

INSTALLATION MANUAL

REF NO.	B910018D
DATE	Feb. 5, 2001

Page 1 of 60

This INSTALLATION MANUAL supersedes the previous issue No. B910018C dated Jul. 7, 2000 which should be discarded.

SUBJECT: ENGINE REPLACEMENT PROCEDURE "WITH SA12V140" ON HD785-2

PURPOSE: To describe how to replace the existing engine with SA12V140 engine

APPLICATION: HD785-2 Dump Trucks, Serial Nos. 1501 and up




FAILURE CODE: A00099

DESCRIPTION:

1-1. Introduction

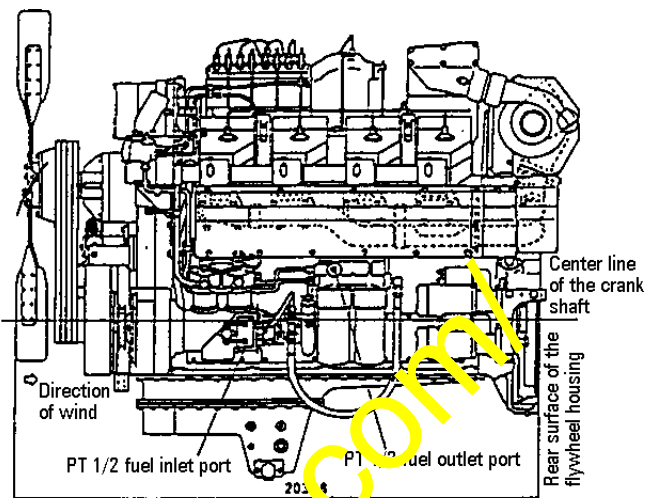
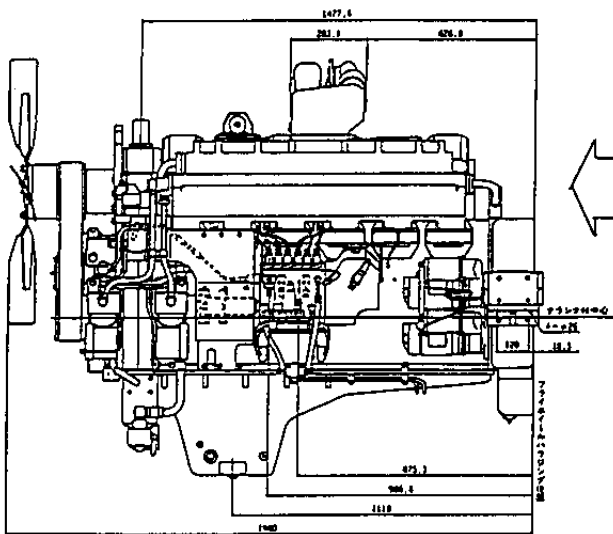
When replacing the model SA8V170 engine existing on HD785-2 with the model SA12V140 engine use the procedure described below.

1-2. Revised places:

8 places 	Nov. 12, 1999	Part number of the engine has been changed. Part number error has been corrected. A section listing the parts that need to be changed periodically has been supplemented.
13 places 	Jul. 7, 2000	Added introduction to the use of part number for the engine equipped with #18 flywheel. See Pages 3, 10, 18, 21 and 55 thru 58.
6 places 	Feb. 5, 2001	Part number of a water tube was changed and a section featuring replacement of two oil tubes was added. See Pages 10, 14, 19, 35, 56 and 57.

2. Outline of the procedure of engine replacement (SA8V170 → SA12V140)

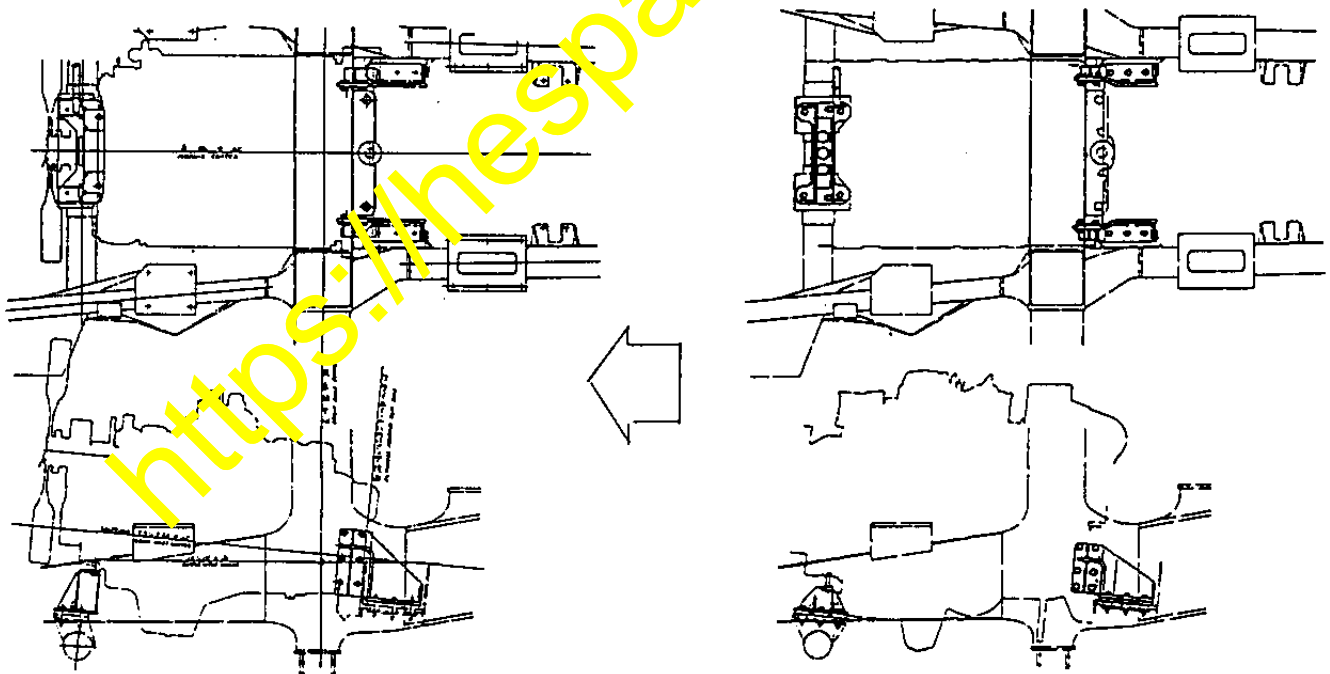
(1) Replace the model SA8V170 engine with the model SA12V140 engine.




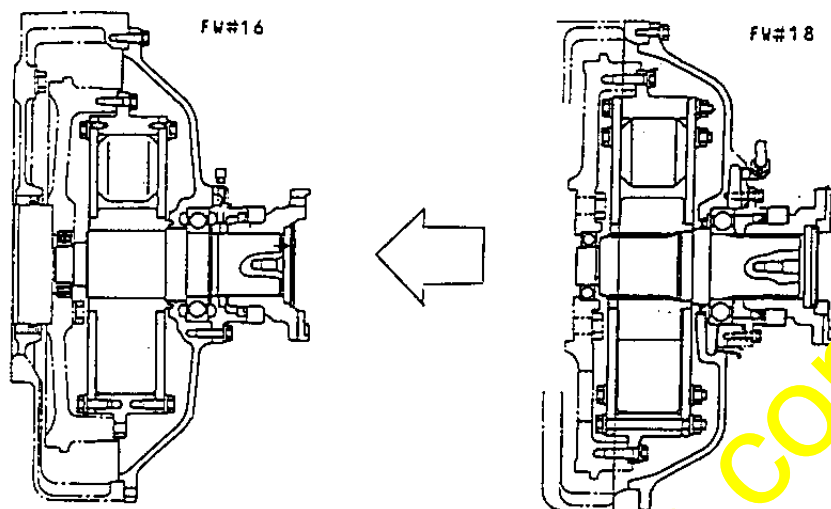
Output / speed : 944 ps (931 HP) / 2100 rpm
Max. torque : 355 kgm / 2100 rpm
/ speed

Output / speed : 944 ps / 2100 rpm
Max. torque : 355 kgm / 2100 rpm
/ speed

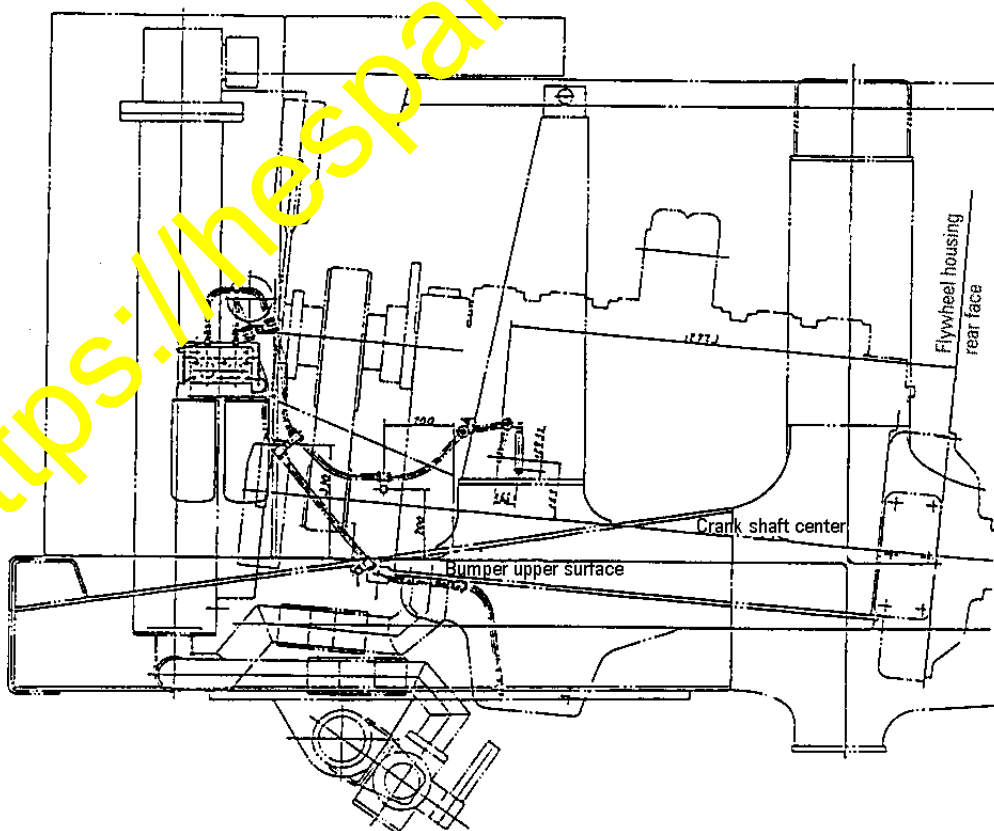
(2) Modifying the engine mount.



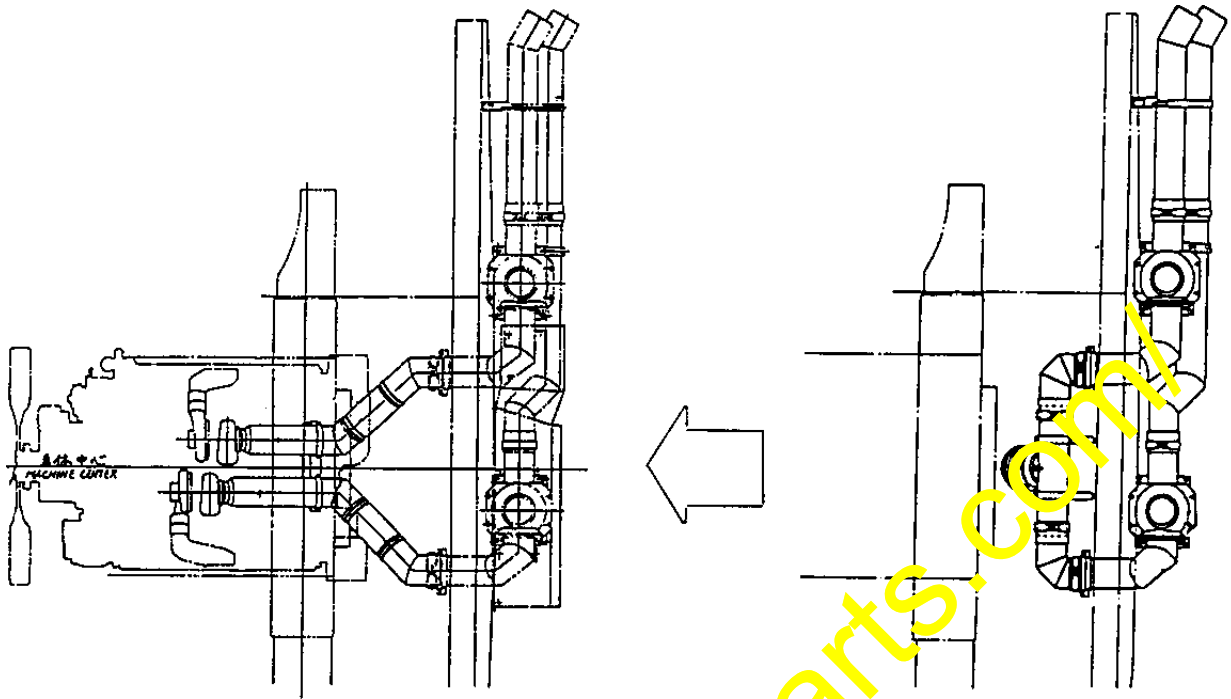
- (3) Modifying the output shaft.  (See Paragraph 7 when you do not change it.)



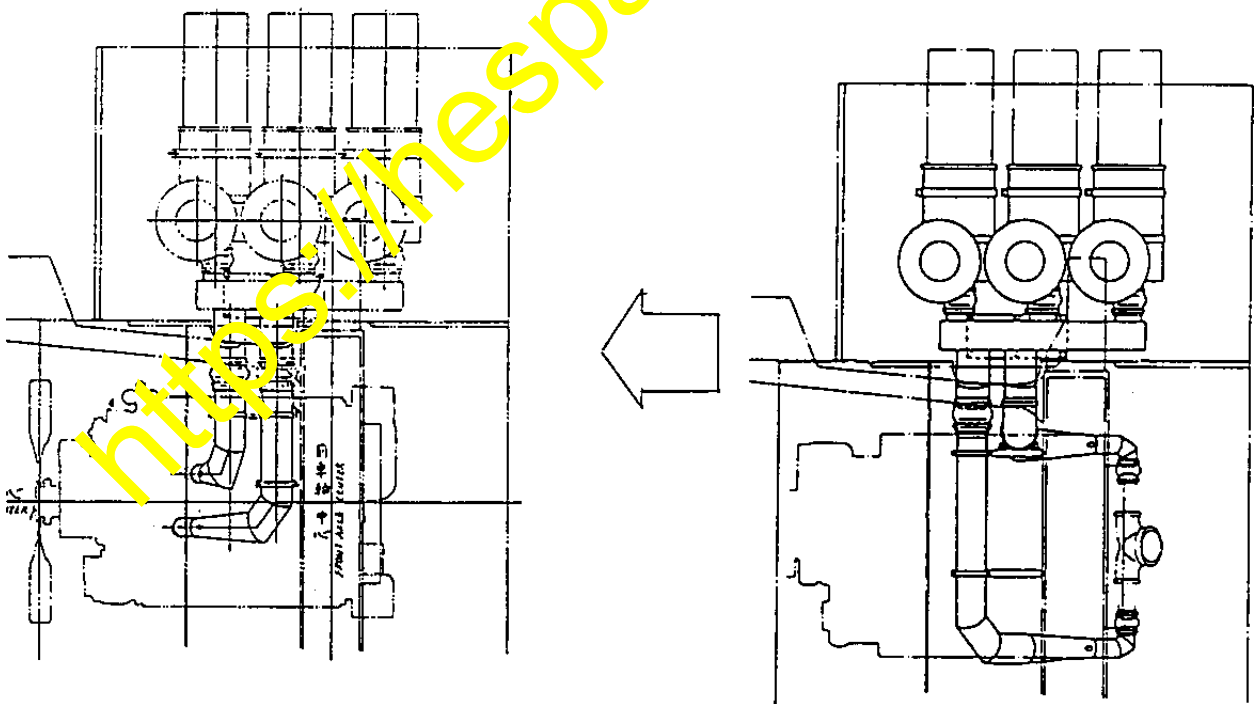
- (4) Installing the by-pass filter.



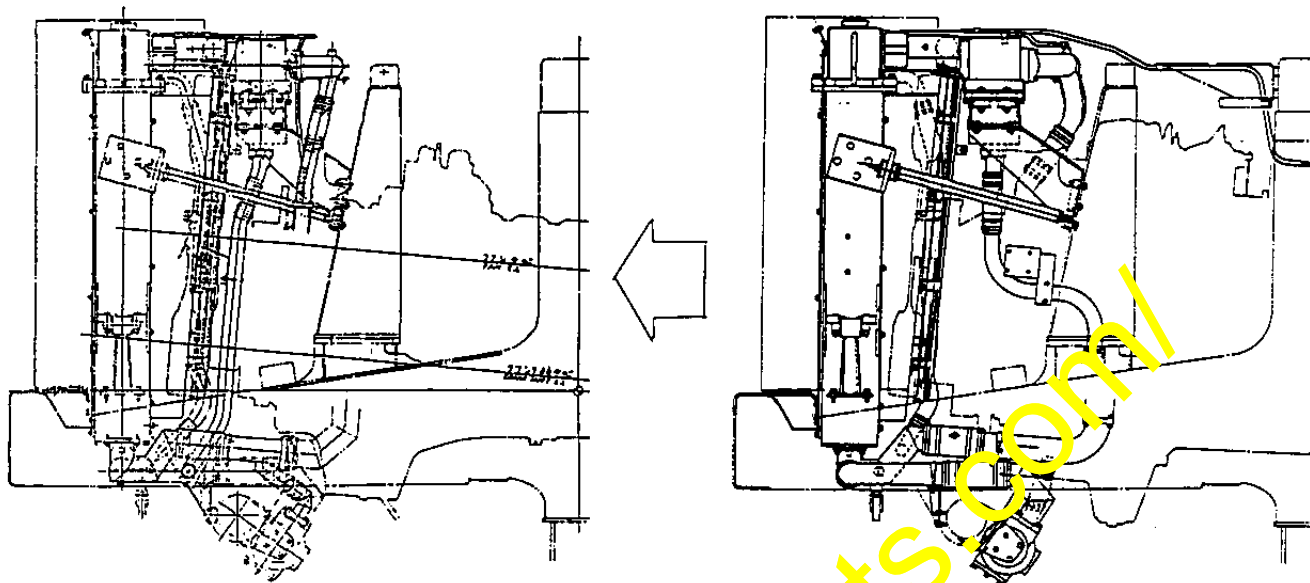
(5) Modifying the exhaust piping.



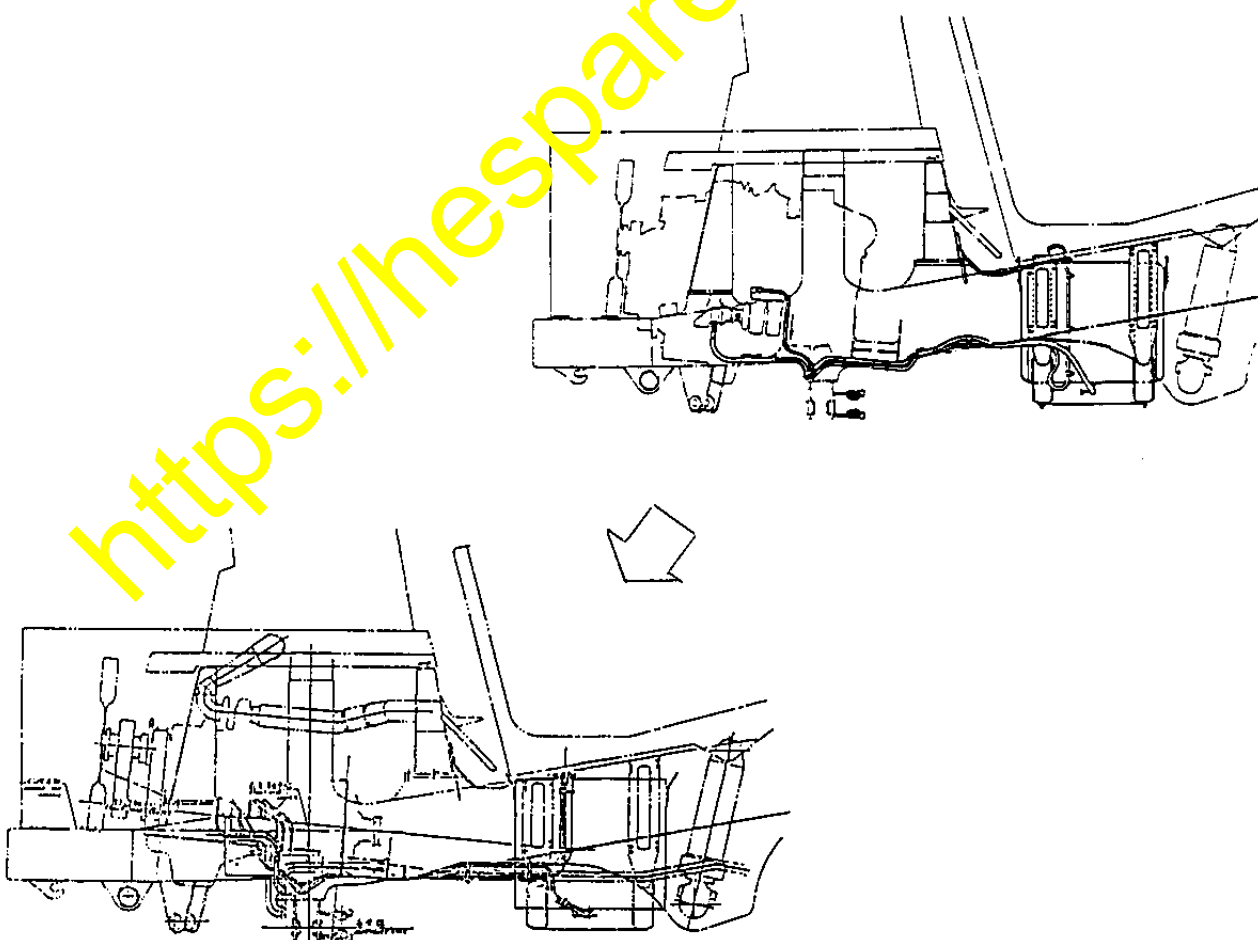
(6) Modifying the air intake piping.



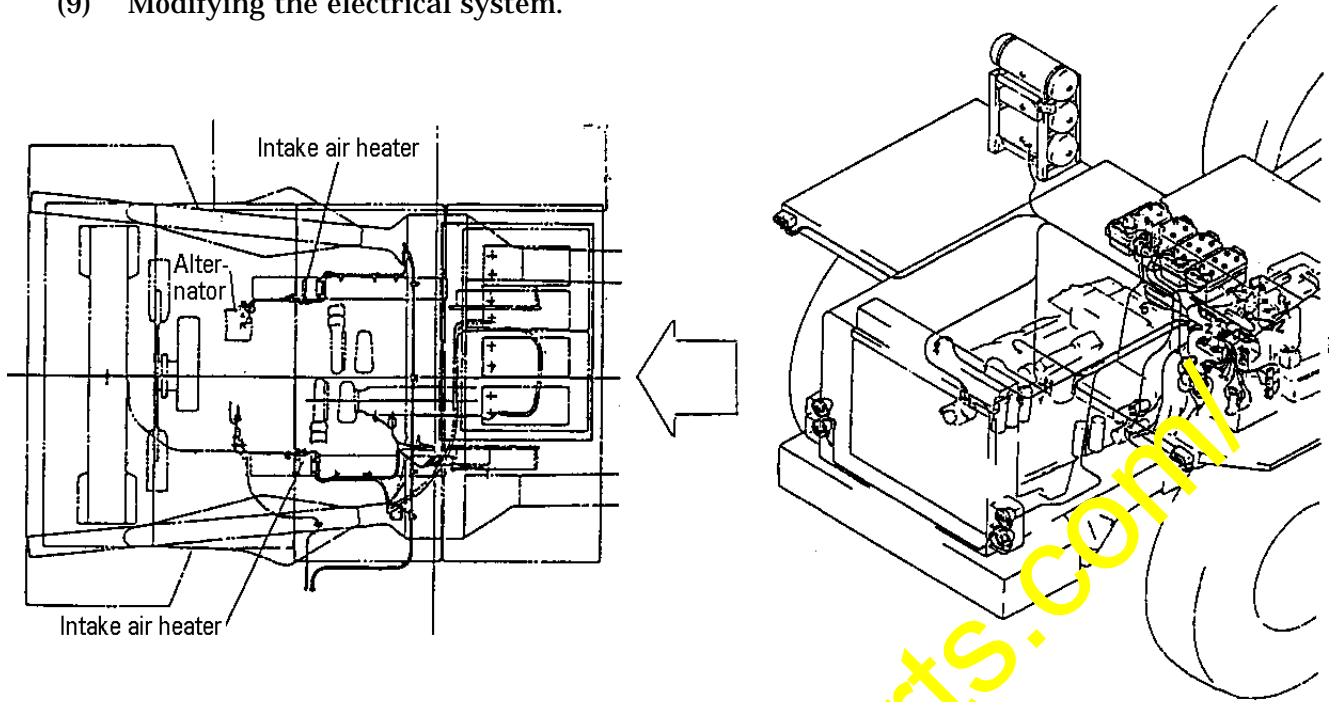
(7) Modifying the radiator piping.



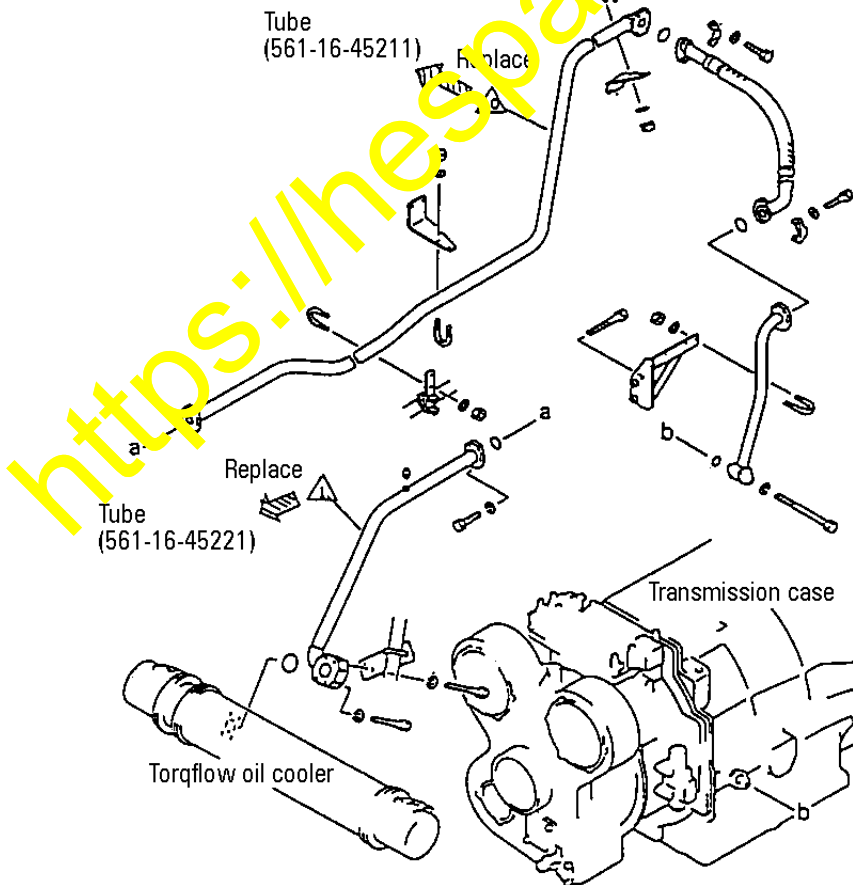
(8) Modifying the fuel tank and fuel piping.



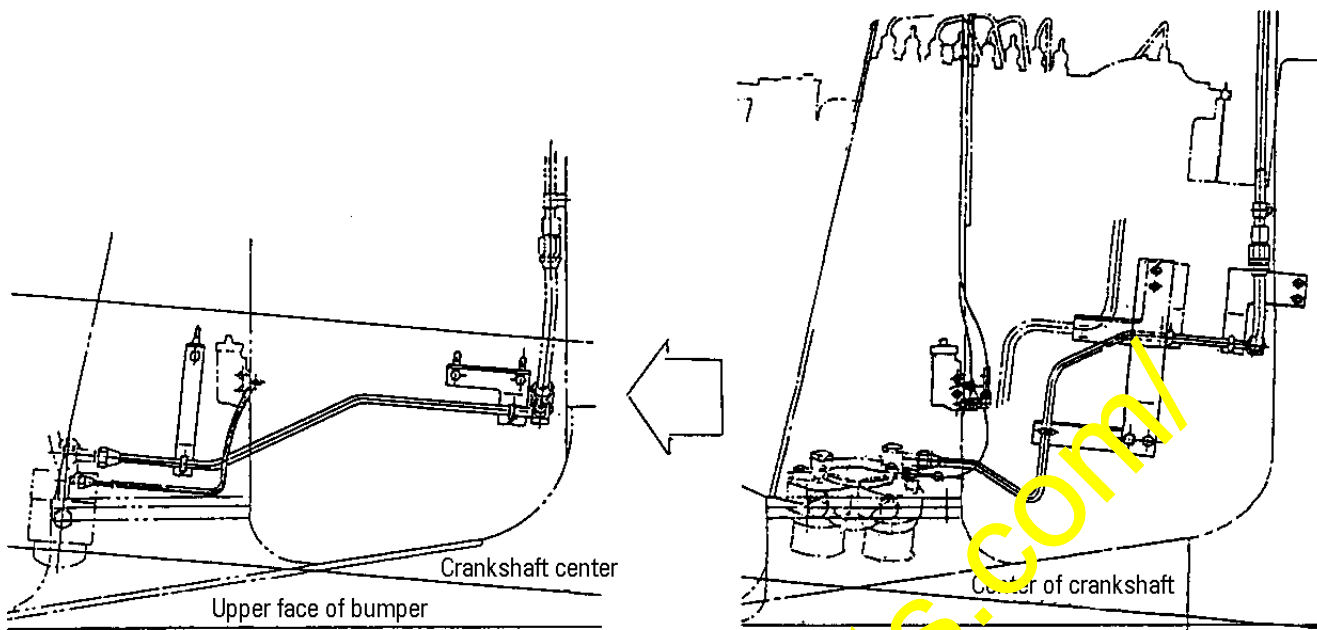
(9) Modifying the electrical system.



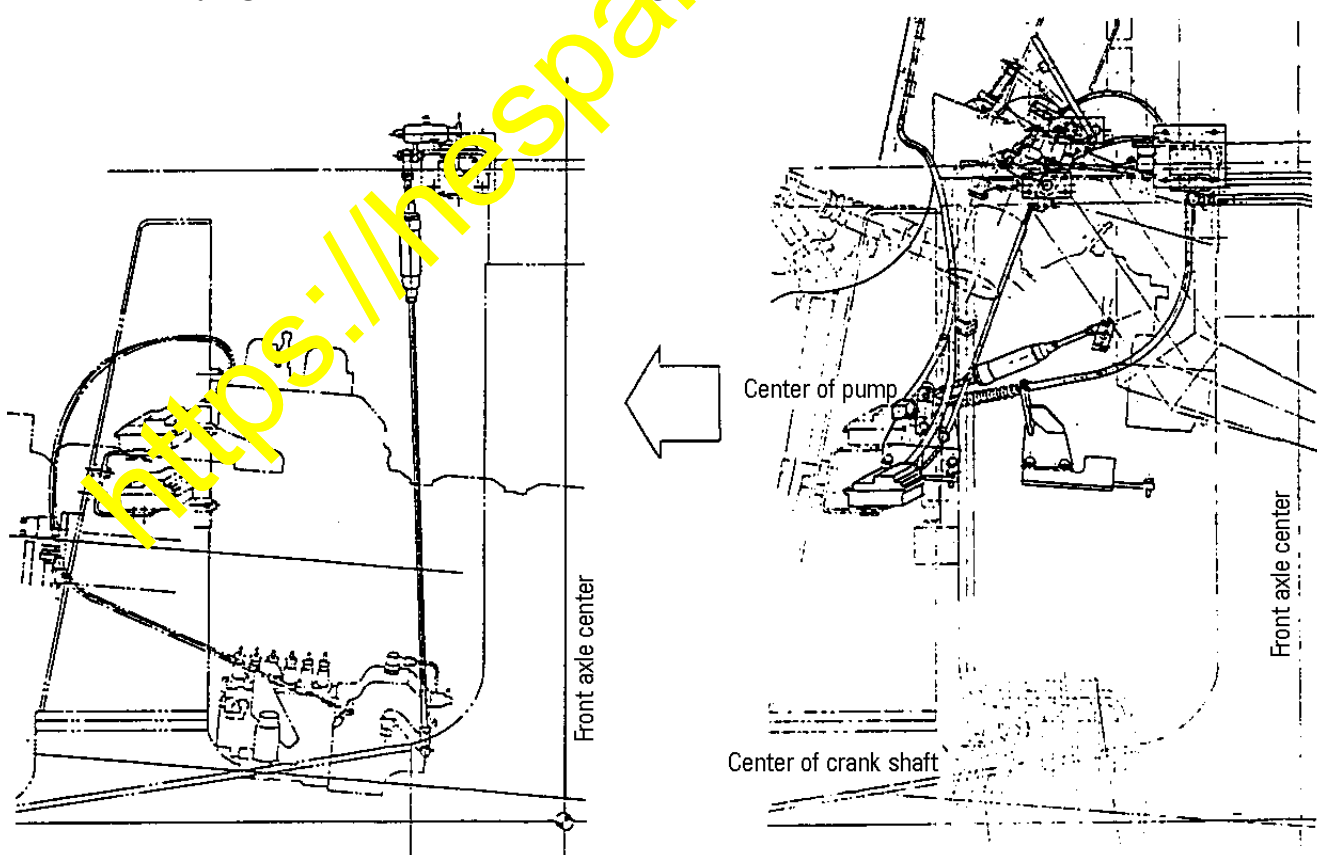
(10) Modifying the transmission oil piping.



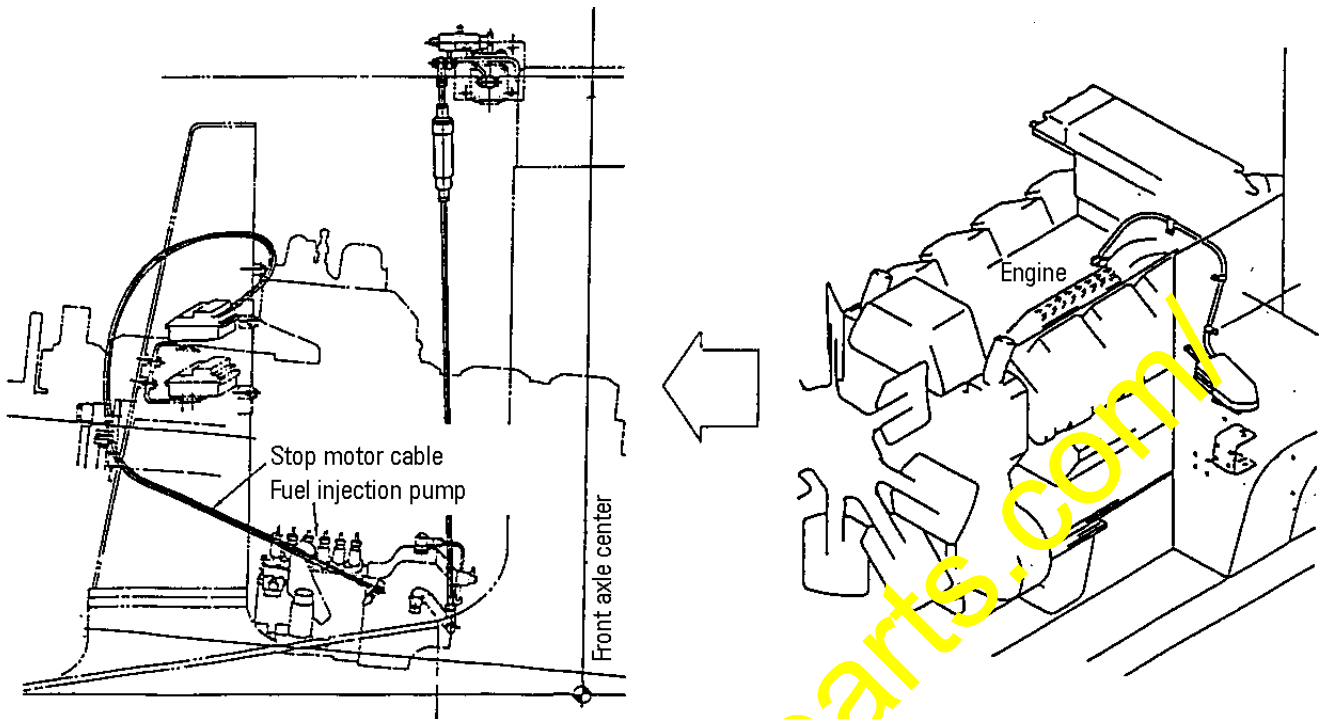
(11) Modifying the air piping.



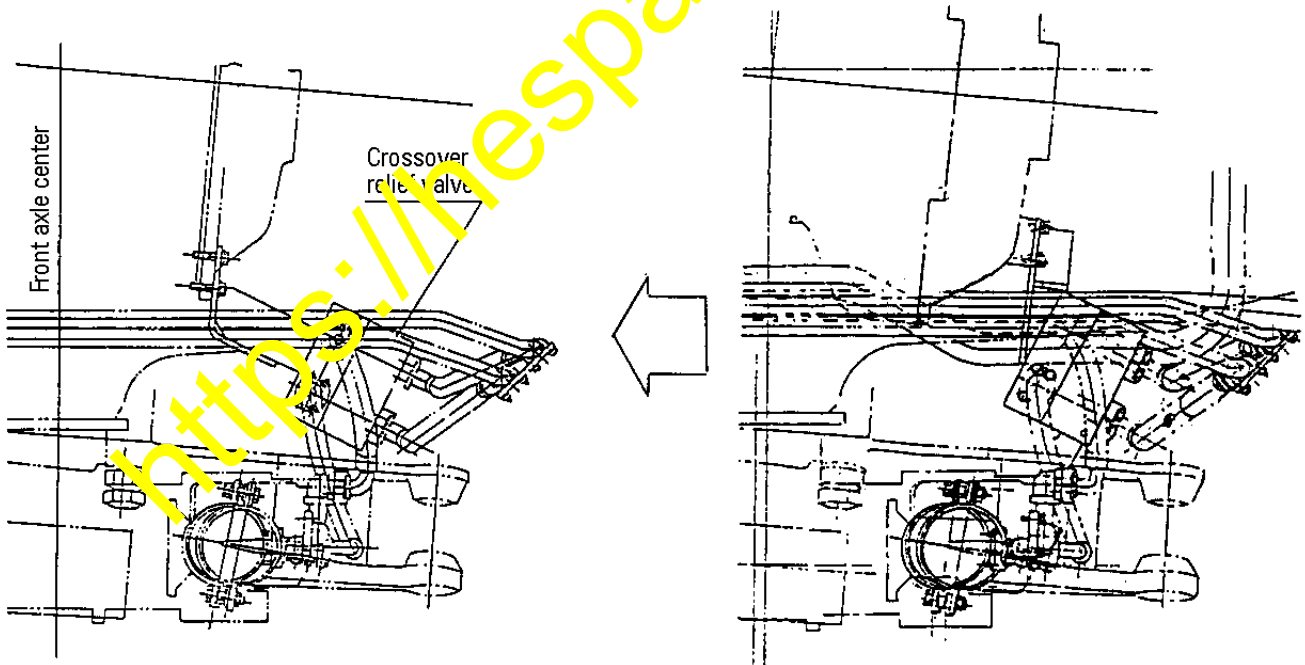
(12) Modifying the accelerator control linkage.



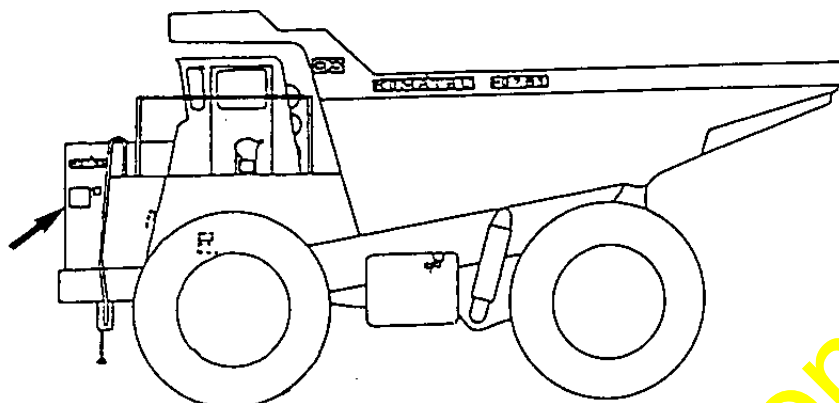
(13) Modifying the engine stop motor.



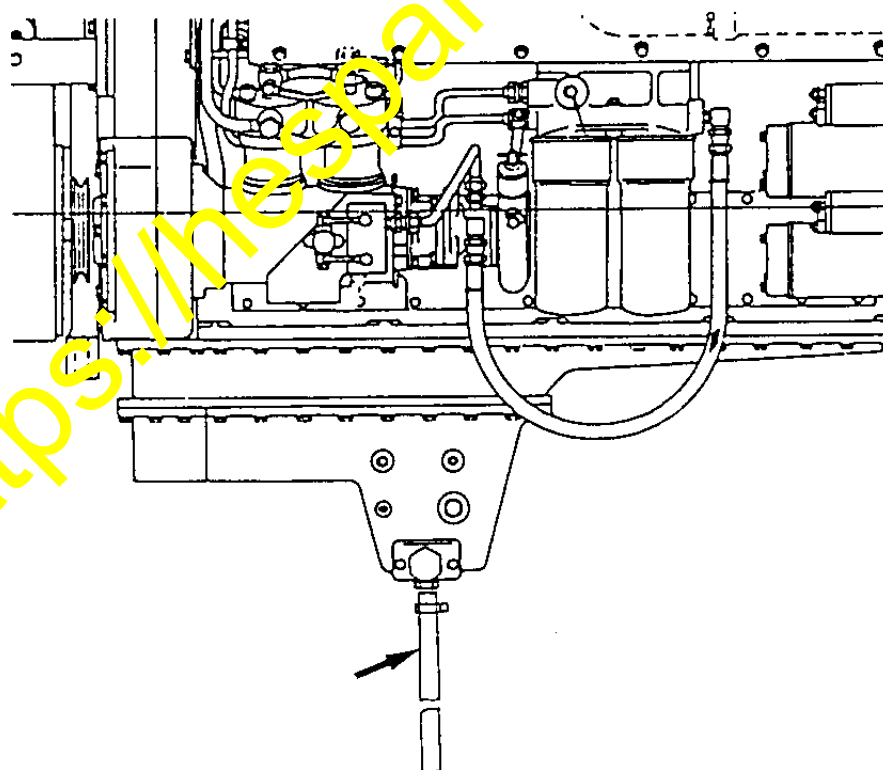
(14) Modifying the crossover relief valve mounting block.




(15) Changing the name plate (lubrication chart).

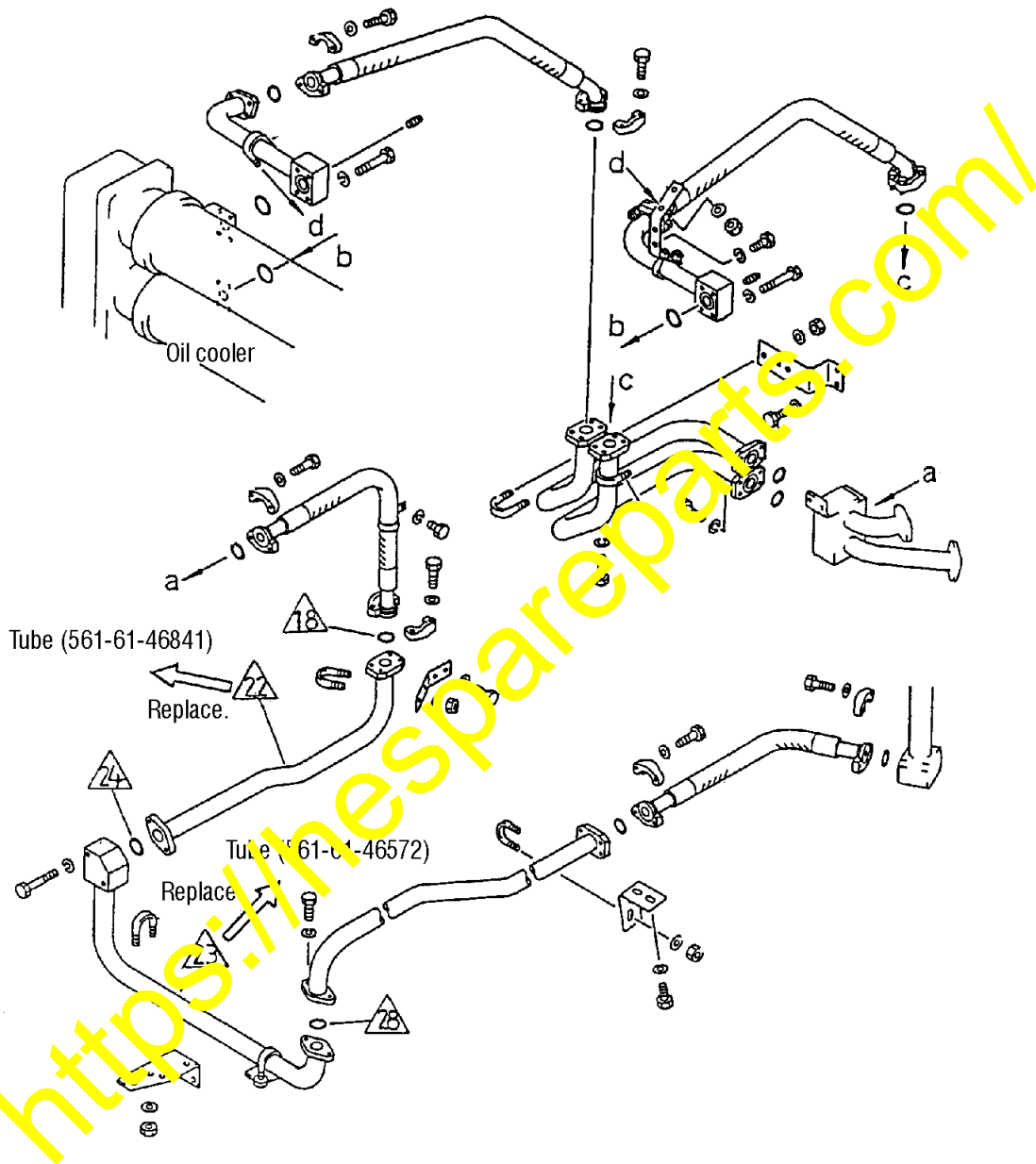


(16) Changing the tool (hose).



 Page added

(17) Changing the brake cooling piping.




3. New parts needed

No.	Part No.	Part Name	Q'ty	Remarks
\triangle	Part number of the kit of necessary parts for this replacement work excluding the engine itself			
1	561-99-05010	12V eng. replace kit	1	(#1501 – 1528) } Kit of necessary parts for this replacement work itemized as 3-2 through 3-16 (A set of newly arranged parts 3-2, 3-4 through 3- 16 and consumable parts of the output shaft)
	561-99-05011	12V eng. replace kit	1	
\triangle	561-99-05020	12V eng. replace kit	1	
\triangle	561-99-05021	12V eng. replace kit	1	
3-1	Engine			
1	\triangle 6215-29-PB00 6215-20-0130 (6164-00-3000)	Engine (Engine)	1 (1)	\triangle (With FW16)
	\triangle 6215-29-PB10 (6164-00-3000)	Engine (Engine)	1 (1)	(With FW18)
3-2	Engine mount			
1	561-01-45110 (561-01-41111)	Bracket (Bracket)	1 (1)	#1529 and up
	561-99-45510 (561-01-41110)	Bracket (Bracket)	1 (1)	#1501 thru 1528
2	01010-52090 (01011-52010)	Bolt (Bolt)	2 (2)	
3	561-01-45120 (561-01-41120)	Bracket (R.L.) (Bracket (R.L.))	1 (1)	
4	561-01-45130 (561-01-41130)	Bracket (R.R.) (Bracket (R.R.))	1 (1)	
5	01010-52050 (01010-52065)	Bolt (Bolt)	12 (12)	
6	04021-01434	Pin, dowel	4	Wear part
3-3	Output shaft			
1	561-01-X1200 (561-01-12001) \triangle or (561-01-12002)	Output shaft ass'y (Output shaft ass'y) (Output shaft ass'y)	1 (1) (1)	
3-4	Bypass filter			
1	01571-01016	Seat	3	} For reworking use
2	01573-10205	Seat	2	
3	561-54-44420	Bracket	1	
4	561-01-45510	Plate	1	
5	01010-51230	Bolt	2	
6	01643-31232	Washer	2	
7	6215-51-5800	By-pass filter	1	

No.	Part No.	Part Name	Q'ty	Remarks
8	07000-23050	O-ring	2	
9	01011-51015	Bolt	3	
10	01010-51085	Bolt	3	
11	01643-31032	Washer	6	
12	07238-10210	Connector	2	
13	07042-20108	Plug	2	
14	561-01-45520	Bracket	1	
15	424-09-12570	Clip	9	
16	581-35-23540	Insulator	9	
17	01010-51020	Bolt	6	
18	01643-31032	Washer	6	
3-5 Exhaust piping				
1	561-02-45110	Tube	1	
2	561-02-45120	Tube	1	
3	07042-20108	Plug	2	
4	6213-11-5350	V-clamp	2	
5	561-02-61141	Bracket	1	
6	01010-51240	Bolt	4	
7	01643-31232	Washer	4	
8	561-02-41230	Band	2	
9	01580-11308	Nut	4	
10	01602-21030	Washer	4	
11	561-02-61230	Tube	2	
12	561-02-61240	V-clamp	4	
13	561-02-45150	Tube	2	
3-6 Air intake piping				
1	561-02-42130	Elbow	2	
2	205-09-61110	Clamp	4	
3	561-02-45510	Tube	1	
4	561-02-45520	Tube	1	

No.	Part No.	Part Name	Q'ty	Remarks
5	568-02-22230	Hose	1	
6	561-02-45540	Bracket	1	
7	561-02-45530	Bracket	1	
8	565-44-12142	Band	1	
9	01602-21030	Washer	2	
10	01580-11008	Nut	2	
11	01572-21219	Seat	2	For reworking use
12	07042-20108	Plug	2	
3-7 Radiator piping				
1	561-03-45320 (561-03-41120)	Tube (Tube)	1 (1)	
2	561-03-45350	Tube	2	
3	566-32-11291	Seat	2	
4	01011-51030	Bolt	8	
5	01643-31032	Washer	8	
6	07260-25825	Hose	2	
7	208-09-11120	Clamp	8	
8	561-03-45220 (561-03-31360)	Bracket (Bracket)	1 (1)	
9	07261-20912 (07261-20917)	Hose (Hose)	1 (1)	Reuse hose removed
10	561-03-41340 (561-03-41141)	Tube (Tube)	1 (1)	
11	561-03-45360 (561-03-41151)	Tube (Tube)	1 (1)	
12	561-03-41330	Bracket	1	
13	01010-51235	Bolt	2	
14	01643-31232	Washer	2	
15	561-03-41320	Bracket	1	
16	01010-51235	Bolt	2	
17	01643-31232	Washer	2	
18	07283-26155	Clip	2	
19	01599-01011	Nut	4	

No.	Part No.	Part Name	Q'ty	Remarks
20	01643-31032	Washer	4	
21	07260-25825	Hose	4	
22	07281-10809	Clamp	4	
23	561-03-41360 (561-03-31670)	Tube (Tube)	1 (1)	
24	561-03-45330 (561-03-41170)	Tube (Tube)	1 (1)	
25	07260-29920 (07260-29925)	Hose (Hose)	1 (1)	
26	 561-03-45311 561-03-45310 (561-03-41210)	Tube (Tube)	1 (1)	
27	07000-02120	O-ring	1	
28	561-03-45340 (561-03-41190)	Tube (Tube)	1 (1)	
29	561-03-45210 (561-03-41481)	Shroud (Shroud)	1 (1)	
30	07000-02085	O-ring	1	} Wear part
31	07000-02090	O-ring	1	
32	07000-02060	O-ring	2	
33	07000-02120	O-ring	1	
3-8	Fuel tank and piping			
1	561-04-45120	Joint	1	For reworking tank
2	561-04-45130 (566-04-15271)	Plate (Plate)	1 (1)	
3	01010-53816	Bolt	2	
4	01643-30823	Washer	2	
5	07326-10604	Adapter	2	
6	07700-50661 (07700-60504)	Valve (Valve)	1 (1)	Fuel valve
7	561-04-61350	Tee	1	
8	07005-01412	Gasket	4	
9	07206-31014	Joint	2	
10	561-04-61560	Hose (L.H.)	1	
11	566-04-81111	Hose (R.H.)	1	
12	561-04-45110	Cover	1	

No.	Part No.	Part Name	Q'ty	Remarks
13	01434-10825	Wing bolt	2	
14	04050-12015	Pin, cotter	2	
15	01643-30823	Washer	2	
16	01010-51420	Bolt	4	
17	01643-31445	Washer	4	
18	6215-71-6200	Fuel filter ass'y	1	
19	01010-51240	Bolt	3	
20	01643-31232	Washer	3	
21	07002-02434	O-ring	2	
22	07235-10522	Elbow	2	
23	07102-20512	Hose	2	
24	561-43-41620	Insulator	4	
25	285-02-11320	Clip	4	
26	01010-51016	Bolt	2	
27	01643-31032	Washer	2	
28	01571-01016	Seat	1	For reworking use
29	07102-20345	Hose (R.H)	1	
30	07102-20355	Hose (L.H)	1	
31	569-04-61320	Clip	19	
32	566-61-49810	Insulator	19	
33	561-04-61290	Plate	6	
34	07283-27671	Clip	6	
35	01559-01011	Nut	12	
36	01643-31032	Washer	12	
37	01010-51016	Bolt	6	
38	01643-31032	Washer	6	
39	209-04-13130	Elbow	1	
40	07238-00315	Connector	2	
41	07270-40450	Tube	1	
42	07209-01040	Nipple	1	
43	562-35-13910	Clamp	2	

No.	Part No.	Part Name	Q'ty	Remarks
44	08036-10814	Clip	10	
45	07834-00817	Elbow	1	
46	568-16-11111	Seat	2	For reworking use
3-9 Electrical system				
1	01571-01016	Seat	1	For reworking use
2	07326-10403	Adapter	1	
3	569-06-67510	Sensor	1	
4	08053-01512	Clip	1	
5	01010-51216	Bolt	1	
6	01643-31232	Washer	1	
7	566-06-41191 (281-06-13910)	Sending unit (Sending unit)	1 (1)	
8	561-06-45110 (561-06-41362)	Wiring harness (Wiring harness)	1 (1)	
9	561-06-45120	Wiring harness	1	
10	569-06-61210	Switch, heat	1	
11	561-06-45140	Plate	1	
12	565-06-11641	Earth	1	
13	01010-51016	Bolt	1	
14	01643-31032	Washer	1	
15	08036-01814	Clip	8	
16	08036-02514	Clip	6	
17	08036-00814	Clip	1	
18	\triangle 08036-02514 08036-05214	Clip	5	
19	08036-01414	Clip	1	
20	01010-51020	Bolt	14	
21	01643-31032	Washer	14	
22	\triangle 08052-11711 08036-11711	Clip	1	
23	01435-01060	Bolt	1	
24	\triangle 08034-00519 08034-01519	Band	20	

No.	Part No.	Part Name	Q'ty	Remarks
25	206-01-44320	Collar	1	
3-10	Transmission oil piping			
1	561-16-45211 (561-16-31273)	Tube (Tube)	1 (1)	
2	561-16-45221 (561-16-11351)	Tube (Tube)	1 (1)	
3	07000-12060	O-ring	1	Wear part
4	07000-13048	O-ring	2	Wear part
3-11	Air piping			
1	561-35-45130 (561-35-41130)	Tube (Tube)	1 (1)	
2	07283-21529	Clip	2	
3	561-35-45160	Bracket	1	
4	01011-31070	Bolt	1	
5	01643-31032	Washer	1	
6	561-35-45150	Bracket	1	
7	01011-31070	Bolt	2	
8	01643-31032	Washer	2	
9	561-35-41110 (561-35-41111)	Tube (Tube)	1 (1)	
3-12	Accelerator control linkage			
1	561-43-47110 (561-43-41460)	Bracket (Bracket)	1 (1)	
2	01010-51035	Bolt	1	
3	01010-51065	Bolt	1	
4	561-43-47120	Lever	1	
5	07020-00900	Fitting	1	
6	06120-01816	Bearing	2	
7	06122-01803	Seal	2	
8	01640-21826	Washer	4	
9	01643-31032	Washer	1	
10	01590-11012	Nut	1	

No.	Part No.	Part Name	Q'ty	Remarks
11	04050-12018	Pin, cotter	1	
12	04252-21061	Rod end	1	
13	01582-11008	Nut	1	
14	01090-51040	Bolt	3	
15	01643-31032	Washer	2	
16	04254-01032	Spacer	6	
17	01599-01011	Nut	3	
18	04250-91056	Rod end	1	
19	04248-31009	Rod	1	
20	01508-41006	Nut	1	
21	01582-11008	Nut	1	
22	561-43-61500	Absorber ass'y	1	
23	561-43-47130	Rod	1	
24	01582-11008	Nut	2	
25	04250-81056	Rod end	1	
3-13	Engine stop motor			
1	600-815-6631 (600-815-6621)	Motor (Motor)	1 (1)	
3-14	Crossover relief valve mounting block			
1	561-61-45110 (561-61-44610)	Bracket (Bracket)	1 (1)	
2	01010-51250 (01010-51240)	Bolt (Bolt)	4 (4)	
3	07000-13032	O-ring	2	Wear part
4	07000-13030	O-ring	2	Wear part
5	07000-13025	O-ring	4	Wear part
3-15	Name plate			
1	561-93-45110 (561-93-41111)	Oil chart (Oil chart)	1 (1)	
3-16	Tool			
1	6215-21-5600 (6166-21-5600)	Hose ass'y (Hose ass'y)	1 (1)	

 Page added

No.	Part No.	Part Name	Q'ty	Remarks
3-17	Brake cooling piping			
1	561-61-46841 (561-61-46840)	Tube (Tube)	1 (1)	
2	561-61-46572 (561-61-46571)	Tube (Tube)	1 (1)	
3	07000-13048	O-ring	1	Consumable part
4	07000-13045	O-ring	2	Consumable part

<https://hespareparts.com/>

4. Engine mounting procedure

- (1) Numbers in parentheses succeeding part name or part number as well as numbers affixed to part numbers appearing in illustrations correspond to index numbers in the list of new parts needed.
- (2) For details of disassembly and reassembly operations mentioned in the following description, see the Shop Manual for the machine involved.
- (3) Unless otherwise specified, bolt tightening torque should be in conformity with the following standard:

Bolt nominal dia. (mm)	Tightening torque (kgm)	Bolt nominal dia. (mm)	Tightening torque (kgm)
6	0.9 - 1.5	14	8.5 - 20.0
8	1.5 - 3.5	16	15.0 - 31.5
10	3.5 - 7.5	18	20.5 - 43.5
12	5.5 - 12.5	20	32.0 - 62.0

- (4) Numbers appearing in illustrations are classified into three categories:
 \circ : Numbers in circle indicate parts to be removed and reused later;
 \triangle : Numbers in triangle indicate parts to be removed and discarded ; and
Others indicate parts which do not need removal.

4-1. Replacing the engine (Fig. 1)

Dismount the existing engine (SA8V170) and replace it with new engine (SA12V140)

~~(6215-20-0130)~~ (1).

\triangle B 6215-29-PB00

\triangle C or 6215-29-PB10

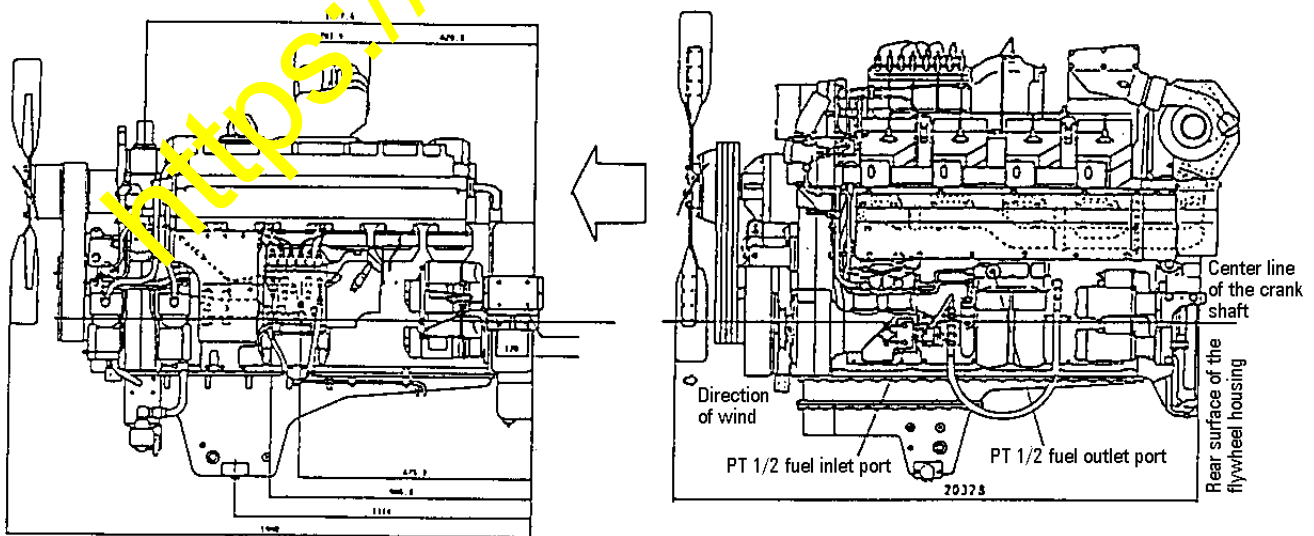
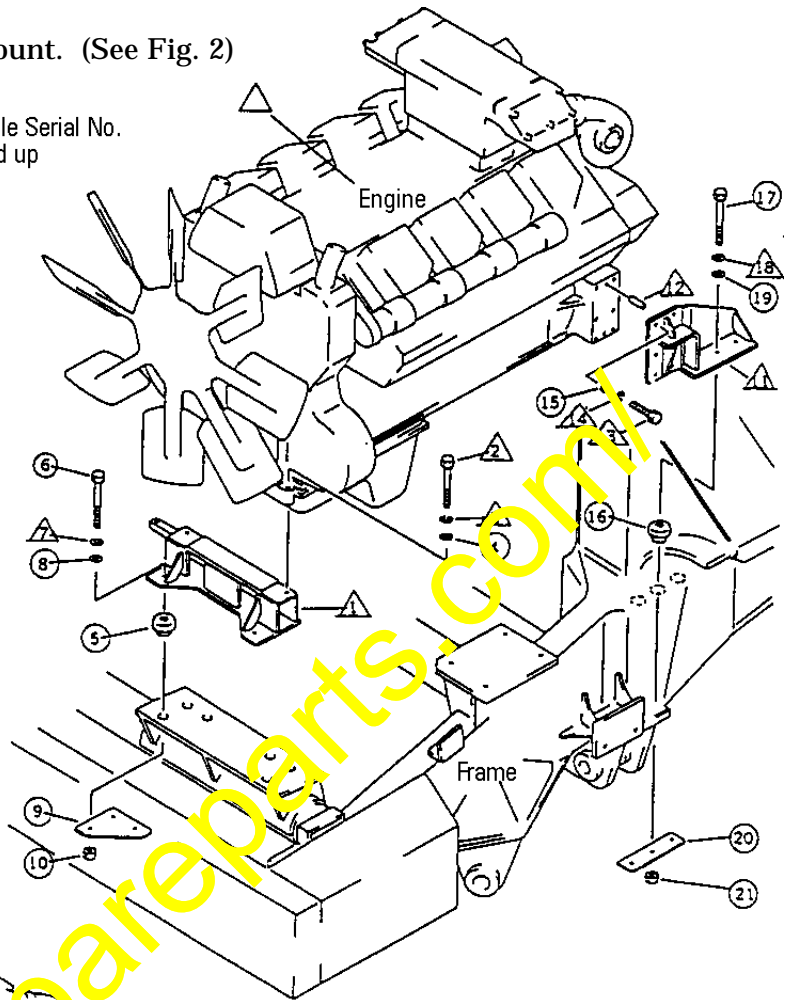


Fig. 1

4-2. Replacing the engine mount

- (1) Remove the existing engine mount. (See Fig. 2)

Applicable Serial No.
1529 and up



Applicable Serial No.
1501 thru 1528

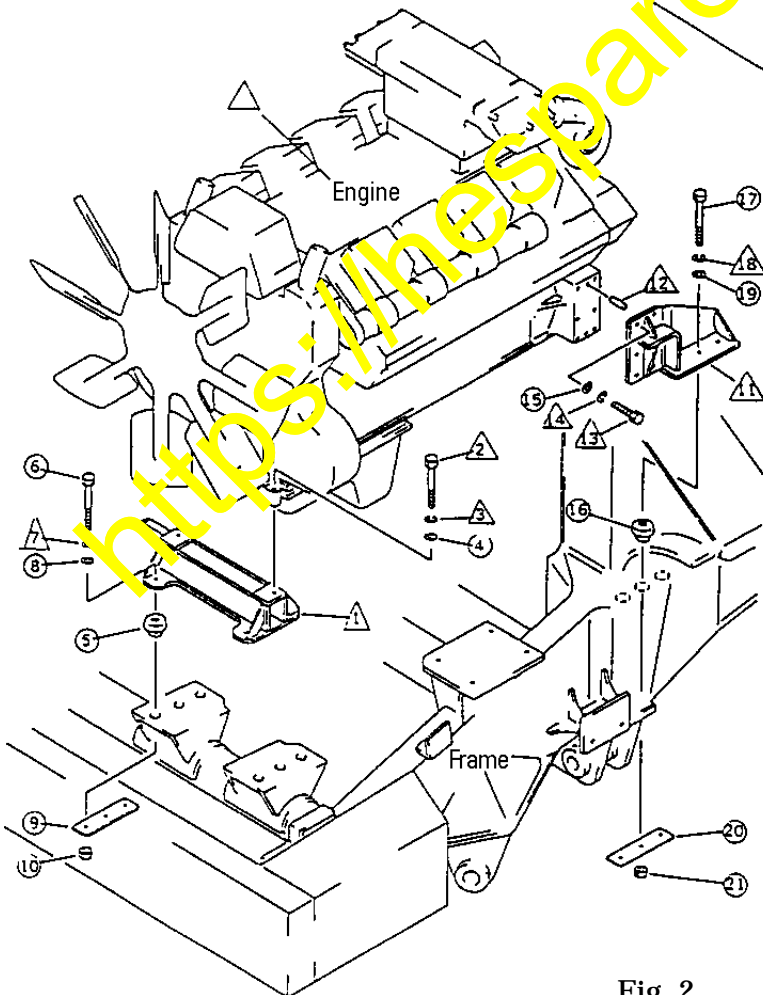


Fig. 2

- (2) Install the newly supplied parts. (See Fig. 3)
In the drawing, ☆ mark indicates parts to be reused.

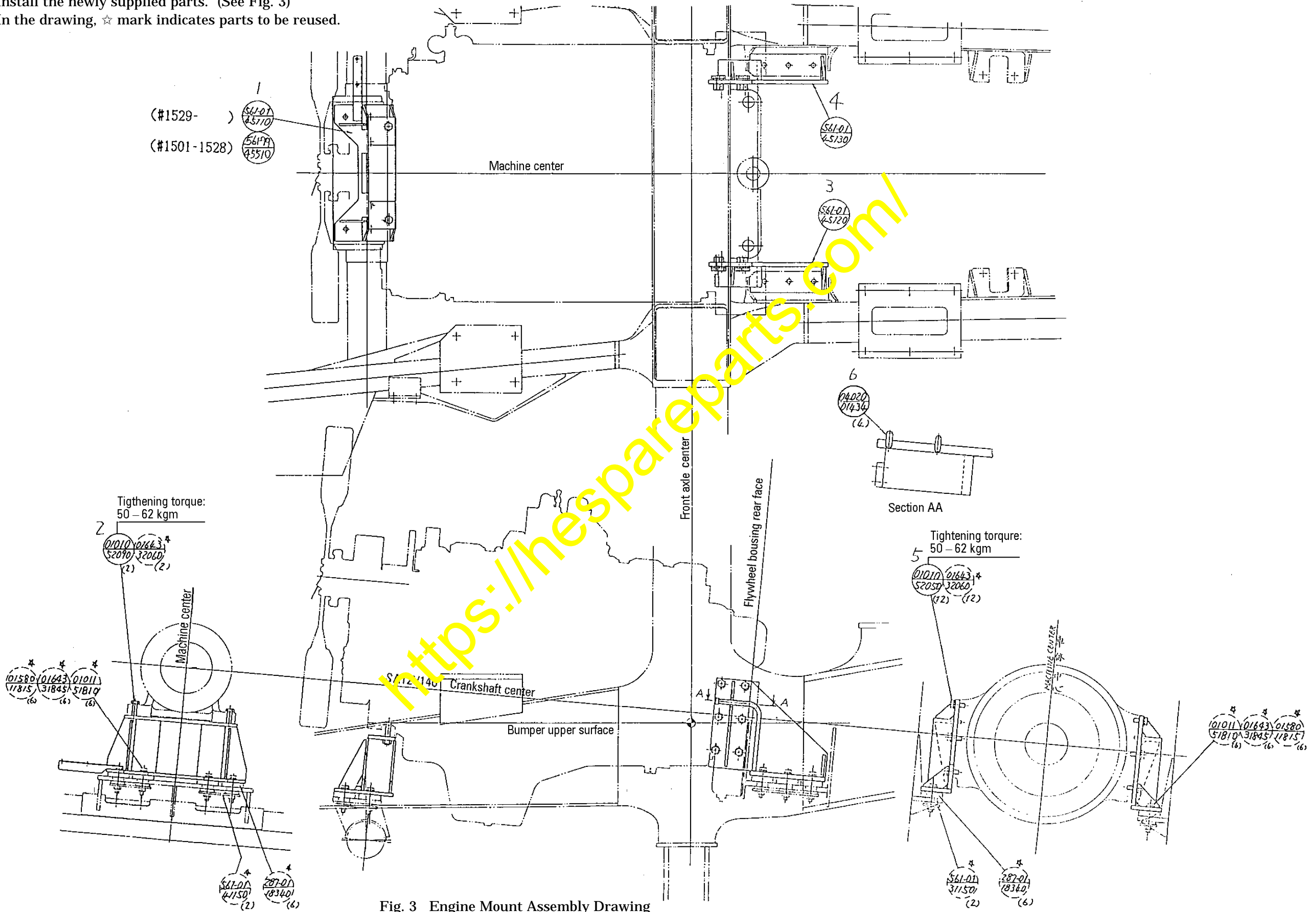



Fig. 3 Engine Mount Assembly Drawing

4-3. Replacing the output shaft  (See Paragraph 7 when you do not change it.)

-  (1) Remove the present output shaft (561-01-12001) or (561-01-12002) and mount the newly arranged output shaft (561-01-X1200) (1). (Fig. 4a)

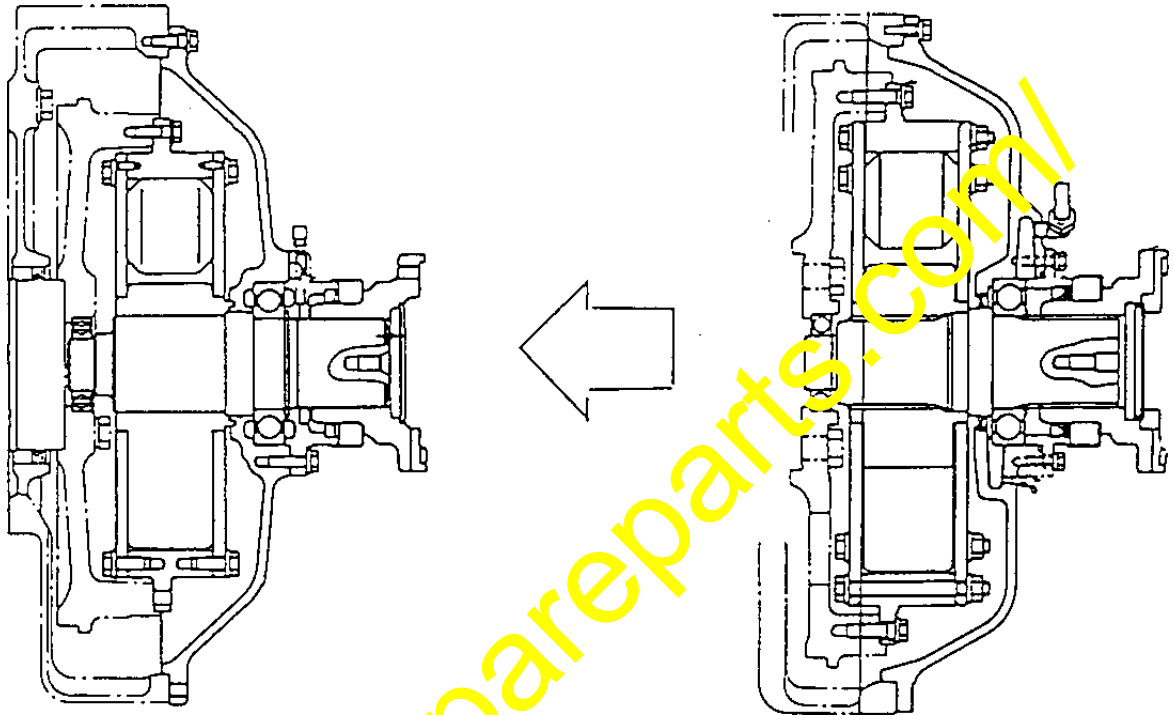


Fig. 4 a

(2) OUTPUT SHAFT ASSEMBLY (561-01-X1200) is shown in a disassembled view (See Fig. 4 b) and its component parts list is on the next page.

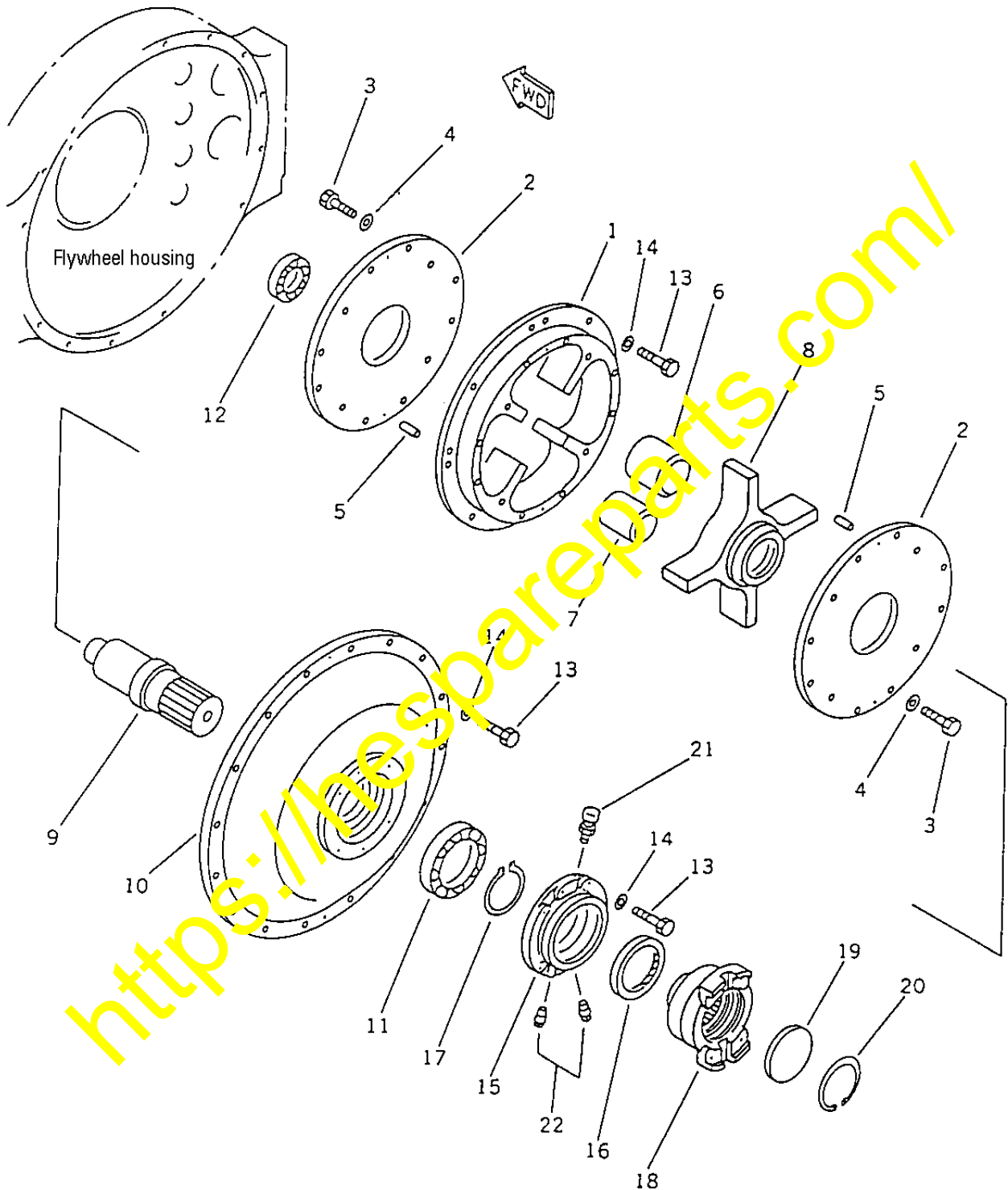


Fig. 4 b

No.	Part No.	Part Name	Q'ty	Remarks
1	561-01-62141	Body, outer	1	
2	561-01-62161	Flange	2	
3	01010-31435	Bolt	24	
4	01643-31445	Washer	24	
5	04020-00820	Pin	4	
6	561-01-62420	Rubber	4	
7	561-01-62410	Rubber	4	
	561-01-62601	Body ass'y	1	
	□561-01-62600	Body ass'y	1	
8	(☆561-01-62650)	•Body, inner	1	
9	(☆561-01-62612)	•Shaft	1	
	(☆561-01-62611)	•Shaft	1	
10	561-01-62111	Cover	1	
11	06000-06219	Bearing	1	
12	569-01-12492	Bearing	1	
	□569-01-12491	Bearing	1	
13	01010-31240	Bolt	30	
14	01643-31232	Washer	30	
15	561-01-62121	Cover	1	
16	562-01-12742	Seal	1	
17	04064-09530	Ring, snap	1	
	561-01-62712	Coupling	1	
	(☒561-01-62711)	Coupling	1	
18	561-01-62720	•Coupling	1	
19	711-60-11340	•Gear	1	
20	04065-01204	•Ring, snap	1	
21	07030-01030	Breather	1	
22	07042-70108	Plug	2	

4-4. Installing the by-pass filter

- (1) Weld a SEAT (01571-01016) (1) to R.H. FRONT SUPPORT (561-54-31270) and another to FRAME (561-46-31103). (See Fig. 5)

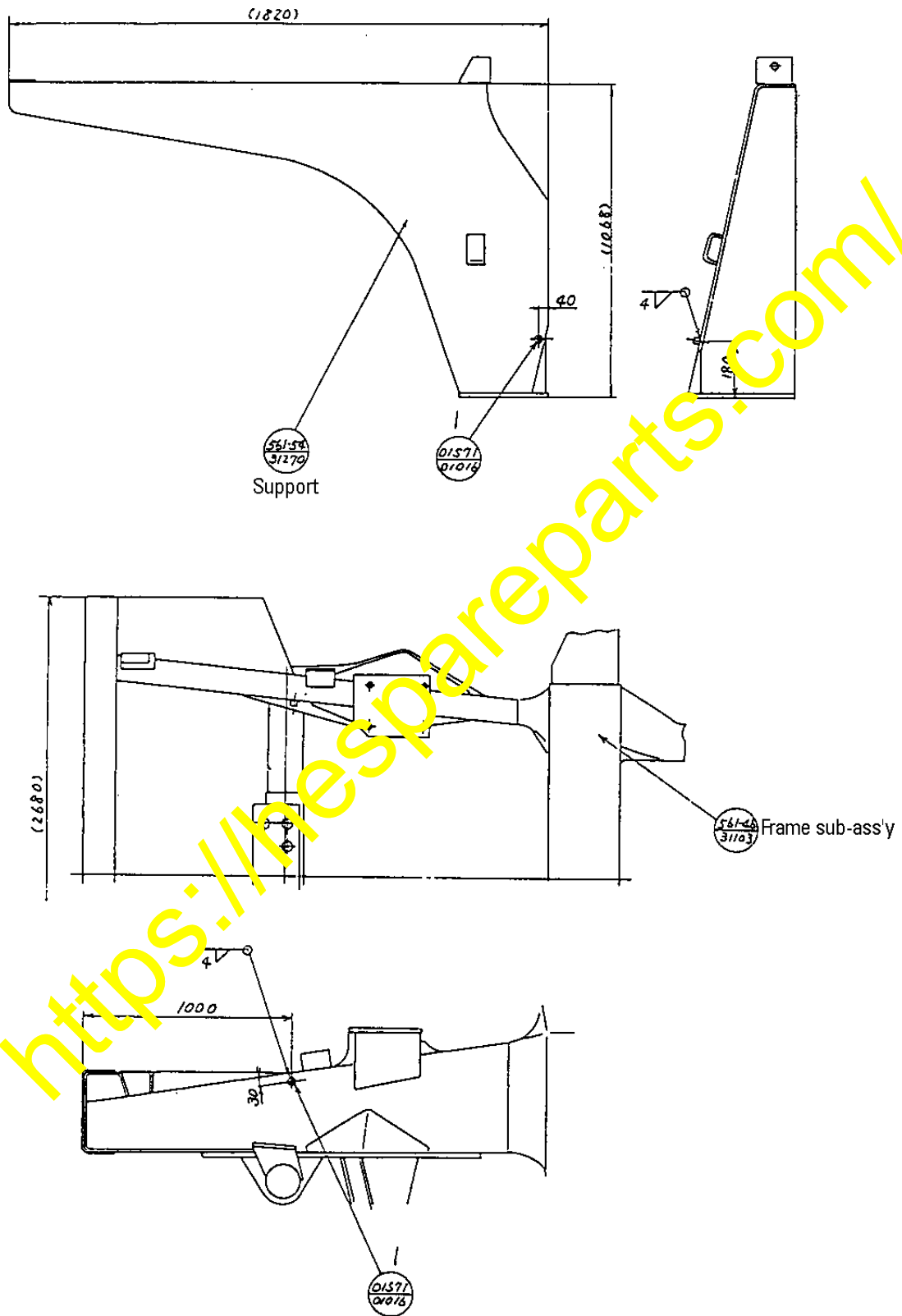


Fig. 5

- (2) Weld a SEAT (01571-01016) (1), two SEATS (01573-10205) (2), and a BRACKET (561-54-44420) (3) to GUARD (561-54-41410). Machine a 130 mm dia. hole to the guard. (See Fig. 6)

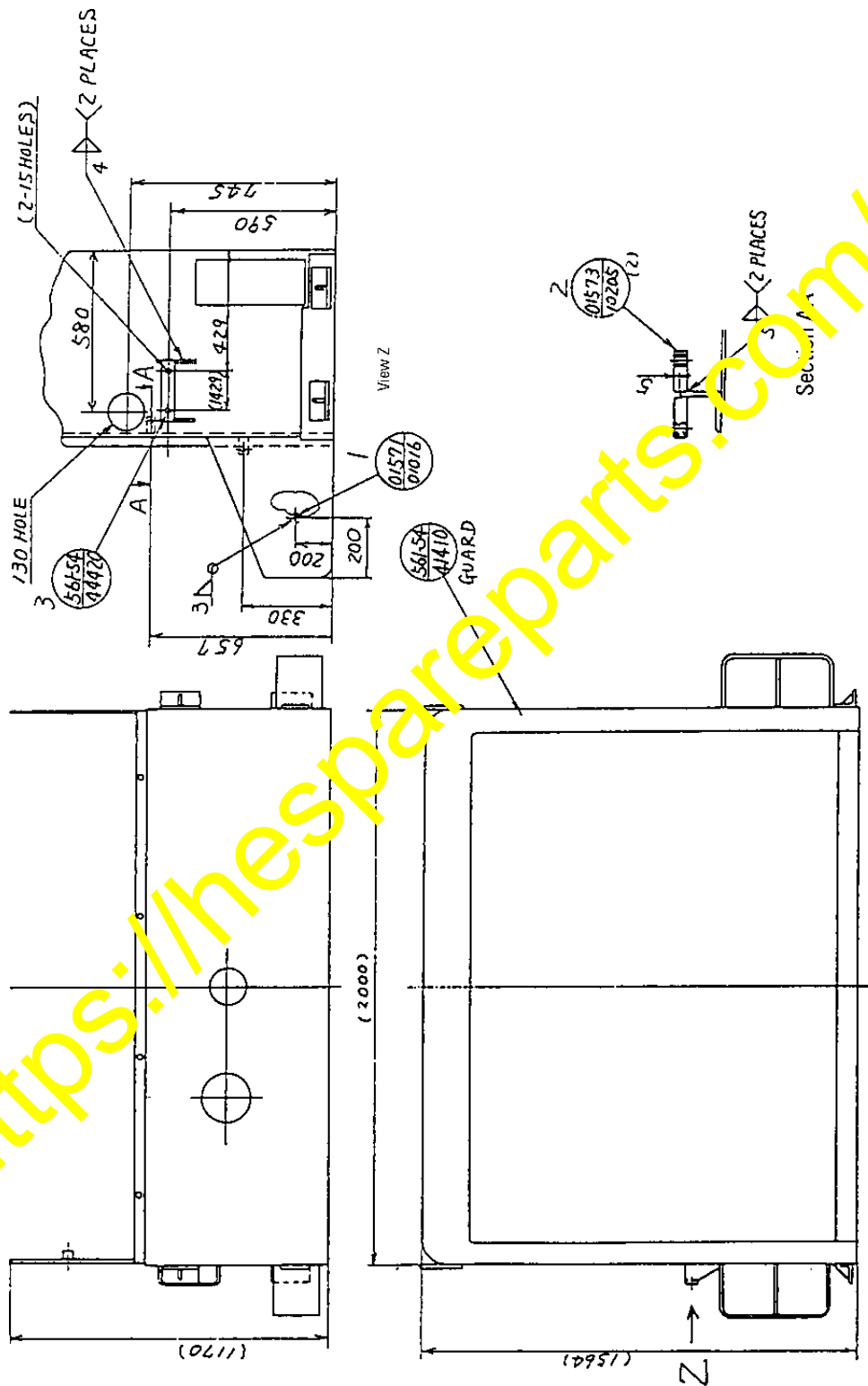


Fig. 6

(3) Install the newly supplied parts. (See Fig. 7)

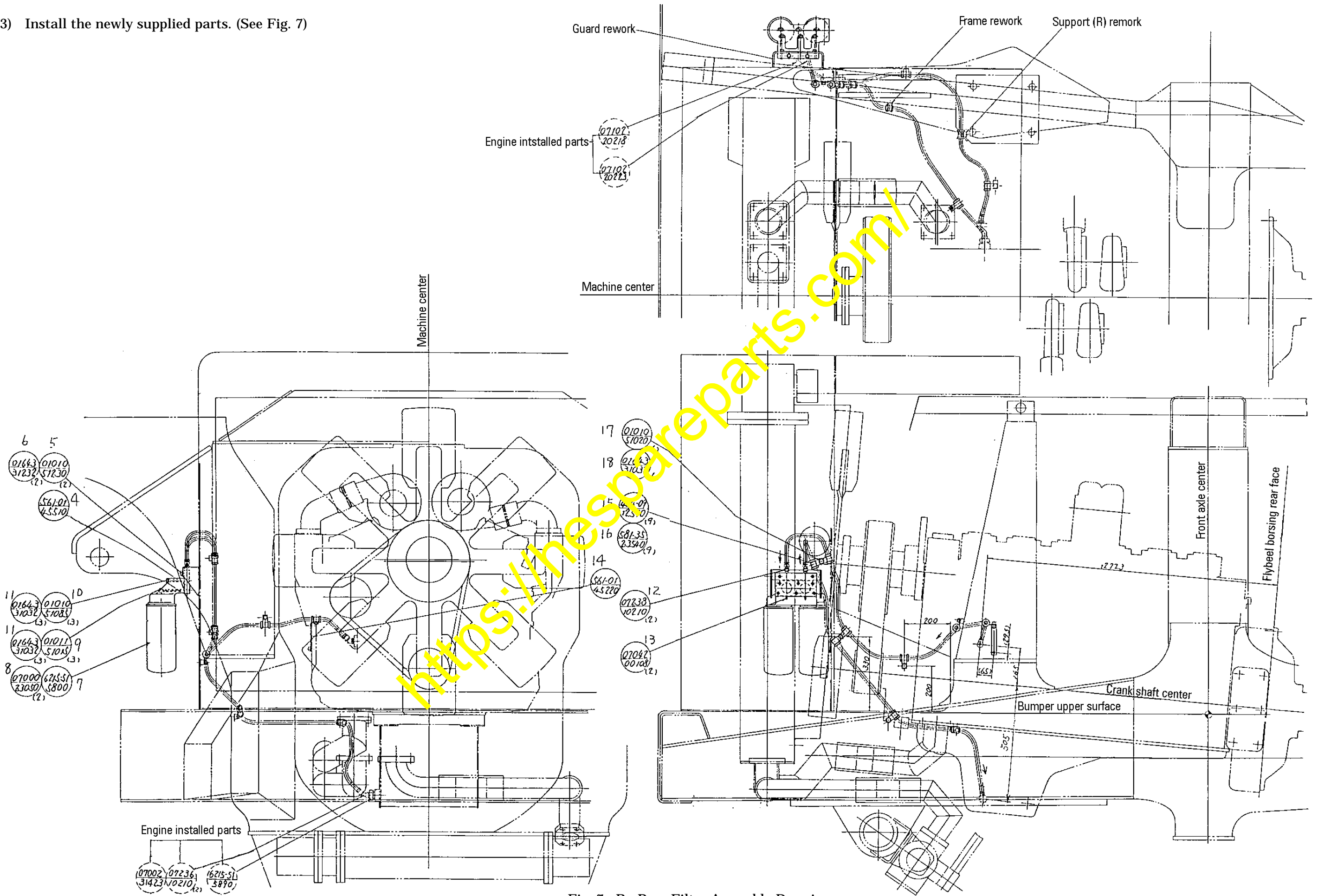


Fig. 7 By-Pass Filter Assembly Drawing

4-5. Replacing the exhaust piping

- (1) Remove the existing exhaust piping. (See Fig. 8)

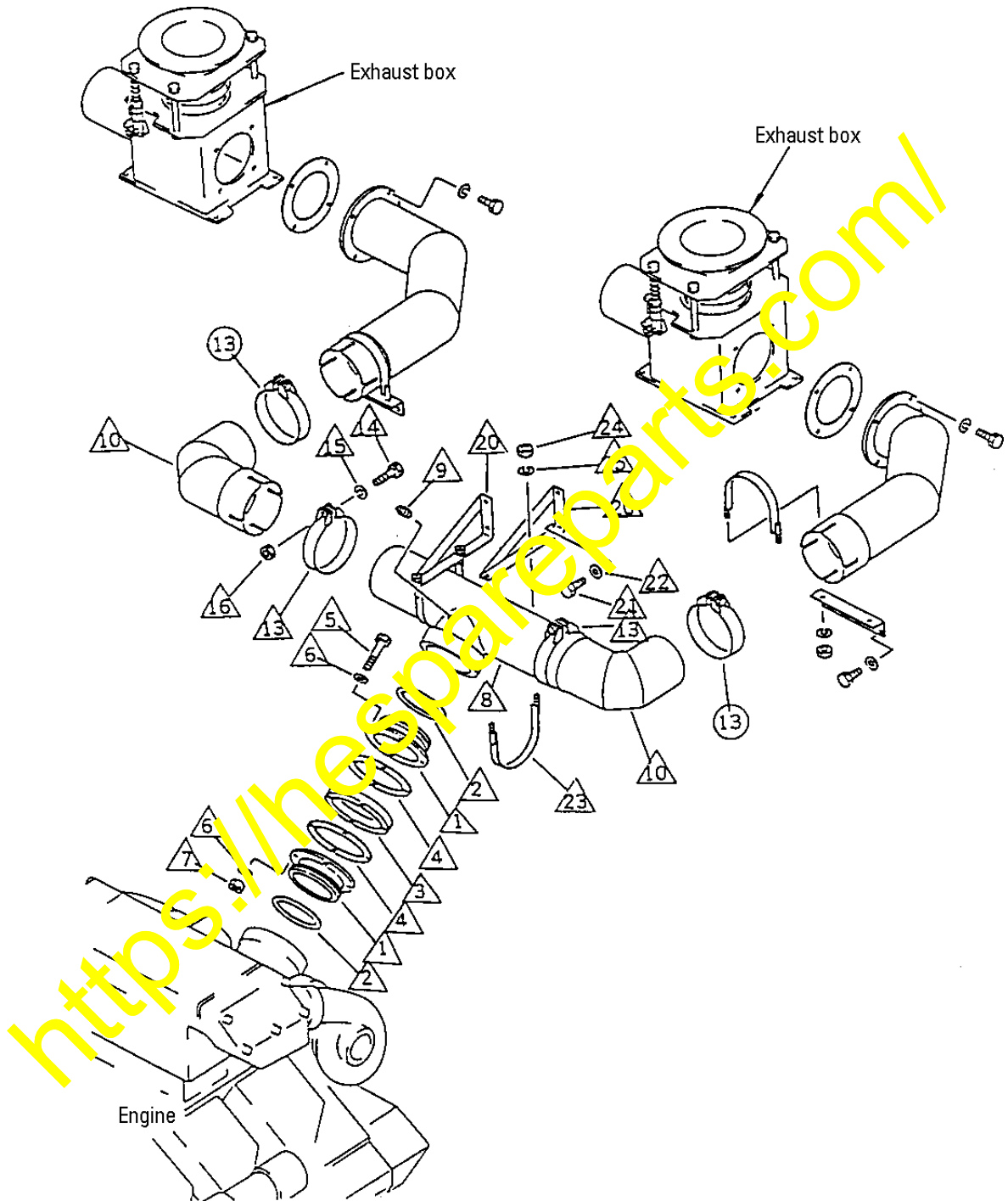


Fig. 8

- (2) Install the newly supplied exhaust piping. (See Fig. 9)
 In the drawing, ☆ mark indicates parts to be reused.

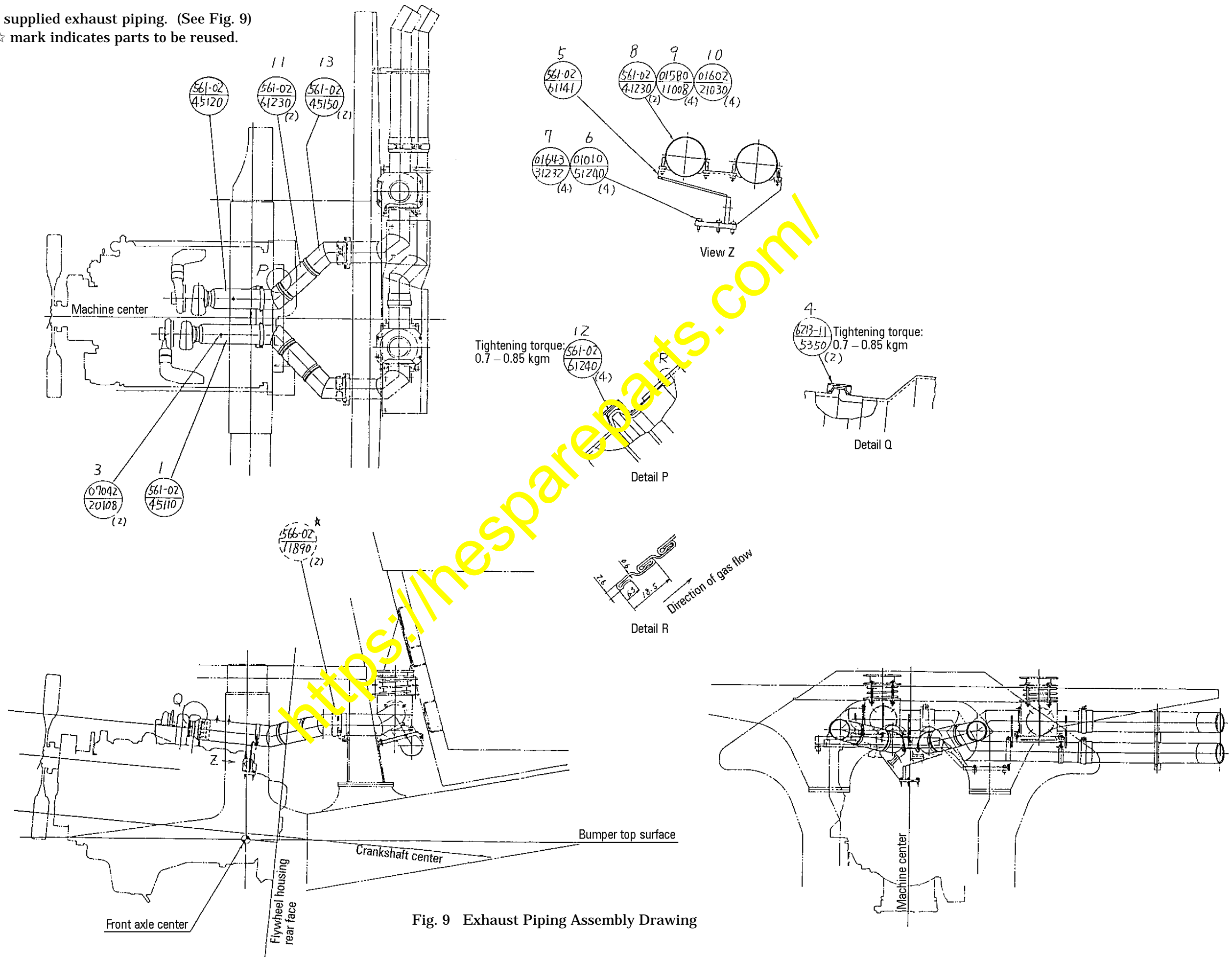


Fig. 9 Exhaust Piping Assembly Drawing

4-6. Replacing the air intake piping

- (1) Remove the existing air intake piping. (See Fig. 10)

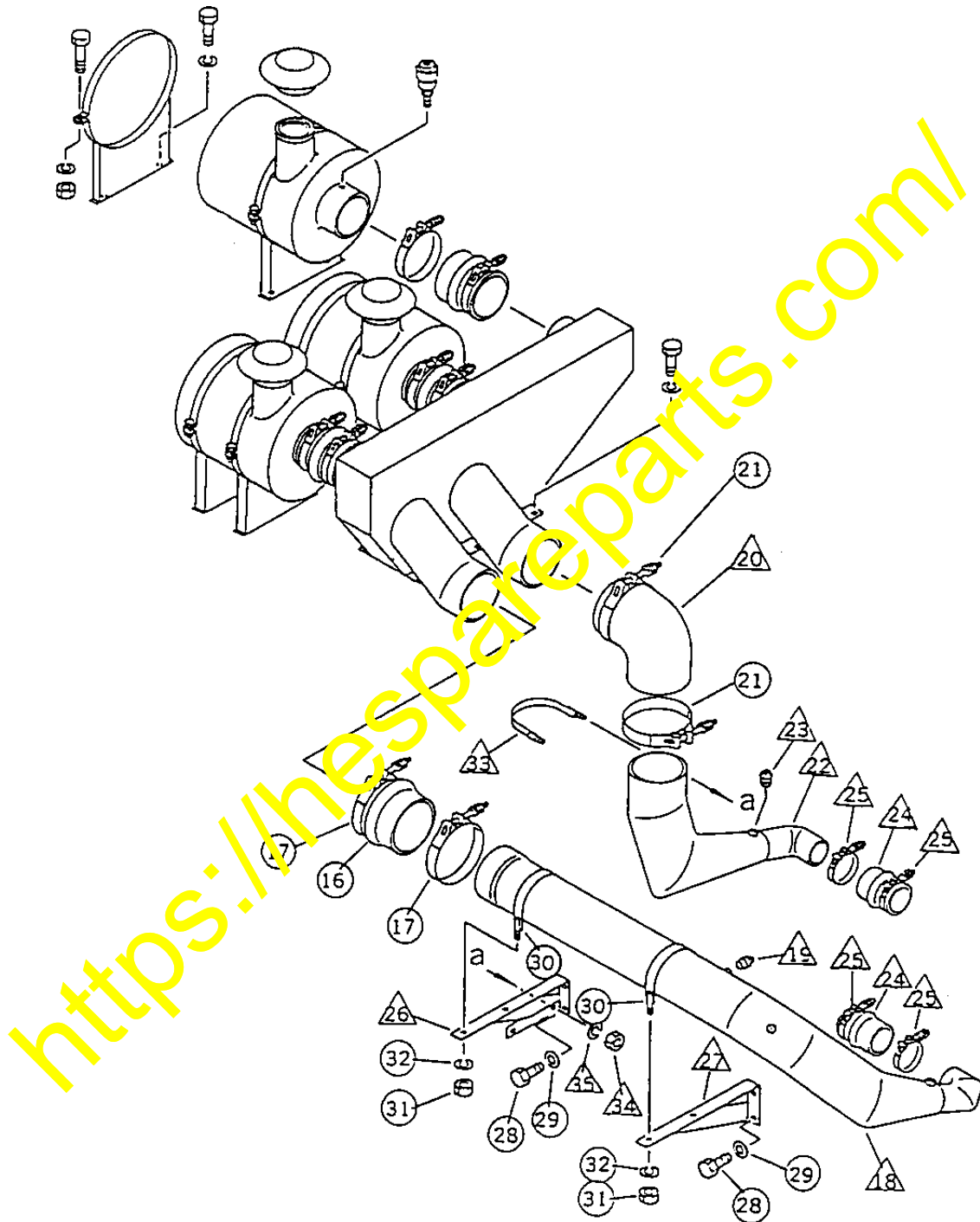


Fig. 10

- (2) Weld two SEATS (01672-21219) (11) to FRAME (561-46-31103). (See Fig. 11)
 - (3) Install the newly supplied air intake piping. (See Fig. 11)
- In the drawing, ☆ mark indicates parts to be reused.

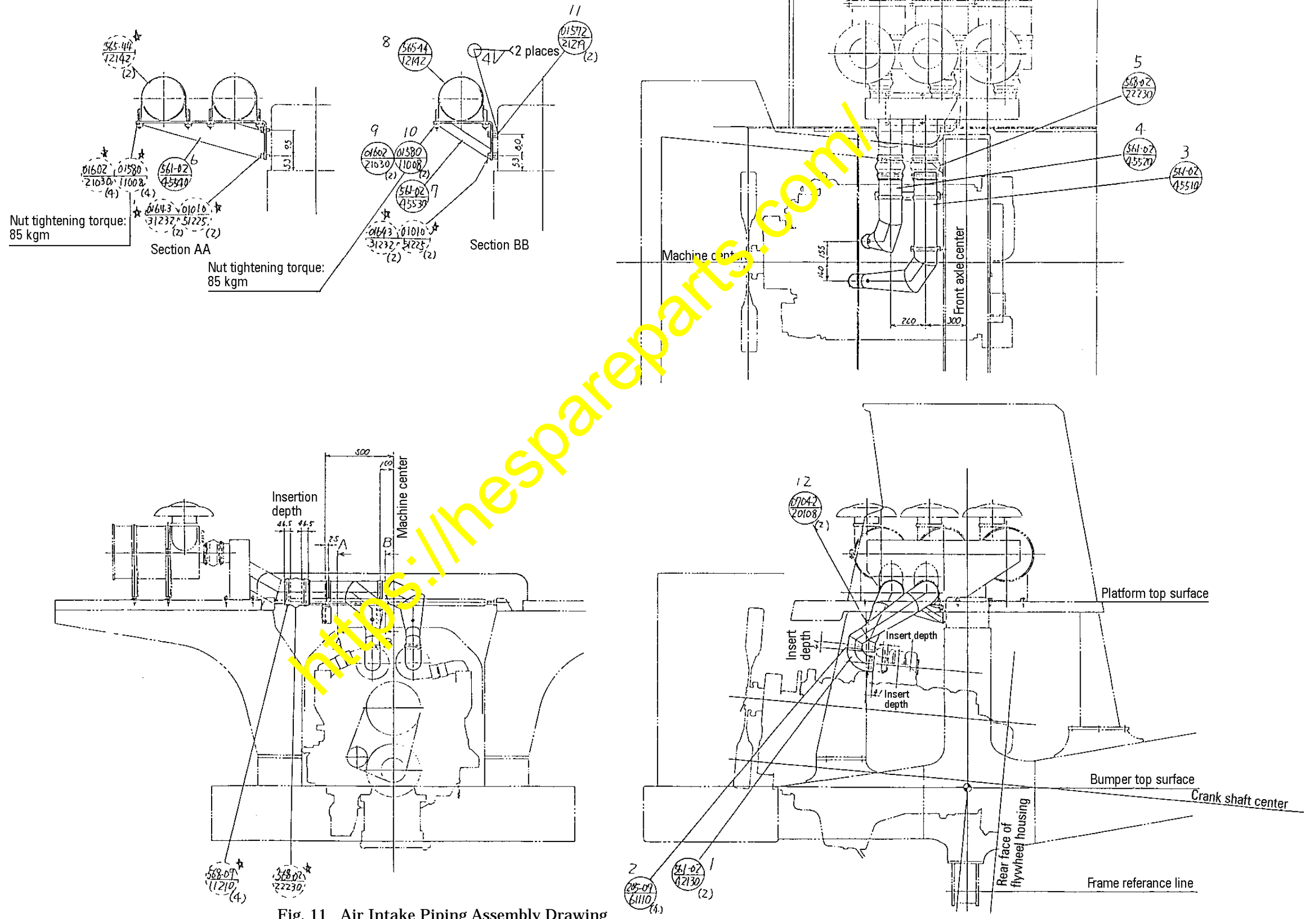


Fig. 11 Air Intake Piping Assembly Drawing

4-7. Replacing the radiator piping

- (1) Remove the existing radiator piping. (See Figs. 12 a and 12 b)

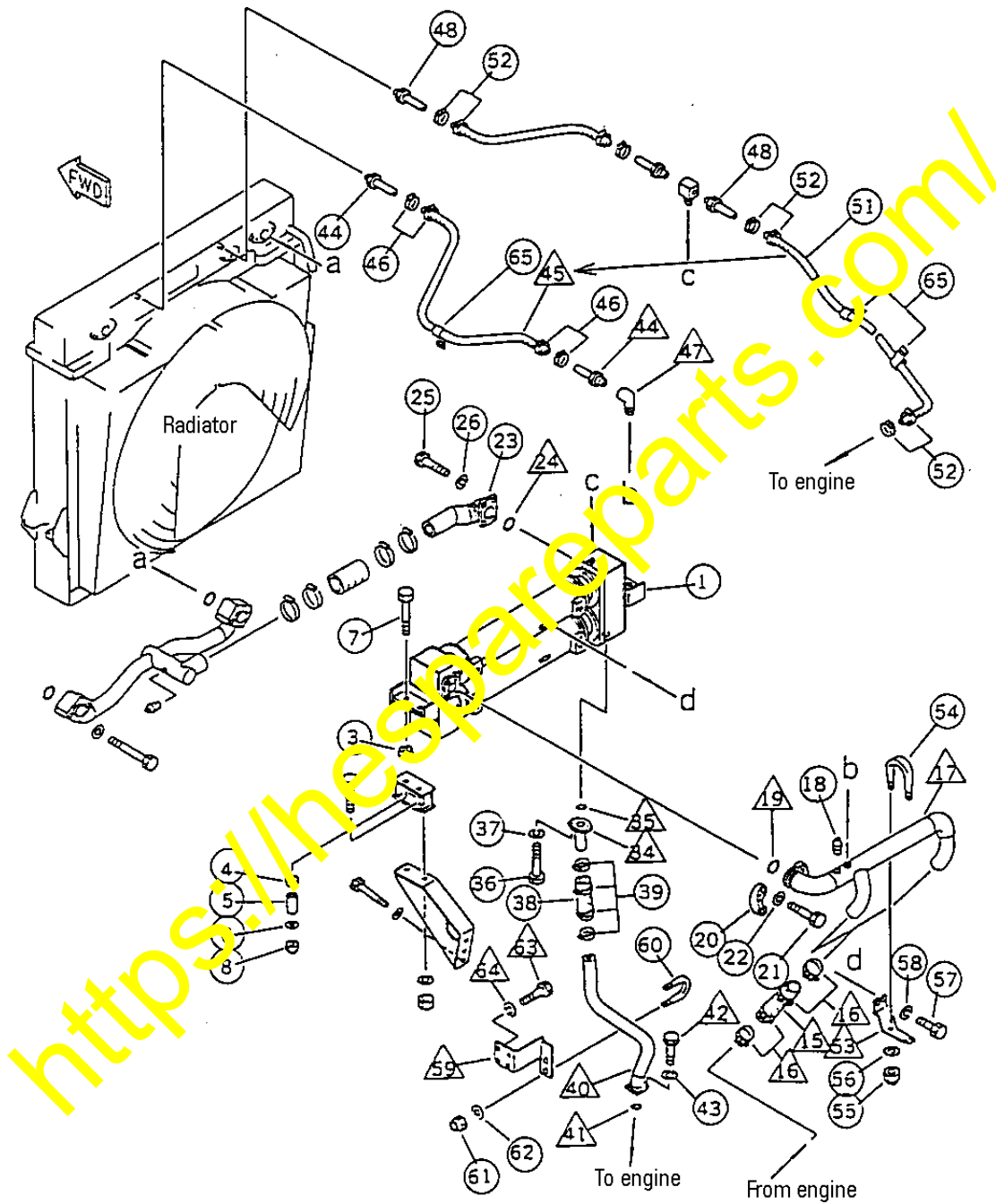


Fig. 12 a

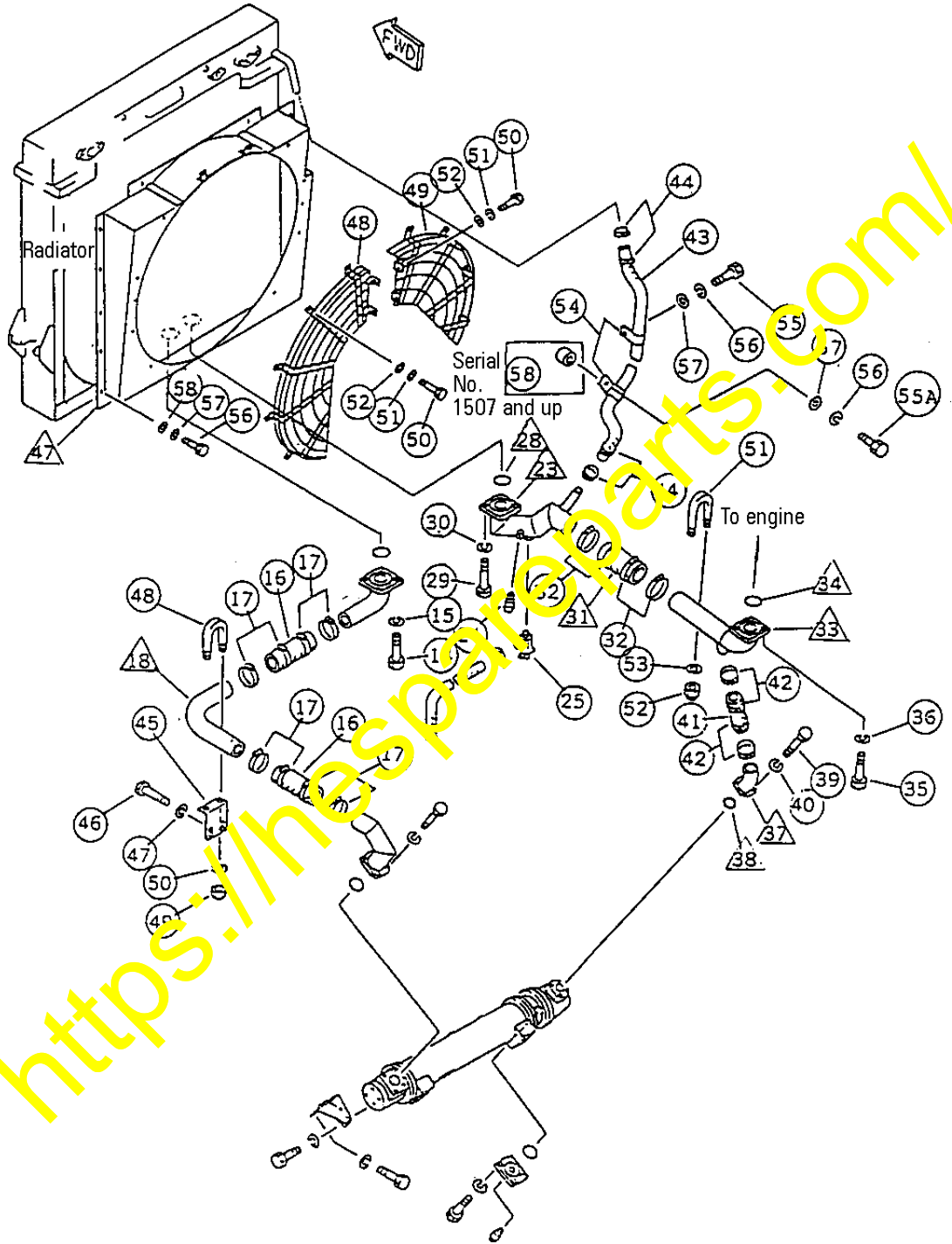


Fig. 12 b

(2) Install the newly supplied radiator piping. (See Fig. 13)
Reuse HOSE (07261-20917) removed from the right side of the radiator
for the hose to be installed on the left side of the radiator.
In the drawing, ☆ mark indicates parts to be reused.

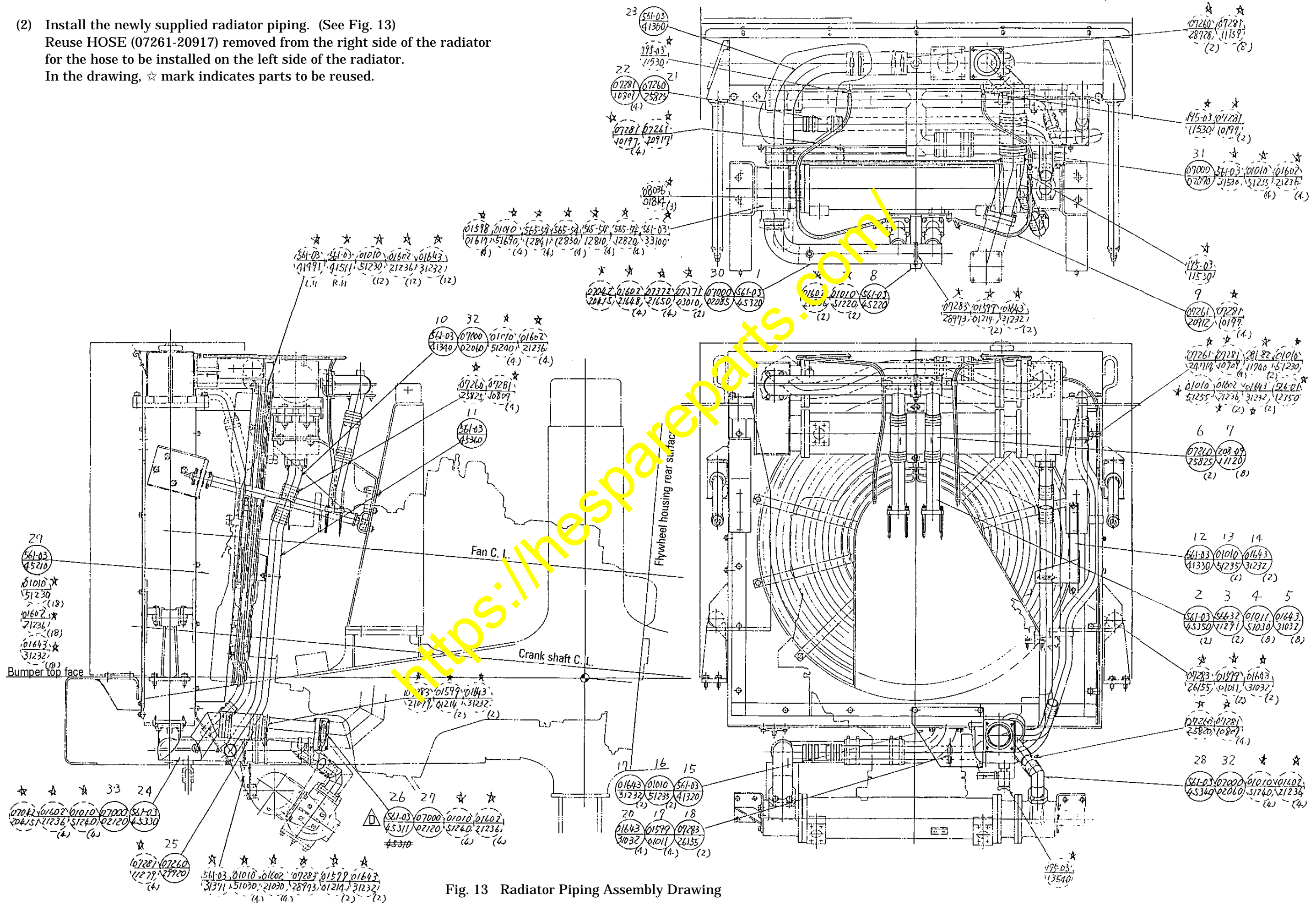


Fig. 13 Radiator Piping Assembly Drawing

4-8. Reworking the fuel tank and replacing the fuel piping

- (1) Remove the existing fuel piping. (See Fig. 14)

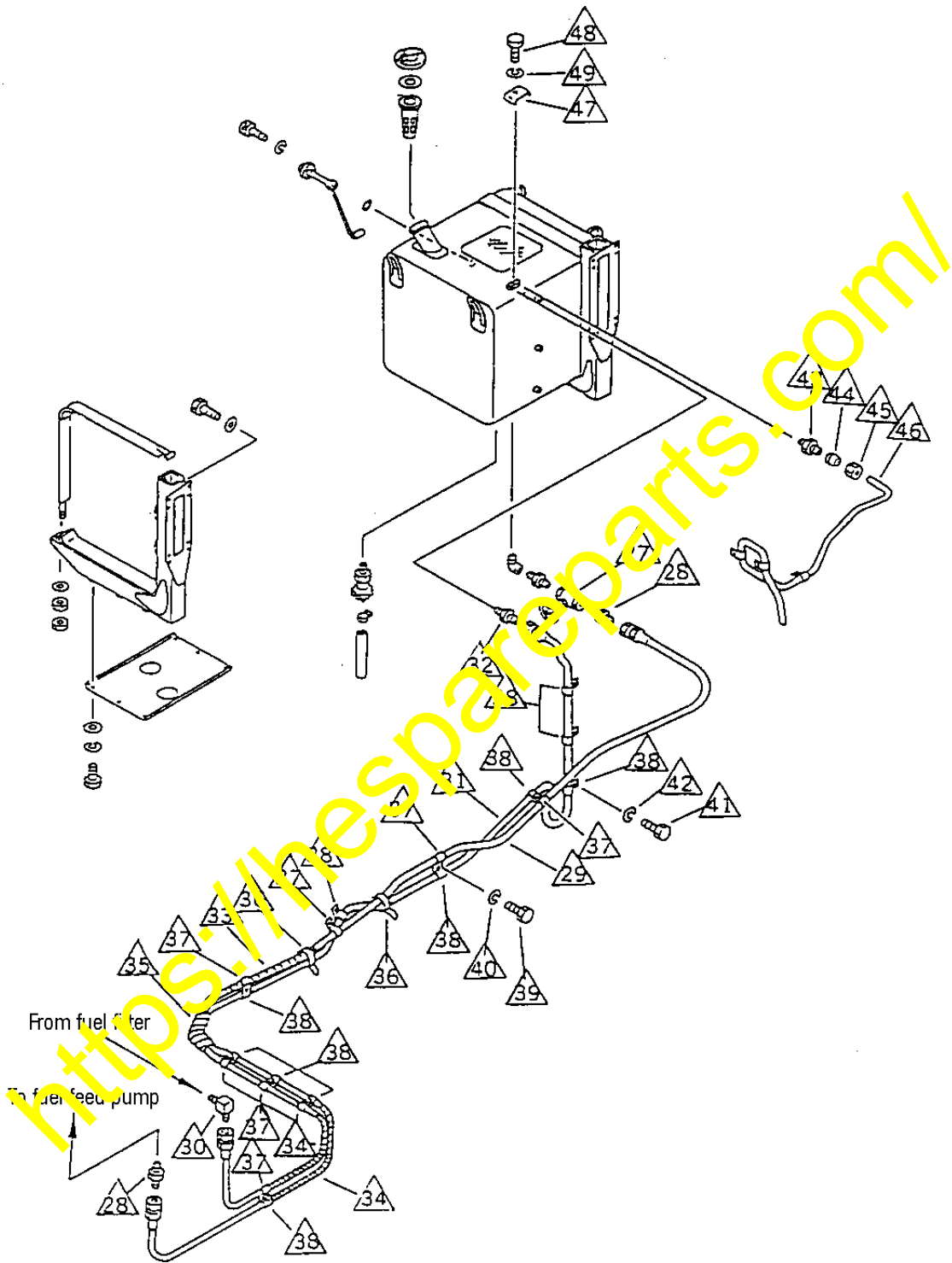


Fig. 14

- (2) Rework FUEL TANK (561-04-41111) as follows: (See Fig. 15)
- 1) Drain the fuel tank completely.
 - 2) Refill 80% of tank capacity with water.
 - 3) Grind off BOSS (566-04-13261) welded to the tank.
★ Take care to prevent dust from entering the tank during grinding.
 - 4) Finish-grind the area smooth, removing the mark of boss.
 - 5) Weld the newly supplied JOINT (561-04-45120) (1).
 - 6) Drain water from the tank.

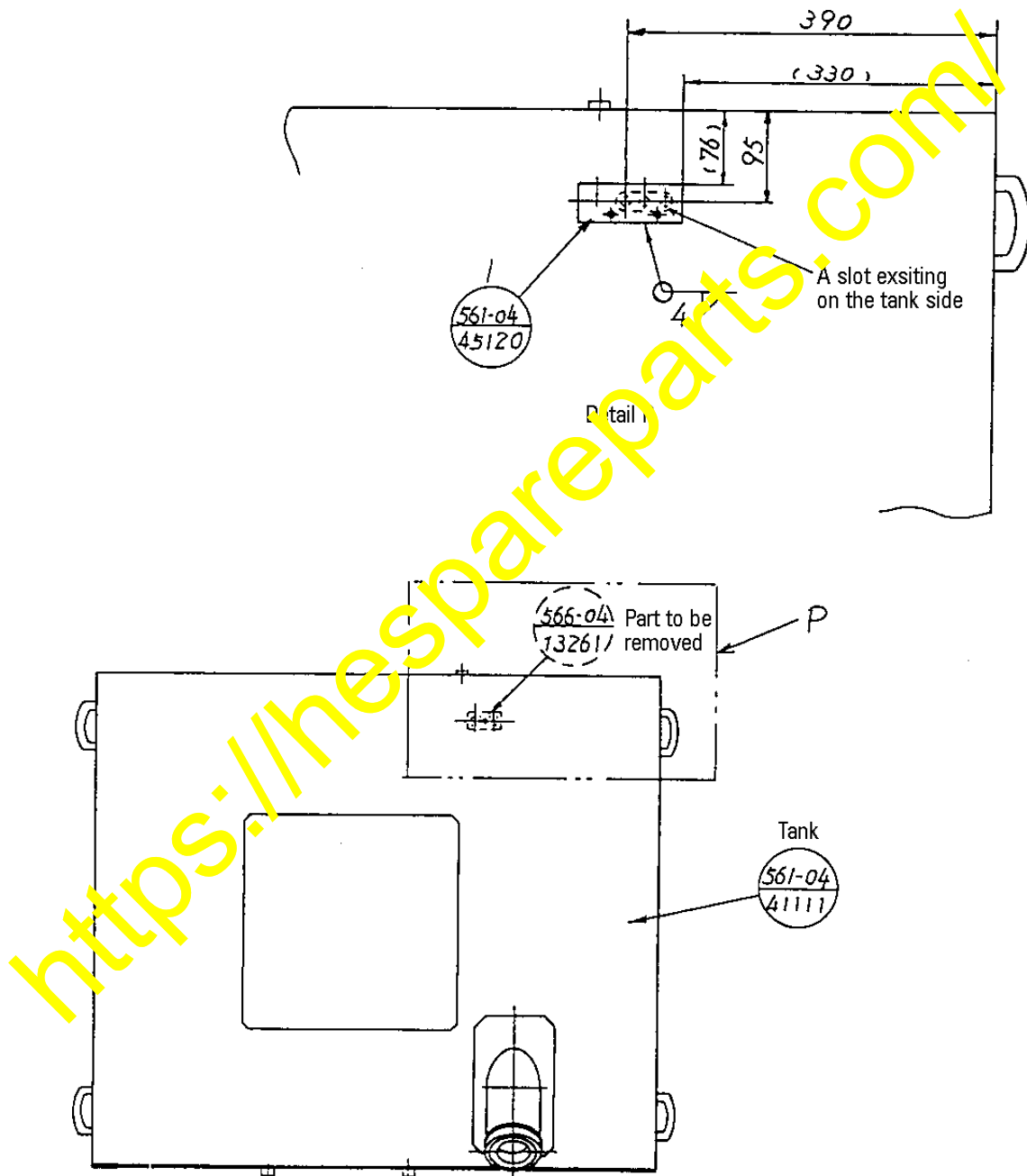


Fig. 15

- (3) Weld a SEAT (01571-01016) (28) and two SEATS (568-16-11111) (29) to FRAME (561-46-31103). (See Fig. 16)

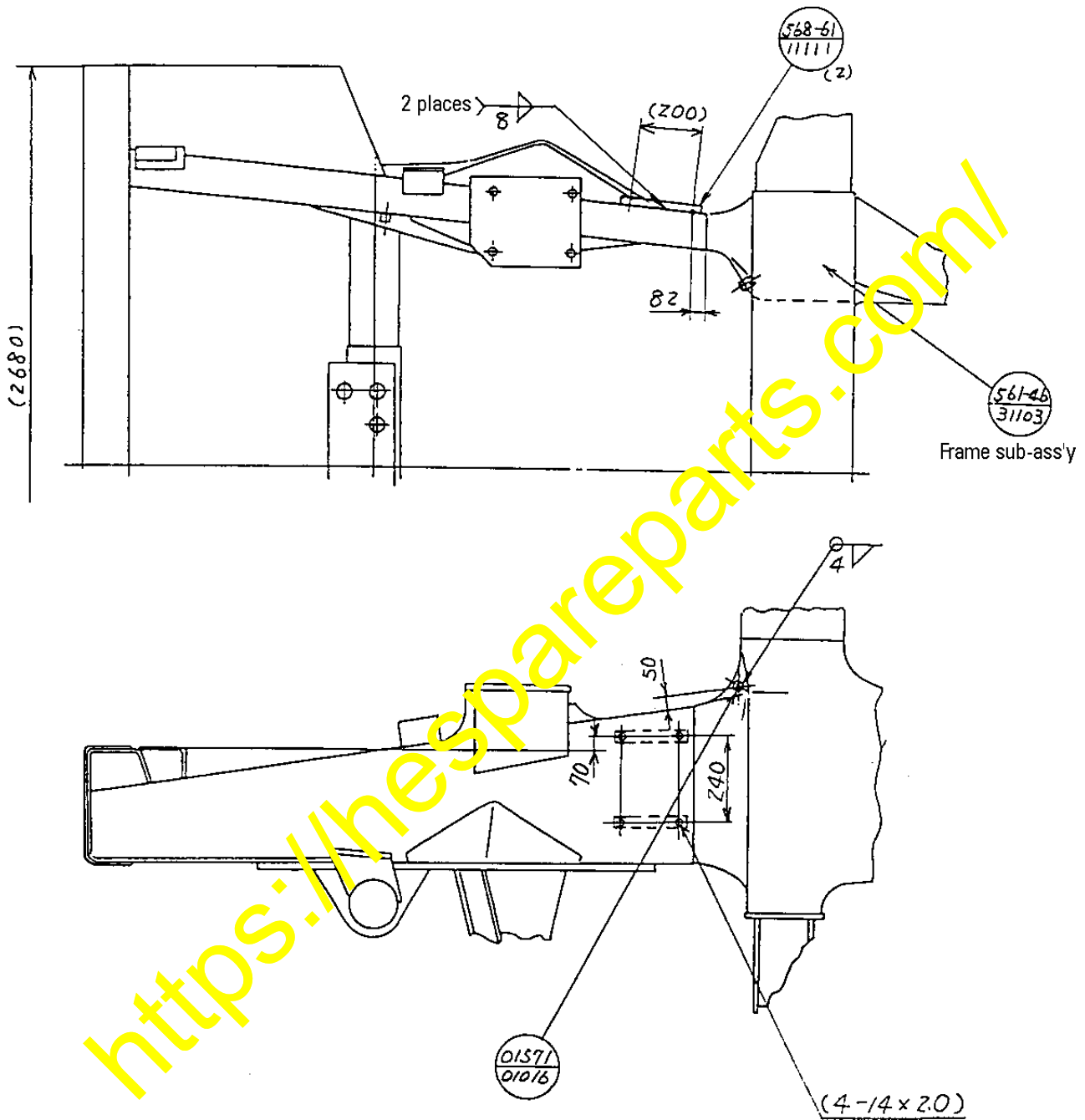


Fig. 16

(4) Install the newly supplied piping. (See Fig. 17)

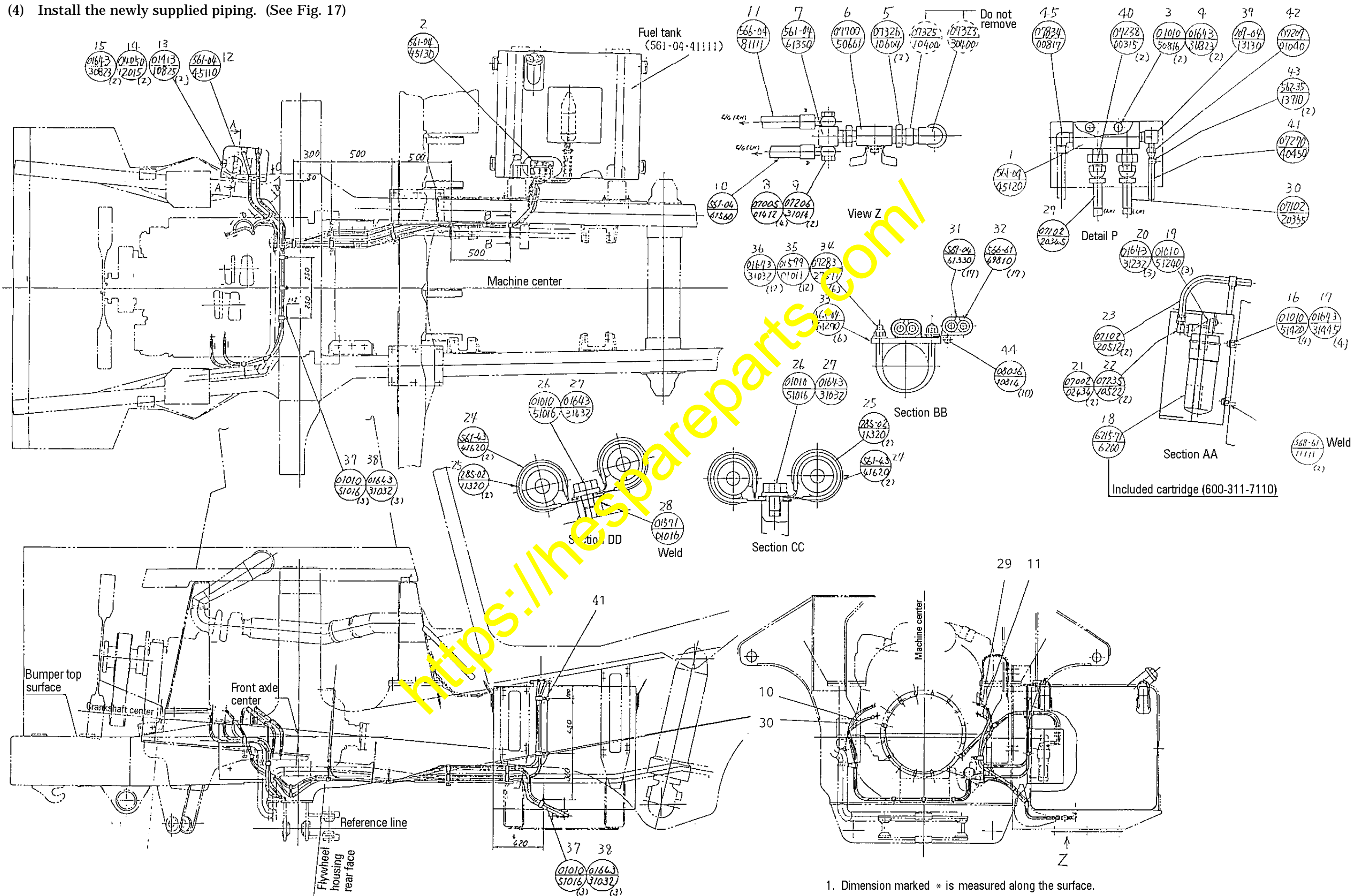


Fig. 17 Fuel Piping Assembly Drawing

4-9. Replacing the electrical system

(1) Reworking CAB (561-54-40000)

Make a hole in the instrument panel in front of the cab. (See Fig. 18)

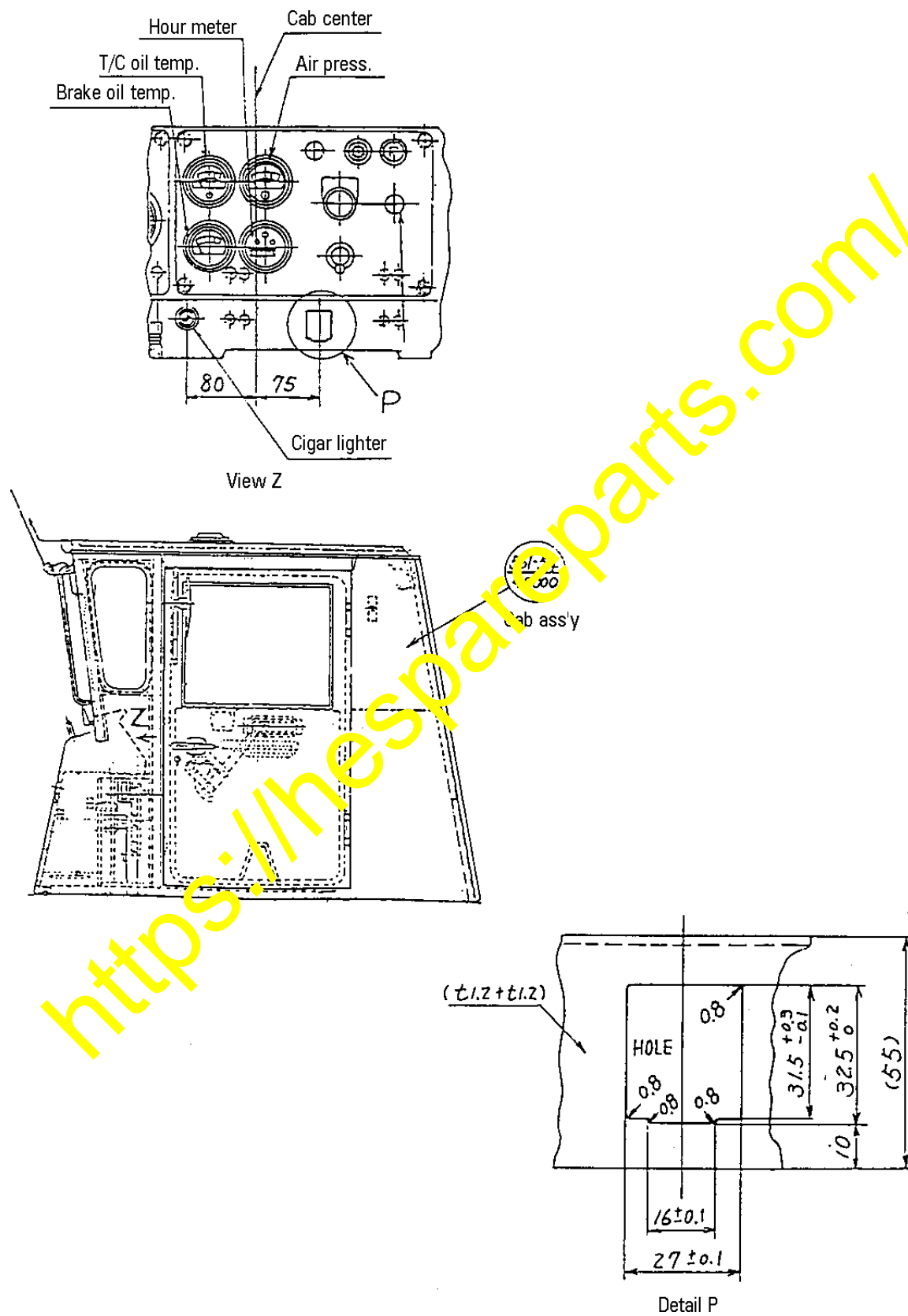


Fig. 18

(2) Weld a SEAT (01571-01016) (1) to FRAME (561-46-31103). (See Fig. 19)

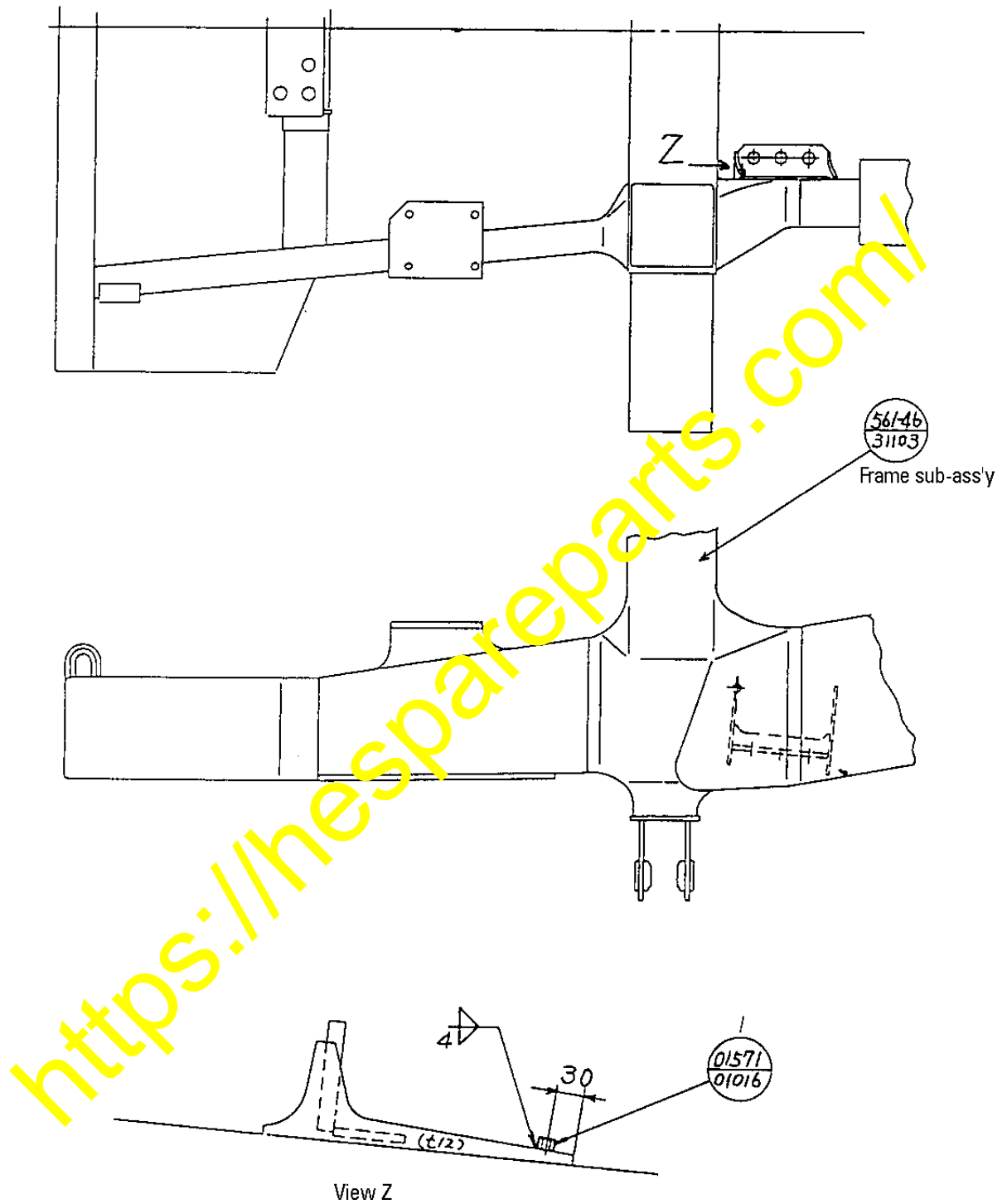


Fig. 19

(3) Remove the existing electrical parts. (See Fig. 20)

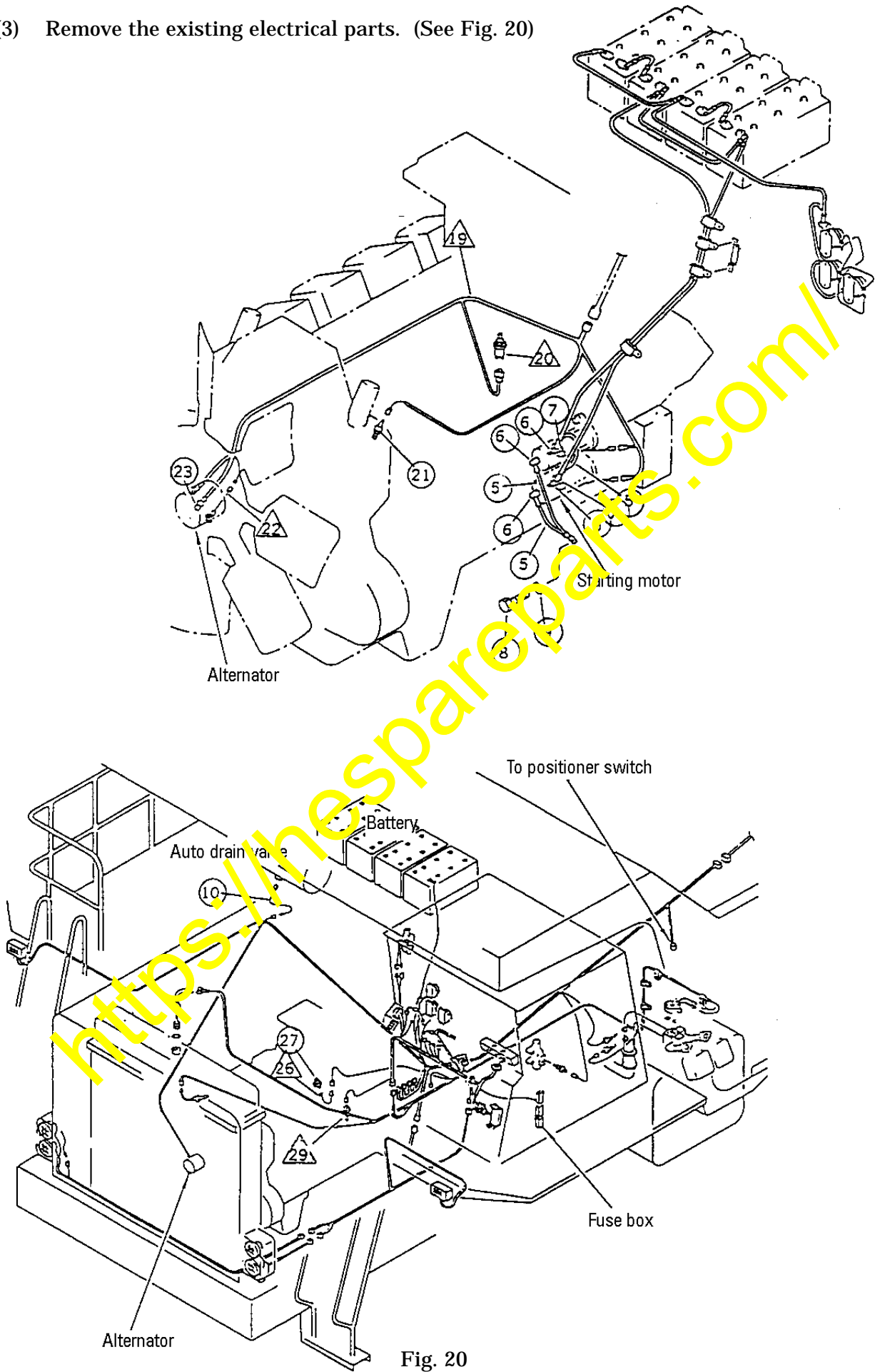


Fig. 20

(4) Install the newly supplied electrical parts. (See Fig. 21)
In the drawing, ☆ mark indicates parts to be reused.

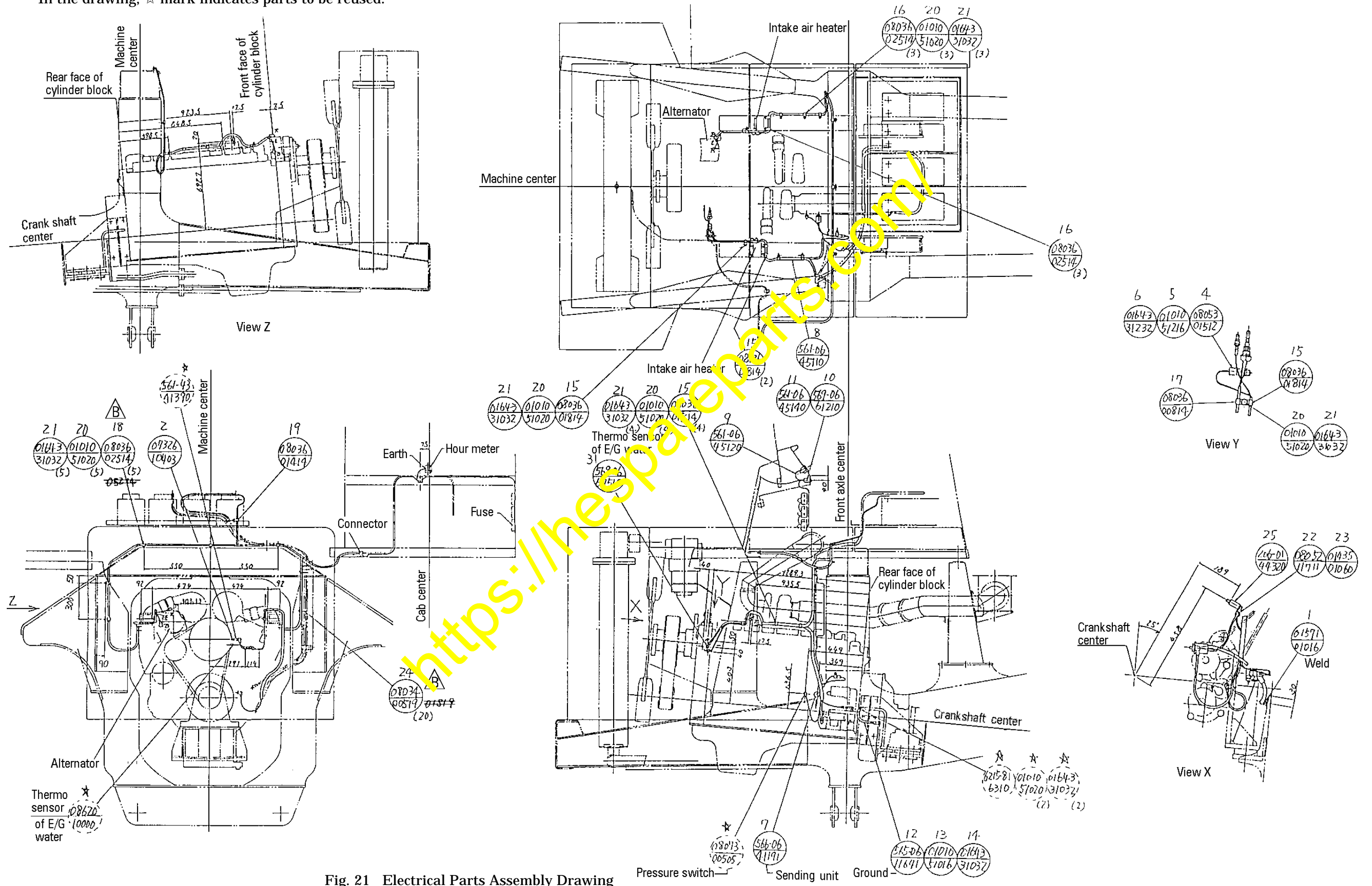
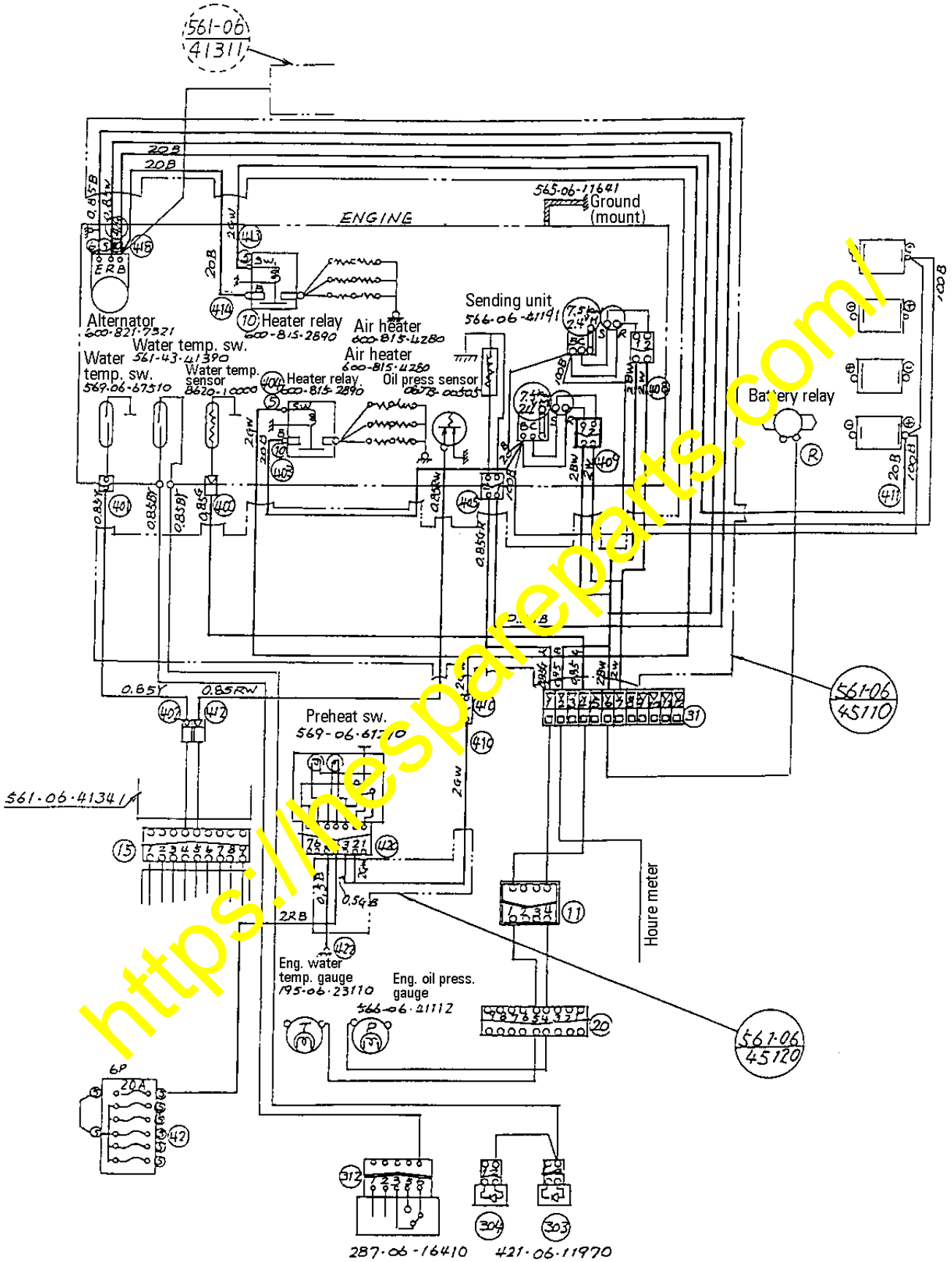


Fig. 21 Electrical Parts Assembly Drawing



[Circuit diagram]

4-10. Replacing the transmission oil tubes. (See Fig. 22)

Replace the existing TUBE (561-16-31273) with newly supplied TUBE (561-16-45211) (1) and the existing TUBE (561-16-11351) with the newly supplied TUBE (561-16-45221) (2).

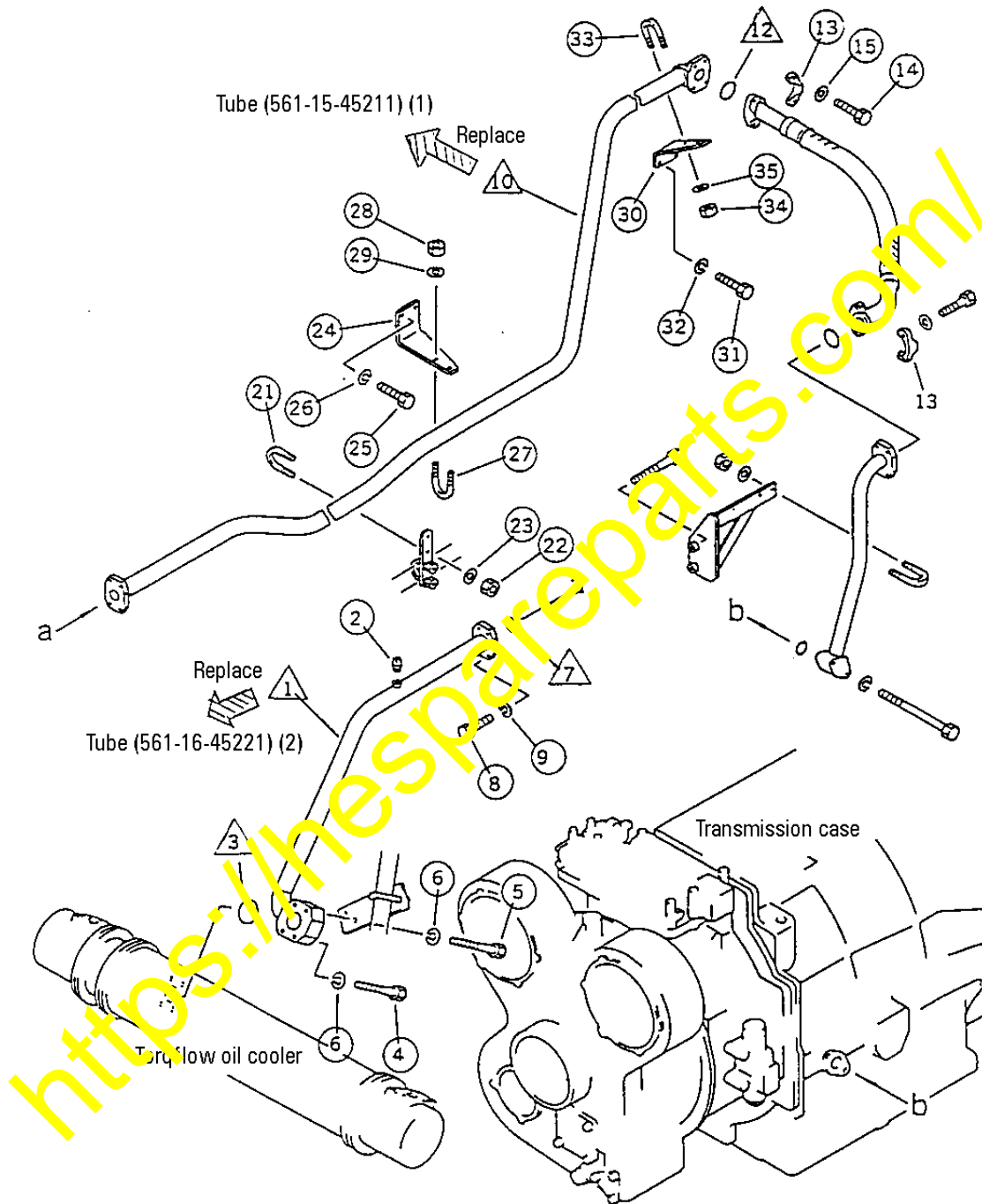


Fig. 22

4-11. Replacing the air piping

- (1) Remove the existing air piping. (See Fig. 23)

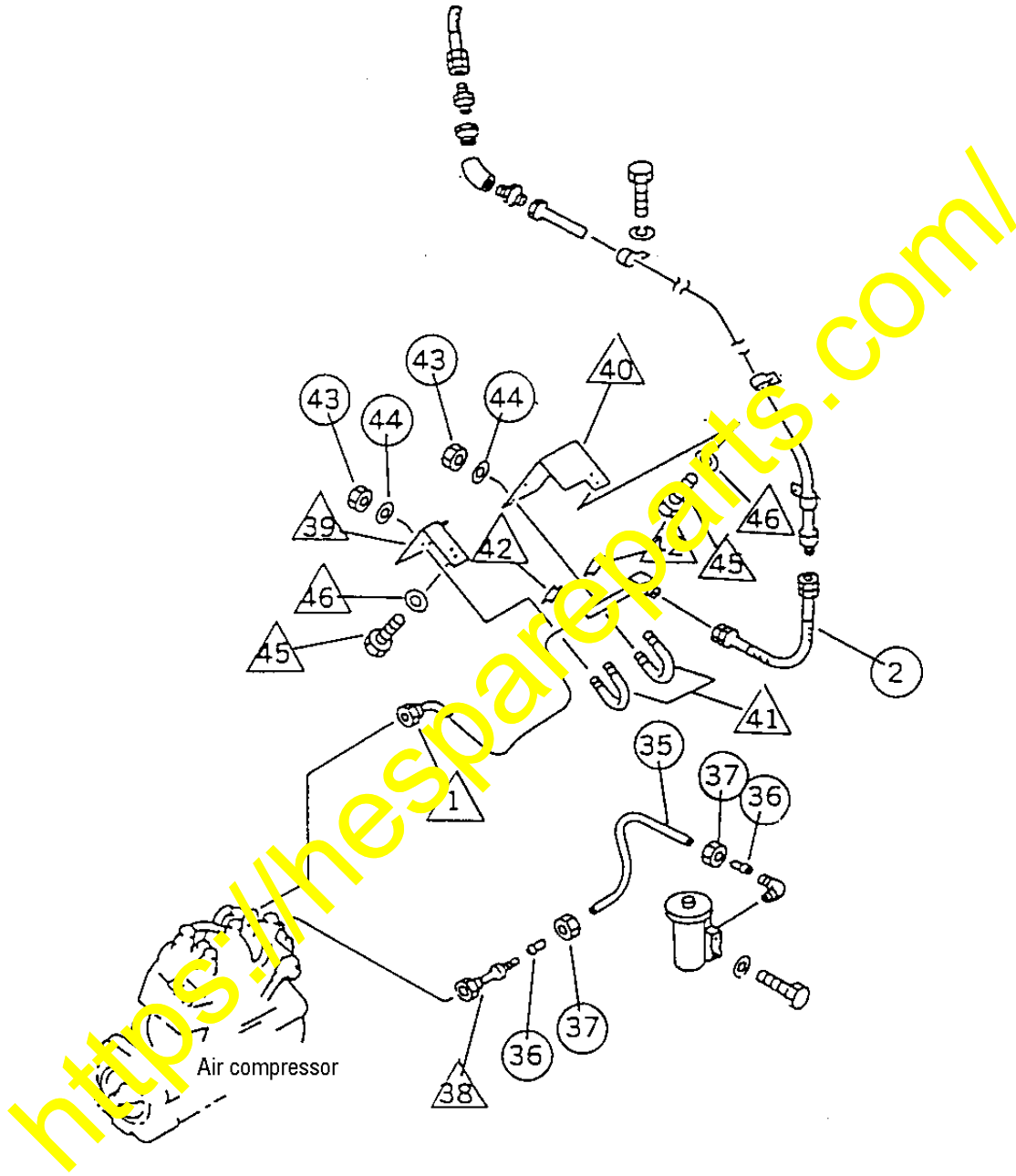


Fig. 23

- (2) Install the newly supplied air piping. (See Fig. 24)
In the drawing, ☆ mark indicates parts to be reused.

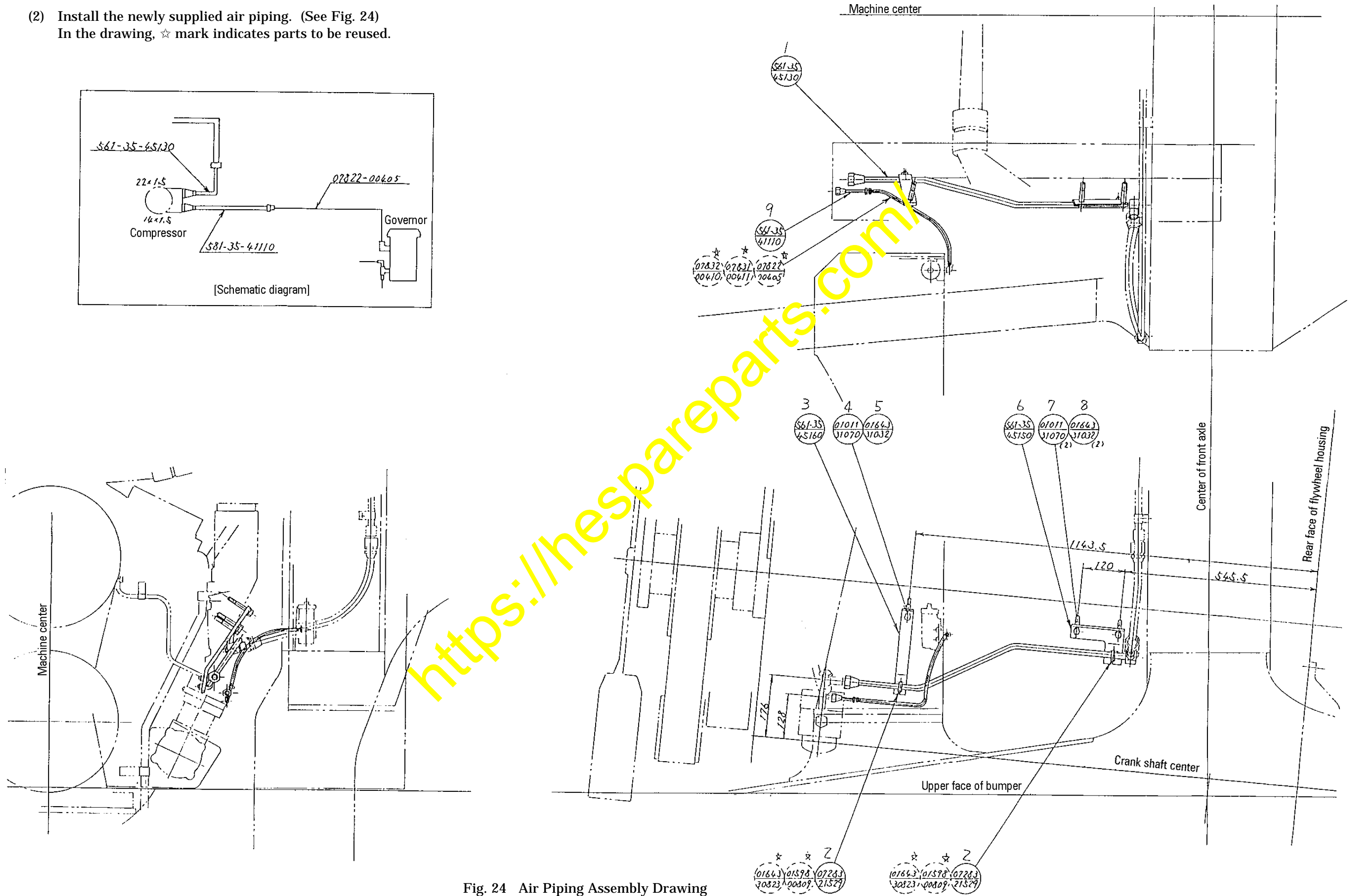
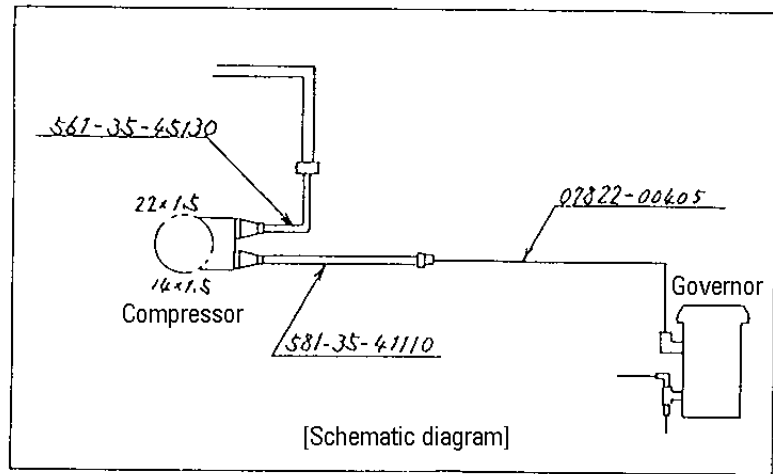


Fig. 24 Air Piping Assembly Drawing

4-12. Replacing the accelerator control linkage

- (1) Remove the existing accelerator control linkage. (See Fig. 25)

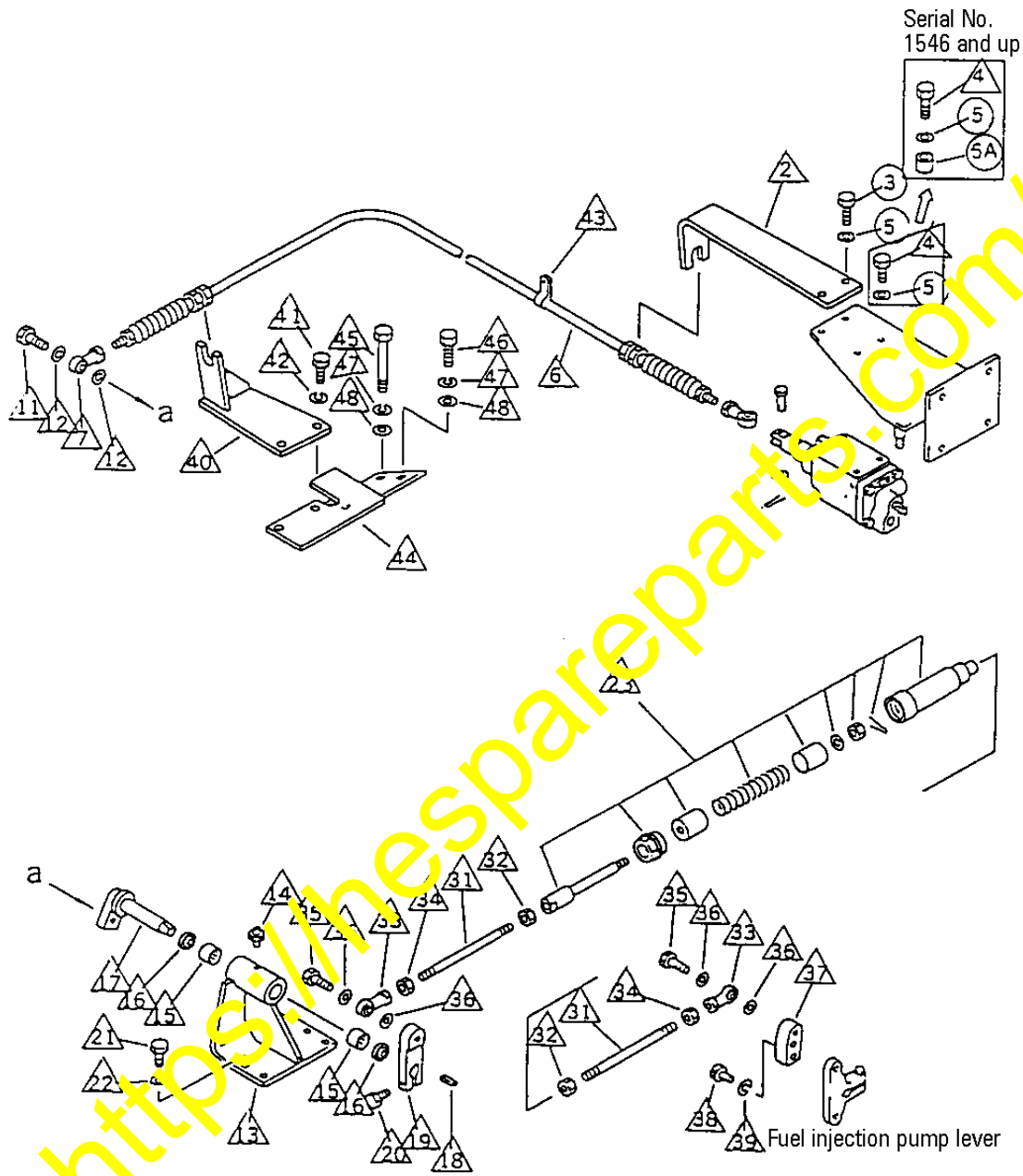


Fig. 25

- (2) Install the newly supplied accelator control linkage. (See Fig. 26)
- In the drawing, ☆ mark indicates parts to be reused.

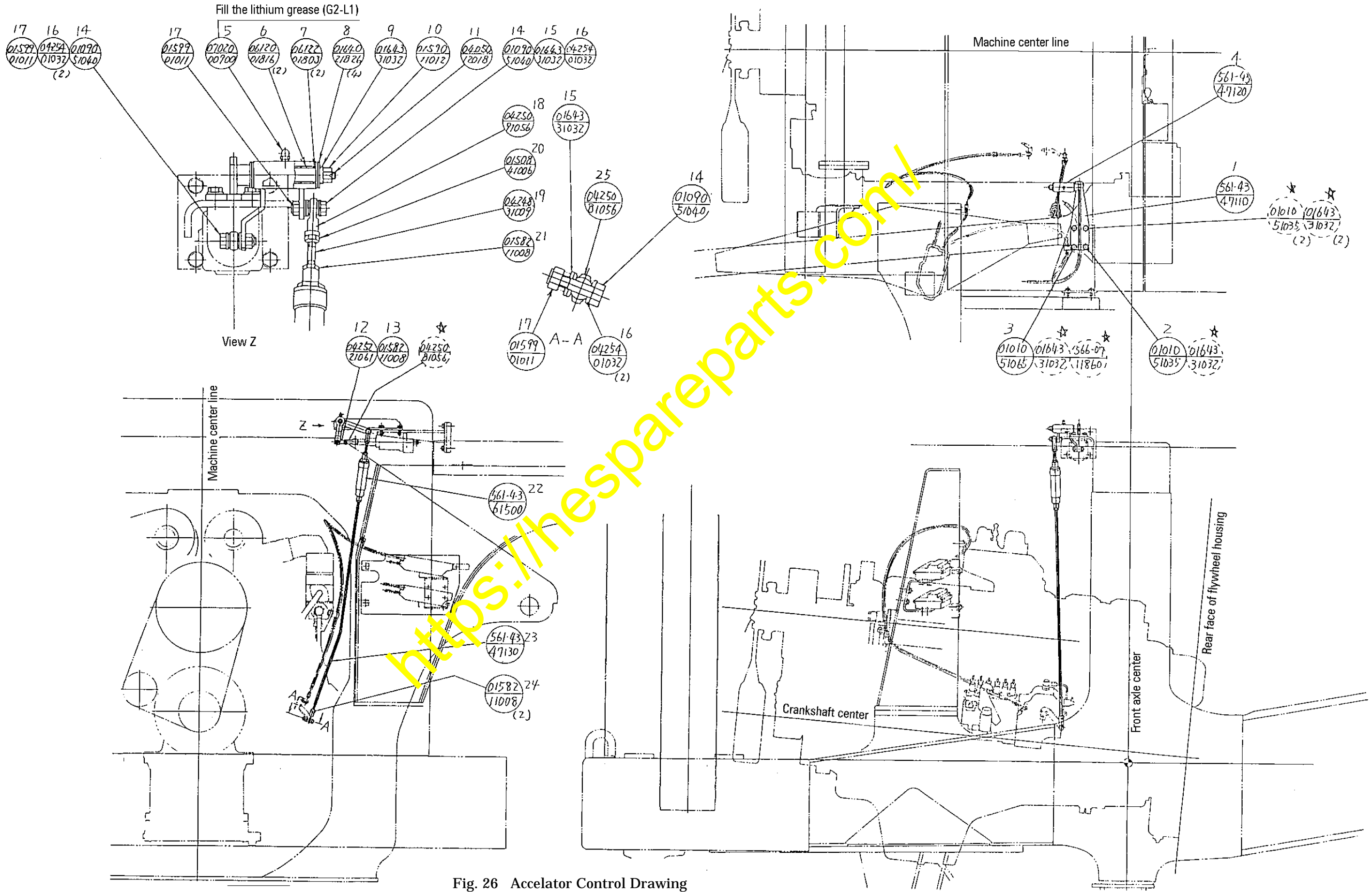


Fig. 26 Accelator Control Drawing

(3) Adjustment procedure of accelerator control linkage

- 1) Start the engine. Release the accelerator pedal to let it return to the slow side position of two-stage idling. (See Fig. 26 a)
- 2) While the speed control lever on the engine side is kept in contact with the slow-speed idling side stopper, fit the linkage and make sure that engine speed is 675 ± 25 rpm. (See Fig. 26 b)
- 3) Loosen the absorber lock nut and the rod end nut. Turn the absorber one rotation in the direction shown by the arrow. (See Fig. 26 c)
(This will cause the absorber to retract by 2.5 mm at show-speed idling.)
- 4) Make sure that idling speed is 675 ± 25 rpm.
- 5) Set the accelerator pedal to the engine full throttle position. Make sure that the speed control lever on the engine side touches the stopper on the full-throttle side and the absorber is elongated fully. (See Figs 26 a, 26 c)
★ If the speed control lever on the engine side does not touch the stopper on the full-throttle side under the above-mentioned full throttle state, adjust the play of the accelerator pedal.
- 6) Make sure that full-throttle engine speed is 2350 ± 50 rpm.

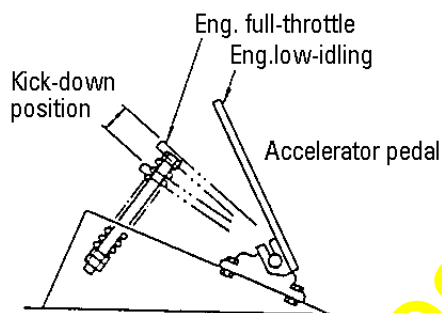


Fig. 26 a
Speed control lever

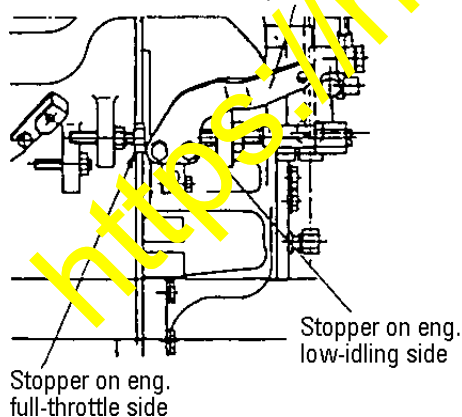


Fig. 26 b

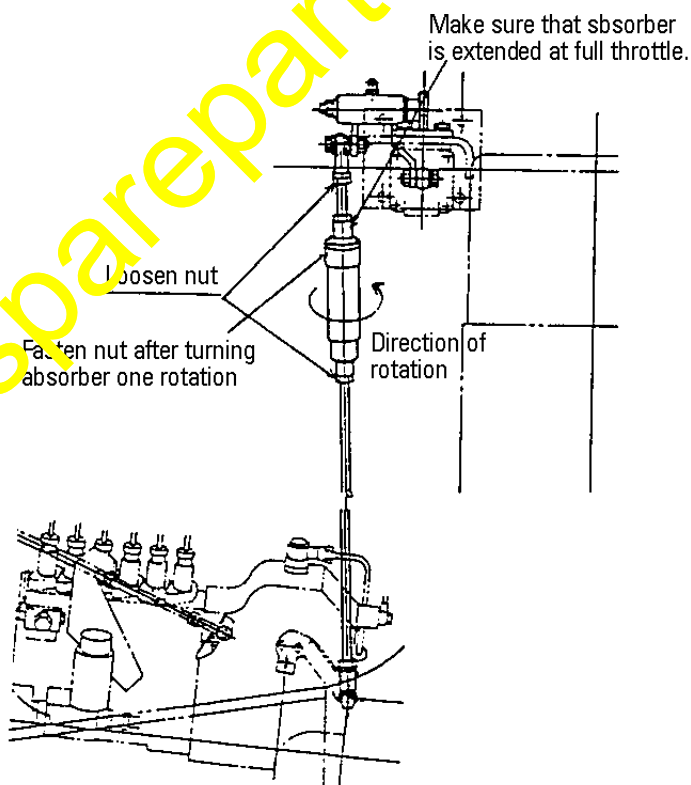
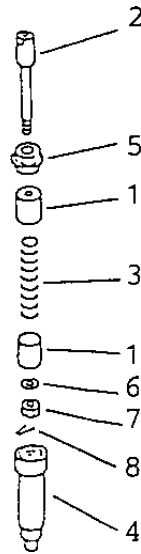


Fig. 26 c

- (4) ABSORBER ASSEMBLY (561-43-47130) is shown in disassembled view (See Fig. 26 d) together with the component part list below.



No.	Part No.	Part Name	Qty	Remarks
	561-43-61500	Absorber assy	1	
1	561-43-41510	•Liner	2	
2	561-43-41520	•Ped	1	
3	232-43-52180	•Spring	1	
4	561-43-41540	•Guide	1	
5	6164-71-7250	•Bolt	1	
6	06142-31022	•Washer	1	
7	01593-01012	•Nut	1	
8	04030-02018	•PIN, cotter	1	

Fig. 26 d

4-13. Replacing the engine stop motor

- (1) Replace the existing engine STOP MOTOR (600-815-6621) with the newly supplied STOP MOTOR (600-815-6631) (1). (See Fig. 27 a)

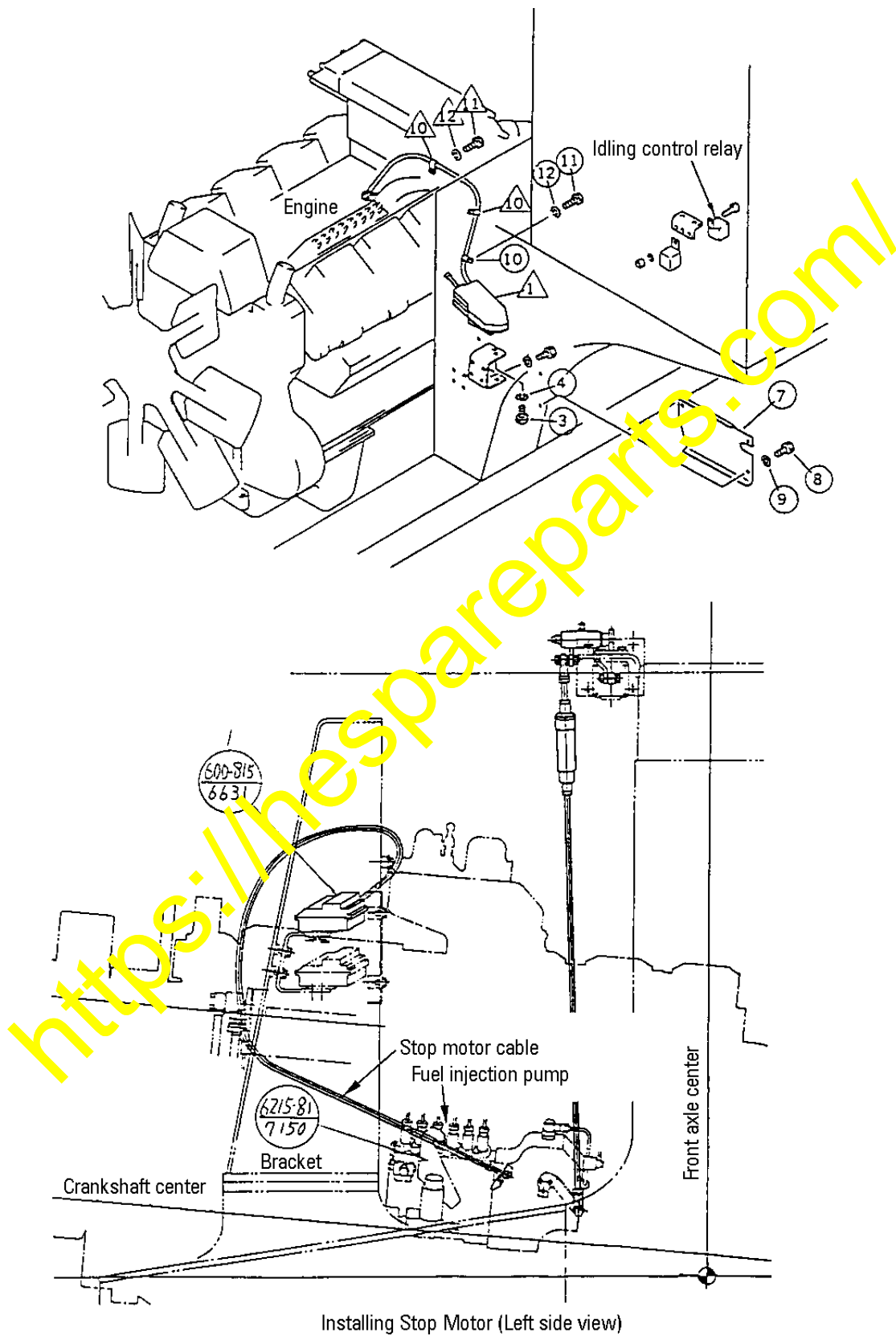


Fig. 27 a

- (2) Engine stop linkage adjustment procedure. (See Fig. 27 b)
- 1) With the inner wire of the engine stop motor cable contracted fully, set the stop lever (01) to the stop side and temporarily assemble BALL JOINT (6966-83-3710).
 - 2) Adjust the clearance between the stop lever (01) and the stop-side stopper screw to 1 ± 0.5 mm with the nut (02) and ball joint. Fasten the locknut (02).
 - 3) Turn the stop motor to ON and OFF about 10 times repeatedly. Make sure of the proper clearance again and, if necessary, readjust the clearance with the nut (02).
 - 4) Make sure that engine stops.

In the drawing, ☆ mark indicates parts to be reused.

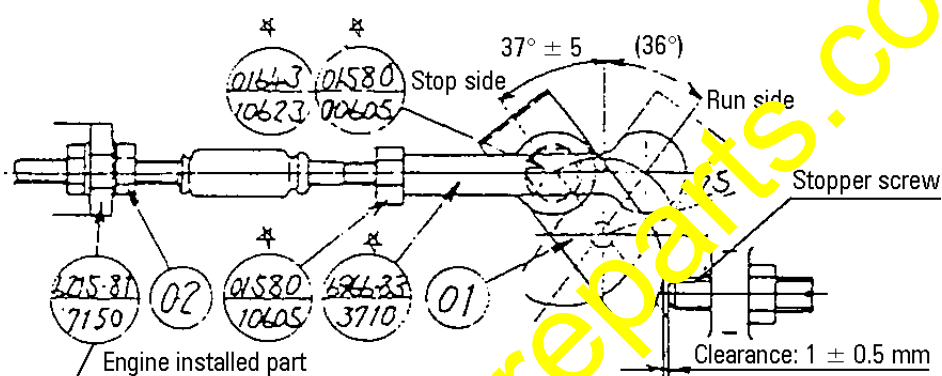


Fig. 27 b

4-14. Replacing the crossover relief valve mounting block

- (1) Remove the existing BLOCK (561-61-44810). (See Fig. 28)

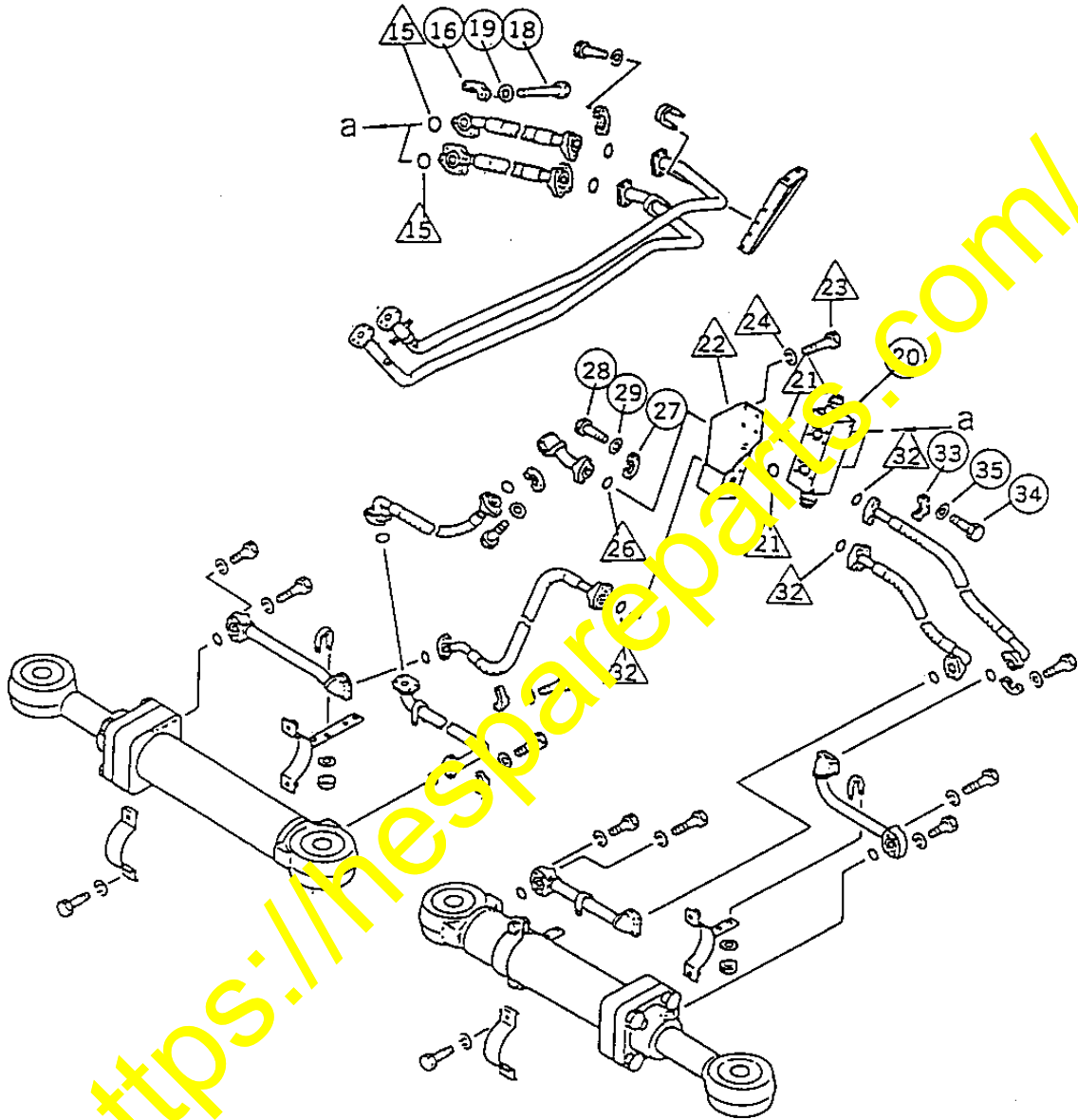


Fig. 28

- (2) Fit the newly supplied BRACKET (561-61-45110)(1) with four newly supplied BOLTS (01010-51250)(2) which supersede the existing BOLTS (01010-51240) on the lower side of the output shaft. (See Fig. 29)

In the drawing, ☆ mark indicates parts to be reused.

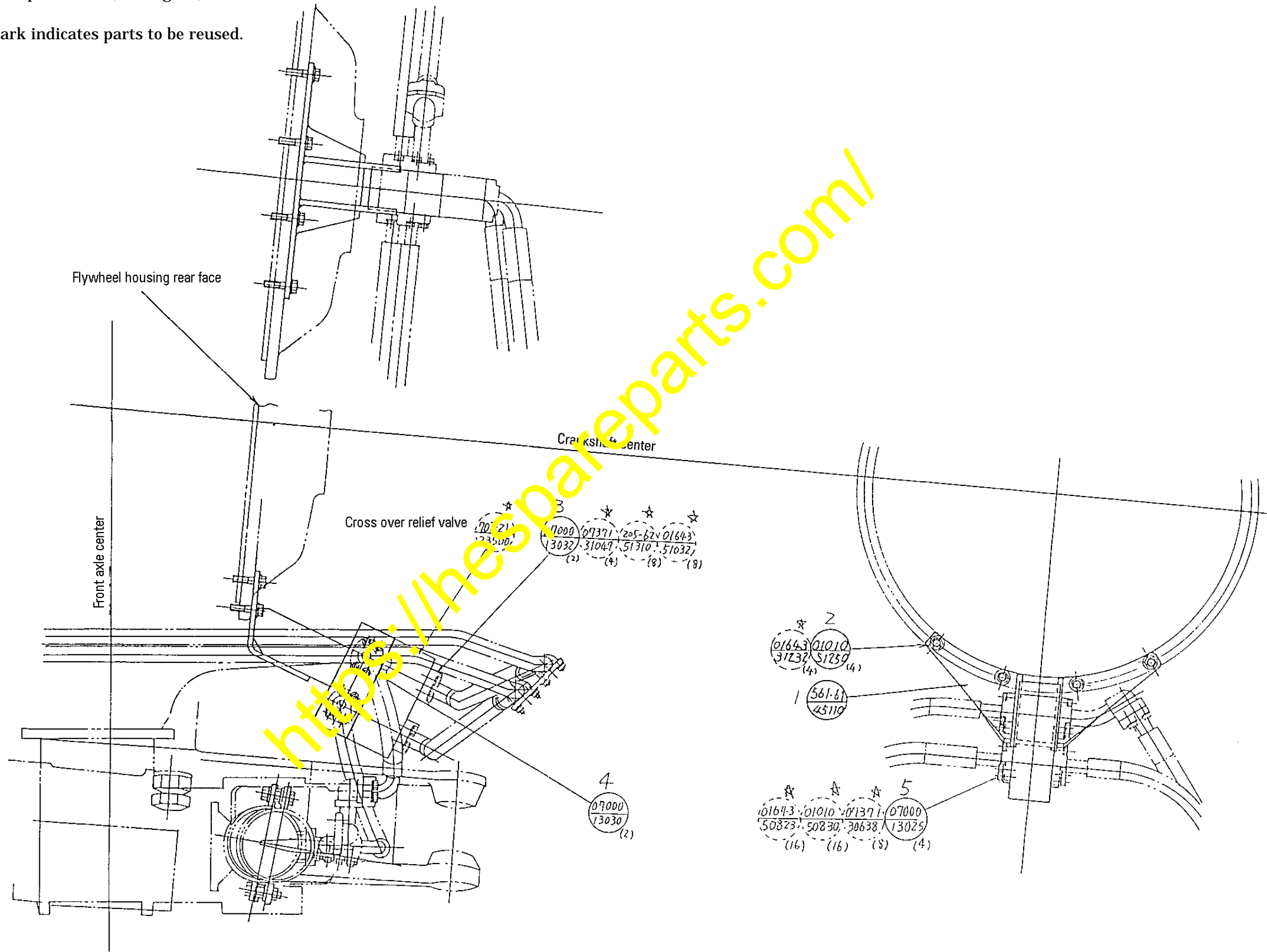


Fig. 29 Crossover Relief Valve Mounting Block Assembly Drawing

4-15. Replacing the name plate

Replace the existing LUBRICATION CHART (561-93-41111) with the newly supplied LUBRICATION CHART (561-93-45110) (1). (See Fig. 30)

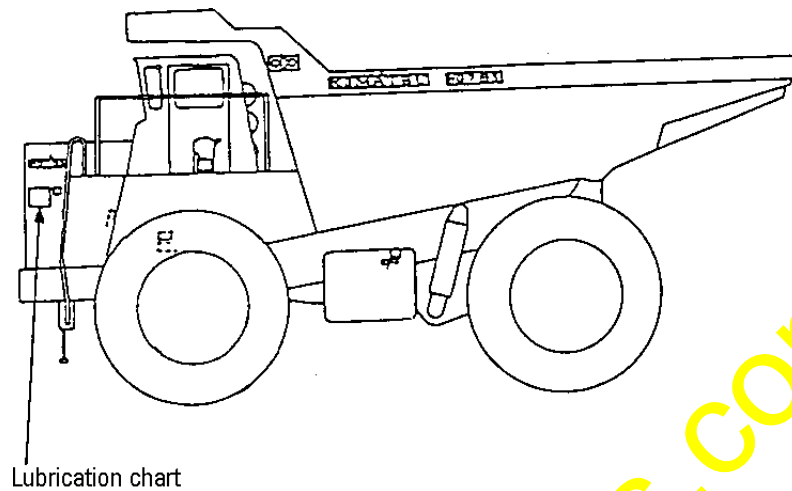


Fig. 30

4-16. Replacing the tool

Replace the existing HOSE (6166-21-5600) for engine oil pan oil drain use with the newly supplied HOSE (6215-21-5600) (1). (See Fig. 31)

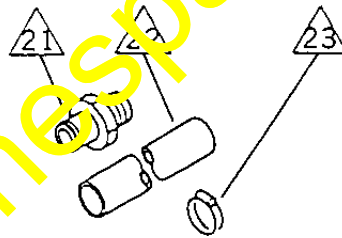


Fig. 31


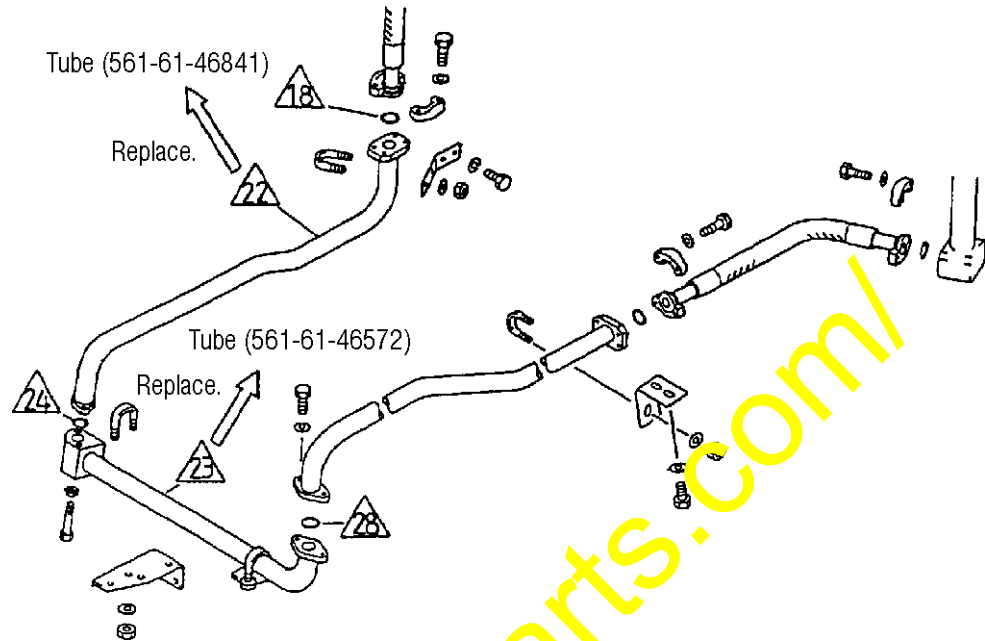
 Page added 4-17. Replacing the brake cooling piping

Fig. 32



5. Inspection standard chart


Item	Unit	Standard
Engine oil refill capacity	l	76 – 90
Coolant capacity	l	270 ± 10 %
Engine speed LI (L)	rpm	675 ± 25
Engine speed LI (H)	rpm	1000 ± 30
Engine speed HI	rpm	2350 ± 50
Engine speed (T/C stalling)	rpm	1780 ± 75

 6. List of parts that need to be changed periodically (Engine related filters)

Change the consumable parts such as the filter element when making periodical servicing according to the table below.

Items	For the SA12V140 engines			<Reference info.> For the SA8V170 engines		
	Part No.	Q'ty	Changing intervals	Part No.	Q'ty	Changing intervals
Engine oil filter	600-211-1231	4	250 h	600-211-1231 (600-211-1230)	3	250 h
Bypass filter	600-212-1511	2	250 h	—	—	—
Fuel filter	600-311-7111	2	500 h	600-311-8612	2	500 h
Corrosion resister	600-411-1171	2	1000 h	600-411-1160	2	500 h

The engine oil filter can be commonly used for these two engine types.

 Page added

7. Procedures to follow when the SA12V140 engine with #18 flywheel and the old output shaft are used and when the output shaft assembly 561-01-X1200 is not used.

- (1) Use the engine assembly (6215-29-PB10) on which #18 flywheel is loaded.
- (2) Overhaul the present output shaft (561-01-12001 or 561-01-12002) and replace the consumable parts with new ones. (See Figs. 7a and 7b)

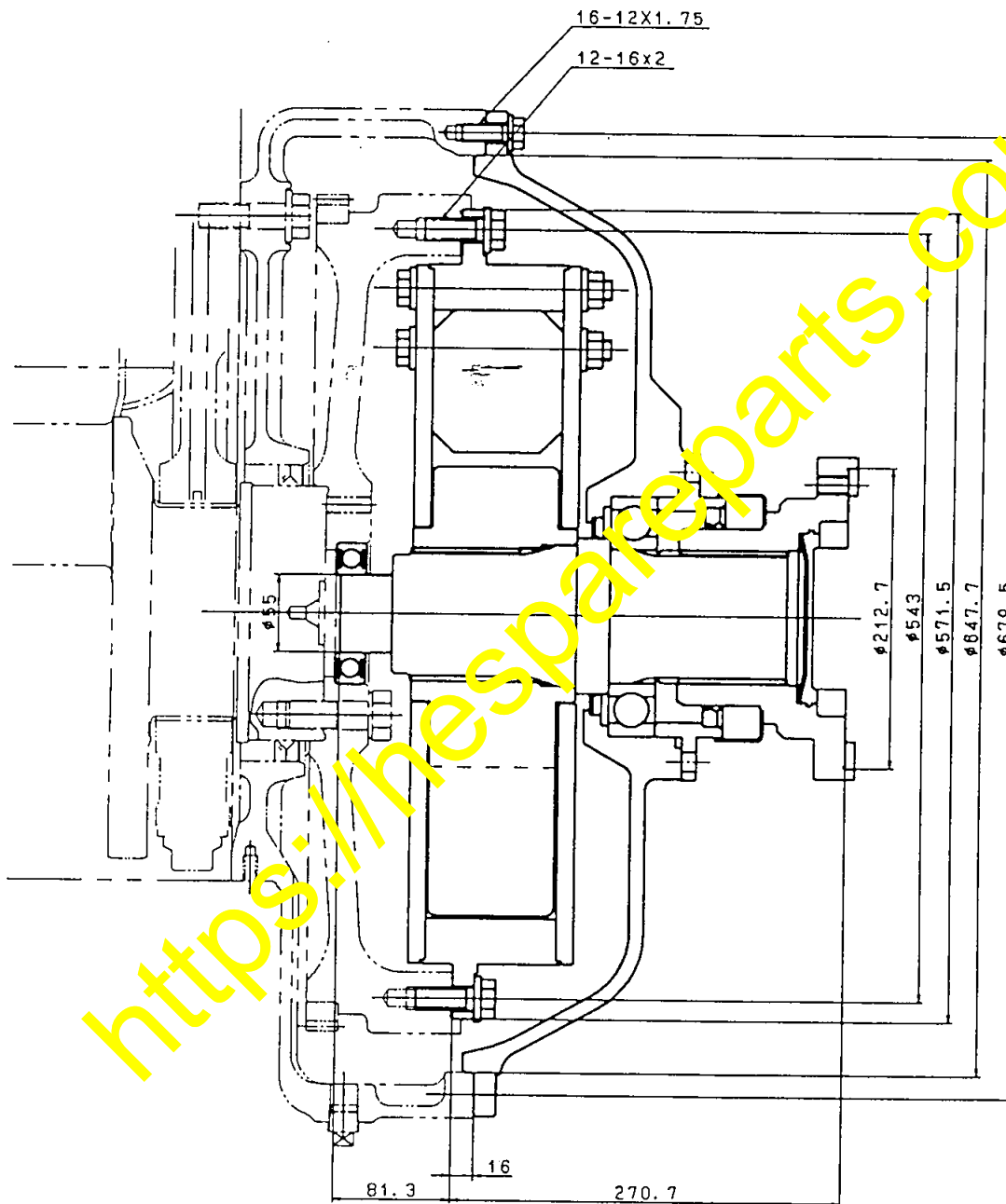



Fig. 7a

 Page added

- (3) The output shaft assembly (561-01-12001 or 561-01-12002) and its component parts are as shown in Fig. 7b below and in the list following.

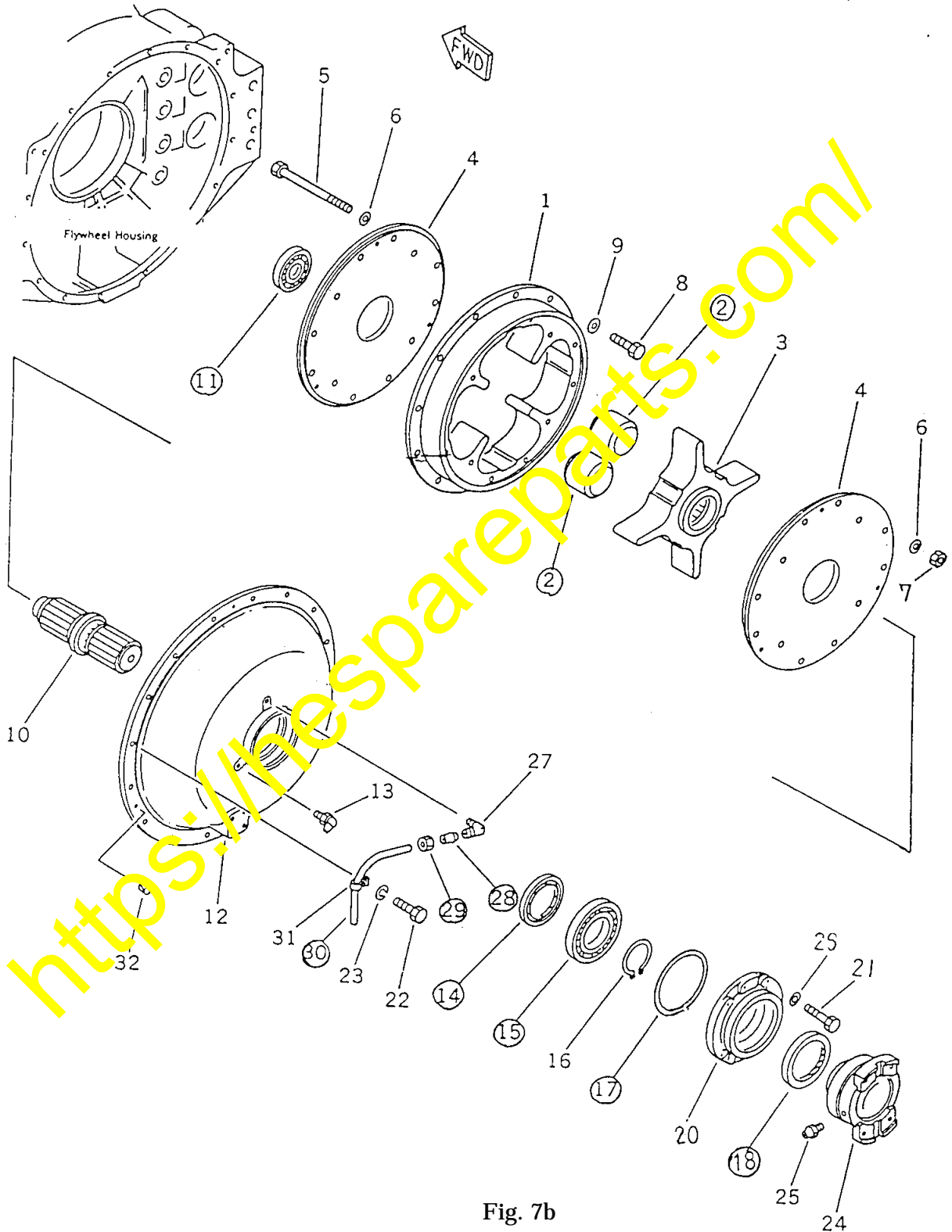



Fig. 7b

 Page added

Component Parts List of Output Shaft Assembly (561-01-12001 or 561-01-12002)
(Replace the consumable parts, the numbers of which are marked with a circle, in the list with the new ones.)

Reference No. in Figure	Parts Numbers	Parts Names	Quantity 561-01-	
			12001	12002
1	562-01-22141	Body, outer	1	1
②	562-01-22410	Rubber	8	8
3	562-01-22151	Body, inner	1	1
4	562-01-22160	Flange	2	2
5	01011-81440	Bolt	12	12
6	01643-31445	Washer	24	24
7	01580-01411	Nut	12	12
8	01010-81645	Bolt	1	6
9	01643-31645	Washer	6	6
10	561-01-12211	Shaft, output	1	
	561-01-12212	Shaft, output		1
⑪	569-01-12491	Bearing	1	1
12	562-01-12114	Cover	1	1
13	07020-00675	Fitting, grease	1	1
⑬	561-01-12910	Seal, oil	1	1
⑮	06000-06219	Bearing	1	1
16	04064-09530	Ring, snap	1	1
⑰	07000-05170	O-ring	1	1
⑱	562-01-12712	Seal, oil	1	
	(□07012-10125)	Seal, oil		1
20	562-01-12120	Cover	1	
	562-01-12121	Cover		1
21	01010-81230	Bolt	6	6
22	01010-81235	Bolt	16	16
23	01643-31232	Washer	16	16
24	562-01-12711	Coupling	1	
	562-01-12712	Coupling		1
25	07020-00000	Fitting, grease	1	1
26	01643-31232	Washer	6	6
27	07834-00817	Elbow	1	1
⑳	07831-00813	Sleeve	1	1
㉑	07832-00817	Nut, sleeve	1	1
㉒	07822-00808	Tube	1	1
31	08036-01214	Clip	1	1
32	07049-01215	Plug	3	3

Note : The works for other than the output shaft are the same as mentioned above.