

## **Specification**

**40' Tandem 40GN**

## **1. General**

The chassis specified is to be operable for repeated use in stevedoring and transporting 40', ISO cargo containers in highway and T.O.F.C. service in the U.S.A. Chassis must meet all Federal and State(s), D.O.T., A.A.R., ANSI, T.O.F.C., FMVSS, SAE, ISO, and TTMA requirements, standards, and recommendations in effect at the time of manufacture to operate in the U.S.A.

## **2. Design Live Load / Gross Vehicle Weight Rating**

The chassis should be designed to support a minimum live load of 67,200 lbs. (30,480 kgs).

## **3. Material**

The main beams are to be two hot-rolled I-beams. Wide Flange 12" beams in depth x 19lbs/ft. Main Beams to be to mill specifications; dual certified Grade 50 and A992. All other fabricated components are A572 GR50 with a 50K min yield.

## **4. Overall Length**

Overall outside length is approximately 40' - 7" (excluding the rear bumper and dock bumpers if applicable).

## **5. Overall Width**

The overall width over bolsters is 96" +/- 1/8"

## **6. King Pin Location**

30" +/- 1/8" from the rear face of the front bolster.

## **7. Tandem Location**

Fixed tandem suspension with the equalizer 54" forward of the rearward facing face of the rear bolster ("west coast" position) with the axles on 49" centers.

## **8. Maximum Rear Height**

48 ± 1" from ground to top of the rear bolster in unloaded condition.

## **9. Landing Gear location**

Approx 128" from the rear face of the front bolster.

## **10. Tare Weight (Tolerance ±2%)**

Tare weight is approximately 6,240 lbs. as built.

## **11. Main Beams**

12" deep x 4" wide x 19 pounds per foot, hot rolled, I-section main beams, ASTM-A572 Grade 50. Feature, 3/4," LED, both side main rails, mid marker lights (mounting bracket if required).

## 12. Gooseneck beams

- a. 5" deep fabricated ASTM-A572, grade 50, I-beam consisting of 4" wide x 1/2" thick top flange, 1/2" x 5" bottom flanges and 3/8" web.
- b. The 1/2" thick x 5" wide bottom flange is welded on the bottom of the beam lower flange to tie the main beam to the fabricated beam.
- c. Gooseneck rails to be 'parallel' to the main rails.
- d. The height between the top flange of the gooseneck rails and the top rails of the main beams conforms to ISO requirements and is consistent with the securement of 40' ISO standard and 40' high cube ISO intermodal containers with gooseneck tunnels at the front.

## 13. Cross Members

- a. 3/16" thick x 3" wide x 8-3/4" high fabricated channel type with integral, triangular gusset for every other cross member.
- b. Landing gear area to be reinforced on both sides with Formed 3/16" Channel. 10" Space between the faces to support the frame at the landing gear.

## 14. Upper Coupler Assembly (48-inch height +/- 1 inch in level condition).

- a. 5/16" thick pick-up plate is installed with continuous welding along the entire perimeter. 1-1/4" Formed Flange on kingpin plate to wrap around the front face of the front bolster.
- b. King Pin is a 2" diameter mushroom type S.A.E. standard J700B certified per AAR. Forged steel alloy heat-treated to surface hardness of Brinell 380 to 420. Kingpin supplier to KPT809CF or RW-KPN20038 or JOST (KW1308). Subject to availability at the time of manufacturing.
- c. 2" diameter water drain holes are provided for each upper coupler "compartment" to permit water drainage in the 'nose up', nose down, and/or 'level' position.
- d. 10" wide 3-1/2" deep x 1/4" thick, transverse, channel-type king pin supporters.
- e. Fifth wheel height: 48" (+/- 1") with chassis in a level condition.

## 15. Front Bolster

- a. Formed 3/16" end cap with integrated hole for 3/4", PC-rated, LED clearance lights.
- b. Fabricated with grade ASTM A572 GR50 Steel
- c. Rear profile tapered forward as a container gatherer in a stevedoring operation.
- d. Front bolster provides full recessing of lights, and air and electrical connectors.
- e. The front bolster is composed of (2) boxed sections on the curbside and roadside. A formed 3/16" reinforcement is made with vertical 25deg flanges on either side. Once welded into the 3/16" body this reinforces the area where the beams tie in.

- f. The ends of the bolster include reflectors as required by law.
- g. Phillips 7-way receptacle (16-724) and Phillips glad-hands (12-00623 and 12-00823) or equivalent are to be located in the center of the front bolster. It will be necessary to ensure that the 7-way receptacle and the glad-hands should be mounted in such a way as to avoid contact damage when making hard turns. The 7-way mounting bolts should be grade 5 or better.
- h. 5/16" thick x 18.5" triangular steel reinforcement plates are welded on each side between the gooseneck main rail and front bolster to reinforce the bolster.

## **16. Front Locking Pins**

The front container pin locking mechanism will be Road Warrior RW-1213 (L&R) pin locks on 89" centers which fit inside the end caps.

## **17. Rear Bolster**

- a. 8" wide x 3/8" steel top plate with 6 3/4" wide x 7" deep x 1/4" thick "U" type bottom channel.
- b. There are reinforcement plates between the bolster and the main rails each of 1/4" thick x 18" for added support.
- c. The assembly shall feature cantilevered twist locks at each end @ 89" centers.
- d. An additional formed plate under the bolster will have a low-profile Optronics tag light, or equivalent.
- e. The rear bolster channel is fabricated from A572 GR50.
- f. Inside, the bolster contains vertical full-height stiffeners incorporated into the interior of the rear bolster where the bolster joins each mainframe I beam.
- g. The bolster accommodates vertical stiffeners and drains holes sufficient to allow full water drainage while providing all strength and reinforcement.
- h. End caps are equipped with a 3/4" diameter, PC-rated, LED, ABS light (plus ABS decal) and a 3/4" diameter, PC-rated, LED clearance light.
- i. The ABS light and the LED clearance light(s) have 0.180 (sealed) bullet connection(s).

## **18. Twist Locks**

- a. Rear twist locks to be top-mount, Road Warrior RW-1259, right and left, twist locks with 45-degree handles.

## **19. DOT Bumper and License Plate Mounting Plate**

- a. 4" X 4" square type step bar with horizontal safety step bar approximately 42" wide with a non-slip top surface and drain holes as needed to prevent internal corrosion.
- b. The horizontal bar will be welded to the uprights and designed to accommodate and protect legally mandated reflective tape in a recessed area.
- c. The vertical components are trapezoidal type with 4" x 1/4" thick rear flange and 4" wide and 1/4" thick front flange and 1/4" thick web.
- d. The license plate mounting plate will be located in a way to prevent damage from dock retainer 'hooks' and large enough to accommodate the chassis prefix and number decals and customer logo decals in addition to the license plate.

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## **20. Landing Gear**

- a. Minimum lifting capacity 55,000 lbs., with minimum 17-inch travel, two-speed manual operation with square legs, and 10" square, low-profile sand shoes with solid axles.
- b. 51.5125" wide stance landing gear mounting with roadside crank handle.
- c. Crank handle is to be secured against theft by tack weld.
- d. Standard travel, AXN TLG60, Automann, or JOST A400
- e. One Fabricated 4.5" channel brace will be mechanically fastened horizontally between the legs at the lowest point of the landing leg(s) outer casing.

## **21. Landing Gear Support Bracket**

- a. Landing gear boxes fabricated of 1/4" thick grade 50 steel welded to the main frame.
- b. 3/16" thick stiffeners fore and aft of the landing gear box.
- c. 1/4" thick angle brace to support the landing gear.
- d. The landing gear box is designed to bend or break before the landing leg when a force occurs longitudinally to the chassis.

## **22. Axles and Wheel Ends – or alternates as approved, in writing.**

- a. N series axles, tapered spindles, 5" round 71.5" track with (minimum of) 22,500 lbs. rated capacity, hub-piloted axles by AXN or equivalent.
- b. Meritor Platinum Shield III KSF5404515Q or B-Lock 4515CXL20 (AXN or MAT) with minimum 20,000-pound rating brake shoes or equivalent.
- c. SKF Pro XT, Stemco Guardian, or Amsted Endurance wheel seal.
- d. Mobilith SCH 007 or Chevron Delo, semi-fluid or Gadus Red Grease or equivalent.
- e. SKF (1343) Stemco (5096), AXN, or Amsted (87009) metal, vented hubcaps
- f. Bearings: Cone - HM218248 / HM212049 and Cup - HM218210 / HM212011. SKF, Stemco, or Amsted
- g. Axles installed cams forward per spec.

## **23. Tandem & Suspension**

- a. AXN FH66 equalized tandem mechanical suspension with springs by Road Warrior part number: RW-354-00 three leaf, high arch or equivalent.
- b. Fabricated, steel hangers and equalizer rockers with 7/8" U-bolts.
- c. Entire suspension is to be torqued to the suspension manufacturer's specification.
- d. Suspension to carry the topcoat used on the rest of the main chassis.
- e. A reinforcement pipe is to be added on the front and middle equalizer hangers per the diameter of the hanger manufacturer. Pipe to be a minimum of SCH 40.

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## 24. Wheels and Drums

10-stud, hub piloted, 285.75 mm bolt pattern, cast steel hub featuring nuts for ferrous dual disc wheels and having a 220mm bore. AXN standard H30-08047, Road Warrior BD2, or Webb V1B cast iron drums.

Steel disc wheels – 8.25 X 22.5 hub-piloted with hand holds, angled valve stems and metal valve caps, white powder coated by Sunrise, Accuride, and Centurion or equivalent.

## 25. Tires

295/75/22.5, 14 Ply, Load Range G, Samson, or equivalent.

## 26. Brake System

- a. Valve: Sealco 110800 spring brake priority valve system and Wabco 2S/1M ABS system or equivalent.
- b. Where applicable, the ABS - ECU unit will be mounted separately on the frame.
- c. One air tank system with Hoosier, Sanborn, Road Warrior 12" Frown brkt or equivalent.
- d. Air lines: 3/8" control and 3/8" for supply. Airlines are secured to the gooseneck, main rails, chassis, and bolsters to avoid chafing.
- e. Airline securement clamps shall be rubber covered and protected from corrosion as shall the means of securing them to the chassis frame to facilitate easy 'in-service' removal if needed.
- f. As needed, hose separators and (hanging) clamps will be used, and hoses will be routed to prevent rubbing, chaffing, or excess movement while the chassis is in use.
- g. Rubber grommets should be provided at each location where airlines pass through cross members. The Cutting of any grommets to facilitate their installation is not permitted.
- h. Brake chamber by: Ranger (CTS3030), or AXN3030: shall be 30/30, 2.5-inch stroke, double diaphragm brake chamber with sealed service side and non-replaceable push rod for spring ride suspensions.
- i. Automatic Brake Adjusters by Meritor, Haldex, TSE, or Road Warrior Stroke Check, Hendrickson, 5 1/2", with visual brake stroke indicators, or equivalent.
- j. Glad-hand: Phillips, Tramec, or fixed glad hands (12-00623 and 12-00823) or equivalent are to be mounted in the center of the front bolster. Glad-hands and 7-way are to be installed in such a way as to avoid contact damage during hard right turns.
- k. Air tank(s) by: Hoosier Sanborn, JWP, or Road Warrior to feature a drain valve with plastic-covered, stainless steel, cables terminating on the roadside main frame so as to allow easy access for the driver to drain the air tank.

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## 27. Electrical System

- a. 12-volt LED lighting system with Phillips QCS2 mold seal wiring harness, or equivalent featuring the Phillips 16-724, 7- pole, split pin, STA-DRY (nylon) socket, or equivalent, and mold seal (slim7) wiring harness, for Wabco 2S 1M ABS system. Jump brown and black wires (conducted by Phillips.).
- b. The harness features 'sealed' connectors for GPS and PSI options in the main wiring harness. The 'drop' location(s) for the GPS and PSI connectors are typically in the area of the landing legs (GPS) and the tandem (PSI) but are to be agreed upon at the time of bid submission.
- c. LED light supplier options are Optronics, Phillips, Peterson, Truck-Lite, Grote, or equivalent.
- d. ¾" LED M/C lamps are approved (PC rated where required by law) with flying leads and 0.180 (sealed) bullet connections, as are 2" LED flange mount lamps with AMP connections, provided they are properly secured against theft.
- e. Single diode LED S/T/T/ lights.
- f. Chassis purchasers should advise in writing their preferred supplier and their recommendation for lights and theft protection at the bid submission stage.
- g. Where applicable, light theft protection covers should NOT feature loose spacers at each securement point, as these are difficult to reinstall during 'in service' repairs.
- h. Lamps are security-ring flange mounts and are installed with stainless steel rivets.
- i. We use high-security protection against the theft of LEDs that do not utilize loose spacers.
- j. All pigtail-to-lamp-to-jumper connections have (as applicable) a positive "click" (AMP) connection and or 0.180 sealed, bullet-type connectors as applicable.
- k. Provide 18"- 24" "excess" air and electric lines properly secured in the upper coupler / front bolster.
- l. Provide protective grommets where electrical lines pass through the frame and properly secure the electrical lines throughout the chassis.
- m. Tail Lamp protective plate for each 4" lamp sufficient to protect from impact

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## 28. Registration / Document Holder

Installed on the roadside near the crank handle with stainless steel cord to prevent loss—source: Optronics, Phillips, Grote or equivalent.

## 29. Mud Flaps

- a. 24"x 30" hybrid rubber 3/8" thick mud flaps with anti-sail and reinforced where mounted.
- b. Approximately 6" X 6" chamfered top, outside corner ends of both mud flaps if using three (3) hole mount.
- c. Lock nuts to face outward (rearward) on the mounting bracket.

## 31. Welding and Sealing

- a. All welding codes, standards, and specifications are to be of the highest standard(s) as required by the American Welding Society.
- b. Cold welds, undercut, offset welds, and welds of insufficient size or placement (for example) will not be applicable.
- c. 'No weld' areas are observed and maintained to prevent and avoid 'in service' stress cracking.
- d. All 'no weld' and unwelded open joints are sealed with an approved sealant with Trempro sealant to prevent water ingress and rust jacking over time.

## 32. Painting

- a. Metal preparation: an abrasive blast of all metal surfaces to achieve clean bare steel per the paint manufacturer's specification, typically SA-2, near white overall.
- b. The entire surface of the chassis will be powder coated to the powder coat manufacturer's specifications and requirements.
- c. The areas of the front pin locks and front bolster castings and the rear twist locks are to be painted white (RAL9010) or any color specified by the customer.

All enclosed spaces and box sections shall be internally sprayed after assembly with ANTAS-221 or equivalent waxy undercoating or fully coated internally with primer during the painting process.

1. PPG, Bradley Coatings, DuPont, Valspar, Hempel, CMP, Akzo Nobel, or equivalent
2. Coating is to be warranted by the chassis manufacturer for not less than one year from the date of delivery against corrosion on any surface in excess of Re3 (European Scale of Corrosion), against fading, and against peeling and or loss-of-adhesion. Subject to warranties provided by the coating supplier.
3. Warranty to include both labor and materials necessary to correct the failed condition.
4. All paint warranties are to be documented and submitted back to the manufacturer for warranty adjustments in writing. All paint warranties are to default back to the coatings supplier and are at the discretion of National Trailer Manufacturing.



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### 33. Marking

- a. One (1) FMCSA decal.
- b. Four (4) fleet number decals – all four sides.
- c. Two (2) tare weight decals – main rail, both sides.
- d. One (1) VIN plate – roadside, transition area.
- e. Two (2) - main rail: Customer logo decals (where supplied)
- f. Two (2) – front and rear. Customer logo decals. (where supplied)
- g. One (1) ABS decal – front bolster.
- h. DOT & AAR label as required.
- i. One (1) suspension torque/maintenance decal – roadside suspension area.
- j. One (1) ABS warning decal – front bolster.
- k. One (1) ‘do not weld” decal – front bolster.
- l. One (1) Tire inflation decal – roadside suspension area.
- m. Two (2) axle components and maintenance decal – main rail, suspension area, both sides.
- n. One (1) grease-type decal – roadside suspension area.
- o. One (1) tractor governor pressure decal – front bolster.
- p. Reflectors as required by law – all four sides.

Decals shall be warranted for a minimum (of 7) years minimum against peeling, cracking, or fading.

### 34. Conspicuity tape & reflectors

- a. Installed per Federal regulations and AAR compliance in loaded and empty conditions.
- b. Where possible, white conspicuity tape should be added, as space permits, to the front face of the front bolster.
- c. White tape on rear face of front bolster per AAR.
- d. No white conspicuity tape to be within 3 inches of any red light.
- e. No red conspicuity tape to be within 3 inches of any amber light.
- f. Conspicuity tape by Orafol, Grote, or 3M or equivalent.
- g. Reflectors (red and amber as applicable by law) by Optronics, Peterson, Trucklite, or equivalent.

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## 35. Hardware

- a. All fasteners should be a minimum grade 5 zinc plated with washers/lock washers or nuts as appropriate.
- b. Stainless steel fasteners should be used for the electrical system.
- c. License plate to be SS riveted / mono-bolted to the backing plate.
- d. If in the horizontal position, nuts face outside whenever possible. If in the vertical position, nuts are to be on the bottom, bolt on top.

## 36. Documentation, etc., to be provided by the chassis manufacturer:

Upon finalization of the order, the chassis manufacturer shall provide:

- a. Soft copy (attachment) files of all assemblies, sub-assemblies, general arrangement drawings, and marking drawings Will be provided at the time of bid acceptance.
- b. Soft copy of manufacturer's proposed specification.
- c. Two hard copies of the manufacturer's warranty, paint warranty, and all component warranties
- a. Two hard or soft copies of an operator's manual with recommended maintenance parts/components manual.
- d. All proof of compliance to D.O.T., A.A.R., ANSI, T.O.F.C., FMVSS, SAE, ISO, and TTMA requirements and standards, as applicable, at the time of manufacture.
- e. Mill certificates for steel components, for example, steel beams, bolsters, and cross-members.
- f. Manufacturer will provide at least digital photos of a fully completed chassis as follows:

Y Picture resolution – 2 MB minimum.

Y Background – as unobstructed as possible.

Y Chassis to fill picture "frame" as much as possible.

1. 1 photo – shows a 45-degree view of the front quarter, i.e., both front and roadside – taken at a camera elevation of 8 to 10 feet above the ground.
2. 1 photo – shows a 45-degree view of the rear and roadside – taken at a camera elevation of 8 to 10 feet above the ground.
3. 1 photo – shows a 45-degree view of the front quarter, i.e., both front and curbside – taken at a camera elevation of 8 to 10 feet above ground.
4. 1 photo – shows 45-degree view of rear and curb side – taken at a camera elevation of 8 to 10 feet above ground.
5. 1 photo – shows full roadside view.
6. 1 photo – shows full curbside view.
7. 1 photo – shows full rear view taken at an elevation of 8 to 10 feet above the ground.
8. 1 photo – shows full front view taken at an elevation of 8 to 10 feet above the ground.

## 37. Options:

37.1 Automatic tire inflation system can be added in PSI brand kit. (HALO by Aperia or Meritor)

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