WSM

WORKSHOP MANUAL
KUBOTA WHEEL LOADER

R310(B)・R410(B)

SERVICE CHAPTER

Kubota

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Code No.97899-60152

Classification

Section 0	:	Precautions
Section I	:	General
Section II	:	A-LST System
Section III	:	Power Train
Section IV	:	Brake System
Section V	:	Steering System
Section VI	:	Front Loader
Section VII	:	Backhoe
Section VIII	:	Structure
Section IX	:	Engine
Section X	:	Electrical
Section XI	:	Optional Units & Attachment

Classement

Section 0	:	*Précautions*
Section I	:	*Généralités*
Section II	:	*Système A-LST*
Section III	:	*Groupe motopropulseur*
Section IV	:	*Système de frein*
Section V	:	*Système de direction*
Section VI	:	*Pelleteuse avant*
Section VII	:	*Pelle rétrocaveuse*
Section VIII	:	*Structure*
Section IX	:	*Moteur*
Section X	:	*Electricité*
Section XI	:	*Unités et accessoires optionnels*

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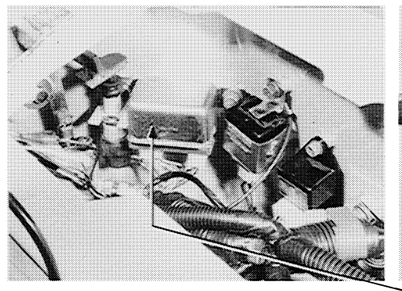
Record of Revisions
Rapport de Révision

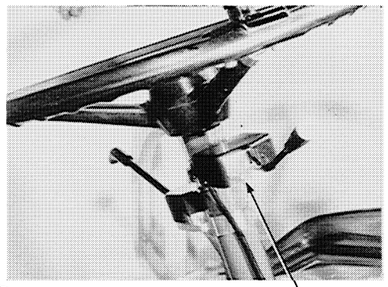
Symbol *Symboles*	Date *Date*	Main Revised Points & Corrective Measures *Principaux points de révision et mesures correctives*	Person-in-charge *Personne responsable*
1	1991 September 30th	1. Optional Units & Attachment 2. Service Information *1. Unités et accessoires optionnels* *2. Information de service*	Hirakata C.E.Service Engineering Section M. Tanaka
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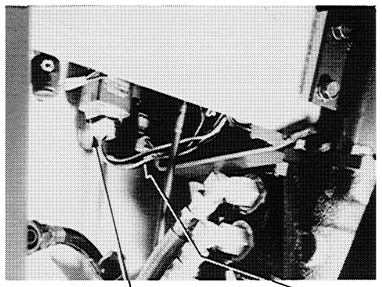
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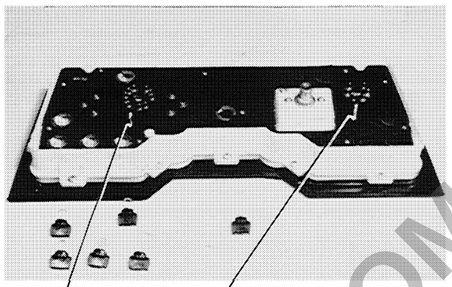
b. Location of electrical units Model: R310 (B)

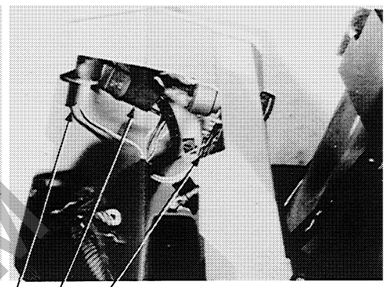
b. Emplacement des unités électriques Modèle: R310 (B)

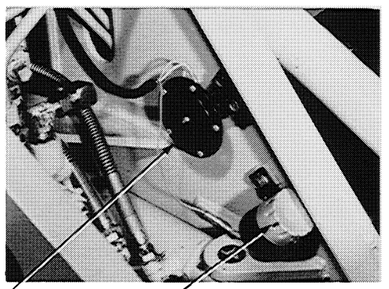


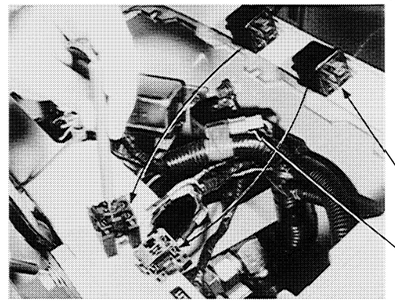


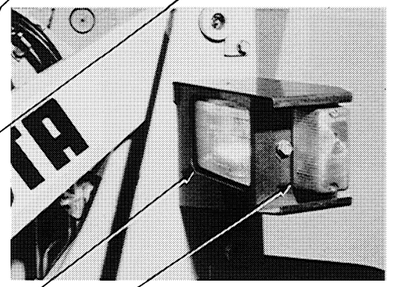


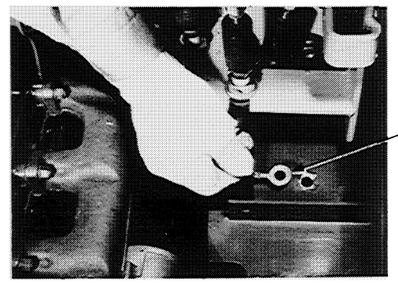


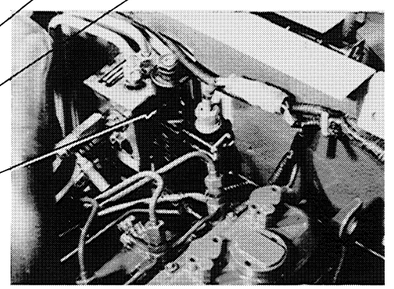


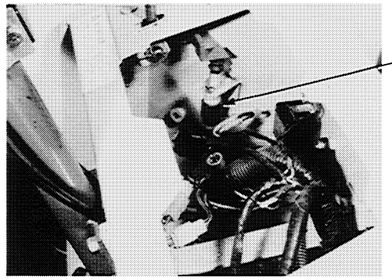


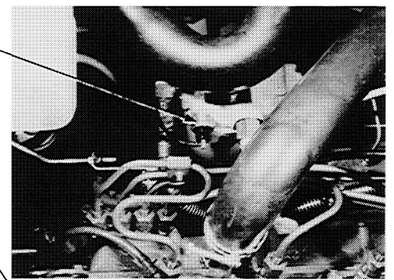


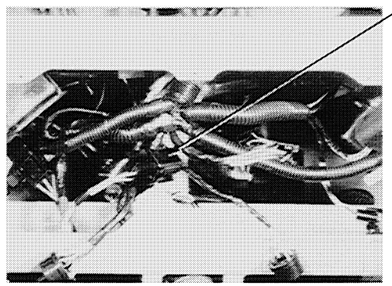


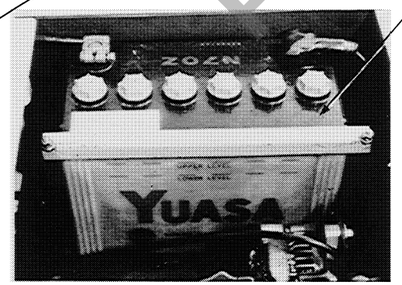


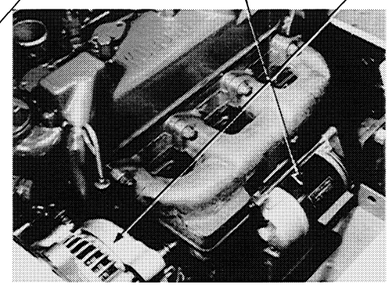


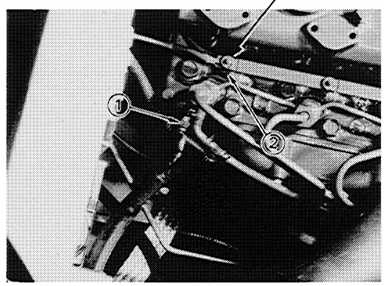


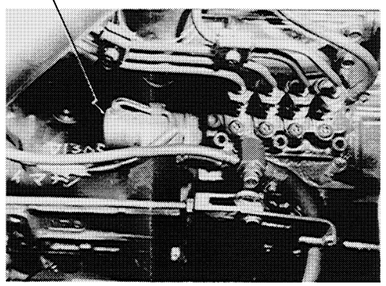


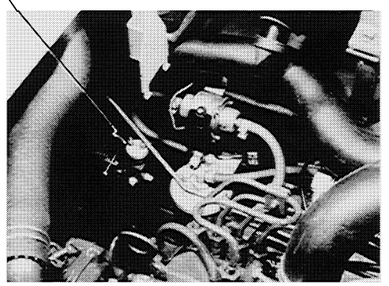










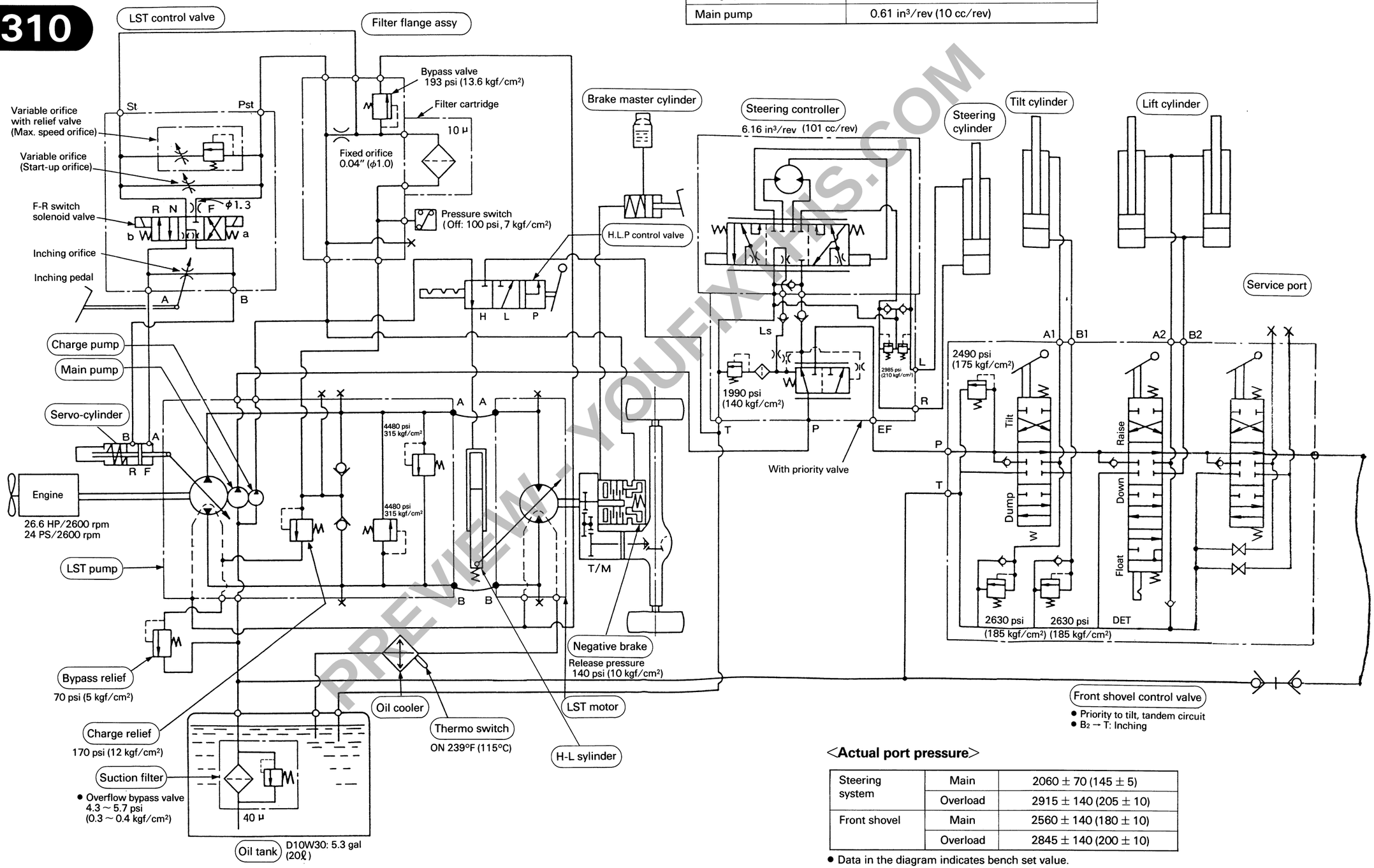


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m. Hydraulic Circuit Diagram

R310



<System capacity>

T/M total reduction ratio	Input: 1.0, Output:41.57
LST pump	1.64 in³/rev (0 ~ 26.8 cc/rev) at 0 ~ 13°
LST motor	Low: 2.30 in³/rev (37.7 cc/rev) at 18° High: 1.12 in³/rev (18.4 cc/rev) at 9°
Charge pump	0.46 in³/rev (7.5 cc/rev)
Main pump	0.61 in³/rev (10 cc/rev)

<Actual port pressure>

Steering system	Main	2060 ± 70 (145 ± 5)
	Overload	2915 ± 140 (205 ± 10)
Front shovel	Main	2560 ± 140 (180 ± 10)
	Overload	2845 ± 140 (200 ± 10)

● Data in the diagram indicates bench set value.

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(When reassembling) R310:

Replace all soft materials, seal and O-ring.

Tightening torque of connector and adaptor;

① 72.3 ~ 86.8 ft.lbf (10 ~ 12 kgf.m)

② 28.9 ~ 36.2 ft.lbf (4 ~ 5 kgf.m)

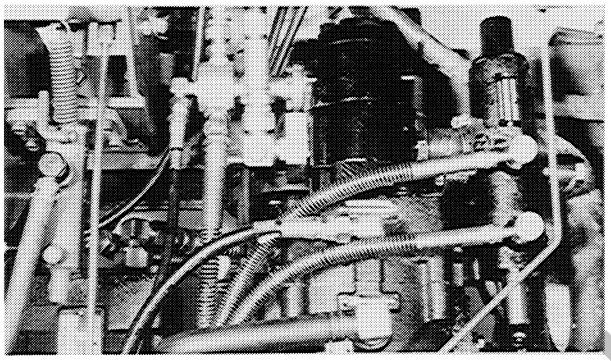
③ 86.8 ~ 101.3 ft.lbf (12 ~ 14 kgf.m)

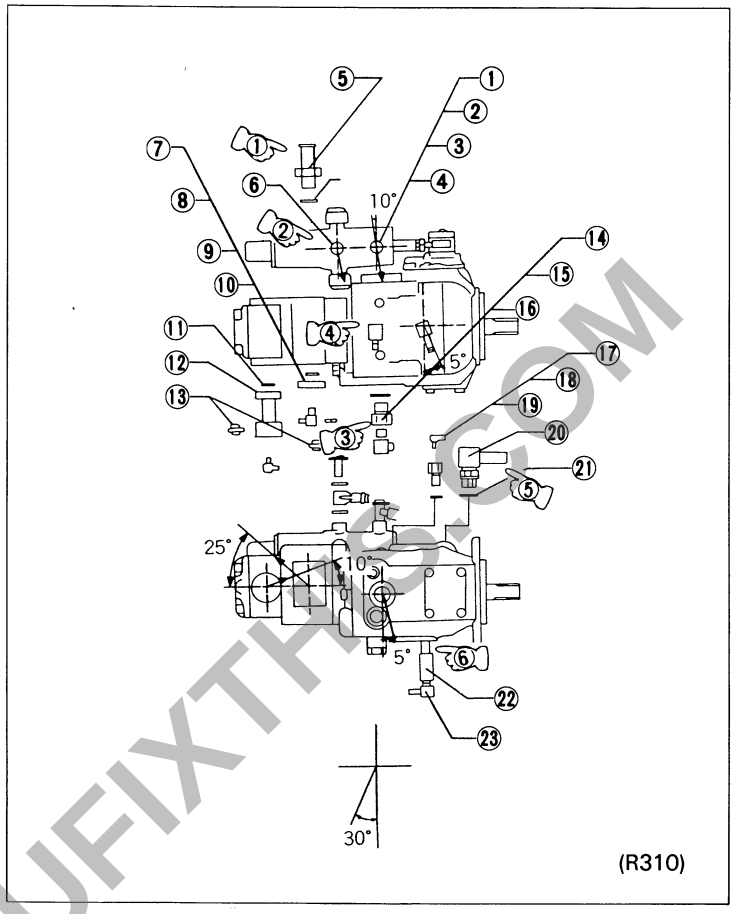
④ ⑤ ⑥ 57.9 ~ 86.8 ft.lbf (8 ~ 12 kgf.m)

Apply grease to the o-ring when tightening.

Tightening torque for PT (tapered thread) and PF (straight thread) are as per the torque table.

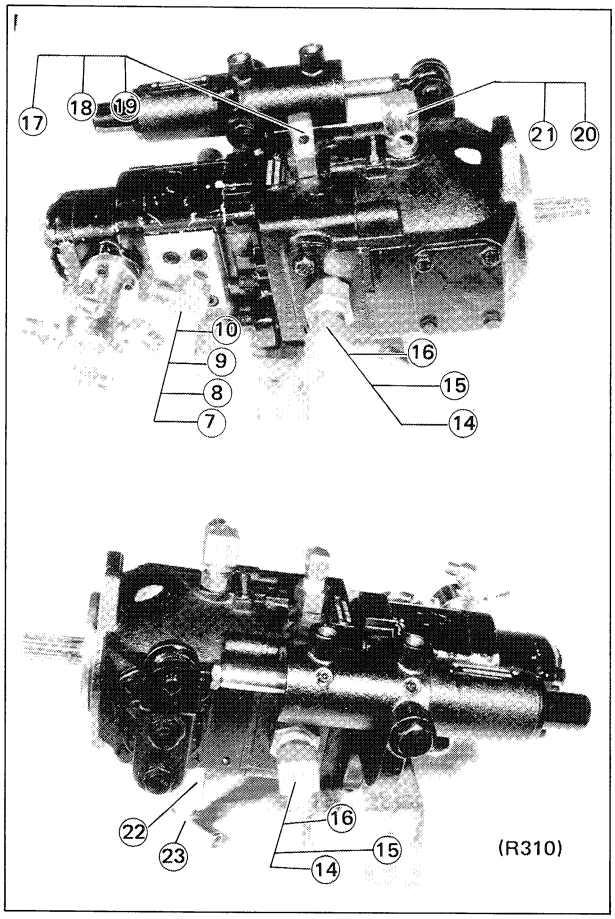
The gap between each hose should be more than 0.4 in (10 mm).





(R310)

① Plug 2 (41081-75165)
② Packing (68841-64211)
③ Hose (68841-64221)
④ O-ring (04811-00290)
⑤ Inlet connector (68841-63121)
⑥ Hose (68841-64231)
⑦ Plug (06312-10030)
⑧ Adaptor elbow (68841-63321)
⑨ Outlet flange (68841-63311)
⑩ O-ring (04811-00280)
⑪ O-ring (04811-00220)
⑫ Adaptor (68841-64411)
⑬ Adaptor 2 (68131-61733)
⑭ Adaptor (68841-64131)
⑮ Adaptor (68841-64111)
⑯ O-ring (68131-61291)
⑰ Elbow 1 (68021-62441)
⑱ Adaptor (68841-64511)
⑲ O-ring (68011-62221)
⑳ Adaptor (68841-63511)
㉑ O-ring 2 (68011-62221)
㉒ Relief valve assy (68841-63901)
㉓ Adaptor (68841-63581)



(R310)

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I. Tightness torque *I. Coupie de serrage et adhésifs*

(1) Piping screw *Vis du tuyau*

Thread size (piping screw) *Cote du pas (vis du tuyau)*	Tightness torque *Couple de serrage* N.m kgf.m, ft.lbf		Wrench size (reference) *Dimension de la clé (référence)*	Remarks *Remarques*
	Union nut section *Ecrou d'accouplement*	Taper thread section *Pas du cône*		
1/8"	7.8 ~ 11.8 N.m 0.8 ~ 1.2 kgf.m, 5.8 ~ 8.7 ft-lbf	14.71 ~ 19.61 N.m 1.5 ~ 20 kgf.m, 10.85 ~ 14.47 ft.lbf	* 0.67 in 17 mm	
1/4"	24.5 ~ 29.4 2.5 ~ 3.0, 18.1 ~ 21.7	36.3 ~ 44.1 3.7 ~ 4.5, 26.8 ~ 32.5	* 0.75 in 19 mm	
3/8"	49.0 ~ 53.9 5.0 ~ 5.5, 36.2 ~ 39.8	39.2 ~ 49.0 4.0 ~ 5.0, 28.9 ~ 36.2	* 0.87 in 22 mm	
1/2"	58.8 ~ 63.7 6.0 ~ 6.5, 43.4 ~ 47.0	49.0 ~ 68.6 5.0 ~ 7.0, 36.2 ~ 50.6	* 1.06 in 27 mm	
3/4"	117.7 ~ 127.5 12.0 ~ 13.0, 86.8 ~ 94.0	127.5 ~ 147.1 13.0 ~ 15.0, 94.0 ~ 108.5	* 1.42 in 36 mm	
1"	137.3 ~ 147.1 14.0 ~ 15.0, 101.3 ~ 108.5	147.1 ~ 166.7 15.0 ~ 17.0, 108.5 ~ 123.0	* 1.61 in 41 mm	

(Note) * Wrench sizes may differ dipending on the manufacturers and thread diameters.
*(Note) * La dimension des clés peut varier suivant les fabricants et le diamètre du pas.*

(2) Joint bodies *Corps du joint*

Thread size (piping screw) *Cote du pas (vis du tuyau)*	Tightness torque *Couple de serrage* N.m kgf.m, ft.lbf		Wrench size (reference) *Dimension de la clé (référence)*	Remarks *Remarques* Steel pipe (O.D.) *Conduit d'acier (D.E.)*	
	(tapered thread) *PT (filet conique)*	PS (straight thread) *PF (filet droit)*			
1/8"	19.6 ~ 29.4 N.m 2.0 ~ 3.0 kgf.m, 14.5 ~ 21.7 ft.lbf		* 0.67 in 17 mm	*When in steel pipe is in use. *En cas d'emploi d'un conduit d'acier.*	0.31 in 8 mm
1/4"	36.3 ~ 44.1 3.7 ~ 4.5, 26.8 ~ 32.5	W/O-ring *Avec/joint torique* W/O-Ring 58.8 ~ 78.5 N.m 6 ~ 8 kgf.m, 43.4 ~ 57.9 ft-lbf	* 0.75 in 19 mm		0.47in 12 mm
3/8"	39.2 ~ 49.0 4.0 ~ 5.0, 28.9 ~ 36.2	W/O-ring *Avec/joint torique* W/O-Ring 78.5 ~ 98.1 N.m 8 ~ 10 kgf.m, 57.9 ~ 72.3 ft.lbf	* 0.91 in 23 mm		0.59 in 15 mm
1/2"	49.0 ~ 68.6 5.0 ~ 7.0, 36.2 ~ 50.6	W/O-ring *Avec/joint torique* W/O-Ring 117.7 ~ 137.3 N.m 12 ~ 14 kgf.m, 86.8 ~ 101.3 ft.lbf	* 1.02 in 26 mm		0.63 in 16 mm

(3) Nuts *Ecrous*

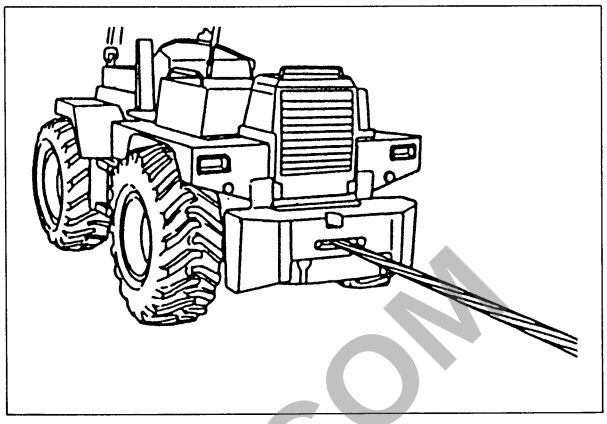
Steel pipe size (O.D. x I.D. x Thickness) *Cote du conduit d'acier (dimension interne externe et épaisseur)*	Tightness torque *Couple de serrage* N.m kgf.m, ft.lbf	Spanner size (reference) *Taille de la clé (référence)*	Remarks *Remarques*
0.31 x 0.24 x 0.04 in ϕ8 x 6 x 1 mm	29.4 ~ 39.2 3.0 ~ 4.0, 21.7 ~ 28.9	* 0.67 in 17 mm	* When sleeve nut is in use * *En cas d'emploi d'un conduit d'acier*
0.39 x 0.28 x 0.06 in ϕ10 x 7 x 1.5 mm	39.2 ~ 44.1 4.0 ~ 4.5, 28.9 ~ 32.5	* 0.75 inn 19 mm	
0.47 x 0.35 x 0.06 in ϕ12 x 9 x 1.5 mm	53.9 ~ 63.7 5.5 ~ 6.5, 39.7 ~ 47.0	* 0.83 inn 21 mm	
0.63 x 0.47 x 0.08 in ϕ16 x 12 x 2 mm	88.3 ~ 98.1 9.0 ~ 10.0, 65.1 ~ 72.3	* 1.14 inn 29 mm	
0.71 x 0.55 x 0.08 in ϕ18 x 14 x 2 mm	127.5 ~ 137.3 13.0 ~ 14.0, 94.0 ~ 101.3	* 1.26 in 32 mm	
1.07 x 0.85 x 0.11 in ϕ27.2 x 21.6 x 2.8 mm	235.4 ~ 254.97 24.0 ~ 16.0, 173.6 ~ 188.1	* 1.61 in 41 mm	

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6. Attach a wire as shown at right to the excavator towing bar. (Possible in KH-191 or 151)
7. Read the relief pressure while gradually depressing the accelerator pedal.

   Note: As the pressure gauge reading exceeds 300 kgf/cm^2 (4265 psi, 29.4 MPa), very slowly depress the accelerator pedal and read the pressure immediately before the relief sound is heard. If the engine speed is raised suddenly, the relief sound is easily generated to make acquisition of the maximum value difficult.

   If there is no traction unit capable of towing 5 ton or more, substitution by the excavator above is possible.



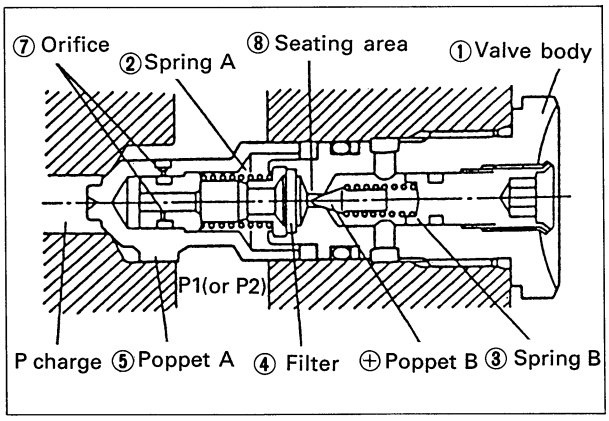
b. Standard value for actual machine in the new traction method

380 ±30 kgf/cm^2, 5405 ±425 psi, 37.3 ±2.9 MPa

c. If the measured value of an actual machine is outside the standard range:
   1. Check the charge relief pressure.
   2. Disassemble the valve ass'y below. Check and wash the seat face.
   3. Replace the valve ass'y.
   4. If recovery to the normal state fails even after valve ass'y replacement, check the seat face of the pump body.

Check/high-pressure Relief Valve

⑦ Orifice
② Spring A
⑧ Seating area
① Valve body
P1 (or P2)
P charge
⑤ Poppet A
④ Filter
⊕ Poppet B
③ Spring B



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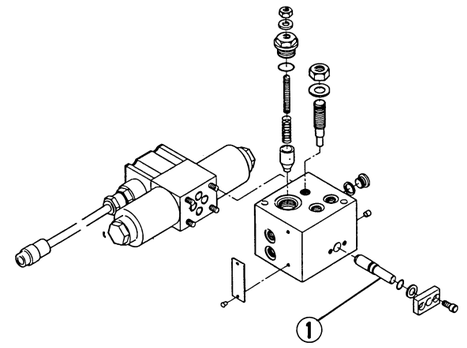
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B. Troubleshooting

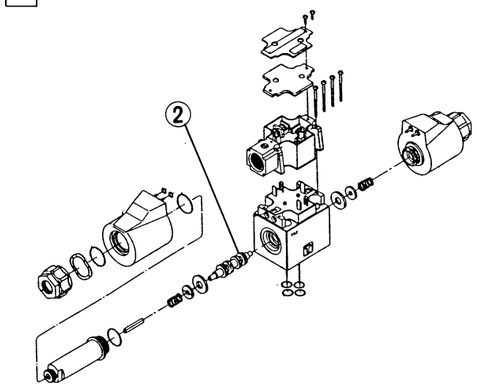
Below table is for your quick reference on what have been occurred in the past and taken the countermeasure.
When you encounter the specific trouble case except these examples, refer to the troubleshooting flow chart listed in the following pages.

Symptom		Cause	Remedy	Ref. page
1. Inching pedal is heavy and machine doesn't move F and R intermittently.		Inching linkage is sticked at FCA control valve side and inching valve ① doesn't rotate smoothly. Refer to Fig. 1 .	Remove and apply grease. Proper reassemble and check inching spool rotating torque. (0.51 ~ 0.58 ft.lbf, 7 ~ 8 kgf.cm)	
2. Machine keeps moving at F-R lever neutral.		Misadjustment of servo-cylinder neutral position.	Adjust.	
		Malfunction of solenoid spool ② in the FCA control valve. Refer to Fig. 2 .	Disassemble, clean the dust or replace with new one.	
		Residual pressure remains in control system (servo-cylinder, etc.)	Depress the inching pedal for several times. If machine stops, then O.K. This isn't a trouble symptom.	
3. Machine start-up engine RPM is high.		Misadjustment of inching linkage ③ . Refer to Fig. 3 .	Adjust.	
		Misadjustment of FCA control valve.	Readjust.	
4. Machine starts moving at engine idle rpm.		Foreign material is stuck in fixed orifice ④ .	Disassemble and clean.	
		Foreign material is stuck in variable orifice. Refer to Fig. 5 .	Disassemble and clean.	
5. Oil leaks	From 10 μm filter flange.	Loosening or improper tightening of filter cartridge ⑤ . Refer to Fig. 4 .	Tighten the filter cartridge 2/3 turns more after contacting the rubber seal.	
	From LST pump shaft seal.	Dust stuck in the seal lip.	Remove and clean or replace with new seal.	
	From LST motor fitting.	Incorrect size of O-ring ⑥ installation. Refer to Fig. 6 .	Replace with correct one.	
	From mating surface of LST pump and gear pump.	Liquid gasket wasn't applied properly or tightening torque is insifficient. Refer to Fig. 7 .	Apply liquid gasket on both sides of packing ⑦ . Torque the mounting bolt ⑧ properly.	

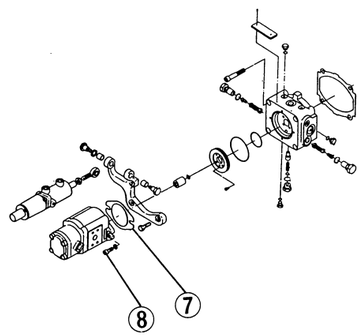
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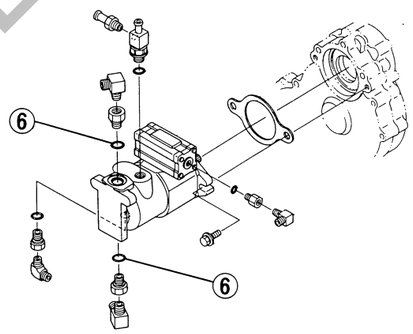
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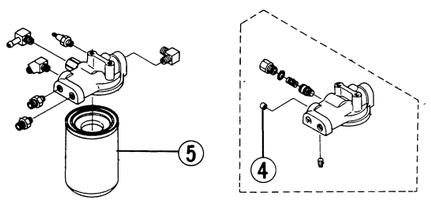
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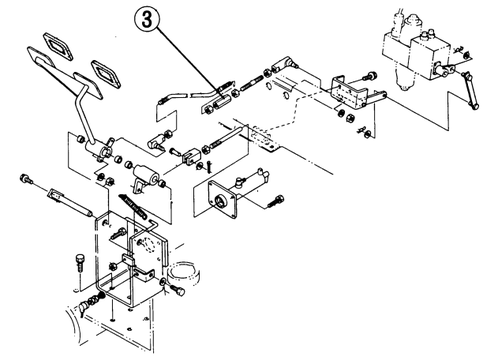
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4



3



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B. Machine specifications — Dimensional (SAE J732)
B. Caractéristiques de la machine — Dimensions (SAE J732)

Attachment used: KBT STD Bucket direct type
Benne KBT STD directe
***Accessoire utilise:* KTC STD Bucket with Multi-coupler**
Benne KBT STD a multi-coupleur

KBT STD Spec.
KTC STD Spec.

	Item / *Elément*			R310	R410
A	Overall operating height *Hauteur de service hors tout*		in (mm)	112.2 (2850) 9'5.5" (2885)	137.8 (3500) 11'7.4" (3540)
B	Height to hinge pin *Hauteur jusqu'à la charnière*		in (mm)	86.2 (2190)	110.4 (2805)
C	Overall height *Hauteur hors tout*	Canopy *Capote en toile*	in (mm)	92.9 (2360)	95.5 (2425)
		Cabin *Cabine*	in (mm)	93.3 (2370)	95.7 (2430)
D_1	Overall length *Longueur hors tout*	Without backhoe *Sans pelle rétrocaveuse*	in (mm)	136.2 (3460) 11'4.2" (3560)	163.8 (4160) 13'9.5" (4200)
		With Backhoe *Avec pelle rétrocaveuse*	in (mm)	151.0 (3835) 12'8.6" (3875)	183.9 (4670) 15'5.6" (4710)
D_2	Overall length Transport posture *Position de transport de longueur hors-tout*	Without backhoe *Sans pelle rétrocaveuse*	in (mm)	135.4 (3440)	162.9 (4135)
		With backhoe *Avec pelle rétrocaveuse*	in (mm)	150.2 (3815)	183.0 (4645)
E	Maximum dump angle *Angle de décharge maximum*		degrees *Degrés*	46	50
F	Dump height *Hauteur de décharge*		in (mm)	65.6 (1665) 5'3.6" (1607)	88.4 (2245) 7'3.2" (2215)
G	Reach, fully raised *Portée, complètement relevé*		in (mm)	28.3 (720) 2'6.1" (764)	29.9 (760) 2'7.1" (790)
H	Maximum rollback at ground *Reprise maximum au sol*		degrees *Degrés*	47	43
I	Carry position *Position de transport*		in (mm)	7.1 (180)	11.4 (290)
J	Maximum rollback at carry position *Reprise maximum en position de transport*		degrees *Degrés*	46	47
K	Maximum rollback, fully raised *Reprise maximum, complètement relevé*		degrees *Degrés*	62.5	60
L	Digging depth *Profondeur de terrassement*		in (mm)	2.56 (65)	1.18 (30)
M	Wheelbase *Empattement*		in (mm)	57.1 (1450)	68.9 (1750)
N	Overall width without bucket *Largeur hors tout sans godet*	Without backhoe *Sans pelle rétrocaveuse*	in (mm)	4'3.2" (1300)	4'11.1" (1500)
		With backhoe *Avec pelle rétrocaveuse*	in (mm)	4'3.2" (1300)	63.8 (1620)
O	Bucket width *Largeur de godet*		in (mm)	53.0 (1345) 4'8" (1422)	62.2 (1580)
P	Ground clearance *Garde au sol*		in (mm)	9.1 (230)	
Q	Tread *Voie*		in (mm)	41.3 (1050)	46.5 (1180)
R	Maximum grading angle *Angle de gravissement maximum*		degrees *Degrés*	30	
S	Angle of articulation *Angle d'articulation*		degrees *Degrés*	41	40

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C. Testing and Adjustment

a. Outline of test

To quickly and efficiently locate and correct problems on the LST, you will be required to perform various tests throughout the troubleshooting procedure.
When the flow chart calls for a test, locate the test in the list below and perform it. Then, proceed until you have located the trouble. (The tests below are not listed in any particular order.)

1. Charge pump flow test
2. Charge relief valve test
3. Servo-cylinder pressure test (Pst ; St)
4. LST stall pressure test (Forward, Reverse)
5. LST pump delivery test (No load and load)
6. LST motor efficiency test
7. Solenoid valve test.

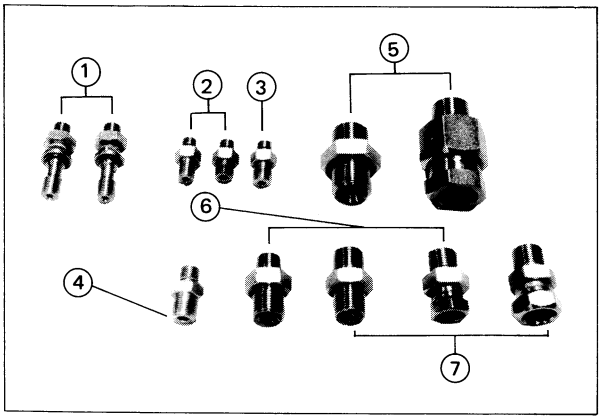
<Test instruments>

Flow meter (in-line type)

- 8.0 gal/min (30l/min) ... Charge pump
- 16.0 gal/min (60l/min) ... Main pump
- 32.0 gal/min (120l/min) ... LST pump, LST motor

Pressure gauge

- 500 psi (35 kgf/cm^2) ... Charge pressure difference, St
- 1000 psi (70 kgf/cm^2) ... Charge pressure difference, Pst
- 2130 psi (150 kgf/cm^2) ... Charge pump pressure
- 355 psi (25 kgf/cm^2) ... Charge relief pressure
- 3500 psi (250 kgf/cm^2) ... Relief pressure of Front loader and Backhoe
- 6000 psi (420 kgf/cm^2) ... LST high pressure

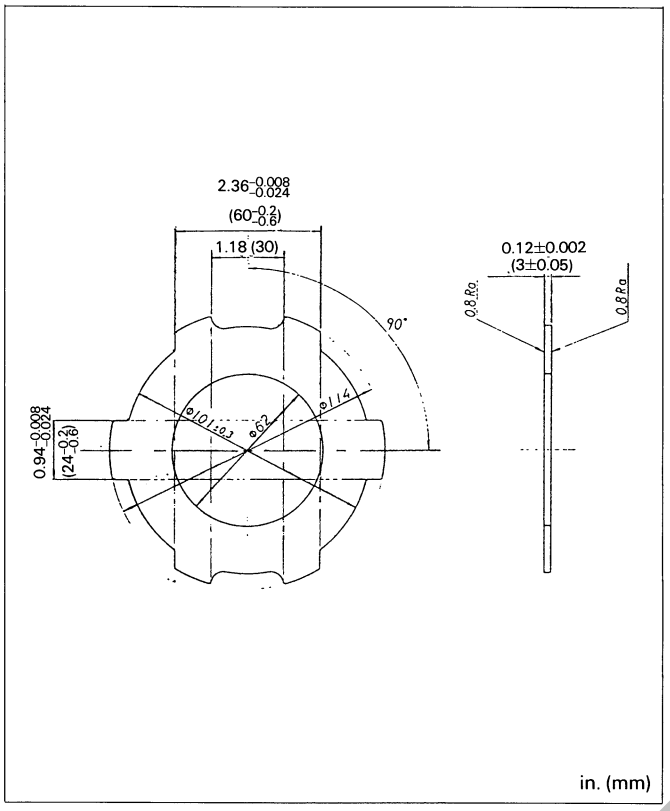


Fittings to connect the above

① Servo-cylinder pressure: PF 1/4
② LST high pressure: 7/16-20 UNF-2B
③ Charge relief pressure: 7/16-20 UNF-2B
④ Main pump pressure port: 3/8"
⑤ LST pump & motor flow test
  R310: 1/2"
  R410: 3/4"
⑥ Flow meter for charge pump: 3/8"
⑦ Flow meter for main pump
  R310: 3/8"
  R410" 1/2"
⑧ Charge pump pressure: PT1/4

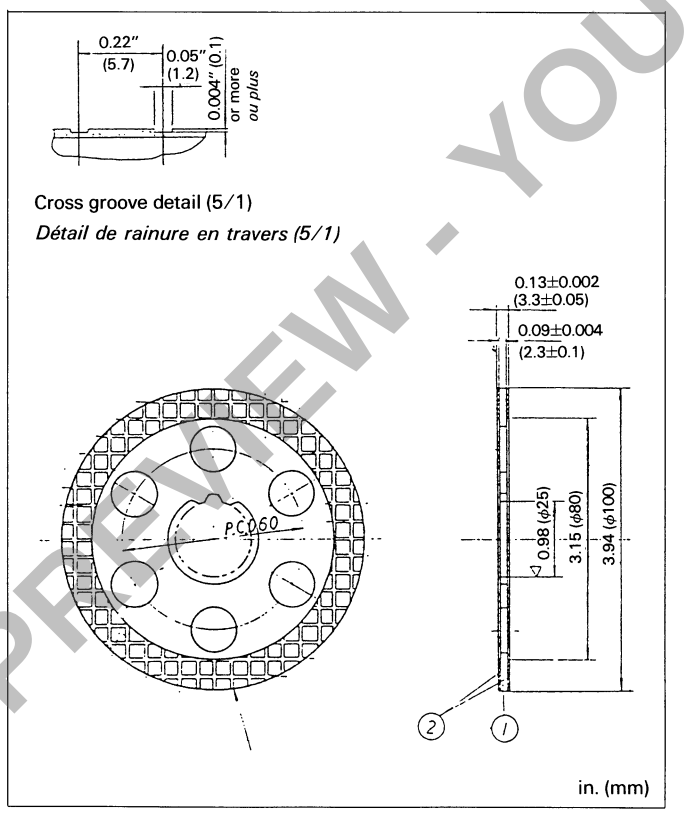
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4. Separator plate
4. Plaque de séparateur
(68841-1523-2)

- Material: S45C ~ S55C
  Matériel: S45C ~ S55C
- Service limit
  Limite de service
  Warp: 5.91 in. (0.15 mm) below
  Voile: moins de 0,15 mm



5. Friction plate
5. Plateau de friction
(68841-1524-1)

- Core plate material: S45C
  Matériel de plaque de noyau: S45C
- Lining material: Paper type
  Matériel de garniture: Type papier
- Service limit: Until lining cross groove disappears.
  Approx. 0.004 in. (0.1 mm) one side.
  Limite de service: Jusqu'à ce que la rainure en travers de la garniture disparaisse.
  Approx. 0,1 mm d'un côté

① Core plate
Plaque de noyau
② Lining
Garniture

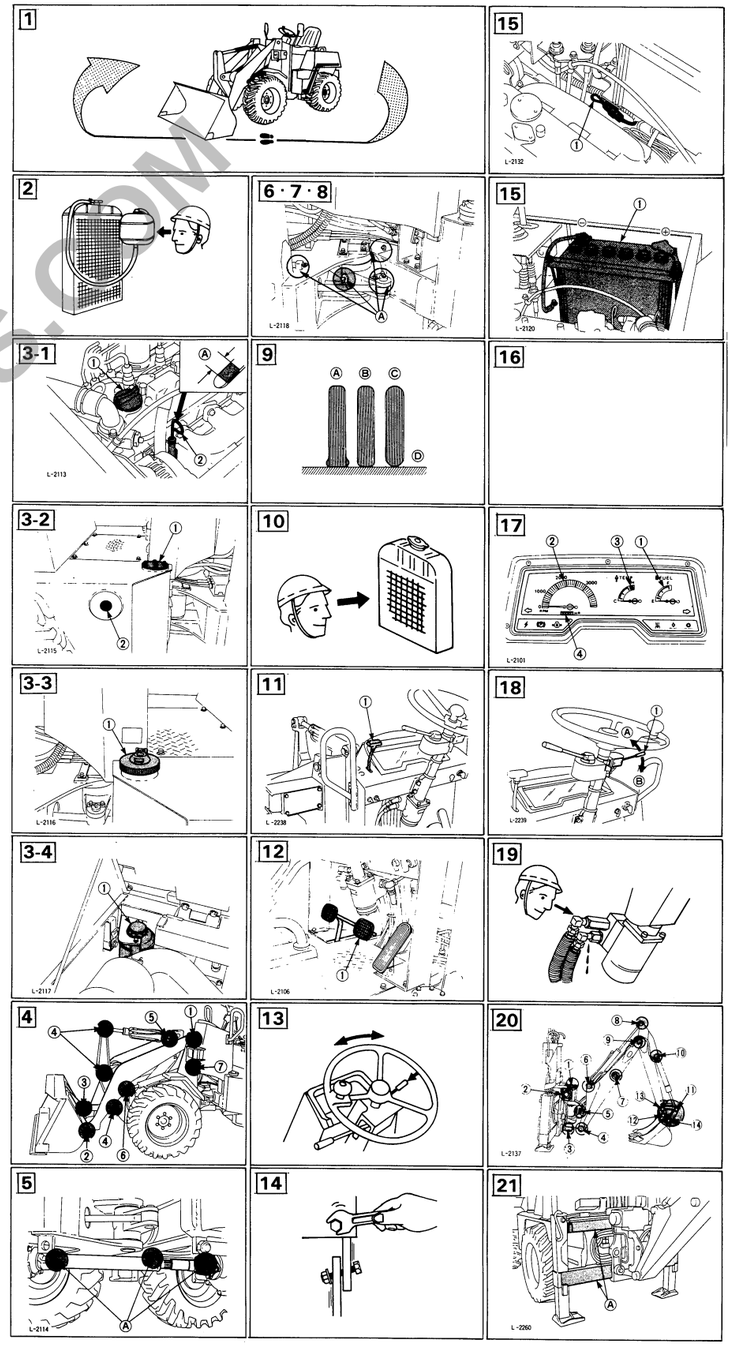
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E. Routine Check Chart

E. Points de Vérification Courante

No.	Check Points		Points de vérification	
1	Parts that has trouble during previous use: check		Pièces ayant provoqué un trouble au cours de l'opération	
2	Check cooling water quantity in radiator and replenish as necessary.		Quantité d'eau de refroidissement dans le radiateur et procéder à l'alimentation, si nécessaire.	
3	Check fuel and oil quantity and replenish as necessary	① Check engine oil level meter and replanish as necessary.	Quantité de carburant et d'huile et procéder	① Relever le niveau d'huile moteur, et procéder à l'alimentation, si nécessaire.
		② Check operating oil level meter and replanish as necessary.		② Relever le niveau d'huile hydraulique, et procéder à l'alimentation, si nécessaire.
		③ Check fuel level meter and refuel as necessary.		③ Relever le niveau de carburant, et procéder à l'alimentation, si nécessaire.
		④ Brake fluid cup.		④ Vérifier et approvisionnement en huile de la cuvette à fluide du frein.
4	Greasing	① Shovel frame attachment pin.	Graissage	① Axe de flèche de chargeur
		② Bucket attachment pin.		② Broche du godet
		③ Bucket link pin.		③ Goupille de laison du godet
		④ Tilt link pin.		④ Goupille de maillon d'inclinaison
		⑤ Tilt cylinder bottom pin.		⑤ Goupille de partie inférieure de mailon d'inclinaison
		⑥ Lift cylinder rod pin.		⑥ Goupille de bielle du cylindre de levage
		⑦ Lift cylinder bottom pin.		⑦ Goupille de partie inférieure de cylindre de levage
5	Universal joint: grease		Joint universal: graisse	
6	Center pin: grease		Goupille de centre: graisse	
7	Articulate shaft: grease		Arbre de articulé: graisse	
8	Steering cylinder pin: replenish		Goupille de cylindre de direction: procéder	
9	Check inflation and wear or damage to tires, check for loosened bolts.		Vérifier le gonflage l'usure et l'état des pneus, Vérifier le serrage des boulons	
10	Check radiator fins for clogging.		Treillis de radiateur	
11	Check the parking brake lever.		Vérifier du levier du frein de stationnement.	
12	Check the brake pedal.		Vérifier le pédale de frein	
13	Check function of steering wheel.		Vérifier le fonctionnement du volant de direction	
14	Check bolts and nuts for tightness, retighten as necessary.		Vérifier l'état de serrage des boulons et écrous, les resserrer, si nécessaire.	
15	Check for cable breakage, short circuit, or terminal looseness.		Rechercher toute présence de: interruption de câble, court-circuit, desserrage de bornes	
16	Stain, damage of number plate or SMV emblem		Saleté ou endommagements de la plaque de numéro: vérification	
17	Check the lamps and meters.		Vérifier des lampes et des compteurs.	
18	Testing the horn.		Essai de l'avertiseur sonore.	
19	Oil and water leakage		Fuite d'huile ou d'eau	
20	Greasing (Backhoe)	① Swing case 1	Graissage (Équipement du pelletage)	① Carter de pivot 1
		② Swing bracket 2		② Ferrure de pivotement 2
		③ Swing bracket 1		③ Ferrure de pivotment 1
		④ Boom mounting pin 1		④ Goupille de montage de la fléche 1
		⑤ Boom cylinder bottom pin 1		⑤ Goupille inférieure du vérin de la flèche 1
		⑥ Dipperstick cylinder bottom pin 1		⑥ Goupille inférieure du vérin 1
		⑦ Boom cylinder rod pin 1		⑦ Goupille de la tige du vérin de la fléche 1
		⑧ Dipperstick cylinder rod pin 1		⑧ Goupille de la tige du vérin du bras 1
		⑨ Dipperstick mounting pin 1		⑨ Goupille de montzge du bras
		⑩ Bucket cylinder bottom pin 1		⑩ Goupille inférieure du vérin du godet 1
		⑪ Bucket cylinder rod pin 1		⑪ Goupille de la tige du vérin du godet 1
		⑫ Bucket mounting pin 1		⑫ Goupille de la tige du vérin du godet 1
		⑬ Bucket link pin 1		⑬ Goupille de la tige du vérin du godet 1
		⑭ Bucket link pin 1		⑭ Goupille de la tige du vérin du godet
21	Greasing the sliding section of the slide frame 2		Section coulissante du châssis de coulissement 2	



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J. Hose List *Liste des durites*

<R310(B)>

No.	Code No. *No. de code*	Location to use *Emplacement pour usage*	pcs/unit *Pcs/unité*	Hose in. (mm) *Durite (mm)*			Joint *Raccord*		Guard spring *Ressort de garde*
				Total length: L *Longueur totale: L*	Type *Type*	Cutting length: e *Longueur de coupe: e*	A	B	
1	68841-3271-1	Charge pump ~ Parking brake *Pompe de charge ~ Frein de stationnement*	1	650	1000-04	590	SF-14-04 -001	SF-14-04 -001	
2	68841-3491-1	Steering controller *Contrôleur de direction*	2	830	N3010-04	756	SA-PT 04-N30	SF-PF 04-N30	YMSN-04
3	68841-6333-1	Main pump ~ Steering controller *Pompe principale ~ Contrôleur de direction*	1	590	N3010-08	497	SF-PF 08-N30	SF-PF-08-N30	
4	68841-6334-1	Steering controller ~ C/V *Contrôleur de direction ~ C/V*	1	760	N3010-06	708	SL-PF 06-N30	SL-PF 06-N30	
5	68841-6373-1	C/V T port ~ Return pipe *Orifice T C/V ~ Tuyau de retour*	1	700	1000-08	629	SA-10-08-SM	SF-14-08-H2	
6	68841-6414-1	LST motor A port ~ LST pump *Orifice A de moteur LST ~ Pompe LST*	1	380	3R80-08	287	SF-PF-08-3R80	SF-PF-08-3R80	YMSH-08
7	68841-6415-1	LST motor B port ~ LST pump *Orifice B de moteur LST ~ Pompe LST*	1	510	3R80-08	417	SF-PF-08-3R80	SF-PF-08-3R80	YMSH-08
8	68841-6422-1	Servo-cylinder ~ LST C/V *Servo-cylindre ~ LST C/V*	1	580	1400-04	522	SR-ϕ14-14-04	SR-ϕ14-14-04	YM10-04
9	68841-6423-1	Servo-cylinder ~ LST C/V *Servo-cylindre ~ LST C/V*	1	670	1400-04	612	SR-ϕ14-14-04-002	SR-ϕ14-14-04	YM10-04
10	68841-6422-1	Charge pump ~ LST filter flange *Pompe de charge ~ Bride de filtre LST*	1	730	1000-06	668	SF-14-06-H2	SF-14-06-H2	YM10-06
11	68841-6452-1	LST filter flange ~ Charge pump *Bride de filtre LST ~ Pompe de charge*	1	820	1000-06	758	SF-14-06-H2	SF-14-06-H2	
12	68841-7312-1	Lift cylinder *Vérin de levage*	4	580	N3010-04	506	SA-PT-04-N30	SF-PF-04-N30	
13	68841-6373-1	C/V T port ~ Return pipe *Orifice T C/V ~ Tuyau de retour*	1	700	1000-08	629	SA-10-08-SM	SF-14-08-H2	
14	68841-6397-1	Carry over hose *Durite de transport*	1	720	N3010-06	636	SF-PF-06-N30	SF-PF-06-N30	
15	68841-6399-1	B.H. hose (Pressure line) *Durite de B.H. (Canalisation pressurisés)*	1	920	N3010-06	844	SA-PT-06-N30	SA-PT-06-N30	Nishi tube *Tube Nishi*
16	68841-6431-1	Charge pump ~ HL valve *Pompe de charge ~ Soupape HL*	1	680	1000-06	618	SF-14-06-H2	SF-14-06-H2	
17	68841-6433-1	HL valve ~ Hi-Lo cylinder *Soupape HL ~ Vérin Hi-Lo*	1	1050	1000-04	958	SA-14-04	SF-14-04-001	
18	68849-6835-1	Outrigger *Stabilisateur*	2	275	N3130-04	201	SA-PT-04	SF-PF-04	
19	68849-6836-1	Outrigger *Stabilisateur*	2	310	N3130-04	236	SA-PT-04	SF-PF-04	
20	68849-6845-1	B.H. Slide section *Section de glissement de B.H.*	3	725	N3130-04	651	SA-PT-04	SF-PF-04	
21	68849-6854-1	B.H. slide section *Section de glissement de B.H.*	3	845	N3130-04	771	SA-PT-04	SF-PF-04	
22	68849-6856-1	Boom cylinder *Vérin de flèche*	2	840	N3130-04	766	SA-PT-04	SF-PF-04	YMS-04
23	68849-6864-1	Arm cylinder *Vérin de bras*	1	1490	N3130-04	1430	SA-PT-04	SL-PF-04	YMS-04
24	68849-6866-1	Arm cylinder *Vérin de bras*	1	1490	N3130-04	1416	SA-PT-04	SF-PF-04	YMS-04
25	68849-6883-1	B.H. Slide section *Section de glissement de B.H.*	3	785	N3130-04	711	SA-PT-04	SF-PF-04	
26	68849-6884-1	Bucket cylinder *Vérin de godet*	2	1410	N3130-04	1336	SA-PT-04	SF-PF-04	YMS-04
27	68849-6886-1	Bucket cylinder *Vérin de godet*	2	500	N3130-04	426	SA-PT-04	SF-PF-04	YMS-04
28	68841-7352-2	Pipe ~ Service port *Tuyau ~ Orifice d'entretien*	2	720	N3010-04	646	SA-PT-04-N30	SF-PF-04-N30	

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Section 0

Précautions

TABLE DES MATIERES

A. Mesures de sécurité pendant l'entretien, le démontage et le remontage 0-01

B. Précautions pendant le démontage et le remontage 0-03

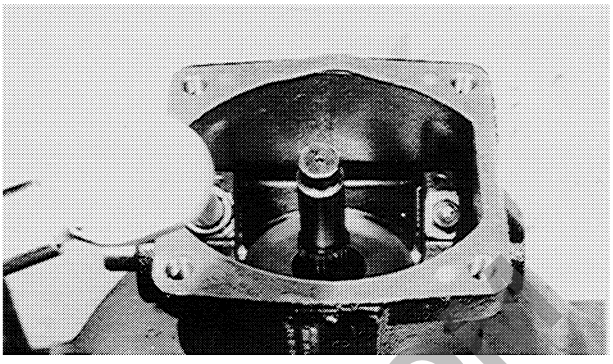
C. Vérification et Entretien 0-04

D. Leviers et dispositifs de sécurité 0-05

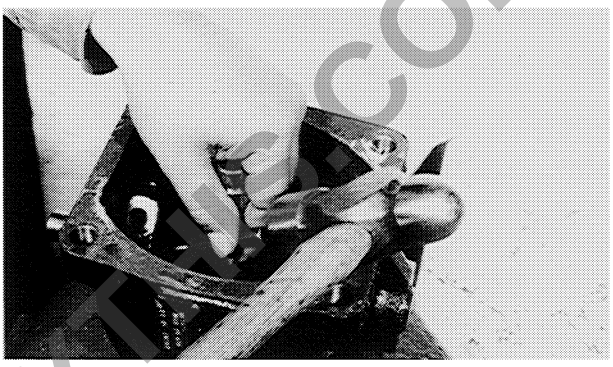
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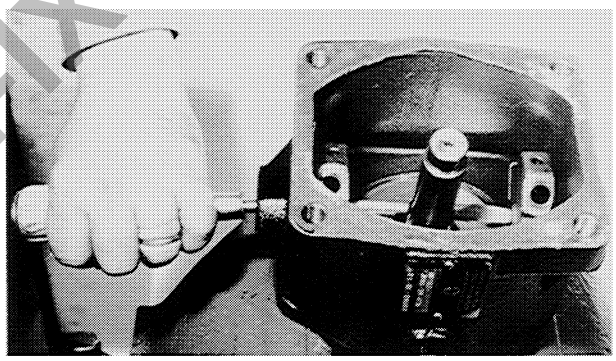
6. Remove the trunnion shaft mounting bolts.
   Bolt: M10 × 55, P = 1.0, 9T
   Tightening torque: 44.8 ~ 49.9 ft.lbs (6.2 ~ 6.9 kgf.m)



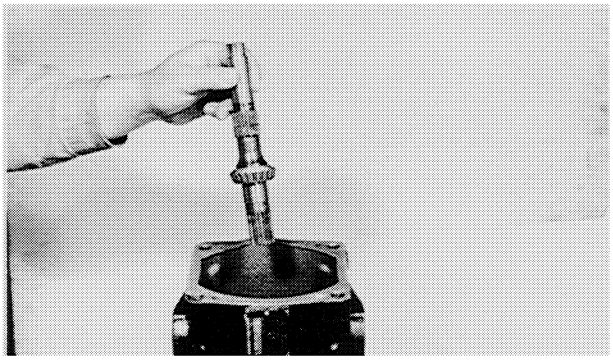
7. Carefully hammer out the trunnion shaft at its center hollow with punch.



8. Tap out the trunnion shaft on other side.



9. Pull the motor shaft out.



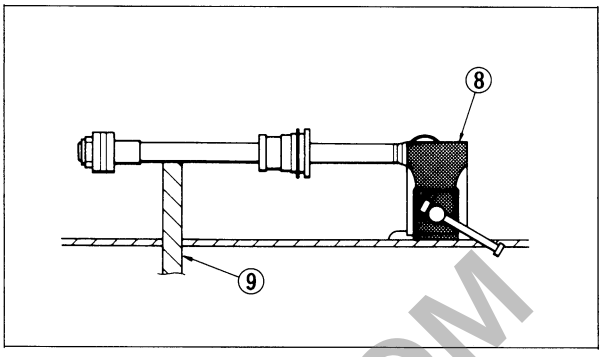
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6. Fix the piston rod at the vise.

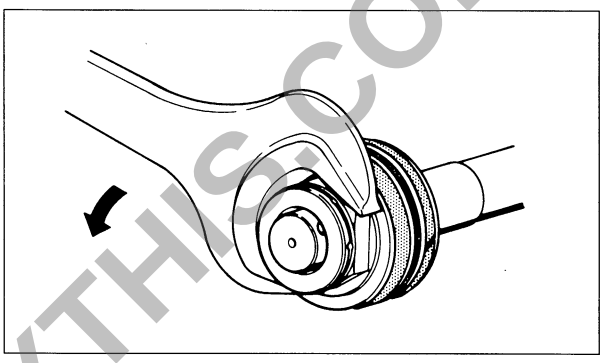
⚠ Be sure to place the wood block under the rod.

⑧ Vise
⑨ Wood block



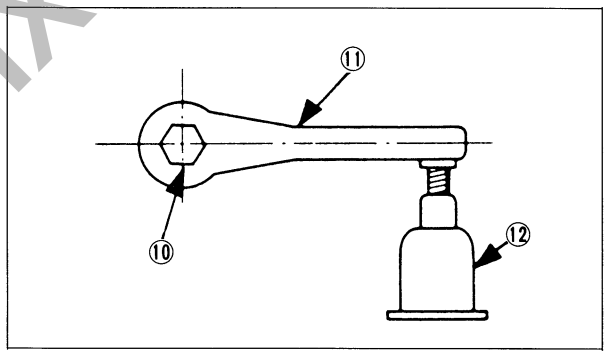
7. Remove the snap ring (wire) with a screwdriver.
8. Take the lock pin out of the piston.
9. Using a wrench, loosen the hex nut of the piston.
   * Preferably use a hydraulic jack and a specific wrench for easier work.

⑩ Piston nut, R310: M16 × 1.5, R410: M20 × 1.5
⑪ Specific wrench
⑫ Hydraulic jack

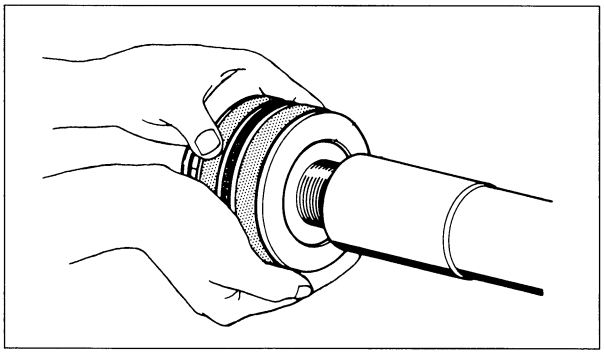


(When reassembling)
Stopper Nut tightening torque

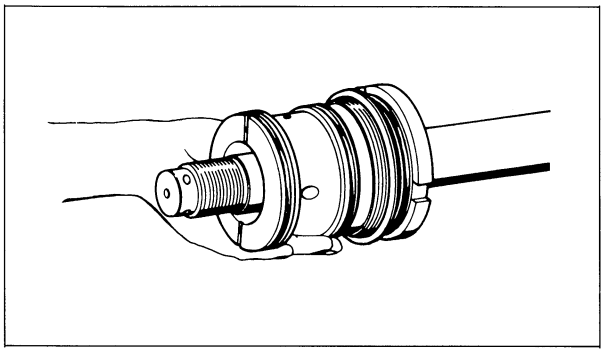
Model / Cylinder	R310	R410
Steering	157 N.m 16 kgf.m 116 ft.lb	308±57 N.m 31.4±5.8 kgf.m 227±42 ft.lb



10. Remove the piston.



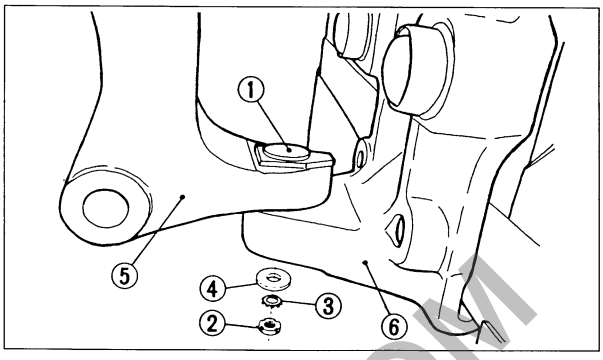
11. Pull out the cylinder head.
12. Release the piston rod from the vise.
    - Buffer ring
      Install the square ring first and then the slide ring.
      * Bend the slide ring into U shape with your fingers, and install into the groove.
      * Do not bend the ring into a too small U, otherwise the ring may get wrinkles thereafter.
      * Finally make sure there is no wrinkle or other permanent deformation left.



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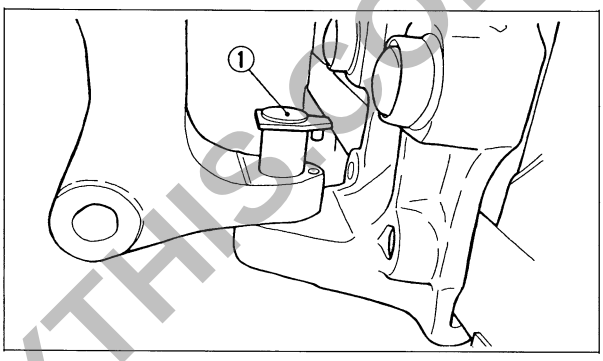
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6. Remove the bearing nut of fulcrum shaft with hook wrench.
   ① Fulcrum shaft
   ② Bearing nut
   ③ Bearing washer
   ④ Washer
   ⑤ Swing bracket
   ⑥ Slide bracket



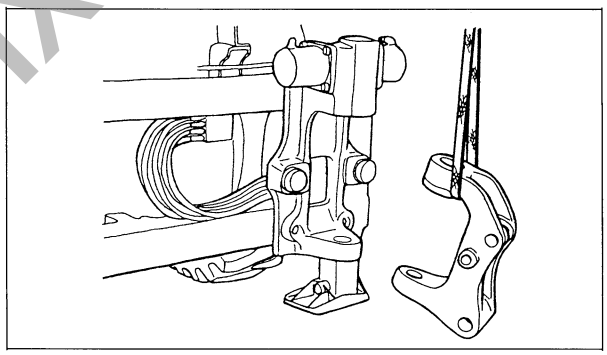
7. Take out the fulcrum shaft.

Caution
Before taking out the fulcrum shaft, be sure to attach the sling wire to the swing bracket for safety.
   ① Fulcrum shaft



8. Remove the swing bracket

Caution
Secure the balance.



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D. SERVICING

a. Alternator

The alternator generates 3-phase AC power utilizing the engine power. Six built-in diodes rectify the AC power to DC for supply to the battery and other use.
R410 uses standard alternator and contact pointer regulator.
R310 uses compact alternator with IC regulator.

Refer to Service information [X]-(1)

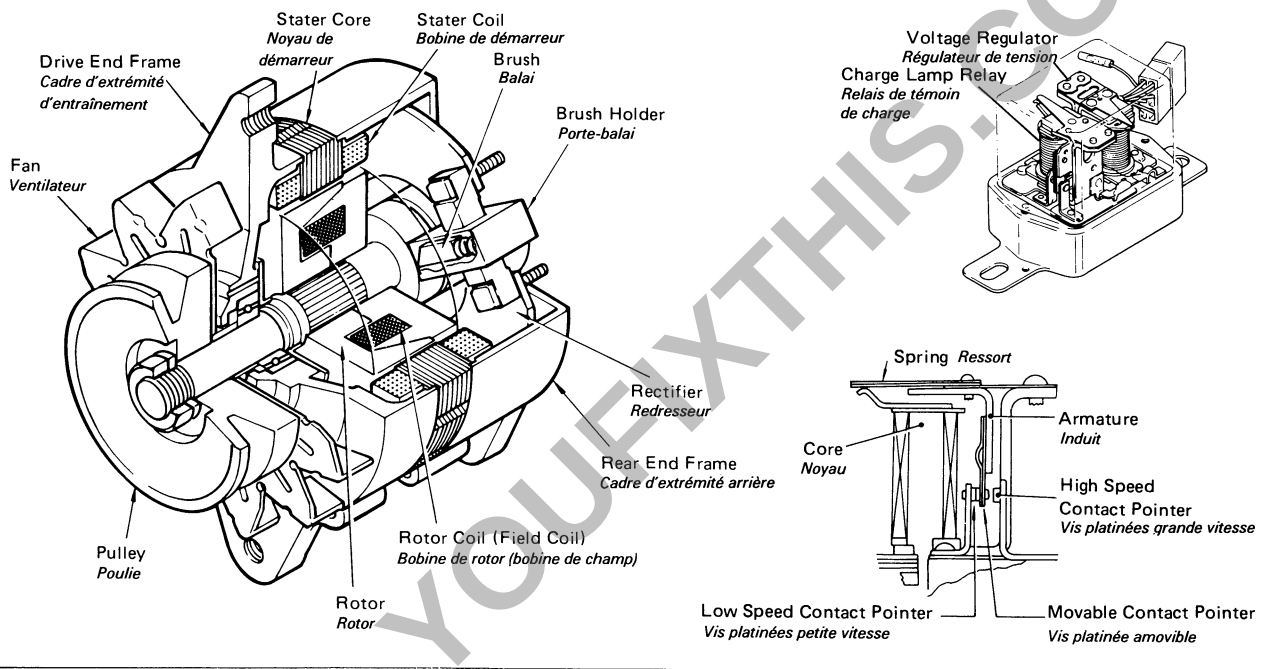
D. Entretien

a. Alternateur

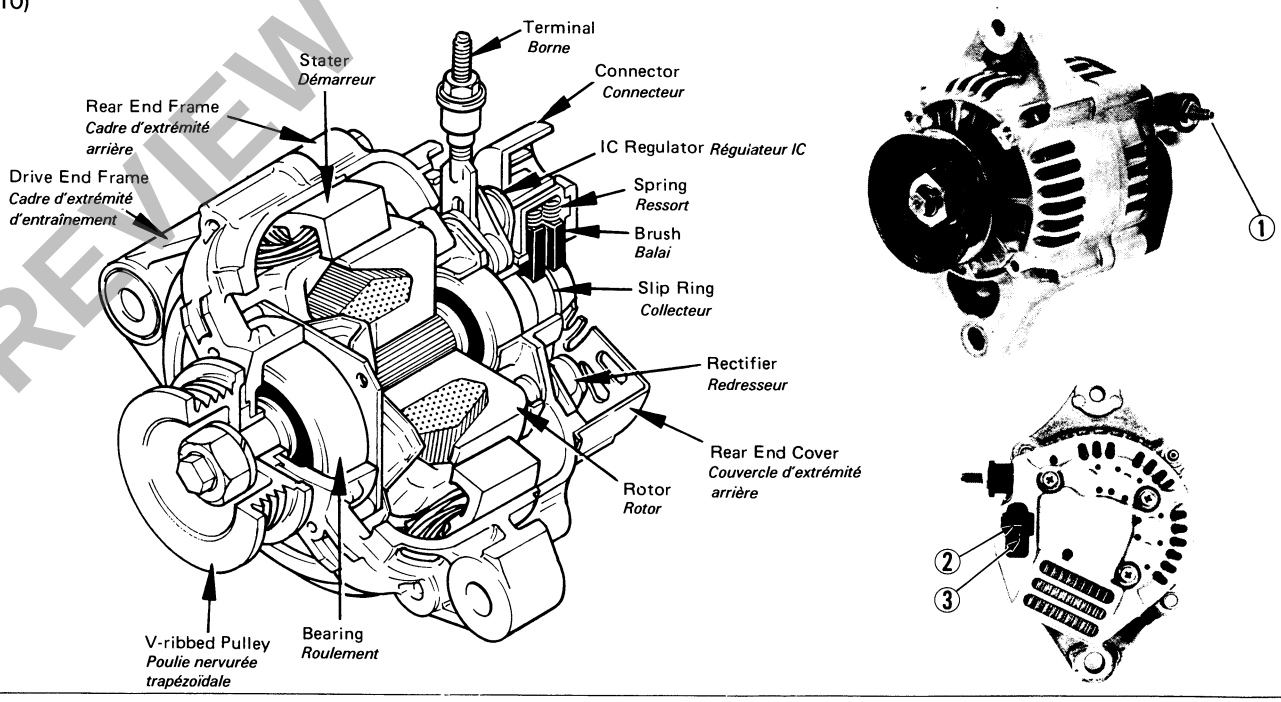
L'alternateur génère un courant alternatif triphasé en utilisant la puis du moteur. Six diodes incorporées redressent le courant alternatif en courant continue pour alimenter la batterie et autre usage.
Le modèle R410 utilise un alternateur standard et un régulateur à vis platinées.
Le modèle R310 utilise un alternateur compact avec un régulateur IC.

Se référer à Information d'entretien [X]-(1)

(R410)



(R310)



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