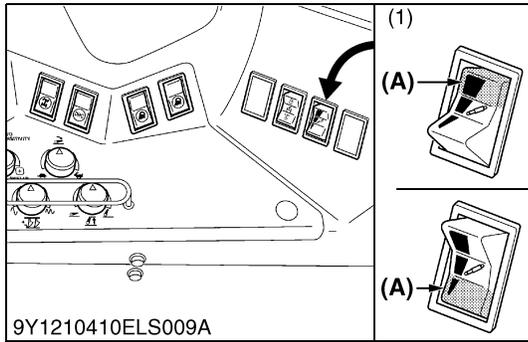
P_c = Compensation Pressure

P_r = Reading Pressure

- (1) Accumulator for Cylinder Extension (3) Accumulator Cap
 (2) Accumulator for Cylinder Descent (4) Pressure Reducer

9Y1210410GEG0003US0

[3] CHECK POINT OF EVERY 2 YEARS



Replacing Front Suspension Hoses

⚠ CAUTION

To avoid personal injury :

- The front suspension control system is working when the engine is running. In the ON mode, the LOCK mode or the AUTO LOCK mode the control system will subtly change the machines height at start up or as weight changes when implements are attached. These subtle movements can be unexpected. Before starting it, make sure the area near the machine is clear of all persons and objects.

1. Start the engine.
2. Hold down the top (Firm mode) or the bottom (Soft mode) of the ride condition damper switch (1) to the second stage for more than 3 seconds, the buzzer starts peeping and the suspension indicator (2) starts flashing. (Two or so flashes every second), then the machine gets in the Manual Control Mode
3. Hold down the bottom (Soft mode) of the ride condition damper switch (1) to the second stage until the suspension cylinder descent to the end.
4. Stop the engine.
5. Remove the battery under cover.
6. To release the accumulator oil pressure and the suspension cylinder pressure, loosen the lock nuts (4) and pressure releasing valves (3) by 3 turns.

■ IMPORTANT

- The fluid is returned from the circuit to the tank and prevent discharge of fluid during hydraulic pressure inspection and repairs by three pressure releasing valve.
7. After releasing the pressure, retighten the pressure releasing valves (3) and the lock nuts (4) at the specified torque.
 8. Renew the front suspension hoses (5).
 9. Attach the battery under cover.
 10. Restart the engine.
 11. Hold down the top (Firm mode) or the bottom (Soft mode) of the ride condition damper switch (1) to the second stage for more than 3 seconds, the buzzer starts peeping and the suspension indicator (2) starts flashing. (Two or so flashes every second) Then the machine gets in the Manual Control Mode.
 12. Hold down the top (Firm mode) of the ride condition damper switch (1) to the second stage, and extend the suspension cylinder to the end.
 13. Hold down the bottom (Soft mode) of the ride condition damper switch (1) to the second stage, and retract the suspension cylinder to the end.

Tightening torque	Lock nut	7.8 to 9.8 N·m 0.80 to 0.99 kgf·m 5.8 to 7.2 lbf·ft
	Pressure releasing valve	4.9 to 6.9 N·m 0.50 to 0.70 kgf·m 3.7 to 5.0 lbf·ft

- (1) Ride Condition Damper Switch
 - (2) Suspension Indicator
 - (3) Pressure Releasing Valve
 - (4) Lock Nut
 - (5) Front Suspension Hose
- (A) "PRESS DOWN TO THE SECOND STAGE"p

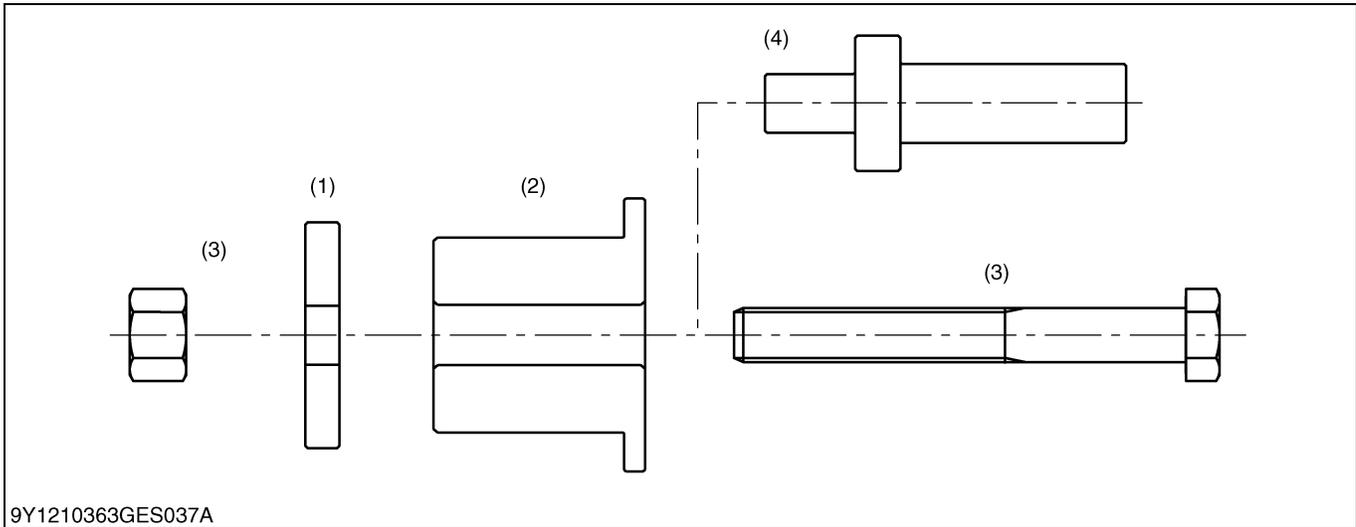
4. SPECIAL TOOLS

[1] SPECIAL TOOLS FOR TRACTOR

Bushing Replacing Tool

Application

- Use to replace the front axle frame bushing.

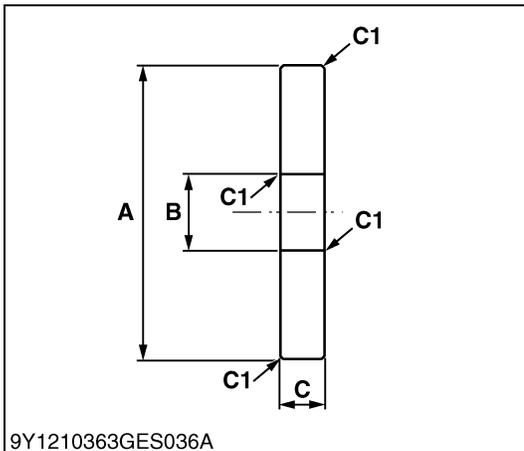


9Y1210363GES037A

- (1) Bushing Replacing Tool-A (2) Bushing Replacing Tool-B (3) Bushing Replacing Tool-C (4) Bushing Replacing Tool-D

9Y1210410GEG0012US0

(1) Bushing Replacing Tool-A

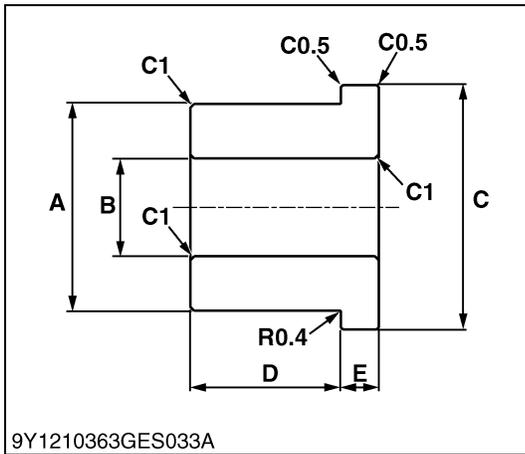


9Y1210363GES036A

A	120 mm dia. (4.72 in. dia.)
B	25 mm dia. (0.98 in. dia.)
C	15 mm (0.59 in.)
C1	Chamfer 1 mm (0.04 in.)

Material : S45C
9Y1210363GEG0036US0

(2) Bushing Replacing Tool-B



[For Front Axle Frame 1]

A	74.970 to 75.000 mm dia. (2.9516 to 2.9527 in. dia.)
B	26.000 to 26.021 mm dia. (1.0237 to 1.0244 in. dia.)
C	100 mm dia. (3.94 in. dia.)
D	40 mm (1.6 in.)
E	10 mm (0.39 in.)
R0.4	0.4 mm radius (0.02 in. radius)
C0.5	Chamfer 0.5 mm (0.02 in.)
C1	Chamfer 1 mm (0.04 in.)

Material : S45C-D

[For Front Axle Frame 2]

(For Bushing)

A	39.950 to 39.975 mm dia. (1.5729 to 1.5738 in. dia.)
B	26.000 to 26.021 mm dia. (1.0237 to 1.0244 in. dia.)
C	64.85 to 64.90 mm dia. (2.554 to 2.555 in. dia.)
D	28 mm (1.6 in.)
E	10 mm (0.39 in.)
R0.4	0.4 mm radius (0.02 in. radius)
C0.5	Chamfer 0.5 mm (0.02 in.)
C1	Chamfer 1 mm (0.04 in.)

Material : S45C-D

(For Bushing)

A	89.965 to 90.000 mm dia. (3.5420 to 3.5433 in. dia.)
B	26.000 to 26.021 mm dia. (1.0237 to 1.0244 in. dia.)
C	94.793 to 94.880 mm dia. (3.7320 to 3.7354 in. dia.)
D	40 mm (1.6 in.)
E	10 mm (0.39 in.)
R0.4	0.4 mm radius (0.02 in. radius)
C0.5	Chamfer 0.5 mm (0.02 in.)
C1	Chamfer 1 mm (0.04 in.)

Material : S45C-D

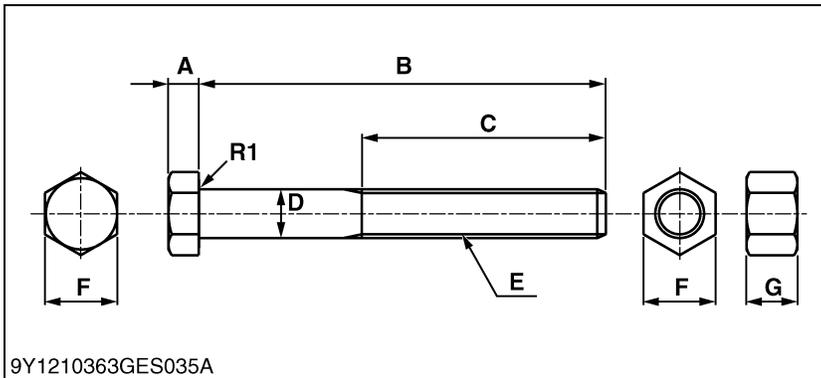
(For Oil Seal)

A	89.965 to 90.000 mm dia. (3.5420 to 3.5433 in. dia.)
B	26.000 to 26.021 mm dia. (1.0237 to 1.0244 in. dia.)
C	99.793 to 99.880 mm dia. (3.9289 to 3.9322 in. dia.)
D	40 mm (1.6 in.)
E	10 mm (0.39 in.)
R0.4	0.4 mm radius (0.02 in. radius)
C0.5	Chamfer 0.5 mm (0.02 in.)
C1	Chamfer 1 mm (0.04 in.)

Material : S45C-D

9Y1210410GEG0005US0

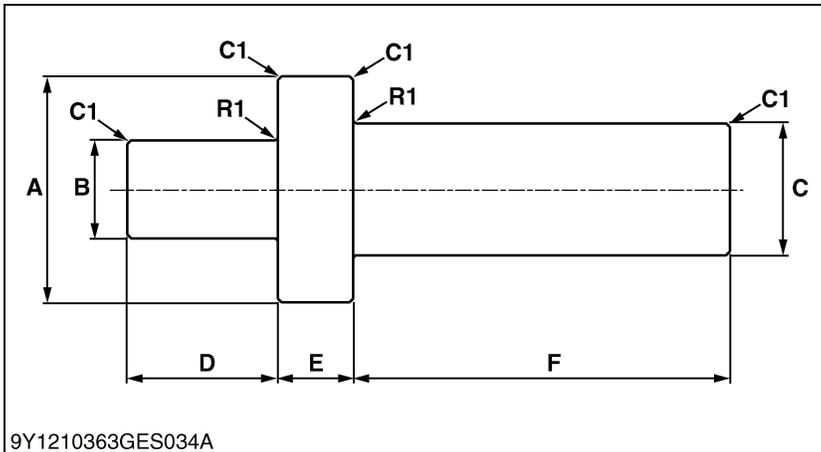
(3) Bushing Replacing Tool-C



A	15 mm (0.59 in.)
B	380 mm (15.0 in.)
C	230 mm (9.06 in.)
D	24 mm dia. (0.94 in. dia.)
E	TR24 × P5.0
F	35 mm (1.4 in.)
G	25 mm (0.98 in.)
R1	1 mm radius (0.04 in. radius)

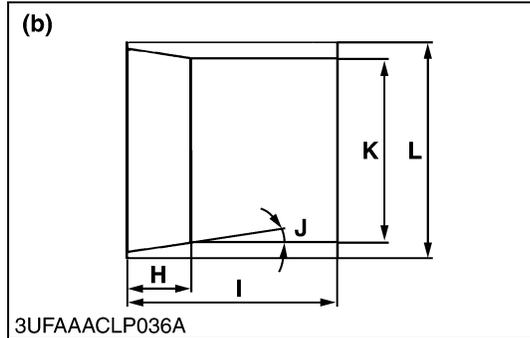
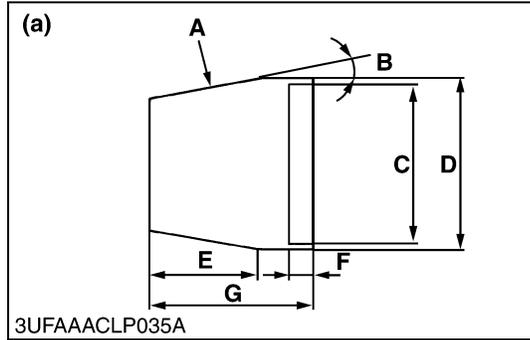
Material : S45C-D
9Y1210363GEG0035US0

(4) Bushing Replacing Tool-D



A	60.00 to 60.10 mm dia. (2.363 to 2.366 in. dia.)
B	25.94 to 26.96 mm dia. (1.0213 to 1.0220 in. dia.)
C	35 mm dia. (1.4 in. dia.)
D	40 mm (1.6 in.)
E	20 mm (0.79 in.)
F	100 mm (3.94 in.)
R1	1 mm radius (0.04 in. radius)
C1	Chamfer 1 mm (0.04 in.)

Material : S45C-D
9Y1210363GEG0034US0



Hydraulic Cylinder Piston Sealing Tool

Application

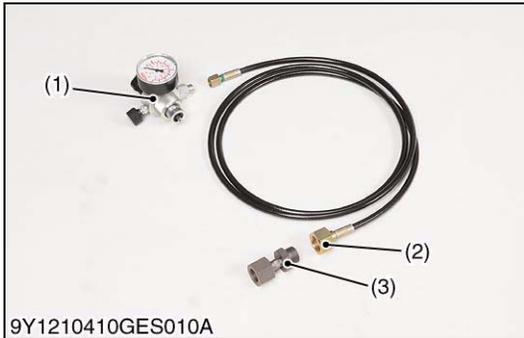
- Tool (a) : Use for installing the position seals to the piston.
- Tool (b) : Use for installing the position to the cylinder.

Cylinder Size : 60 mm (2.36 in)	
A	80 √
B	0.16 rad (9.0 °)
C	60.18 mm (2.369 in.)
D	61.18 mm (2.409 in.)
E	42 mm (1.7 in.)
F	10 mm (0.39 in.)
G	58.5 mm (2.30 in.)
H	14 mm (0.55 in.)
I	35 mm (1.4 in.)
J	0.12 rad (7.0 °)
K	60.0 mm (2.36 in.)
L	68.9 mm (2.71 in.)

9Y1210410GEG0007US0



9Y1210410GES009A



9Y1210410GES010A

Accumulator Gas Charge Kit

Application

- Use to charge nitrogen gas to accumulator.

(Reference)

Those tools are provided by HYDAC TECHNOLOGY GMBH. (HYDAC Universal Charging and Testing Unit FPU-1)

Reference web page

<http://www.hydacusa.com/accum/accum.htm>

- Adaptors (3) are for nitrogen bottles from different countries, so that it is necessary to select the adapter as shown in the chart below.

Country	Adaptor	HYDAC / part No.
USA	G4	236373
Canada	G4	236373
France	G3	2103421
Germany	G1	Already fitted to hose
Spain	G2	236376
	G3	2103421

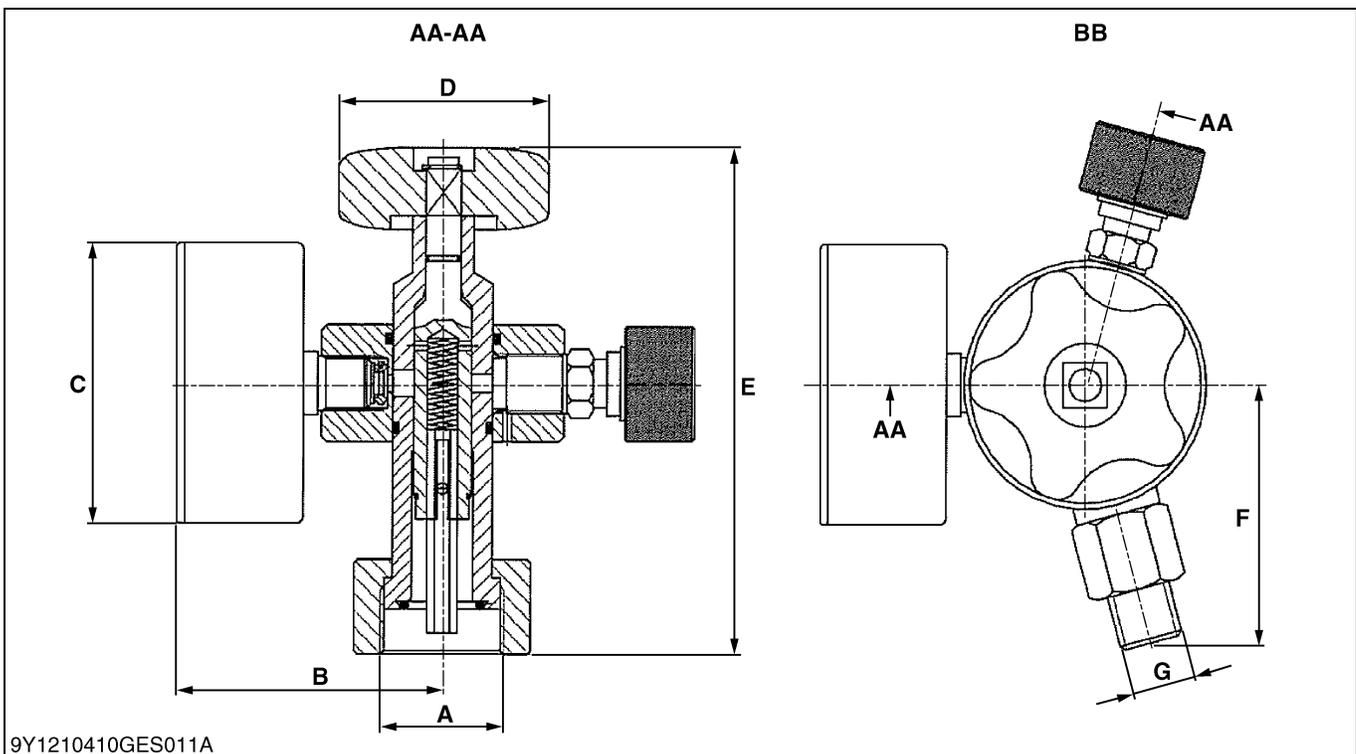
- Charging hose length 2.5 m (98 in.).

- (1) Pressure Reducer
- (2) Charging Hose

- (3) Adaptor
- (4) Operator's Manual

9Y1210410GEG0008US0

(1) Pressure Reducer

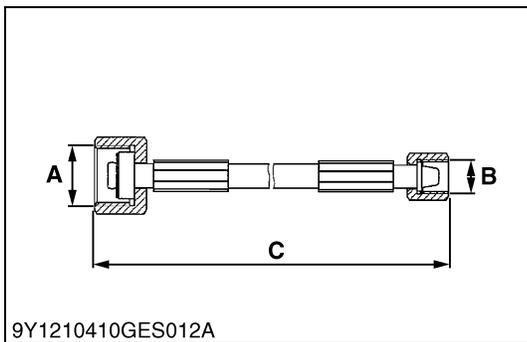


9Y1210410GES011A

A	M28 × P1.5	E	110 mm (4.33 in.)
B	60 mm (2.4 in.)	F	56 mm (2.2 in.)
C	63 mm dia. (2.5 in. dia.)	G	M14 × P1.5
D	47 mm dia. (1.8 in. dia.)		

9Y1210410GEG0009US0

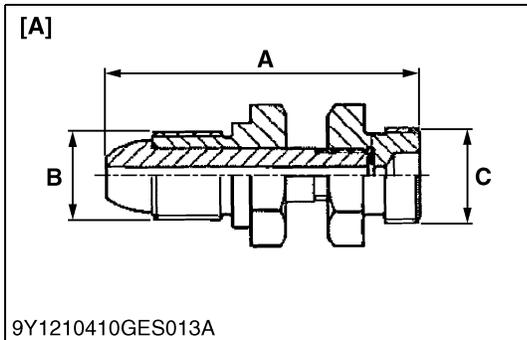
(2) Charging Hose



A	W24.32 × 1/14"
B	M14 × P1.5
C	2.5 m (98 in.)

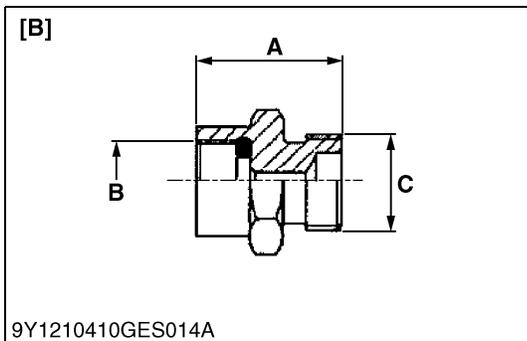
9Y1210410GEG0010US0

(3) Adaptor



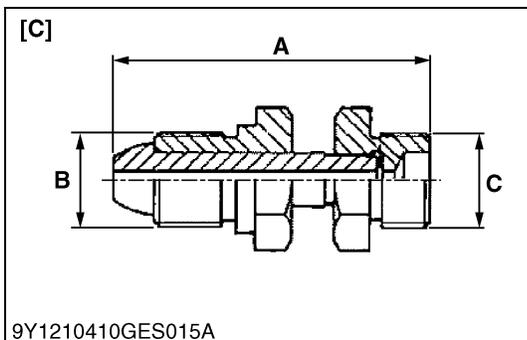
[A] G2

A	81 mm (32 in.)
B	G 5/8
C	W24.32 × 1/14"



[B] G3

A	37 mm (1.5 in.)
B	W21.8 × 1/14"
C	W24.32 × 1/14"



[C] G4

A	81 mm (32 in.)
B	W24.51 × 1/14"
C	W24.32 × 1/14"

9Y1210410GEG0011US0

S6 FRONT AXLE

MECHANISM

CONTENTS

1. STRUCTURE.....	S6-M1
[1] 4-WHEEL DRIVE TYPE	S6-M1
[2] FRONT SUSPENSION.....	S6-M2

1. STRUCTURE

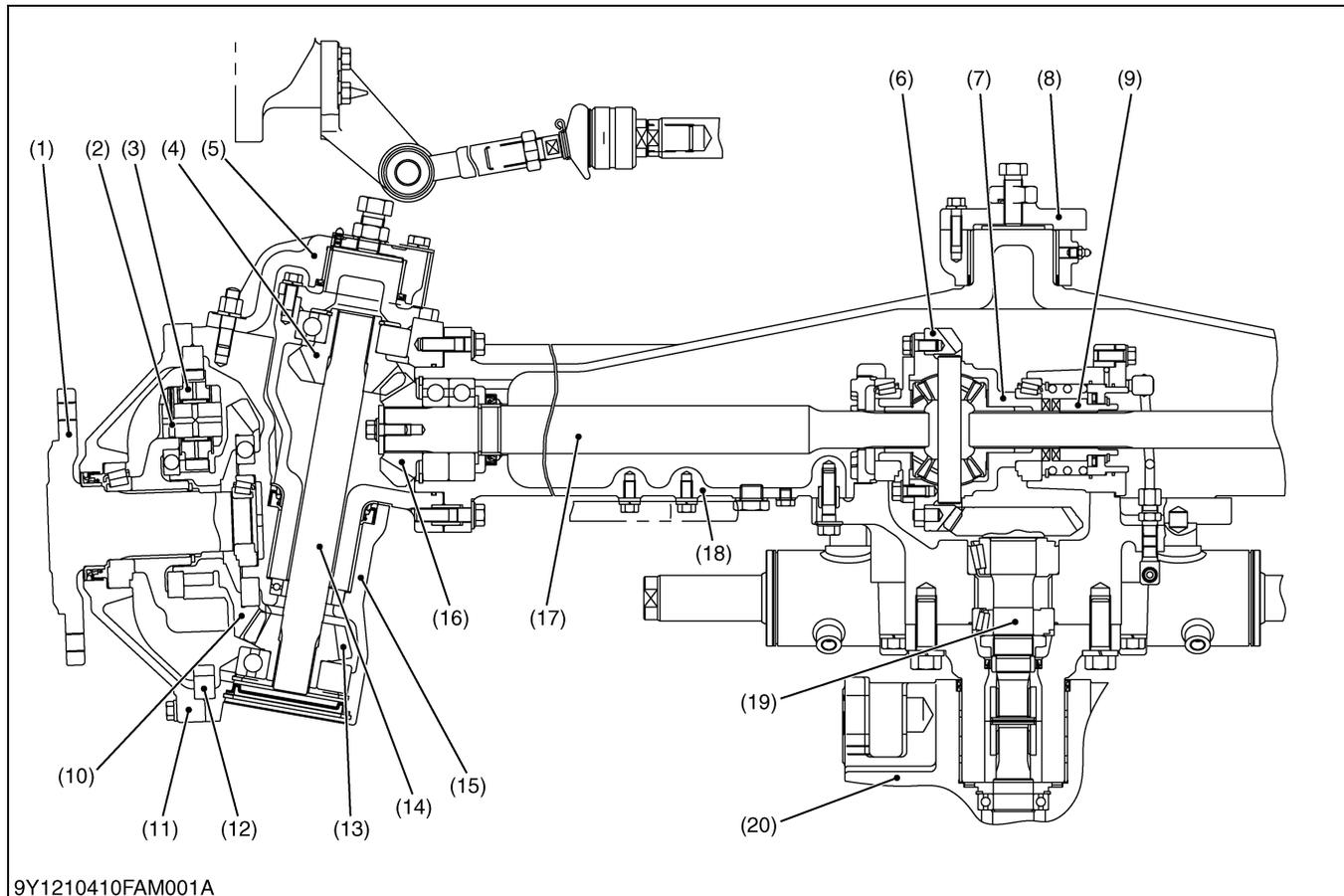
The front axle supports the front of tractor and facilitates steering. The four wheel drive axle has powered front wheels.

■ NOTE

- Refer to "6. FRONT AXLE" section in the workshop manual of tractor mechanism (Code No. 9Y021-18200).

9Y1210269FAM0001US0

[1] 4-WHEEL DRIVE TYPE



9Y1210410FAM001A

- | | | | |
|-----------------------------|-----------------------|----------------------------|------------------------------|
| (1) Front Axle | (6) 33T Bevel Gear | (11) Front Axle Case Cover | (16) 15T Bevel Gear |
| (2) Planetary Gear Pin | (7) Differential Case | (12) 56T Internal Gear | (17) Differential Yoke Shaft |
| (3) 17T Planetary Gear | (8) Bracket (Front) | (13) 14T Bevel Gear | (18) Front Differential Case |
| (4) 16T Bevel Gear | (9) Piston | (14) Bevel Gear Shaft | (19) 18T Bevel Pinion Shaft |
| (5) Front Axle Case Support | (10) 35T Bevel Gear | (15) Front Axle Case | (20) Bracket (Rear) |

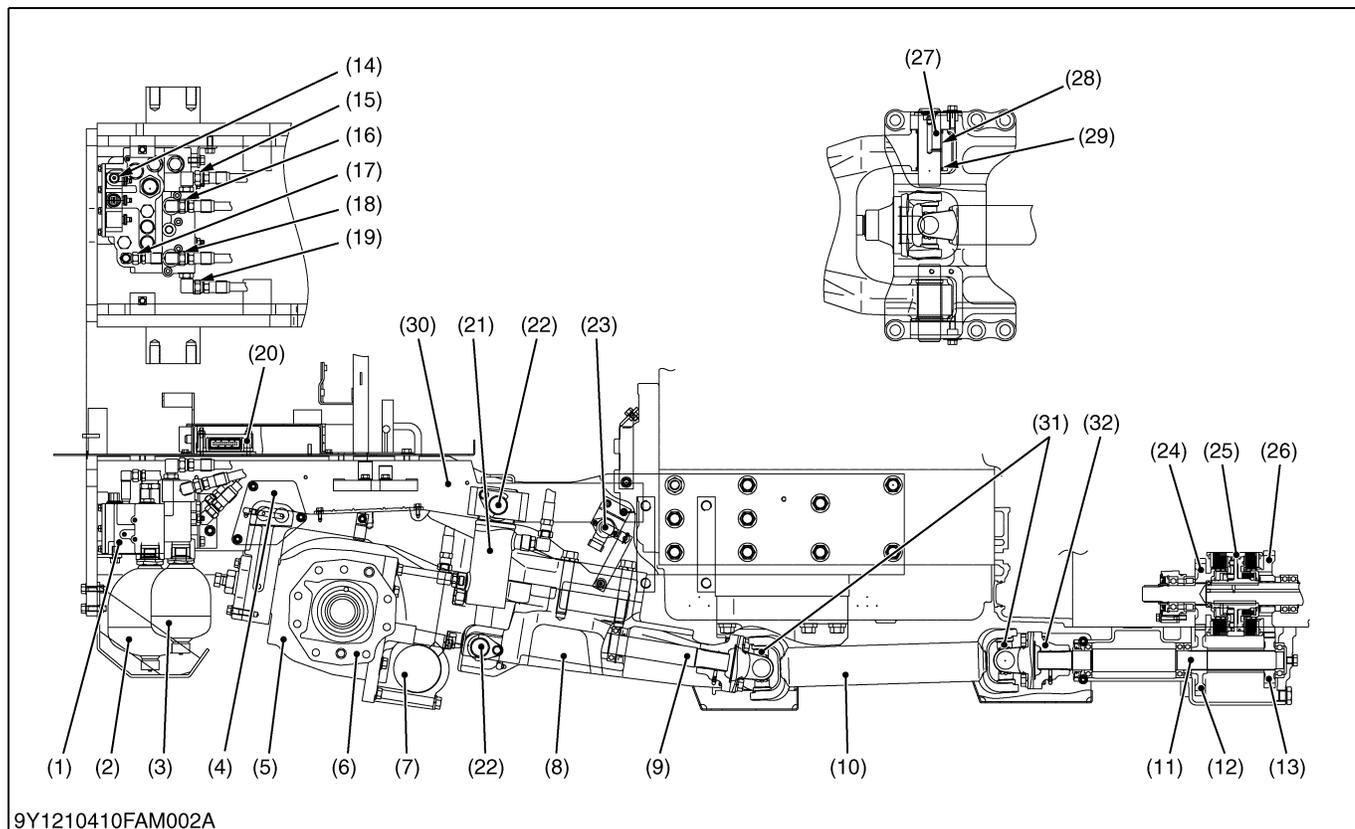
The front axle of the 4WD is constructed as shown above. Power is transmitted from the transmission through the propeller shaft to the bevel pinion shaft (19), then to the bevel gear (16) after that to the differential gear.

The power through the differential is transmitted to the differential yoke shaft (17), and to the bevel gear shaft (14) in the front axle case (15).

The revolution is greatly reduced by the bevel gears (13), (10), then the power is transmitted to the axle (1). The differential system allows each wheel to rotate at a different speed to make turning easier.

9Y1210410FAM0001US0

[2] FRONT SUSPENSION



- | | | | |
|--|-----------------------------|---------------------------|----------------------------|
| (1) Suspension Valve | (9) Front Propeller Shaft | (17) Hose (Pilot) | (25) 4WD/Bi-speed Clutch |
| (2) Accumulator for Cylinder Extension | (10) Middle Propeller Shaft | (18) Hose (Cylinder Rod) | (26) 36T Gear for Bi-speed |
| (3) Accumulator for Cylinder Descent | (11) Rear Propeller Shaft | (19) Hose (Cylinder Head) | (27) Main Frame Pin |
| (4) Plate | (12) 29T Gear for 4WD | (20) ECU (FS) | (28) Bush |
| (5) Differential Gear Lock Case | (13) 22T Gear for Bi-speed | (21) Cylinder | (29) Oil Seal |
| (6) Front Axle Case | (14) Fuel Hose | (22) Cylinder Pin | (30) Front Frame |
| (7) Steering Cylinder | (15) Hose (Cylinder Head) | (23) Stroke Sensor | (31) Universal Joint |
| (8) Main Frame | (16) Hose (Cylinder Rod) | (24) 29T Gear for 4WD | (32) Flange Yoke |

Two suspension cylinders (21) are located under the both inside of the front frame (30).

The suspension cylinders (21) support the front wheels and stabilize the tractor body by its elongation and retraction.

Accumulator (2), (3) tied to the cylinder provides ability to hold up weight in place and the function of absorbing the shock generated when the cylinder (21) is extended or retracted. There are different size of two accumulators adapting with this suspension system.

A large size accumulator for cylinder extension (2) is located on the extension side fluid circuit of the cylinder (21), a small size accumulator for cylinder descent (3) is located on the retraction side of the cylinder (21).

Stroke sensor (23) is located under the right inside of the front frame to detect the cylinder (21) length.

When the engine is started, regardless of the suspension switch state, the cylinder (21) is automatically extended or retracted for chassis height adjustment maintaining of a neutral height position.

The ECU (FS) (20) is located under the battery and this controls the cylinder (21) through outputs to solenoids inside the suspension valves (1) based on information from the related switches and sensors.

The universal joint (31) is used due to the change in the angle of propeller shafts when acting the front suspension.

9Y1210410FAM0002US0

SERVICING

CONTENTS

1. TROUBLESHOOTING.....	S6-S1
2. SERVICING SPECIFICATIONS.....	S6-S2
3. TIGHTENING TORQUES.....	S6-S3
4. CHECKING, DISASSEMBLING AND SERVICING.....	S6-S4
[1] DISASSEMBLING AND ASSEMBLING.....	S6-S4
[2] SERVICING.....	S6-S8