Supplement DT 354

MODIFICATION NOTE
EVOLUTIONS ON THE KERAX RANGE

Some modifications have been carried out on the vehicles. According to configuration, the application dates are as follows :

- 4x2 / 4x4 14/06/99
- 6x4 / 6x6 06/09/99
- 8x4 29/11/99

The "Guide to Body Mounting" is being re-written, so meanwhile you will find the main changes in the following pages.

.../...

ELECTRICITY

- Deletion of the separate isolator switch box - relocation of the isolator switch to the battery box.
  Prepared insulated wires for « auxiliaries » in the battery box.

- Deletion of the junction box on the rearmost cross member.
  Prepared insulated wires for « auxiliaries ».

- Harness for side marker lights available, coiled up in the right side member.

CAB

- Fixings for a tipper control becomes possible by 2 M8 nutserts (behind trim)

  - on the step behind the left door

  - on the back wall

AIR CIRCUIT

- Relocation of « auxiliary » air tappings behind the left side lateral tanks on the 4x2, 4x4, 6x4, 6x6.

REAR CROSS MEMBER

- Possibility to move the rear cross member in 55 mm steps using existing holes.

- The drilling pattern for towing hook fixings on 40, 44 and 60T cross members permits fitment of an « MG » brand towing hook.

- The electrical sockets can be positioned on top of the cross member by turning the brackets.

POSITION OF UNDERRUN BAR

- The rear protection must not be located more than 316 mm from the rear face of the bodywork.

BODY FIXINGS ON THE EXTREME REAR OF CHASSIS

- Recommendations for 4x2 - 4x4

  - 5 bolts per side, 14 mm diameter

  - minimum fixing plate thickness = 8 mm

- Recommendations for 6x4 - 6x6 - 8x4

  - 2 lines of 4 bolts per side, 14 mm diameter

  - minimum fixing plate thickness = 12 mm

NEW WHEELBASES

6x4 vehicles

3500 rear overhang 1 605 and 1 850mm
4200 rear overhang 2 560mm
4600 rear overhang 2 560mm
End of production of 4 300 wheelbase

8x4 vehicles

4550 rear overhang 1 605mm
5365 rear overhang 1 515mm
6163 rear overhang 2 202mm *(Transformation between tandem axles of 6076)*

MAXIMUM TRAVEL OF TANDEM BRAKE CHAMBERS

- During maximum suspension travel, the brake chambers of the middle axle can rise above the upper level of the side members.

  This displacement can reach:
  33mm maxi on 6x4 and 8x4
  75mm maxi on 6x4 Heavy Export with optional GCW 120 T (no registrated)

RECOMMENDATIONS FOR FITTING CLOSE COUPLED HYDRAULIC PUMPS TO TYPE C POWER TAKE OFFS ON ZF GEARBOXES

Refer to auxiliary Drawings N° 5430127762-3

CAUTION:

Hydraulic pumps each have an upper speed limit which must not be exceeded. On gearboxes such as the ZF 16S..., for any given engine speed, two power take off output speeds are possible according to the position of the gearbox splitter switch.

Example: on PTO type N71/2
1000 engine revs --> 1210 or 1440 PTO output revs

Hydraulic pump connection must comply with ISO 7653 Standard Type D.

a) Additional specification:
(for all PTO versions)
Sealing between pump and PTO

Sealing between pump and PTO must be effected by means of two sealing rings **(D1 + D2)** and a vent **(E1)** between the sealing rings.

The vent is to make sure that no transmission oil is sucked out and no hydraulic oil can penetrate into the transmission.

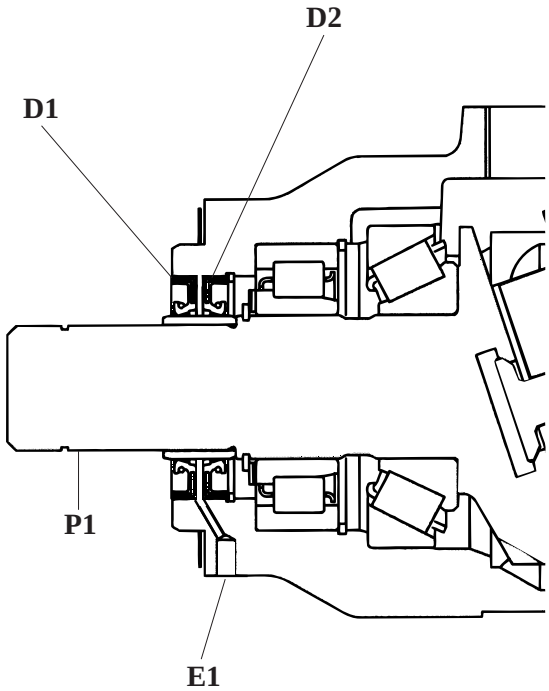
The sealing rings must resist temperatures of up to120°C.

The sealing ring on the PTO side **(D1)** must seal off the transmission with the oil released by the vehicle manufacturer / ZF.

The sealing ring on the pump side **(D2)** must seal off the pump with the hydraulic oil.

Vent bore function must be guaranteed at all times (not blocked by paint, plug, or dirt).

In the event of oil leakage of (E1), a prompt check of the entire system is required.



b) Additional specification:
(for PTO N ../2c)
Radial force of PTO output gear

Pump bearing design must be such that the resulting radial force (9700 Nm) can be transmitted by the PTO gear **(P1)**.

The specified value corresponds to the max. permitted output torque of 300 Nm (calculated lifetime: 500 h).

Positioning of the gear must be effected according to ISO 7653.

The torgues on the PTO can be ascertained by means of the following formulas.

Example:

$$\textbf{Torque T} = \frac{\textbf{15.92 x Q x p}}{\textbf{n x } \eta} = \textbf{[Nm]}$$

$$\textbf{Torque T} = \frac{\textbf{15.92 x 50 x 350}}{\textbf{1000 x 0.95}} = \textbf{300 Nm}$$

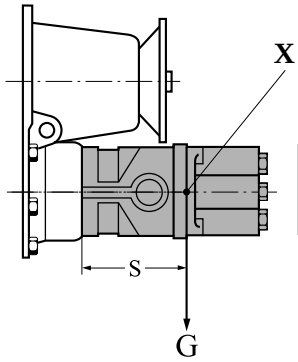
Q = Flow rate (l/min) *p = Pressure (bar)*
n = Speed (min^{-1}) *η = Efficiency*

c) Load: Gravity torque “M”

With version “c” of the PTOs, static load caused by the pump on the mounting face (gravity moment “M”) may amount to 30 Nm.

EXCEPTION

Elevated static loads of max. 50 Nm are only permitted for transmissions with PTO N..1 and PTO N..4 flanged directly to the housing.



$\mathbf{M}_{perm} = \mathbf{s} \times \mathbf{G}$ [Nm]

M = Gravity torque

G = Pump weight (incl. fittings)

s = Distance between the centre of gravity of the pump and the flange mounting face

X = Centre of gravity

SUPPLEMENT

PREMIUM RANGE - KERAX RANGE

CONTENTS

RENAULT V.I. S.A. au capital de 3 042 620 000 F.
Siège social : 129, rue Servient “La Part-Dieu” 69003 LYON

2.1 GENERAL DRILLING PRINCIPLES

2.2 GENERAL WELDING PRINCIPLES

2.3 STEEL GRADES FOR SIDEMEMBERS

2.4 REINFORCEMENT, EXTENSION, REDUCTION OF SIDEMEMBERS

2.5 ATTACHMENT OF BODYWORK

2.6 BODY SUB-FRAMES

2.6.1 KERAX sub-frame . . . . .

2.6.2 PREMIUM sub-frame

2.11 ADDING OF EQUIPMENT

2.12 CHANGING THE POSITION OF EQUIPMENT

2.13 SOUNDPROOFING SCREENS AND HEAT SHIELDS

3.5 HANDLING CRANES

3.7. TIPPERS

3.10. COUPLINGS FOR PREMIUM RIGID DRAWBAR VEHICLES (trailer with central axles)

3.11. TANKERS

3.12. PREMIUM refuse collectors and municipal vehicles

4. KITS

4.1. PREMIUM bolting kit

4.2. KERAX bolting kit

5. QUALITY ASSURANCE

PRESENTING THE PREMIUM RANGE

This new range consists of two families of vehicles that have been fully adapted according to their use.

The DISTRIBUTION concept over short and medium distances.

Its main attributes are :

- choice of 5 power units ranging from 210 to 340 hp
- 2 staircase type steps giving easy access to the cab (floor only 1.10 metre from ground)
- versions designed specially for certain applications : tanker, large volume, car transporter, refuse collector
- “VISION” passenger door
- “EASY” automatic clutch (ACS) option.

The LONG DISTANCE concept over medium and long distances.

Its main attributes are :

- 3 power units of 300, 340 and 380 hp
- high driving position with 3 access steps
- 4-point air suspension cab
- day, sleeper or raised cabs
- optimized dead weight.

When developing this new range, **RENAULT V.I.** naturally concentrated on aptitude to bodybuilding. The trends retained are expressed directly by :

- choice of 9 wheelbases for 4x2 rigids, 5 wheelbases for 6x2 rigids and 4 wheelbases for 6x2/4 rigids giving complete coverage to all body lengths
- no equipment projecting above the chassis
- 2 sidemember module heights : a low sidemember for optimizing payload loading height and a higher sidemember offering higher technical loading capacities
- grouping together and standardization of locations for battery compartments, fuel tank, air tanks...
- pre-drillings with constant pitch for the fastening of equipment
- brackets divided over the full length of the sidemember
- electrical and pneumatic pre-arrangements.

The enclosed document is a supplement for this new range, which completes and states the requirements contained in Bodybuilder’s Guide, ref. N° DT 6/354, already in your possession.
It includes the technical features specific to this new range : sub-frame heights, location of electrical and pneumatic pre-arrangements, equipment such as cab catwalk, roof deflector, antennae...

PRESENTING THE KERAX RANGE

This new on-off road range is in keeping with the continuity of the MAXTER range, with the comfort level and equipment level of a highway vehicle originating from our PREMIUM range.

It is hinged around :

- 3 families of modular chassis :
  Construction site approach (chassis A)
  Construction site (chassis B)
  Harsh construction site (chassis C)

- 4 power levels : 260 / 300 / 340 / 380 hp

- 5 wheel spreads : 4x2 / 4x4 / 6x4 / 6x6 / 8x4

- The BODYBUILDING function has been optimized with :
  - a chassis featuring parallel sidemembers (L = 800 mm) over the major part of the body and whose top flanges are completely smooth ;

  - a chassis frame assembly technology featuring BOLTING with locations allowing great flexibility of displacement, removal/fitting of vehicle and body components ;

  - fastening brackets in the forward part of the chassis and drillings distributed along the sidemembers making for easy attachment of all types of body ;

  - a pre-arrangement for mounting a crane rearward of the cab, available as option on 4x2. 6x4. 8x4 models ;

  - a pre-arrangement for a compressed air take-off and 24 V electrical socket on the chassis.

In this way the new ON-OFF ROAD range takes a new step towards the “**ready to assemble**” vehicle.

This new range resumes the majority of the bodywork attachment principles that are already known on all **RENAULT V.I.** vehicles.

1.5 - ELECTRICAL EQUIPMENT

Generalities

- All assembly of electrical equipment on commercial vehicles must conform to **RENAULT V.I.** recommendations and the legislation in force. The equipment manufacturer remains fully responsible for the finished result both in respect of vehicle reliability and for any electromagnetic interference.

- To consult schematic electrical diagrams, refer to the vehicle driving and servicing handbook.

- To consult wiring diagrams, refer to the vehicle electrical equipment section in the workshop manual.

- Check that the electrical consumption of the equipment is adequate to battery capacity and alternator load intensity. For specific assemblies, consult the **RENAULT V.I.** Product Applications Department.

- For any specific problem, propose a schematic diagram for **RENAULT V.I.** validation.

- A bodybuilder's or equipment manufacturer's electrical installation diagram must without fail be appended to the vehicle driving and servicing handbook. If **RENAULT V.I.** instructions cannot be observed, clearly and precisely indicate on that diagram the electrical hook-up points (even after agreement from **RENAULT V.I**).

- Respect the protections recommended by **RENAULT V.I :** it is forbidden to change the fuse rating.

- So as to harmonize the vehicle equipment, preferably adapt elements identical to basic elements (warning lamps, controls, relays...).

- Assembly of a protective shield on the electric retarder is compulsory for vehicles transporting hazardous substances (refer to RTMD/ADR regulations in force).

- **The supply voltage for the installed equipment must be equal to the rated voltage of the vehicle.** On the other hand, the installation of appliances having a rated voltage of 12 Volts on 24 Volt vehicles requires the addition of a voltage dropper.

- Any extra lamps should be mounted in such a way as to ensure drainage of condensation water.

Wiring harnesses

- Use the routing facilities already installed by the manufacturer as much as possible (troughs, tubes, sleeves...), while respecting their capacity limits.

- All wiring harnesses added by the bodybuilder are to be protected by a sealed sheath (smooth and thick or ringed) that may run with the original wiring harnesses on condition that they do not affect the mechanical fastenings of the original harnesses. For vehicles transporting hazardous substances, use the protections authorized by the RTMD/ADR regulations.

- If wiring harnesses are obliged to be routed close to heat sources (engine, exhaust...), the minimum distance to be observed is 200 mm.

- Never route wiring harnesses over projecting corners.

- Never attach wiring harnesses to any moving parts (even if movement is only slight).

- The cable cross-section must be adapted to the desired use : diameter calculated according to the maximum line current (5 amperes per mm^2).

- The equipment wiring harnesses should be long enough to allow disengagement of the hooked up electrical appliance (e.g. main display, tachograph...).

- Numbering of the wires must take into account the standard established by the manufacturer.

- The link between the sheath and the connector must be fluidtight.

Electrical connections

- All extra connections require protection adapted to the required use (even if the power supply made available to the customer by **RENAULT V.I.** is already protected by a fuse).

- All electrical connections must without fail be made at the available bodybuilder power supply points made available by the manufacturer (see relevant vehicle servicing handbook).

- It is FORBIDDEN to make an electrical tap on the different wiring harnesses of the vehicle (e.g. rear parking lamps, marker lamps, switches, pressure switches, relays...). For reference : A 12 Volt tap at the batteries mid-pint is strictly FORBIDDEN, (see page 13 of Bodybuilders' Guide DT 6/354).

- The electrical connections of the different bodybuilder wiring harnesses must mandatorily be made via a sealed junction box.
  If electrical hook-up has to be made on circuits connected to electronic appliances :
  - respect the recommended polarities,
  - no self-induction current should circulate in the added circuits,
  - all the earths should be connected to the available "EARTH" points provided and not to the vehicle bodywork.

- All work on junction boxes must be carried out so as to integrally preserve the original seal.

- All equipment power supplies requiring direct connection to the batteries must without fail be protected by a battery isolation switch (e.g. tail lifts). Use suitable connection terminals.

- The positive (+) power supply is taken from the master switch, or failing this, from the battery terminal for vehicles without master switch, **BUT IN NO CASE FROM THE ALTERNATOR OR STARTER MOTOR TERMINAL**.

- Comfort power supply : telephone, fax... The installer is responsible for the quality of the installation (reception, static, interference...).

- Preferably, use and adapt connectors approved and distributed by **RENAULT V.I.** (type, seal, power, number of ways...).

- Position appliance connectors downwards to avoid areas of splashing (wheelarches...).

Available power supply points

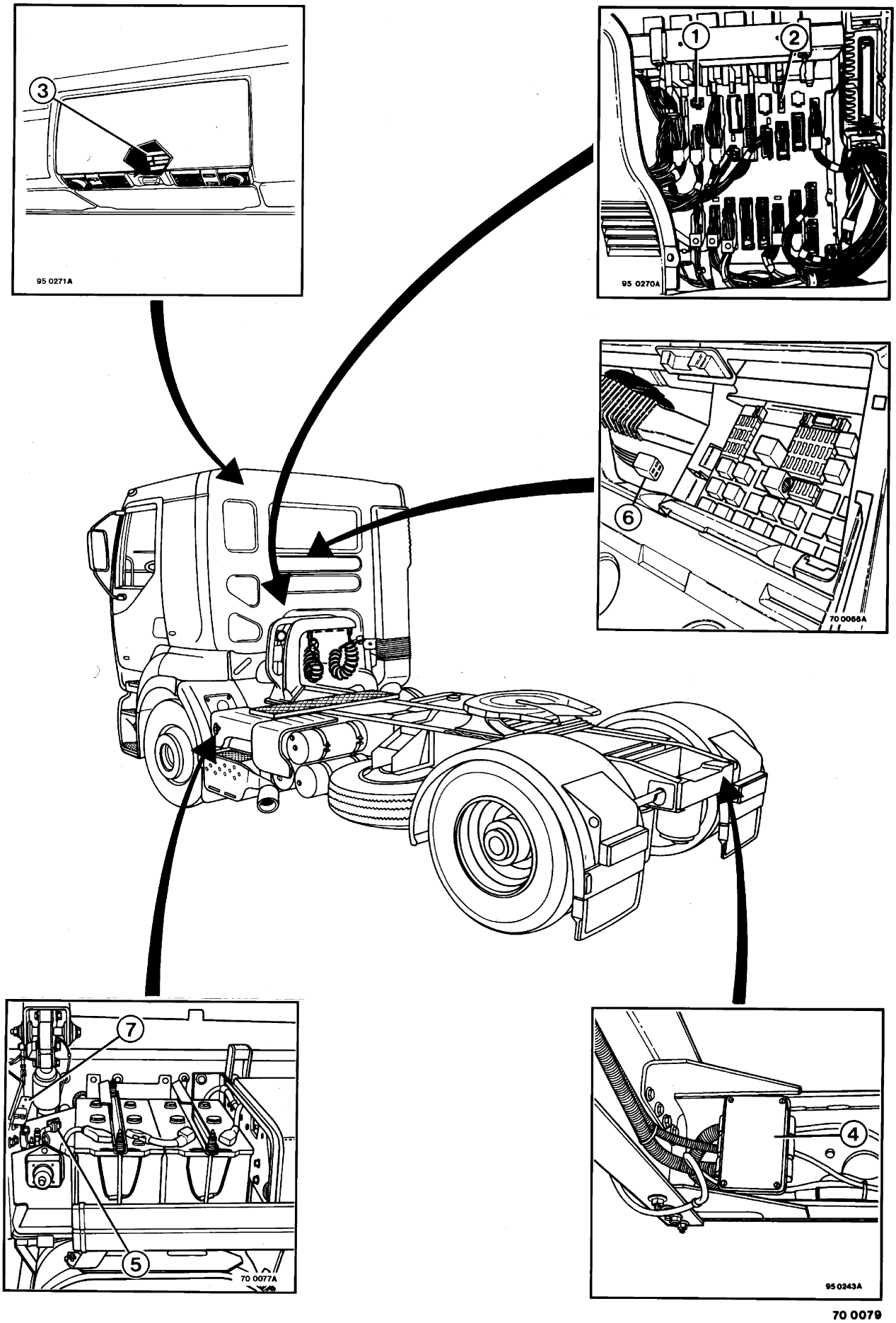
All our vehicles are equipped with available power supply points protected by fuses, placed at the disposal of bodybuilders and equipment manufacturers.

These available supply points are described in the driving and servicing handbook (supplied with each vehicle) or workshop manual (available from the **RENAULT V.I.** network).

PREMIUM

LOCATION	CONNECTOR	CABLE	ASSIGNMENT	FUSE	RATING
1 : Connection unit (inside cab)	Grey	1 208	Earth Available power supply (after master switch)	— F 21	— 10A
2 : Connection unit (inside cab)	Grey 275	1	Earth Available power supply (after ignition)	— F 35	— 15 A
3 - Cab top ledge	6 isolated wires on stand-by	1 305 4000 144 46 155	Earth Available power supply (lighting) Available + 12V power supply (CB) Available - power supply (CB) Available + 12V power supply (radiotelephone) Available power supply (radiotelephone)	— F3 F17 F17 F17 F17	— 10A 20A 20A 20A 20A
4 : Chassis rear box	White	1 632	Earth Available power supply (lighting)	 F5	 10A
5 : Battery compartment	Black	1 208 275 632	Earth Available power supply (after master switch) Available power supply (after ignition) Available power supply (lighting)	— F21 F35 F5	— 10A 15A 10A
5 : Battery compartment (refuse collector)	Black	1 208 275 632 258 828	Earth Available power supply (after master switch) Available power supply (after ignition) Available power supply (lighting) Available power supply (zero speed) Available power supply (fast idling)	— F21 F35 F5 — —	— 10A 15A 10A — —
6 : To left of connection unit (inside cab) (refuse collector)	Black	1 7 12 211	Earth Available power supply (rev counter) Available power supply (neutral) Available power supply (after ignition)	— — — F1	— — — 10A
As per equipment 7 : Battery compartment : 150 A electrical socket		Black 1 201	Earth Available power supply (before master switch)	— —	— —

PREMIUM



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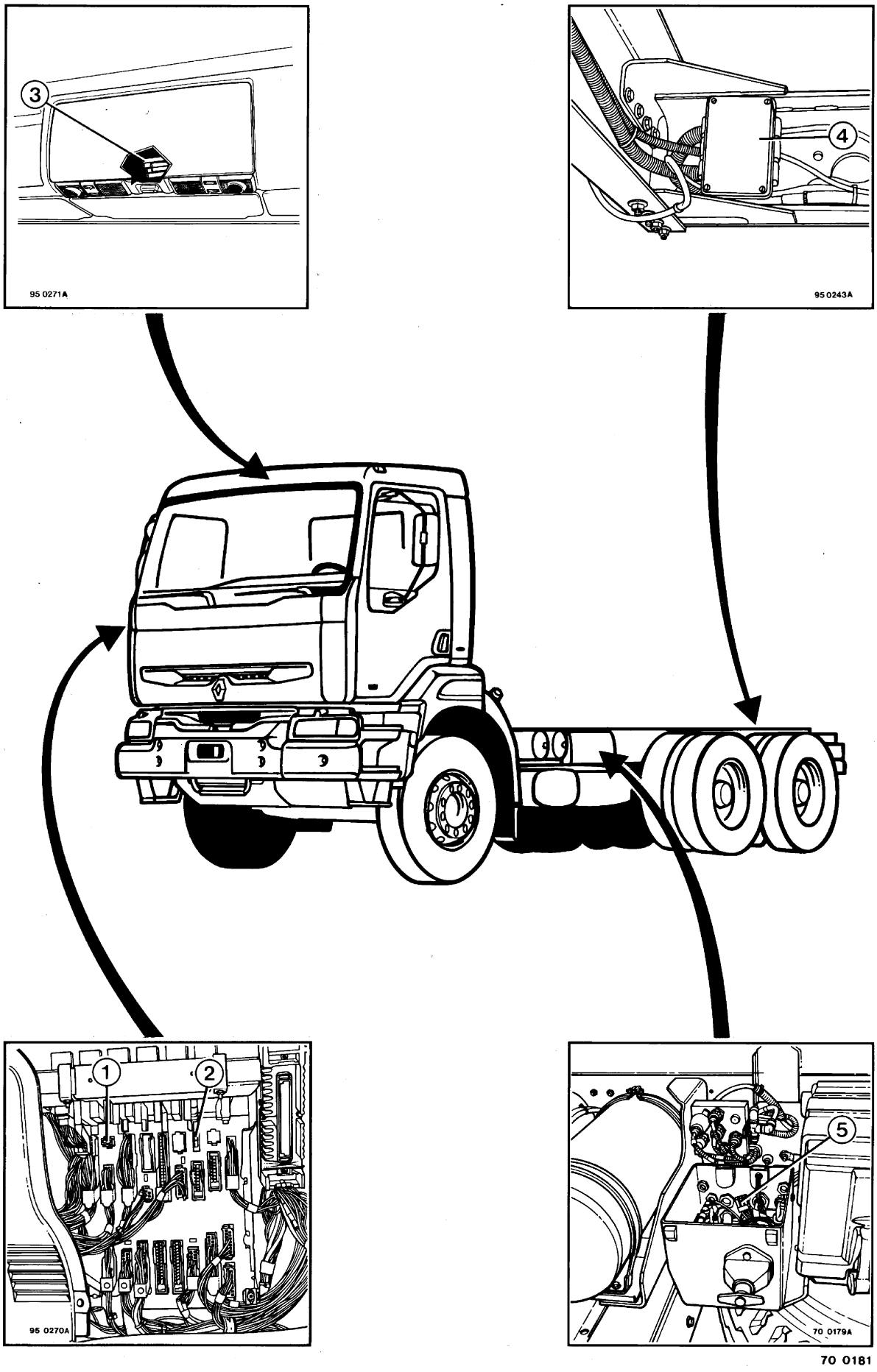
KERAX

LOCATION	CONNECTOR	CABLE	ASSIGNMENT	FUSE	RATING
1 : Connection unit (inside cab)	Grey	1 208	Earth Available power supply (after master switch)	— F21	— 10A
2 : Connection unit (inside cab)	Grey	1 275	Earth Available power supply (after ignition)	— F35	— 15A
3 : Cab top ledge	6 isolated wires on stand-by	1 305 4000 144 46 155	Earth Available power supply (lighting) Available + 12V power supply (CB) Available - power supply (CB) Available + 12V power supply (radiotelephone) Available power supply (radiotelephone)	— F3 F17 F17 F17 F17	— 10A 20A 20A 20A 20A
4 : Chassis rear box	White	1 632	Earth Available power supply (lighting)	F5	10A
5 : Battery compartment	Black	1 208 275 632	Earth Available power supply (after master switch) Available power supply (after ignition) Available power supply (lighting)	— F21 F35 F5	— 10A 15A 10A

KERAX



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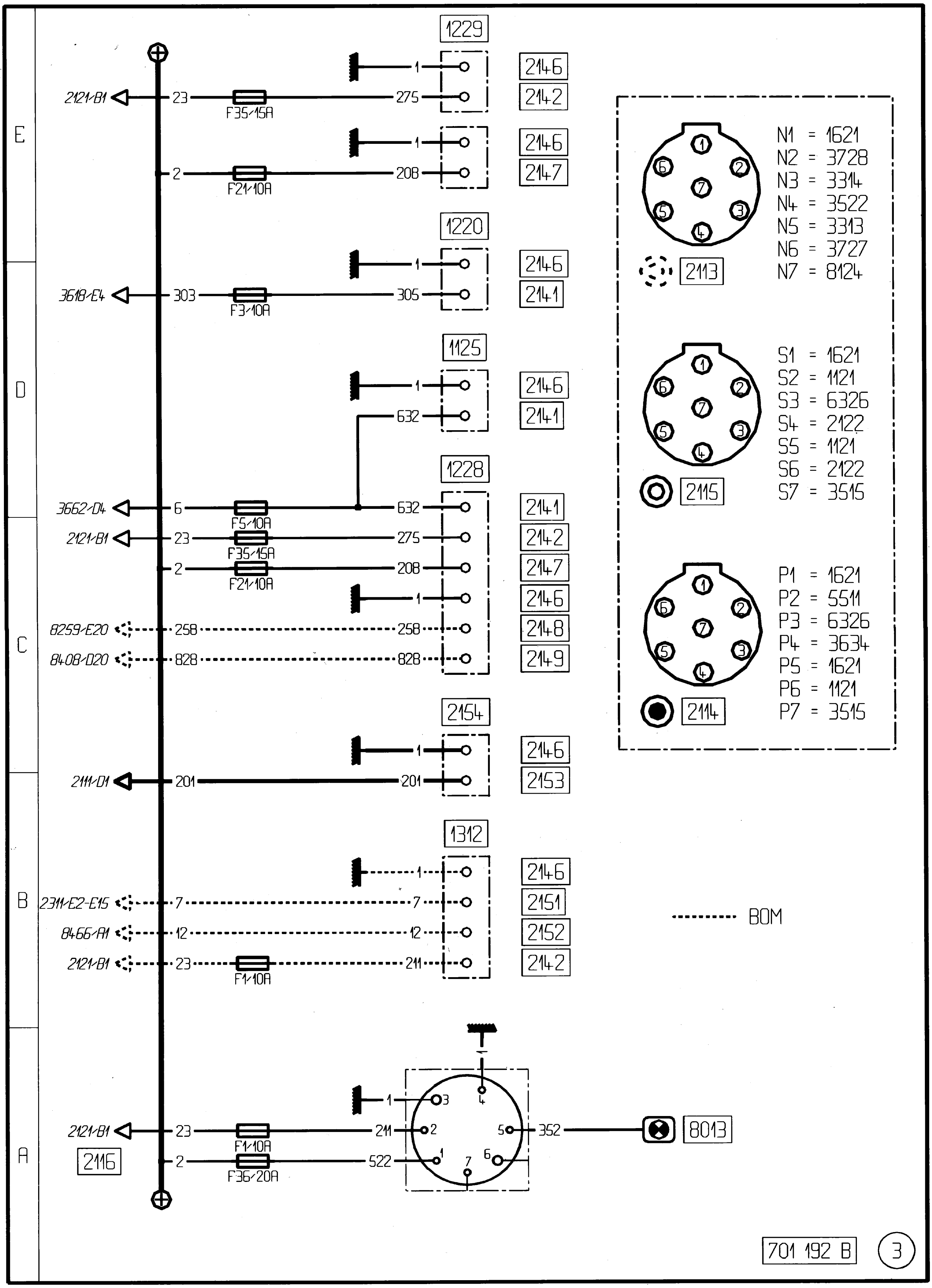
SCHEMATIC DIAGRAM
AVAILABLE POWER SUPPLIES / TRAILER SOCKETS

KEY TO DIAGRAM

1121 Not allocated
1125 Chassis electrical box
1220 Cab top ledge
1228 Battery tray
1229 Chassis-cab connection unit
1311 Connector
1621 Earth
2111 Battery (set of batteries)
2113 Trailer socket, 7-pin type 24 N
2114 Trailer socket, 7-pin type 24 P
2115 Trailer socket, 7-pin type 24 S
2116 Trailer socket, 7-pin type (ABS)
2121 After ignition power supply relay
2122 Trailer + 24 Volts power supply
2141 Available power supply (lighting)
2142 Available power supply (after ignition)
2146 Available power supply (earth)
2147 Available power supply (after master switch)
2148 Available power supply (zero speed)
2149 Available power supply (fast idling)
2151 Available power supply (rev counter)
2152 Available power supply (neutral)
2153 Available power supply (before master switch)
2154 Plug socket (150 Amps)
2311 Alternator
3313 Trailer RH flashing lamps
3314 Trailer LH flashing lamps
3515 Trailer fog lamps
3522 Trailer stop lamps
3618 Side/parking lights relay
3634 Trailer marker lamps
3662 Lighting relay
3727 Trailer RH side/parking lamp
3728 Trailer LH side/parking lamp
5511 Gate valves illumination
6326 Trailer reversing lamp
8013 Trailer ABS safety warning lamp
8124 Exhaust brake
8259 Zero speed relay
8408 Automatic clutch ECU
8466 Neutral switch

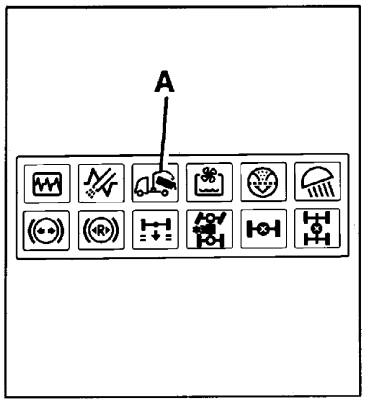
Item	Assignment	Number	Reference N°
1	VEHICLE connector	1	**Integrated in unit**
	BODYBUILDER connector	1	**50 10 214 473**
	BODYBUILDER connector contact	2	**50 10 214 345**
2	VEHICLE connector	1	**Integrated in unit**
	BODYBUILDER connector	1	**50 10 293 074**
	BODYBUILDER connector contact	2	**77 01 997 034**
4	VEHICLE connector	1	**77 01 996 121**
	BODYBUILDER connector	1	**77 01 996 117**
	BODYBUILDER connector contact	2	**50 00 812 493**
5	VEHICLE connector	1	**77 03 197 812**
	BODYBUILDER connector	1	**77 03 197 259**
	BODYBUILDER connector contact	6	**50 00 812 492**
6	VEHICLE connector	1	**50 10 214 482**
	BODYBUILDER connector	1	**50 10 214 477**
	BODYBUILDER connector contact	6	**50 10 214 617**

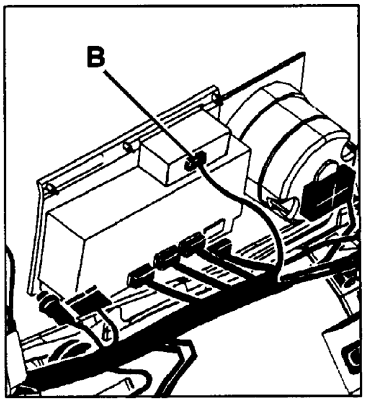
Remark
Location 3 corresponds to 3 isolated wires on stand-by (without connector) for 12V power supply for CB radio, radiotelephone and 24V power supply for one accessory.

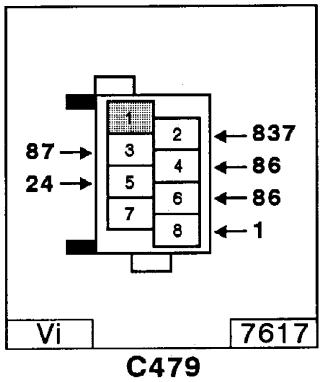


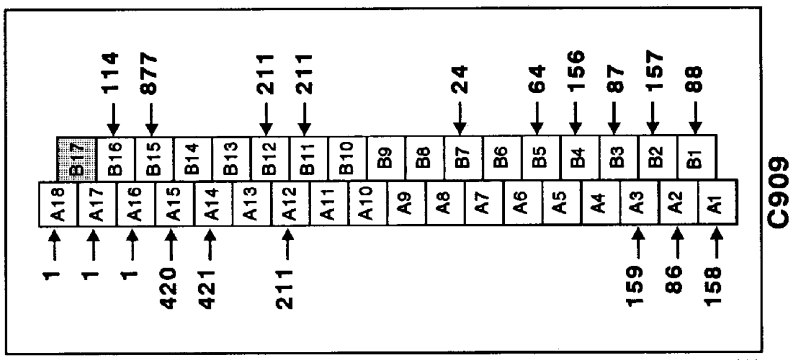
E
D
C
B
A
1229
2121-B1
23
F35-15A
275
1
2146
2142
2
F21-10A
208
2147
1220
3618-E4
303
F3-10A
305
2141
1125
632
1228
3662-D4
6
F5-10A
8259-E20
258
8408-D20
828
2148
2149
2154
2111-D1
201
2153
1312
2311-E2-E15
7
8466-A1
12
2151
2152
F1-10A
211
2116
522
F36-20A
352
8013
2113
N1 = 1621
N2 = 3728
N3 = 3314
N4 = 3522
N5 = 3313
N6 = 3727
N7 = 8124
2115
S1 = 1621
S2 = 1121
S3 = 6326
S4 = 2122
S5 = 1121
S6 = 2122
S7 = 3515
2114
P1 = 1621
P2 = 5511
P3 = 6326
P4 = 3634
P5 = 1621
P6 = 1121
P7 = 3515
BOM
701 192 B
3

Connecting up a tipper or crane warning lamp for unequipped KERAX vehicles





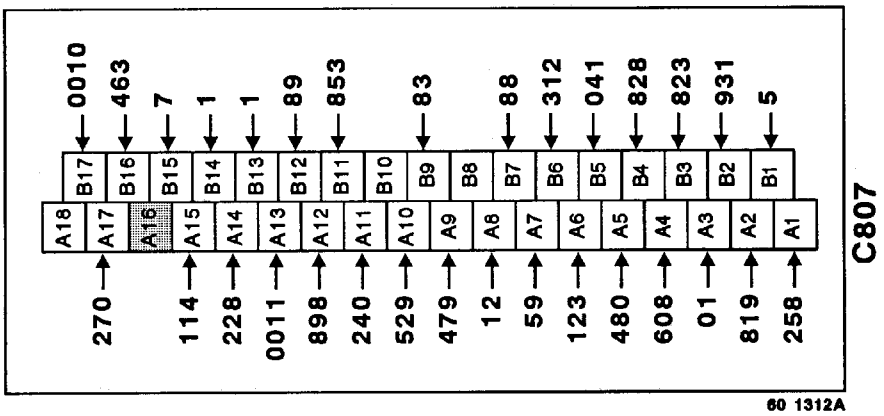




A : Available warning lamp
B : Purple connector
1 : Available location for connector B
B17 : Available location on 35-way connector (yellow) on connection unit (inside cab)

WARNING LAMP WIRING
Install a 0.6 mm² section wire fitted with RENAULT V.I. plugs ref. N° 50 102 14 345 between terminals 1 and B17 of the display and connection unit connectors.

NOTE
Use the routing facilities already installed by the manufacturer as much as possible (troughs, tubes, sleeves...), while respecting their capacity limits (see Wiring harnesses, page 6).

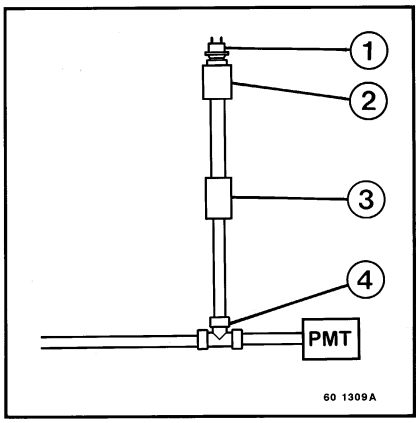


Connect the tipper or crane information installation to terminal A16 of the 35-way connector (white) on the connection unit (outside cab).
For the warning lamp to light up, earth terminal A16 of connector 807 (outside cab).

Connecting up the KERAX PTO engaged information installation

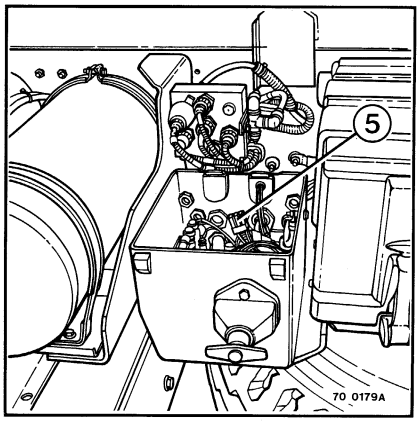
Pneumatic connection

On the PTO control pneumatic circuit, install :
- 3-way union **(4)** ref. N° 50 05 330 159,
- reducer **(3)** ref. N° 50 05 330 184,
- grommet **(2)** ref. N° 50 05 430 146,
- pressure switch **(1)** ref. N° 50 10 270 576.



Electrical connection

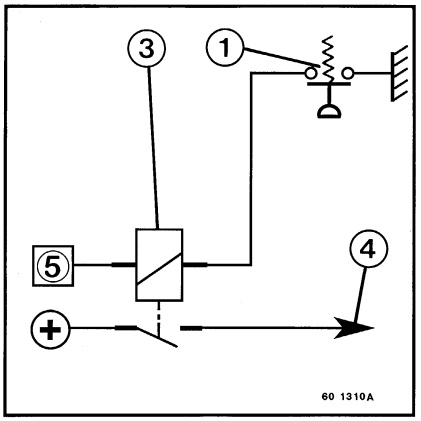
Install a 50 Amp relay ref. N° 50 00 787 913 in the electrical box.
(5) = wire 208 or 275.



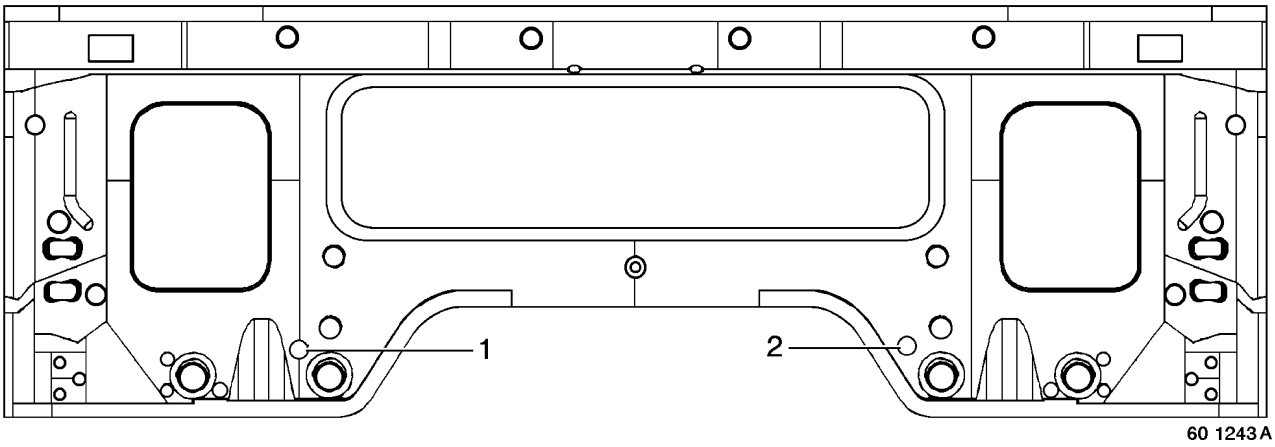
Supply power to the coil of relay **(3)** by means of wire 208 or 275 to terminal **(5)** of the available power supply connector.
The coil earth must be controlled by pressure switch **(1)** which is connected to earth.

(4) = available power supply.

Parts with reference numbers are available from the Spare Parts Department.

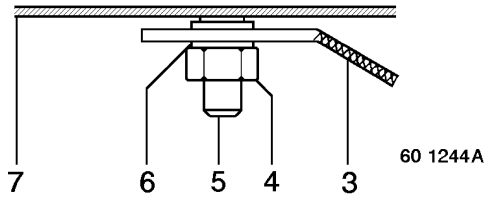


EARTHING ON FRONT END



1 - Stainless steel stud M6 welded to front end sheet metal
Connection unit - Cab
2 - Stainless steel stud M6 welded to front end sheet metal
Cab - Chassis

FASTENING OF EARTHING LUG OR BRAID

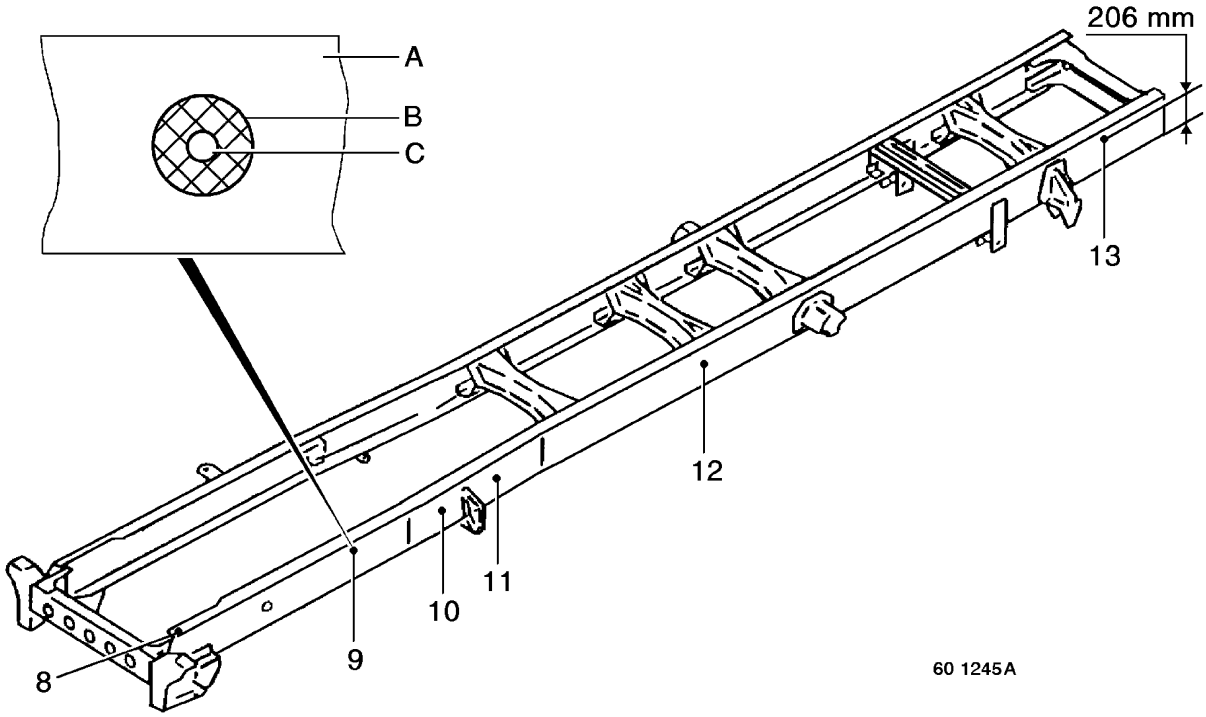


3 - Earthing lug or braid
4 - Stainless steel nut M6
5 - Stainless steel stud M6 welded to front end sheet metal
6 - Stainless steel washer Ø 6
7 - Front end sheet metal

NUT 4 TIGHTENING TORQUE :
- Minimum torque : 8 Nm
- Maximum torque : 10 Nm

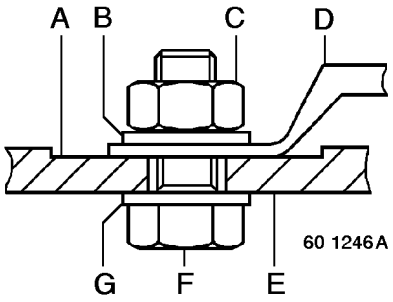
EARTHING ON PREMIUM LEFT-HAND SIDEMEMBER

8 - Cab + shield (Ø 13)
9 - Starter (Ø 11)
10 - Trailer socket (tractor) (Ø 11)
11 - Batteries (Ø 13)
12 - Electric retarder (Ø 11)
13 - Rear line + trailer socket (rigid Ø 11)
A - Painted sidemember
B - Specific tinned surface Ø 45
C - Fixing hole Ø 11 or Ø 13 for electrical earths



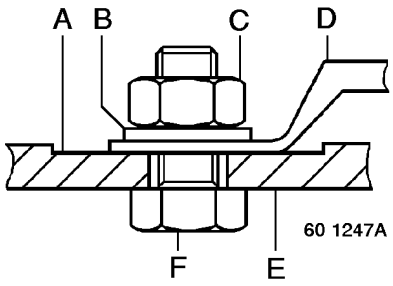
Assembly to electrical earthing points Ø 13

A - Tinned surface Ø 45
B - Stainless steel plain washer Ø 10
C - Stainless steel nut H10 x 150
D - Lug or braid
E - Sidemember
F - Stainless steel hexagon bolt H10 x 150
G - Stainless steel plain washer Ø 10



Assembly to electrical earthing points Ø 11

A - Tinned surface Ø 45
B - Stainless steel plain washer Ø 10
C - Stainless steel nut H10 x 150
D - Lug or braid
E - Sidemember
F - Stainless steel hexagon bolt H10 x 150

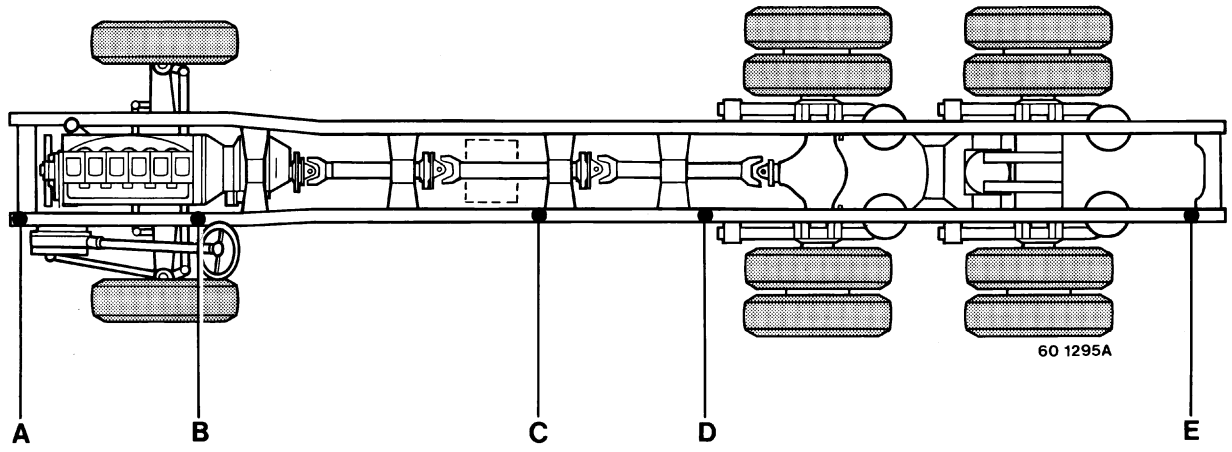


Tightening torque

45.5 Nm ± 20%

Stainless steel threaded hardware for electrical equipment available from the Spare Parts Department.
Kit ref. N° 50 01 838 838 (composition : 5 screws, 5 washers, 5 nuts).

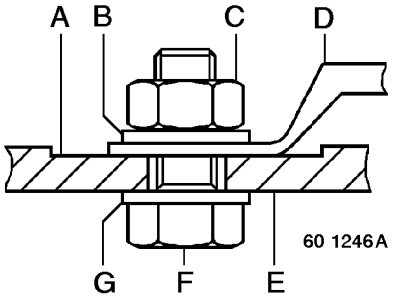
EARTHING ON KERAX LEFT-HAND SIDEMEMBER



A - Front signalling earth
B - Engine earth
C - Battery earth
D - Electric retarder earth
E - Rear signalling earth

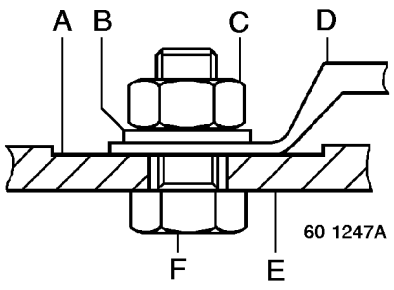
Assembly to electrical earthing points Ø 13

A - Tinned surface Ø 45
B - Stainless steel plain washer Ø 10
C - Stainless steel nut H10 x 150
D - Lug or braid
E - Sidemember
F - Stainless steel hexagon bolt H10 x 150
G - Stainless steel plain washer Ø 10



Assembly to electrical earthing points Ø 11

A - Tinned surface Ø 45
B - Stainless steel plain washer Ø 10
C - Stainless steel nut H10 x 150
D - Lug or braid
E - Sidemember
F - Stainless steel hexagon bolt H10 x 150



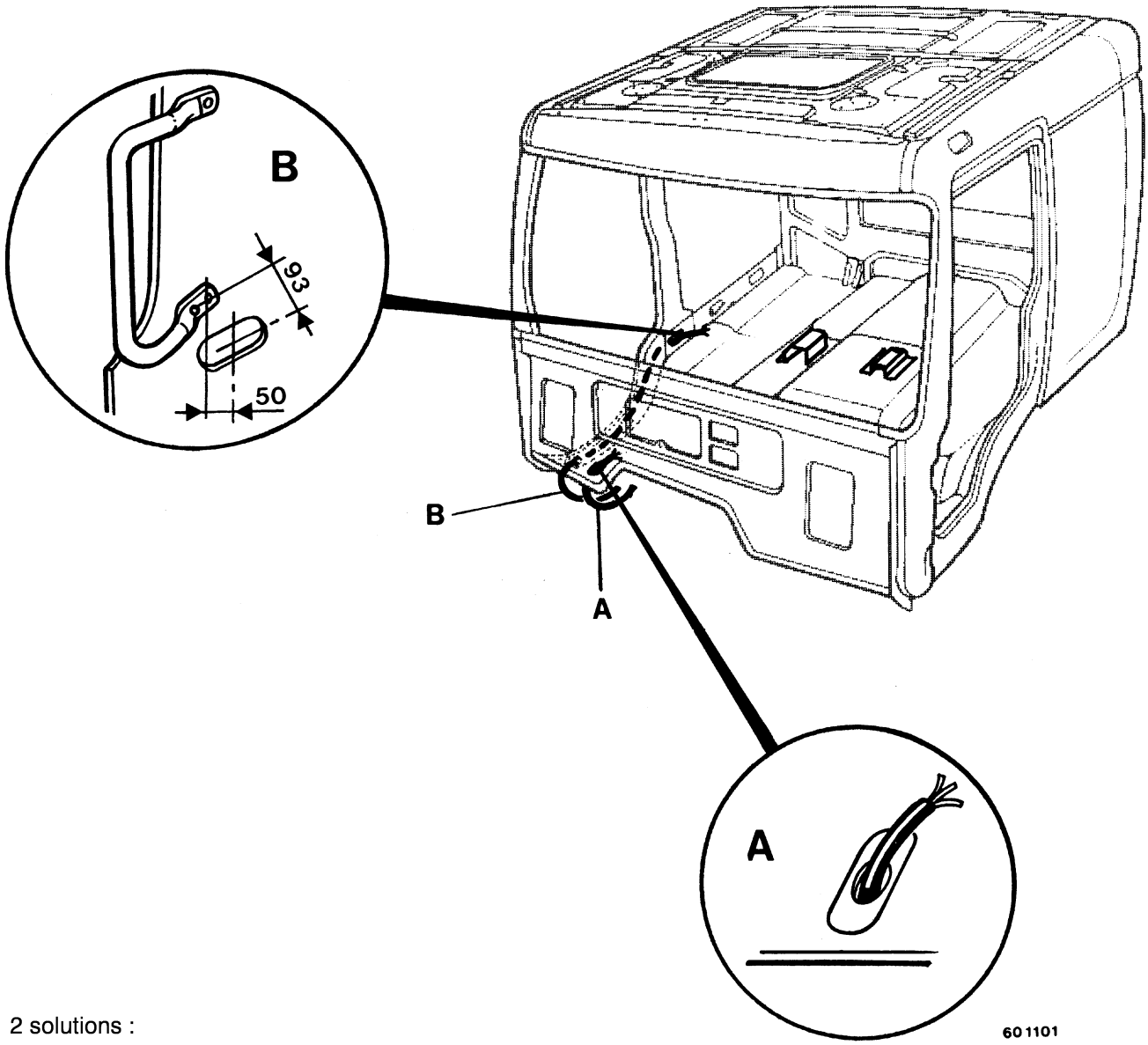
Tightening torque

45.5 Nm ± 20%

Stainless steel electrical screw hardware available from the Spare Parts Department.
KIT ref. N° 50 01 838 838 (composition : 5 bolts, 5 washers, 5 nuts).

Wiring harness and air hose passages

Two routings for the passage of wiring harnesses have been studied on the cab to ensure electrical connection between the inside of the cab and the chassis (RH & LH sides).



2 solutions :

A - In the Ø 45 mm impression on the floor :
Drill a hole big enough to allow a wiring harness to pass through.
Fit a grommet to provide a seal.

B - Cut the trim and pass the wiring harness through the side rail to gain access to the chassis.

1.6 - AIR-OPERATED EQUIPMENT

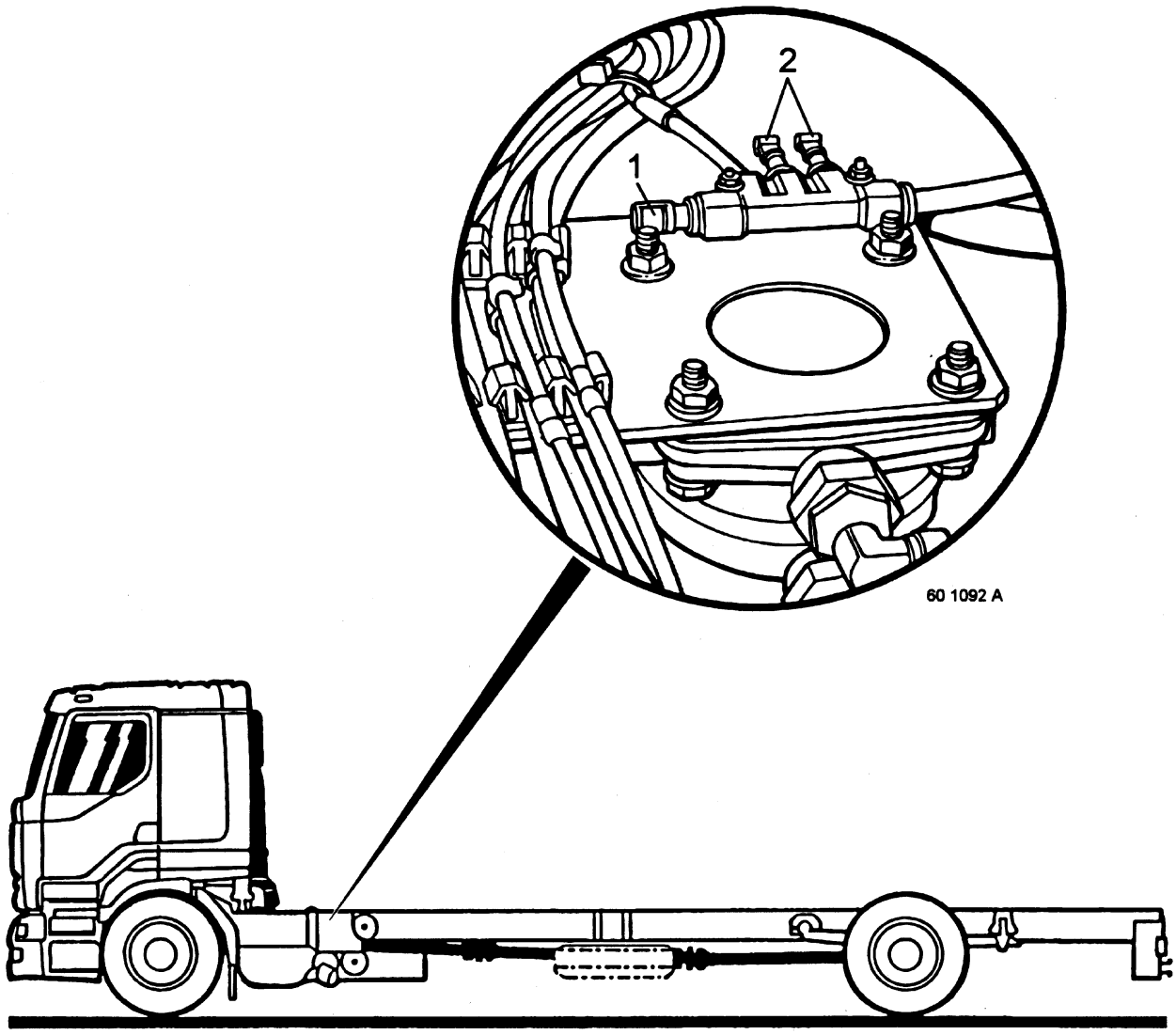
Position of unions for extra auxiliary equipment

Snap-on unions (1) Ø 6-8 and (2) Ø 4-6 are located under the plastic cowling on the left-hand side. Extra pipes should not place any mechanical strain on the union.

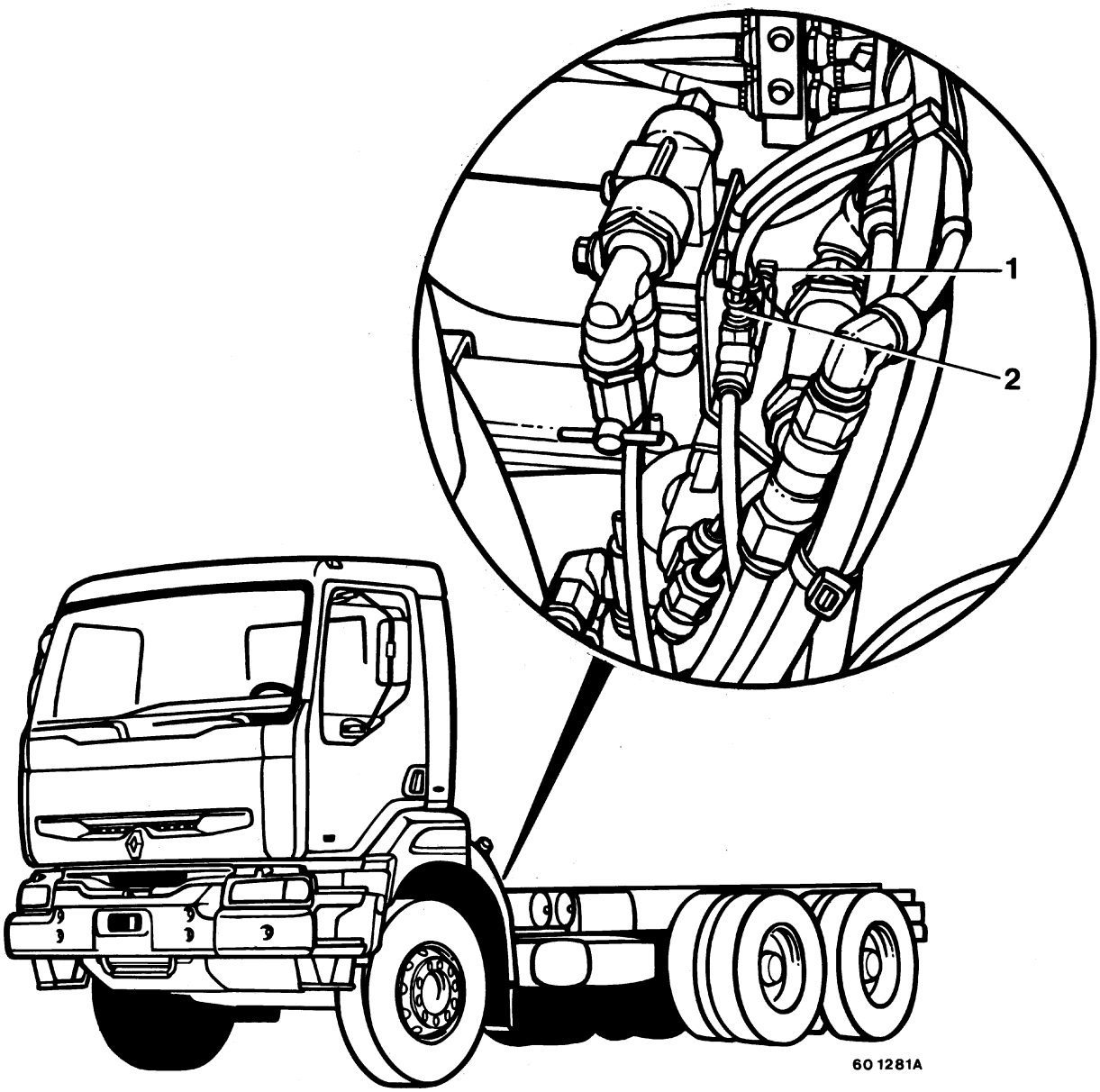
Item 1 : always available
Item 2 : available according to variants

NOTE :
On the auxiliary equipment circuit, the pipe unions are removable.
On the braking circuit, the unions are not removable.

PREMIUM



KERAX



Air-operated equipment + table of compressors

The addition of extra auxiliary equipment not planned by the manufacturer must without fail be connected to the specific auxiliary equipment circuit.

The compressed air consumption of this auxiliary equipment should in no way compromise the **braking circuit filling times laid down by the legislation in force**.

The **RENAULT V.I.** Product Applications Department is at your disposal for any further information.

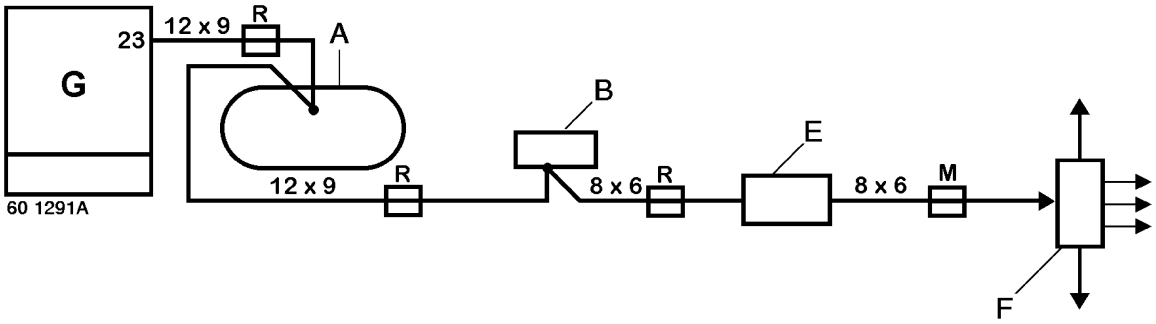
The assembly of extra equipment must be routed in the trough located on the left-hand side inside the chassis.

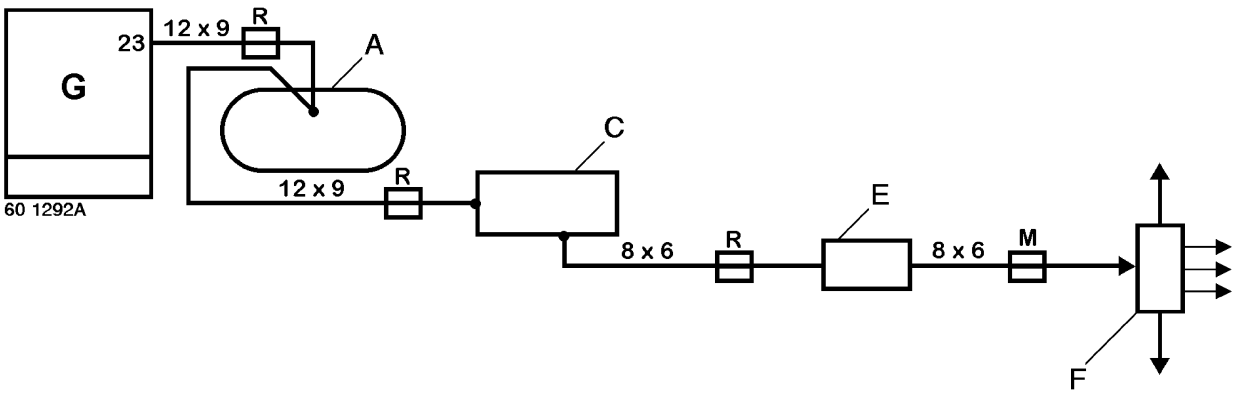
If the trough does not allow passage of extra equipment, route the pipe on the outside of the trough. Hold the pipe with “COLSON” clamps.

If the vehicle is equipped with an electric retarder, route the auxiliary equipment between the heat shield and the trough.

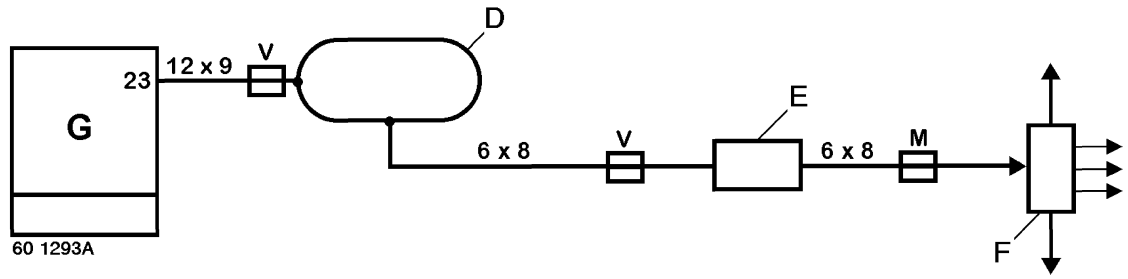
Connection diagrams

PREMIUM range - Mechanical suspension

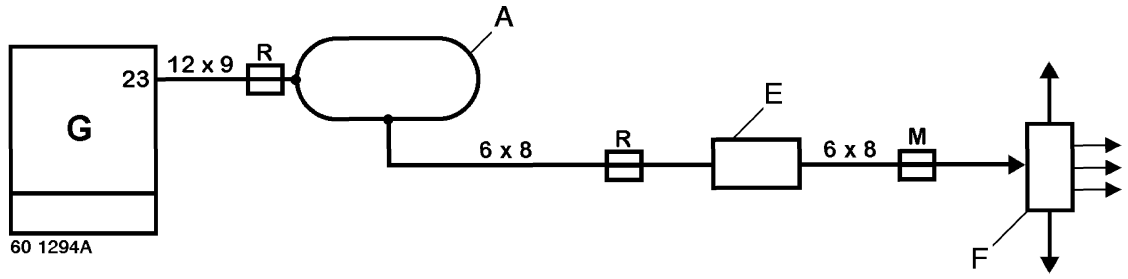




KERAX solo rigid



KERAX tractor and drawbar rigid



A - Trailer and parking brake air tank
B - Back pressure valve
C - Combined pressure reducing valve
D - Parking brake air tank
E - Overflow valve
F - Bodybuilder's compressed air take-off
G - Pressure gauge block
R - Red coloured ring
M - Brown coloured ring
V - Green coloured ring

Table of compressors (vehicle at standstill)

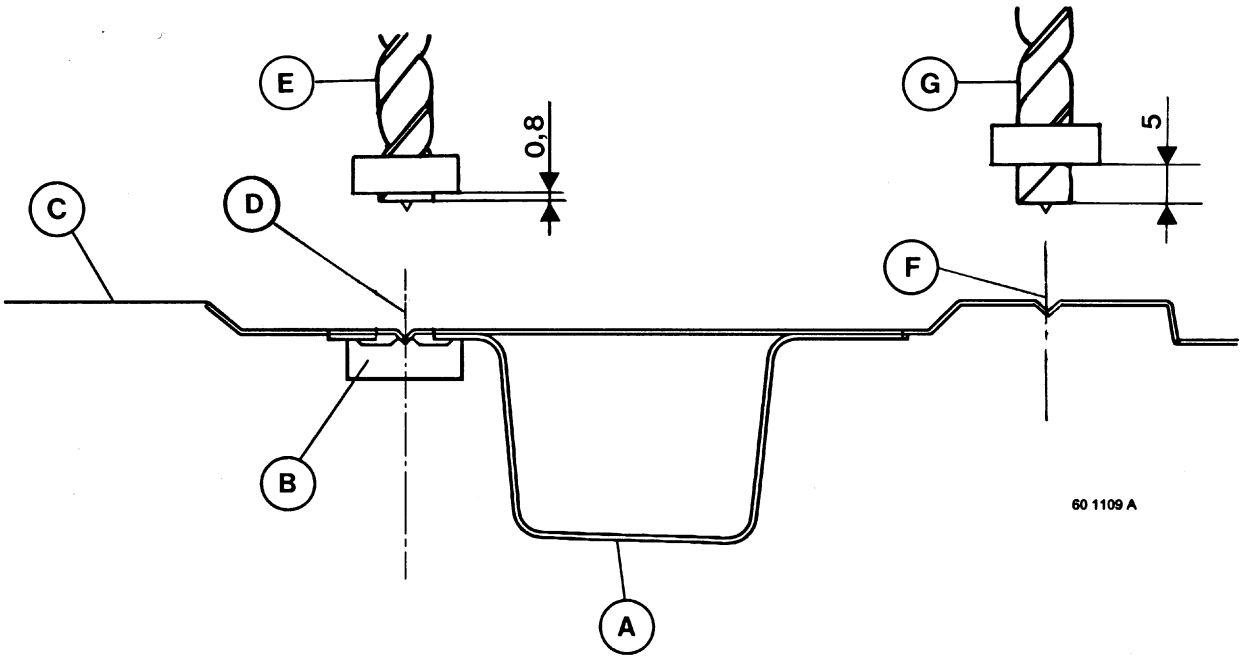
VEHICLE	ENGINE	COMPRESSOR TYPE	DISPLA-CEMENT	DRIVE RATIO	OUTPUT at 8 bars at 1500 engine rpm	OUTPUT at 9 bars at 1500 engine rpm	OUTPUT at 12.5 bars at 1500 engine rpm Air suspension
Premium 210-250 Solo rigid Mech susp	MIDR 06.02.26	LP 3833 LP 4819	Single-cyl. 250 cc Twin-cyl. 500 cc	1,03	225 L/min 470 L/min		
Premium 210. 250	MIDR 06.02.26	LP 4819	Twin 500 cc	1,03	470 L/min		400 L/min
Premium 260. 300. 340 Solo rigid Mech susp	MIDR 06.20.45	LP 3833 LP 4819	Single-cyl. 250 cc Twin-cyl. 500 cc	1,31	290 L/min 470 L/min		
...→9.96 Premium 260. 300. 340	MIDR 06.20.45	LP 4819	Twin-cyl. 500 cm³	1,31	580 L/min		500 L/min
10.96 →… Premium 260. 300. 340	MIDR 06.20.45	LP 4845	Twin-cyl. 500 cm³	1,31	580 L/min		500 L/min
Premium 385 Solo rigid Mech susp	MIDR 06.23.56	LP 3833	Single-cyl. 250 cm³	1,31	290 L/min		
…→ 9.96 Premium 385	MIDR 06.23.56	LP 4819	Twin-cyl. 500 cc	1,31	580 L/min		500 L/min
10.96 →… Premium 385	MIDR 06.23.56	LP 4845	Twin-cyl. 500 cc	1,31	580 L/min		500 L/min
KERAX 260. 300 340	MIDR 06.20.45	LP 4845	Twin-cyl. 500 cc	1,31		560 L/min	
KERAX 385 TI	MIDR 06.23.56	LP 4845	Twin-cyl. 500 cc	1,31		560 L/min	

2.1 - GENERAL DRILLING PRINCIPLES

Drilling the roof for mounting accessories

Drilling the roof gives access to weld nuts and allows fastening of sealed crimping nuts for mounting accessories.

The recommendations below will help avoid damage to the roof headlining and weld nuts at the time of drilling.



A - Roof stiffener
B - Nut welded to stiffener
C - Roof thickness 0.80 mm
D - Position of impression for drilling and access to weld nut
E - Centring drill Ø 10 mm with stop
F - Position of impression for drilling and fastening crimping nut
G - Centring drill with stop: Ø 9.2 for crimping nut Ø 6 mm
Ø 11.2 for crimping nut Ø 8 mm

Method

Use a centring drill with stop positioned on the bit to drill the roof:

Drilling depth = 0.80 mm for access to weld nut.
= 5 mm max. for fastening crimping nut.

Anti-corrosion protection
Deburr the holes after drilling.
Protect the metal with a zinc spray (available from Spare Parts Department under ref. N° 50 00 244 332).

Drilling into PREMIUM sidemembers

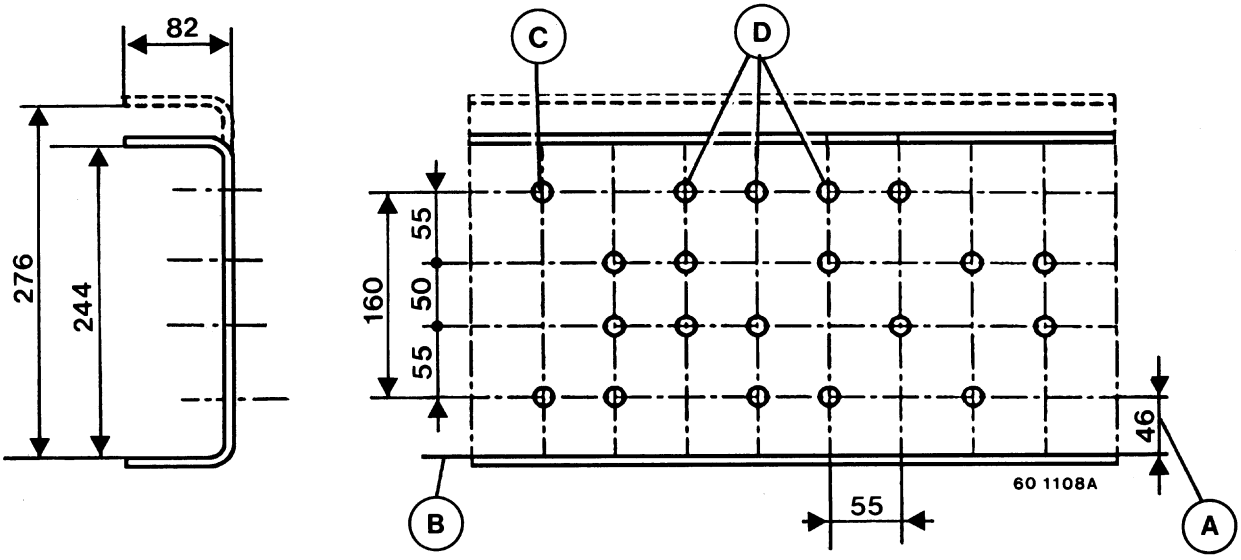
IMPORTANT
It is formally forbidden to drill into the flanges of our sidemembers. **All drillings must mandatorily be made in the web of the sidemembers** while respecting the possible positions shown below.

For all chassis of the PREMIUM range, the maximum drilling diameter is **15 mm**.

Position of drillings

It is forbidden to drill more than three holes on the same vertical.

Drilling into sidemember webs



A - Basic dimension
B - Chassis zero plane
C - Recommended drilling diameter 13H13 - 15H13
D - Alignment of 3 holes maximum on same vertical axis

CAR TRANSPORTERS

Consult the **RENAULT V.I.** Product Applications Department to procure drilling drawing ref. N° 50 10 334 439.

Drilling into KERAX sidemembers

- See page 30 of Bodybuilder's Guide DT 6/354.

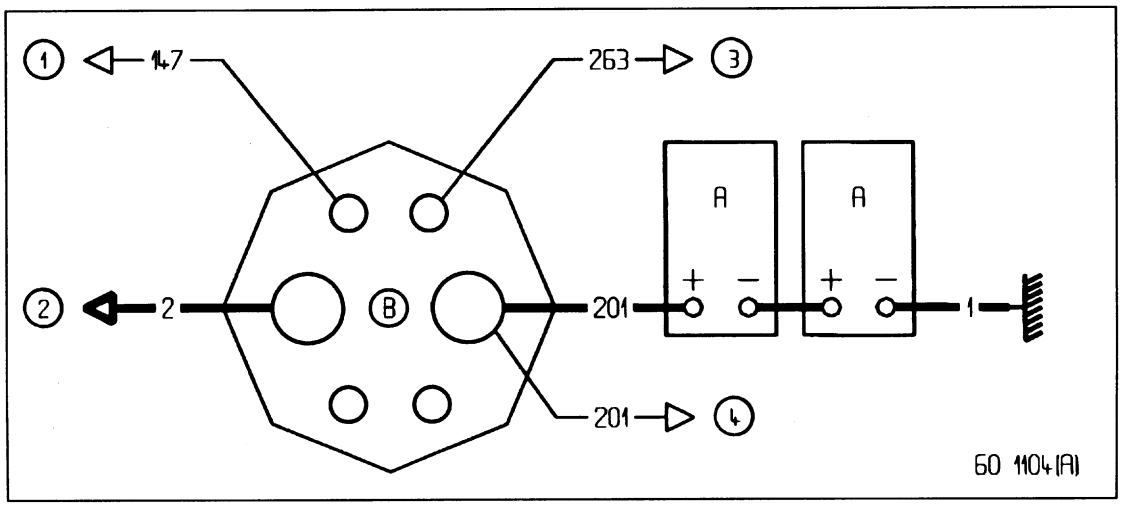
2.2 - GENERAL WELDING PRINCIPLES (precautions)

Soundproofing screens

In case of welding on-vehicle or when using a disker, efficiently protect or remove the soundproofing screens.

Welding on-vehicle with electromagnetic master switch

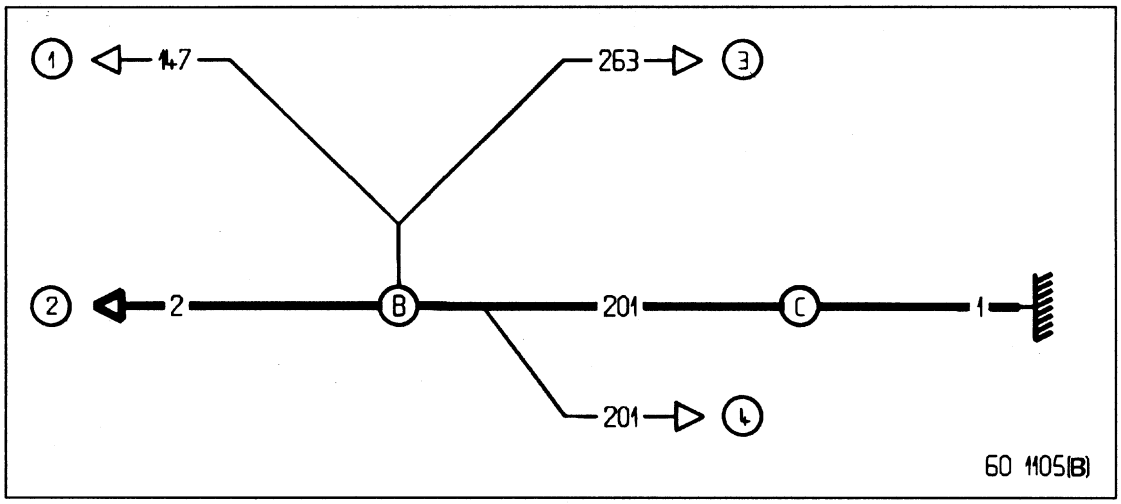
Schematic electrical diagram



- A : Batteries
- B : Electromagnetic master switch
- Cables 147 and 263 : Electromagnetic master switch control portion
- Cables 2 and 201 : Electromagnetic master switch power portion
- Cable 1 : Batteries earth cable
- 1 : Infra-red remote control box
- 2 : After master switch positive (+) power supply
- 3 : Infra-red remote control box
- 4 : DC positive (+) power supply

Precautions before welding

- Move the electromagnetic master switch to the “open” position (vehicle not supplied with power).
- Disconnect the 2 negative “-” (1) and positive “+” (201) cables from the batteries and join them together to earth.
- Mark and note down the location of the 5 cables connected to the electromagnetic master switch.
- Disconnect the 5 cables (1, 2, 147, 201, 263) from the electromagnetic master switch and join them together.
- Cables 1, 2, 147, 201 and 263 make an equipotential link connected to earth.



- C : Equipotential link N° 1.

- B : Equipotential link N° 2.

Precautions after welding

- Reconnect the 5 cables (1, 2, 147, 201, 263) to the electromagnetic master switch, paying attention to the location of their respective connections.
- Reconnect the 2 battery cables, starting with the positive (+) terminal (201) followed by the negative (-) terminal (1).

MIG or MAG semi-automatic welding sets

MIG : Metal Inert Gas (for welding using an inert gas : e.g. Argon)

MAG : Metal Active Gas (for welding using an active gas : 85 % Argon + CO_2 mixture).

Solid wires, used in semi-automatic welding, are defined by standard :
NF A 81-311 : (type GS2).

Wire diameter (in mm)	**Thickness to be welded** (in mm)
0.8	up to 2
1.0	from 2 to 8

2.3 STEEL GRADES FOR SIDEMEMBERS

Steel grades table

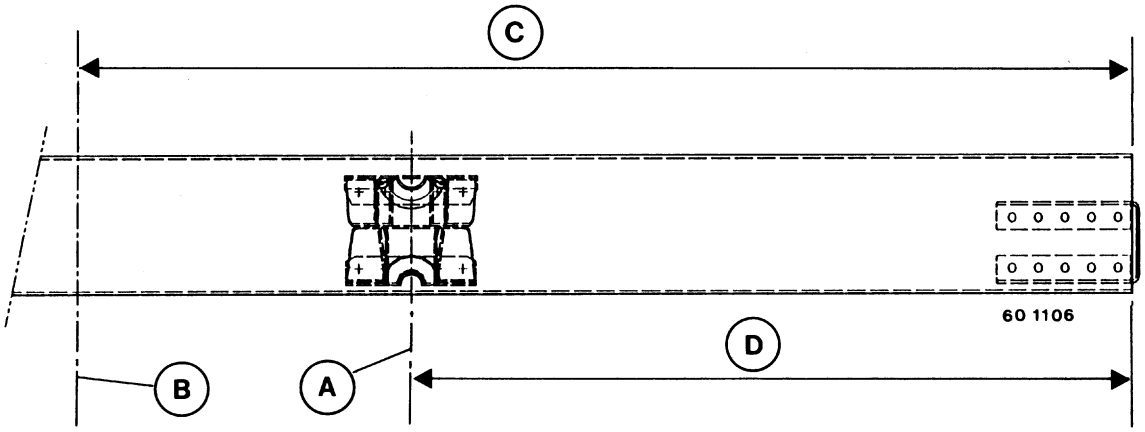
Vehicle range Rigid-Tractor	Sidemember section	Steel grade			
		C	D	E	F
PREMIUM Long distance - Distribution	258 x 82 x 7				X
PREMIUM Long distance - Distribution	260 x 82 x 8				X
PREMIUM Long distance - Distribution	290 x 82 x 7				X
PREMIUM Long distance - Distribution	292 x 82 x 8				X
KERAX 4x2 4x4 6x4 Tractor	302 x 82 x 8			X	
KERAX 4x2 6x4 6x6 8x4 Rigid	302 x 82 x 8	X			

Steel equivalence table (see Bodybuilder's Guide DT 6/354, page 35).

2-4 - REINFORCEMENT, EXTENSION, REDUCTION OF PREMIUM SIDEMEMBERS

Intermediate cross-member

If after extension, dimension (D) is greater than 1850 mm, add an intermediate cross-member in the rear overhang in the middle of dimension (D) (observing the data on page 26).



A - Cross-member centre-line
B - Drive axle centre-line
C - Sidemember rear overhang
D - Max. dimension 1850 mm

Procurement

- 1 cross-member ref. N° 00 00 782 454
- 2 gussets ref. N° 00 00 782 451
- 16 hexagon bolts M14 x 150-40 - class 10.9
- 16 hexagon nuts M14 x 150 - class 10
- 32 plain washers 14 x 30 x 4

For threaded hardware, see table, page 61.

2.5 - ATTACHMENT OF PREMIUM BODYWORK

The following instructions are to be observed without fail for attaching bodywork or equipment to our vehicles :
(For special cases, contact the Product Applications Department).

- All bodywork or equipment must have an inertia stop to the aft of each sidemember to retain the bodywork against motion.

- Lateral guiding must be assured :
  at the front : by brackets mounted as standard fitment,
  at the rear : by two guides (see Bodybuilders' Guide DT 6/354 - page 52).

- **The use of brackets mounted as standard fitment on the chassis is mandatory.**

- Fastening of sub-frames or underbodies must without fail be carried out according to defined recommendations (pages 36-39).

  A - Flexible fastening
  B - Semi-flexible fastening
  D - Rigid fastening

- Sub-frames or underbodies must without fail be continuous and follow the necking of the sidemembers and form a flat seat over the entire length of the chassis. They may be discontinuous according to the equipment and our recommendations, pages 58 to 61.

- The shape of sub-frames or underbodies must be degressive towards the front, under the cab, so as to avoid sudden variations in inertia (see Bodybuilders' Guide DT 6/354, pages 48-49).

  Overall cab aft dimensions are specified (pages 62-65).

- Protection against heat radiation : The closeness of the bodywork to the exhaust pipe, as well as the fitting of certain accessories (electric retarder, etc...) may require suitable heat shields to be installed by the bodybuilder.

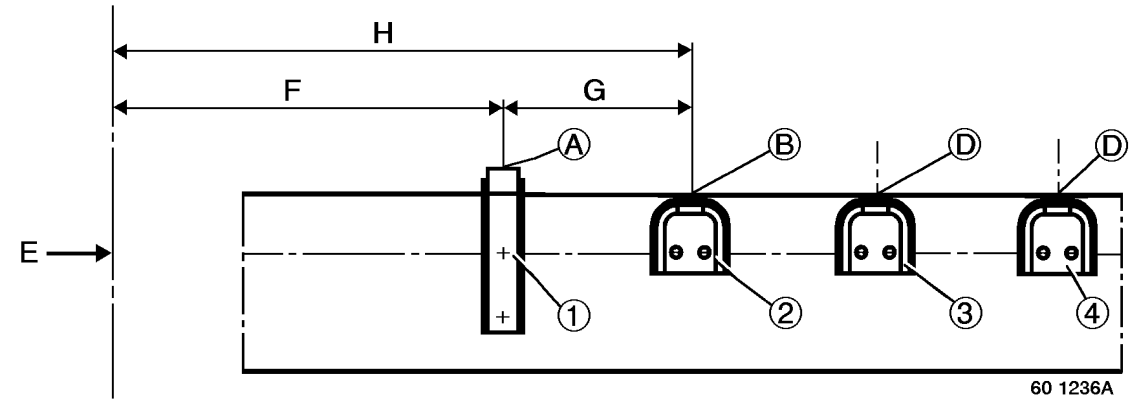
Correct attachment of the bodywork is essential so that both static and dynamic forces are unable to cause excessive localized stress and on the same occasion prejudice the reliability of the entire chassis frame or affect the road behaviour of the vehicle.

WE FORBID :

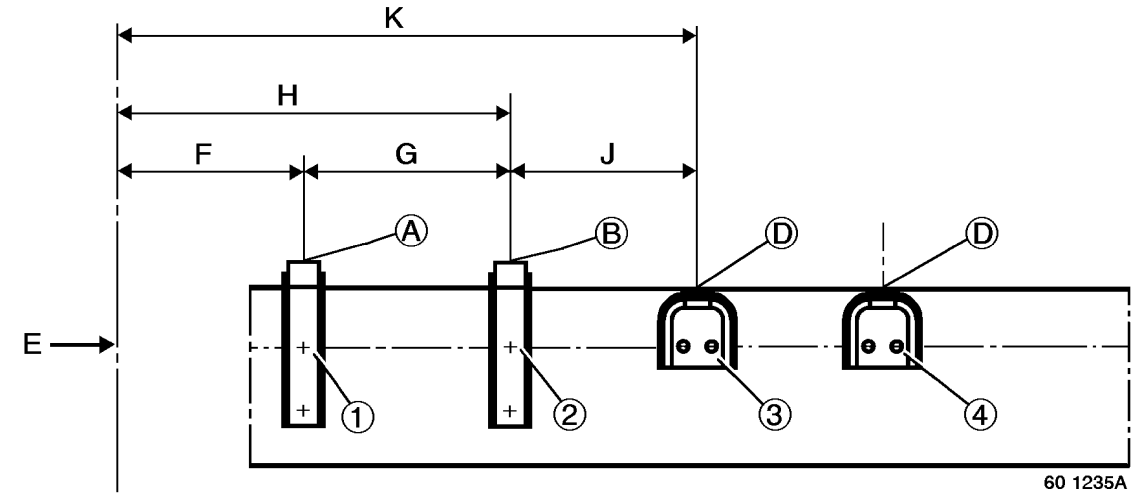
- Fastening of sub-frames using U-bolts, clamps or equivalent systems (hooks).
- Use, drilling or welding of spring hangers.
- Any modification to : chassis, driveline, suspension.
- Fastening of sub-frames by welding to our sidemembers.
- Drilling of stiffener gussets.
- Welding, notching of sidemembers, gussets or cross-members.
- With the exception of special cases described in this document, use or modification of our nut and bolt hardware for the fastening of bodies or sub-frames.
- Dismantling of brackets attached to the chassis.
- Inserting wooden blocks between the sub-frame and the chassis.

SIDEMEMBERS Height 290/292

SLEEPER CAB



DAY CAB



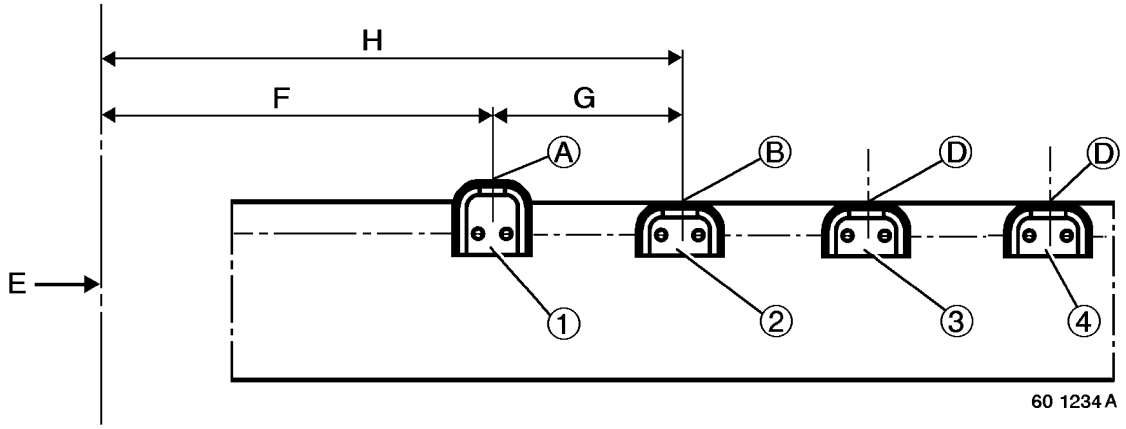
E = Axle centre-line

BRACKETS	1	2	3	4
FLEXIBLE FASTENING	A			
SEMI-FLEXIBLE		B		
RIGID			D	D

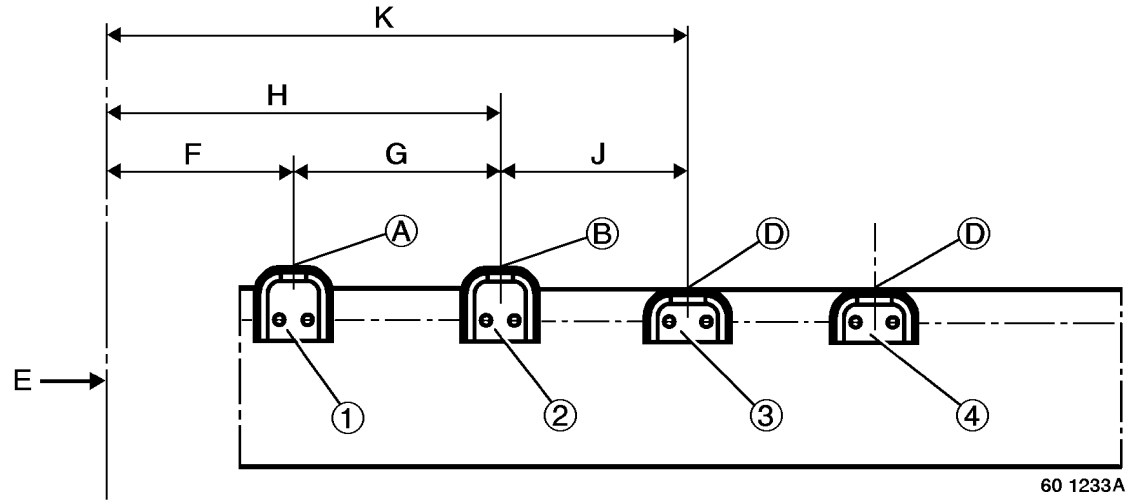
	DIMENSION		F	G	H	J	K
Day cab	Sidemember	RH	885	440	1325	742.5	2067.5
		LH				797.5	2122.5
	Sidemember 6x 2/4	RH	885	577.5	1490	577.5	2067.5
		LH					
Sleeper cab	Sidemember	RH	1325	742.5	2067.5		
		LH		797.5	2122.5		
	Sidemember 6 x 2/4	RH	1490	577.5	2095		
		LH					

SIDEMEMBERS Height 258/260

SLEEPER CAB



DAY CAB

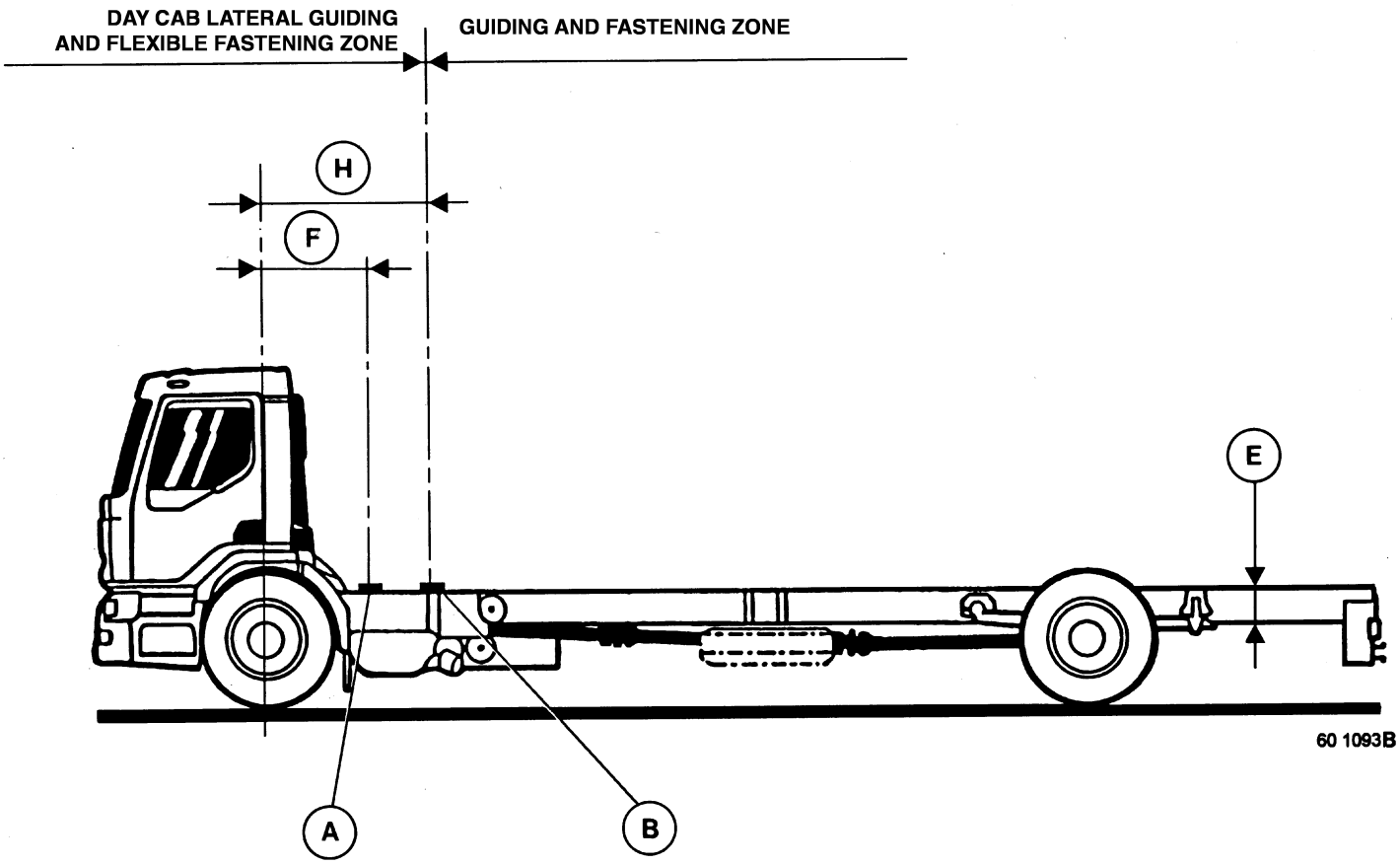


E = Axle centre-line

BRACKETS	1	2	3	4
FLEXIBLE FASTENING	A			
SEMI-FLEXIBLE		B		
RIGID			D	D

	DIMENSION		F	G	H	J	K
Day cab	Sidemember	RH	857.5	495	1352.5	715	2067.5
		LH				770	2122.5
Sleeper	Sidemember	RH	1352.5	715	2067.5		
		LH		770	2122.5		

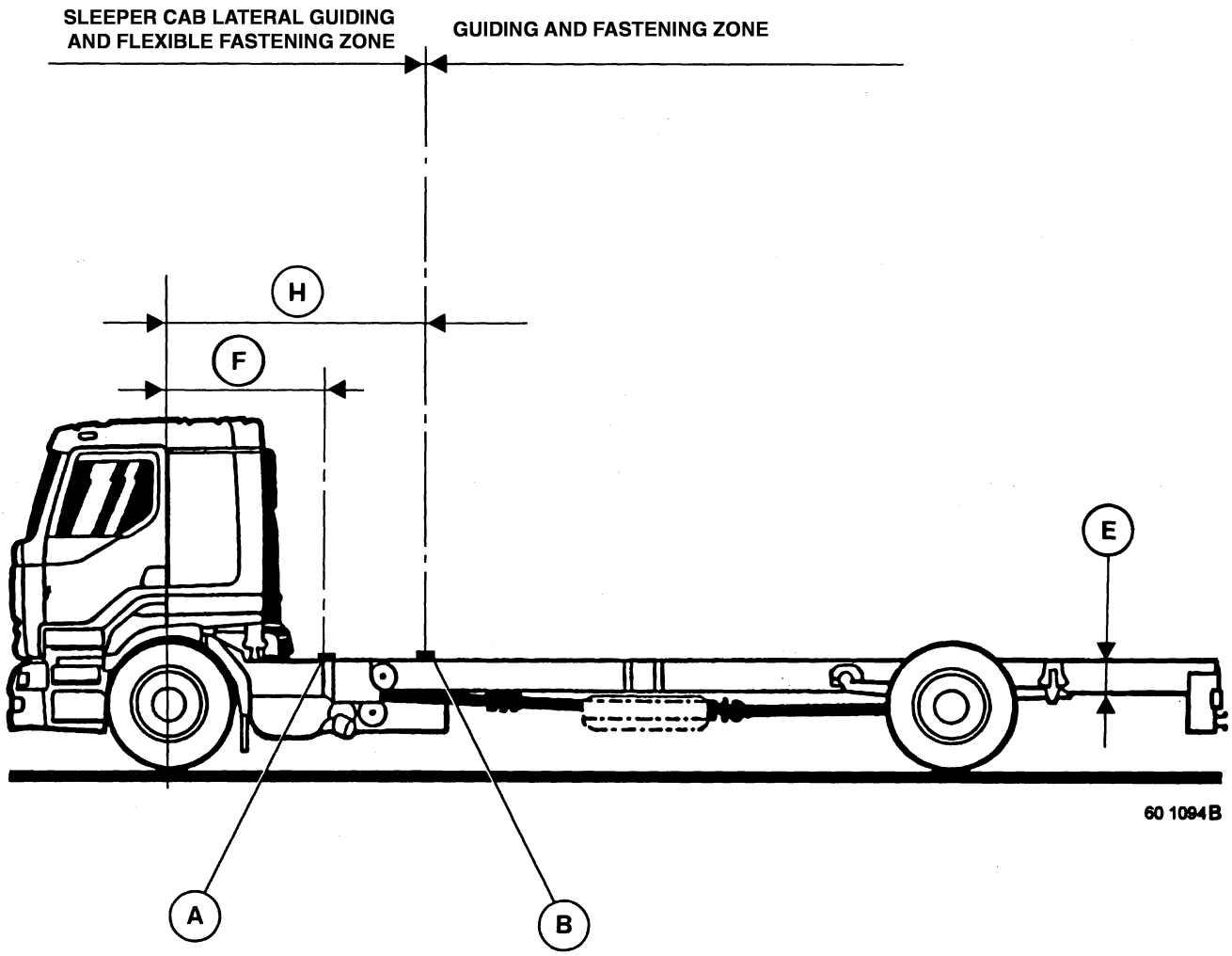
Day cab lateral guiding and fastening zone



B - Semi-flexible fastening (2 possibilities, see pages 37-38)
A - Flexible fastening (2 possibilities, see page 36)

E Sidemember height	F RH side	H LH side
258/260 mm	857.5 mm	1352.5 mm
290/292 mm 4x2 rigid 6x2 rigid	885 mm	1325 mm
290/292 mm 6x2/4 rigid	885 mm	1490 mm

Sleeper cab lateral guiding and fastening zone



B - Semi-flexible fastening (2 possibilities, see pages 37-38)
A - Flexible fastening (2 possibilities, see page 36)

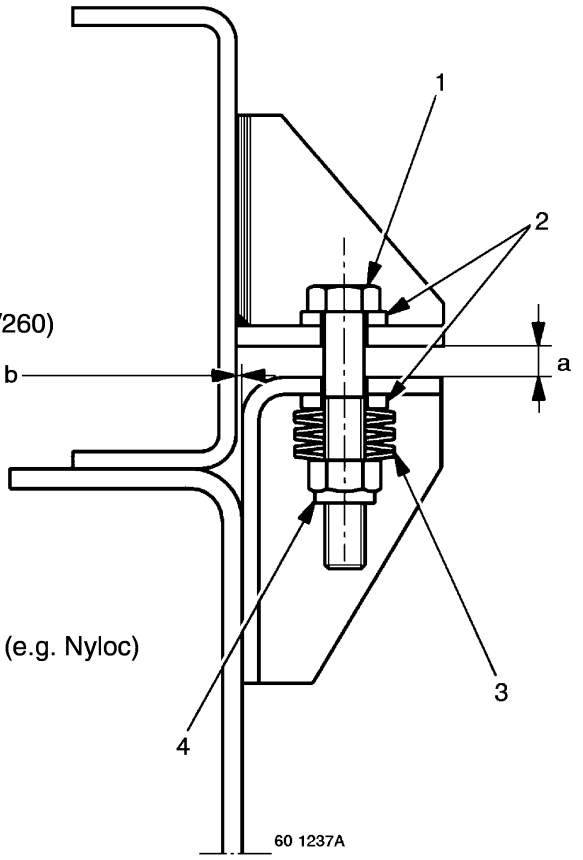
E Sidemember height	F	H RH side	H LH side
258/260 mm	1352.5 mm	2067.5 mm	2122.5 mm
290/292 mm 4x2 rigid 6x2 rigid	1325 mm	2062.5 mm	2122.5 mm
290/292 mm 6x2/4 rigid	1490 mm	2067.5 mm	2067.5 mm

Types of bodywork fastenings

A - Flexible fastening (sidemember 258/260)

1 - Hexagon bolt M14 x 150 x 90, class 10.9
2 - 2 plain washers 14 x 30 x 5
3 - 6 cone washers (BELLEVILLE type) :
i/d 14.5 mm
o/d 35 mm
thickness 1.8 mm
unit preload 400 kg
4 - Nut DRH M14 class 10,
or other locknut except nut with nylon ring (e.g. Nyloc)
a - Clearance 10 to 15 mm max.
b - Clearance 2 mm max.
- Tightening to 50% of the deflection

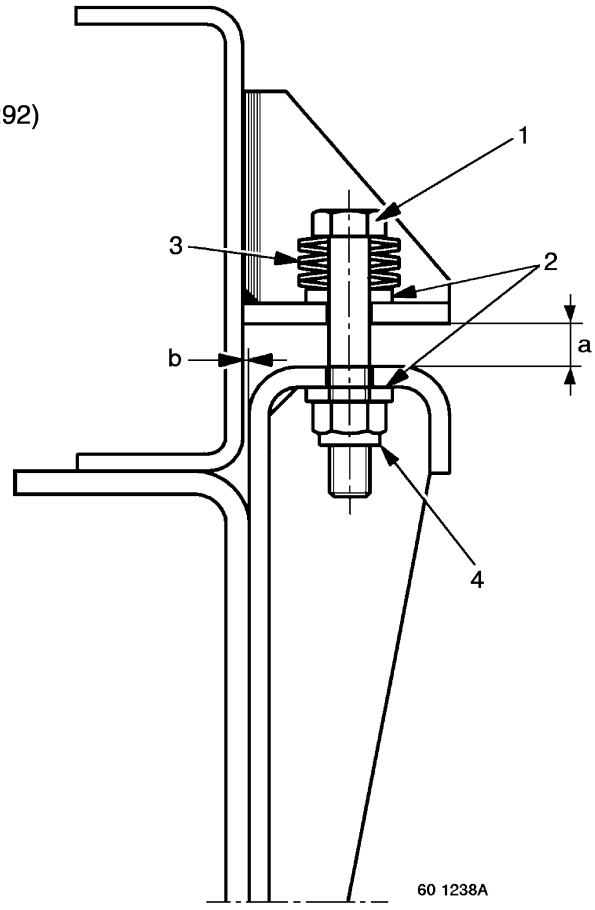
$$\frac{6 \times 1.2 \text{ (deflection)}}{2} = 3.6 \text{ mm}$$



B - Flexible fastening (sidemember 290/292)

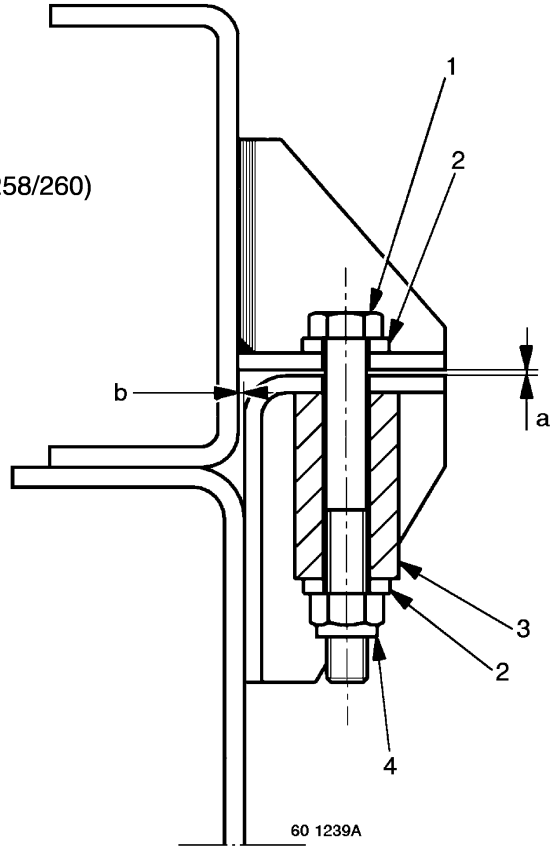
1 - Hexagon bolt M14 x 150 x 90, class 10.9
2 - 2 plain washers 14 x 30 x 5
3 - 6 cone washers (BELLEVILLE type) :
i/d 14.5 mm
o/d 35 mm
thickness 1.8 mm
unit preload 400 kg
4 - Nut DRH M14 class 10,
or other locknut except nut
with nylon ring (e.g. Nyloc)
a - Clearance 10 to 15 mm max.
b - Clearance 2 mm max.
- Tightening to 50% of the deflection

$$\frac{6 \times 1.2 \text{ (deflection)}}{2} = 3.6 \text{ mm}$$



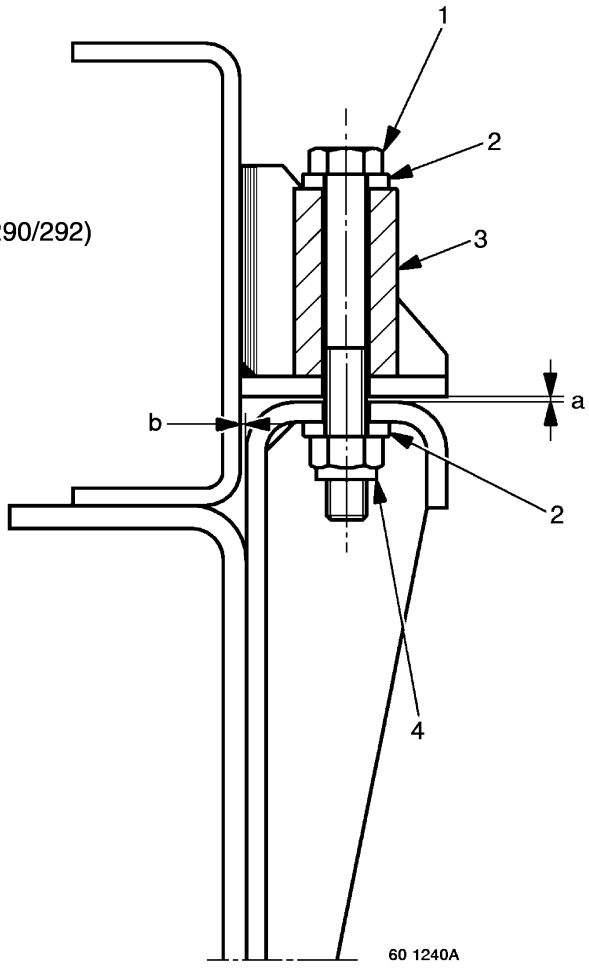
B - **Semi-flexible fastening** (sidemember 258/260)
Day cab

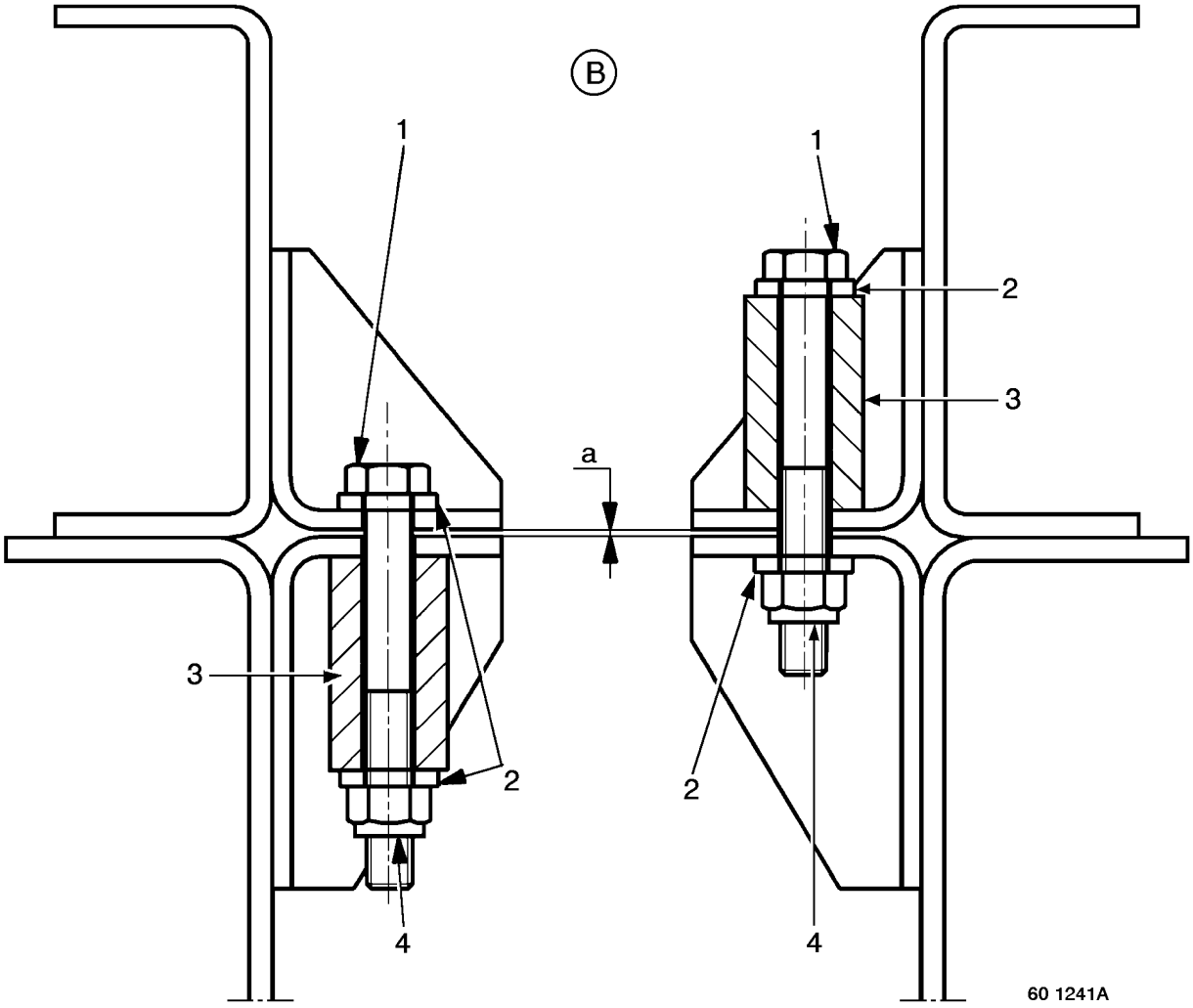
1 - Hexagon bolt M14 x 150 x 110, class 10.9
2 - 2 plain washers 14 x 30 x 5
3 - Steel spacer 15x38-65 (min.)
After cutting, true the 2 faces.
4 - Nut DRH M14 class 10,
or other locknut except nut
with nylon ring (e.g. Nyloc).
a - Clearance 1 to 2 mm before tightening
b - Clearance 2 mm max.
- Tightening at standardized
torque (see page 61).



B - **Semi-flexible fastening** (sidemember 290/292)
Sleeper cab

1 - Hexagon bolt M14 x 150 x 110, class 10.9
2 - 2 plain washers 14 x 30 x 5
3 - Steel spacer 15x38-65 (min.)
After cutting, true the 2 faces.
4 - Nut DRH M14 class 10,
or other locknut except nut
with nylon ring (e.g. Nyloc).
a - Clearance 1 to 2 mm before tightening
b - Clearance 2 mm max.
- Tightening at standardized
torque (see page 61).





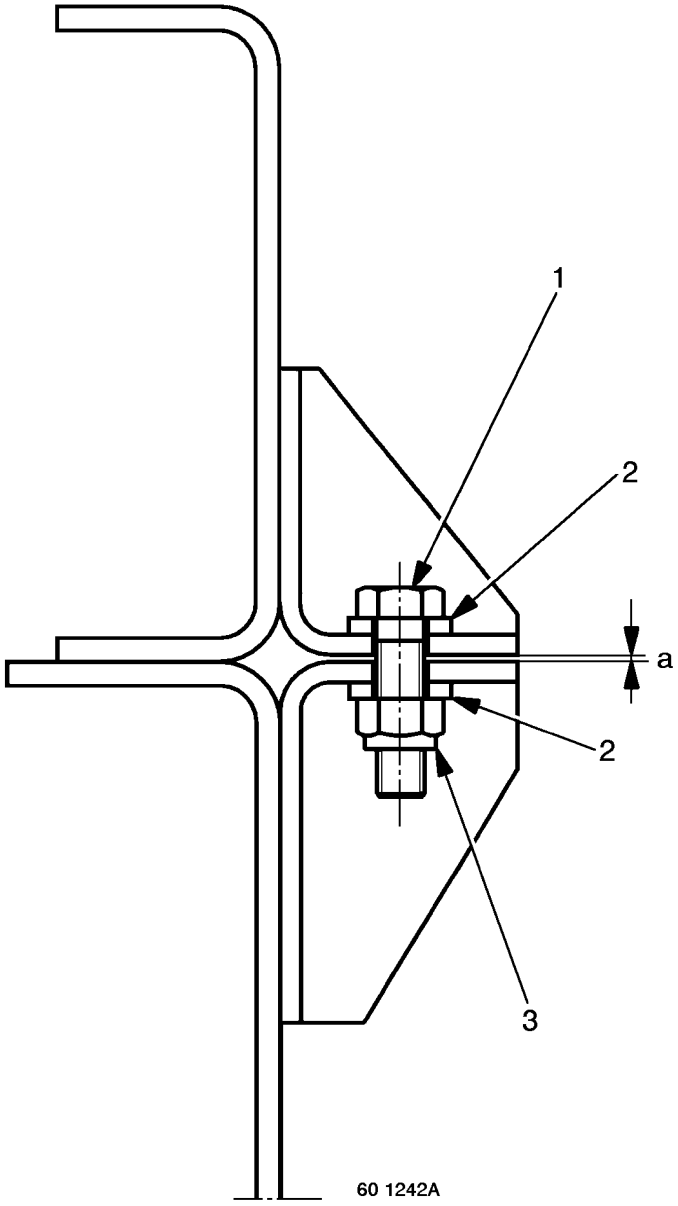
B - Semi-flexible fastening (sidemembers 258/260 & 290/292)
Sleeper cab

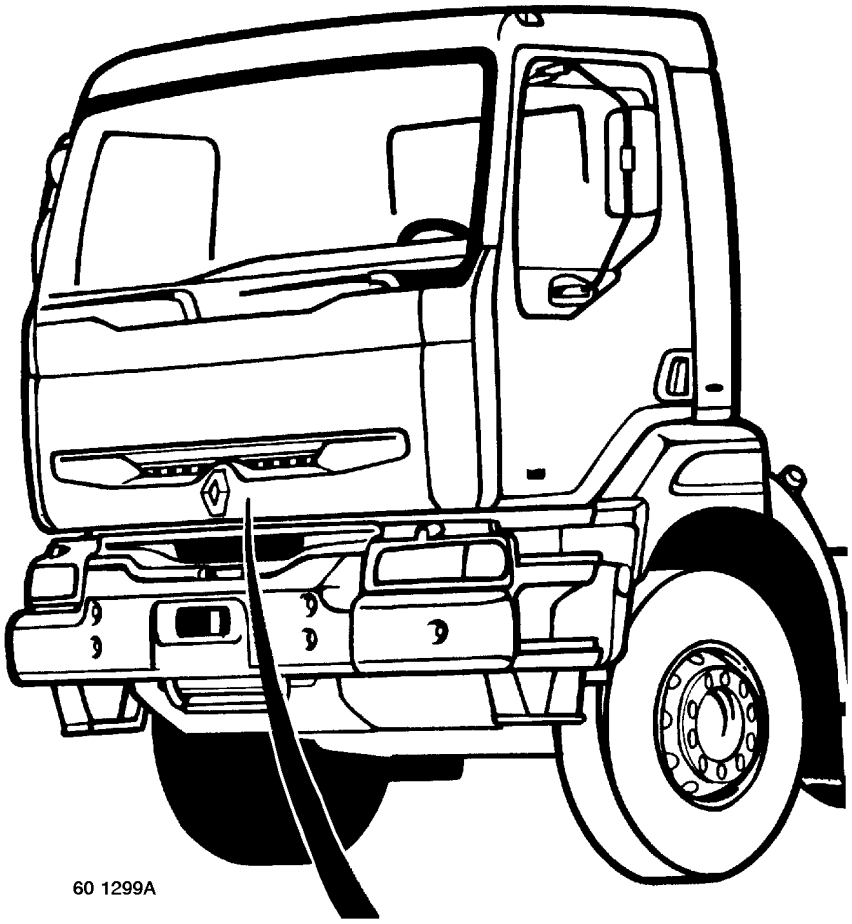
1 - Hexagon bolt M14 x 150 x 110, class 10.9
2 - 2 plain washers 14 x 30 x 5
3 - Steel spacer 15x38-65 (min.),
positioned above or below depending on surroundings.
After cutting, true the 2 faces.
4 - Nut DRH M14 class 10,
or other locknut except nut with nylon ring (e.g. Nyloc).
a - Clearance 1 to 2 mm before tightening
- Tightening at standardized torque (see page 61).

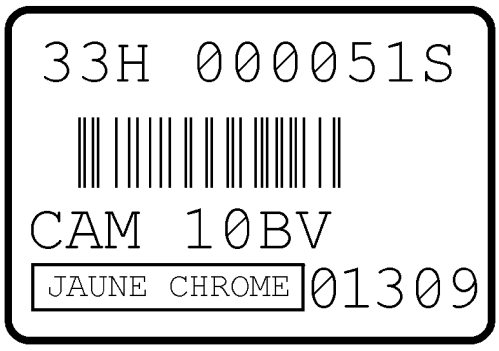
B - Rigid fastening

(sidemembers 258/260 & 290/292)

1 - Hexagon bolt M14 x 60, class 10.9
2 - 2 plain washers 14 x 30 x 5
3 - Nut DRH M14 class 10,
or other locknut except nut
with nylon ring (e.g. Nyloc).
a - Clearance 1 to 2 mm before tightening,
then tighten at standardized
torque (see page 61).







Example : 33 H 6x4 tipper

2.5 - ATTACHMENT OF KERAX BODYWORK

The following instructions are to be observed without fail for attaching bodywork or equipment to our vehicles :

- Lateral guiding must be assured :
  at the front : by brackets mounted as standard fitment,
  at the rear : by plates (pages 44 to 47).

- **The use of brackets mounted as standard fitment on the chassis is mandatory.**

- Fastening of sub-frames or underbodies must without fail be carried out according to defined recommendations.

- Sub-frames or underbodies must without fail be continuous and follow the necking of the sidemembers and form a flat seat over the entire length of the chassis.

- The shape of sub-frames or underbodies must be degressive towards the front, under the cab, so as to avoid sudden variations in inertia (see Bodybuilders' Guide DT 6/354, pages 48-49).

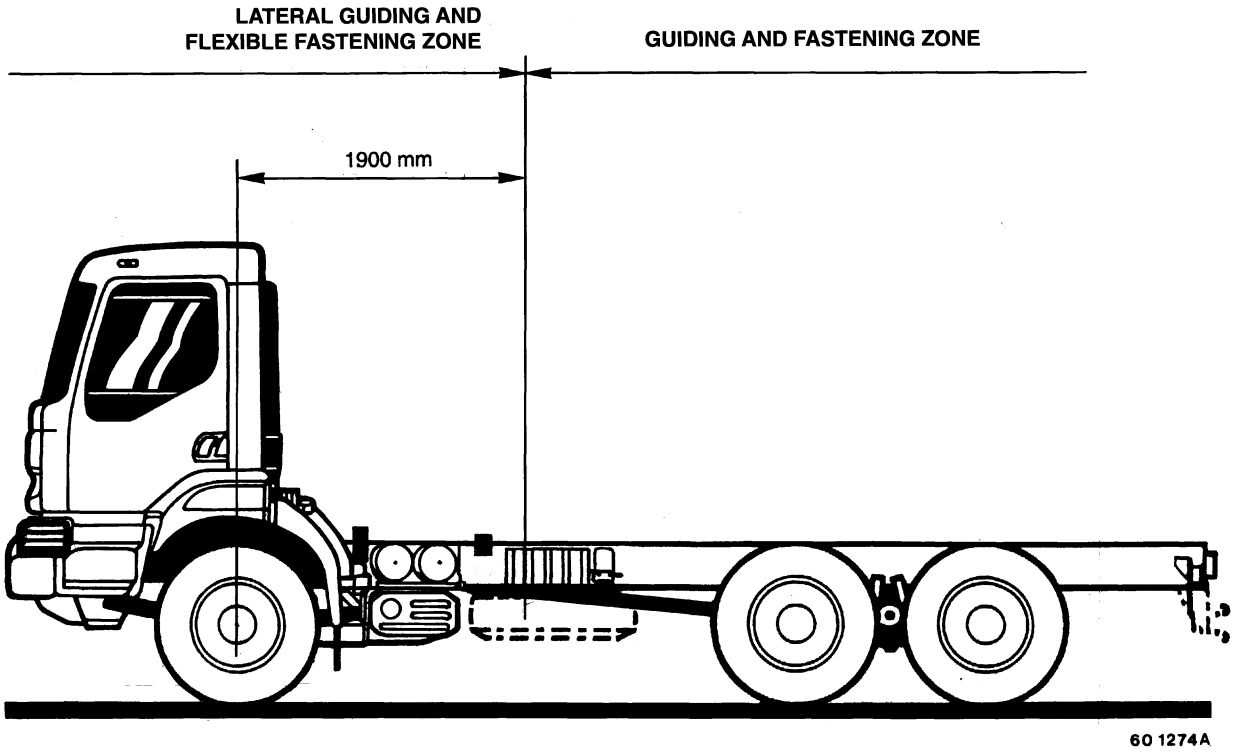
- Protection against heat radiation : The closeness of the bodywork to the exhaust pipe, as well as the fitting of certain accessories (electric retarder, etc...) may require suitable heat shields to be installed by the bodybuilder.

Correct attachment of the bodywork is essential so that both static and dynamic forces are unable to cause excessive localized stress and on the same occasion prejudice the reliability of the entire chassis frame or affect the road behaviour of the vehicle.

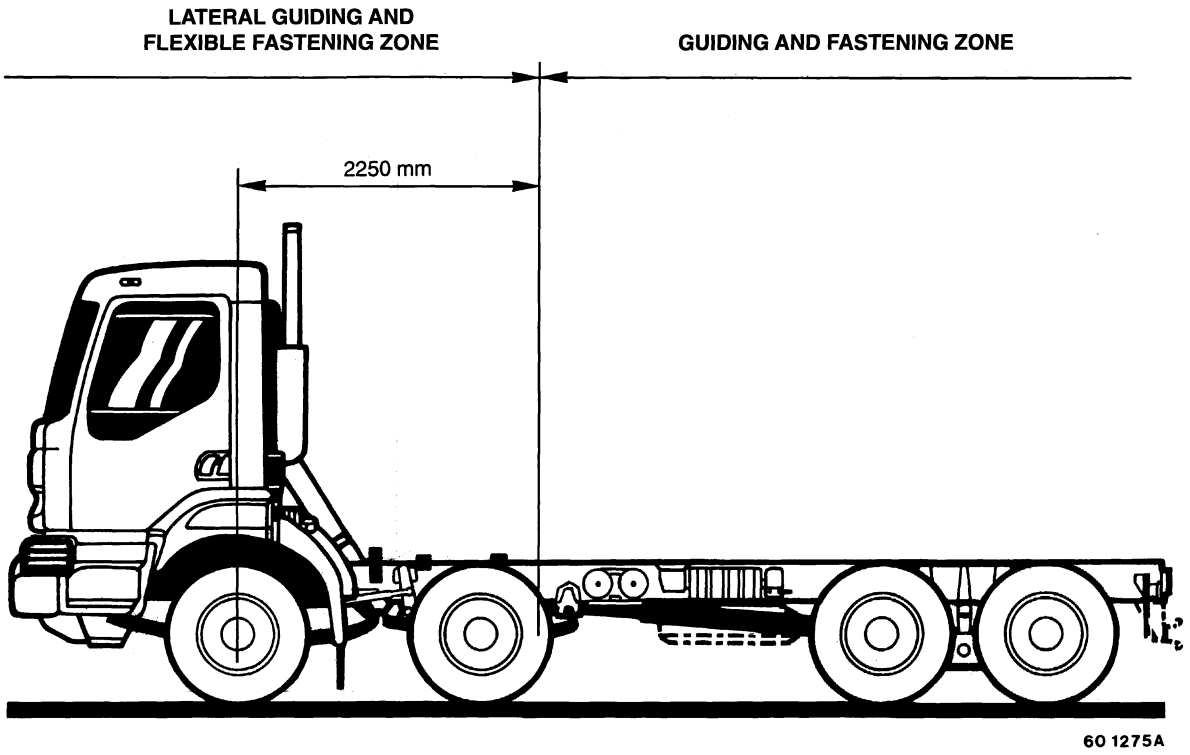
WE FORBID :

- Fastening of sub-frames using U-bolts, clamps or equivalent systems (hooks).
- Use, drilling or welding of spring hangers.
- Any modification to : chassis, driveline, suspension.
- Fastening of sub-frames by welding to our sidemembers.
- Drilling of stiffener gussets.
- Welding, notching of sidemembers, gussets or cross-members.
- Dismantling of brackets attached to the chassis.
- Wooden blocks.

KERAX 4x2, 4x4, 6x4, 6x6 RANGE

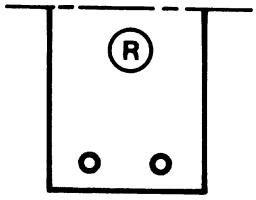


KERAX 8x4 RANGE

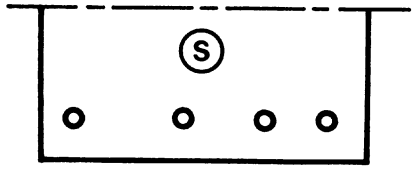


BODYWORK FASTENING PLATES FOR KERAX 4x2, 4x4, 6x4, 6x6, 8x4

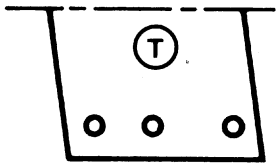
R - Side plate, 2 holes with 55 mm between-centres



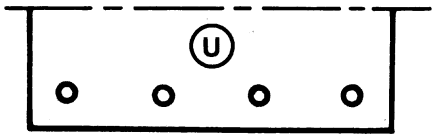
S - Side plate towards tandem



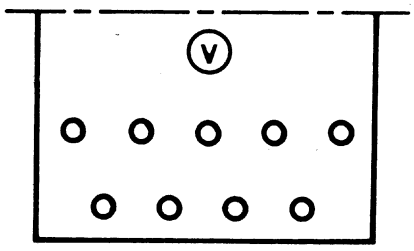
T - Specific LH & RH side plate with elastomer suspension



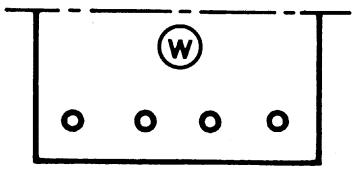
U - Rear end plate, 4 holes with 80 mm between-centres



V - Rear end plate, 9 holes, for tipper



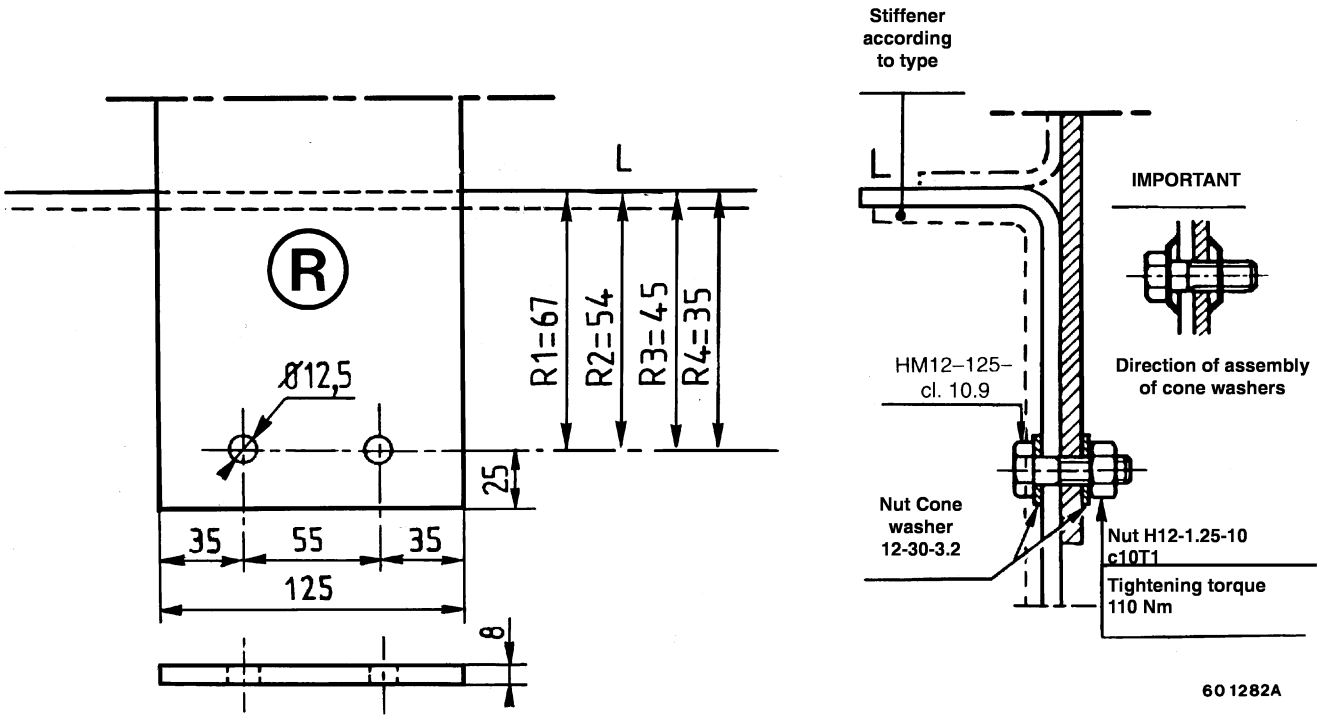
W - Rear side plate



Plates fastening principle

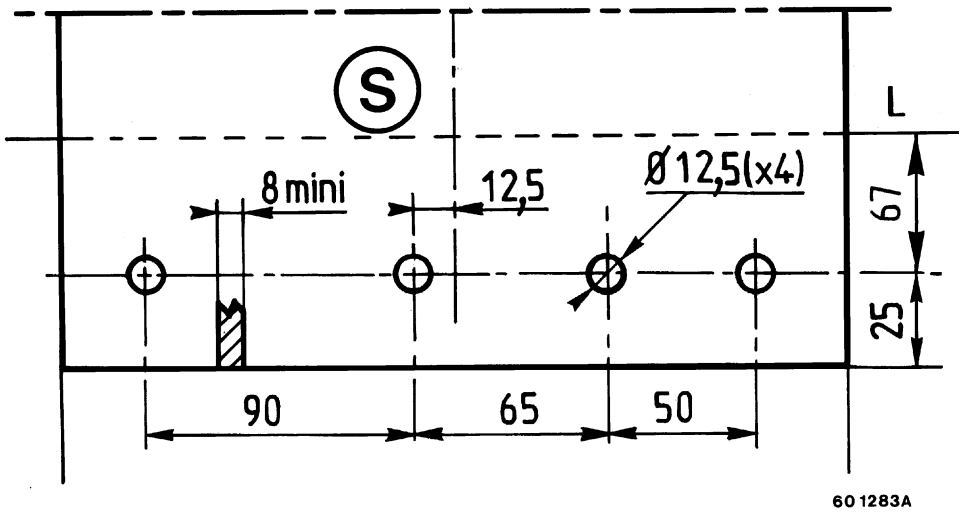
General drilling tolerance ± 0.5 mm for hole between-centres.

Side plate, 2 holes with 55 mm between-centres SHEET METAL HLE 355D NF A 36231



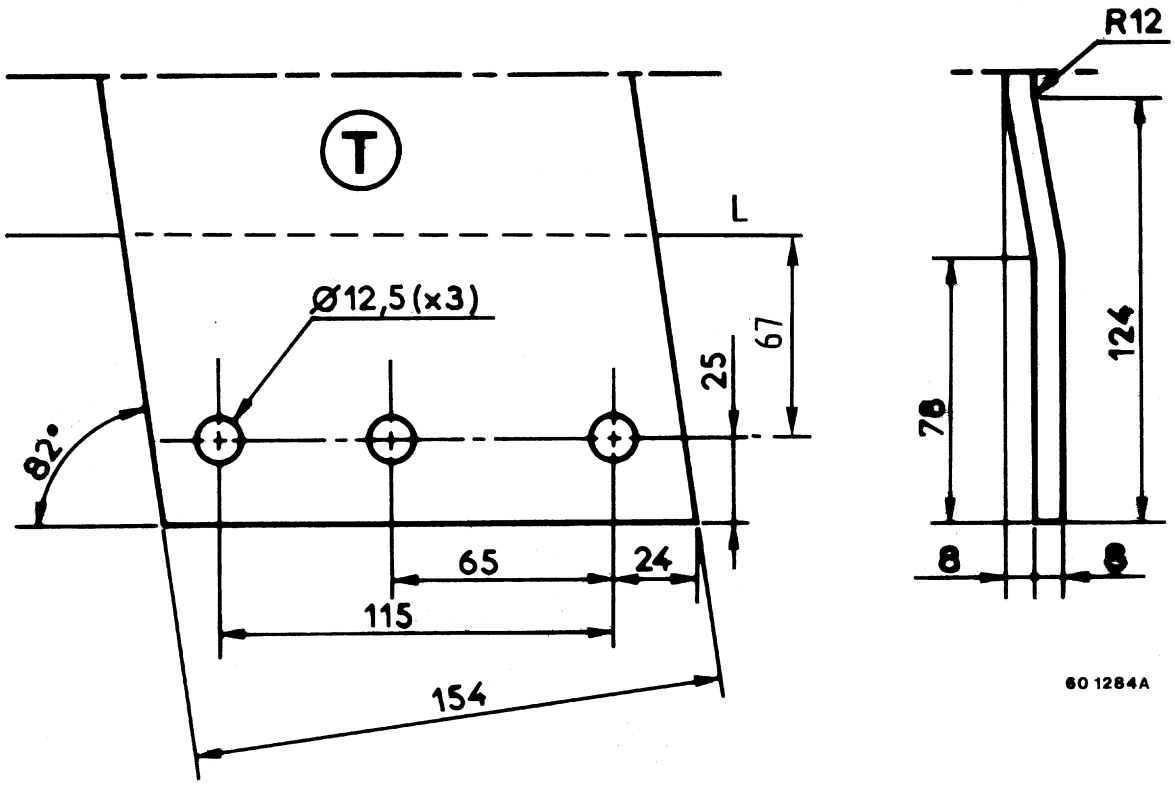
L = Sidemember top

Side plate towards tandem SHEET METAL HLE 355D NF A 35231



Specific LH & RH side plate
with elastomer suspension

SHEET METAL HLE 355D NF A 36231

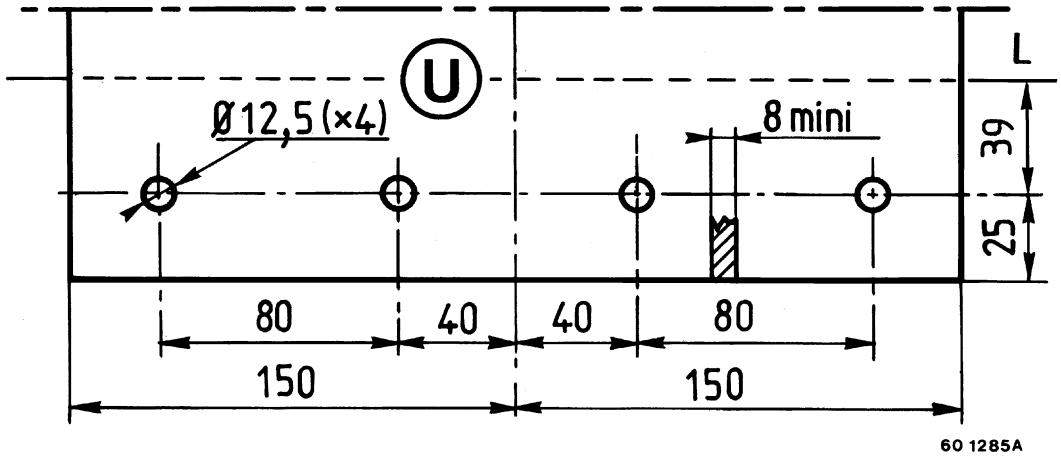


L = Sidemember top

Left-hand front and right-hand rear of tandem assembly and other position of symmetrical parts

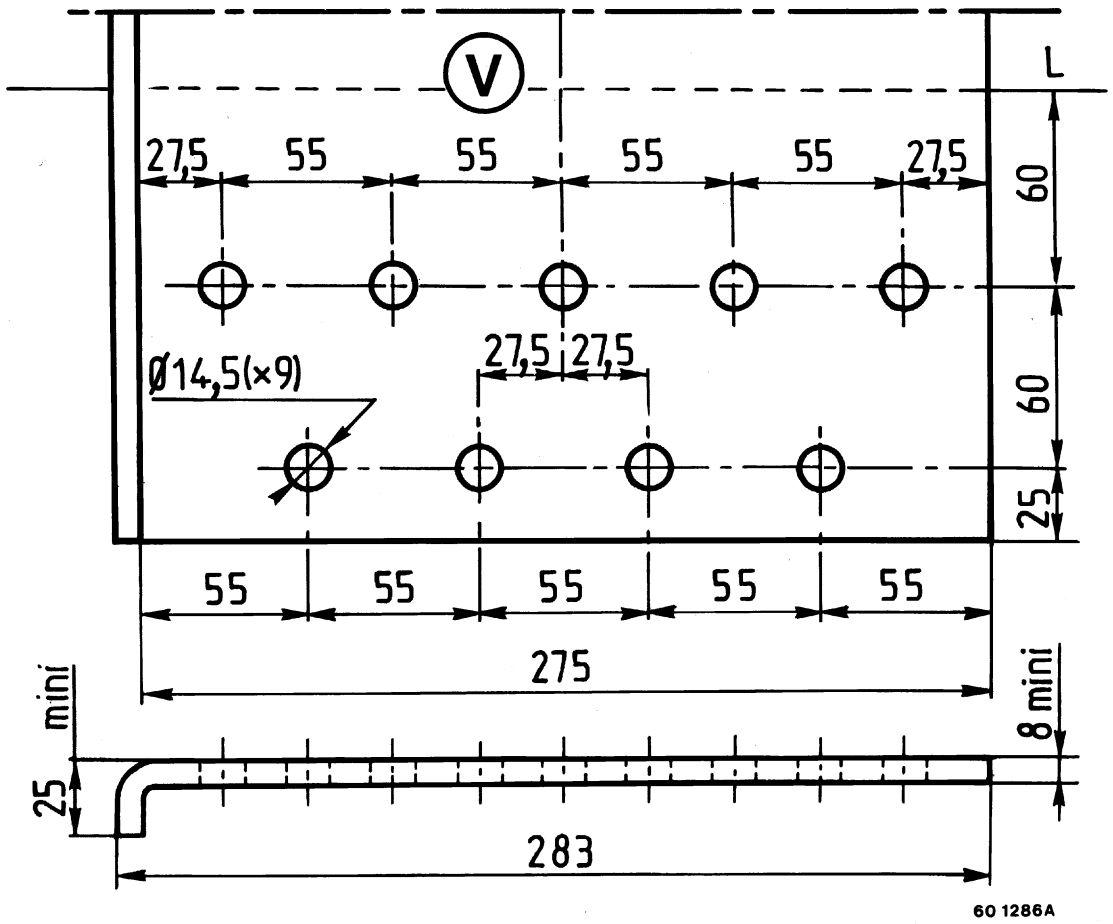
Rear end plate, 4 holes with 80 mm
between-centres

SHEET METAL HLE 355D NF A 35231

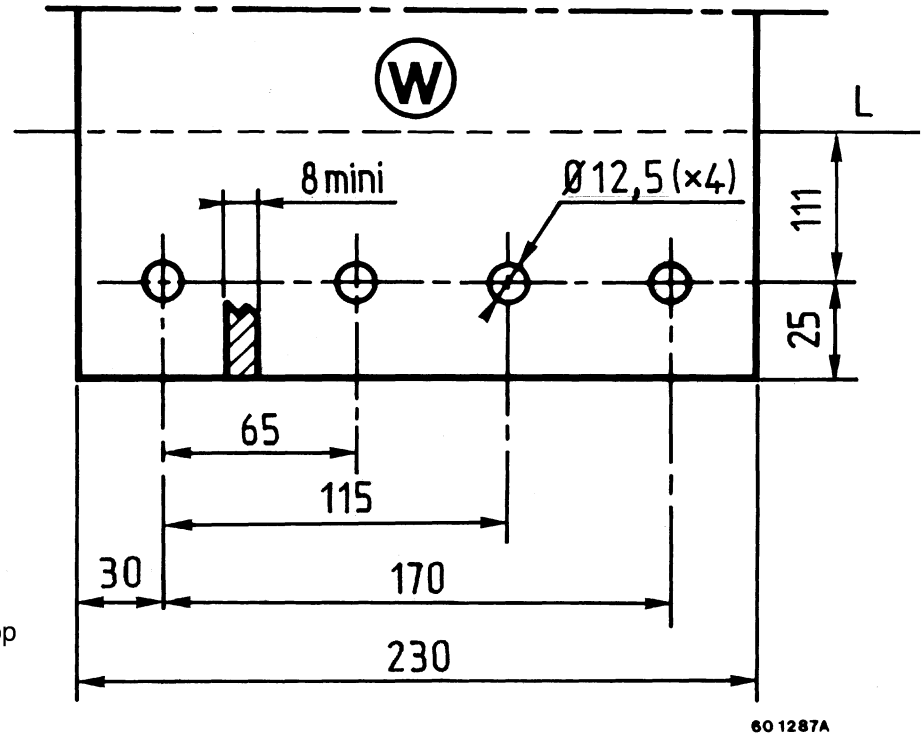


Rear end plate, 9 holes, for tipper SHEET METAL HLE 355D NF A 36231

Nuts and bolts dia. 14.150 - class 10.9
170 Nm - washer 14 x 30 x5



Rear side plate SHEET METAL HLE 355D NF A 35231

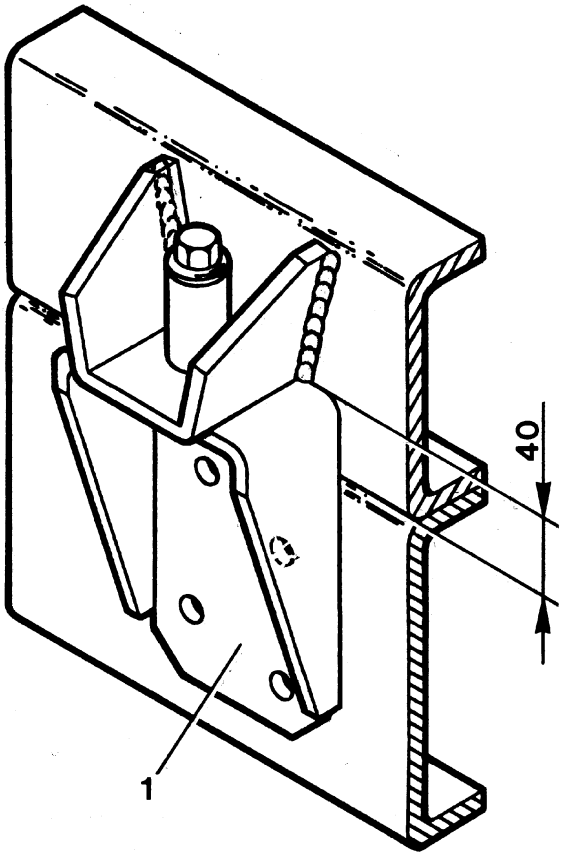


L = Sidemember top

Brackets fastening principle

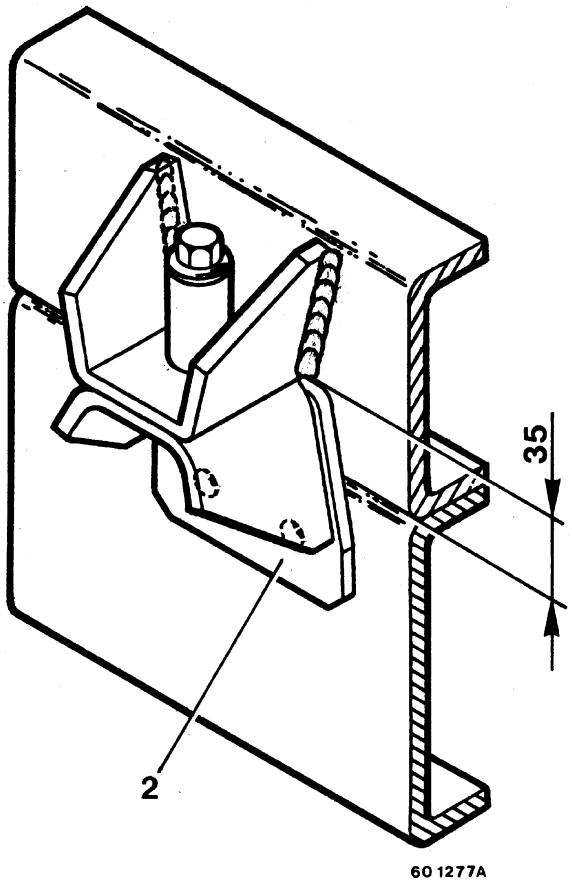
MINIMUM CHARACTERISTICS

- See kit, page 90.
- Spacer, H = 65
- Bolts = Ø 14/150 fine pitch, class 10.9
- Washers= 14x30x5
- Lock nuts type DRH
- Tightening torques = 170 Nm
- Slight clearance before tightening
- Contact under a torque of 20 to 30 Nm
- Sheet metal type HLE 355D NF A 36231

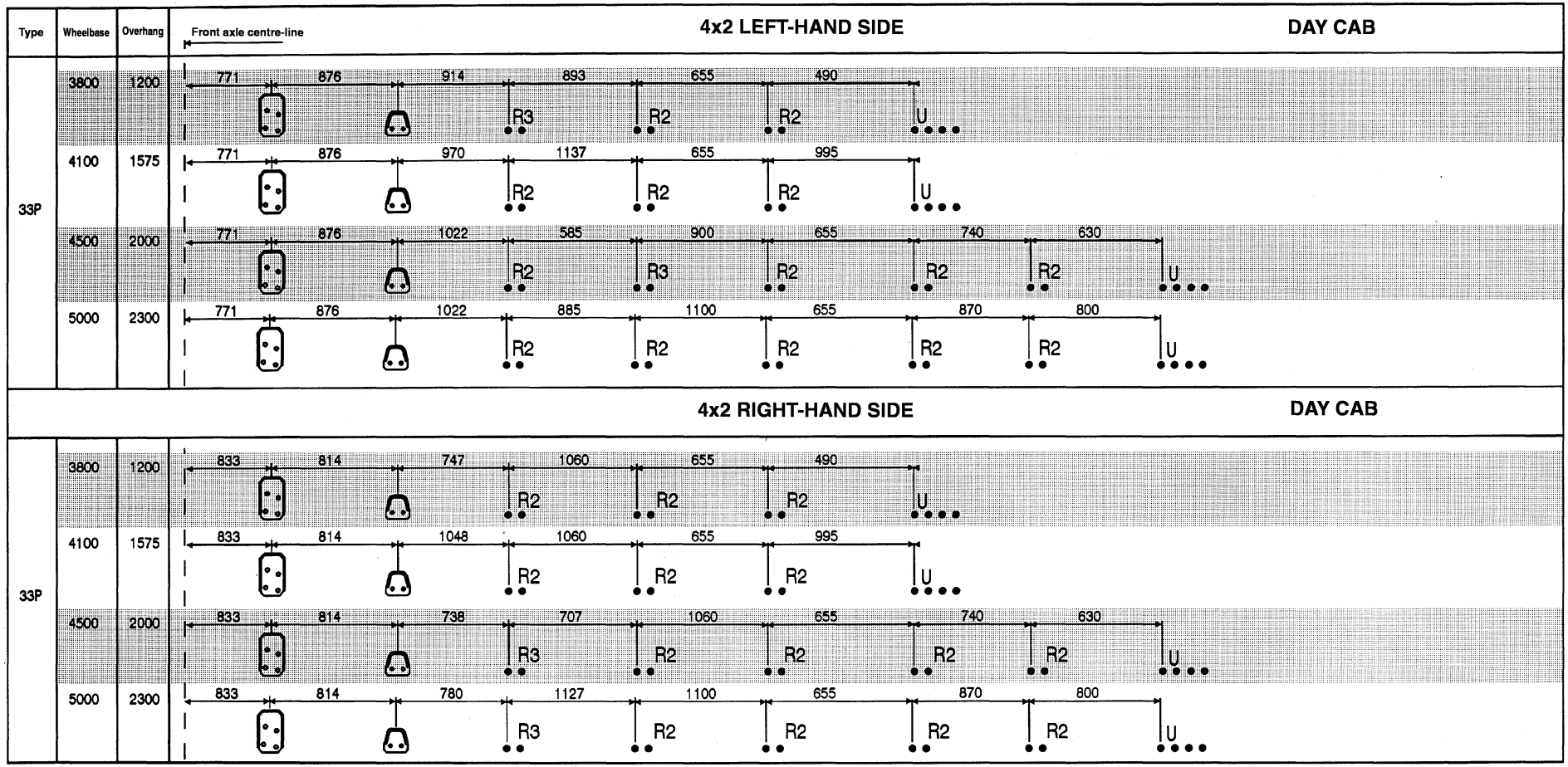


60 1276A

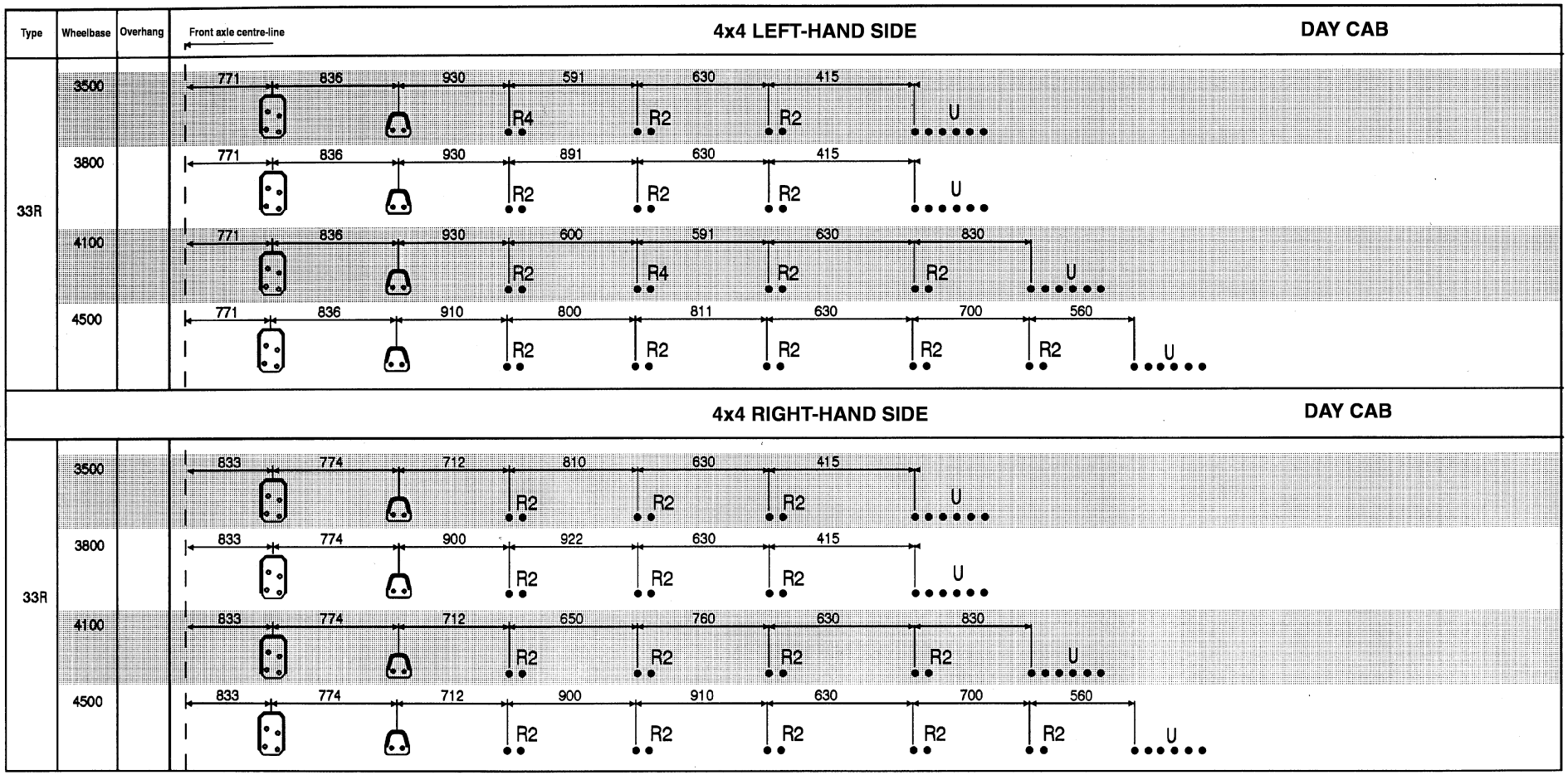
- 1st bracket (1)
- 2nd or 3rd bracket (2)



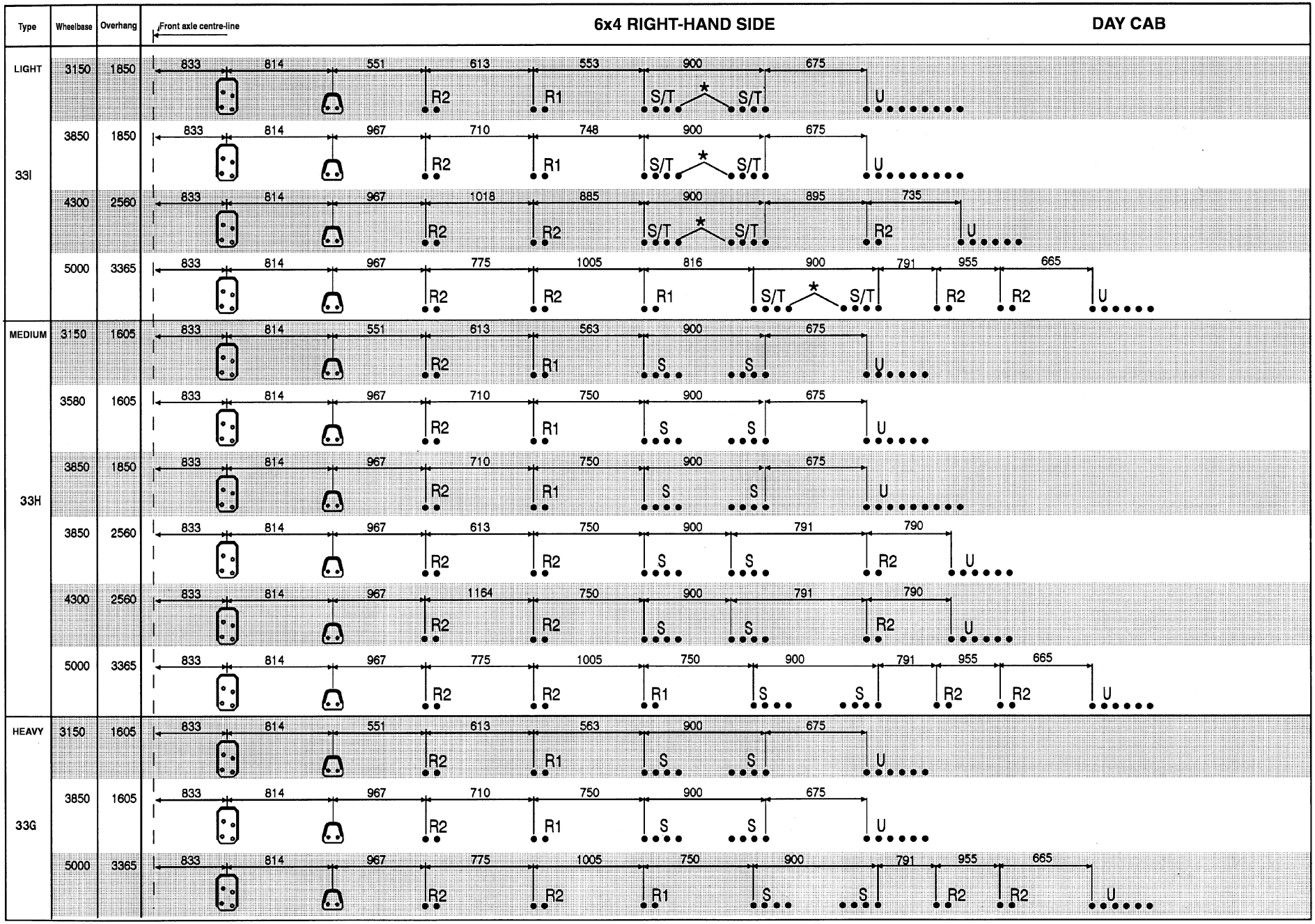
60 1277A



Note : Change the nuts and bolts for holes already used for chassis fastenings (cross-member, gusset, etc...).

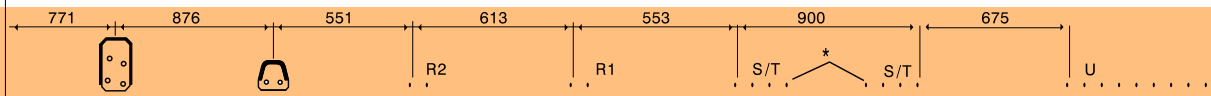
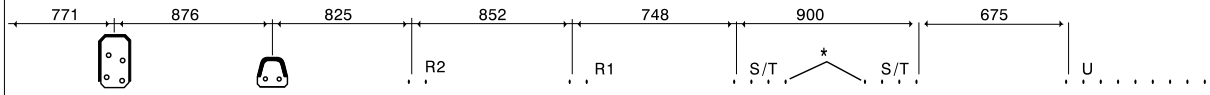
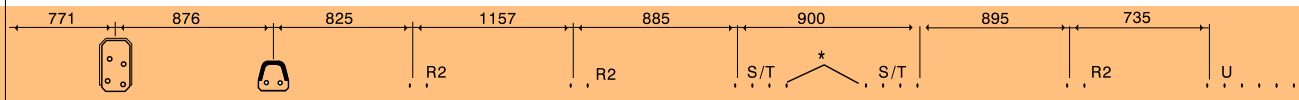
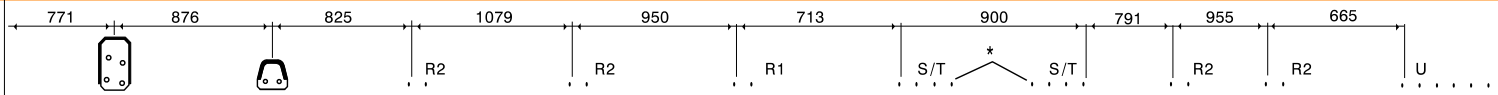
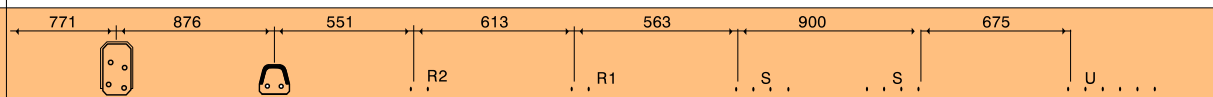
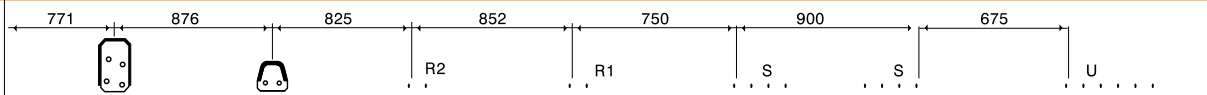
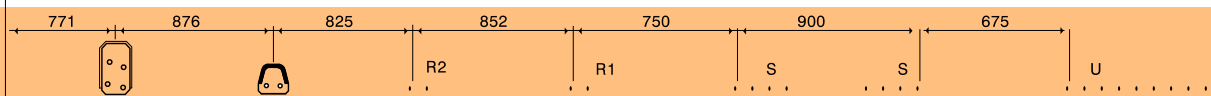
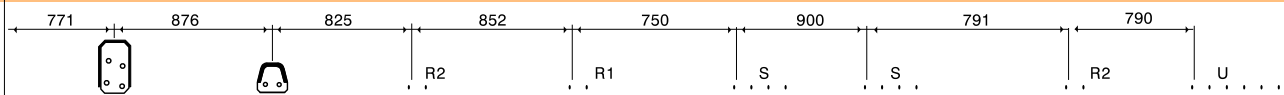
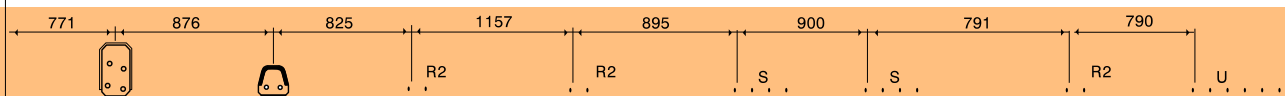
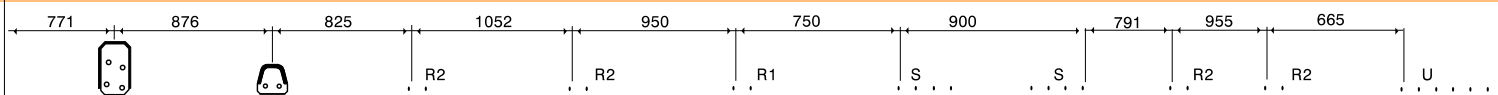
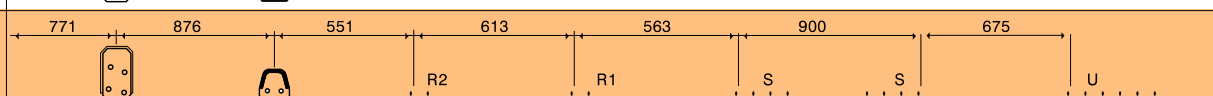
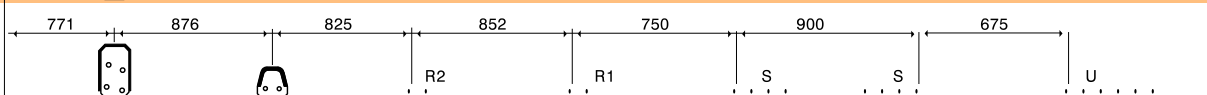
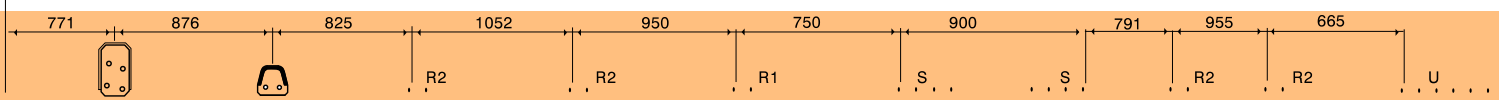


Note : Change the nuts and bolts for holes already used for chassis fastenings (cross-member, gusset, etc...).



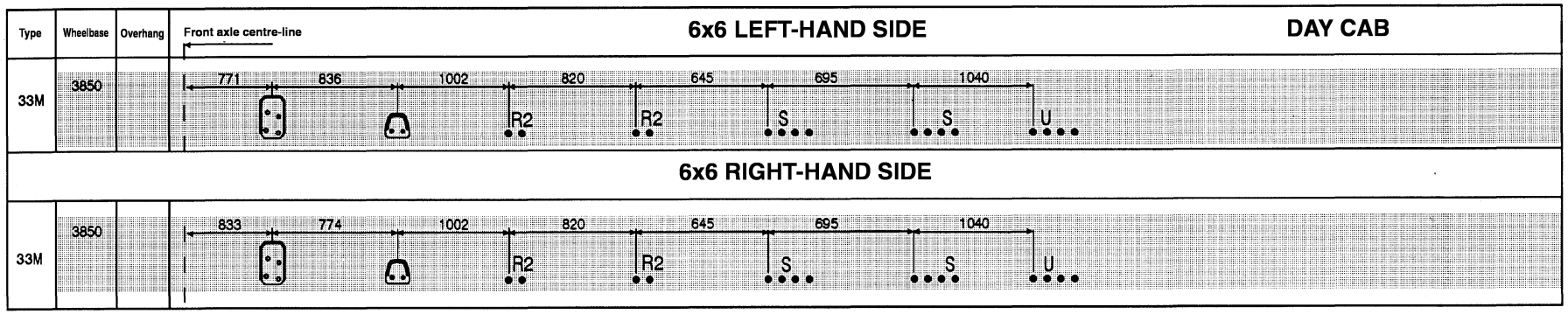
* With elastomer suspension (use plate T). For other suspensions, use plate S.

Note : Change the nuts and bolts for holes already used for chassis fastenings (cross-member, gusset, etc...).

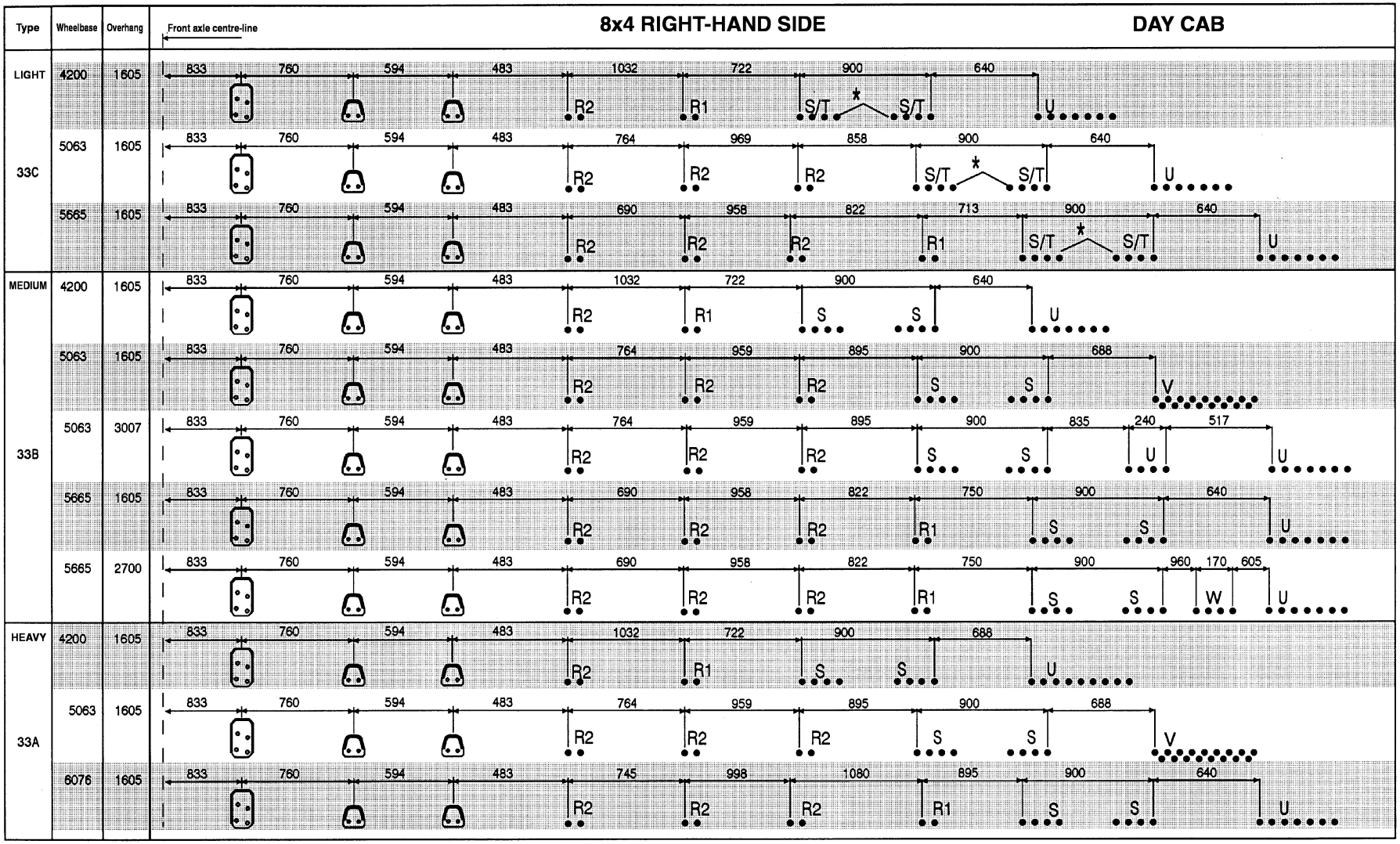
TYPE	EMPAT.	P.A.F	Axe essieu AV — 6x4 COTE GAUCHE — CABINE COURTE
LEGER	3150	1850	
33I	3850	1850	
	4300	2560	
	5000	3365	
MOYEN	3150	1605	
	3850	1605	
33H	3850	1850	
	3850	2560	
	4300	2560	
	5000	3365	
LOURD	3150	1605	
33G	3850	1605	
	5000	3365	

* Avec suspension élastomère (utiliser la plaque T). Autres suspension utiliser la plaque S

Nota : Changer la boulonnerie pour les trous déjà utilisés pour fixations chassis (traverse, gousset

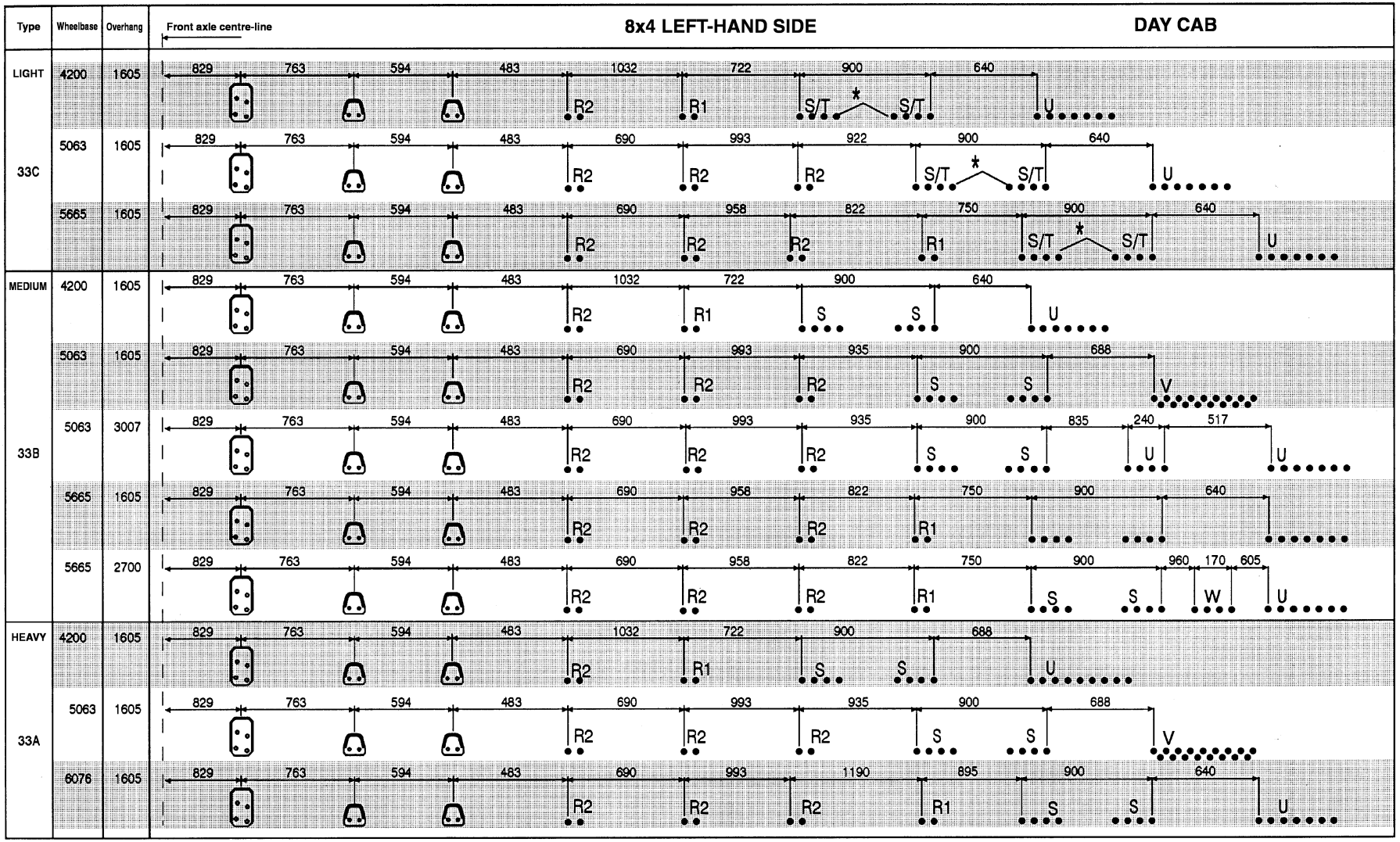


Note : Change the nuts and bolts for holes already used for chassis fastenings (cross-member, gusset, etc...).



* With elastomer suspension (use plate T). For other suspensions, use plate S.

Note : Change the nuts and bolts for holes already used for chassis fastenings (cross-member, gusset, etc...).



* With elastomer suspension (use plate T). For other suspensions, use plate S.

Note : Change the nuts and bolts for holes already used for chassis fastenings (cross-member, gusset, etc...).

For sleeper cab, positioning of 1st bracket

Type	Front drive axle centre-line	LEFT-HAND SIDE	SLEEPER CAB
All vehicles	800		
		RIGHT-HAND SIDE	SLEEPER CAB
All vehicles	862		

Note : Position of 1st bracket for all sleeper cab vehicles.
The other brackets remain identical to each axle spread.

2.6 - SUB-FRAMES

2.6.1 - KERAX body sub-frames

Sub-frame dimensions

The KERAX range consists of 3 families of modular chassis (A, B, C) designed for accommodating much diversified bodies and equipment corresponding to numerous normal and harsh usages.

This diversity does not allow us to recommend sub-frame modules covering all applications. The bodybuilder/equipment manufacturer will have to determine the most suitable sub-frame while observing our attachment rules by ensuring that sufficient clearance is given for the tyres.

Dimension B (body entrance dimension)

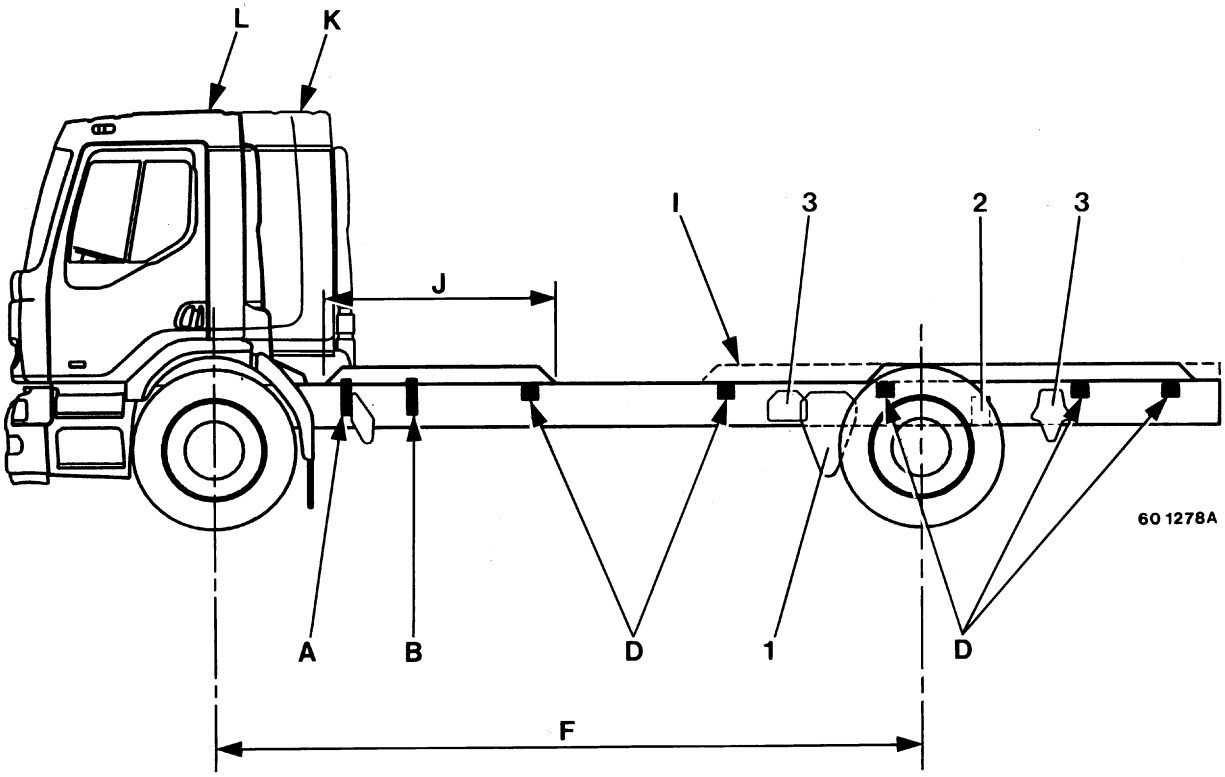
For this highly diversified range, we recommend you to consult the bodybuilder drawings relative to the chassis to be equipped.

2.6.2 - PREMIUM body sub-frames

Discontinuous sub-frame (2 parts)

Specific to tankers and demountable bodies.
Only on sidemembers 290 & 292 on rigid vehicle axle spreads 4x2, 6x2, 6x2/4.
Min. sidemember section 120 x 70 x 7 mm (inertia module I/V = 63800 mm^3).
The spacing between the front and rear sub-frames shall be limited to the minimum.

4x2 diagram

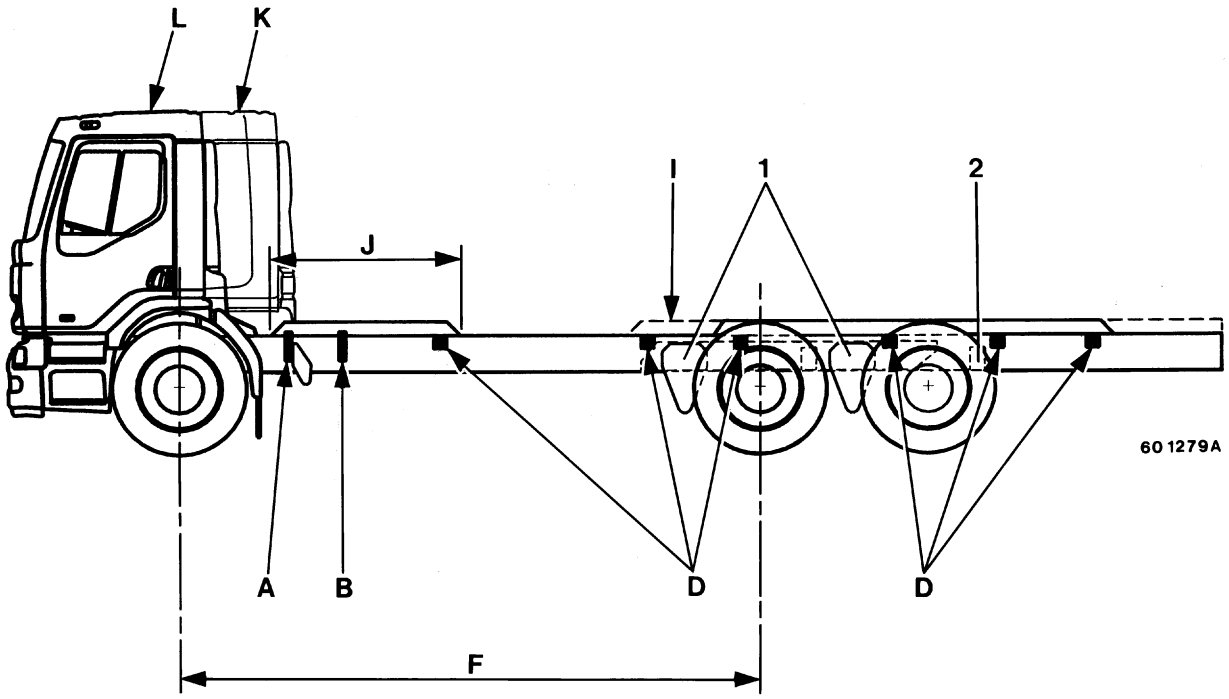


A - Flexible fastening
B - Semi-flexible fastening
D - Rigid fastening
I - For long wheelbases : extension (forward of spring hangers) of rear 1/2 sub-frame
J - = 1500 mm min.
K - Sleeper cab
L - Day cab
1 - Air suspension hanger
2 - Air springs bracket
3 - Mechanical suspension hanger

NOTE
The rear sub-frame must be held by at least 3 rigid fastenings.
The first fastening should not be at a distance of more than F away from the front axle centre-line.
F = Distance between front axle and rear drive axle

The front sub-frame must be held by 3 fastenings : flexible at the front, semi-flexible in the middle and rigid at the rear.
In the sleeper cab, the RH side flexible fastening can be deleted (proximity of air intake).

6x2 - 6x2/4 diagram



A - Flexible fastening
B - Semi-flexible fastening
D - Rigid fastening
I - For long wheelbases : extension (forward of spring hangers) of rear sub-frame
J - = 1500 mm min.
K - Sleeper cab
L - Day cab
1 - Air suspension hanger
2 - Air springs bracket

NOTE
The sub-frame must be held by at least 3 rigid fastenings.
The first fastening should not be at a distance of more than F away from the front axle centre-line.
F = Distance between front axle and rear drive axle

Continuous sub-frame

- Body sub-frames must follow the necking of the sidemembers (see page 31).
- Body sub-frames must form a flat seat over the entire length of the chassis.
- For certain body configurations (e.g. municipal), reduction in height of the sub-frame is permitted on condition that its inertia remains equivalent to the minimum of that of the recommended sub-frame. In such case, it is necessary to avoid sudden changes in inertia.
- Check the running clearance of roadwheels under load and at maximum cant (including snow chains).

Sub-frame dimensions

- 18-tonne GVW 4x2 rigid long distance and distribution vehicles with 258 and 260 mm sidemembers :

WHEELBASE	MIN. SUB-FRAME	* INERTIA MODULE (I/V) in mm^3
6785	140 x 70 x 7	78650
6400	100 x 70 x 7	49890
5960	60 x 70 x 7	24970
5575	60 x 70 x 7	24970
5190	60 x 70 x 7	24970
4750	60 x 70 x 7	24970
4365	60 x 70 x 7	24970
4090	60 x 70 x 7	24970
3815	60 x 70 x 7	24970

* Reminder of formula $(\sigma = \frac{MF}{I/V})$

- 18-tonne and 19-tonne GVW 4x2 rigid long distance and distribution vehicles with 290 and 292 mm sidemembers :

WHEELBASE	MIN. SUB-FRAME	* INERTIA MODULE (I/V) in mm^3
6785	120 x 70 x 7	63800
6400	120 x 70 x 7	63800
5960	120 x 70 x 7	63800
5575	100 x 70 x 7	49890
5190	60 x 70 x 7	24970
4750	60 x 70 x 7	24970
4365	60 x 70 x 7	24970
4090	60 x 70 x 7	24970
3815	60 x 70 x 7	24970

- 6x2 rigid long distance and distribution vehicle with 258 and 260 mm sidemembers :

WHEELBASE	MIN. SUB-FRAME	* INERTIA MODULE (I/V) in mm^3
5575	160 x 70 x 7	94950
5190	140 x 70 x 7	78650
4750	140 x 70 x 7	78650
4365	120 x 70 x 7	63800
4090	120 x 70 x 7	63800

- 6x2 and 6x2/4 rigid long distance and distribution vehicle with 290 and 292 mm sidemembers :

WHEELBASE	MIN. SUB-FRAME	* INERTIA MODULE (I/V) in mm^3
5575	140 x 70 x 7	78650
5190	100 x 70 x 7	49890
4750	80 x 70 x 7	36940
4365	60 x 70 x 7	24970
4090	60 x 70 x 7	24970

Threaded hardware and tightening torques for steel or cast-iron parts

The torque loadings given in the table are nominal torques (average value calculated on the basis of minimal torque and maximal torque).
Class III is the tightening precision class (± 20% of the nominal torque) as per standard 01504002 (coefficient of friction 0.15 ± 003).
Tightening torques are given for dry Dacromet treated threaded hardware.

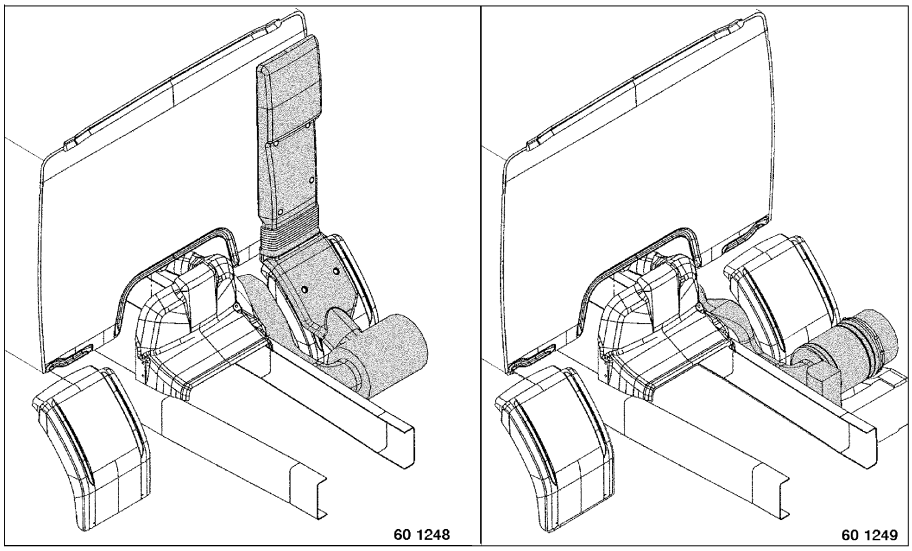
Designation	Characteristics	Steel grade	Spare parts N°	Tightening torque
Bolt	H 10 x 125 L 30	10.9	50 03 101 460	60 Nm
	H 10 x 125 L 50	10.9	50 03 101 148	60 Nm
	H 12 x 125 L 40	10.9	50 03 101 151	110 Nm
	H 12 x 125 L 45	10.9	50 03 101 749	110Nm
	H 12 x 125 L 50	10.9	77 03 101 679	110 Nm
	H 12 x 125 L 60	10.9	50 03 101 153	110 Nm
	H 14 x 150 L 40	10.9	50 03 101 161	170 Nm
	H 14 x 150 L 50	10.9	50 03 101 162	170 Nm
	H 14 x 150 L 90	10.9	50 03 101 169	170 Nm
	H 14 x 150 L 110	10.9	50 03 101 171	170 Nm
	H 14 x 150 L 60	10.9	50 03 101 163	170 Nm
	H 14 x 150 L 100	10.9	50 03 101 660	170 Nm
	H 16 x 150 L 50	10.9	50 03 101 103	220 Nm

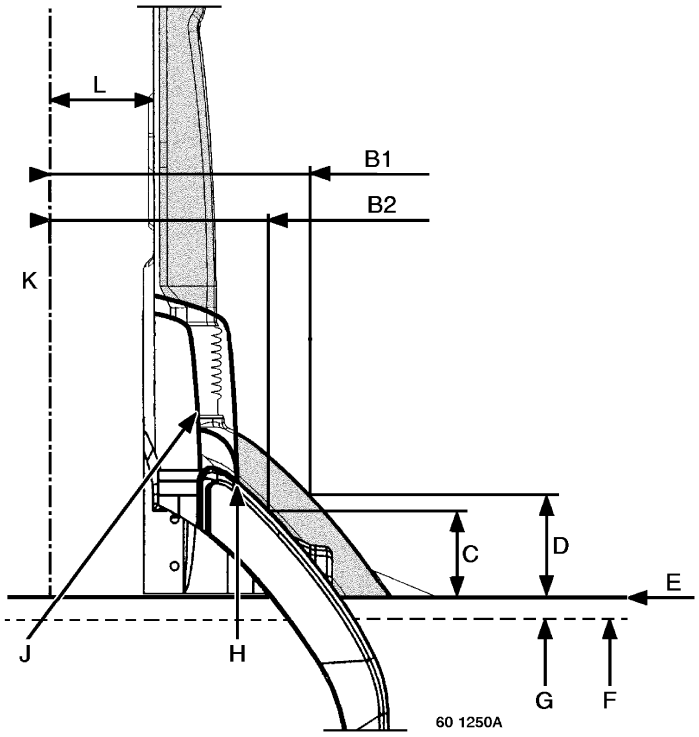
Designation	Characteristics	Spare parts N°
Cone washer	10 x 20 x 2.2	50 03 058 081
Cone washer	12 x 24 x 2.8	50 03 058 071
Cone washer	12 x 30 x 3.2	50 03 058 075
Cone washer	14 x 28 x 3	50 03 058 069
Plain washer	14 x 30 x 5	50 03 053 014
Belleville cone washer	14.5 x 35 x 1.8	00 21 721 040
Cone washer	16 x 32 x 3.4	50 03 058 034
Cone washer	16 x 39 x 3.6	50 03 058 070
Cone washer	16 x 40 x 2	50 03 058 029

Designation	Steel grade	Characteristics	Spare parts N°
Nut	10	10 x 125	50 03 032 156
Nut	10	12 x 125	50 03 032 157
Nut	10	14 x 150	50 03 032 159
Nut	10	14 x 150 DRH	50 03 034 250
Nut	10	16 x 150	50 03 032 236

DIMENSION B (day cab)

Roof air intake **Low air intake**

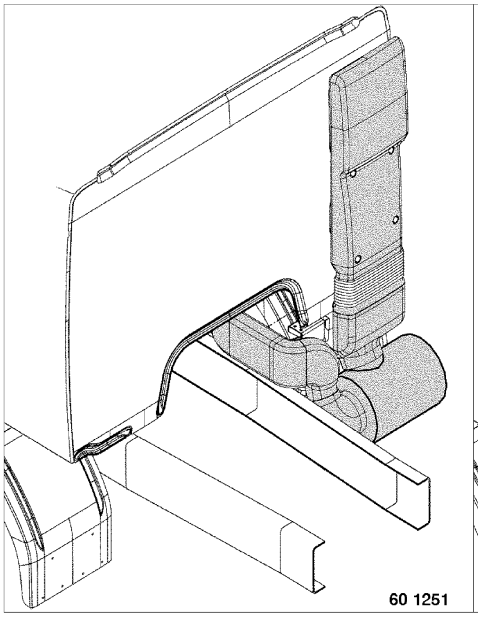




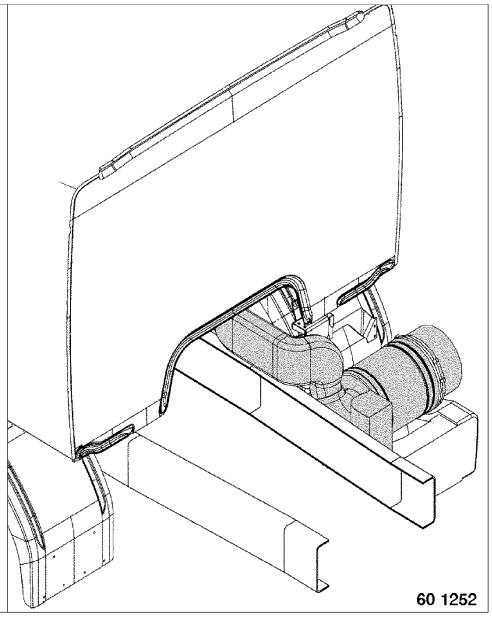
B1 - Body entrance with roof air intake = 465 mm
B2 - Body entrance with low air intake = 400 mm
C - Sub-frame height = 180 mm
D - Sub-frame height = 200 mm
E - Sidemember height = 290 mm
F - Sidemember height = 258 mm
G - Sidemember height difference = 32 mm
H - Soundproofing screens for 260/300/340 hp power units
J - Soundproofing screens for 210/250 hp power units
K - Axle centre-line
L - Cab back = 205 mm

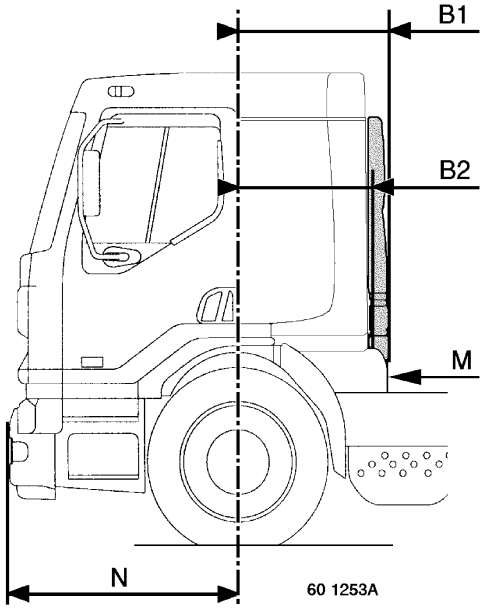
DIMENSION B (sleeper cab)

Roof air intake



Low air intake



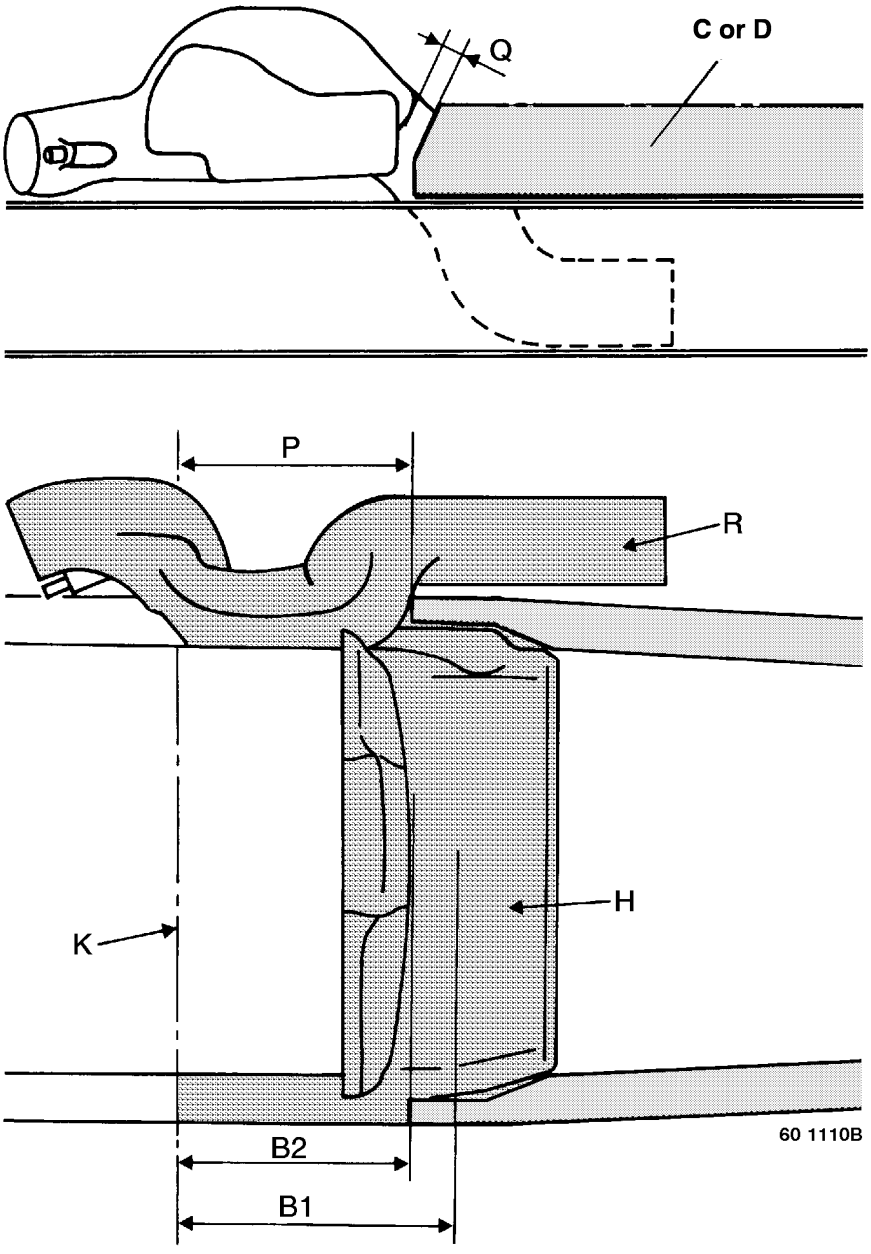


B1 - Body entrance with roof air intake = 955 mm
B2 - Body entrance with low air intake = 870 mm
M - Air filter/air manifold pipe
N - Dimension N = 1395 mm

Sub-frame behind cab

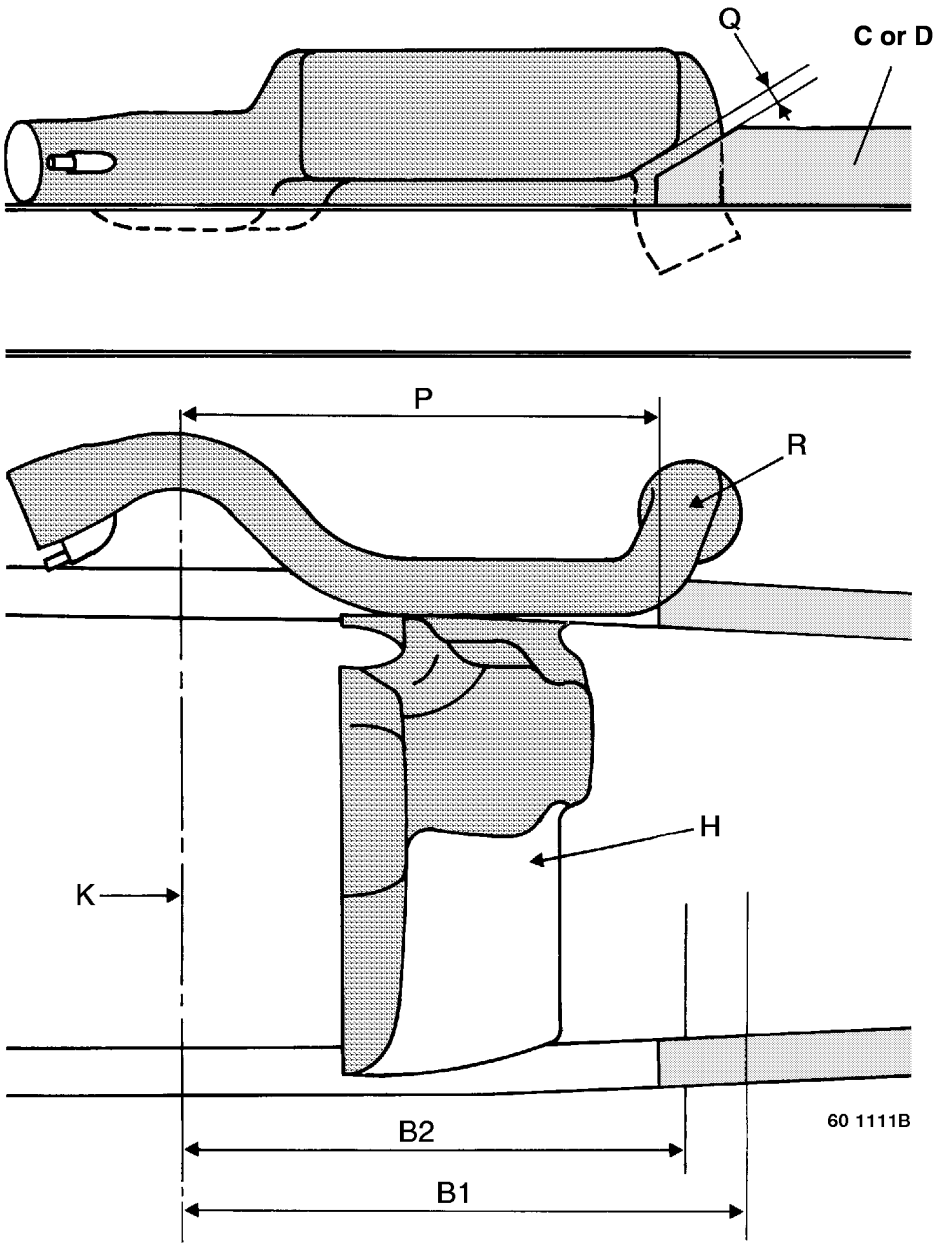
To optimize the positioning of the sub-frame under the cab, it is necessary to observe the following recommendations :

Day cab



B1 - Body entrance with roof air intake = 465 mm
B2 - Body entrance with low air intake = 400 mm
K - Front axle centre-line
P - Sub-frame entrance = 390 mm
Q - Observe the 25 mm clearance
C/D - Sub-frame
R - Air manifold
H - Engine soundproofing

Sleeper cab



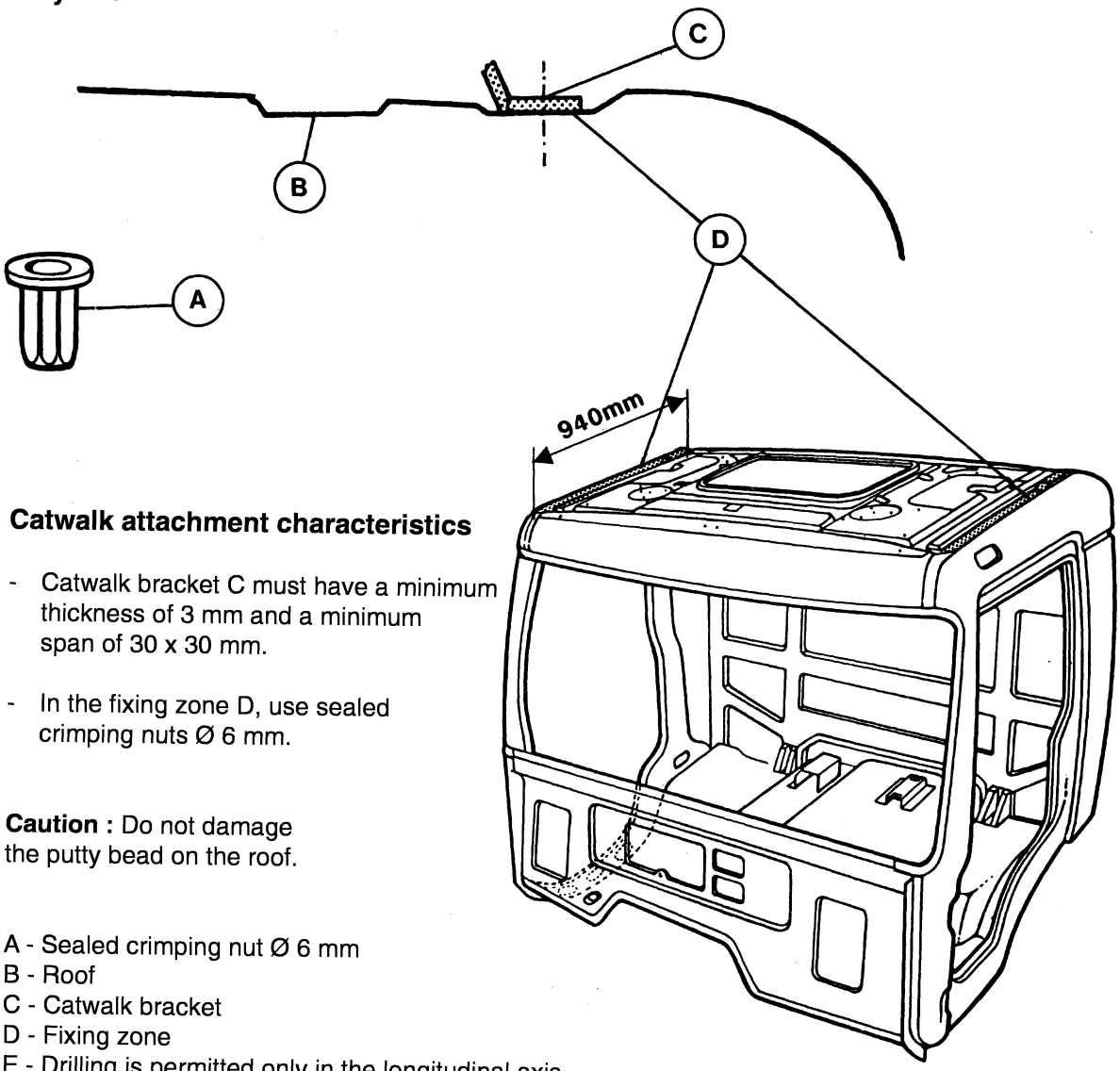
B1 - Body entrance with roof air intake = 955 mm
B2 - Body entrance with low air intake = 870 mm
K - Front axle centre-line
P - Sub-frame entrance = 820 mm
Q - Observe the 25 mm clearance
C/D - Sub-frame
R - Air manifold
H - Engine soundproofing

2.11 - ADDING OF EQUIPMENT

Attachment of catwalk to roof

The cab roofs are designed to accommodate attachment of a catwalk.

Day cab

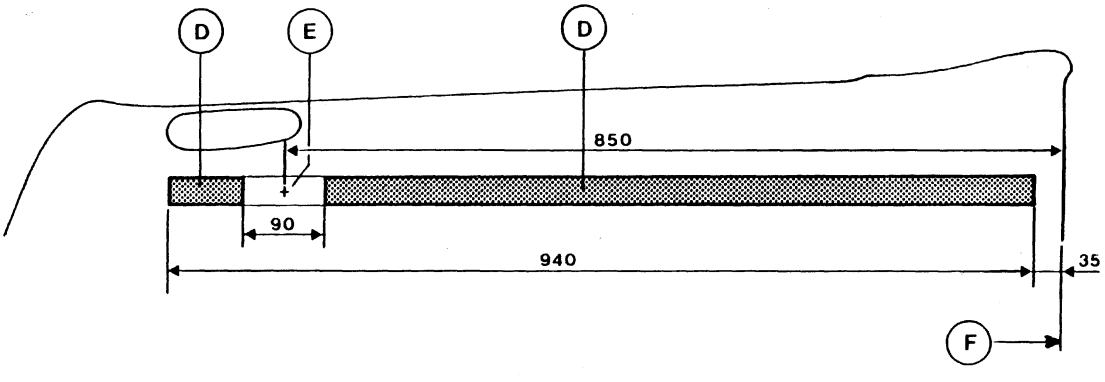


Catwalk attachment characteristics

- Catwalk bracket C must have a minimum thickness of 3 mm and a minimum span of 30 x 30 mm.
- In the fixing zone D, use sealed crimping nuts Ø 6 mm.

Caution : Do not damage the putty bead on the roof.

A - Sealed crimping nut Ø 6 mm
B - Roof
C - Catwalk bracket
D - Fixing zone
E - Drilling is permitted only in the longitudinal axis
F - Rear end



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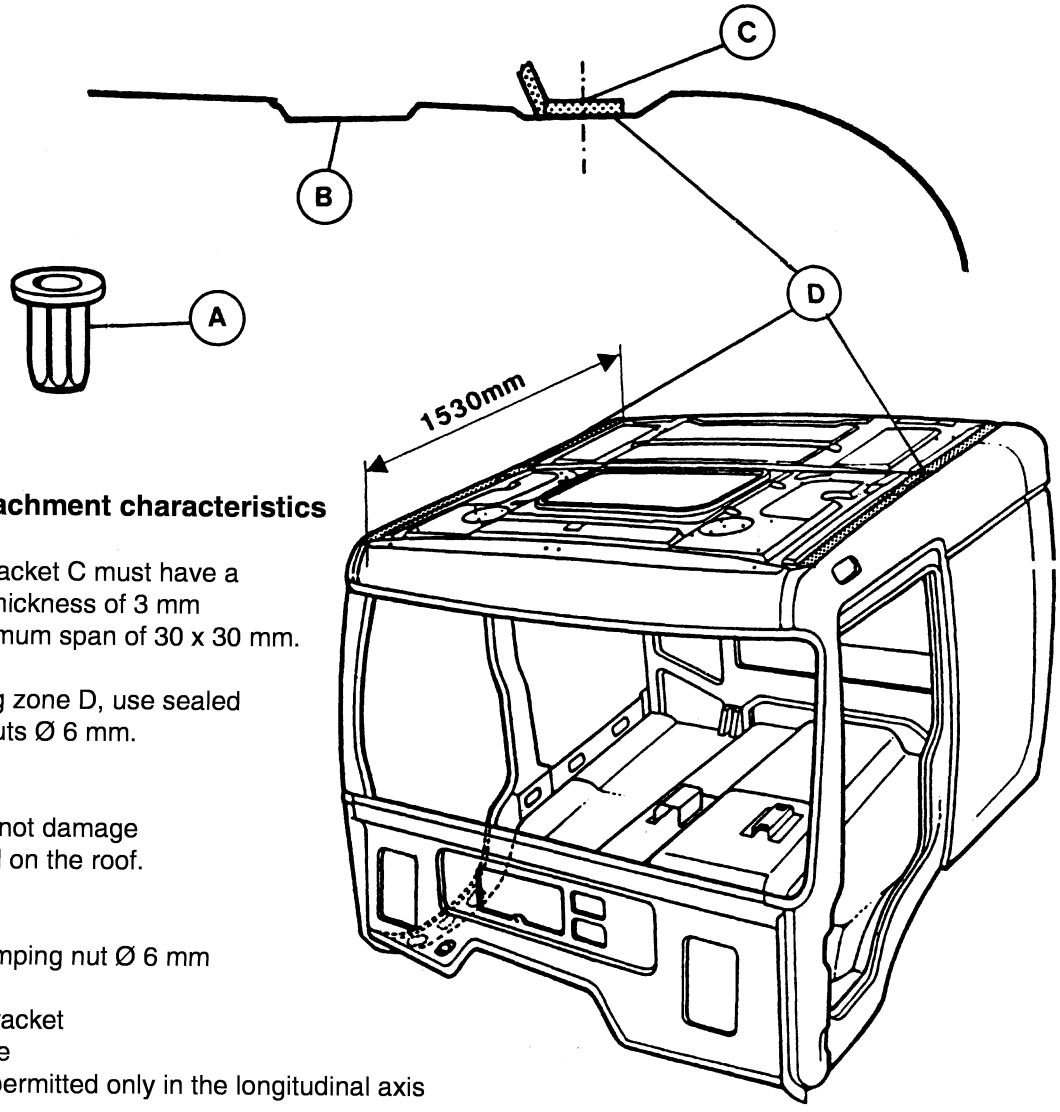
Sleeper cab

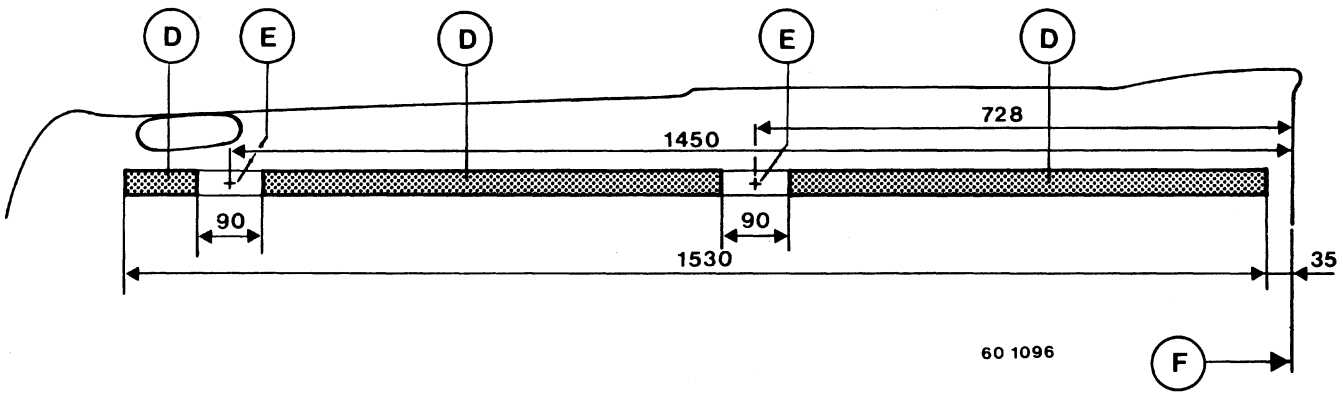


Catwalk attachment characteristics

- Catwalk bracket C must have a minimum thickness of 3 mm and a minimum span of 30 x 30 mm.
- In the fixing zone D, use sealed crimping nuts Ø 6 mm.

Caution : Do not damage the putty bead on the roof.

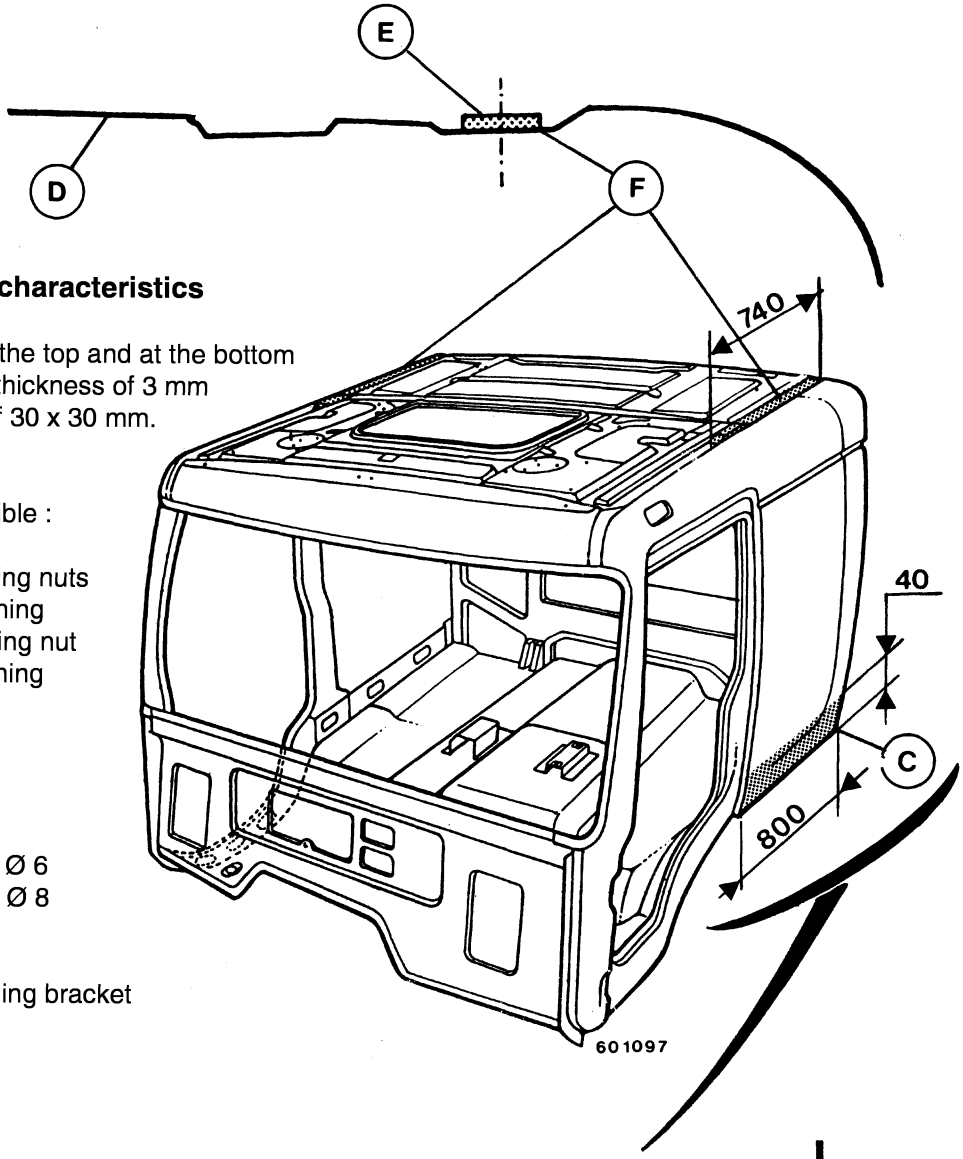
A - Sealed crimping nut Ø 6 mm
B - Roof
C - Catwalk bracket
D - Fixing zone
E - Drilling is permitted only in the longitudinal axis
F - Rear end



Attachment of ladder to cab (LH or RH side)

The design of the roof and the lower parts of the cab sides allows a ladder to be attached.

Sleeper cab



Ladder attachment characteristics

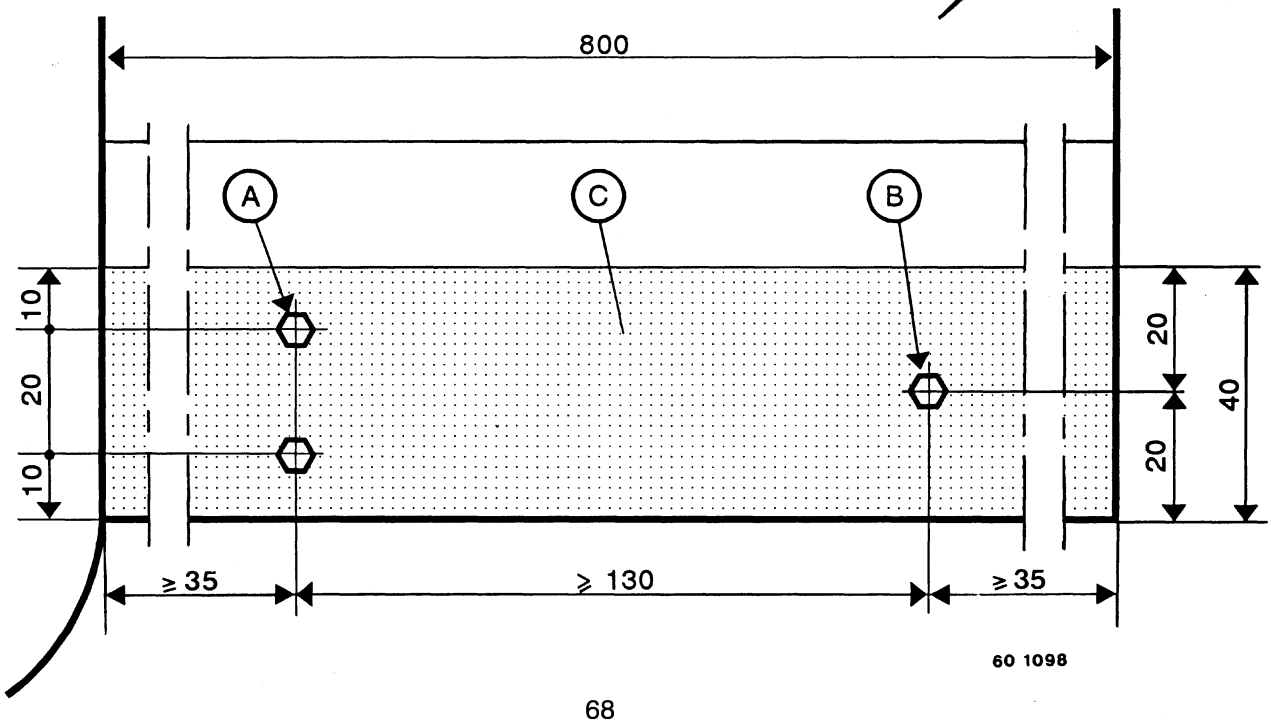
The ladder brackets at the top and at the bottom must have a minimum thickness of 3 mm and a minimum span of 30 x 30 mm.

Bottom part : zone C
Two solutions are possible :

A - Two sealed crimping nuts Ø 6 mm per fastening
B - One sealed crimping nut Ø 8 mm per fastening

Top part : zone F
In zone F, use sealed crimping nuts Ø 6 mm.

A - Sealed crimping nut Ø 6
B - Sealed crimping nut Ø 8
C - Lower fixing zone
D - Roof
E - Ladder upper fastening bracket
F - Upper fixing zone



Day cab

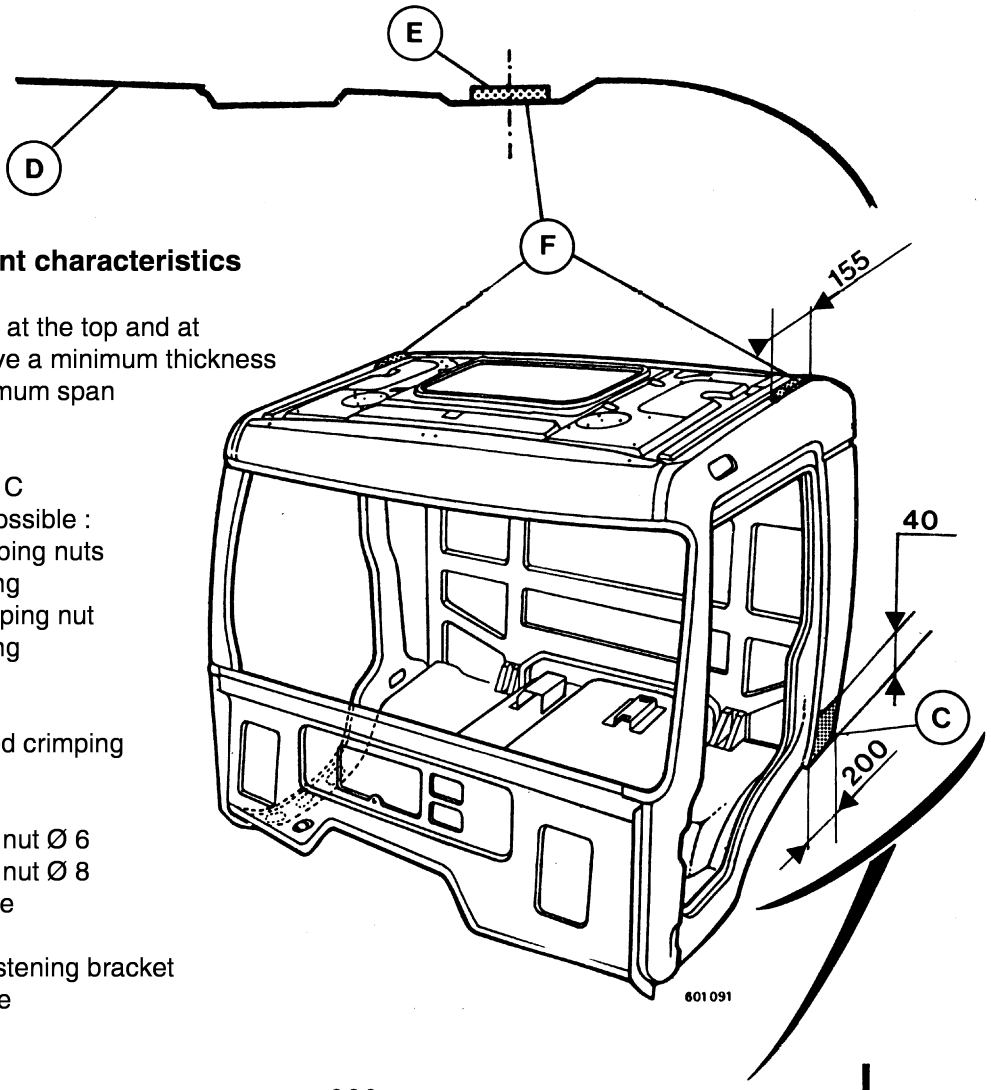
Ladder attachment characteristics

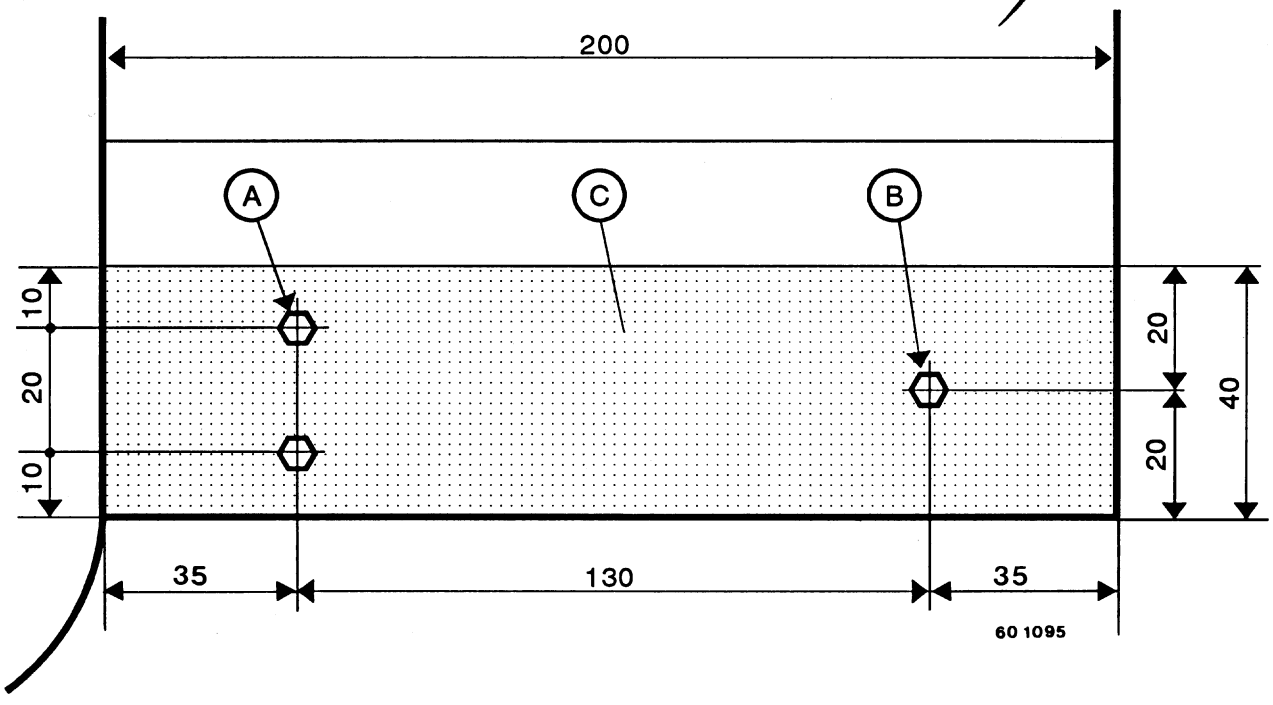
The ladder brackets at the top and at the bottom must have a minimum thickness of 3 mm and a minimum span of 30 x 30 mm.

Bottom part : zone C
Two solutions are possible :
A - Two sealed crimping nuts Ø 6 mm per fastening
B - One sealed crimping nut Ø 8 mm per fastening

Top part : zone F.
In zone F, use sealed crimping nuts Ø 6 mm.

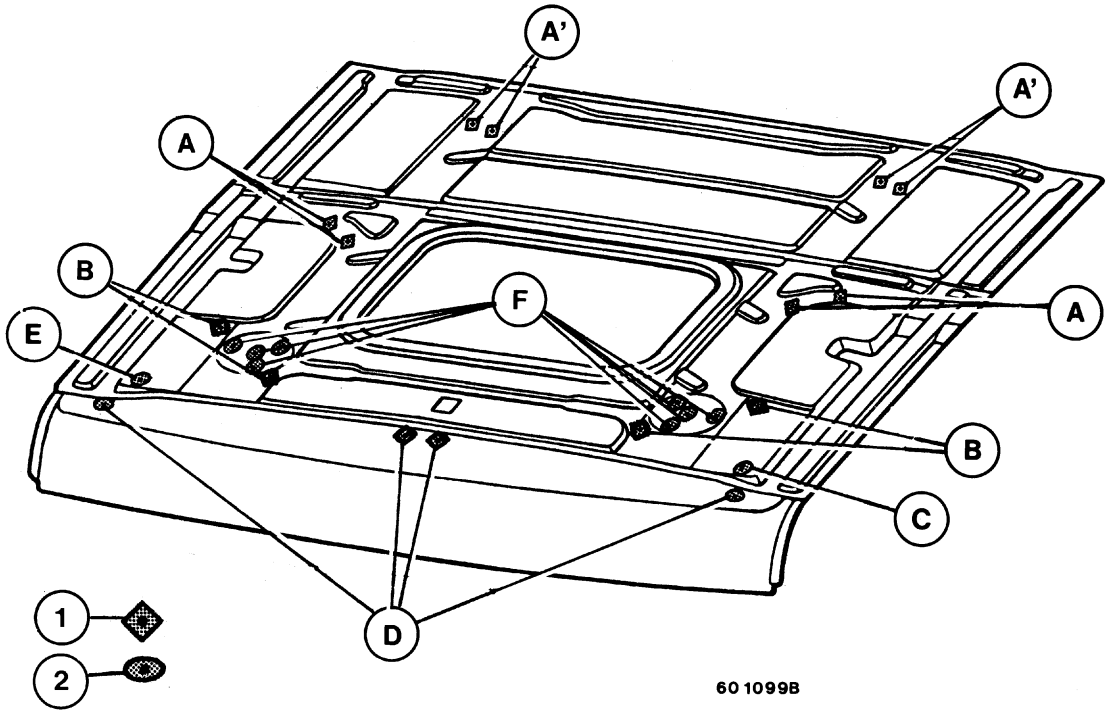
A - Sealed crimping nut Ø 6
A - Sealed crimping nut Ø 8
C - Lower fixing zone
D - Roof
E - Ladder upper fastening bracket
F - Upper fixing zone





Assembly of accessories on roof

On the roof, impressions materialize the position of fastenings for the assembly of accessories. The impressions give drilling access to weld nuts or allow drilling for fitting crimping nuts.



Key

1 - Drilling impression positions to gain access to weld nuts :

A - Day cab deflector
A' - Sleeper cab deflector
B - Day cab gantry or deflector
D - Sunshade

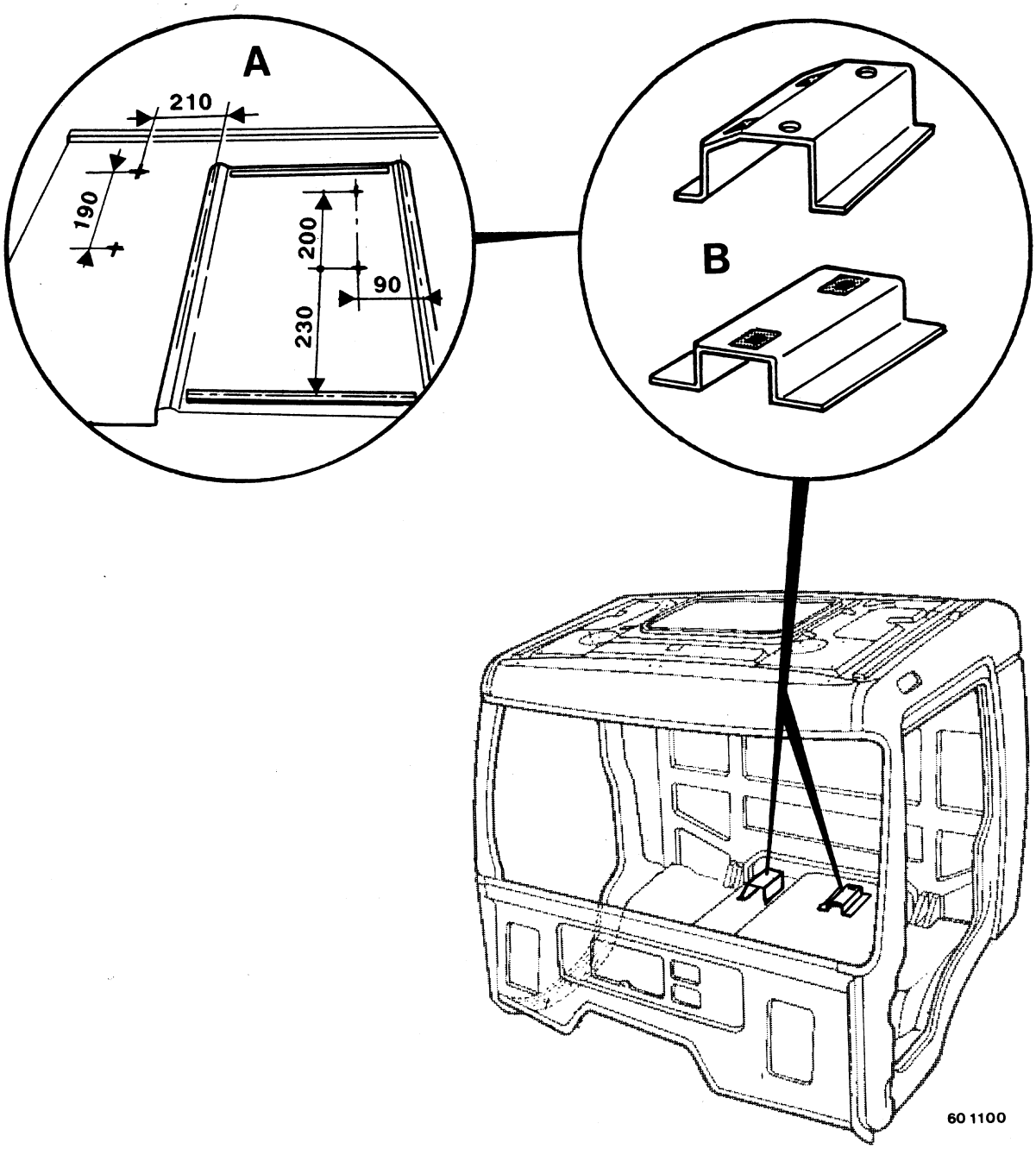
2 - Impression positions for drilling crimping nut fixing holes :

C - CB antenna
D - Sunshade
E - Telephone antenna
F - Revolving beacon

NOTE :
For the assembly of sunshades and deflectors having received RENAULT V.I. approval, observe the assembly recommendations defined in the supplier's handbook.

Attachment of PREMIUM and KERAX accessories

Distribution vehicle cabs are equipped with fittings on the engine tunnel in order to adapt various accessories.

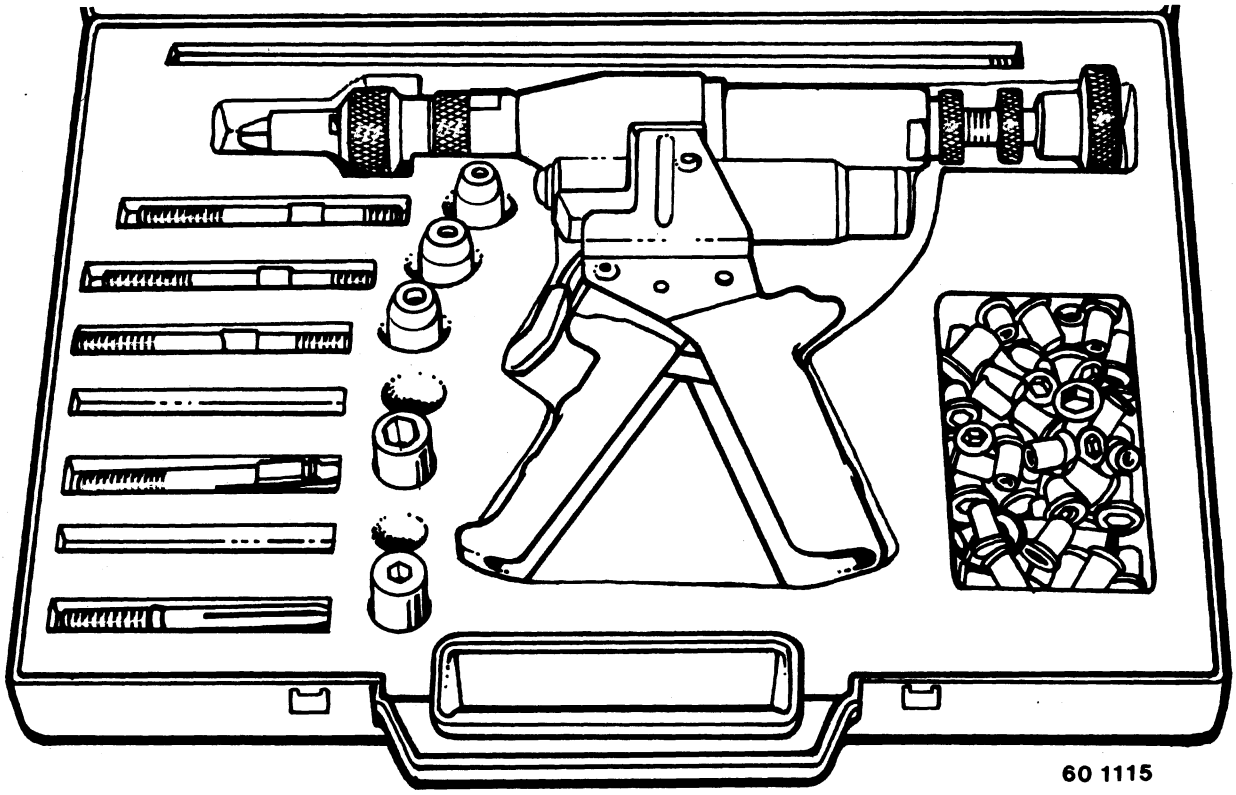


Location of fastenings

A - On the engine tunnel trim, mark and cut the covering.
B - Fittings detail

Crimping tools and crimping nuts

Tools



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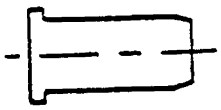
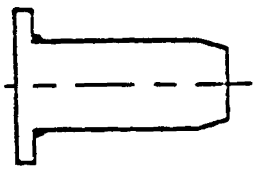


Crimping nut M6 - hexagonal barrel

Ref. N° 50 30 043 050

Method
- Drill to Ø 9.2 mm.
- Use crimping tool OPEX from the firm OTALU.
- Punch out the hexagon.
- Fit the crimping nut.

Data
- Tightening torque : 10 Nm max.
- Barrel length protruding past bracket after crimping : 17 mm



Crimping nut M8 - hexagonal barrel

Ref. N° 50 03 043 052

Method
- Drill to Ø 11.2 mm.
- Use crimping tool OPEX from the firm OTALU.
- Punch out the hexagon.
- Fit the crimping nut.

Data
- Tightening torque : 24 Nm max.
- Barrel length protruding past bracket after crimping : 21 mm

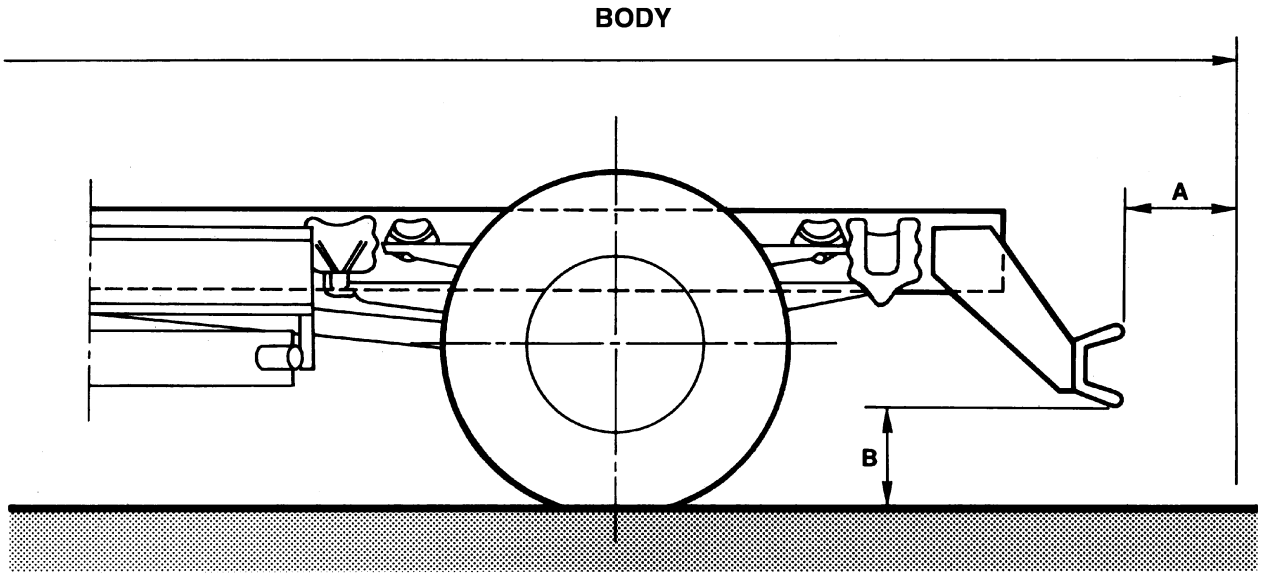
2.12 - CHANGING THE POSITION OF EQUIPMENT

Rear under-run guard

Dimensions A and B are to be mandatorily respected as per the following table :

RANGE	VEHICLE	DIMENSION A	DIMENSION B
PREMIUM	18-19-22-24-26 tonne rigids	from 0 to 348 max.	550 max. unladen
KERAX	18-19-26-32 tonne rigids	from 0 to 341 max.	550 max. unladen

LAYOUT OF REAR UNDER-RUN GUARD



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2.13 - SOUNDPROOFING SCREENS AND HEAT SHIELDS

Instructions for soundproofing screens

Soundproofing screens should neither be removed, modified nor moved so as not to downgrade the vehicle sound level, which is covered by official homologation.

If it is unavoidable for them to have to be removed, they must without fail be put back into place when the work is completed.

Any damage to the internal protective film of the screen requires the screen to be replaced.

After removal, only perfectly clean screens should be refitted.
Pay particular attention that there are no inflammable products present on the screen protective films.
The screens are to be cleaned using a cloth. If necessary, use soapy water (all other products are to be forbidden).

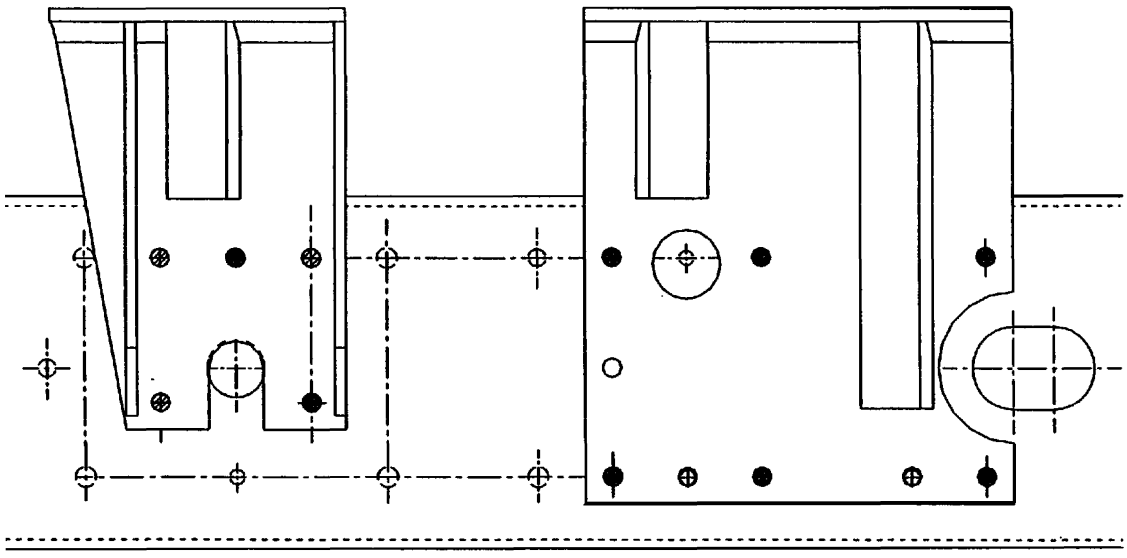
Important
In case of welding on-vehicle or when using a disker, efficiently protect or remove the soundproofing screens.

Instructions for heat shields
It is forbidden to remove or modify these shields. They play a part in your safety.

3.5 - PREMIUM BEHIND-CAB HANDLING CRANES

Fastening of crane bracket

- Sidemember LH side



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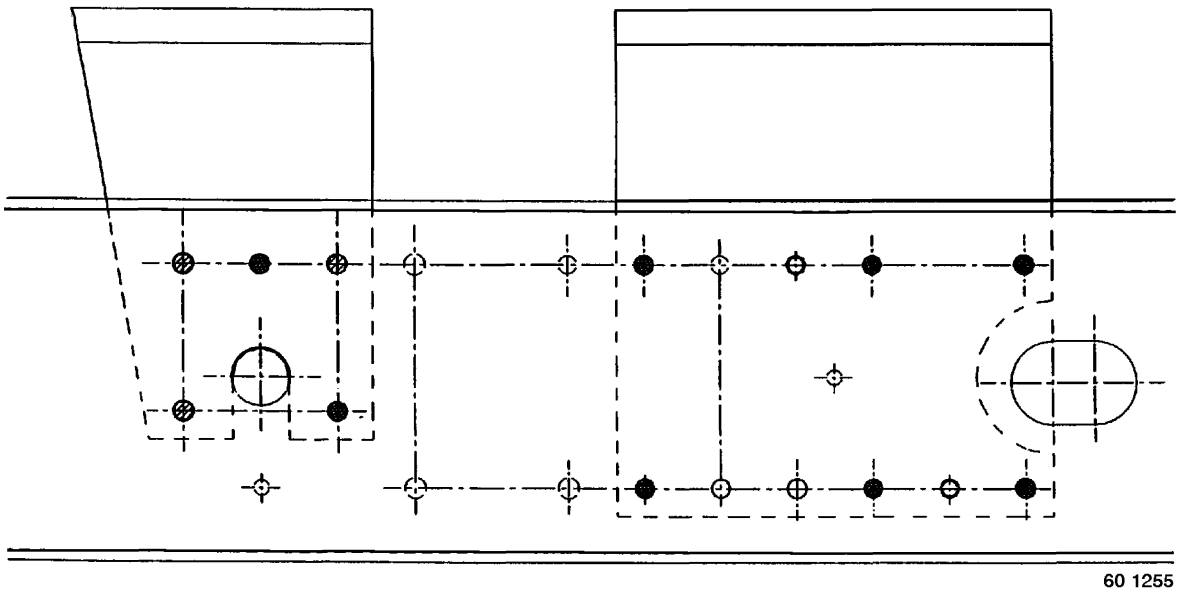
● Existing holes

⊕ Holes to be drilled or bored to Ø 5H13 (if non-existent)

- Sidemember RH side



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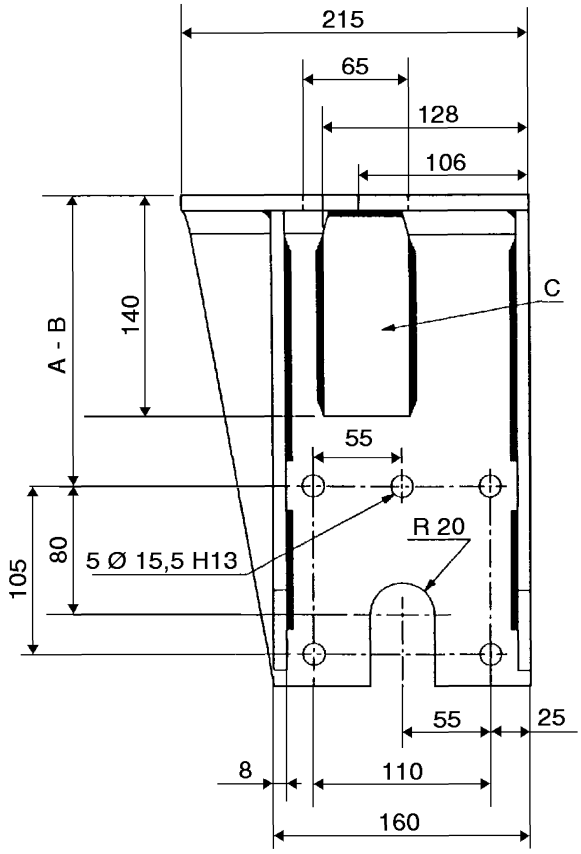
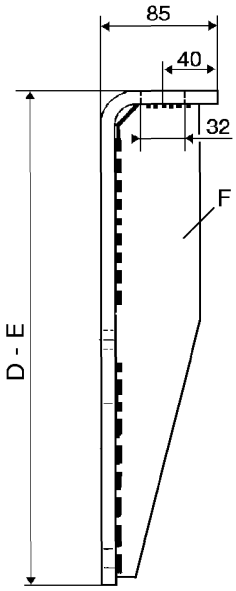
- For low module sidemembers (H = 258/260 mm), the crane lifting torque is limited to **11 tonnes/metre**.

- For high module sidemembers (H = 290/292 mm), the crane lifting torque is limited to **17 tonnes/metre**.

LH FRONT BRACKET





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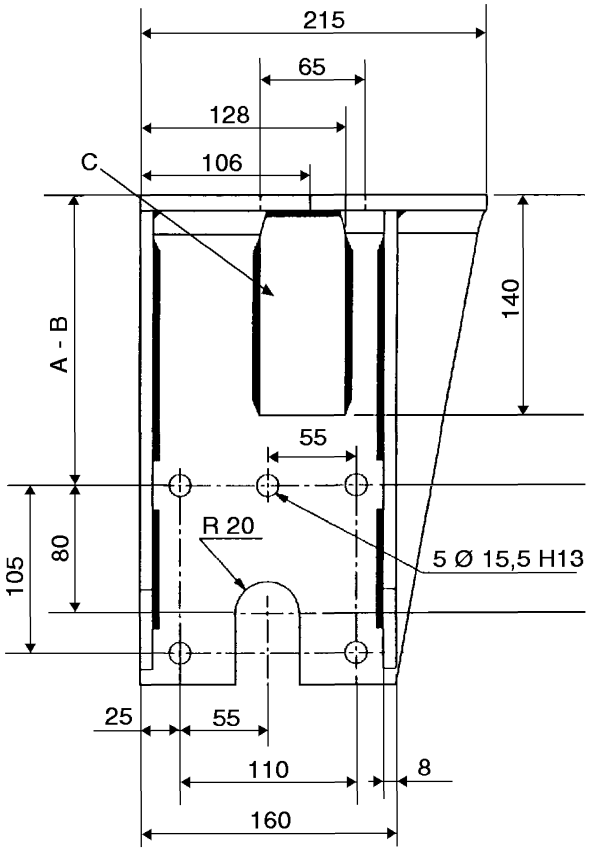
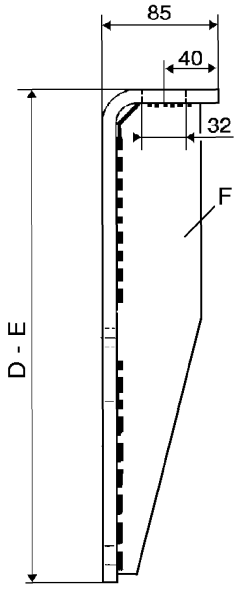
A - For 258 sidemember = 183 mm
B - For 290 sidemember = 215 mm
C - Spacer 1
D - For 258 sidemember = 308 mm
E - For 290 sidemember = 340 mm
F - Stiffener

RH FRONT BRACKET





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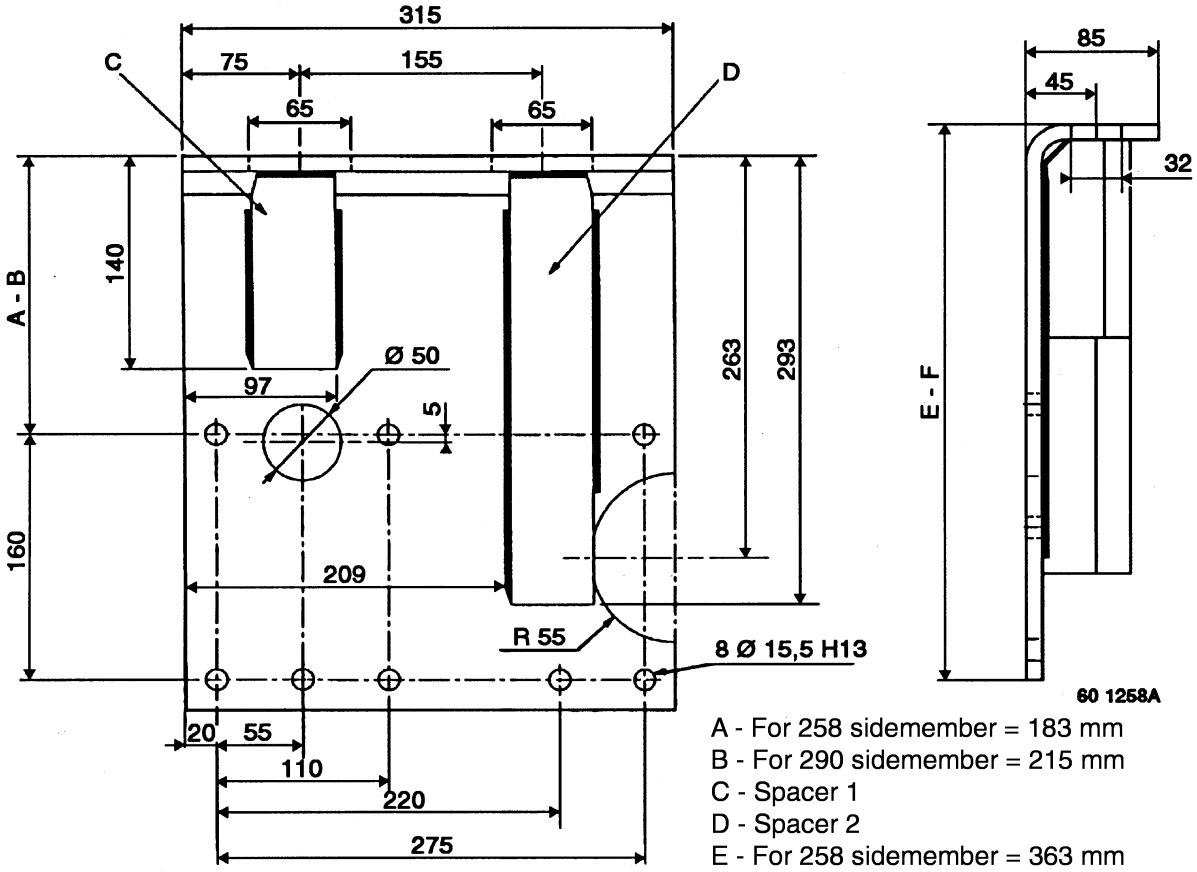
For sub-frame 140 x 70 x 7

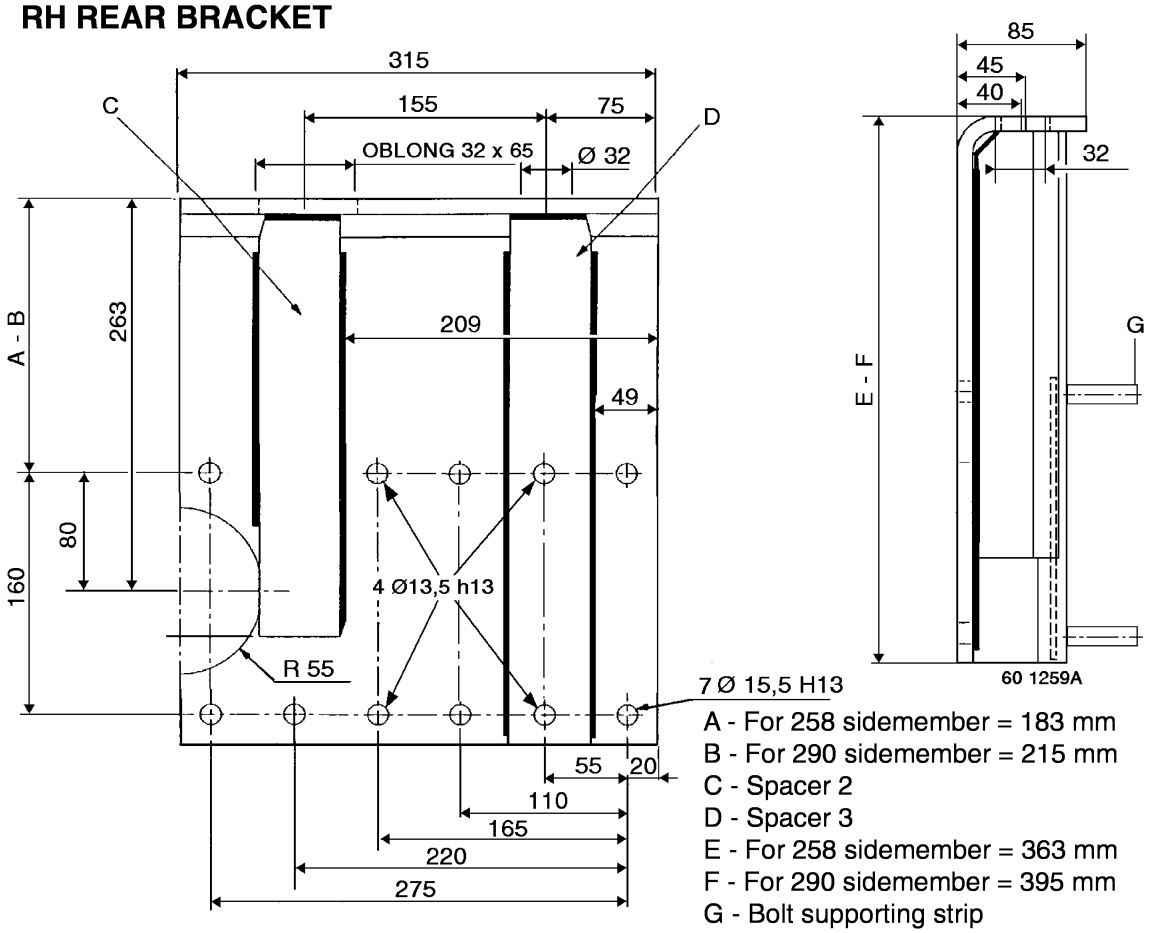
A - For 258 sidemember = 183 mm
B - For 290 sidemember = 215 mm
C - Spacer 1
D - For 258 sidemember = 308 mm
E - For 290 sidemember = 340 mm
F - Stiffener

LH REAR BRACKET



A - For 258 sidemember = 183 mm
B - For 290 sidemember = 215 mm
C - Spacer 1
D - Spacer 2
E - For 258 sidemember = 363 mm
F - For 290 sidemember = 395 mm

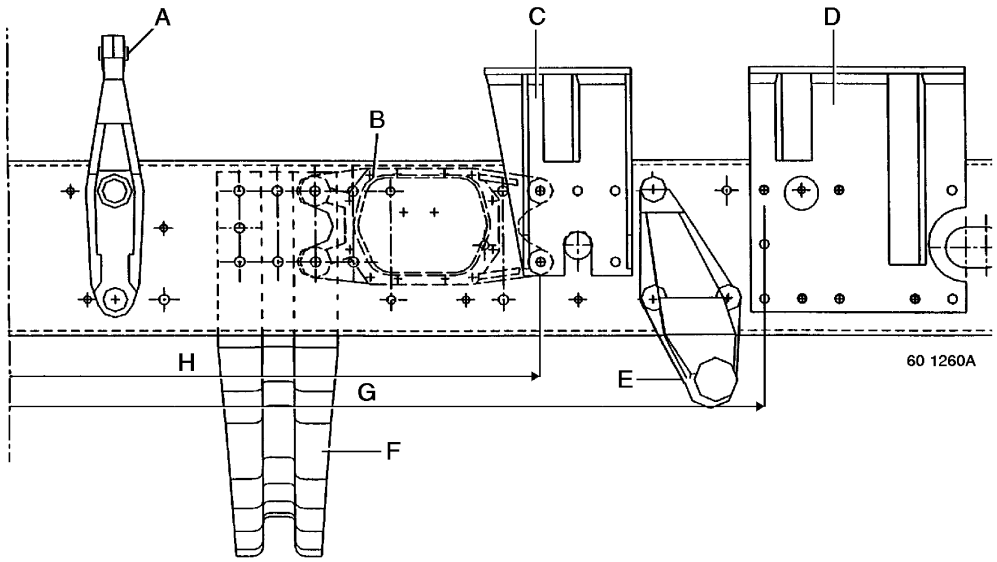
RH REAR BRACKET



A - For 258 sidemember = 183 mm
B - For 290 sidemember = 215 mm
C - Spacer 2
D - Spacer 3
E - For 258 sidemember = 363 mm
F - For 290 sidemember = 395 mm
G - Bolt supporting strip

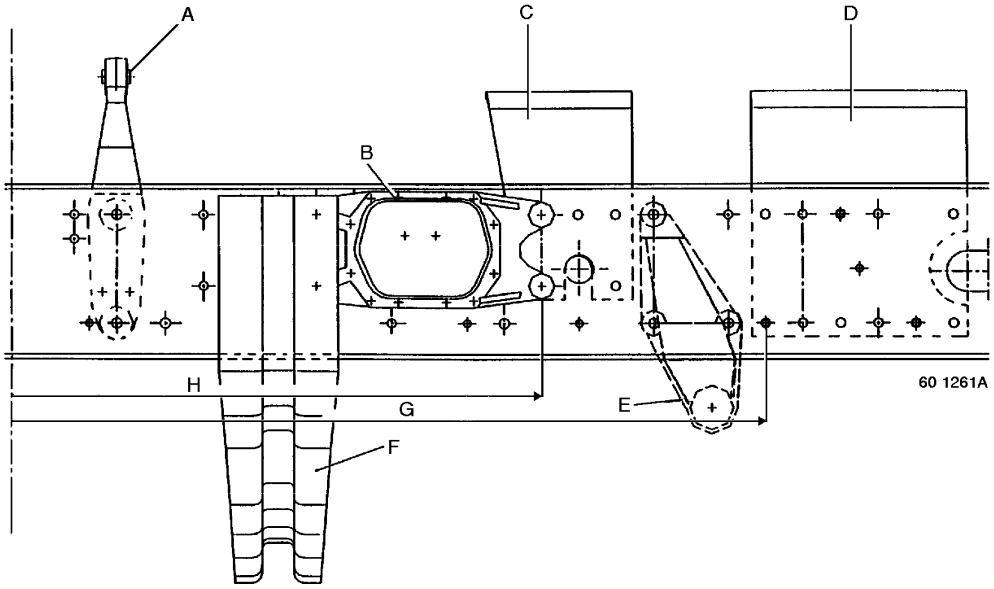
ASSEMBLY PLATE

Sidemember left-hand side



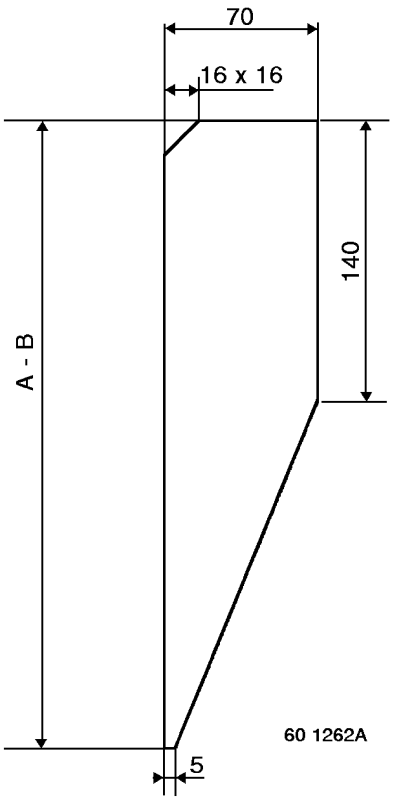
A - Day cab rear fitting
B - Engine bracket
C - LH front fixing plate
D - LH rear fixing plate
E - N° 2 spring hanger
F - Under-engine cross-member
G - Sidemember reference axle centre-line = 1105 mm
H - Sidemember reference axle centre-line = 775 mm

Sidemember right-hand side



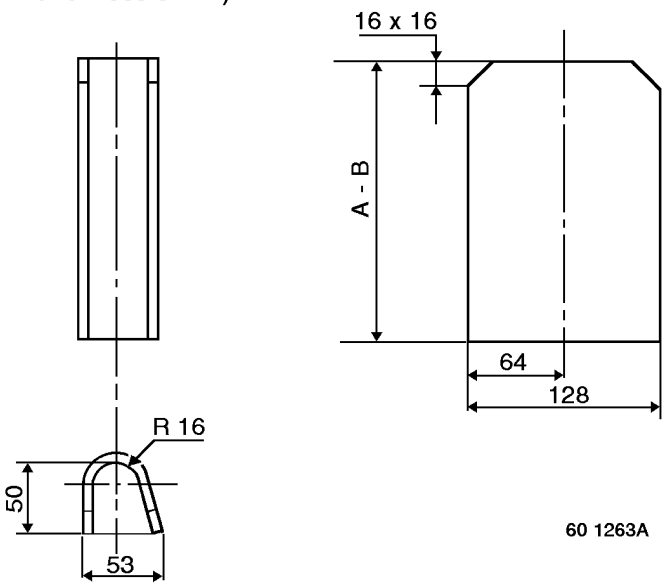
A - Day cab rear fitting
B - Engine bracket
C - RH front fixing plate
D - RH rear fixing plate
E - N° 2 spring hanger
F - Under-engine cross-member
G - Sidemember reference axle centre-line = 1105 mm
H - Sidemember reference axle centre-line = 775 mm

STIFFENER (sheet steel E24-2 thickness 8 mm)



A - For 258/260 sidemember = 288 mm
B - For 290/292 sidemember = 320 mm

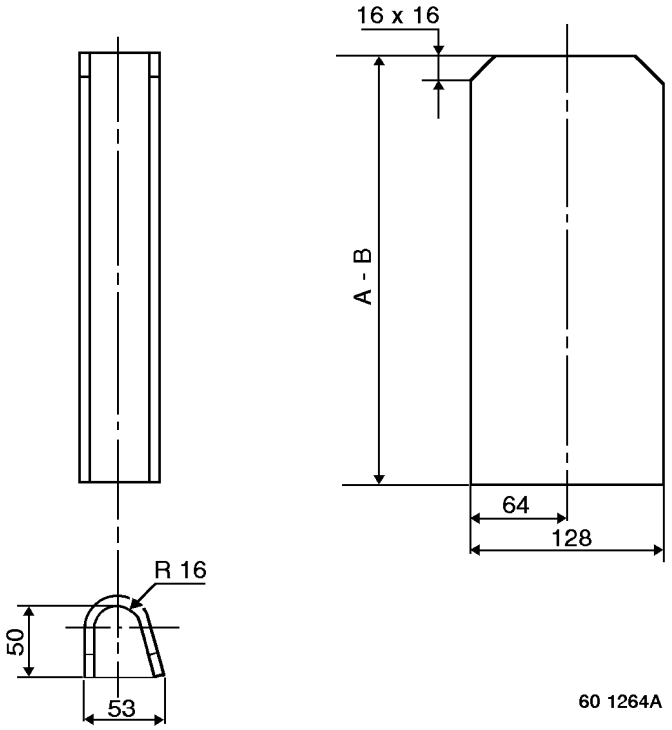
SPACER 1 (sheet steel E24-2 thickness 6 mm)



A - For 258/260 sidemember = 130 mm
B - For 290/292 sidemember = 162 mm

SPACER 2 (sheet steel E24-2 thickness 6 mm)

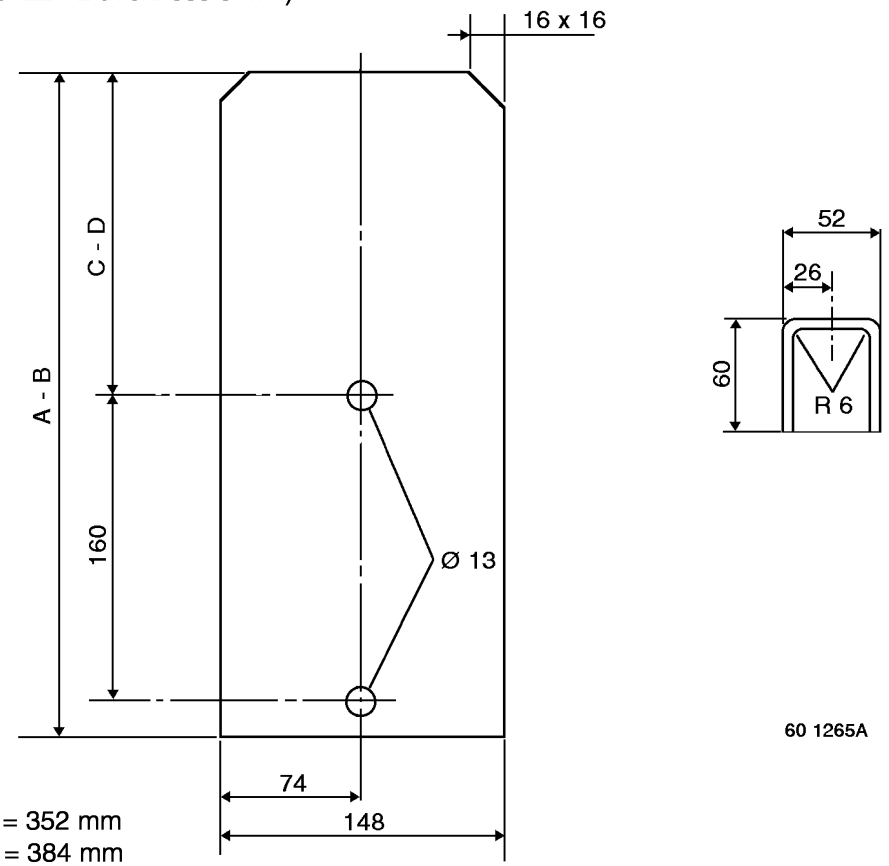
Right-hand part
Symmetrical left-hand part



60 1264A

A - For 258/260 sidemember = 283 mm
B - For 290/292 sidemember = 315 mm

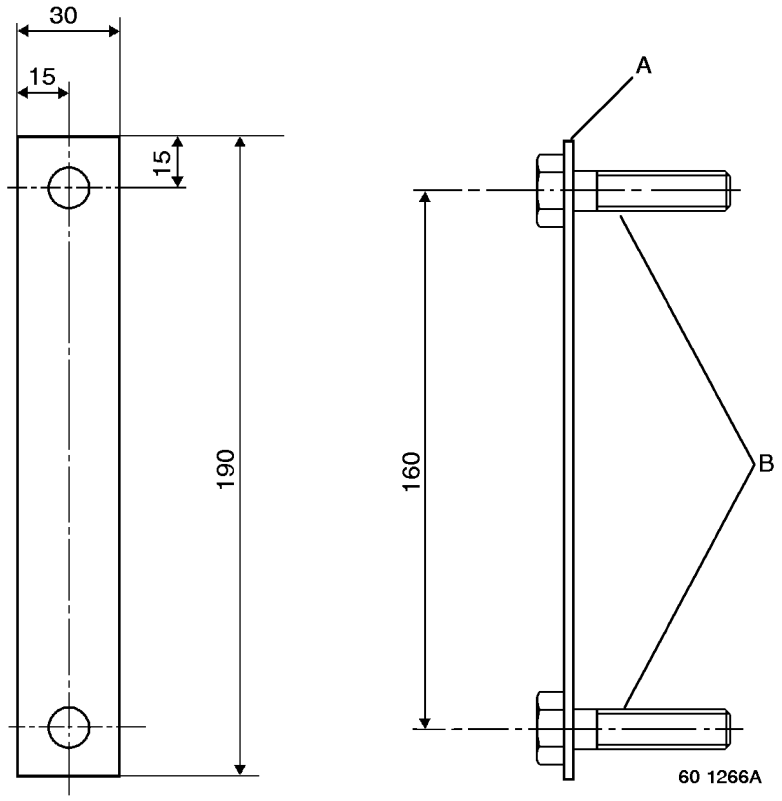
SPACER 3 (sheet steel E24-2 thickness 6 mm)



60 1265A

A - For 258 sidemember = 352 mm
B - For 290 sidemember = 384 mm
C - For 258 sidemember = 172 mm
D - For 290 sidemember = 204 mm

BOLT SUPPORTING STRIP



A - Sheet steel E24-2 thickness 3 mm
B - Hexagon bolt M12 x 125 length 50 class 10.9

Recommendations for the assembly of plates

- The assembly of rear plates requires checking out the conformity of regulations regarding position of side/parking lights and side impact protective beams.

LH side

- Wedge the rear flange.
- Unlock the silencer bracket to avoid any stress between silencer and exhaust pipe.
- Push the silencer back 10 mm and tighten, observing the tightening torques.

RH side

- Retract the filter bracket cradle (holes to be drilled if non-existent) and the RH side panel lock bracket by 70 mm.
- Modify the routing of fuel pipes (if prefilter and/or independent heating pump fitted).

PREMIUM

Handling cranes with lifting torque outside graph limit

- The assembly of a sub-frame in one single piece, starting from the back of the cab and going as far as the rear tip of the chassis with bevel cut at the front, is mandatory.
- The assembly of 4 landing legs on the sub-frame is mandatory.
- The strength of the sub-frame is to be determined by the installer according to the capacity of the crane.
- Attachment of the crane sub-frame to the rigid vehicle sidemembers is to be carried out according to our recommendations by means of body brackets provided as standard.

Handling cranes inside rear overhang

- General recommendations : see Bodybuilder's Guide DT 6/354, pages 91-92.
- The plates fastening principle is recommended.
- The dimensions of the plates are to be determined by the installer in relation to the spacing of the crane mountings.
- Attachment (number and diameter of bolts) shall be at least that defined for the behind-cab crane.
- Drillings are to be carried out as per recommendations, page 26.

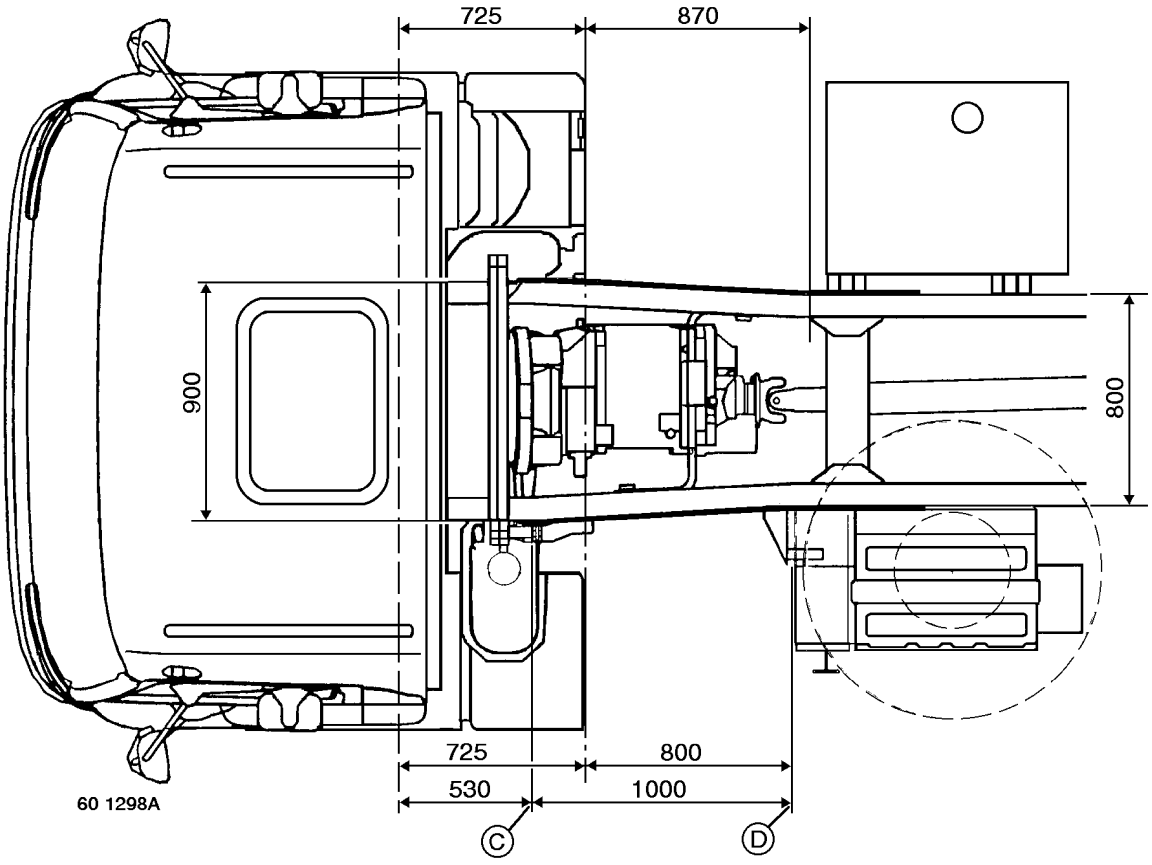
Pre-arrangement for crane assembly on KERAX

RENAULT V.I. makes available to its customers a pre-arrangement option for assembly of a **behind-cab** crane.
The principle retained is assembly on plates allowing installation of the crane without having to displace important elements, which improves our service and preserves the original quality of the chassis and of the vehicle.
The sketches hereafter present the different installation principles on 4x2, 6x4 and 8x4 axle spreads.

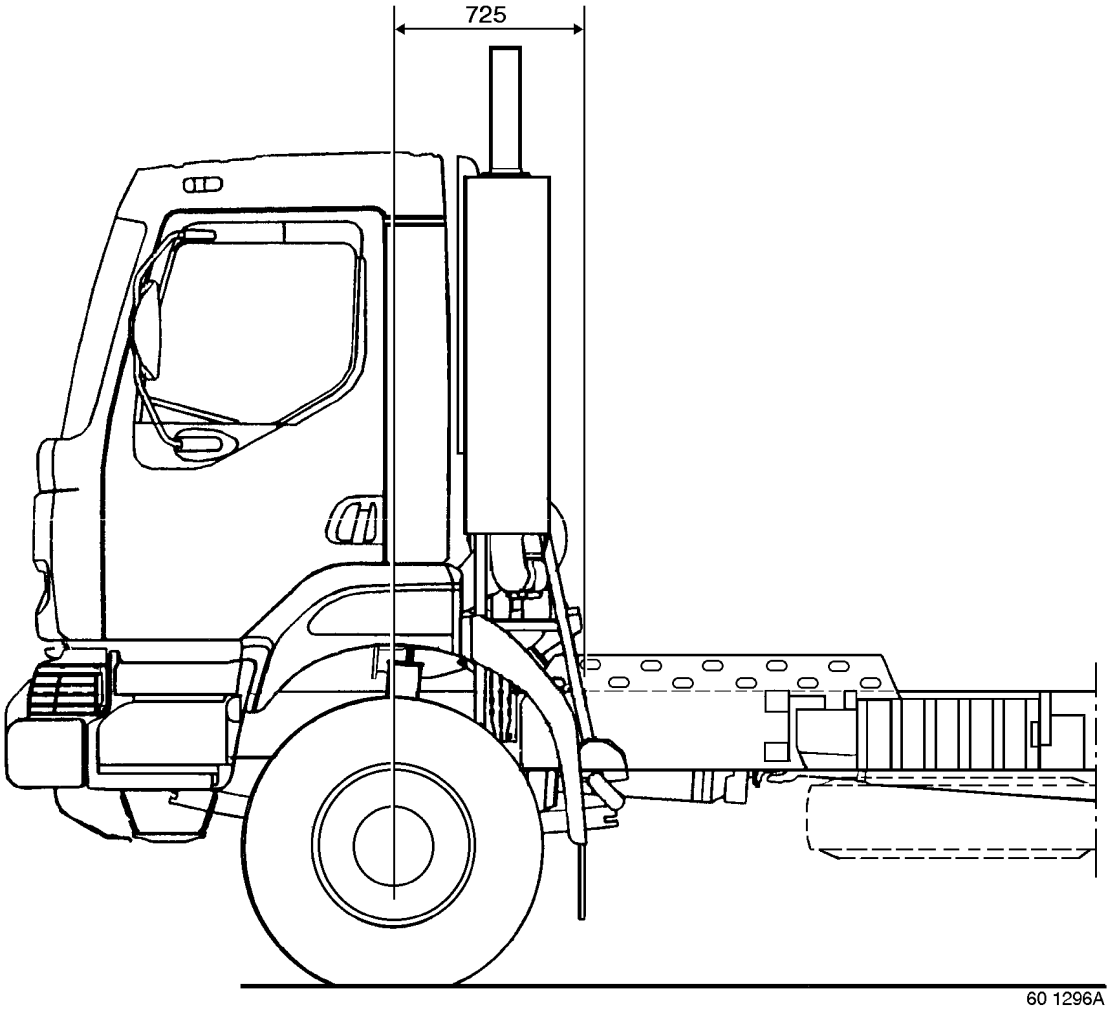
LIFTING TORQUE

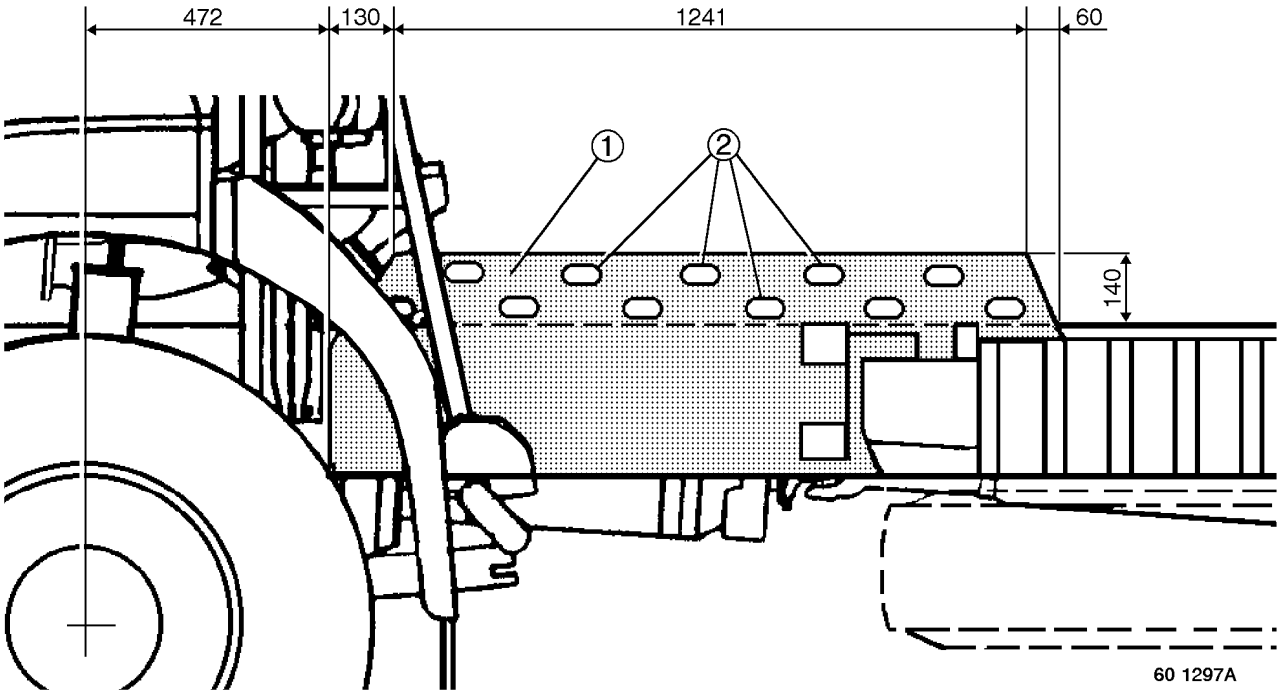
The maximum authorized lifting torque is limited to **25 tonnes/metre** (2 landing legs).

4x2 and 6x4 VEHICLES



- C : Start of necking (900 mm)
- D : End of necking (800 mm)





- 1 : Plate, thickness 10 mm
- 2 : 11 slots 35 x 70 for welding sub-frame

3.7 - TIPPERS

- On the Premium 4x2 long distance and distribution range only transporter type tippers are permitted.

PREMIUM standard transporter tipper

- The recommendations regarding sub-frames and their attachment to the vehicle chassis are identical to those defined on pages 29 to 31.

PREMIUM 2-way and demountable tipper

- The recommendations regarding sub-frames and their attachment to the vehicle chassis are identical to those defined on pages 29 to 31 in the guiding and flexible fastening zone.
- For the guiding and rigid fastening zone, it is permitted to use link-up plates positioned in the place of original brackets.
- In all other cases, the rear fastening is to be by means of a plate fastened by two rows of nuts and bolts Ø 14 mm.

PREMIUM 6x2 demountable tipper

- A tipper or body of around 15,000 kg can be picked up from the ground without risk on condition that the air suspension is in the “down” position with the lift-up axle in abutment on the ground.
- Under such conditions the vehicle remains stable, front axle on the ground with steerability assured.
- The maximum permissible static load on the rearmost axle in abutment is 18 tonnes with single or twin tyre fitment.

KERAX all types tipper

- It is forbidden to mount tippers on vehicles 33 I, 33 C (6x4 and 8x4 distribution concrete mixer and materials distribution trucks).

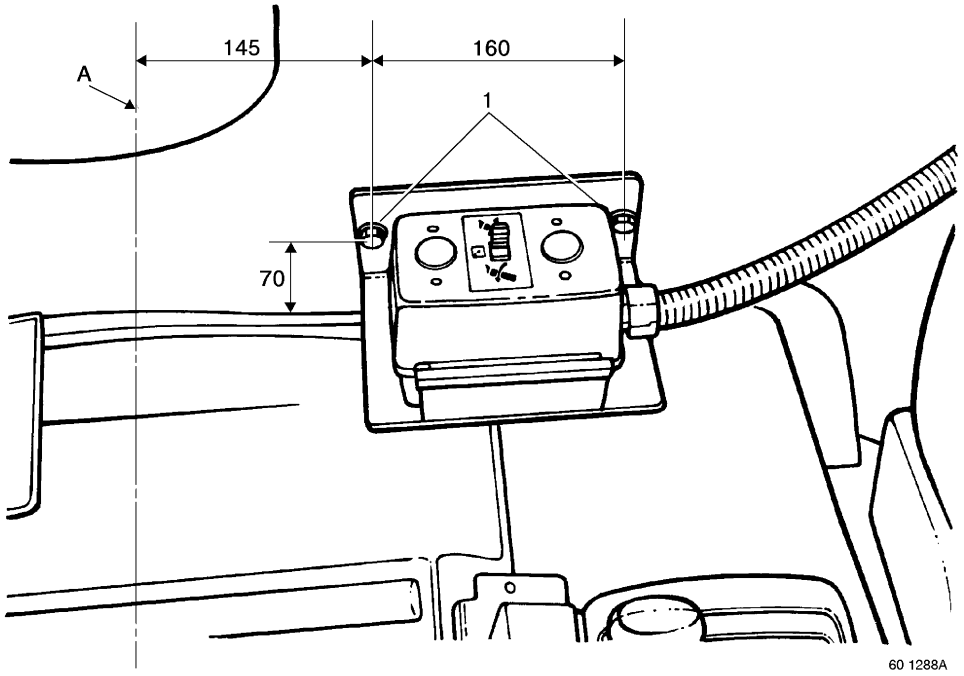
Use of KERAX 6x4 - 6x6 - 8x4 tipper

- For positioning the rear axis of articulation of the tipper, observe the dimension 1605 mm max. between the axis of the tandem and the axis of articulation of the tipper.
- If this dimension is exceeded at all, a request for waiver accompanied by calculation notes must be made without fail.

Assembly of KERAX control box (see routing, page 19)

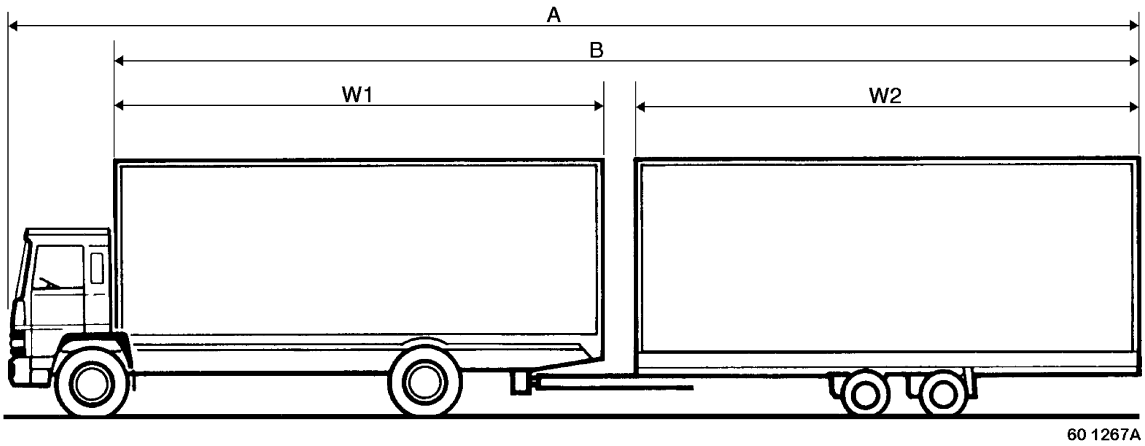
Method

- Locate the holes in the rear end (A : rear end trim centre-line).
- Use crimping nuts M8 - hexagonal barrel.
- Position the control box and fasten it with nuts and bolts as in (1).



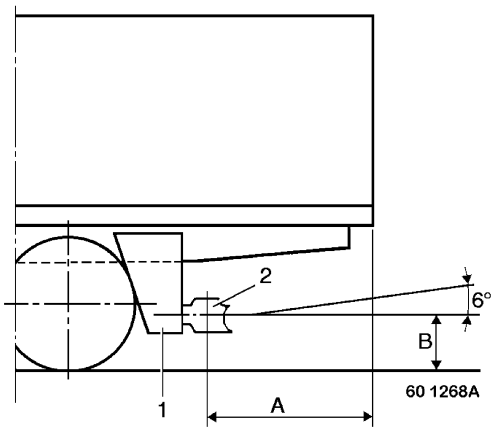
3.10 - COUPLINGS FOR PREMIUM RIGID DRAWBAR VEHICLES TRAFFIC DIRECTIVE (N° 15011407)

Rigid drawbar vehicle lengths



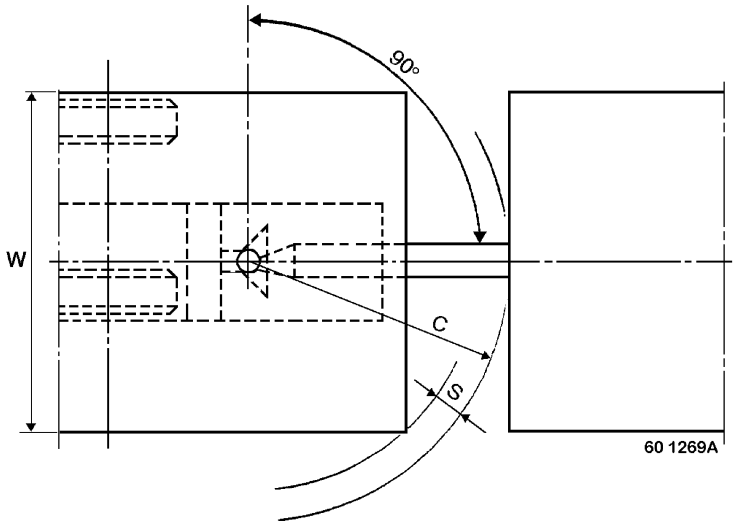
A= 18,75 m
B= 16,40 m
W1+W2 =15.65

Tractor vehicle rear end



Class designation	Dimension A	Dimension B laden
1400	1400^{-100}	$425^{\pm 25}$
1600	1600^{-100}	$425^{\pm 25}$
1900	1900^{-100}	$425^{\pm 25}$

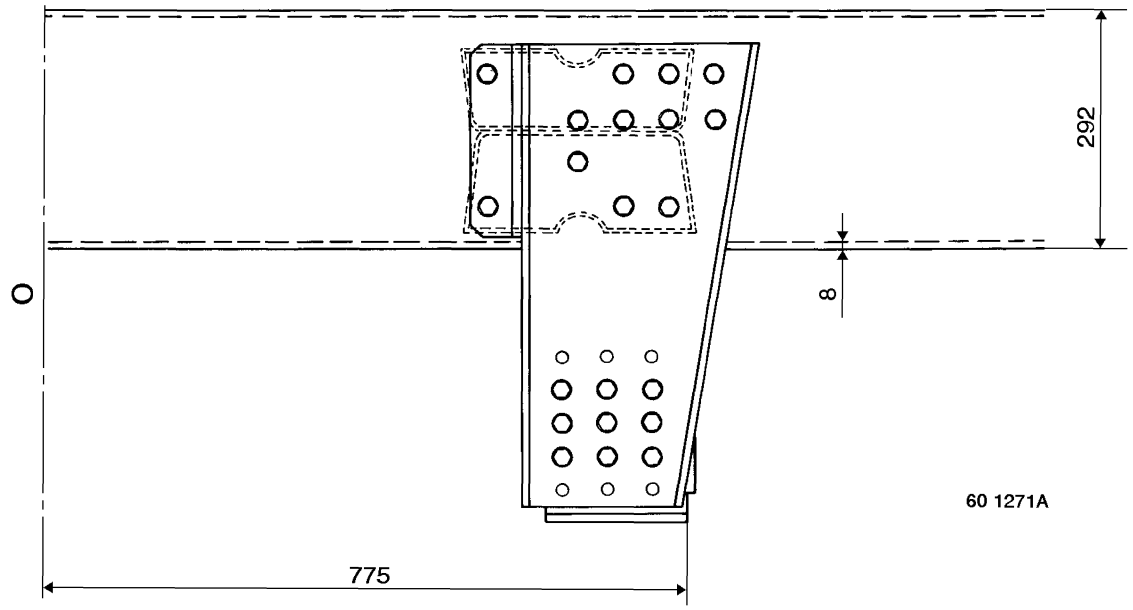
Trailer forward clearance



S = Running clearance sector
S = 250 mm
C = Articulation radius
W = Body width

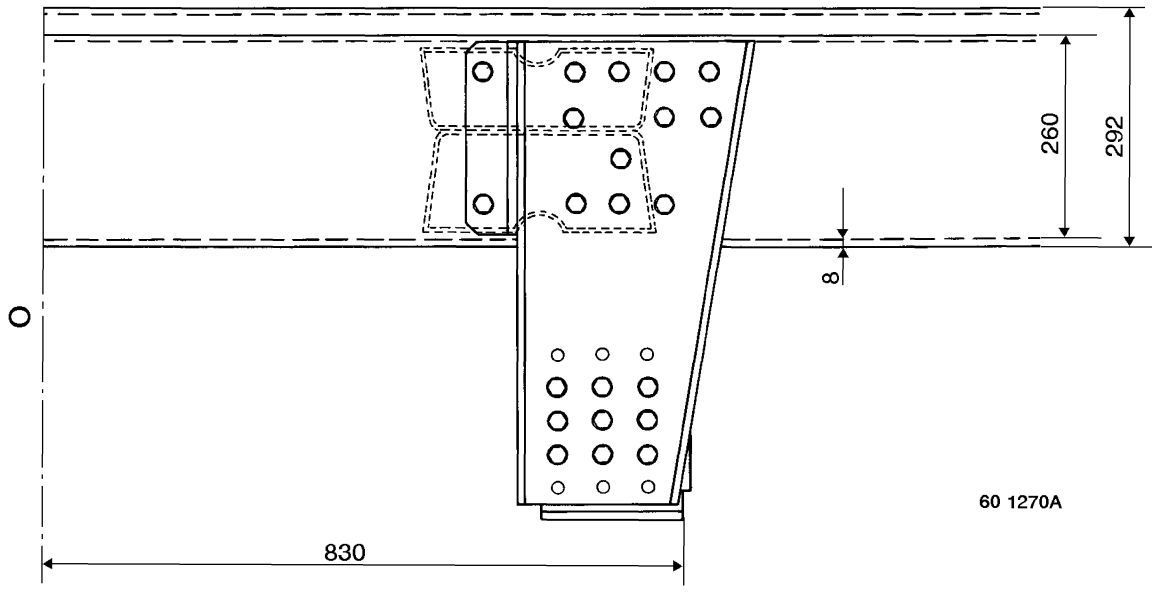
Assembly principle

4x2 rigid GVW 19 T wheelbase 5575



0 = 6x2 rear drive axle or rear axle centre-line

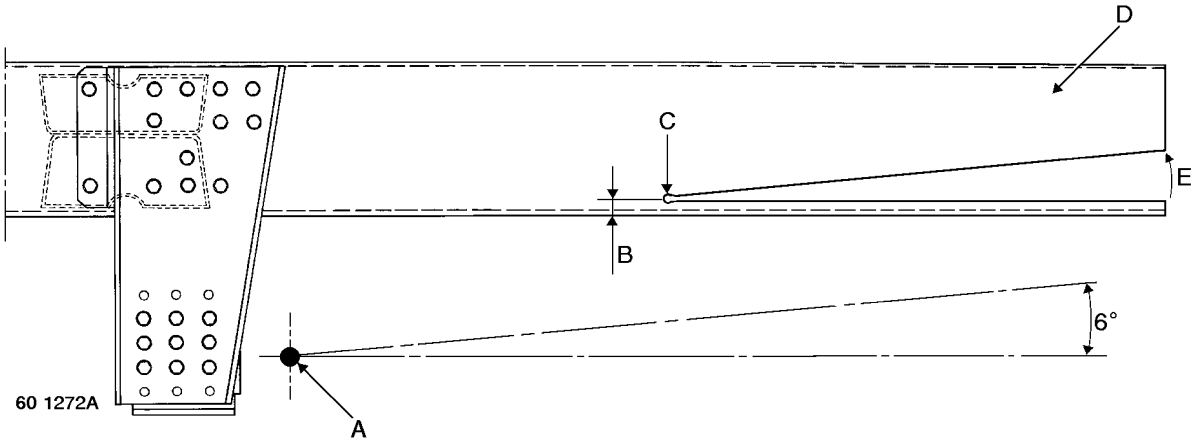
6x2 rigid wheelbase 5190
4x2 rigid wheelbase 5960



0 = rear drive axle centre-line

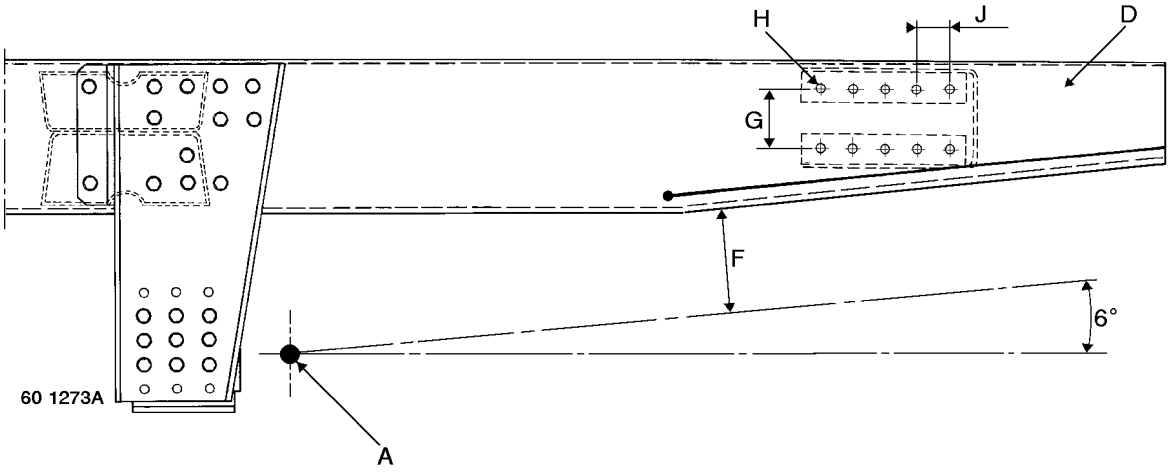
For other wheelbases, use the same principle in compliance with the directive.

Rear bevelling of sidemembers



A = Hook centre-line
B = Dimension 20 mm
C = Holes Ø 15 mm max.
D = Sidemember
E = Bend

Method :
Cut the web of the sidemember (D).
Bend the lower flange of the sidemember as in (E).

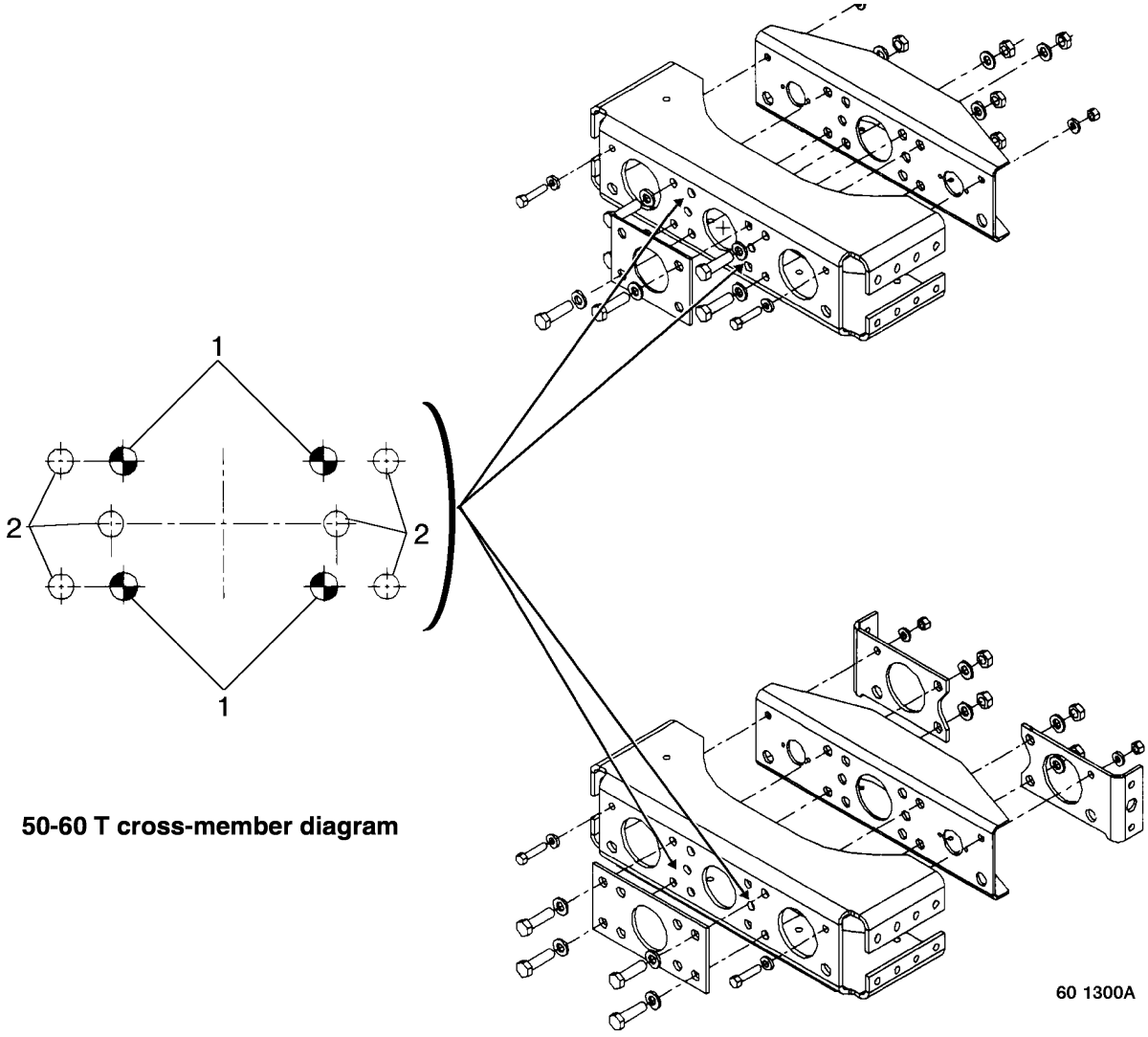


A = Hook centre-line
D = Sidemember
F = Trailer tongue radius
G = 105 mm
H = cross-member
J = 55 mm

Method :
Weld the sidemember (D) as per RENAULT V.I. recommendations.
Position the rearmost cross-member (H) and drill the sidemember.

Assembly of towing hook to 40-44 T & 50-60 T PREMIUM cross-members

40-44 T cross-member diagram



50-60 T cross-member diagram

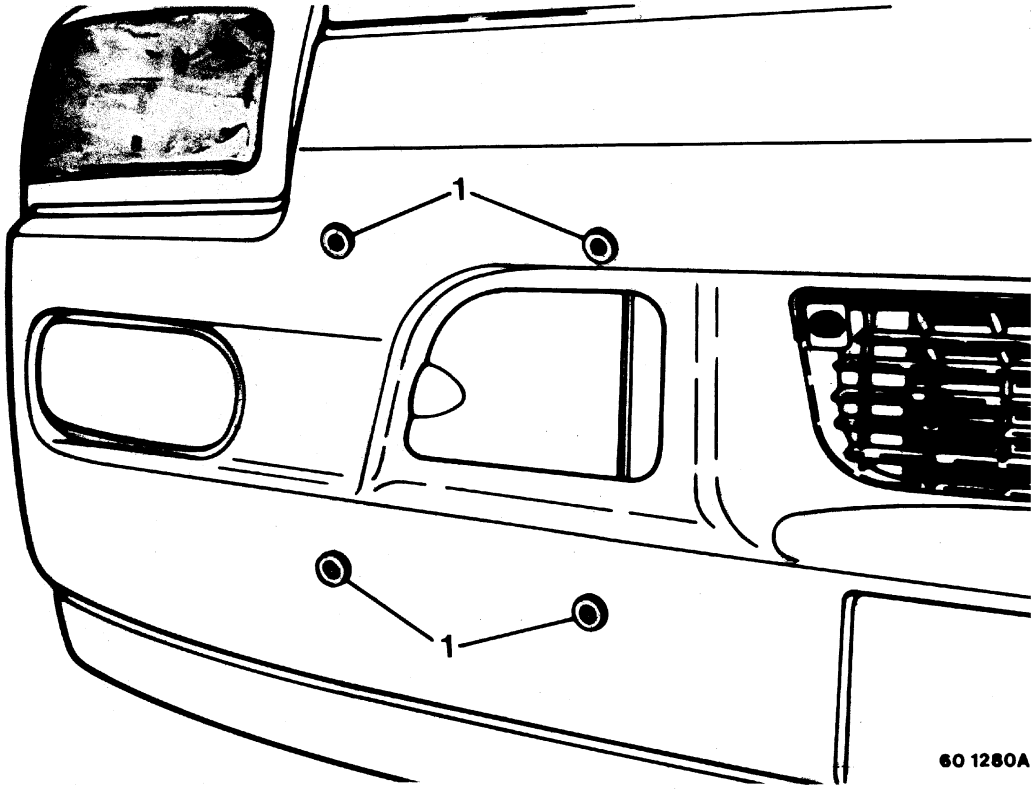
- Use the holes (1) to assemble the “DIN” towing hook to the cross-member.
- Use the holes (2) to assemble the “BNA” towing hook to the cross-member.

3.11 - TANKERS (water, hydrocarbons, food products, sewer cleaners)

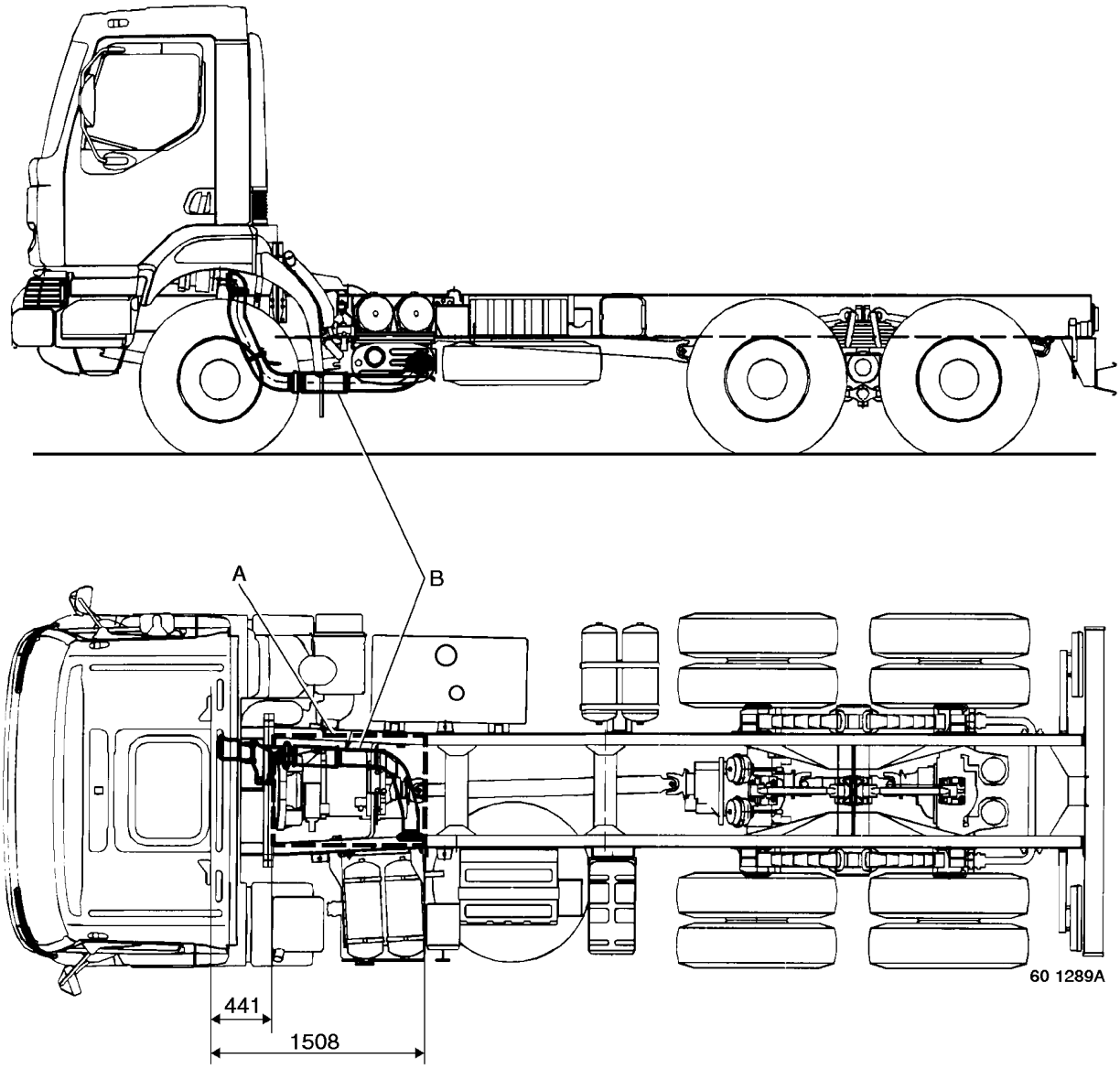
- The recommendations regarding sub-frames and their attachment to the vehicle chassis are identical to those defined on pages 58 and 59.
- The assembly of flexible mountings in the guiding and fastening zone is permitted. Their characteristics are to be equivalent to those of the mechanical system recommended.
- In the case where the layout of lateral accessories (e.g. pumps) do not permit the use of body brackets, attachment using plates is permitted in the guiding and fastening zone.

PREMIUM RTMDR (transport of hazardous substances) plates

- Bracket fixing **(1).**



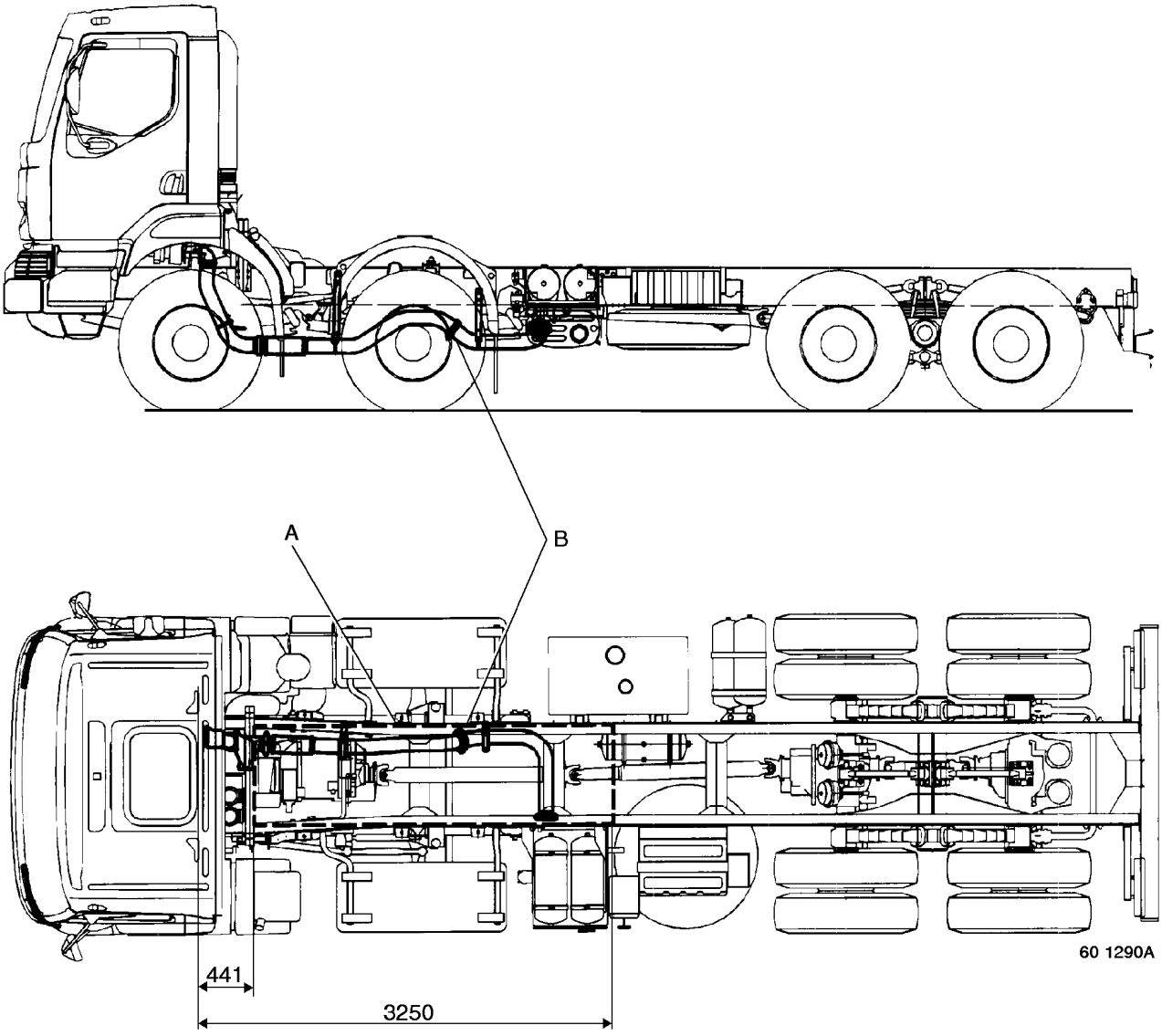
Exhaust line and silencer protection
KERAX 4x2 - 4x4 - 6x4 rigids, RTMDR on-off road vehicles



A - Zone to be protected
B - Exhaust and silencer line to be protected against leakage and discharge of the product transported

441 & 1508 - Minimum dimensions to be observed in relation to the front axle centre-line.

KERAX 8x4 rigids, RTMDR on-off road vehicles



A - Zone to be protected
B - Exhaust and silencer line to be protected against leakage and discharge of the product transported

441 & 3250 - Minimum dimensions to be observed in relation to the front axle centre-line.

3.12 - PREMIUM refuse collectors and municipal vehicles

- The assembly of a continuous sub-frame is mandatory.
- The recommendations regarding sub-frames and their attachment to the vehicle chassis are identical to those defined on pages 60 and 61.
- The assembly of flexible mountings in the guiding and fastening zone is permitted. Their characteristics are to be equivalent to those of the mechanical system recommended.

4 - KITS

4.1 - PREMIUM bolting kit

Stainless steel threaded hardware for electrical equipment available from the Spare Parts Department :
Kit ref. N° 50 01 838 838.
Threaded hardware for fastening bodywork (all vehicles) :
Kit ref. N° 50 01 839 172

4.2 - KERAX bolting kit

Stainless steel threaded hardware for electrical equipment available from the Spare Parts Department :
Kit ref. N° 50 01 838 838.
Threaded hardware for fastening body brackets and plates (4x2, 4x4 vehicles) :
Kit ref. 500 1843 166
Threaded hardware for fastening body brackets and plates (6x4, 6x6, 8x4 except tippers)
Kit ref. N° 50 01 843 167.
Threaded hardware for fastening body brackets and plates (8x4 medium and heavy tipper vehicles with wheelbase 5063) :
Kit ref. N° 50 01 843 168.

5 - QUALITY ASSURANCE

The satisfaction of our customers is a permanent goal that we must attain for the end product consisting of a chassis, a body and related equipment.

To meet this objective, the setting up of an organization and an efficient quality system is a proceeding that **RENAULT V.I.** demands from all its bodybuilding and equipment manufacturing partners.

For any bodybuilding, equipment fitting or conversion of the basic vehicle, with reference to ISO 9000 standards, **RENAULT V.I.** may request proof of :

- compliance with laws, EEC directives and domestic regulations,
- compliance with manufacturers' directives,
- quality control of the build.