H. CLEARANCE BETWEEN FRONT AXLE CASE BOSSES AND BRACKET BUSHINGS

1. Measure the front axle case bosses O.D. with an outside micrometer.
2. Measure the bracket bushing I.D. with an inside micrometer and calculate the clearance.
3. If the clearance exceeds the allowable limit, replace the bracket bushing.
4. If the clearance still exceeds the allowable limit, replace the front axle case.

Item	Factory spec.	Allowable limit
Clearance between front axle case boss (front) and bracket bushing (front)	0.000 ~ 0.110 mm 0.0000 ~ 0.0040 in.	0.35 mm 0.0138 in.

Item	Factory spec.	Allowable limit
Front axle case boss (front) O.D.	34.075 ~ 35.000 mm 1.34154 ~ 1.37795 in.	-
Bracket bushing (front) I.D.	35.000 ~ 35.085 mm 1.37795 ~ 1.38130 in.	-

Item	Factory spec.	Allowable limit
Clearance between front axle case boss (rear) and bracket bushing (rear)	0.060 ~ 0.220 mm 0.00236 ~ 0.00866 in.	0.35 mm 0.0138 in.

Item	Factory spec.	Allowable limit
Front axle case boss (rear) O.D.	64.070 ~ 65.000 mm 2.52244 ~ 2.55906 in.	-
Bracket bushing (rear) I.D.	65.060 ~ 65.190 mm 2.56142 ~ 2.56654 in.	-

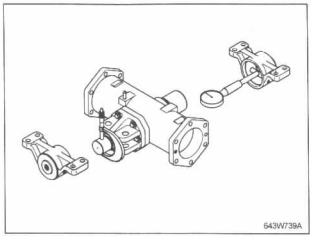
a. Press-fitting Bushing

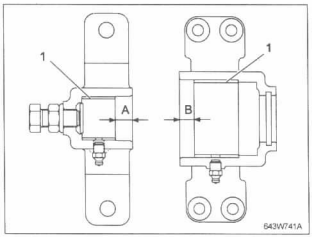
- When press-fitting a new bushing, observe the dimension described in the figure.

Item	Factory spec.	Allowable limit
Press-fit depth of bushing (A)	15.5 mm 0.61 in.	-
Press-fit depth of bushing (B)	13 mm 0.51 in.	-

NOTE:

- *After replacing the bushing, be sure to adjust the front axle rocking force. (see page 7-9)*



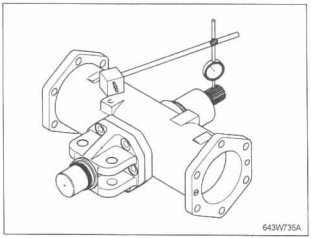


(1) Bushing

E. BACKLASH BETWEEN SPIRAL BEVEL PINION SHAFT AND SPIRAL BEVEL GEAR

1. Set a dial gauge (lever type) with its finger on the spline of spiral bevel pinion shaft.
2. Measure the backlash by moving the spiral bevel pinion shaft by hand lightly.
3. If the backlash is not within the factory specifications, change the adjusting collars (3), (4). Change the adjusting collar (4) to 0.1 mm (0.004 in.) smaller size, and change the adjusting collar (3) to 0.1 mm (0.004 in.) larger size.
4. Adjust the backlash properly by repeating the above procedures.

Item	Factory spec.
Backlash between spiral bevel pinion shaft and spiral bevel gear	0.1 ~ 0.3 mm 0.004 ~ 0.012 in.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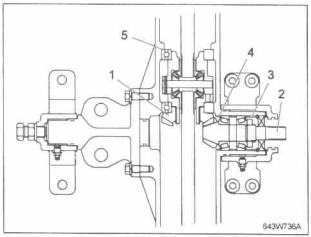

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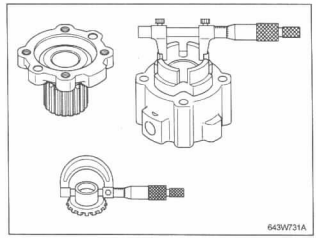
(1) Spiral Bevel Gear
(2) Spiral Bevel Pinion Shaft
(3) Adjusting Collar
(4) Adjusting Collar
(5) Shim

2.4 SERVICING

A. CLEARANCE BETWEEN DIFFERENTIAL CASE AND DIFFERENTIAL SIDE GEAR

1. Measure the differential side gear boss O.D.
2. Measure the differential case bore I.D. and calculate the clearance.
3. Measure the differential case cover bore I.D. and calculate the clearance.
4. If the clearance exceeds the allowable limit, replace faulty parts.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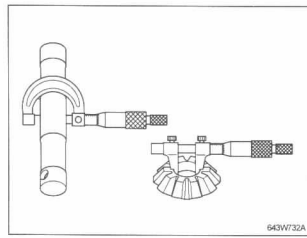
Item	Factory spec.	Allowable limit
Clearance between differential case (Differential case cover) and differential side gear	0.040 ~ 0.074 mm 0.00167 ~ 0.00291 in.	0.35 mm 0.0138 in.

Item	Factory spec.	Allowable limit
Differential case bore I.D.	26.020 ~ 26.041 mm 1.02441 ~ 1.02524 in.	-
Differential case cover bore I.D.	26.020 ~ 26.041 mm 1.02441 ~ 1.02524 in.	-
Differential side gear O.D.	25.067 ~ 25.080 mm 0.98689 ~ 0.98740 in.	-

B. CLEARANCE BETWEEN PINION SHAFT AND DIFFERENTIAL PINION

1. Measure the pinion shaft O.D.
2. Measure the differential pinion I.D. and calculate the clearance.
3. If the clearance exceeds the allowable limit, replace faulty parts.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Item	Factory spec.	Allowable limit
Clearance between pinion shaft and differential pinion	0.016 ~ 0.052 mm 0.00063 ~ 0.00204 in.	0.25 mm 0.0098 in.

Item	Factory spec.	Allowable limit
Pinion shaft O.D.	10.966 ~ 10.984 mm 0.43173 ~ 0.43244 in.	-
Differential pinion I.D.	11.000 ~ 11.018 mm 0.43307 ~ 0.43378 in.	-

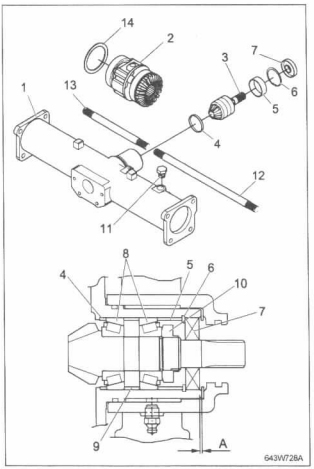
j. Disassembling Spiral Bevel Pinion Shaft and Differential Gear Assembly

1. Take out the differential yoke shaft (12), (13) both sides.
2. Remove the oil seal (7) and internal snap ring (6).
3. Remove the plug (11), and then tap out the spiral bevel pinion shaft (3) by the brass rod and hammer.
4. Take out the differential gear assembly (2), ball bearing and shim (14) from right side of front axle case (1).
5. Remove the stake of lock nut (10), and then remove the lock nut (10).
6. Remove the taper roller bearings (8).

(When reassembling)

- Replace the lock nut (10), oil seal (7) and plug (11) with new ones.
- Apply grease to the oil seal (6).
- Install the same shims and collars before they are removed.
- Install the taper roller bearings correctly, noting their direction, and apply gear oil to them.
- When press-fitting a oil seat (6), observe the dimension "A" described in the figure.
- Stake the lock nut (10) firmly.
- Tighten up the lock nut (10) until the turning force of the spiral bevel pinion shaft reaches the factory specifications. (See page 7-19)

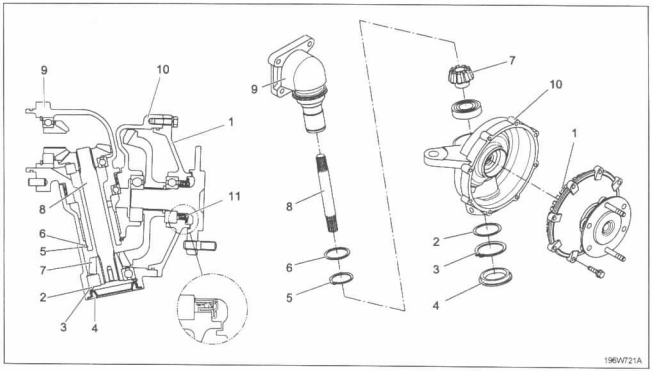
Item	Factory spec.
Spiral bevel pinion shaft turning torque	0.98 ~ 1.18 N·m 0.1 ~ 0.12 Kgf·m 0.72 ~ 0.89 lbs·ft



(A) 1 mm (0.039 in.)

(1) Front Axle Case
(2) Differential Gear Assemly
(3) Spiral Bevel Pinion Shaft
(4) Adjusting Collar
(5) Collar
(6) Snap Ring
(7) Oil Seal
(8) Taper Roller Bearings
(9) Collar
(10) Lock Nut
(11) Plug
(12) Differential Yoke Shaft RH
(13) Differential Yoke Shaft LH
(14) Shim

g. Disassembling Bevel Gear Case, Front Differential Case and 40 Bevel Gear



(1) 40T Bevel Gear
(2) Shim
(3) Snap Ring
(4) Plug
(5) Snap Ring
(6) Shim
(7) 9T Bevel Gear
(8) Bevel Gear Shaft
(9) Bevel Gear Case
(10) Front Differential Case
(11) Oil Seal

1. Remove the plug (4).
2. Remove the internal snap ring (3) and shim (2).
3. Remove the 40T bevel gear (1).
4. Tap out the bevel gear (7) and ball bearing.
5. Draw out the bevel gear shaft (8).
6. Remove the external snap ring (5).
7. Tap the bevel gear case (9), and separate it from the front differential case (10).

(When reassembling)

- Apply grease to the O-ring of 40T bevel gear (1).
- Tighten the axle flange mounting bolts and nuts diagonally in several steps.
- Install the oil seal (11) of bevel gear case, noting its direction as shown in the upper figure.

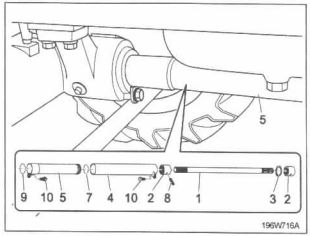
Item	Tightening torque
Axle flange mounting stud bolt	11.8 ~ 15.7 N·m 1.2 ~ 1.6 Kgf·m 8.7 ~ 11.5 lbs·ft
Axle flange mounting screws and nuts	23.6 ~ 27.4 N·m 2.4 ~ 2.8 Kgf·m 17.4 ~ 20.2 lbs·ft

c. Disconnecting Propeller Shaft

1. Slide the propeller shaft cover (5), (4) after removing the bolts (10).
2. Tap out the spring pin (8), and then slide the coupling (2) to the rear.

(When reassembling)

- Apply grease to the splines of the propeller shaft.



(1) Propeller Shaft
(2) Coupling
(3) Cir-Clip
(4) Propeller Shaft Cover 1
(5) Propeller Shaft Cover 2
(6) O-Ring
(7) O-Ring
(8) Spring Pin
(9) O-Ring
(10) Bolt

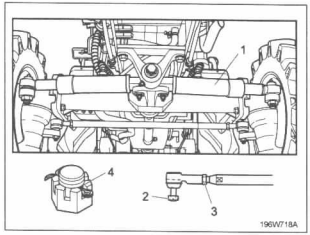
d. Disconnecting Tire-rod

1. Remove the tie-rod.

   In this case, take special care not to damage the tie-rod (1) and slotted nuts (2).

(When reassembling)

Item	Tightening torque
Slotted nut	39.3 ~ 49.1 N·m
	4.0 ~ 5.0 Kgf·m
	29.0 ~ 36.1 lbs·ft
Tie-rod lock nut	166.8 ~ 191.3 N·m
	17.0 ~ 19.5 Kgf·m
	122.9 ~ 141.0 lbs·ft

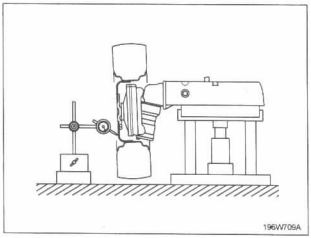


(1) Tie-Rod
(2) Slotted Nut
(3) Tie-Rod Lock Nut
(4) Slotted Nut

d. Axial Sway of Front Wheel

1. Jack up the front side of tractor.
2. Set a dial gauge on the outside of rim.
3. Turn the wheel slowly and read the runout of rim.
4. If the runout exceeds the factory specifications, check the bearing, rim, and front wheel hub.

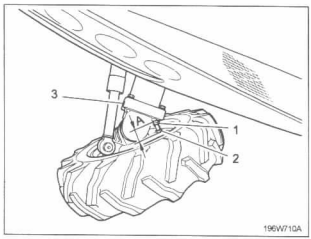
Item	Factory spec.
Axial sway of front wheel	Less than 5.0 mm 0.20 in.



e. Front Wheel Steering Angle

1. Inflate the tires to the specified pressure.
2. Loosen the lock nut and shorten the length of stopper bolt LH (1).
3. Steer the wheels to the extreme left.
4. Lengthen the length of stopper bolt (1) until the stopper bolt contacts with the bevel gear case (3).
5. Return the steering wheel to straight ahead and lengthen the stopper bolt half turn from above position further.
6. Lock the stopper bolt by lock nut (2).
7. For adjusting the right steering angle, perform the same procedure as mentioned in left steering angle.

Item	Factory spec.
Length of adjusting bolt (A)	32 mm 1.259 in.
Steering angle	51 ~ 53° 0.89 ~ 0.92 rad



(1) Stopper Bolt
(2) Lock Nut
(3) Bevel Gear Case

Item		Factory Specification	Allowable Limit
Spiral bevel pinion shaft (Pinion shaft only)	Turning force	98.1 ~ 117.7 N 10 ~ 12 kgf 22.0 ~ 26.5 lbs	-
Spiral bevel pinion shaft to spiral bevel gear	Backlash	0.2 ~ 0.3 mm 0.0078 ~ 0.0118 in.	-
11T bevel gear to 16T bevel gear	Backlash	0.15 ~ 0.35 mm 0.0059 ~ 0.0138 in.	- -
Shim	Thickness	0.1 mm 0.0039 in. 0.2 mm 0.0078 in. 0.4 mm 0.0157 in. 0.8 mm 0.03149 in. 0.1 mm 0.0393 in.	- - - - -
9T bevel gear to 40T bevel gear	Backlash	0.15 ~ 0.35 mm 0.0059 ~ 0.0138 in.	-
Shim	Thickness	0.1 mm 0.0039 in. 0.2 mm 0.0078 in. 0.4 mm 0.0157 in. 0.8 mm 0.03149 in. 1.0 mm 0.0393 in. 1.2 mm 0.0472 in.	- - - - - -

2. SERVICING

2.1 TROUBLESHOOTING

Symptom	Provable Causes	Solution
Front wheels wander to right or left	• Tire pressure uneven	Adjust
	• Improper toe-in adjustment (improper alignment)	Adjust
	• Clearance between front axle case boss and front axle bracket (front, rear) bushing excessive.	Replace
	• Front axle rocking force too small	Adjust
	• Front wheel sway excessive	Replace
	• Tie-rod end loose	Tighten
	• Air sucked in power steering circuit	Bleed
Front wheel can not be driven	• Propeller shaft broken	Replace
	• Front wheel drive gears in transmission broken	Replace
	• Front differential gear broken	Replace
	• Shift fork broken	Replace
	• Coupling displaced	Reassemble
Noise	• Gear backlash excessive	Adjust or replace
	• Oil insufficient	Replenish
	• Bearings damaged or broken	Replace
	• Gears damaged or broken	Replace
	• Spiral bevel pinion shaft turning force improper	Adjust

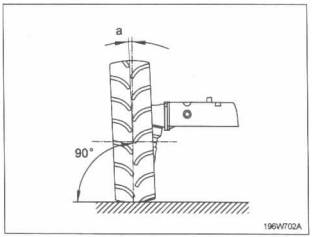
1.2 WHEEL ALIGNMENT

To improve control and safety running, front wheel is applied with adequate inclination in the direction of left, right and forward.

1. Camber reduces bending or twisting of the front axle caused by vertical load or running resistance, and also maintains the stability in running.

   Camber angle

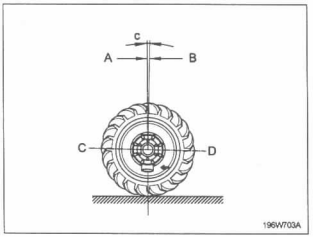
   Camber angle (a) = 2°



2. Caster helps provide steering stability.

   Caster angle

   Caster angle (c) = 0°



(A) Perpendicular (C) Front
(B) Kingpin Center Line (D) Rear

3. Kingpin angle reduces rolling resistance of the wheels, and prevents any shimmy motion of the steering.

   King pin angle

   King pin angle (b) = 12°