KK-FD301A

HINO 500 SERIES
Body Mounting Manual

TRUCK CHASSIS

MODEL FD7J

Hino Motors, Ltd.

Hino Motors, Ltd.

PRODUCT PLANNING DIVISION

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RECORD OF CHANGES

We have published the new revised edition of Body Mounting Manual with the following changes.

Consequently, please discard the current Body Mounting Manual **CD-ROM NO.KK-FD301**, and use the new **CD-ROM NO.KK-FD301A** from now on.

CONTENTS OF CHANGES

1. The information about "PRECAUTION FOR FRONT UNDER-RUN PROTECTOR (FUP)" has been newly added to Chapter 2.

2. The information about "CHASSIS MASS" of Chapter 3 has been changed.

3. The information about "CAB, CAB BACK, CHASSIS and CHASSIS FRAME DRAWINGS" of Chapter 8 has been changed.

Request for alteration to make when reading MODEL NAME.

- The MODEL NAME in this manual of BODY MOUNTING MANUAL is described according to the “PRODUCTION CODE” name.
- When making use of the BODY MOUNTING MANUAL, use the MODEL NAME after replacing it in accordance with the following table.

(MODEL)	(PRODUCTION CODE)	REMARKS
HINO 51024	FD7JJMA	
	FD7JLMA	
	FD7JLMA	WITH DOUBLE CAB
	FD7JLMG	
	FD7JPMA	
	FD7JPMG	
HINO 51026	FD7JLMG	W/HIGH PERFORMANCE ENGINE
	FD7JPMG	W/HIGH PERFORMANCE ENGINE

Purpose

This manual is provided to Body and Equipment Manufacturers, including inter-mediate and/or final stage manufacturers (hereinafter collectively referred to as Body and Equipment Manufacturers), to provide;

- Technical instructions for Hino truck chassis with cab for modification and mounting of bodies,
- An aid to Body and Equipment Manufacturers for producing safe vehicles under their own discretion and responsibility,
- Other general advice for installation, modification or alteration,

when Body and Equipment Manufacturers install any body or other equipment or device on Hino truck chassis with cab (hereinafter collectively referred to as Hino Chassis), or modify or alter a Hino Chassis.

Content

This manual contains chassis specifications and instructions particular to FD model of HINO 500 series with EURO-5 in the medium duty trucks.

Important

This instruction manual must be used in combination with the Common Manual, No. KC-AA201.

- The Common Manual is available in this CD-R.
- For more information on mounting of bodies and equipments or on chassis modifications, refer to the appropriate workshop manuals, parts catalogs, and maintenance guides and owner's or driver's manual.
- The information in this manual is accurate to the best of Hino's knowledge at the time of going to press.
  Hino reserves the right to modify any and all information without notice and without obligation.
- Should more detailed data or information be needed, please contact authorized Hino distributor.

Warning

- It is the responsibility of Body and Equipment Manufacturers or modification companies to make sure that the completed vehicle with body and equipment, or after modification, conforms to all applicable laws and regulations of the country in which the vehicle is to be used (e. g. regulations on lighting, tilt, overall size, axle load, external noise control etc).
- This manual does not guarantee the safety of a Hino chassis once a body or equipment has been mounted or modification has been made by a Body and Equipment Manufacturer or a modification company.
- This manual does not affect that ultimate responsibility for the manufacture and mounting of the body, installation, modification or alteration on Hino Chassis devolves upon the Body and Equipment Manufacturer.
- Each individual Body and Equipment Manufacturer has the sole responsibility for the design, functions, materials and work concerning the body and equipment.
- Hino Motors, Ltd. does not assume any liability whatsoever for any injury to persons or damage to property caused as a result of the utilization of this manual.

- This vehicle is installed the SRS air bag, ABS system.
  The SRS air bag may inflate incorrectly according to wrong operations of body mounting or unexpected cause.
  The function of ABS system fall remarkably according to incorrect body mounting.
  Therefore it is strictly prohibited that the following operations, modification or provision of equipments install to the vehicle.
  1. Removing the steering wheel, steering system and parts of cab.
  2. Wheelbase modification
  3. Front bumper modification
     Stay extension
     Bumper thickness change
     Shape modification
  4. Provide snow plough
     (Snow removal)
  5. Provide grill guard
  6. Provide winch
  7. Provide kangaroo bar, and so on.

- Before starting work be sure to refer to Chapter 2-17 PRECAUTION FOR SRS AIR BAG or please consult Hino sales dealer or distributor.

- This vehicle is controlled by VEHICLE CONTROL ECU.
  Therefore, don't change the specification of vehicle. (Ex. Tire size, Final gear ratio, etc.)

CONTENTS

Chapter 1

VEHICLE SUMMARY

1. MODEL CODE

F	D	7J	J	M	A
①	②	③	④	⑤	⑥

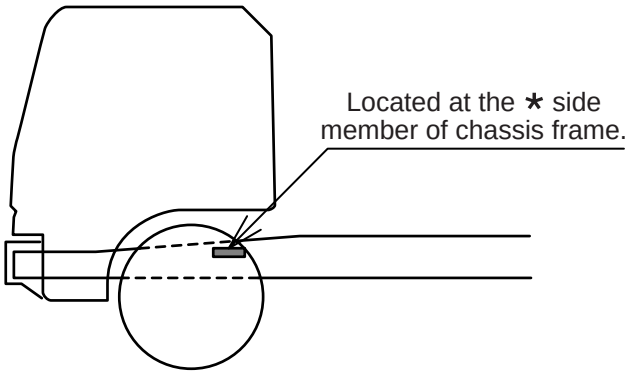
①		②			③		④		⑤			⑥	
VEHICLE TYPE		GVMR & (DRIVE) CODE			ENGINE CODE		WHEELBASE CODE		MODIFICATION CODE			APPLICABLE CODE	
			GVMR	DRIVE	CODE	MODEL	CODE	WHEELBASE (mm)	CODE	STEERING POSITION	MODIFY	CODE	BODY TYPE ETC.
F	CAB-OVER TRUCK	C	10,400kg CLASS	4 x 2	6J	J05D	C	～3000	K ⟆ R	RH	FIRST ↓	A	GENERAL CARGO & LEAF SUSPENSION
							D	3000～3249					
G	CAB-OVER TRUCK	D	10,000～12,000kg CLASS	4 x 2	7J	J07E	E	3250～3499				B	GENERAL CARGO & LEAF SUSPENSION
							G	3750～3999					
S	SEMI-TRACTOR	G	14,000～15,500kg CLASS	4 x 2	8J	J08E	H	4000～4249	S ⟆ Z	LH	FIRST ↓	D	DUMP & LEAF SUSPENSION
							J	4250～4499					
		H	17,000kg CLASS	4 x 2	9J	J05E	K	4500～4749				G	GENERAL CARGO & REAR AIR SUSPENSION
							L	4750～4999					
		L	26,000kg CLASS	6 x 2	1A	A09C	M	5000～5249				H	GENERAL CARGO & REAR AIR SUSPENSION
							N	5250～5499					
		M	26,000kg CLASS	6 x 4	2P	P11C	P	5500～5749				M	MIXER & LEAF SUSPENSION
							R	5750～5999					
		T	10,000～13,000kg CLASS	4 x 4			S	6000～6249				Q	DUMP & REAR AIR SUSPENSION
							T	6250～6499					
							W	7000～7249				U	MIXER & REAR AIR SUSPENSION

NOTE

- Refer to chassis specification for GVMR (Gross vehicle mass rating).

2. IDENTIFICATION NUMBER

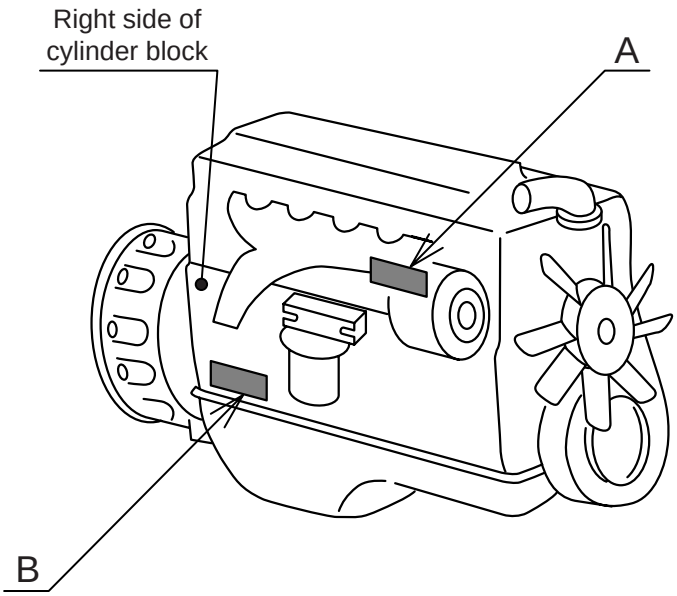
CHASSIS NUMBER



VEHICLE MANUFACTURED	STAMPING POSITION (✶)	DISTINATION
LOCAL	RIGHT	TAIWAN ONLY
ORIGIN (JAPAN)	LEFT	
LOCAL or ORIGIN (JAPAN)	LEFT	EXCEPT TAIWAN

ENGINE NUMBER

: ENGINE NUMBER



	ENGINE MODEL
A	J05E
B	J05D J07E J08E A09C P11C

3. CHASSIS SPECIFICATIONS

DIMENSIONS & MASS

CLASSIFICATION NUMBER			FD-022	FD-023	FD-024	FD-025	FD-026	FD-027	FD-028	FD-029
CHASSIS MODEL / ITEM			FD7JJMA	FD7JLMA	FD7JPMA	FD7JLMG	FD7JPMG	FD7JLMG	FD7JPMG	FD7JLMA
			GENERAL CARGO							GENERAL CARGO DOUBLE CAB
WHEEL BASE		(mm)	4,250	4,850	5,500	4,850	5,500	4,850	5,500	4,850
TREAD	FRONT	(mm)	1,770	1,770	1,770	1,770	1,770	1,770	1,770	1,770
	REAR	(mm)	1,660	1,660	1,660	1,660	1,660	1,660	1,660	1,660
MAX. GVM/GCM CAPACITY		(kg)	10,400/20,000	10,400/20,000	10,400/20,000	10,400/20,000	10,400/20,000	10,400/20,000	10,400/20,000	10,400/20,000
PERMISSIBLE AXLE CAPACITY (GAM. RATING)	FRONT	(kg)	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600
	REAR	(kg)	7,000	7,000	7,000	7,000	7,000	7,000	7,000	7,000
Tire Capacity (kg)	9.5R17.5-129/127 (STD)		Fr 3,700 / Rr 7,000							
CHASSIS MASS ON STD SPECIFICATIONS (INCLUDING WATER, OIL AND FULL FUEL)		(kg)	Refer to 3. 1							
HEIGHT OF CENTER OF GRAVITY		(mm)	Refer to 3. 1							
RECOMMENDED MAXIMUM BODY WIDTH		(mm)	MAX. 2,500 MIN. 2,340							

NOTE

- Permissible axle capacity and GVM or GCM capacity listed above table must not be exceeded.
- The front axle load must exceed 30% of the gross vehicle mass under full loaded condition for 4x2 and 4x4 drive vehicle.
- The front axle load must exceed 20% of the gross vehicle mass under full loaded condition for 6x2 and 6x4 drive vehicle.
- The height of center of gravity from ground on the unloaded vehicle with body mounted should be 1.08 m or less for 16/17.5inches disc wheel.
- The height of center of gravity from ground on the unloaded vehicle with body mounted should be m or less for 20/22.5inches disc wheel.
- Mass distribution on the left and right wheels should be balanced.
- Both front axle and rear axle loads must not exceed the permissible load based on the tire load capacity according to the tire standards in your country.
- The mass and dimension of tires to be mentioned in above chassis specification shows design figure according to JATMA or ETRTO standard.
- The max. and min. body width are decided by existing mirror stays and regulation (ADR14/02, 43/04).

ENGINE RELEVANT MODEL

CLASSIFICATION NUMBER	ITEMS			
	J07E-TR	MAX. OUTPUT	JIS GROSS	
			ISO NET	
		MAX. TORQUE	JIS GROSS	
			ISO NET	
FD-022,023,024, 025,026,029	J07E-TP	MAX. OUTPUT	JIS GROSS	180kW {245PS} at 2400r/min
			ISO NET	176kW {240PS} at 2400r/min
		MAX. TORQUE	JIS GROSS	725N·m {74kgf·m} at 1500r/min
			ISO NET	716N·m {73kgf·m} at 1500r/min
FD-027,028	J07E-TN	MAX. OUTPUT	JIS GROSS	195kW {265PS} at 2400r/min
			ISO NET	191kW {260PS} at 2400r/min
		MAX. TORQUE	JIS GROSS	804N·m {82kgf·m} at 1500r/min
			ISO NET	794N·m {81kgf·m} at 1500r/min
	J08E-VD	MAX. OUTPUT	JIS GROSS	
			ISO NET	
		MAX. TORQUE	JIS GROSS	
			ISO NET	
	J08E-VE	MAX. OUTPUT	JIS GROSS	
			ISO NET	
		MAX. TORQUE	JIS GROSS	
			ISO NET	
	J08E-UC	MAX. OUTPUT	JIS GROSS	
			ISO NET	
		MAX. TORQUE	JIS GROSS	
			ISO NET	
	J08E-UD	MAX. OUTPUT	JIS GROSS	
			ISO NET	
		MAX. TORQUE	JIS GROSS	
			ISO NET	
	J08E-UE	MAX. OUTPUT	JIS GROSS	
			ISO NET	
		MAX. TORQUE	JIS GROSS	
			ISO NET	
	J08E-UF	MAX. OUTPUT	JIS GROSS	
			ISO NET	
		MAX. TORQUE	JIS GROSS	
			ISO NET	
	J08E-UG	MAX. OUTPUT	JIS GROSS	
			ISO NET	
		MAX. TORQUE	JIS GROSS	
			ISO NET	
	J08E-TB	MAX. OUTPUT	JIS GROSS	
			ISO NET	
		MAX. TORQUE	JIS GROSS	
			ISO NET	
	J08E-TE	MAX. OUTPUT	JIS GROSS	
			ISO NET	
		MAX. TORQUE	JIS GROSS	
			ISO NET	
	A09C-TU	MAX. OUTPUT	JIS GROSS	
			ISO NET	
		MAX. TORQUE	JIS GROSS	
			ISO NET	
	A09C-TT	MAX. OUTPUT	JIS GROSS	
			ISO NET	
		MAX. TORQUE	JIS GROSS	
			ISO NET	

TRANSMISSION RELEVANT MODEL

CLASSIFICATION NUMBER	STD/OPT	ITEMS
FD-022,023,024, 025,026,029	S	LX06S
FD-027,028	S	LJ06S
		MF06S
		HK06S
		EATON RT-8908LL
		ZF 9S109
		EATON FS-6109A
		EATON FS-8209BBE
		ALLISON 3000
		ALLISON 3500

REAR SUSPENSION RELEVANT MODEL

CLASSIFICATION NUMBER	STD/OPT	ITEMS
FD-025,026,027,028	S	AIR
FD-022,023,024,029	S	LEAF

S : STANDARD EQUIPMENT
P : OPTION EQUIPMENT

- Refer to chapter 1, 3 chassis specification for classification number.

TIRE RELEVANT MODEL

CLASSIFICATION NUMBER	STD/OPT	ITEMS
		8.25-16-14PR
FD-022,023,024,025, 026,027,028,029	S	9.5R17.5 (129/127)
		235/75R17.5
		265/70R19.5 (136/134)
		8.25-20-14PR
		9.00-20-12PR
		9.00-20-14PR
		9.00R20-14PR
		10.00-20-14PR
		10.00-20-16PR
		11.00-20-14PR
		11.00-20-16PR
		11.00R20-16PR
		9R22.5 (133/131)
		10R22.5 (144/142)
		11R22.5-14PR
		11R22.5-16PR
		11R22.5 (148/145)
		235/70R22.5 (138/135)
		255/70R22.5 (140/137)
		275/70R22.5 (148/145)
		275/80R22.5 (149/146)
		295/80R22.5
		295/80R22.5 (152/148)
		Fr:295/80R22.5 (152/148) Rr:11R22.5 (148/145)
		8.25R16-14PR
		9.5R17.5 (129/127)
		235/75R17.5 (130/128)
		8.25R20-14PR
		9.00-20-14PR
		9.00R20-12PR
		9.00R20-14PR
		10.00-20-16PR
		10.00R20-14PR
		10.00R20-16PR
		11.00-20-14PR
		11.00-20-16PR
		11.00R20-14PR
		11.00R20-16PR
		9R22.5 (133/131)
		10R22.5-14PR
		11R22.5-14PR
		11R22.5-16PR
		11R22.5 (148/145)
		12R22.5-16PR
		235/70R22.5 (138/135)
		255/70R22.5 (143/140)
		275/70R22.5 (148/145)
		275/80R22.5 (151/148)
		295/80R22.5

WHEEL DISC RELEVANT MODEL

CLASSIFICATION NUMBER	STD/OPT	ITEMS
		16x6.00GS-offset135mm
FD-022,023,024,025, 026,027,028,029	S	17.5x6.75-offset135mm
		19.5x6.75-offset147mm
		20x6.50T-offset145mm
		20x6.50T-offset152mm
		20x7.00T-offset152mm
		20x7.00T-offset162mm
		20x7.50V-offset165mm
		22.5x6.75-offset152mm
		22.5x7.50-offset162mm
		22.5x8.25-offset165mm
		16x6.00GS-offset135mm
		17.5x6.75-offset135mm
		20x6.50T-offset152mm
		20x7.50V-offset165mm
		22.5x7.50-offset162mm
		22.5x8.25-offset165mm

FUEL TANK RELEVANT MODEL

CLASSIFICATION NUMBER	STD/OPT	ITEMS
		100L
FD-022,023,024,025, 026,027,028,029	S	200L
		300L
		200L
		200Lx2
		400L

BATTERY RELEVANT MODEL

CLASSIFICATION NUMBER	STD/OPT	ITEMS
FD-022,023,024,025, 026,027,028,029	S	65AH
FD-022,023,024,025, 026,027,028,029	P	120AH

ALTERNATOR RELEVANT MODEL

CLASSIFICATION NUMBER	STD/OPT	ITEMS
		24V-50A
FD-022,023,024,025, 026,027,028,029	S	24V-60A
		24V-90A

S : STANDARD EQUIPMENT
P : OPTION EQUIPMENT

- Refer to chapter 1, 3 chassis specification for classification number.

Chapter 2

GENERAL PRECAUTIONS

1. FIRE SHIELD

GAP BETWEEN CAB REAR END AND BODY

If the vehicle has a flat bed or similar body, a fire shield should be fitted across the gap between the rear arch cover and the front end of the rear body (header board of rear body) on the chassis frame to prevent fires that may be caused by flammable materials falling off from the load platform onto the exhaust pipe. (See the illustration below.)

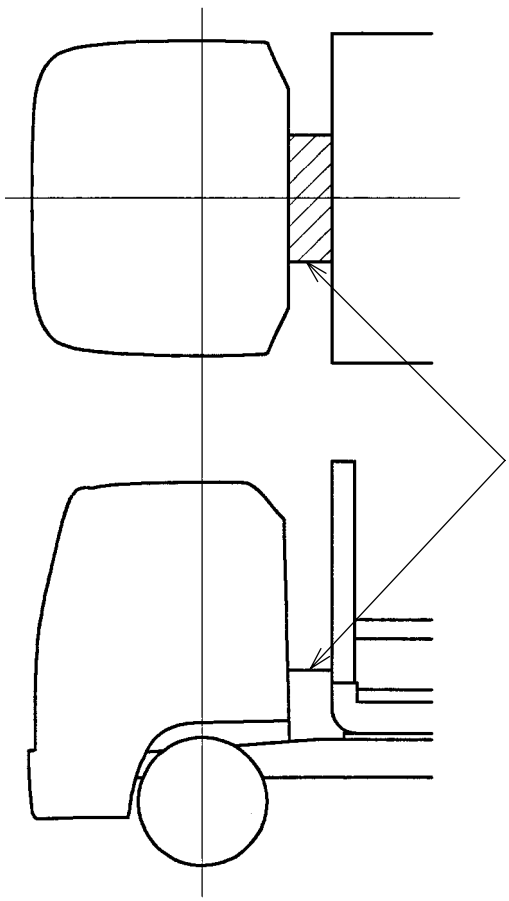
A fire shield is not necessary when the body is fitted with a sheet carrier attached directly to the top of header board.

A fire shield is also not necessary for such bodies as dump trucks, concrete mixer, tankers and aluminum vans, where there is no danger of falling - off of flammable materials.

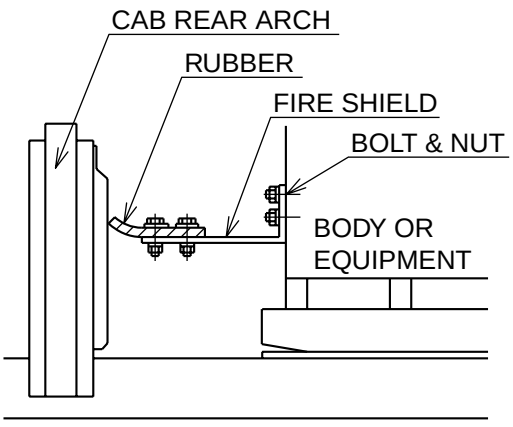
NOTE

- When you mount the fire shield, use bolts, etc., that can be taken out to allow for replacement of the chassis parts which are located at the rear part of cab.

FITTING THE FIRE SHIELD



- For approximately 50mm from the front end (vehicle front), use rubber to match the shape of the fire shield to that of the rear arch.
- The clearance between the engine and fire shield material must be not less than 40mm.
- You may also install the fire shield so that it covers only the exhaust pipe.



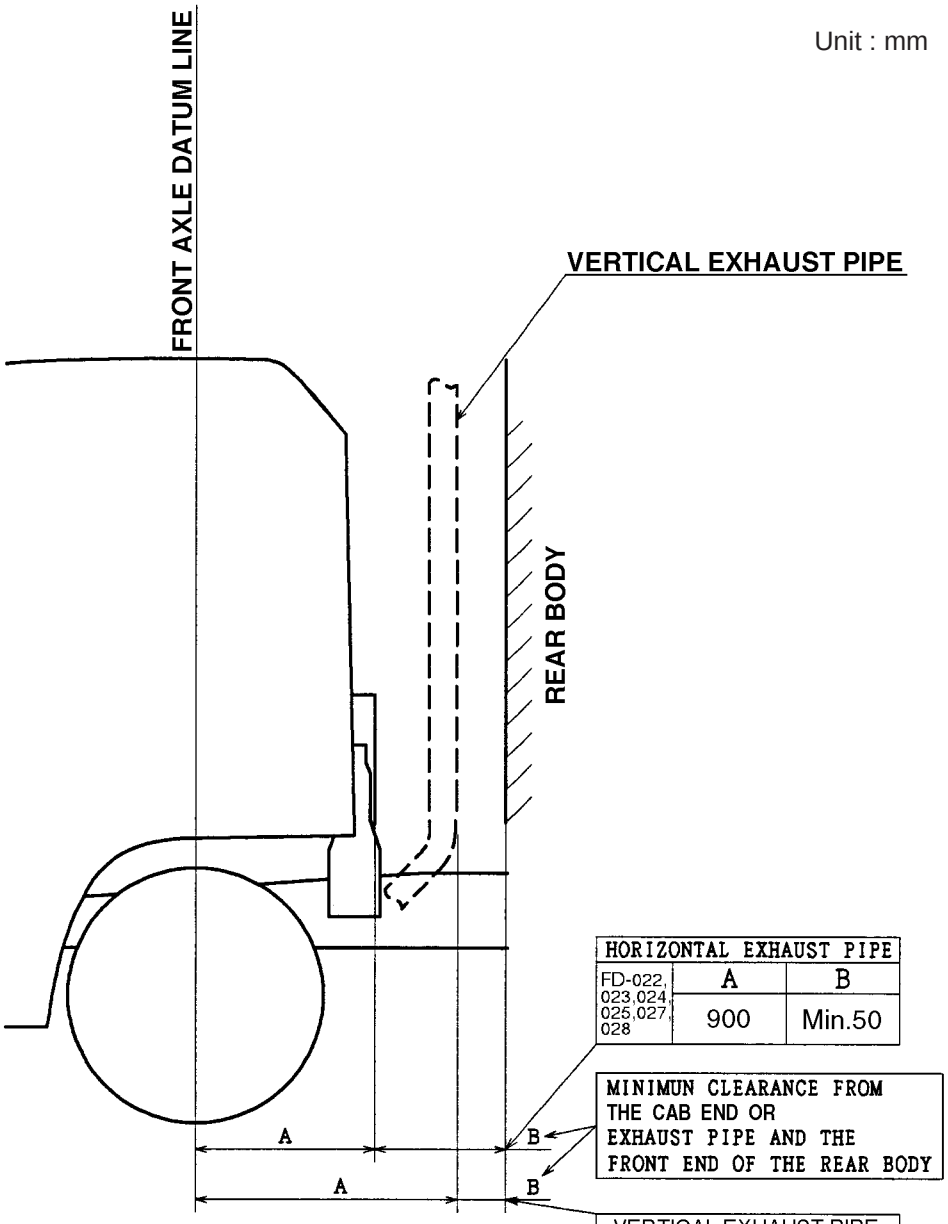
2. CLEARANCE BETWEEN CAB AND REAR BODY OR EQUIPMENT

MINIMUM CLEARANCE WITH CAB REAR END

The rear part of the cab contains the cab lock mechanism and the tilt mechanism, as well as the engine cylinder block or other various equipment as trailer brake connector stand and etc.

When mounting the body or equipment, allow at least the minimum clearance between the rear end of the cab or some of the chassis component and the front end of the rear body or swept radius of the trailer front end to avoid obstructing the operation and maintenance of these mechanisms or various equipments, and to avoid damage due to contact.

Unit : mm

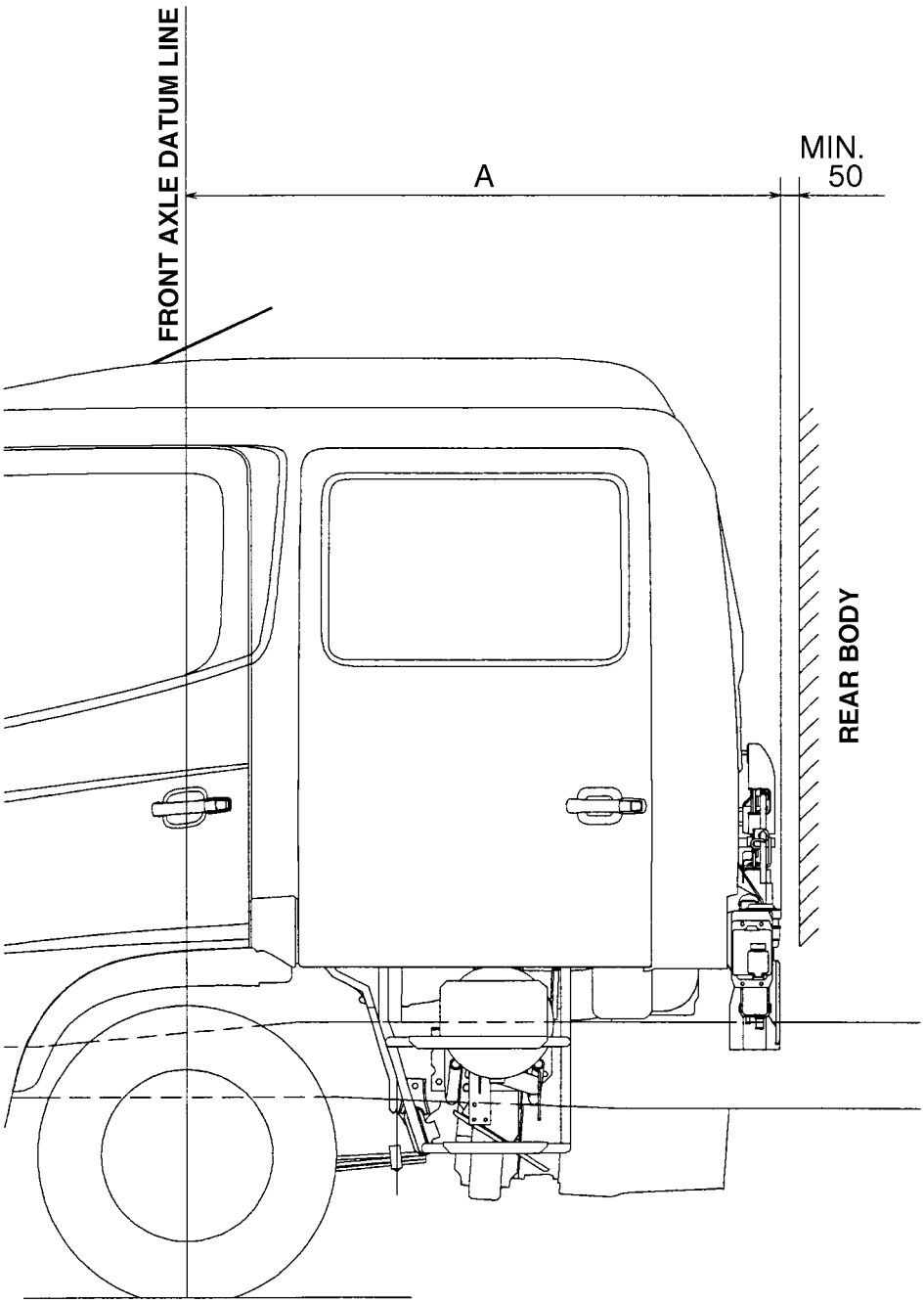


- Refer to chapter 1, 3 chassis specification for classification number.

MINIMUM CLEARANCE WITH DOUBLE CAB REAR END

Unit : mm

MODEL	A
FD, FT	1,600
FG	1,575
GT	1,550



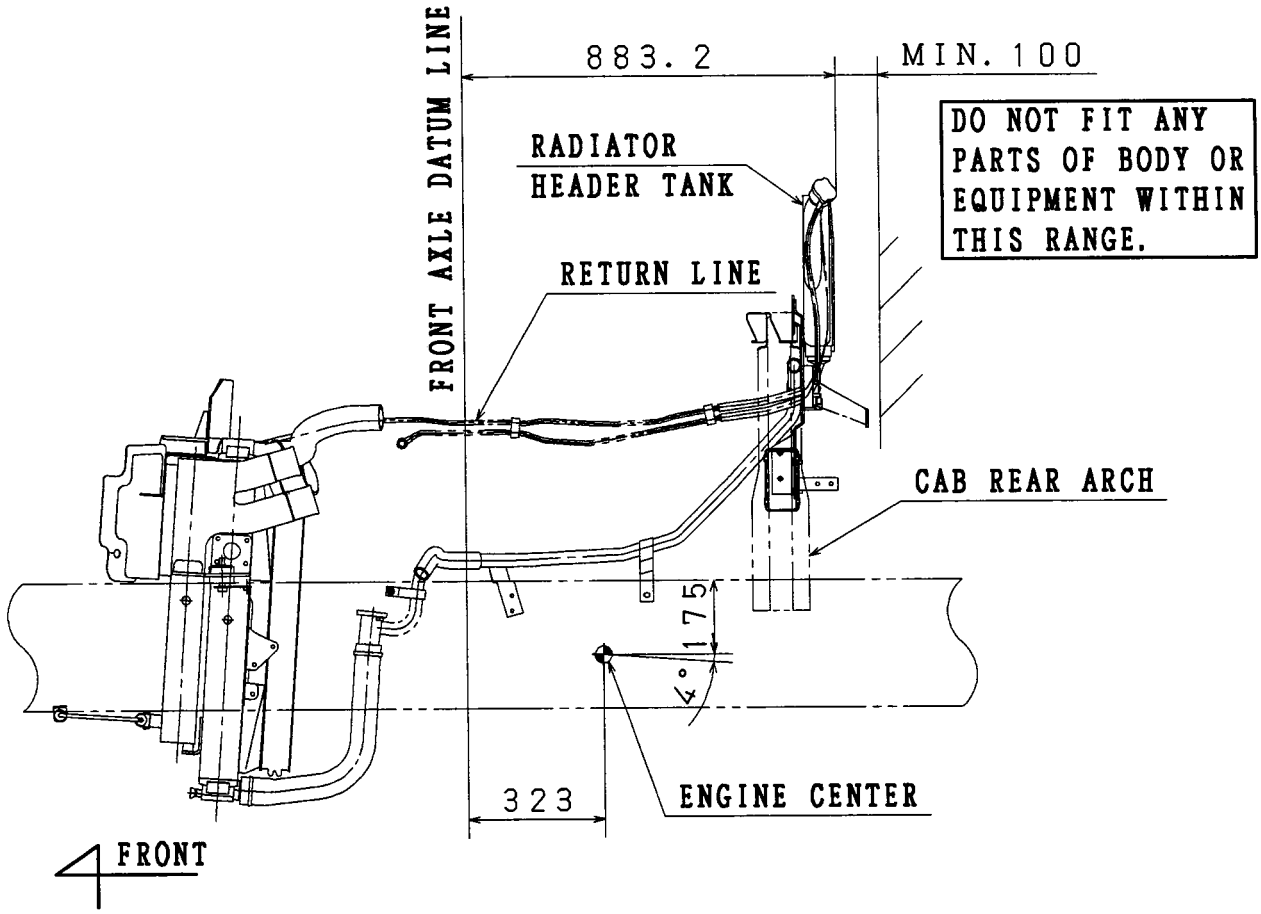
MEASUREMENT DETAIL OF RADIATOR HEADER TANK

RELEVANT MODEL

CLASSIFICATION NUMBER

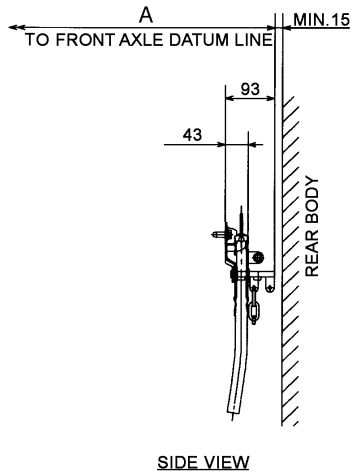
- Refer to chapter 1, 3 chassis specification for classification number.

Unit : mm

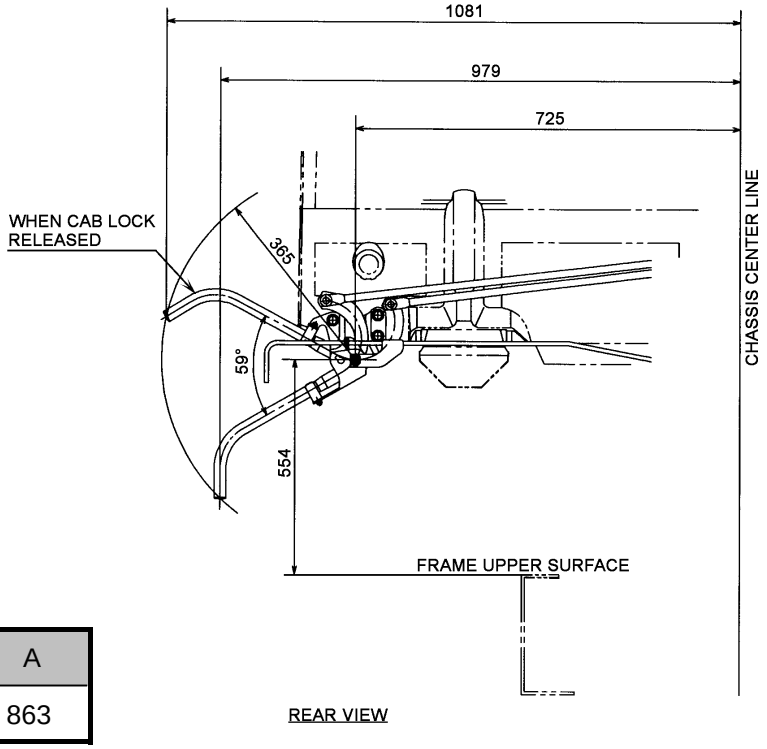


MEASUREMENT DETAIL OF CAB TILT MECHANISM (FOR SINGLE CAB)

Unit : mm



SIDE VIEW

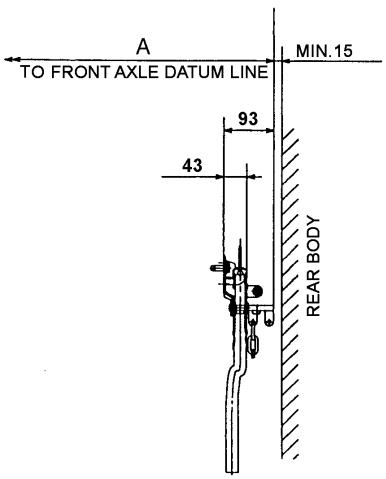


REAR VIEW

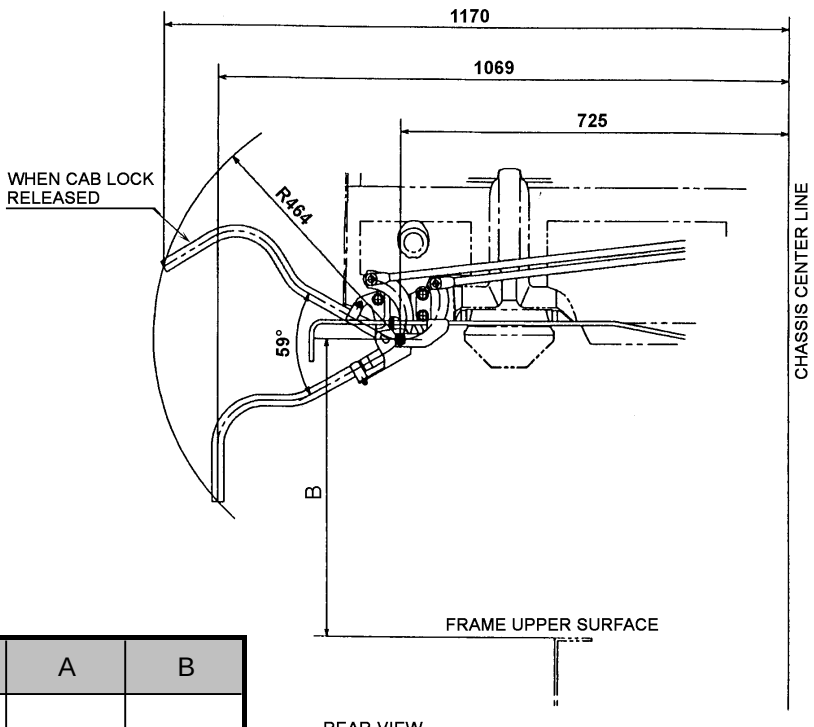
RELEVANT MODEL

CLASSIFICATION NUMBER	A
FD-022,023,024,025, 026,027,028	863

- Refer to chapter 1, 3 chassis specification for classification number.



SIDE VIEW



REAR VIEW

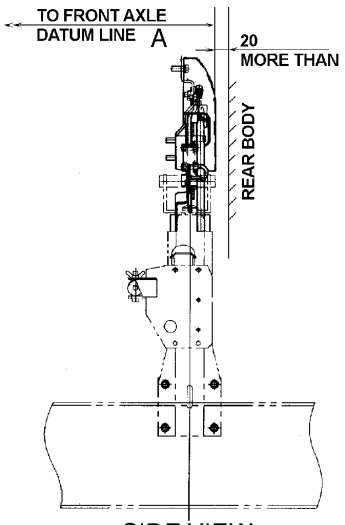
RELEVANT MODEL

CLASSIFICATION NUMBER	A	B

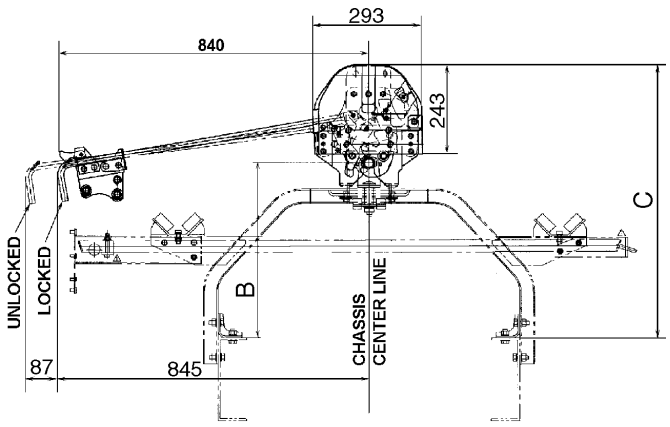
- Refer to chapter 1, 3 chassis specification for classification number.

MEASUREMENT DETAIL OF POWER CAB TILT MECHANISM (FOR DOUBLE CAB ONLY)

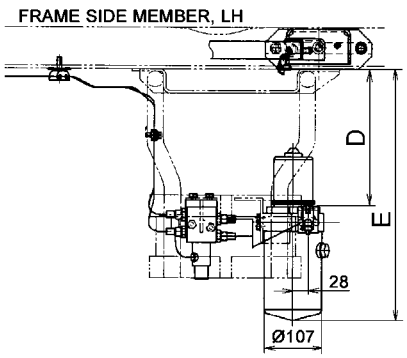
Unit : mm



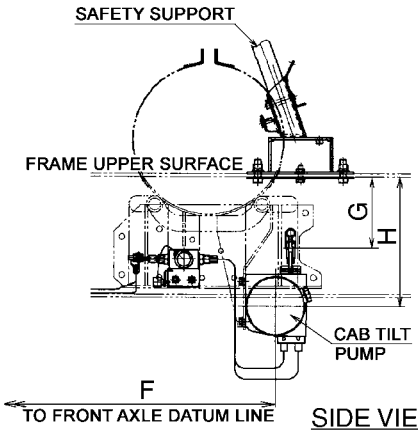
SIDE VIEW



REAR VIEW

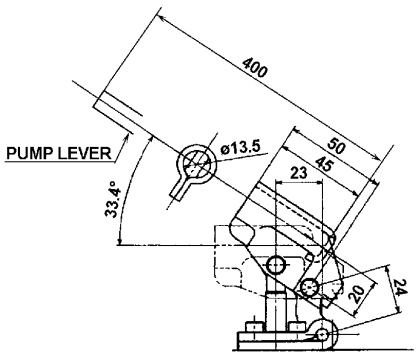


UPPER VIEW



SIDE VIEW

DETAIL, CAB TILT PUMP INSTALLATION



OPERATION RANGE, MANUAL TILT PUMP LEVER

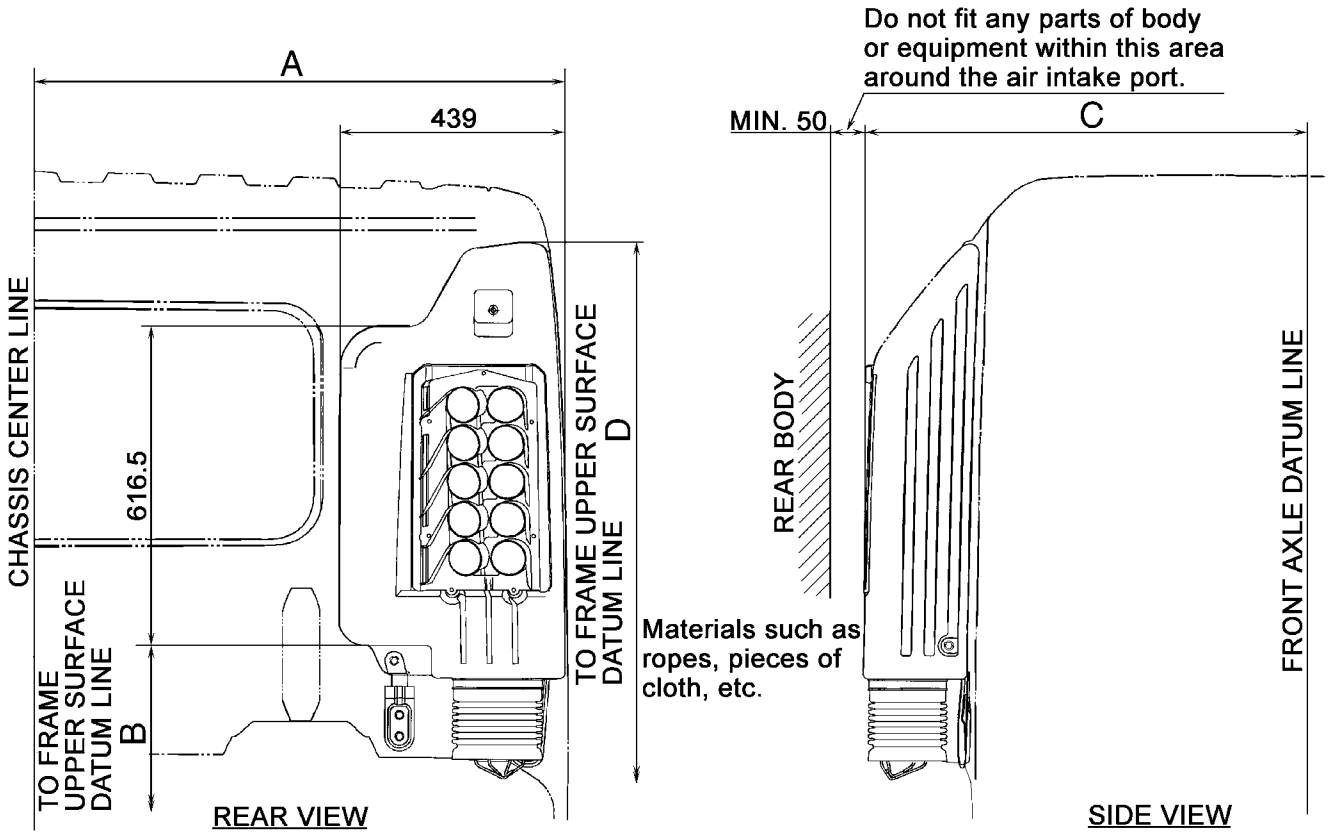
RELEVANT MODEL

CLASSIFICATION NUMBER	A	B	C	D	E	F	G	H
FD-029	1,570	483	749	179	382	1,007.50	114	205

- Refer to chapter 1, 3 chassis specification for classification number.

MEASUREMENT DETAIL OF ENGINE AIR INTAKE PORT

Unit : mm



RELEVANT MODEL

CLASSIFICATION NUMBER	A	B	C	D
FD-022,023,024,025, 026,027,028	1032.5	762.5	875	1541.5

- Refer to chapter 1, 3 chassis specification for classification number.

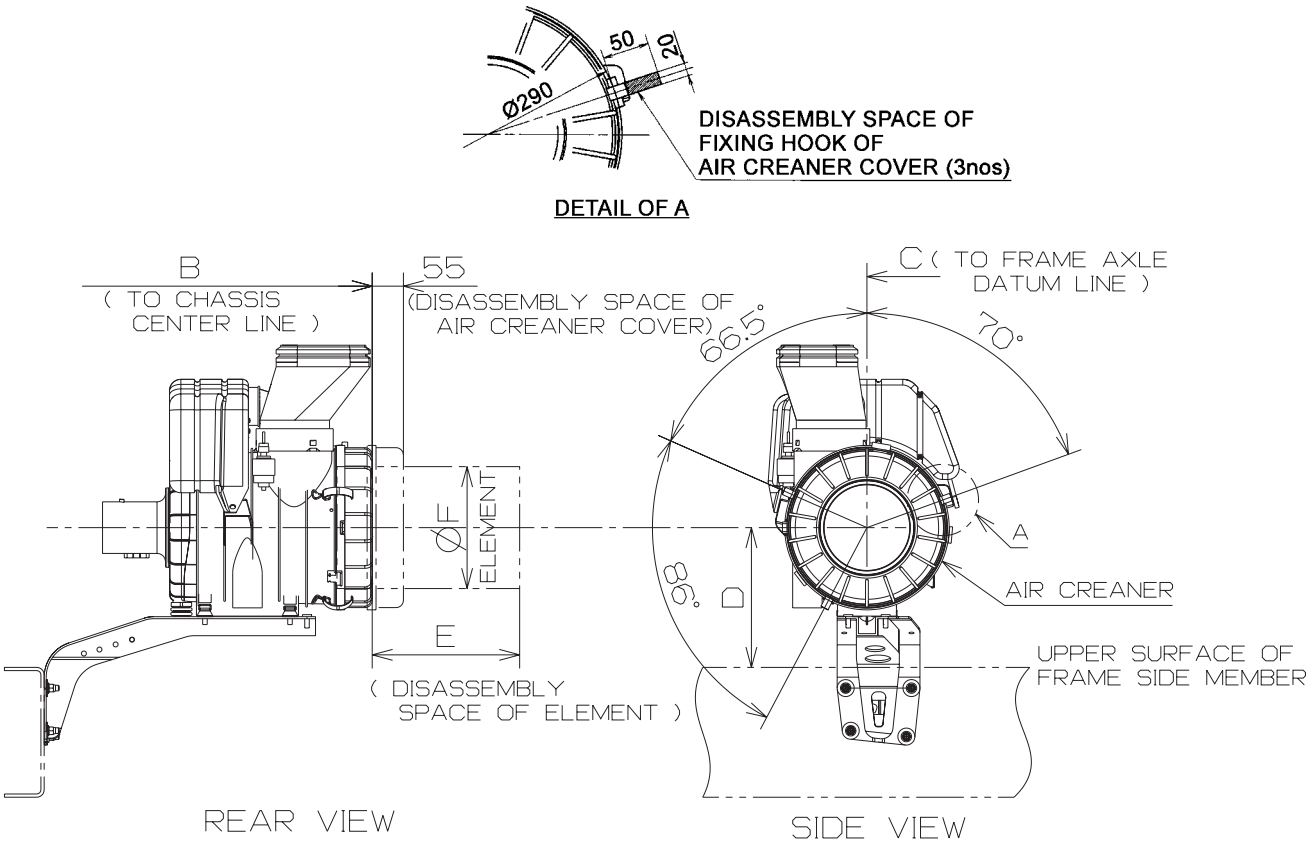
CAUTION

The blocking of the smooth flow of air into the air intake pipe caused by any materials such as ropes, pieces of cloth, etc. leads to the increase of exhaust temperature if driven long intervals. The increase in exhaust temperature is caused by the decreased efficiency in the combustion process, as the proportion of air in the combustion chamber is also decreased by the above mentioned factor. This situation will lead to major malfunctions such as the cracking of the exhaust manifold and the breaking down of the turbocharger. To avoid such malfunctions, please keep the air intake pipe free from any blocking materials at all times.

MEASUREMENT DETAIL OF ENGINE AIR CLEANER (FOR SINGLE CAB)

RELEVANT MODEL
CLASSIFICATION NUMBER : FD-022,023,024,025,026,027,028

Unit : mm



B	C	D	E	F
988.5	434.5	246.5	260	215

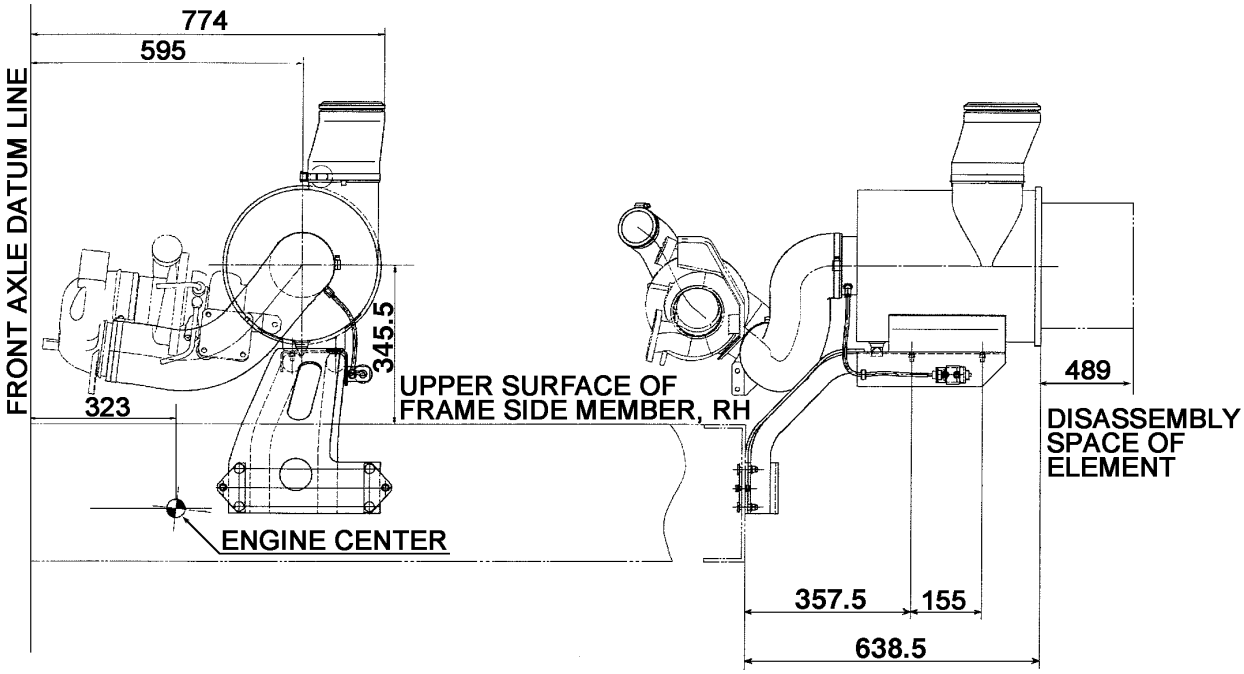
※ Be sure to install both primary (outer) and secondary (inner) HINO genuine element to avoid engine, performance and fuel-efficiency being affected. Use of non-genuine element may result in the malfunction of Diesel Particulate Active Reduction (DPR) System, and may damage engine parts and DPR system.

- Refer to chapter 1, 3 chassis specification for classification number.

MEASUREMENT DETAIL OF ENGINE AIR CLEANER

RELEVANT MODEL
CLASSIFICATION NUMBER :

Unit : mm

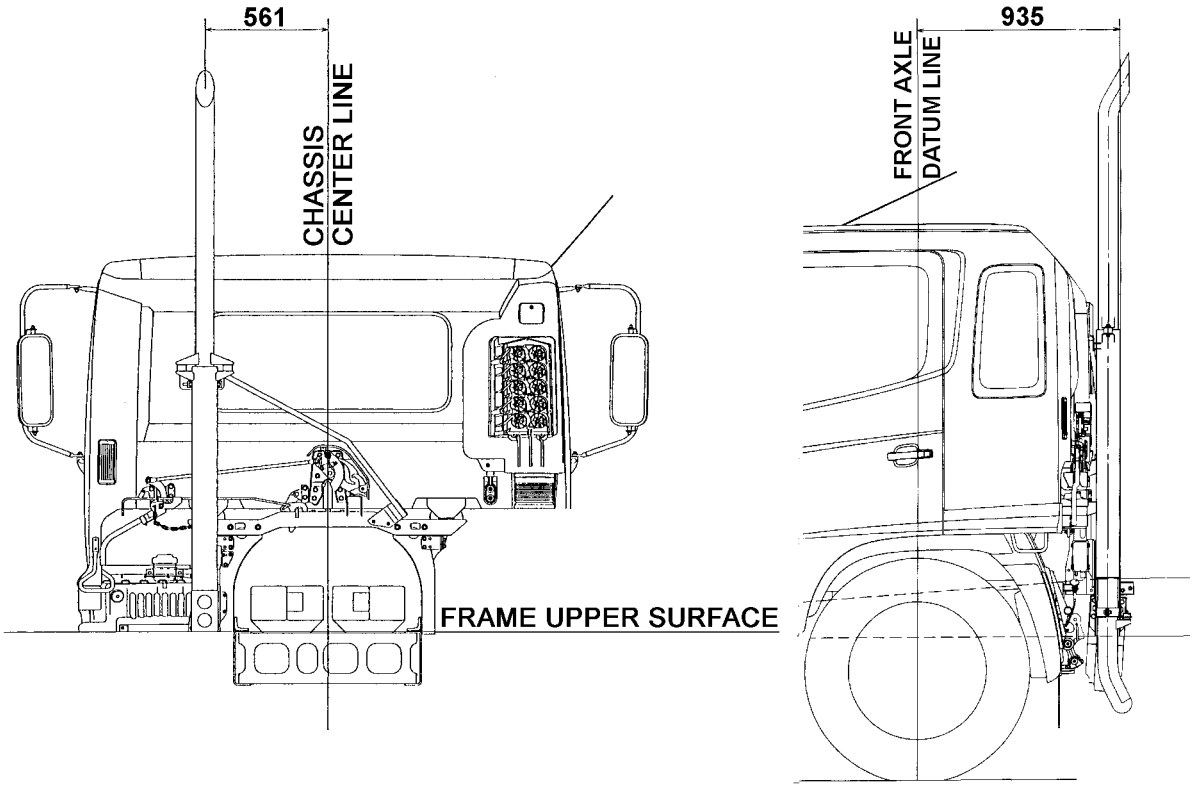


- Refer to chapter 1, 3 chassis specification for classification number.

MEASUREMENT DETAIL OF VERTICAL EXHAUST PIPE

RELEVANT MODEL
CLASSIFICATION NUMBER :

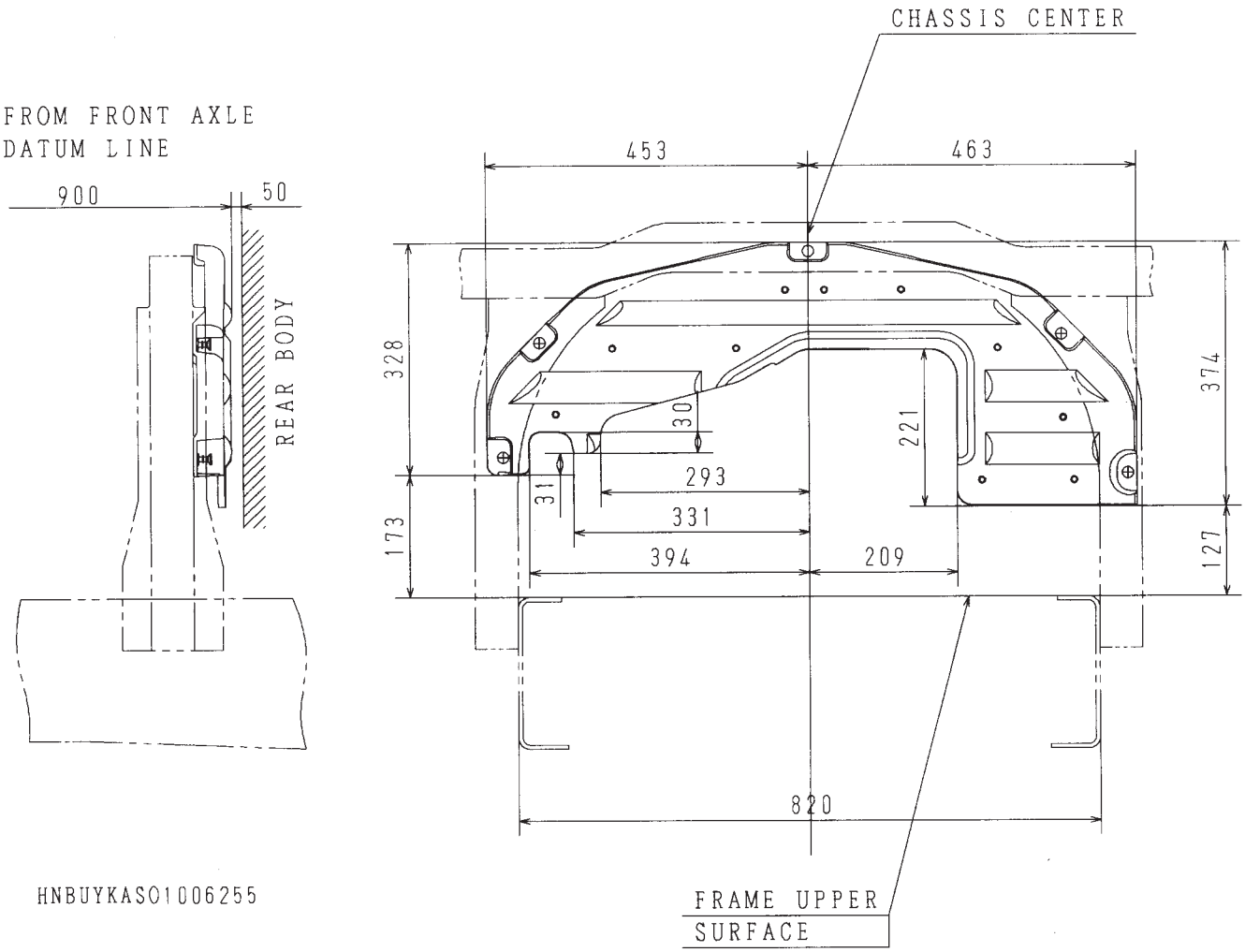
Unit : mm



- Refer to chapter 1, 3 chassis specification for classification number.

MEASUREMENT DETAIL OF REAR ARCH COVER

RELEVANT MODEL
CLASSIFICATION NUMBER : FD-022,023,024,025,
026,027,028



- Refer to chapter 1, 3 chassis specification for classification number.

3. RECOMMENDED POSITIONS OF U-BOLTS

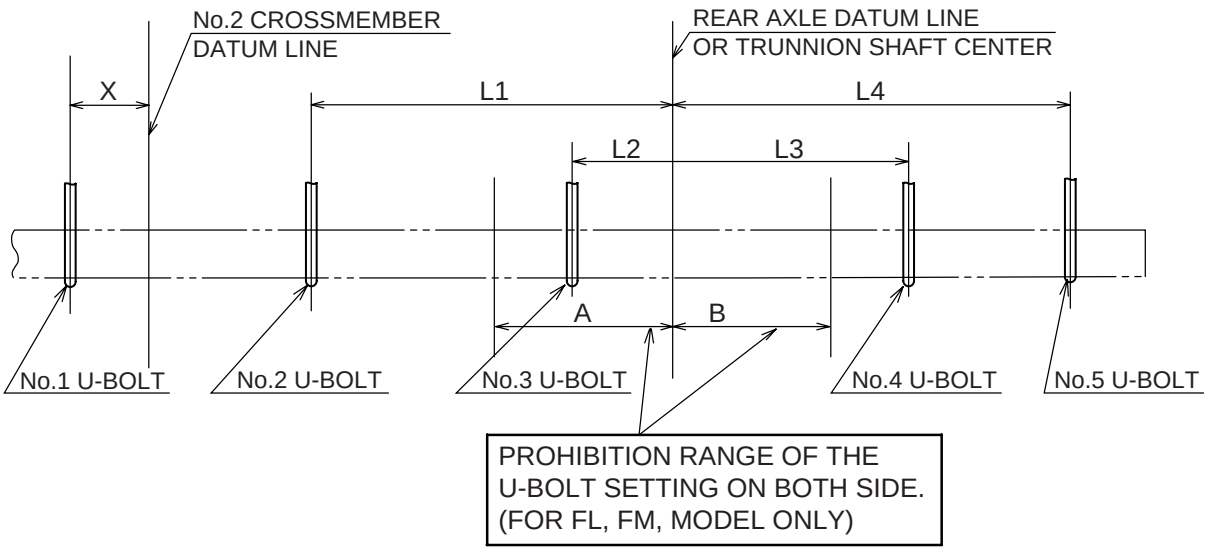
- The U-bolts to be fastened on the body sub-frame and the chassis frame must be provided sufficient clearance to prevent contact with the brake pipes, hoses, and harness wires etc.
- The recommended setting positions of U-bolts should be observed according to the figure shown below.

MOUNTING POSITION
RELEVANT MODEL

Unit : mm

CLASSIFICATION NUMBER		X	L1	L2	L3	L4	A	B
FD-022	RH	330	1,030	–	–	1,600		
	LH	330	1,030	–	–	1,600		
FD-023,025 027, 029	RH	330	1,600	220	–	1,670		
	LH	330	1,600	220	–	1,670		
FD-024, 026, 028	RH	330	2,380	220	–	2,050		
	LH	330	2,380	220	–	2,050		
	RH							
	LH							
	RH							
	LH							
	RH							
	LH							
	RH							
	LH							

- Refer to chapter 1, 3 chassis specification for classification number.



NOTE

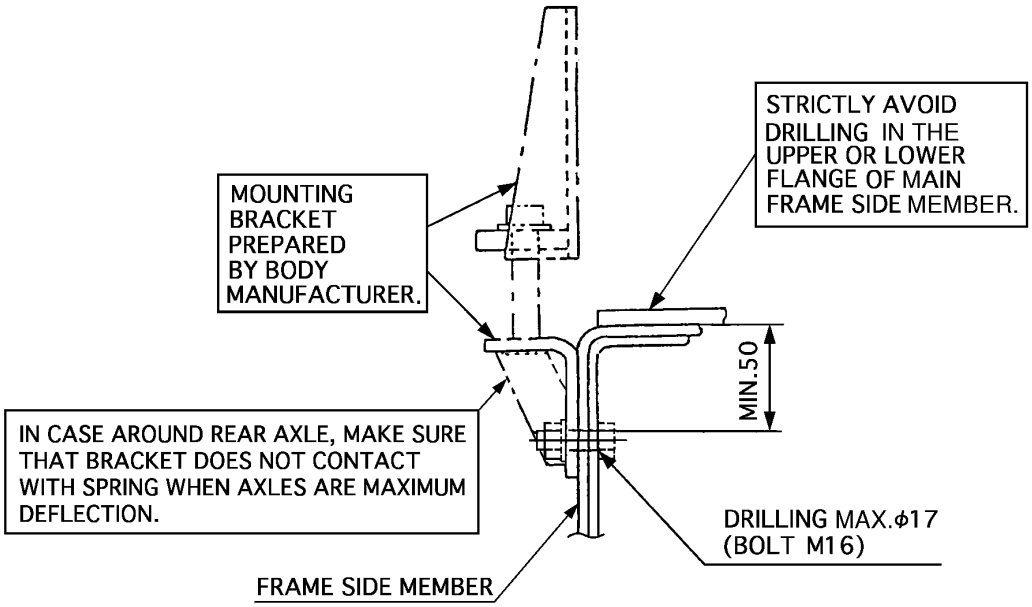
- When mounting only with U-bolts, use props.
  When the sub-frame is open section steel also use this props.
- With respect to how to mount them, refer to the chapter 12, item 3 Body mounting manual common version issued by HINO.
- Make sure to control tightening torque of the U-bolts.
  Apply double nut system to prevent slackening of the nuts.
- When delivering the vehicle, securely carry out PDI and check to it there is any slackening of the U-bolts.

DRILLING PROCESS FOR INSTALLING

THE MOUNTING BRACKET AROUND REAR AXLE

RELEVANT MODEL
CLASSIFICATION NUMBER :

Unit : mm

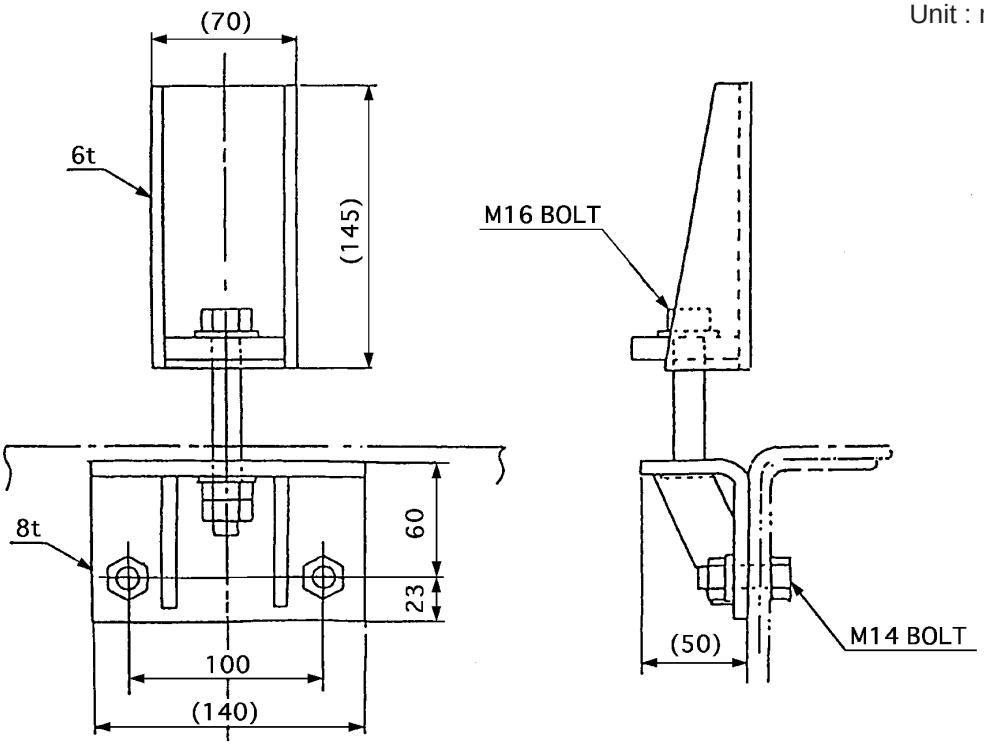


NOTE

- For more information on drilling process of the chassis frame to install the mounting bracket, refer to the Common Manual, No.KC-AA001F or KC-AA201 of Body Mounting Manual.

EXAMPLE DETAIL OF MOUNTING BRACKET

Unit : mm



- Refer to chapter 1, 3 chassis specification for classification number.

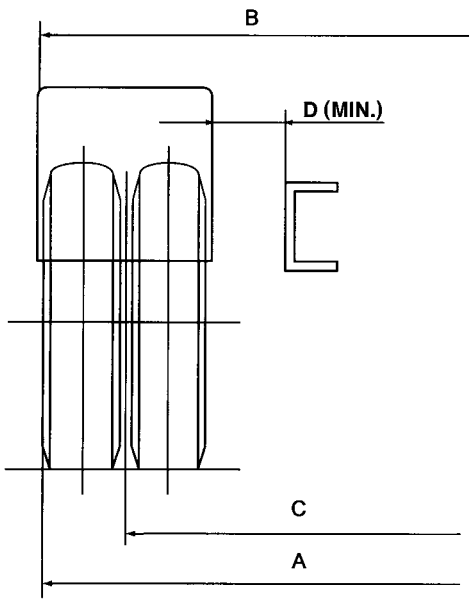
4. RECOMMENDED POSITIONS OF REAR FENDERS AND MUDGUARDS

When mounting rear fenders and mudguards, determine required clearances with reference to the following table and figures of “MAXIMUM VERTICAL DEFLECTION OF REAR WHEELS” in 4 - 2.

RELEVANT MODEL (FOR REAR SINGLE AXLE)

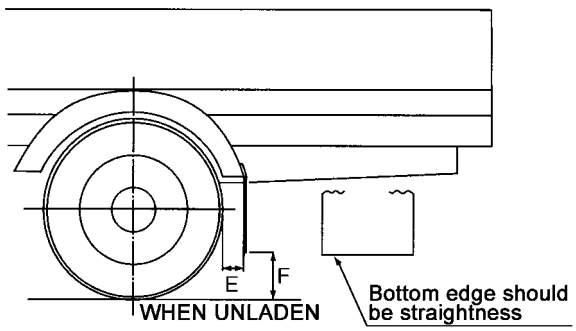
Unit : mm

CLASSIFICATION NUMBER	STD/OPT	REAR TIRE	A	B	C	D
		8.25-16-14PR				
		8.25R16-14PR				
FD-022,023,024,025, 026,027,028,029	STD	9.5R17.5 (129/127)	2,170	2,190	1,660	155
		235/75R17.5 (130/128)				
		8.25-20-14PR				
		8.25R20-14PR				
		9.00-20-12PR/14PR				
		9.00R20-12PR/14PR				
		10.00-20-14PR/16PR				
		10.00R20-14PR/16PR				
		11.00-20-14PR/16PR				
		11.00R20-14PR/16PR				
		9R22.5 (133/131)				
		10R22.5-14PR				
		10R22.5 (144/142)				
		11R22.5-14PR/16PR				
		11R22.5 (148/145)				
		12R22.5-16PR				
		235/70R22.5 (138/135)				
		255/70R22.5 (140/137)				
		255/70R22.5 (143/140)				
		275/70R22.5 (148/145)				
		275/80R22.5 (151/148)				
		295/80R22.5				
		295/80R22.5 (152/148)				



- Refer to chapter 1, 3 chassis specification for classification number.

TIRE WHEEL SIZE (in)	E	F
16 or 17.5	150 ~ 200	200
20 or 22.5	200 ~ 250	300



NOTE

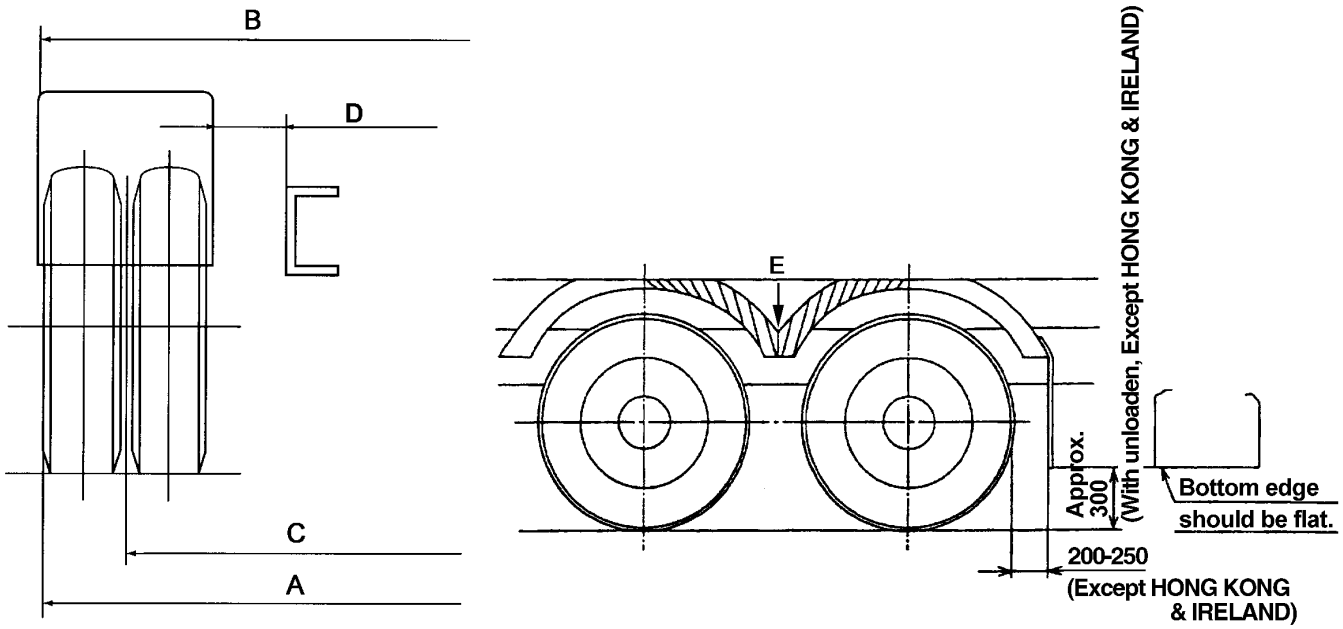
- The dimension of tire to be mentioned in above table shows design figure according to JATMA or ETRTO standard.

RELEVANT MODEL (FOR TANDEM REAR AXLE)

Unit : mm

CLASSIFICATION NUMBER	STD/OPT	REAR TIRE	A	B	C	D
		8.25-16-14PR				
		8.25R16-14PR				
		9.5R17.5 (129/127)				
		235/75R17.5 (130/128)				
		8.25-20-14PR				
		8.25R20-14PR				
		9.00-20-12PR/14PR				
		9.00R20-12PR/14PR				
		10.00-20-14PR/16PR				
		10.00R20-14PR/16PR				
		11.00-20-14PR/16PR				
		11.00R20-14PR/16PR				
		9R22.5 (133/131)				
		10R22.5-14PR				
		10R22.5 (144/142)				
		11R22.5-14PR/16PR				
		11R22.5 (148/145)				
		12R22.5-16PR				
		235/70R22.5 (138/135)				
		255/70R22.5 (140/137)				
		255/70R22.5 (143/140)				
		275/70R22.5 (148/145)				
		275/80R22.5 (151/148)				
		295/80R22.5				
		295/80R22.5 (152/148)				

- Refer to chapter 1, 3 chassis specification for classification number.



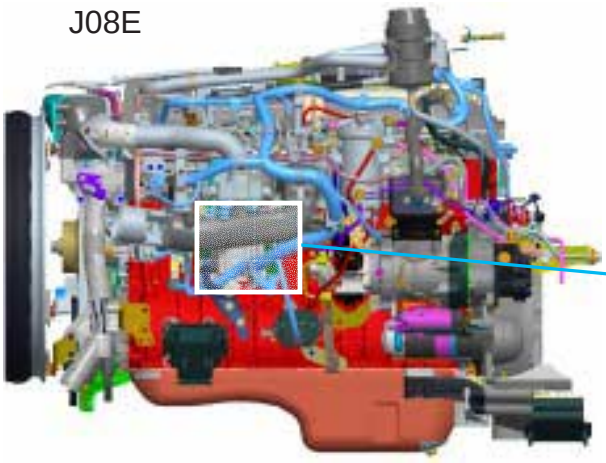
NOTE

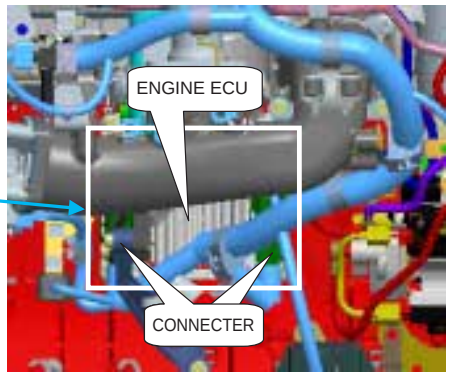
- When mounting the fenders (shaded in the figure) make a drain hole at E to allow water to escape.
- The dimension of tire to be mentioned in above table shows design figure according to JATMA or ETRTO standard.

5. PRECAUTION FOR ENGINE ECU

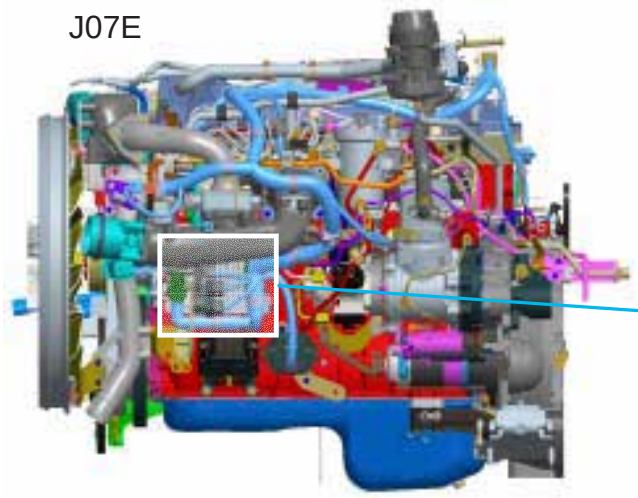
- ENGINE ECU is installed in the engine. (Refer to the following figure)
  When mounting the body, should not give any shock to ECU.
- Strictly prohibited following manner to ENGINE ECU and related part when body mounting.
  To given shock.
  To perform electrical welding.
  To apply paint and removal.
- The parts which to be generated heat do not provide near ECU.
- ECU has air bent valve, therefor do not perform body mounting and modification which to be closed bent valve, and also do not always splash water and oil to the bent valve.
- Do not remove connecter of ECU to avoid malfunction of ENGINE CONTROL SYSTEM.

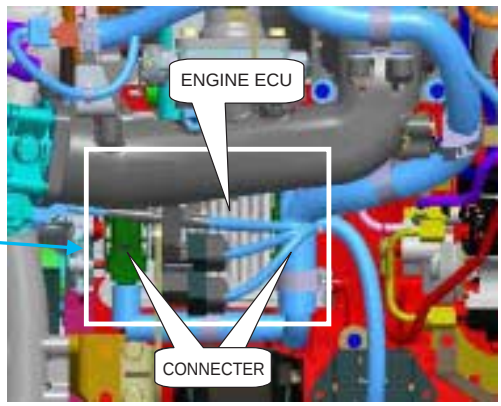
J08E





J07E

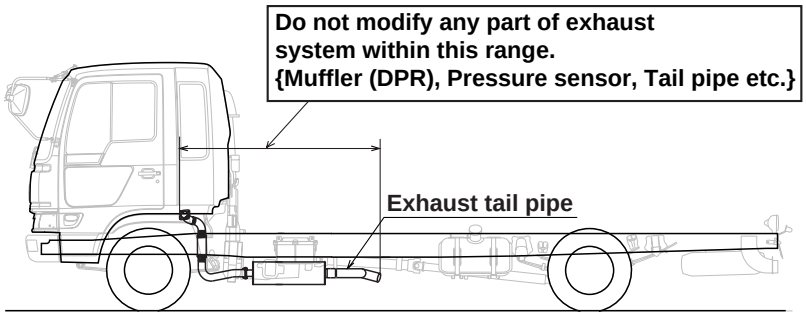




6. PRECAUTION FOR EXHAUST SYSTEM

Modifying the exhaust system has a major effect on vehicle performance, gaseous emission and external noise. As a rule, the exhaust system must not be modified.

Do not modify any part within the range shown in the drawing below.



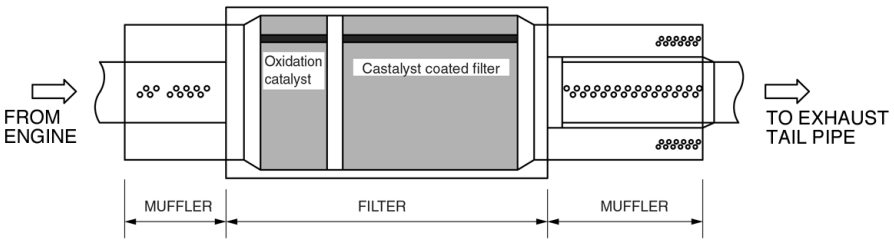
- Do not install spark arrester to avoid bad influence at the DPR SYSTEM and the ENGINE.

ABOUT THE DPR MUFFLER

(DPR = Diesel Particulate active Reduction system)

(1) Outline of DPR Muffler
Structure of DPR muffler is shown following figure.

[EXAMPLE]



The DPR filter collects particulate matter found in exhaust gas and automatically burns them.
Be extra careful when refueling, refer to the “Fuel Caution Plate” attached on the instrument panel in the cab and on the fuel tank.

(2) Working condition while running
The DPR automatically purifies particulate matter during normal operation.
This system does not negatively effect the vehicle operation.

(3) Working condition while under operation
Purification of particulate matter
: When the vehicle stops for a traffic signal, the DPR may enter filter mode. At this time the engine idle speed may temporarily increase causing the exhaust brake to actuate.
When idling long time
: To prevent emission of white smoke, when vehicle is left idling for certain time (approx. 1 hour), idling speed will increase causing exhaust brake to work.

(4) Precautions

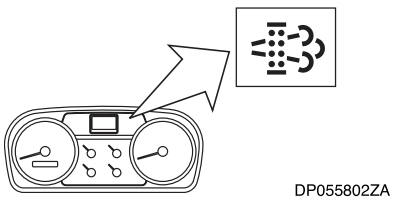
1) An exhaust pressure outlet pipe and an exhaust temperature sensor are installed on muffler and a harness is attached to the sensor. At the time of mounting the body, take extra care with these system.
If these parts are damaged, purification of particulate matter may not be performed sufficiently.

2) Muffler may be removed and remounted for maintenance.
Place the parts of the body so that it is easy to remove and mount the muffler.

3) Depending on how vehicle is operated, DPR indicator light may be flashing.
If the DPR indicator light is flashing, follow the instruction below within 150km.
To prevent fire, make sure there is no flammable matter near the exhaust pipe.

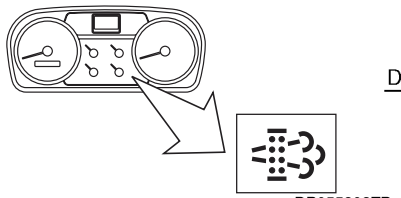
1. Park vehicle in safe place.
2. Do not stop the engine.
3. Press the DPR switch shown below.
Confirm that the flashing DPR indicator light turns on and idle speed increases, and turn on the exhaust brake.
Wait for 15 to 20 minutes.
When the DPR indicator light goes off and the idle speed returns to normal, you can drive normally.

[Automatic transmission vehicle]

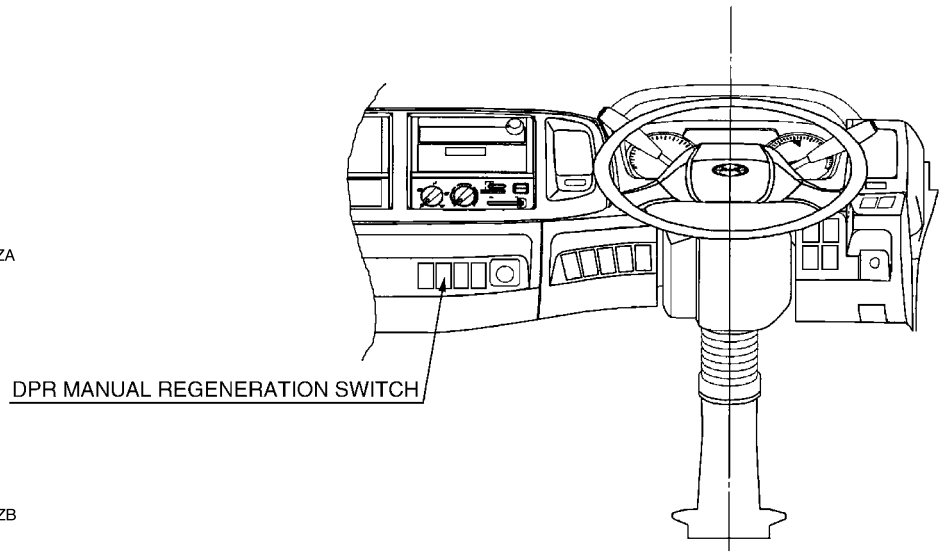


DP055802ZA

[Manual transmission vehicle]



DP055802ZB



This instruction is to reproduce the function of DPR filter and it does not mean there is a problem.
However, if the vehicle is left with the flashing DPR indicator light on and engine runs long time, the check engine light will turn on and output power will be restricted in order to prevent damage to the DPR. If vehicle is used in one spot for body operation for a long time, it is necessary to make sure the DPR indicator light does not turn on.

(5) Paint application

Never paint the muffler (DPR) or pressure sensor.

Clearances between exhaust parts and other parts

The exhaust system becomes very hot during driving.
Observe the following procedures to prevent vehicle fires.

Clearances from body parts
When mounting a body or equipment, observe the precautions given in this section.

Clearances from fuel system parts
- Maintain a clearance of at least 200mm between the fuel tank, fuel hose or pipes, etc. and the hot parts of the exhaust system.
  If you cannot maintain a clearance of 200mm, fit heat insulators to protect the fuel tank and fuel pipes.
  When arranging fuel piping, make sure that even if a fuel line ruptures and fuel leaks out, no fuel will come into contact with the hot parts of the exhaust system.
- Never make joints in the fuel piping above the hot parts of the exhaust system, etc.
- When moving the fuel tank or installing an additional tank, make sure that the filling port is at least 300mm away from the mouth of the tail pipe and at least 200mm away from exposed electrical terminals.

Clearances from other chassis parts
Maintain the clearances shown in the table below. If you cannot maintain these clearances, fit heat insulators.

CLEARANCE (mm)	CHASSIS PART
Min. 100	Vacuum pipes, oil pipes, Air pipes
Min. 150	Components and parts for brake system.
Min. 200	Electrical wires, battery, battery cables, rubber parts (hoses, etc.) resin parts.

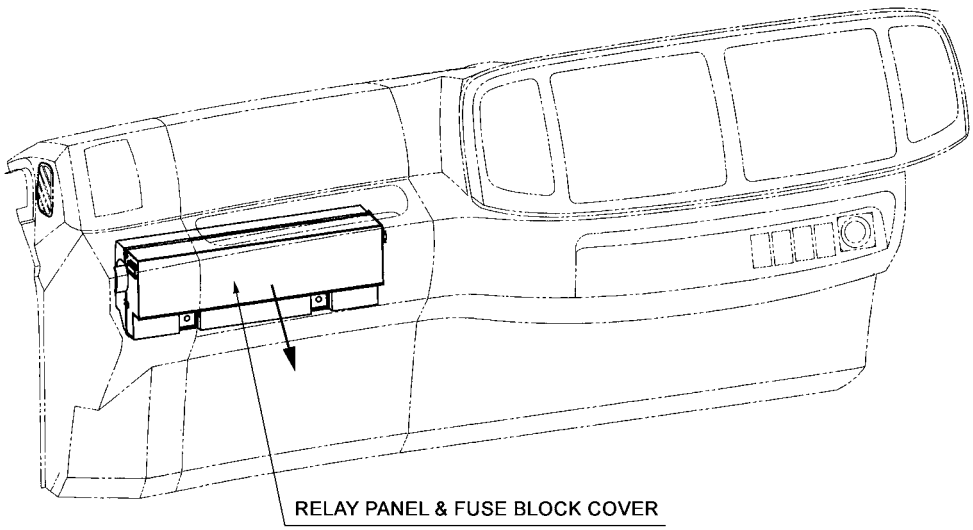
The effect and interference of the heat from the exhaust pipe, muffler, etc. of the exhaust system have a significant influence to safety. Maintain adequate clearances between components such as the exhaust pipe, muffler and a body or equipment, measure the temperature of these components as necessary to check for safe operation.

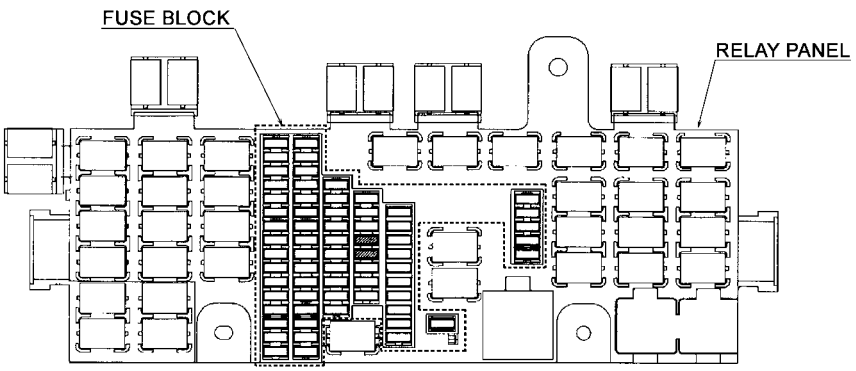
7. ELECTRIC WELDING WORK

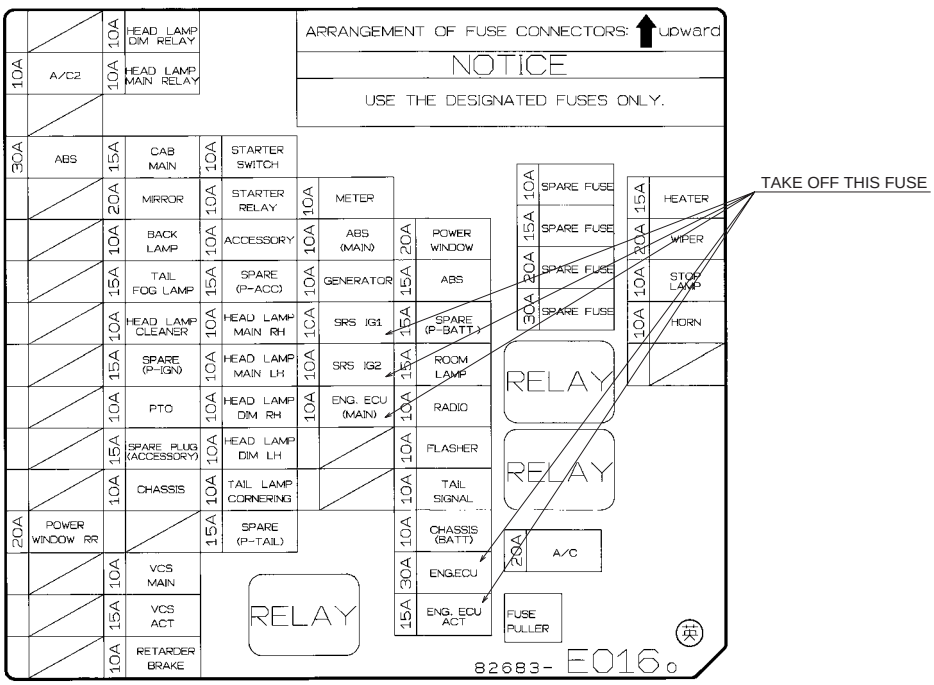
Internal clocks in the tachograph and the radio and all the electronic instruments are directly connected to the battery, and are cab body-earthed at one end.
Under these conditions, electric welding will cause damage to these electrical units as the welding current flow back along the earth circuit.
When welding, take following step of manner.

1) Procedure before welding
(Step of manner before welding.)

1. Turn the starter switch to "LOCK" position.
↓
2. Wait more than 60 seconds.
↓
3. Disconnect the negative terminal of the battery.
↓
4. Wait more than 90 seconds.
↓
5. Take off fuses of SRS air bag and Engine ECU.
   (See the figure of the next page.)







POSITION OF SRS AIR BAG AND ENGINE ECU FUSE

2) Ground of the welding equipment

- Ground the welding equipment securely, near the place where to be welded. (Ground to the plating parts is strictly prohibited.)
- Peel off the paint where to be welded.
- Connecting the ground to the chassis spring is strictly prohibited to prevent damage of the spring.
- In the case to weld to the cab body, connect the ground to the fixing bolt of cab hinge or to the cab body near the place where to be welded.

3) Other precautions of welding

- To protect ancillary equipment from sparks during welding, place fire-resistant covers over the DPR system, rubber hoses, wire harness, pipes, chassis spring and tires, etc.. Remove the SRS air bag and the SRS air bag computer, in the case of the ambient temperature of them exceed 80°C during welding work. Consult with your nearest Hino dealer or distributor when removing SRS device.
- perform to weld under most suitable conditions of the welding, and minimize the heat influence to the circumference where to be welded, and as far as possible to keep the welding quality.

4) After welding

- Put back fuses of SRS air bag and Engine ECU original position.
- Make sure to connect the ground terminal of the batery. And the terminal should be horizontally setting.
- Re-paint the place where to be peeled off the paint for grounding the welding equipment by same color.

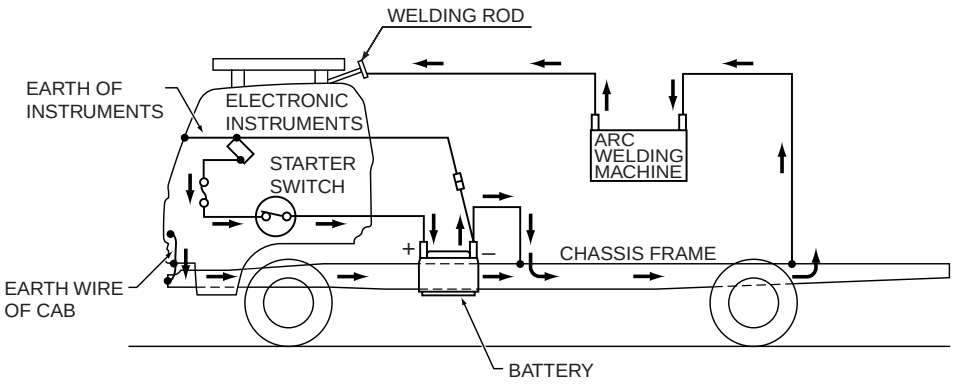
5) After restored

- Inspect the operation and function of each electronic instrument and equipment.
- Consult to each Hino dealer or distributor for details of inspection's procedure.
- Check the warning lamp of SRS air bag.
- See 2-17 PRECAUTION FOR SRS AIR BAG.
- If the warning lamp dose not turn on or remains turn off, bring the vehicle to your nearest Hino dealer or distributor.

FOR REFERENCE

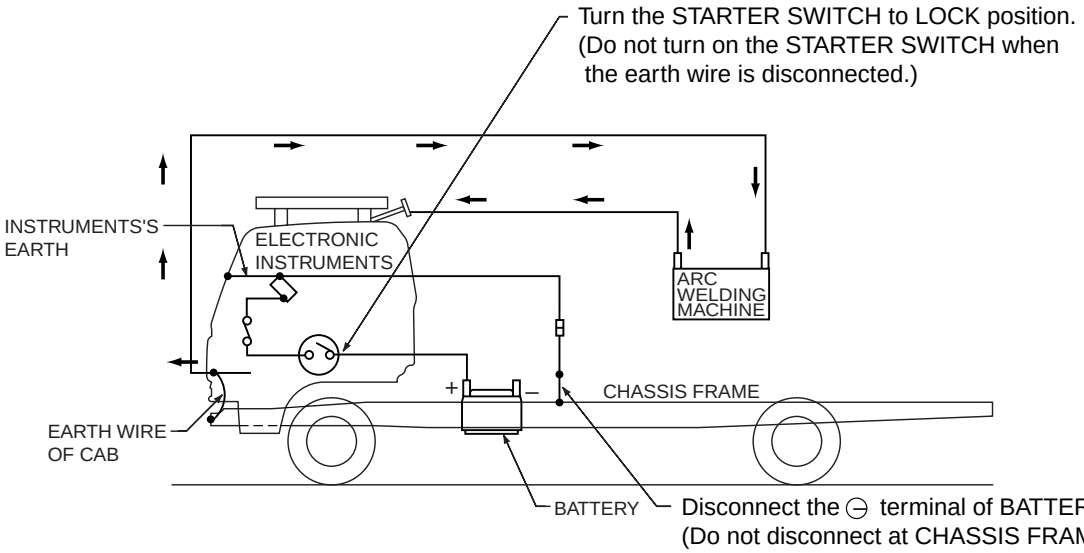
CURRENT FLOW OF ELECTRIC WELDING WHEN WELD CAB BODY

Case of connecting the ⊖ terminal of BATTERY.
ELECTRONIC INSTRUMENTS will be damaged.



The electric current of welding.
WELDING ROD → CAB → ELECTRONIC INSTRUMENTS → BATTERY → EARTH of ARC WELDING MACHINE
CAB → EARTH WIRE OF CAB → EARTH of ARC WELDING MACHINE

Case of disconnecting the ⊖ terminal of BATTERY.



8. NOTES ON ADDITIONAL WIRING IN THE ENGINE COMPARTMENT

Since the engines in HINO trucks are covered with sound arrest plates, the engine compartment tends to heat up.

Avoid wiring in the engine compartment if possible.

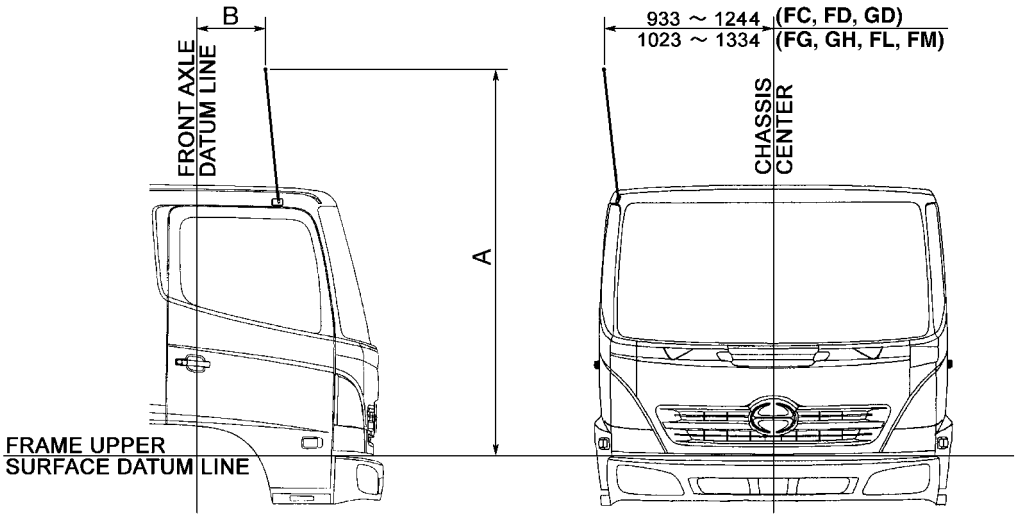
Additional wiring harness or cable should be kept away from heated elements, and should be wired along the main harness.

9. PRECAUTION OF THE ANTENNA POSITION

- The antenna which is installed on roof corner top of the cab use right angle position in normal operation.
- Make sure that not to obstruct the moving range of the antenna in described following figure when perform to mount body or equipment.
- It may cause the noise or poor receiving of the radio if occur an interference with the antenna and body part.

Unit : mm

FOR RIGHT HAND DRIVE ONLY

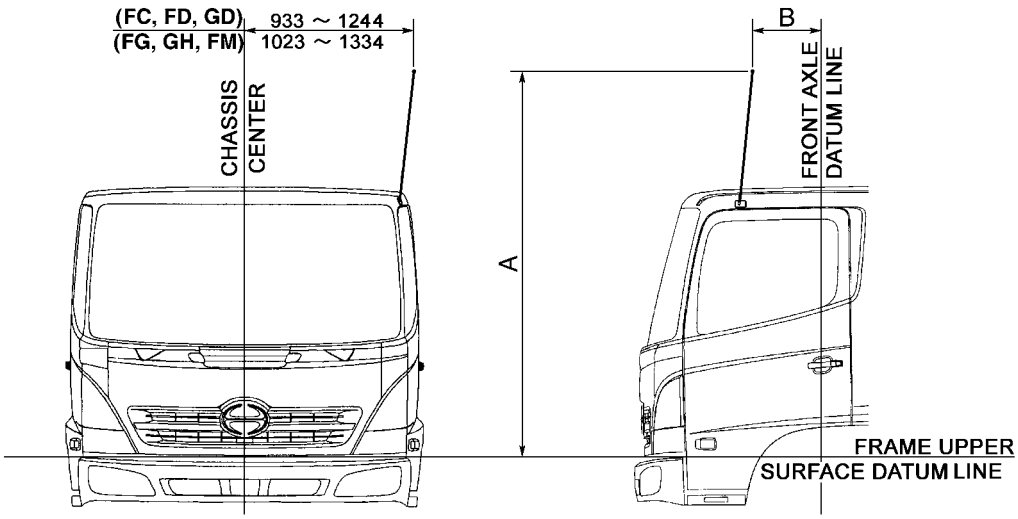


RELEVANT MODEL

CLASSIFICATION NUMBER	A	B
FD-022,023,024,025, 026,027,028,029	1,869~ 2,446	-230~ 1,303

- Refer to chapter 1, 3 chassis specification for classification number.

FOR LEFT HAND DRIVE ONLY



RELEVANT MODEL

CLASSIFICATION NUMBER	A	B

- Refer to chapter 1, 3 chassis specification for classification number.

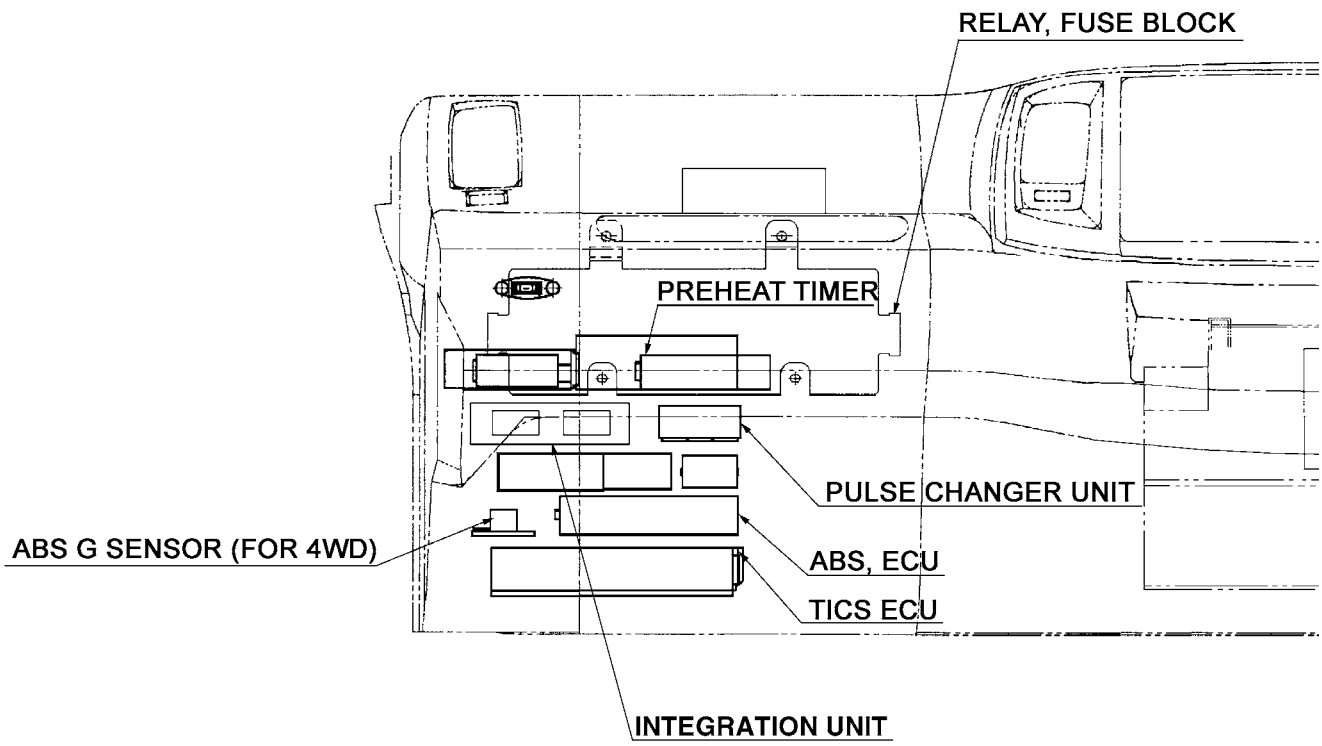
10. NOTES ON SYSTEM CONTROL COMPUTERS

Brake ABS computers are installed left or right part, inside of the instrument panel as described following figure.

Therefore, give great care to the computer when performing any body mounting work or modification as following points.

- Be sure to cover the computer to protect the water penetration when performing cleaning up the inside of cab.
- When mounting such devices as a radiophone, a wireless communication device, be sure to use the devices that conforms to the electric control act and install the devices on the places which are as far as possible from the computers and it's harness.
  Do not install any high output (over 50W) device.
  Be sure to check that no abnormal electric wave or electromagnetic wave is found, after having installed the device, which affects on the electronic signals passing through in computer harness.
- Do not alter the computer, harness wire or sensors (ex. acceleration sensor).
- As you will see on the following Fig. Various kind of computers are installed inside the cab, when fitting and modifying the inside of the cab, be careful not to give any shock to the vicinity of the computer.

[EXAMPLE]



The figure shows RHD VEHICLE, LHD VEHICLE's figure is symmetrical.

11. PRECAUTION FOR ADDITIONAL FUEL TANK

When you wish to mount an additional fuel tank, pay attention to the following points.

The meter of this vehicle incorporates a computer that calculates the input signals and displays on different meters and gauges.

In the case of a fuel gauge, in order to prevent it from moving of the indicator needle its movement is intentionally dull, consequently if you move the float from [E] to [F] (or vice-versa) it will not follow. (The indicator only about 2 per minute.)

SOLUTION (How to check if the fuel sender works correctly)

a. Disconnect the battery and wait for more than 30 seconds.
b. Bring the float of the fuel sender to the position corresponding to [F].
   (The highest position of raised float.)
c. Connect the battery ground and turn the starter switch to [ON] position.
   (The fuel gauge points [F].)
d. Disconnect the battery ground again and wait for more than 30 seconds.
e. Bring the float of the fuel sender to the position corresponding to 1/2 position.
   (Mid position between the highest and the lowest position of the float.)
f. Connect the battery ground and turn the starter switch on [ON] position.
   (The fuel gauge points 1/2.)

As the result if the fuel gauge points [F] in 3) and further 1/2 in 6) there is no problem.

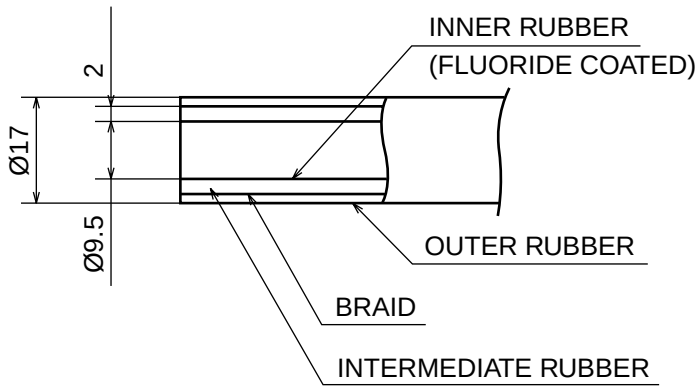
12. PRECAUTIONS FOR THE FUEL HOSE

Be sure to observe the following notes, if it will be changed a fuel hose by a movement or an addition of a fuel tank.

Always use the fuel hose of the HINO genuine parts.

The following figure is an example of genuine parts.
(The material and quality of each component are based on the standard of HINO.)

Unit : mm



If genuine parts cannot be obtained, please get the following rubber hoses as a substitute.

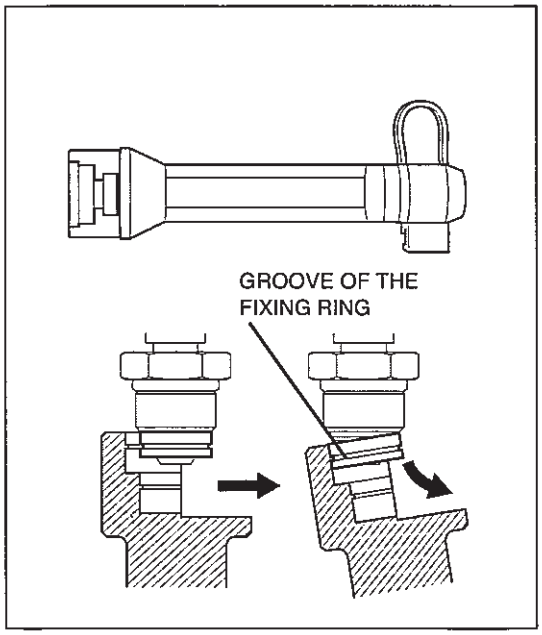
- The rubber hoses which dose not contain a metal element.
  or
- The rubber hoses which a metal element does not melt into fuel.
  (For example : The rubber hose which give the fluoride coat to the inside.)

The quality of the rubber hoses of a substitute should be more than equivalent to genuine, or equivalent.

Use of unsuitable rubber hose may cause serious faults of engine, such as the decline of an exhaust gas purification function.

For more detailed information, please consult your nearest HINO sales outlet.

13. PRECAUTIONS FOR REMOVE NYLON TUBE FROM CONNECTOR



Removal procedures

a. When removing the whole coupling with the nylon tube press fitted into the connector
Make sure that there are no adherents such as dirt and stains around.
If adherents are recognized, remove all of them with air blow.
Fix the nylon tube near the press fit area so that it does not turn together and is twisted, and turn only the coupling at the base with a tool to remove.

b. When removing the connector from the coupling
Tilt the tool with the special tool for removal fitted into the groove of the fixing ring of the coupling as shown in the illustration, and remove the resin ring. Or break the fixing ring with nippers to remove.
Pull out two clips using the hook area of the special tool as shown in the illustration, remove the clip holding ring, and then remove the connector.
It is not permissible to reuse a coupling from which a fixing ring is removed.
Special tool for disassembling coupling (VOSS made) (S0911-E0030)

NOTICE

- In the case of both a. and b. , store them so that no dirt, stain and flaw adhere to either inner or outer surface of the connector.
- It is not permissible to remove the press fitted nylon tube from the connector and to reuse the connector because it cannot be guaranteed against air leak.

14. ADJUSTMENT OF LIGHT AXIS OF HEADLIGHT

HALOGEN OR DISCHARGE (HID) HEADLAMP

Light axis of headlight will be changed due to vehicle posture change to be influenced by the rear body or equipment to be mounted.

Therefore, consult the adjustment of light axis after rear body or equipment to be mounted to authorized Hino distributor or sales dealer.

NOTES

- Make sure that the light axis of headlamp of the completed vehicle with rear body or equipment, conforms to all applicable laws and regulations of the country in which the vehicle is to be operated.
- Should more detailed information be needed, please contact authorized Hino distributor or sales dealer.

15. PRECAUTION FOR VEHICLE TO BE PROVIDED HID LIGHT AXIS SENSOR

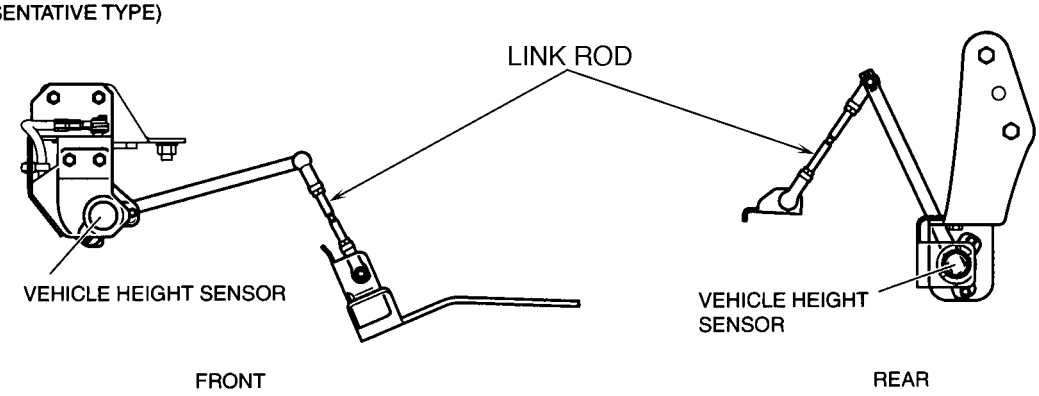
GENERAL PRECAUTION

- The light axis adjustment system (HEADLIGHT AUTOLEVERING) is controlled with autoleveling ECU.
- Vehicle speed signal to be output by the speed sensor as well as vehicle height signal to be output by the vehicle height sensors installed on the LH front and LH rear wheels of the vehicle are inputted the autoleveling ECU.
- The ECU will control the light axis of the headlight by computing a change of pitch angle of the vehicle posture with these signals and also wheelbase information memorized in the ECU, and activating headlight actuator to respond against changing amount of the vehicle posture.
- Therefore, any alteration or modification are strictly prohibited at the time of rear body or equipment to be mounted as following manner.
    - DO NOT LOAD CARRING GOODS UNDER ABNORMAL LOADED CONDITION AS ONE SIDE MASS DISTRIBUTION ON FRONT OR REAR WHEELS.
    - USE THE TIRE WITH STANDARD INFLATION PRESSURE.
    - DO NOT ALTER OR MODIFY THE SUSPENSION.
    - DO NOT MAKE ANY ALTERATION OR MODIFICATION TO BE CONSEQUENTLY OCCURED WITH WHEELBASE CHANGE.
    - DO NOT INSTALL ANY TIRES EXCEPT TIRES TO BE PROVIDED WITH OPTION SPECIFICATION.

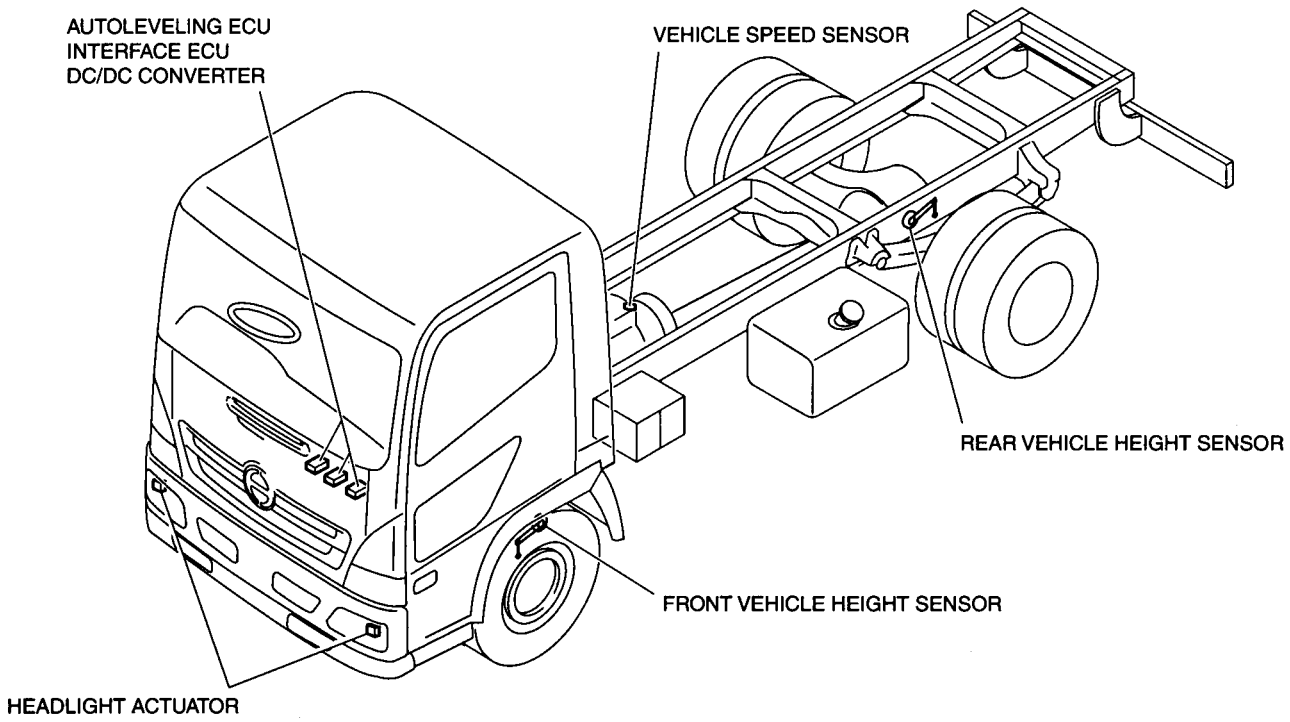
PRECAUTION AT THE TIME OF REAR BODY OR EQUIPMENT MOUNTING

- Make sure to observe the following manner strictly.
  - DO NOT DISASSEMBLE THE VEHICLE HEIGHT SENSOR UNIT DUE TO PRECISION PARTS.
  - DO NOT GIVE ANY SHOCK TO THE HEIGHT SENSOR DUE TO PRECISION PARTS.
  - DO NOT CHANGE THE LENGTH OF LINK ROD TO AVOID ABNORMAL ADJUSTMENT OF LIGHT AXIS.

(REPRESENTATIVE TYPE)



- Location of components are described as following figure.



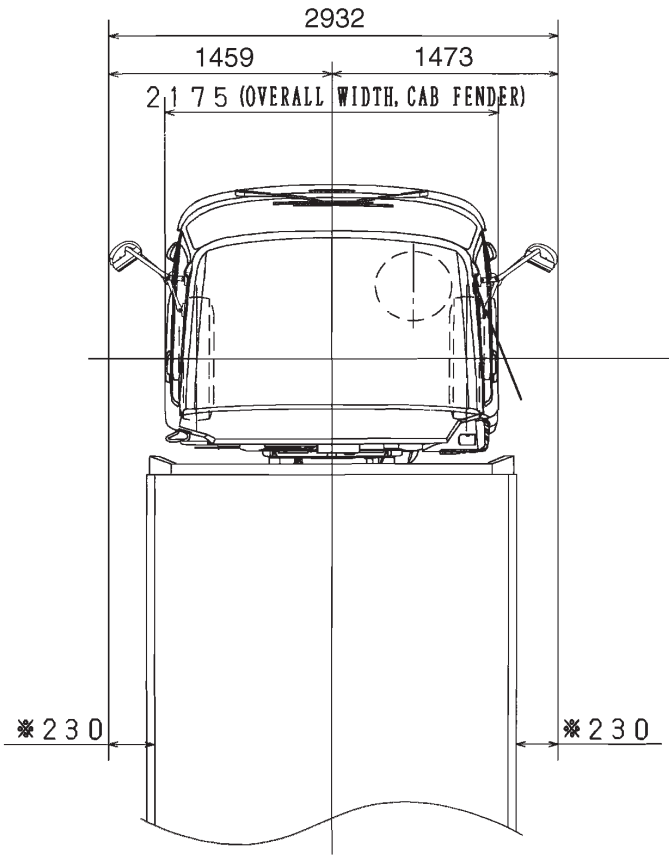
16. MAX. AND MIN. BODY WIDTH BY REGULATION CONTROL

When mounting body on the chassis, make sure to comply with ADR regulation.

- According to regulation the body width will be determined in max. out side mirror width as following figure. (ADR14/02)
- And, also to be complied max. vehicle width within 2,500 mm. (ADR43/02)

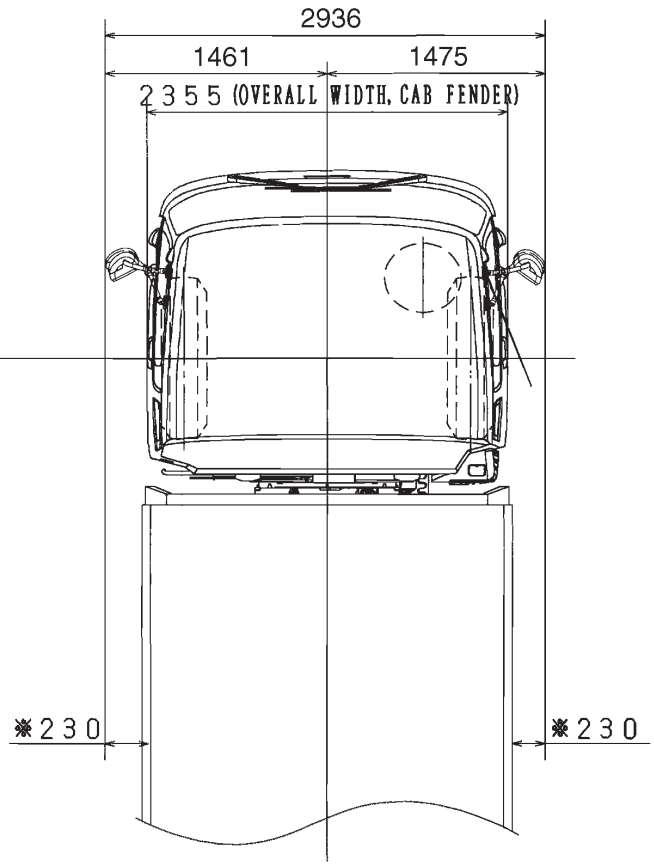
<STD CAB SERIES>

MODEL : FC, FD & GD



<WIDE CAB SERIES>

MODEL : FG, GH, FL, FM, FT & GT



※:MAX. DIFFERENCE WITH BODY ON BOTH SIDE:230mm

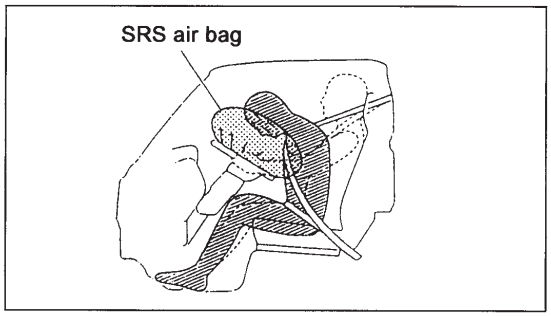
17. PRECAUTION FOR SRS AIR BAG

Vehicle equipped a SRS air bag, be sure to take the following cautions securely.

WARNING

When body mounted, observe following cautioning points securely. Otherwise, at the collision (accident), SRS air bag does not operate correctly or inflates incorrectly, which may result in a serious injury.

- SRS stands for Supplemental Restraint System, a device to supplement the protection of the crews.



Precaution for Alteration or Body Mounting

When body mounting or alteration of cab body especially cab floor structure, be sure to take the following cautions securely.

Do not make any reinforcement not modification at a part of cab floor.
Otherwise, an impact to be conveyed to a sensor of SRS air bag computer will change, by which SRS air bag will not function correctly.

Do not cover over the pad of steering wheel with something
like a sticker, a cover, etc.
At the same time, at an opening space for the air bag to be inflated, do not install any attachment or do not place anything thereon.
Otherwise, SRS air bag will not function correctly.

Do not make any modification of the suspension.
A change of vehicle height or a change of the suspension hardness may lead to a malfunction of SRS air bag computer.

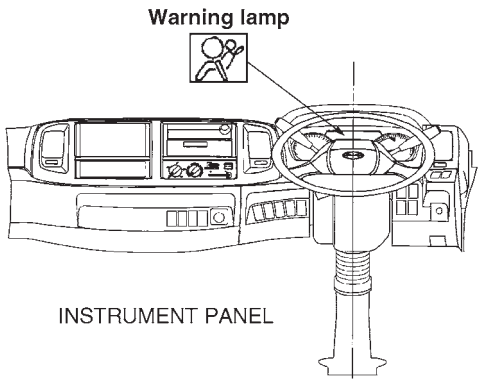
An electric wave of wireless device may affect badly to the computer, by which SRS air bag functions.
Take care to the following points for its installation.
Install an antenna, away possibly from the computer.
Install an antenna cord, 200 mm away from the computer.
Do not install a high power wireless device.
As the installation of the said device may affect to other electronic apparatus, install it securely in accordance with a "Installation Manual" by the manufacturer of the devices.

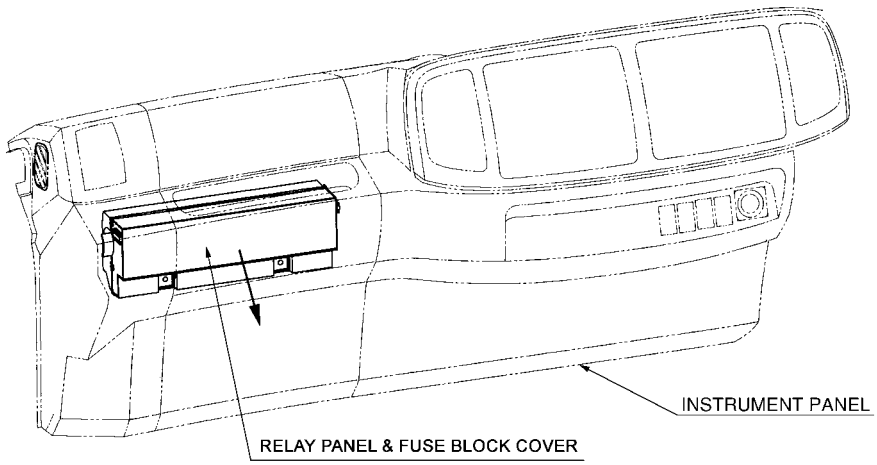
Strictly prohibited the following modification or provision of equipments.

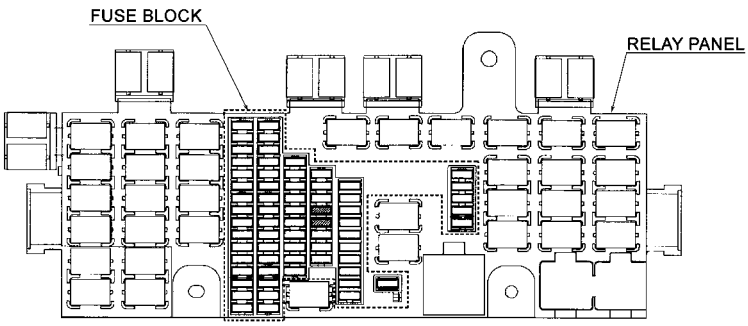
- Front bumper modification
  Stay extension
  Bumper thickness change
  Shape modification
- Provide snow plough
  (Snow removal)
- Provide grill guard
- Provide winch
- Provide kangaroo bar

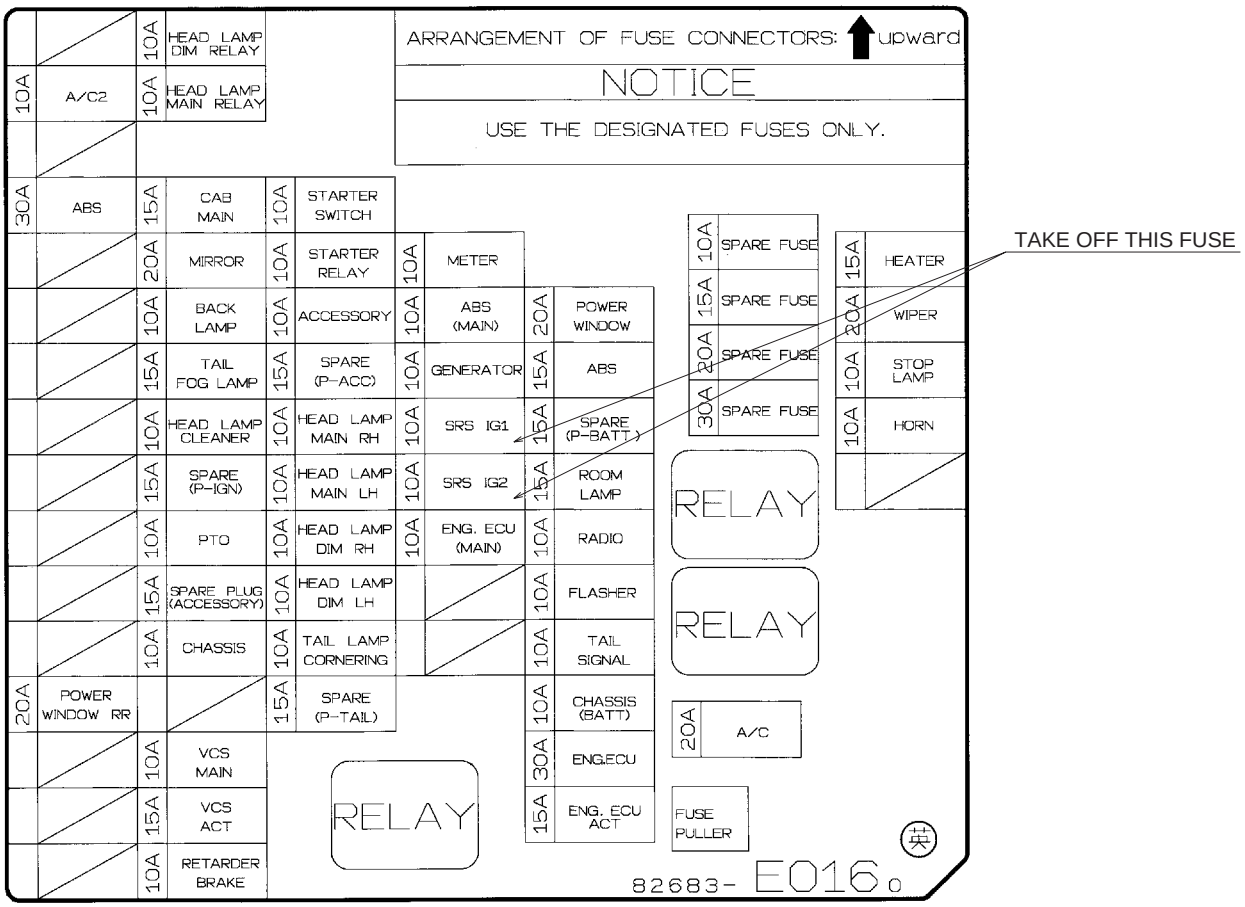
Before work
Turn the starter switch to "OFF" position and disconnect the negative terminal of battery.
Wait more than 90 seconds and start the work.
If you weld, take off fuses of the SRS air bag.
(See the figure of the next page.)

Affore work
If fuses of SRS air bag are taken off, put back them original position.
Connect the negative terminal of battery.
Check the warning lamp of SRS air bag by the following.
If the warning lamp dose not light up or remains light up, bring the vehicle to your nearest authorized Hino dealer or distributor for an inspection.









POSITION OF SRS AIR BAG

Precautions for electric wiring harness

Never alter or modify electric wiring harness of SRS air bag system.
(wiring harness and connectors of SRS air bag system are unified with yellow color.)
Also, never try to check SRS air bag system by a general purpose tester, which may lead to a malfunction of SRS air bag system.
Do not take out power source of the mounting body or accessories from fuses of SRS air bag system, which may lead to a malfunction of it.
If you damage or cut harness of SRS air bag system accidentally, exchange harness assembly including SRS air bag system.

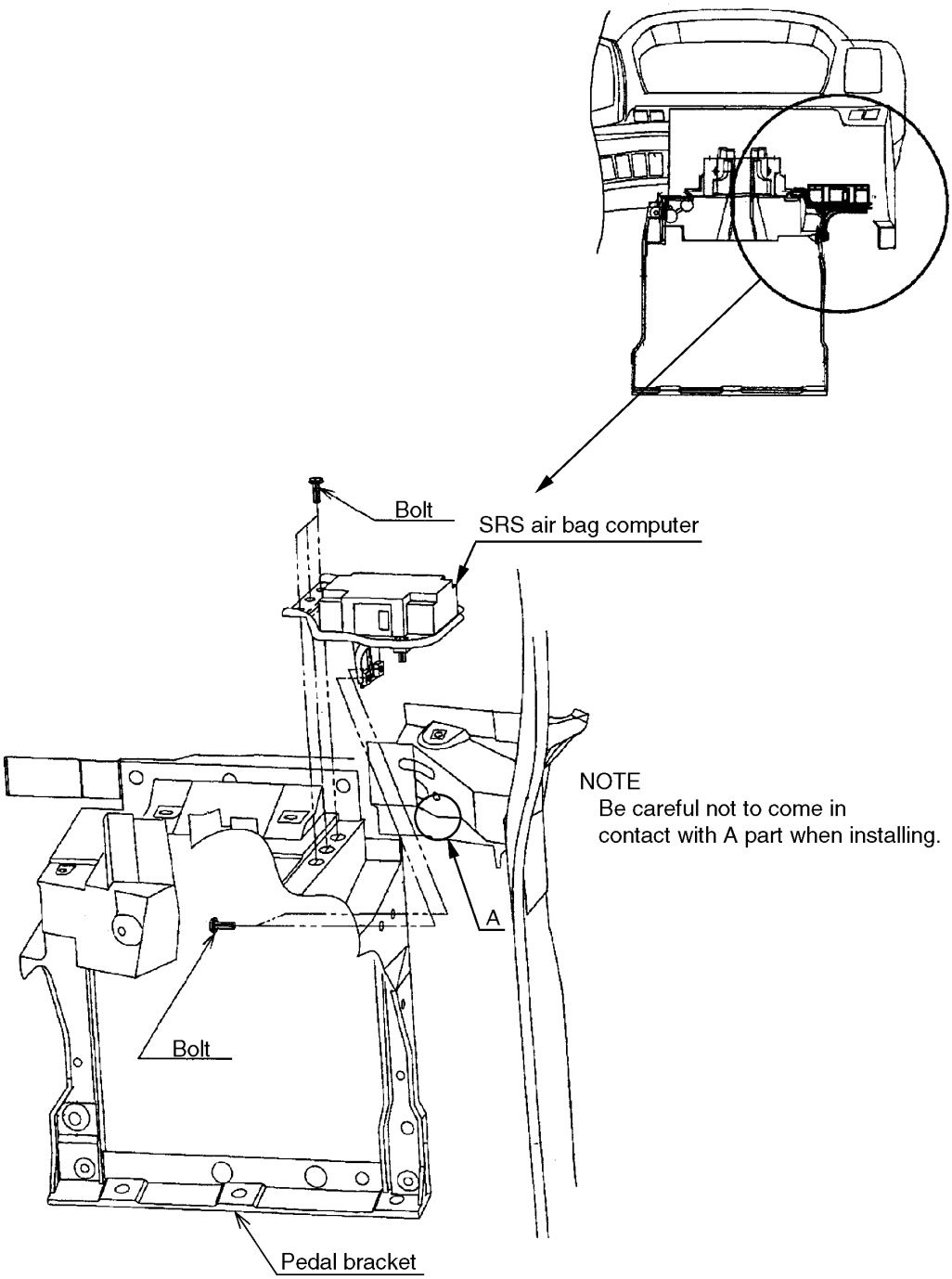
Precautions for electric welding

Before welding work be sure to turn the starter switch to "OFF" position, disconnect the negative terminal of battery and take off fuses of SRS air bag system.
Cover with a heat resisting sheet the resin parts of SRS air bag and an instrument panel.
Remove the SRS air bag and the SRS air bag computer, in the case of the ambient temperature of them exceed 80°C during welding work.
Consult with your nearest Hino dealer or distributor when removing work.
Refer to Chapter 2. 5 for detail of ELECTRIC WELDING WORK.

SRS air bag and chassis numbers are recorded for manufacturer's control.
When removed off the SRS air bag, install it to the original chassis without fail.

Precautions for cab sheet metal repair etc.

The acceleration sensor is built in the SRS air bag computer and the computer is installed to the pedal bracket.
(see the following figure)
Take care to the following points.
Otherwise, the SRS air bag will not function correctly or lead to a malfunction.
Remove the computer, when the sheet metal work of the surroundings (less than 500mm in radius) of it.
Do not to impact the surroundings (less than 500mm in radius) of the computer.
Do not to impact the cab floor under the computer.
Do not to impact the pedal bracket which is installed the computer.
Do not use an air impact wrench when installation and removal of the computer and other parts of the surroundings.



Precautions for cab paint

When heating the cab (ex. painting jobs) and it's temperature exceeds 80°C, remove off SRS air bag and SRS air bag computer.
Consult with your nearest Hino sales dealer or distributor When needed a removing work.

Precautions for installing off the computer

Install the removed SRS air bag computer in the position and direction of origin.
Tighten installing bolts with regular torque.
If an installing position or direction is different from origin or tightening torque is outside regulation, the SRS air bag may not work normally.
Do not use an air impact wrench when tightening bolts.

Tightening torque : 5.9±1.2 N·m {58±12 kgf·cm}

Do not drop a computer.
Do not provide an impact by a tool etc.
Exchange the computer witch got a shock by fall etc. or damp in water for a new article.
If an accident etc., cannot be re-used if a SRS air bag inflated.
Consult with your nearest Hino sales dealer or distributor.

Others

When SRS air bag inflates at accidents, etc., it can not be usable again. Change it at your nearest Hino sales dealer or distributor.

When the vehicle or SRS air bag is scrapped, consult with your nearest Hino sales dealer or distributor.

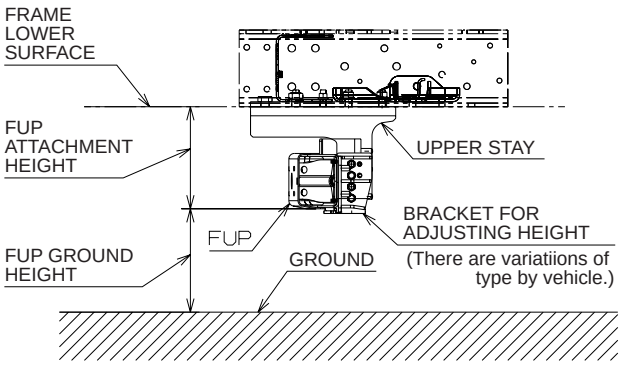
18. PRECAUTION FOR FRONT UNDER-RUN PROTECTOR (FUP)

(1) FRONT UNDER-RUN PROTECTOR REGULATION

This vehicle in compliance with a regulation (ECE R93) of FUP has equipped.

Make sure following precautions at the time of body mounting.

- Don't perform body mounting which prevents the function of FUP, and modification.
- The ground-height of FUP should satisfy a regulation.



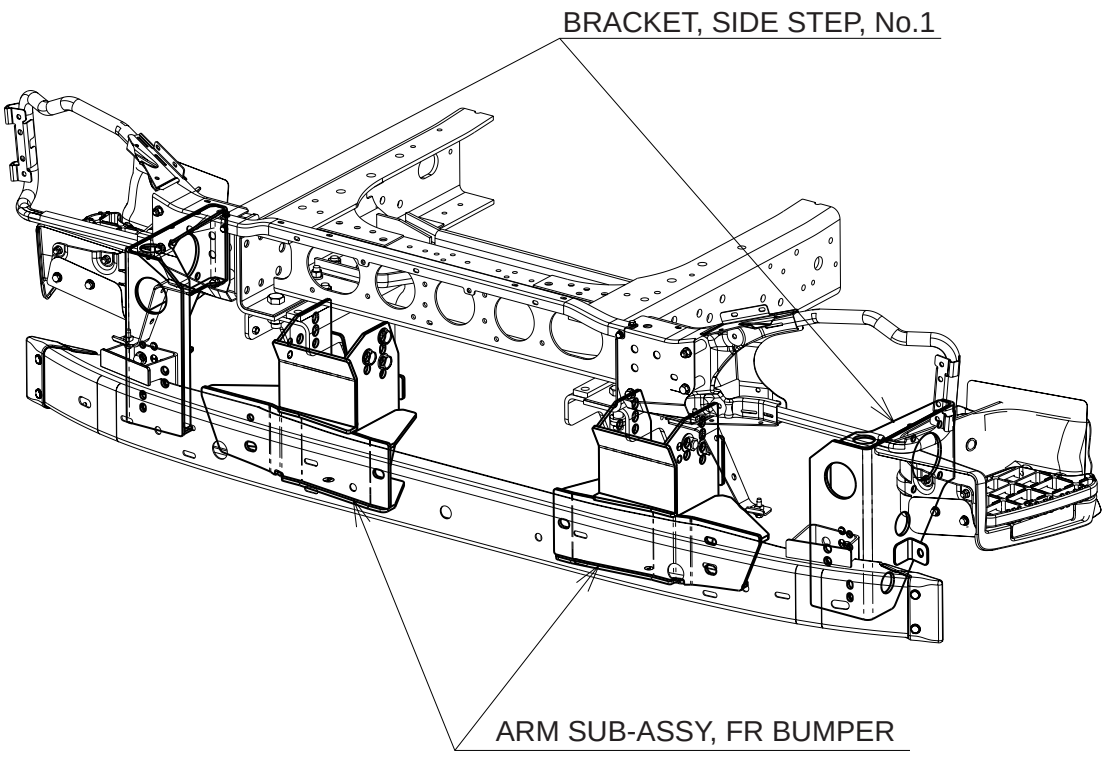
ECE R93

EXCEPT OFF-ROAD	MAX. 400mm
OFF-ROAD	Inapplicable

After performing body mounting, the ground height of FUP should satisfy a regulation.
If the ground height of FUP does not satisfy a regulation after performing body mounting, adjust in the following manner.

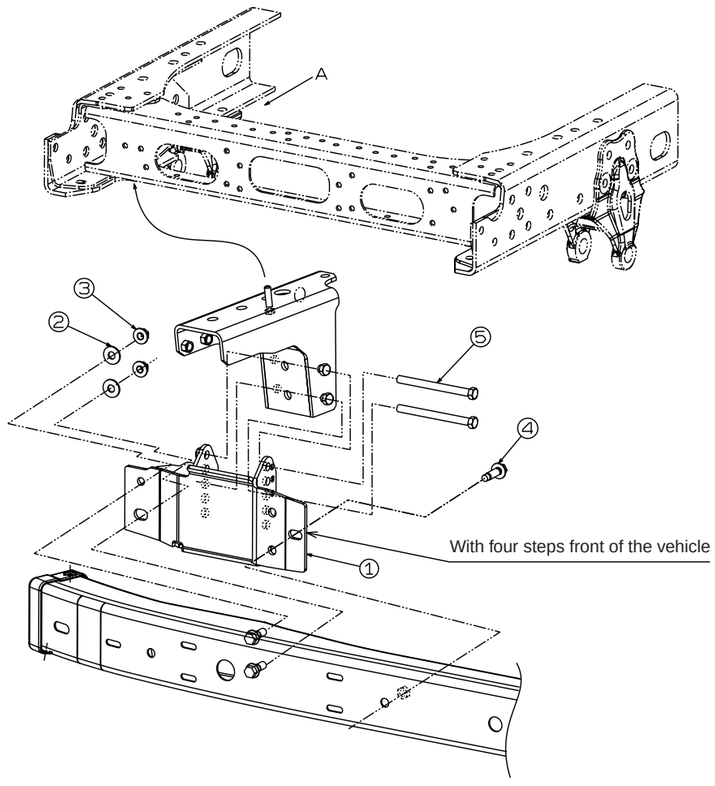
Adjustment method of the ground height of FUP

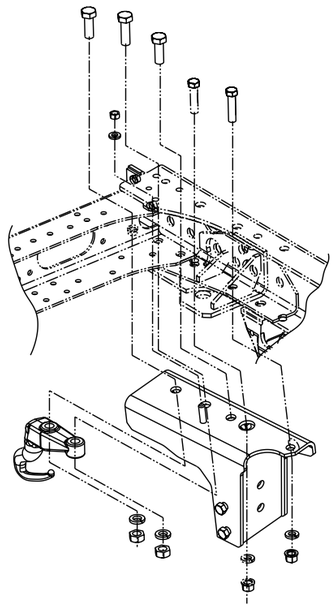
The bracket of attachment by a standard, please check by the current vehicles.
Please alter the position of the adjustment hole of a bracket and adjust height of FUP.



ARM SUB-ASSY, FUP

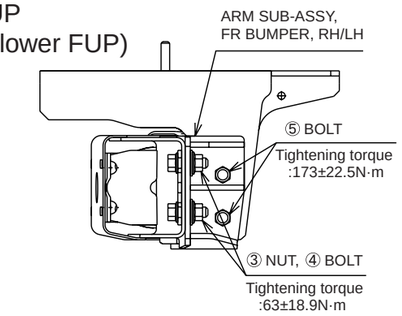
[EXAMPLE]



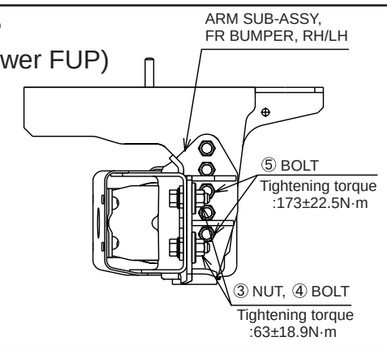


Installation position of bracket for adjusting height

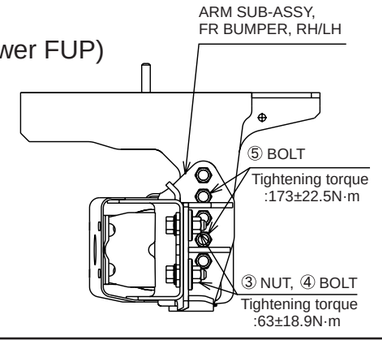
Installation position of FUP
: 197mm (lower frame ~ lower FUP)



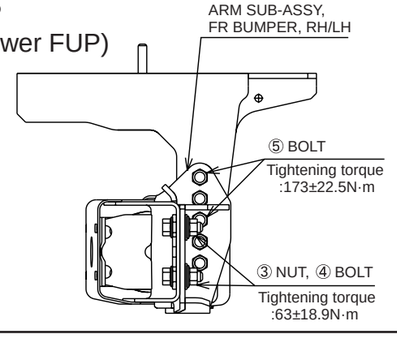
Installation position of FUP
: 219mm (lower frame ~ lower FUP)



Installation position of FUP
: 244mm (lower frame ~ lower FUP)

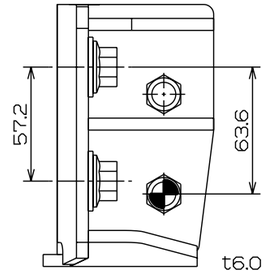


Installation position of FUP
: 269mm (lower frame ~ lower FUP)

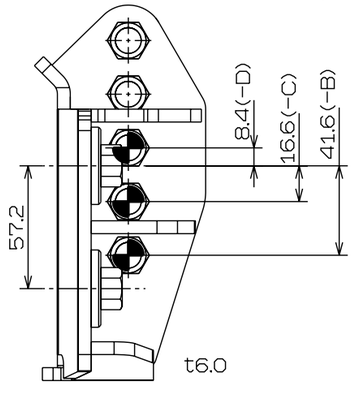


Shape of bracket for adjusting height

Parts Number : 52011-E0070 (RH)
: 52012-E0070 (LH)

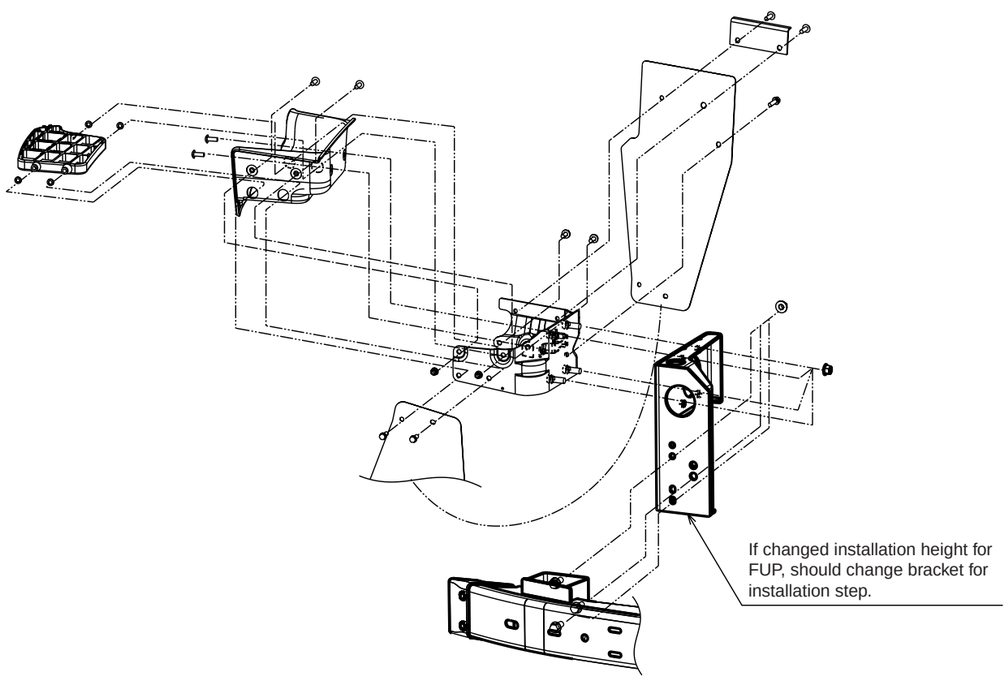


Parts Number : 52011-E0080 (RH)
: 52012-E0080 (LH)

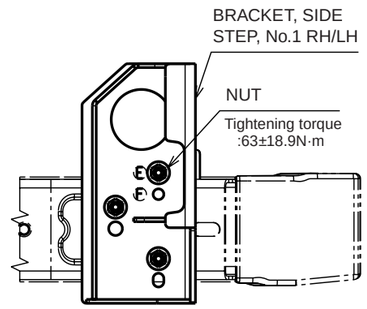


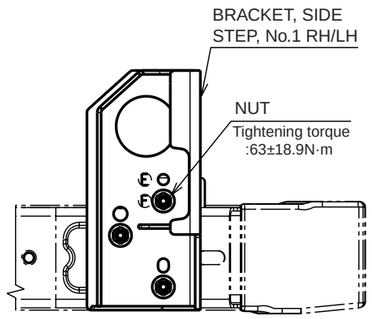
BRACKET SIDE STEP

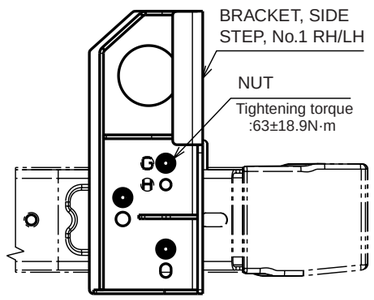
[EXAMPLE]

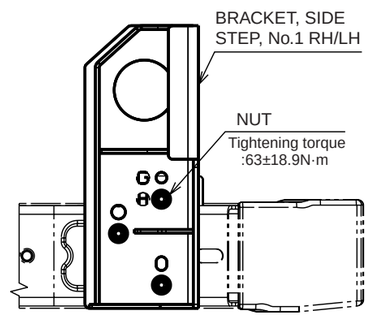


Installation position of bracket for adjusting height



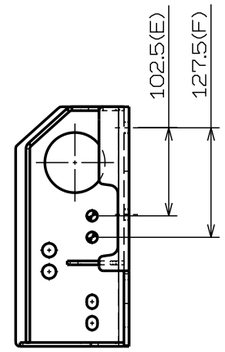




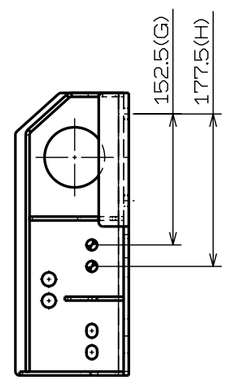


Shape of bracket for adjusting height

Parts Number : 51793-E0071 (RH)
: 51794-E0061 (LH)



Parts Number : 51793-E0081 (RH)
: 51794-E0071 (LH)



(2) Precaution for removing and reinstalling of the FUP (FC,FD,FE ONLY)

A sim may be installed between the FUP stay and a bracket for adjusting FUP height for improving effect of tightening.

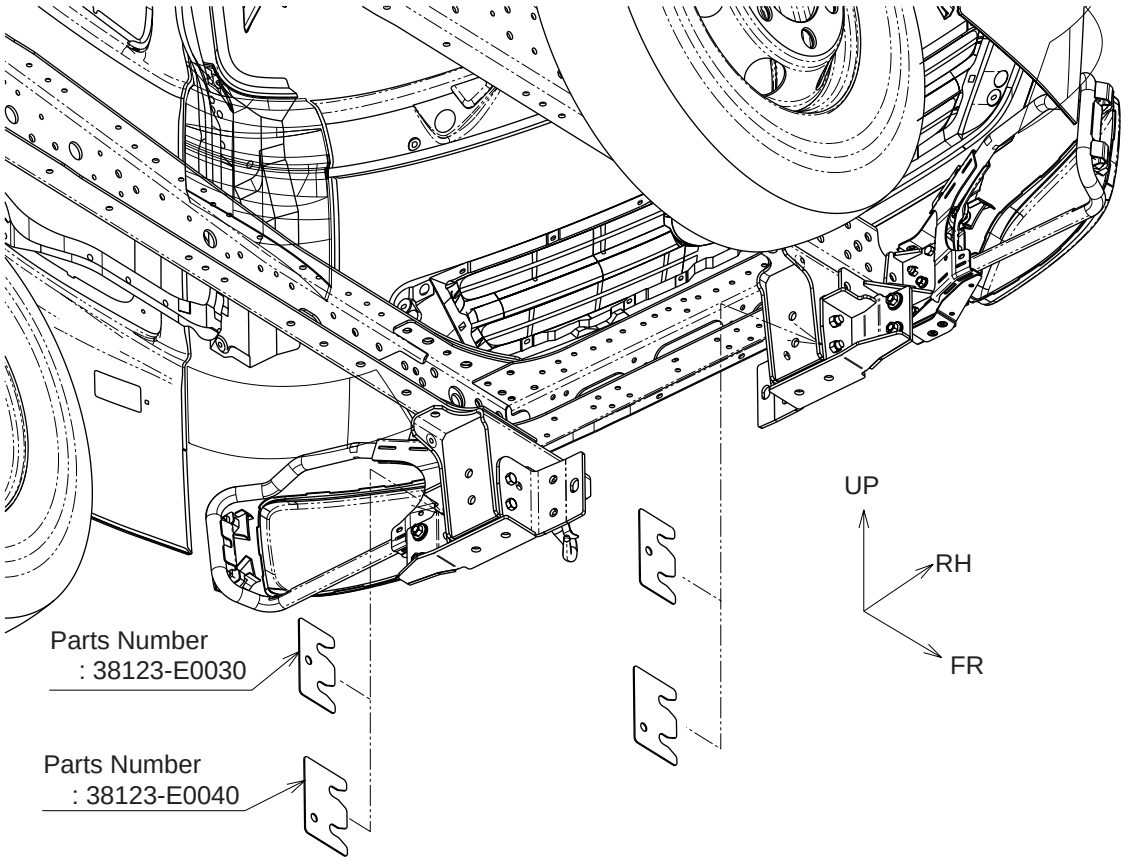
Be sure to observe the following precautions, if removing or replacement a bracket for adjusting FUP height with the vehicle concerned.

1. When removed a bracket for adjusting FUP height.

- Be sure to reinstall a sim when installing the FUP.
  (If there is no sim, do not need to install it)
- Tightening torque : 125±16.3 N·m

2. When replace a bracket for adjusting FUP height.

- Be sure to install a sim between the FUP stay and a bracket for adjusting FUP height.
  (Sim parts number : 38123-E0030 or 38123-E0040)
- If a sim will not be able to insert between the FUP stay and a bracket for adjusting FUP height by pounding with hammer, do not need to insert a sim.
  (Do not need a sim when the clearance less than 1.2mm between the FUP stay and a bracket for adjusting FUP height / FUP height.)
- Make sure that there is no shaking / moving a bracket for adjusting FUP height when installed FUP without sim.
- If a paint is peeling off when installing, should repaint it.
- Tightening torque :125±16.3 N·m



Chapter 3

CHASSIS MASS & FRAME SECTION MODULUS

CHASSIS MASS AND FRAME SECTION MODELS

Refer to CHASSIS MASS and FRAME SECTION MODULUS based on following.

RELEVANT MODEL

CLASSIFICATION NUMBER	CHASSIS MASS NUMBER	PAGE	SECTION MODULUS DRAWING NUMBER	PAGE
FD-022	W1	2	Z1	11
FD-023	W2	3	Z2	12
FD-024	W3	4	Z3	13
FD-025	W4	5	Z4	14
FD-026	W5	6	Z5	15
FD-027	W6	7	Z4	14
FD-028	W7	8	Z5	15
FD-029	W8	9	Z2	12

- Refer to chapter 1, 3 chassis specification for classification number.

1. CHASSIS MASS

No. W1

ITEMS	Mass (kg)	Gravity position from F.A.C (m)	Moment from F.A.C (kg·m)	Gravity height from frame upper surface (m)	Moment from frame upper surface (kg·m)
Front Bumper	33	-1.130	-37.290	-0.170	-5.610
Cab Front	332	-0.975	-323.700	0.740	245.680
Cab Front Mtg.	26	-0.975	-25.350	0.100	2.600
Steering	40	-0.830	-33.200	0.025	1.000
Step	0	0.000	0.000	0.000	0.000
Radiator	36	-0.390	-14.040	0.020	0.720
Steering Control	5	0.720	3.600	-0.110	-0.550
Engine Front	317	0.210	66.570	-0.150	-47.550
Control	5	0.200	1.000	0.050	0.250
T/M Power Shift	3	0.830	2.490	0.000	0.000
Engine Room	14	1.033	14.462	-0.375	-5.250
Air Cleaner	11	0.685	7.535	0.245	2.695
Cab Rear	185	0.815	150.775	0.740	136.900
Cab Rear Mtg.	23	0.815	18.745	0.230	5.290
Engine Rear	471	0.815	383.865	-0.150	-70.650
Rear Splash	6	0.600	3.600	-0.100	-0.600
Brake System	50	1.450	72.500	-0.165	-8.250
Electoric System	17	1.740	29.580	-0.115	-1.955
Exhaust System	47	1.650	77.550	-0.330	-15.510
Stack Tail	0	0.000	0.000	0.000	0.000
Battery	35	2.320	81.200	-0.180	-6.300
Fuel Tank	217	2.180	473.060	-0.255	-55.335
Transfer	0	0.000	0.000	0.000	0.000
Properller Shaft	44	2.785	122.540	-0.350	-15.400
Frame etc.	351	2.435	854.685	-0.135	-47.385
Platform	0	0.000	0.000	0.000	0.000
Coupler	0	0.000	0.000	0.000	0.000
TIRE CARRIER	0	0.000	0.000	0.000	0.000
Rear Bumper	0	0.000	0.000	0.000	0.000
Car Cooler	16	-0.600	-9.600	-0.110	-1.760
Tool Box	9	5.440	48.960	-0.150	-1.350
Rear Spring	0	0.000	0.000	0.000	0.000
Fuel Cooler & Filter	0	0.000	0.000	0.000	0.000
FUP	42	-0.938	-39.396	-0.316	-13.272
SUB TOTAL	2335	0.827	1930.141	0.042	98.408
UNSPRUNG MASS FRONT	357	0.000	0.000	-0.037	-13.209
UNSPRUNG MASS REAR	688	4.250	2924.000	-0.455	-313.040
TOTAL	3380	1.436	4854.141	-0.067	-227.841

		FRONT	REAR	TOTAL
SPRUNG MASS	(kg)	1881	454	2335
UNSPRUNG MASS	(kg)	357	688	1045
CHASSIS MASS	(kg)	2238	1142	3380
GRAVITY POSITION FROM F.A.C			(m)	1.436
GRAVITY HEIGHT FROM FRAME UPPER SURFACE			(m)	-0.067

NOTE

- The mass of tires to be mentioned in above table shows design figure according to JATMA or ETRTO standard.
- Mass to be mentioned above table shows on standard specification condition.
- In the case to be provided option equipment, make sure mass distribution on front, rear and total followed by mass of option equipment.

No. W2

ITEMS		Mass (kg)	Gravity position from F.A.C (m)	Moment from F.A.C (kg·m)	Gravity height from frame upper surface (m)	Moment from frame upper surface (kg·m)
Front Bumper		33	-1.130	-37.290	-0.170	-5.610
Cab Front		332	-0.975	-323.700	0.740	245.680
Cab Front Mtg.		26	-0.975	-25.350	0.100	2.600
Steering		40	-0.830	-33.200	0.025	1.000
Step		0	0.000	0.000	0.000	0.000
Radiator		36	-0.390	-14.040	0.020	0.720
Steering Control		5	0.720	3.600	-0.110	-0.550
Engine Front		317	0.210	66.570	-0.150	-47.550
Control		5	0.200	1.000	0.050	0.250
T/M Power Shift		3	0.830	2.490	0.000	0.000
Engine Room		14	1.033	14.462	-0.375	-5.250
Air Cleaner		11	0.685	7.535	0.245	2.695
Cab Rear		185	0.815	150.775	0.740	136.900
Cab Rear Mtg.		23	0.815	18.745	0.230	5.290
Engine Rear		471	0.815	383.865	-0.150	-70.650
Rear Splash		6	0.600	3.600	-0.100	-0.600
Brake System		50	1.450	72.500	-0.165	-8.250
Electoric System		17	1.740	29.580	-0.115	-1.955
Exhaust System		47	1.650	77.550	-0.330	-15.510
Stack Tail		0	0.000	0.000	0.000	0.000
Battery		35	2.320	81.200	-0.180	-6.300
Fuel Tank		217	2.180	473.060	-0.255	-55.335
Transfer		0	0.000	0.000	0.000	0.000
Properller Shaft		48	3.160	151.680	-0.350	-16.800
Frame etc.		441	2.865	1263.465	-0.135	-59.535
Platform		0	0.000	0.000	0.000	0.000
Coupler		0	0.000	0.000	0.000	0.000
TIRE CARRIER		0	0.000	0.000	0.000	0.000
Rear Bumper		0	0.000	0.000	0.000	0.000
Car Cooler		16	-0.600	-9.600	-0.110	-1.760
Tool Box		9	5.440	48.960	-0.150	-1.350
Rear Spring		0	0.000	0.000	0.000	0.000
Fuel Cooler & Filter		0	0.000	0.000	0.000	0.000
FUP		42	-0.938	-39.396	-0.316	-13.272
SUB TOTAL		2429	0.975	2368.061	0.035	84.858
UNSPRUNG MASS	FRONT	357	0.000	0.000	-0.037	-13.209
	REAR	688	4.850	3336.800	-0.455	-313.040
TOTAL		3474	1.642	5704.861	-0.069	-241.391

		FRONT	REAR	TOTAL
SPRUNG MASS	(kg)	1941	488	2429
UNSPRUNG MASS	(kg)	357	688	1045
CHASSIS MASS	(kg)	2298	1176	3474
GRAVITY POSITION FROM F.A.C			(m)	1.642
GRAVITY HEIGHT FROM FRAME UPPER SURFACE			(m)	-0.069

NOTE

- The mass of tires to be mentioned in above table shows design figure according to JATMA or ETRTO standard.
- Mass to be mentioned above table shows on standard specification condition.
- In the case to be provided option equipment, make sure mass distribution on front, rear and total followed by mass of option equipment.

No. W3

ITEMS	Mass (kg)	Gravity position from F.A.C (m)	Moment from F.A.C (kg·m)	Gravity height from frame upper surface (m)	Moment from frame upper surface (kg·m)
Front Bumper	33	-1.130	-37.290	-0.170	-5.610
Cab Front	332	-0.975	-323.700	0.740	245.680
Cab Front Mtg.	26	-0.975	-25.350	0.100	2.600
Steering	40	-0.830	-33.200	0.025	1.000
Step	0	0.000	0.000	0.000	0.000
Radiator	36	-0.390	-14.040	0.020	0.720
Steering Control	5	0.720	3.600	-0.110	-0.550
Engine Front	317	0.210	66.570	-0.150	-47.550
Control	5	0.200	1.000	0.050	0.250
T/M Power Shift	3	0.830	2.490	0.000	0.000
Engine Room	14	1.033	14.462	-0.375	-5.250
Air Cleaner	11	0.685	7.535	0.245	2.695
Cab Rear	185	0.815	150.775	0.740	136.900
Cab Rear Mtg.	23	0.815	18.745	0.230	5.290
Engine Rear	471	0.815	383.865	-0.150	-70.650
Rear Splash	6	0.600	3.600	-0.100	-0.600
Brake System	50	1.450	72.500	-0.165	-8.250
Electoric System	17	1.740	29.580	-0.115	-1.955
Exhaust System	47	1.650	77.550	-0.330	-15.510
Stack Tail	0	0.000	0.000	0.000	0.000
Battery	35	2.320	81.200	-0.180	-6.300
Fuel Tank	217	2.180	473.060	-0.255	-55.335
Transfer	0	0.000	0.000	0.000	0.000
Properller Shaft	64	3.425	219.200	-0.350	-22.400
Frame etc.	488	3.330	1625.040	-0.135	-65.880
Platform	0	0.000	0.000	0.000	0.000
Coupler	0	0.000	0.000	0.000	0.000
TIRE CARRIER	0	0.000	0.000	0.000	0.000
Rear Bumper	0	0.000	0.000	0.000	0.000
Car Cooler	16	-0.600	-9.600	-0.110	-1.760
Tool Box	9	5.440	48.960	-0.150	-1.350
Rear Spring	0	0.000	0.000	0.000	0.000
Fuel Cooler & Filter	0	0.000	0.000	0.000	0.000
FUP	42	-0.938	-39.396	-0.316	-13.272
SUB TOTAL	2492	1.122	2797.156	0.029	72.913
UNSPRUNG MASS FRONT	357	0.000	0.000	-0.037	-13.209
UNSPRUNG MASS REAR	688	5.500	3784.000	-0.455	-313.040
TOTAL	3537	1.861	6581.156	-0.072	-253.336

		FRONT	REAR	TOTAL
SPRUNG MASS	(kg)	1983	509	2492
UNSPRUNG MASS	(kg)	357	688	1045
CHASSIS MASS	(kg)	2340	1197	3537
GRAVITY POSITION FROM F.A.C			(m)	1.861
GRAVITY HEIGHT FROM FRAME UPPER SURFACE			(m)	-0.072

NOTE

- The mass of tires to be mentioned in above table shows design figure according to JATMA or ETRTO standard.
- Mass to be mentioned above table shows on standard specification condition.
- In the case to be provided option equipment, make sure mass distribution on front, rear and total followed by mass of option equipment.

No. W4

ITEMS		Mass (kg)	Gravity position from F.A.C (m)	Moment from F.A.C (kg·m)	Gravity height from frame upper surface (m)	Moment from frame upper surface (kg·m)
Front Bumper		33	-1.130	-37.290	-0.170	-5.610
Cab Front		332	-0.975	-323.700	0.740	245.680
Cab Front Mtg.		26	-0.975	-25.350	0.100	2.600
Steering		40	-0.830	-33.200	0.025	1.000
Step		0	0.000	0.000	0.000	0.000
Radiator		36	-0.390	-14.040	0.020	0.720
Steering Control		5	0.720	3.600	-0.110	-0.550
Engine Front		317	0.210	66.570	-0.150	-47.550
Control		5	0.200	1.000	0.050	0.250
T/M Power Shift		3	0.830	2.490	0.000	0.000
Engine Room		14	1.033	14.462	-0.375	-5.250
Air Cleaner		11	0.685	7.535	0.245	2.695
Cab Rear		185	0.815	150.775	0.740	136.900
Cab Rear Mtg.		23	0.815	18.745	0.230	5.290
Engine Rear		471	0.815	383.865	-0.150	-70.650
Rear Splash		6	0.600	3.600	-0.100	-0.600
Brake System		53	1.450	76.850	-0.165	-8.745
Electoric System		17	1.740	29.580	-0.115	-1.955
Exhaust System		47	1.650	77.550	-0.330	-15.510
Stack Tail		0	0.000	0.000	0.000	0.000
Battery		35	2.320	81.200	-0.180	-6.300
Fuel Tank		217	2.180	473.060	-0.255	-55.335
Transfer		0	0.000	0.000	0.000	0.000
Properller Shaft		48	3.160	151.680	-0.350	-16.800
Frame etc.		404	2.680	1082.720	-0.135	-54.540
Platform		0	0.000	0.000	0.000	0.000
Coupler		0	0.000	0.000	0.000	0.000
TIRE CARRIER		0	0.000	0.000	0.000	0.000
Rear Bumper		0	0.000	0.000	0.000	0.000
Car Cooler		16	-0.600	-9.600	-0.110	-1.760
Tool Box		9	5.440	48.960	-0.150	-1.350
Rear Spring		0	0.000	0.000	0.000	0.000
Fuel Cooler & Filter		0	0.000	0.000	0.000	0.000
FUP		42	-0.938	-39.396	-0.316	-13.272
SUB TOTAL		2395	0.915	2191.666	0.037	89.358
UNSPRUNG MASS	FRONT	357	0.000	0.000	-0.037	-13.209
	REAR	749	4.850	3632.650	-0.455	-340.795
TOTAL		3501	1.664	5824.316	-0.076	-264.646

		FRONT	REAR	TOTAL
SPRUNG MASS	(kg)	1943	452	2395
UNSPRUNG MASS	(kg)	357	749	1106
CHASSIS MASS	(kg)	2300	1201	3501
GRAVITY POSITION FROM F.A.C			(m)	1.664
GRAVITY HEIGHT FROM FRAME UPPER SURFACE			(m)	-0.076

NOTE

- The mass of tires to be mentioned in above table shows design figure according to JATMA or ETRTO standard.
- Mass to be mentioned above table shows on standard specification condition.
- In the case to be provided option equipment, make sure mass distribution on front, rear and total followed by mass of option equipment.

No. W5

ITEMS		Mass (kg)	Gravity position from F.A.C (m)	Moment from F.A.C (kg·m)	Gravity height from frame upper surface (m)	Moment from frame upper surface (kg·m)
Front Bumper		33	-1.130	-37.290	-0.170	-5.610
Cab Front		332	-0.975	-323.700	0.740	245.680
Cab Front Mtg.		26	-0.975	-25.350	0.100	2.600
Steering		40	-0.830	-33.200	0.025	1.000
Step		0	0.000	0.000	0.000	0.000
Radiator		36	-0.390	-14.040	0.020	0.720
Steering Control		5	0.720	3.600	-0.110	-0.550
Engine Front		317	0.210	66.570	-0.150	-47.550
Control		5	0.200	1.000	0.050	0.250
T/M Power Shift		3	0.830	2.490	0.000	0.000
Engine Room		14	1.033	14.462	-0.375	-5.250
Air Cleaner		11	0.685	7.535	0.245	2.695
Cab Rear		185	0.815	150.775	0.740	136.900
Cab Rear Mtg.		23	0.815	18.745	0.230	5.290
Engine Rear		471	0.815	383.865	-0.150	-70.650
Rear Splash		6	0.600	3.600	-0.100	-0.600
Brake System		53	1.450	76.850	-0.165	-8.745
Electoric System		17	1.740	29.580	-0.115	-1.955
Exhaust System		47	1.650	77.550	-0.330	-15.510
Stack Tail		0	0.000	0.000	0.000	0.000
Battery		35	2.320	81.200	-0.180	-6.300
Fuel Tank		217	2.180	473.060	-0.255	-55.335
Transfer		0	0.000	0.000	0.000	0.000
Properller Shaft		64	3.425	219.200	-0.350	-22.400
Frame etc.		448	3.135	1404.480	-0.135	-60.480
Platform		0	0.000	0.000	0.000	0.000
Coupler		0	0.000	0.000	0.000	0.000
TIRE CARRIER		0	0.000	0.000	0.000	0.000
Rear Bumper		0	0.000	0.000	0.000	0.000
Car Cooler		16	-0.600	-9.600	-0.110	-1.760
Tool Box		9	5.440	48.960	-0.150	-1.350
Rear Spring		0	0.000	0.000	0.000	0.000
Fuel Cooler & Filter		0	0.000	0.000	0.000	0.000
FUP		42	-0.938	-39.396	-0.316	-13.272
SUB TOTAL		2455	1.051	2580.946	0.032	77.818
UNSPRUNG MASS	FRONT	357	0.000	0.000	-0.037	-13.209
	REAR	749	5.500	4119.500	-0.455	-340.795
TOTAL		3561	1.882	6700.446	-0.078	-276.186

		FRONT	REAR	TOTAL
SPRUNG MASS	(kg)	1986	469	2455
UNSPRUNG MASS	(kg)	357	749	1106
CHASSIS MASS	(kg)	2343	1218	3561
GRAVITY POSITION FROM F.A.C			(m)	1.882
GRAVITY HEIGHT FROM FRAME UPPER SURFACE			(m)	-0.078

NOTE

- The mass of tires to be mentioned in above table shows design figure according to JATMA or ETRTO standard.
- Mass to be mentioned above table shows on standard specification condition.
- In the case to be provided option equipment, make sure mass distribution on front, rear and total followed by mass of option equipment.

No. W6

ITEMS	Mass (kg)	Gravity position from F.A.C (m)	Moment from F.A.C (kg·m)	Gravity height from frame upper surface (m)	Moment from frame upper surface (kg·m)
Front Bumper	33	-1.130	-37.290	-0.170	-5.610
Cab Front	332	-0.975	-323.700	0.740	245.680
Cab Front Mtg.	26	-0.975	-25.350	0.100	2.600
Steering	40	-0.830	-33.200	0.025	1.000
Step	0	0.000	0.000	0.000	0.000
Radiator	36	-0.390	-14.040	0.020	0.720
Steering Control	5	0.720	3.600	-0.110	-0.550
Engine Front	318	0.210	66.780	-0.150	-47.700
Control	5	0.200	1.000	0.050	0.250
T/M Power Shift	3	0.830	2.490	0.000	0.000
Engine Room	14	1.033	14.462	-0.375	-5.250
Air Cleaner	11	0.685	7.535	0.245	2.695
Cab Rear	185	0.815	150.775	0.740	136.900
Cab Rear Mtg.	23	0.815	18.745	0.230	5.290
Engine Rear	516	0.815	420.540	-0.150	-77.400
Rear Splash	6	0.600	3.600	-0.100	-0.600
Brake System	53	1.450	76.850	-0.165	-8.745
Electoric System	17	1.740	29.580	-0.115	-1.955
Exhaust System	47	1.650	77.550	-0.330	-15.510
Stack Tail	0	0.000	0.000	0.000	0.000
Battery	35	2.320	81.200	-0.180	-6.300
Fuel Tank	217	2.180	473.060	-0.255	-55.335
Transfer	0	0.000	0.000	0.000	0.000
Properller Shaft	48	3.160	151.680	-0.350	-16.800
Frame etc.	404	2.680	1082.720	-0.135	-54.540
Platform	0	0.000	0.000	0.000	0.000
Coupler	0	0.000	0.000	0.000	0.000
TIRE CARRIER	0	0.000	0.000	0.000	0.000
Rear Bumper	0	0.000	0.000	0.000	0.000
Car Cooler	16	-0.600	-9.600	-0.110	-1.760
Tool Box	9	5.440	48.960	-0.150	-1.350
Rear Spring	0	0.000	0.000	0.000	0.000
Fuel Cooler & Filter	0	0.000	0.000	0.000	0.000
FUP	42	-0.938	-39.396	-0.316	-13.272
SUB TOTAL	2441	0.913	2228.551	0.034	82.458
UNSPRUNG MASS FRONT	357	0.000	0.000	-0.037	-13.209
UNSPRUNG MASS REAR	749	4.850	3632.650	-0.455	-340.795
TOTAL	3547	1.652	5861.201	-0.077	-271.546

		FRONT	REAR	TOTAL
SPRUNG MASS	(kg)	1982	459	2441
UNSPRUNG MASS	(kg)	357	749	1106
CHASSIS MASS	(kg)	2339	1208	3547
GRAVITY POSITION FROM F.A.C			(m)	1.652
GRAVITY HEIGHT FROM FRAME UPPER SURFACE			(m)	-0.077

NOTE

- The mass of tires to be mentioned in above table shows design figure according to JATMA or ETRTO standard.
- Mass to be mentioned above table shows on standard specification condition.
- In the case to be provided option equipment, make sure mass distribution on front, rear and total followed by mass of option equipment.

No. W7

ITEMS	Mass (kg)	Gravity position from F.A.C (m)	Moment from F.A.C (kg·m)	Gravity height from frame upper surface (m)	Moment from frame upper surface (kg·m)
Front Bumper	33	-1.130	-37.290	-0.170	-5.610
Cab Front	332	-0.975	-323.700	0.740	245.680
Cab Front Mtg.	26	-0.975	-25.350	0.100	2.600
Steering	40	-0.830	-33.200	0.025	1.000
Step	0	0.000	0.000	0.000	0.000
Radiator	36	-0.390	-14.040	0.020	0.720
Steering Control	5	0.720	3.600	-0.110	-0.550
Engine Front	318	0.210	66.780	-0.150	-47.700
Control	5	0.200	1.000	0.050	0.250
T/M Power Shift	3	0.830	2.490	0.000	0.000
Engine Room	14	1.033	14.462	-0.375	-5.250
Air Cleaner	11	0.685	7.535	0.245	2.695
Cab Rear	185	0.815	150.775	0.740	136.900
Cab Rear Mtg.	23	0.815	18.745	0.230	5.290
Engine Rear	516	0.815	420.540	-0.150	-77.400
Rear Splash	6	0.600	3.600	-0.100	-0.600
Brake System	53	1.450	76.850	-0.165	-8.745
Electoric System	17	1.740	29.580	-0.115	-1.955
Exhaust System	47	1.650	77.550	-0.330	-15.510
Stack Tail	0	0.000	0.000	0.000	0.000
Battery	35	2.320	81.200	-0.180	-6.300
Fuel Tank	217	2.180	473.060	-0.255	-55.335
Transfer	0	0.000	0.000	0.000	0.000
Properller Shaft	64	3.425	219.200	-0.350	-22.400
Frame etc.	448	3.135	1404.480	-0.135	-60.480
Platform	0	0.000	0.000	0.000	0.000
Coupler	0	0.000	0.000	0.000	0.000
TIRE CARRIER	0	0.000	0.000	0.000	0.000
Rear Bumper	0	0.000	0.000	0.000	0.000
Car Cooler	16	-0.600	-9.600	-0.110	-1.760
Tool Box	9	5.440	48.960	-0.150	-1.350
Rear Spring	0	0.000	0.000	0.000	0.000
Fuel Cooler & Filter	0	0.000	0.000	0.000	0.000
FUP	42	-0.938	-39.396	-0.316	-13.272
SUB TOTAL	2501	1.047	2617.831	0.028	70.918
UNSPRUNG MASS FRONT	357	0.000	0.000	-0.037	-13.209
UNSPRUNG MASS REAR	749	5.500	4119.500	-0.455	-340.795
TOTAL	3607	1.868	6737.331	-0.078	-283.086

		FRONT	REAR	TOTAL
SPRUNG MASS	(kg)	2025	476	2501
UNSPRUNG MASS	(kg)	357	749	1106
CHASSIS MASS	(kg)	2382	1225	3607
GRAVITY POSITION FROM F.A.C			(m)	1.868
GRAVITY HEIGHT FROM FRAME UPPER SURFACE			(m)	-0.078

NOTE

- The mass of tires to be mentioned in above table shows design figure according to JATMA or ETRTO standard.
- Mass to be mentioned above table shows on standard specification condition.
- In the case to be provided option equipment, make sure mass distribution on front, rear and total followed by mass of option equipment.

No. W8

ITEMS	Mass (kg)	Gravity position from F.A.C (m)	Moment from F.A.C (kg·m)	Gravity height from frame upper surface (m)	Moment from frame upper surface (kg·m)
Front Bumper	33	-1.130	-37.290	-0.170	-5.610
Cab Front	443	-0.975	-431.925	0.740	327.820
Cab Front Mtg.	36	-0.975	-35.100	0.100	3.600
Steering	40	-0.830	-33.200	0.025	1.000
Step	0	0.000	0.000	0.000	0.000
Radiator	62	-0.093	-5.766	-0.052	-3.224
Steering Control	5	0.720	3.600	-0.110	-0.550
Engine Front	317	0.210	66.570	-0.150	-47.550
Control	5	0.200	1.000	0.050	0.250
T/M Power Shift	3	0.830	2.490	0.000	0.000
Engine Room	2	0.389	0.778	-0.375	-0.750
Air Cleaner	26	0.835	21.710	0.245	6.370
Cab Rear	295	1.530	451.350	0.740	218.300
Cab Rear Mtg.	38	1.530	58.140	0.230	8.740
Engine Rear	471	0.815	383.865	-0.150	-70.650
Rear Splash	-	-	-	-	-
Brake System	53	1.450	76.850	-0.165	-8.745
Electoric System	17	1.740	29.580	-0.115	-1.955
Exhaust System	47	1.650	77.550	-0.330	-15.510
Stack Tail	-	-	-	-	-
Battery	35	2.320	81.200	-0.180	-6.300
Fuel Tank	217	2.180	473.060	-0.255	-55.335
Transfer	0	0.000	0.000	0.000	0.000
Properller Shaft	48	3.160	151.680	-0.350	-16.800
Frame etc.	441	3.090	1362.690	-0.135	-59.535
Platform	0	0.000	0.000	0.000	0.000
Coupler	0	0.000	0.000	0.000	0.000
TIRE CARRIER	0	0.000	0.000	0.000	0.000
Rear Bumper	0	0.000	0.000	0.000	0.000
Car Cooler	16	-0.600	-9.600	-0.110	-1.760
Tool Box	9	6.040	54.360	-0.150	-1.350
Rear Spring	0	0.000	0.000	0.000	0.000
Fuel Cooler & Filter FUP	42	-0.938	-39.396	-0.316	-13.272
SUB TOTAL	2668	1.014	2704.196	0.096	257.184
UNSPRUNG MASS FRONT	357	0.000	0.000	-0.037	-13.209
UNSPRUNG MASS REAR	688	4.850	3336.800	-0.455	-313.040
TOTAL	3713	1.627	6040.996	-0.019	-69.065

		FRONT	REAR	TOTAL
SPRUNG MASS	(kg)	2110	558	2668
UNSPRUNG MASS	(kg)	357	688	1045
CHASSIS MASS	(kg)	2467	1246	3713
GRAVITY POSITION FROM F.A.C			(m)	1.627
GRAVITY HEIGHT FROM FRAME UPPER SURFACE			(m)	-0.019

NOTE

- The mass of tires to be mentioned in above table shows design figure according to JATMA or ETRTO standard.
- Mass to be mentioned above table shows on standard specification condition.
- In the case to be provided option equipment, make sure mass distribution on front, rear and total followed by mass of option equipment.

No. W9

ITEMS		MASS (kg)	GRAVITY POSITION FROM F.A.C. (m)	MOMENT FROM F.A.C. (kg·m)	GRAVITY HEIGHT FROM FRAME UPPER SURFACE (m)	MOMENT FROM FRAME UPPER SURFACE (kg·m)
Sub Total						
Unsprung Mass	Front					
	Rear					
Total						

	Front	Rear	Total
Sprung Mass (kg)			
Unsprung Mass (kg)			
Chassis Mass (kg)			
Gravity position from F.A.C. (m)			
Gravity height from frame upper surface (m)			

NOTE

- The mass of tires to be mentioned in above table shows design figure according to JATMA or ETRTO standard.

2. MASS OF THE OPTION EQUIPMENT

RELEVANT MODEL

CLASSIFICATION NUMBER	CONTENT OF OPTION	MASS (kg)	GRAVITY POSITION FROM F.A.C. (m)	MOMENT FROM F.A.C. (kg·m)	W/B	REMARKS
FD-022,023,024,025, 026,027,028	RETERDER	40	1.915	76.600	J,L,P	
	SPARE TIRE					
	T/M POWER SHIFT					
	HORIZONTAL TO STACK TAIL PIPE					
FD-022,023,024,025, 026,027,028	BED	3	0.450	1.350	J,L,P	
	AIR CONDITIONER					
	CAR HERTER					
	OVERHEAD CONSOLE					
	ABS					
	GENERATOR					
FD-022,023,024,025, 026,027,028,029	T/M PTO	14	1.270	17.780	ALL	LJ06 T/M LX06 T/M
FD-022,023,024,025, 026,027,028,029	BATTERY	35	2.245	78.575	ALL	
	FRONT SUS. (MULTI –> TAPER)					
FD-022,023,024,025, 026,027,028,029	FRONT SUS. (REINFORCED TAPER)	2	0.000	2.000	ALL	UNSPRUNG MASS
	FRONT SUS. (TAPER –> MULTI)					
	FRONT SUS. (REINFORCED MULTI)					
	FRONT SUS. (MULTI WITH STB)					
FD-022,023,024,025, 026,027,028,029	CAR COOLER LESS	-14.5	-0.900	13.050	ALL	
FD-022	REAR SUS. (REINFORCED)	25	4.250	106.250	J	UNSPRUNG MASS
FD-023,029		25	4.850	121.250	L	
FD-024		25	5.500	137.500	P	
FD-022	TIRE CARRIER	3	5.195	15.585	J	LEAF SUS
FD-023,029		3	5.905	17.715	L	
FD-024		3	6.555	19.665	P	
FD-025,027		3	6.005	18.015	L	AIR SUS
FD-026,028		3	6.655	19.965	P	
FD-022,023,024,025, 026,027,028,029	CENTER SEAT LESS	-4	-0.145	-0.580	J,L,P	

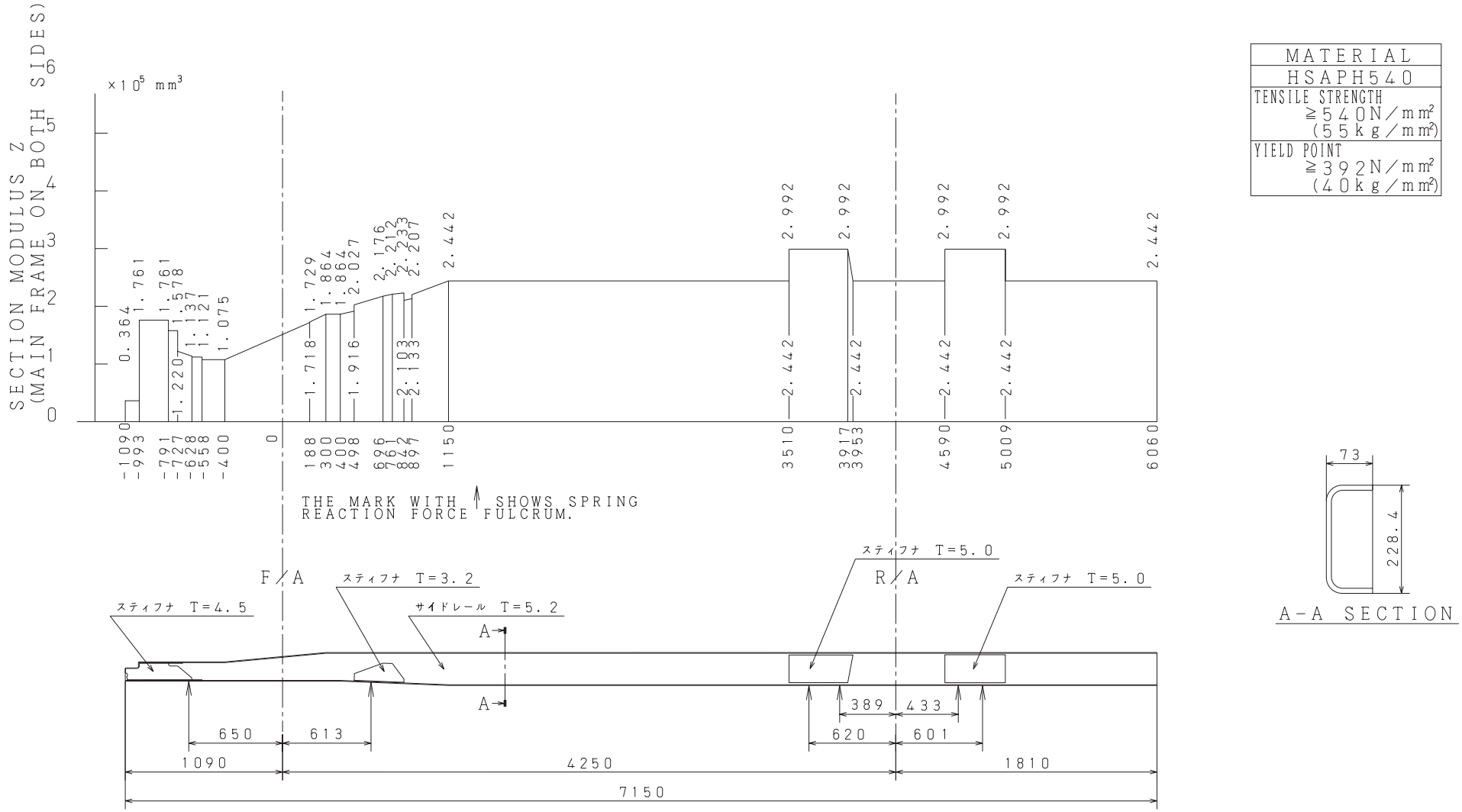
- Refer to chapter 1, 3 chassis specification for classification number.

3. FRAME SECTION MODULUS

FRAME SECTION MODULUS (MAIN FRAME ON BOTH SIDE)

Unit : mm

No. Z1



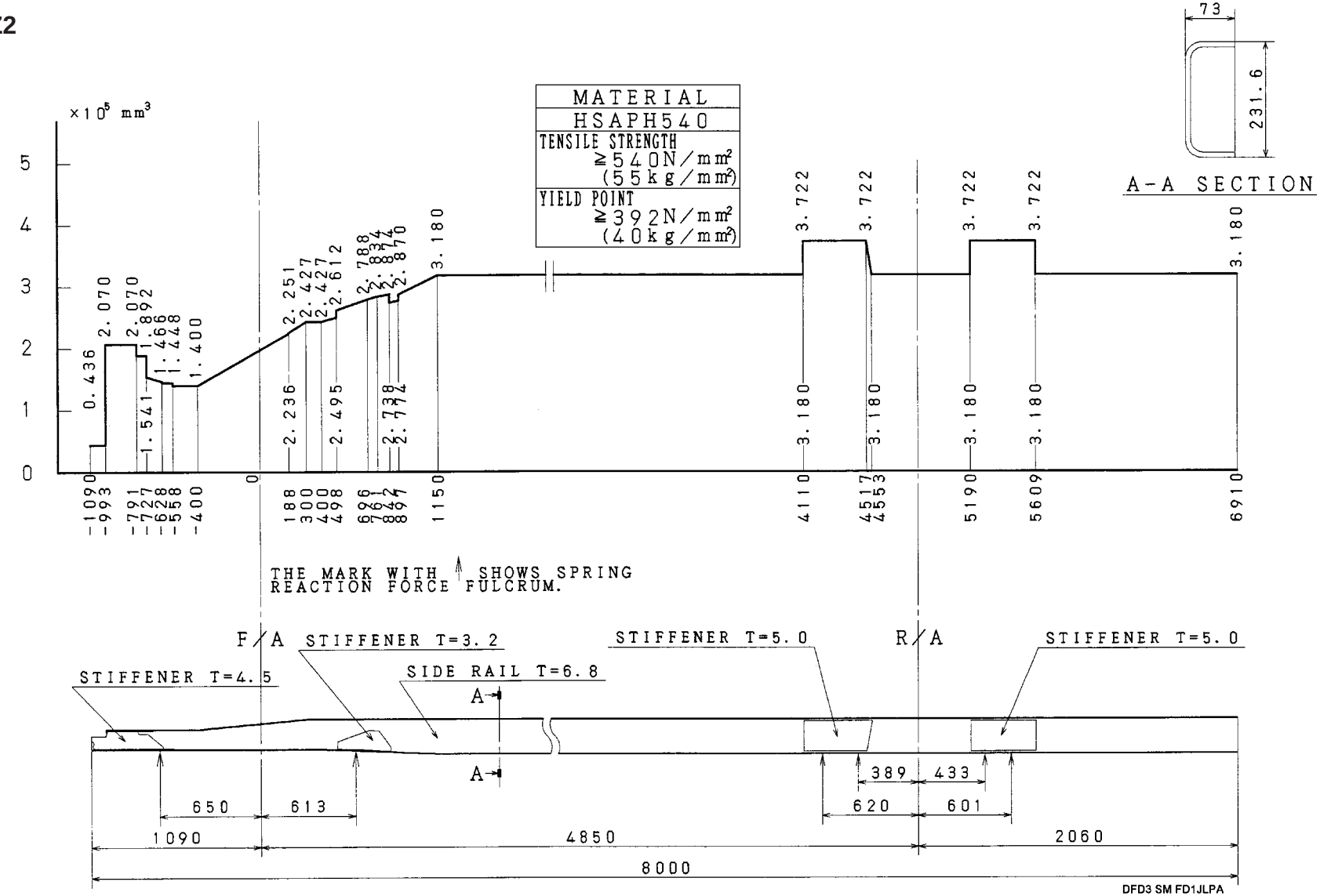
MATERIAL
HSAPH540
TENSILE STRENGTH ≧540N/mm² (55kg/mm²)
YIELD POINT ≧392N/mm² (40kg/mm²)

A-A SECTION

FRAME SECTION MODULUS (MAIN FRAME ON BOTH SIDE)

Unit : mm

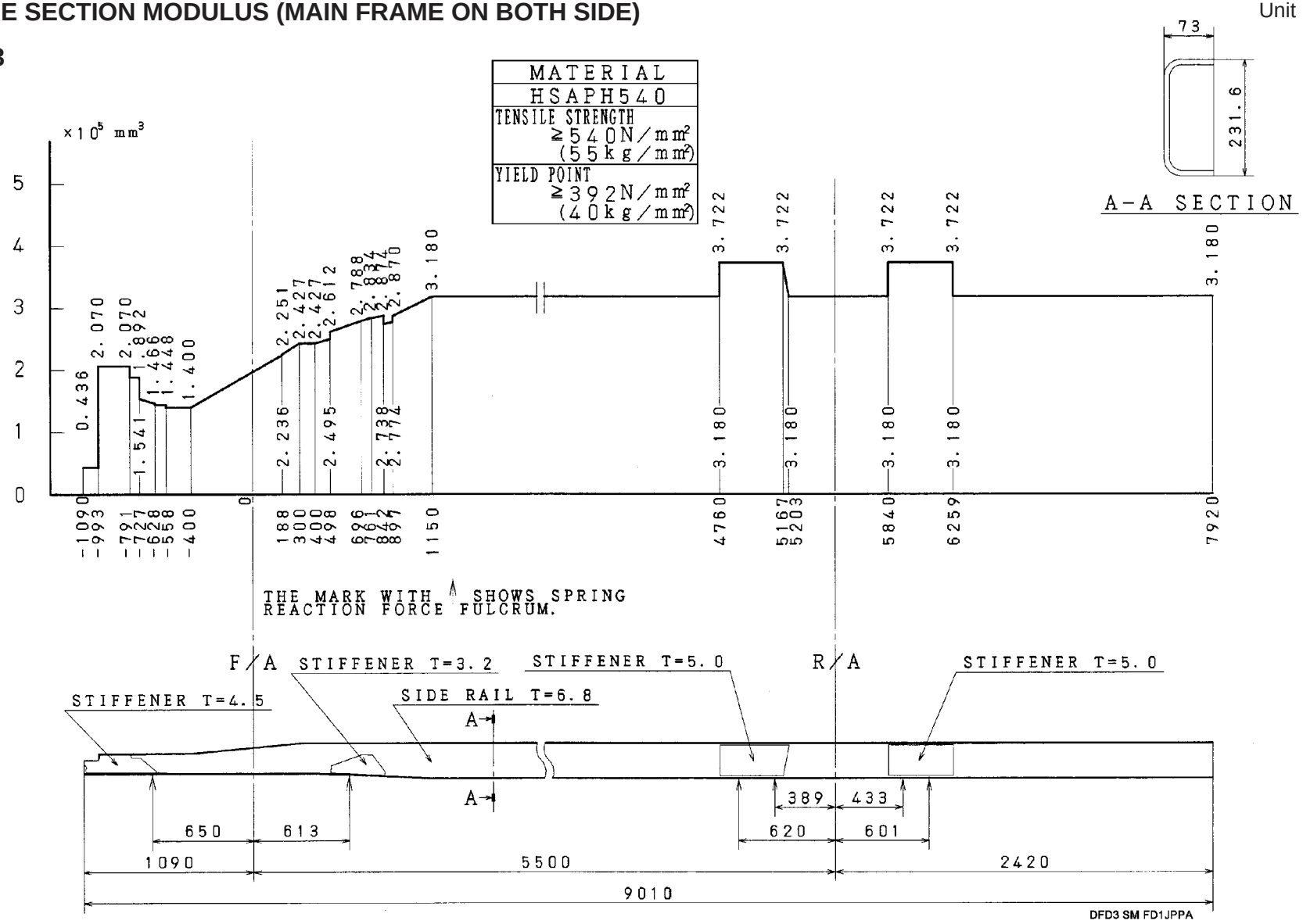
No. Z2



FRAME SECTION MODULUS (MAIN FRAME ON BOTH SIDE)

Unit : mm

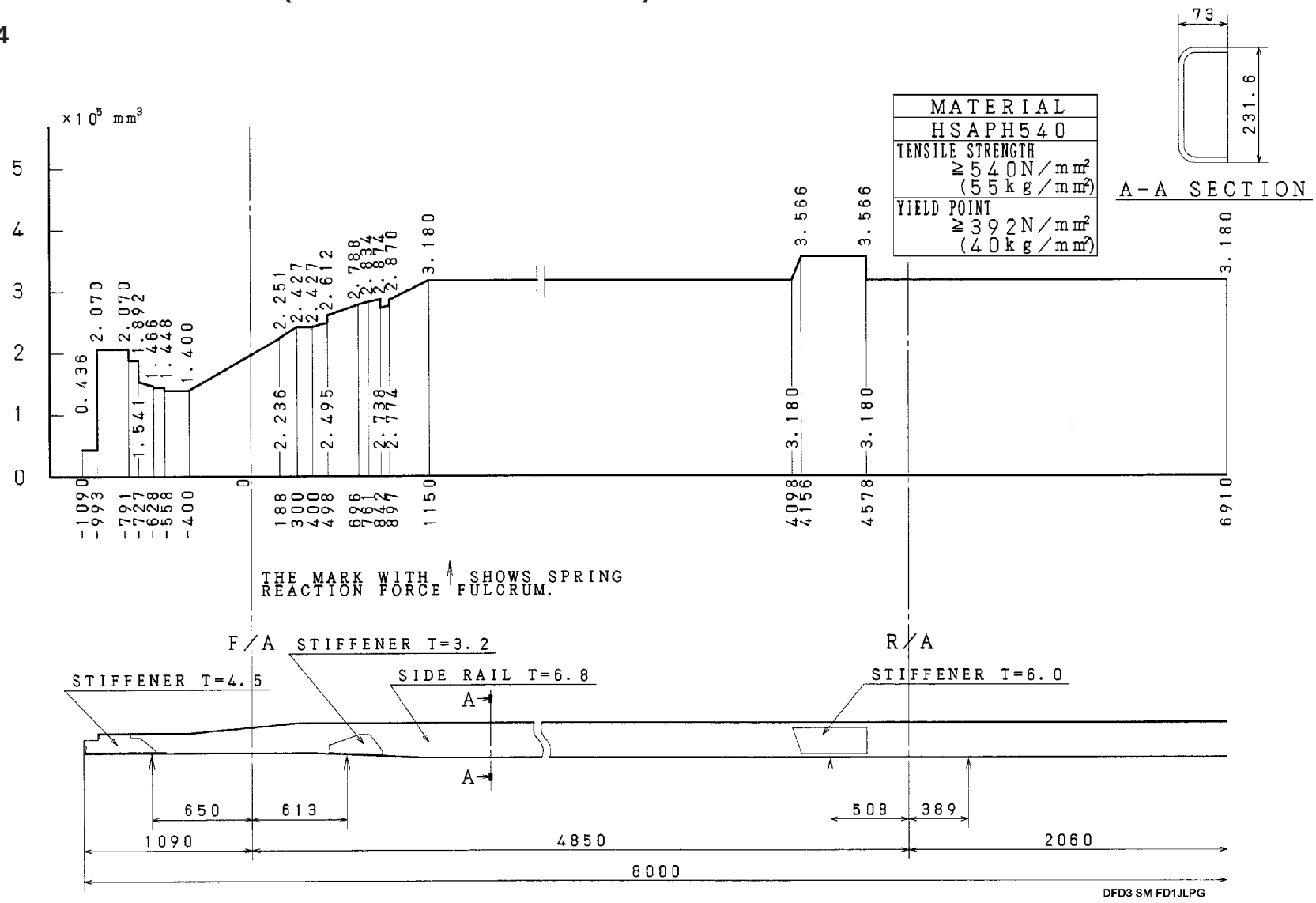
No. Z3



FRAME SECTION MODULUS (MAIN FRAME ON BOTH SIDE)

Unit : mm

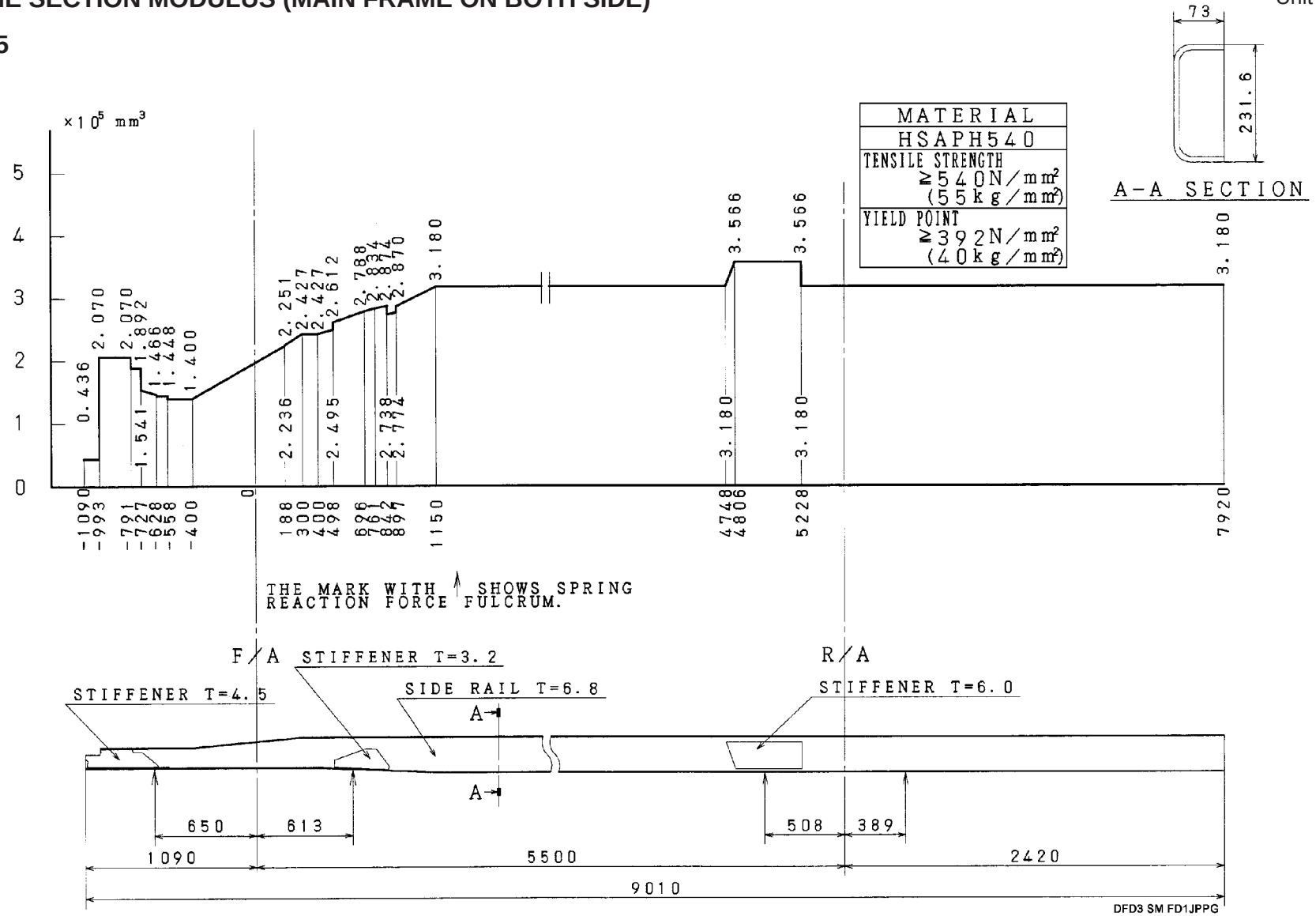
No. Z4



FRAME SECTION MODULUS (MAIN FRAME ON BOTH SIDE)

Unit : mm

No. Z5



FRAME SECTION MODULUS (MAIN FRAME ON BOTH SIDE)

Unit : mm

No. Z6

FRAME SECTION MODULUS (MAIN FRAME ON BOTH SIDE)

Unit : mm

No. Z7

FRAME SECTION MODULUS (MAIN FRAME ON BOTH SIDE)

Unit : mm

No. Z8

FRAME SECTION MODULUS (MAIN FRAME ON BOTH SIDE)

Unit : mm

No. Z9

Chapter 4

SPRINGS & REAR AXLES

1. SPRING CHARACTERISTICS

For All Models

SPRING COMBINATION

Refer to SPRING CHARACTERISTICS CHART based on following table.

SPRING COMBINATION TABLE

· COMBINATION OF LEAF SPRING

RELEVANT MODEL

	STD	OPT1	OPT2	OPT3
CLASSIFICATION NUMBER	**FD-022, 023, 024, 029**	**FD-022, 023, 024, 029**		
FRONT	F1 (FTL)	F2 (FRT)		
REAR	R1 (RML)	R2 (RRM)		

- Refer to chapter 1, 3 chassis specification for classification number.

· COMBINATION OF REAR AIR SPRING

RELEVANT MODEL

	STD	OPT1	OPT2	OPT3
CLASSIFICATION NUMBER	**FD-025, 026, 027, 028**	**FD-025, 026, 027, 028**		
FRONT	F1 (FTL)	F2 (FRT)		
REAR	AIR SPRING			

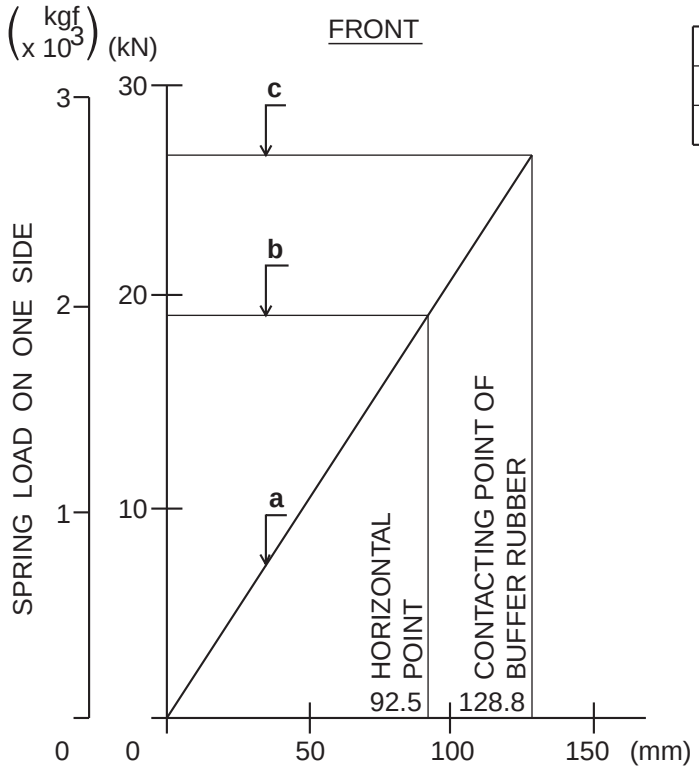
- Refer to chapter 1, 3 chassis specification for classification number.

NOTE

SYMBOL	SPECIFICATION
FTL	TAPER LEAF SPRING
FML	MULTI LEAF SPRING
FRT	REINFORCED TAPER LEAF SPRING
FRM	REINFORCED MULTI LEAF SPRING
RML	MULTI LEAF SPRING
RRM	REINFORCED MULTI LEAF SPRING

LEAF SPRING

• SPRING CHARACTERISTICS CHART "F1"

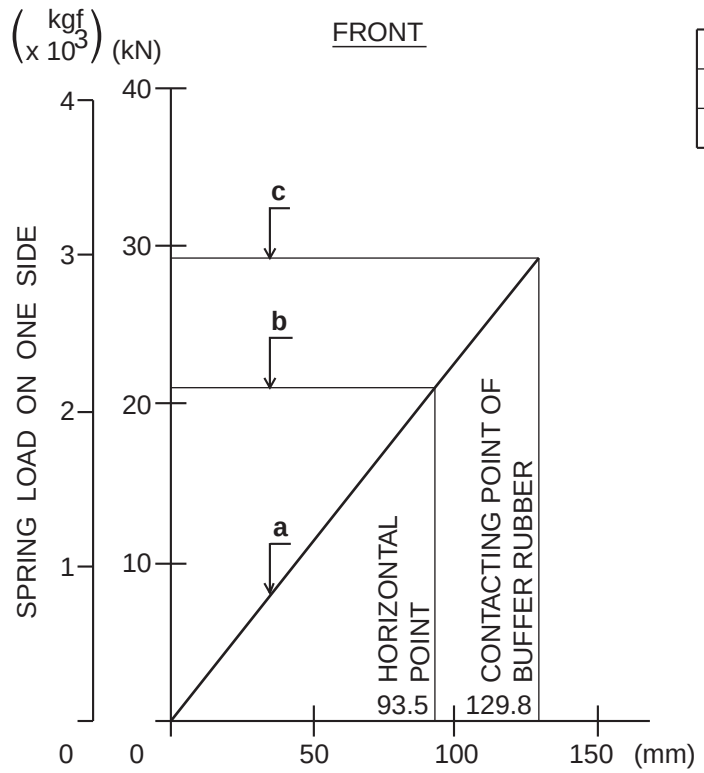


a	0.207kN/mm	{21.1kgf/mm}
b	19.150kN	{2718.5kgf}
c	26.660kN	{1952.7kgf}

VERTICAL SPRING DEFLECTION ON FRONT LEAF SPRING
LOAD VS. DEFLECTION

FFD4 4J SPG CHARA "A"

• SPRING CHARACTERISTICS CHART "F2"



a	0.226kN/mm	{23.0kgf/mm}
b	21.130kN	{2154.6kgf}
c	29.340kN	{2991.8kgf}

VERTICAL SPRING DEFLECTION ON FRONT LEAF SPRING
LOAD VS. DEFLECTION

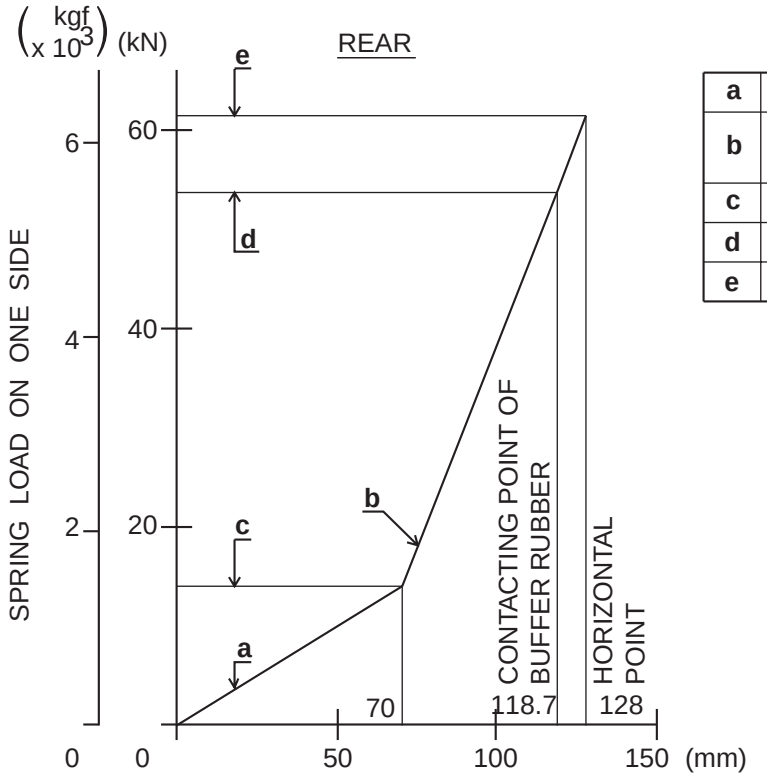
FFD4 4J SPG CHARA "C"

LEAF SPRING

- **SPRING CHARACTERISTICS CHART "F3"**

- **SPRING CHARACTERISTICS CHART "F4"**

• SPRING CHARACTERISTICS CHART "R1"

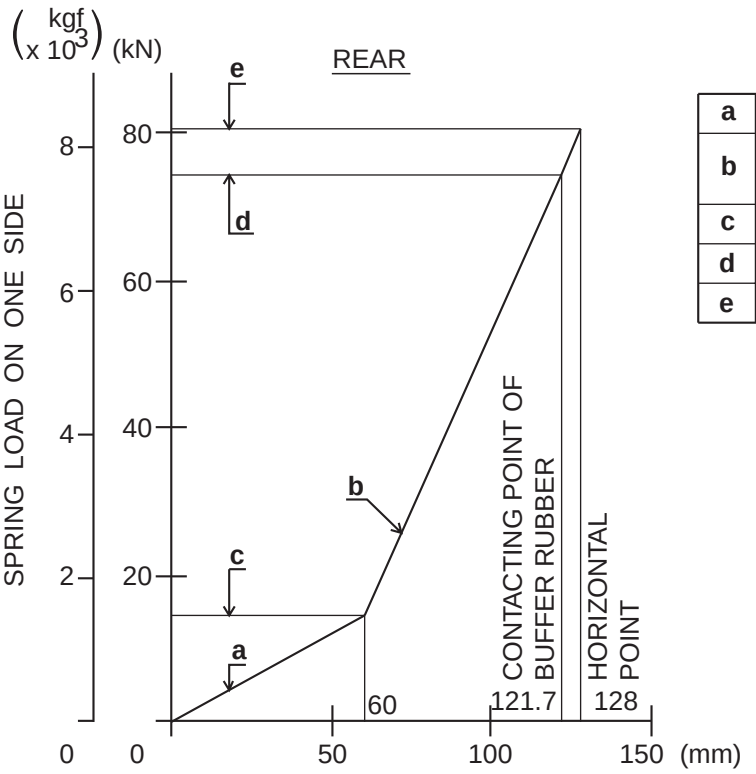


a	0.202kN/mm {20.6kgf/mm}
b	0.202+0.610=0.812kN/mm {20.6+62.2=82.8kgf/mm}
c	14.140kN {1441.8kgf}
d	53.680kN {5473.8kgf}
e	61.240kN {6244.6kgf}

VERTICAL SPRING DEFLECTION ON REAR LEAF SPRING
LOAD VS. DEFLECTION

FFD4 4J SPG CHARA "E"

• SPRING CHARACTERISTICS CHART "R2"



a	0.245kN/mm {25.0kgf/mm}
b	0.245+0.722=0.967kN/mm {25.0+73.6=98.6kgf/mm}
c	14.700kN {1499.0kgf}
d	74.370kN {7583.5kgf}
e	80.460kN {8204.5kgf}

VERTICAL SPRING DEFLECTION ON REAR LEAF SPRING
LOAD VS. DEFLECTION

FFD4 4J SPG CHARA "F"

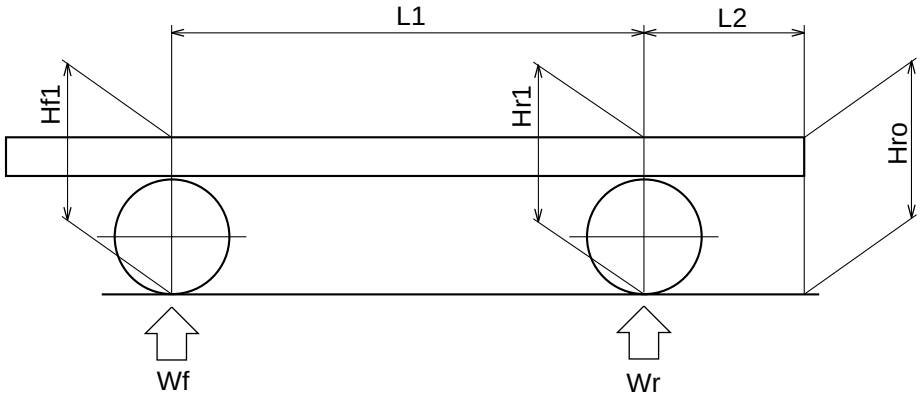
• **SPRING CHARACTERISTICS CHART "R3"**

• **SPRING CHARACTERISTICS CHART "R4"**

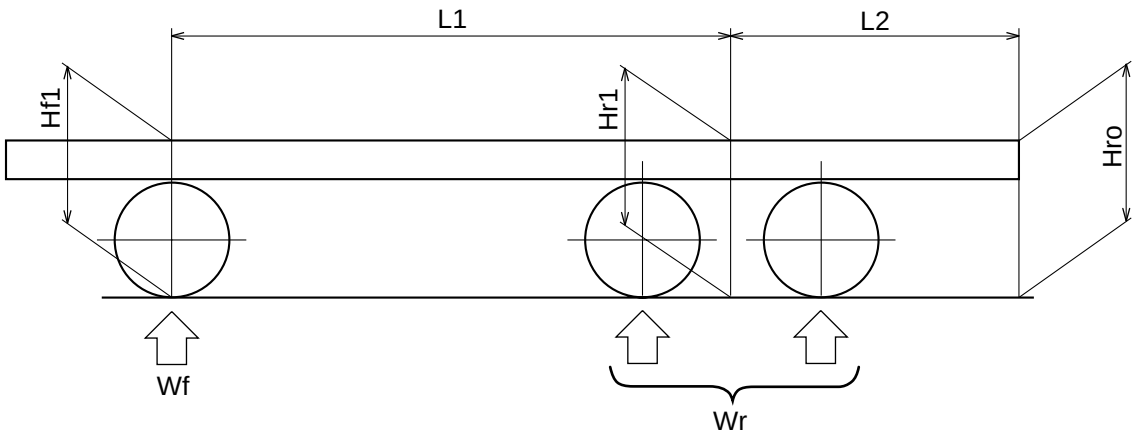
2. CALCULATION FOR HEIGHT OF FRAME UPPER SURFACE FROM GROUND

When installing body or equipment on chassis, must be calculating height of frame upper surface from ground.
In order to confirm the vehicle posture as frame end upper surface from ground slightly higher than front end to ensure vehicle stability during operation.
Following are as formula how to calculate.

[FOR 4x2 DRIVE MODEL ONLY]



[FOR 6x2, 6x4 DRIVE MODEL ONLY]



Wf : Load on front axle (kg)
Wr : Load on rear axle (kg)
Hf1 : Height of frame upper surface from ground on front axle datum line (mm)
Hr1 : Height of frame upper surface from ground on rear axle datum line (mm)
Hfo : Height of frame upper surface from ground on frame end (mm)
L1 : Distance from front axle datum line to rear axle loading center (mm)
L2 : Frame rear overhung (mm) · · · From rear loading center to frame end.

$$Hro = Hr1 + \frac{Hr1 - Hf1}{L1} \times L2$$

NOTE

- Refer to the next page how to calculate the figure Hf1 and Hr1.
- The deflection of tire due to loaded do not be considered in calculation formula. Therefore, figure of the tire deflection has to be added in Hf1 and Hr1 according to ETRTO or JATMA standard.

CALCULATION FORMULA OF Hf1 & Hr1

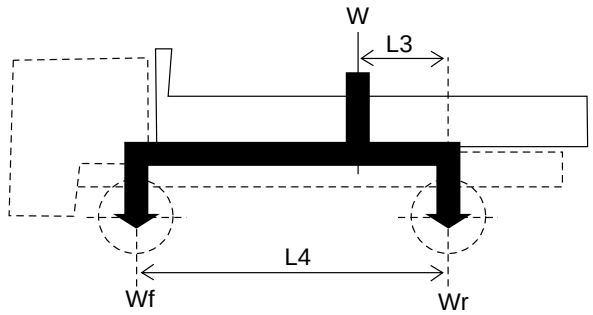
<CALCULATION DATA TO BE REFERED>

ITEM	CHAPTER TO BE REFERED		ELEMENT	
	CHAPTER	NAME OF CLAUSE	FRONT	REAR
SPRING CONSTANT (kg/mm)	4	SPRING CHARAC-TERISTICS CHART	Tf	Tr
HIGHT OF FRAME UPPER SURFACE FROM GROUND (mm)	8	CHASSIS DRAWING	Hf	Hr

<CLCULATION DATA TO BE PROVIDED>

ITEM	ELEMENT	
	FRONT	REAR
MASS DISTRIBUTION OF BODY OR EQUIPMENT(kg) *Mass of payload should also be calculated mass distribution, Front and Rear, if necessary.	Wf	Wr

CALCULATION FORMULA OF MASS DISTRIBUTION



$Wf = \frac{W \times L3}{L4}$ $Wr = W - Wf$

W : BODY (EQUIPMENT) MASS
Wf : FRONT DISTRIBUTION MASS OF BODY (EQUIPMENT)
Wr : REAR DISTRIBUTION MASS OF BODY (EQUIPMENT)
L3 : GRAVITY CENTER OF BODY (EQUIPMENT) MASS
L4 : WHEELBASE

*For more details if needed, refer to the Chapter 1 of Common Manual, No.KC-AA001 or KC-AA201.

<CALCULATION FORMULA OF Hf1>

$Hf1 = Hf - \left(\frac{Wf}{2} \div Tf \right)$

<CALCULATION FORMULA OF Hr1>

$Hr1 = Hr - \left(\frac{Wr}{2} \div Tr \right)$

FOR INSTANCE OF CALCULATION

This is the calculation of "Hro" of the vehicle to be mounted rear body or equipment.
When calculate "Hro" under the condition of GVM, mass of the payload also be calculated to mass distribution on front and rear separately, and it should be added to mass distribution on ,Front and Rear, of body or equipment.

Since, the deflection of tire due to loaded do not be considered in calculation formula.
Therefore, figure of the tire deflection has to be added in Hf and Hr according to ETRTO or JATMA standard.

<CONDITION OF CALCULATION>

① SPRING CONSTANT : FRONT : 34.7 kgf/mm, REAR : 255.8 kgf/mm
② HIGHT OF FRAME UPPER SURFACE FROM GROUND : FRONT : 1036 mm, REAR : 1098 mm
③ BODY MASS :
- BODY MASS : 6000 kg
- GRAVITY CENTER OF BODY MASS : 1500 mm
- WHEELBASE : 5000 mm
- REAR OVER HANG : 3000 mm

$\underline{Wf} = \frac{W \times L3}{L4} = \frac{6000 \times 1500}{5000} = \underline{1800\ kg}$

$\underline{Wr} = W - Wf = 6000 - 1800 = \underline{4200}$

$\underline{Hf1} = Hf - \left(\frac{Wf}{2} \div Tf \right)$

$= 1036 - \left(\frac{1800}{2} \div 34.7 \right)$

$= \underline{1010\ mm}$

$\underline{Hr1} = Hr - \left(\frac{Wr}{2} \div Tr \right)$

$= 1098 - \left(\frac{4200}{2} \div 255.8 \right)$

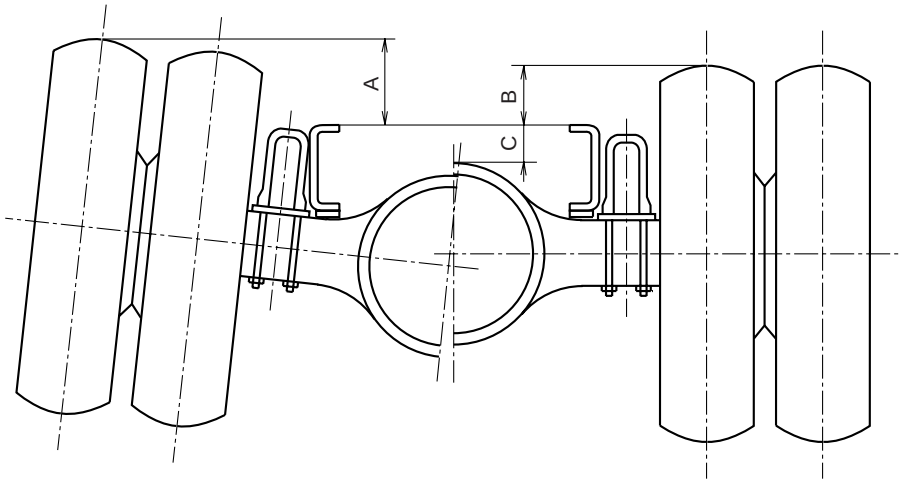
$= \underline{1090\ mm}$

$Hro = Hr1 + \frac{(Hr1 - Hf1)}{L1} \times L2 = 1090 + \frac{(1090 - 1010)}{5000} \times 3000 = 1138\ mm$

3. MAXIMUM VERTICAL DEFLECTION OF REAR WHEELS

Measurements for the maximum deflection for one side tire and for simultaneous left and right deflection are shown below.
When you mount the body, allow a clearance of at least 30mm so as not to obstruct tire deflection.

DEFLECTION OF REAR TIRES



A : MAXIMUM DEFLECTION FOR ONE SIDE WHEELS

B,C : MAXIMUM SIMULTANEOUS DEFLECTION RIGHT AND LEFT WHEELS

RELEVANT MODEL

Unit : mm

CLASSIFICATION NUMBER	STD/OPT	REAR TIRE	A	B	C
		8.25-16-14PR			
		8.25R16-14PR			
FD-022,023,024,025, 026,027,028,029	STD	9.5R17.5 (129/127)	190	180	50
		235/75R17.5 (130/128)			
		8.25-20-14PR			
		8.25R20-14PR			
		9.00-20-12PR/14PR			
		9.00R20-12PR/14PR			
		10.00-20-14PR/16PR			
		10.00R20-14PR/16PR			
		11.00-20-14PR/16PR			
		11.00R20-14PR/16PR			
		9R22.5 (133/131)			
		10R22.5-14PR			
		10R22.5 (144/142)			
		11R22.5-14PR/16PR			
		11R22.5 (148/145)			
		12R22.5-16PR			
		235/70R22.5 (138/135)			
		255/70R22.5 (140/137)			
		255/70R22.5 (143/140)			
		275/70R22.5 (148/145)			
		275/80R22.5 (151/148)			
		295/80R22.5			
		295/80R22.5 (152/148)			

- Refer to chapter 1, 3 chassis specification for classification number.

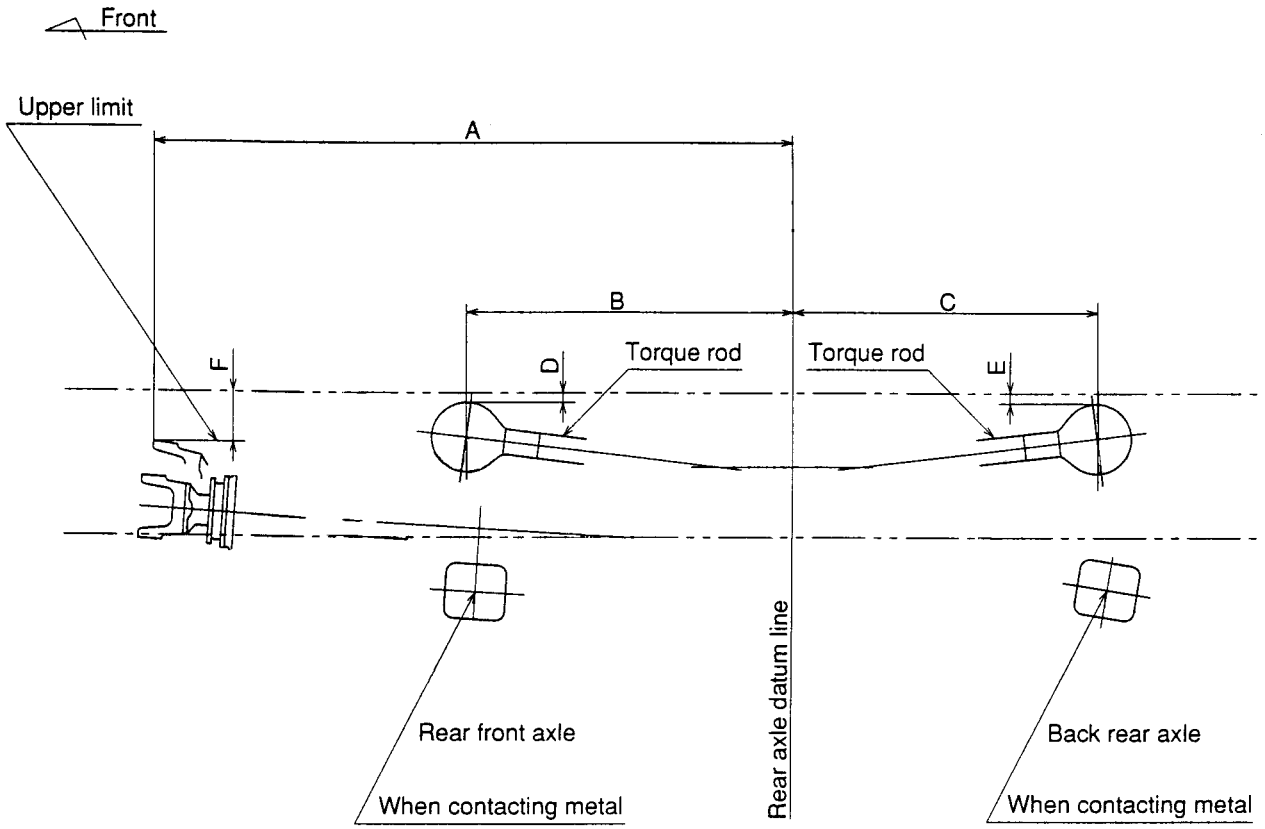
NOTE

- When snow chains are fitted, add 50mm to measurements A and B.
- The dimension of tire to be mentioned in above table shows design figure according to ETRTO or JATMA standard.

4. MAXIMUM VERTICAL TRAVEL RANGE OF REAR AXLE AND SUSPENSION

Measurement for maximum vertical travel range of the rear torque rod is shown below. When you mount a body or equipment, allow a clearance of at least 30mm so as not to interfere with rear torque rod.

VERTICAL TRAVEL RANGE OF REAR AXLE AND SUSPENSION (FOR REAR TANDEM AXLE)



RELEVANT MODEL

Unit : mm

CLASSIFICATION NUMBER	A	B	C	D	E	F

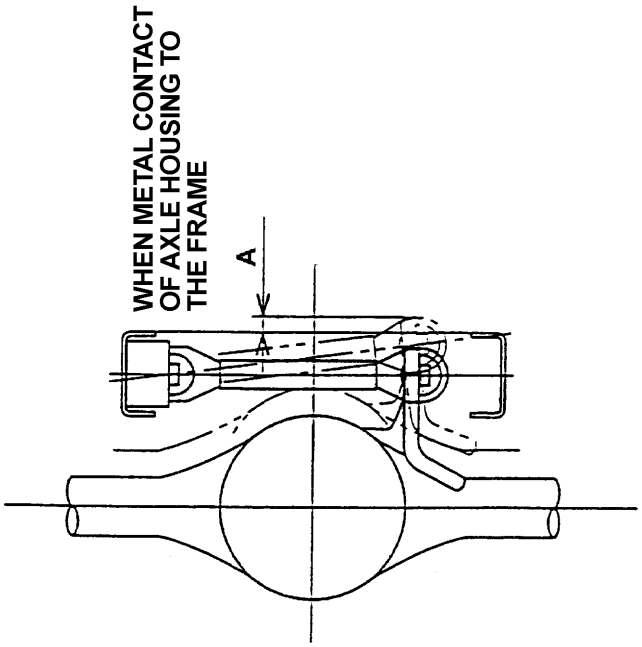
- Refer to chapter 1, 3 chassis specification for classification number.

5. MAXIMUM VERTICAL TRAVEL RANGE OF REAR LATERAL ROD (For rear air spring series)

Measurement for maximum vertical travel range of the rear lateral rod is shown below. When you mount a body or equipment, allow a clearance of at least 30mm so as not to interfere with rear lateral rod.

VERTICAL TRAVEL RANGE OF REAR LATERAL ROD

4x2 DRIVE MODEL

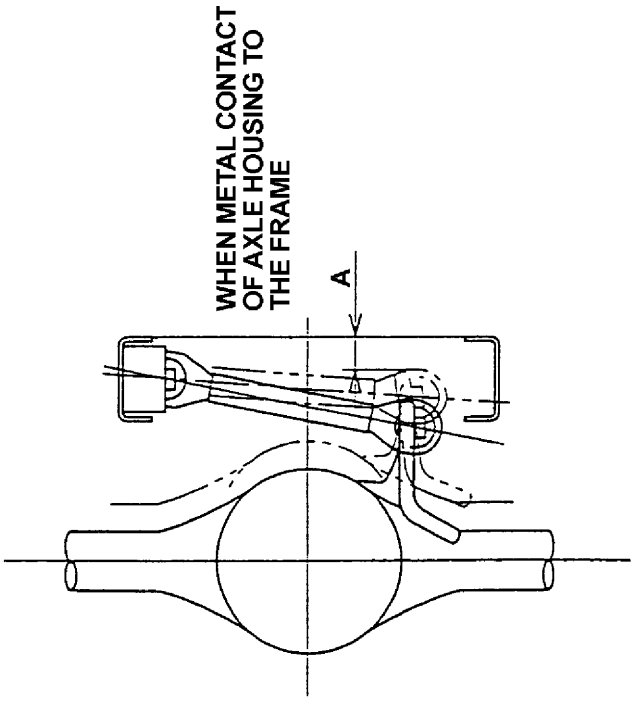


RELEVANT MODEL Unit : mm

CLASSIFICATION NUMBER	A
FD-025,026, 027,028	37

- Refer to chapter 1, 3 chassis specification for classification number.

6x2, 6x4 DRIVE MODEL



RELEVANT MODEL Unit : mm

CLASSIFICATION NUMBER	A	
	FORWARD	REARWARD

- Refer to chapter 1, 3 chassis specification for classification number.

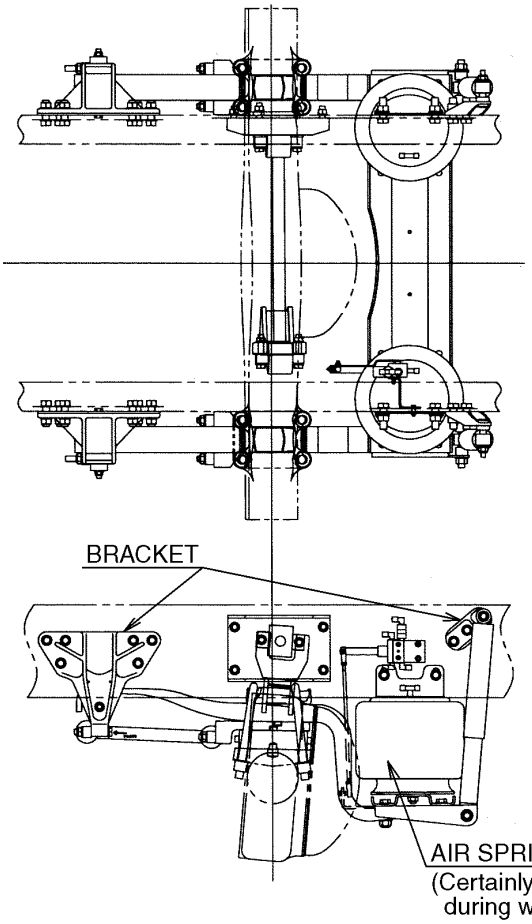
6. PRECAUTION WHEN WELDING OPERATIONS AROUND THE SUSPENSION PARTS

GENERAL PRECAUTION

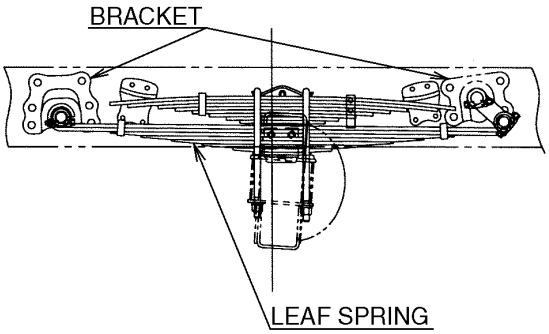
- Suspension parts absorb shocks from the road surface received while driving and are always changing shape.
- Accordingly, the parts are manufactured from very special metal materials or other materials.
- Accordingly, if subjected to the effects of heat or other environmental factors, this is danger that the material hardness may easily drop or suffer damage.
- Therefore, do not use electrical welding of the suspension parts or a gas torch to apply heat.
- The ground used during electrical welding must not make connect with the suspension parts.
- During welding operations around the periphery of suspension parts, be sure to protect the suspension parts using a cover or similar item so the parts are not subjected to welding sparks.
- Because in the peripheral portion of the bracket where the suspension parts are installed constantly a large amount of stress is generated while the vehicle is driving, heat must not be applied to this portion by electrical welding or a gas torch.
- The above sentences only describe a multi-leaf suspension. The same precautions also apply to air bag type rear suspension as well.

Installation of suspension parts (For example)

AIR SUSPENSION



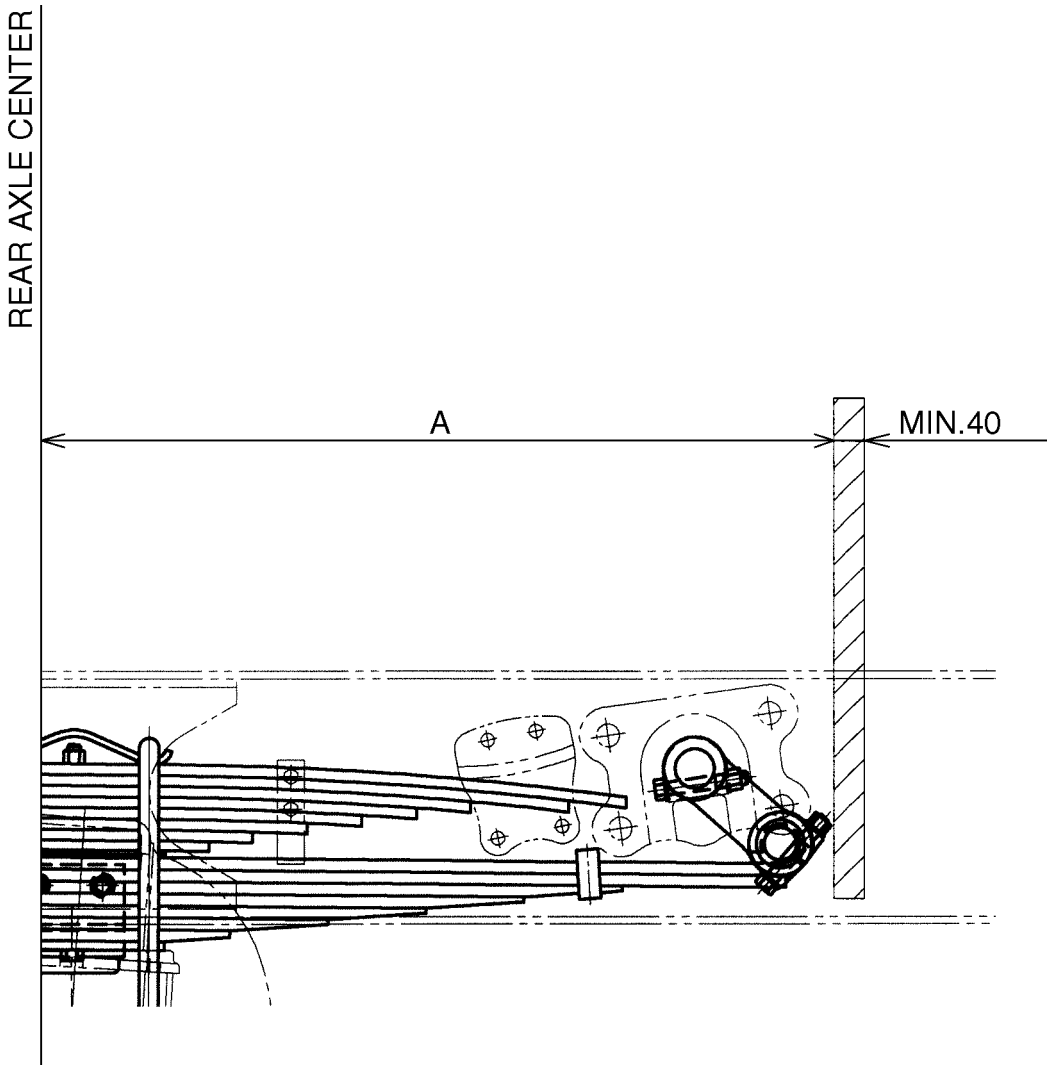
LEAF SPRING SUSPENSION



7. TRAVEL RANGE OF REAR SPRING

During driving, the shackle of the main spring moves beyond the end of the rear bracket. Do not mount any parts of body inside of the hatching range.

Unit : mm



RELEVANT MODEL

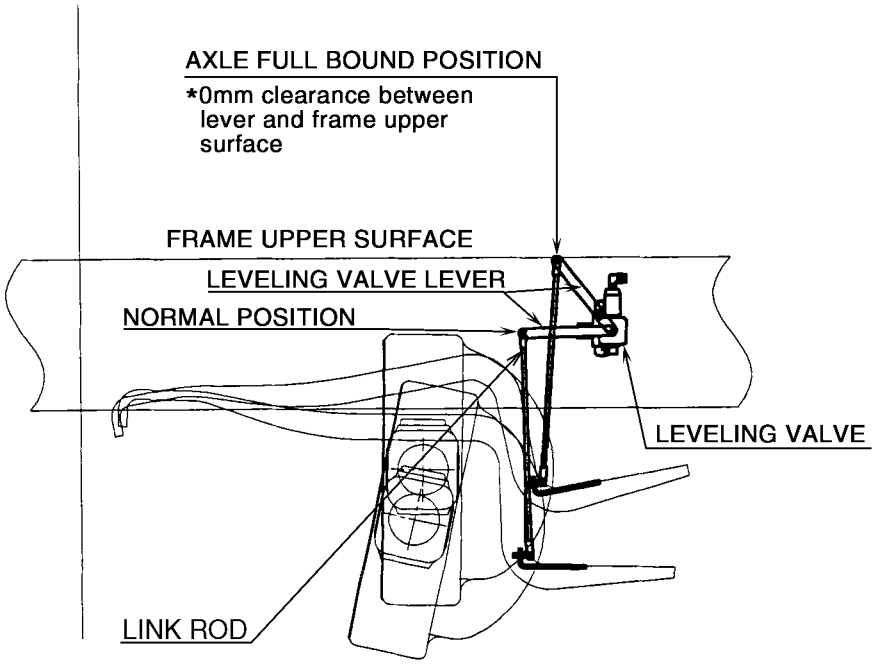
CLASSIFICATION NUMBER	A
FD-022,023,024,029	726

- Refer to chapter 1, 3 chassis specification for classification number.

8. PRECAUTION FOR LEVELING VALVE LEVER

- Rear air suspension vehicle installed leveling valve to keep vehicle height. When mounting body or equipment on the vehicle, must be keep 30mm clearance between lever and body or equipment.

RELEVANT MODEL
CLASSIFICATION NUMBER : FD-025,026,027,028



- Refer to chapter 1, 3 chassis specification for classification number.

- The adjustment of Leveling Valve has already been made under the chassis condition before deliver the chassis to body or equipment manufacturer.
  Therefore, do not re-adjust and disassembly the Leveling Valve at the time or after rear body mounted.
  (Should more detailed data or information regarding adjust ment of Leveling Valve be needed, please contact your nearest HINO sales dealer.)
- Do not change the length of link rod.

9. REAR SHOCK ABSORBER

Unit : mm

RELEVANT MODEL
CLASSIFICATION NUMBER :

- Refer to chapter 1, 3 chassis specification for classification number.

Chapter 5

P.T.O. AND CONTROL

NOTE

- Mark ▭ to be mentioned in each table of relevant model shows applicable specification.

1. PROVISION OF P.T.O. AND CONTROL

When the body require transmission Power Take Off (P.T.O.) and Control, genuine P.T.O. and control should be supplied as option equipment.
Refer to details for P.T.O. and CONTROL based on following table.

TRANSMISSION SIDE POWER TAKE OFF (OPT)

RELEVANT MODEL

CLASSIFICATION NUMBER	T/M MODEL	T/M P.T.O.	REMARKS
FD-022,023,024,025, 026,029	LX06S	TP-1	
FD-027,028	LJ06S	TP-2	
	MF06S	TP-3	
	HK06S	TP-4	NOT PROVIDE
	EATON RT-8908LL / RTO-11909ALL	TP-5	NOT PROVIDE
	ZF 9S109	TP-6	
	EATON FS-6109A	TP-7	
	EATON FS-8209BBE	TP-8	
	ALLISON 3000	TP-9	
	ALLISON 3500	TP-10	

- Refer to chapter 1, 3 chassis specification for classification number.

ENGINE REAR END POWER TAKE OFF

RELEVANT MODEL

CLASSIFICATION NUMBER	ENGINE REAR END P.T.O.	APPLICATION
	STANDARD EQUIPMENT	GENERAL USE
		CONCRETE MIXER

- Refer to chapter 1, 3 chassis specification for classification number.

TRANSFER POWER TAKE OFF (OPT)

RELEVANT MODEL

CLASSIFICATION NUMBER	TRANSFER SERIES	APPLICATION
	MA12C	GENERAL USE

- Refer to chapter 1, 3 chassis specification for classification number.

ENGINE CONTROL FOR BODY OR EQUIPMENT

RELEVANT MODEL

CLASSIFICATION NUMBER	ENGINE MODEL	ENGINE CONTROL TYPE	PROVISION OF ENGINE ACCELERATOR
	J05E-TE	MECHANICAL	–
	J08E-UG	MECHANICAL	–
	J08E-UF	MECHANICAL	–
	P11C-UB	MECHANICAL	–
	J05D-TG	U-2	OPTION EQUIPMENT
	J05E-TC	U-2	OPTION EQUIPMENT
	J05E-TD	U-2	OPTION EQUIPMENT
FD-027,028	J07E-TN	U-2	OPTION EQUIPMENT
FD-022,023,024,025, 026,029	J07E-TP	U-2	OPTION EQUIPMENT
	J08E-UD	U-2	OPTION EQUIPMENT
	J08E-UE	U-2	OPTION EQUIPMENT
	J08E-TB	U-2	OPTION EQUIPMENT
	J08E-TE	U-2	OPTION EQUIPMENT
	A09C-TE	U-2	OPTION EQUIPMENT

- Refer to chapter 1, 3 chassis specification for classification number.

REAR BODY CONTROL LEVER

RELEVANT MODEL

CLASSIFICATION NUMBER	REAR BODY CONTROL LEVER	DETAILS
	DL-1	DUMP LEVER (RHD, OPTION EQUIPMENT)
	DL-2	DUMP LEVER (LHD, OPTION EQUIPMENT)
	ML-1	MIXER LEVER (RHD, STANDARD EQUIPMENT)
	ML-2	MIXER LEVER (RHD, OPTION EQUIPMENT)

- Refer to chapter 1, 3 chassis specification for classification number.

2. TRANSMISSION SIDE POWER TAKE OFF (OPT)

[T/M P.T.O. : TP-1]

When the body require transmission Power Take Off (P.T.O.) , genuine P.T.O. equipment and related parts should be supplied as shown below.

• Data of the P.T.O. output shaft

TRANSMISSION SERIES	PERMISSIBLE TORQUE (N·m {kgf·m} at r/min)	P.T.O. CONTROL TYPE	DIRECTION OF ROTATION
LX06S	245 {25} / 1,000	Pneumatic control	Reverse to engine

• Necessary parts

CLASSIFICATION NUMBER	FD-022,023,024,025,026,029					
TRANSMISSION MODEL	LX06S					
TRANSMISSION GEAR RATIO						
1ST	6.098		6.515		8.190	
2ND	3.858		4.122		5.072	
3RD	2.340		2.500		2.981	
4TH	1.422		1.718		1.848	
5TH	1.000		1.261		1.343	
6TH	0.761		1.000		1.000	
REV	5.672		6.060		7.619	
P.T.O. CONTROL TYPE	Pneumatic					
PARTS NAME	Parts No.	Q'ty / unit	Parts No.	Q'ty / unit	Parts No.	Q'ty / unit
POWER TAKE OFF ASSY	S3661-05251	01	S3661-05391	01	S3661-05171	01
POWER TAKE OFF SUB ASSY	S3661-05261	01	S3661-05201	01	S3661-05181	01
SWITCH ASSY, T/M POSITION	S8422-01560	01	S8422-01560	01	S8422-01560	01
BRACKET, ELEC. PART	S5591-23970	01	S5591-23970	01	S5591-23970	01
CONNECTOR, SUB ASSY	SN352-10613	01	SN352-10613	01	SN352-10613	01
ADAPTER, P.T.O. CASE	S3662-82770	01	S3662-82890	01	S3662-82740	01
	or S3662-82780	01	or S3662-82900	01	or S3662-82750	01
	or S3662-82790	01	or S3662-82910	01	or S3662-82760	01
GASKET, P.T.O. CASE	S3663-51560	02	S3663-51560	02	S3663-51560	02
LOCK WASHER	SL512-01030	08	SL512-01030	08	SL512-01030	08
STUD, REAMER	SZ116-10086	02	SZ116-10086	02	SZ116-10084	02
STUD	SZ116-10079	06	SZ116-10079	06	SZ116-10085	06
NUT	SZ170-10064	08	SZ170-10064	08	SZ170-10064	08
VALVE ASS'Y, SOLENOID	S2761-04550	01	S2761-04550	01	S2761-04550	01
BOLT, FLANGE	SH552-10825	02	SH552-10825	02	SH552-10825	02
BRACKET, MAGNETIC VALVE	S4458-23270	01	S4458-23270	01	S4458-23270	01
BOLT, FLANGE	SZ105-10041	02	SZ105-10041	02	SZ105-10041	02
HOLDER, CLIP	S7999-32610	01	S7999-32610	01	S7999-32610	01
BOLT	SH782-01020	01	SH782-01020	01	SH782-01020	01

NOTE

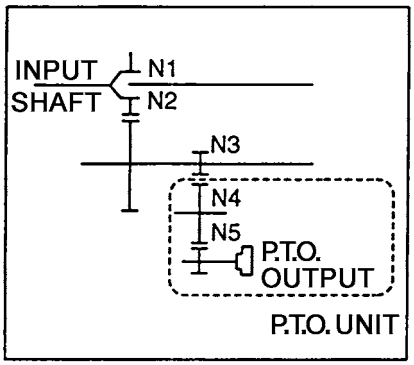
- Parts mentioned above table shows transmission P.T.O. unit only.
- Other related parts of transmission P.T.O. control, please contact each Hino sales dealer.

DETAIL OF P.T.O., TRANSMISSION MODEL HINO LX06S

• P.T.O. Installation procedure

- Drain the transmission oil.
  (Do not remove the drain plug while the oil is hot, or you will scald yourself.)
- Remove the P.T.O. cover which is at the left of the transmission.
  (Do not reuse the bolts and gasket that you remove at this time.)
- Clean the P.T.O. mounting surface on the transmission side.
- Prepare the necessary parts, referring to table of necessary parts.
- Apply liquid packing to all fitting surfaces, such as the P.T.O. mounting surface of the transmission case and installation gasket, adaptor and P.T.O. body.
- Fit the P.T.O. on the P.T.O. mounting and secure the mounting position by means of the reamer bolts (See the part described with marked "R" in the section "P.T.O. mounting location on transmission case") and tighten the other fitting bolts.Tightening torque for bolts : 61±7 N·m {625±75 kgf·cm}
- After attaching the P.T.O., turn the output shaft coupling a few revolutions to be sure that it turns freely.
- When you refill the transmission oil, increase the amount by 2.5 liters to allow for the P.T.O..

• Gear layout and gear ratio



Gear ratio : i = N2/N1xN4/N3xN5/N4

TRANSMISSION	GEAR RATIO	P.T.O. CONTROL TYPE	N1	N2	N3	N4	N5	i
LX06S	6.098 ~ 0.761	PNEUMATIC	25	39	26	31	21	1.260
	6.515 ~ 1.000		24	40	26	31	20	1.282
	8.190 ~ 1.000		21	44	26	31	16	1.289

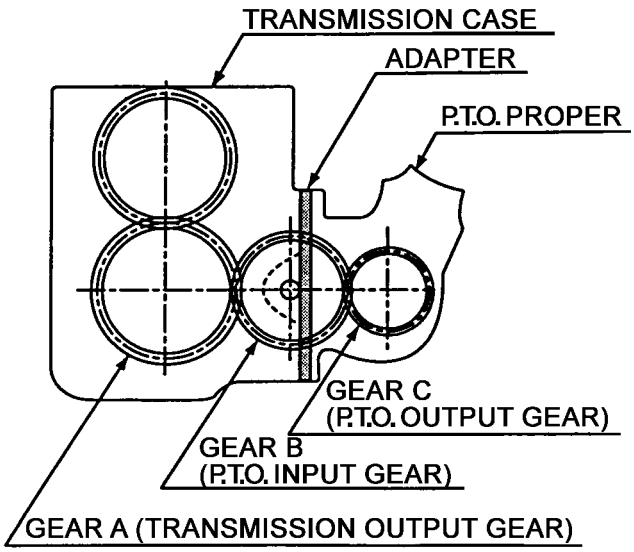
NOTE

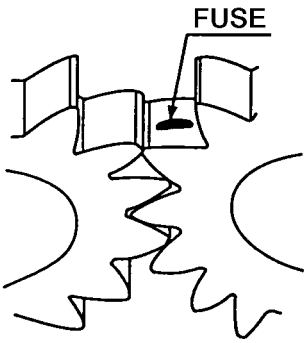
- Number of revolutions of P.T.O. output shaft
  = number of revolutions of engine x1/ i
- The P.T.O. output shaft turns in the opposite direction to the engine.

• How to check the gear backlash

The gear backlash of the P.T.O. is important factor to prolong the P.T.O. gear life. The bigger backlash causes the noise from gears on the contrary the smaller backlash causes the damage of gears. When installing the P.T.O. measure and check the backlash according to the following procedures.

- Measurement of backlash (a) (between gear A and B)
  Attach a fuse (Ø1x10mm), with grease on the tooth surface of the P.T.O. gear B (3 places of gear tooth).
  After rotating gear B, measure the thickness of crashed fuses with a micro-meter.
- Adjustment of backlash (a) (between gear A and B) When the backlash is not within the following standard backlash adjust the backlash by selecting an appropriate adapter.



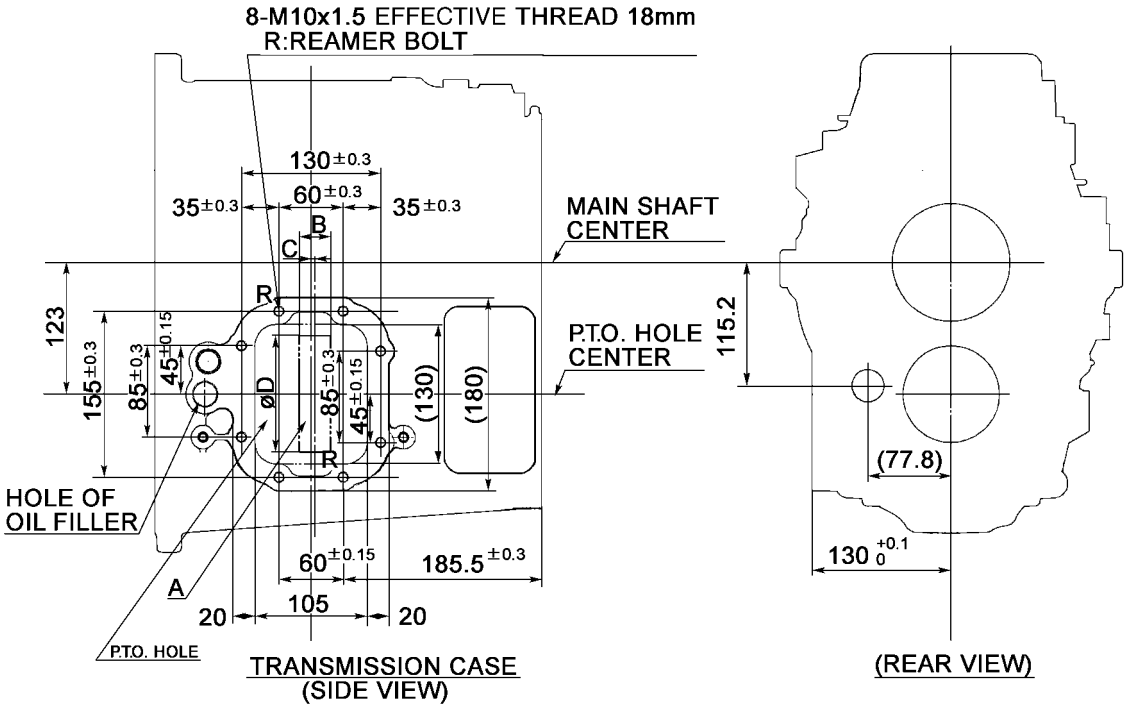


MODEL	GEAR POSITION	STANDARD BACKLASH
LX	Between gear A and gear B (a)	0.08 ~ 0.21mm

If specified gear backlash value cannot be obtained, check whether all the parts have been installed correctly.
If the specified gear backlash value cannot be obtained despite correct installation, use another P.T.O. assembly.

• P.T.O. mounting location on transmission case

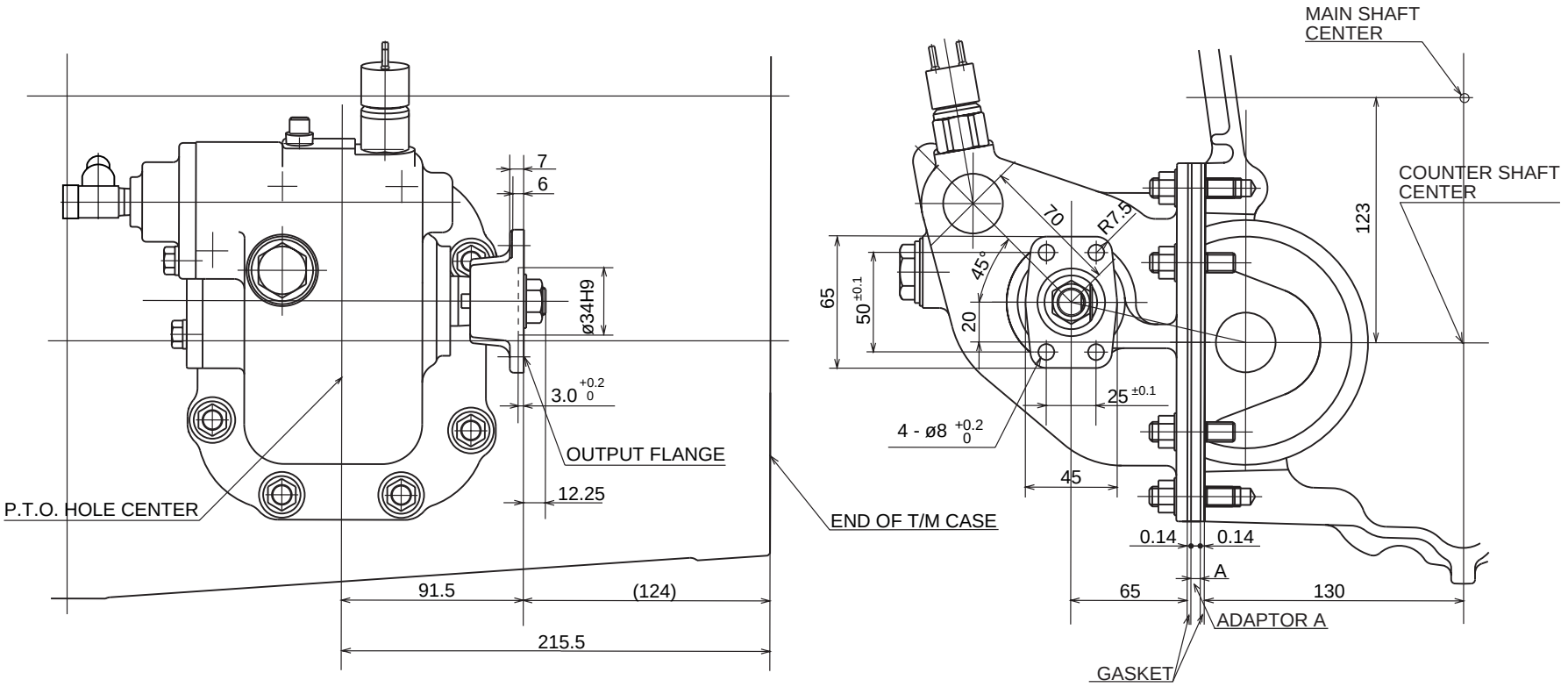
Unit : mm

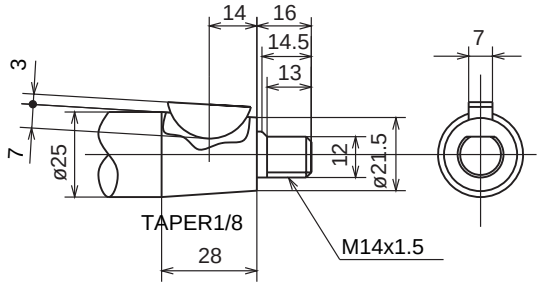


TRANSMISSION MODEL		LX06S	
T/M GEAR RATIO		6.098 - 0.761	6.515 - 1.000, 8.190 - 1.000
(A) GEAR SPECIFICATION			
NUMBER OF TEETH		26	26
OUTSIDE DIAMETER	(D)	108.1 +0.8 +0.6	110.0
FACE WIDTH	(B)	30.5	30.5
OFFSET	(C)	3	3
PITCH DIAMETER		98.859	98.859
CHORDAL THICKNESS (5 TEETH)		48.763 0 -0.04	49.549 0 -0.04
COEFFICIENT OF PROFILE SHIFT		+0.28628	+0.5798
OVER BALL DIAMETER / PIN DIAMETER		110.018 0 -0.087 / 6.350	113.661 0 -0.080 / 7.000
MODULE		3.5	3.5
PRESSURE ANGLE OF CUTTING TOOL		22° 30'	22° 30'
HELIX ANGLE & DIRECTION		23° RH	23° RH

• Transmission P.T.O. mounting for pneumatic control type

Unit : mm





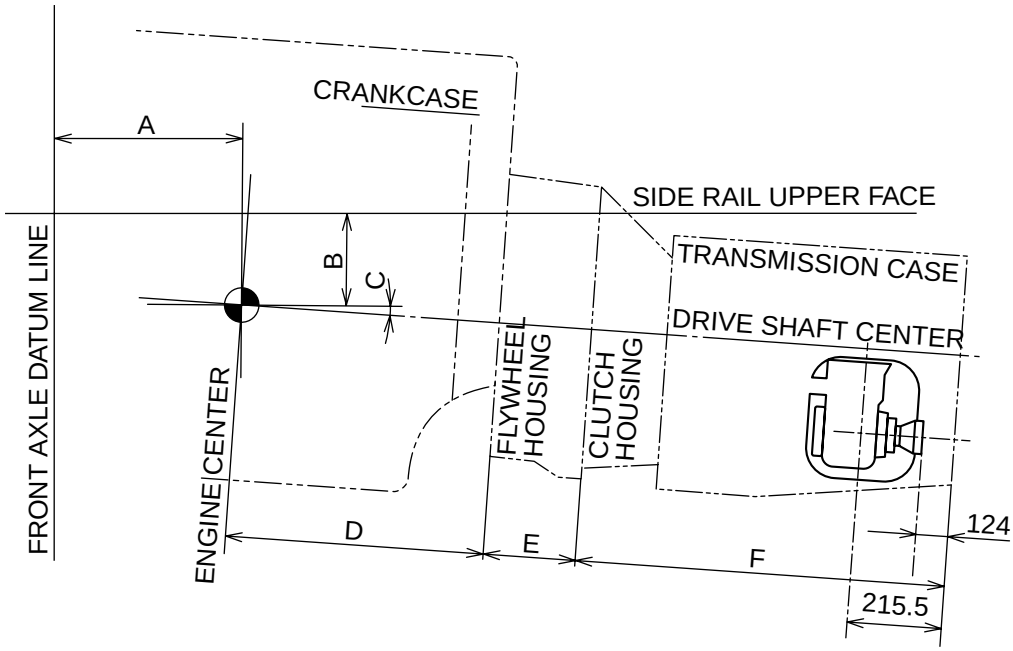
DETAIL OF P.T.O. SHAFT

A (ADAPTOR)		
T/M GEAR RATIO	PARTS No.	t (mm)
6.098 ~ 0.761	S3662-82770	10.19
	S3662-82780	10.07
	S3662-82790	9.97
6.515 ~ 1.000	S3662-82890	8.15
	S3662-82900	8.04
	S3662-82910	7.94
8.190 ~ 1.000	S3662-82740	1.98
	S3662-82750	1.87
	S3662-82760	1.77

NOTE

- The devises on the body or equipment side (e. g. oil pump) must be mounted at the same angle as engine to the body. (Direct mounting the devices to the P.T.O. output flange is strictly prohibited.)
- The three-dimensional angle of the universal joint of the drive shaft must be a Min. 1° to Max. 6°.

• **Layout of power line**



Unit : mm

CHASSIS MODEL	A	B	C	D	E	F
FD7J	402.9	171.3	3.5°	331	173.5	577

[T/M P.T.O. : TP-2]

When the body require transmission Power Take Off (P.T.O.) , genuine P.T.O. equipment and related parts should be supplied as shown below.

• Data of the P.T.O. output shaft

TRANSMISSION SERIES	PERMISSIBLE TORQUE (N·m {kgf·m} at r/min)	P.T.O. CONTROL TYPE	DIRECTION OF ROTATION
LJ06S	245 {25} / 1,000	Pneumatic control	Reverse to engine

• Necessary parts

CLASSIFICATION NUMBER	**FD-027,028**	
TRANSMISSION MODEL	LJ06S	
TRANSMISSION GEAR RATIO		
1ST	6.477	
2ND	4.382	
3RD	2.450	
4TH	1.470	
5TH	1.000	
6TH	0.723	
REV	6.064	
P.T.O. CONTROL TYPE	Pneumatic	
PARTS NAME	Parts No.	Q'ty / unit
POWER TAKE OFF ASSY	36610-E0180	01
POWER TAKE OFF SUB ASSY	36610-E0190	01
SWITCH ASSY, T/M POSITION	S8422-01560	01
ELBOW	SN352-10613	01
JOINT, PIPE	SZ407-13007	01
CLAMP, CONNECTOR	S8258-61060	01
BRACKET, SWITCH	84113-E0210	01
ADAPTER, P.T.O. CASE	S3662-81490	01
	or S3662-81670	01
	or S3662-81680	01
GASKET, P.T.O. CASE	S3663-51370	02
LOCK WASHER	SL512-01030	02
BOLT	SZ101-10165	02
BOLT	SZ119-10105	06

NOTE

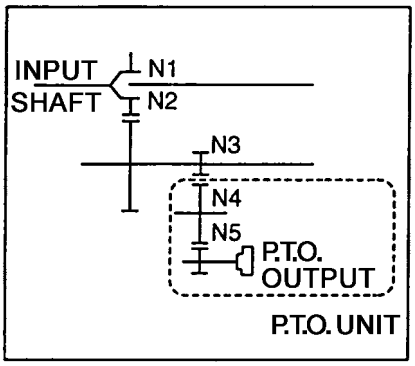
- Parts mentioned above table shows transmission P.T.O. unit only.
- Other related parts of transmission P.T.O. control, please contact each Hino sales dealer.

DETAIL OF P.T.O., TRANSMISSION MODEL HINO LJ06S

• P.T.O. Installation procedure

- Drain the transmission oil.
  (Do not remove the drain plug while the oil is hot, or you will scald yourself.)
- Remove the P.T.O. cover which is at the left of the transmission.
  (Do not reuse the bolts and gasket that you remove at this time.)
- Clean the P.T.O. mounting surface on the transmission side.
- Prepare the necessary parts, referring to table of necessary parts.
- Apply liquid packing to all fitting surfaces, such as the P.T.O. mounting surface of the transmission case and installation gasket, adaptor and P.T.O. body.
- Fit the P.T.O. on the P.T.O. mounting and secure the mounting position by means of the reamer bolts (See the part described with marked "R" in the section "P.T.O. mounting location on transmission case") and tighten the other fitting bolts.Tightening torque for bolts : 61±7 N·m {625±75 kgf·cm}
- After attaching the P.T.O., turn the output shaft coupling a few revolutions to be sure that it turns freely.
- When you refill the transmission oil, increase the amount by 0.5 liters to allow for the P.T.O..

• Gear layout and gear ratio



Gear ratio : i = N2/N1xN4/N3xN5/N4

TRANSMISSION	GEAR RATIO	P.T.O. CONTROL TYPE	N1	N2	N3	N4	N5	i
LJ06S	6.477 ~ 0.723	PNEUMATIC	26	43	36	26	23	1.05

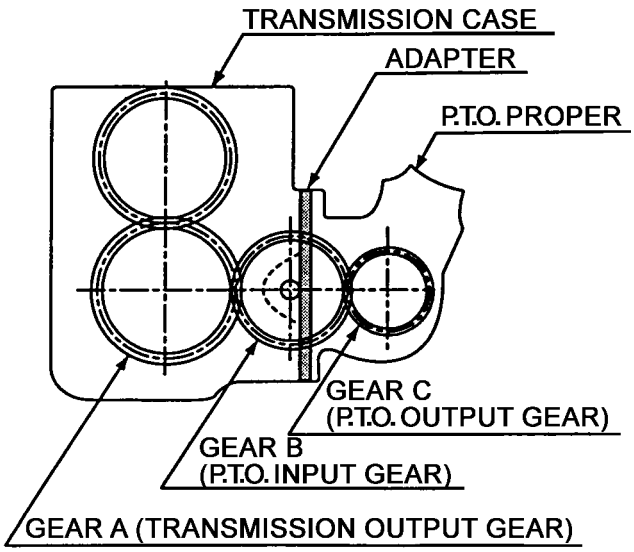
NOTE

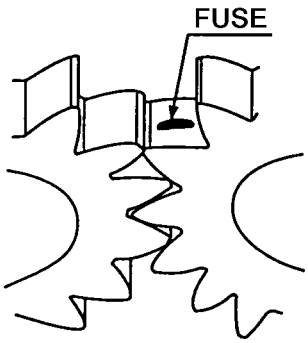
- Number of revolutions of P.T.O. output shaft
  = number of revolutions of engine x1/ i
- The P.T.O. output shaft turns in the opposite direction to the engine.

• How to check the gear backlash

The gear backlash of the P.T.O. is important factor to prolong the P.T.O. gear life. The bigger backlash causes the noise from gears on the contrary the smaller backlash causes the damage of gears. When installing the P.T.O. measure and check the backlash according to the following procedures.

- Measurement of backlash (a) (between gear A and B)
  Attach a fuse (ø1 X 10mm), with grease on the tooth surface of the P.T.O. gear B (3 places of gear tooth).
  After rotating gear B, measure the thickness of crashed fuses with a micro-meter.
- Adjustment of backlash (a) (between gear A and B) When the backlash is not within the following standard backlash adjust the backlash by selecting an appropriate adapter.

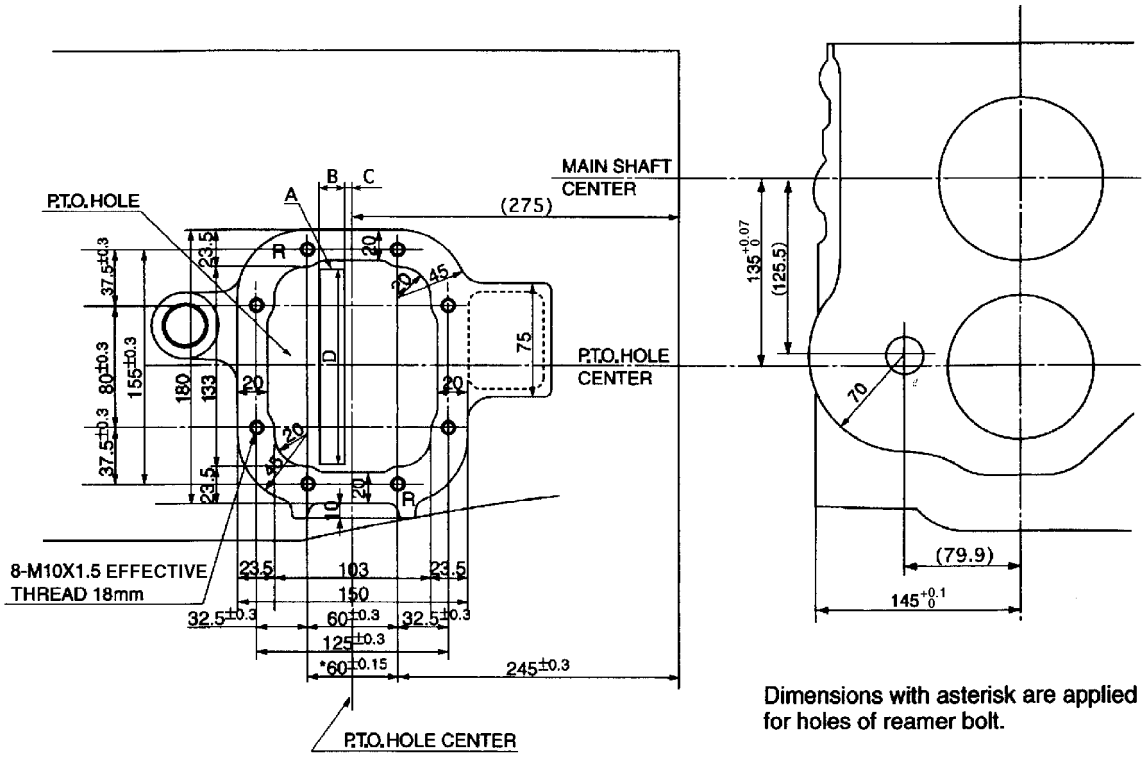




MODEL	GEAR POSITION	STANDARD BACKLASH
LJ	Between gear A and gear B (a)	0.09 ~ 0.25mm
	Between gear B and gear C (b)	0.09 ~ 0.27mm

If specified gear backlash value cannot be obtained, check whether all the parts have been installed correctly.
If the specified gear backlash value cannot be obtained despite correct installation, use another P.T.O. assembly.

• P.T.O. Mounting location on transmission case



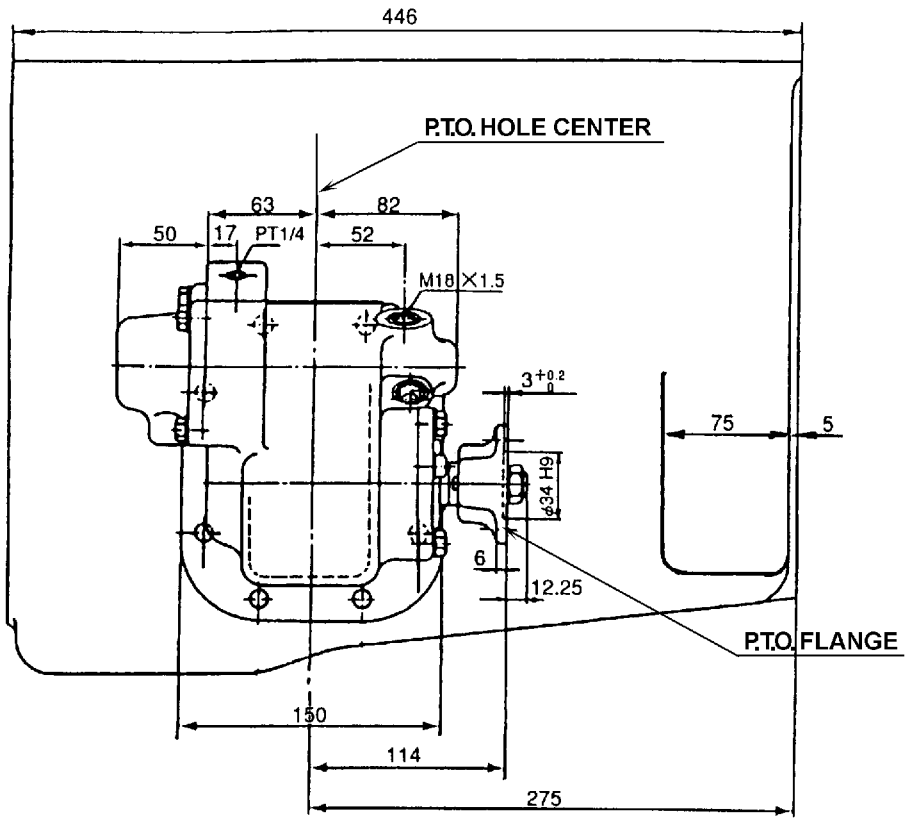
Dimensions with asterisk are applied for holes of reamer bolt.

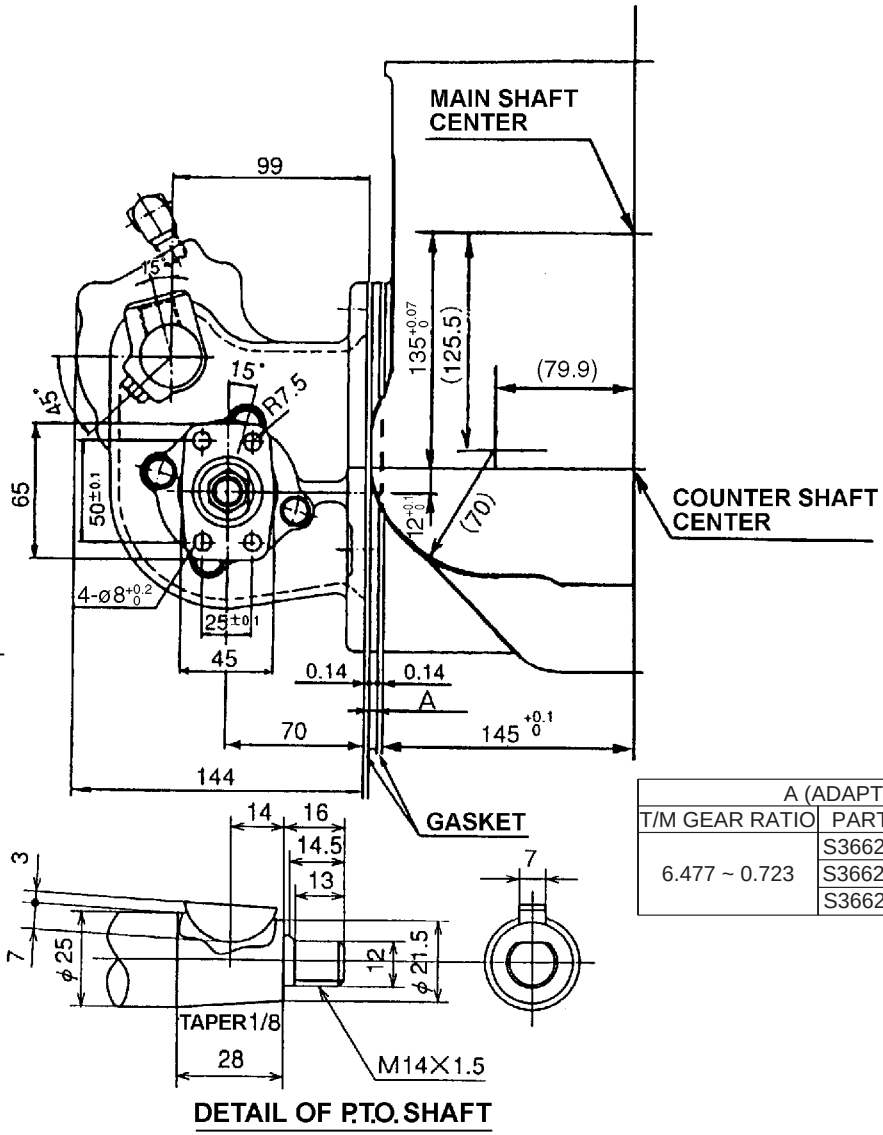
TRANSMISSION CASE (SIDE VIEW) (REAR VIEW)

TRANSMISSION MODEL		LJ06S
T/M GEAR RATIO		6.477 - 0.723
(A) GEAR SPECIFICATION		
NUMBER OF TEETH		36
OUTSIDE DIAMETER	(D)	150.6 +0.8 +0.6
FACE WIDTH	(B)	27.0
OFFSET	(C)	6.5
PITCH DIAMETER		142.704
CHORDAL THICKNESS (5 TEETH)		49.550 0 -0.04
COEFFICIENT OF PROFILE SHIFT		+0.10787
OVER BALL DIAMETER / PIN DIAMETER		151.726 - 0 0.096 / 6.000
MODULE		3.5
PRESSURE ANGLE OF CUTTING TOOL		22° 30'
HELIX ANGLE & DIRECTION		28° RH

• Transmission P.T.O. mounting for pneumatic control type

Unit : mm



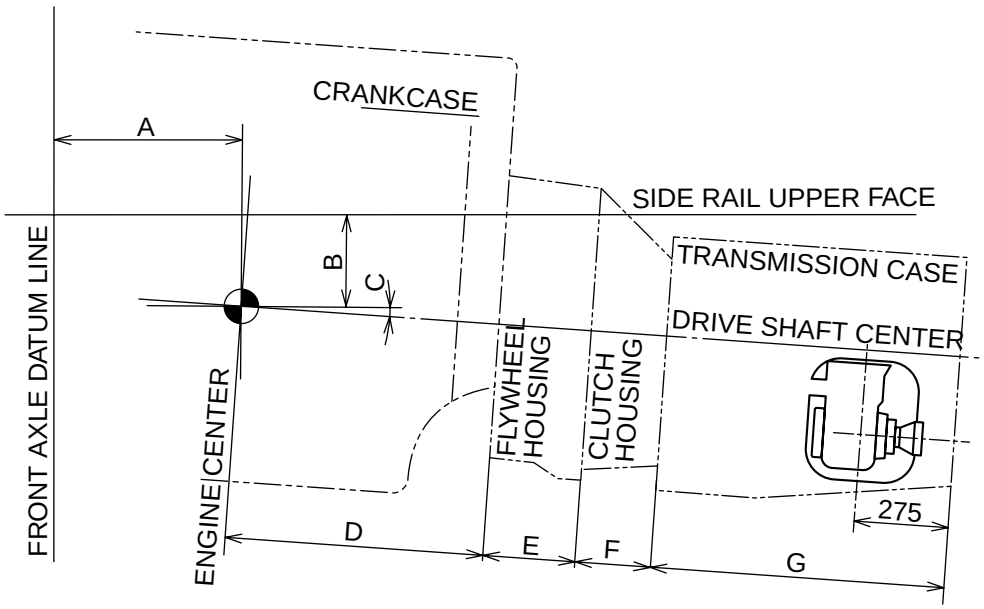


A (ADAPTOR)		
T/M GEAR RATIO	PARTS No.	t (mm)
6.477 ~ 0.723	S3662-81490	6.12
	S3662-81670	5.99
	S3662-81680	5.86

NOTE

- The devises on the body or equipment side (e. g. oil pump) must be mounted at the same angle as engine to the body. (Direct mounting the devices to the P.T.O. output flange is strictly prohibited.)
- The three-dimensional angle of the universal joint of the drive shaft must be a Min. 1° to Max. 6°.

• **Layout of power line**



Unit : mm

CHASSIS MODEL	A	B	C	D	E	F	G
FD7J	402.9	171.3	3.5º	331	173.5	108	446

[T/M P.T.O. : TP-3]

When the body require transmission Power Take Off (P.T.O.) , genuine P.T.O. equipment and related parts should be supplied as shown below.

• Data of the P.T.O. output shaft

TRANSMISSION SERIES	PERMISSIBLE TORQUE (N·m {kgf·m} at r/min)	P.T.O. CONTROL TYPE	DIRECTION OF ROTATION
MF06S	245 {25} / 1,000	Pneumatic control	Reverse to engine

• Necessary parts

CLASSIFICATION NUMBER			
TRANSMISSION MODEL	MF06S		
TRANSMISSION GEAR RATIO			
1ST	8.189	7.395	
2ND	5.340	4.758	
3RD	3.076	3.076	
4TH	1.936	1.936	
5TH	1.341	1.341	
6TH	1.000	1.000	
REV	7.142	7.142	
P.T.O. CONTROL TYPE	Pneumatic		
PARTS NAME	Parts No.		Q'ty / unit
POWER TAKE OFF ASSY	S3661-05311		01
SWITCH ASSY, T/M POSITION	S8422-01560		01
ELBOW	SZ407-14002		01
CONNECTOR	SZ404-14005		01
GASKET, P.T.O. CASE	S3663-51030		01
BOLT	SZ101-10151		02
LOCKWASHER	SL511-01025		03
BOLT	SH782-01030		05
STUD	SJ182-01022		01
NUT	SL110-01008		01
BRACKET, ELEC. PARTS	S5591-24450		01

NOTE

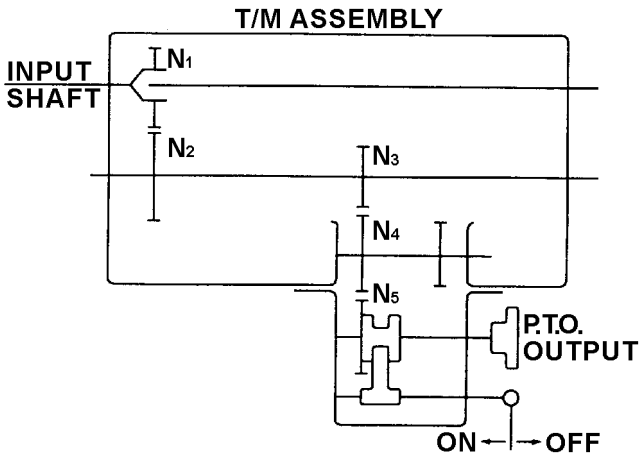
- Parts mentioned above table shows transmission P.T.O. unit only.
- Other related parts of transmission P.T.O. control, please contact each Hino sales dealer.

DETAIL OF P.T.O., TRANSMISSION MODEL HINO MF06S

• P.T.O. Installation procedure

- Drain the transmission oil.
  (Do not remove the drain plug while the oil is hot, or you will scald yourself.)
- Remove the P.T.O. cover which is at the left of the transmission.
  (Do not reuse the bolts and gasket that you remove at this time.)
- Clean the P.T.O. mounting surface on the transmission side.
- Prepare the necessary parts, referring to table of necessary parts.
- Apply liquid packing to all fitting surfaces, such as the P.T.O. mounting surface of the transmission case, installation gasket and P.T.O. body.
- Fit the P.T.O. on the P.T.O. mounting and secure the mounting position by means of the reamer bolts (See the part described with marked "R" in the section "P.T.O. mounting location on transmission case") and tighten the other fitting bolts.Tightening torque for bolts : 49±4.9 N·m {500±50 kgf·cm}
- After attaching the P.T.O., turn the output shaft coupling a few revolutions to be sure that it turns freely.
- When you refill the transmission oil, increase the amount by 0.3 liters to allow for the P.T.O..

• Gear layout and gear ratio



Gear ratio : i = N2/N1xN4/N3xN5/N4

TRANSMISSION	N1	N2	N3	N4	N5	N6	i
MF06S	22	47	21	29	12	—	1.220

NOTE

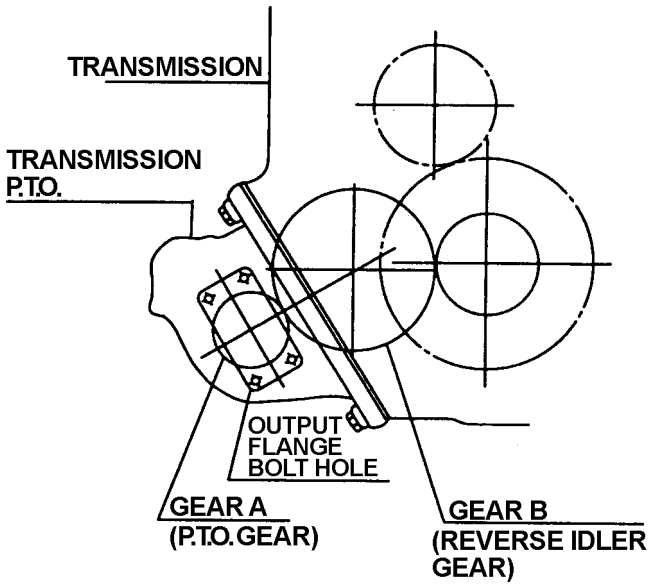
- Number of revolutions of P.T.O. output shaft
  = number of revolutions of engine x1/ i
- The P.T.O. output shaft turns in the opposite direction to the engine.

• How to check the gear backlash

The gear backlash of the P.T.O. is important factor to prolong the P.T.O. gear life. The bigger backlash causes the noise from gears on the contrary the smaller backlash causes the damage of gears. When installing the P.T.O. measure and check the backlash according to the following procedures.

• Measuring the backlash at the output flange

- Measure the free play of the P.T.O. gear (gear A; the transmission P.T.O. unit gear) and the shaft spline. Fix the P.T.O. gear so that it will not turn when the P.T.O. is on, and use a dial gauge or similar to measure the change in position of one of the output flange bolt holes. This value is a_1.
- Fix the reverse idler gear (gear B) such that it will not turn, and attach the P.T.O. to the transmission. With the P.T.O. on, use a dial gauge or similar to measure the change in position of one of the output flange bolt holes. This value is a_2.
- Calculate the backlash using the formula below:

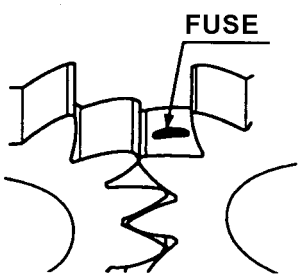


Unit: mm

	FORMULA
STD	$(a_2 - a_1) \times 1.080$

• Measuring the backlash caused with a fuse

Use grease to paste a fuse (ø1X10mm) to the surface of a tooth of P.T.O. gear B. Make the teeth interlock over the fuse, then measure the thickness of the crushed fuse with a micrometer (at three points on the perimeter). This value is the backlash.



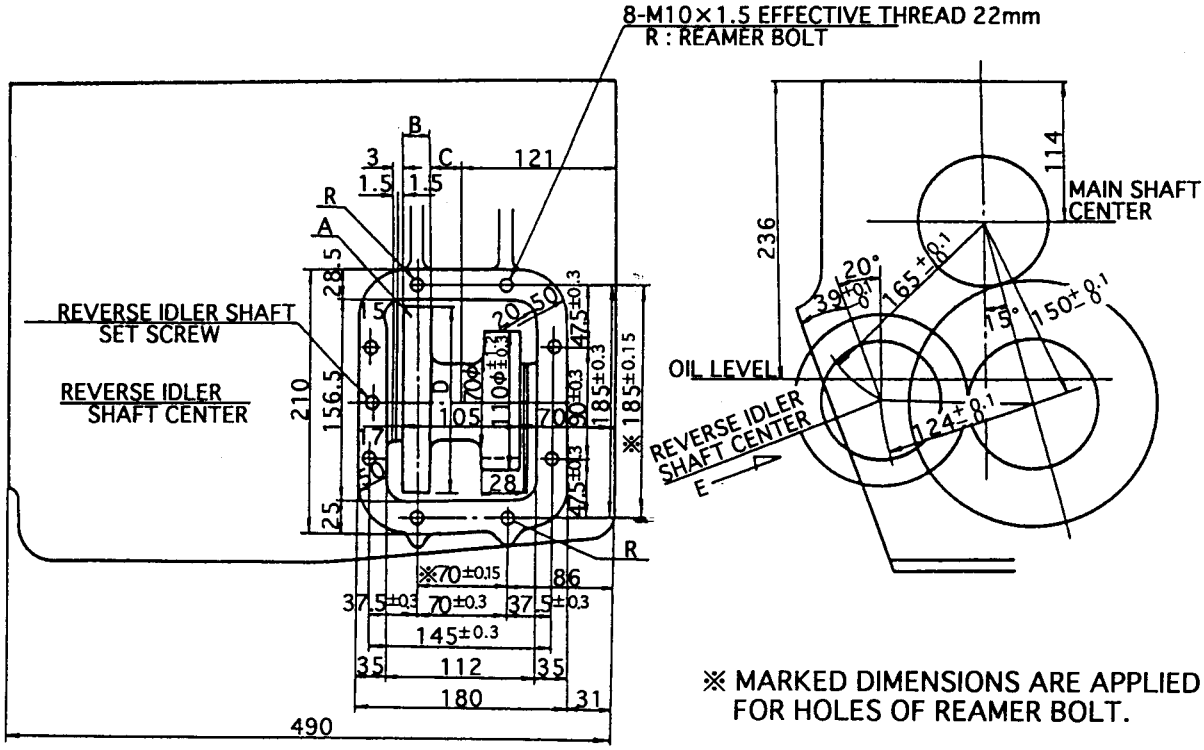
Unit: mm

	STANDARD BACKLASH VALUE
STD	0.07 - 0.20

If specified gear backlash value cannot be obtained, check whether all the parts have been installed correctly. If the specified gear backlash value cannot be obtained despite correct installation, use another P.T.O. assembly.

• P.T.O. Mounting location on transmission case

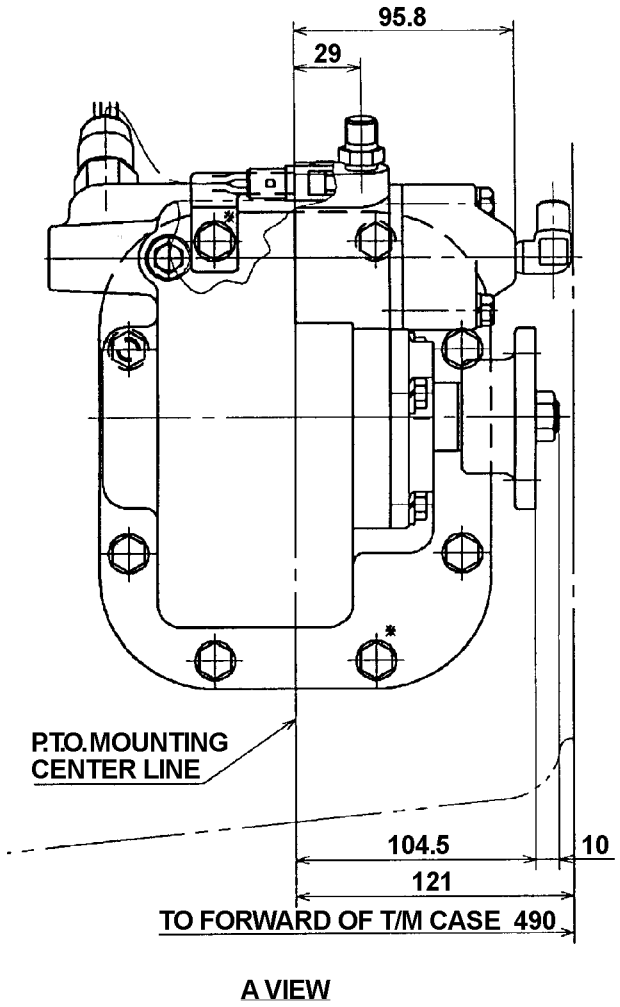
Unit : mm



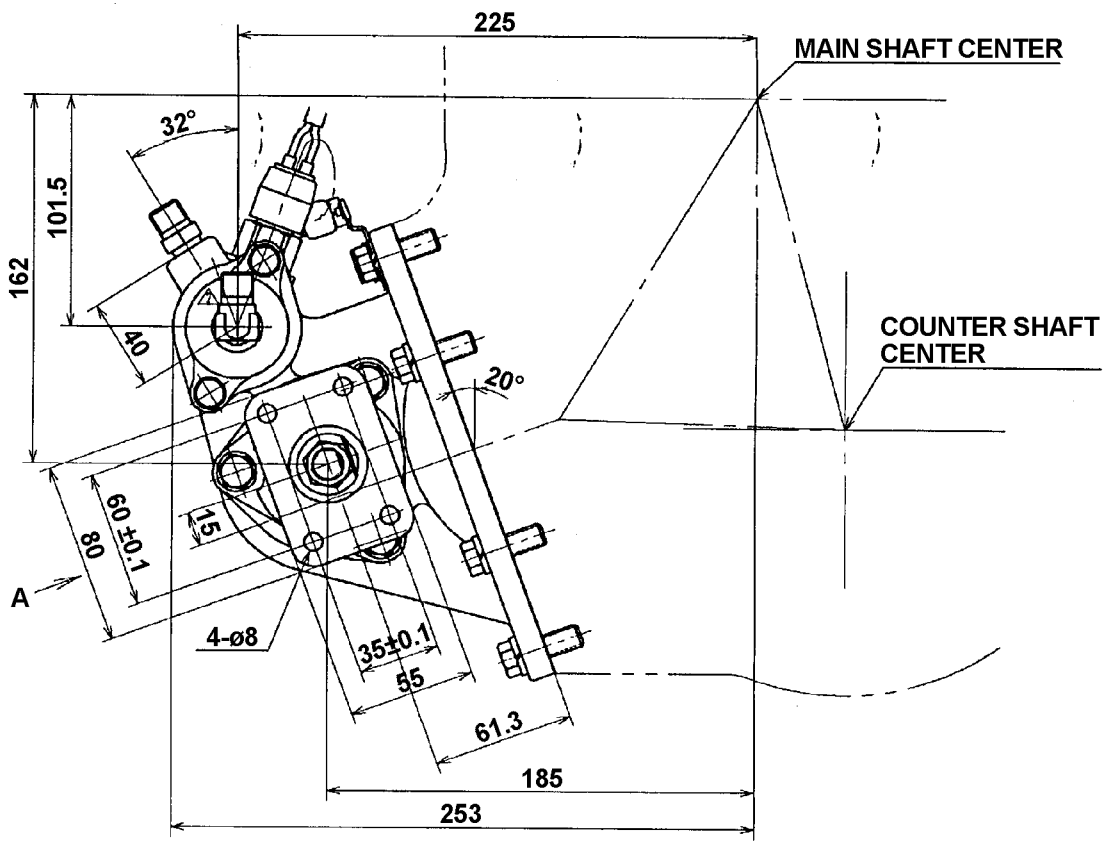
TRANSMISSION MODEL		MF06S
T/M GEAR RATIO		8.189 - 1.000 / 7.395 - 1.000
(A) GEAR SPECIFICATION		
NUMBER OF TEETH		29
OUTSIDE DIAMETER	(D)	$150.6\ ^{+1.2}_{+0.8}$
FACE WIDTH	(B)	27.0
OFFSET	(C)	23.7
PITCH DIAMETER		145
CHORDAL THICKNESS / TEETH		$37.457\ ^{0}_{-0.032}$ / 3
COEFFICIENT OF PROFILE SHIFT		+0.4313
OVER BALL DIAMETER / PIN DIAMETER		$153.151\ ^{0}_{-0.096}$ / 8.731
MODULE		5.0
PRESSURE ANGLE OF CUTTING TOOL		20°
HELIX ANGLE & DIRECTION		—

- **Transmission P.T.O. mounting for pneumatic control type**

Unit : mm



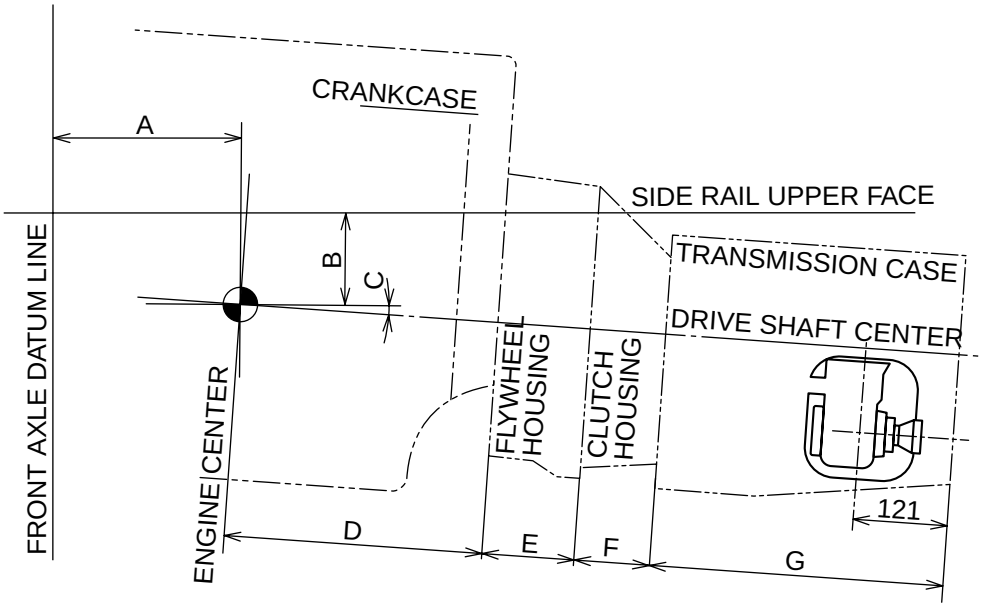
A VIEW



NOTE

- The devises on the body or equipment side (e. g. oil pump) must be mounted at the same angle as engine to the body. (Direct mounting the devices to the P.T.O. output flange is strictly prohibited.)
- The three-dimensional angle of the universal joint of the drive shaft must be a Min. 1° to Max. 6°.

• **Layout of power line**



Unit : mm

CHASSIS MODEL	A	B	C	D	E	F	G
FG8J	290	187.6	3.5º	394	173.5	136	490
GH8J	270	187.6	3.5º	394	173.5	136	490

[T/M P.T.O. : TP-4]

Do not provide transmission Power Take Off (P.T.O.) as option equipment, consult with authorized Hino distributor when the mounted body require transmission P.T.O..

• Data of the P.T.O. output shaft

TRANSMISSION SERIES	PERMISSIBLE TORQUE (N·m {kgf·m} at r/min)	P.T.O. CONTROL TYPE	DIRECTION OF ROTATION
HK06S	——— (245 {25} / 1,000) (CAPACITY OF OUTPUT GEAR OF T/M.)	———	———

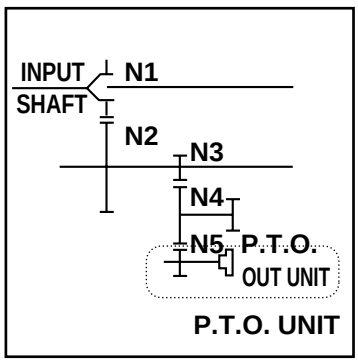
• Necessary parts

TRANSMISSION MODEL	HK06S	
TRANSMISSION GEAR RATIO		
1ST	7.028	
2ND	4.389	
3RD	2.495	
4TH	1.592	
5TH	1.000	
6TH	0.743	
REV	6.987	
PARTS NAME	Parts No.	Q'ty / unit
POWER TAKE OFF ASSY	– – –	—
Power take off sub assy	– – –	—
Knob sub assy,shift	– – –	—
Cap, shift lever	– – –	—
Booster assy, T/M	– – –	—
Gasket, P.T.O. case	– – –	—

• P.T.O. Installation procedure

- Remove the drain plug to drain transmission oil.
  (Do not remove the drain plug while the oil is hot, as you may be burned.)
  Remove the P.T.O. cover which is at the left of the transmission.
  Do not reuse bolts and gasket that you remove at this time.
  Clean the P.T.O. mounting surface on the transmission side.
- Prepare the necessary parts.
- Insert reamer bolts on the P.T.O. mounting surface of the transmission.
  (see part marked "R" In the section "P.T.O. mounting location on transmission case")
- Apply liquid packing to all fitting surfaces, such as the P.T.O. mounting surface of the transmission case and installation gasket, shim and P.T.O. body.
- Tightening torque for bolts : 44.1 ~ 53.9 N·m {450 ~ 550 kgf·cm}
- After attaching the P.T.O., turn the output shaft coupling a few revolutions to be sure that it turns freely.
- When you refill the transmission with oil, increase the amount by 0.5 liters,to allow for the P.T.O..

• Gear layout and gear ratio



Gear ratio : i = N2/N1xN4/N3xN5/N4

TRANSMISSION	N1	N2	N3	N4	N5	N6	i
HK06S	24	43	20	30	—	—	—

NOTE

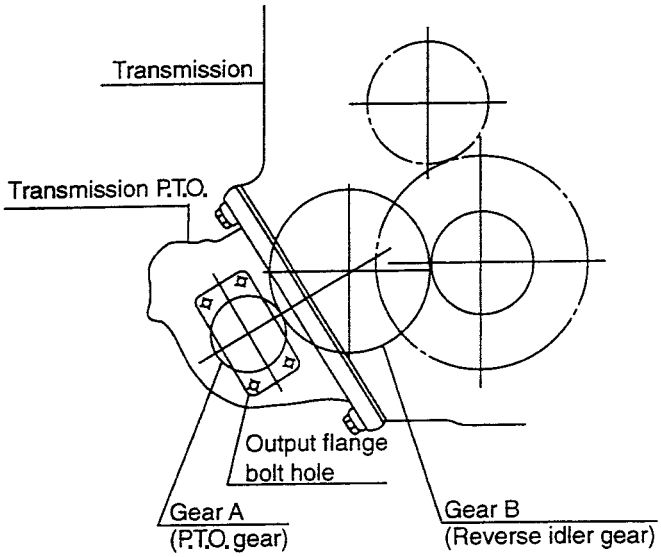
- Number of revolutions of P.T.O. output shaft
  = number of revolutions of engine x1/ i
- The P.T.O. output shaft turns in the opposite direction to the engine.

• How to check the gear backlash

The gear backlash of the P.T.O. is important factor to prolong the P.T.O. gear life. The bigger backlash causes the noise from gear, on the contrary the smaller backlash causes the damage of gear. When installing the P.T.O., measure and check the backlash according to the following procedures.

• Measuring the backlash at the output flange

- Measure the free play of the P.T.O. gear (gear A; the transmission P.T.O. unit gear) and the shaft spline. Fix the P.T.O. gear so that it will not turn when the P.T.O. is on, and use a dial gauge or similar to measure the change in position of one of the output flange bolt holes. The value is a_1.
- Fix the reverse idler gear (gear B) such that it will not turn, and attach the P.T.O. to the transmission. With the P.T.O. on, use a dial gauge or similar to measure the change in position of the output flange bolt holes. This value is a_2.
- Calculate the backlash using the formula below:



Unit: mm

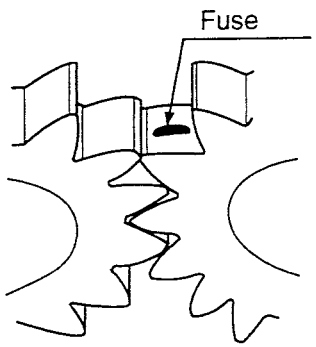
Formula
$(a_2 - a_1) \times 1.152$

• Measuring the backlash caused with a fuse

Use grease to paste a fuse (ø1 x 10 mm) to the surface of a tooth of P.T.O. gear B. Make the teeth interlock over the fuse, then measure the thickness of the crushed fuse with a micrometer (at three points on the perimeter). This value is the backlash

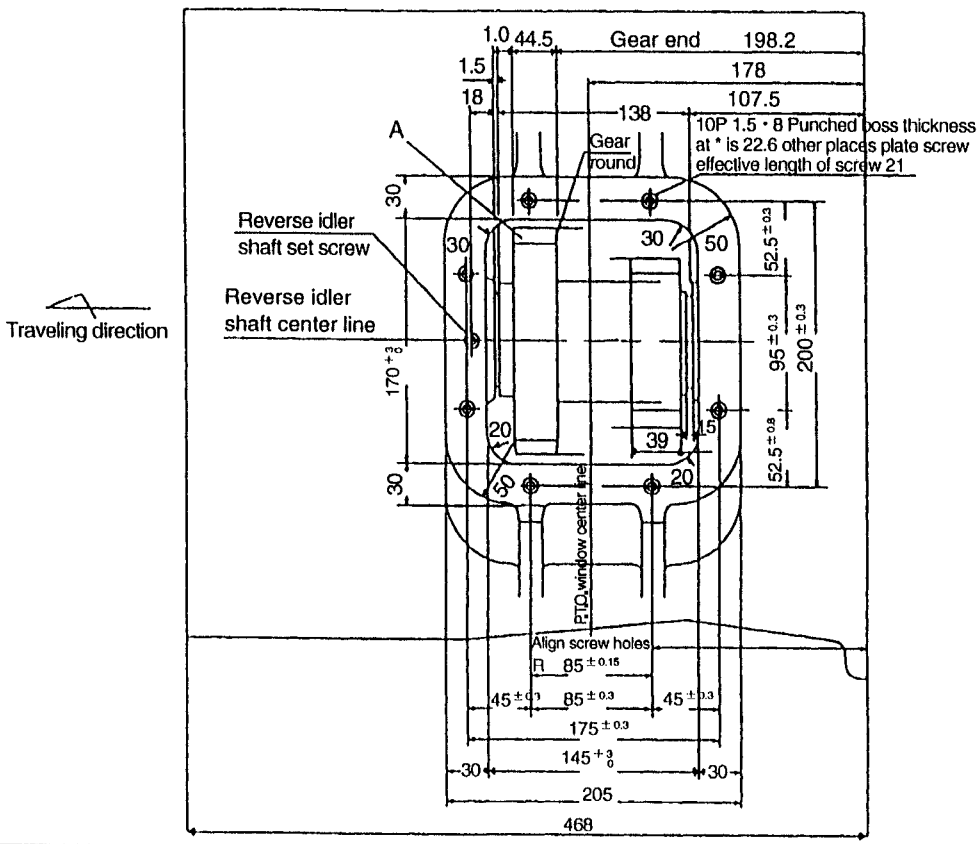
Unit: mm

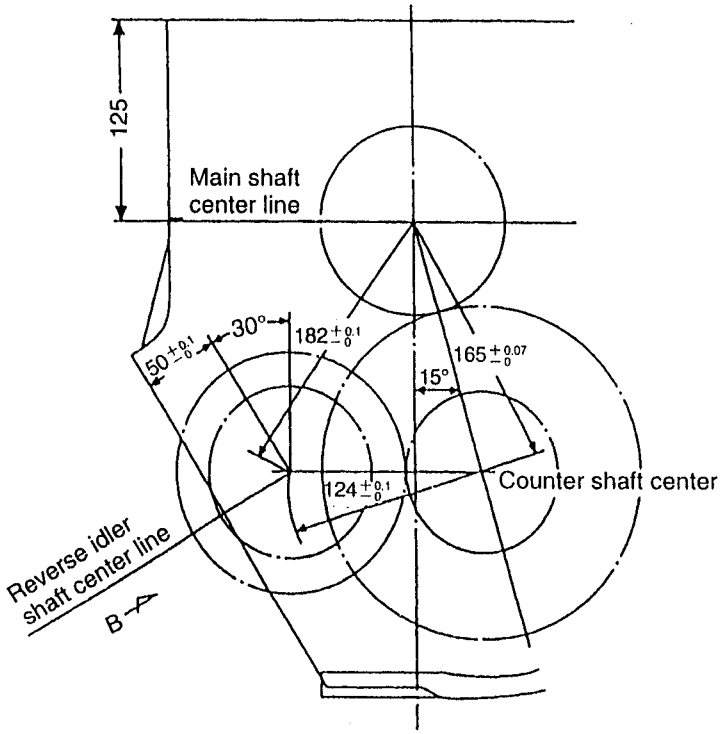
Standard backlash value
0.15 - 0.36



• P.T.O. mounting location of transmission case

Unit : mm



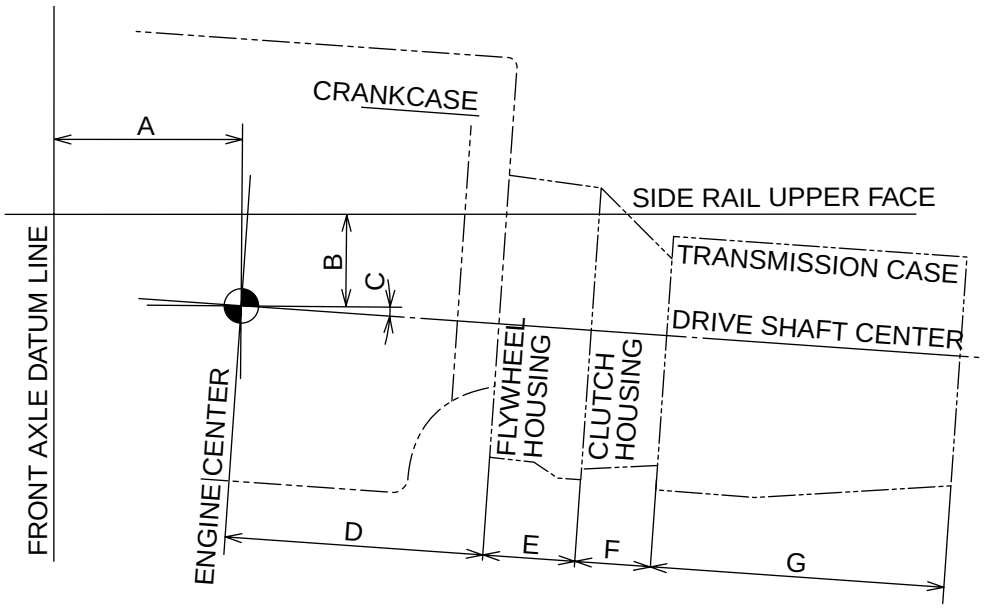


A dimension of toothed gear			
Tooth profile	Spur	Pitch diameter	150
Module cutting tool	5.0	Outside diameter	156.3 ‡ 0.7 0.3
Pressure angle of cutting teeth	22° 30'	Chordal thickness (4 teeth)	52.32 − 0 0.04/4
Number of teeth	30		
Helix angle	0°	Profile of cutting tool	Involute
Coefficient of profile shift	— 0.38		
Face width	44.5		

NOTES

- Hold the reverse idler adjust screw using a power take-off to avoid it coming loose.
- Change HINO recommended gear oil to set level.
- Use reamer bolts at all points embossed with "R".

• **Layout of power line**



Unit : mm

CHASSIS MODEL	A	B	C	D	E	F	G
FM1A	270	217.6	3.5º	438.5	197.5	147.5	468

[T/M P.T.O. : TP-5]

Do not provide transmission Power Take Off (P.T.O.) as option equipment, consult with authorized Hino distributor when the mounted body require transmission P.T.O..

• Data of the P.T.O. output shaft

TRANSMISSION SERIES	PERMISSIBLE OUTPUT TORQUE
EATON RT-8908LL RTO-11909ALL	IN ACCORDANCE WITH SAE STD HEAVY DUTY P.T.O.

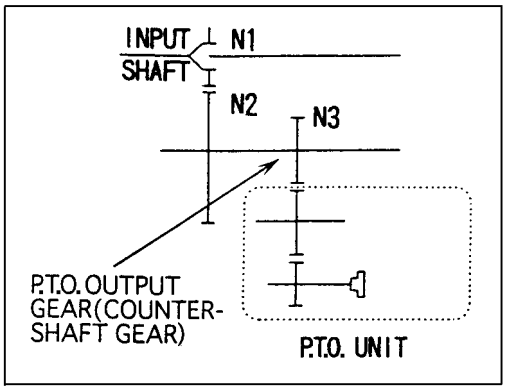
• Necessary parts

TRANSMISSION MODEL / TRANSMISSION GEAR RATIO	EATON RT-8908LL	EATON RTO-11909ALL
LL1	–	26.078
Lo	–	16.299
LL2	–	11.853
1ST	19.577	7.408
2ND	12.668	5.234
3RD	8.390	3.794
4TH	6.229	2.770
5TH	4.578	1.952
6TH	3.404	1.379
7TH	2.464	1.000
8TH	1.829	0.730
9TH	1.344	–
10TH	1.000	–
LL Rev.	20.467	20.848
Low Rev.	13.243	13.030
high Rev.	3.889	3.434

PARTS NAME	Parts No.	Q'ty / unit
POWER TAKE OFF ASSY	NIL (IN ACCORDANCE WITH SAE STD HEAVY DUTY P.T.O.)	
SWITCH ASSY, T/M POSITUION		
ELBOW		
CONNECTOR		
GASKET, P.T.O. CASE		
BOLT		
LOCK WASHER		
BOLT		
STUD		
NUT		
BRACKET, ELEC. PARTS		

DETAIL OF P.T.O., TRANSMISSION MODEL EATON RT-8908LL / RTO-11909ALL

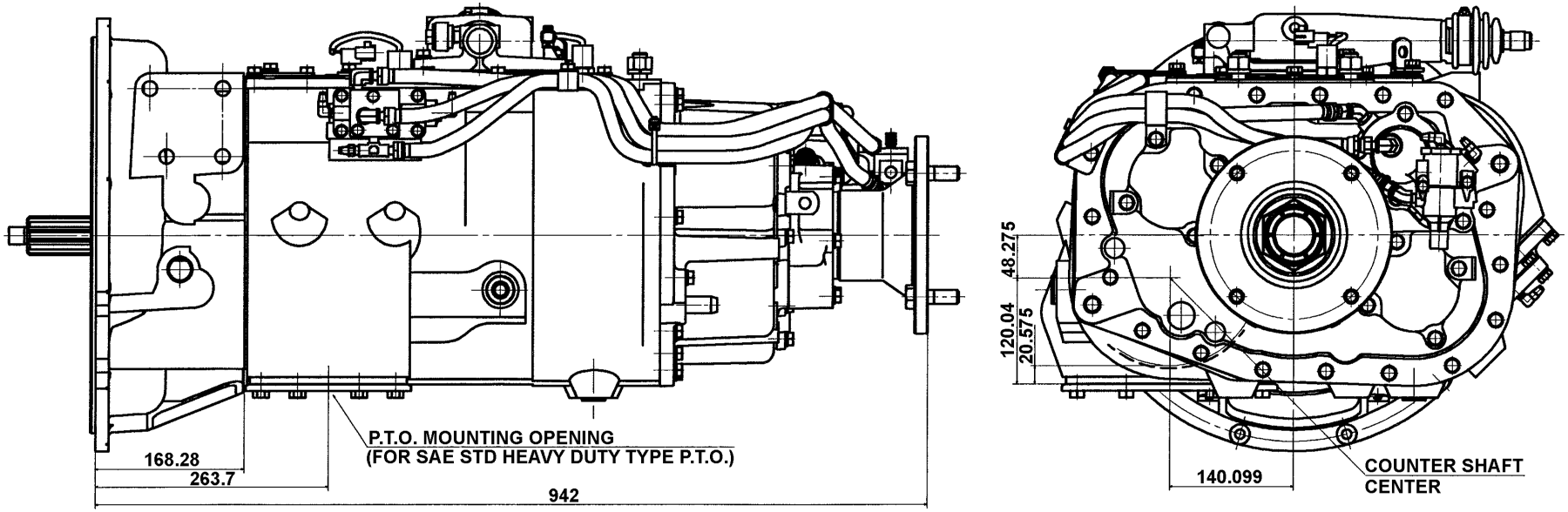
• **Gear layout and gear ratio**



NO. OF GEAR / TRANSMISSION	N1	N2	N3
EATON RT-8908LL RTO-11909ALL	48	69	47

• P.T.O. mounting location on transmission case

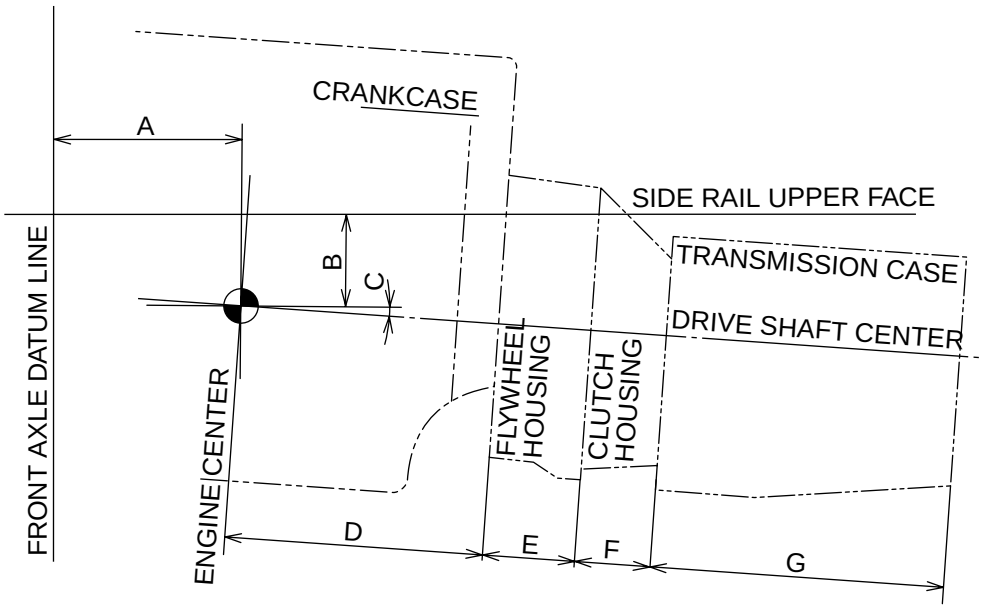
Unit : mm



NOTE

- Gear data and backlash are specified by gear box manufacturer.
- More detail information if needed, please contact with "EATON CORPORATION (TRANSMISSION DIVISION)".

• **Layout of power line**



Unit : mm

CHASSIS MODEL	A	B	C	D	E	F	G
FM8J FM1A	270	217.6	3.5º	394	173.5	168.28	470.22

[T/M P.T.O. : TP-6]

When the body require transmission Power Take Off (P.T.O.), genuine P.T.O. equipment and related parts should be supplied as shown below.

This vehicle is mounted the ZF 9S109 transmission.
Therefore, consult with the technical staff of ZF authorized dealer in your country if need more detail information and data concerning ZF transmission and P.T.O..

• Data of the P.T.O. output shaft

TRANSMISSION SERIES	PERMISSIBLE TORQUE (N·m {kgf·m})	P.T.O. CONTROL TYPE	DIRECTION OF ROTATION
ZF 9S109	800 {81.5}	Pneumatic control	Reverse to engine

• Necessary parts

TRANSMISSION MODEL	ZF 9S109	
TRANSMISSION GEAR RATIO		
CRAWLER GERA	10.245	
1ST	6.573	
2ND	4.775	
3RD	3.529	
4TH	2.610	
5TH	1.862	
6TH	1.353	
7TH	1.000	
8TH	0.739	
REV.	9.436	
P.T.O. CONTROL TYPE	Pneumatic	
PARTS NAME	Parts No.	Q'ty / unit
POWER TAKE OFF ASSY (T/M ASSY W/P.T.O.)	S3307-03492	01

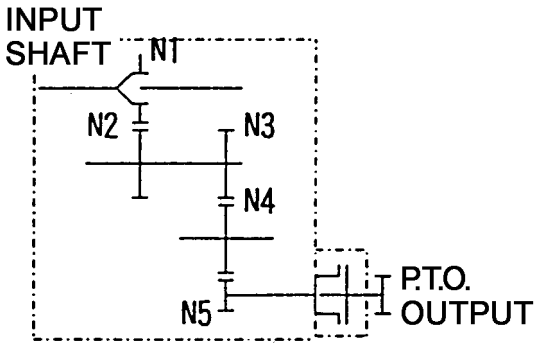
NOTE

- Parts mentioned above table shows transmission P.T.O. unit only.
- Other related parts of transmission P.T.O. control, please contact each Hino sales dealer.

• P.T.O. Installation procedure

- P.T.O. units is installed in place of the rear end plate of the layshaft.
  The adapter shaft required for driving the P.T.O. is engaged with the reverse intermediate gear of the main gearbox. The adapter shaft is included in the P.T.O. delivery specification.
- When installing the P.T.O., it is important to ensure that the temperature of the gearbox oil is not greatly affected by ambient conditions on the vehicle (e. g. exhaust pipe etc.). Check the oil temperature and if necessary provide forced cooling(e.g.a fan) so that an operating temperature of 110ºC is not exceeded. Brief temperature peaks of up to 130ºC are permissible(lasting not more than 30 minutes).

• Gear layout and gear ratio



Gear ratio : i = N2/N1xN4/N3xN5/N4

TRANSMISSION	N1	N2	N3	N4	N5	N6	i
ZF 9S109	27	33	16	22	17	—	1.298

NOTES

- Number of revolutions of P.T.O. output shaft
  = number of revolutions of engine x1/ i
- The P.T.O. output shaft turns in the opposite direction to the

• Technical data of P.T.O.

Model			NH/1
Output-torque	Continuous operation	[Nm]	800
Input			Layshaft
Output speed for transmission ratio 9S109 10.24-0.74			Speed factor f 0.77
Direction of output rotation			Reverse to engine
Required air pressure for pneumatic engagement		[bar]	6.2 to max. 10.0bar
Weight		[kg]	3 - 5
Gravity torque		[kg]	50

Output power

The permissible output power depends on permissible output torque and output speed. It is calculated by the following formula :

$$P_{perm.} = \frac{\text{perm. output torque X } n_{output}}{9552} \text{ [kw]}$$

Speed

$$n_{output} = f \text{ X } n_{engine} \text{ [rpm]}$$

Output torque

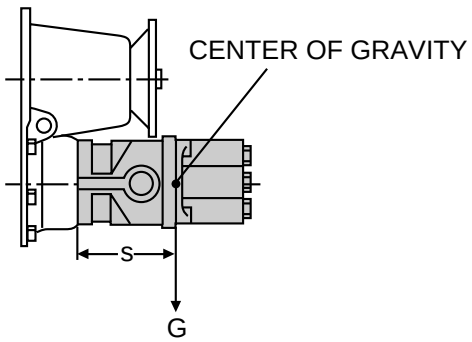
$$T = \frac{15.92 \text{ X } Q \text{ X } p}{n \text{ X } \eta} \text{ [Nm]}$$

or

$$T = \frac{9552 \text{ X } P_{perm.}}{n} \text{ [Nm]}$$

Perm. pump gravity torque

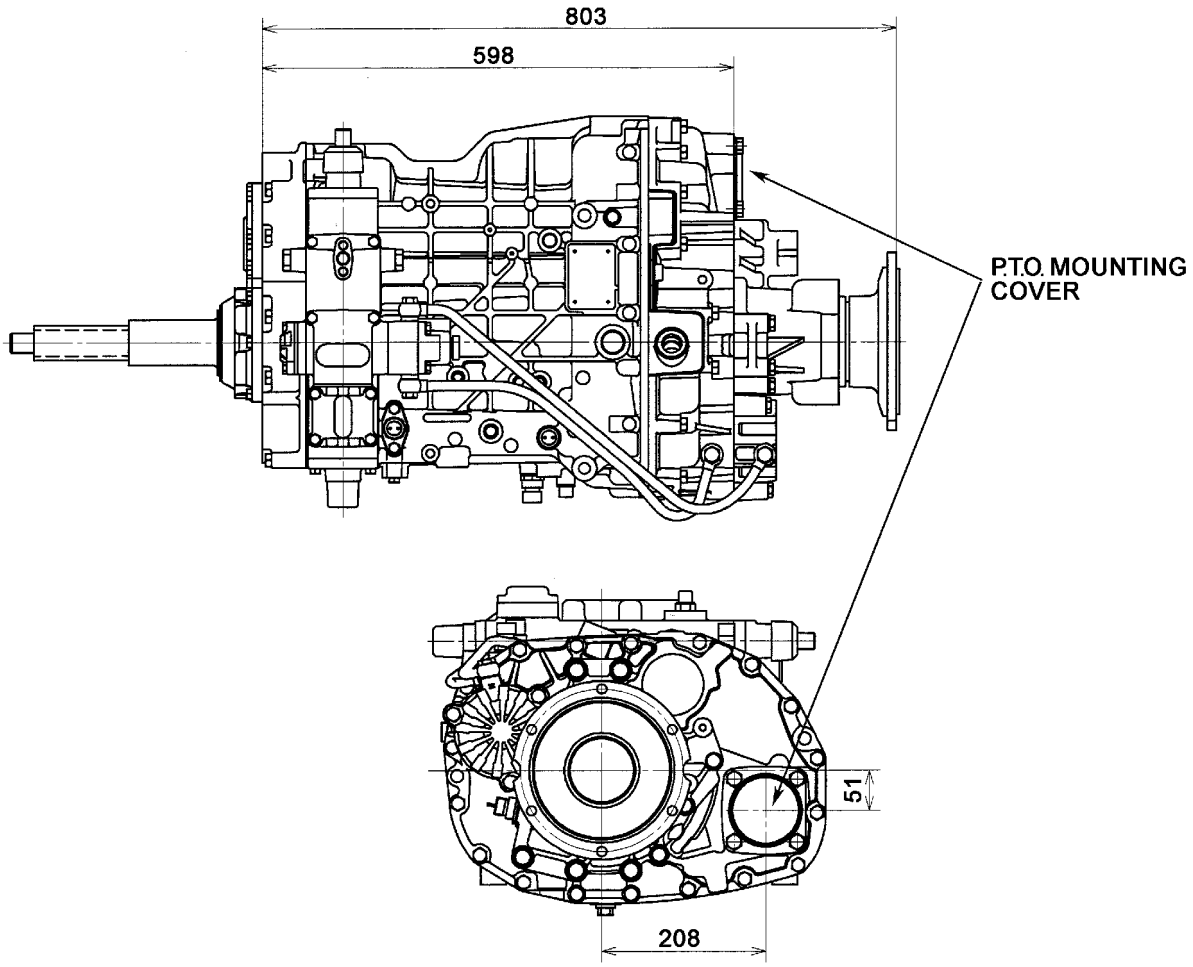
$$M_{perm.} = s \text{ X } G \text{ [Nm]}$$

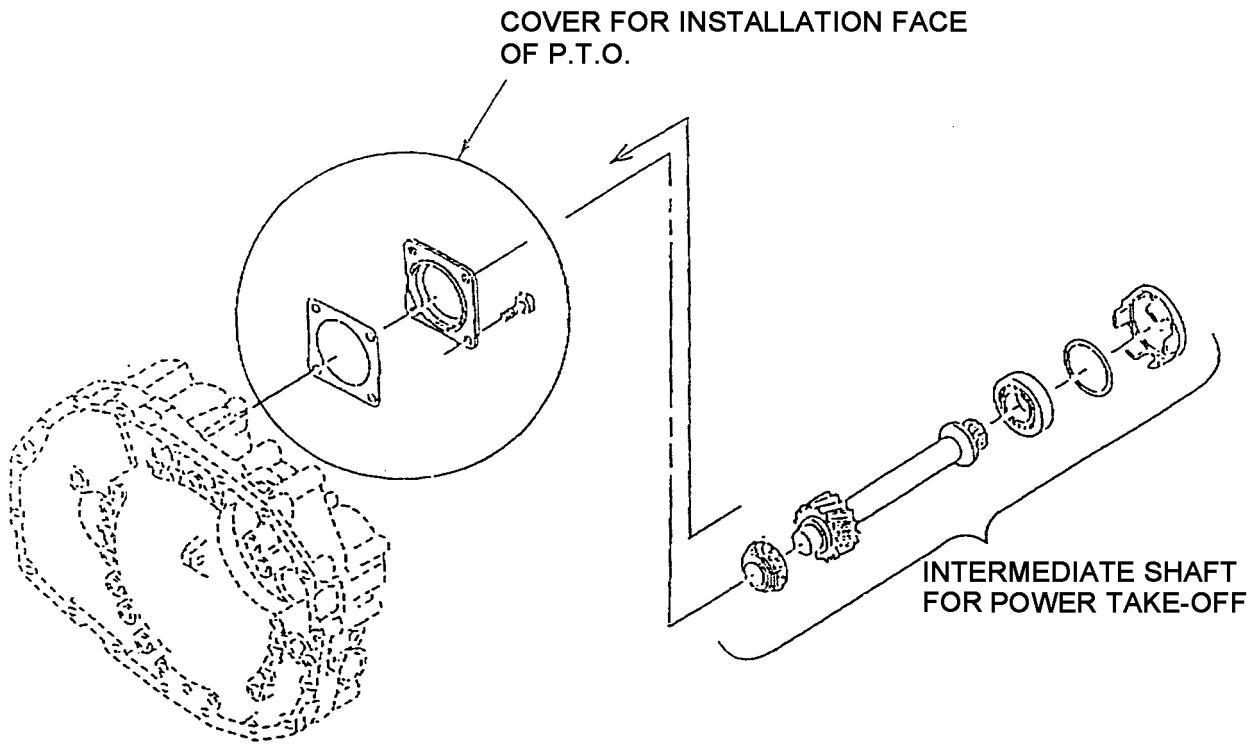


P.T.O. calculation

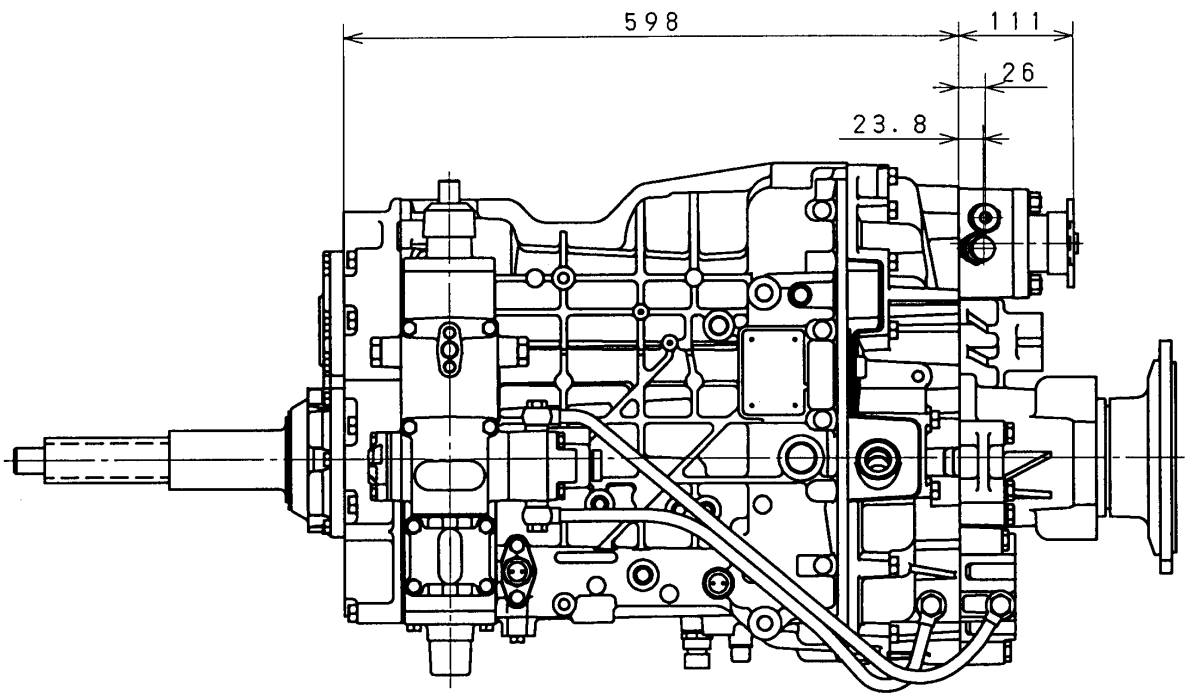
P =	Power	[kw]
T =	Torque	[Nm]
n =	Speed	[rpm]
Q =	Delivery volume	[l]
p =	Pressure	[bar]
f =	Speed factor	
M =	Gravity torque	[Nm]
s =	Distance between the center of gravity of the flange mounting face	[m]
G =	Pump weight	[kg]
η =	Efficiency	

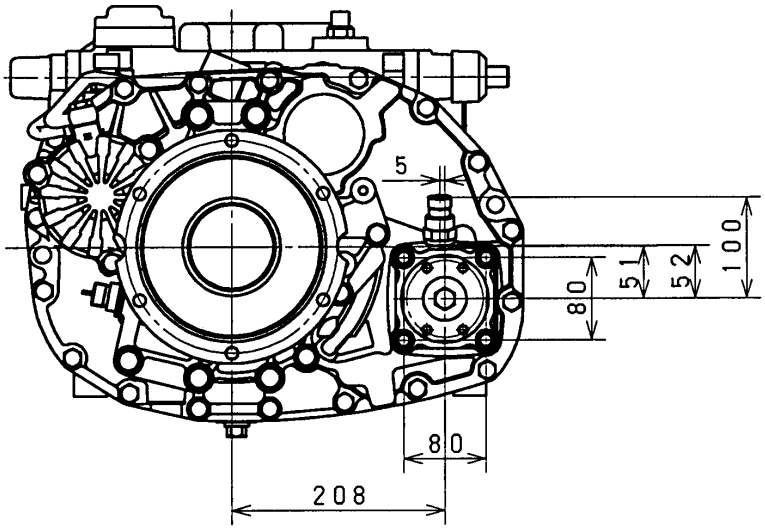
• **P.T.O. Mounting location of transmission case**

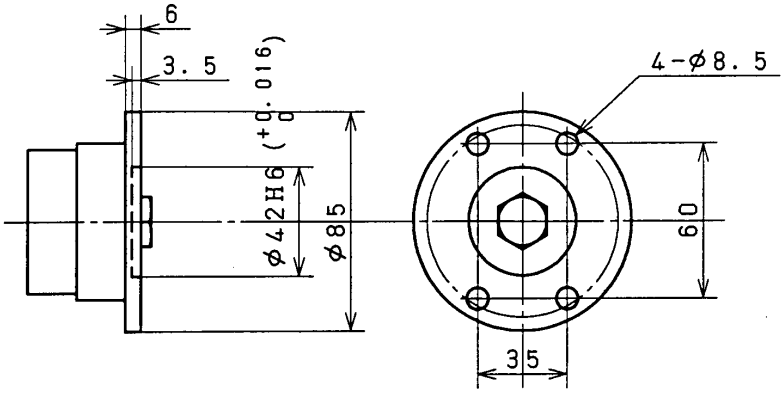




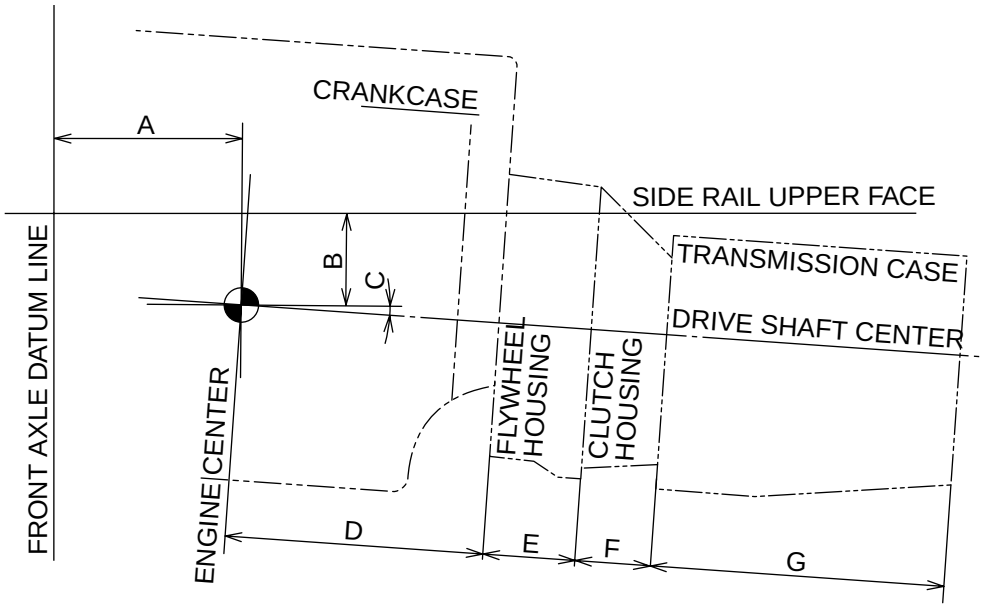
• **P.T.O. Mounting on transmission case**







• **Layout of power line**



Unit : mm

CHASSIS MODEL	A	B	C	D	E	F	G
FM1A	270	217.6	3.5º	438.5	138	216	598

[T/M P.T.O. : TP-7]

When the body require transmission Power Take Off (P.T.O.) , genuine P.T.O. equipment and related parts should be supplied as shown below.

• Data of the P.T.O. output shaft

TRANSMISSION SERIES	PERMISSIBLE TORQUE (N·m {kgf·m} at r/min)	P.T.O. CONTROL TYPE	DIRECTION OF ROTATION
EATON FS-6109A	235 {24} / 1,000	Pneumatic control	Same to engine

• Necessary parts

TRANSMISSION MODEL	EATON FS-6109A	
TRANSMISSION GEAR RATIO		
LOW 1ST 2ND 3RD 4TH 5TH 6TH 7TH 8TH REV	12.637 8.806 6.550 4.768 3.548 2.481 1.845 1.343 1.000 13.210	
P.T.O. CONTROL TYPE	Pneumatic	
PARTS NAME	Parts No.	Q'ty / unit
POWER TAKE OFF ASSY	S3661-05900	01
ADAPTER, SUB ASSY	S3190-61230	01
HARNESS SUB ASSY, TRANSMISSION	S8206-51121	01
BRACKET, ELEC. PARTS	S5591-23920	01
ELBOW	SZ407-10059	01
CONNECTOR	SZ404-14004	01

NOTE

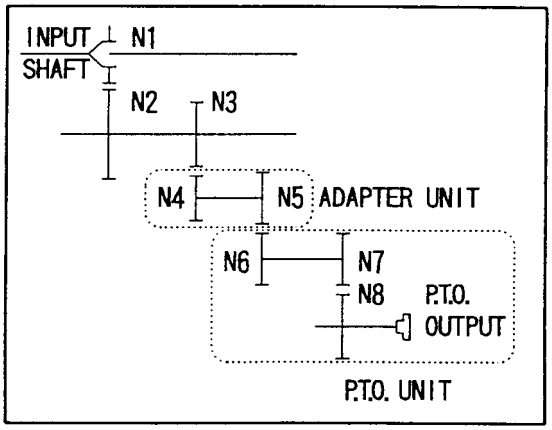
- Parts mentioned above table shows transmission P.T.O. unit only.
- Other related parts of transmission P.T.O. control, please contact each Hino sales dealer.

DETAIL OF P.T.O. TRANSMISSION MODEL EATON FS-6109A

• P.T.O. Installation procedure

- Remove the drain plug to the transmission oil.
  (Do not remove the drain plug while the oil is hot, or you maybe burned.)
  Remove the P.T.O. cover which is at the left forward of the transmission. Do not reuse the bolts and gasket that you remove at this time.
  Clean the P.T.O. mounting surface on the transmission side.
- Prepare the necessary parts, referring to table of last page.
- Tighten the elbow and connector to the P.T.O., after binding up a sealing tape at 1.5 to 2 times on the taper thread and make sure air do not leak from the taper thread. (When binding up a sealing tape on the taper thread, two thread from top of screw should not be binded and bind up counter direction of the taper thread. And also make sure a foreign material do not came into joint and control cylinder.)
- Installation angle of the elbow should be adjusted the tightening direction of the taper thread.
- Adjust the backlash of each gears, between transmission counter shaft gear and adapter gear, adapter gear and P.T.O. gear as described with paragraph "How to check the gear backlash".
- Apply liquid packing to all fitting surfaces, such as the P.T.O. mounting surface of the transmission case, adapter and P.T.O. body. (Do not apply liquid packing between contact surface of each other of the gasket.)
- Install the adapter with proper bolts (furnished with adapter) in the P.T.O. aperture of the transmission case and the P.T.O. with proper studs and nuts (furnished with P.T.O.) in the adapter.
- Tightening torque of bolt : 40 - 47 N·m {414 - 484 kgf·cm}
- Tightening torque of stud and nut : 48 - 54 N·m {490 - 551 kgf·cm}
- After attaching the P.T.O., turn the output shaft coupling a few revolutions to be sure that it turns freely.
- When you refill the transmission with oil, increase the amount by 0.5 liters, to allow for the P.T.O.. And check the oil level of the transmission case with filler plug of main case.
- More detail information if needed, please contact with "DANA CORPORATION".

• **Gear layout and gear ratio**



Gear ratio : i = N2/N1xN4/N3xN6/N5xN8/N7

TRANSMISSION	N1	N2	N3	N4	N5	N6	N7	N8	i
EATON FS-6109A	33	43	32	18	24	22	21	37	1.183

NOTES

- Number of revolutions of P.T.O. output shaft
  = number of revolutions of engine x1/ i
- The P.T.O. output shaft turns in the opposite direction to the engine.

• How to check the gear backlash

The gear backlash of the P.T.O. is important factor to prolong the P.T.O. gear life. The bigger backlash causes the noise from gears, on the contrary the smaller backlash causes the damage of gears. When installing the P.T.O. measure and check the backlash according to the following procedures.

- Remove the P.T.O. shaft housing and/or inspection plate.
- Mount the dial indicator so that it registers movement of the input gear (driven gear) of the P.T.O.. (See Fig. 1.)

NOTES

- See figure 2 for proper location of dial indicator contact point. (Two common type dial indicators shown.)

- Hold the P.T.O. driver gear in transmission with a screwdriver or bar and rock the P.T.O. input gear (driven gear) back and forth with your hand. Note the total movement on the dial indicator.
- Establish backlash at 0.15mm - 0.30mm by adding or subtracting gaskets. General rule -- A CHELSEA'S 0.25mm gasket will change backlash approx. 0.15mm, a 0.51mm gasket changes backlash approx. 0.30mm.
- Replace the shift housing and/or inspection plate and retorque four capscrews to 22 - 27 N·m {221 - 276 kgf·cm}.
- Use same procedure for mounting the adapter and checking backlash as was used when mounting the P.T.O. to transmission as described above.

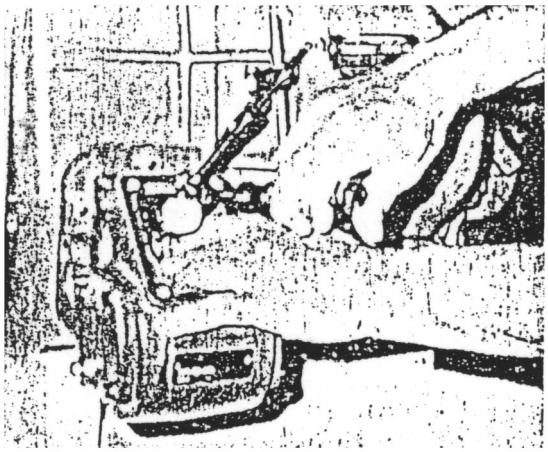


FIG.1

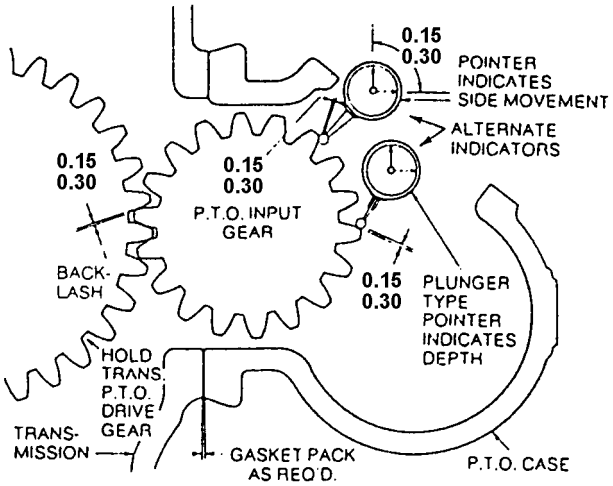


FIG.2

• Pouring gear oil

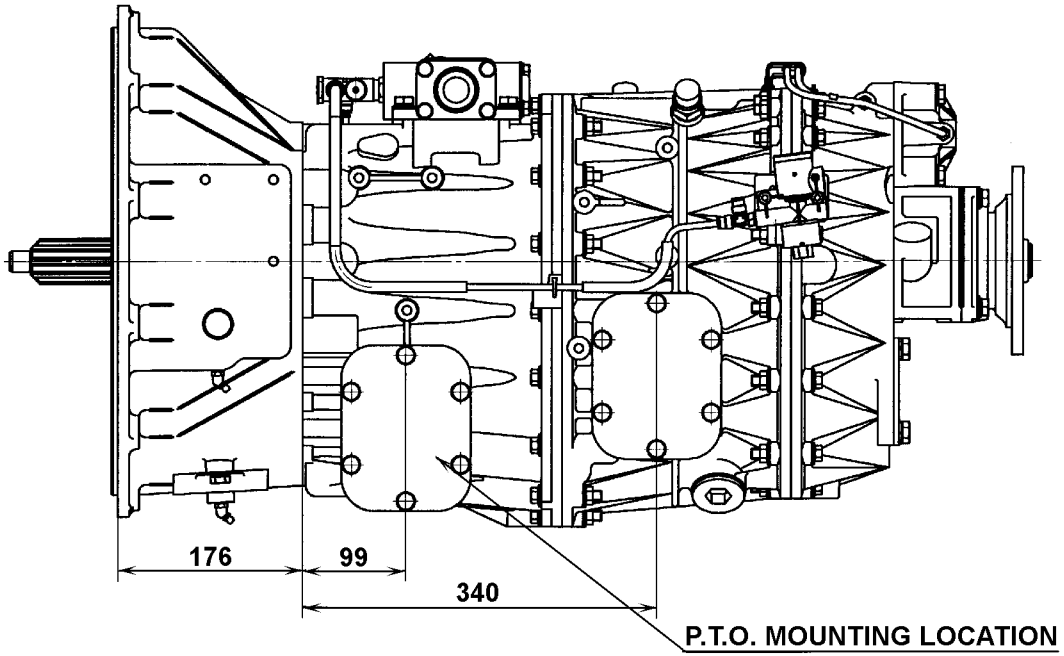
When pouring gear oil into the transmission, add more oil (0.5L) for the lubrication of P.T.O. gears.

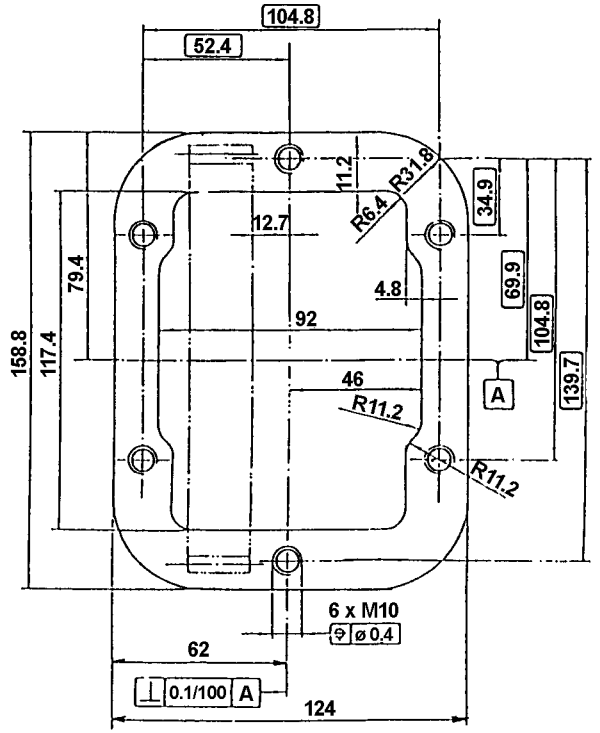
• Other notices

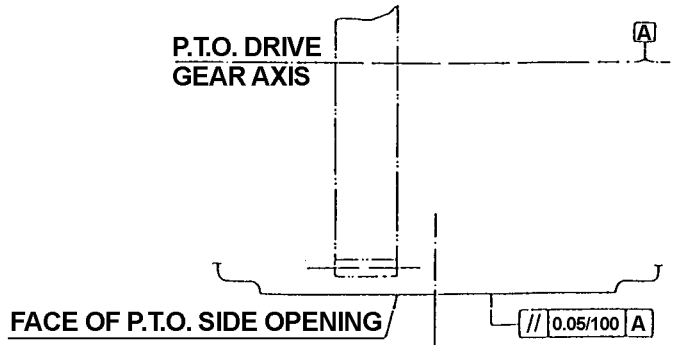
After finishing P.T.O. installation, check whether the output shaft can be smoothly rotated when P.T.O. is in the neutral position.

• P.T.O. mounting location on transmission case

Unit : mm





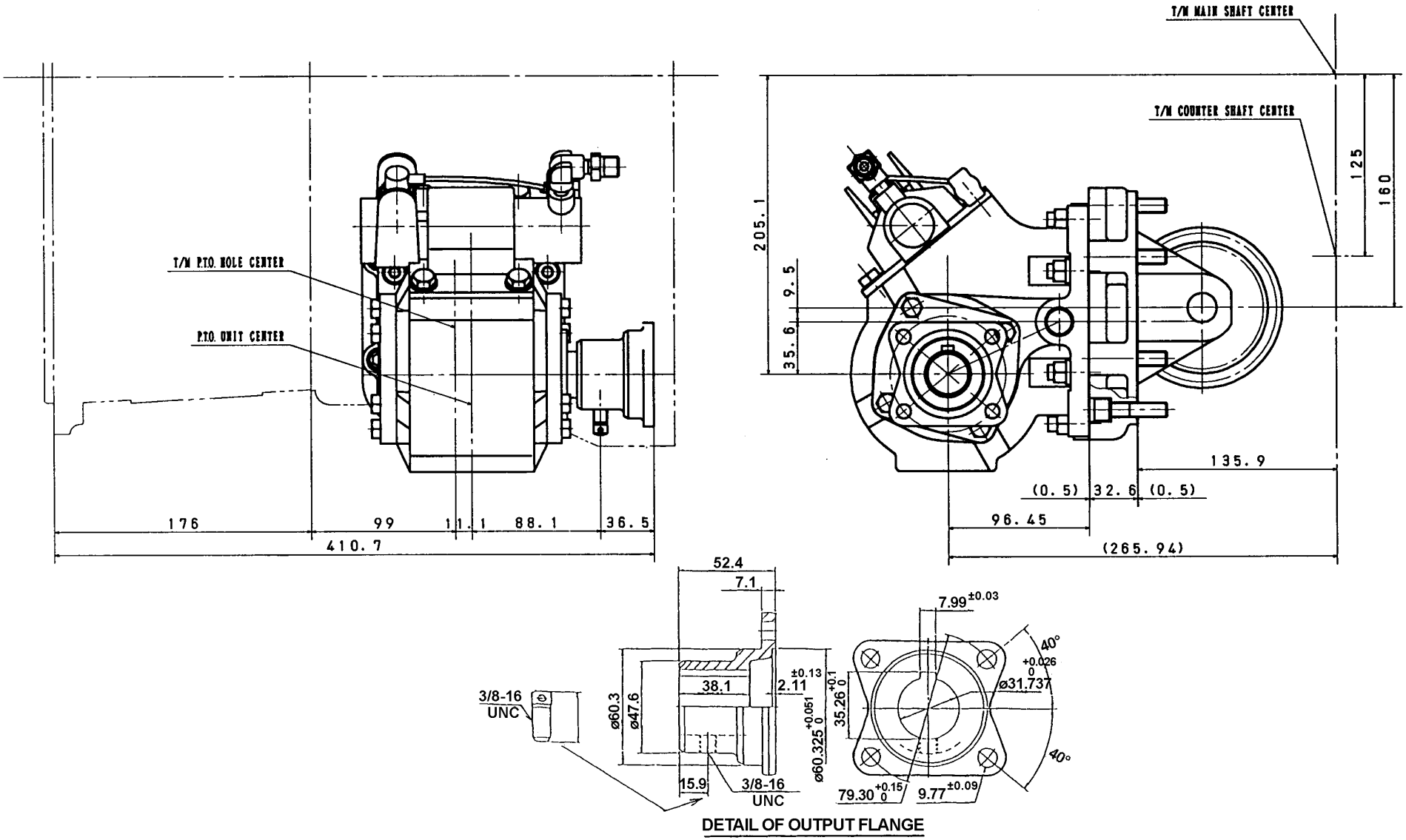


NOTE

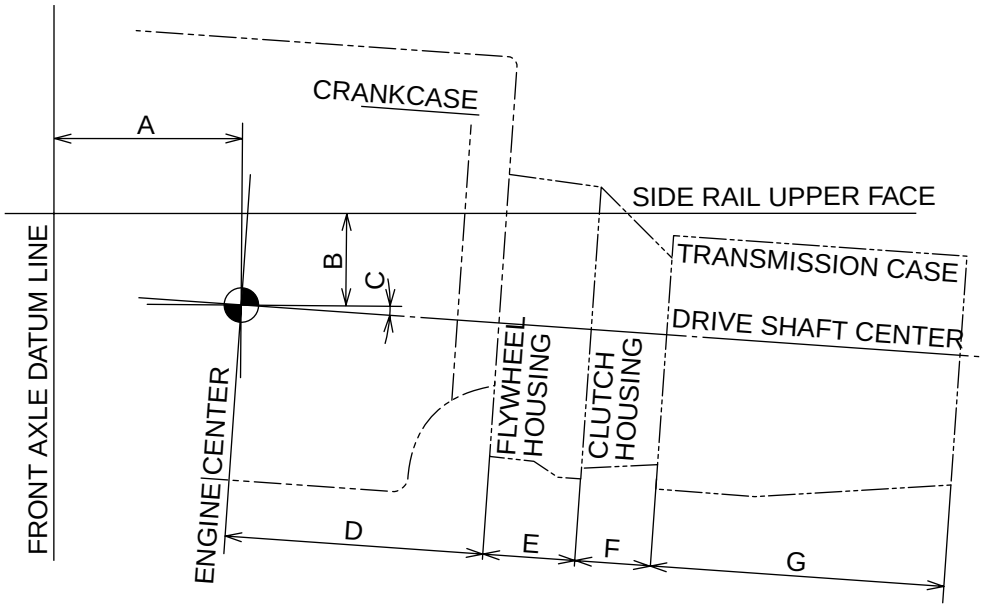
• Gear data and backlash are specified by gear box manufacturer.

• Transmission P.T.O. mounting

Unit : mm



• **Layout of power line**



Unit : mm

CHASSIS MODEL	A	B	C	D	E	F	G
FG8J	290	187.6	3.5º	394	173.5	176	567
GH8J	270	187.6	3.5º	394	173.5	176	567

[T/M P.T.O. : TP-8]

When the body require transmission Power Take Off (P.T.O.) , genuine P.T.O. equipment and related parts should be supplied as shown below.

• Data of the P.T.O. output shaft

TRANSMISSION SERIES	PERMISSIBLE TORQUE (N·m {kgf·m} at r/min)	P.T.O. CONTROL TYPE	DIRECTION OF ROTATION
EATON FS-8209BBE	235 {24} / 1,000	Pneumatic control	Same to engine

• Necessary parts

TRANSMISSION MODEL	EATON FS-8209BBE	
TRANSMISSION GEAR RATIO		
LOW 1ST 2ND 3RD 4TH 5TH 6TH 7TH 8TH REV	12.637 8.806 6.550 4.768 3.548 2.481 1.845 1.343 1.000 13.210	
P.T.O. CONTROL TYPE	Pneumatic	
PARTS NAME	Parts No.	Q'ty / unit
POWER TAKE OFF ASSY	S3661-05900	01
ADAPTER, SUB ASSY	S3190-61230	01
HARNESS SUB ASSY, TRANSMISSION	S8206-51121	01
BRACKET, ELEC. PARTS	S5591-23920	01
ELBOW	SZ407-10059	01
CONNECTOR	SZ404-14004	01

NOTE

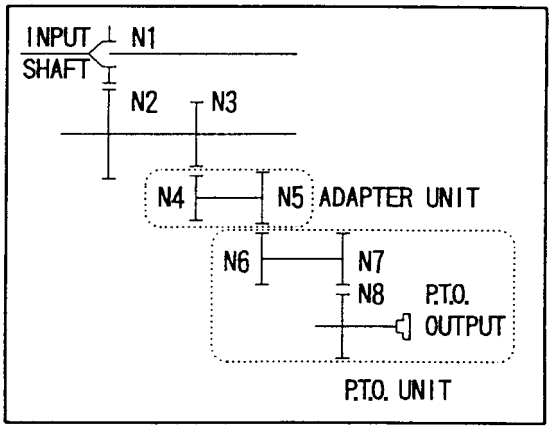
- Parts mentioned above table shows transmission P.T.O. unit only.
- Other related parts of transmission P.T.O. control, please contact each Hino sales dealer.

DETAIL OF P.T.O. TRANSMISSION MODEL EATON FS-8209BBE

• P.T.O. Installation procedure

- Remove the drain plug to the transmission oil.
  (Do not remove the drain plug while the oil is hot, or you maybe burned.)
  Remove the P.T.O. cover which is at the left forward of the transmission. Do not reuse the bolts and gasket that you remove at this time.
  Clean the P.T.O. mounting surface on the transmission side.
- Prepare the necessary parts, referring to table of last page.
- Tighten the elbow and connector to the P.T.O., after binding up a sealing tape at 1.5 to 2 times on the taper thread and make sure air do not leak from the taper thread. (When binding up a sealing tape on the taper thread, two thread from top of screw should not be binded and bind up counter direction of the taper thread. And also make sure a foreign material do not came into joint and control cylinder.)
- Installation angle of the elbow should be adjusted the tightening direction of the taper thread.
- Adjust the backlash of each gears, between transmission counter shaft gear and adapter gear, adapter gear and P.T.O. gear as described with paragraph "How to check the gear backlash".
- Apply liquid packing to all fitting surfaces, such as the P.T.O. mounting surface of the transmission case, adapter and P.T.O. body. (Do not apply liquid packing between contact surface of each other of the gasket.)
- Install the adapter with proper bolts (furnished with adapter) in the P.T.O. aperture of the transmission case and the P.T.O. with proper studs and nuts (furnished with P.T.O.) in the adapter.
- Tightening torque of bolt : 40 - 47 N·m {414 - 484 kgf·cm}
- Tightening torque of stud and nut : 48 - 54 N·m {490 - 551 kgf·cm}
- After attaching the P.T.O., turn the output shaft coupling a few revolutions to be sure that it turns freely.
- When you refill the transmission with oil, increase the amount by 0.5 liters, to allow for the P.T.O.. And check the oil level of the transmission case with filler plug of main case.
- More detail information if needed, please contact with "DANA CORPORATION".

• **Gear layout and gear ratio**



Gear ratio : i = N2/N1xN4/N3xN6/N5xN8/N7

TRANSMISSION	N1	N2	N3	N4	N5	N6	N7	N8	i
EATON FS-8209BBE	33	43	32	18	24	22	21	37	1.183

NOTES

- Number of revolutions of P.T.O. output shaft
  = number of revolutions of engine x1/ i
- The P.T.O. output shaft turns in the opposite direction to the engine.

• How to check the gear backlash

The gear backlash of the P.T.O. is important factor to prolong the P.T.O. gear life. The bigger backlash causes the noise from gears, on the contrary the smaller backlash causes the damage of gears. When installing the P.T.O. measure and check the backlash according to the following procedures.

- Remove the P.T.O. shaft housing and/or inspection plate.
- Mount the dial indicator so that it registers movement of the input gear (driven gear) of the P.T.O.. (See Fig. 1.)

NOTES

- See figure 2 for proper location of dial indicator contact point. (Two common type dial indicators shown.)

- Hold the P.T.O. driver gear in transmission with a screwdriver or bar and rock the P.T.O. input gear (driven gear) back and forth with your hand. Note the total movement on the dial indicator.
- Establish backlash at 0.15mm - 0.30mm by adding or subtracting gaskets. General rule -- A CHELSEA'S 0.25mm gasket will change backlash approx. 0.15mm, a 0.51mm gasket changes backlash approx. 0.30mm.
- Replace the shift housing and/or inspection plate and retorque four capscrews to 22 - 27 N·m {221 - 276 kgf·cm}.
- Use same procedure for mounting the adapter and checking backlash as was used when mounting the P.T.O. to transmission as described above.

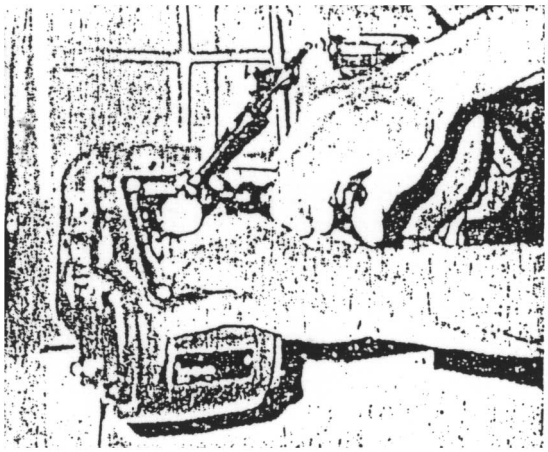


FIG.1

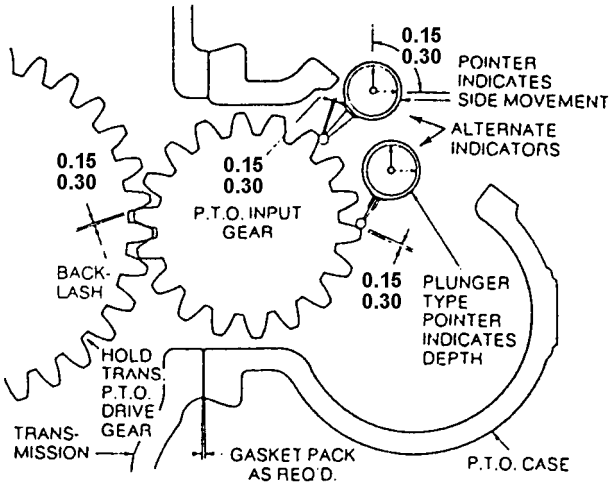


FIG.2

• Pouring gear oil

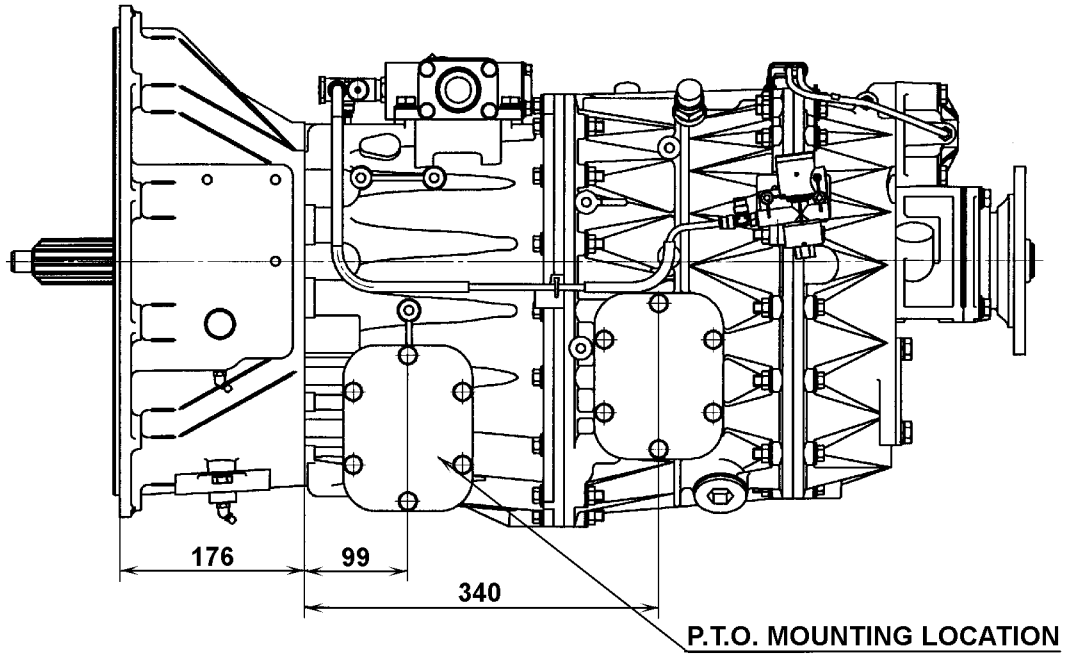
When pouring gear oil into the transmission, add more oil (0.5L) for the lubrication of P.T.O. gears.

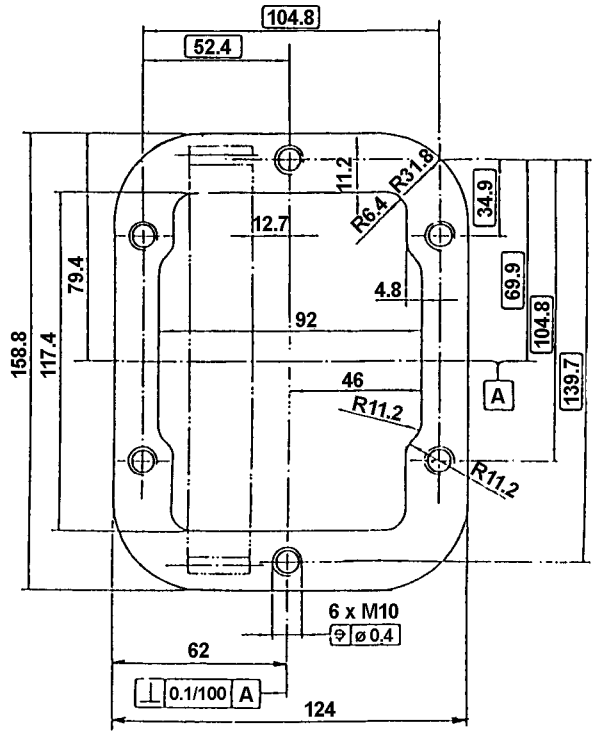
• Other notices

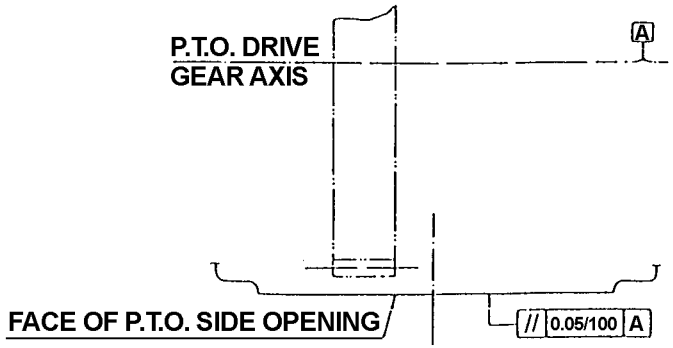
After finishing P.T.O. installation, check whether the output shaft can be smoothly rotated when P.T.O. is in the neutral position.

• P.T.O. mounting location on transmission case

Unit : mm





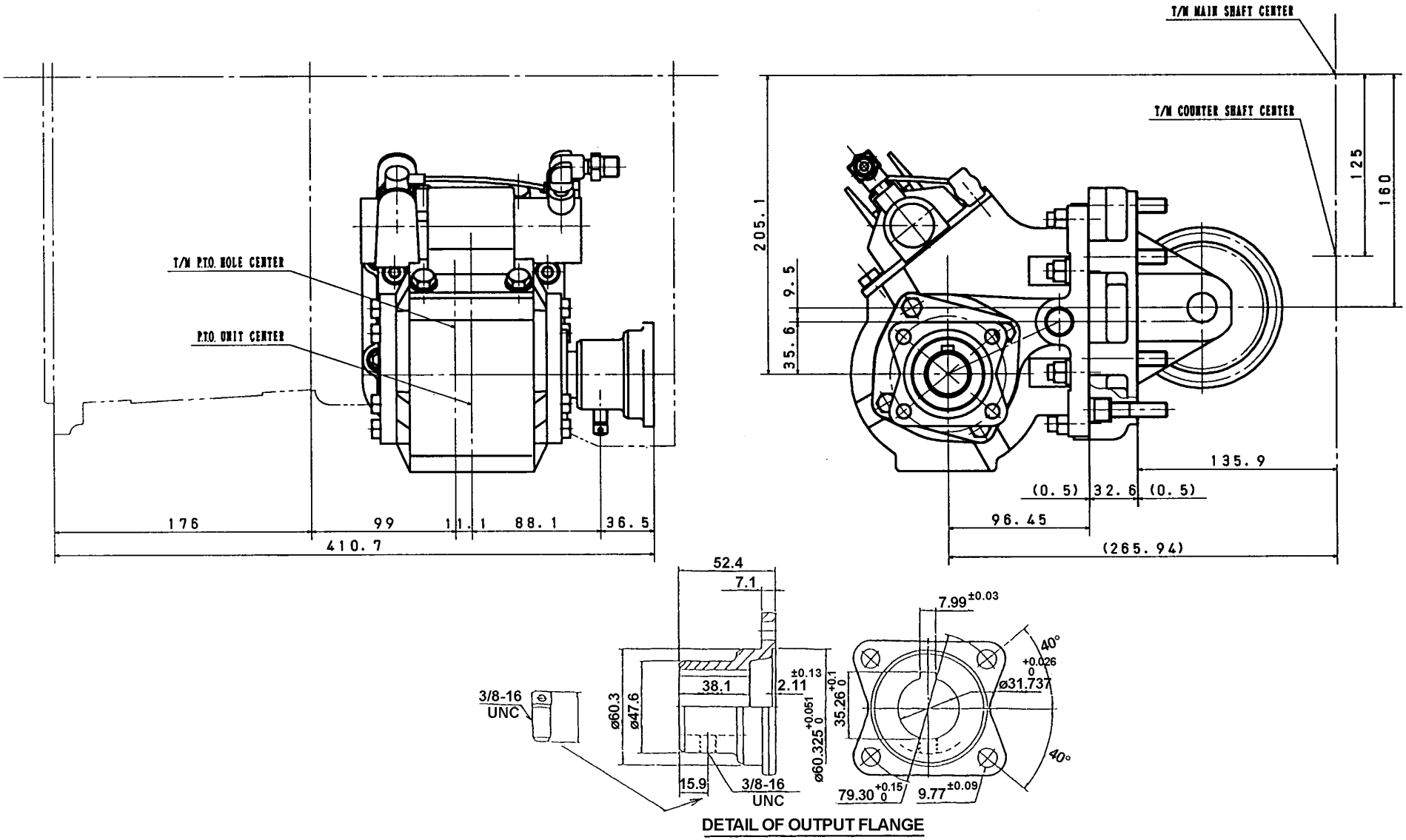


NOTE

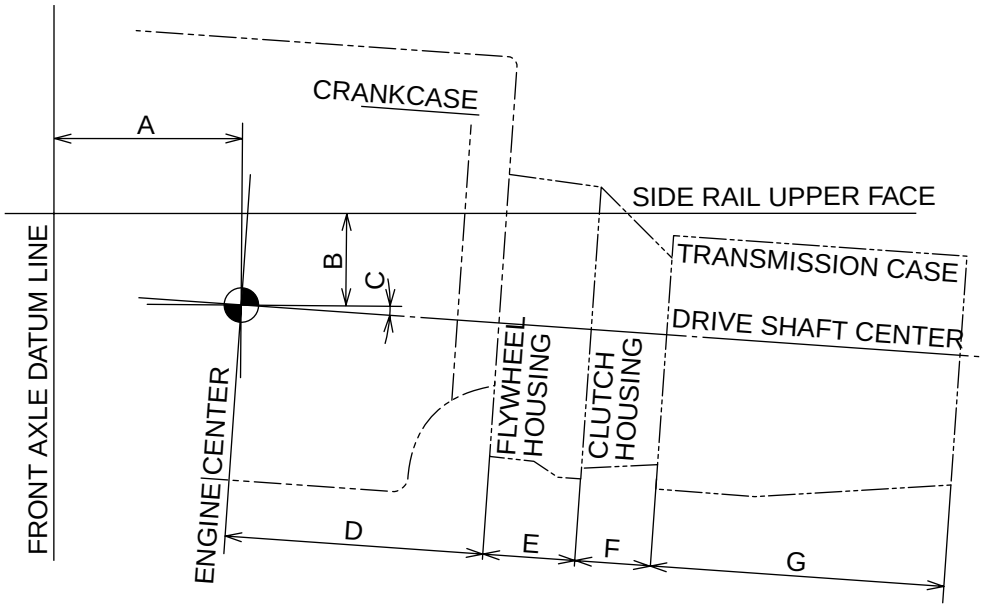
• Gear data and backlash are specified by gear box manufacturer.

• Transmission P.T.O. mounting

Unit : mm



• **Layout of power line**



Unit : mm

CHASSIS MODEL	A	B	C	D	E	F	G
FL, FM8J	270	217.6	3.5º	394	173.5	176	567

[T/M P.T.O. : TP-9]

Do not provide transmission Power Take Off (P.T.O.) as option equipment, consult with authorized Hino distributor when the mounted body require transmission P.T.O..

• Data of the P.T.O. output shaft

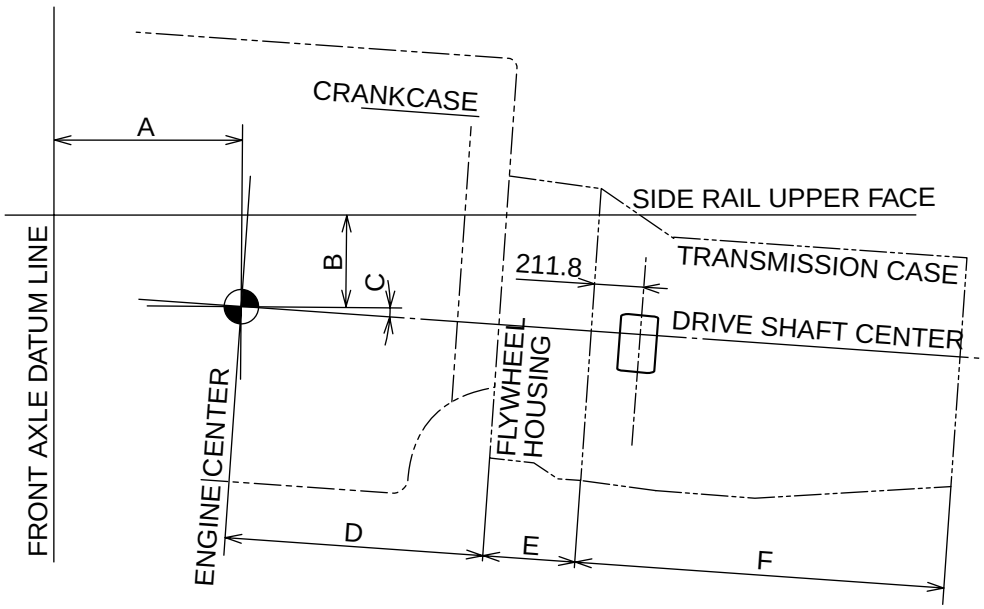
TRANSMISSION SERIES	PERMISSIBLE TORQUE (N·m {kgf·m} at r/min)	P.T.O. CONTROL TYPE	DIRECTION OF ROTATION
ALLISON 3000	See ALLISON's specifications section of the tech data book.		

• Necessary parts

TRANSMISSION MODEL	ALLISON 3000	
TRANSMISSION GEAR RATIO		
1ST 2ND 3RD 4TH 5TH REV	3.487 1.864 1.409 1.000 0.750 5.027	
PARTS NAME	Parts No.	Q'ty / unit
POWER TAKE OFF ASSY	NIL (See ALLISON's specifications section of the tech data book.)	
ADAPTER, SUB ASSY		
HARNESS SUB ASSY, TRANSMISSION		
ELBOW		
CONNECTOR		

DETAIL OF P.T.O. TRANSMISSION MODEL ALLISON 3000

• **Layout of power line**

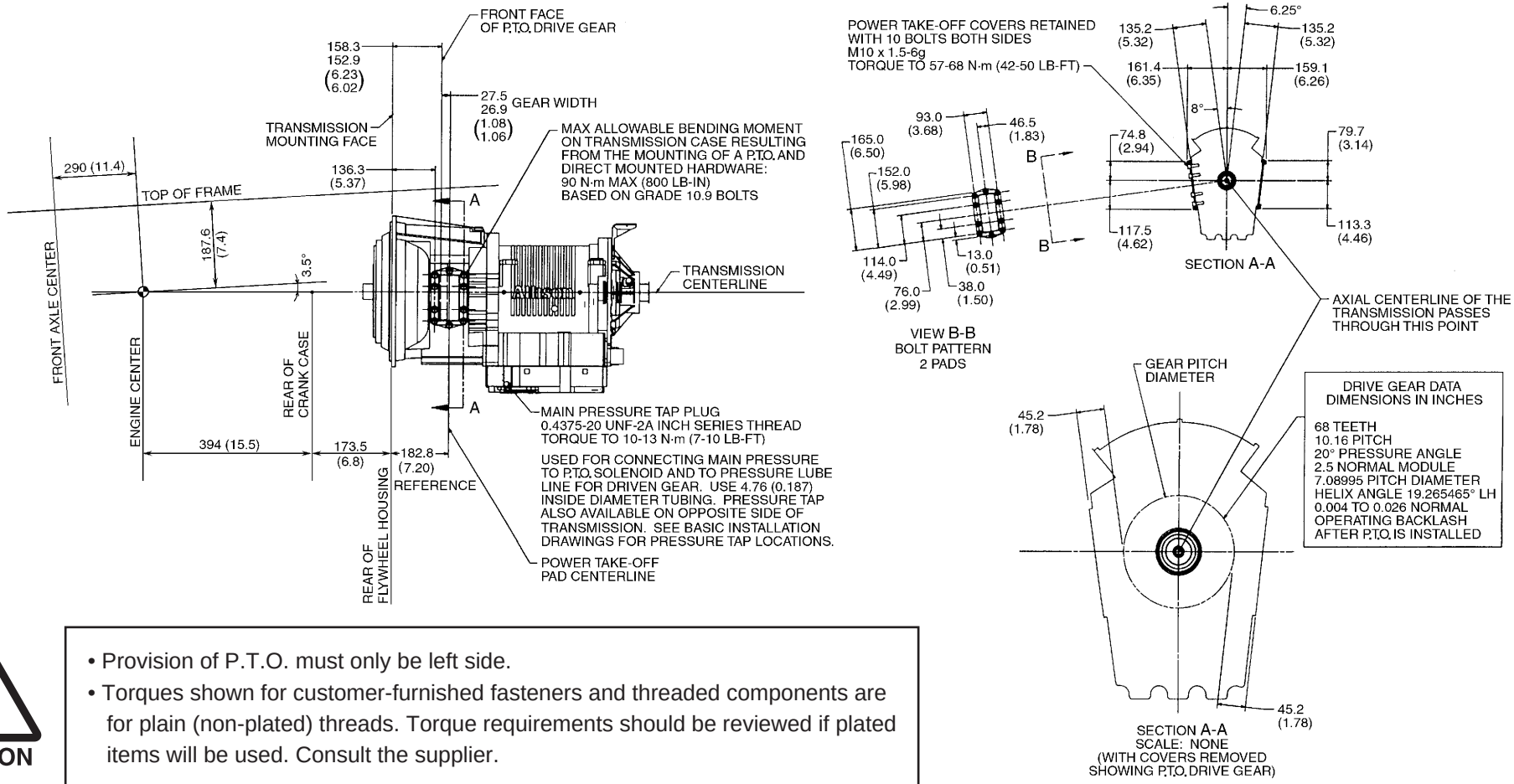


Unit : mm

CHASSIS MODEL	A	B	C	D	E	F
FG8J	290	187.6	3.5º	394	173.5	688.0

• Mounting position of transmission P.T.O. ass'y for ALLISON 3000

Unit : mm



CAUTION

- Provision of P.T.O. must only be left side.
- Torques shown for customer-furnished fasteners and threaded components are for plain (non-plated) threads. Torque requirements should be reviewed if plated items will be used. Consult the supplier.

$$\text{P.T.O. output speed (rpm)} : \text{Engine speed} \times \frac{\text{Drive gear}}{\text{Driven gear}} \times \frac{\text{P.T.O. input gear}}{\text{P.T.O. output gear}}$$

- For P.T.O. gear torque ratings.
  See transmission specifications section of the tech data book.

[T/M P.T.O. : TP-10]

Do not provide transmission Power Take Off (P.T.O.) as option equipment, consult with authorized Hino distributor when the mounted body require transmission P.T.O..

• Data of the P.T.O. output shaft

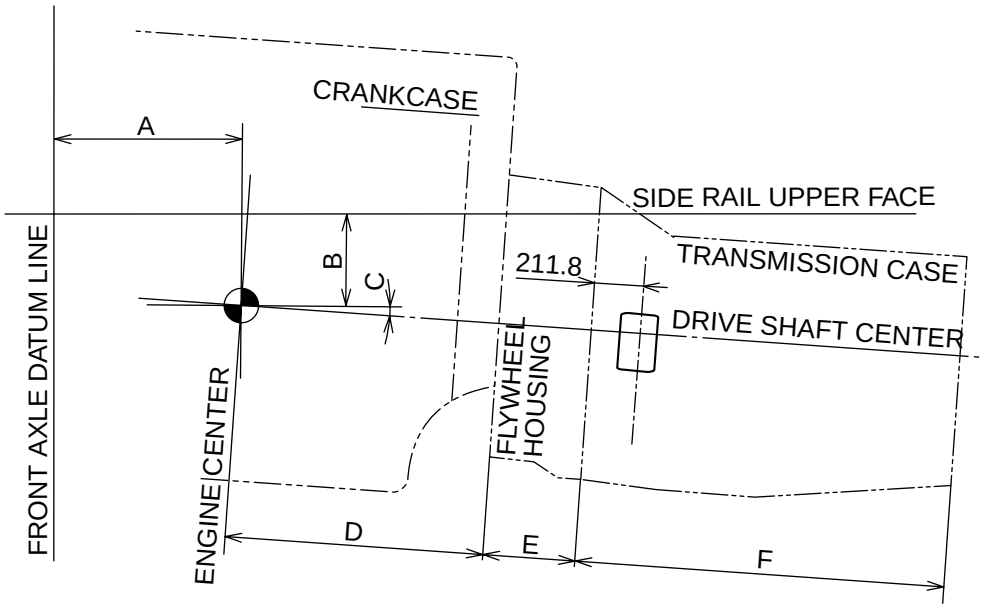
TRANSMISSION SERIES	PERMISSIBLE TORQUE (N·m {kgf·m} at r/min)	P.T.O. CONTROL TYPE	DIRECTION OF ROTATION
ALLISON 3500	See ALLISON's specifications section of the tech data book.		

• Necessary parts

TRANSMISSION MODEL	ALLISON 3500	
TRANSMISSION GEAR RATIO		
1ST 2ND 3RD 4TH 5TH 6TH REV	4.593 2.257 1.535 1.000 0.749 0.651 4.999	
PARTS NAME	Parts No.	Q'ty / unit
POWER TAKE OFF ASSY	NIL (See ALLISON's specifications section of the tech data book.)	
ADAPTER, SUB ASSY		
HARNESS SUB ASSY, TRANSMISSION		
ELBOW		
CONNECTOR		

DETAIL OF P.T.O. TRANSMISSION MODEL ALLISON 3500

• Layout of power line

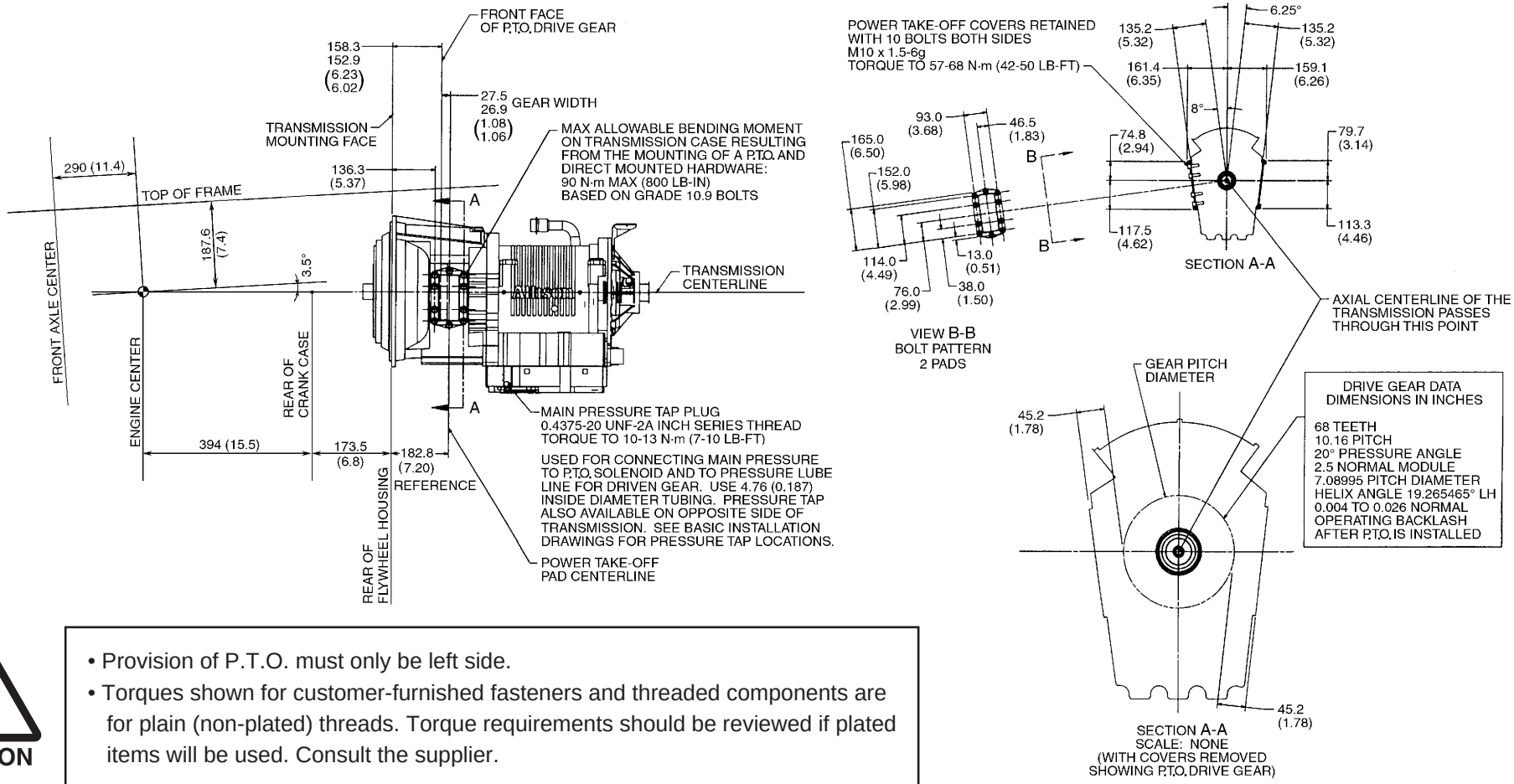


Unit : mm

CHASSIS MODEL	A	B	C	D	E	F
FM8J	270	217.6	3.5º	394	173.5	688

• Mounting position of transmission P.T.O. ass'y for ALLISON 3500

Unit : mm



CAUTION

- Provision of P.T.O. must only be left side.
- Torques shown for customer-furnished fasteners and threaded components are for plain (non-plated) threads. Torque requirements should be reviewed if plated items will be used. Consult the supplier.

$$\text{P.T.O. output speed (rpm)} : \text{Engine speed} \times \frac{\text{Drive gear}}{\text{Driven gear}} \times \frac{\text{P.T.O. input gear}}{\text{P.T.O. output gear}}$$

- For P.T.O. gear torque ratings.
  See transmission specifications section of the tech data book.

3. ENGINE REAR END POWER TAKE OFF

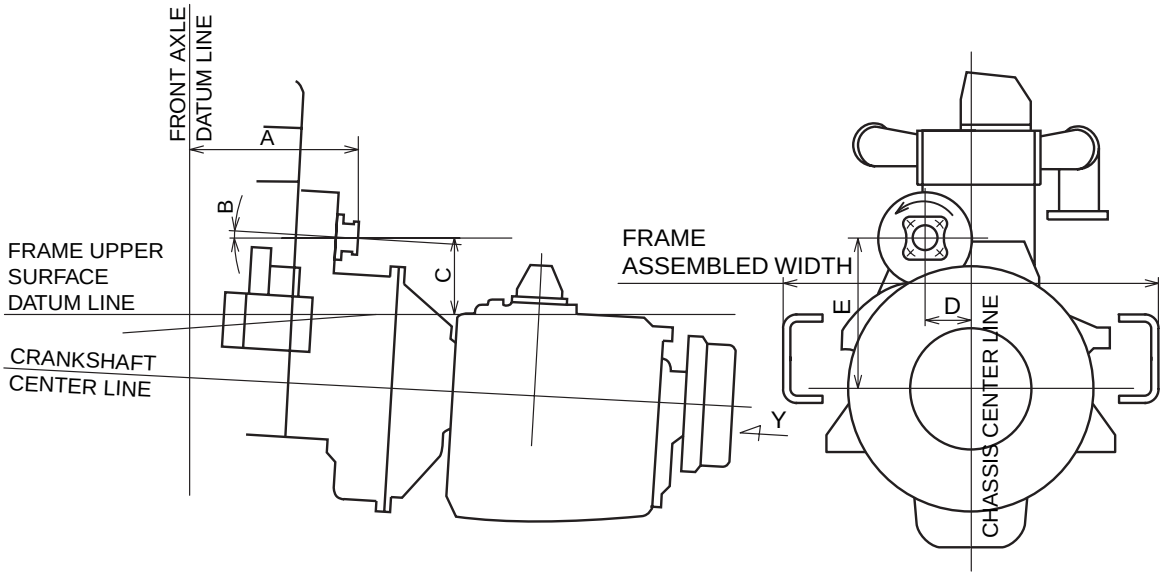
RELEVANT MODEL

CLASSIFICATION NUMBER

- Refer to chapter 1, 3 chassis specification for classification number.

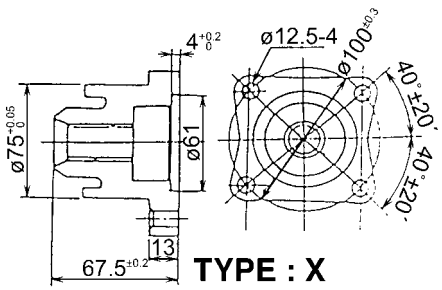
MOUNTING PARTICULARS

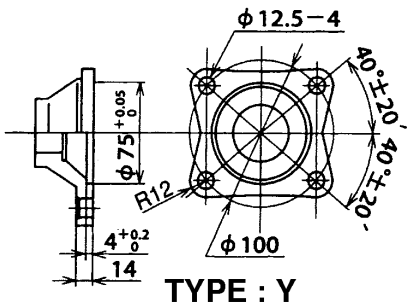
Unit : mm



VIEW Y

ENGINE MODEL	
A	
B	
C	
D	
E	
TYPE OF COUPLING	
PERMISSIBLE TORQUE N·m {kgf·m}	
REV. RATIO	
REV. DIRECTION	





COUPLING PARTICULARS

NOTE

- The devices on the body or equipment side (e.g.oil pump) must be mounted at the same angle as engine to the body.
  (Direct mounting the devices to the P.T.O. output flange is strictly prohibited.)
- The three-dimensional angle of the universal joint of the drive shaft must be a Min. 1° to Max. 6°.

4. TRANSFER POWER TAKE OFF (OPT)

When the body require transfer Power Take Off (P.T.O.) , genuine P.T.O. equipment and related parts should be supplied as shown below.

RELEVANT MODEL

CLASSIFICATION NUMBER

- Refer to chapter 1, 3 chassis specification for classification number.

• Transfer series

Transfer series
MA12C

• Data of the standard P.T.O. output shaft

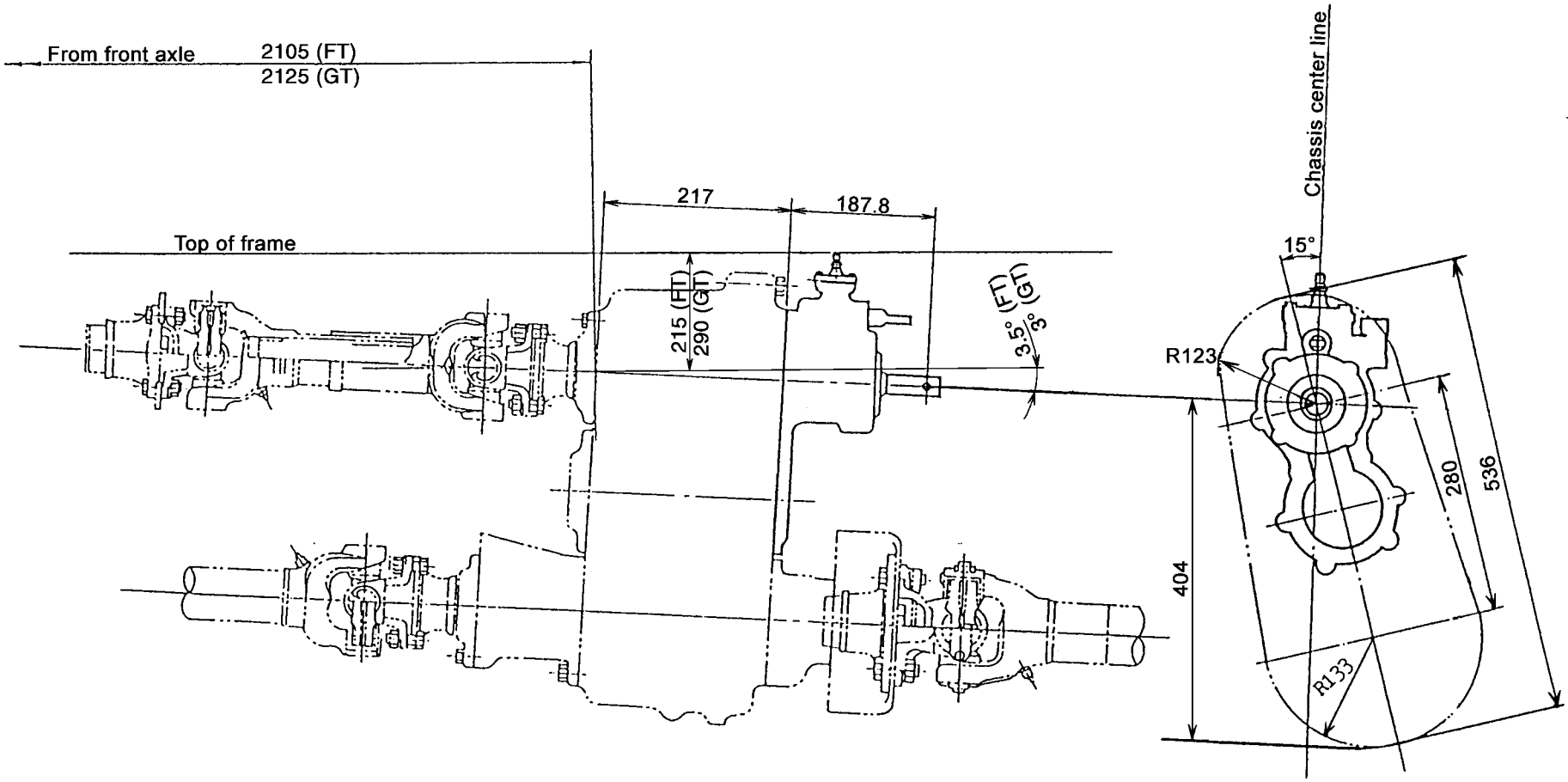
Tranfer series	Permissible torque (N·m{kgf·m} at r/min)	P.T.O. control type	Direction of rotation
MA12C	196 {20} / 1,500	Mechanical control	Same to engine

• Necessary parts

Transfer model	MA12C	
Transfer reduction ratio		
Low gear	2.224	
High gear	1.000	
Parts name	Parts No.	Q´ty / unit
Power take off assy	S3622-01060	01
Transfer assy, w / P.T.O.	S3620-01414	01

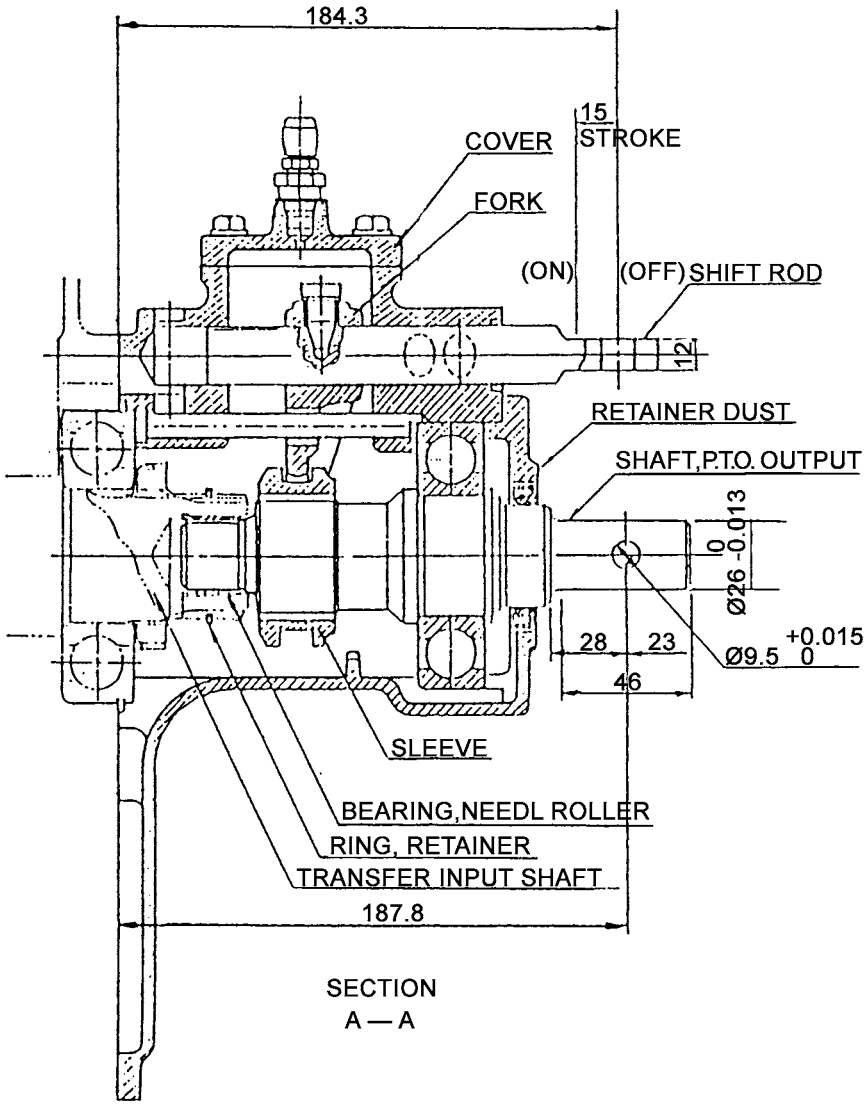
• **Transfer P.T.O. mounting**

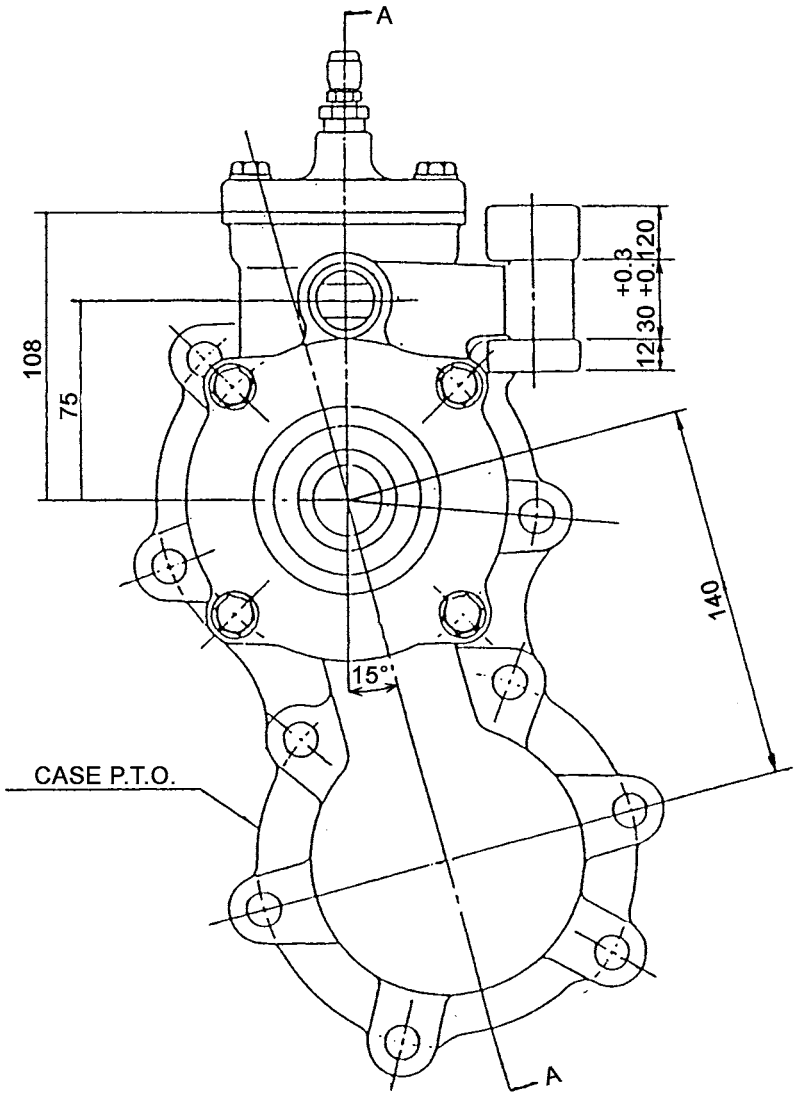
Unit : mm



- **Transfer P.T.O. particulars**

Unit : mm

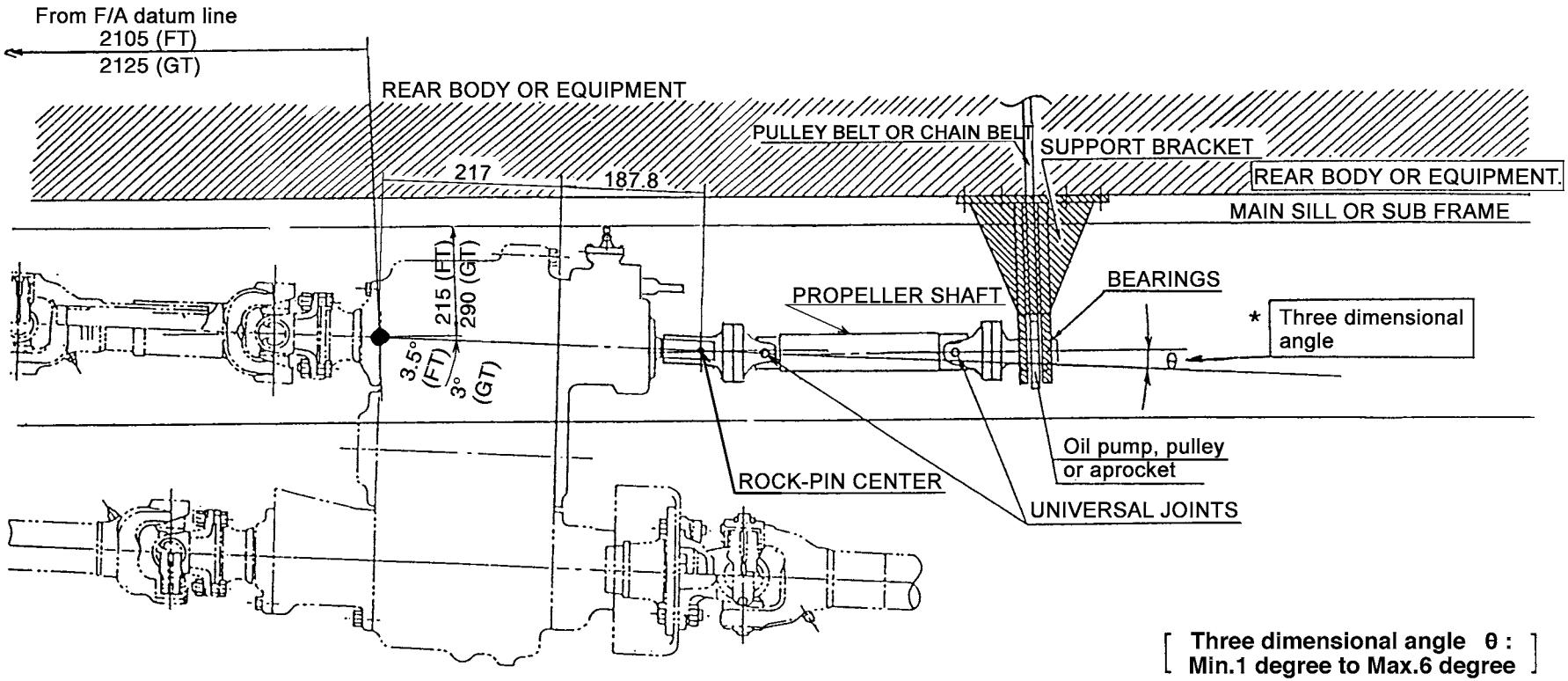




• Cautions for P.T.O.

Unit : mm

Example layout of P.T.O. drive shaft is shown following figure.
Make sure to details of cautions to be installed P.T.O. drive shaft as following page.



Caution when installing the propeller shaft for T/F P.T.O.

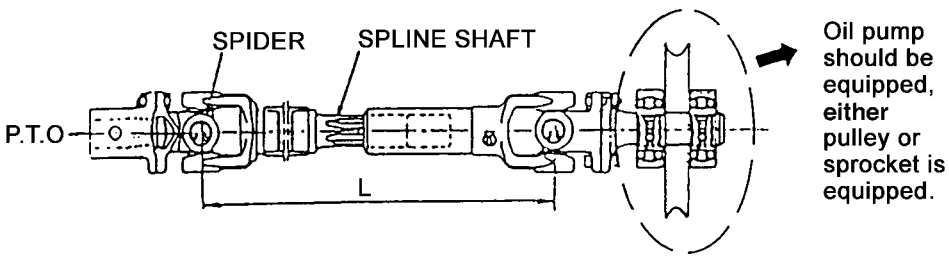
Be sure to observe the following indications.

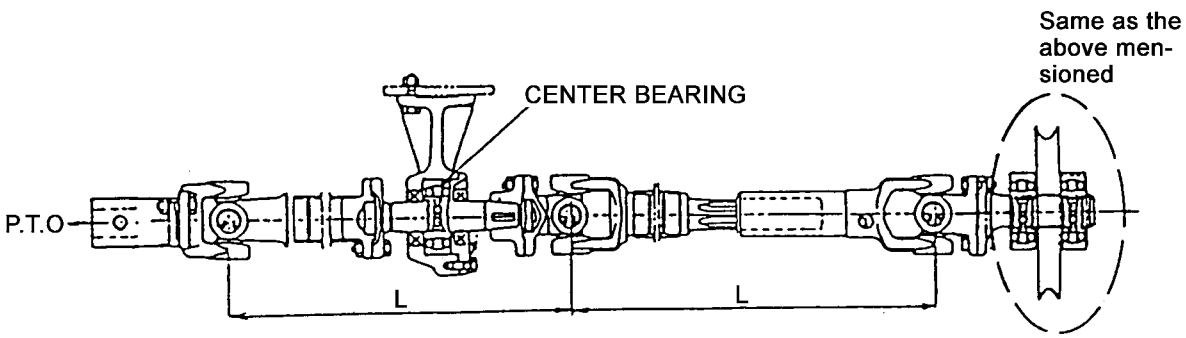
- Fitting a pulley or a sprocket directly to the output shaft of transfer P.T.O. is strictly prohibited.
- An oil pump, a pulley or a sprocket wheel should be supported properly with the support bracket which is fixed firmly to the mounted body.
- Indications for power taking out should be followed as the indicated below.

ITEMS	INDICATIONS
Prop. shaft tube dia.	less than Ø50mm
Prop. shaft length	less than 1,000mm
Prop. shaft weight	less than 10kg
Three dimensional angle	Min.1 degree to Max.6 degree

Length of drive shaft

To reduce the vibration of drive shaft during operation, HINO recommend that the drive shaft length should be less than the value shown in the table.
If body builder must make the shaft which is longer than the value shown in the table, fit a center bearing for the reduction of excessive vibration.





NOTE

- The support bracket for center bearing should be fixed on the mounted body.

5. ENGINE CONTROL FOR BODY OR EQUIPMENT

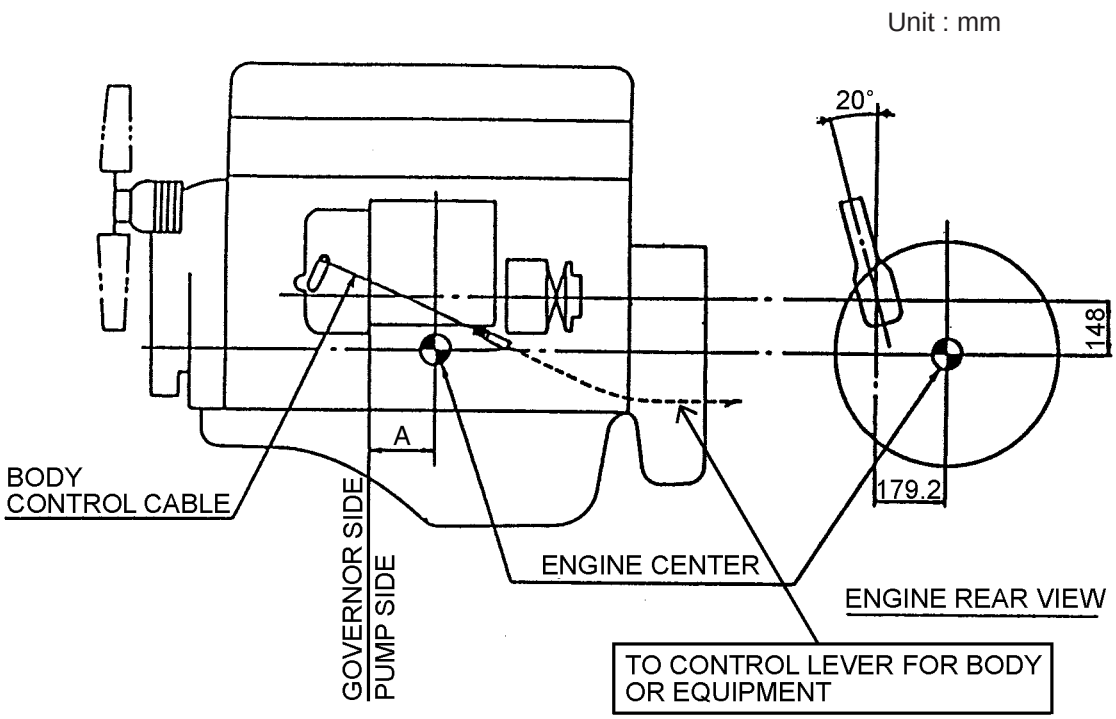
FUEL INJECTION PUMP WITH MECHNICAL GOVERNOR TYPE

RELEVANT MODEL

CLASSIFICATION NUMBER	ENGINE MODEL	A
	J05E-TE	183.5
	J08E-UG	120.5
	J08E-UF	105.5

• Governor model : Mechanical, all speed control type. (DENSO R901)

Unit : mm



NOTE

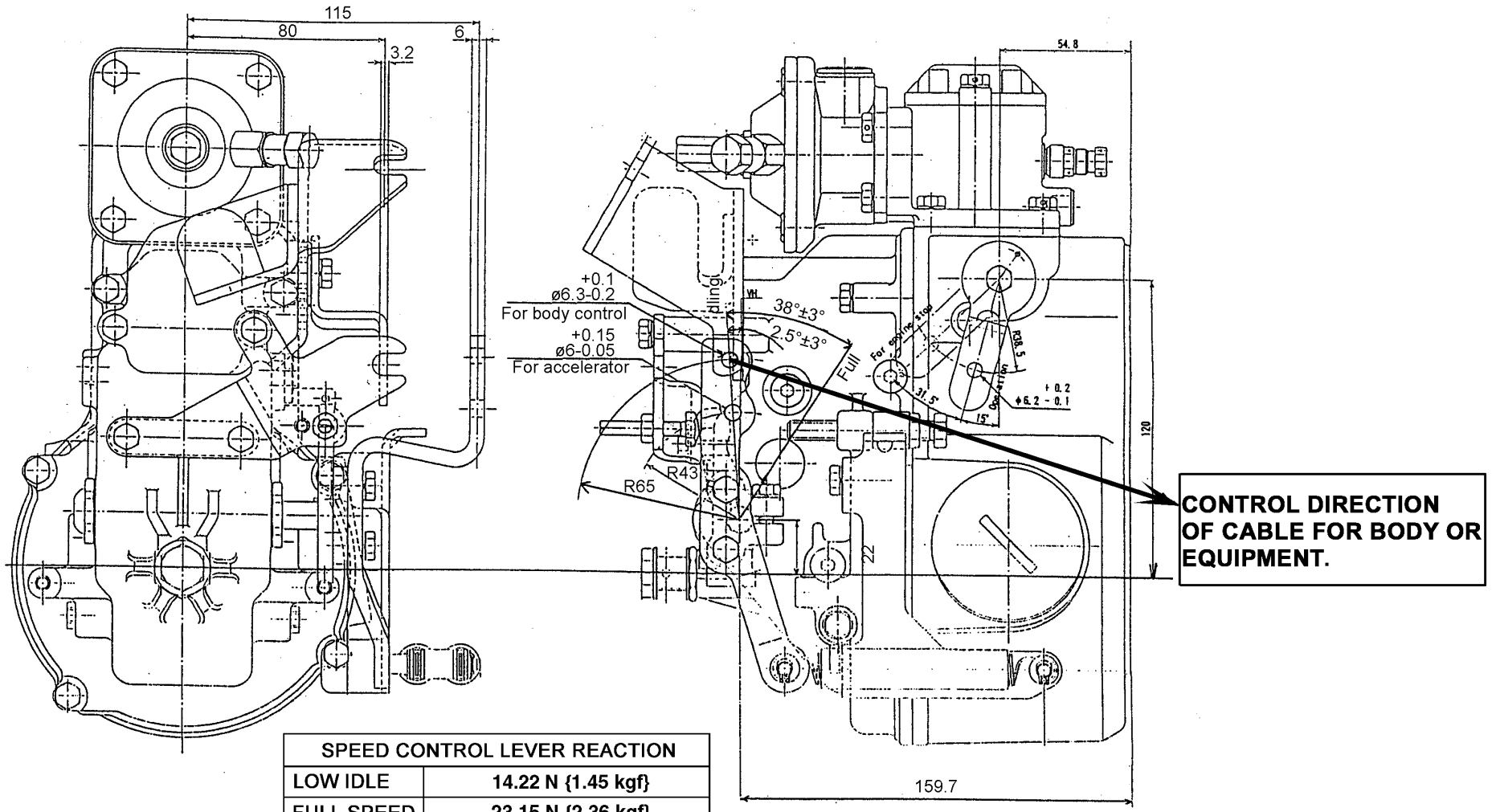
Precautions for installation of engine control device of the body or equipment.

- Make sure that the devices (as control cable) do not interfere with engine parts while control devices to be installed.
- If use the bolts or nuts of the engine parts for installing the devices, make sure that the bolt or nut can be properly tightened and confirm the tightening torque.
- Should more detailed data or information regarding the engine control be needed, please contact authorized Hino distributor or sales dealer.

- **Governor lever for body control**

Engine Model : J05E-TE

Unit : mm



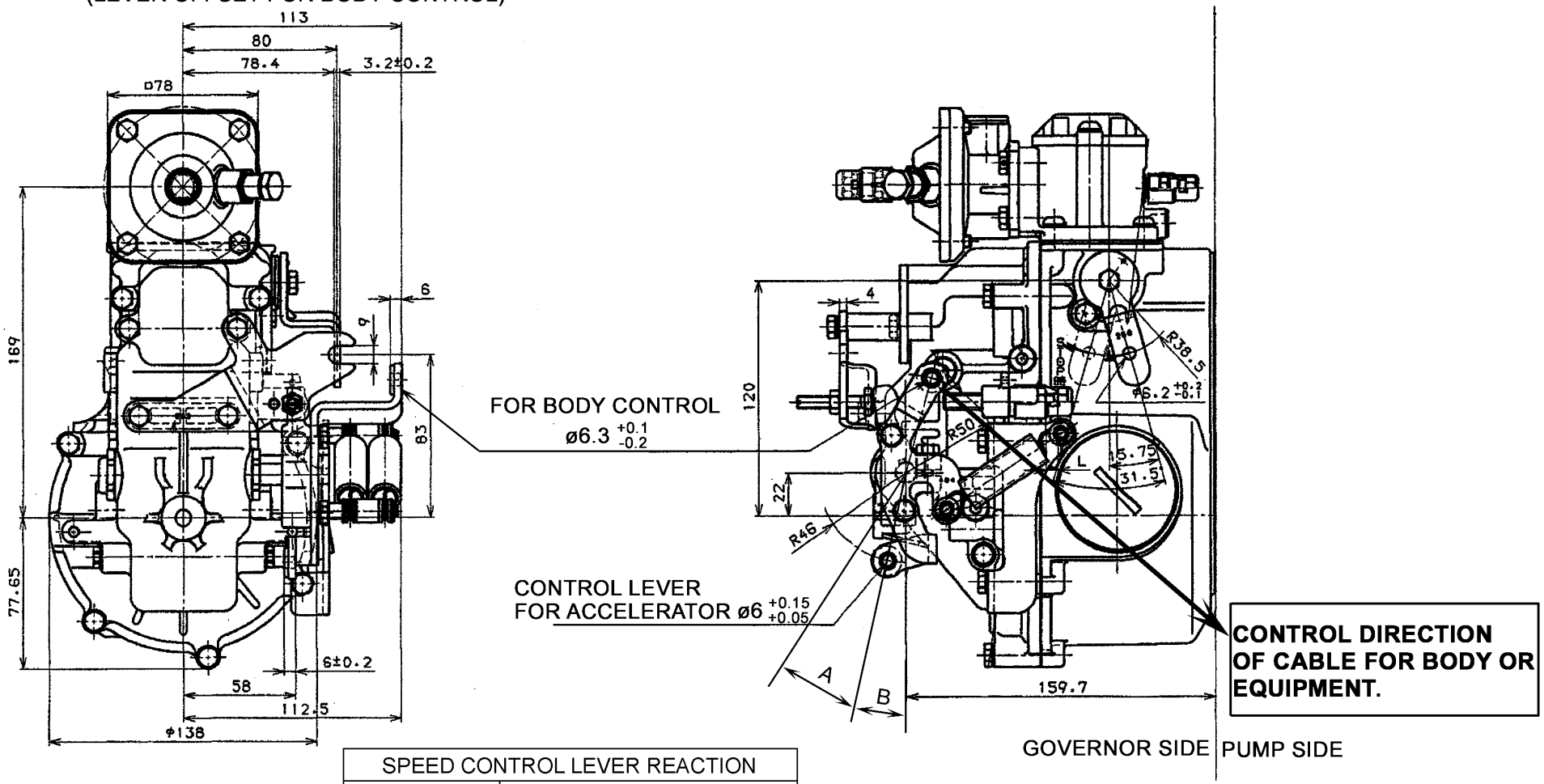
SPEED CONTROL LEVER REACTION	
LOW IDLE	**14.22 N {1.45 kgf}**
FULL SPEED	**23.15 N {2.36 kgf}**

- **Governor lever for body control**

Unit : mm

Engine Model : J08E-UG & J08E-UF

(LEVER OFFSET FOR BODY CONTROL)



SPEED CONTROL LEVER REACTION	
LOW IDLE	14.4 N {1.47 kgf}
FULL SPEED	23.5 N {2.40 kgf}

	J08E-UG	J08E-UF
A	37°±3°	39°±3°
B	13.5°±5°	12.5°±5°

RELEVANT MODEL

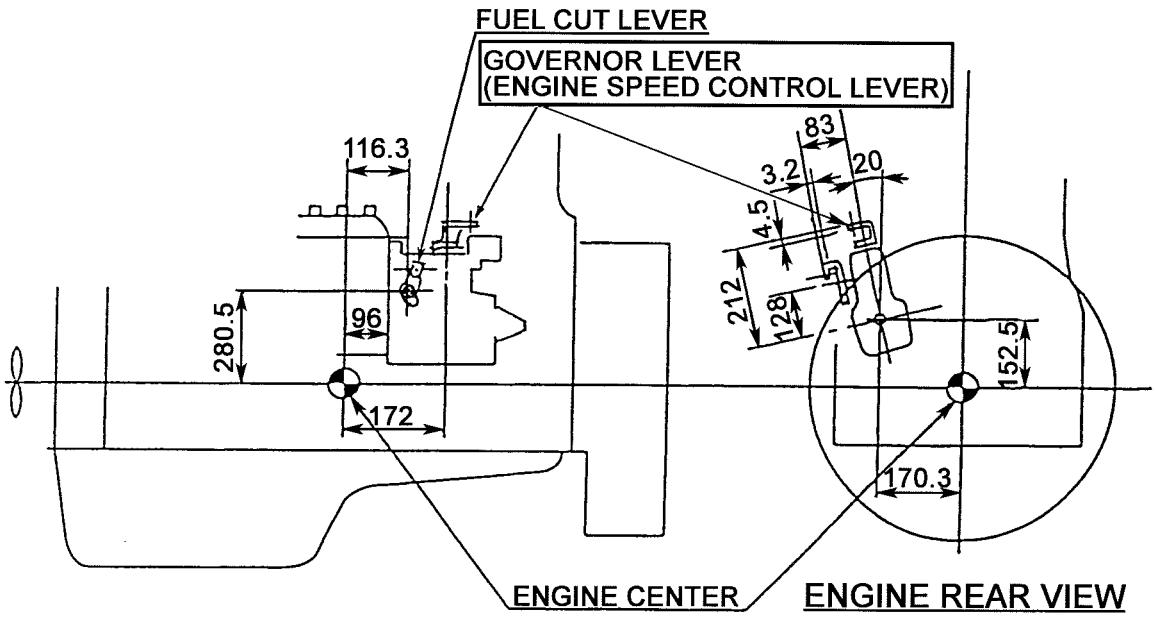
CLASSIFICATION NUMBER

- Refer to chapter 1, 3 chassis specification for classification number.

ENGINE MODEL : P11C-UB

• Governor model : Mechanical, all speed control type. (BOSCH RLD-J)

Unit : mm



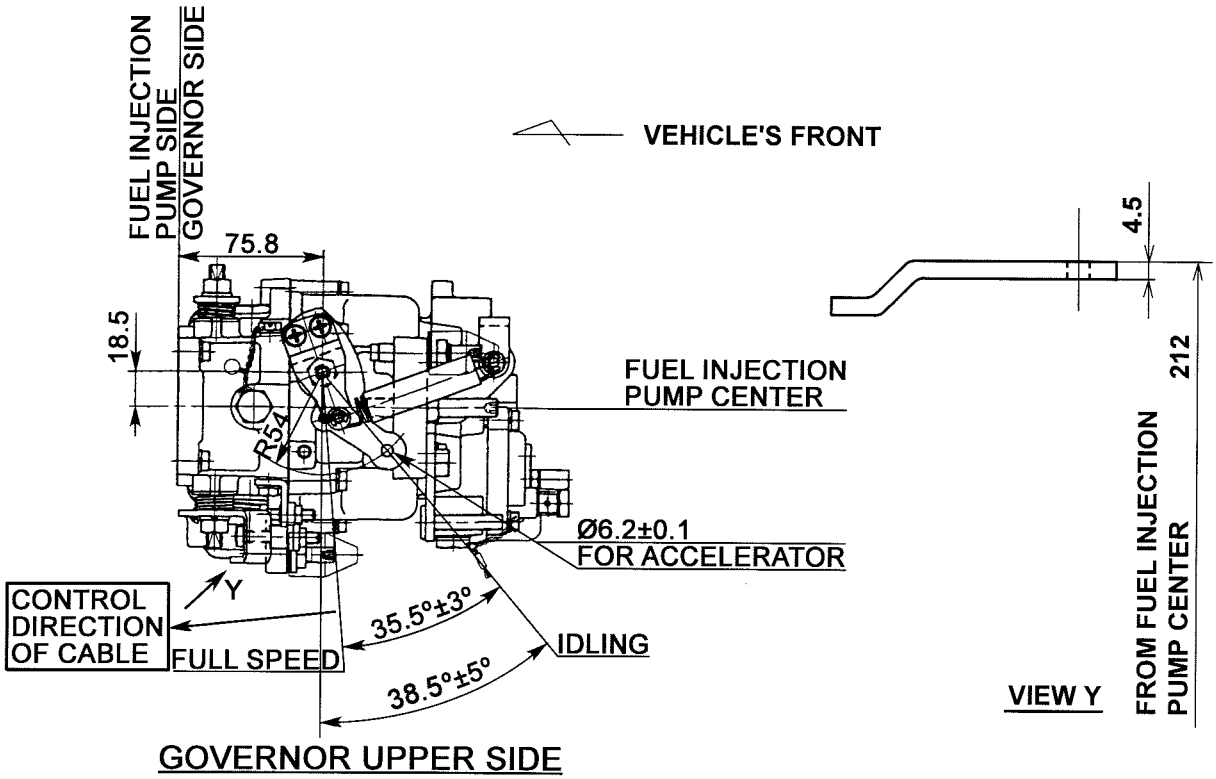
NOTE

Precautions for installation of engine control device of the body or equipment.

- Make sure that the devices (as control cable) do not interfere with engine parts while control devices to be installed.
- If use the bolts or nuts of the engine parts for installing the devices, make sure that the bolt or nut can be properly tightened and confirm the tightening torque.
- Should more detailed data or information regarding the engine control be needed, please contact authorized Hino distributor or sales dealer.

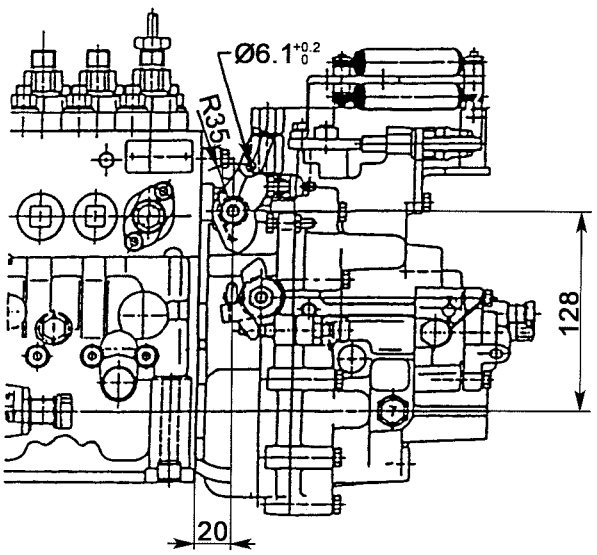
• **Governor lever for body control**

Engine Model : P11C-UB

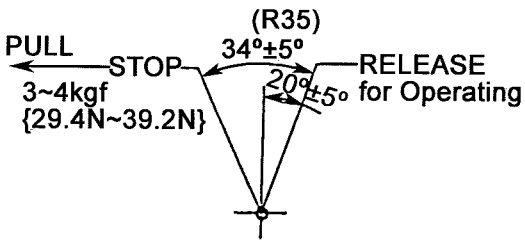


GOVERNOR UPPER SIDE

SPEED CONTROL LEVER REACTION	
IDLING POSITION	11.8N {1.2kgf}
FULL SPEED POSITION	31.4N {3.2kgf}



GOVERNOR LEFT SIDE

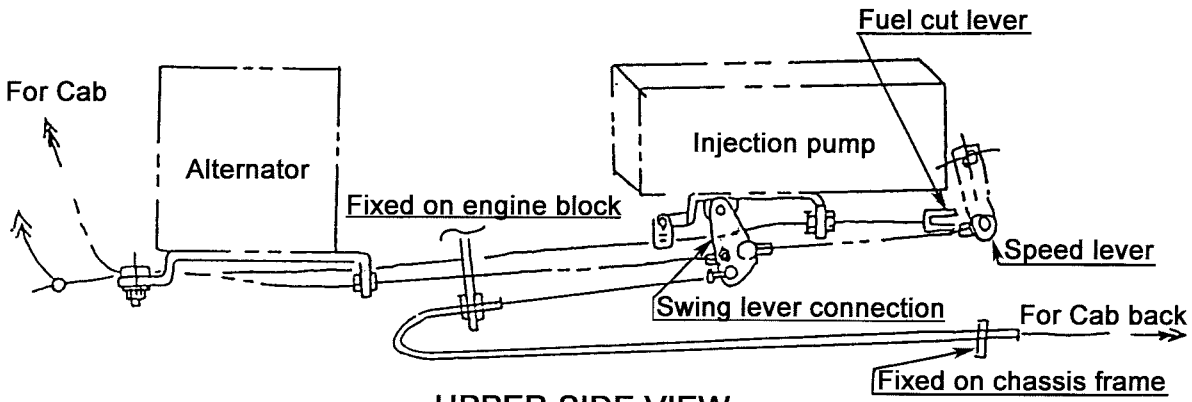


FUEL CUT LEVER

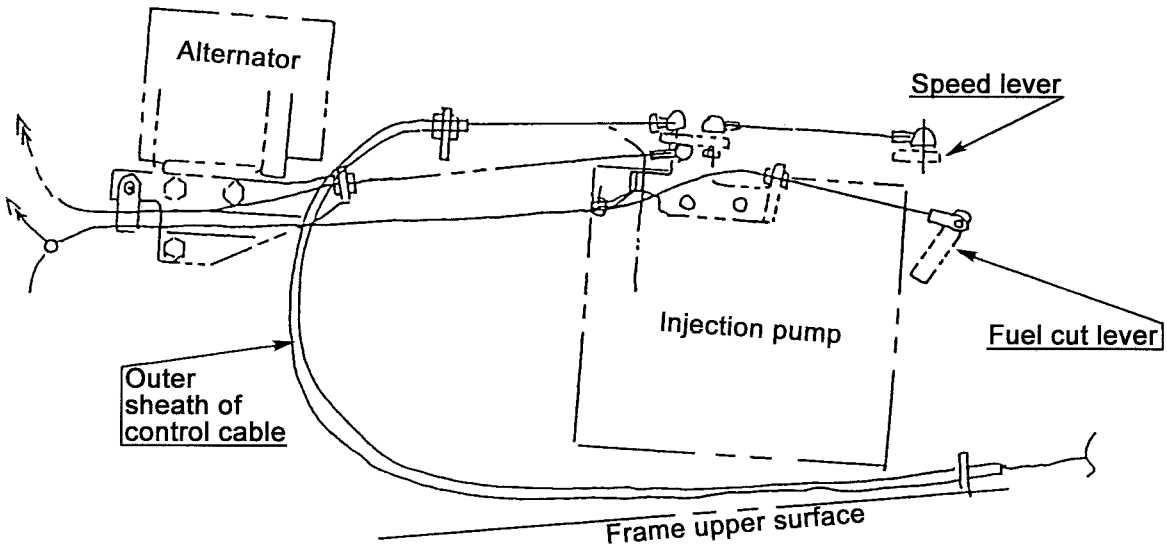
• HOW TO INSTALL THE ENGINE CONTROL LINKAGES FROM ENGINE INJECTION PUMP (ENGINE MODEL P11C-UB ONLY)

If body builder wants to install the engine control cable or linkage to engine, prepare the following parts.

- Speed meter cable (or the like)
- Flared nuts for fixing the outer sheath of above control cable
- Cable holder (clip) for holding outer sheath of above cable
- Cable end connectors (crevice pins or the like)
- Steel sheet (or small brackets) for supporting brackets of above cable
- Etc.



UPPER SIDE VIEW

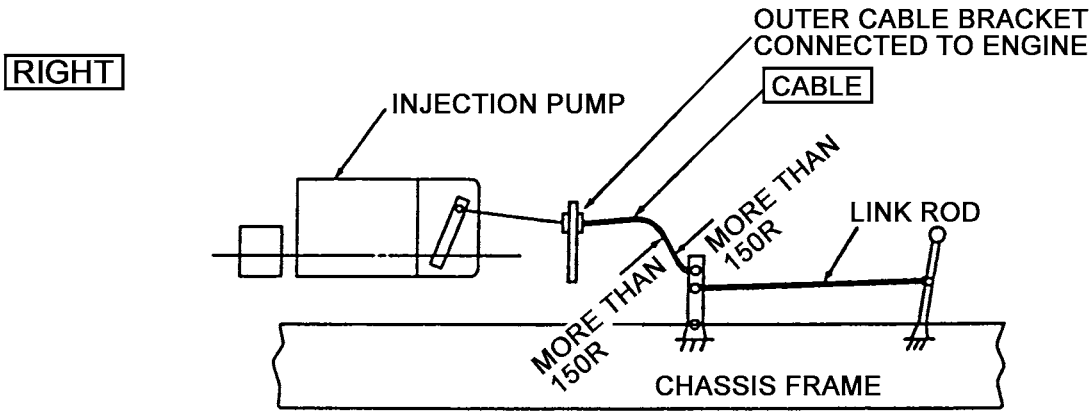


LEFT SIDE VIEW

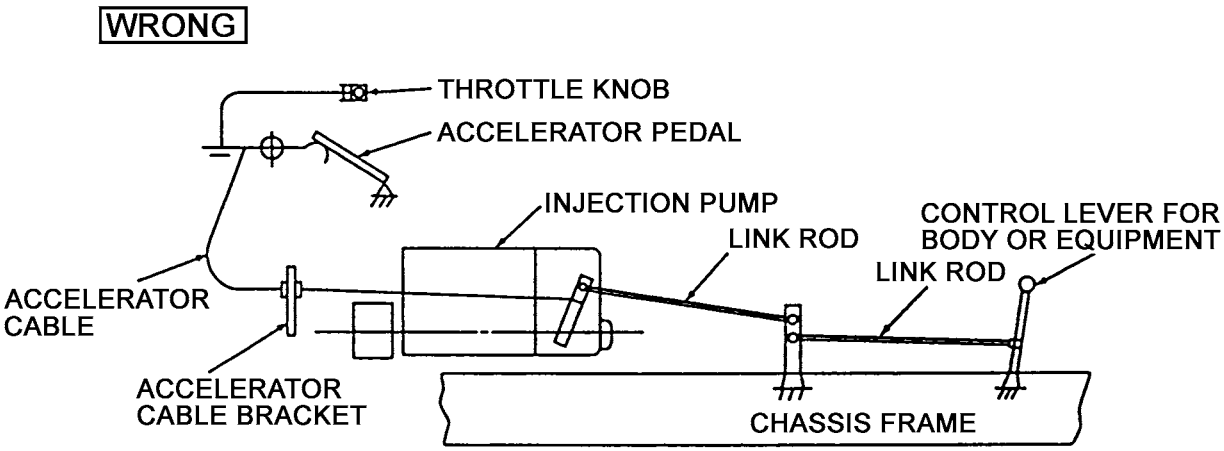
• ENGINE CONTROL FOR BODY

If you intend to fit a device to control engine revolutions when working with a body or equipment, make sure that the device is able to absorb the relative movement between the engine and the chassis (mounting of control lever for body or equipment, etc.).
If the mechanism cannot absorb the relative motion, the control lever of the injection pump may be moved by the normal vibration of the engine (displacement) and abnormal vibrations may arise.

RELATIVE MOVEMENT OF ENGINE AND CHASSIS ABSORBED



RELATIVE MOVEMENT OF ENGINE AND CHASSIS NOT ABSORBED



U-2 FUEL INJECTION TYPE

RELEVANT MODEL

CLASSIFICATION NUMBER	ENGINE MODEL
	J05D-TG
	J05E-TC
	J05E-TD
FD-027,028	J07E-TN
FC-022,023,024, 025,026,029	J07E-TP
	J08E-UD
	J08E-UE
	J08E-TB
	J08E-TE
	A09C-TE

ENGINE CONTROL

Hino engine is controlled by computer (hereinafter termed E/G ECU).

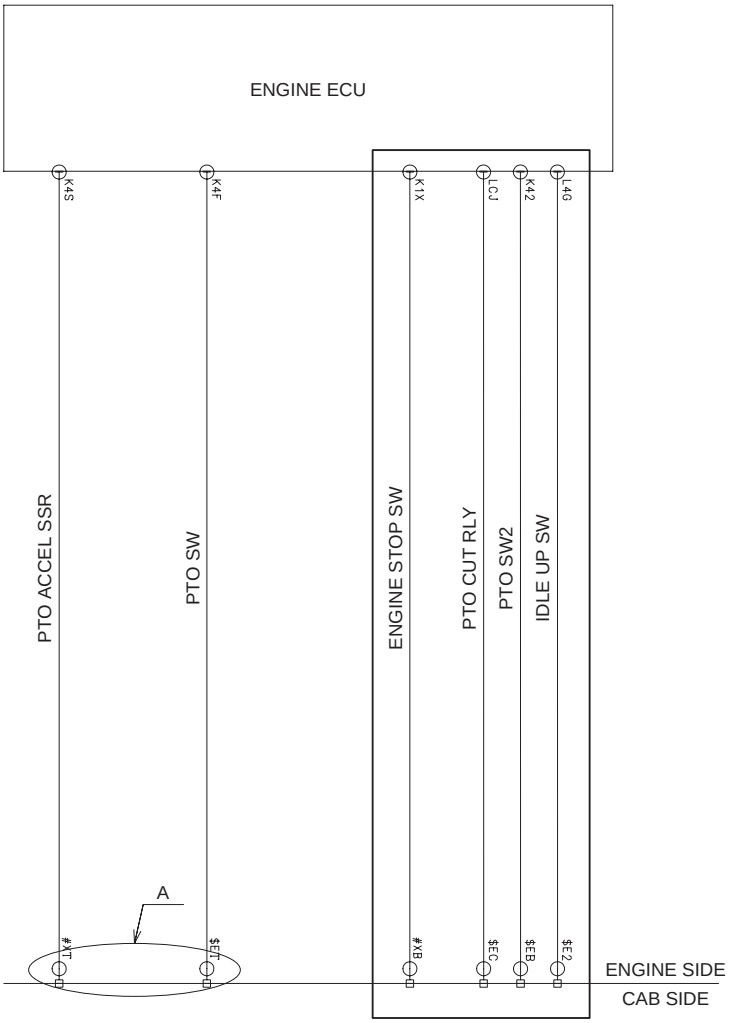
Take following measure when engine speed to be controlled for body or equipment installation.

• KIND OF METHOD

Device	Range to be controlled engine speed	Provision of device
Idle up switch	Idle to 980 rpm (Can be controlled constant revo. Only)	Related parts to be provided by standard equipment
Engine accelerator	Idle to Max. revolution (Can be controlled variable revo.)	Related parts to be provided by optional equipment
Engine Control ECU (CUSTOMIZE)	Idle to Max. revolution (Can be controlled constant revo. Only)	Hino Diagnostic Explore

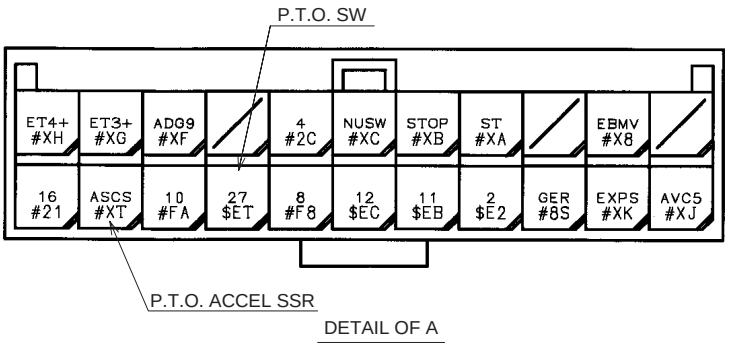
• ELECTRIC CIRCUIT OF ENGINE CONTROL FOR BODY OR EQUIPMENT

Whatever P.T.O. control system is mechanical or pneumatic or electric, the signal of P.T.O. switched on should be always connected to E/G ECU.



In case of ENGINE ECU customize.

ECU CONNECTOR



[NOTE]

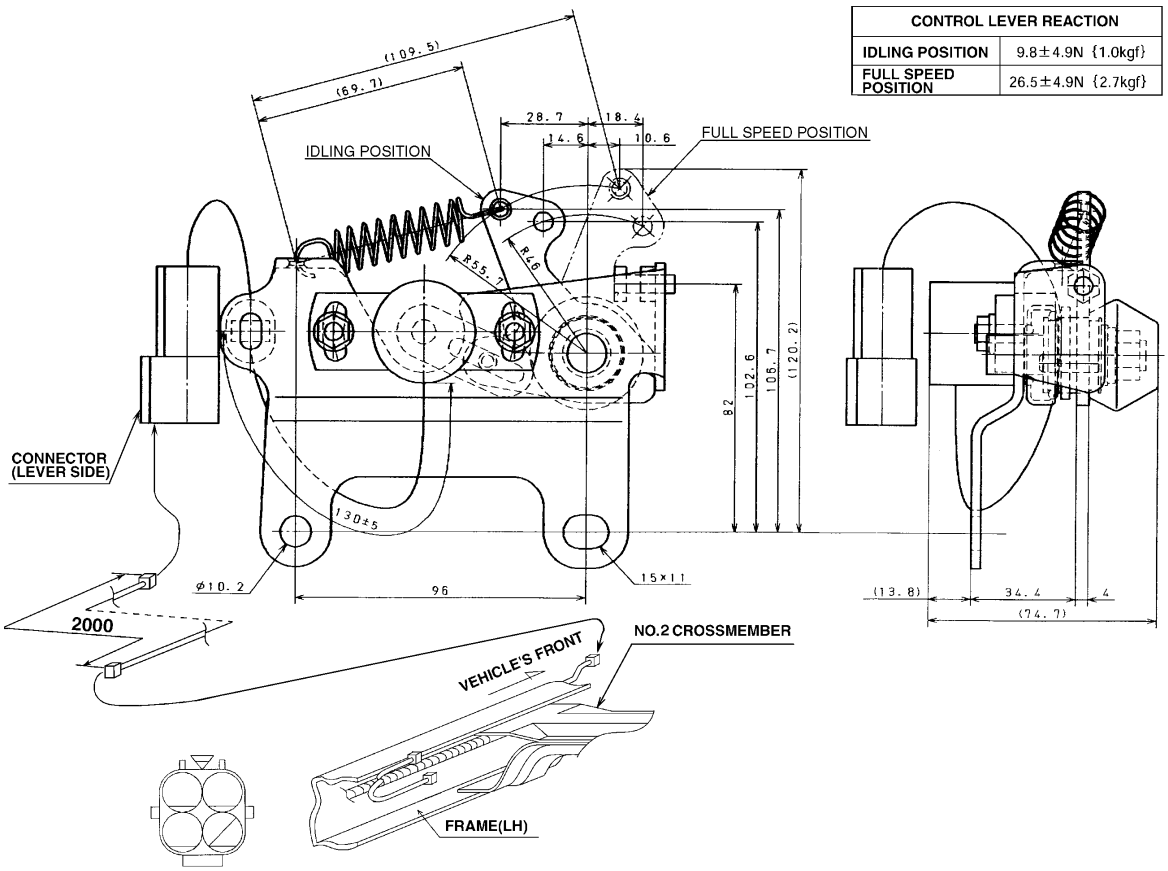
- ALTERATION OF ENGINE SPEED CUSTOMIZE INCLUDING PROVISION OF P.T.O. UNIT ETC. MUST BE PROVIDED OWN RESPONSIBILITY OF BODY OR EQUIPMENT MANUFACTURER.
- SET OF ENGINE SPEED BY MEANS OF REWRITING OF THE PROGRAM OF E/G ECU CAN BE MADE BY "HINO DIAGNOSTIC EXPLORE".
- STANDARD FUNCTION OF ENGINE ACCELERATION CONTROL BY ACCELERATOR PEDAL INSIDE OF CABIN IS CANCELLED DURING OPERATION OF BODY OR EQUIPMENT.
- CONSULT TO HINO SALES DEALER WHEN CUSTOMIZE ENGINE SPEED.

- Engine accelerator

a. Related parts, Engine accelerator unit and extension harness, are packed in cabin as optional equipment.

b. Connect the connector of Engine accelerator unit with spare connector which is provided forward No.2 crossmember at chassis frame LH side member.

Details of how to connect the connectors, see following figure.



- Other precautions

a. Conditions of change of E/G ECU to body or equipment control mode as following.

- Vehicle speed is Max. 20km/h or less.
- Transmission shift position is neutral.
- Engine speed is idling revolution.
- Engine accelerator unit is idle position.
- P.T.O. switch on signal is connected.

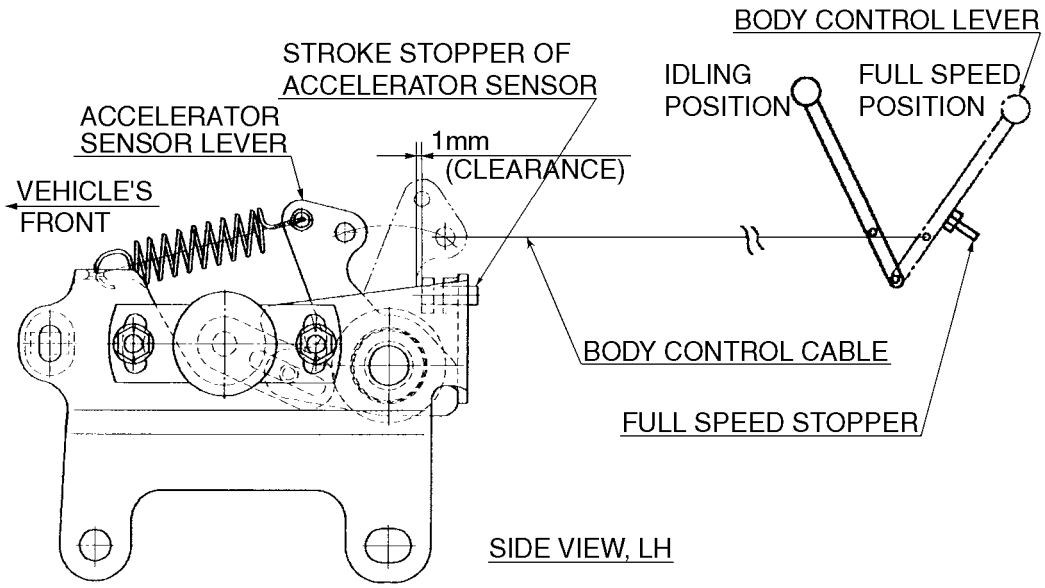
E/G ECU will be changed as body or equipment control mode with fully completed above conditions.

If a condition is loss, engine will run under normal vehicle operation to be controlled by accelerate pedal.

b. Details of installation of Engine accelerator to be controlled for body and equipment, refer to following page.

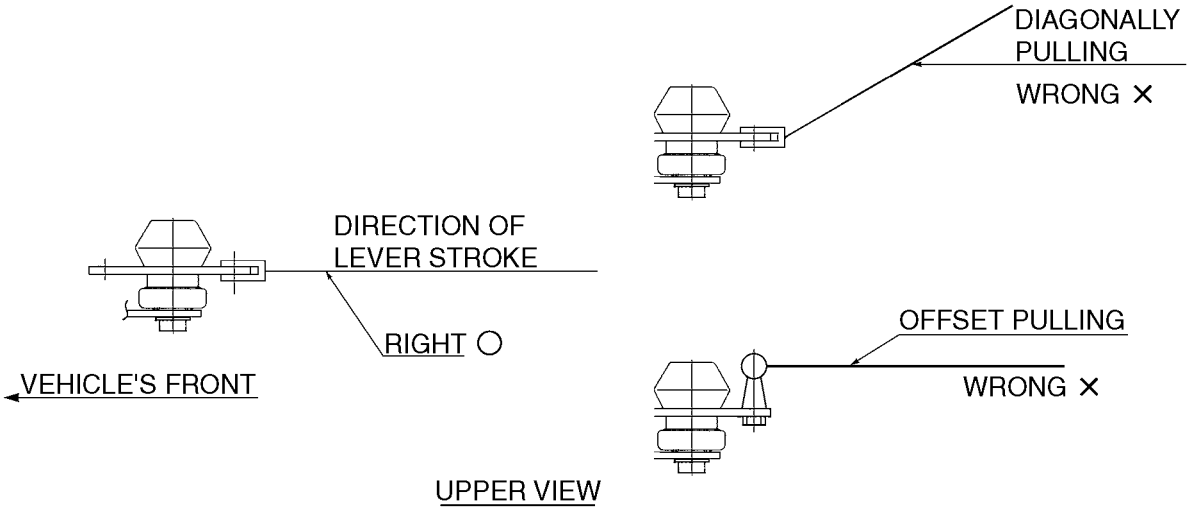
[HOW TO INSTALL ENGINE ACCELERATOR FOR BODY OR EQUIPMENT]

- Be sure to provide the body control lever with the full speed stopper for controlling the stroke of the sensor.
  In that case, adjust the body side stroke in such a way that the body side stopper comes in contact earlier than the sensor side stopper.
  The standard for adjustment is 1mm clearance between the sensor side lever and stopper under the condition than the body side lever touches the stopper.
  (See the following illustration.)
- Be sure to set the accelerator sensor lever that sensor lever should be contacted with idling stopper by adjusting body control lever while body or equipment do not operate (while vehicle is driving).



The clearance indicated for the stroke stopper of accelerator stopper is just for reference.
If the sensor side stopper comes into contact earlier, a forcible stress will be imposed on the sensor shaft and it may result in the damage of the part in cause.
Moreover if sensor lever do not came into contact with idling stopper may result in a bad condition of the engine while vehicle to be driving.

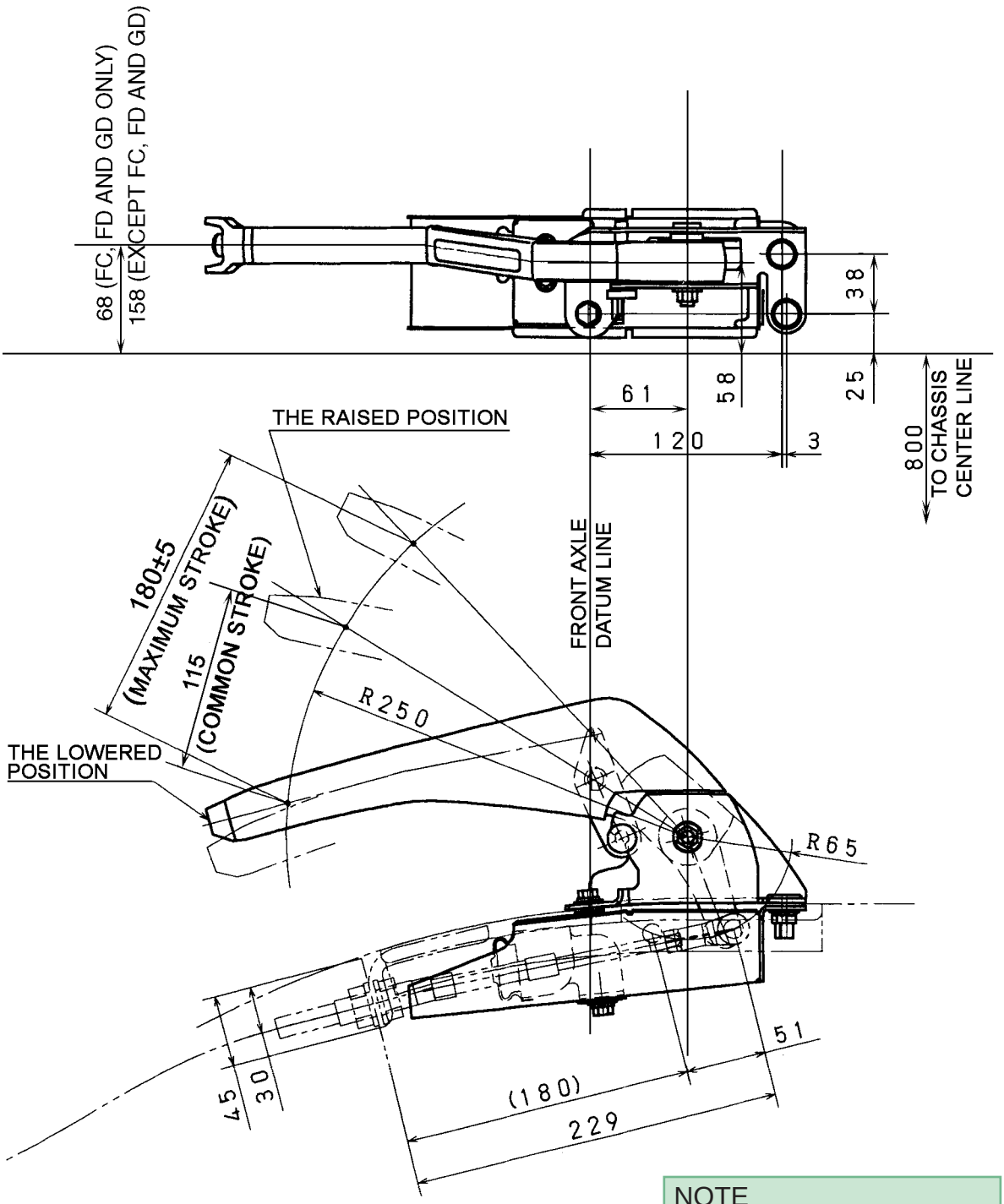
- When fitting the cable on the accelerator sensor lever, define the direction by pulling the cable parallelly to the direction of lever stroke so that an imbalanced load may not be imposed on the sensor shaft. (See the following illustration.)



- The accelerator sensor is not of integral water proof type.
  Therefore, when installing it, pay attention to avoid the direct projection of vehicle washing water, tire splash, etc..

6. REAR BODY CONTROL LEVER

DUMP LEVER : DL-1, DL-2

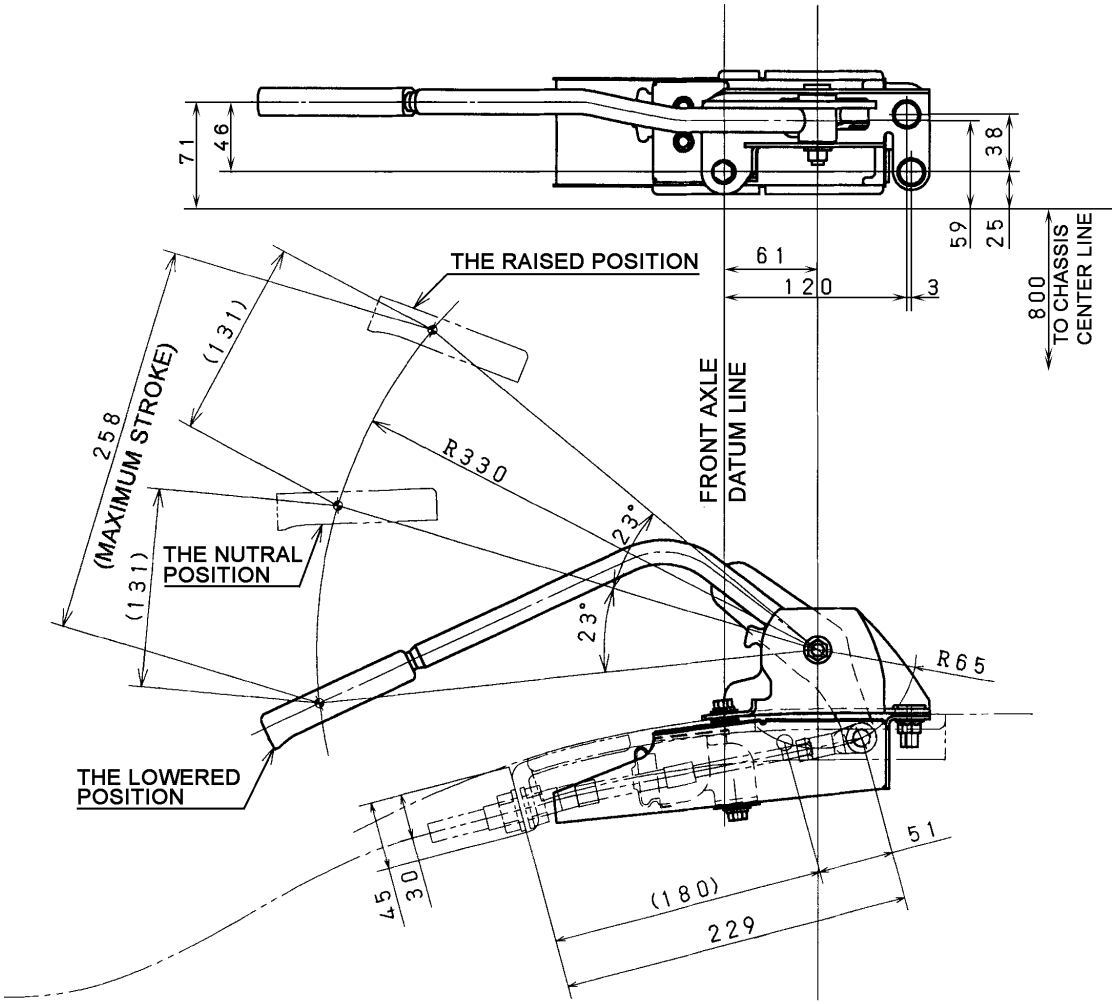


NOTE

- LEVER RATIO 250/65=3.8

RIGHT HAND DRIVE IS SHOWN IN THIS FIGURE, LEFT HAND DRIVE IS SYMMETRICAL TO THIS FIGURE.

MIXER LEVER : ML-1, ML-2



NOTE

- LEVER RATIO 330/65=5.1

RIGHT HAND DRIVE IS SHOWN IN THIS FIGURE, LEFT HAND DRIVE IS SYMMETRICAL TO THIS FIGURE.

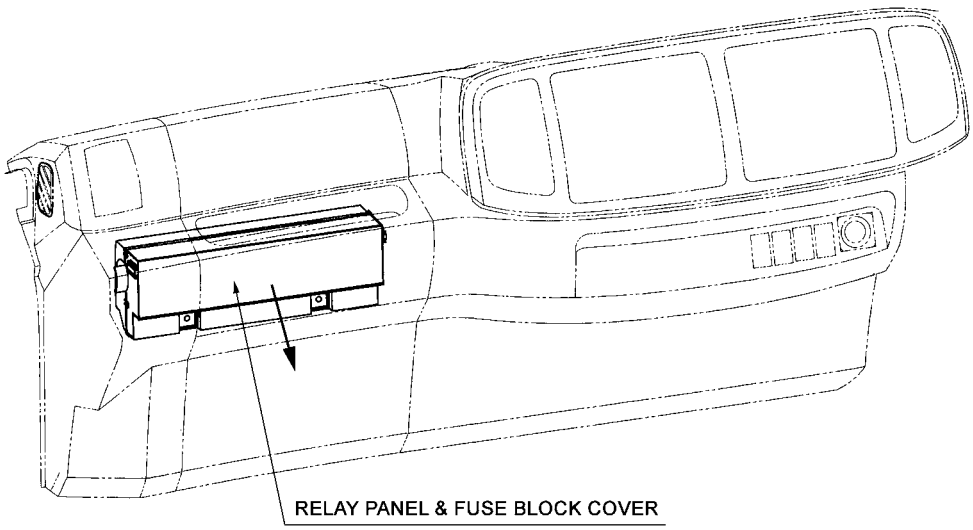
Chapter 6

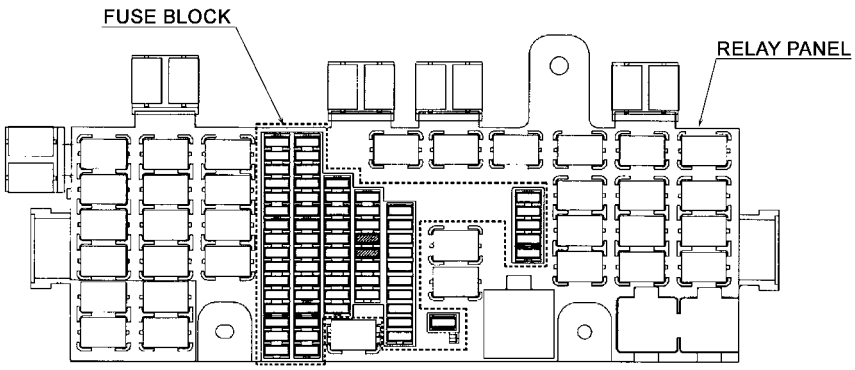
ELECTRICAL SYSTEMS

1. FUSE BLOCK, RELAY PANEL AND FUSIBLE LINK BLOCK

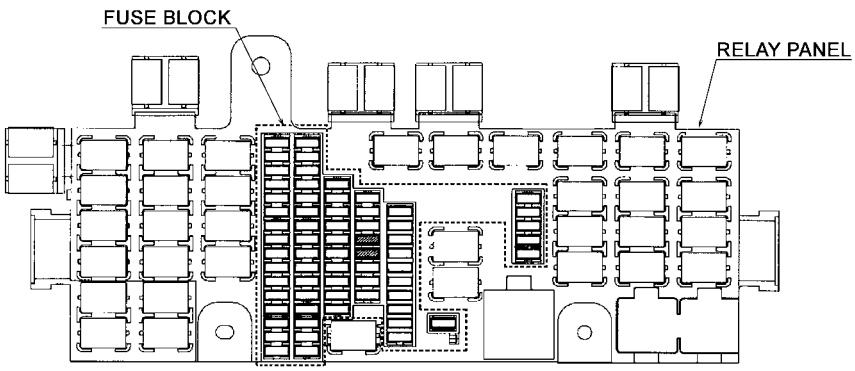
LOCATION OF THE CAB SIDE

The fuse block and the relay panel are located inside the instrument panel as shown below.
(The figure shown below is for RHD vehicle. LHD vehicle is symmetrical to this figure.)





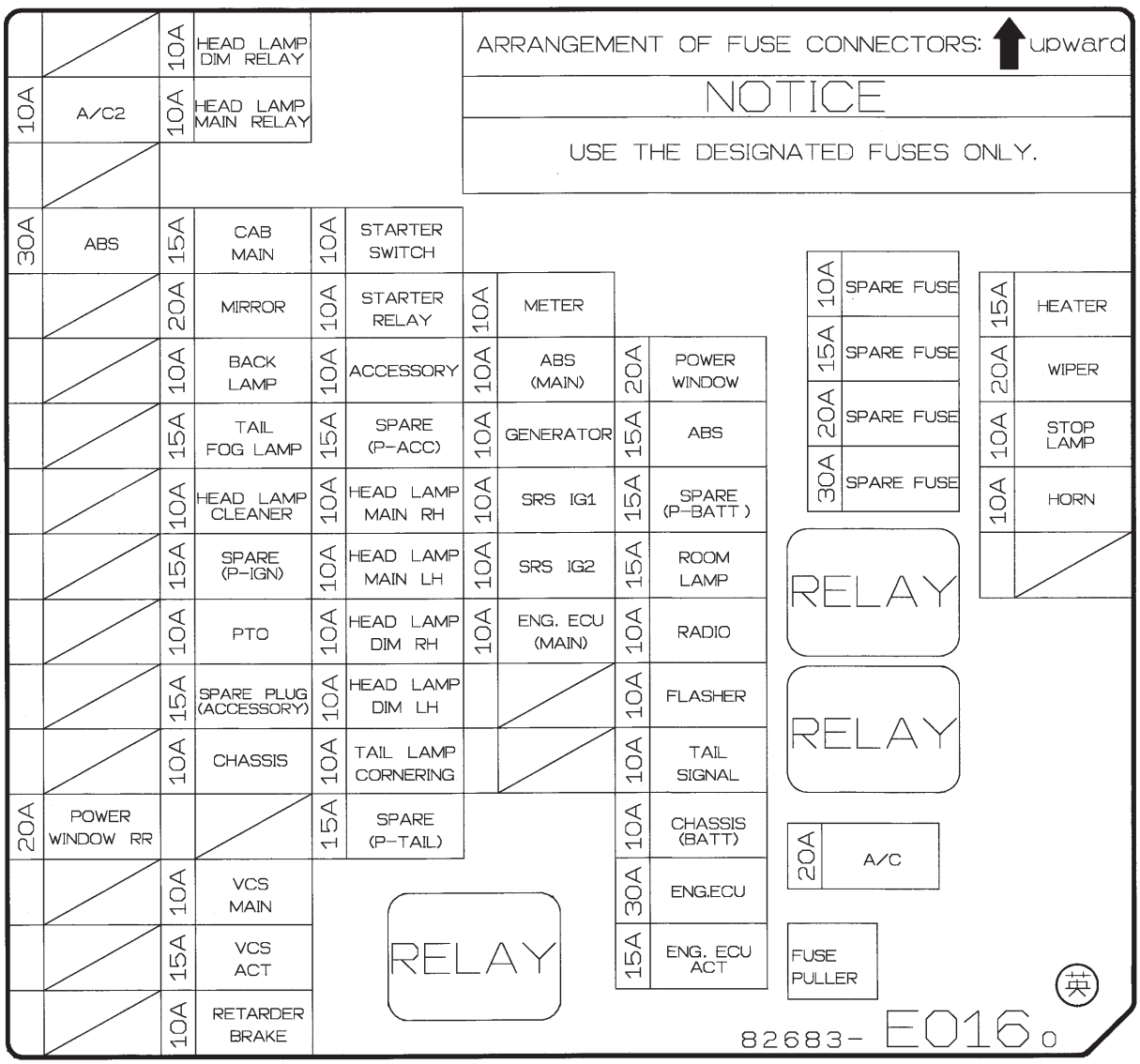
FOR RHD VEHICLE



FOR LHD VEHICLE

RELAY PANEL & FUSE BLOCK

Fuse block

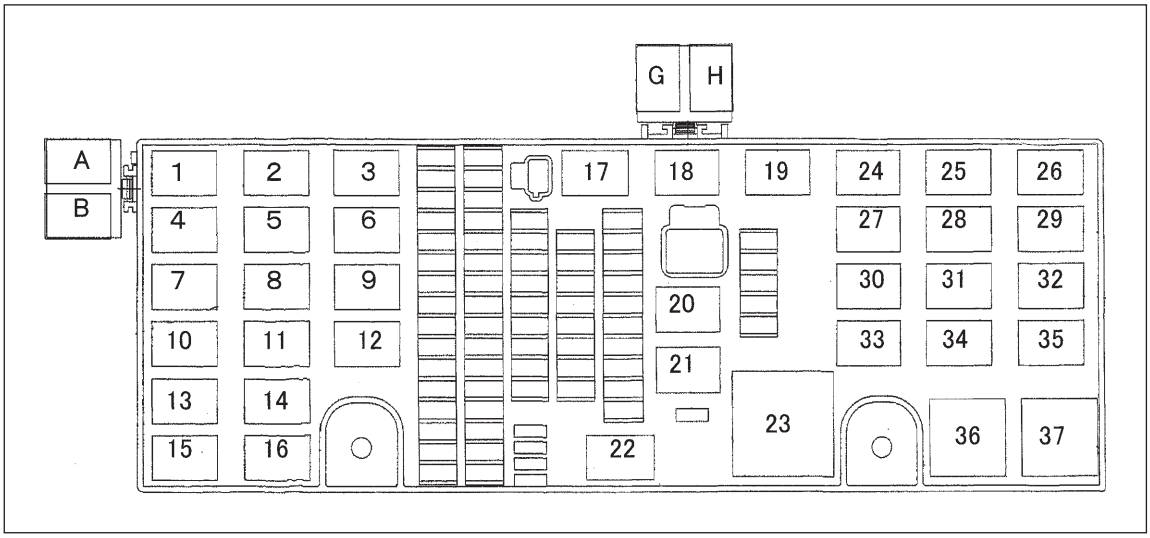


NOTE

- Be sure to use each capacity fuse designated in the above table.
  Never use the capacity fuse exceeding the designated one in the above, otherwise over current may damage the harness wires, and fusible linkage wires are in the same.
- The figure mentioned above is example, consequently, for various particular items, check them on the actual vehicle.

Relay panel

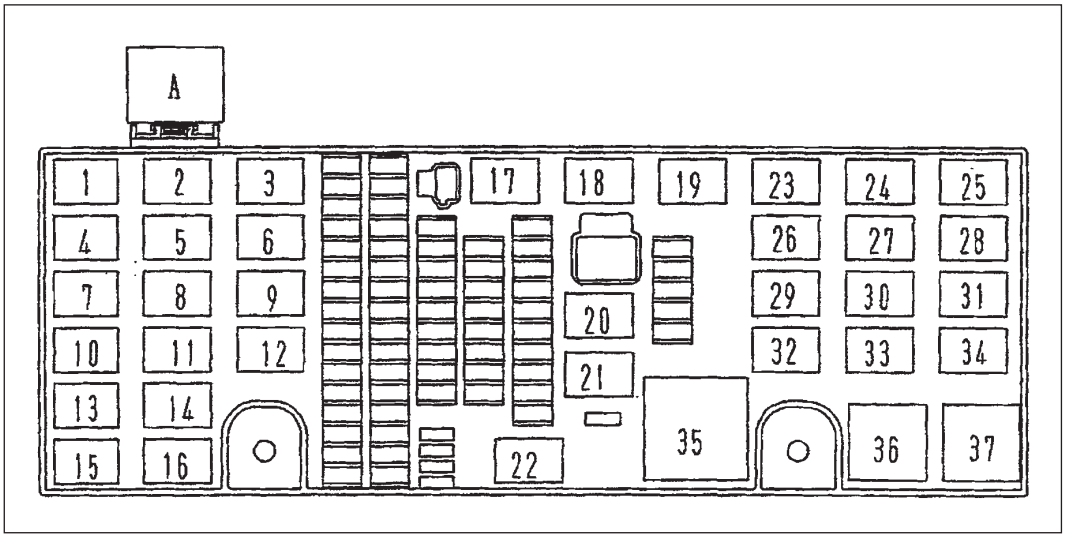
• RHD VEHICLE



RHD VEHICLE

No.	POLE NUMBER OF CONNECTOR	DESCRIPTION
1	4	LAMP CHECK RLY
2	–	–
3	–	–
4	–	–
5	–	–
6	4	RR P/W RLY
7	–	–
8	–	–
9	4	HORN RLY
10	–	–
11	–	–
12	–	–
13	4	IMMO PWR RLY
14	5	STARTER CUT RLY
15	4	IMMO 12VDMY RLY
16	–	–
17	4	PWR RLY1
18	4	PWR RLY3
19	4	PWR RLY2
20	4	TAIL LAMP RLY 1
21	4	TAIL LAMP RLY 2
22	4	U2 ACT PWR RLY
23	4	ABS MOTOR RLY
24	4	PWR RLY4
25	4	PWR ACC RLY
26	4	U2 ECU MAIN RLY
27	4	AIR CON RLY
28	4	A/C COS RLY
29	4	HEATER RLY
30	4	ABS EXH CUT RLY
31	4	U2 T-CUT DMY RLY
32	4	VSS ACT RLY
33	4	FR FOG LP RLY
34	4	H-LP DIM RLY
35	4	H-LP MAIN RLY
36	4	ABS SOL RLY
37	–	–
A	4	TILT UP RELAY
B	4	TILT DOWN RELAY
G	4	MIR HTR RLY

• LHD VEHICLE

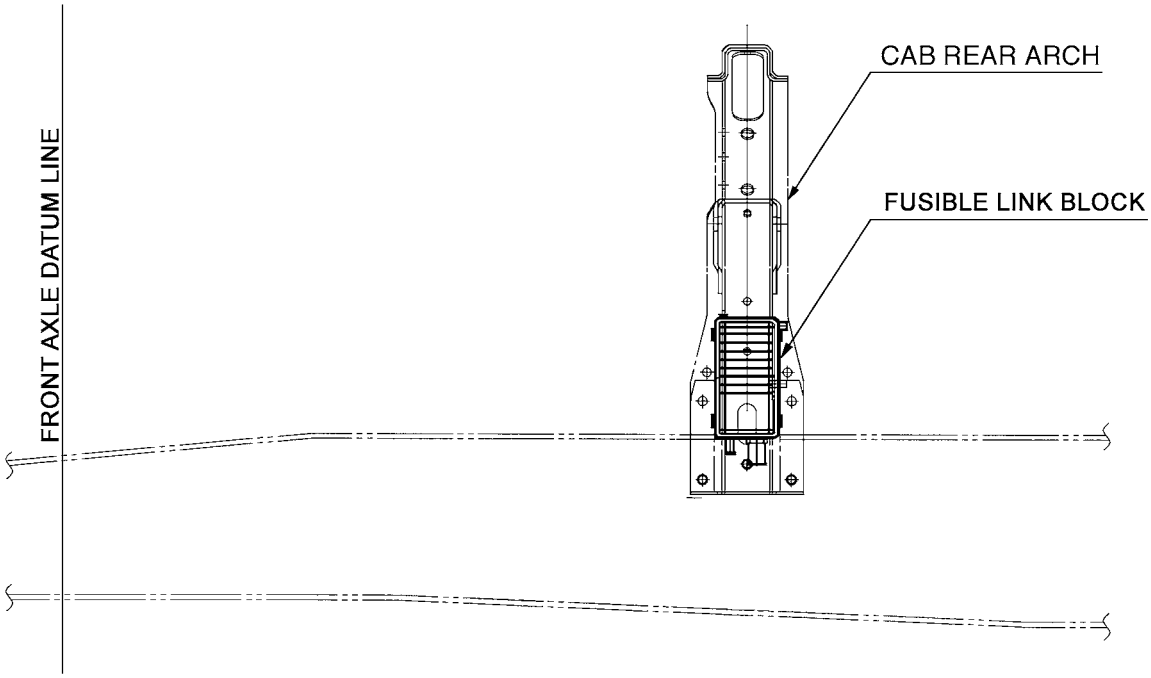


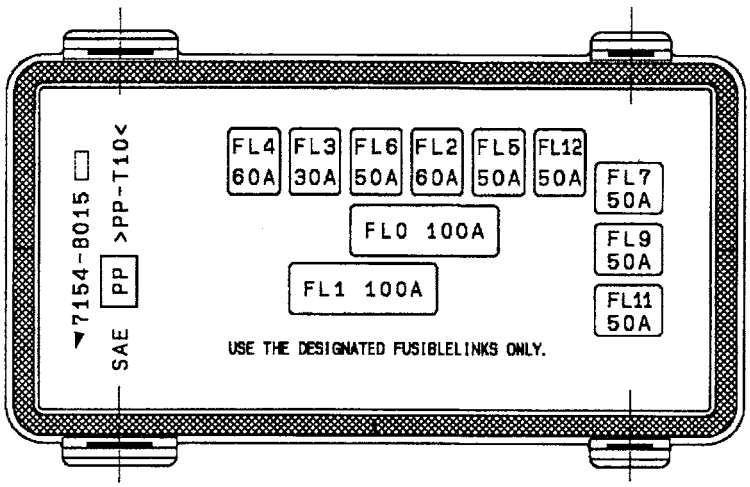
LHD VEHICLE

No.	POLE NUMBER OF CONNECTOR	DESCRIPTION
1	4	HEATER RELAY
2	4	A/C RELAY
3	4	A/C CONDENSER RELAY
4	4	HORN RELAY
5	–	–
6	–	–
7	4	HEAD LAMP RELAY (MAIN)
8	4	HEAD LAMP RELAY (DIMMER)
9	4	FOG LAMP RELAY
10	–	–
11	4	ECU MAIN RELAY
12	4	REAR FOG LAMP RELAY
13	4	ABS WARNING LAMP RELAY
14	4	ABS EXHAUST BRAKE CUT RELAY
15	4	ACTUATOR POWER RELAY
16	5	LO-HI INDICATOR RELAY
17	4	POWER RELAY No.1
18	4	POWER RELAY No.3
19	4	POWER RELAY No.2
20	4	TAIL LAMP RELAY 1
21	4	TAIL LAMP RELAY 2
22	–	–
23	4	POWER RELAY No.4
24	4	POWER RELAY ACC.
25	5	PTO RELAY (FOR EATON T/M ONLY)
26	–	–
27	–	–
28	–	–
29	4	BACK-UP LAMP RELAY
30	–	–
31	–	–
32	–	–
33	–	–
34	–	–
35	4	ABS MOTOR RELAY
36	5	ONE-KEY RELAY
37	4	STOP LAMP RELAY
A	4	ABS SOLENOID RELAY

LOCATION OF THE FUSIBLE LINK BLOCK

The fusible link block is located on left side of the cab rear arch as shown below.





FUSIBLE LINK BLOCK

2. SPARE POWER TERMINALS

SPARE POWER SUPPLIES AND POSITIONS

If you must take an electrical power supply for the body from the chassis, take it from the spare power supply.

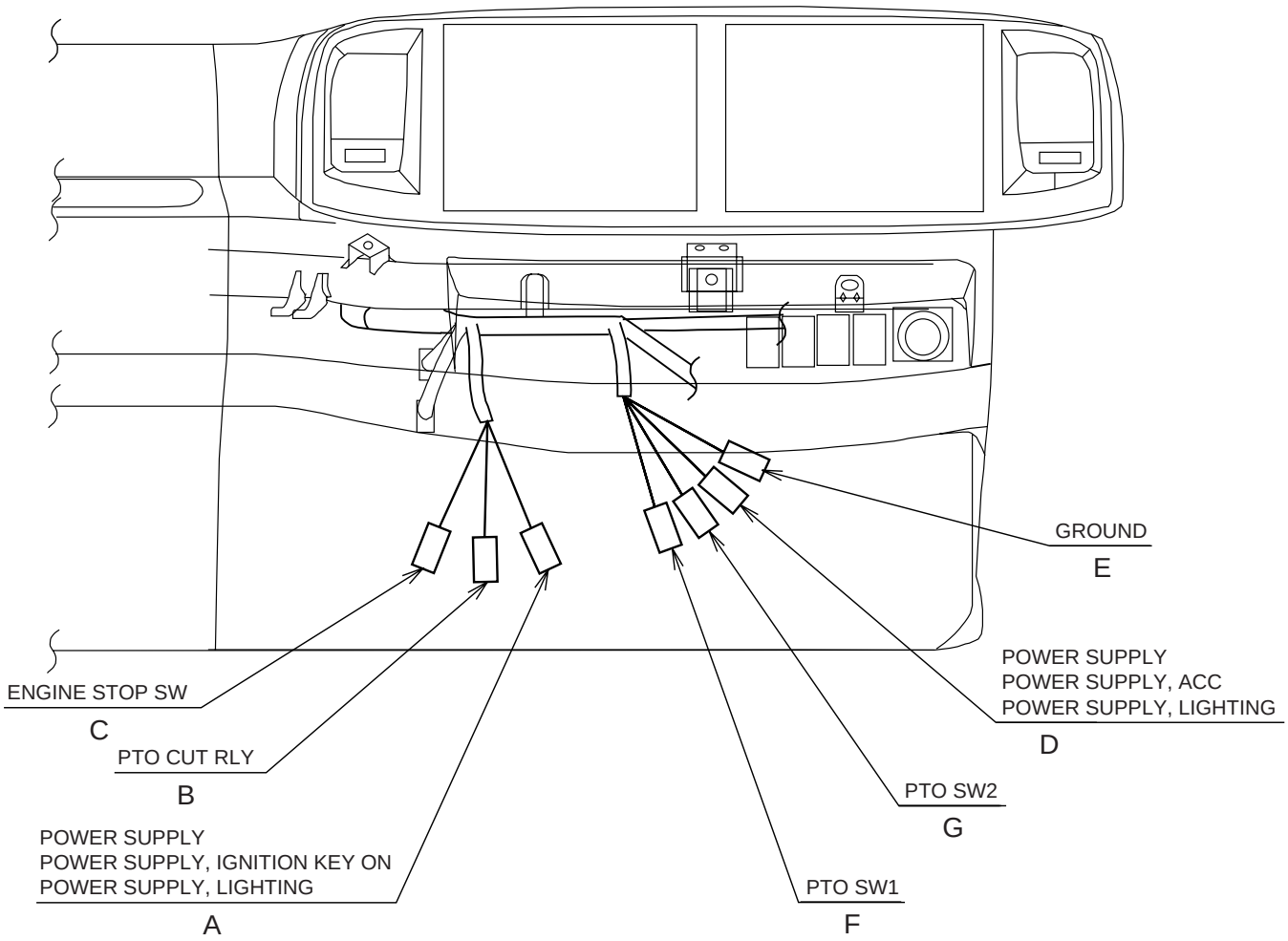
	TERMINAL MARK	POLE CODE	CIRCUIT (MAIN APPLICATION)	MAX. CAPACITY (A)	WIRE SIZE & COLOR	TERMINAL (CONNECTOR) PARTS No.	COUPLING CONNECTOR (SPARE PARTS) PARTS No.	APPLICABLE MODEL	REMARKS
CAB SIDE	A	AGH	POWER SUPPLY	※1 10A	1.25 Y -	82824 - E0K70	82824 - E0K60		
		AGM	POWER SUPPLY IGNITION KEY ON	10A	0.85 W - R				
		AGP	POWER SUPPLY LIGHTING	※2 10A	0.85 O				
	B	&06	PTO CUT RLY	–	0.5 W	82580 - 6170	82580 - 6160	J ENGINE	
	C	&07	ENGINE STOP SW	–	0.5 L - W			ALL MODEL	
	D	I0P	POWER SUPPLY	※1 10A	1.25 Y -	82824 - E0U70	82580 - 8380	ALL MODEL	
		I0Q	POWER SUPPLY, ACC	※3 10A	0.85 R -				
		I0K	POWER SUPPLY, LIGHTING	※2 10A	1.25 O -				
		I0S	GROUND	30A	2.0 B -				
	E	AQK	GROUND	30A	3.0 B -	82560 - 2970	82560 - 2960	ALL MODEL	
	F	&04	PTO SW1	–	0.5 G -	82580 - 6170	82580 - 6160	J ENGINE	
	G	&05	PTO SW2	–	0.5 Y - W			J ENGINE	
CHASSIS SIDE	H	U39	POWER SUPPLY, DUMP-UP SWITCH	7	0.5 W - B	82580 - 4240	82580 - 4230	DUMP	
	I	AGQ	POWER SUPPLY, LIGHTING	※2 10	※ 0.85 O -	82824 - E0M10	82824 - E0M00	ALL MODEL	PERMISSIBLE CURRENT : 10A {TOTAL CURRENT = INSIDE CAB CONNECTOR D (I0K) CONNECTOR I (AGQ)
	J	K95	POWER SUPPLY	–	0.5 R or LG -	82560 - 1260	82560 - 1250	RHD ALL	E/G Control For Rear Body Prt.2
		K96	ACCEL SENSOR	–	0.5 Y				
		K97	GROUND	–	0.5 B				

NOTE

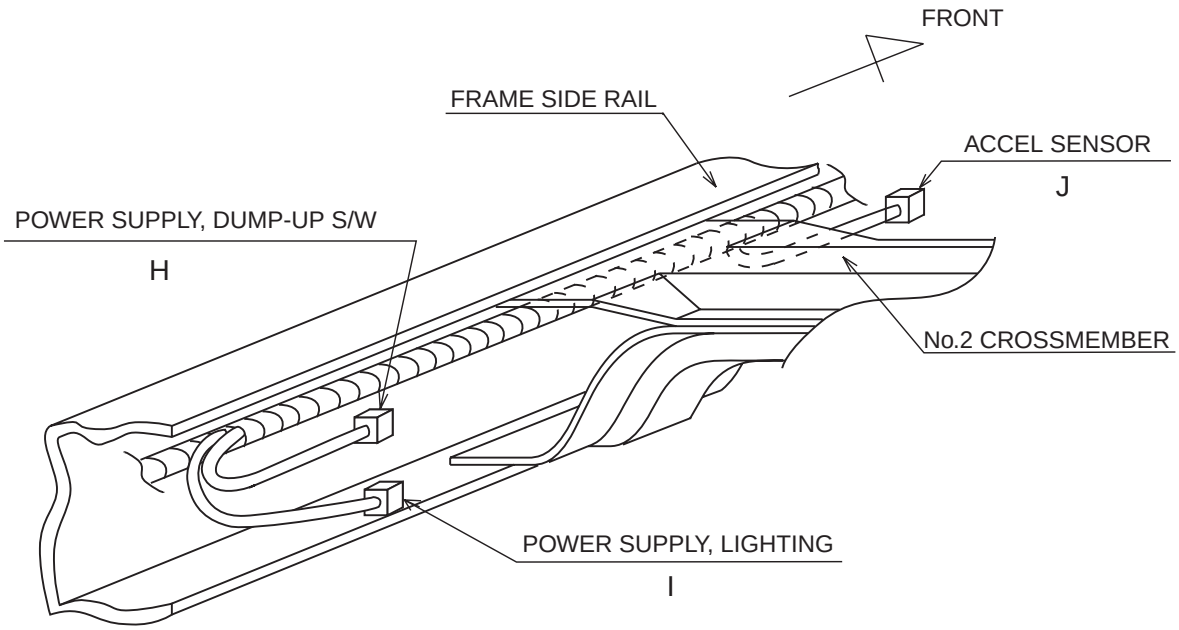
- The permissible current to be taken from spare power terminal is determined from the capacity of the fuse and wire size.
- Make sure that the maximum load (current) of the installed equipment must be kept lower current than the permissible capacity to be able to take from spare power terminal.
- Total current of 12V POWER SUPPLY (OPT) and POLE CODE AGH should be within 10A. (MARK ※1)
- Total current of 12V POWER SUPPLY (OPT) and POLE CODE AGP, AGQ and I0K should be within 10A. (MARK ※2)
- Total current of 12V POWER SUPPLY (OPT) and POLE CODE I0Q should be within 10A. (MARK ※3)
- Be sure to keep the lower current value than the alternator generated capacity when switched on the original and additional equipment same time to avoid over discharging electricity of the battery.
- ※0.85 for all models except tractor, 1.25 for tractor only.

OUTLET POSITION INSIDE CAB

- **Center of instrument panel**

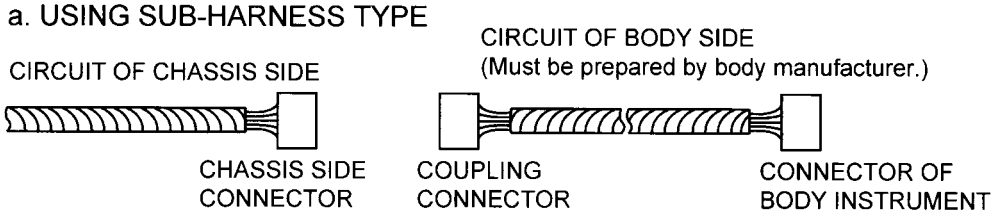


OUTLET POSITION OF CHASSIS SIDE

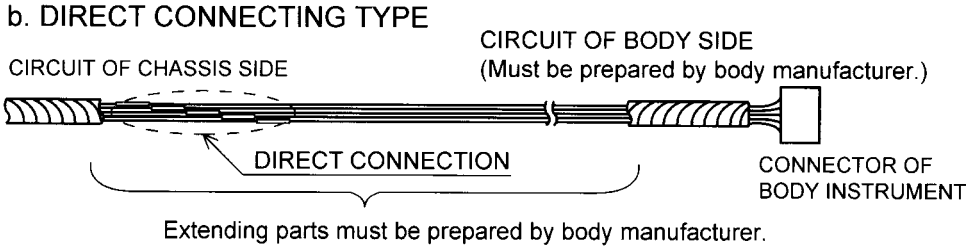


HOW TO TAKE ELECTRICITY FROM POWER SUPPLY CIRCUIT

a. USING SUB-HARNESS TYPE



b. DIRECT CONNECTING TYPE

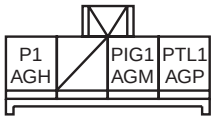
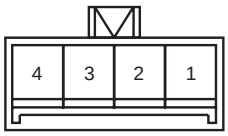
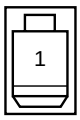
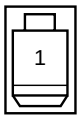
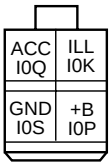
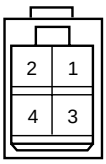
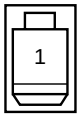
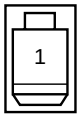


NOTE

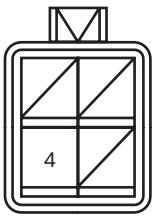
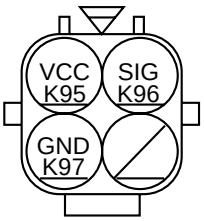
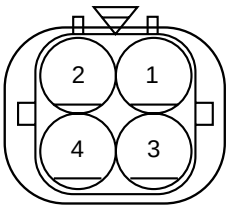
- As far as possible take power using sub-harness type.
- If you must take power using direct connecting type, be sure to observe the precautions in described item “ELECTRICAL EQUIPMENT AND WIRING” of Common Manual.

DETAIL OF CONNECTOR

• **Cab side**

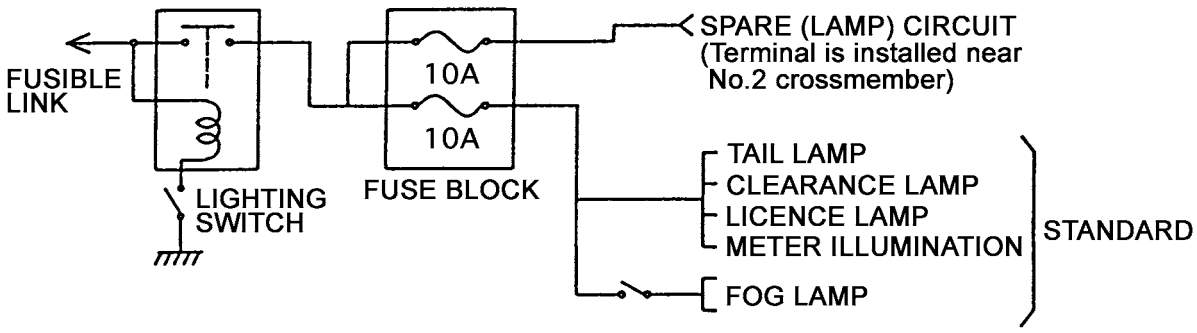
	CONNECTOR	
	VEHICLE SIDE	COMPANION SIDE
A		
	PARTS No. 82824 - E0K70	PARTS No. 82824 - E0K60
B		
	PARTS No. 82580 - 6170	PARTS No. 82580 - 6160
C		
	PARTS No. 82580 - 6170	PARTS No. 82580 - 6160
D		
	PARTS No. 82824 - E0U70	PARTS No. 82580 - 8380
E		
	PARTS No. 82560 - 2970	PARTS No. 82560 - 2960
F		
	PARTS No. 82580 - 6170	PARTS No. 82580 - 6160
G		
	PARTS No. 82580 - 6170	PARTS No. 82580 - 6160

• **Chassis side**

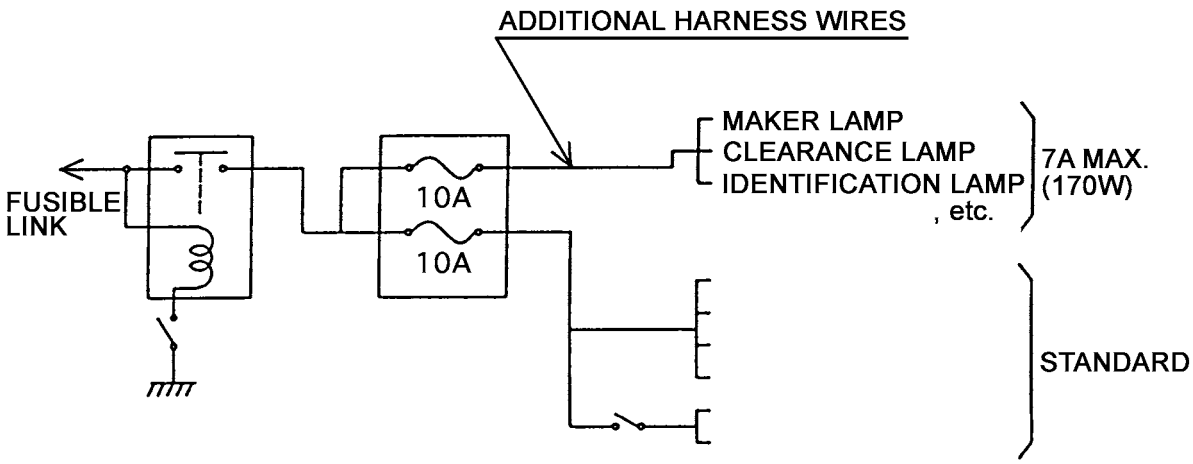
	CONNECTOR	
	VEHICLE SIDE	**COMPANION SIDE**
H		
	PARTS No. 82580 - 4240	PARTS No. 82580 - 4230
I		
	PARTS No. 82824 - E0M10	PARTS No. 82824 - E0M00
J		
	PARTS No. 82560 - 1260	PARTS No. 82560 - 1250

3. ELECTRIC WIRING OF SPARE OUTLET

STANDARD WIRING CONFIGURATION

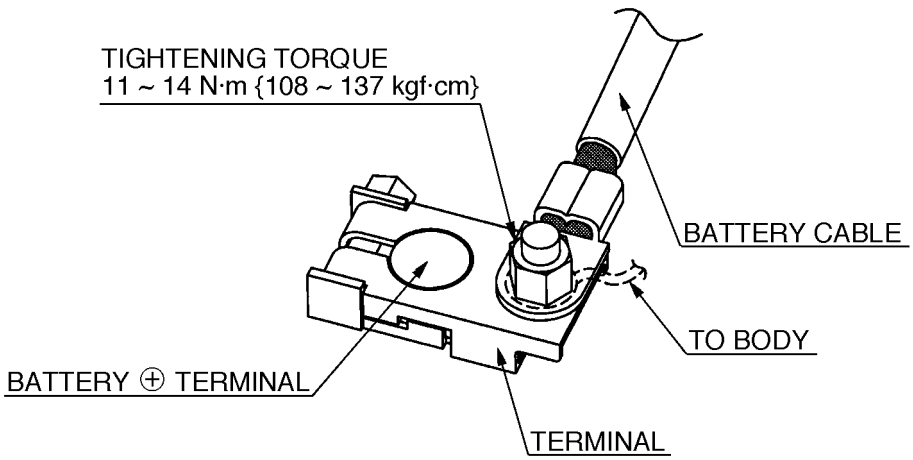


WIRING CONFIGURATION FOR INCREASED LOAD



TAKING POWER DIRECTLY FROM THE BATTERY

If you intend to take power for the body directly from the battery, secure the battery cable and the body power supply terminal together with the same nut (see drawing).
In this case, you must install a fuse at a suitable point in the circuit and take precautions to prevent short circuits as these may lead vehicle fires.
When securing the cable and power terminal, make sure you tighten the nut properly.



INSTALLATION OF ADDITIONAL EQUIPMENT AND SWITCHES

Layout of switches

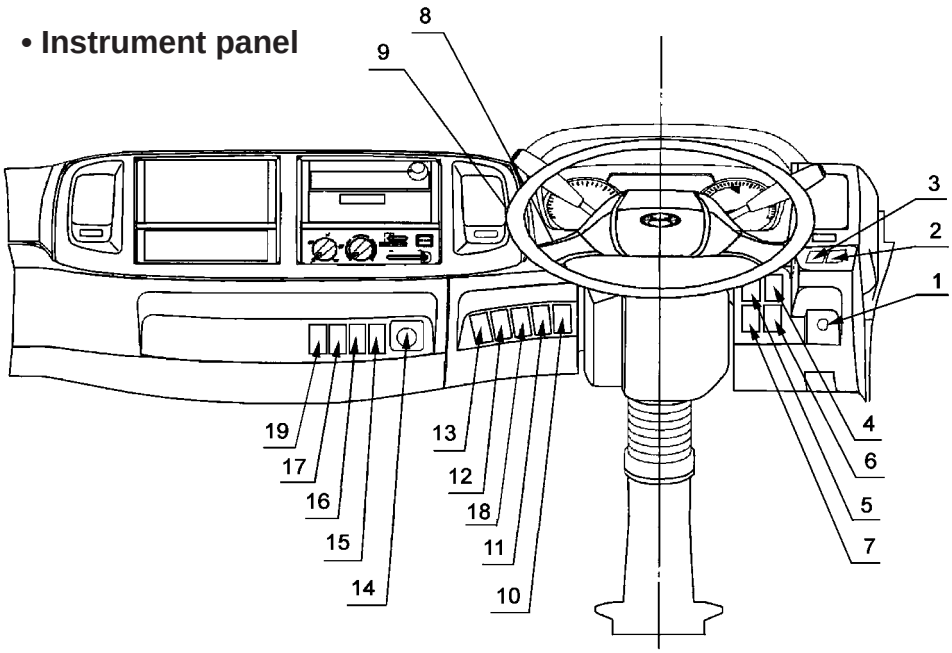
- Standard layout of switches include option equipment are as following figure.
- If you intend to install additional switches at instrument panel for the convenience of body mounting, be sure to install it at empty space after confirmation of original condition on the actual vehicle.

Avoid using additional switches with existing switches

- If you install additional switches, fit a caution plate showing the purpose of each switch, etc., to prevent accidental operation or confirmation.

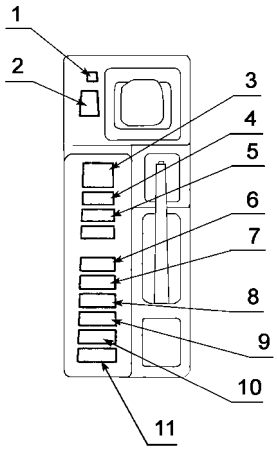
RHD VEHICLE

• Instrument panel



No.	DESCRIPTION	APPLICATION
1	IDLE VOLUME SWITCH	STD
2	RR POWER WINDOW SWITCH (RH)	INSTALLATION BY VEHICLE SPECIFICATION
3	RR POWER WINDOW SWITCH (LH)	INSTALLATION BY VEHICLE SPECIFICATION
	CRUISE MAIN SWITCH	INSTALLATION BY VEHICLE SPECIFICATION
4	HEAD LAMP LEVELING SWITCH	INSTALLATION BY VEHICLE SPECIFICATION
5	——	——
	HEAD LAMP WASHER SWITCH	INSTALLATION BY VEHICLE SPECIFICATION
6	FRONT FOG LAMP SWITCH	OPT
7	——	——
8	INFORMATION DISPLAY CONTROL SWITCH	STD
9	FRONT DRIVE SWITCH	INSTALLATION BY VEHICLE SPECIFICATION
	ASR OFF SWITCH	INSTALLATION BY VEHICLE SPECIFICATION
10	EXHAUST BRAKE CHECK SWITCH	STD
11	T/M PTO SWITCH	OPT
12	——	——
13	DIFF LOCK SWITCH	INSTALLATION BY VEHICLE SPECIFICATION
	2-SPEED HI/LO SWITCH	INSTALLATION BY VEHICLE SPECIFICATION
14	CIGAR LIGHTER	OPT
15	ES START SWITCH	OPT
	——	——
16	ECO RUN SWITCH	INSTALLATION BY VEHICLE SPECIFICATION
17	DPR MANUAL REGENERATION SWITCH	STD
18	BRAKE LOCK SWITCH	——
	AIR SUSPENSION SWITCH	——
19	HOOK	STD

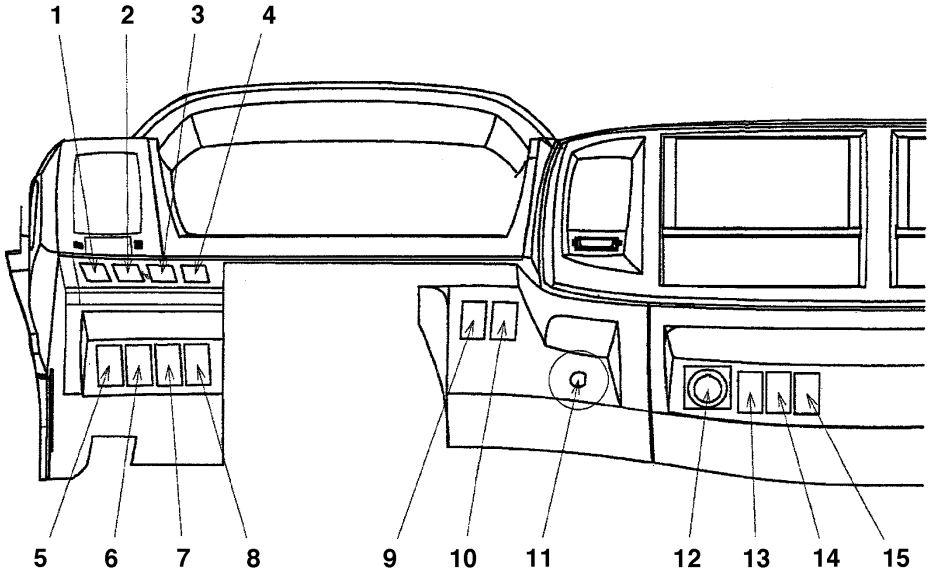
• Floor console



No.	DESCRIPTION	APPLICATION
1	——	——
2	——	——
3	REMOTE CONTROL MIRROR SWITCH	INSTALLATION BY VEHICLE SPECIFICATION
4	POWER MIRROR SWITCH	INSTALLATION BY VEHICLE SPECIFICATION
5	MIRROR HEATER SWITCH	INSTALLATION BY VEHICLE SPECIFICATION
6	——	——
	FLUORESCENT LIGHT SWITCH	OPT
7	——	——
8	——	——
9	——	——
10	——	——
11	——	——

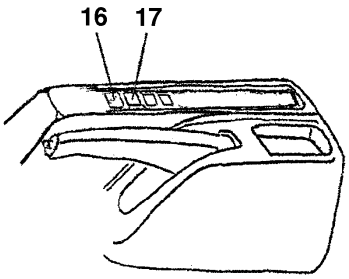
LHD VEHICLE

• Instrument panel



No.	DESCRIPTION	APPLICATION
1	FR FOG LAMP SWITCH	OPT
2	T/M PTO SWITCH	OPT
3	- -	- -
4	H/L LEVELING SWITCH	INSTALLATION BY VEHICLE SPECIFICATION
5	RR FOG LAMP SWITCH	INSTALLATION BY VEHICLE SPECIFICATION
6	PARK LAMP SWITCH	INSTALLATION BY VEHICLE SPECIFICATION
7	- -	- -
8	- -	- -
9	HI/LO SWITCH	INSTALLATION BY VEHICLE SPECIFICATION
10	2WD/4WD SWITCH OR DIFF. LOCK SWITCH	INSTALLATION BY VEHICLE SPECIFICATION
11	IDLE VOLUME SWITCH	STD (FOR VEHICLE WITH ENGINE TO BE CONTROLLED ECU ONLY)
12	CIGARETTE LIGHTER	OPT
13	ES START SWITCH	INSTALLATION BY VEHICLE SPECIFICATION
14	- -	- -
15	CONVENIENCE HOOK	STD

• Floor console

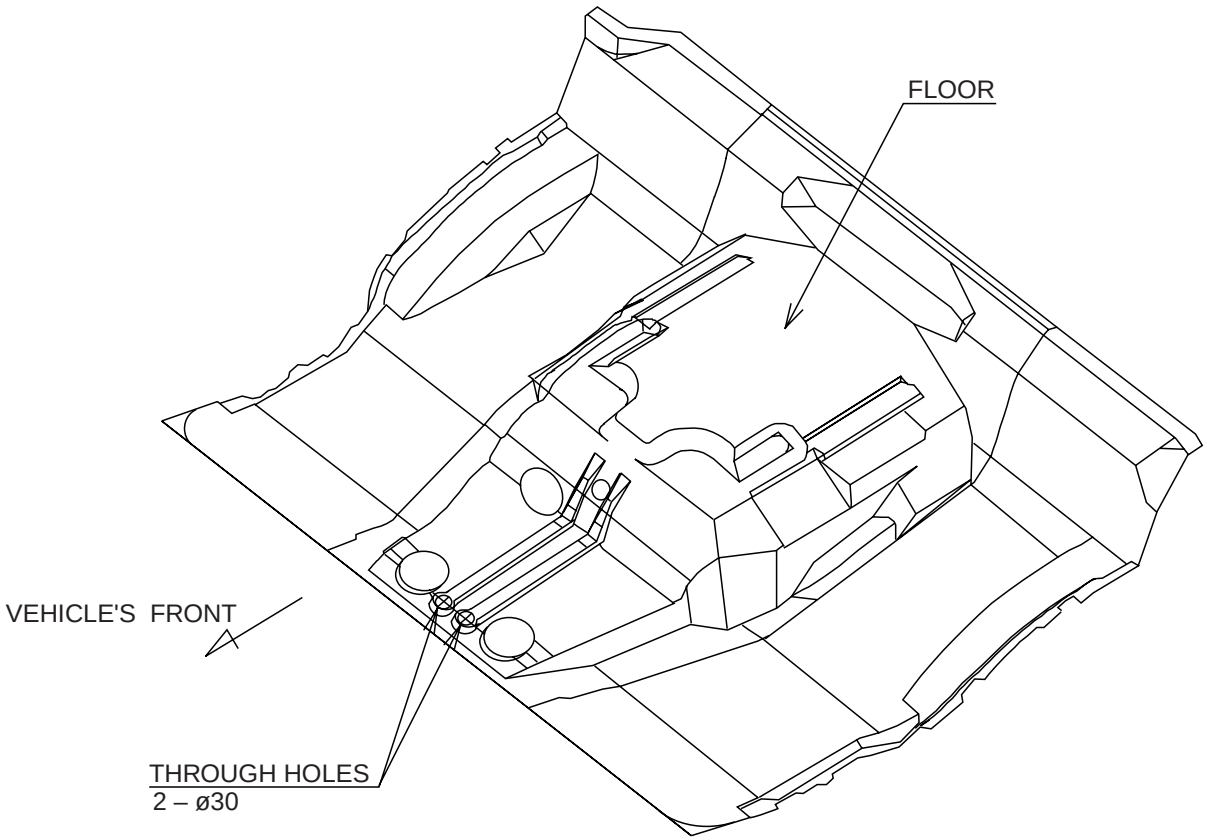


No.	DESCRIPTION	APPLICATION
16	POWER MIRROR STAY SWITCH	INSTALLATION BY VEHICLE SPECIFICATION
17	FLUORESCENT LIGHT SWITCH	INSTALLATION BY VEHICLE SPECIFICATION
	- -	- -
	- -	- -

4. PRECAUTION FOR INSTALLING WIRES, etc.,TO CAB

USING THE THROUGH HOLE FOR PIPING AND HARNESS ON THE FLOOR

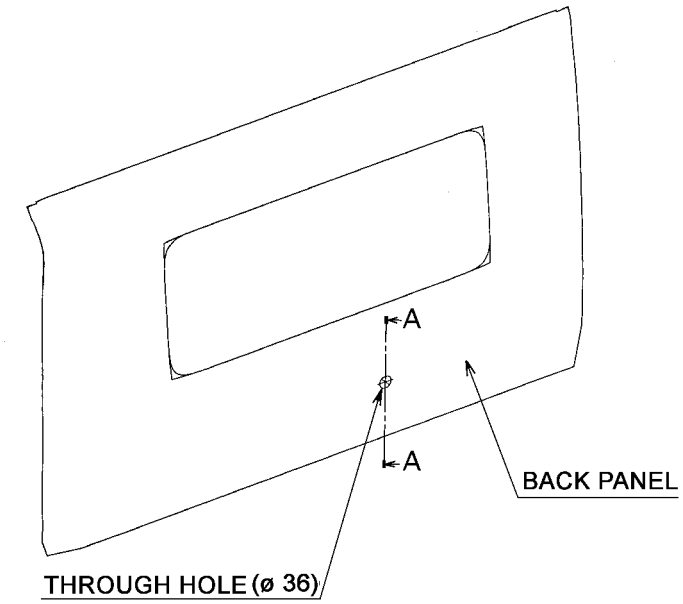
When using the through hole for piping and harness on the floor,
at the front part of the floor panel through hole is provided for mounting harnesses or cables.
When mounting the body, remove the plug hole and then carry out wiring with using the harness grommets.

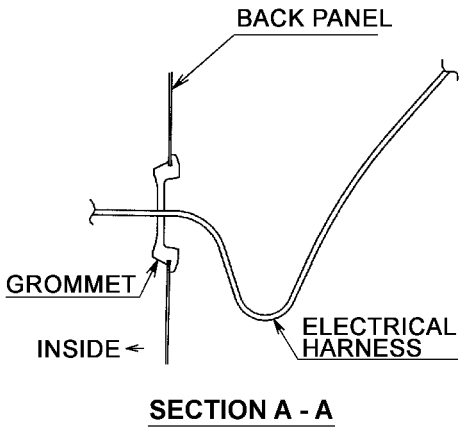


USING THROUGH HOLE OF BACK PANEL FOR WIRING

When using through hole of back panel for wiring, to secure the rust prevention and water proof before the said taken-in, carry out fitting and wiring according to the following instructions.

- A through hole of ø 36 is provided on the back panel but it is closed with a grommet.Make a slit on this grommet and, after the wiring, sufficiently seal its periphery with a sealing agent.
- In order to secure the water proofness, lower the wiring once as shown on " Section A - A " to drain the water and after that bring the wiring into the cab.
- It is prohibited to fix the wiring with a tapping screw etc., because this can be a cause of penetration of rust.





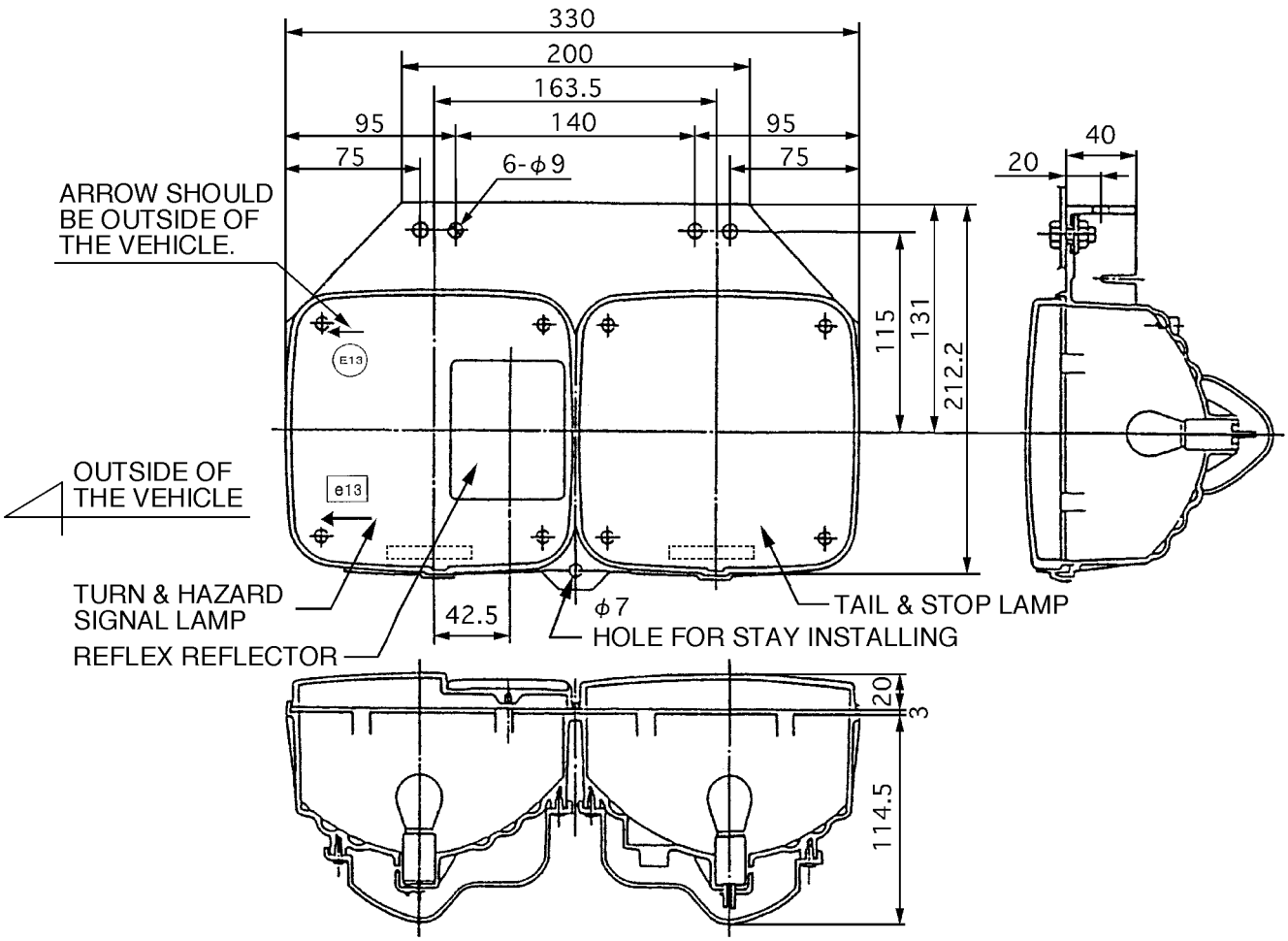
5. REAR COMBINATION LAMP

When chassis with cab are shipped, the rear combination lamp assembly is temporarily installed onto the end of the frame.

Therefore, when installing it regularly, attach the combination lamp assembly directly such that the tail lamp (red) is inside and the direction indicator lamp (turn signal lamp, umber) is outside of the vehicle.

Do not install the rear combination lamps vertically so as not to affect the performance of reflectors and water drain holes.
When installing the rear combination lamps onto the rear body, install reinforcing stays to prevent breakage, deflection and vibration of rear combination lamp body.

Unit : mm



NOTE

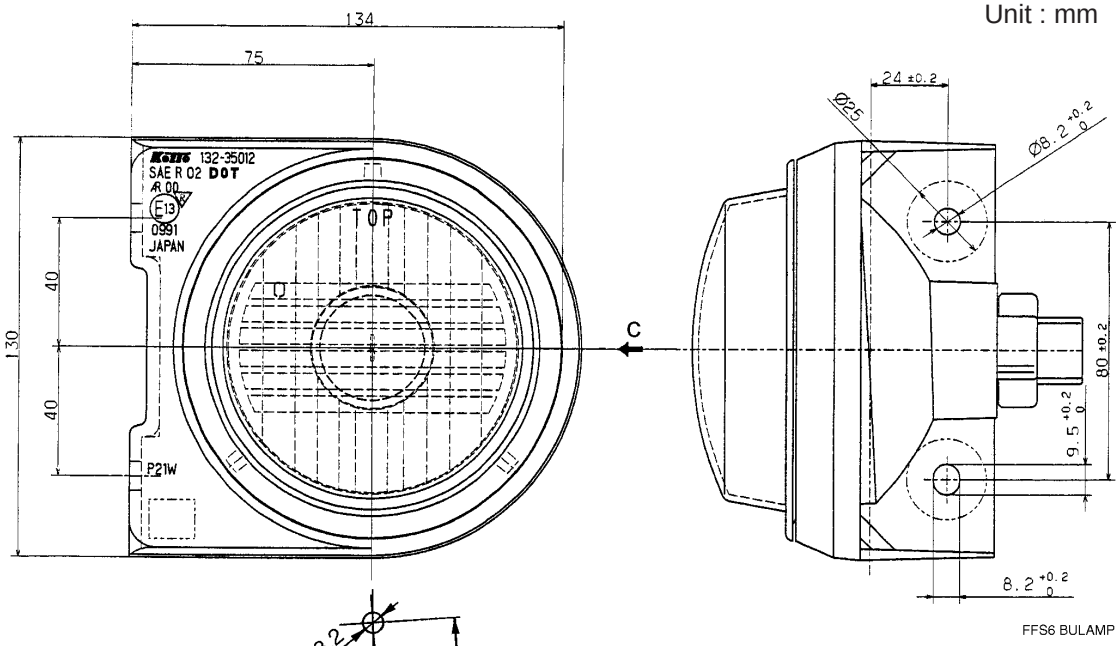
- Drawing shows rear combination lamp, LH side.
  And, RH side is symmetrical this drawing.

6. OTHER LAMPS

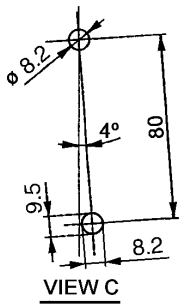
BACK-UP LAMP

It is temporary attachment at the time of chassis shipment.
Install in a regular position correctly according to the following directions at the time of body mounting.

Unit : mm



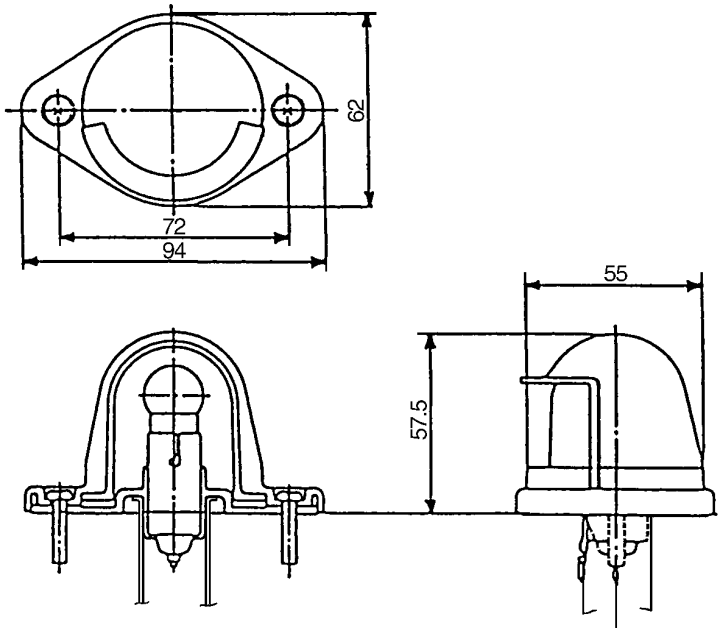
FFS6 BULAMP



[NOTE]
- When install the back-up lamp, mark “TOP” on the lens must always be up side.
- Installation angle must be kept 4°.
- This drawing is for RH side.
  And, LH side is symmetrical this drawing.

LICENSE PLATE LAMP

Unit : mm



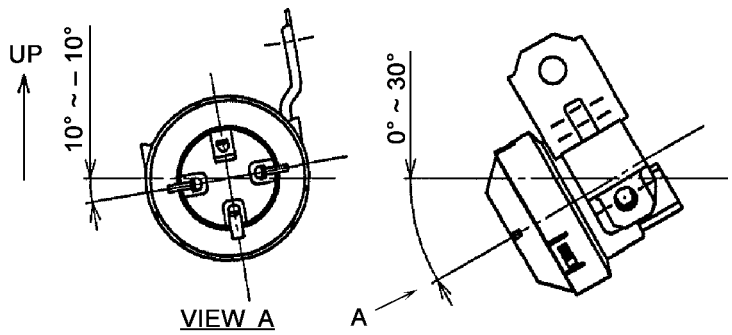
7. BACK-UP BUZZER

If you move or install the back-up buzzer, or modify the surrounding parts of the chassis, observe the precautions as followings.

INSTALLATION ANGLE

- Must be kept the permissible range of installing angles shown in the figure below.
- If the installing angle is not within range, water will accumulate inside the buzzer and may lead to failure.

Unit : mm



POSITION

Install the back-up buzzer in a position where it is not exposed to splashing with muddy water, stone or water.

PRECAUTION FOR PAINTING

Make sure that the buzzer should be covered during painting to protect the paint coming into buzzer from sound emitting hole for avoiding failure of no sound.

8. ELECTRICAL WIRING DIAGRAMS

This manual does not contain electrical wiring diagrams.
The electrical wiring diagrams are in the WORKSHOP MANUAL.
For more details, please contact authorized Hino distributor.

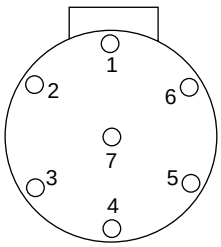
9. SEMI-TRAILER ELECTRICAL CONNECTION

CONNECTOR TYPE : SAE TYPE, 7- CONDUCTOR ELECTRICAL CONNECTION

• JUMPER CABLE

RELEVANT MODEL
CLASSIFICATION NUMBER :

Detail of Connector's Plug Pin

Form for plug of jumper cable	Number of conductor	Wire color	Lamps and Signal circuits	Max. capacity
 FRONT VIEW	1	White	Earth	-
	2	Black	Spare outlet	7A
	3	Yellow	Turn signal lamp (LH) Hazard lamp (LH)	1.8A
	4	Red	Stop lamp	1.8A
	5	Green	Turn signal lamp (RH) Hazard lamp (RH)	1.8A
	6	Brown	Tail lamp License plate lamp	10.5A
	7	Blue	Back up lamp	1.8A

• Refer to chapter 1, 3 chassis specification for classification number.

Chapter 7

PAINTING

1. GENERAL PRECAUTIONS FOR PAINTING

When you apply finish paint to the cab etc. observe the following precautions.

Some parts of the cab and chassis are sensitive to heat of the drying, some parts must not be painted and so require masking, etc.

GENERAL PRECAUTIONS FOR PAINTING

- Parts to be masked:
  Parts that must not be painted-ornaments, name plates (model names, Hino logo mark chassis number), caution plate, etc. must all be masked.
  (It is possible to take off the top mark.)
  Never paint the rubber hoses and nylon tubes or valves, the brake booster, or hoses or valves of the brake fluid reservoir.

- If you get paint on the cab compartment, wipe it clean with gasoline.
  Never use thinner.

- If the body of the air cleaner has been taken out, seal off the engine intake port completely so that paint and dirt do not get in.
  When you replace the body of the air cleaner, make sure that the hose is properly fitted and securely clamped.

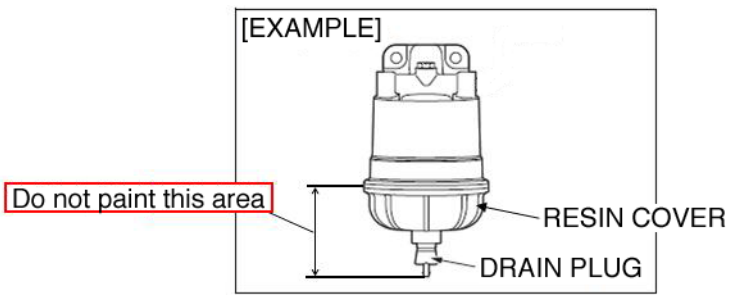
- Cover the battery, wiring connections and hoses to protect them from paint.

- When clean inside of the cab,must be clean it with a neutral detergent.
  Never use gasoline and paint thinner.

- Pay attention when dismounting and removing the cab exterior fittings.
  The bolts that thread diameter exceeds 6mm to be tighten the exterior parts of the cab body have been modified from “+ type screw bolt” to “star type bolt (torx bolt)” in order to improve stabilization of tightening torque and avoiding the damage of tool groove.
  Use proper tools to fit with “torx bolt”.

- Precaution for prevent painting the resin cover of fuel pre filter
  If painted the resin cover of fuel pre filter, there will be a crack in the resin cover, then it may occur serious problems such as leaking of fuel and the engine hasn't started by suck the air.
  Therefore, make sure the following manner.

  NOTES
  - When painting, should put a mask completely on the resin cover.
  - When painting, if painted the resin cover, it need replace a new one.
    (There is nothing changed shortly after painted the resin cover but it may be a crack in resin cover proceed with time.)



GENERAL PRECAUTIONS FOR FORCED DRYING

- When you use forced drying, a temperature on the surface of any parts to be painted must be 80°C as an upper limit.

  Removing off any plastic parts, rubber parts from the vehicle, paint them when you use a forced drying at over 80°C. (Refer to the figure as shown in after.)

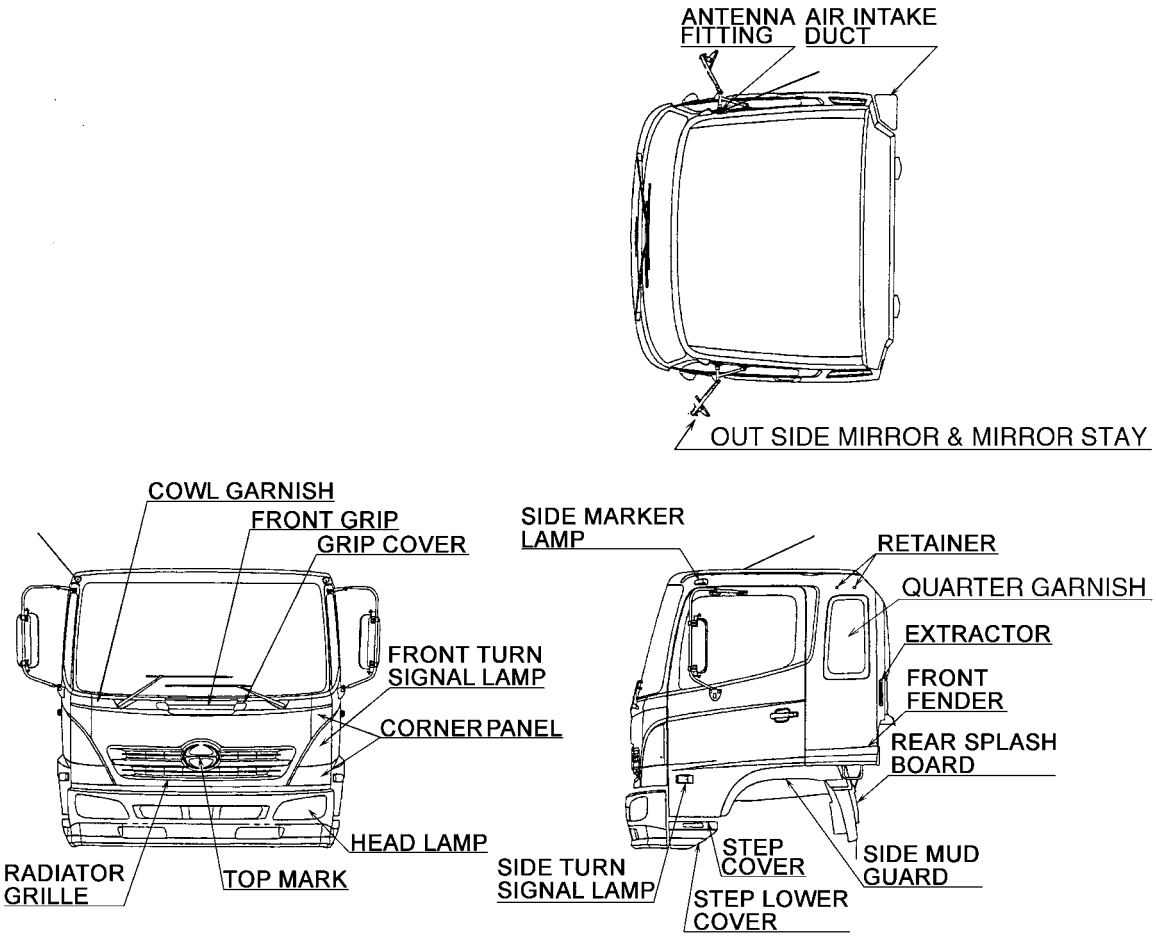
  Take care to those as plastic parts like fender, air cleaner, etc. are much used.

- When a vehicle with air-conditioning whose piping and hosing are heated at abnormal temperature (more than 100°C), a pressure safety valve may function and come out refrigerant gas.

- When removing off a air-cleaner assy, seal completely the inlet port side of engine to prevent any penetration of dirt, paint or etc.

- Remove off the parts shown below, when you use forced drying at over 80°C.

NON-HEAT RESISTING PARTS AT THE HEATED AIR OR MORE THAN 80°C



NOTE

- The figure shows RHD vehicle, LHD vehicle is the same with above figure, except location of ANTENNA FITTING which is symmetrical.
- When drying with heated air more than 80°C these parts described above must be removed.
- Detail of outside mirror to be equipped is shown following page.

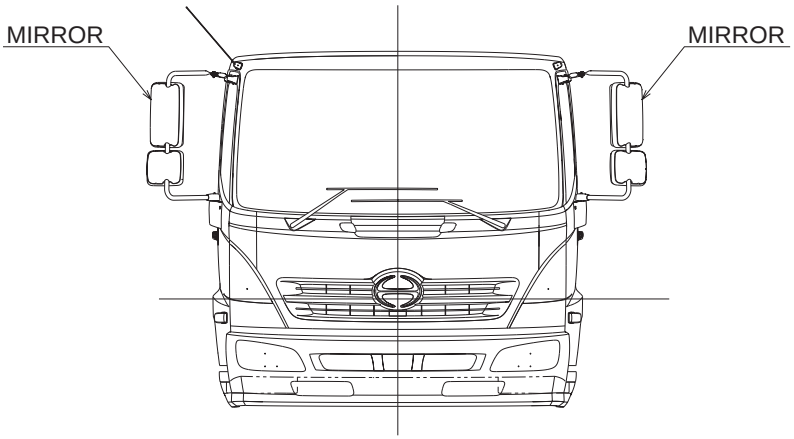
DETAIL OF OUTSIDE MIRROR TO BE EQUIPPED

RELEVANT MODEL

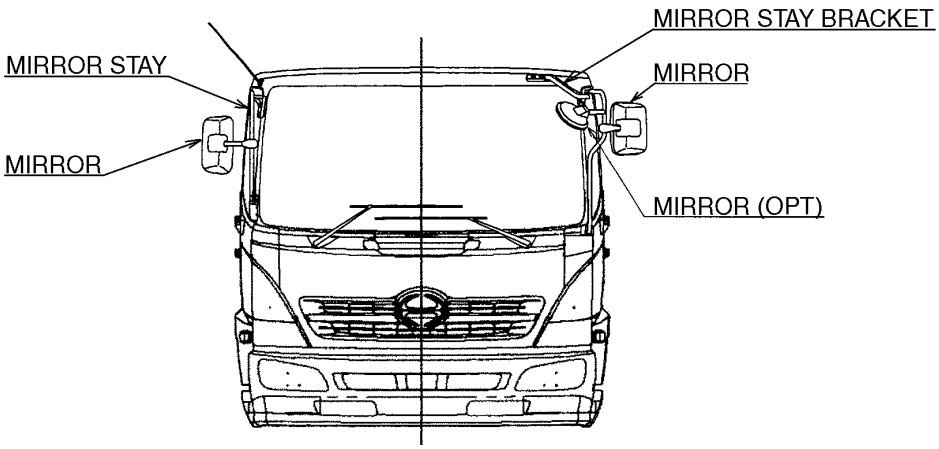
CLASSIFICATION NUMBER	MIRROR TYPE
FD-022,023,024, 025,026,027,028, 029	A

- Refer to chapter 1, 3 chassis specification for classification number.

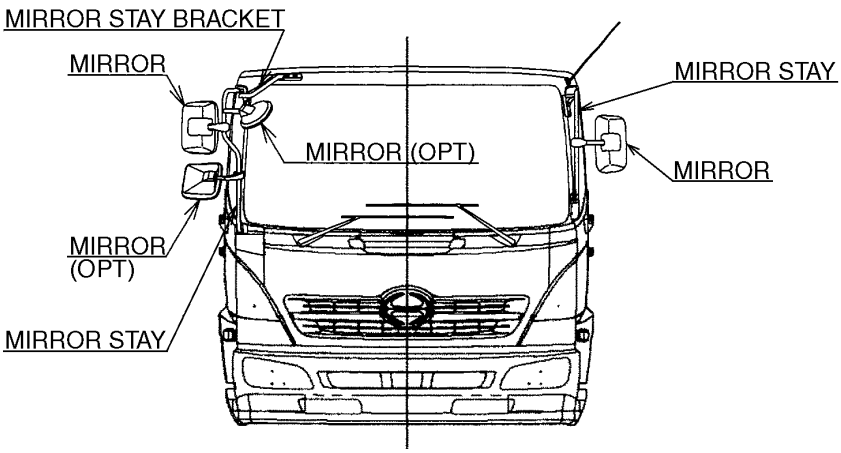
FLAT MIRROR TYPE [TYPE A]



CONVEX MIRROR TYPE [TYPE B]



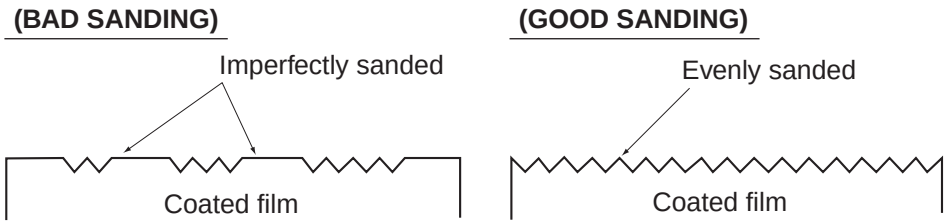
CONVEX MIRROR TYPE [TYPE C]



2. NOTE ON THE TOP COAT OF PAINT

NOTE ON THE TOP COAT OF PAINT

- To make sure that the top coat of paint adheres well, you must sand the middle coat carefully.
  Make sure that the sanding is even and complete.
  When you have finished sanding, carefully dust off the shavings.



- How to choose top coat paint
  HINO recommends urethane-type paints for the top coat,as they have superior rust-prevention properties to lacquer-type paints.
  The top coat should be at 30 µ thick and the total paint thickness including undercoat and primers should be at least 80 µ thick.

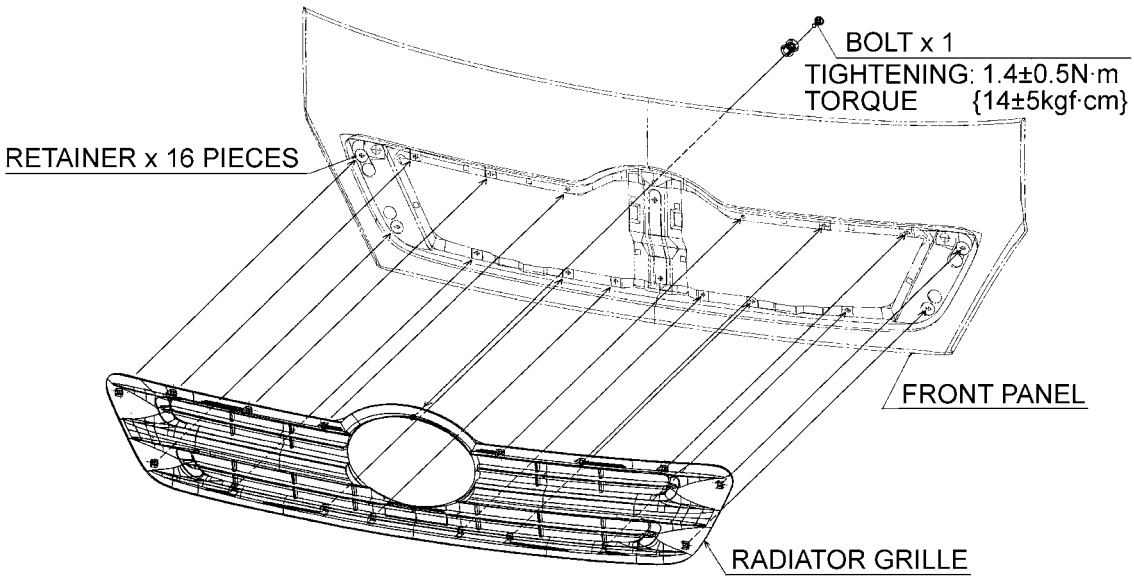
- How to install weather strips
  If door weather strips have been removed when painting the cab, remount them according to the following procedure, item 7.5.
  Be very careful not to make mistake in deciding the mounting procedure to avoid an eventual cause of rain drop leakage.

3. HOW TO REMOVE THE PARTS OF CAB

HOW TO REMOVE THE PARTS OF CAB FRONT

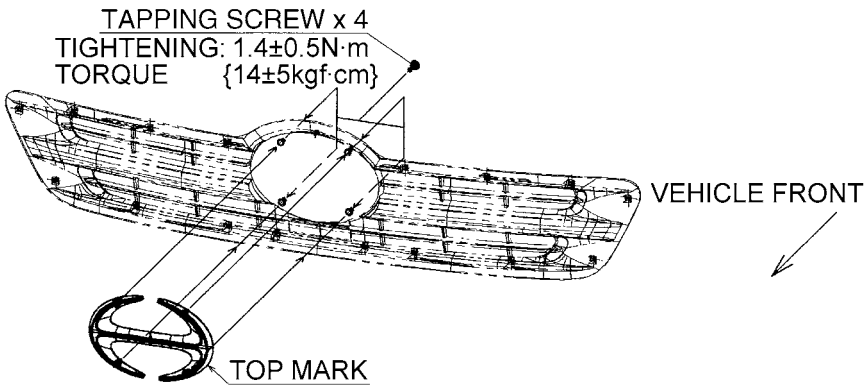
• Radiator grille

- Open the front panel. (front inspection lid)
- Loose the bolt from back side of the front panel.
- Remove the retainer. (16 pieces)

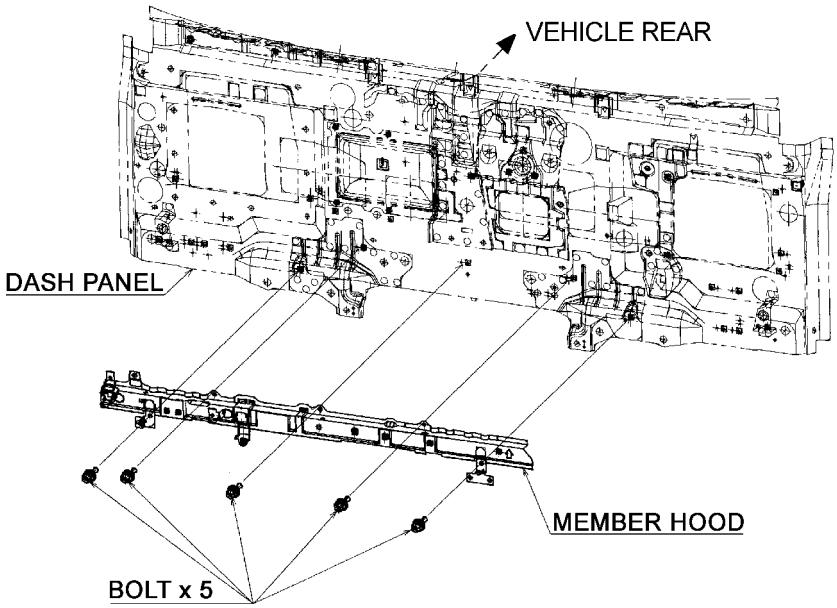


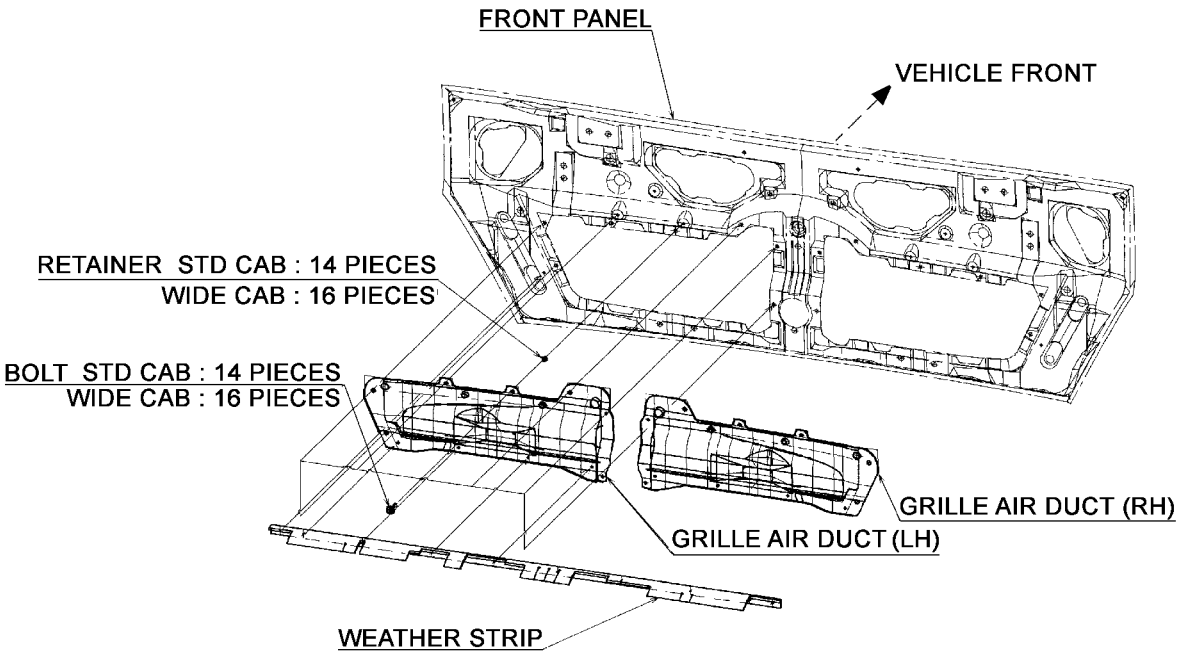
• Top mark

Loose the tapping screw (4 pieces) from back side of radiator grille.



• **Front panel**

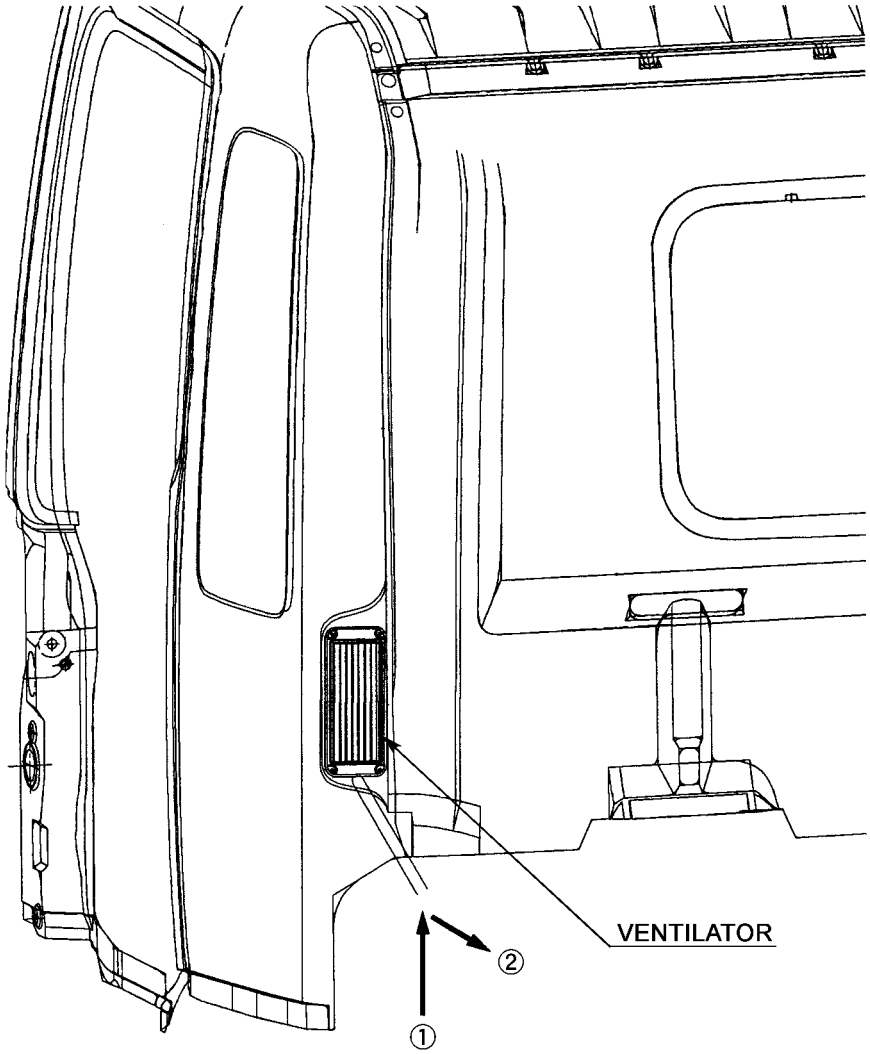

VEHICLE REAR
DASH PANEL
MEMBER HOOD
BOLT x 5


FRONT PANEL
VEHICLE FRONT
RETAINER STD CAB : 14 PIECES
WIDE CAB : 16 PIECES
BOLT STD CAB : 14 PIECES
WIDE CAB : 16 PIECES
GRILLE AIR DUCT (RH)
GRILLE AIR DUCT (LH)
WEATHER STRIP

HOW TO REMOVE THE VENTILATOR

• Ventilator

- Hang your hand at under side of the ventilator.
- Push up ventilator to upper side. (Move to upper side about 1 or 2 mm only.)
- Pull under side of the ventilator toward you to remove ventilator.

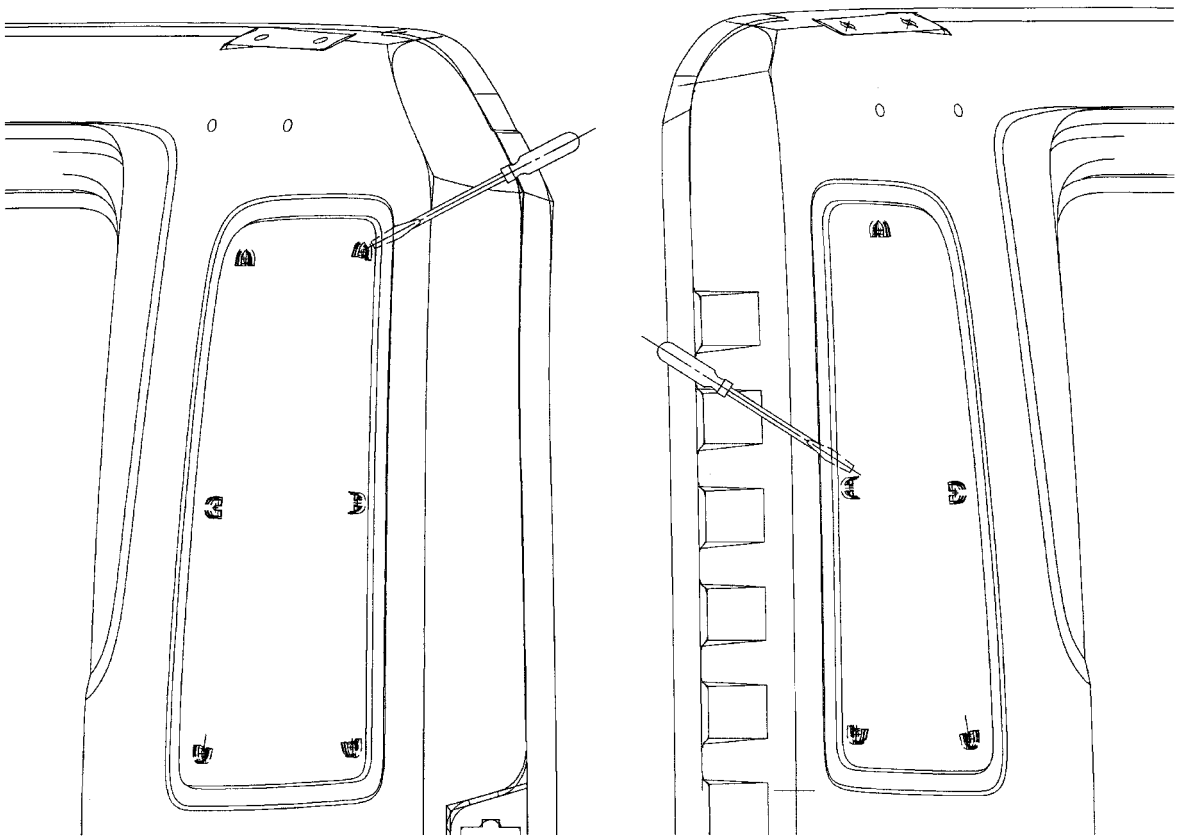


HOW TO REMOVE THE QUARTER GARNISH (OPTION)

RELEVANT MODEL
CLASSIFICATION NUMBER :

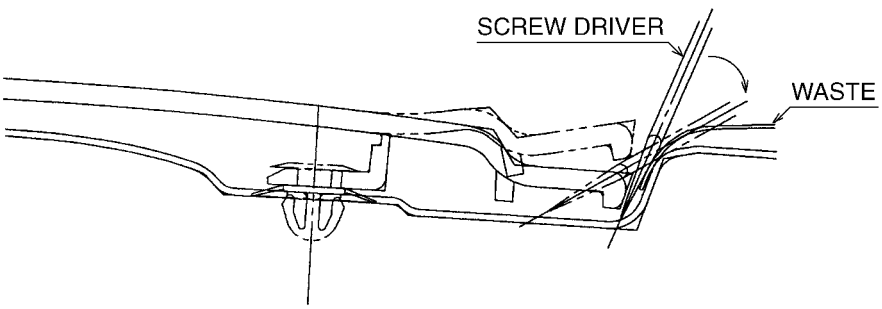
Quarter garnish is installed by clips (Right side : 5 numbers / Left side : 6 numbers).
It can be uninstalled with to remove one or two clips by screw driver.

- Be sure to protect the cab body (outer panel) where to be insert the screw driver from scratch or damage by clean waste.
- Insert the screw driver between the quarter garnish and the cab body near the position where the clips are fitted. (See the following illustration)
- Introduce the tip of the screw driver into the end and move it toward the outside of the vehicle and the clips can be removed.
- Remove one or two clips.
- For the rest of clips, hold the quarter garnish directly by hand, apply force toward the outside of the vehicle and the remaining clips can be removed.



LEFT VIEW

RIGHT VIEW



CROSS SECTION OF INSTALLATION

- Refer to chapter 1, 3 chassis specification for classification number.

REMOUNTING THE DISMOUNTED MIRROR STAY

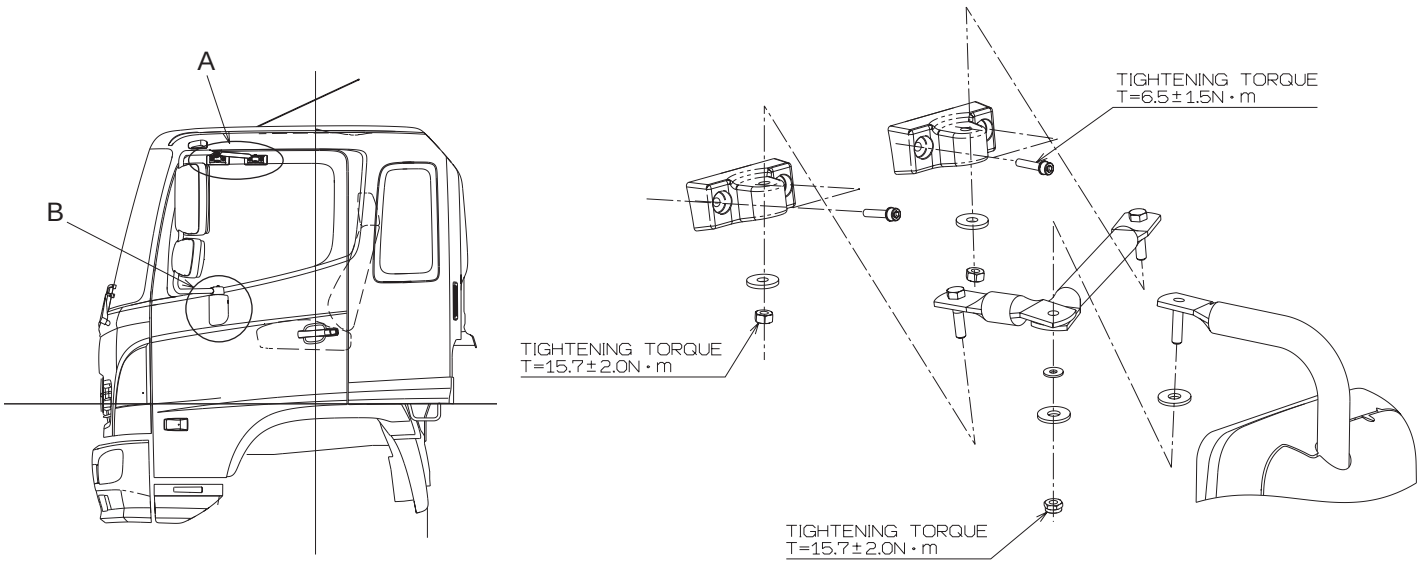
- When remounting the dismounted mirror stay, mount it after the paint has been completely hardened.
- When tightening the mirror stay, be careful not to scratch the painted surface.
- Never fail to retouch with clear lacquer, etc., those tool scratches which have been made by screws, bolts and nuts when dismounting and remounting the mirror stay.
- When remounting the mirror stay adjust the tightening torques.

  Refer to the following figure for details.

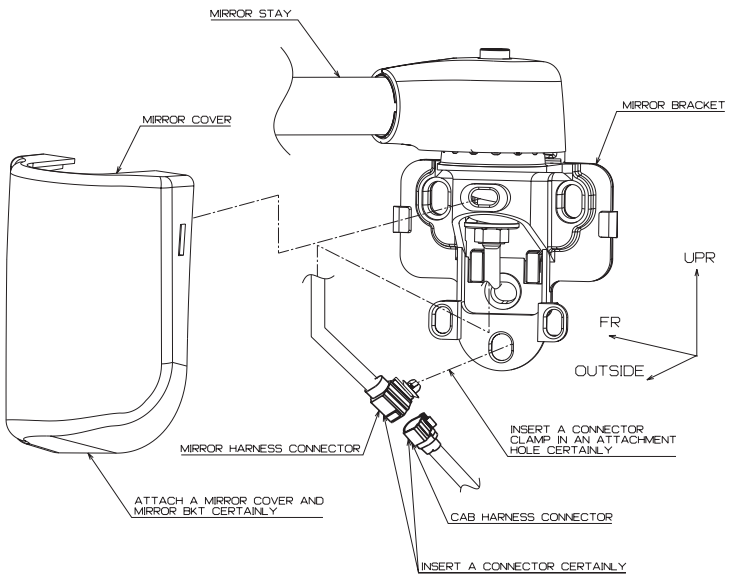
• FLAT MIRROR TYPE [TYPE A]

RELEVANT MODEL
CLASSIFICATION NUMBER : FD-022,023,024,025,026,027,028,029

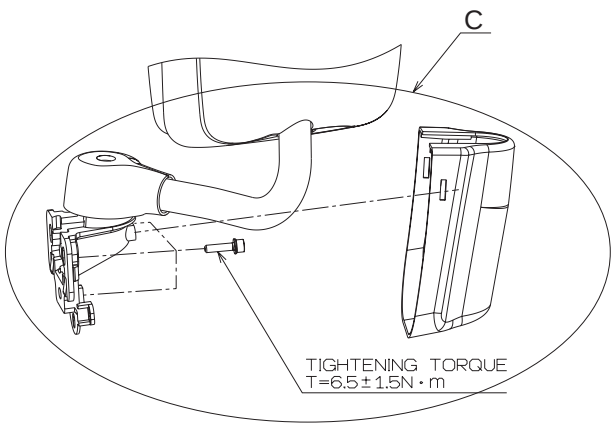
- Refer to chapter 1, 3 chassis specification for classification number.



DETAIL A (LH/RH)



DETAIL C (LH/RH)



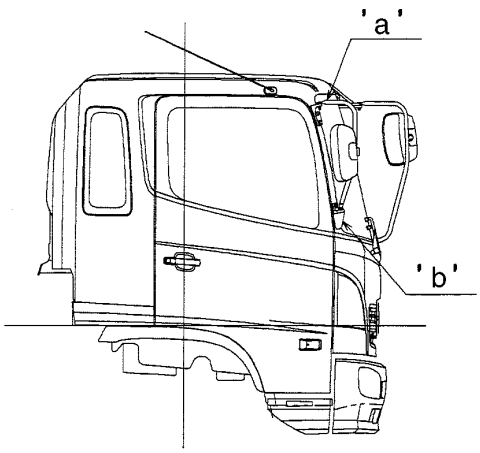
DETAIL B (LH/RH)

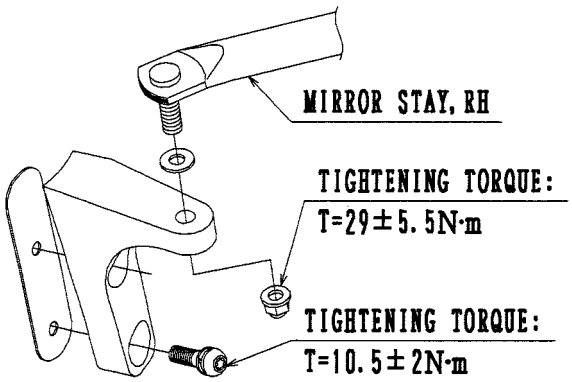
• CONVEX MIRROR TYPE [TYPE B]

RELEVANT MODEL
CLASSIFICATION NUMBER :

- Refer to chapter 1, 3 chassis specification for classification number.

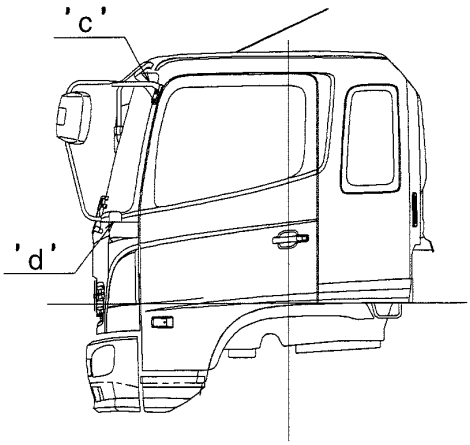
RH DRIVER SIDE

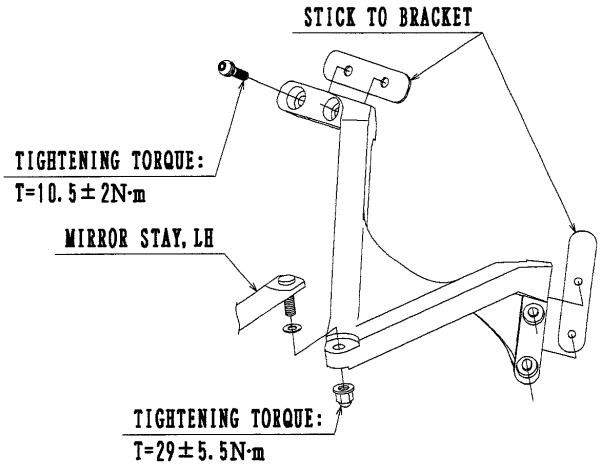




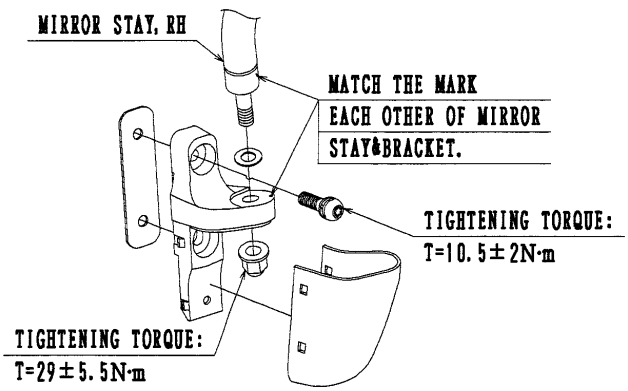
a : RH MIRROR STAY (UPPER)

LH ASSISTANT SIDE, BRACKET & STAY

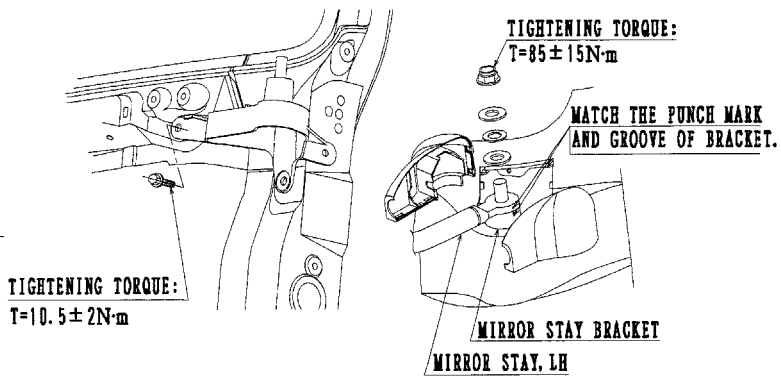




c : LH MIRROR STAY (UPPER)



b : RH MIRROR STAY (LOWER)



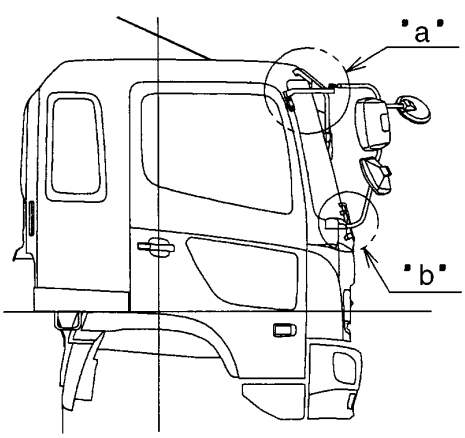
d : LH MIRROR STAY (LOWER)

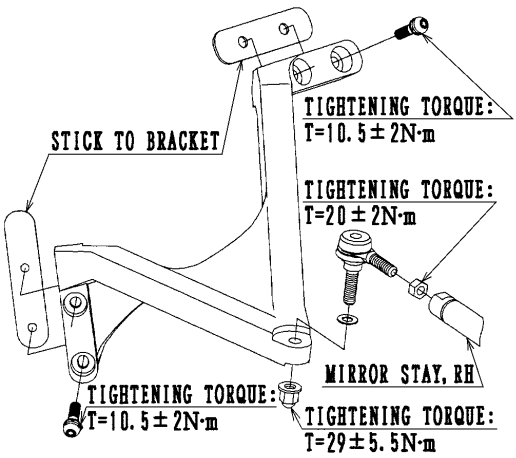
• CONVEX MIRROR TYPE [TYPE C]

RELEVANT MODEL
CLASSIFICATION NUMBER :

- Refer to chapter 1, 3 chassis specification for classification number.

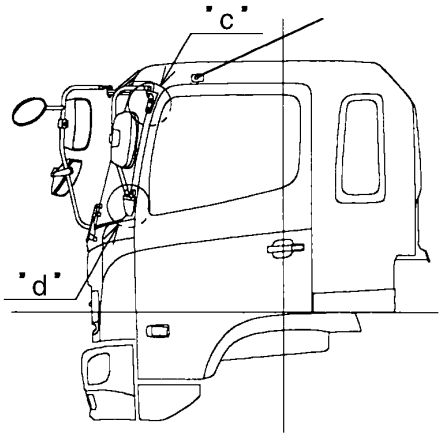
RH ASSISTANT SIDE, BRACKET & STAY

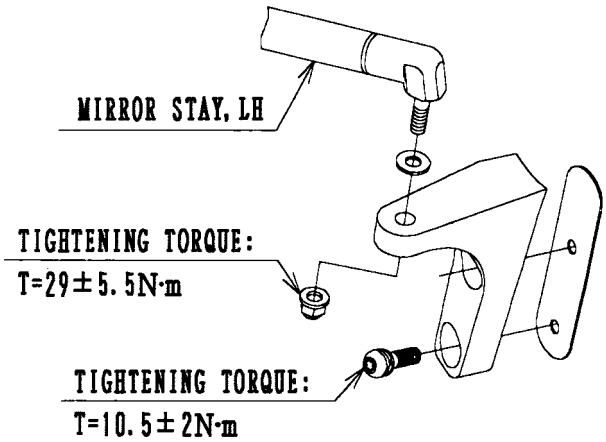




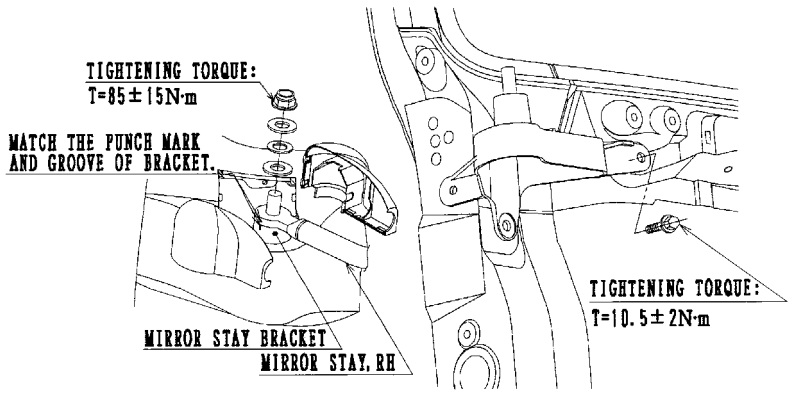
a : RH MIRROR STAY (UPPER)

LH DRIVER SIDE

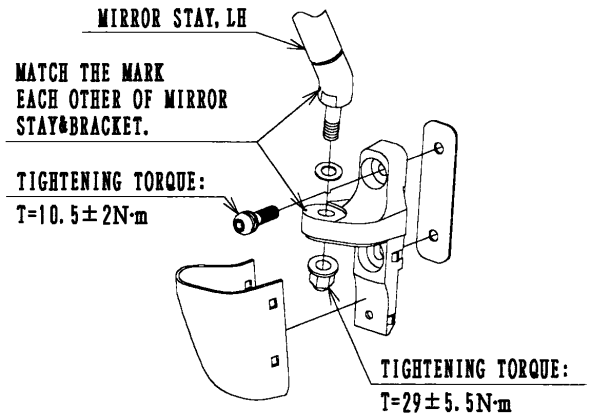




c : LH MIRROR STAY (UPPER)



b : RH MIRROR STAY (LOWER)



d : LH MIRROR STAY (LOWER)

REMOUNTING THE WIPER

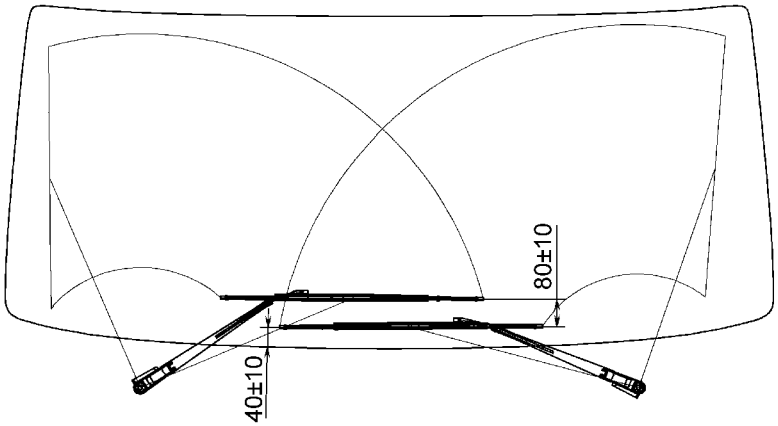
- When dismounting and remounting the wiper, confirm before remounting that the wiper stays are at the automatic stop position.
  (After turning ON the wiper switch and then turn OFF the wiper switch, so that the wiper motor stops at the automatic stop position.)

NOTE

- Operate the wiper with the front panel shut down.
- With the front panel opened, you may risk to have your hand pinched by the wiper links.
- Also after stop of the wiper motor, take out the starter key.

- When tightening the wiper arms, tighten them by adjusting the blade position (height) with in the limit as shown as the following illustration.
- Adjust the wiper arms and the pivot positions to the following tightening torque values.
  - Wiper arm tightening torque
    19.6 ± 2 N·m {200 ± 20 kgf·cm}
  - Wiper pivot tightening torque
    11.8 ± 1 N·m {120 ± 10 kgf·cm}

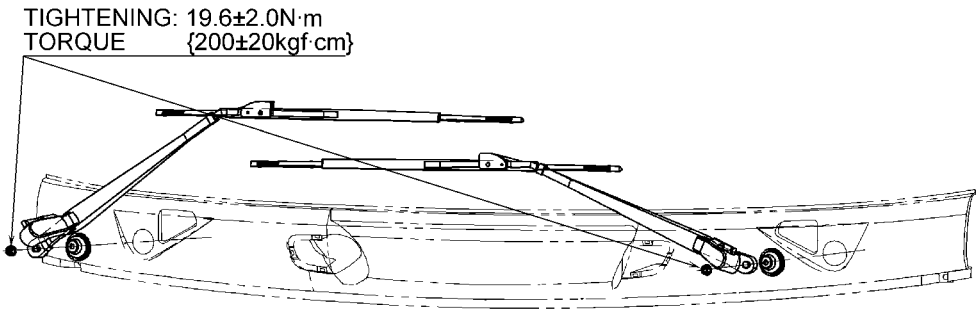
WIPER BLADE SET POSITION (FOR RHD ONLY)



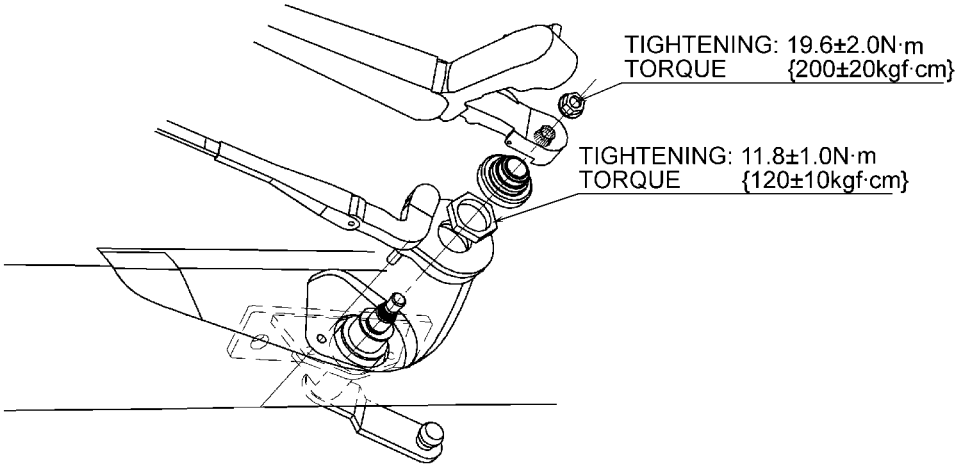
NOTE

- The set positions of the blades show the gaps at the top ends of the blades.

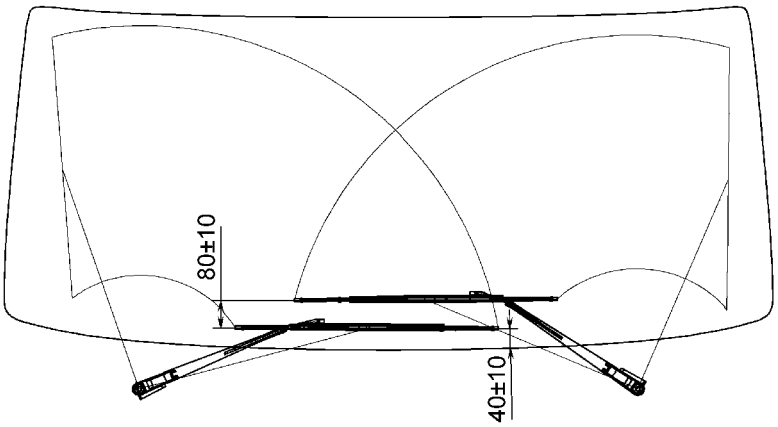
DETAIL OF WIPER ARM INSTALLATION FOR MODEL FC, FD & GD ONLY



DETAIL OF WIPER ARM INSTALLATION FOR MODEL FG, GH, SG, FL, FM, FT & GT ONLY



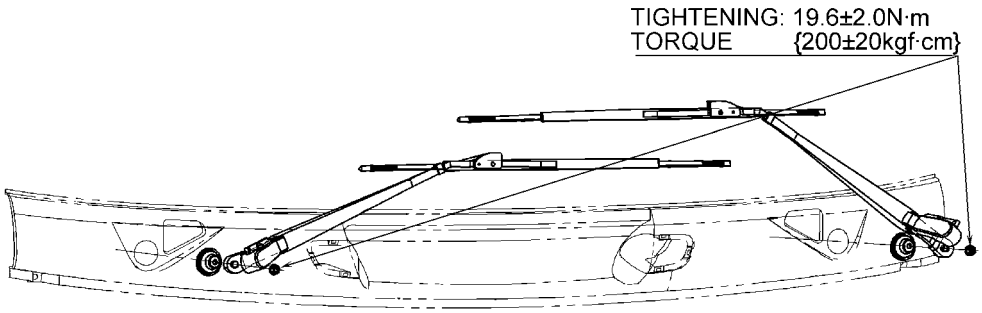
WIPER BLADE SET POSITION (FOR LHD ONLY)



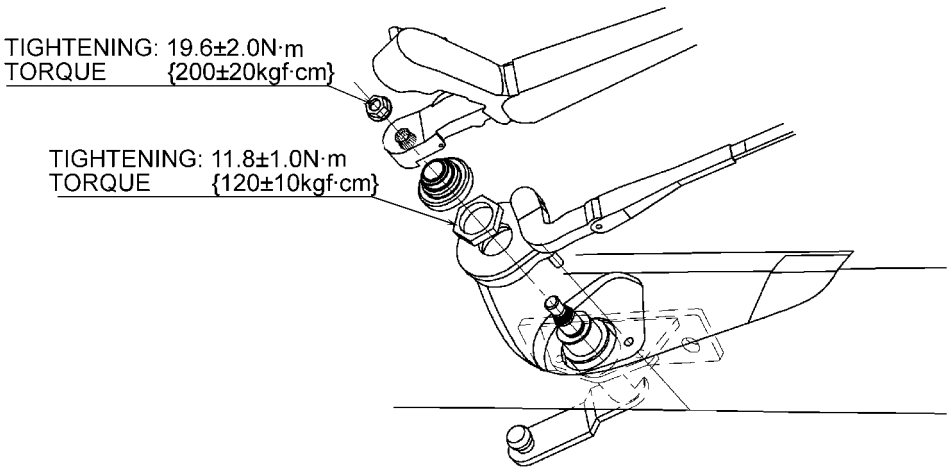
NOTE

- The set positions of the blades show the gaps at the top ends of the blades.

DETAIL OF WIPER ARM INSTALLATION FOR MODEL FC, FD & GD ONLY



DETAIL OF WIPER ARM INSTALLATION FOR MODEL FG, GH, FL, FM ONLY



4. PROCEDURE FOR ADHERING ORNAMENTS

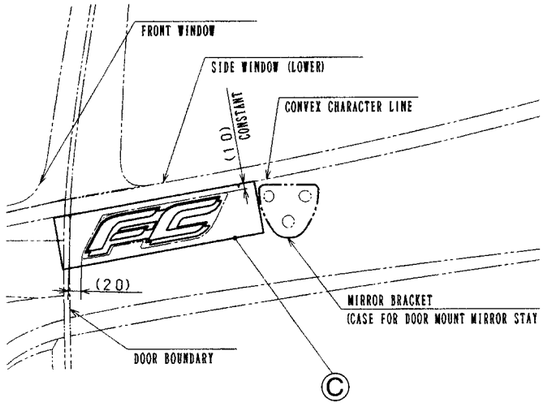
Ornaments adopt the inside adhesive system which is easy to fit.
Adhere them according to the following procedures.

- What to prepare
  Clean waists

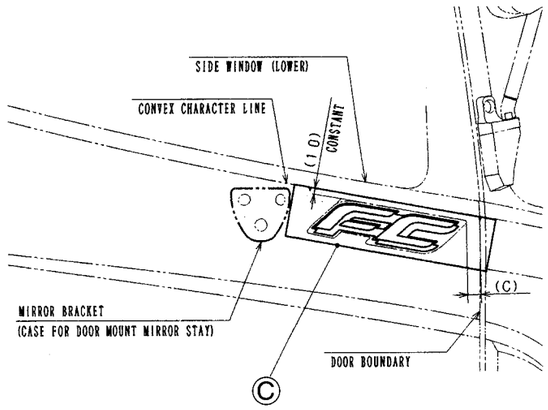
- Points to pay attention
  - Reuse of ornaments once adhered should be avoided because their adhering power is reduced.
  - Perform the adhering operation by adjusting the surface temperature (20 to 40°C). If the ambient temperature is below the above, raise the temperature.
  - Wipe off dust, dirt, stain, oil, water, etc., deposited on the adhering surface.

- Adhering procedure
  - After having cleaned the surface to adhere, take off the backing paper of the ornament.
  - Adhere door boundary line and door character line with the outer form of the ornament.
    (Details are described in the following figure.)

ADHERING POSITION OF MODEL SERIES ORNAMENT (FOR DOOR)



SIDE VIEW (LH)



SIDE VIEW (RH)

Match the upper outer form with the door convex character line and the application notch with the door boundary line of the ornament.

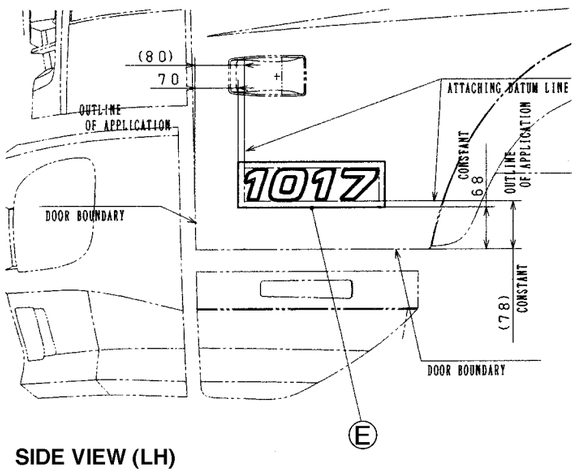
DIMENSION (C)	APPLICABLE MODEL
(13)	FM, FT, GT
(22)	FC, GH, FG, SG
(36)	FD, GD, FL

ADHERING POSITION OF HINO LOGO MARK AND SERIES NAME ORNAMENT

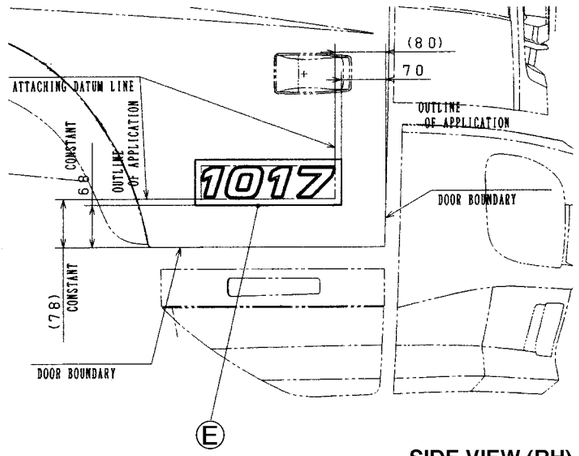
SIDE VIEW (LH)

SIDE VIEW (RH)

FRONT VIEW



SIDE VIEW (LH)



SIDE VIEW (RH)

RELEVANT MODEL

CLASSIFICATION NUMBER	HINO LOGO MARK (A)	SERIES NAME ORNAMENT (B)	MODEL NAME ORNAMENT (C)	EXHAUST GAS ORNAMENT (D)	MODEL NAME ORNAMENT (E)
FD-022,023,024, 025,026,027,028, 029	WITH	WITH	LESS	LESS	WITH

- Refer to chapter 1, 3 chassis specification for classification number.

NOTE

- Figures are shown to be representative of the FC model,exact mark and ornament should be adhered by each model.
- Apply ornament, after remove moisture, oil and dust from attaching position.

5. MOUNTING AND STICKING OF DOOR WEATHER STRIP

In the case to disassemble the door weather strip when perform top coat paint, reassemble it as following procedure.

Pay special attention when reassemble the door weather strip, otherwise it will cause leakage of rain water.

MOUNTING AND STICKING OF WEATHER STRIP

- Match the marks A and B on body side notch and the marks on the weather strip then start mounting from this point.
- Mounting of weather strips on general positions
  Mount the weather strips on general positions after having finished mounting of point A and B and stick them in such a way that the slack of the weather strips concentrate on corners of the point A and of the point B. Execute this operation by squeezing them in the direction of the arrow in the illustration of the weather strip position.

ILLUSTRATION OF THE WEATHER STRIP MOUNTING POSITION

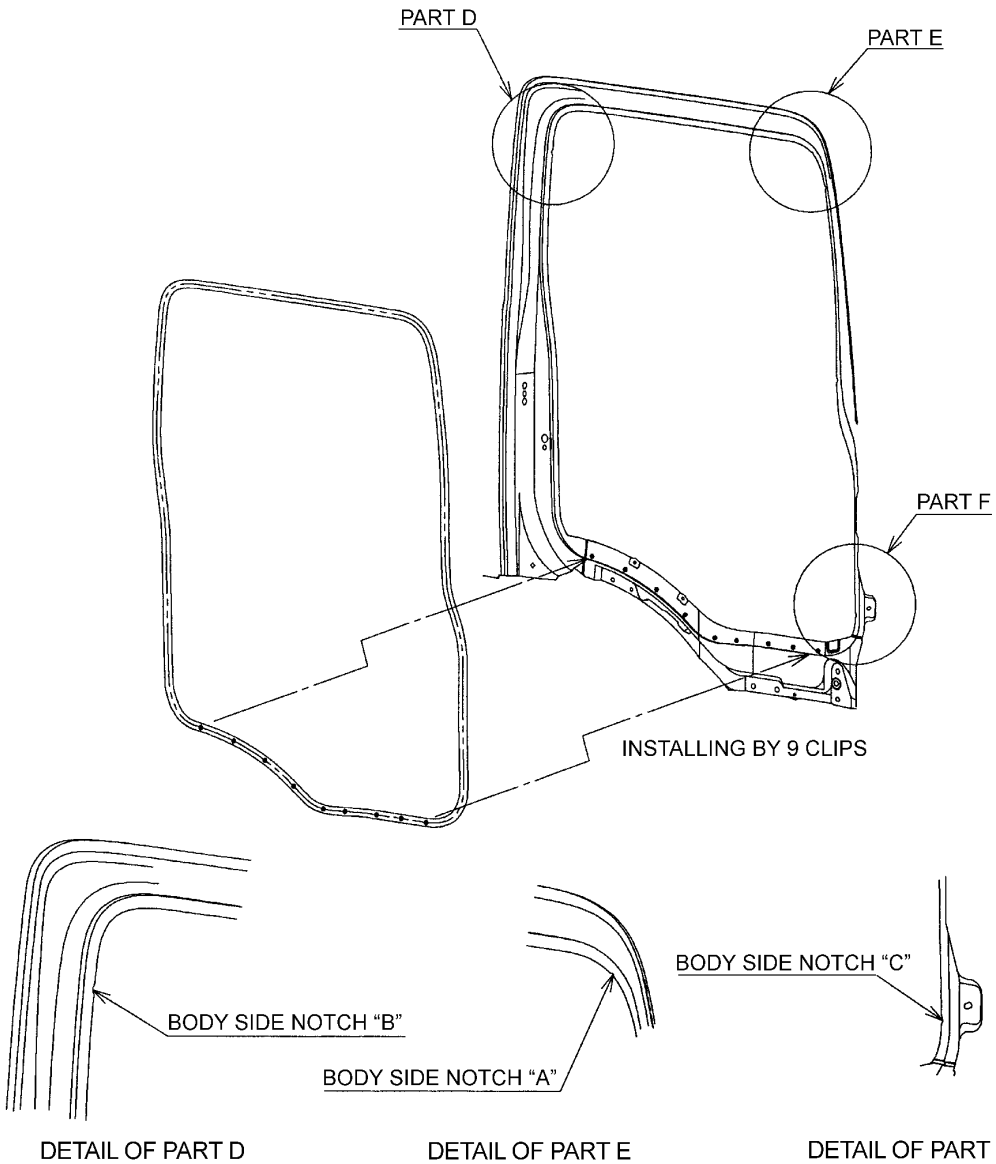
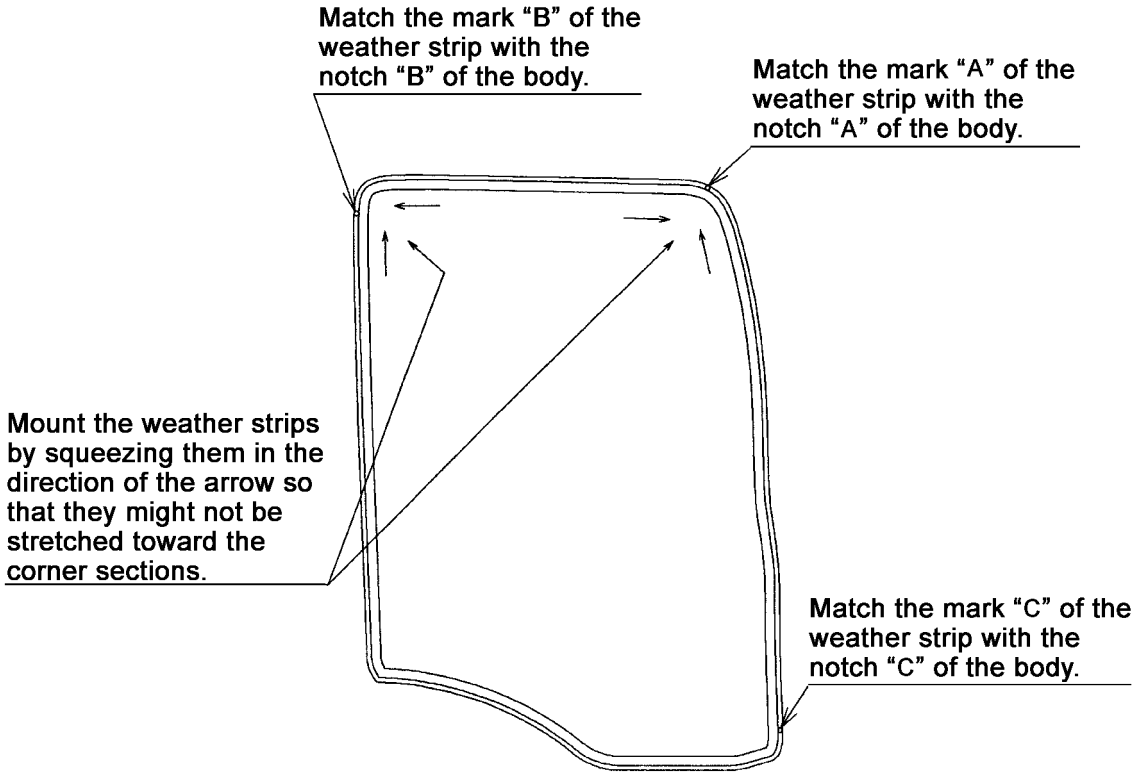
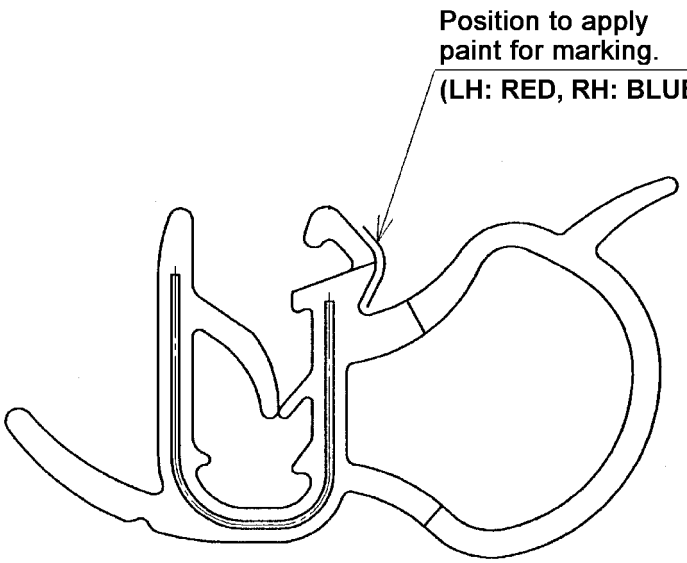


ILLUSTRATION OF THE WEATHER STRIP MARK POSITION



SECTIONAL VIEW OF THE WEATHER STRIP



6. HOW TO MOUNT THE MAIN AND SUB SEAL

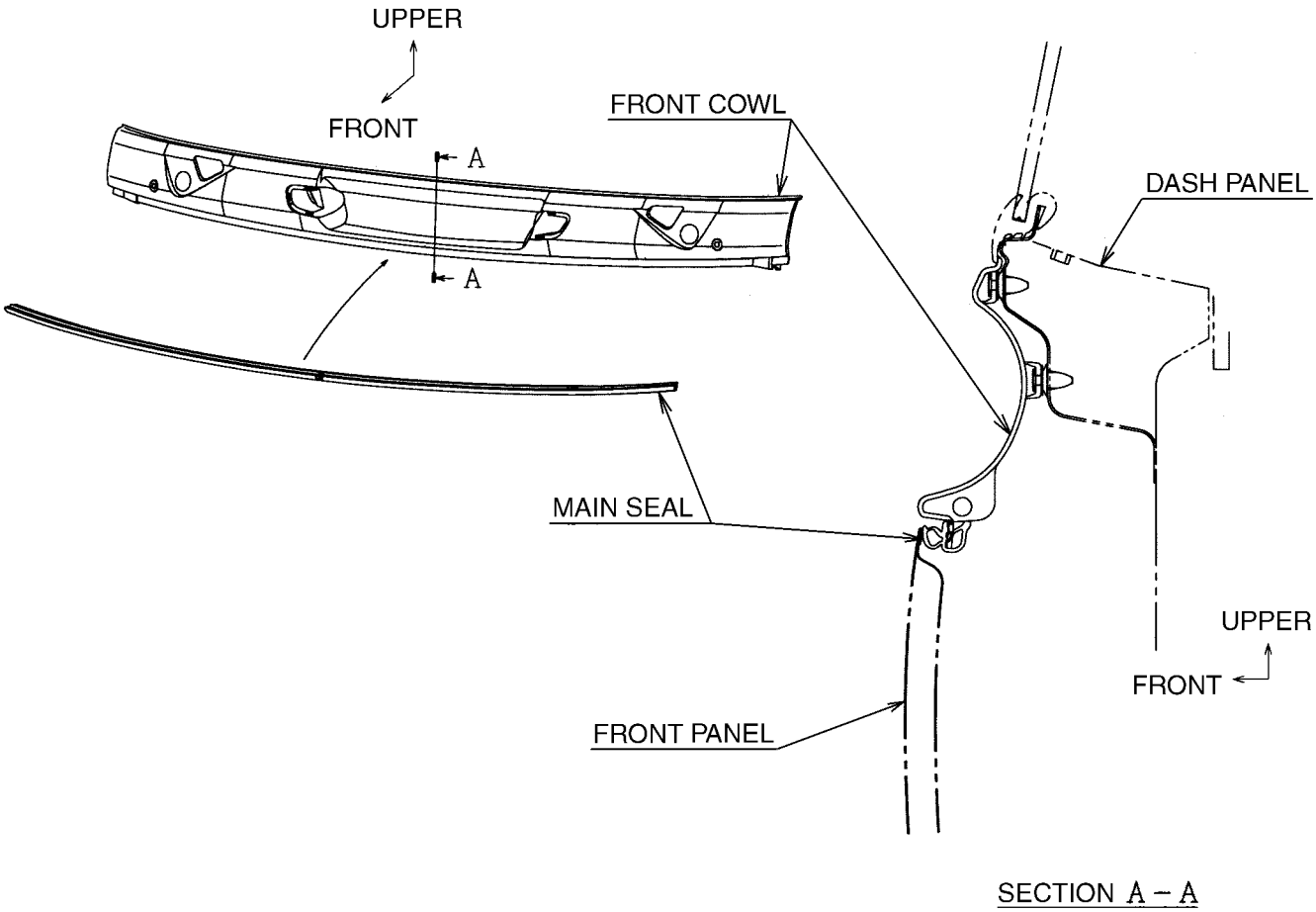
HOW TO MOUNT THE MAIN SEAL AT THE POSITION OF THE FRONT COWL

When you apply the top coating, apply masking on the main seal of the front cowl.

If you are obliged to remove the door sub seal, replace it with a new part in the following manner,
Part number of front cowl main seal : 76821-1260 (FC, FD, GD) 1 piece/vehicle
76821-1270 (FG, GH, SG
FL, FM, FT, GT)

- Mounting procedures
  - Define both edges of the main seal in relation to the lange section of the front cowl and insert it along the positioning ribs.
  - Insert the main seal slowly from the both edges to center of the vehicle.

- Caution
  - In order to avoid the penetration of water into the front panel have the both end of the front panels matched with the positioning ribs and tighten them together.
  - Mount the main seal in such a way that the section shape might become as illustrated by Section A-A.



SECTION A – A

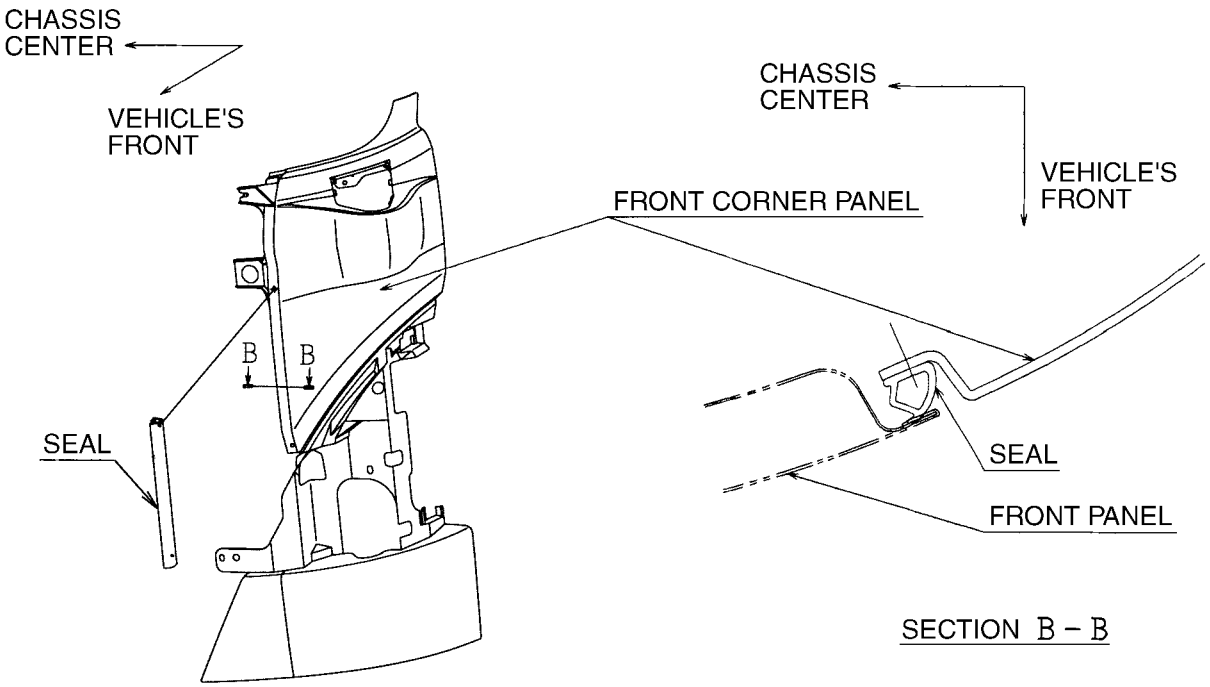
MOUNTING PROCEDURES OF MAIN SEAL AT THE POSITION OF THE FRONT CORNER PANEL

When applying top coating do it either by dismounting the main seal at the front corner panel or by masking the section concerned.

Parts number of main seal at the front corner panel : 76811-1120 (2 pieces/vehicle)

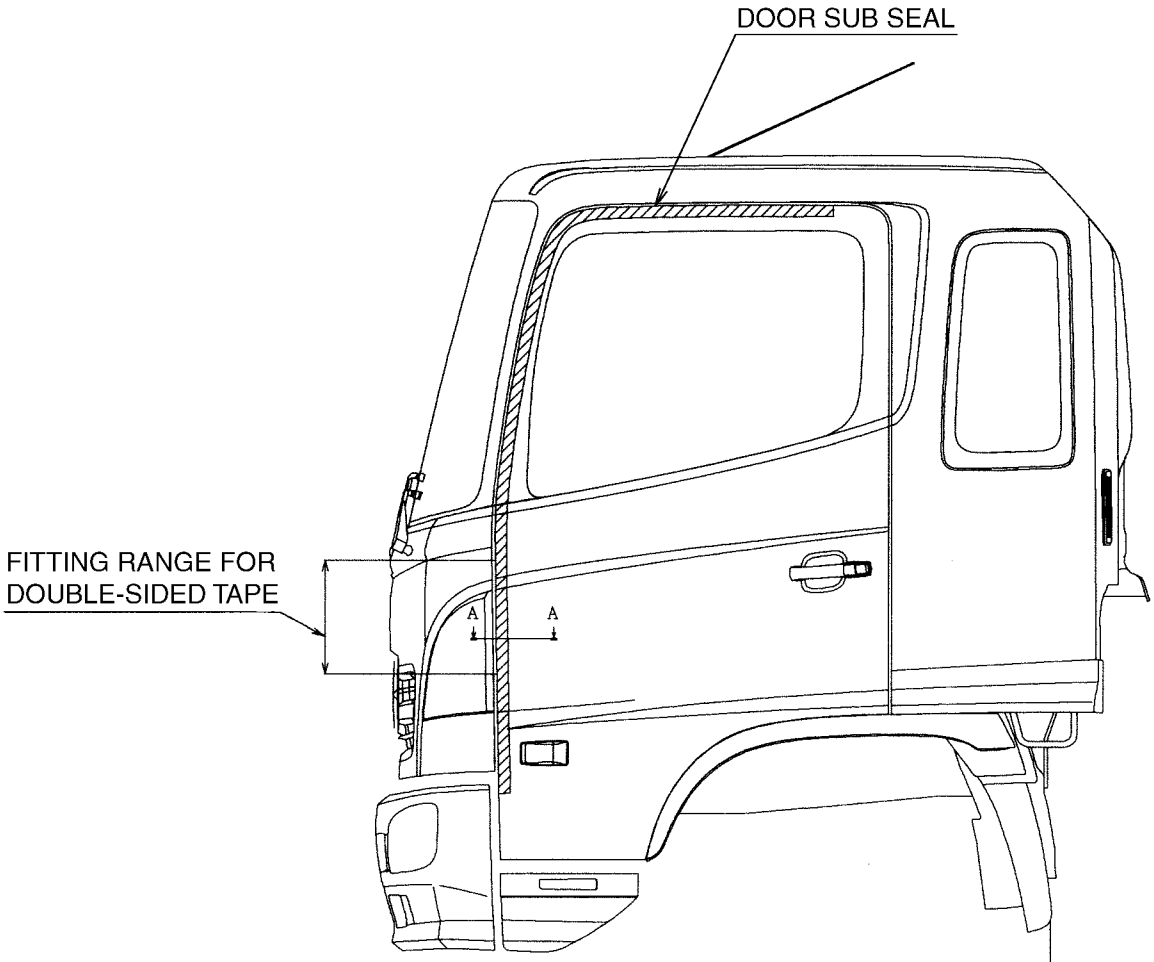
- Mounting procedure
  - Insert the front corner main seal into the hole provided on the front corner panel.

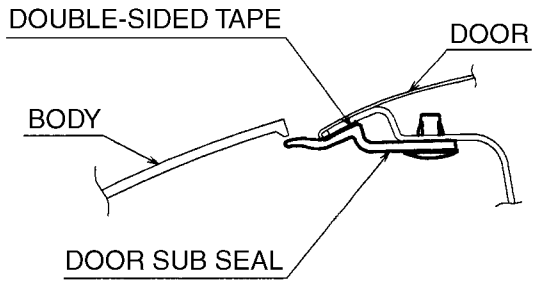
- Caution
  - Securely fix the retainer on the front corner panel which is mounted onto main seal.
  - In order to avoid the penetration of water, mount it in such a way that the section shape of the seal might become as illustrated on the Section B-B.



MOUNTING PROCEDURE FOR DOOR SUB SEAL

- Wipe dirt, water, oil and wax etc. with clean waste on the double-sided tape's fitting surface of door panel.
- Insert the clip of the door sub seal sufficiently well and fix it.
- Peel off the release coated paper of double-sided tape and press fit it on the door panel.





SECTION A-A

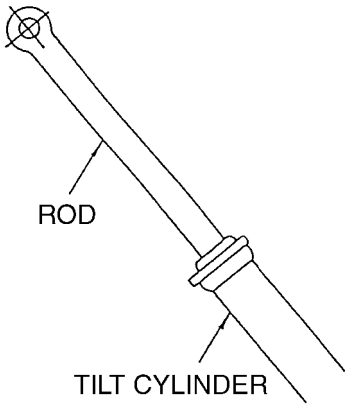
7. CAUTIONS FOR PAINTING TILT CYLINDER ROD

- Make sure you do not get paint on the tilt cylinder rod.
- If there is paint on the tilt cylinder rod or the seal inside of the cylinder, or if the seal is damaged due to the paint, this may lead to cylinder oil leaks.

To prevent paint from adhering to the rod,make the rod carefully.
If paint adheres to the rod,make sure to remove it completely.
Take care not to dent or scratch the rod.

NOTES

- Before painting, mask the rod completely
- Take great care not to dent or scratch the rod.



TILT CYLINDER ROD

8. HANDLING OF LAMINATED WINDSHIELD

A laminated glass is produced in such order that polyvinyl butyral film is inserted between 2 glasses and pressed with heat.
Under driving general condition, there is no problem. But under a hot temperature and a high moisture when painting, intermediate film is fallen off or such defective occur as foaming may be caused. Therefore, a special caution needs to be taken.

• Caution when Painting

There is no problem when you use a natural drying. But when a forced drying is used with infrared ray lamp, etc., be sure that the drying should be implemented within 30 minutes at less than 120°C.
When drying at the temperature of more than 120°C, remove off the windshield glass or cover over the glass with something so that the temperature on the glass surface should not go up more than 120°C.

9. HANDLING OF COMPUTERS (ECU)

When paint by forced drying, must be care to handle the computers as following points.

	CONDITION OF FORCED DRYING PAINT	HANDLING OF COMPUTER
1	• INSIDE TEMPERATURE OF THE FORCED DRYING BOOTH : 120°C • INSIDE TEMPERATURE OF THE CAB (PLACE AT THE 50mm HEIGHT FROM UPPER SURFACE OF CAB FLOOR.) : LESS THAN 85°C	INSTALLED
2	WHEN UNKNOWN THE TEMPERATURE OF THE FORCED DRYING BOOTH OR USE INFRARED LAMP INSIDE TEMPERATURE OF THE CAB (PLACE AT THE 50mm HEIGHT FROM UPPER SURFACE OF CAB FLOOR.) : LESS THAN 85°C	
3	WHEN EXPECT MORE HIGH TEMPERATURE THAN ABOVE MENTIONED CASES.	REMOVE COMPUTER

10. PRECAUTIONS FOR FITTING AND STORING THE CAUTION PLATE

• How to Stick It

a. Stick the caution plate to a dry place which is free from dust and dirt after the paint has completely dried up.
b. Clean your hand and don't use cotton work gloves, etc..
c. Completely remove water, oil, dust, etc. from the surface to stick (surface of cab) with ethyl alcohol if they are found remaining there.
d. When the temperature is less than 10°C, warm up the surface to stick as well as the caution plate with warm wind of more than 20°C before sticking the caution plate.
e. After sticking the caution plate, press it with a roller, etc., with a force of approximately 49 N/cm2 {5 kgf/cm2 }.
f. Remove liner paper (backing paper) just before using it.
g. When air remains inside, make a tiny hole with a needle or a cutter knife and press it out with your fingers from the bubble area.

• How to Store It

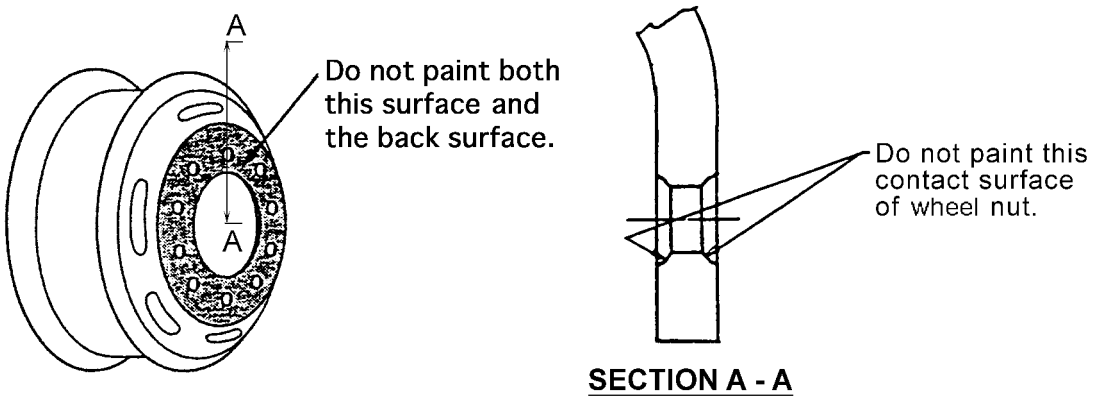
a. When storing the caution plate, select a dry place with an ambient temperature (of 20 to 25°C) and without dust, dirt and stain.
b. Also, store the caution plate at a flat place such as a shelf, etc., and do not place anything on it.

• Other Precautions for the Caution Plate

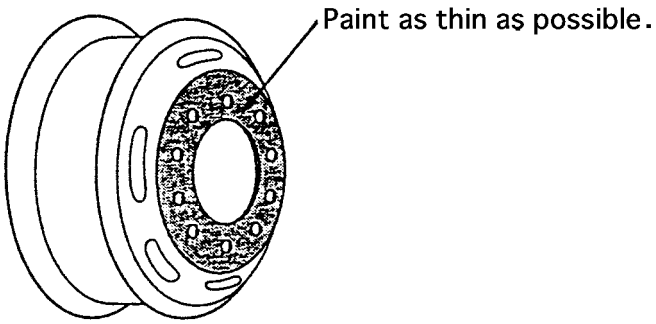
a. As the caution plate is made from vinyl chloride, it is thin, soft and easily extensible.
Therefore, take utmost care for handling it.
b. When removing the caution plate, etc., be careful not to damage the painted surface with a sharp knife, etc.
On the other hand, removal of the caution plate can be done more easily by pulling the caution plate in perpendicular direction to the sticking surface while heating it with a hair dryer.
c. Do not throw the caution plates away but keep them together to compare with new caution plates and to prevent mixing up with the new ones.

11. CAUTIONS FOR PAINTING THE TIRE WHEELS

- Before painting the tire wheel, cover its inside and outside surface to be contacted with the hub, the brake drum and wheel nuts.
  Refer to the illustration below concerning the covering portions.



- After installing the tire wheel onto the vehicle, paint the remained portions with same color paint as thin as possible.
  It is because these surfaces are installation surface rotation tire.
  If the painting layer is thick, it causes wheel nuts loosen.



- Precaution for carrying out tire rotation
  Sometimes, the mounting position of tire wheel may be changed and paint coated face may become contact face.
  At this moment, if the thickness of the painted layer is excessively thick, this may lead to the loosening of the wheel nuts.
  Therefore observe the following instructions when carrying out the tire rotation.
  - Take off the paint on the contact face (including the contact surface of wheel nut) of the tire wheel and after having completely cleaned the face with a wire brush etc., apply thin layer of paint for rust preventive purpose.
  - If you use the tire wheel without taking off the paint, even if the face is completely cleaned with wire brush, etc., the thick painted layer may lead to the loosening of wheel nuts.

Chapter 8

CHASSIS DRAWINGS

Refer to detail of the cab, chassis and chassis frame drawing based on following table.

RELEVANT MODEL

CLASSIFICATION NUMBER	CHASSIS DRAWINGS			
	CAB	CAB BACK	CHASSIS	CHASSIS FRAME
FD-022	C-1	CB-1	CH-1	CF-1
FD-023	C-1	CB-1	CH-2	CF-2
FD-024	C-1	CB-1	CH-3	CF-3
FD-025	C-2	CB-1	CH-4	CF-4
FD-026	C-2	CB-1	CH-5	CF-5
FD-027	C-2	CB-2	CH-4	CF-4
FD-028	C-2	CB-2	CH-5	CF-5
FD-029	C-3	–	CH-6	CF-2

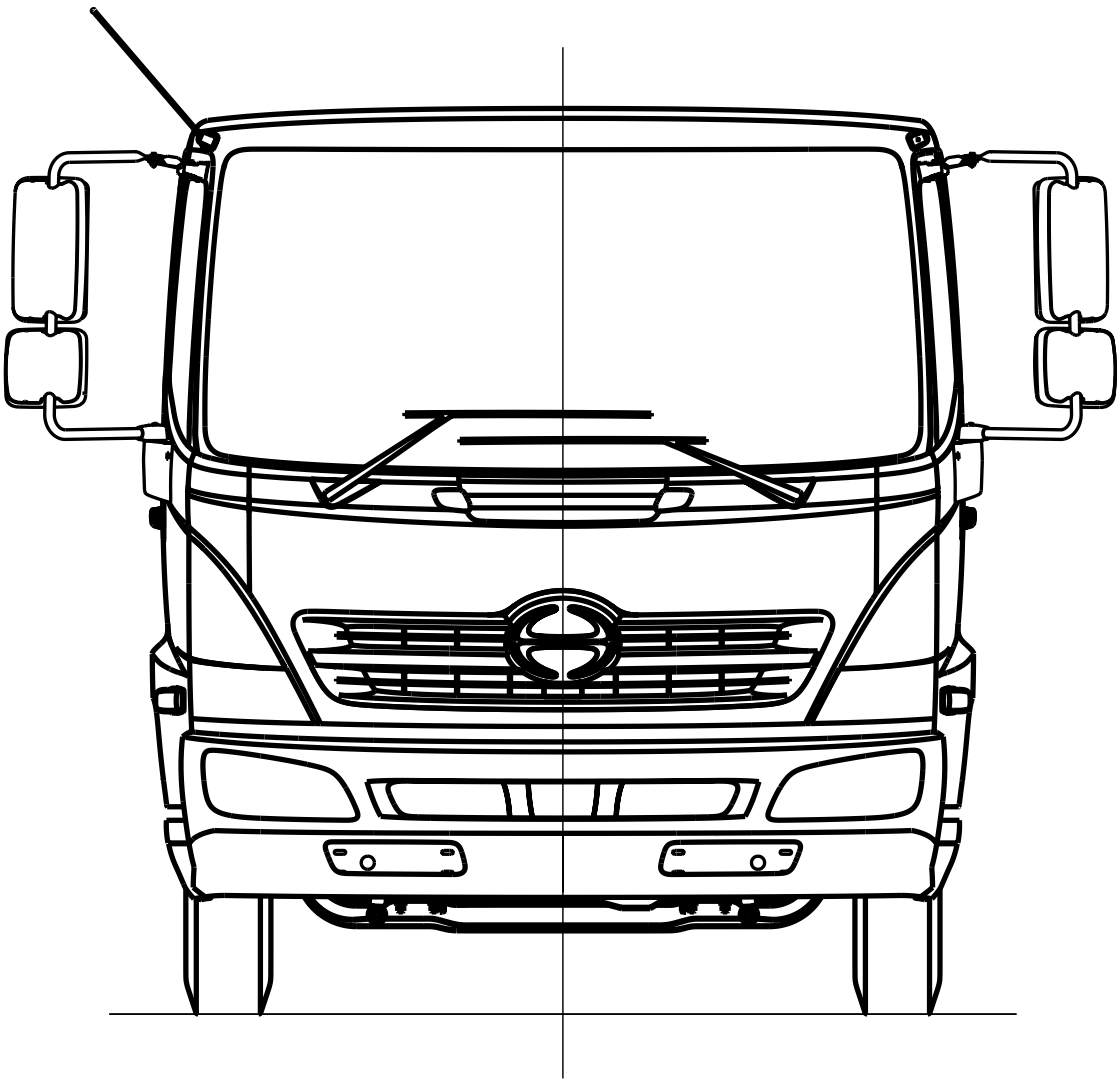
- Refer to chapter 1, 3 chassis specification for classification number.

1. CAB DRAWINGS

No. C-1

• Front

Unit : mm

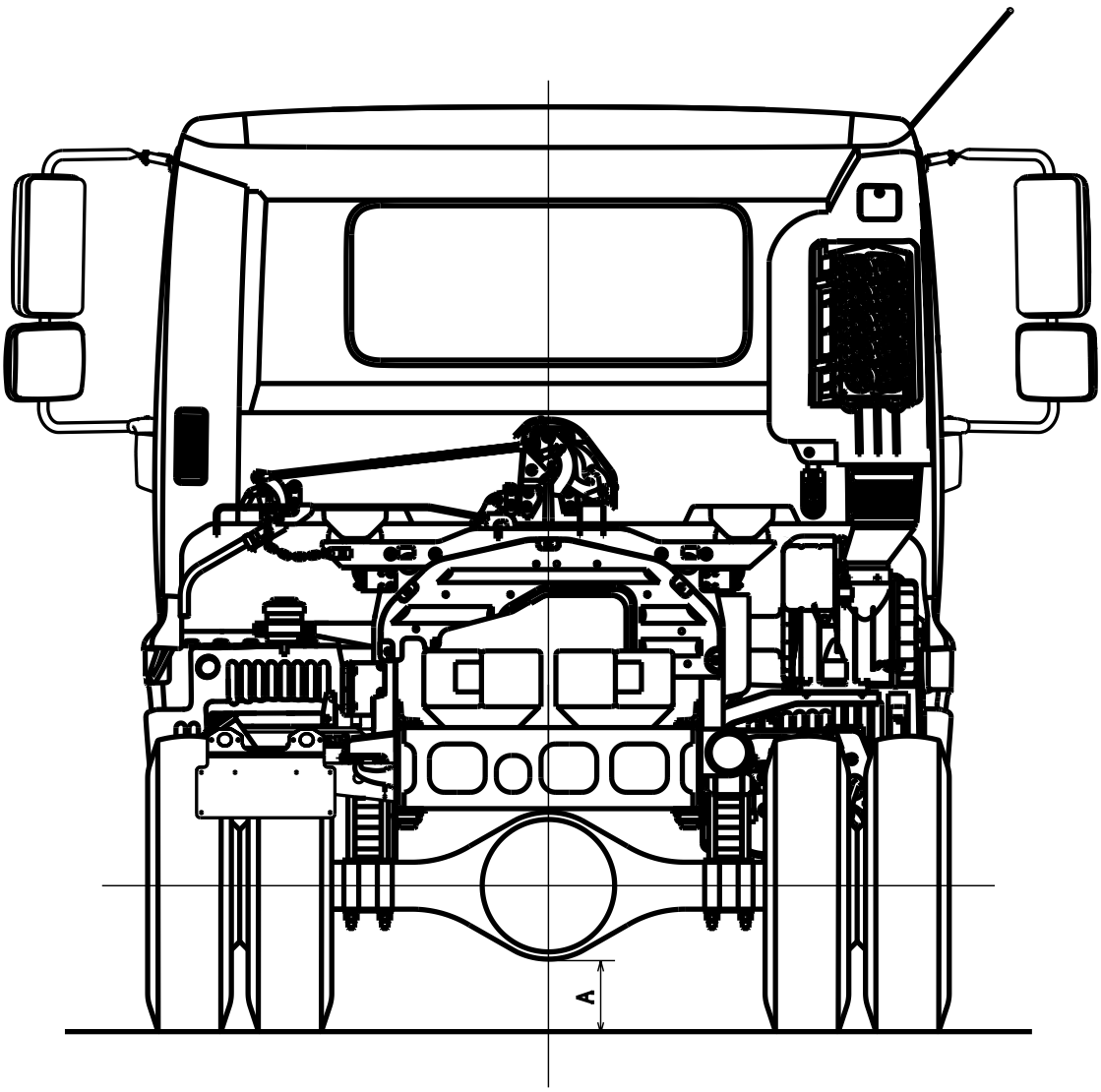


No. C-1

• Rear

Unit : mm

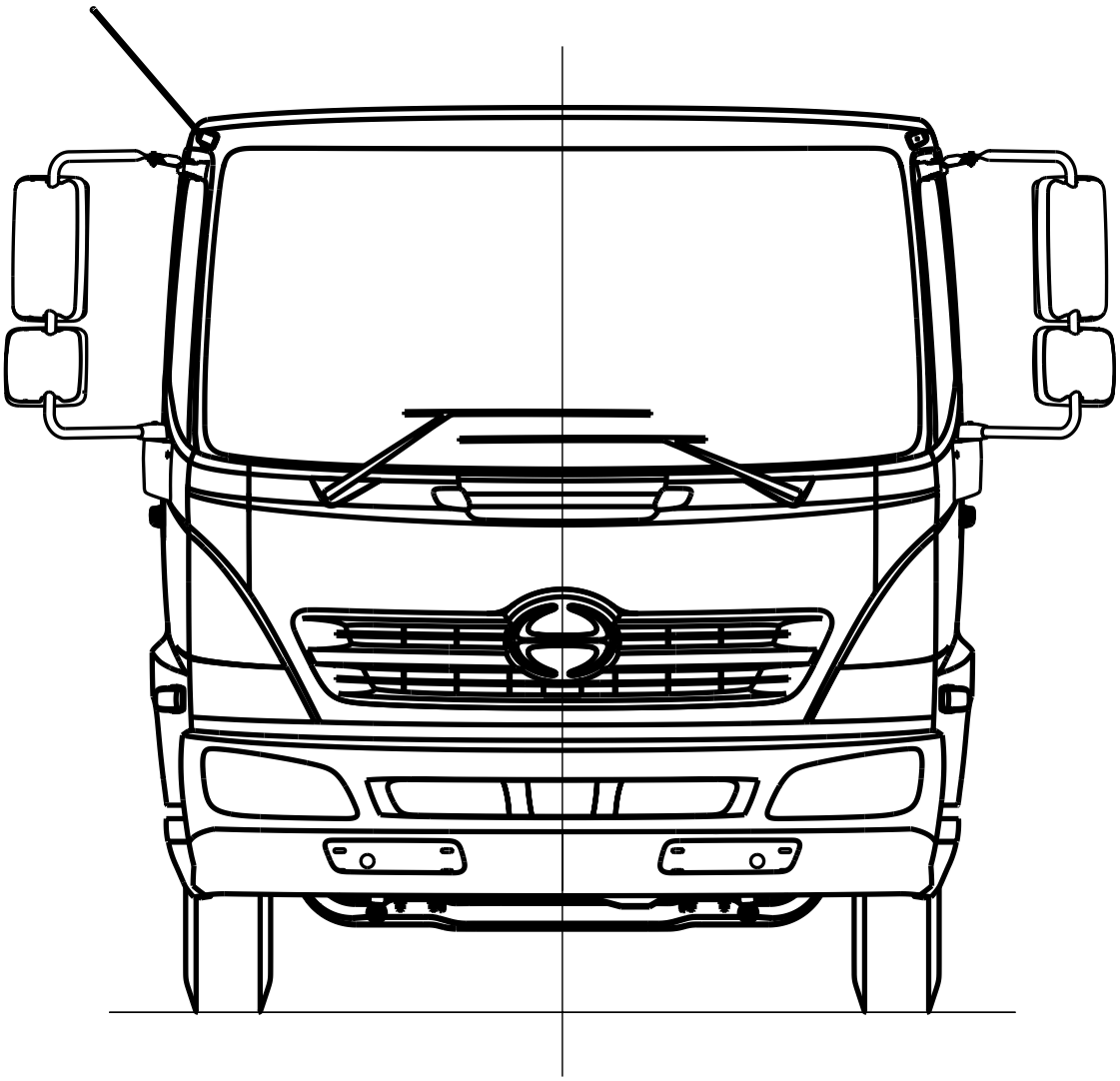
MODEL	TIRE	A
FD7J	9.5R17.5 129/127	220



No. C-2

• Front

Unit : mm

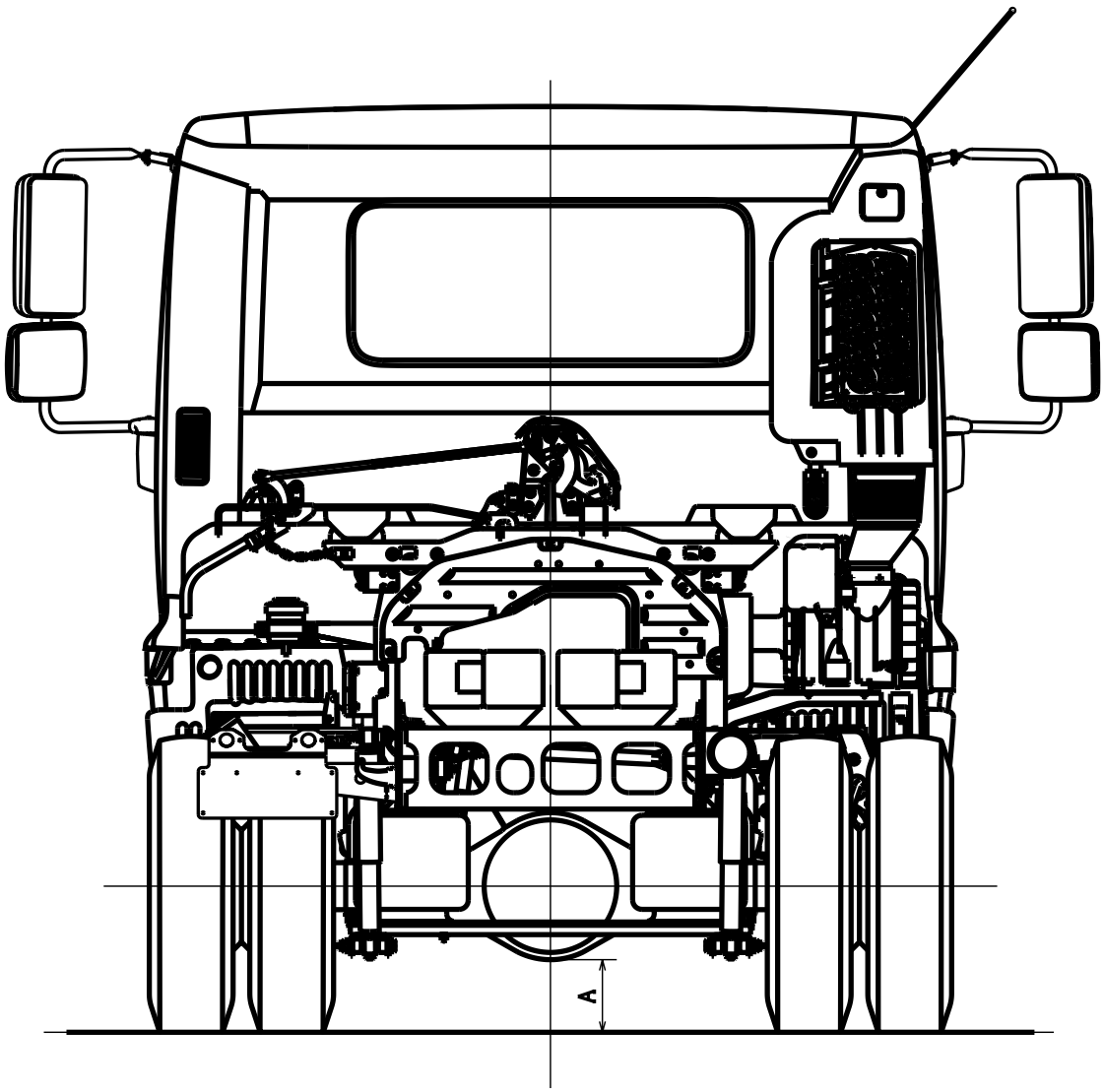


No. C-2

• Rear

Unit : mm

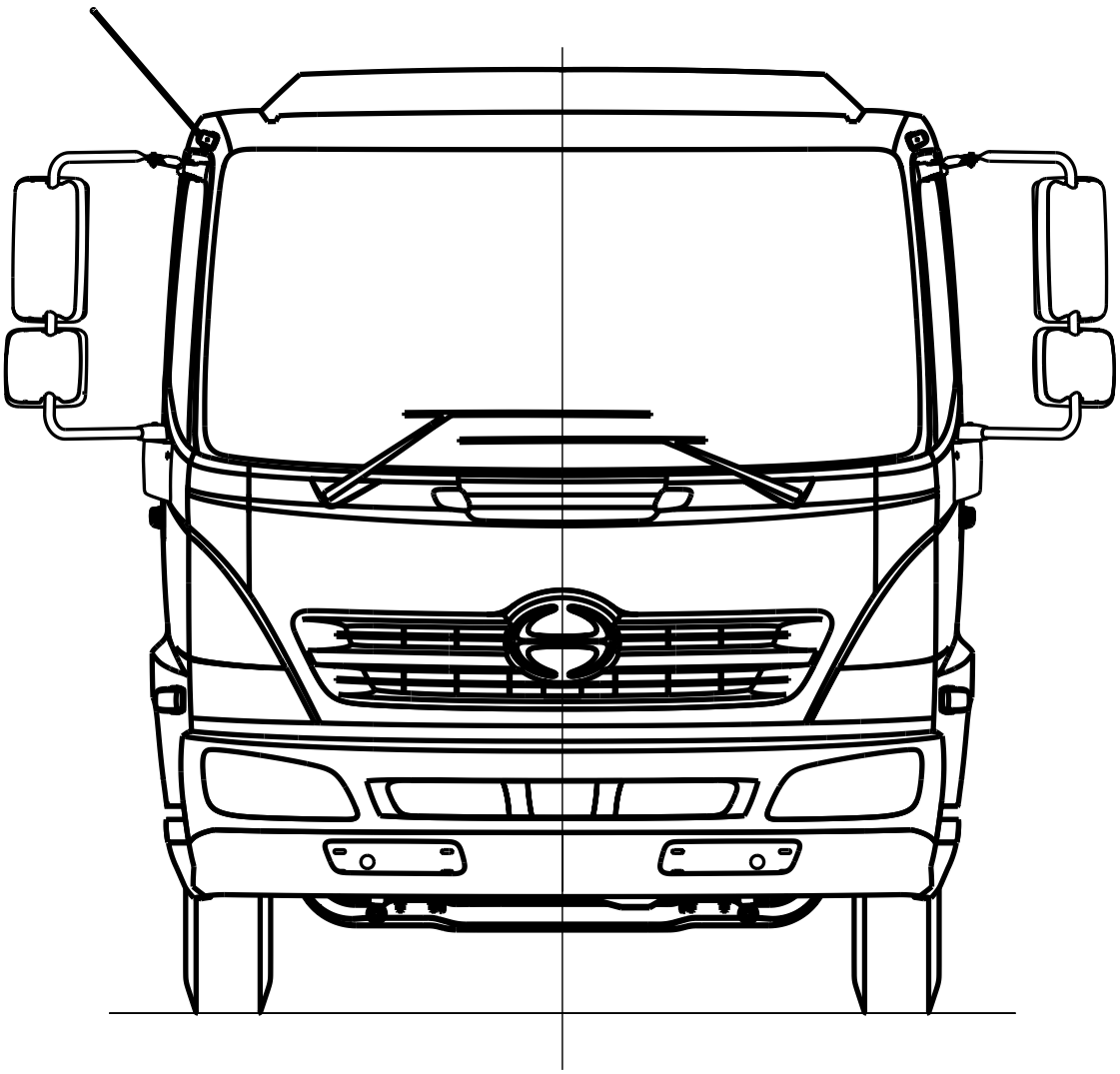
MODEL	TIRE	A
FD7J	9.5R17.5 129/127	220



No. C-3

• Front

Unit : mm

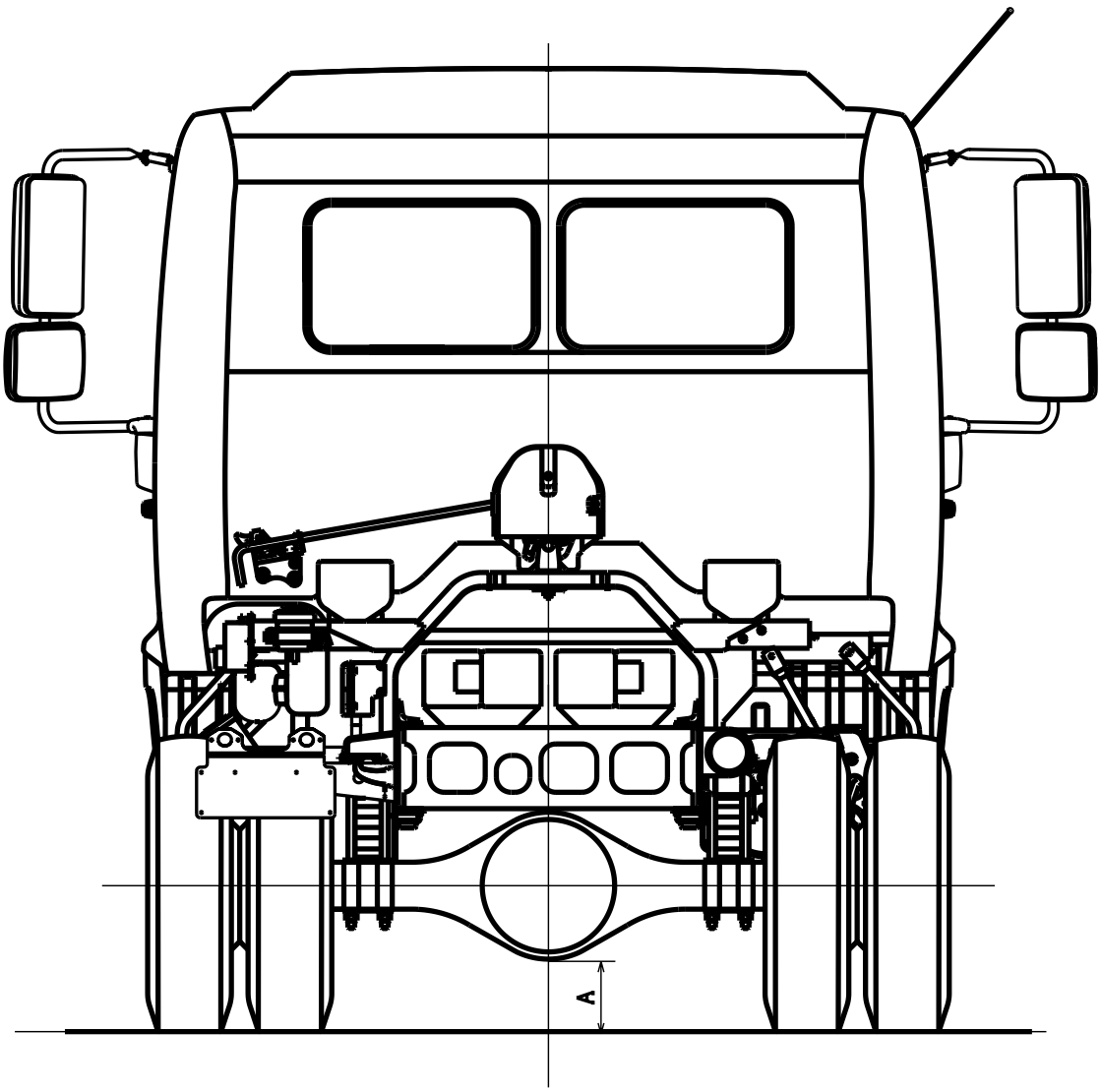


No. C-3

• Rear

Unit : mm

MODEL	TIRE	A
FD7J	9.5R17.5 129/127	220

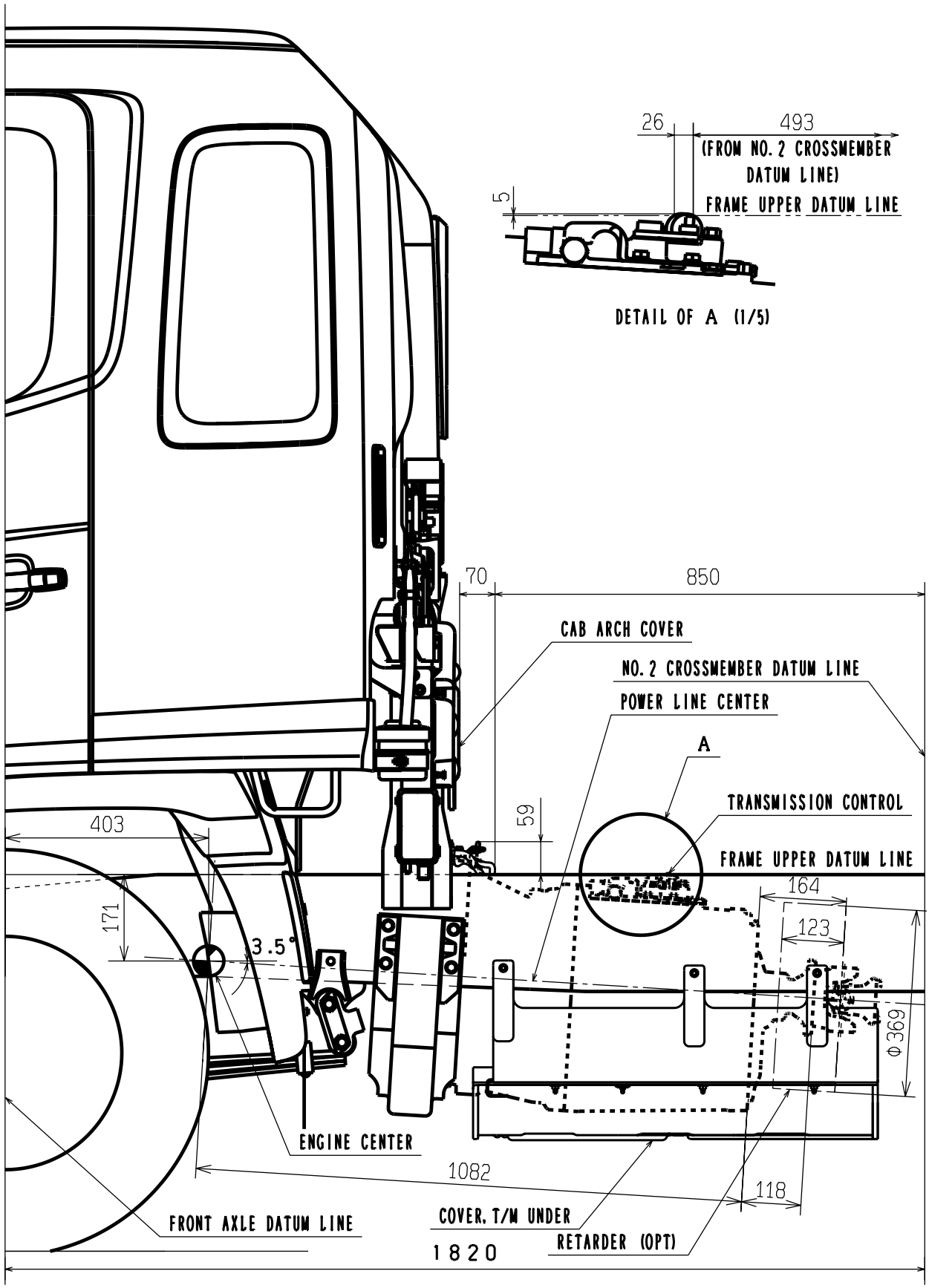


2. CAB BACK DRAWINGS

No. CB-1

• Left view

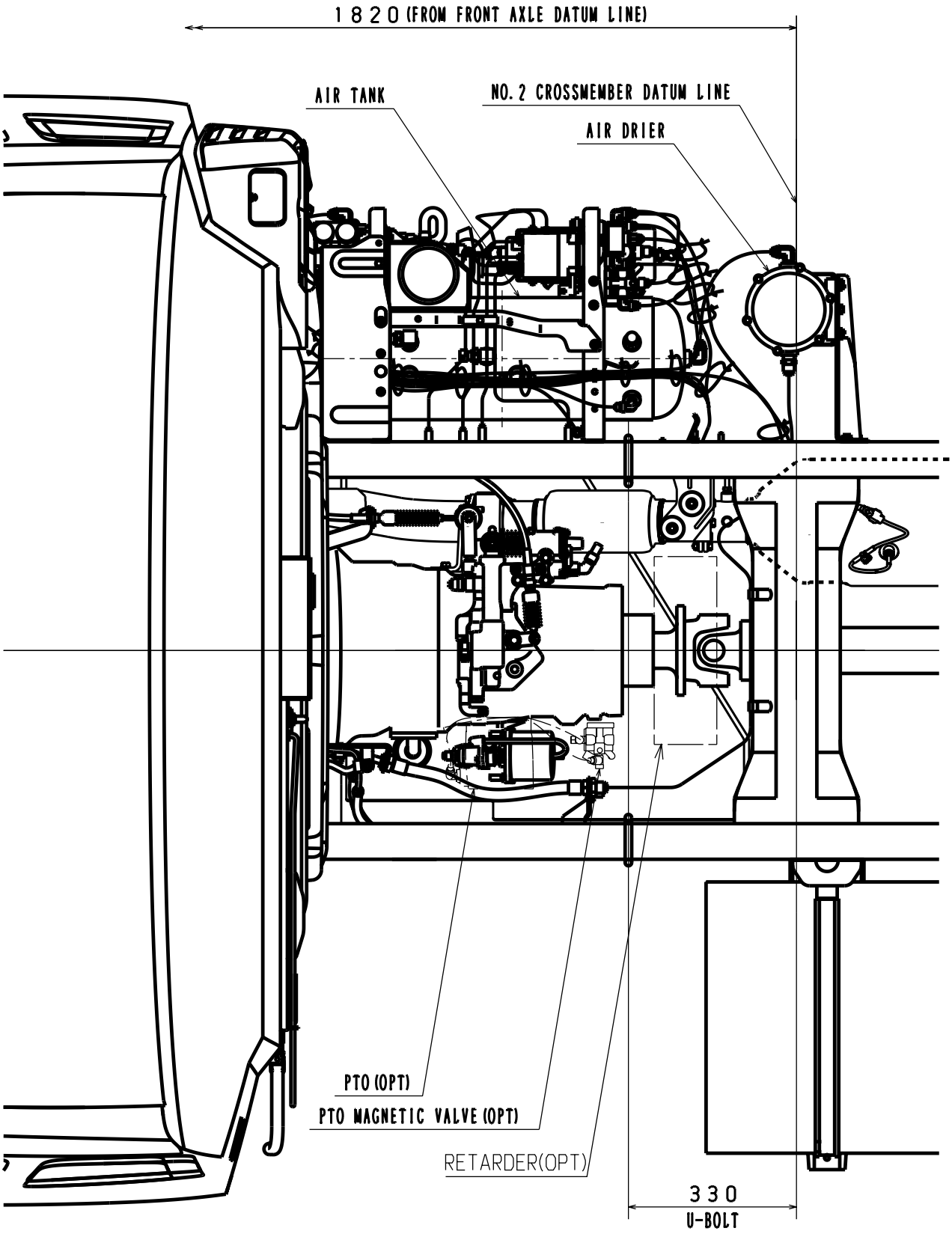
Unit : mm



No. CB-1

• Upper view

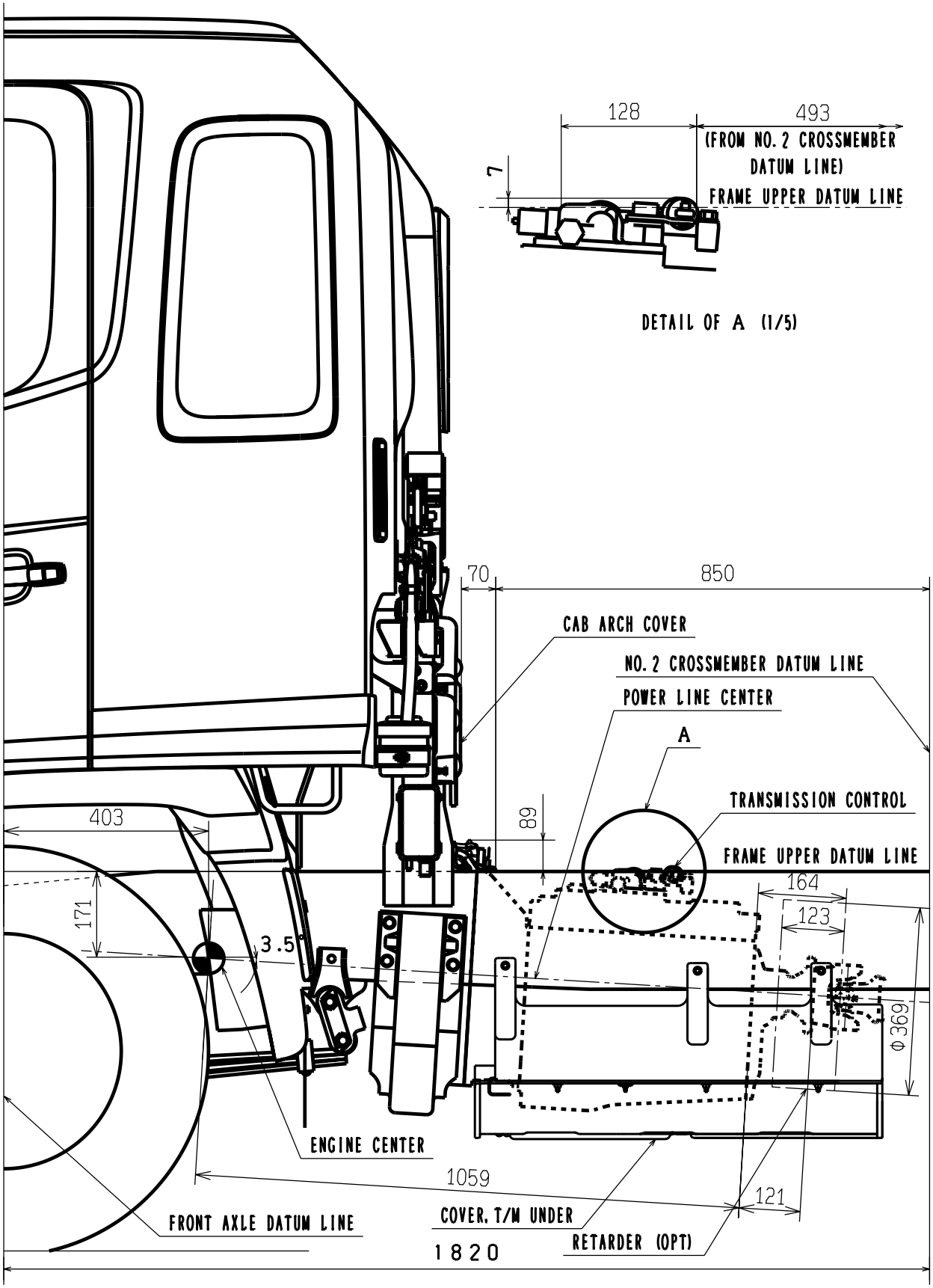
Unit : mm



No. CB-2

• Left view

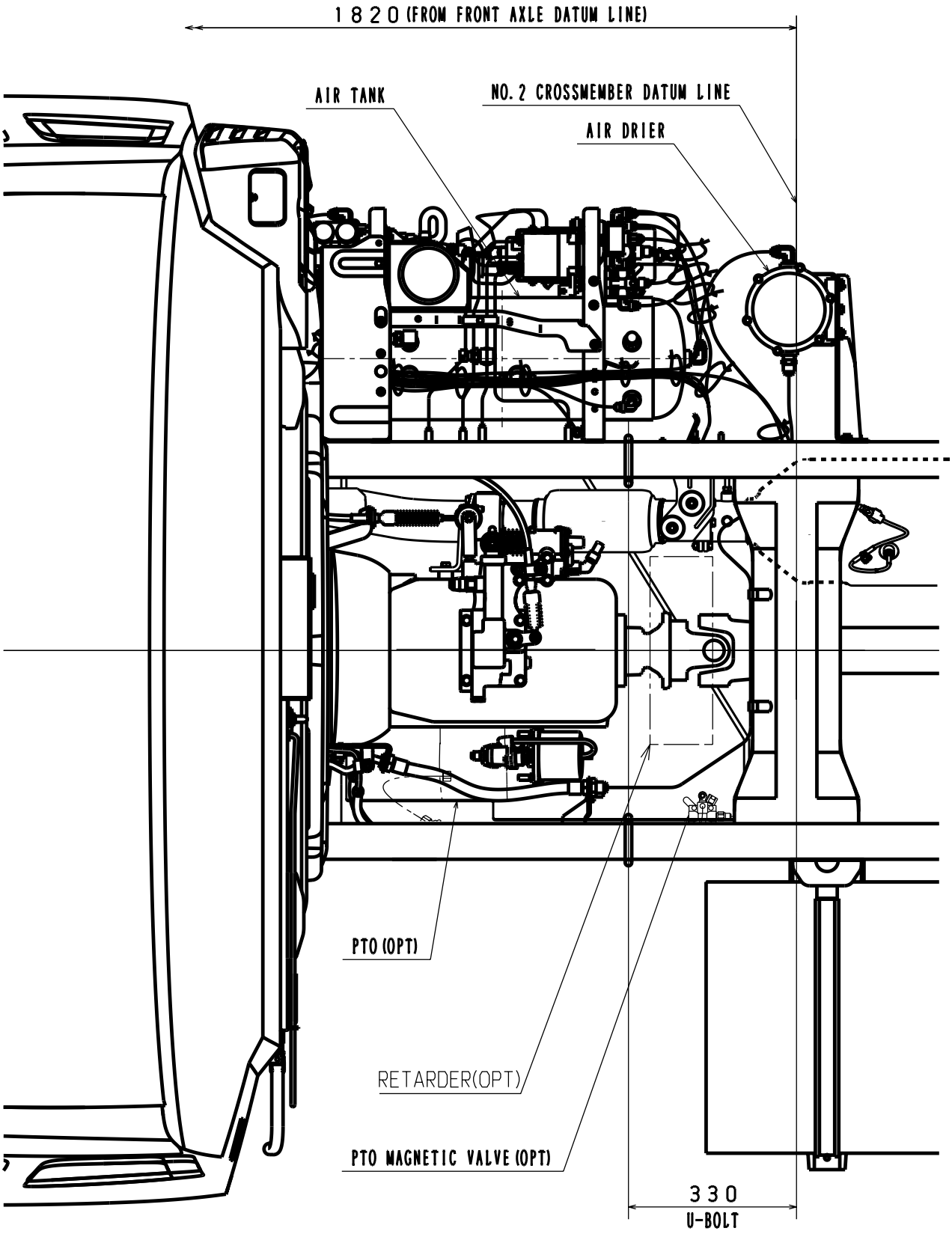
Unit : mm



No. CB-2

• Upper view

Unit : mm



No. CB-3

• Left view

Unit : mm

No. CB-3

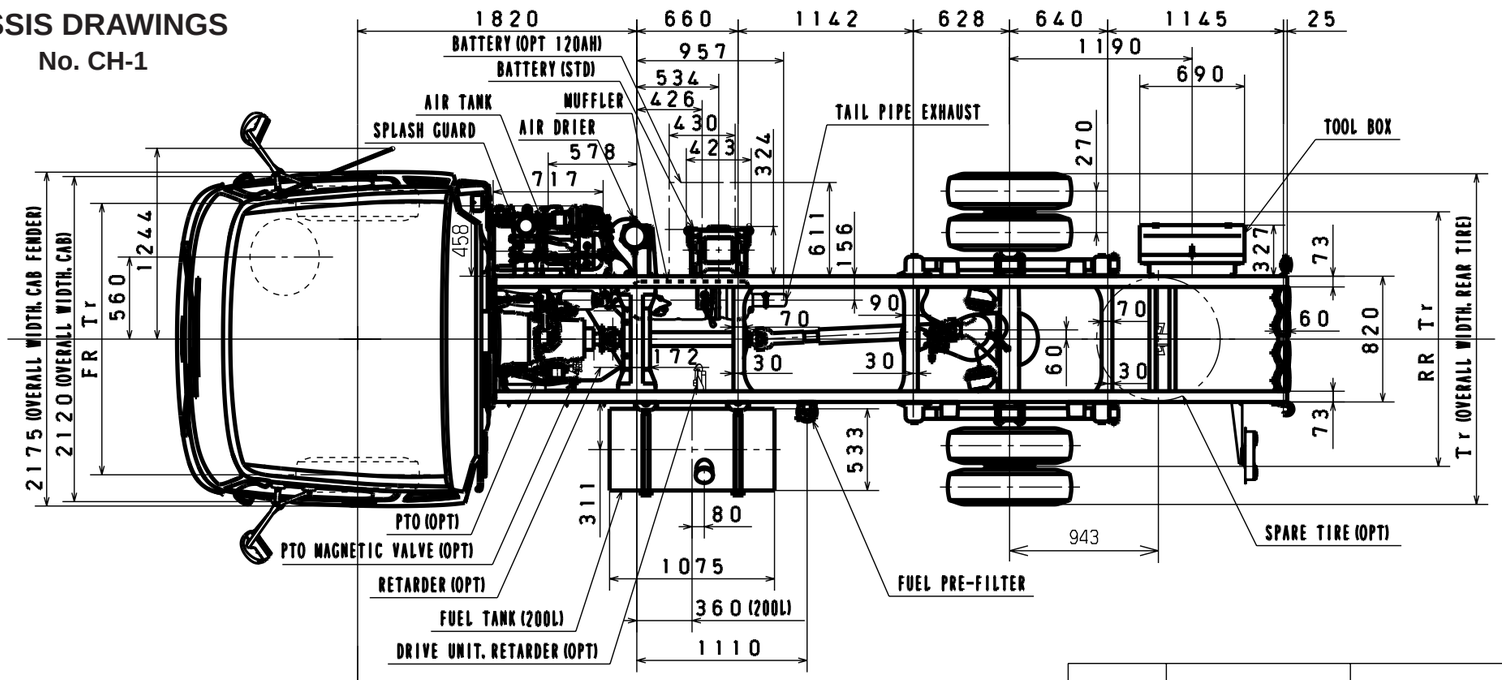
• Upper view

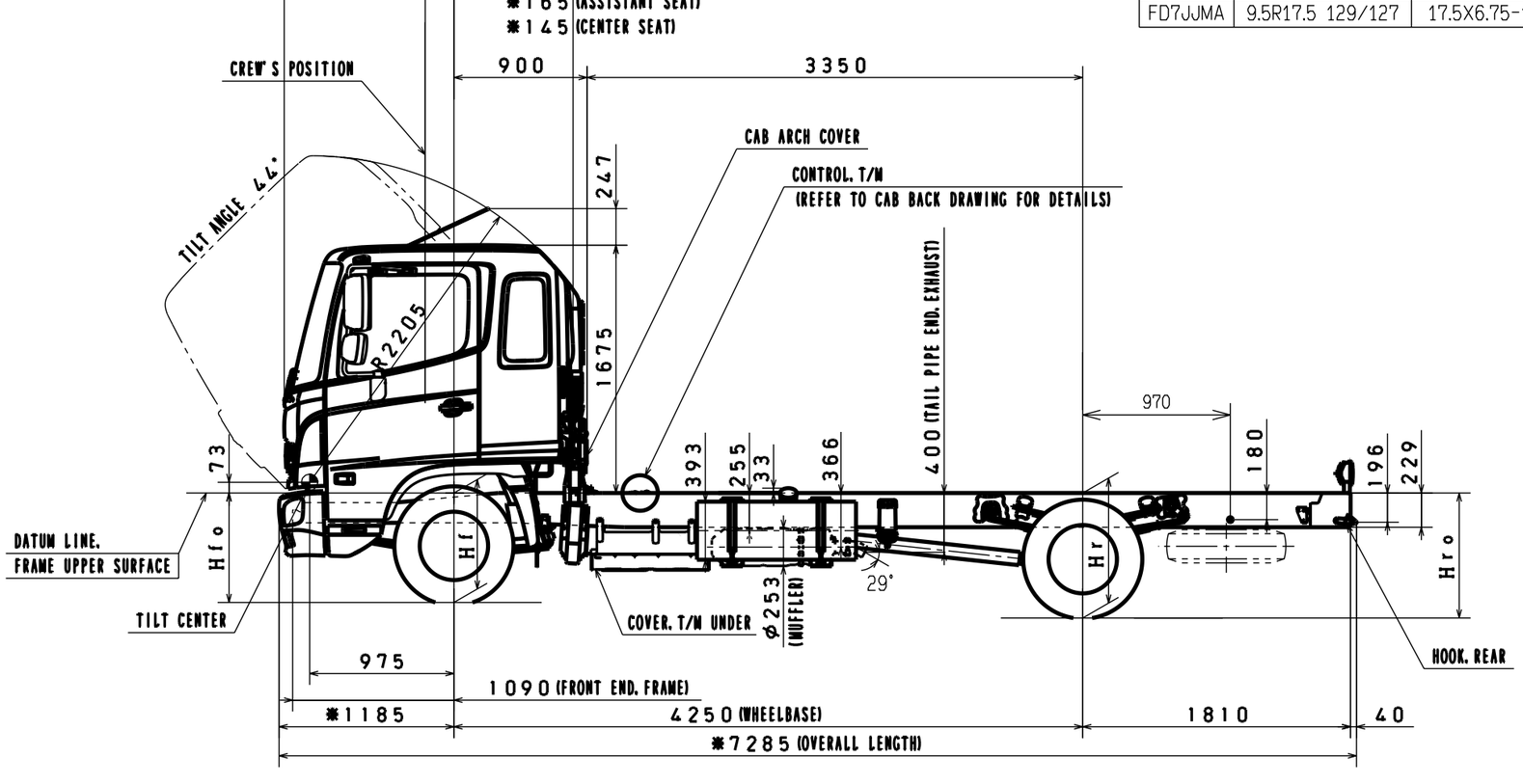
Unit : mm

3. CHASSIS DRAWINGS

No. CH-1

Unit : mm



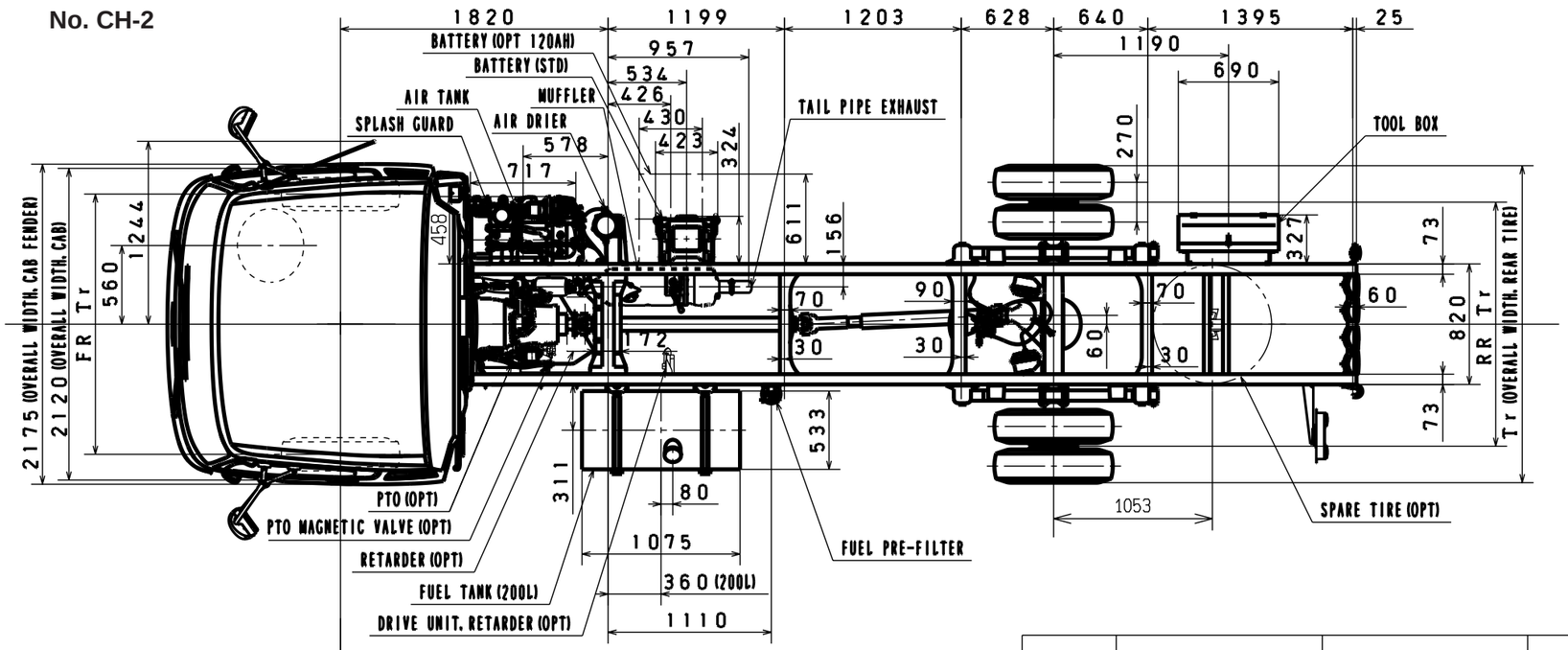


MODEL	TIRE	WHEEL	GROUND HEIGHT, FRAME UPPER SURFACE				FR Tr	RR Tr	Tr
			Hfo	Hf	Hr	Hro			
FD7JJMA	9.5R17.5 129/127	17.5X6.75-135-9	755	775	880	920	1770	1660	2170

NOTE: 1.Figures marked "※" dimensions are measured in parallel with the surface of the ground.
2.The dimension of tire to be mentioned in above table shows design figure according to JATMA or ETRTO standard.

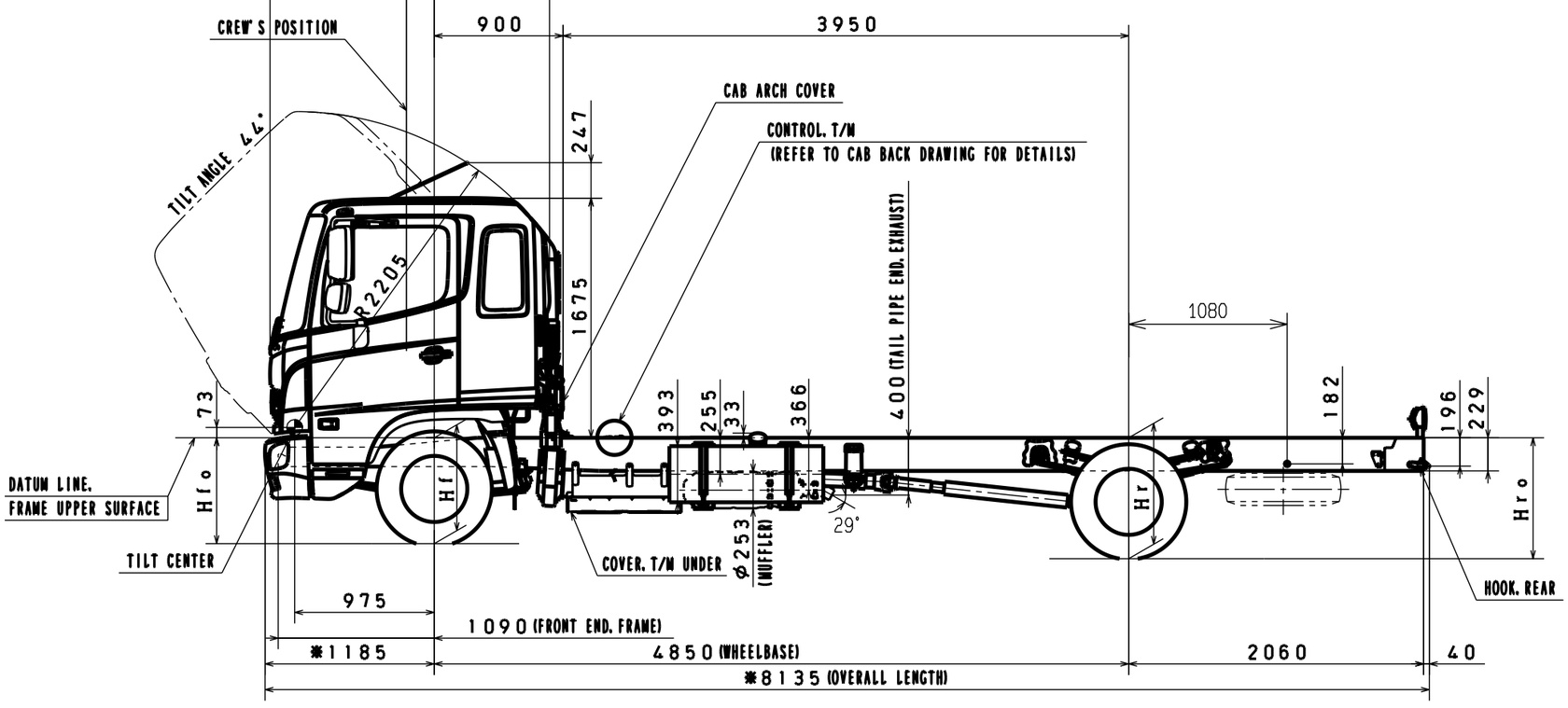
No. CH-2

Unit : mm



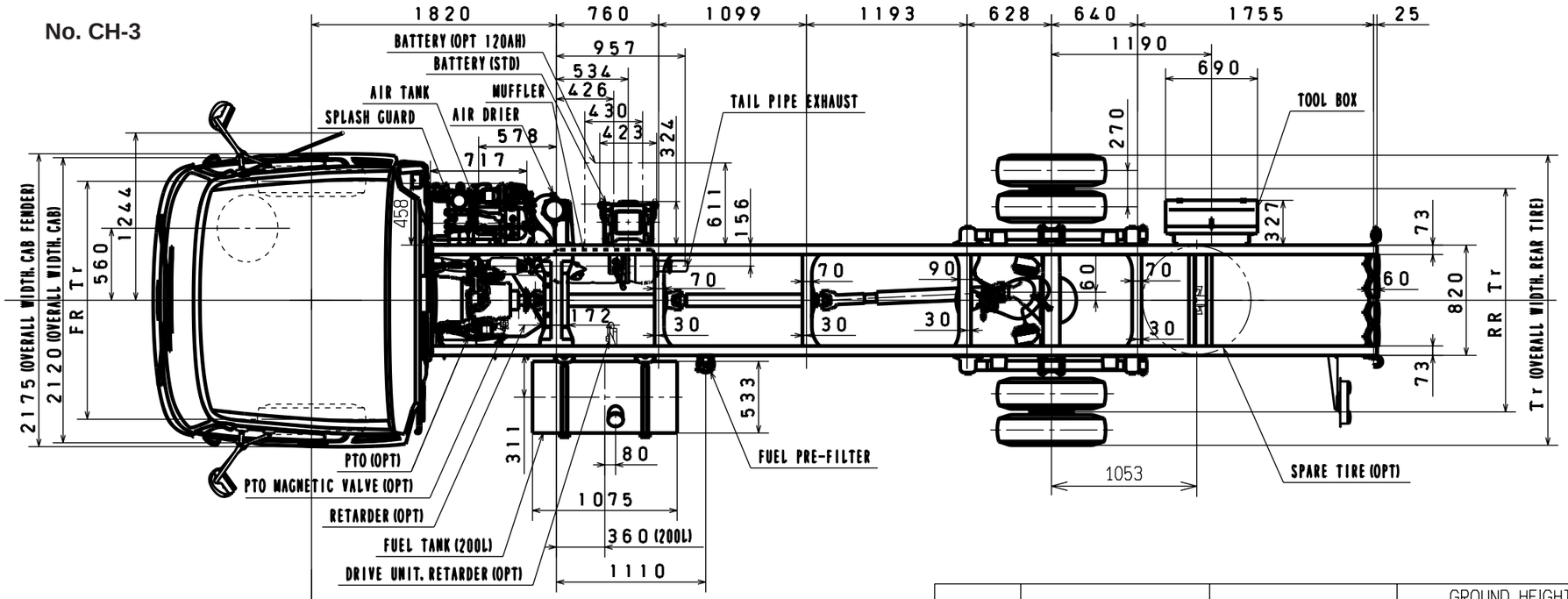
MODEL	TIRE	WHEEL	GROUND HEIGHT, FRAME UPPER SURFACE				FR Tr	RR Tr	Tr
			Hfo	Hf	Hr	Hro			
FD7JLMA	9.5R17.5 129/127	17.5X6.75-135-9	755	775	880	920	1770	1660	2170

NOTE: 1.Figures marked "※" dimensions are measured in parallel with the surface of the ground.
2.The dimension of tire to be mentioned in above table shows design figure according to JATMA or ETRTO standard.

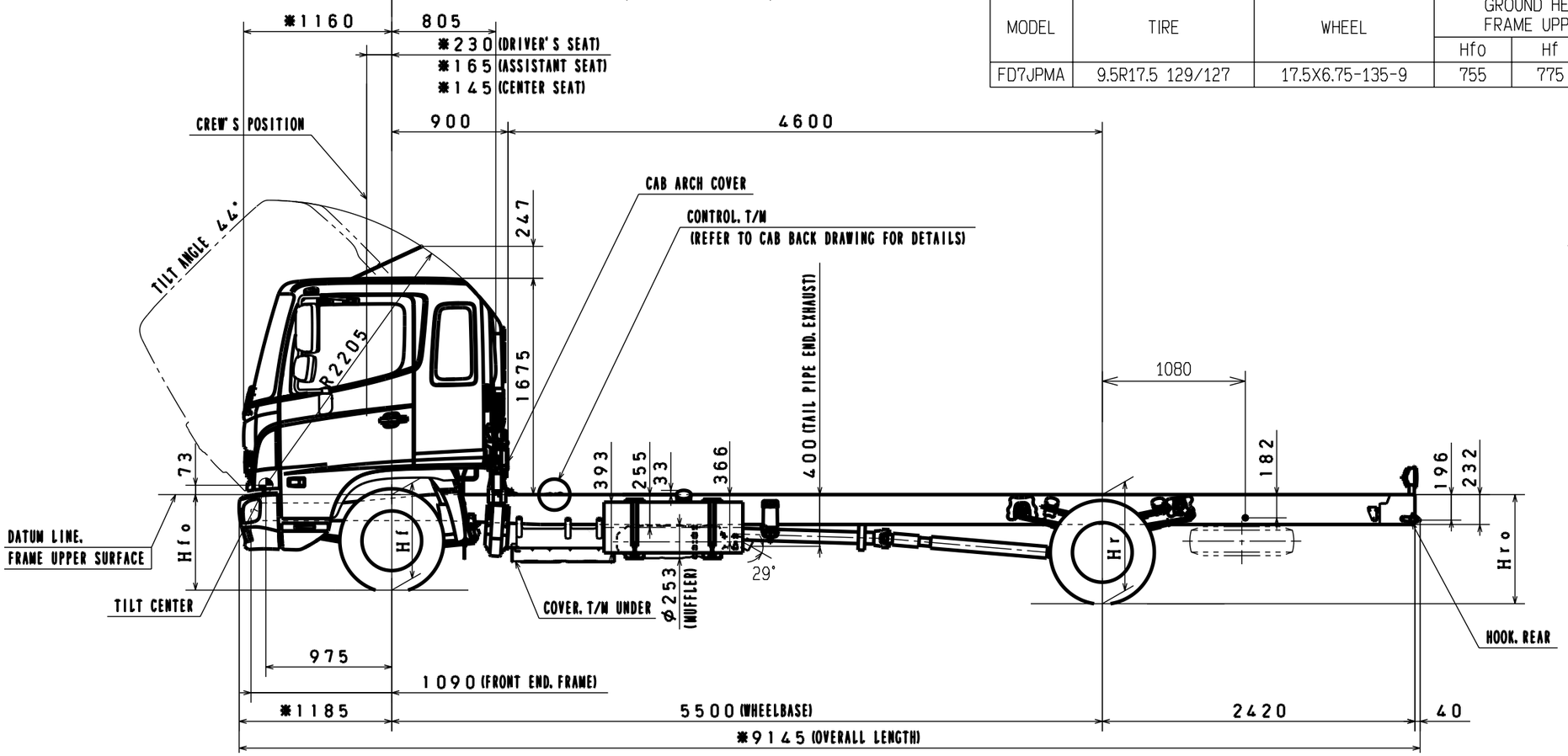


No. CH-3

Unit : mm



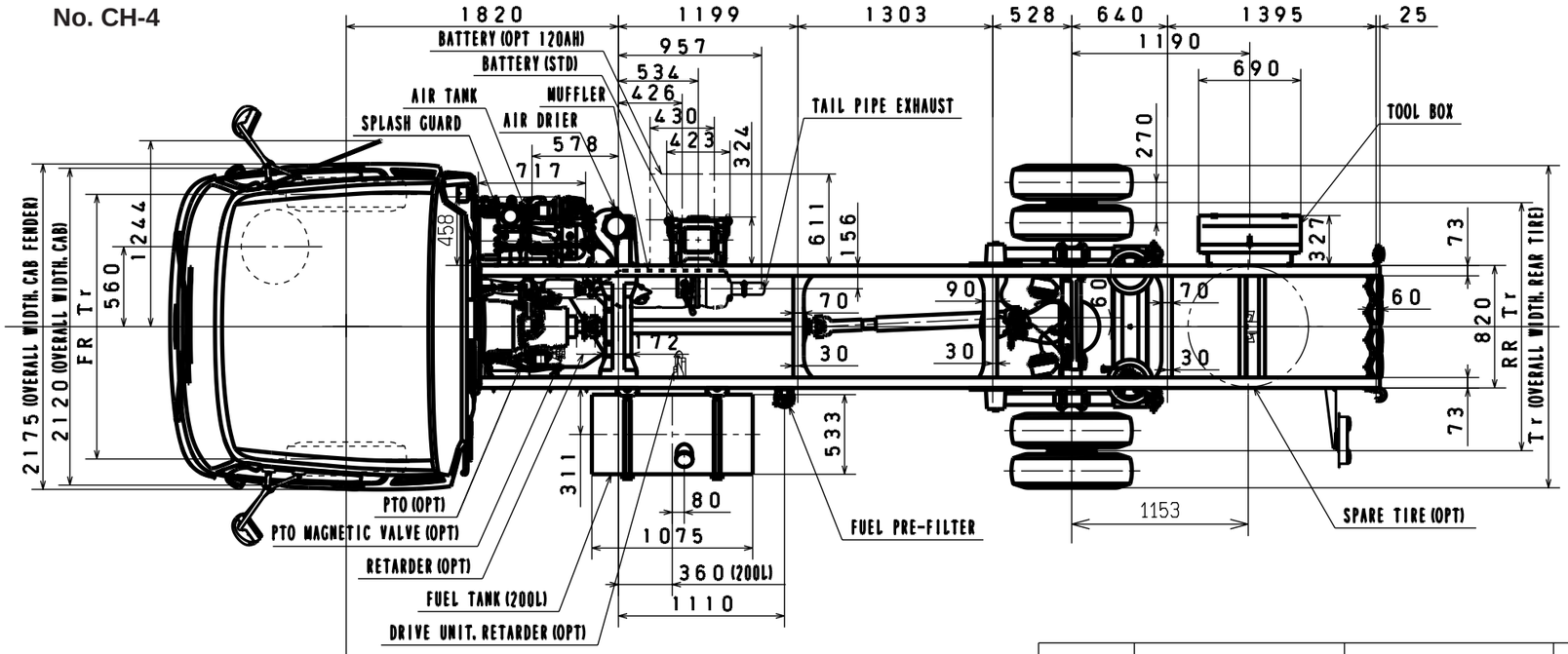
MODEL	TIRE	WHEEL	GROUND HEIGHT, FRAME UPPER SURFACE				FR Tr	RR Tr	Tr
			Hfo	Hf	Hr	Hro			
FD7JPMA	9.5R17.5 129/127	17.5X6.75-135-9	755	775	880	920	1770	1660	2170



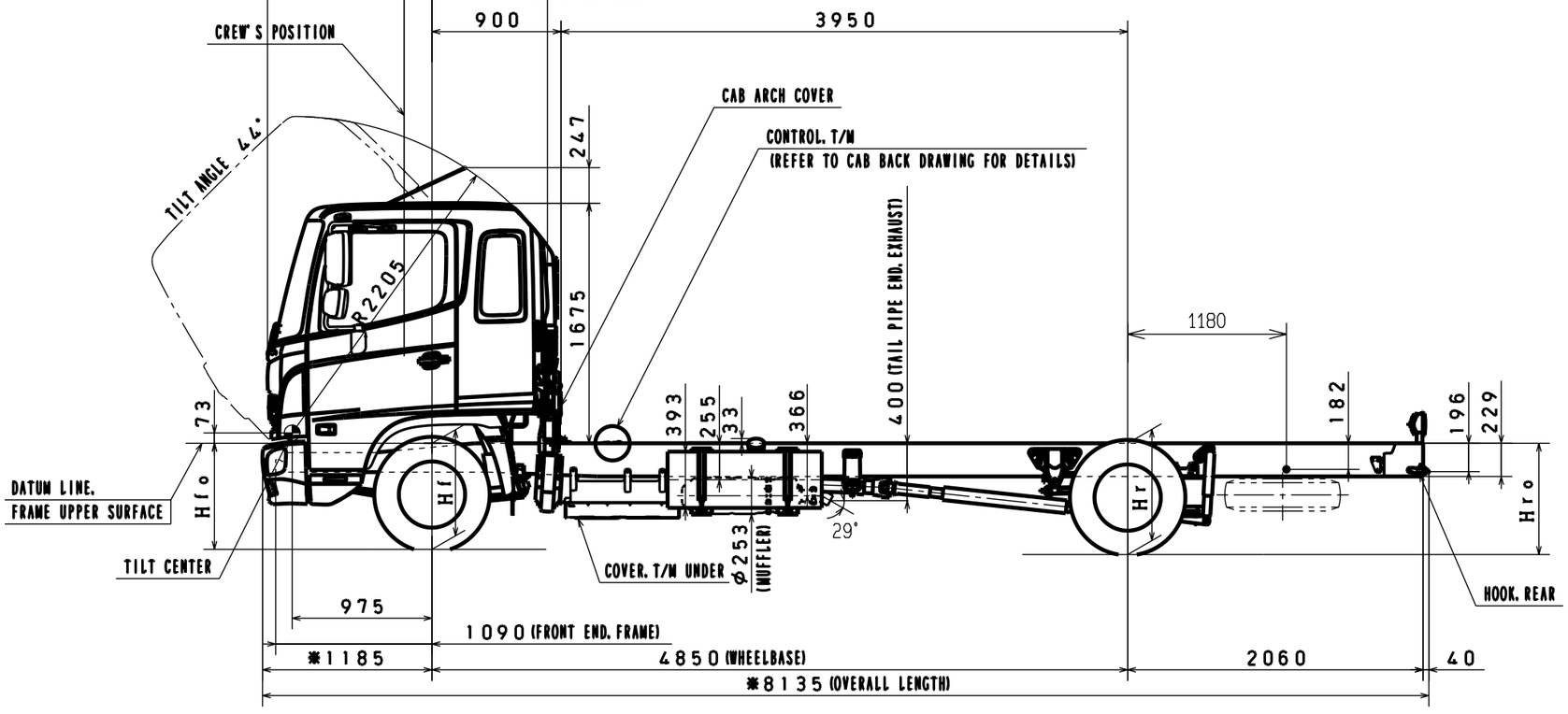
NOTE: 1.Figures marked "※" dimensions are measured in parallel with the surface of the ground.
2.The dimension of tire to be mentioned in above table shows design figure according to JATMA or ETRTO standard.

No. CH-4

Unit : mm



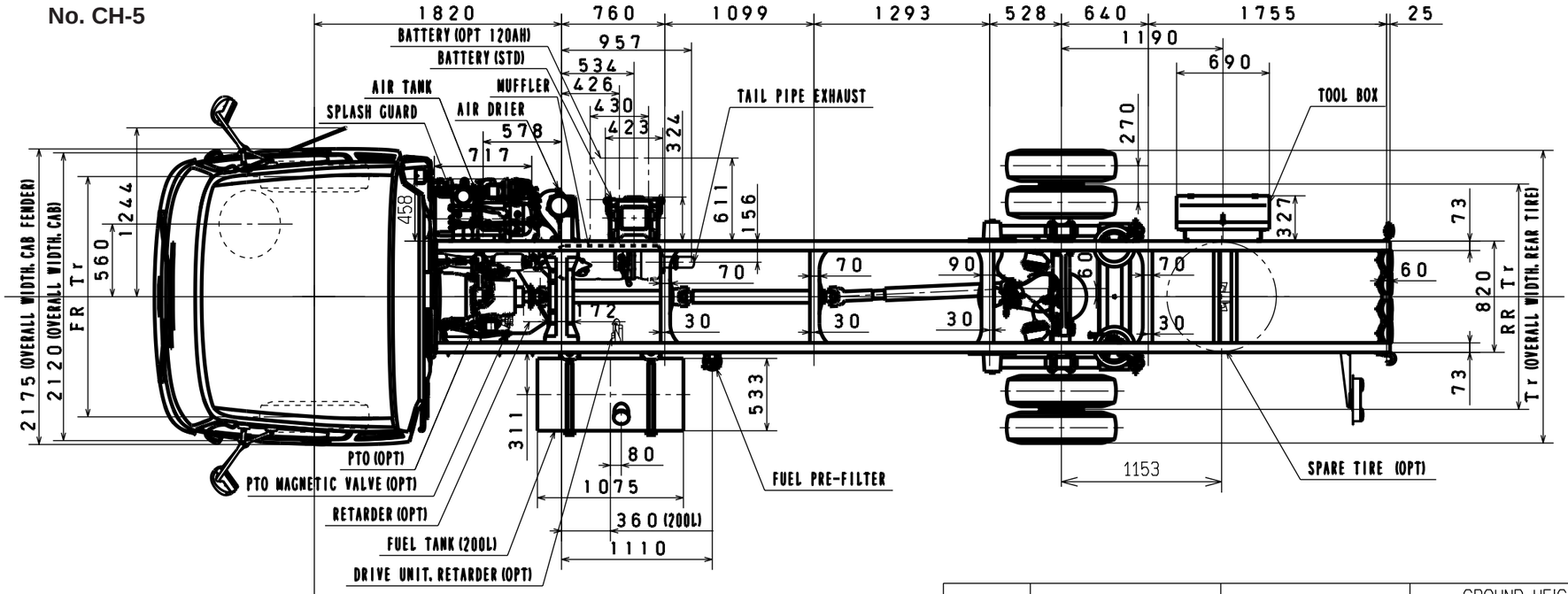
MODEL	TIRE	WHEEL	GROUND HEIGHT, FRAME UPPER SURFACE				FR Tr	RR Tr	Tr
			Hfo	Hf	Hr	Hro			
FD7JLMG	9.5R17.5 129/127	17.5X6.75-135-9	770	775	800	810	1770	1660	2170

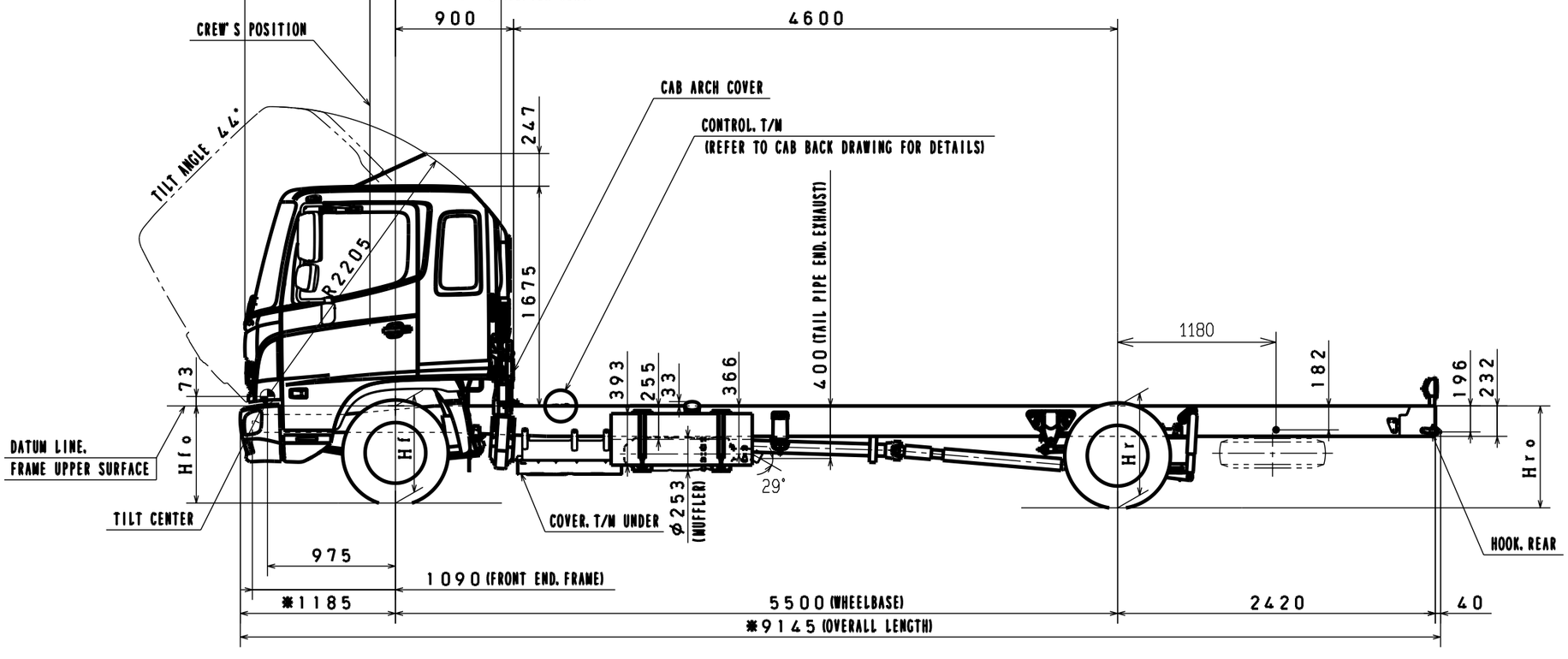


NOTE: 1.Figures marked "※" dimensions are measured in parallel with the surface of the ground.
2.The dimension of tire to be mentioned in above table shows design figure according to JATMA or ETRTO standard.

No. CH-5

Unit : mm



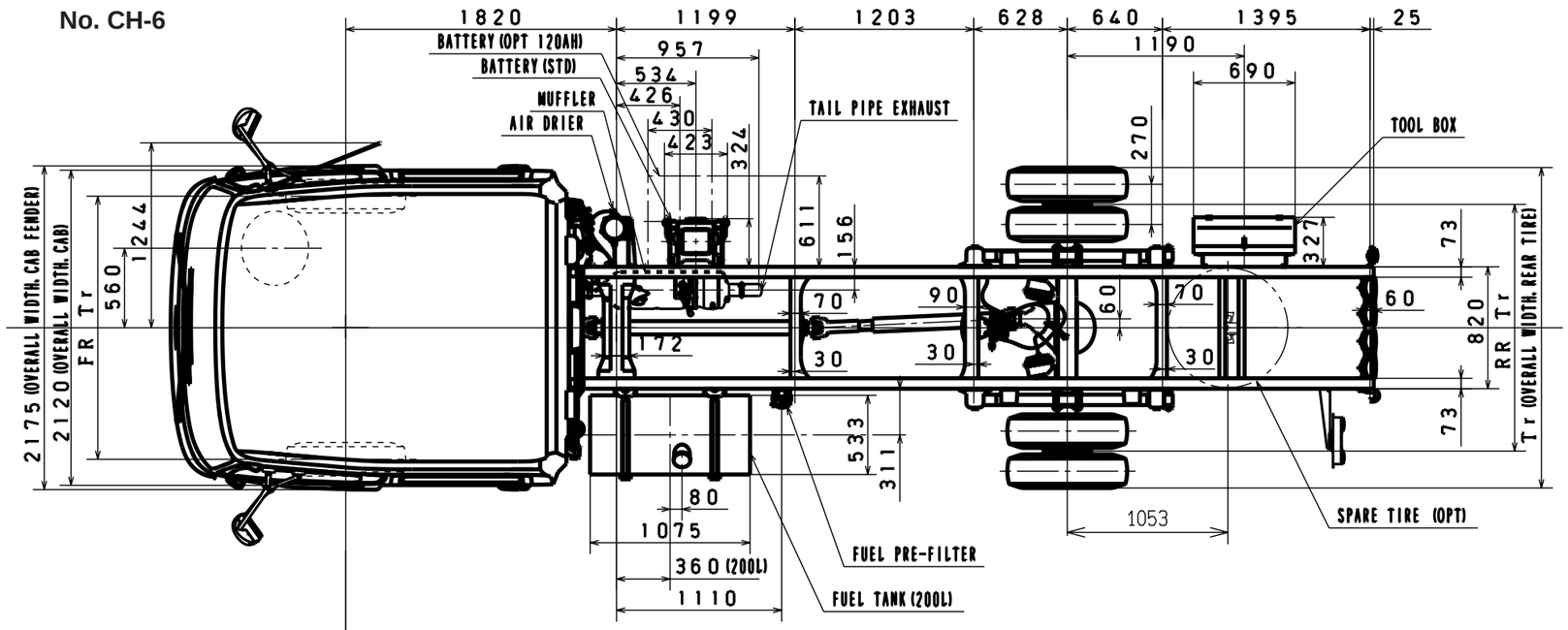


MODEL	TIRE	WHEEL	GROUND HEIGHT. FRAME UPPER SURFACE				FR Tr	RR Tr	Tr
			Hfo	Hf	Hr	Hro			
FD7JPMG	9.5R17.5 129/127	17.5X6.75-135-9	770	775	800	810	1770	1660	2170

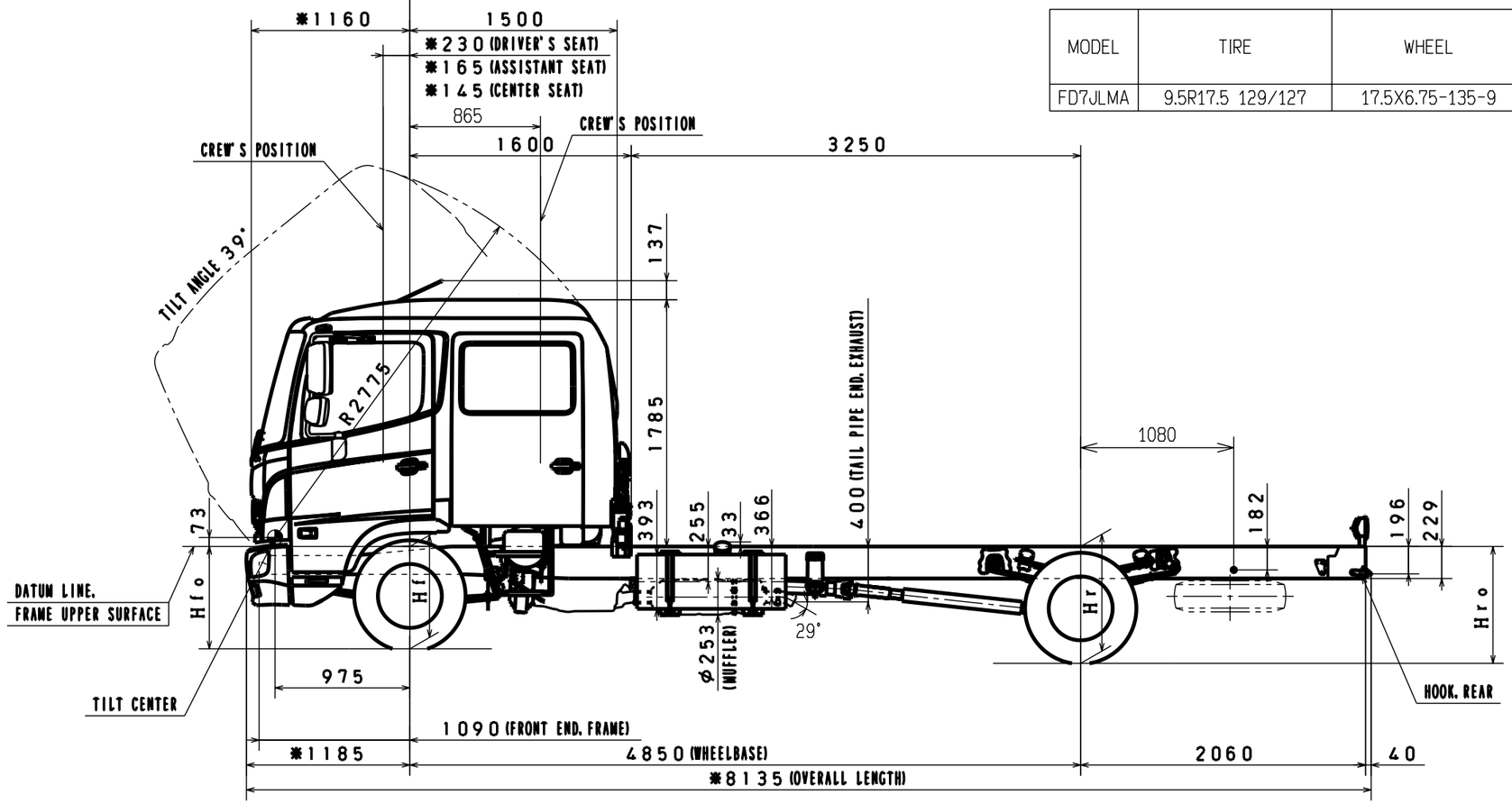
NOTE: 1.Figures marked "※" dimensions are measured in parallel with the surface of the ground.
2.The dimension of tire to be mentioned in above table shows design figure according to JATMA or ETRTO standard.

No. CH-6

Unit : mm



MODEL	TIRE	WHEEL	GROUND HEIGHT, FRAME UPPER SURFACE				FR Tr	RR Tr	Tr
			Hfo	Hf	Hr	Hro			
FD7JLMA	9.5R17.5 129/127	17.5X6.75-135-9	750	770	875	930	1770	1660	2170



NOTE: 1.Figures marked "※" dimensions are measured in parallel with the surface of the ground.
2.The dimension of tire to be mentioned in above table shows design figure according to JATMA or ETRTO standard.

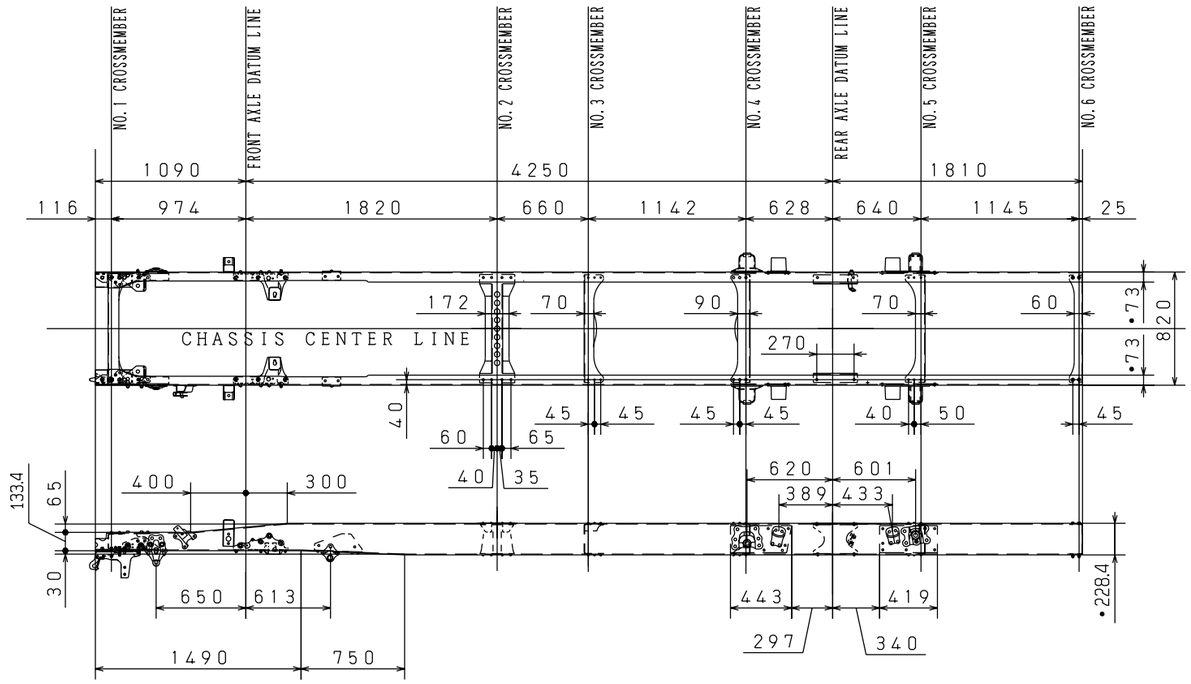
No. CH-7

4. CHASSIS FRAME DRAWINGS

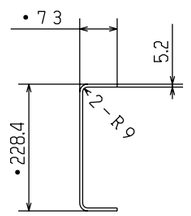
No. CF-1

• Detail of the chassis frame

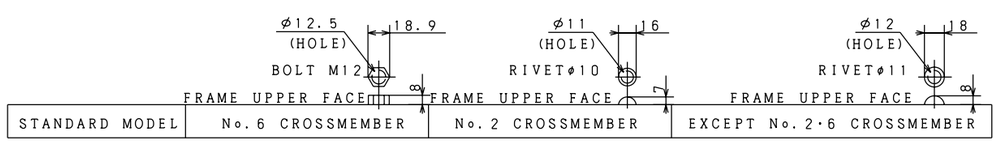
Unit : mm



DETAIL OF FRAME END



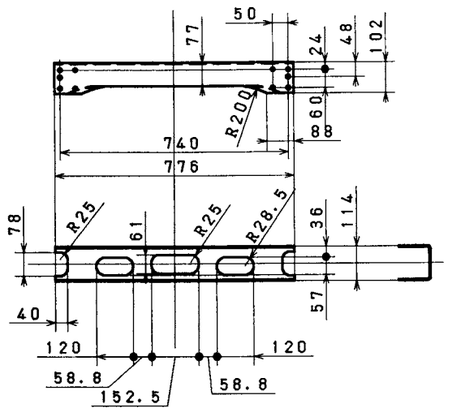
DETAILS OF BOLT AND RIVET



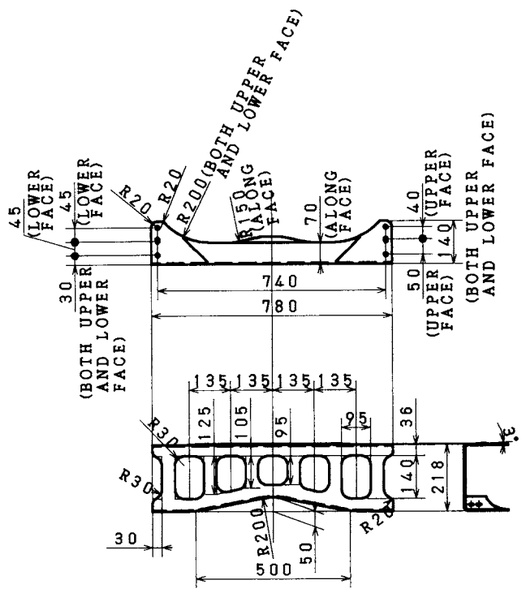
No. CF-1

• Detail of the cross member

Unit : mm



No.1 CROSSMEMBER



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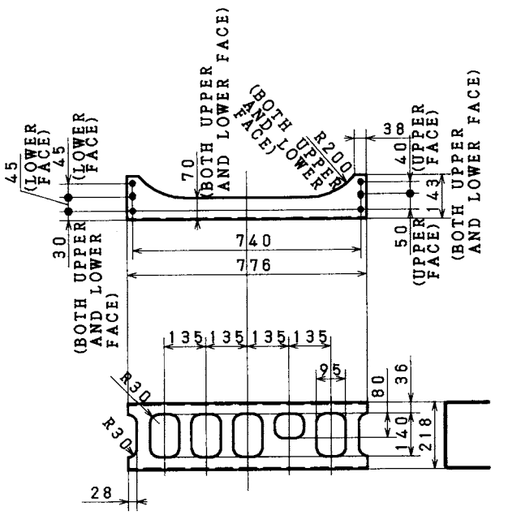
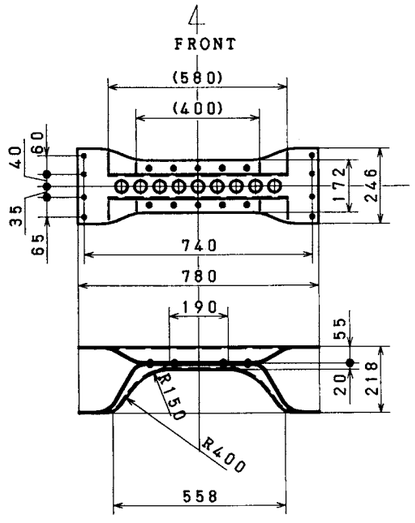
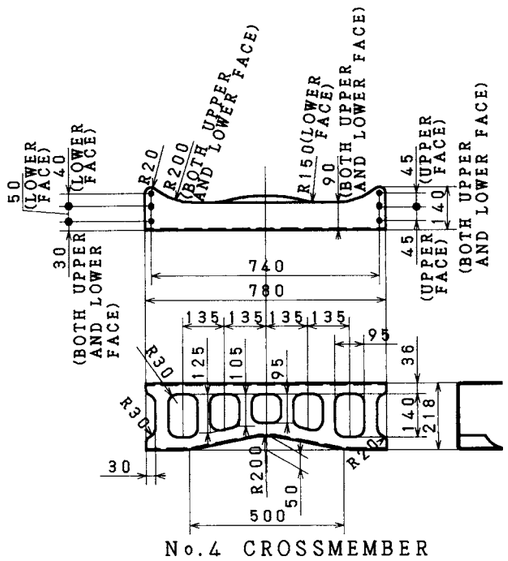


No.5 CROSSMEMBER



No.2 CROSSMEMBER



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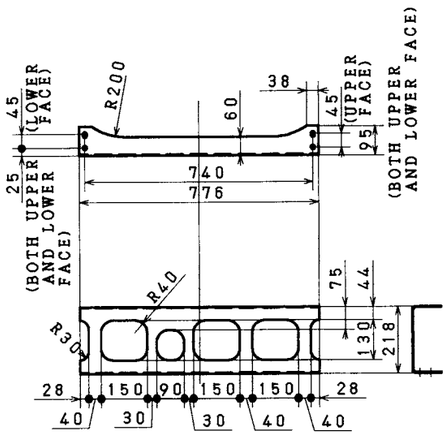


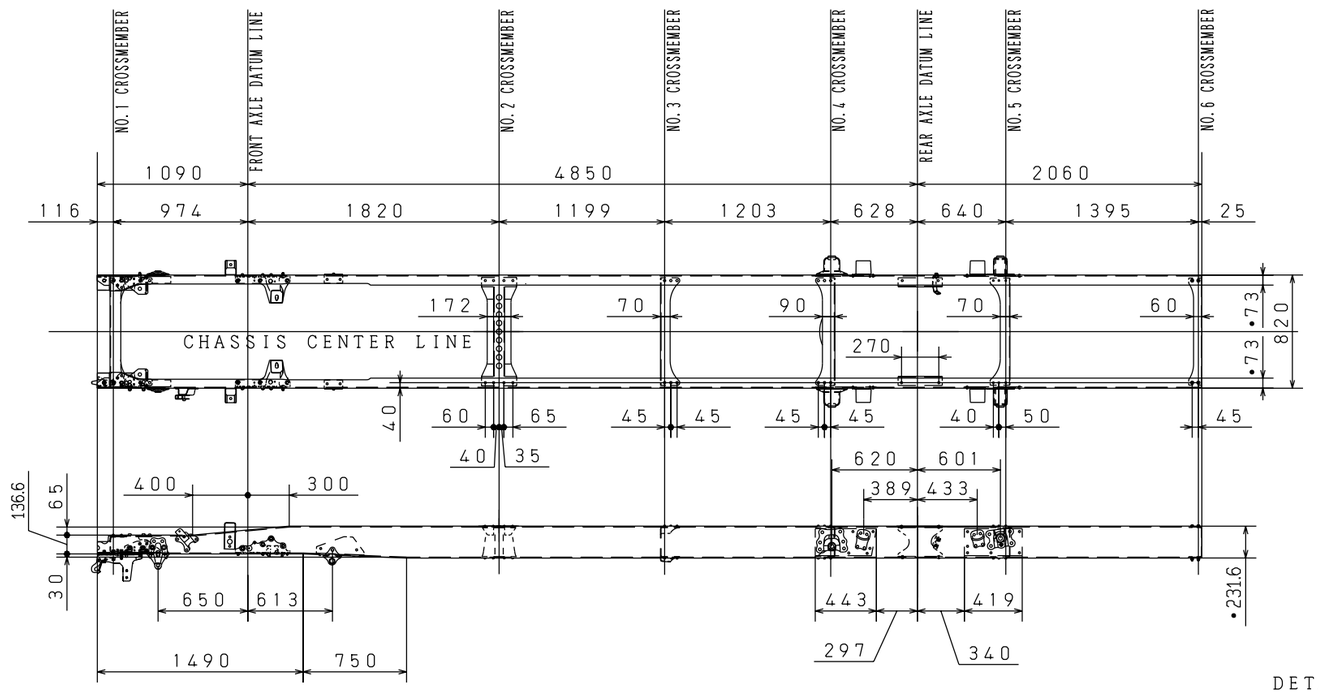
No.6 CROSSMEMBER

DFD8 CF FD1JJPA2

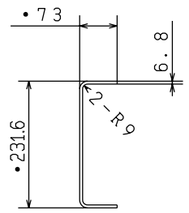
No. CF-2

• Detail of the chassis frame

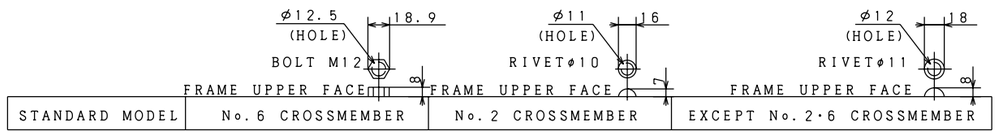
Unit : mm



DETAIL OF FRAME END



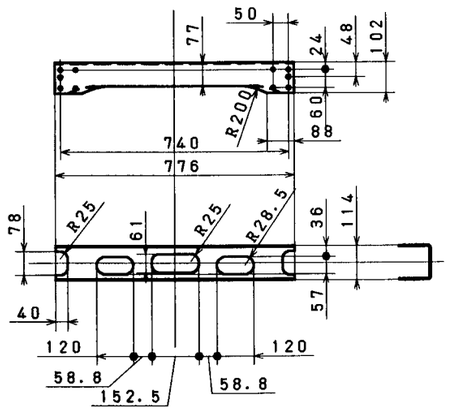
DETAILS OF BOLT AND RIVET



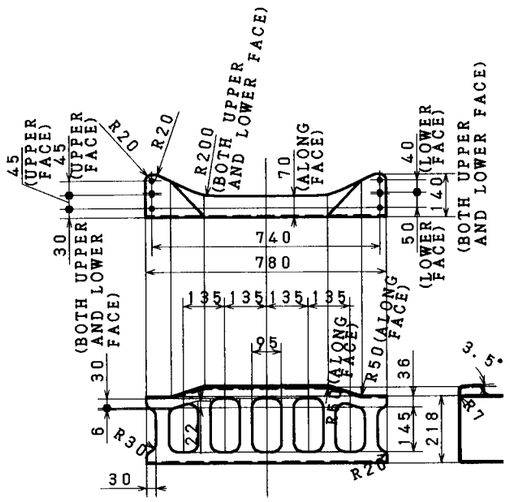
No. CF-2

• Detail of the cross member

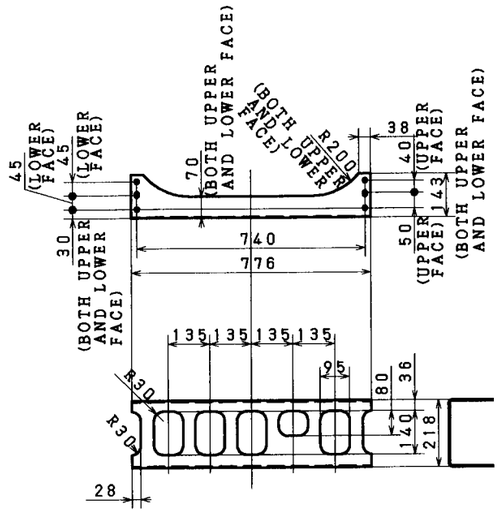
Unit : mm



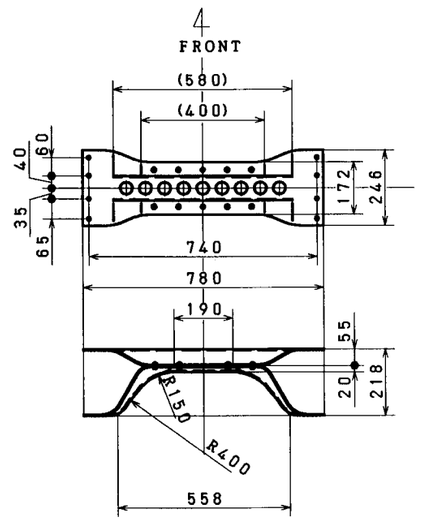
No.1 CROSSMEMBER



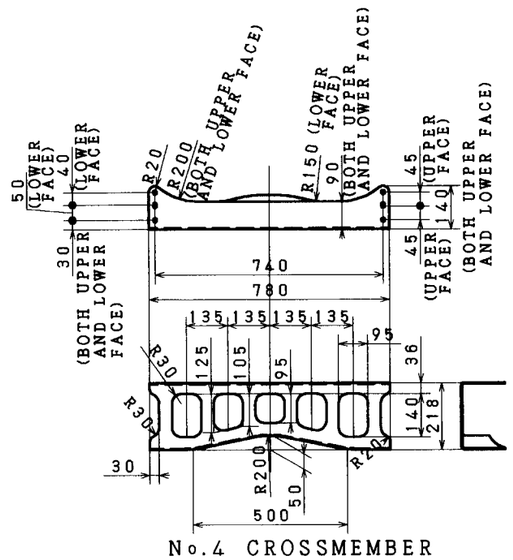
No.3 CROSSMEMBER



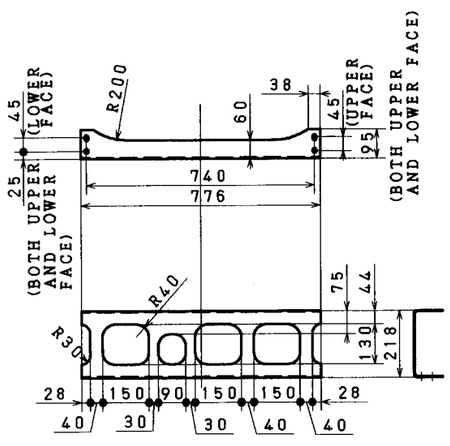
No.5 CROSSMEMBER



No.2 CROSSMEMBER



No.4 CROSSMEMBER



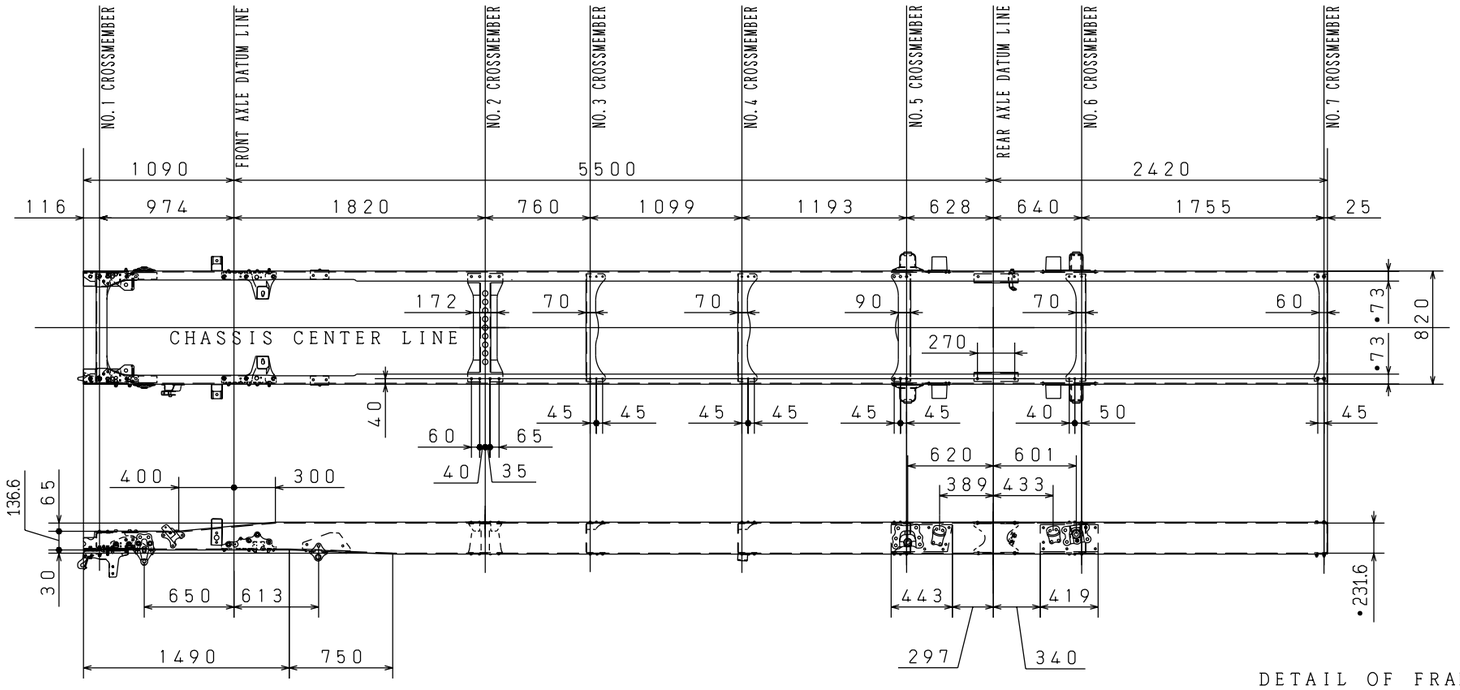
No.6 CROSSMEMBER

DFD8 CF FD1JLPA2

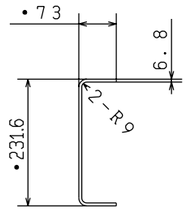
No. CF-3

• Detail of the chassis frame

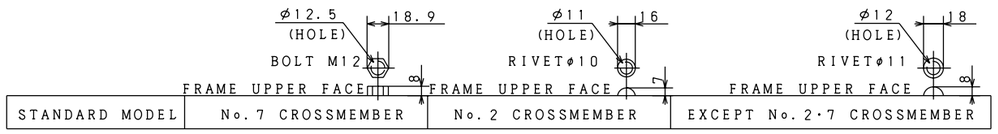
Unit : mm



DETAIL OF FRAME END



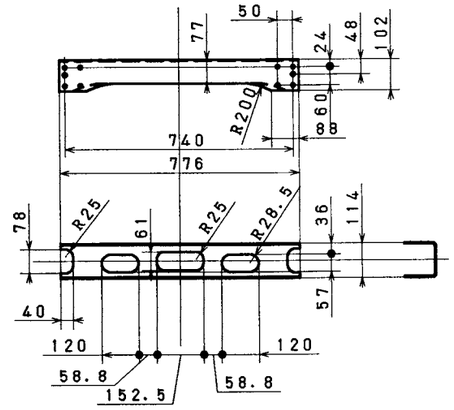
DETAILS OF BOLT AND RIVET



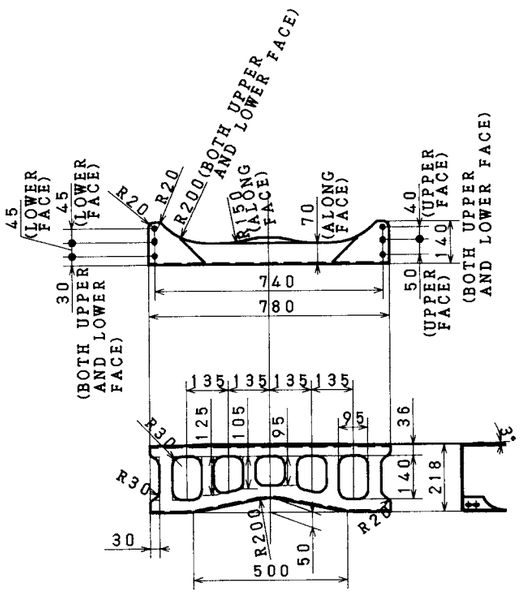
No. CF-3

• Detail of the cross member

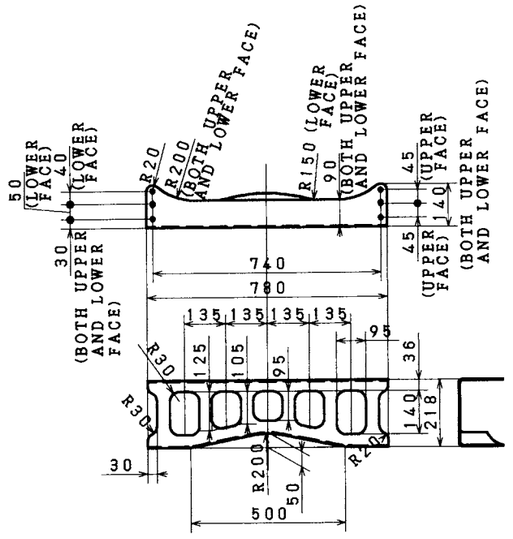
Unit : mm



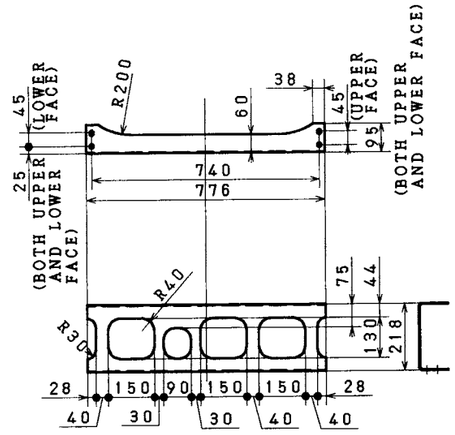
No.1 CROSSMEMBER



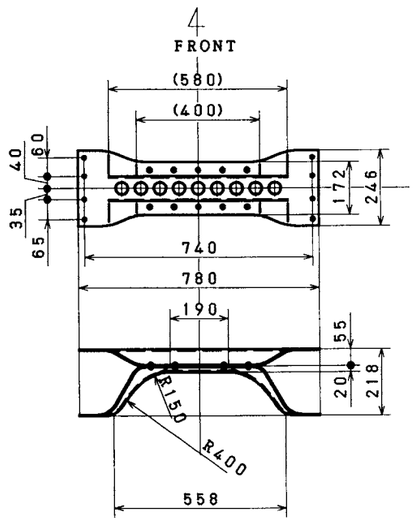
No.3 CROSSMEMBER



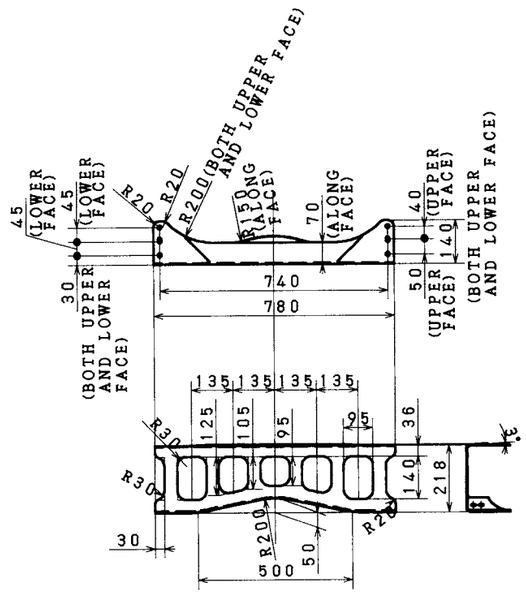
No.5 CROSSMEMBER



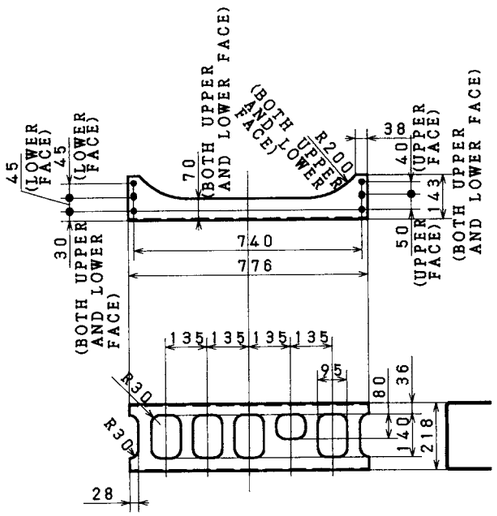
No.7 CROSSMEMBER



No.2 CROSSMEMBER



No.4 CROSSMEMBER



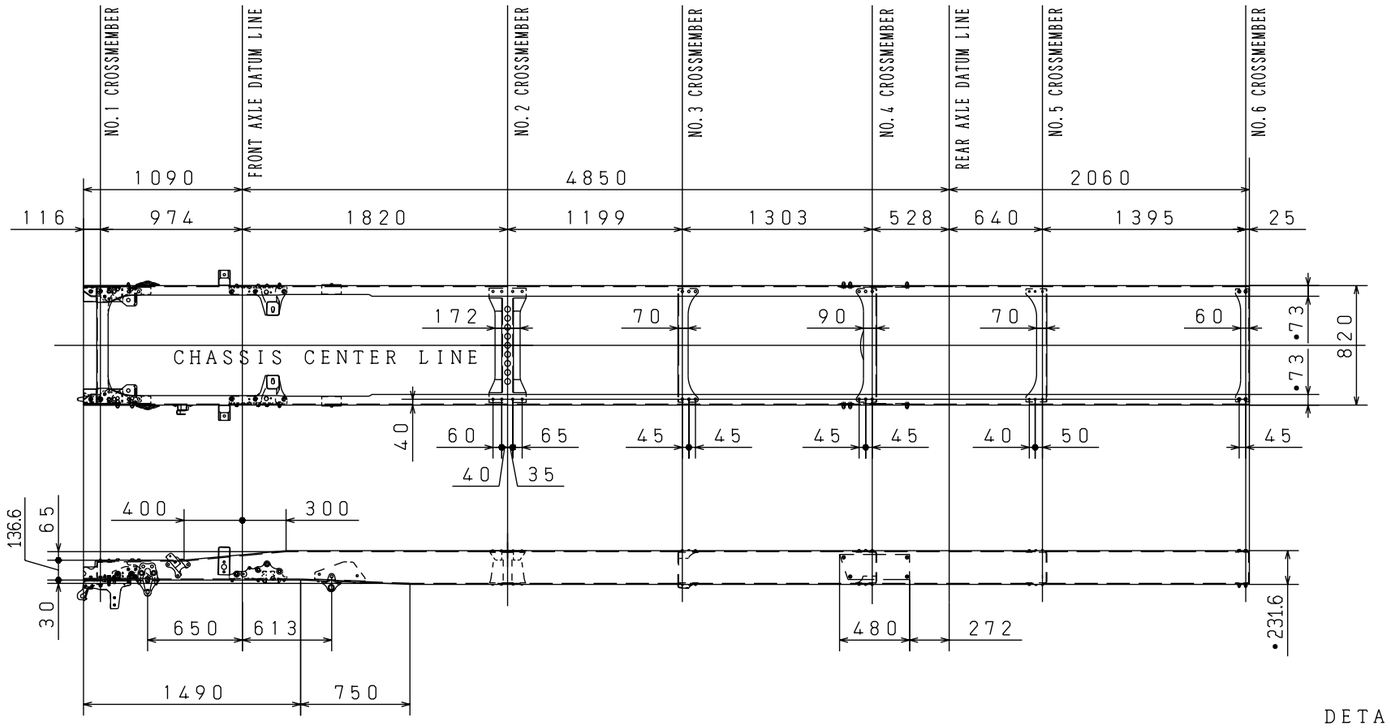
No.6 CROSSMEMBER

DFD8 CF FD1JPPA2

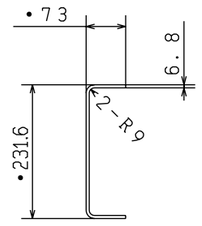
No. CF-4

• Detail of the chassis frame

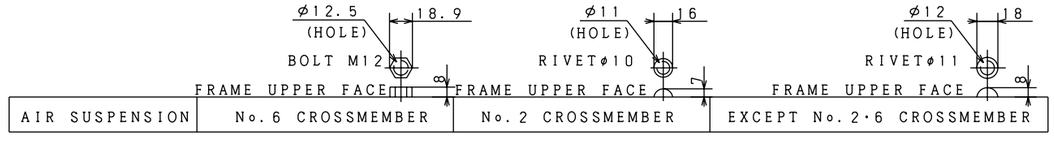
Unit : mm



DETAIL OF FRAME END



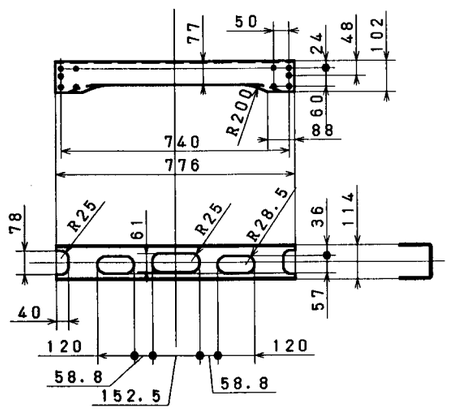
DETAILS OF BOLT AND RIVET



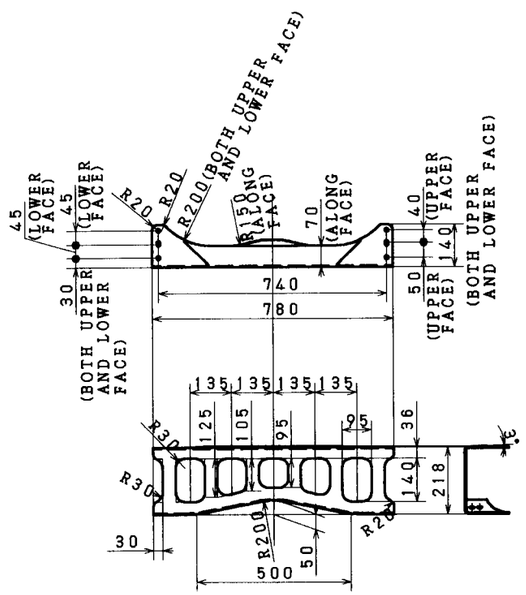
No. CF-4

• Detail of the cross member

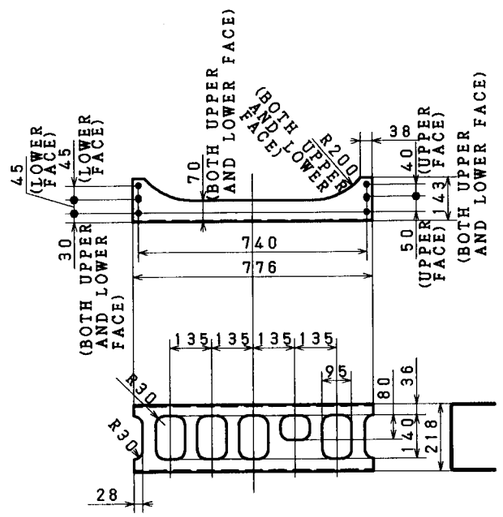
Unit : mm



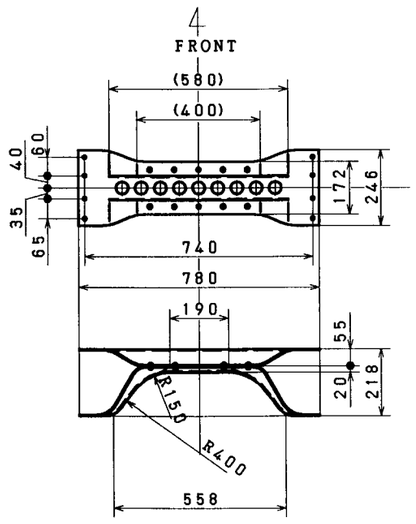
No.1 CROSSMEMBER



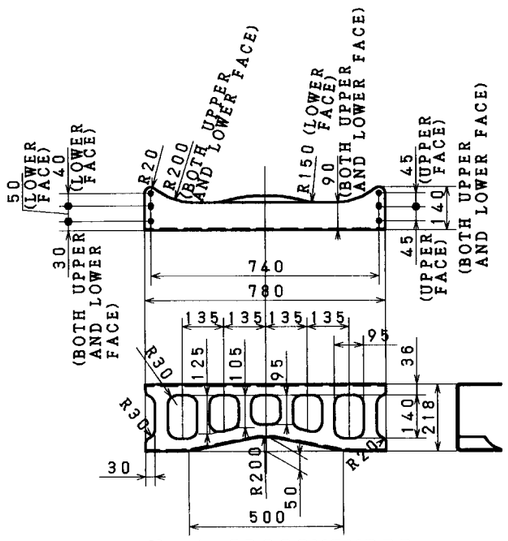
No.3 CROSSMEMBER



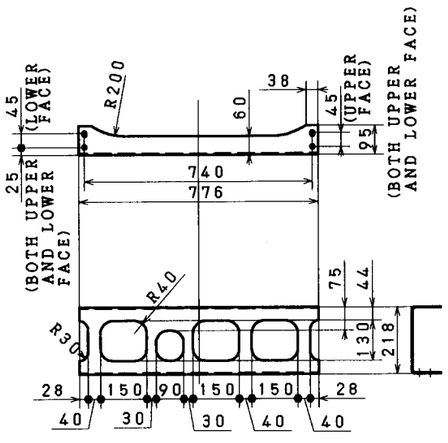
No.5 CROSSMEMBER



No.2 CROSSMEMBER



No.4 CROSSMEMBER



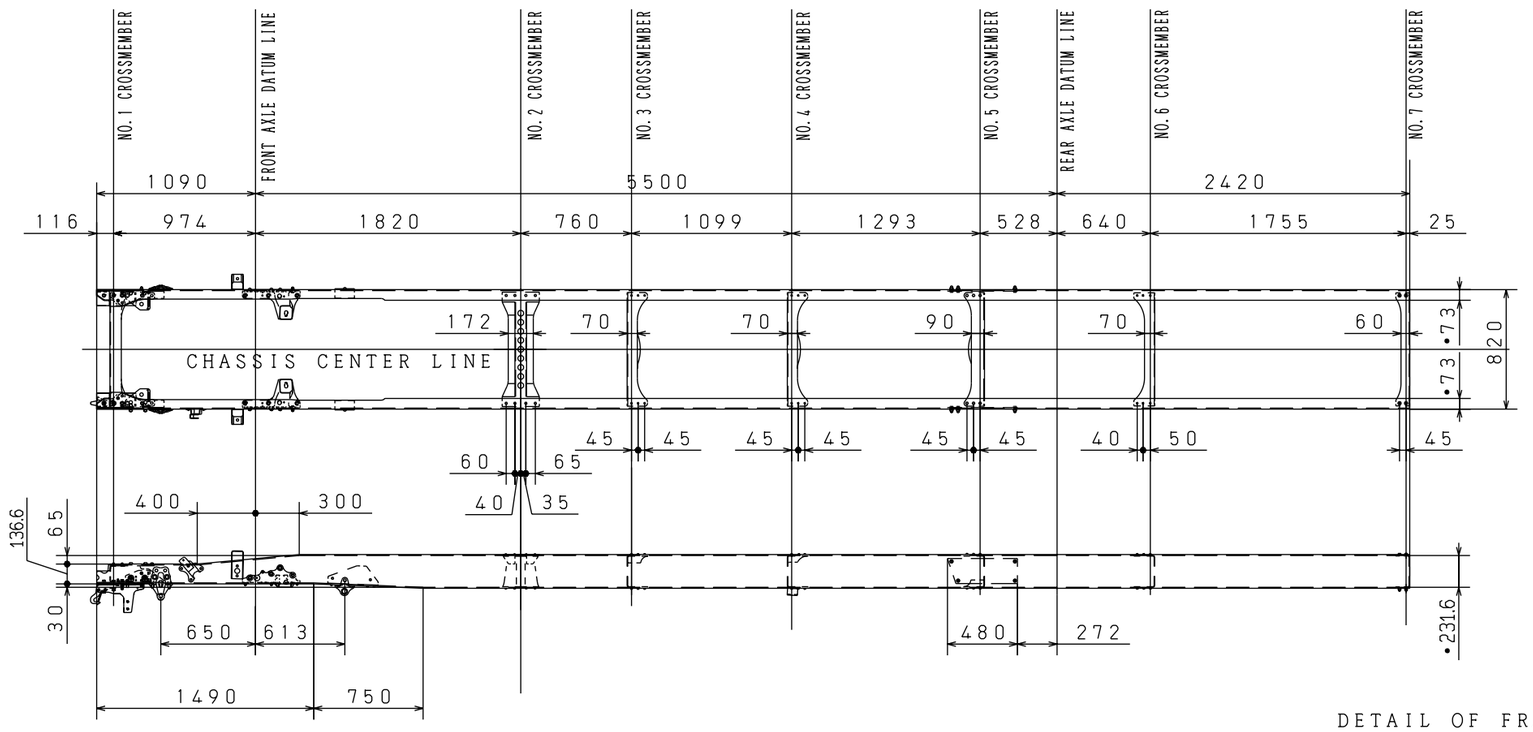
No.6 CROSSMEMBER

DFD8 CF FD1JJPG2

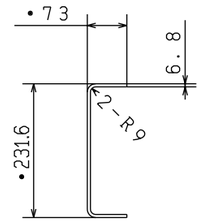
No. CF-5

• Detail of the chassis frame

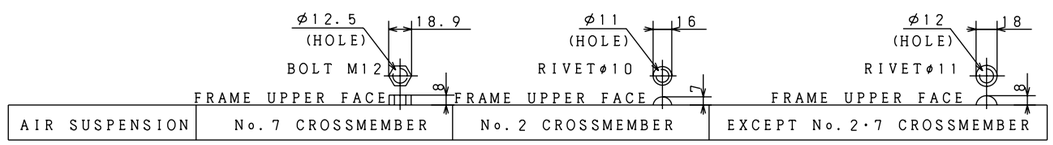
Unit : mm



DETAIL OF FRAME END



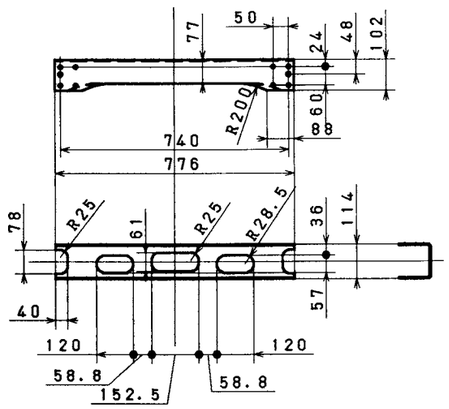
DETAILS OF BOLT AND RIVET



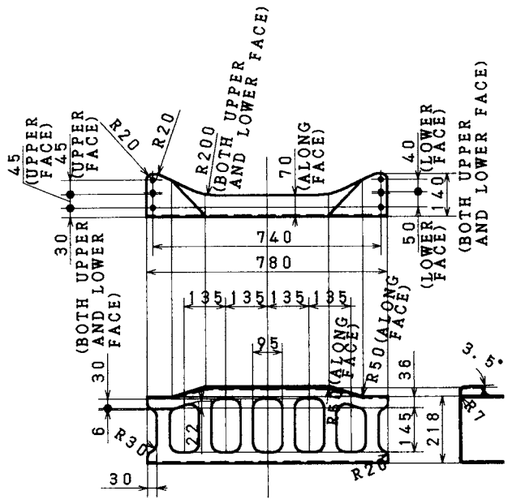
No. CF-5

• Detail of the cross member

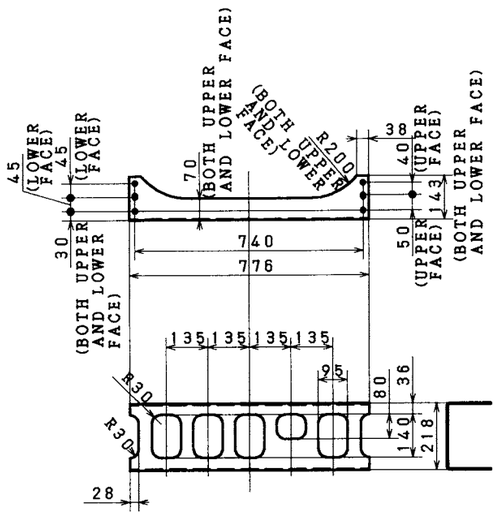
Unit : mm



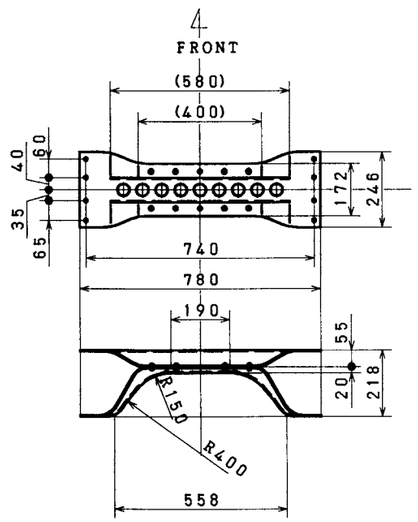
No.1 CROSSMEMBER



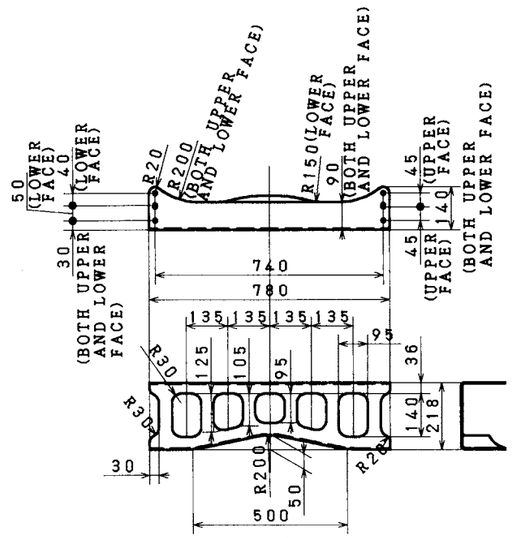
No.3 CROSSMEMBER



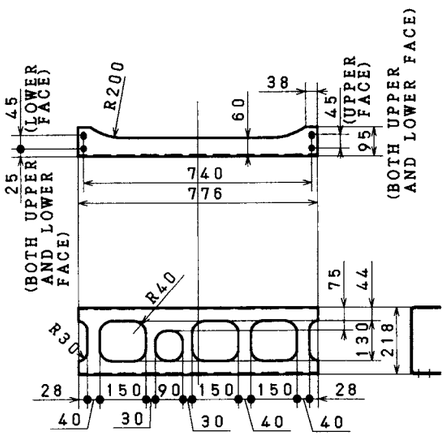
No.5 CROSSMEMBER



No.2 CROSSMEMBER



No.4 CROSSMEMBER



No.6 CROSSMEMBER

DFD8 CF FD1JLPG2

No. CF-6

• Detail of the chassis frame

Unit : mm

No. CF-6

• Detail of the cross member

Unit : mm

Chapter 9

MOUNTING OF CHASSIS EQUIPMENT

Refer to detail of the fuel tank, air tank & air booster, battery and exhaust system drawing based on following table.

[STANDARD EQUIPMENT]

RELEVANT MODEL

CLASSIFICATION NUMBER	FUEL TANK	AIR TANK & AIR BOOSTER	BATTERY	EXHAUST SYSTEM
FD-022,023,024, 025,026,027, 028,029	FT-1	AT & A-1	BAT-1	EX-1

- Refer to chapter 1, 3 chassis specification for classification number.

[OPTION EQUIPMENT]

RELEVANT MODEL

CLASSIFICATION NUMBER	FUEL TANK	AIR TANK & AIR BOOSTER	BATTERY	EXHAUST SYSTEM
FD-022,023,024, 025,026,027, 028,029	–	–	BAT-2	–

- Refer to chapter 1, 3 chassis specification for classification number.

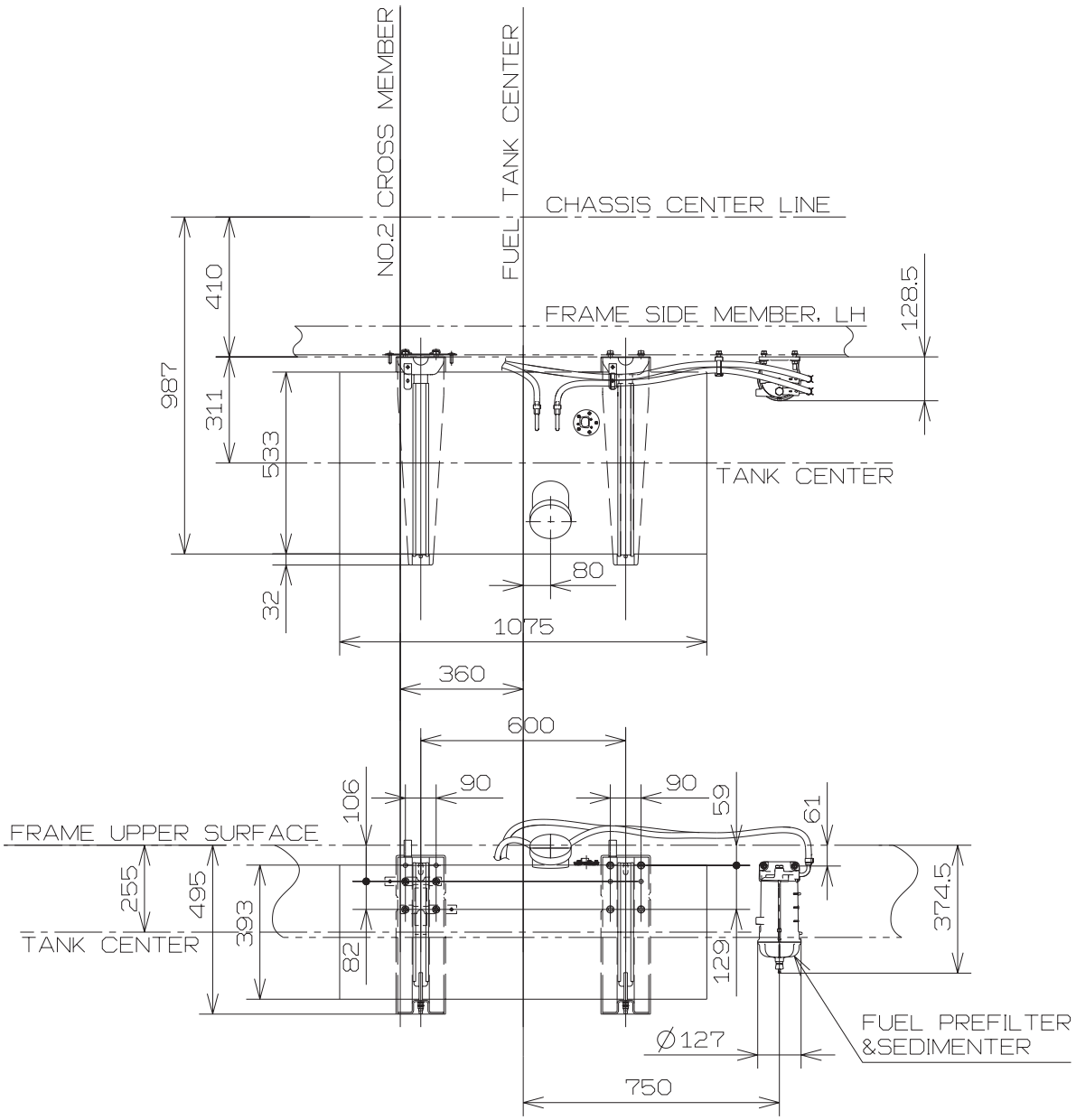
NOTE

SYMBOL	SPECIFICATION
FT-1	STD : 200L
FT-2	
FT-3	
FT-4	
FT-5	
BAT-1	STD : 234kC {65AH}
BAT-2	OPT : 432kC {120AH}
EX-1	HORIZONTAL EXHAUST PIPE (STD)
	VERTICAL EXHAUST PIPE (STD)
	VERTICAL EXHAUST PIPE (OPT)

1. FUEL TANK

FT-1

Unit : mm



FT-2

Unit : mm

FT-3

Unit : mm

FT-4

Unit : mm

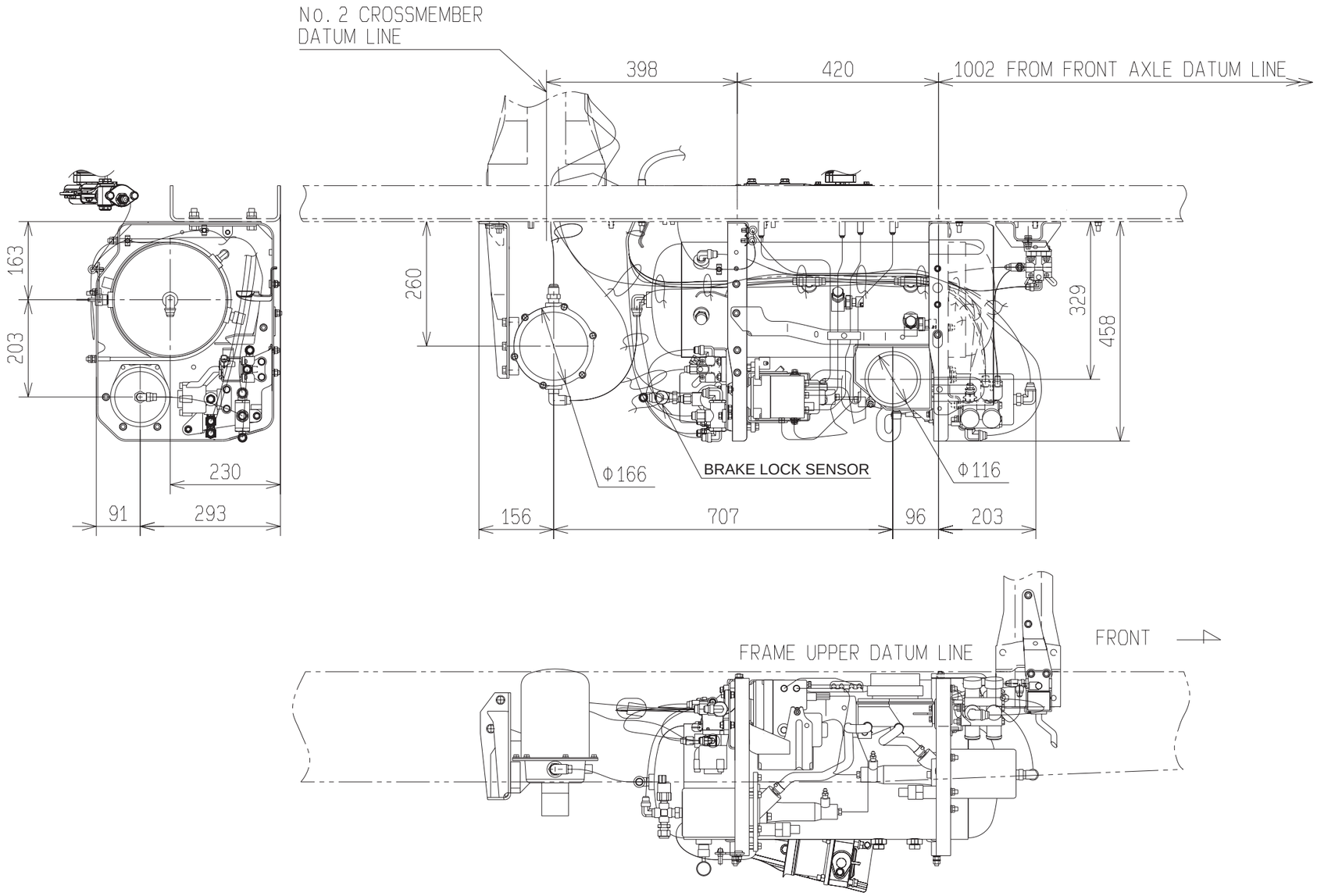
FT-5

Unit : mm

2. AIR TANK & AIR BOOSTER

AT & A-1

Unit : mm



AT & A-2

Unit : mm

AT & A-3

Unit : mm

AT & A-4

Unit : mm

AT & A-5

Unit : mm

AT & A-6

Unit : mm

AT & A-7

Unit : mm

AT & A-8

Unit : mm

AT & A-9

Unit : mm

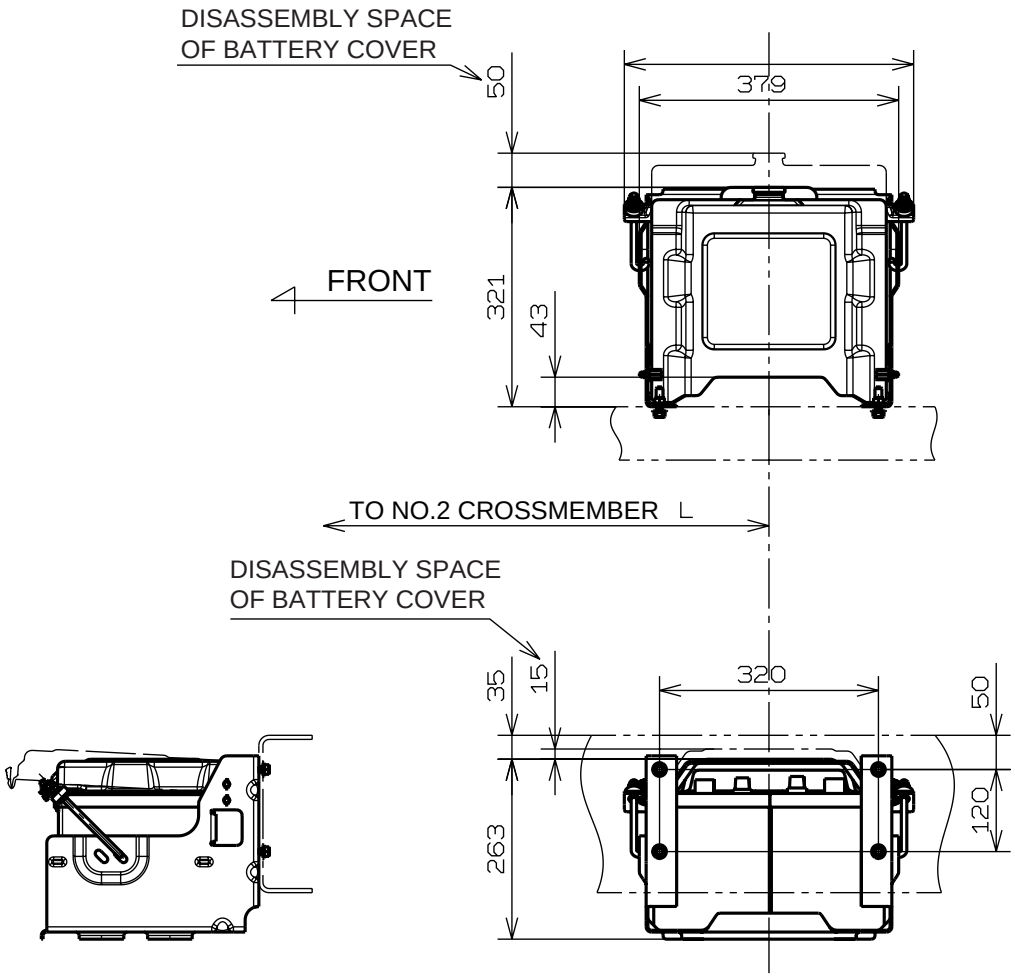
AT & A-10

Unit : mm

3. BATTERY

Unit : mm

BAT-1

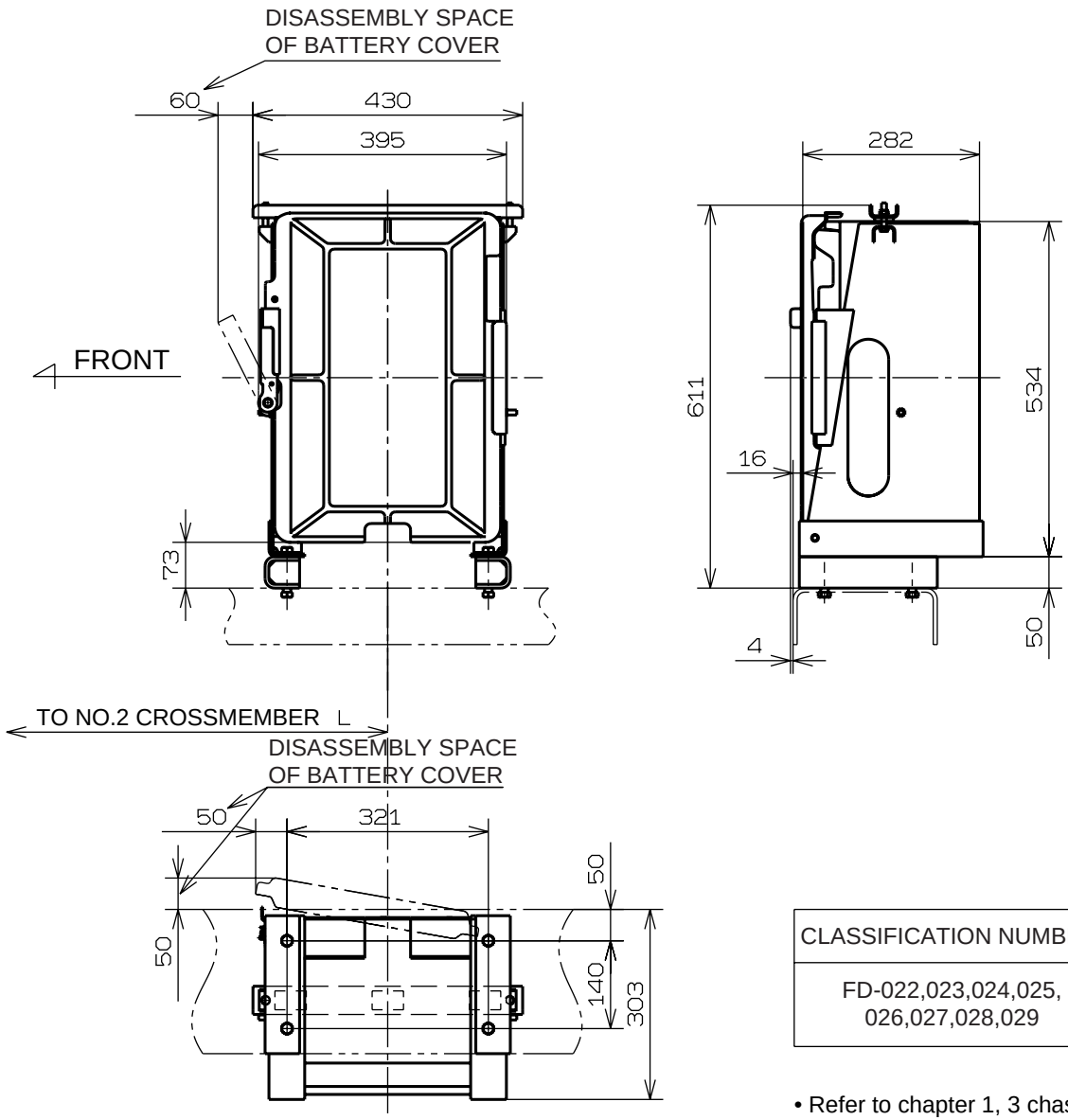


CLASSIFICATION NUMBER	TO NO.2 CROSSMEMBER L
FD-022,023,024,025, 026,027,028,029	534

• Refer to chapter 1, 3 chassis specification for classification number.

BAT-2

Unit : mm



CLASSIFICATION NUMBER	TO NO.2 CROSSMEMBER L
FD-022,023,024,025, 026,027,028,029	426

• Refer to chapter 1, 3 chassis specification for classification number.

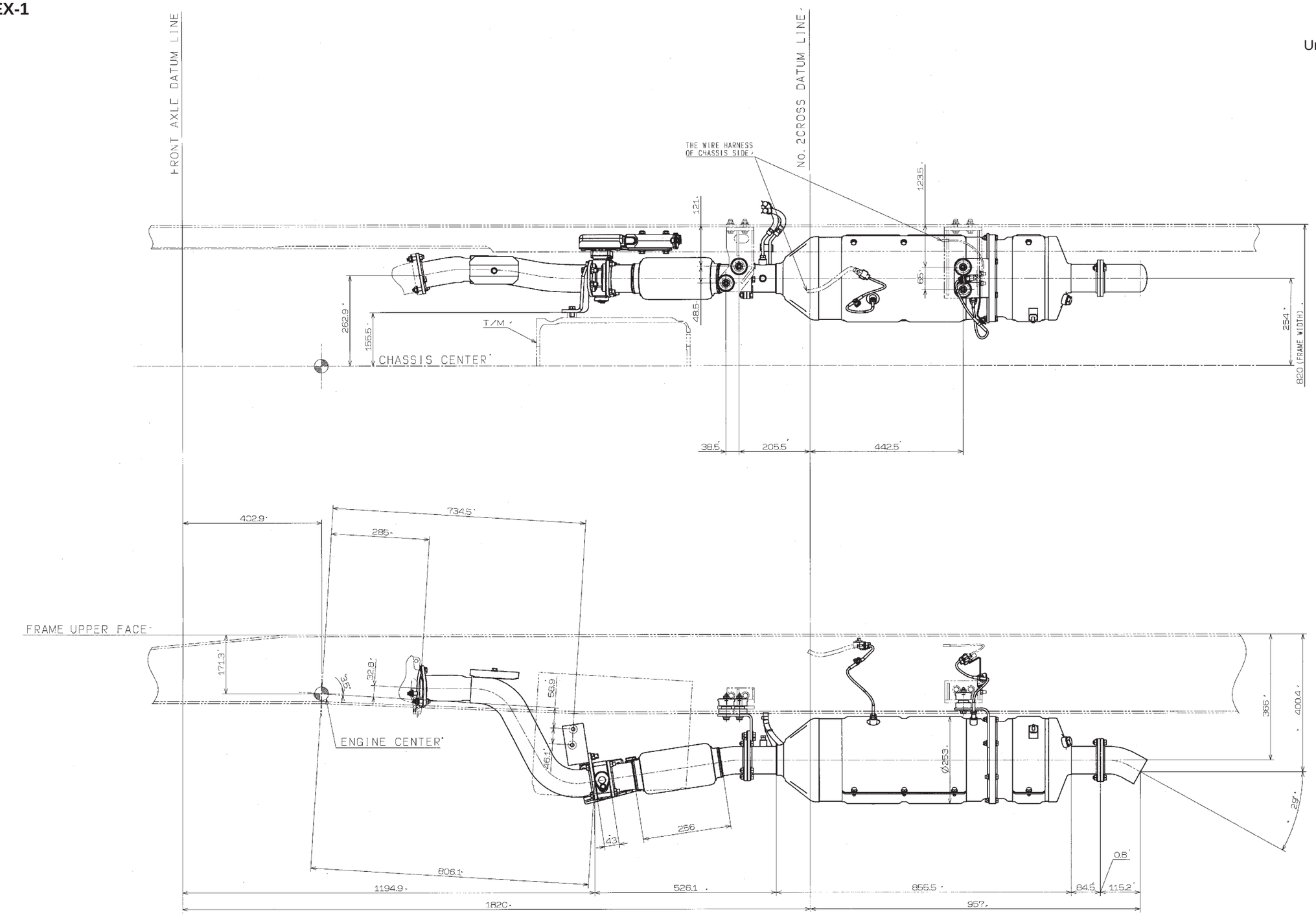
BAT-3

Unit : mm

4. EXHAUST SYSTEM (EXHAUST TAIL PIPE)

EX-1

Unit : mm



EX-2

Unit : mm

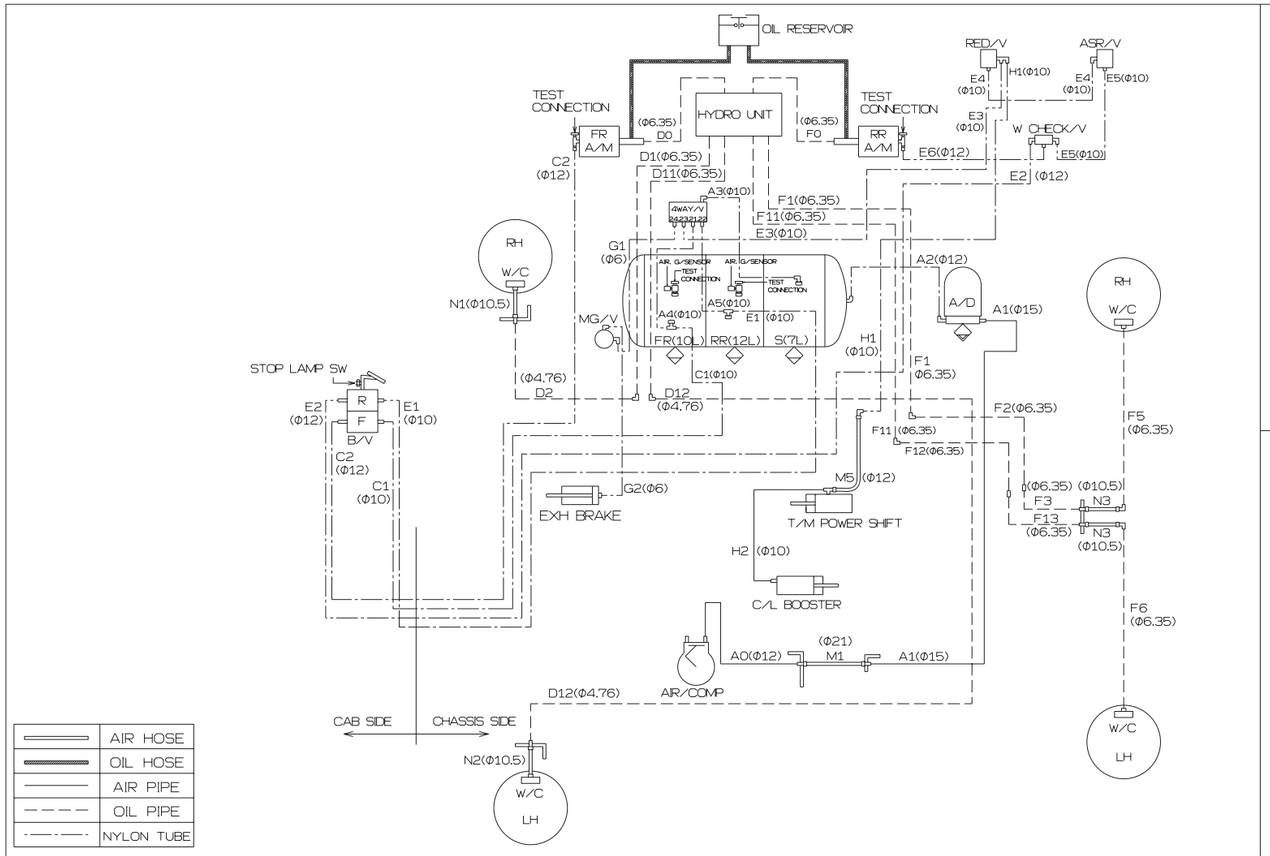
EX-3

Unit : mm

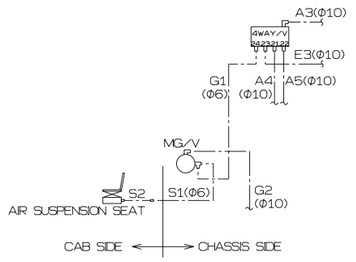
Chapter 10

OTHER

1. BRAKE PIPING DIAGRAM (1/4)

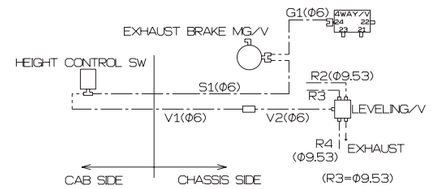


STD



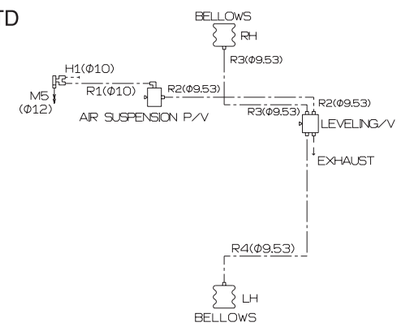
エアサスシート付の場合
WITH AIR SUSPENSION SEAT

OPT



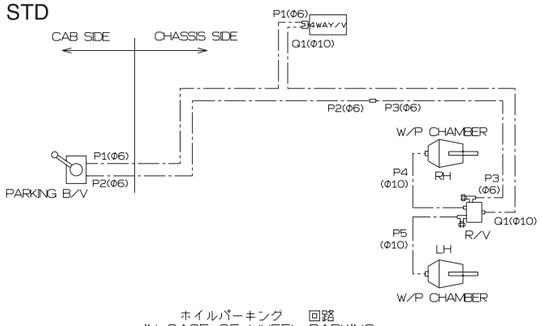
ハイトコントロール付の場合(エアサス)
WITH HEIGHT CONTROL (AIR SUSPENSION)

STD



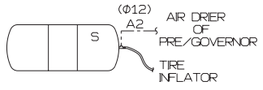
エアサス 回路
IN CASE OF AIR SUSPENSION

STD



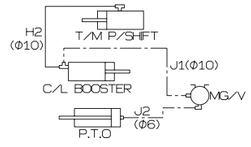
ホイルパーキング 回路
IN CASE OF WHEEL PARKING

OPT



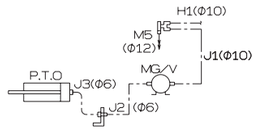
タイヤインフレータ付の場合
WITH TIRE INFLATOR

OPT



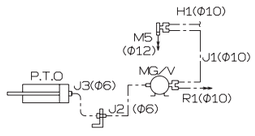
P.T.O 回路
IN CASE OF P.T.O
(LX06.T/Mの場合)
(IN CASE OF LX06.T/M)

OPT



P.T.O 回路
IN CASE OF P.T.O
(LX06.T/M以外)
(EXCEPT LX06.T/M)

OPT



P.T.O 回路(エアサス)
IN CASE OF P.T.O(AIR SUSPENSION)
(LX06.T/M以外)
(EXCEPT LX06.T/M)

BRAKE PIPING DIAGRAM (2/4)

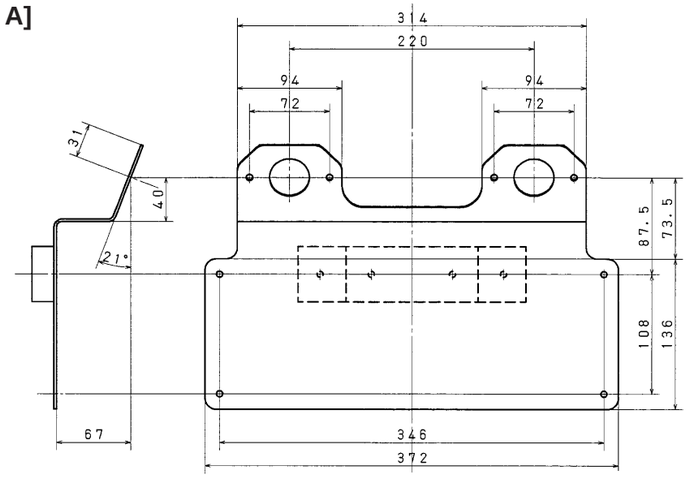
BRAKE PIPING DIAGRAM (3/4)

BRAKE PIPING DIAGRAM (4/4)

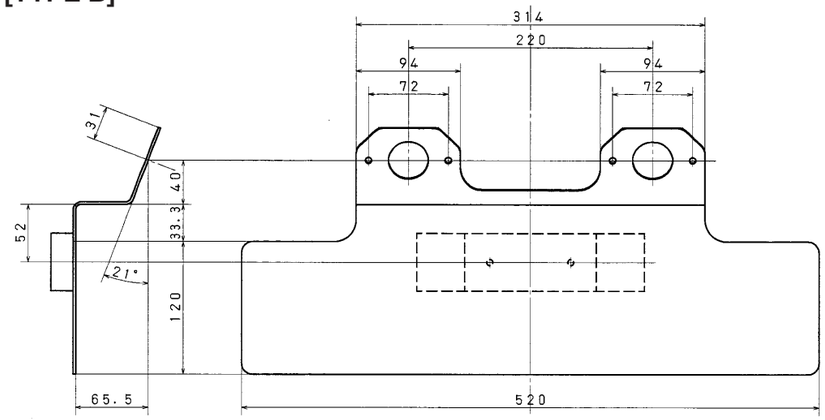
2. LICENSE PLATE BRACKET

Unit : mm

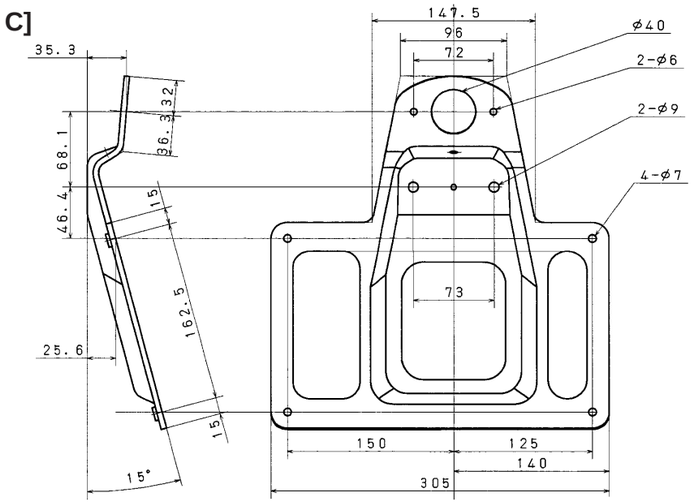
[TYPE A]



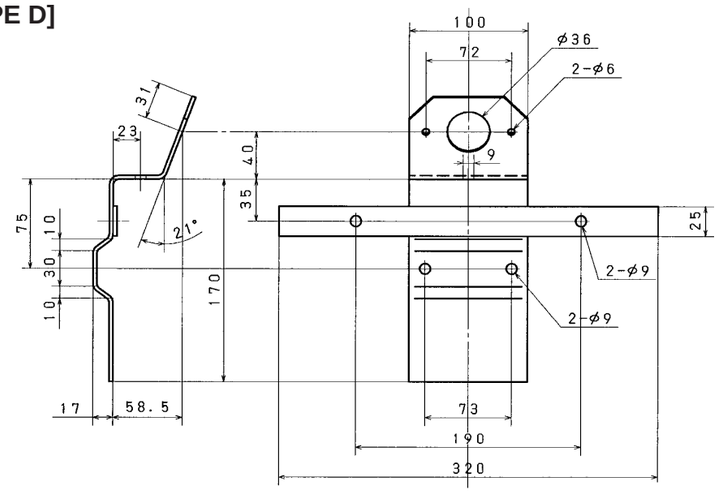
[TYPE B]



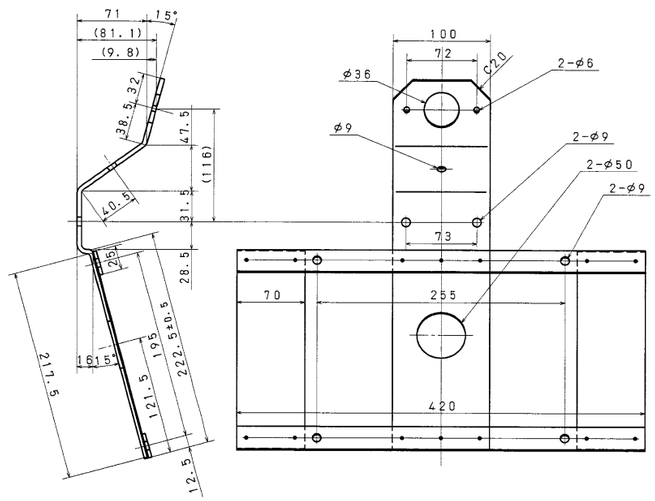
[TYPE C]



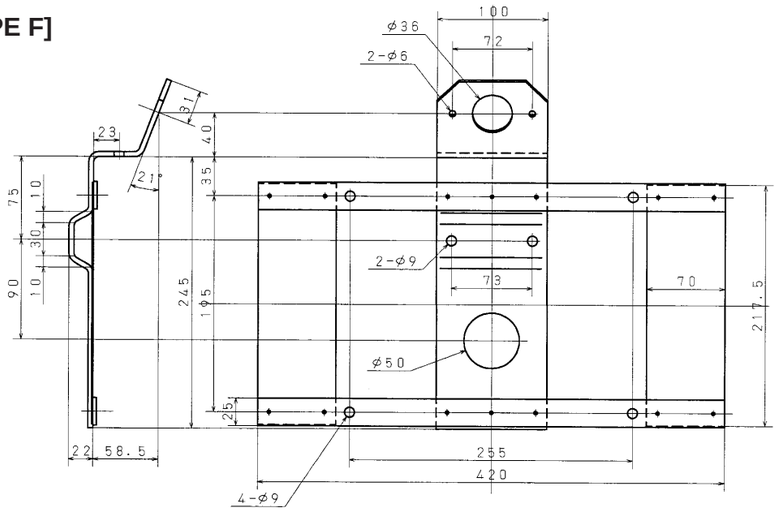
[TYPE D]



[TYPE E]



[TYPE F]



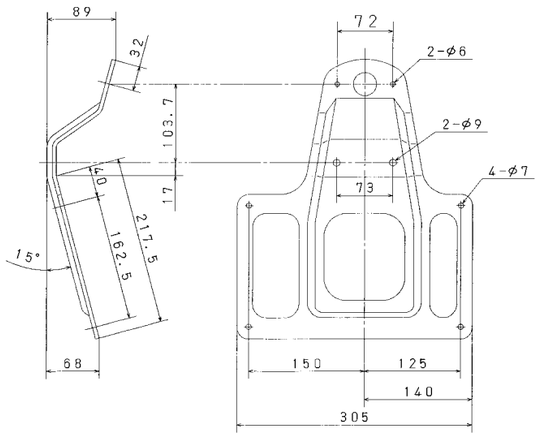
RELEVANT MODEL

CLASSIFICATION NUMBER	TYPE
FD-022,023,024, 025,026,027, 028,029	A

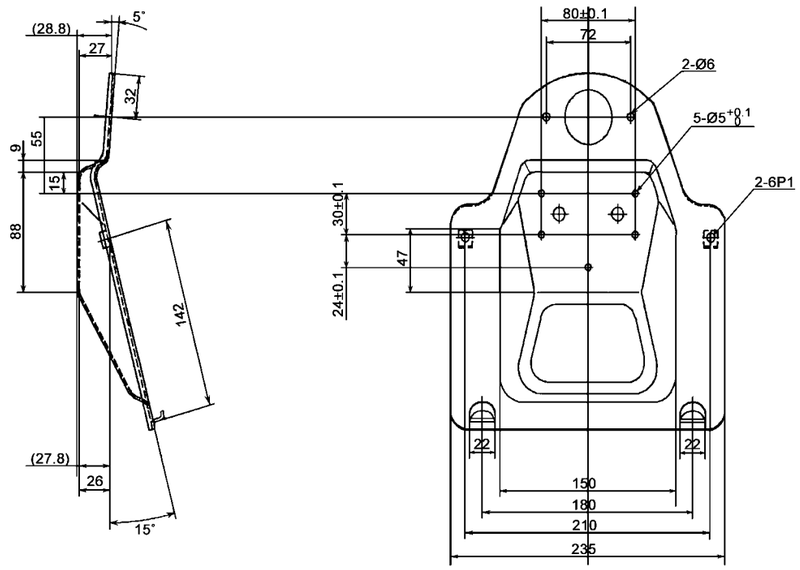
- Refer to chapter 1, 3 chassis specification for classification number.

Unit : mm

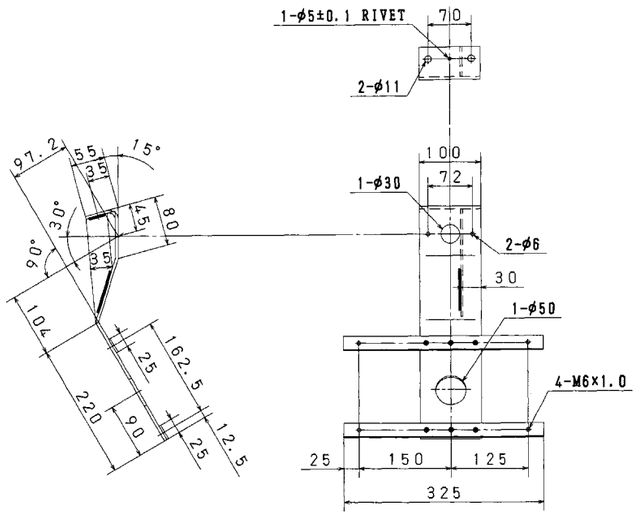
[TYPE G]



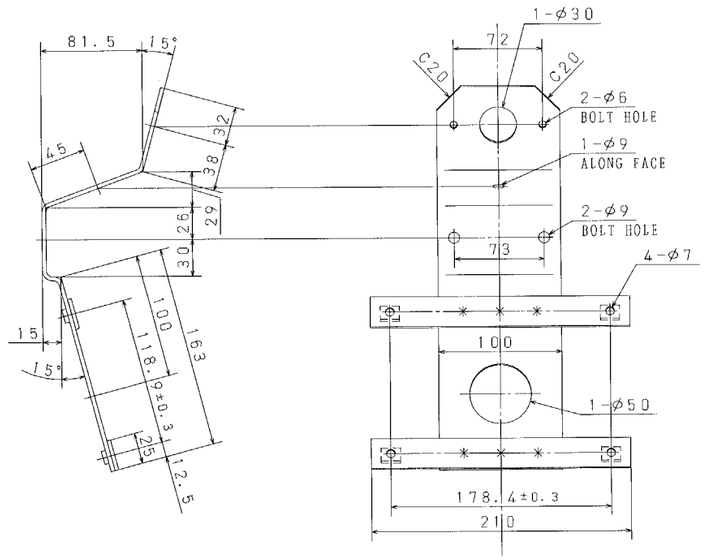
[TYPE H]



[TYPE I]



[TYPE J]



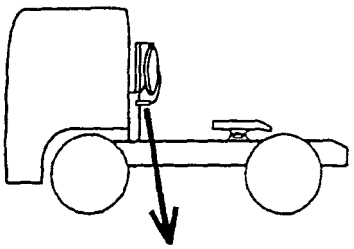
RELEVANT MODEL

CLASSIFICATION NUMBER	TYPE
	G
	H
	I
	J

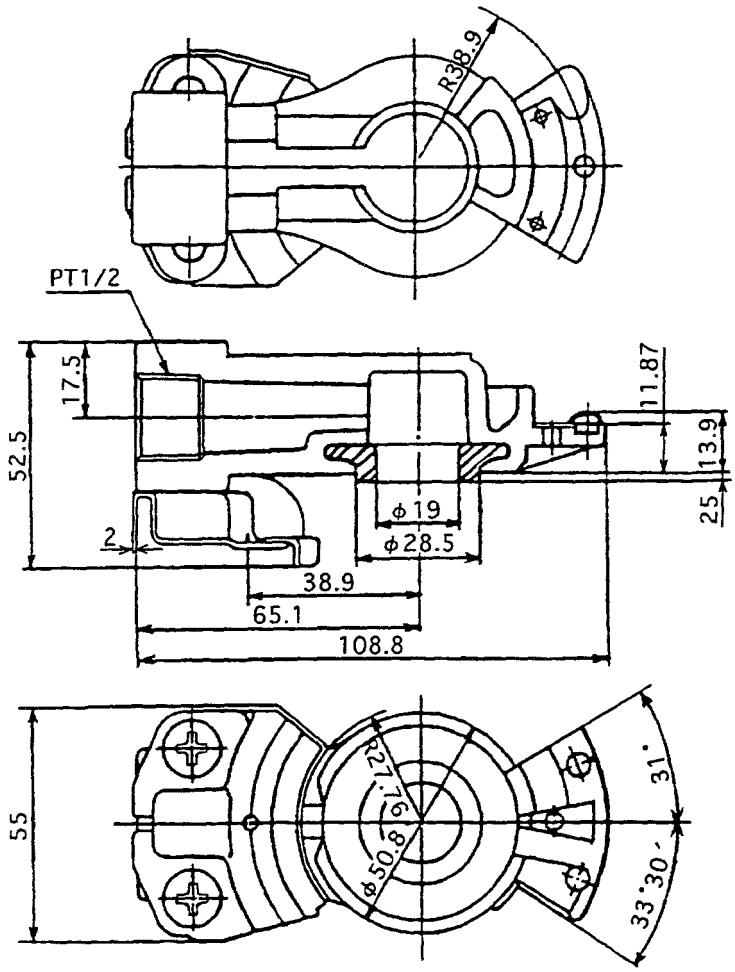
- Refer to chapter 1, 3 chassis specification for classification number.

3. SEMI-TRAILER BRAKE COUPLING (FOR TRACTOR ONLY)

The trailer brake system can be actuated by operating the foot brake and hand brake valves that are provided at the inside of the tractor cab.
The trailer brake system is connected by a jumper hose and an air-coupling.
The air-coupling equipped on the HINO vehicle complies with SAE standard and color distinction is made to clarify the purpose for use ; Blue being for Service purpose while Red being for an Emergency purpose.
The actual form is as shown below.



BRAKE AIR-COUPLING



Chapter 11

REGULATION

This section is described the informations in relation to vehicle's lows and regulations that must be complied while body or equipment is mounted on the Hino truck chassis with cab as following contents.

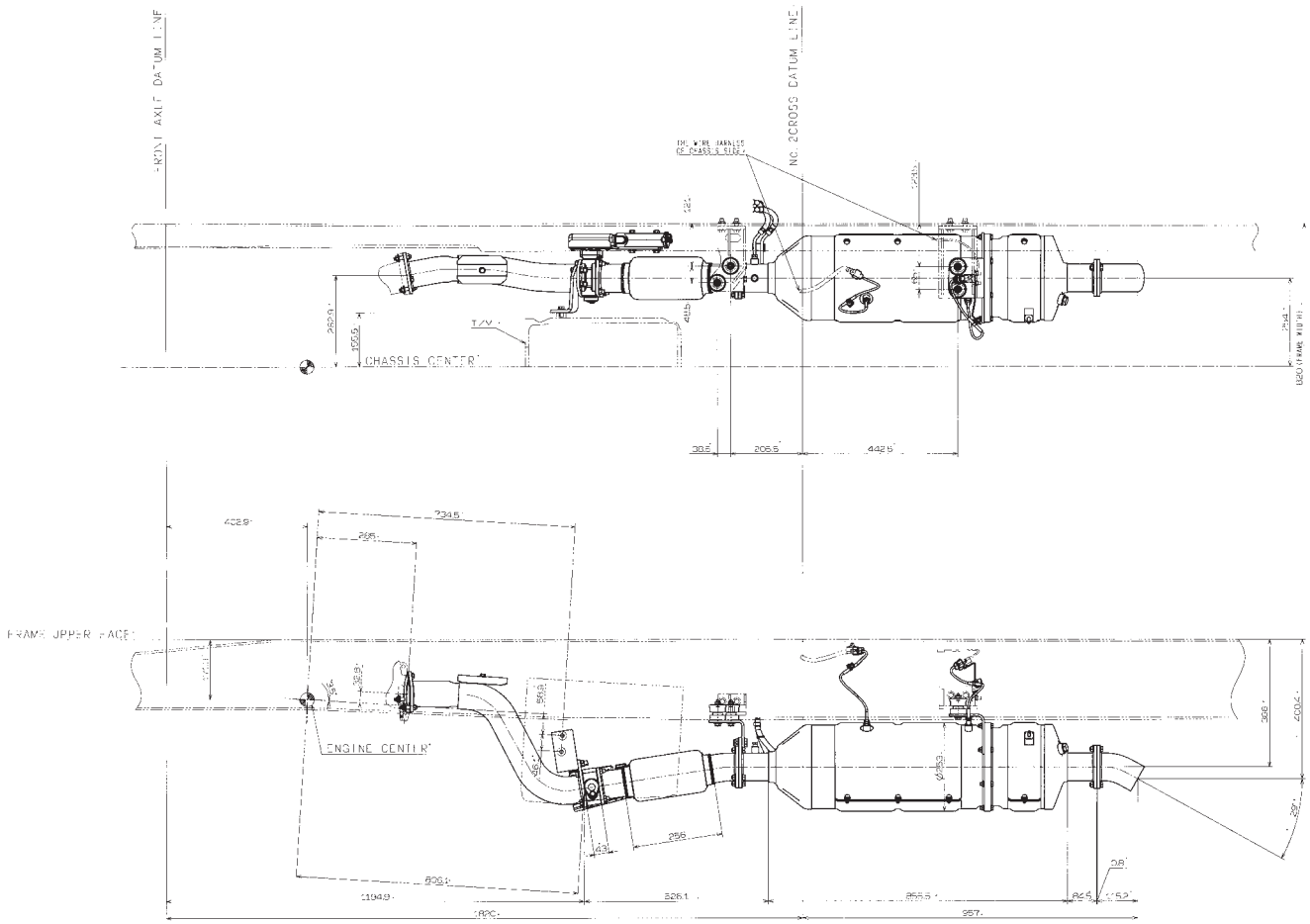
- Items which the body or equipment manufacturer must be provided the facilities.
- Handling precautions of parts which has already been equipped on the chassis, the cab, and the engine.
- Other precautions which must be taken during the work of the body or equipment mounting.

The body or equipment manufacturer must make sure the contents to be described in this section.

1. HANDLING PRECAUTIONS OF CATALYST MUFFLER

To comply with exhaust gaseous emission control regulation, the Catalyst Muffler is equipped to the Model FD7J series.
Pay special attention that water do not intrude into the muffler, when washing the vehicle especially under part of the chassis.
Do not give any shock as dropping a goods while rear body or equipment mounting to the muffler.

STANDARD EQUIPMENT



OPTION EQUIPMENT

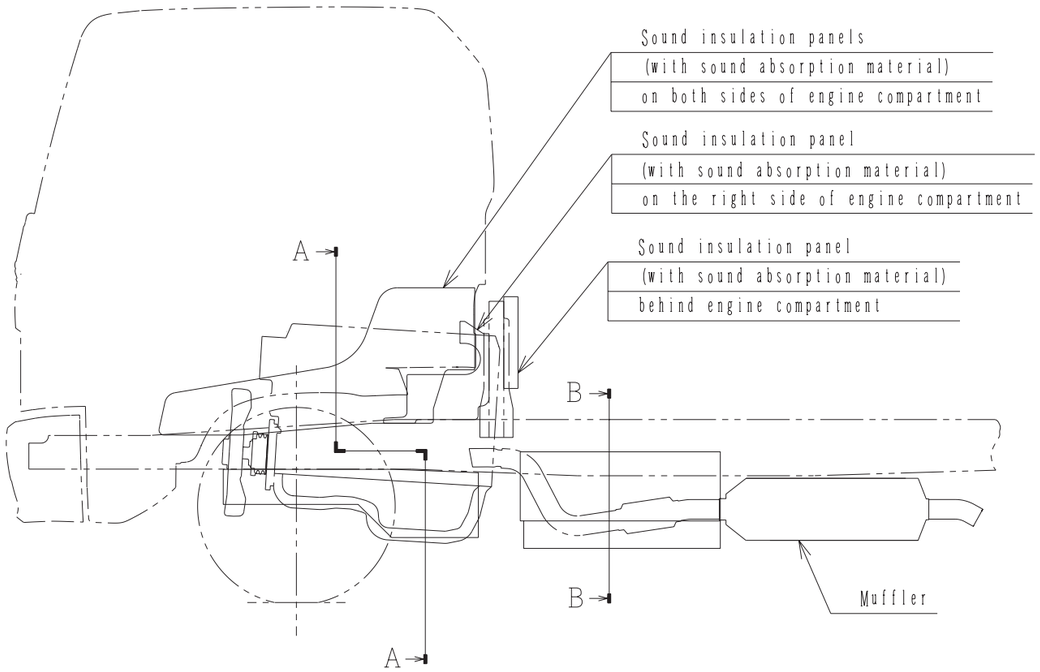
2. HANDLING OF PARTS FOR MEETING THE EXTERNAL NOISE CONTROL REGULATION

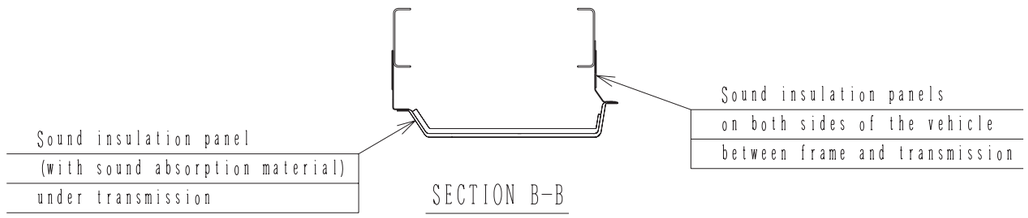
To comply with the external noise control regulation, parts for external noise reduction, such as sound-insulating materials (cover, rubber), sound-absorbing materials and muffler etc., are equipped on the cab, the engine and the chassis.
Since the parts for external noise reduction and their fitting locations are depending on the vehicle model, refer to the corresponding explanatory example drawing shown in the following.
To ensure external noise reductions, following items must be observed when mounting a rear body or a equipment.

- The parts for external noise reduction must not be modified or detached, since their specifications are determined to comply with the limiting value of the external noise regulation.
  The position and/or direction of the tail pipe must also not be changed.
- If the parts for external noise reduction are temporarily detached for mounting a rear body or a equipment, handle them carefully to prevent their deformation and/or damage, and be sure attach them on original position after completion of mounting a rear body or a equipment.

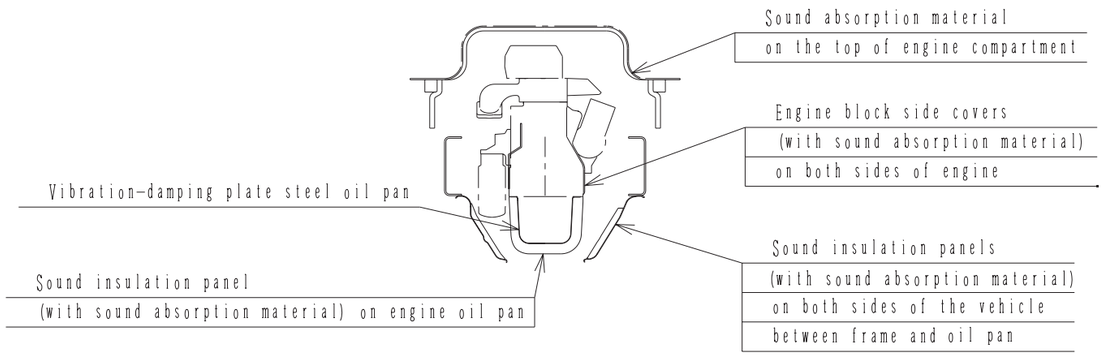
If the parts for external noise reduction have been deformed and/or damaged, replace them with genuine parts and never use rectified parts.
Refer to next page for detail of external noise control parts.

EXTERNAL NOISE CONTROL PARTS





SECTION B–B



SECTION A–A

EXTERNAL NOISE CONTROL PARTS

3. REQUIREMENTS FOR 3RD ADR (AUSTRALIAN DESIGN RULE)

Lamps, Reflective devices and associated equipment (hereinafter called “devices”) must be provided, located and/or wired in accordance with the requirements for the 3rd ADR
(hereinafter called “the 3rd ADR”).
Form the viewpoint of the vehicle construction, these devices are divided into four groups (A, B, C, and D) shown bellow.

A : Devices conforming to the 3rd ADR are completely fixed on a chassis with cab which complies with the 3rd ADR.
B : Devices conforming to the 3rd ADR are fixed temporarily onto a chassis with cab.
C : Hino Motors, Ltd . does not provide these devices.
But these devices must be provided in accordance with the 3rd ADR.
D : Devices for optional parts.
This means that it is not mandatory to fit a lamp. However, if a lamp(s) is fitted, they must comply with the 3rd ADR.

With respect to each group, the body or equipment manufacturer must undertake, under their own responsibility, to see that the complete vehicle meets the following requirements.

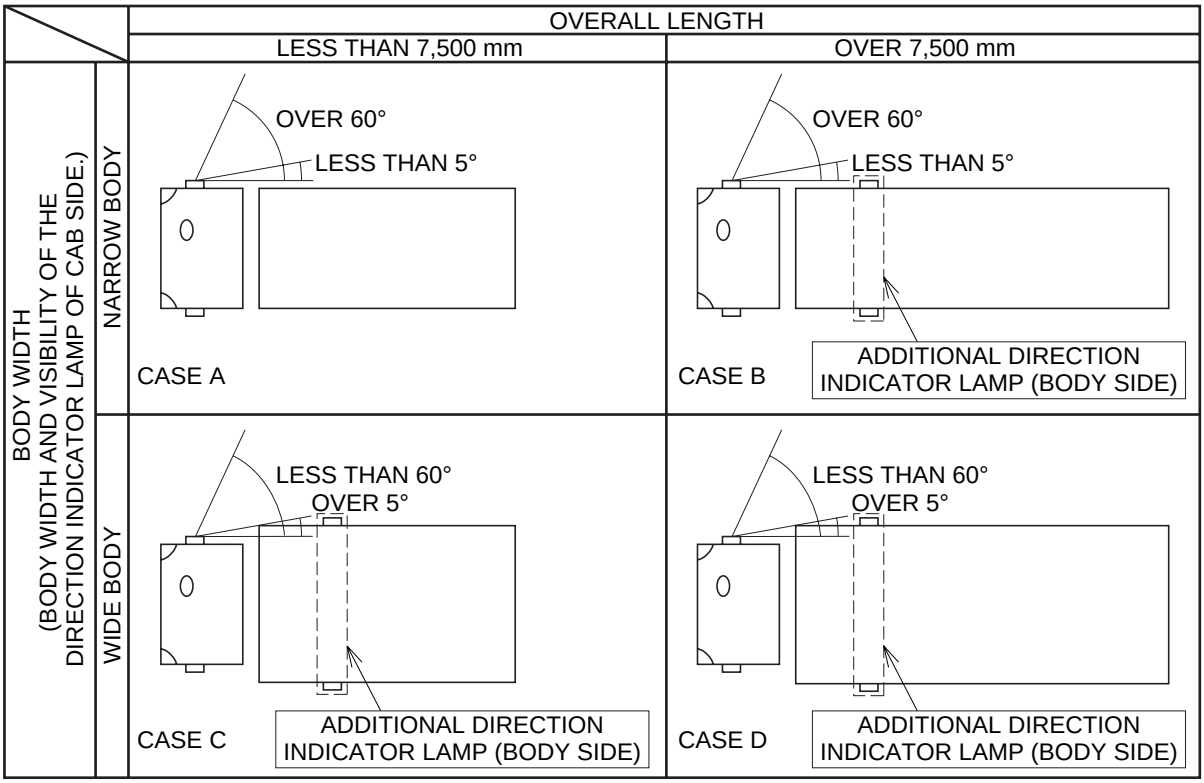
Group A : Do not modify, except when modification is indicated by Hino Motors, Ltd.
Group B : Attach devices in accordance with the indications in the following page 11-3-6, and with the relevant articles in the 3rd ADR.
Group C : Prepare the devices conforming with the 3rd ADR and attach them in accordance with the 3rd ADR.
Group D : If optional lamps are to be attached, they must complies with the 3rd ADR.

	APPLICABLE DEVICE	APPLICABLE ADR NO.		GROUP	REMARK
		DEVICE	FITTING		
1	REVERSING LAMP	ADR. 1/00	ADR. 13/00 APPENDIX. A 6. 4	A	
2	DIRECTION INDICATOR LAMPS (FRONT)	ADR. 6/00	ADR. 13/00 APPENDIX. A 6. 5	A	
3	DIRECTION INDICATOR LAMPS (SIDE)			A	See Notice. 1), 2), 9)
4	DIRECTION INDICATOR LAMPS (REAR)			B	See Notice. 4)
5	SIDE MARKER LAMPS (REAR)	ADR. 74/00 or ADR. 45/01 45. 3. 1	ADR. 13/00 7. 2 or APPENDIX. A 6. 18	C	
6	REAR MARKING PLATES	ADR. 45/01 45. 3. 6		C	See Notice. 8)
7	INTERNAL LAMP	ADR. 45/01 45. 3. 5		A	Installed in the cab.
8	HEAD LAMPS (MAIN-BEAM)	ADR. 46/00	ADR. 13/00 APPENDIX. A 6. 1	A	
9	HEAD LAMPS (DIPPED-BEAM)		ADR. 13/00 APPENDIX. A 6. 2	A	
10	REFLEX REFLECTOR (SIDE)	ADR. 47/00	ADR. 13/00 APPENDIX. A 6. 17	C	See Notice. 5)
11	REFLEX REFLECTOR (REAR)		ADR. 13/00 APPENDIX. A 6. 14	B	See Notice. 4)
12	ILLUMINATING LAMPS FOR REGISTRATION PLATE	ADR. 48/00	ADR. 13/00 APPENDIX. A 6. 8	B	See Notice. 6)
13	FRONT POSITION LAMPS		ADR. 13/00 APPENDIX. A 6. 9	A	
14	REAR POSITION LAMPS		ADR. 13/00 APPENDIX. A 6. 10	B	See Notice. 4)

	APPLICABLE DEVICE	APPLICABLE ADR NO.		GROUP	REMARK
		DEVICE	FITTING		
15	STOP LAMPS	ADR. 49/00	ADR. 13/00 APPENDIX. A 6. 7	B	See Notice. 4)
16	END-OUTLINE MARKER LAMPS (FRONT)		ADR. 13/00 APPENDIX. A 6. 13	A	
17	END-OUTLINE MARKER LAMPS (REAR)			C	
18	FRONT FOG LAMPS	ADR. 50/00	ADR. 13/00 APPENDIX. A 6. 3	C	See Notice. 3)
	HAZARD WARNING SIGNAL	ADR. 6/00	ADR. 13/00 APPENDIX. A 6. 6	A	See Notice. 7)
	SIDE MARKER LAMP (FRONT)	ADR. 74/00 or ADR. 45/01 45. 3. 1	ADR. 13/00 7. 2 or APPENDIX. A 6. 18	A	
	CORNERING LAMPS	ADR. 45/01 45. 3. 8	ADR. 13/00 7. 4	D	
	EXTERNAL CABIN LAMP	ADR. 45/01 45. 3. 2	ADR. 13/00 7. 1	D	
	DAYTIME RUNNING LAMP	ADR. 76/00 or ADR. 45/01 45. 3. 7	ADR. 13/00 APPENDIX. A 6. 19	D	
	SEARCH LAMP	ADR. 45/01 45. 3. 4		D	
	REAR FOG LAMP	ADR. 52/00	ADR. 13/00 APPENDIX. A 6. 11	D	

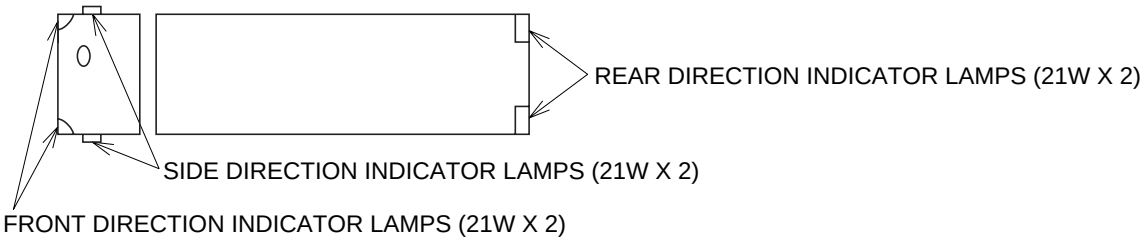
[NOTICE]

- Visibility of direction indicator lamp (cab side) from back side must be satisfied the following condition.



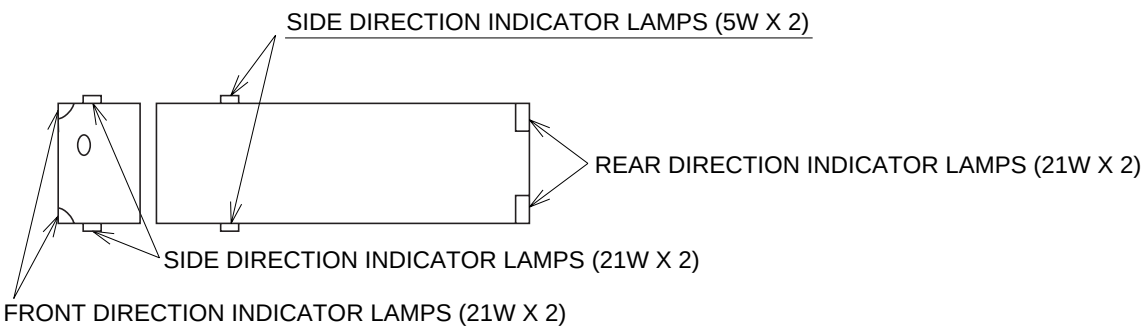
- Installation of flasher lamps.

CASE A : NO MODIFY ORIGINAL PARTS

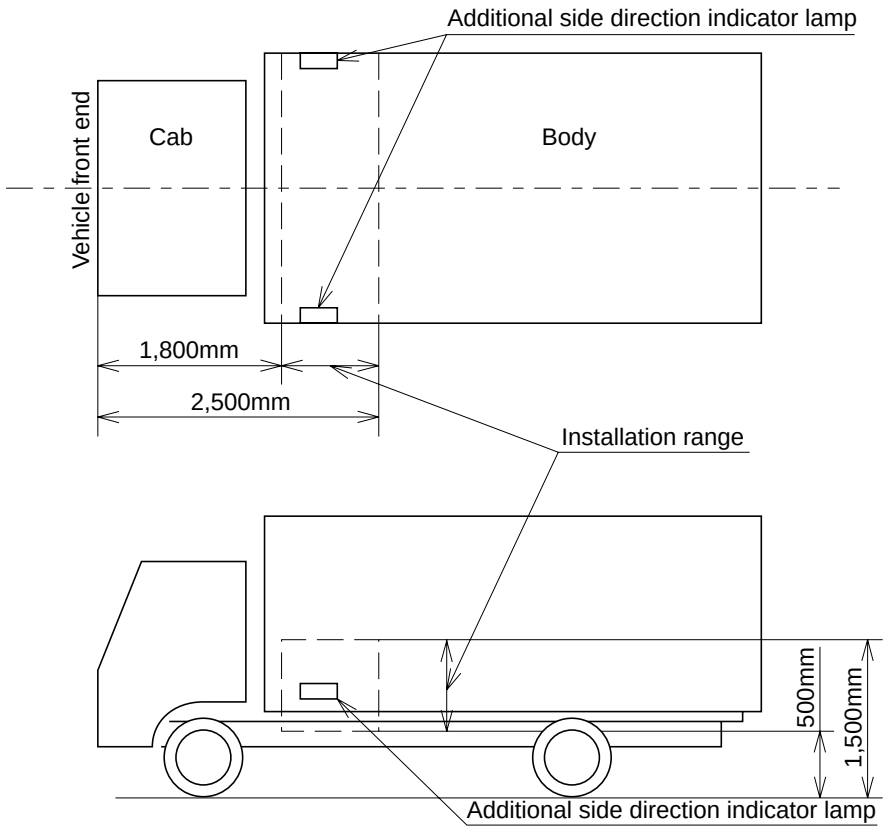


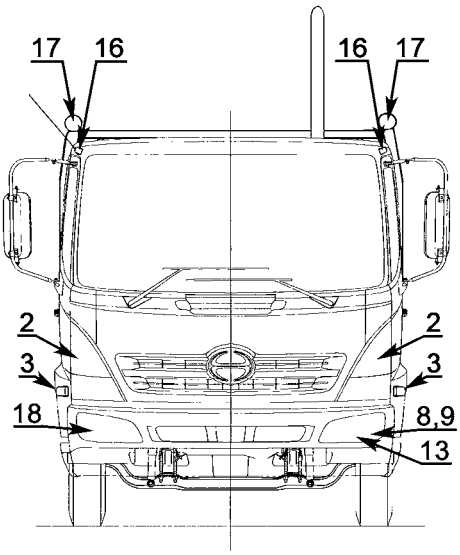
CASE B,C AND D : INSTALLING ADDITIONAL DIRECTION INDICATOR LAMPS

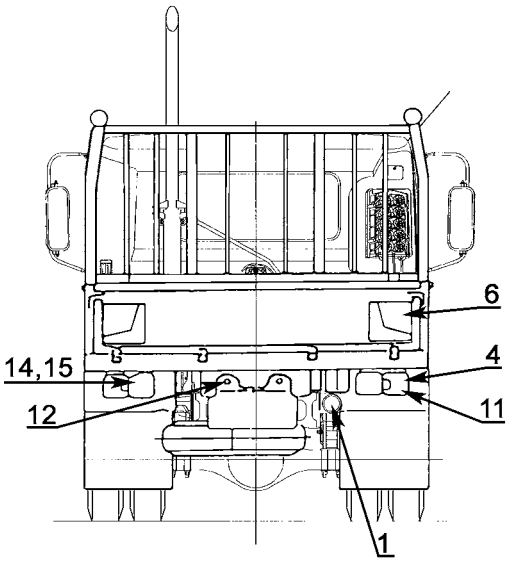
Install the additional direction indicator lamps at the body side by body manufacturer.

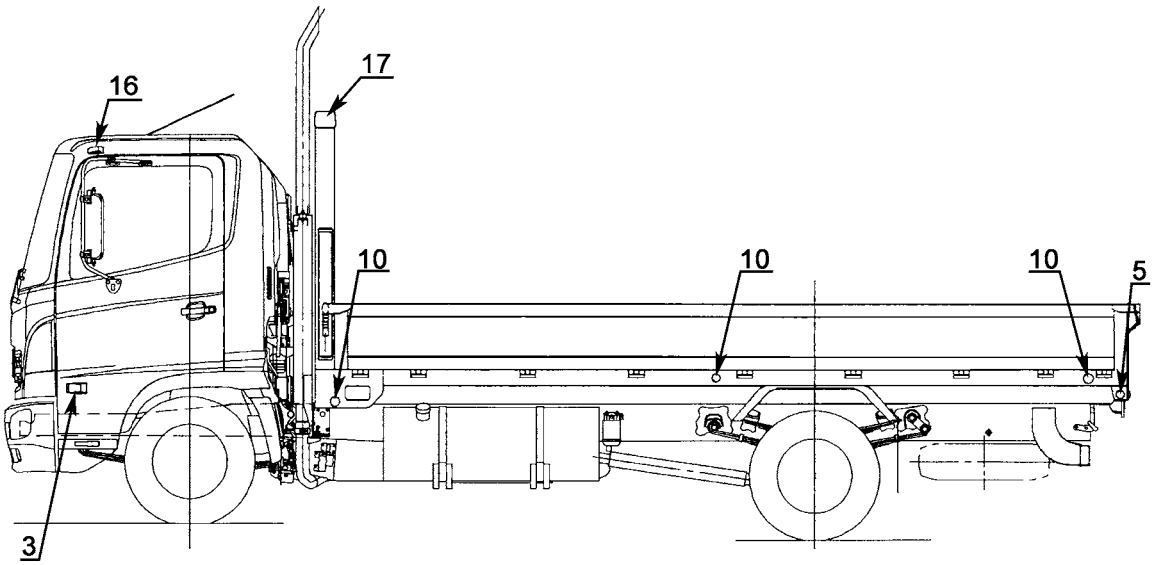


- The maximum width for the body mounted on the chassis must be limited 2,500mm, in order for the attachment position of the front fog lamp to comply with the 3rd ADR.
- This device is grouped as a rear combination lamp.
- The foremost reflex reflector must be located within 3m from the front end of the vehicle.
- This device is attached onto the bracket for the rear registration plate.
- Signaling must be done by simultaneous operation of the direction indicator lamps.
- This device need not be provided on this model when the GVM is less than 12 tones.
- Installation position of the side direction indicator lamps at body side.
  When installing the side direction indicator lamps, must be installed following position for complying with the 3rd ADR.




17
16
16
17
2
3
18
2
3
8,9
13


6
14,15
4
12
11
1


16
17
10
10
10
5
3