

## SPECIFICATION

### Truck Body

Large trucks of the off-highway type give rise to transport problems since various regulations restrict the transportation thereof on commercial carriers. A truck body is normally fully fabricated at a manufacturing facility to secure the various plate and beam members thereof together. One prior art technique for overcoming the transport problems is one of cutting the completed truck body into several sections at the various weld joints to separate the truck body into component parts for transportation.

The component parts are then reassembled and aligned at a remote job site by utilisation of relatively complex fixtures and methods for applying high quality welds to the weld joints which have been severed previously. Such a procedure is laborious and time consuming and occasionally the resulting welds may be found defective thereby impairing the overall structural integrity of the completed truck body.

A more recent solution to the transport problems may be found in our U.S. Patent Specification No. 3,938,238. As disclosed in that specification, a truck body is fabricated comprising a bottom section and a pair of side sections which are pre-assembled at a manufacturing facility, disassembled for transportation and thereafter re-assembled and secured together at a remote job site. A front module and canopy module are thereafter secured to the other modules to complete the truck body for mounting on the undercarriage of a vehicle.

As will be hereinafter described, the modular truck body and method of this invention constitute improvements over that disclosed in U.S. Patent Specification No. 3,938,238. In particular, assembly time and the number of welds employed are substantially reduced and the integrated truck body exhibits a substantial increase in structural integrity thereover.

Regarding the latter desideratum, loads imposed upon the floor section of a truck body during the loading and carrying phases of vehicle operation tend to exert substantial forces thereon.

In accordance with the invention, a truck body comprises a unitary first module having a generally L-shaped cross section with an upwardly extending first side section and a substantially horizontal first bottom section; a unitary second module having a generally L-shaped cross section with an upwardly extending second side section spaced laterally from the first side section and a substantially horizontal second bottom section having a lateral width less than the lateral width of the first bottom section, the first and second bottom sections being divided from one another across a separation line which extends longitudinally the full lengths thereof and which is laterally offset relatively to the longitudinal centre line of the truck body; and securing means provided along the separation

line and securing the first and second bottom sections together.

The invention also includes a method of making a truck body according to the primary aspect of the invention, the method comprising the steps of fabricating the unitary first module; fabricating the unitary second module; disposing and aligning the first and second modules in side-by-side relationship to define a separation line between the first and second bottom sections extending the full length thereof and laterally disposed in offset relationship relative to the longitudinal centre line of the composite first and second modules forming the truck body; releasably attaching the first and second modules together at the separation line to form a pre-assembled and fully aligned truck body; detaching and separating the first and second modules from each other at the separation line, transporting the separated first and second modules to a remote location; again disposing and aligning the first and second modules in side-by-side relationship at the separation line; again releasably attaching the first and second modules together at the separation line; and permanently securing the first and second modules together at the separation line to form a structurally integrated truck body.

The method is thus substantially simplified over prior art methods and results in a truck body exhibiting a greater degree of structural integrity than conventional ones of the type described above.

An example of a truck having a body constructed in accordance with the invention is illustrated in the accompanying drawings, in which:—

- Fig. 1 is a side elevation of the truck;
- Fig. 2 is an enlarged bottom plan view of the truck body;
- Fig. 3 is an inverted, front elevation of the truck body, taken in the direction of arrows III—III in Fig. 2;
- Fig. 4 is an enlarged and partially sectioned side elevation, illustrating a forward end of the truck body having a canopy module secured thereon;
- Fig. 5 is an enlarged view of a forward portion of the truck body and secured canopy module, taken within circle V in Fig. 1;
- Fig. 6 is an enlarged section taken on the line VI—VI in Fig. 2, illustrating means securing bottom sections of a pair of modules of the truck body together;
- Fig. 7 is a section taken on the line VII—VII in Fig. 6; and
- Fig. 8 is an enlarged section taken on the line VIII—VIII in Fig. 3, illustrating means for securing front sections of the modules together.

Fig. 1 shows an off-highway truck 10 comprising an operator's station or cab 11, a main frame 12 of an undercarriage and a plurality of roadwheels 13 suitably mounted on the frame in a conventional manner. A modular truck body 14 is pivotally mounted at its rearward end on the frame by a pair of laterally spaced pivot means 15

(one shown). A pair of double-acting hydraulic cylinders 16 (one shown) are pivotally interconnected between the frame and the truck body to selectively tilt the truck body rearwardly about pivot means 15 for dumping purposes.

Referring to Fig. 2, showing truck body 14 in bottom plan view, the truck body comprises a first module 17, a second module 18 disposed in side-by-side relationship with respect to the first module and a third or canopy module 19. As will be described hereinafter, the three modules constituting the truck body may be fabricated and preassembled at a manufacturing facility and thereafter detached from each other for shipment to a remote job site or the like whereat the modules may be fixedly secured together and mounted on frame 12 of truck 10 (Fig. 1). Modules 17 and 18 are secured together at a separation line 20, extending the full lengths thereof and substantially offset in a lateral direction relative to a longitudinal axis X of the truck body.

First module 17 is generally L-shaped in cross section to define a generally vertical first side section 21 and a generally horizontal first bottom section 22. An elongate rail 23 is secured to an upper edge of the side section and a plurality of longitudinally spaced and laterally extending L-shaped ribs 24, having a decreasingly shorter vertical height towards a rearward end of the truck body, are secured to the undersides of the bottom and side sections. The ribs are interrupted by a pair of longitudinally extending and laterally spaced beams 25, secured to the underside of bottom section 22 and disposed on either side of longitudinal axis X of the truck body.

Second module 18 also comprises a generally L-shaped cross section to define a generally vertical second side section 26, spaced laterally from first side section 21, and a generally horizontal second bottom section 27. It should be noted in Fig. 2 that the lateral width of second bottom section 27 is substantially less than the lateral width of first bottom section 22 whereby the integrated truck body is provided with a high degree of structural integrity, particularly in the central floor area of the truck body whereat the magnitude of loading is the greatest. An elongate rail 28 is secured to an upper edge of second side section 26 and a plurality of longitudinally spaced and L-shaped ribs 29, also having a decreasingly shorter vertical height towards a rearward end of the truck body, are secured to an underside of second module 18 and are disposed in alignment with ribs 24.

Referring to Fig. 3, module 17 further comprises a front section 30 formed integrally with side section 21 and bottom section 22. Likewise, second module 18 comprises a front section 31 formed integrally with side section 26 and bottom section 27. Front sections 30 and 31 are aligned laterally relative to each other and meet at a separation line 32 which is conterminous with separation line 20 (Fig. 2).

Referring to Figs. 1, 2, 4 and 5, canopy module

19 is preferably secured on a forward end of the truck body and to modules 17 and 18 at a separation line 33 to overlie and protect operator's station 11. As more clearly shown in Fig. 5, the canopy module is secured to a laterally extending rail 34 formed in two sections and secured on the upper edges of front sections 30 and 31 (Fig. 3), by welds 35. The canopy module is further secured to each upper rail 23 and 28 of modules 17 and 18, respectively, by a weld 36 (one shown in Figs. 4 and 5).

The means for securing modules 17 and 18 together will now be described with particular reference to Figs. 2, 3 and 6—8. Referring to Figs. 6 and 8, a pair of brackets 37 and 38 are secured to the undersides of modules 17 and 18, respectively. The brackets are disposed longitudinally between respective longitudinally spaced pairs of ribs 24 and 29 and are secured together by releasable fastening means 39, such as the illustrated bolt-type fasteners.

A combined weld back-up and guide strip or plate 40 overlaps the full length of separation lines 20 and 32 between each modules 17 and 18 and is accommodated within cutouts suitably formed on the undersides of ribs 24 and 29 (Figs. 6—8). Each plate is secured to modules 17 and 18 by longitudinally extending welds 41 and 42, respectively. The separation line defines an elongate and generally V-shaped groove having a continuous weld seam 43 deposited therein to secure the modules together along with plates 40.

As further illustrated in Figs. 6 and 8, a second combined weld back-up and guide plate 44, also having cutouts formed thereon to accommodate plate 40, is solely secured to a respective rib 24 of module 17 by a U-shaped weld 45. The latter plate is also U-shaped and overlaps the separation line to be disposed in sliding relationship within a respective rib 29. A U-shaped weld seam 46 is deposited within the generally V-shaped groove defined at the separation line between the ribs to complete the structural integration of bottom sections 22 and 27.

Referring to Figs. 3 and 8, it should be noted that front sections 30 and 31 of modules 17 and 18, respectively, are secured together in a like manner. Thus, plates 40 are structurally integrated with the fabricated truck body to close and reinforce separation line 32, along with welds 43. Each pair of laterally adjacent and aligned ribs 24 and 29, secured beneath the front sections, are secured together by a respective U-shaped plate 44 and U-shaped weld 46 which extends about the three sides of the ribs. As described hereinafter, plates 40 and 44 further function as guide means to aid in aligning and interlocking the modules relative to each other upon final secureance thereof together at a remote job site.

#### Pre-assembly Operation

Referring to Fig. 2, modules 17, 18 and 19 are each prefabricated at a manufacturing facility for

individual shipment to a customer's job site for the final assembly operation. At such facility, modules 17 and 18 are disposed in their illustrated side-by-side relationship and attached together by fastening means 39 to dispose them in proper alignment. At this stage of the operation, plate 40 (more than one plate could be utilized, if so desired) is solely secured to bottom section 22 of module 17 by weld 41 (Fig. 6) whereas each plate 44 is solely secured internally to a respective rib 24.

Upon prealignment of partially fabricated modules 17 and 18, plates 40 will function to guide the modules in their proper alignment whereby brackets 37 and 38 may be welded in place and fastening means 39 may be tightened-down to maintain the modules in their preassembled condition. It should be noted that module 17 may be completely fabricated with rail 23, ribs 24 and beams 25 secured in place by welding thereon. Likewise, module 18 is completely fabricated with rail 28 and ribs 29 welded in place thereon. Canopy module 19 is secured to modules 17 and 18 during the final assembly operation, as described hereinafter.

#### Final Assembly Operation

Upon release of fastening means 39, modules 17, 18, 19 are shipped to a remote job site for final assembly. At such job site, modules 17 and 18 are again realigned in their inverted positions, as shown in Fig. 2, and fastening means 39 are again secured thereto to maintain them in their proper relative positions. It should be noted that plates 40 and 44 function to guide the modules into proper alignment and also interlock them together to prevent both vertical and longitudinal movement of the modules relative to each other. Welds 42 and 46 are then applied to the modules to secure them together. If so desired, fastening means 39 may remain in their installed positions to form part of the securing means along with welds 41, 42, 43, 45 and 46 and plates 40 and 44 or they may be removed for reuse.

Upon turning-over the partially completed truck body to its upright position, continuous weld 43 is formed to further secure bottom sections 22 and 27 together. Canopy module 19 is then secured in place, as described above, to form the completed and structurally integrated truck body. The truck body may then be mounted on the chassis of truck 10 (Fig. 1) in a conventional manner.

From the above description it can be seen that the truck body can be prefabricated, preassembled, shipped and assembled at a remote job site in a relatively expeditious and efficient manner. The fact that only three major modules (17, 18 and 19) are involved substantially reduces fabrication and alignment problems. In addition, only one continuous major weld 43 is required along coterminous separation lines 20 and 32 to further expedite the operation.

Employment of major weld 43 and attendant welds 41, 42, 45 and 46 in offset relationship

relative to the central longitudinal axis  $X$  of the truck body substantially increases the structural integrity of the integrated truck body, particularly in the central floor area thereof, i.e. substantially larger first bottom section is void of welds in the plate forming the floor thereof. As suggested above, the central floor area is subjected to the greatest magnitude of load both during the loading and carrying phases of vehicle operation.

#### Claims

1. A modular truck body comprising a unitary first module having a generally L-shaped cross section with an upwardly extending first side section and a substantially horizontal first bottom section; a unitary second module having a generally L-shaped cross section with an upwardly extending second side section spaced laterally from the first side section and a substantially horizontal second bottom section having a lateral width less than the lateral width of the first bottom section, the first and second bottom sections being divided from one another across a separation line which extends longitudinally the full lengths thereof and which is laterally offset relative to the longitudinal centre line of the truck body; and securing means provided along the separation line and securing the first and second bottom sections together.

2. A truck body according to Claim 1, further comprising a canopy module secured forwardly on the first and second modules.

3. A truck body according to Claim 1 or Claim 2, further comprising a plurality of laterally extending and longitudinally spaced ribs secured to an underside of each of the first and second modules, each rib of the first module being disposed in alignment with and secured to a respective rib of the second module.

4. A truck body according to Claim 3, wherein each rib of the first module is located relatively to a respective rib of the second module by means comprising a guide plate disposed within and in overlapping relationship with such aligned ribs.

5. A truck body according to Claim 4, wherein the guide plate is secured to one and slidably received within the other of the aligned ribs, and forms a back-up plate for a weld joining the adjacent ends of the aligned ribs together.

6. A truck body according to any one of the preceding claims, wherein the securing means comprises a plurality of longitudinally spaced releasable fastening means detachably securing the first and second modules together at the separation line.

7. A truck body according to Claim 6, wherein each of the releasable fastening means comprises a pair of brackets respectively secured to the first and second modules and a releasable fastener releasably secured between the brackets.

8. A truck body according to any one of the preceding claims, wherein the securing means comprises at least one plate disposed on the undersides of the bottom sections of the first and second modules to underlap the separation line



individual shipment to a customer's job site for the final assembly operation. At such facility, modules 17 and 18 are disposed in their illustrated side-by-side relationship and attached together by fastening means 39 to dispose them in proper alignment. At this stage of the operation, plate 40 (more than one plate could be utilized, if so desired) is solely secured to bottom section 22 of module 17 by weld 41 (Fig. 6) whereas each plate 44 is solely secured internally to a respective rib 24.

Upon prealignment of partially fabricated modules 17 and 18, plates 40 will function to guide the modules in their proper alignment whereby brackets 37 and 38 may be welded in place and fastening means 39 may be tightened-down to maintain the modules in their preassembled condition. It should be noted that module 17 may be completely fabricated with rail 23, ribs 24 and beams 25 secured in place by welding thereon. Likewise, module 18 is completely fabricated with rail 28 and ribs 29 welded in place thereon. Canopy module 19 is secured to modules 17 and 18 during the final assembly operation, as described hereinafter.

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Upon turning-over the partially completed truck body to its upright position, continuous weld 43 is formed to further secure bottom sections 22 and 27 together. Canopy module 19 is then secured in place, as described above, to form the completed and structurally integrated truck body. The truck body may then be mounted on the chassis of truck 10 (Fig. 1) in a conventional manner.

From the above description it can be seen that the truck body can be prefabricated, preassembled, shipped and assembled at a remote job site in a relatively expeditious and efficient manner. The fact that only three major modules (17, 18 and 19) are involved substantially reduces fabrication and alignment problems. In addition, only one continuous major weld 43 is required along coterminous separation lines 20 and 32 to further expedite the operation.

Employment of major weld 43 and attendant welds 41, 42, 45 and 46 in offset relationship

relative to the central longitudinal axis X of the truck body substantially increases the structural integrity of the integrated truck body, particularly in the central floor area thereof, i.e. substantially larger first bottom section is void of welds in the plate forming the floor thereof. As suggested above, the central floor area is subjected to the greatest magnitude of load both during the loading and carrying phases of vehicle operation.

#### Claims

1. A modular truck body comprising a unitary first module having a generally L-shaped cross section with an upwardly extending first side section and a substantially horizontal first bottom section; a unitary second module having a generally L-shaped cross section with an upwardly extending second side section spaced laterally from the first side section and a substantially horizontal second bottom section having a lateral width less than the lateral width of the first bottom section, the first and second bottom sections being divided from one another across a separation line which extends longitudinally the full lengths thereof and which is laterally offset relative to the longitudinal centre line of the truck body; and securing means provided along the separation line and securing the first and second bottom sections together.

2. A truck body according to Claim 1, further comprising a canopy module secured forwardly on the first and second modules.

3. A truck body according to Claim 1 or Claim 2, further comprising a plurality of laterally extending and longitudinally spaced ribs secured to an underside of each of the first and second modules, each rib of the first module being disposed in alignment with and secured to a respective rib of the second module.

4. A truck body according to Claim 3, wherein each rib of the first module is located relative to a respective rib of the second module by means comprising a guide plate disposed within and in overlapping relationship with such aligned ribs.

5. A truck body according to Claim 4, wherein the guide plate is secured to one and slidably received within the other of the aligned ribs, and forms a back-up plate for a weld joining the adjacent ends of the aligned ribs together.

6. A truck body according to any one of the preceding claims, wherein the securing means comprises a plurality of longitudinally spaced releasable fastening means detachably securing the first and second modules together at the separation line.

7. A truck body according to Claim 6, wherein each of the releasable fastening means comprises a pair of brackets respectively secured to the first and second modules and a releasable fastener releasably secured between the brackets.

8. A truck body according to any one of the preceding claims, wherein the securing means comprises at least one plate disposed on the undersides of the bottom sections of the first and second modules to underlap the separation line



and provide a back-up plate for a weld seam joining the adjacent edges of the bottom sections together.

9. A truck body according to any one of the preceding claims, wherein the first and second modules further comprise upwardly extending first and second front sections formed integrally therewith, respectively; the separation line further separates the first and second front sections; and the securing means further secures the first and second front sections together.

10. A truck body according to any one of the preceding claims, further comprising a pair of longitudinally extending and laterally spaced beams secured to an underside of the first bottom section and disposed one on each side of the centre line of the truck body.

11. A truck body according to Claim 1, substantially as described with reference to the accompanying drawings.

12. A method of making a truck body according to any one of the preceding claims, the method comprising the steps of fabricating the unitary first module; fabricating the unitary second module; disposing and aligning the first and second modules in side-by-side relationship to define a separation line between the first and second bottom sections extending the full length thereof and laterally disposed in offset relationship relative to the longitudinal centre line of the composite first and second modules forming the truck body; releasably attaching the first and second modules together at the separation line to form a pre-assembled and fully aligned truck body; detaching and separating the first and second modules from each other at the separation line, transporting the separated first and second modules to a remote location; again disposing and aligning the first and second modules in side-by-side relationship at the separation line; again releasably attaching the first and second modules together at the separation line, and permanently securing the first and second modules together at the separation line to form a structurally integrated truck body.

13. A method according to Claim 12, further comprising the step of securing a canopy module on a forward end of the first and second modules subsequent to the transporting step.

14. A method according to Claim 11 or Claim

12, wherein the releasably attaching step comprises releasably attaching the first and second modules together by a plurality of releasable fasteners.

15. A method according to any one of Claims 12 to 14, wherein the step of fabricating a unitary first module comprises the step of securing a plurality of laterally extending and longitudinally spaced ribs to an underside of the first bottom section.

16. A method according to Claim 15, wherein the step of fabricating a unitary second module comprises the step of securing to an underside of the second bottom section a plurality of laterally extending and longitudinally spaced ribs which will, when the first and second modules are subsequently disposed and aligned side-by-side, be in alignment with respective ones of the ribs of the first module.

17. A method according to claim 16, wherein the step of fabricating the first module comprises the step of securing a back-up guide plate internally to each rib of one module so that the guide plate projects from the end of the rib; the second of the disposing and aligning steps comprises guiding each pair of laterally aligned ribs of the first and second modules together with the guide plates sliding into respective ones of the ribs of the other module; and the permanently securing step comprises welding the pair of ribs together.

18. A method according to any one of claims 12 to 17, wherein the permanently securing step comprises providing a back-up plate on an underside of the first and second modules in overlapping relationship relative to the separation line and welding the adjacent edges of the first and second modules together.

19. A method according to claim 18, wherein the step of securing the first and second module together comprises initially securing the back-up plate to only the first module during the fabricating step thereof and thereafter securing the back-up plate to the second module; the back-up plate assisting in guiding the first and second modules together prior to the step of securing the back-up plate to the second module.

20. A method according to claim 12, substantially as described with reference to the accompanying drawings.