

# User Manual for JAK Integrated Air Suspension

2026A0

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## Preface

### After-Sales Service Commitment & Warranty Terms

Thank you for choosing L1 Yonglitali products. All L1 Yonglitali series products undergo strict factory inspection and full traceability management. For any product inquiries, please contact our After-sales Service Department. To ensure safe operation, please read this User Manual thoroughly before installation and use.

Based on our product quality confidence and customer responsibility, we make the following after-sales commitments:

1. We have established a complete nationwide sales and service network to provide users with prompt, high-quality services.

2. This product User Manual is available via the official L1 Yonglitali WeChat account and website ([WWW.LTCMC.COM](http://WWW.LTCMC.COM)). Users must strictly follow the Manual's requirements for installation, operation, maintenance and repair. **\*\*Unauthorized modification of L1 Yonglitali products is strictly prohibited\*\***. Only genuine L1 Yonglitali original parts shall be used for maintenance; otherwise, the warranty will be invalid, and we will not be liable for any resulting consequences.

3. During the warranty period (see details on Page 33), we will provide free repair or replacement for product damage caused by manufacturing defects that impede normal use. To claim free warranty service, users shall provide valid proof of the product within the warranty period (trailer registration document, purchase invoice, etc.). If no such proof is available, our internal quality records or the vehicle manufacturer's factory records shall prevail.

4. For products beyond the warranty period that cannot operate normally or meet performance requirements, we will provide paid upon-request services, with parts charged at cost price plus relevant service fees.

5. Product after-sales service is under the unified management of our After-sales Service Department, with nationwide service outlets. For the full service outlet directory, please refer to the official Yonglitali website and WeChat account.

6. In case of product quality issues or related quality accidents, users may file a complaint directly with our After-sales Service Department or local L1 Yonglitali branches/service outlets, with detailed product and fault information. For major accidents that may cause heavy economic losses or civil/criminal liability and are potentially related to our products, users shall NOT dispose of the relevant

L1 Yonglitalai products without our written consent, and must properly protect the accident scene while notifying us; otherwise, the user shall bear all resulting consequences.

7. After receiving a user's quality complaint or service request, we will respond with a handling solution within 2 hours. If on-site service is required, we will arrange dispatch immediately:

- Within 24 hours for locations within 300 km of our company or the nearest service station
- Within 48 hours for locations over 300 km
- For remote areas, dispatch time will be determined based on actual circumstances

For non-on-site service requests, our Marketing Department lead or After-sales Service Department will respond with professional guidance and explanations.

8. Free warranty service will NOT be provided under the following circumstances:

- Failure to select, install, operate or maintain the product in accordance with this User Manual;
- Product damage caused by unauthorized modification, welding or part disassembly by the user;
- Product damage caused by improper or abnormal use;
- Product damage caused by overloading, exceeding rated limits, or use in extreme road conditions;
- Product damage caused by the trailer itself or other non-genuine accessories;
- Consequential faults or part damage caused by unauthorized disassembly or part replacement after a fault occurs;
- Disputes arising from false publicity (including exaggerated product performance or extended warranty period) by the vehicle manufacturer or sales unit;
- Products beyond the valid warranty period.

9. We implement a regular user return visit system to collect valuable user

feedback, ensuring users have a worry-free purchase and use experience.



#### 10. L1 Yonglitali After-Sales Service Contact Information:

- After-Sales Service Hotline: 400-668-9027
- For one-click repair service, please scan the QR code on the right.

## Driver Instructions

1. If the air suspension system remains depressurized for an extended period, prevent the vehicle frame from directly contacting the deflated air spring to avoid creasing and structural damage. Maximum vehicle speed must NOT exceed 105 km/h.

2. This system must be operated strictly within the rated axle load limits and in full compliance with GB 1589 standards.

3. Driving with faults is strictly prohibited. Perform the following checks before every trip:

- Verify tire pressure is within the specified normal range;
- Confirm wheel and suspension main fasteners are tightened to the required pre-tightening torque;
- Inspect the suspension main beam for abnormalities (cracks, deformation, etc);
- Confirm lighting, braking system and suspension system are functioning normally;
- Check air pressure status of the braking and air suspension systems.

4. Only genuine L1 Yonglitali original parts shall be used to ensure the performance of L1 Yonglitali axles.

5. To ensure driving safety, perform routine inspection and maintenance of the axle in accordance with regulations. Troubleshooting and part replacement must be completed by qualified professional maintenance personnel. We will not be liable for any quality accidents caused by improper maintenance.



Note: For a new vehicle on its first loaded journey, or after 15 days of operation, all wheel nuts and suspension system bolts and nuts must be inspected and tightened to the specified torque.

# Safety Guidelines

## Responsibilities and Obligations

1. During axle maintenance and repair, L1 Yonglitali shall not be liable for any property loss, damage or personal injury caused by failure to follow the safety guidelines and specifications in this manual, or by operational negligence.

2. Additional safety instructions may apply based on trailer type, repair/maintenance tasks, workshop conditions, operating environment and cargo load. As these variables are beyond L1 Yonglitali's direct control, repair workshops must ensure all safety guidelines comply with local occupational health and safety regulations to prevent accidents.

## Nameplates and Labels on the Axle

Nameplates and labels affixed to the axle are integral safety components. They must not be covered, defaced or removed, and must remain in their original position for the full service life of the axle.

## Maintenance and Repair

1. To ensure safe operation and vehicle performance, all maintenance work must be performed in accordance with L1 Yonglitali's established maintenance schedule and the vehicle manufacturer's technical specifications.

2. Every time a wheel is removed, check the tightening status of wheel nuts to confirm they meet the specified torque.

3. All maintenance work, whether performed in-house or entrusted to a repair station/garage, must follow the requirements of this manual. Otherwise, our company shall not be liable for quality accidents caused by improper maintenance.

4. Only trained and qualified technicians are permitted to perform maintenance and repair operations.

## Before Starting Work

1. Ensure the trailer is secured against movement.
2. Keep unauthorized personnel out of the work area.
3. Ensure the work area has sufficient lighting and ventilation.

4. Wear appropriate protective clothing; loose, torn clothing, jewelry, watches and similar items are prohibited.

5. Wear safety shoes, and tie back long hair.

#### During Work

1. Always stay alert and follow safe working practices. Do not operate the axle when fatigued, after drinking alcohol, or after taking medication that impairs operation. Smoking is strictly prohibited during work.

2. Use certified lifting equipment for heavy objects over 25 kg. Only experienced personnel may perform rigging work, and must give instructions to the equipment operator within their visual and auditory range.

3. Only use tools, parts, materials and grease approved by L1 Yonglitai. Contaminated or reused grease is prohibited. Used grease, cleaning agents and replaced old parts must be disposed of in a safe, environmentally friendly manner.

4. Avoid direct skin contact with grease.

5. Do not use worn or damaged tools, and never leave tools on the axle or trailer.

6. No modification or welding on the trailer axle is allowed without written consent from L1 Yonglitai.

7. Self-locking fasteners must not be reused; they must be replaced after each disassembly.

#### After Work is Completed

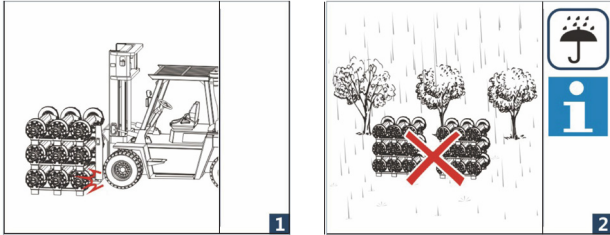
1. Inspect the axle for damage, brake air leaks, or other quality abnormalities.

2. All parts removed during maintenance or repair must be reinstalled and inspected after all work is finished.



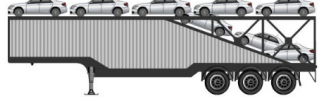


#### Transport and Storage of Suspension

1. During transport, loading and unloading of the suspension, avoid collisions with brake discs, brake components, and their rubber and plastic parts.

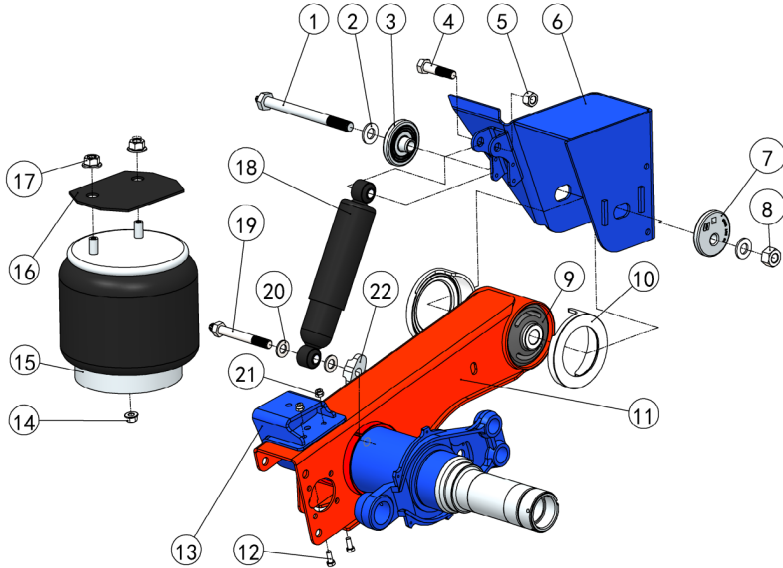
2. The suspension must be stored in a well-ventilated, dry warehouse. Exposure to rain and open-air storage is strictly prohibited.



## I. Vehicle Types Applicable to the JAK Air Suspension Assembly

Tank Semi-Trailers	Fuel tank trailers (fuel, edible oil)	
	Cryogenic liquefied gas tank trailers	
	Liquid food tank trailers	
	Corrosive chemical tank trailers	
Fully Enclosed Box Trailers	Refrigerated trailers	
	Curtainside trailers	
	Promotional trailers (mobile exhibition vehicles)	
	Other enclosed specialty trailers	
Vehicle Transport Semi-Trailers	Car hauler trailers	
	Chassis transport trailers	
High-Pressure Tube Trailers	High-pressure tube skid trailer	
Other Special- Purpose Trailers	Tobacco transport trailers	
	Medical transport trailers	
	Electronics transport trailers	
	Express delivery transport trailers	

## II. Exploded View of the JAK Air Suspension



### 1. Bill of Materials

Item No.	Part Name	Model No. / Drawing No.	Qty Per Axle	Remarks
1	Pivot Bolt	LTJAK11-010003	2	7/8" -9UNC
2	Washer 7/8"	LTJAK11-010005	4	
3	Bushing II	LTJAK11-010002	2	
4	Shock Absorber Bolt I	LTJAK11-010007	2	
5	Shock Absorber Nut	LTJAK11-010009	2	
6	Front Hanger Bracket (L/R)	LTJAK11-010100L/R	2	1 Left, 1 Right
7	Bushing I	LTJAK11-010001	2	
8	Pivot Bolt Nut	LTJAK11-010004	2	
9	Shock Absorber Bushing	LTNAK09-010002	2	
10	Bushing Tube Spacer	LTJAK11-010006	4	

11	Main Beam (L/R)	LTJAK11-020100L/R	2	Must be used with axle
12	Hex Flange Bolt	GB5787-M10×25	4	
13	Air Spring Pedestal (L/R)	LTJAK11-020200L/R	2	1 Left, 1 Right
14	Hex Flange Nut I	LTJAK11-050001	2	1/2" -13 UNC
15	Air Spring	29012	2	Selected per suspension model
16	Air Spring Mounting Plate	LTJAK11-020300	2	
17	Hex Flange Nut II	LTJAK11-050002	4	3/4" -16 UNF
18	Shock Absorber	LTJAK11-010014\	2	
19	Shock Absorber Bolt II	LTJAK11-010002	2	3/4" -10 UNC
20	Washer 3/4"	LTJAK11-010011	2	
21	All-Metal Hex Flange Nut	GB/T 6187.1-M10-8Grade	4	
22	Shock Absorber Spacer	LTJAK11-010012	2	

## 2. Tightening Torque Table

Item No.	Part Name	Specification	Torque	Remarks
1、8	Pivot Bolt / Nut	7/8" -9 UNC	750±50 N·m	Rated Load: 11 t
		1-1/8" -12 UNF	1150±50 N·m	Rated Load: 13 t
4、5、19	Shock Absorber Bolt / Nut	3/4" -9 UNC	325±25 N·m	
14	Hex Flange Nut I	1/2" -13 UNC	50±5 N·m	
17	Hex Flange Nut II	3/4" -16 UNF	60±5 N·m	
12、21	Hex Flange Bolt & Nut	M10	40±5 N·m	



(1) The pivot bolt and self-locking nut must be tightened at the design ride height (FH).

(2) The shock absorber bolt and nut must also be tightened at the design ride height (FH).

(3) Insufficient torque may cause loosening; excessive torque may lead to fastener failure.

(4) Failure to apply the specified torque will void the warranty.

## III. Installation of the Air Suspension

### 1. Precautions Before Installation

#### 1.1 Key Precautions During Installation

Welding is strictly prohibited when air springs are installed. When flipping the chassis, protect the air springs from scratches or overextension damage.

Welding on the upper or lower surface of the axle is strictly prohibited, as it may cause fatigue cracking and reduce service life.

During welding, grounding through rotating axle components is prohibited to prevent bearing damage caused by electrical current.

All fasteners must be checked after initial operation and re-tightened to the specified torque if necessary.

#### 1.2 Preparation Work Before Welding

Remove all coatings, dirt, and rust from the welding area.

Thoroughly clean the area and wipe with a clean cloth to remove any residue.

#### 1.3 Welding Requirements

Welding must be performed by certified and qualified welders.

All components must be clean and free from moisture, dirt, paint, oil, or grease before welding.

Welding must be carried out in a flat or horizontal position.

Unless otherwise specified, weld seams must stop 13 mm (0.5 in) from the edge of the base material.



**Warning:** Failure to follow welding specifications may result in suspension or axle damage, and may lead to serious injury, death, or property loss.

**Note:** Welding up to the edge of the base material may cause cracking.

## 2. Installation of Air Suspension and Frame

(1) With the frame inverted, draw reference lines for positioning the air suspension front and rear brackets on the frame per the vehicle's design dimensions (ensure equal diagonals), *as shown in Fig. 1*.

(2) Place the 2nd axle front bracket, measure the AB line to ensure  $L1=L2\pm 1\text{ mm}$ ,  $L3=L4\pm 1\text{ mm}$ , and tack weld the front bracket(*Fig. 1*).

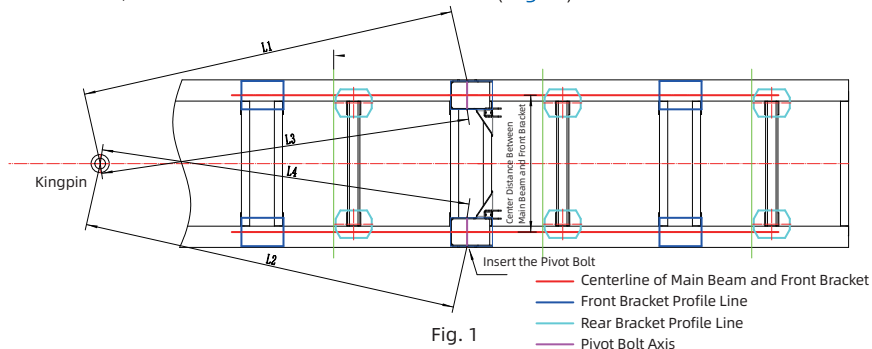


Fig. 1

Note: ① For bulk-shipped air suspension, start installation from this step(2).

② For fully assembled air suspension (pivot bolt and shock absorber bolt nuts inserted but not tightened), remove the pivot bolt, front bracket and shock absorber before starting from this step(2).

(3) Place the 1st and 3rd axle front brackets, measure the AB line to ensure  $ab=de\pm 1\text{ mm}$ ,  $bc=ef\pm 1\text{ mm}$ ,  $ae=bd\pm 1\text{ mm}$ ,  $bf=ce\pm 1\text{ mm}$ (*Fig. 2*). Tack weld all front brackets in place.

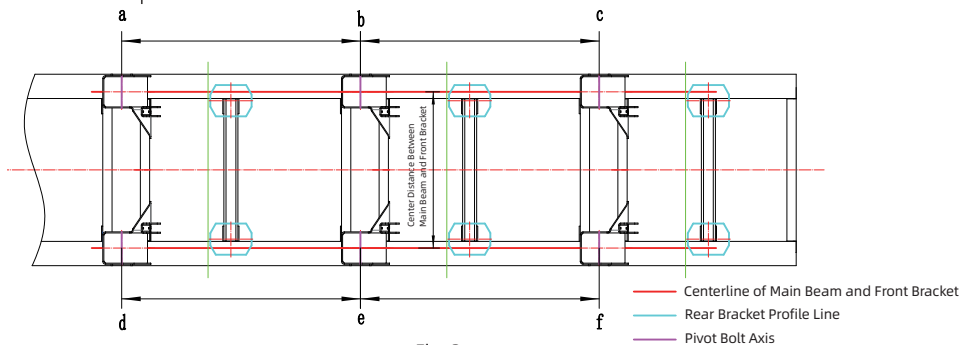


Fig. 2

(4) Place and tack weld all rear brackets in place(Fig. 3).

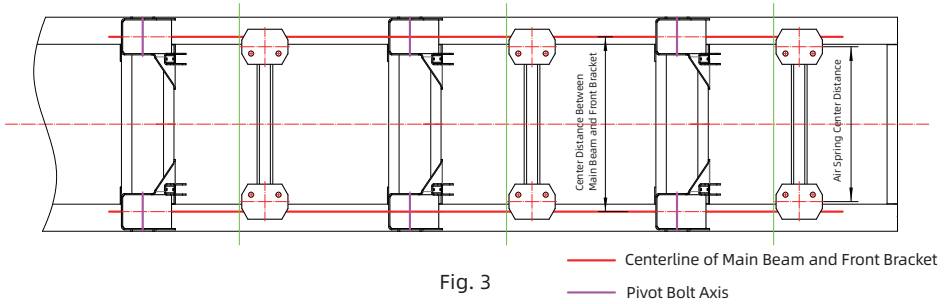


Fig. 3

(5) Lift the pre-welded main beam and axle assembly, and place it into the front bracket.

(6) Insert the wear-resistant sleeve between the front bracket and main beam, install the pivot bolt, washers, eccentric flange bushing and nut (hand-tighten only).

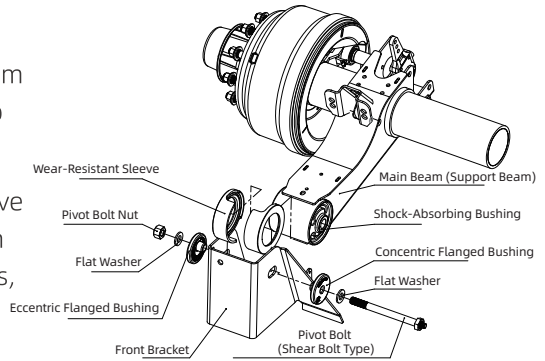


Fig. 4

(7) Place the auxiliary support and adjust the axle to the installation height FH. (see Fig. 5 and Fig. 6).

Note: The length of the auxiliary support varies according to the suspension installation height FH, with no restrictions on shape and material (see Fig. 6).

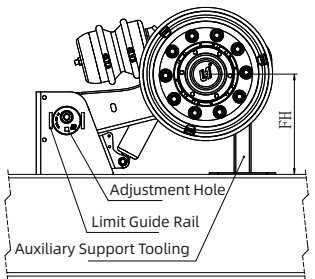


Fig. 5

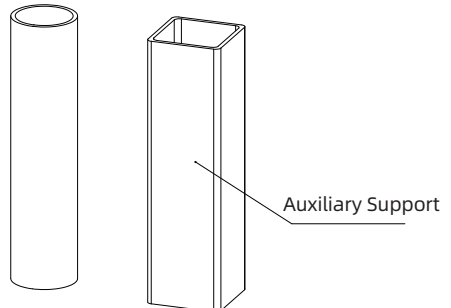


Fig. 6

(8) Install the shock absorber bolt, washer and nut (pre-tighten only). Refer to the exploded view of suspension components on [Page 07](#).

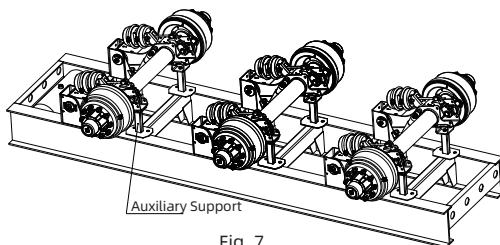


Fig. 7

(9) Check the adjustment hole direction of the eccentric flange bushing (must be at 12 o'clock position, the middle of the adjustment range), as shown in [Fig. 8](#).

If misaligned, insert an adjustment lever into the square hole of the eccentric flange bushing, rotate the collar to 12 o'clock; while rotating the outer eccentric flange bushing, tap the inner concentric flange bushing with a rubber mallet.

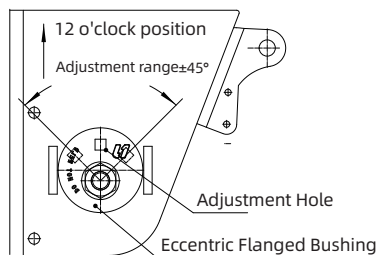


Fig. 8

(10) Pre-tighten the pivot bolt nut until the washer can still be rotated.

(11) Rotate the eccentric bushing ([Fig. 9](#)) to ensure  $AB=AC\pm 2\text{mm}$ , and tighten the 2nd axle pivot bolt nut to specification. Refer to the suspension components exploded view and torque table on [Pages 07-08](#).

(12) Adjust the front and rear wheelbases,  $DB=EC\pm 1\text{mm}$ ,  $BF=CG\pm 1\text{mm}$  (ensure diagonals  $DC=BE\pm 1\text{mm}$ ;  $BF=CE\pm 1\text{mm}$ ). After wheelbase fine-tuning is completed, lock the 1st and 3rd axle pivot bolt nuts to specification.

(13) When the air suspension is installed at the FH value, tighten the shock absorber bolts and nuts to specification.

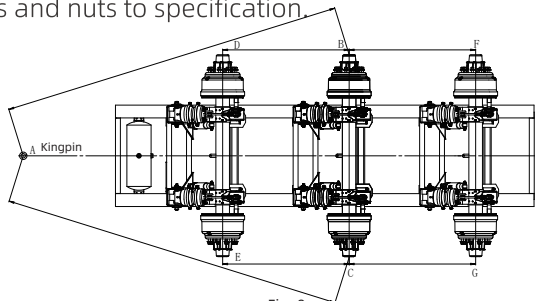


Fig. 9

Note: (1) The front and rear brackets can be installed in different sequences.

(2) The length of the auxiliary support tooling must be made according to the installation height (FH); shape and material are not limited.

(3) After fine-tuning the wheelbase, the Pivot bolt nuts must be re-tightened according to the specifications on [Pages 07-08](#).

(4) The eccentric flange bushing on the outside of the front bracket is used to adjust the axle's position during installation. Rotating it clockwise moves the axle forward; rotating it counterclockwise moves the axle backward. The maximum adjustment range is  $\pm 45$  degrees from the 12 o'clock position.

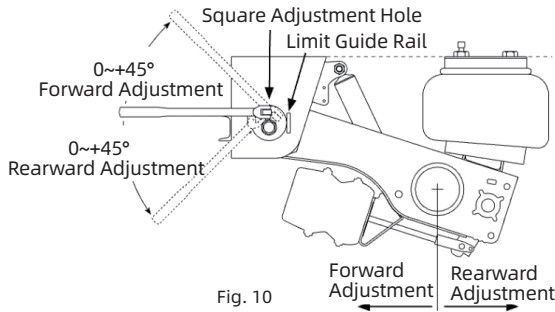


Fig. 10

### 3. Welding and Fixing of the Front Bracket

The figure below is a typical example of air suspension installation. Please refer to the specific air suspension drawings for actual installation details. The indicated sequence may need to be adjusted due to different semi-trailer designs.

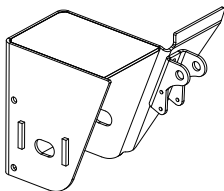


Fig. 11 Front Bracket(Wing-Type)

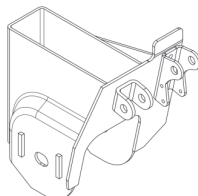


Fig. 12 Front Bracket (Wing-Type Necked Version)

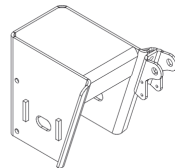


Fig. 13 Front Bracket(Non-Wing Type)



### 3.2 Welding Method for Centering the Frame

Additional gussets or other reliable support methods are required when the outer side of the front bracket is not fully supported, as shown in Fig. 16.

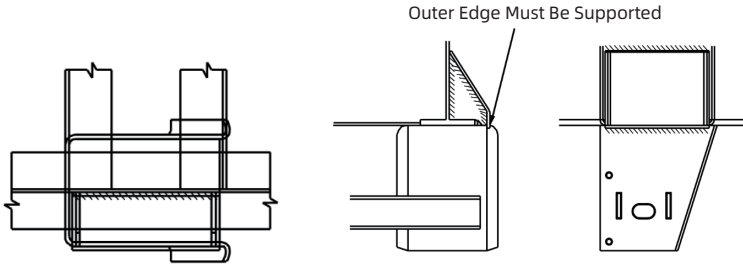


Fig. 16 Bracket Welding Method at Frame Center (Wing-Type or Non-Wing Type)

### 3.3 Reinforcement of the Front Bracket

Multiple front bracket reinforcement methods are available, common methods are as follows:

(1) C-Channel Steel Reinforcement Method (Applicable to all front bracket types): Weld 8# channel steel (80 mm height) to the frame bracket.

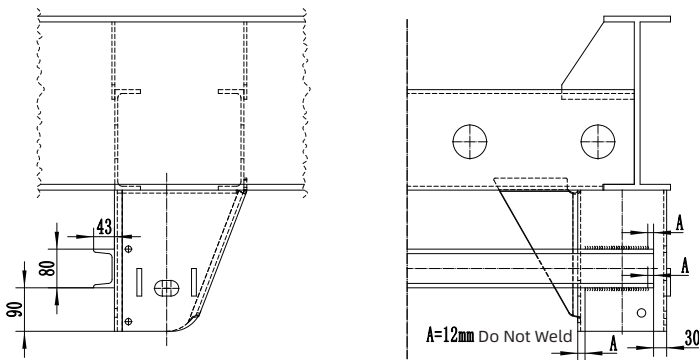


Fig. 17 Bracket Welding Method at Frame Center (Wing-Type or Non-Wing Type)

(2) Stiffener Plate Reinforcement Method (Applicable to Winged Front Brackets):

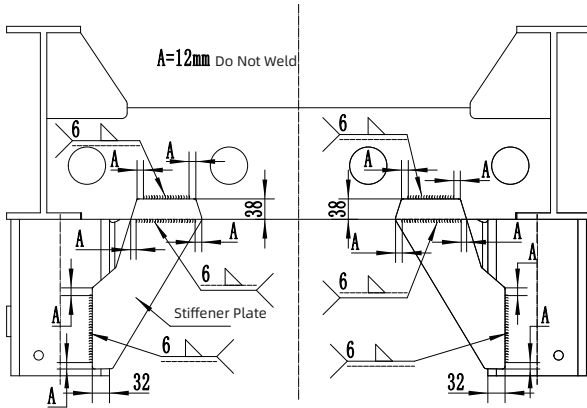


Fig. 18 Stiffener Reinforcement Diagram

Note: Installing channel steel or stiffener plates is the standard reinforcement method; other compliant methods are permissible.

4. Reinforcement Method for the Rear Bracket

As shown in Fig. 19. The figure illustrates common reinforcement methods; other alternative reinforcement methods are permissible.

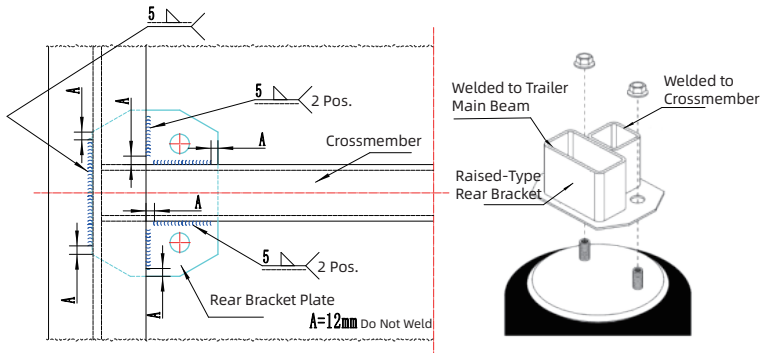


Fig. 19 Installation of Wing-Type Front Bracket (Top View)



Notes: Do not weld within 12 mm of the mating edges of the frame, front/rear brackets, channel steel, or side plates.

## 5. Installation of the Air Spring

(1) Place the load-bearing air spring between the beam and the rear bracket. Install the air spring fastening bolts, washers, and nuts. Tighten to the specified torque according to the parts exploded view and torque table on [Pages 07–08](#).

(2) For lift air spring installation (for lift air suspension configurations)– see [Fig. 20](#).

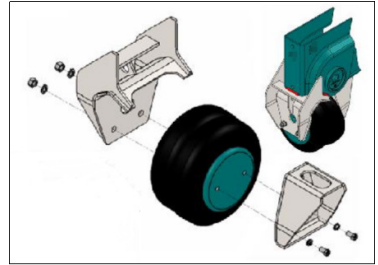


Fig. 20



### Notes:

- (1) Welding is not allowed while air springs are assembled during air suspension installation.
- (2) Protect air springs from overstretching and damage when flipping the vehicle.
- (3) Air springs must be installed after the vehicle completes sandblasting and painting to avoid damage.

### 5.1 JAK Air Suspension Lift Mechanism Assembly Instructions

Notes: Applicable only to the L1 Yonglitali JAK air suspension.

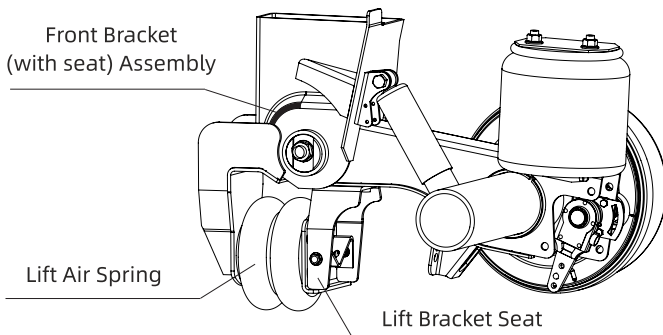


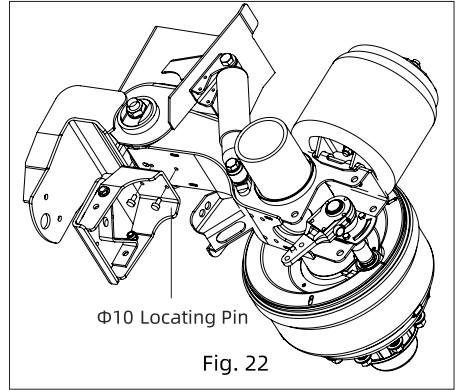
Fig. 21

### 5.1.1 Preparation

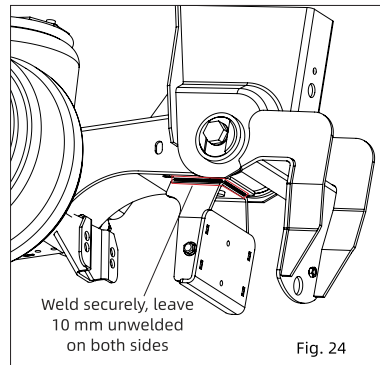
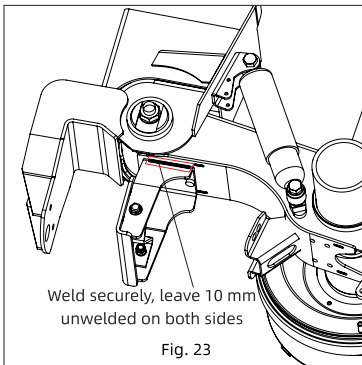
- Prepare a welding machine
- Two  $\Phi 10$  locating pins

### 5.1.2 Work Procedure

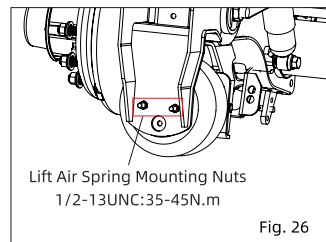
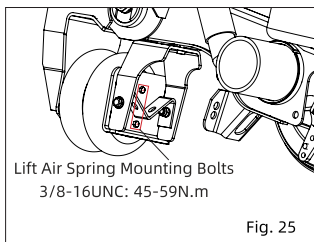
Step 1: Place the lift bracket base beneath the main beam, and connect the lift bracket base to the main beam using  $\Phi 10$  locating pins.



Step 2: Weld the lift bracket base to the main beam using the welding method shown in the figure below.



Step 3: Install the lift air spring and tighten the bolts and nuts to the specified torque using a torque wrench. (As shown in the figure below)



## 6. Installation of the Air Tank

- The 60 L air tank shall be installed close to the height control valve, typically on the frame near the 2nd axle.
- The 10 L lift air tank (for lift air suspension configuration) is installed close to the 1st axle, strictly for lift air spring use only.
- The air tank drain valve port must be installed facing the ground.

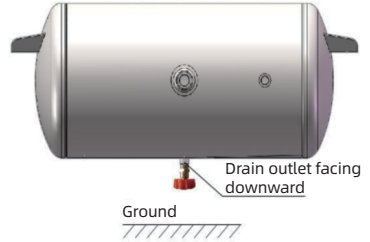


Fig. 27

## 7. Installation of the Height Control Valve

### 7.1 Common Height Control Valves Installation

American-type air suspension common height control valve installation method, as shown in Fig.28.

- Only one height control valve is allowed per vehicle.
- The load sensing valve installation method is the same as the height control valve.
- At the suspension installation height FH, adjust the actuating lever to a horizontal position, forming a 90° angle with the connecting rod.
- Height control valve installation is strictly prohibited on the lifting axle.

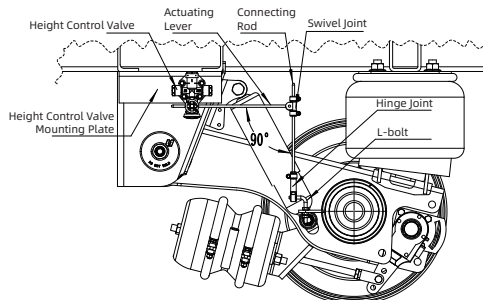


Fig. 28 Typical Installation Diagram of Height Control Valve

## 7.2 Setting of the Height Control Valve

As shown in Fig. 29, The hinge joint is fixed at the axle center. The axis of rotation must be parallel to the axle to ensure flexible rotation during air suspension upward and downward travel.

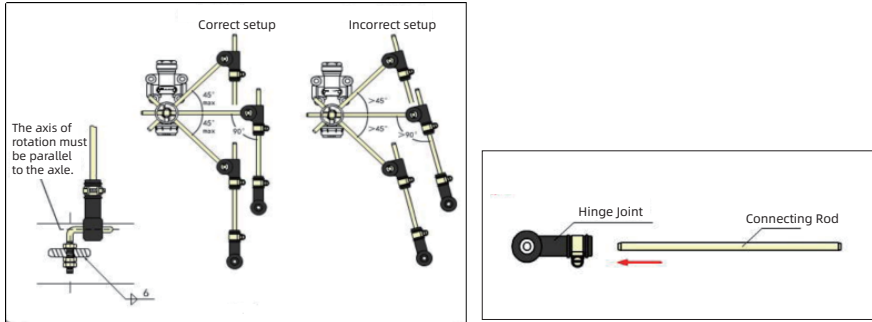


Fig. 29 Height Control Valve Setting

Fig. 29.1



**Note:** As shown in Figure 29.1, when assembling the height control valve components, the connecting rod must be fully inserted to the very bottom of the hinge joint!

## 7.3 Connecting Parts for Height Control Valve / Load Sensing Valve

Trailer manufacturers need to self-fabricate height control valve / load sensing valve connectors according to on-site installation needs. Fig. 30 is provided for general reference only.

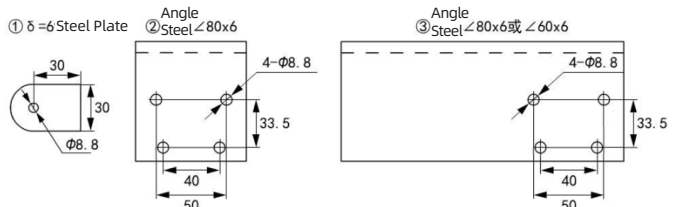


Fig. 30 Height Control Valve Connecting Parts Schematic

7.4 Installation of the Load Sensing Valve

(1) For vehicles with mixed air suspension and mechanical leaf spring suspension, a load sensing valve replaces the height control valve in the pneumatic control system. The LSV must be installed on the mechanical suspension axle closest to the air suspension during installation.

(2) The installation method of the LSV to the axle and frame is basically the same as that of the height control valve, as shown in Fig. 31. The angle of the LSV control arm depends on the vehicle load distribution: typically a 7° to 10° downward angle from the horizontal under unladen conditions.

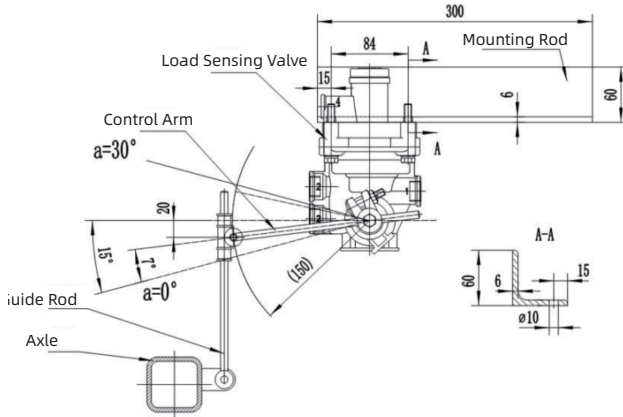


Fig. 31 LSV Installation Schematic

(3) Trailer manufacturers need to self-fabricate LSV connectors according to on-site installation needs. Refer to Fig. 32 for reference.

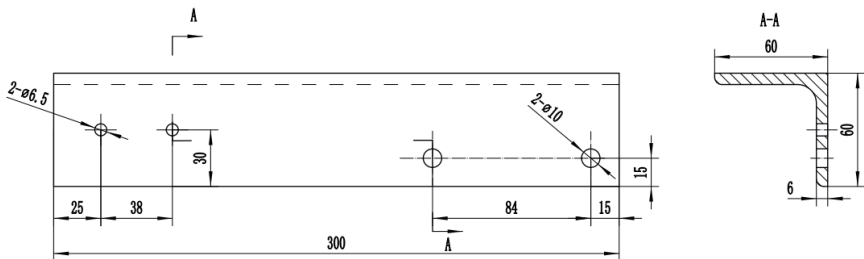
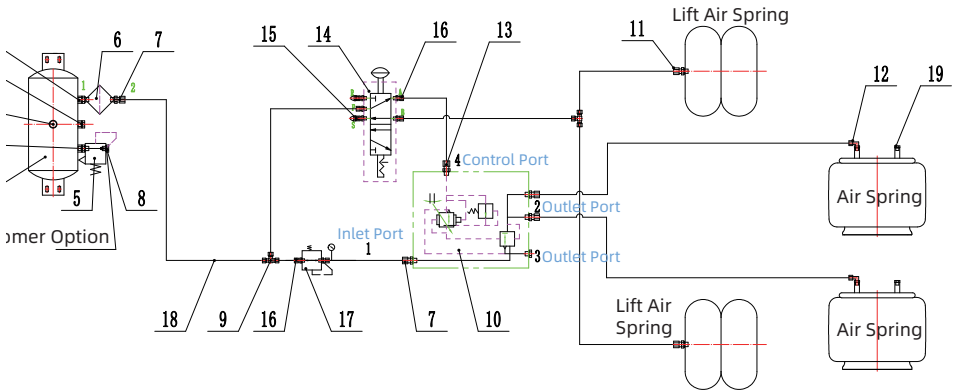


Fig. 32 LSV Connecting Parts Reference Drawing

## 8. Installation and Commissioning of the Air Circuit

### 8.1 Air Circuit Installation

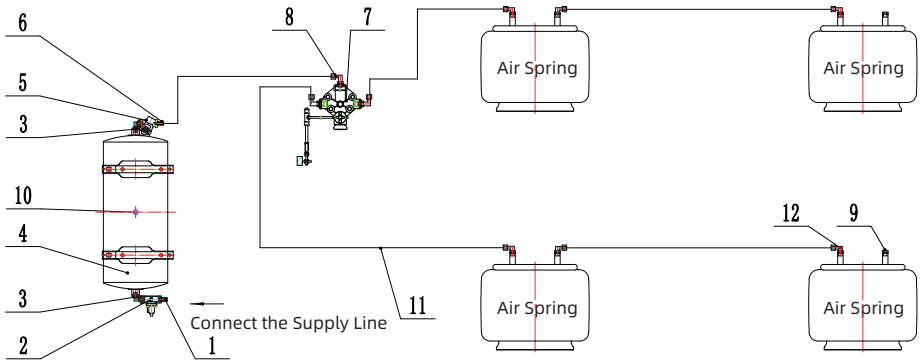
(1) Air circuit diagram and parts list for 1st axle dual-side lift air suspension mixed with mechanical leaf spring suspension.



One-Axle Air Suspension (with Lift) Air Circuit Parts List

No.	Part Name	Qty	No.	Part Name	Qty
1	Air Tank (LT-CQT-48L)	1	7	1/4-M14×1 (Compression Fitting)	2
2	M22×1.5 - 3/8" (Air Line Transition Fitting)	2	8	90° Elbow - 1/4 (NPTF) - M14×1 (Compression Fitting)	2
3	Drain Valve (Spiral Type) 1/4	1	B1	M16×1.5 - M14×1 (Compression Fitting)	1
4	Z3/4" Plug	1	B2	Manual Valve (3-PT3/8, 2-PT1/4 ports)	1
5	Pressure Protection Valve (2-M22×1.5 ports)	1	B3	Universal Brass Silencer (BSL-02 1/4)	2
6	Air Line Filter (2-M22×1.5 ports)	1	B4	3/8"(PT) - M14×1 (Compression Fitting) Brass	5
7	M22×1.5 - M14×1 (Compression Fitting)	4	B5	Pressure Regulating Valve (PT3/8")	1
8	M22×1.5 - (Customer Selected Fitting)	1	B6	∅8×1 Nylon Tube (Black, 20 meters)	1
9	3×M14×1 (Compression Fitting) Tee	2	B7	Plug (NPTF-1/4)	2
10	Load Sensing Valve (3-M22×1.5, 1-M16×1.5 ports)	1			

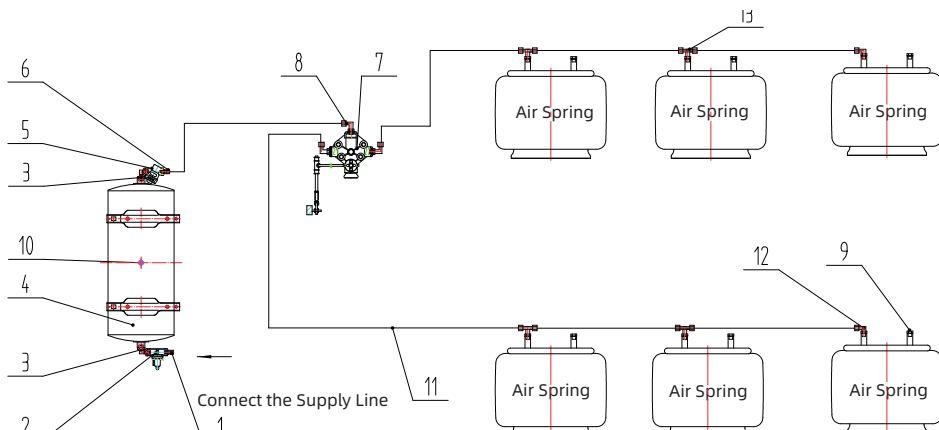
(2) Air circuit diagram and parts list for two-axle air suspension (without lift).



Two-Axle Air Suspension (Without Lift) Air Circuit Parts List

No.	Part Name	Qty	No.	Part Name	Qty
1	M22×1.5 - (Customer Selected Fitting)	1	7	Height Control Valve Assembly	1
2	Pressure Protection Valve	1	8	M12×1.5 - M14×1 (Compression Fitting) Elbow	3
3	2×M22×1.5 90° Elbow (Air Line Transition Fitting)	2	9	Plug (NPTF-1/4)	2
4	Air Tank Assembly (60L)	1	10	Drain Valve (Spiral Type) 1/4	1
5	Air Line Filter	1	11	∅8×1 Nylon Tube (Black, 17 meters)	1
6	M22×1.5 - M14×1 (Compression Fitting) Straight	1	12	90° Elbow - 1/4 (NPTF) - M14×1 (Compression Fitting)	6

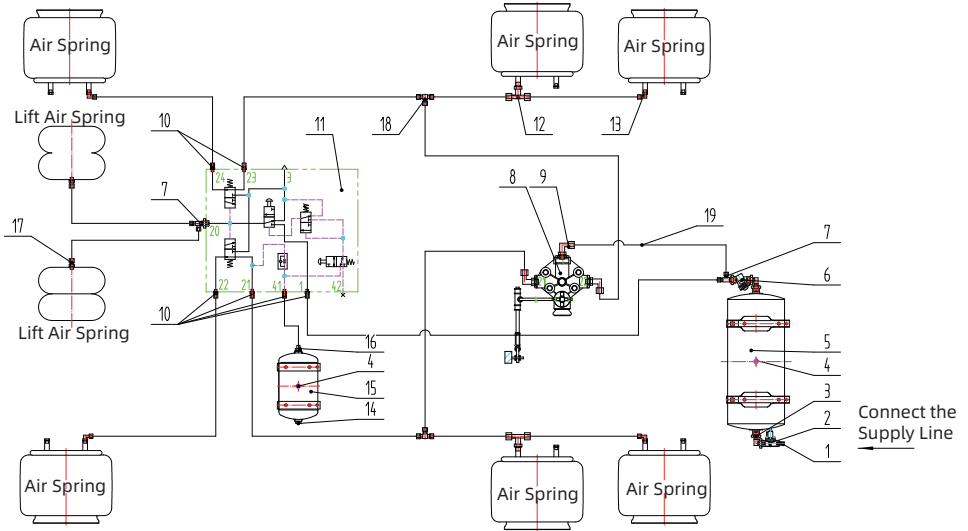
(3) Air circuit diagram and parts list for three-axle air suspension (without lift).



Three-Axle Air Suspension (Without Lift) Air Circuit Parts List

No.	Part Name	Qty	No.	Part Name	Qty
1	M22×1.5 - (Customer Selected Fitting)	1	8	M12×1.5 - M14×1 (Compression Fitting) Elbow	3
2	Pressure Protection Valve	1	9	Plug (NPTF-1/4)	6
3	2×M22×1.5 90° Elbow (Air Line Transition Fitting)	2	10	Drain Valve (Spiral Type) 1/4	1
4	Air Tank Assembly (60L)	1	11	∅8×1 Nylon Tube (Black, 15 meters)	1
5	Air Line Filter	1	12	90° Elbow - 1/4 (NPTF) - M14×1 (Compression Fitting)	2
6	M22×1.5 - M14×1 (Compression Fitting) Straight	1	13	Tee Fitting	4
7	Height Control Valve Assembly	1			

(4) Air circuit diagram and parts list for three-axle air suspension (with front axle lift).



Three-Axle Air Suspension (With Front Axle Lift) Air Circuit Parts List

No.	Part Name	Qty	No.	Part Name	Qty
1	M22×1.5 - (Customer Selected Fitting)	1	11	Lift Control Valve	1
2	Pressure Protection Valve	1	12	NPT1/4" - 2×M14×1	2
3	2×M22×1.5 90° Elbow (Air Line Transition Fitting)	2	13	90° Elbow - 1/4 (NPTF) - M14×1 (Compression Fitting)	4
4	Drain Valve (Spiral Type) 1/4	2	14	Plug	1
5	Air Tank Assembly (60L)	1	15	Air Tank (10L)	1
6	Air Line Filter	1	16	M22×1.5 - M14×1 (Compression Fitting)	1
7	M22×1.5 - 2×M14×1 (Compression Fitting)	2	17	1/4 - M14×1 (Compression Fitting)	2
8	Height Control Valve	1	18	3×M14×1 (Compression Fitting) Tee	2
9	M12×1.5 - M14×1 (Compression Fitting) Elbow	3	19	Ø8×1 Nylon Tube (Black, 17 meters)	1
10	M16×1.5 - M14×1 (Compression Fitting)	6			

## 8.2 Air Circuit Commissioning

- (1) Verify all air line connections meet diagram requirements.
- (2) Pressurize the air system, then check all connections for air tightness with soapy water.
- (3) Perform a road test to check for component/air line interference, and confirm all lines are securely fastened.
- (4) Verify suspension installation height FH meets design specifications; adjust the height control valve as needed.
- (5) If lift function operates in reverse: loosen bolts, remove actuating lever, rotate rotary valve 180°, reinstall lever and retighten bolts (see Fig. 33).
- (6) If the air suspension is depressurized long-term, prevent the vehicle frame from directly contacting deflated air springs to avoid folding and structural damage.
- (7) If air springs fail to inflate:
  - a. Confirm supply air pressure is sufficient to open the Pressure Protection Valve (PPV) (min. 0.6 MPa / 6 bar);
  - b. Check air line connection correctness;
  - c. Ensure all suspension exhaust (dump) functions are fully closed.

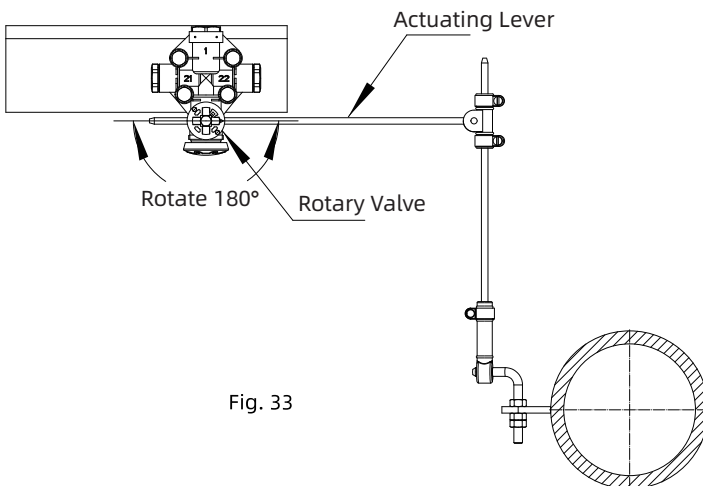


Fig. 33

## IV. Maintenance of Air Suspension

Inspection Item	Inspection Content	Inspection Cycle
<b>1. All Components</b>	<ul style="list-style-type: none"> <li>● Visual inspection for damage and wear.</li> </ul>	Frequent Inspection
<b>2. Air Springs &amp; Pistons</b>	<ul style="list-style-type: none"> <li>● After driving on oily roads, muddy roads, or other harsh conditions, inspect and keep the air spring and lower piston clean.</li> <li>● Check air spring surface for scratches, wear, cracks, foreign objects, etc.</li> <li>● Replace immediately if air leakage occurs.</li> </ul>	Frequent Inspection
<b>3. Air Line System</b>	<ul style="list-style-type: none"> <li>● Inspect and keep the air filter clean and intact; replace if damaged.</li> <li>● Check the air tightness, mounting security and damage of the valve body and line connections.</li> </ul>	Every 3 Months
<b>4. Shock Absorbers</b>	<ul style="list-style-type: none"> <li>● Check tightening condition of upper and lower shock absorber fasteners (torque values refer to Page 8).</li> <li>● Replace immediately if oil leakage is found.</li> </ul>	Every 3 Months
<b>5. Beam Bolts</b>	<ul style="list-style-type: none"> <li>● Check tightening condition of beam bolts. Replace damaged fasteners. Torque values refer to Page 8.</li> </ul>	Every 6 Months
<b>6. Air Spring Fasteners</b>	<ul style="list-style-type: none"> <li>● Check tightening condition of air spring bolts and nuts. Torque values refer to Page 8.</li> </ul>	Frequent Inspection
<b>7. Pivot Bolts, Bushings &amp; Wear Plates</b>	<ul style="list-style-type: none"> <li>● Check for looseness: slightly move the trailer forward/rearward or pry the suspension beam near the pivot bolts. Movement indicates possible looseness or damaged bushings.</li> <li>● Check wear condition of pivot bolt bushings and wear pads.</li> <li>● Check tightening condition of suspension beam lock nuts. Torque values refer to Page 8.</li> </ul>	Every 6 Months
<b>8. Lift Mechanism</b>	<ul style="list-style-type: none"> <li>● Check tightening condition of lift air spring lock nuts. Re-tighten with torque wrench if necessary. Torque values refer to Page 8.</li> </ul>	Every 6 Months
<b>9. Limit Straps</b>	<ul style="list-style-type: none"> <li>● Check limit straps and related parts. Replace if necessary.</li> </ul>	Every 3 Months
<b>10. Air Tank</b>	<ul style="list-style-type: none"> <li>● Check drainage condition of the air tank. Drain if water accumulation exists. In freezing weather, drain twice per week.</li> </ul>	Every 1 Month
<b>11. Installation Height FH</b>	<ul style="list-style-type: none"> <li>● FH selection: Refer to product specifications corresponding to installed air suspension model. Before vehicle delivery, confirm FH value meets specified height requirements. After confirmation, FH value must not be adjusted arbitrarily (see operation manual for details) to ensure proper trailer ride height.</li> <li>● Regularly inspect and calibrate the FH value to maintain factory ride height setting. Refer to ride height valve instructions for FH adjustment.</li> </ul>	Every 3 Months



Note: If the air suspension vehicle encounters a sudden failure (air line leakage or valve malfunction) and cannot be repaired on site, and the air springs are under-inflated, first ensure the rubber portions of the air springs are flat and not under stress. Then drive the vehicle at a speed of less than 30 km/h to a safe location (maximum allowable distance 30 km) for repair.

## V. Common Faults, Causes, and Troubleshooting Methods

Fault Phenomenon	Cause Analysis	Troubleshooting Method
<b>Air springs fails to inflate</b>	1. Air spring damaged or leaking; 2. Air line system; 3. Height control valve damaged or improperly installed; 4. Pressure protection valve or limiting valve failure.	1. Replace air spring; 2. Inspect and repair air line system; 3. Replace or adjust height control valve; 4. Adjust or replace valve.
<b>Air spring damaged, base destroyed</b>	1. Hard objects (gravel, etc.) trapped between air spring and lower base causing friction; 2. Hard foreign objects puncturing air spring; 3. FH value (ride height) improperly adjusted; 4. Severe overloading; 5. Improper suspension-to-beam installation; 6. Tire or brake components rubbing against air spring; 7. Brake chamber rubbing against air spring.	1. Replace damaged parts; regularly inspect and clean air springs 2. Replace air spring; 3. Replace damaged parts and readjust FH; 4. Replace damaged parts and operate within rated load; 5. Replace damaged parts and readjust/reinstall suspension; 6. Replace air spring; check clearance around air spring and reinstall if too small; 7. Replace the air spring, change the mounting position of the air chamber, or rotate the clamp to increase clearance.

Fault Phenomenon	Cause Analysis	Troubleshooting Method
<b>Front bracket cracked, pivot bolt worn</b>	<ol style="list-style-type: none"> <li>1. Reinforcement channel steel or side plates not installed as specified;</li> <li>2. Severe overloading;</li> <li>3. Poor road conditions;</li> <li>4. Failure to tighten the pivot bolt lock nut in time, or the torque of the pivot bolt nut does not meet the requirements.</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace damaged parts and install reinforcement as specified;</li> <li>2. Replace damaged parts and operate within rated load;</li> <li>3. Replace damaged parts and drive slowly;</li> <li>4. Replace pivot bolt and tighten to specified torque.</li> </ol>
<b>Beam damaged</b>	<ol style="list-style-type: none"> <li>1. Severe overloading;</li> <li>2. Poor road conditions;</li> <li>3. FH value improperly adjusted;</li> <li>4. Shock absorber damaged.</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace beam and operate within rated load;</li> <li>2. Replace beam and drive slowly;</li> <li>3. Replace beam and readjust FH;</li> <li>4. Replace beam and shock absorber.</li> </ol>
<b>Air line leaking or unable to inflate</b>	<ol style="list-style-type: none"> <li>1. Improper line routing causing abrasion/leakage;</li> <li>2. Line connectors damaged;</li> <li>3. Air line kinked or folded;</li> <li>4. Valve body damaged or blocked.</li> </ol>	<ol style="list-style-type: none"> <li>1. Reroute lines properly and replace damaged hoses;</li> <li>2. Replace damaged connectors;</li> <li>3. Inspect and replace damaged hoses;</li> <li>4. Replace damaged valve.</li> </ol>
<b>Insufficient pressure in load-bearing air spring</b>	<ol style="list-style-type: none"> <li>1. Insufficient air supply pressure from the towing vehicle;</li> <li>2. Pressure protection valve malfunction;</li> <li>3. Height control valve not functioning;</li> <li>4. Leakage or damaged lines.</li> </ol>	<ol style="list-style-type: none"> <li>1. Ensure the towing vehicle pressure reaches above 0.6 MPa;</li> <li>2. Inspect/replace pressure protection valve;</li> <li>3. Inspect height control valve;</li> <li>4. Locate leak and repair or replace.</li> </ol>
<b>Excessive air spring extension</b>	<ol style="list-style-type: none"> <li>1. Suspension height too high.</li> </ol>	<ol style="list-style-type: none"> <li>1. Adjust installation height FH.</li> </ol>
<b>Excessive extension of the shock absorber</b>	<ol style="list-style-type: none"> <li>1. Poor road conditions;</li> <li>2. Suspension height too high or too low;</li> <li>3. Limit kit damaged.</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace shock absorber and drive slowly;</li> <li>2. Replace shock absorber and readjust FH;</li> <li>3. Replace limit kit.</li> </ol>

Fault Phenomenon	Cause Analysis	Troubleshooting Method
<b>Shock absorber leaking</b>	<ol style="list-style-type: none"> <li>1. Suspension height too high or too low;</li> <li>2. Shock absorber worn.</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace shock absorber and readjust FH;</li> <li>2. Replace shock absorber.</li> </ol>
<b>Trailer pulls to one side</b>	<ol style="list-style-type: none"> <li>1. Pivot bolt loose or worn;</li> <li>2. AB line or wheelbase changes.</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace the pivot bolt or bushing, and tighten the pivot bolt nut with the specified torque;</li> <li>2. Readjust the AB line or wheelbase, and tighten the pivot bolt nut with the specified torque.</li> </ol>
<b>Height control valve responds slowly</b>	<ol style="list-style-type: none"> <li>1. Supply pressure insufficient;</li> <li>2. Line blocked;</li> <li>3. Line frozen.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check the pressure protection valve and the tractor air supply pressure;</li> <li>2. Clean the lines and filter;</li> <li>3. Defrost and drain the air tank.</li> </ol>



Note: When the vehicle is parked for a long time with no working air pressure in the air suspension, prevent the frame from directly pressing on the uninflated air springs, which may cause the air springs to fold and become damaged.

## VI. After-Sales Service Provisions

Foshan Yonglitali Axle Co., Ltd. is a professional manufacturer of semi-trailer axles and related components. Our products have won multiple National Science and Technology Progress Awards. All products are designed, manufactured, and inspected in strict accordance with the IATF16949 quality system requirements. Our company has always adhered to the corporate culture of "Customer First, Pursuit of Excellence".

We have established sales outlets and after-sales service networks nationwide to provide high-quality and efficient services, and we make the following commitments and provisions for product after-sales service:

## 1. Service Guidelines

1.1 For L1 Yonglitali axles, if any product quality issue occurs within the warranty period from the date of vehicle purchase by the user, our company is responsible for providing free repair and necessary replacement.

1.2 All products from our company are supplied with a Product User Manual at the time of delivery. Users shall strictly follow the instructions specified in the Product User Manual for operation, maintenance, and repair.

1.3 When a product quality issue occurs, users may directly file a complaint, consult, or request service with our company's Marketing Department, or with the local distributor of L1 Yonglitali axles, or the local after-sales service station. L1 Yonglitali Company ensures that a response with a proposed solution will be provided to the user within 2 hours. After receiving a user complaint or service request, if on-site service is required, our company will arrange the service as quickly as possible. Generally, if the service location is within 300 km of our company or the nearest service station, we commit to arriving within 24 hours; if it exceeds 300 km, within 48 hours; for remote areas, the response time will be determined based on actual conditions.

For issues that do not require dispatching personnel to the site, the After-Sales Service Department will directly guide the user to adopt a quicker and more convenient solution.

## 2. Service Precautions

2.1 Products must be used and maintained correctly according to the User Manual provided by our company. When replacing parts, genuine L1 Yonglitali original parts or company-approved substitutes should be used. Our company is not responsible for any consequences caused by the use of non-approved parts.

2.2 Vehicle manufacturers should provide the User Manual supplied by our company to end users along with the vehicle and remind users to read it carefully.

2.3 When requesting free service from L1 Yonglitali, users must provide proof that the product is still within the warranty period, along with trailer information and contact details (including photos of the trailer registration certificate,

overall vehicle photos, odometer reading, product nameplate, fault area, and a continuous video recording of the above).

2.4 For major accidents that may cause serious economic loss or civil/criminal liability and may be related to our products, users must not handle or dispose of the L1 Yonglitali product without our company's consent. The scene must be properly protected while notifying our company or service station. Otherwise, all consequences shall be borne by the user.

### 3. Warranty Period and Coverage

3.1 The after-sales warranty period for L1 Yonglitali axles is 3 years or 500,000 km (whichever comes first). This applies to the main structural components (support beam/axle tube weldment). Warranty terms for other components are detailed in the Product Warranty Parts List.

3.2 Wear parts are covered according to the time or mileage limits specified in the Product Warranty Parts List (whichever comes first). Service for wear parts is based on product failure and does not cover normal wear or minor defects that do not affect normal use. If failure to replace a wear part in time causes damage to other components, the warranty period for those components shall follow the wear part's warranty period.

3.3 In the spirit of providing lifetime service to users, for products beyond the warranty period, if the product performance fails to meet the requirements and repair or maintenance is needed, if performance requirements are not met, our company will provide paid service upon user request and charge only the cost of parts and related expenses.

3.4 This standard applies to current product specifications. Future product additions or specification changes shall still be governed by this standard, based on product name.

3.5 The warranty period for wear parts is determined by whichever comes first – time or mileage – and is based on actual product failure. It does not include normal wear or minor cosmetic defects that do not affect normal function.

3.6 If damage to other components results from failure to promptly replace a wear part, the warranty period for the affected components shall be calculated in accordance with the warranty period of the wear part.

3.7 If a wear part has reached the end of its warranty period but continues to be used, or when the product is operated under extremely harsh conditions, mountainous roads, or heavy overload conditions, there is no guarantee that the product will meet the service life specified in this standard. Users should closely monitor the condition of wear parts, appropriately increase inspection and maintenance frequency, and replace them promptly when necessary.

### Product Warranty Parts List (After-Sales Service)

Note: Parts marked with “\*” are wear parts.

Product Category	Part Name	After-Sales Service		
		Remarks	Warranty Period (Time)	Mileage
Air Suspension	Beam / Axle Tube Weldment Assembly	All models	3 years	500,000 km
	Air Spring	Load-bearing	24 months	200,000 km
		Lifting	12 months	100,000 km
	Shock Absorber *	Domestic	12 months	150,000 km
		Imported	12 months	150,000 km
	Trailing Arm Bolt *	All models	12 months	150,000 km
	Shock Absorber Bolt *	All models	12 months	150,000 km
Shock Absorber Bushing *	All models	12 months	150,000 km	
	Other parts	All models	12 months	100,000 km
Air Circuit	Valves *	All models	12 months	150,000 km
	Connectors *	All models	12 months	150,000 km
	Brake Chambers *	All models	12 months	150,000 km
	Air Tank *	All models	12 months	100,000 km

#### 4. Conditions Not Covered by Free Service

4.1 Failure to follow the requirements of our company's User Manual for model selection, installation, use, or maintenance.

4.2 Damage caused by unauthorized modification, welding, or removal of parts by the user.

4.3 Damage caused by improper or abnormal use by the user.

4.4 Damage caused by overloading, exceeding legal limits, or operation under severe road conditions.

4.5 Damage to our products caused by the trailer or other accessories.

4.6 Continuing faults or component damage caused by unauthorized handling or replacement of parts without our company's consent.

4.7 Disputes arising from incorrect promotion by the vehicle manufacturer or seller.


4.8 Failures occurring beyond the warranty period.




## FOSHAN YONGLITAI AXLE CO., LTD.

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