INSTALLATION BULLETIN

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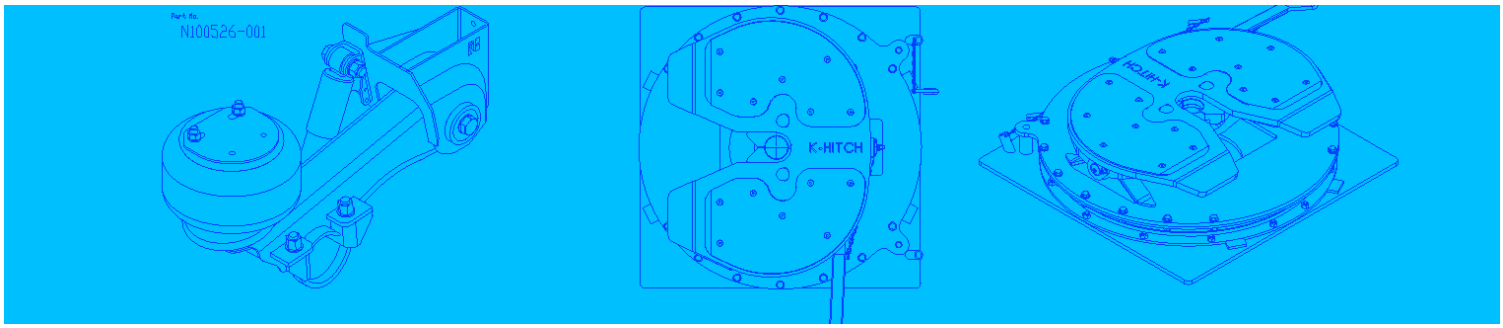
Revision : Rev A **Reference Documents :** T001-01 Rev 02-22

AUTOMATIC TYRE INFLATION SYSTEM *(ATIS)* INSTALLATION INSTRUCTIONS



SERVICE NOTES

About This Manual

This manual provides installation and maintenance procedures for the P.S.I.® Tyre Inflation System *(ATIS)* for trailers. Use the procedures in this manual to install the system on either a new trailer axle at original equipment manufacturers or on in-service trailer axles in workshops by qualified technicians.

Before You Begin

Caution: do not perform unauthorized maintenance, repair procedures or install non-p.s.i.® components on any p.s.i. ® system. This can void the warranty.

1. Read and understand all instructions and procedures before starting the installation procedure.

2. Read and observe all **Warning** and **Caution** alert messages in this publication. They provide information that can prevent personal injury, damage to components or both.

3. Follow the P.S.I. installation, maintenance, service and troubleshooting guidelines.

4. Use special tools when required to avoid personal injury and damage to components.

Hazard Alert Messages and Torque Symbols

WARNING:

A Warning alerts the technician to an instruction or procedure that must be followed to avoid personal injury and damage to components.

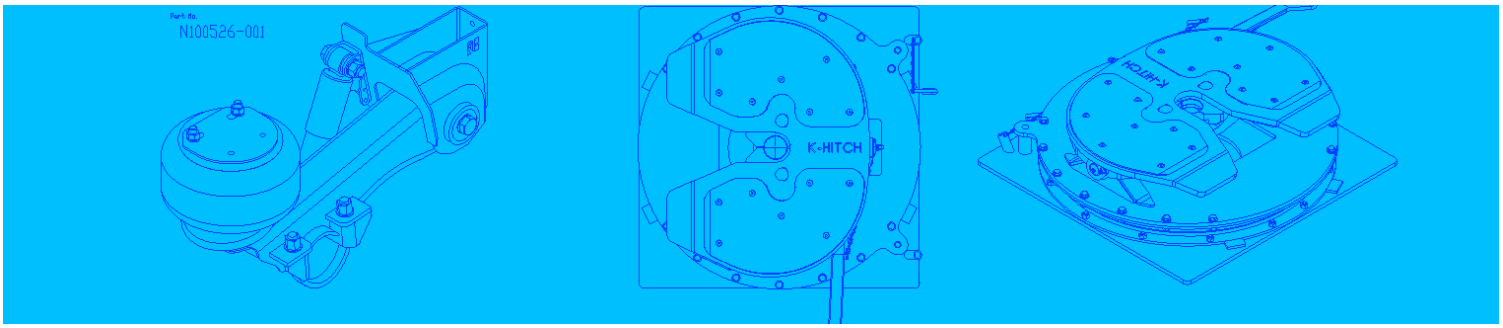
CAUTION:

A Caution alerts the technician to an instruction or procedure that must be followed to avoid damage to components.

TORQUE REQUIRED:

The torque symbol alerts the technician to tighten fasteners to a specified torque value.

Additional support can be obtained through the FUWA K-Hitch website to contact us.



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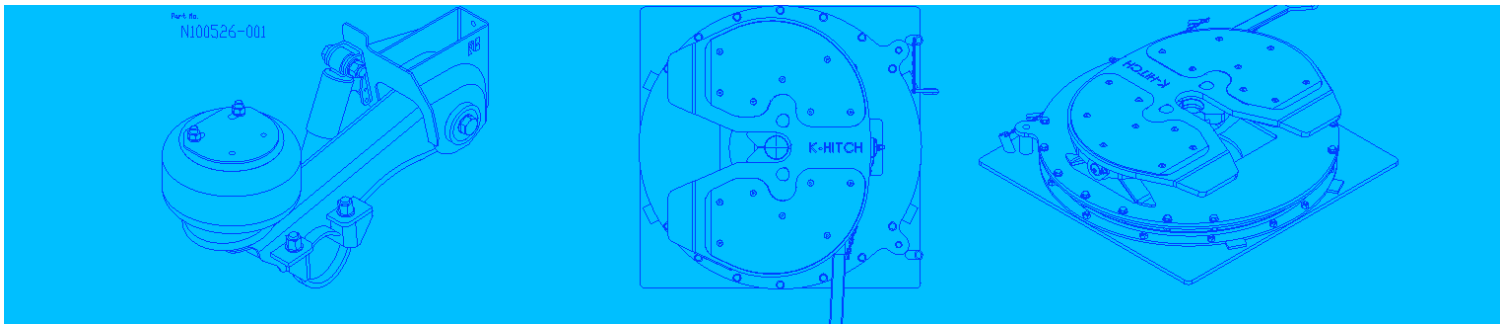
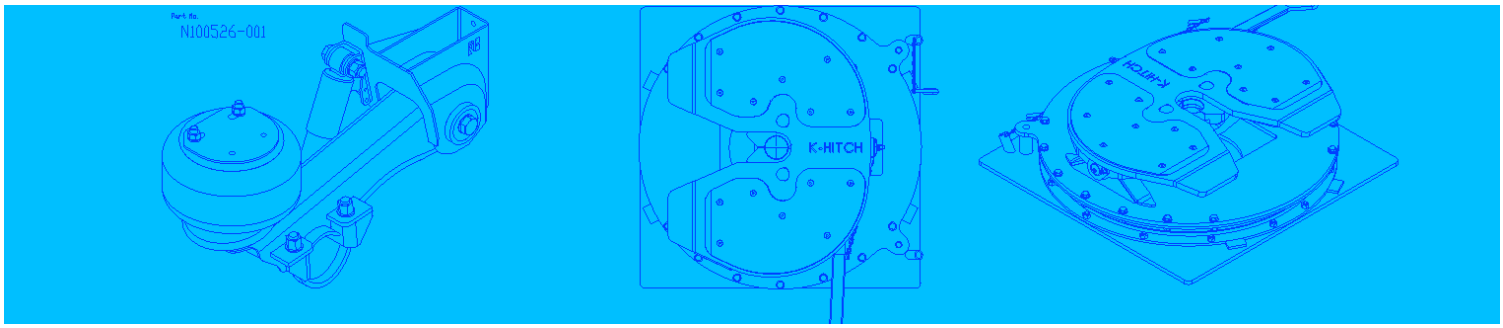
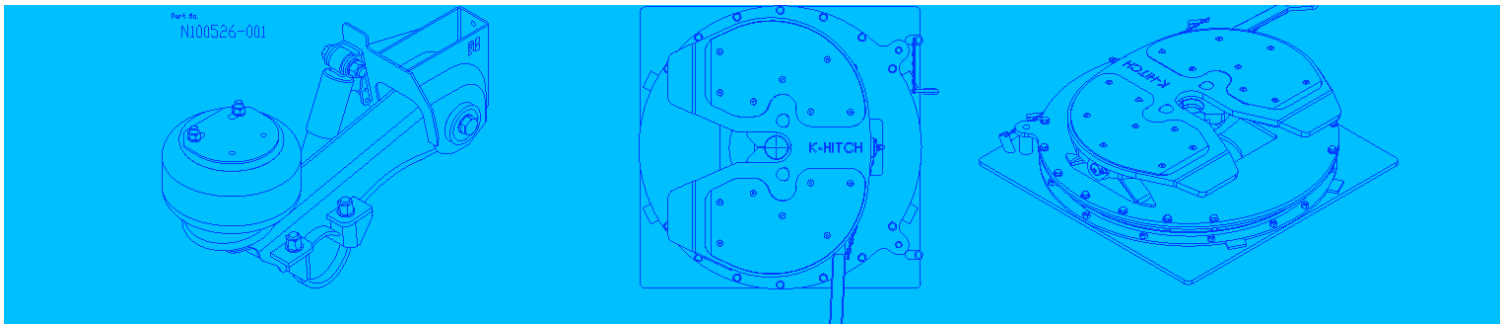






1.0 – INTRODUCTION

In this section the ATIS system will be explained in order to assist the installer, maintenance technician or operator how to interact with this critical trailer equipment.

1.1 - System Overview

Figure 1 below graphicly illustrates the main components and layout of the FUWA K-Hitch ATIS system.

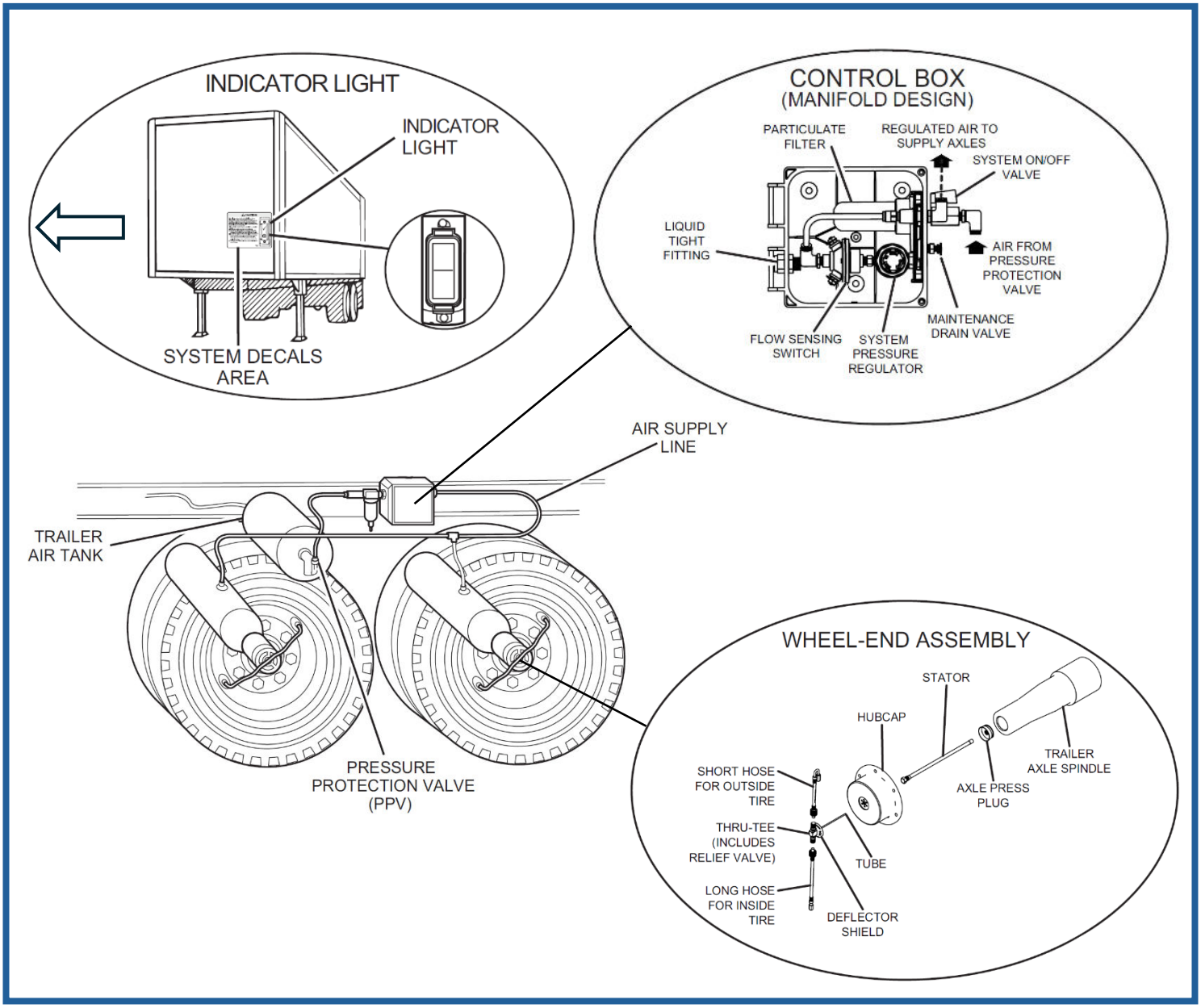
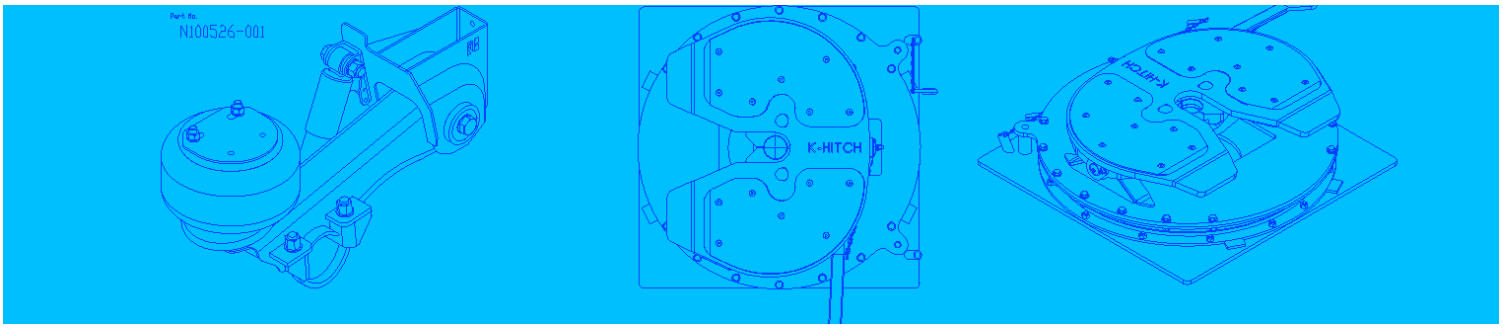


Figure 1: ATIS System Layout



1.2 - System Description

The FUWA K-Hitch ATIS uses compressed air taken from the trailers air tanks, through a Pressure Protection Valve *(PPV)* to feed a control box that regulates the air pressure to a set point prescribed by the trailer operator to suit their application.

The regulated air is then routed into the axle beam that acts as a reservoir and distributes it to each wheel end as shown in Figure 1 above. Check valves in the tyre hoses ensues each wheel is isolated in case of a failure of a tyre, the remaining tyres will be maintained at the ATIS system regulated air pressure.

To further protect the integrity of the wheel and each wheel end is fitted with a ThermALERT™ that will melt a eutectic screw fitted to the axle end plug when it is exposed to a predetermined critical temperature caused by abnormal operating conditions. This will release air through the vent holes in the hubcap causing a loud whistling noise as an audible alert to the vehicle operator. The excessive airflow will also cause the illumination of the warning light on the front of the trailer as a visual alert to the vehicle operator.

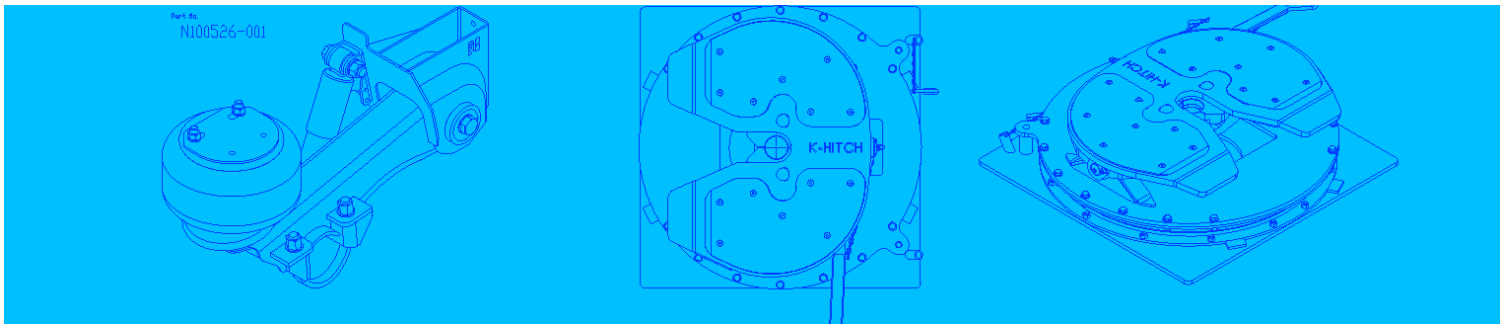
WARNING: ANY TIME THAT THE ATIS INDICATOR LIGHT ILLUMINATES ON THE FRONT OF THE TRAILER WHEN DRIVING, THE VEHICLE OPERATOR SHOULD PULL OVER AT THE NEXT SAFE LOCATION AND INSPECT THE TRAILER FOR TYRE FAILURE OR A THERMAL EVENT. DO NOT OPERATE THE VEHICLE WITH A THERMALERT™ ACTIVATED.

1.3 - Indicator Light Operation

The indicator light mounted on the front of the trailer, illuminating when the system delivers an excessive amount of air due to either a leaking tyre, a leaking tyre inflation system component or a wheel-end operating at an abnormally high temperature. If the indicator light illuminates during operation, immediately find a safe place to bring the tractor and trailer to a complete stop. Make sure the component that caused the air leak is repaired before returning the vehicle to service.

1.3.1 - Indicator Light On During Air System Charging

When air is supplied to the trailer the system indicator light may illuminate while the system is charging. If the indicator light remains illuminated for more than 10 minutes a tyre may be losing air pressure. Inspect the tyres for damage and air leaks. Repair damaged or leaking tyres before returning the vehicle to service.



1.3.2 - Indicator Light On During Vehicle Operation

If the ThermALERT ™ system activates during vehicle operation, repair or replace the components that caused the wheel-end to overheat before returning the vehicle to service. The thermal screw is not reusable and must be removed and replaced. *(PN: H2200-02)* Otherwise, the indicator light will remain ON during vehicle operation, even though the wheel-end has been repaired.

Follow the guidelines below if the system indicator light illuminates:

1. Bring the tractor and trailer safely to a complete stop as soon as possible.

2. Inspect the trailer hubs for air leaks.

3. Listen for the ThermALERT™ system's audible sound at the wheel-end. If a sound can be heard the wheel-end is overheated. Do not operate the trailer until the wheel-end components are repaired. If a wheel-end overheats during operation it can separate from the vehicle. Serious personal injury and damage to components can happen.

4. If you do not hear the ThermALERT™ system's audible sound at the wheel-end, inspect the tyres for damage. Repair damaged or leaking tyres before returning the vehicle to service.

1.4 - Wheel End Assembly

At each end of the axle the regulated air pressure is directed through the components shown in figure 2 below and into each tyre.

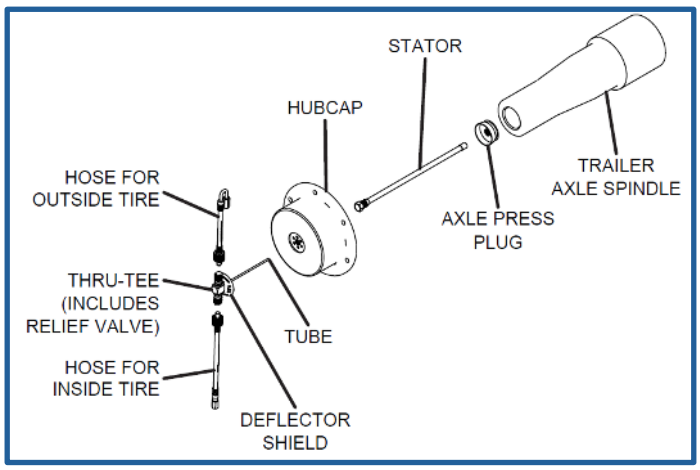
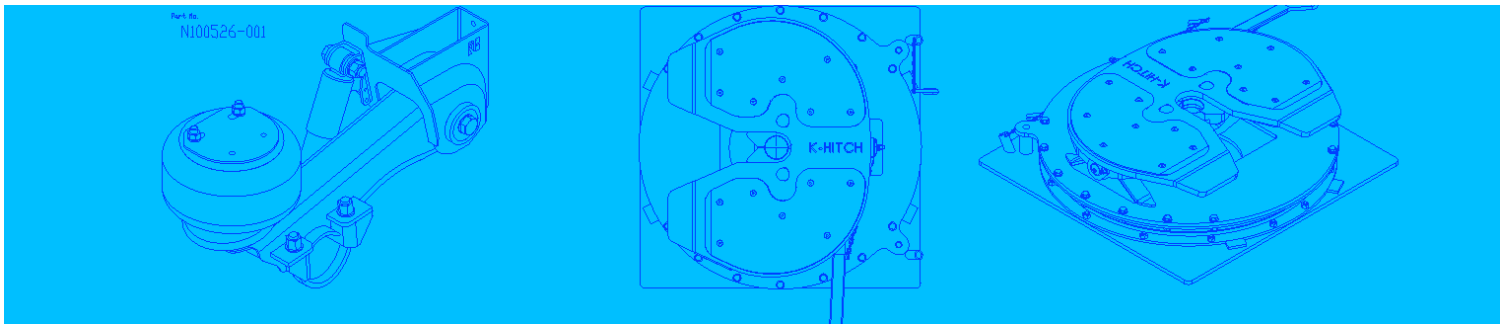


Figure 2: Wheel End Components, Exploded View



1.4.1 - Axle Press Plug

The axle press plug is used to seal off the pressurized axle interior from the wheel-end and provide a means of holding and securing the stator. Figure 3 below illustrates the axle press plug viewed from the outside of the axle.

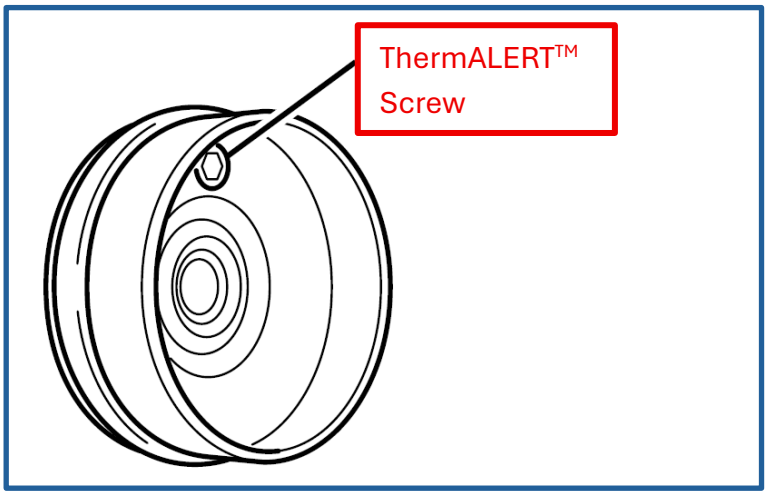


Figure 3: Axle Press Plug

1.4.2 - Stator

The stator is screwed into the axle press plug and remains stationary with the axle beam. Its function is to provide a path for the pressurized air and to seal the Thru-Tee as it rotates with the wheel hub. Figure 4 below illustrates the Stator.

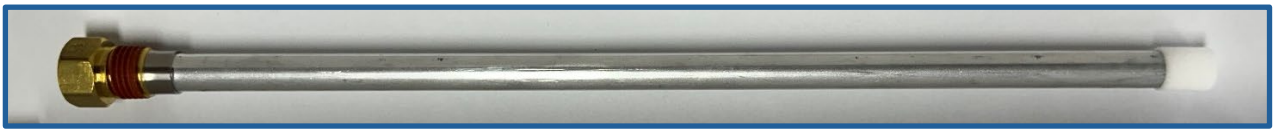
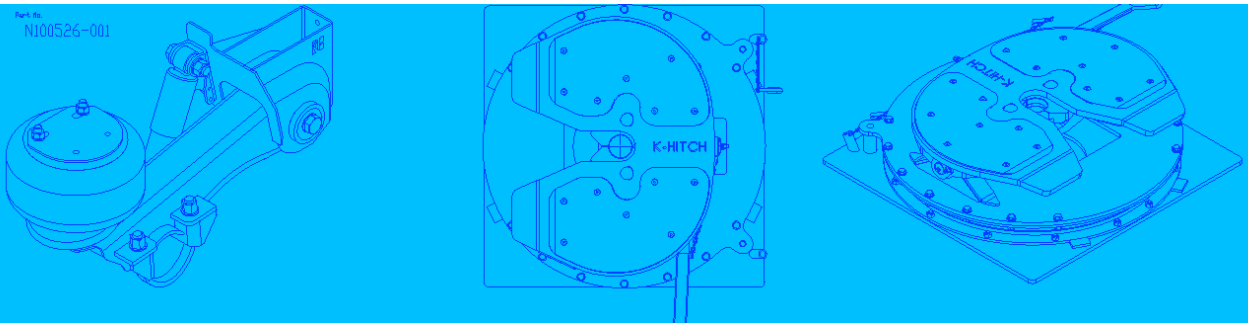


Figure 4: Stator

1.4.3 - Thru-Tee

The Tru-Tee is mounted onto the hubcap and extends into the stator creating an air tight connection between the stationary axle tube and rotating wheel hub. The Thru-Tee also has a “Deflector Seal” that helps prevent contaminants entering the wheel end. Figure 5 below illustrates the Thru-Tee.



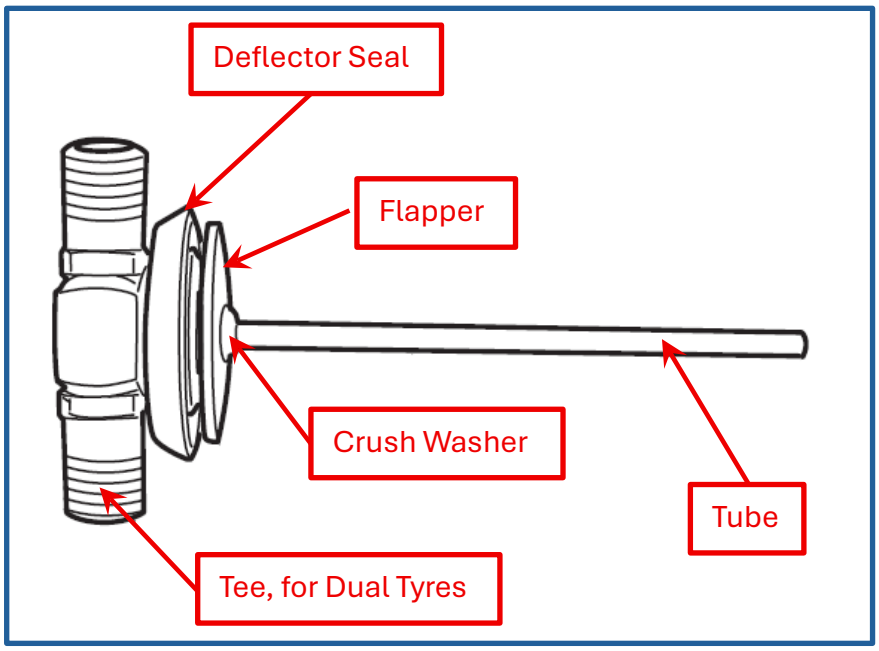


Figure 5: Thru-Tee Assembly

Caution: the Thru-Tee has a very low installation torque, do not over tighten!

1.4.4 - Hubcap

The hubcap needs to be selected to suit the FUWA K-Hitch hub that is fitted to the axle. Tables 2 & 3 will assist in selecting the correct hubcap for your trailer build.

The hubcap provides a seal for the outside of the hub and also allows the Thru-Tee to be mounted.

The hubcap also contains the ThermALERT™ audible warning sysyem. The hubcap has a circle of small brass tubes that create a whistling noise when air is passed through them if the ThermALERT™ screw melts. Figure 6 illustrates the brass tubes fitted to all hubcaps supplied by FUWA K-Hitch.

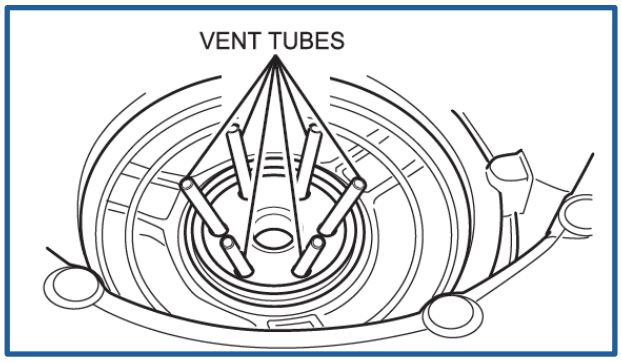
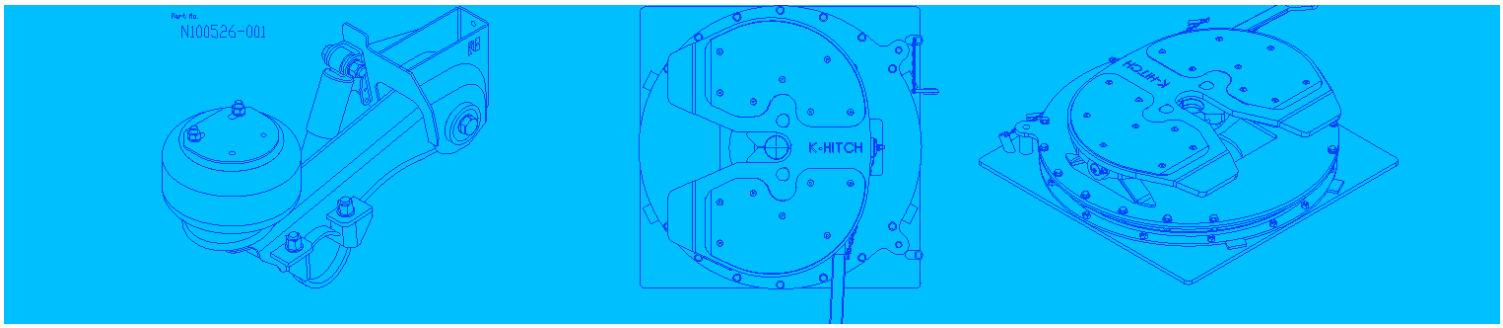


Figure 6: Hubcap Interior, ThermALERT™ Tubes



1.4.5 - Hoses Assemblies

The hose assemblies include an actuator which mechanically opens the tyre valve core and allows air to pass into the tyre. A check valve located at the knurled end of a hose allows air to flow in one direction only towards the tyre. This protects each tyre from loss of air pressure if the system or any tyre loses air pressure during operation. Figure 7 below illustrates the two hoses contained in the FUWA K-Hitch kit.

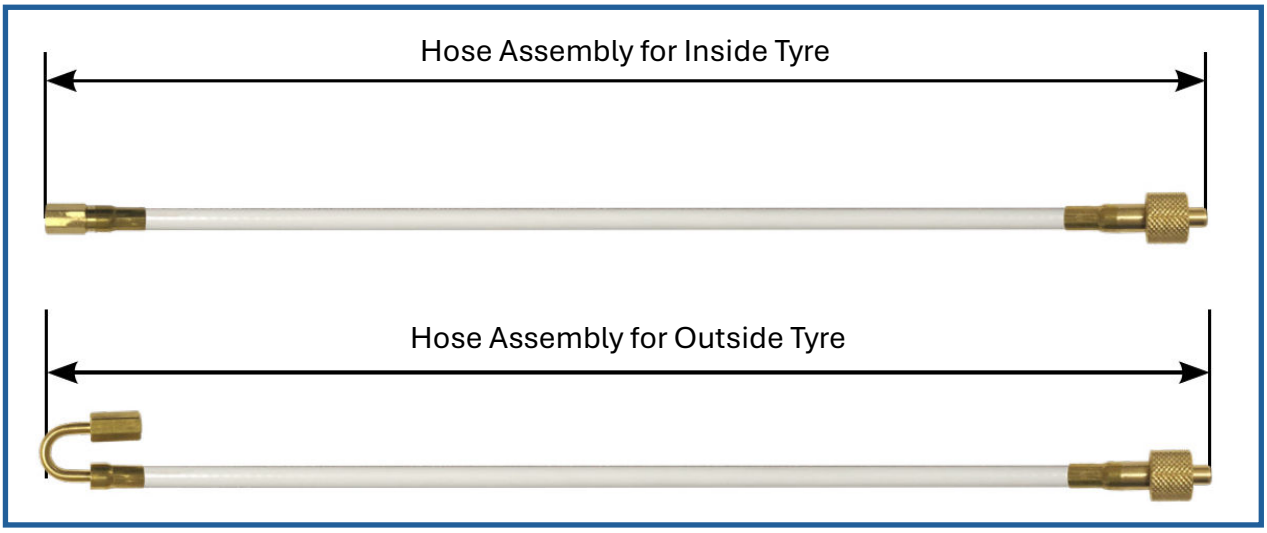


Figure 7: Hose Assemblies

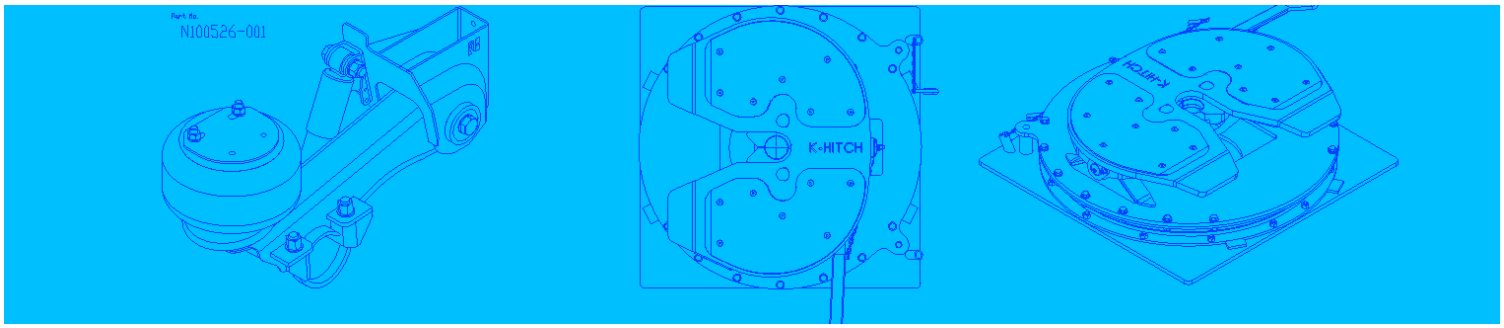
1.5 - Control Box

1.5.1 - Pressure Protection Valve (PPV)

In the event of a catastrophic system air loss the PPV ensures that air is available for other critical trailer functions and maintains air tank pressure if a tyre or a system component is damaged. Only use the PPV provided in the system kit.

The PPV is fitted to the trailer air tank and feeds the control box as shown in Figure 1.

WARNING: USE ONLY THE P.S.I.® PRESSURE PROTECTION VALVE *(PPV)* PROVIDED IN THE SYSTEM INSTALLATION KIT. DO NOT USE A NON-P.S.I.® PPV ON ANY OF THE SYSTEMS. DAMAGE TO THE COMPONENTS CAN OCCUR.



1.5.2 - System On/Off Valve

The system On/Off valve controls air supply to the system allowing the air to be shut off when performing maintenance. The valve is fitted to the control box as shown in Figure 8 below.

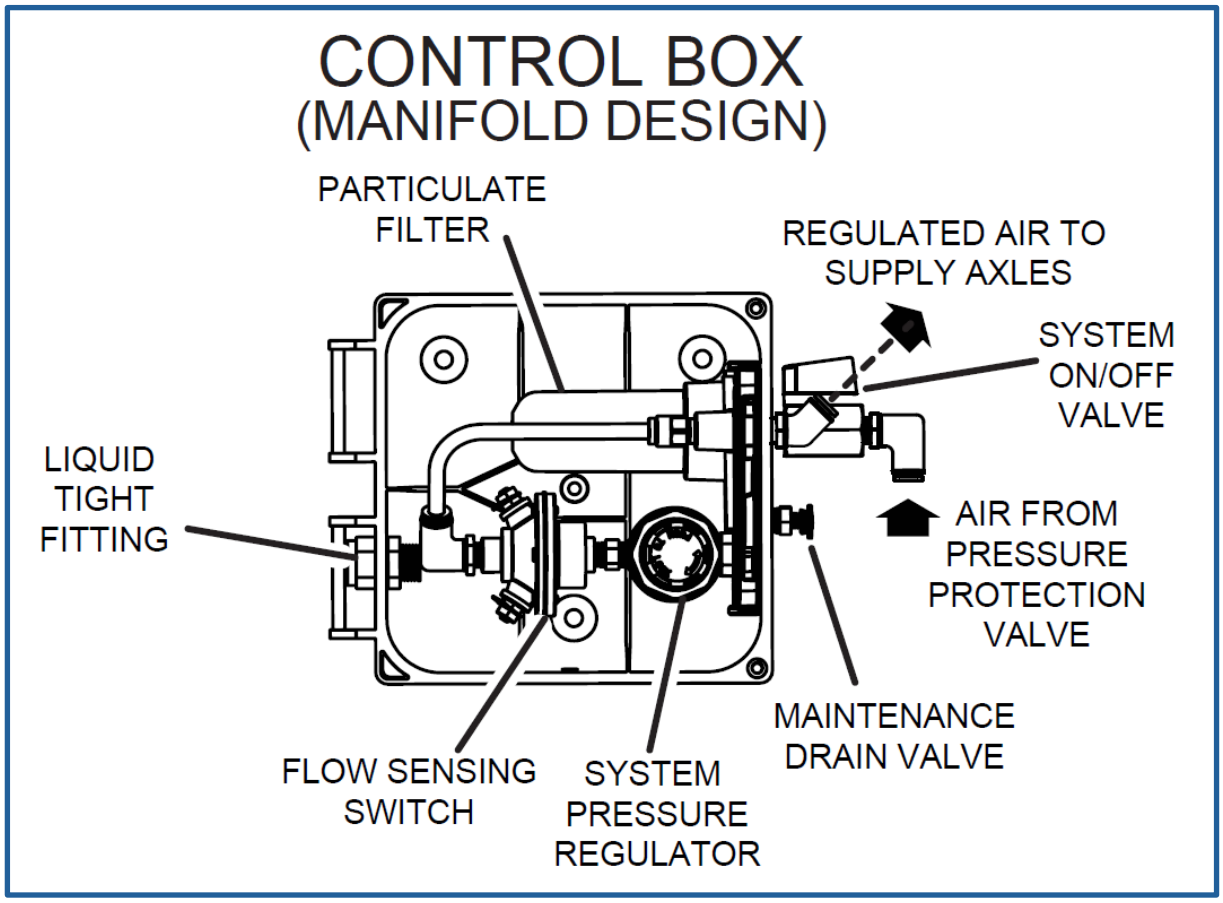


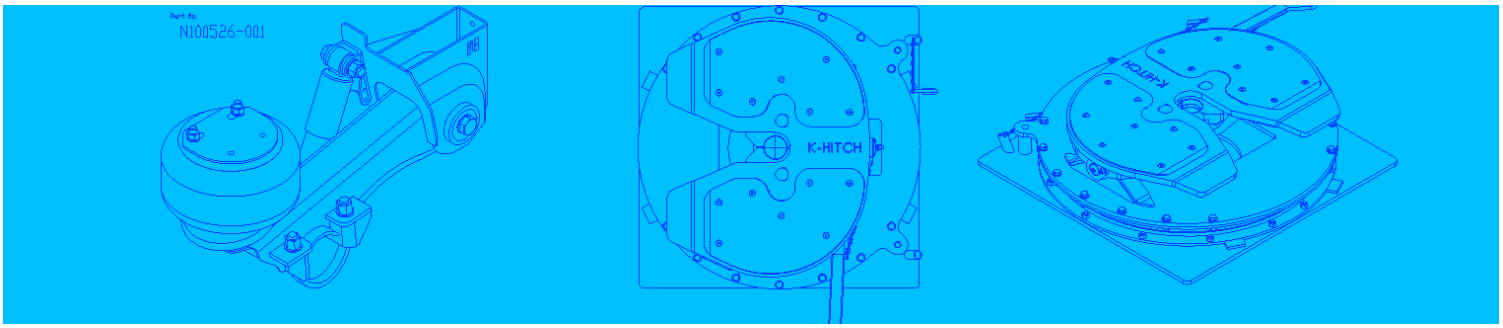
Figure 8: Control Box, Components

1.5.3 - Particulate Filter

The particulate filter helps remove contaminants from the inflation air system and is mounted inside the control box as shown in Figure 8 above.

1.5.4 - System Pressure Regulator

The pressure regulator is mounted inside the control box as shown in Figure 8 above. Use the adjustment knob on the system pressure regulator to adjust the system set point pressure controling the tyre pressure to the desired operating air pressure.



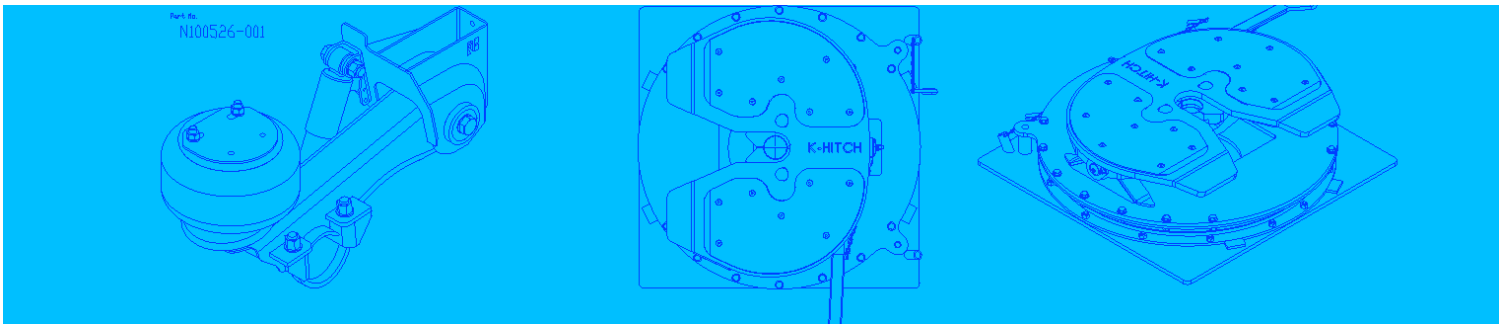
1.5.5 - Flow Sensing Switch

The flow sensing switch causes the indicator light mounted on the front of the trailer to illuminate when the system delivers an excessive amount of air due to either a leaking tyre, a leaking tyre inflation system component or a wheel-end operating at an abnormally high temperature when equipped with the ThermALERT™ system. The flow sensing switch is mounted in the control box as shown in Figure 8 above.

WARNING: DO NOT INSTALL THE BLACK FLOW SENSING SWITCH ON A TYRE INFLATION SYSTEM EQUIPPED WITH THE THERMALERT™ SYSTEM. PERSONAL INJURY AND DAMAGE TO COMPONENTS MAY OCCUR.

1.5.6 - Maintenance Drain Valve

The maintenance drain valve is used to manually exhaust pressure from the tyre inflation system. This enables maintenance to be performed on either the trailer axle components or the tyre inflation system. The maintenance drain valve is located on the outside of the control box as shown in Figure 8 above.



2.0 - PARTS SUMMARY

FUWA K-Hitch ATIS systems are packaged for a Tri-axle configuration only. If your project requires more or less axles per trailer a corresponding amount of Tri axles kits will need to be purchased to meet your needs.

The ATIS system kits are to fit both tapered spindles and parallel spindles manufactured by FUWA K-Hitch with all configurations of available hubs. The kits do not suit the unique Unitized spindles with cartridge bearing inserts.

If the ATIS kit is being fitted to a KI suspension system, please also refer to the supplementary document "FKH-INSTL-0024_CTI Installation-KI suspension Supplement" available from your FUWA K-Hitch reseller or the FUWA K-Hitch website.

Two kits are offered by FUWA K-Hitch: one option for a tapered spindle axle *(TN)* and one for a parallel spindle axle *(TP)*. Table 1 below shows these options.

Table 1: Kit Part Numbers

Kit Number	Spindle Type	Hub Type	Brake Type	Pressure
P1975-33	Parallel *(TP)*	ISO Hub Spigot	Drum / Disc	690 Kpa (100 Psi
P1965-33	Tapered *(TN)*	ISO Hub Spigot	Drum / Disc	690 Kpa (100 Psi

Once the base ATIS package has been chosen, the hub caps to suit the trailer build need to be added to the order.

Table 2 below shows the four hub cap options available. *(Please select the correct ATIS hub cap to suit the hub on the axle being fitted to your trailer)*

All hub caps are diecast aluminum with the TherALERT™ brass tubes and are supplied with gaskets or "O" Rings to suit.

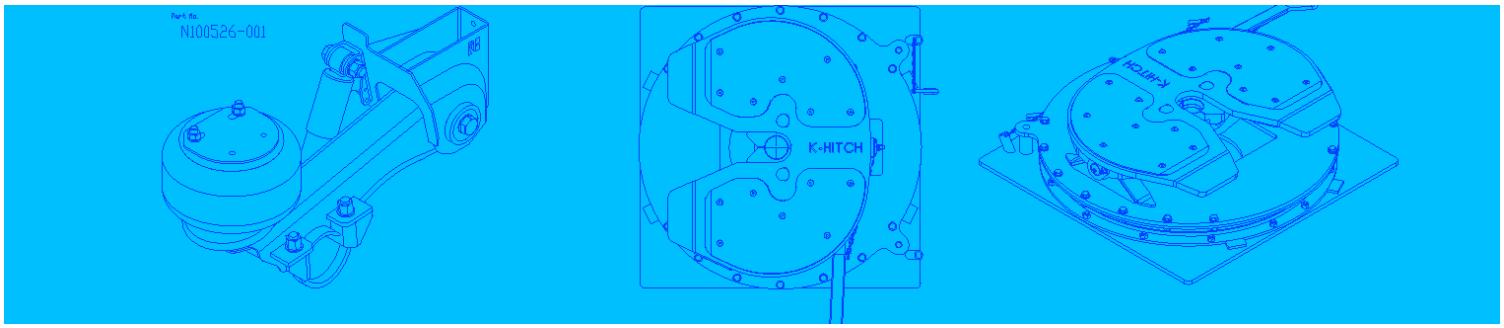
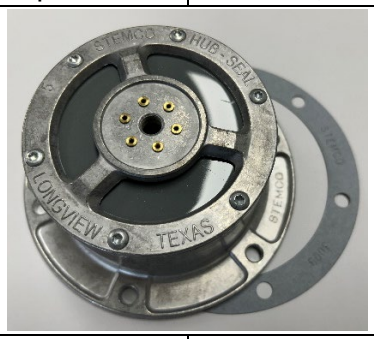
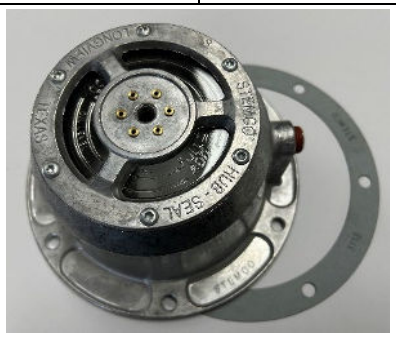


Table 2: ATIS Hub Cap Identification

Part Number	Application	Bolt Pattern	Seal
31429-00	Tapered Spindle	6 holes, 5.5” PCD	Gasket - Grease
		139.7 mm PCD	
31437-00	ConMet – Both	6 holes, 6.75” PCD	Gasket – Semi Fluid
		171.5 mm PCD	
31439-00	Disc brake - TP	6 holes, 6.75” PCD	Gasket - Grease
		171.5 mm PCD	
32293-00	Parallel Spindle	Screw On Design	“O” Ring - Grease
		6.25” by 8 TPI (159 mm)	

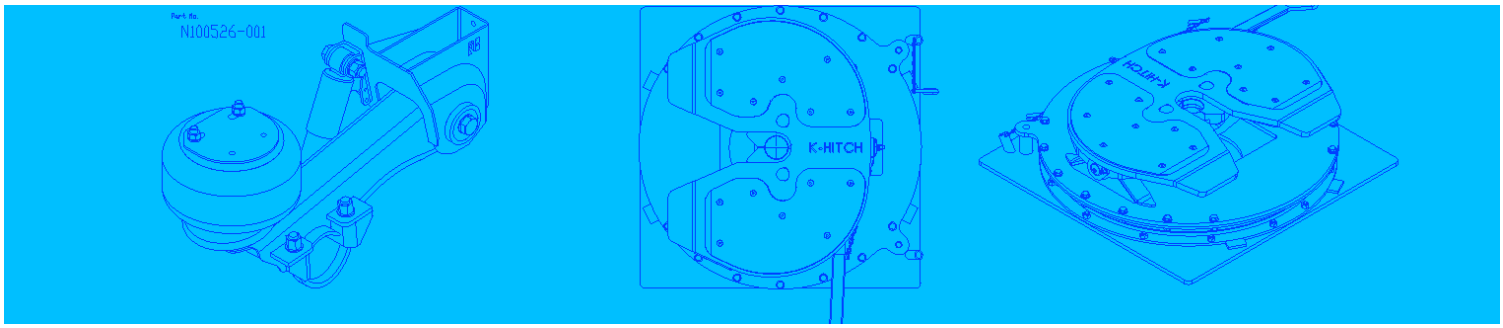


Table 3 below is a quick reference for the hub caps to suit different FUWA K-Hitch axle and hub combinations. If your FUWA K-Hitch axle or hub are not shown, please contact your local FUWA K-Hitch agent for support.

Table 3: Hub Cap Quick Reference Guide

FUWA K-Hitch Axle, Hub and ATIS Hubcap Part Numbers							
Product			**Hub PN**	**Cap PN**	**ATIS Hub Cap PN**	**PCD**	**Bolt Holes**
Model	**Brake**	**Spindle**					
KSS1	Drum	TN	KH3601-3010Z	KH800110B	**31429-00**	139.7	6x 5/16" / Ø8.8
KSS1	ConMet Drum	TN	10045570	10083537	**31429-00**	139.7	6x 5/16" / Ø9.7
KF85	Drum	TN	H31-8201	KH800205B	**32293-00**	N/A	6.25" 8 TPI
KF75	Drum	TN	KH800229	KH800205B	**32293-00**	N/A	6.25" 8 TPI
KF37	Drum	TN	H31-9901Z	KH800110B	**31429-00**	139.7	6x 5/16" / Ø8.8
KK44	Drum	TN	H30-9401Z	KH800110B	**31429-00**	139.7	6x 5/16" / Ø8.8
KF29	Drum	TN	KH3601-3010Z	KH800110B	**31429-00**	139.7	6x 5/16" / Ø8.8
KF29	Drum	TP	KH3601-0302Z	KH800205B	**32293-00**	N/A	6.25" 8 TPI
KF22	Drum	TN	KH3601-3010Z	KH800110B	**31429-00**	139.7	6x 5/16" / Ø8.8
KF22	Drum	TP	KH3601-0302Z	KH800202B	**32293-00**	N/A	6.25" 8 TPI
KF21	Drum	TP	KH3601-0302Z	KH800205B	**32293-00**	N/A	6.25" 8 TPI
KSS1	Disc	TN	FW429	KHALU01	**31429-00**	139.7	6x 5/16" / Ø9.5
KFS16	Disc	Unitised	N/A	N/A	N/A	N/A	N/A
FB24	Disc	TN	H31-6101DB	KH800205B	**32293-00**	N/A	6.25" 8 TPI
KF36	Disc	TN	FW429	KH800110B	**31429-00**	139.7	6x 5/16" / Ø8.8
KF36	Disc	TP	FW431	KH800205B	**32293-00**	N/A	6.25" 8 TPI
KF36	Disc	5 Spoke TP	FW336	KH800205B	**32293-00**	N/A	6.25" 8 TPI
KF23	Disc	TP	H31-D201	H14-0301	**31439-00**	171.5	6x 5/16" / Ø8.8
KF23	Disc	ConMet TP	10016242	10085634	**31437-00**	171.5	6x 5/16" / Ø9.0
KF26	Disc	TN	FW429	KH800110B	**31429-00**	139.7	6x 5/16" / Ø8.8
KF26	Disc	TP	FW431	H14-0301	**31439-00**	171.5	6x 5/16" / Ø8.8
KF26	Disc	5 Spoke TP	FW336	KH800205B	**32293-00**	N/A	6.25" 8 TPI
KI S25 2T OS	Drum	ConMet TP	10041701	10085634	**31437-00**	171.5	6x 5/16" / Ø9.0
KI S25 2U US	Drum	ConMet TP	10041701	10085634	**31437-00**	171.5	6x 5/16" / Ø9.0
KI S25 2T OS	Disc	TP	FW431	H14-0301	**31439-00**	171.5	6x 5/16" / Ø8.8

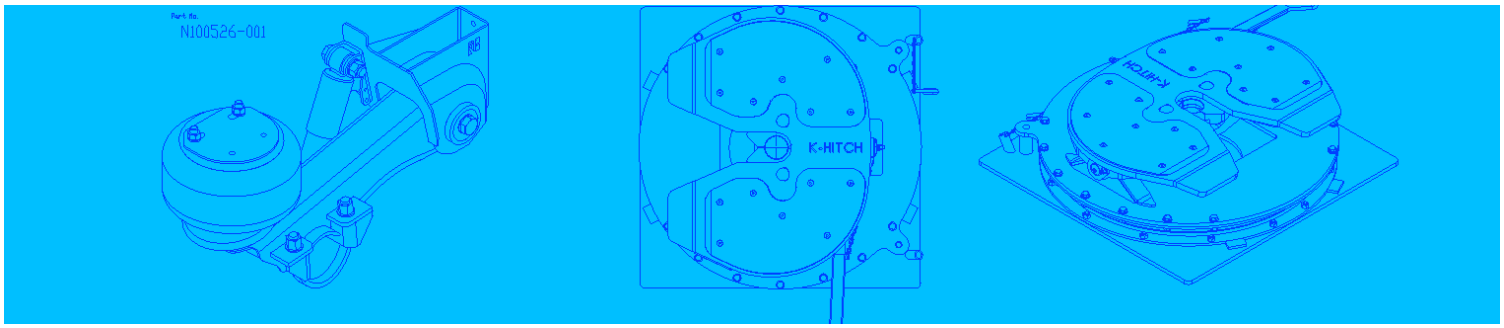


Figure 2 below illustrates the parts that should be included in the base parts kit. Table 4 below describes the parts illustrated in Figure 9. Table 4 also includes the FUWA K-Hitch part numbers for the replacement of parts if required during the lifecycle of the ATIS system. Please inspect the kit to ensure all parts are supplied and undamaged.

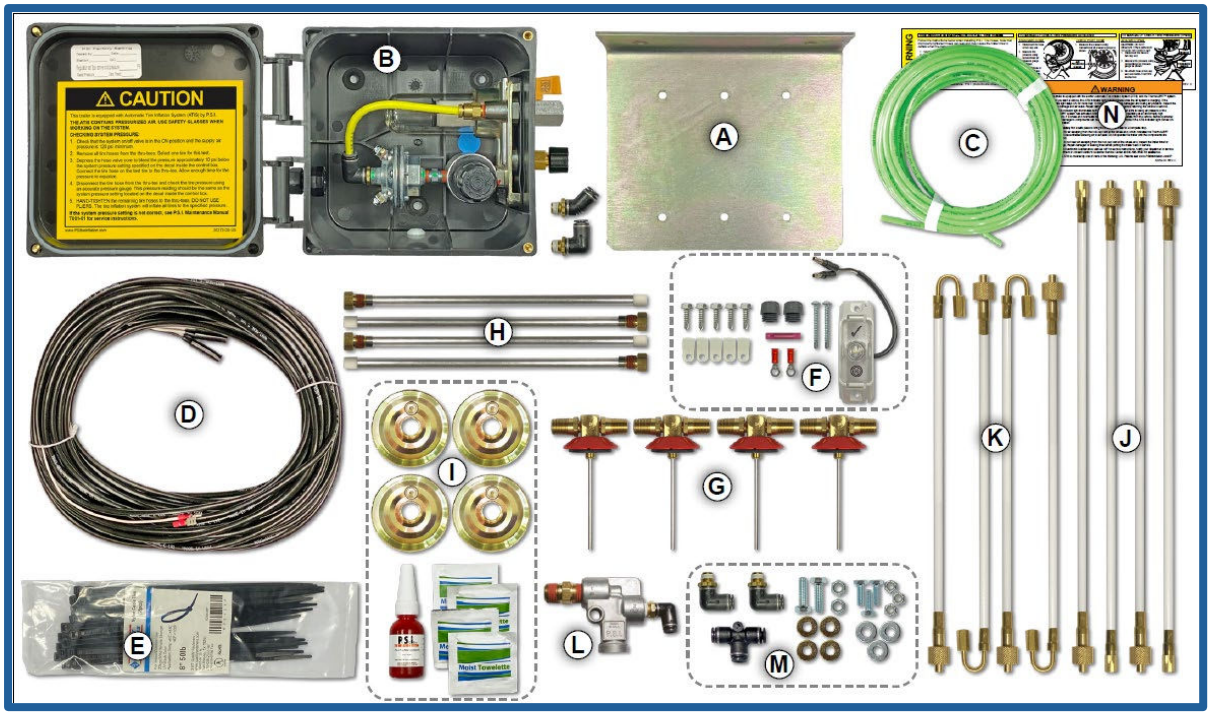
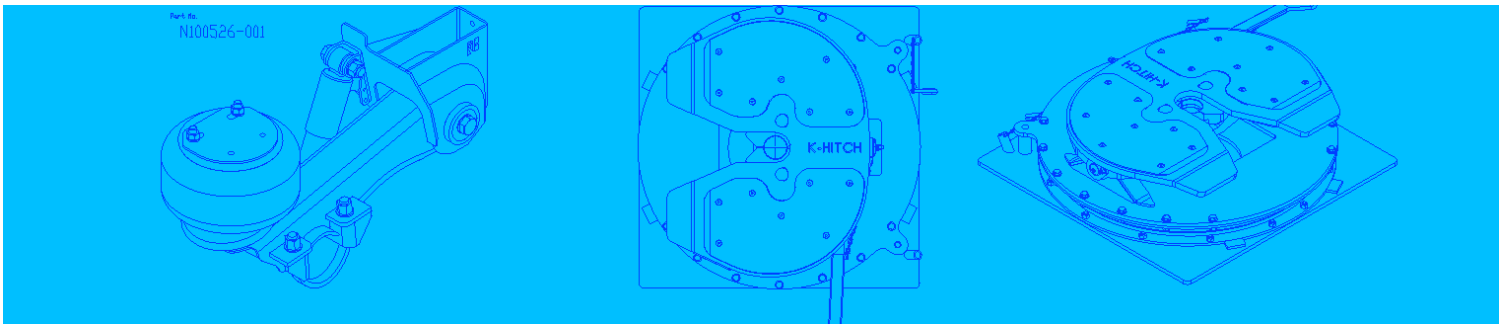


Figure 9: Part Suppled in Basic Kit

Table 4: Figure 1, Part identification Key

Item	Part Number	Quantity	Description
A	31073-00	1	Control Box Bracket
B	31092-00-PSI	1	Control Box Assembly
C	31052-35	2	Nylon Air Tubing, 7.6 m *(25 feet)* ¼”
D	31182-70	1	Electrical Cable, 21 m *(70 feet)* 2 core
E	628408P	1	Nylon Tie Straps, 25 Pieces
F & N	H1263-06-US	1	Trailer Light With Hardware
G	31317-14	6	Thru-Tee Assemblies – 127 mm *(5”)*
H	31314-21	6	Stators
I	H2184-01-0A	6	ThermALERT™ Press Plugs, Parallel 69.9 mm *(2.75”)*
	H2202-01-A	6	ThermALERT™ Press Plugs, Tapered 44.5 mm *(1.75”)*
J	31373-00	6	Hose Assemblies - Inside Tyres, 420 mm *(17”)*
K	31363-00	6	Hose Assemblies - Outside Tyres, 340 mm *(13.5”)*
L	31025-01-US	1	Pressure Protection Valve *(PPV)*
M	31982-02-30	1	Fitting And Hardware Kit
N/A	H2200-02	6	Thermal Screw Replacement Assembly



3.0 - INSTALLATION INSTRUCTIONS

The procedures in this manual shall be used to install the system onto FUWA K-Hitch axles, both on new trailer builds during the Original Equipment Manufacturing *(OEM)* process or on axles already in service.

FUWA K-Hitch can supply axles that have the air fitting and hub components already fitted or sell the ATIS as a kit. Please follow the instructions in this section that reflect the installation being undertaken. *(Based on the PSI Installation Instructions TOO1-01)*

3.1 - Preparation

WARNING: EYE PROTECTION MUST BE WORN WHEN PERFORMING VEHICLE MAINTENANCE OR SERVICE. INJURY OR DAMAGE TO YOUR EYES CAN OCCUR. GET MEDICAL ATTENTION IMMEDIATELY.

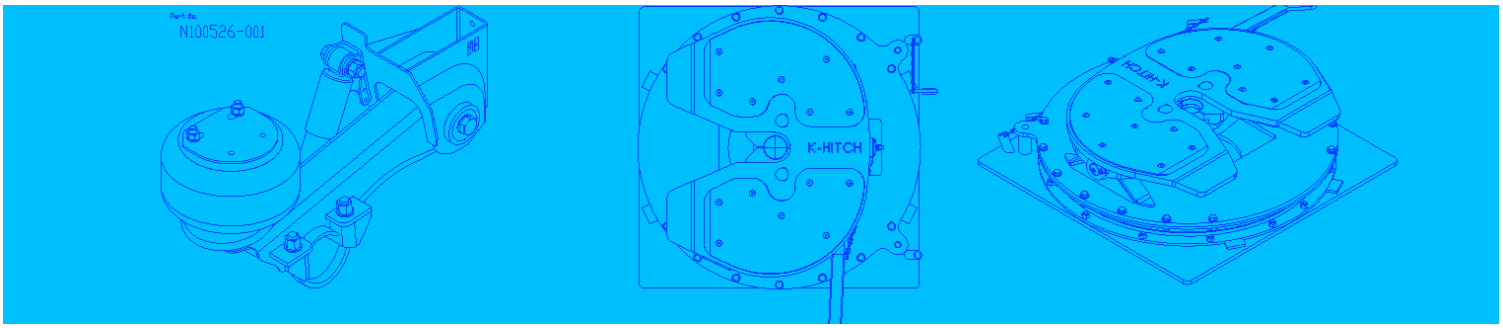
WARNING: THE VEHICLE MUST BE PARKED ON A LEVEL SURFACE WITH ALL TYRES ON THE GROUND. BLOCK OR CHOCK THE WHEELS TO PREVENT THE VEHICLE FROM MOVING. PERSONAL INJURY OR DAMAGE TO THE VEHICLE CAN OCCUR.

WARNING: THE VEHICLE MUST BE SUPPORTED WITH SAFETY STANDS. DO NOT WORK UNDER A VEHICLE SUPPORTED ONLY BY JACKS. PERSONAL INJURY OR DAMAGE TO THE VEHICLE CAN OCCUR.

Caution: Follow all manual handling procedures applicable to the workplace.

Caution: Follow all OH&S/SHE policies in the workplace that the work will be carried out in.

Torque Requirements: Please follow all fastener torque recommendations for the FUWA K-Hitch ATIS kit supplied. Or supplier recommendations for other components used.



3.2 – Axle Installation

The follow sequence of tasks is also the recommended workflow for installation of the FUWA K-Hitch ATIS kit onto an axle.

1) Prepare and install the inlet air fitting
2) Prepare and install the press plug
3) Install the stator
4) Install the wheel-end components

3.2.1 - Prepare and Install the Inlet Air Fitting

The recommended location to fit the axle inlet air fitting is in the centre of the axle on the upper most section of the axle tube.

Caution: FUWA K-Hitch integrated suspension and axles known as “KI” require the axle inlet air fitting to be located at the rear of the axle tube in a gap in the trailing arm. Please refer to the supplement document “FKH-INSTL-0024_CTI Installation-KI suspension Supplement_ Rev B” for specific instructions.

On the top surface of the axle tube measure the centre of the axle as shown in Figure 10 below.

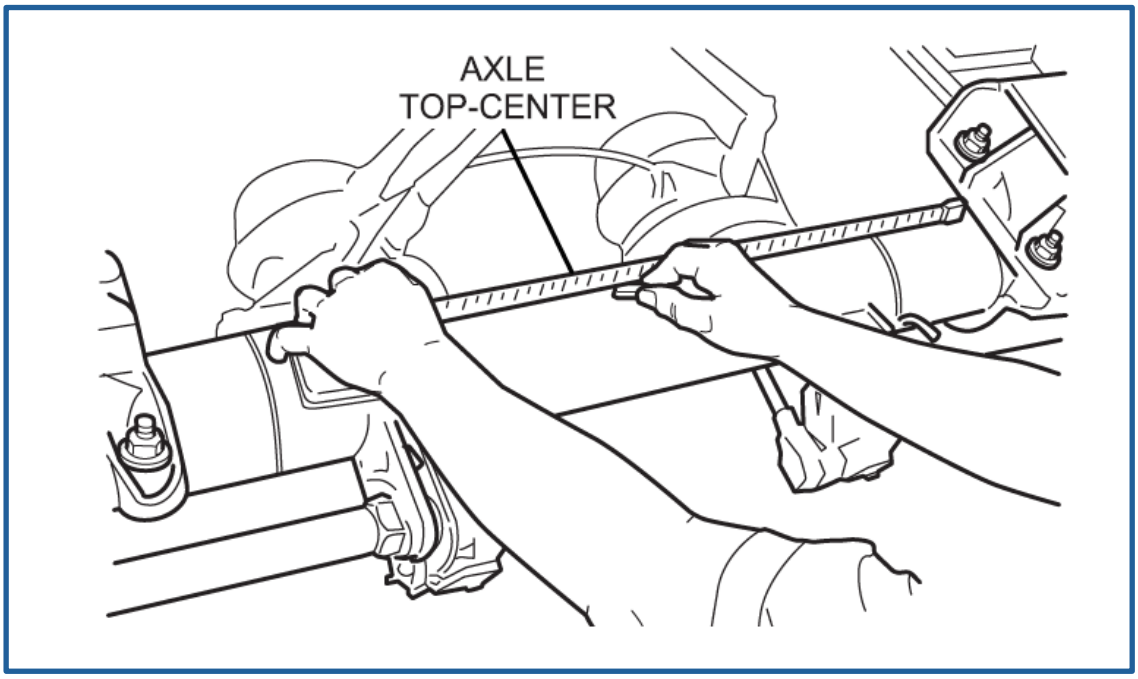
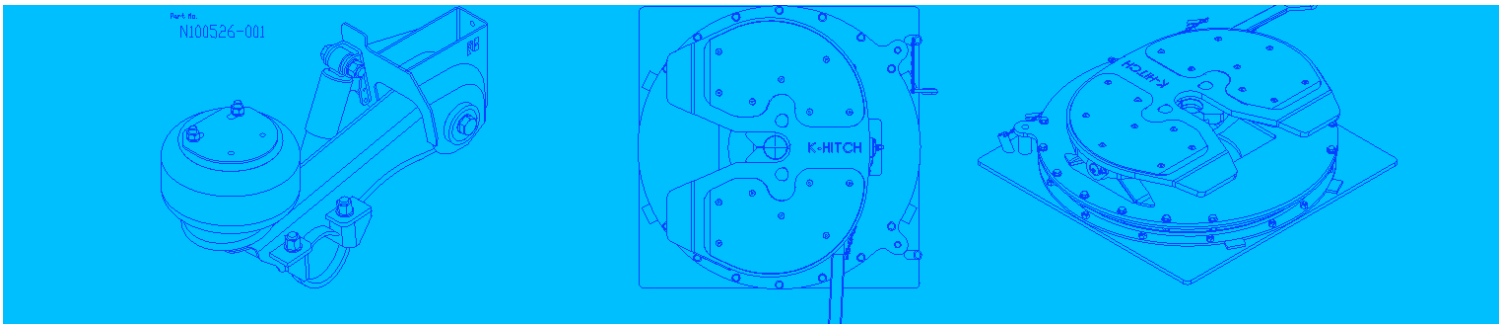


Figure 10: Mark Centre Of Axle



Centre punch the location marked for the inlet air fitting. Drill a pilot hole and then a final hole to 8.73 mm *(11/32")* normal to the axle surface as shown in Figure 11 below.

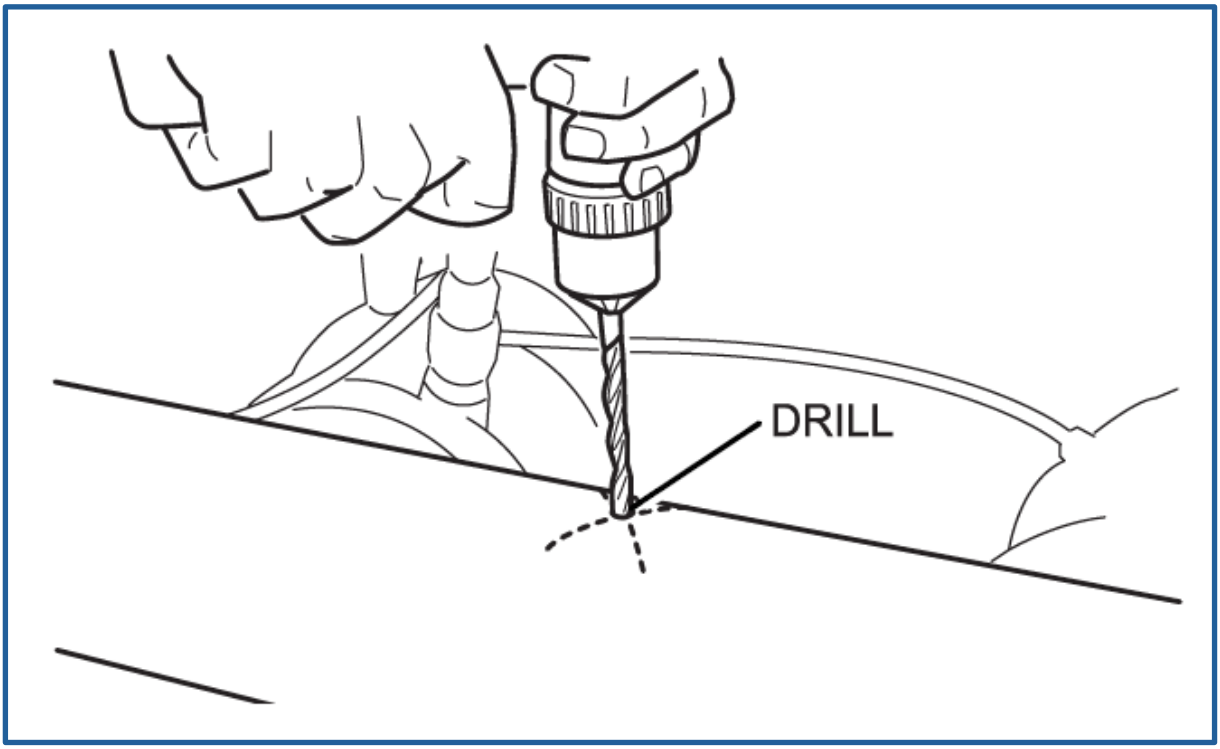


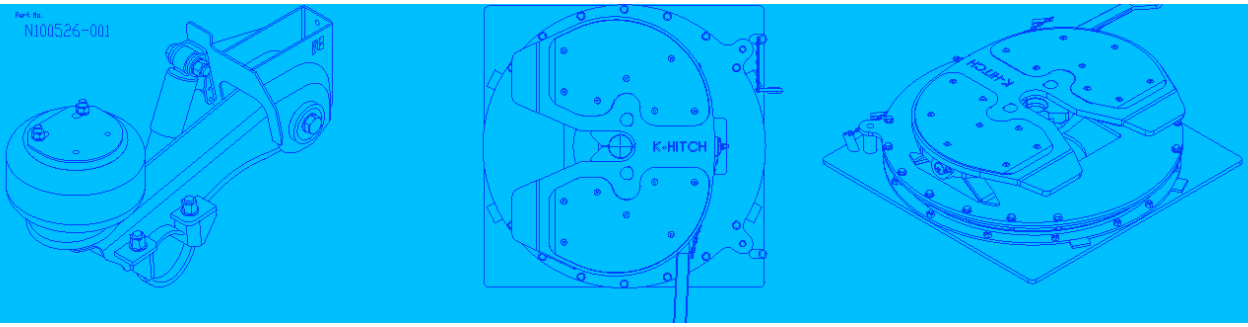
Figure 11: Drill hole for Thread

Caution: do not drill into the axle at an angle. Make sure the drill is straight. Damage to the axle can occur. Also stop metal swarf entering the axle during the drilling process.

Select a sharp 1/8- 27 National Pipe Thread *(NPT)* tap and a suitable cutting compound.

Keeping the tap perpendicular to the drilled hole apply pressure downward and rotate the tap clockwise until the tap starts cutting. Then for every full rotation clockwise, move the tap anti-clockwise ½ a turn to break the swarf created from the tapping process.

Continue tapping the pipe thread and lubricate the tap until the thread of the tap is 6.35 mm to 9.53 mm (1/4" to 3/8") above the axle tube as shown in Figure 12 below.



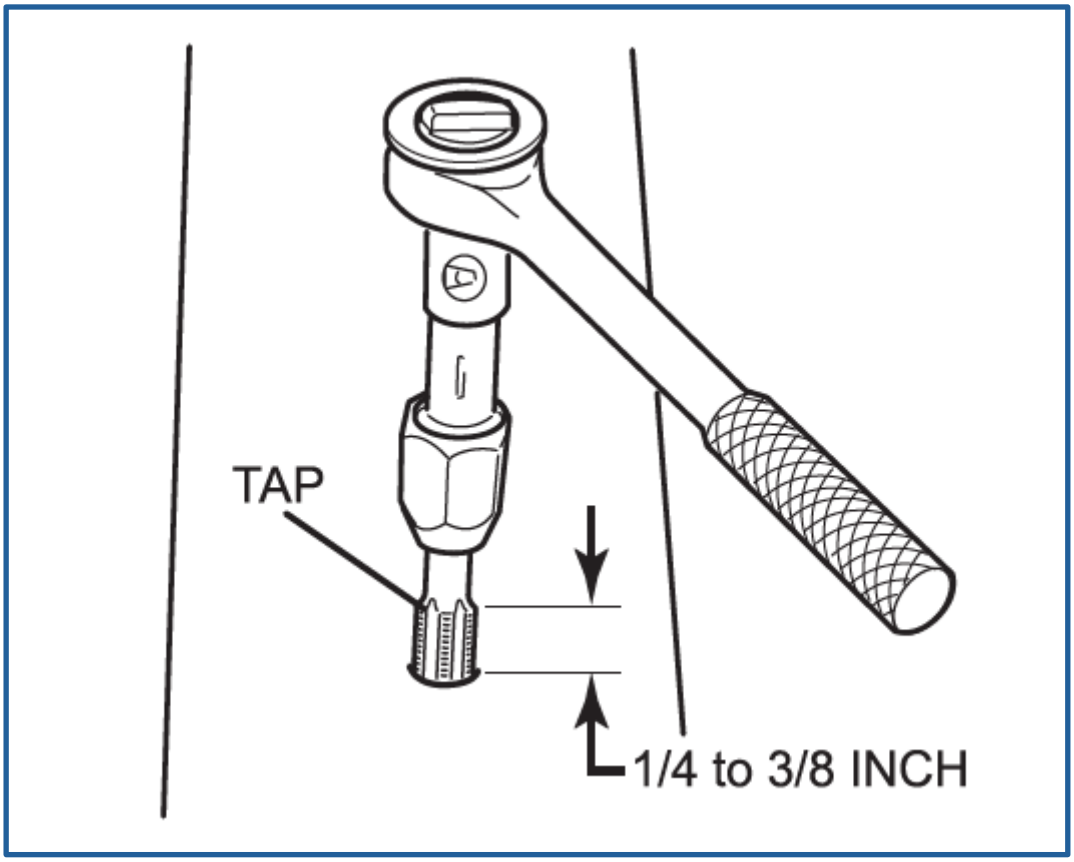


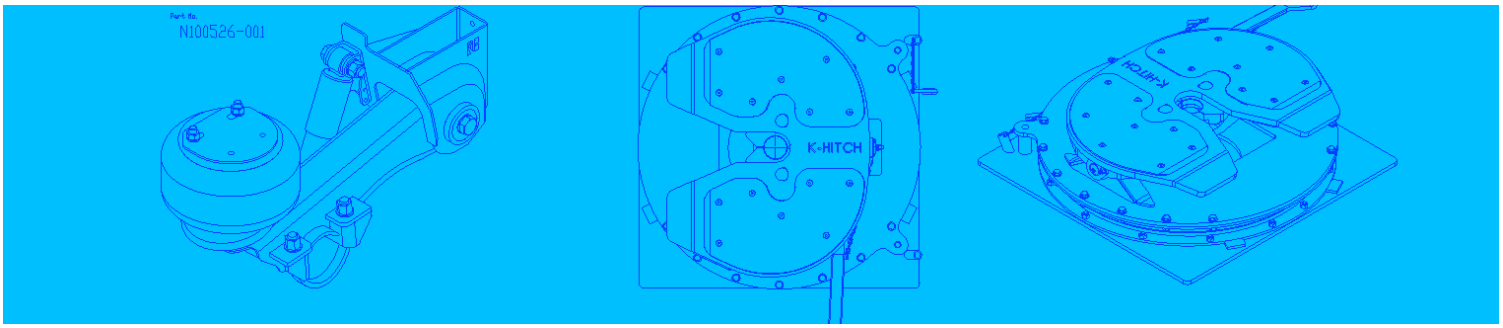
Figure 12: Tapping the Pipe Thread

Then trial fit the air inlet fitting to make sure that the tapered thread on the air fitting can start in the cut thread on top of the axle tube. It should start to get tight approximately 2/3 along the thread of the air fitting. If the air fitting does not start in the thread the tap may need to be used to carefully deepen the thread in the axle tube.

Caution: Try to stop the swarf from cutting the thread falling into the axle tube. If the tapered pipe thread is cut too deep the air fitting may not seal on the axle tube creating an air leak.

Install the air fitting hand tight. Use a wrench to tighten approximately 2-1/2 additional turns to make an airtight seal in the tapered pipe thread.

NOTE: Current production fittings have sealant pre-applied to the threads. If the fitting is removed from the axle apply sealant to the threads before installation.



3.2.2 - Prepare and Install the Axle Press Plug

Carefully remove the original fitted hubcap from both the wheel hubs and set aside the hubcap bolts to be reused as shown in figure 13 below.

If the ATIS is being fitted to a ConMET wheel hub a drain tray needs to be fitted under the wheel hub to catch and semi-fluid that may leak out and replaced when completed.

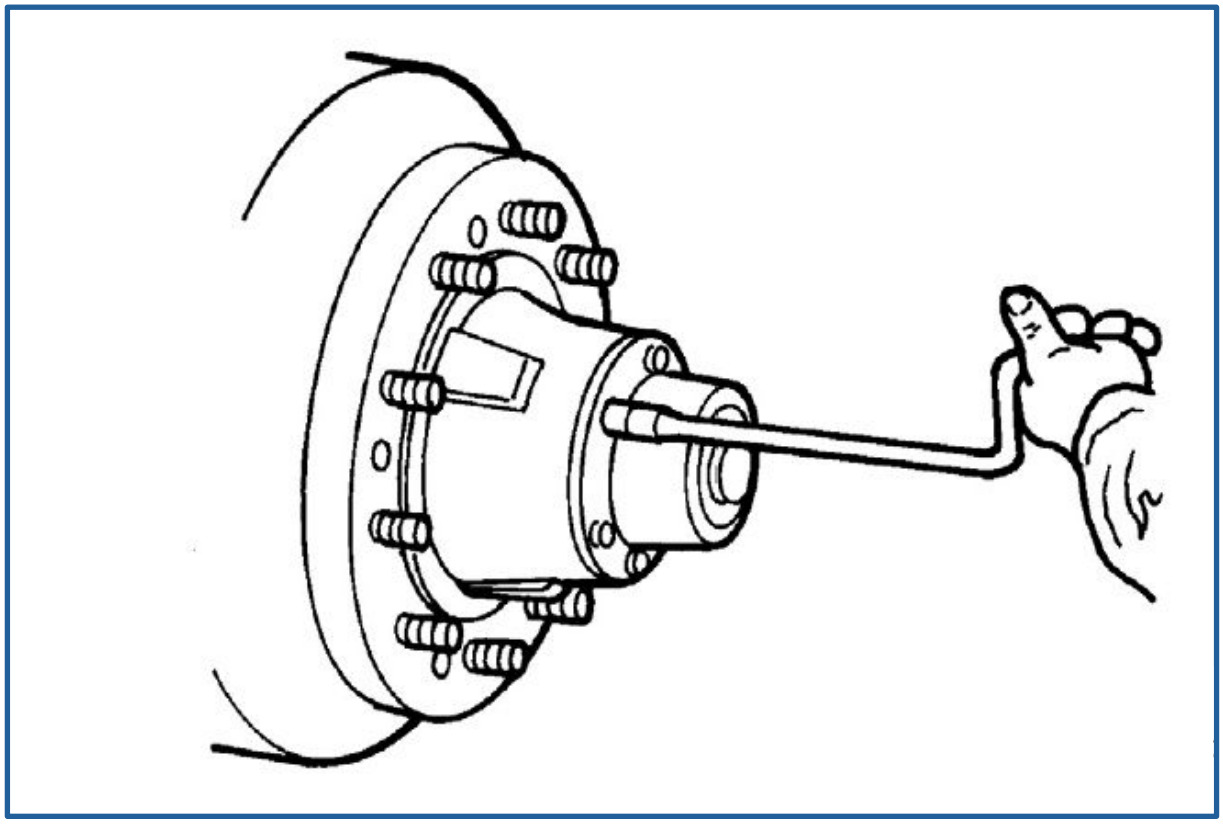
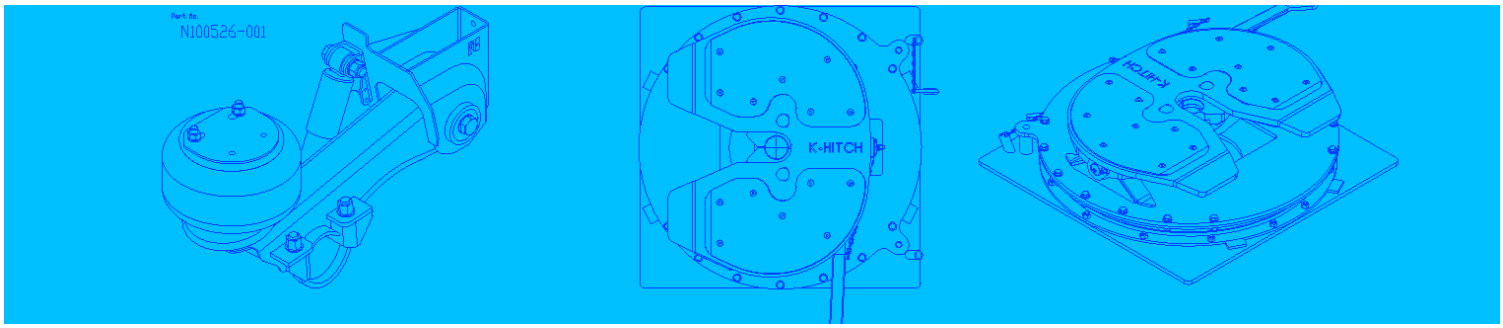


Figure 13: Remove the Hubcap

Protect the wheel hub grease and wheel bearings from foreign material falling in and contaminating them. *(wrap a rag or tape around the open bearing opening)*

Remove the hub gasket and remove any gasket material affixed to the hub face. Discard the old gasket. *(Never reuse gaskets or "O" Rings)*

Use a slide hammer as illustrated in Figure 14 to remove the original fitted "Welch Plug" from the inside of the axle spindle on both sides of the axle.



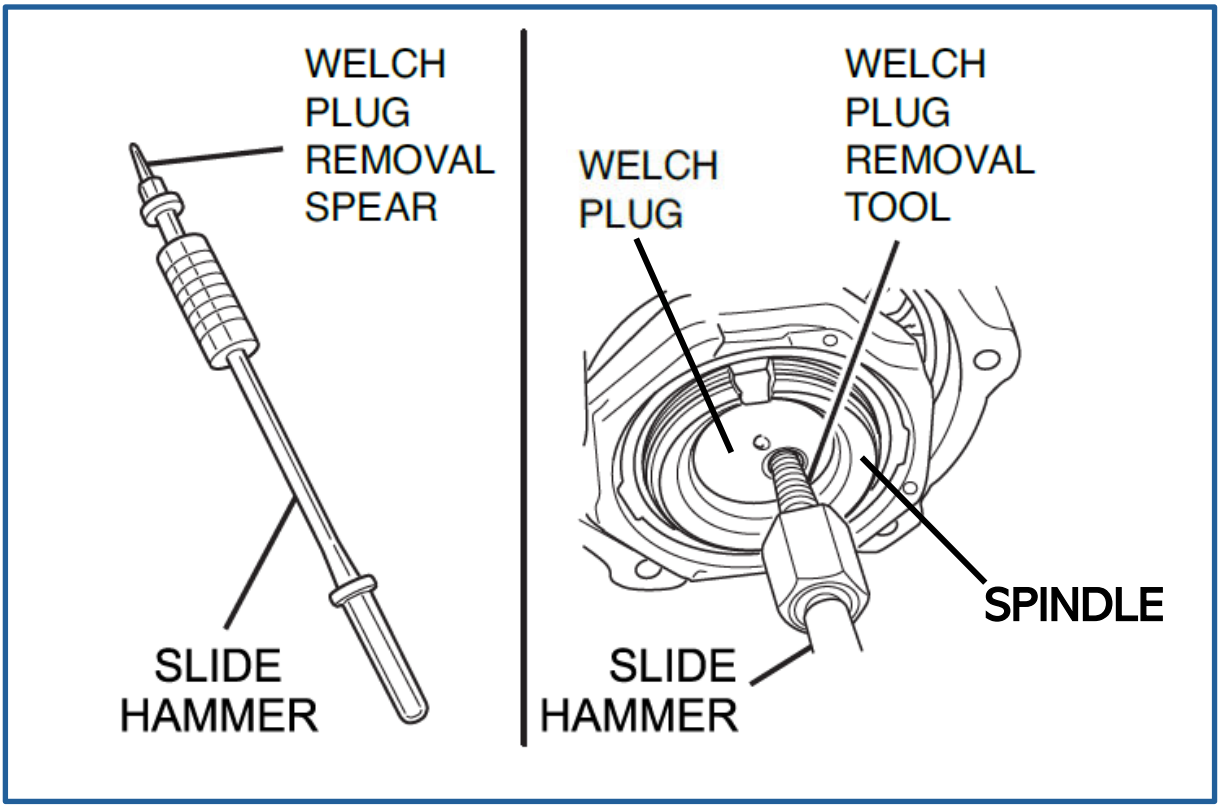


Figure 14: Welch Plug Removal Tool

Caution: do not score the spindle bore when removing the welch plug. The spindle bore must remain smooth. Damage to system components can occur creating an air leak.

Assemble a die grinder with a fine grit, soft emery cloth wheel similar to the image shown in Figure 15 below.

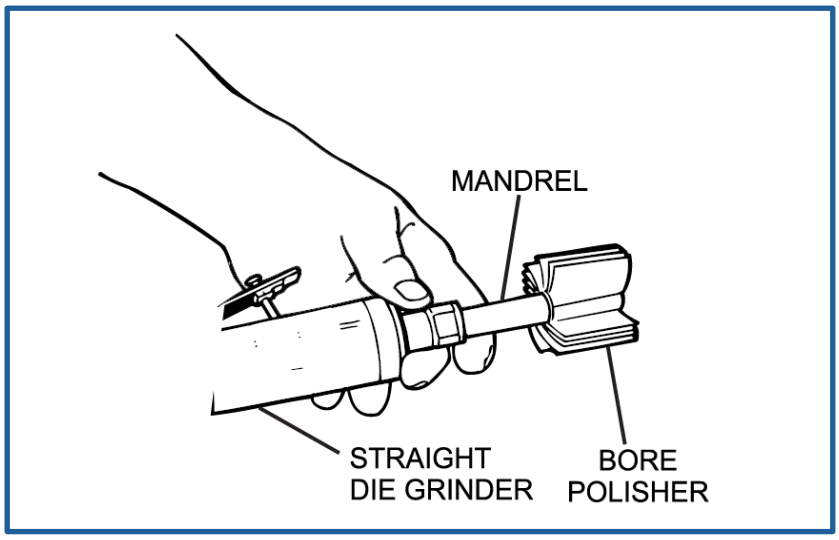
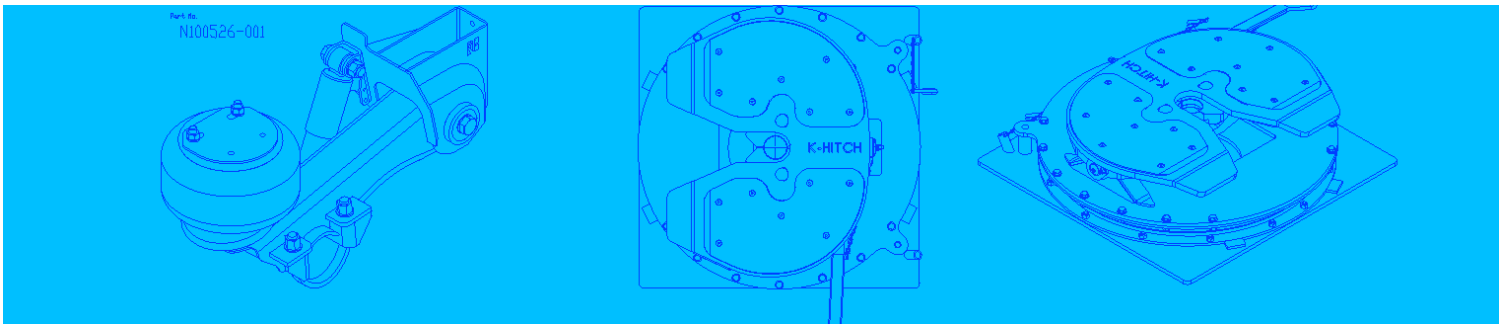


Figure 15: Die Grinder and Bore Polishing Wheel



Carefully use the die grinder to polish the inside of both sides of the spindle tube where the Welsch Plug was removed from as illustrated in figure 16 below. There should not be any lines or defects in the smooth internal spindle bores surface finish.

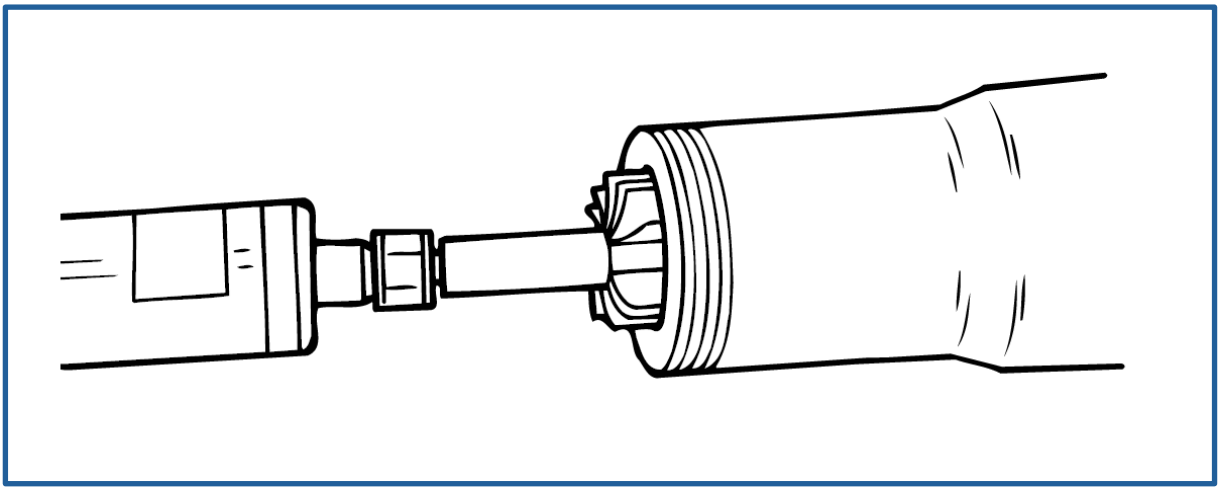


Figure 16: Polishing Inside of Spindle Bore

Use a fine grit round abrasive tool to remove any metal burrs or sharp edges from the spindle bore side of the cotter pin holes. See Figure 17 below.

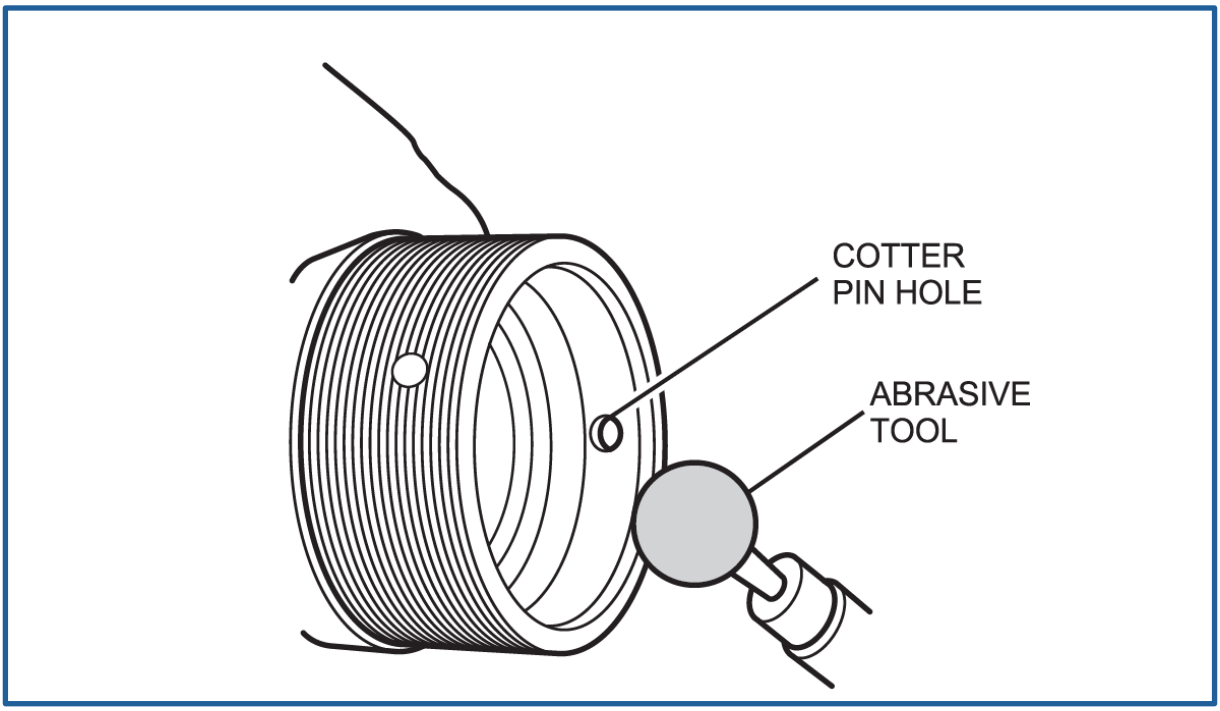
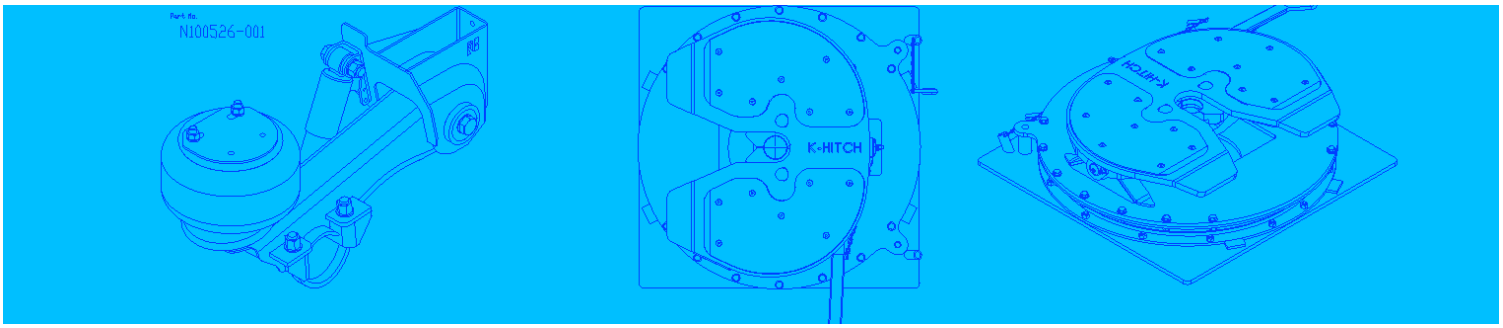


Figure 17: Tooling to Remove Sharp Edges



Using compressed air and a cleaning wand, remove and metal swarf and other debris from the inside of the axle tube as illustrated in Figure 18 below.

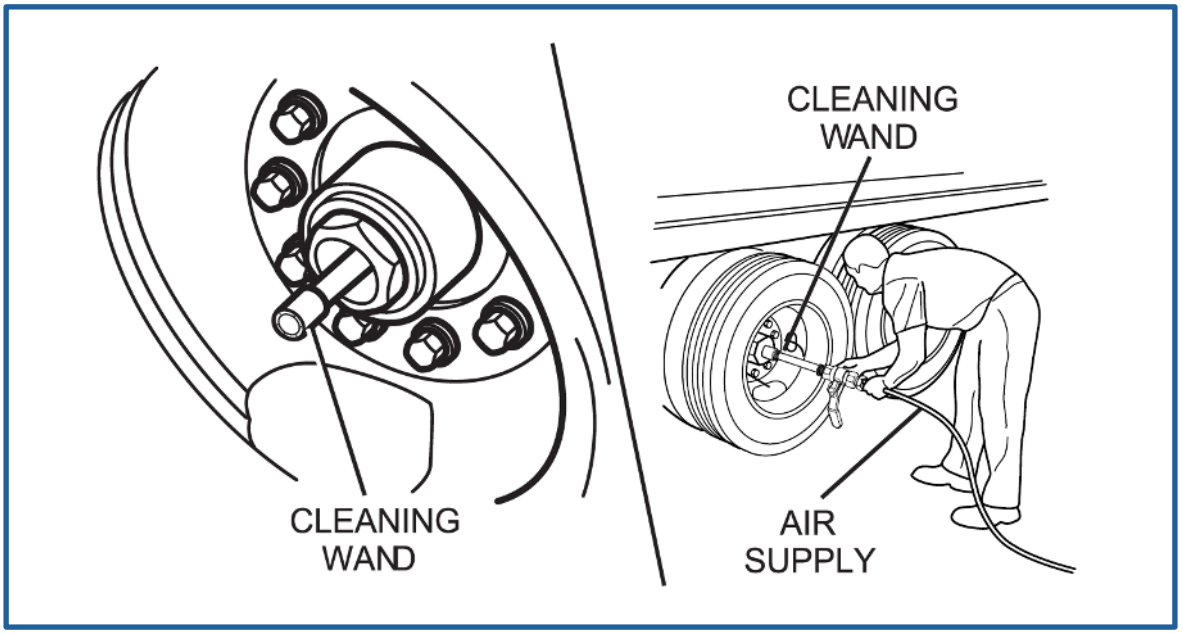


Figure 18: Cleaning the Inside of the Axle Tube

From the table of available drivers found in the section of this document "8.0 - SPARE PARTS AND ACCESSORIES", select the correct axle press plug driver to suit the axle press plug supplied with the ATIS kit and install it onto the drive handle as shown in Figure 19 below.

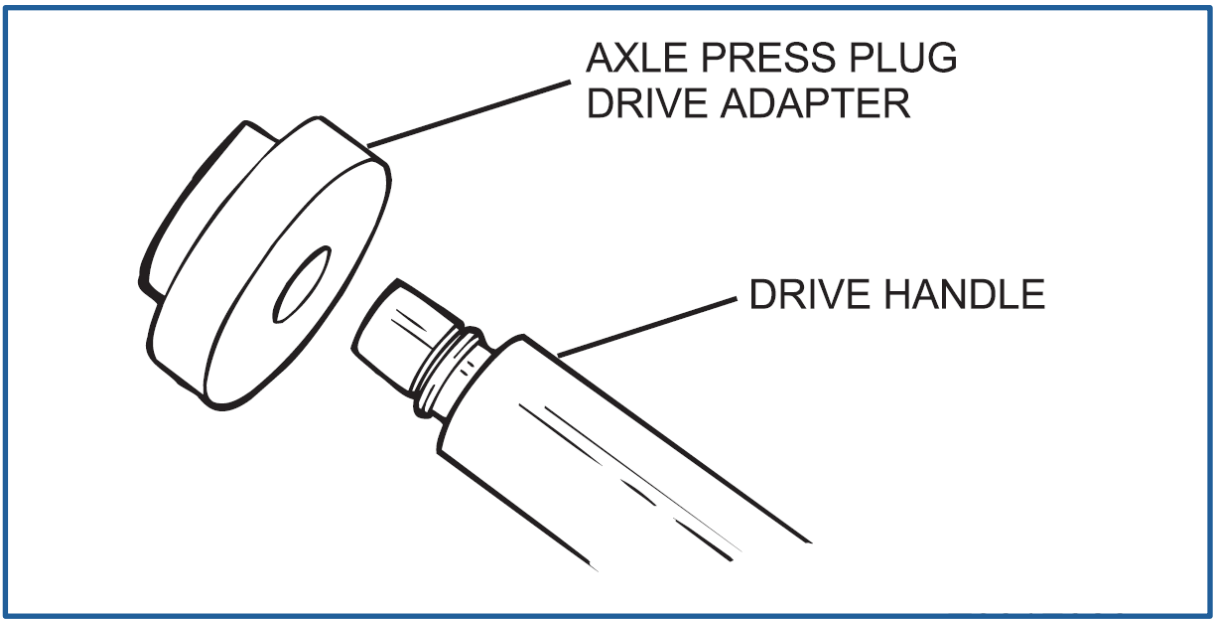
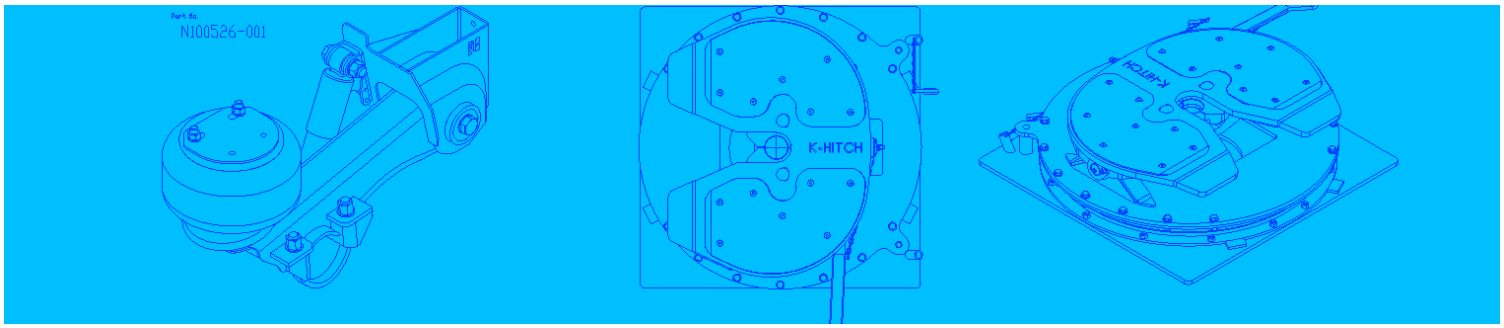


Figure 19: Press Plug Installation Tool



Using the towelette supplied with the axle press plug, clean the outside surface of the axle press plug and inside bore of the spindle where the Welsch Plug was removed from. Figure 20 illustrates the cleaning process.

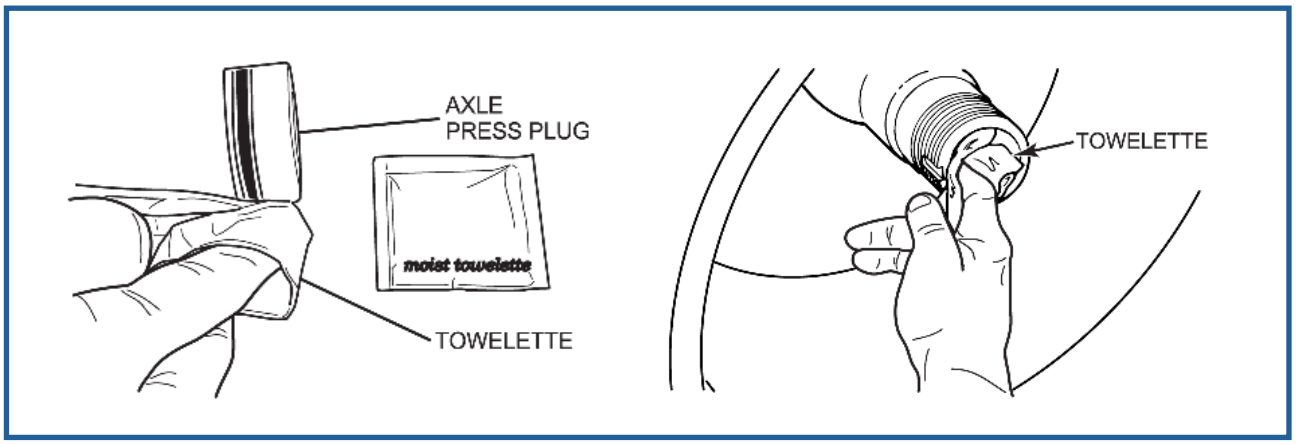


Figure 20: Cleaning Axle Press Plug and Spindle Bore

Apply Loctite® 620, 3M® RT20, or PermaBond® HH 0040 retaining compound evenly to the outside diameter of the axle press plug as illustrated in Figure 21 below.

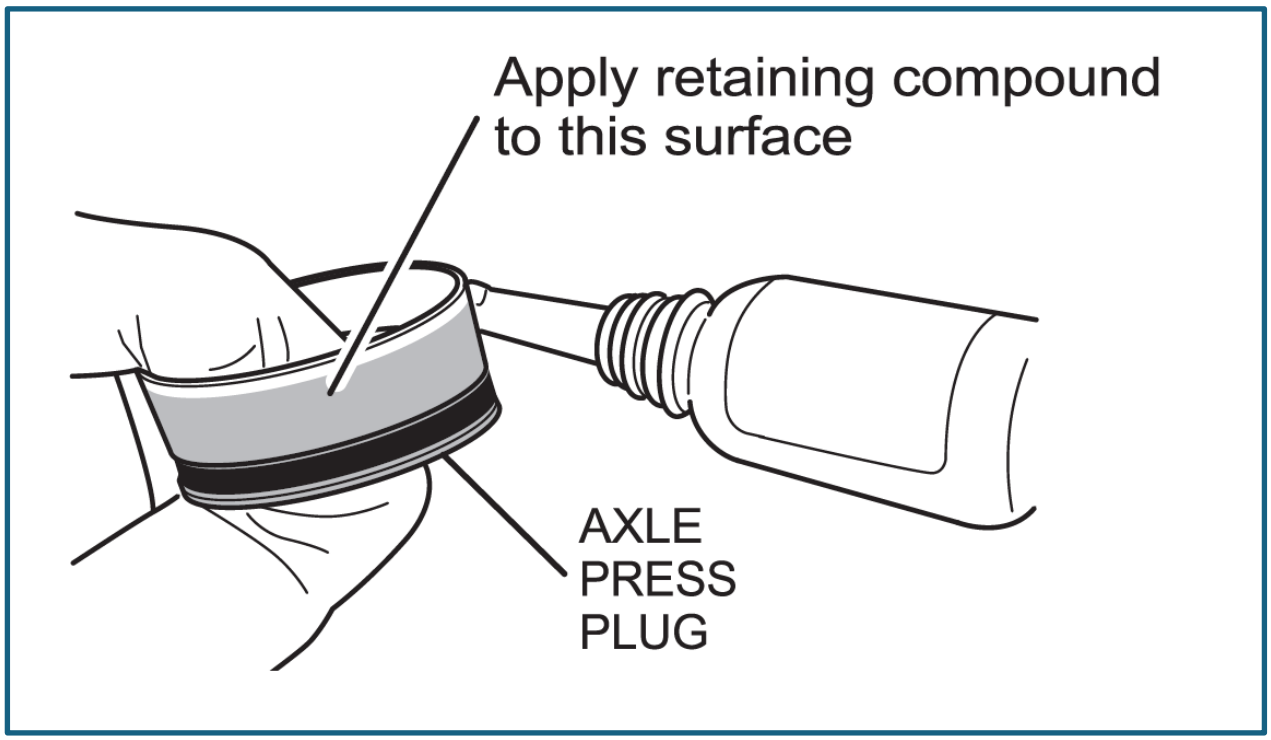
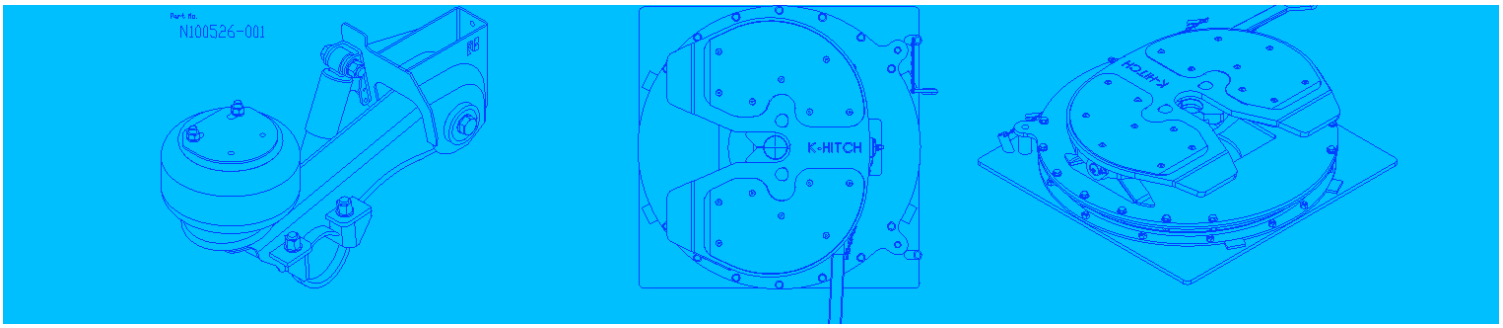


Figure 21: Applying Sealing Compound to Axle Press Plug



NOTE: The installation kit contains enough retaining compound for the axle press plugs in the kit and should be divided equally amongst them.

NOTE: Install the axle press plug within 10 minutes of applying the retaining compound to ensure the compound cures correctly.

WARNING: LOCTITE® 620, 3M® RT20, AND PERMABOND® HH 004 RETAINING COMPOUNDS CAN IRRITATE THE SKIN. CLEAN LATEX GLOVES MUST BE WORN TO DO THIS PROCEDURE. PERSONAL INJURY CAN OCCUR.

Caution: Do not apply the retaining compound to the inside diameter of the spindle bore, axle press plug stator threads or axle spindle threads. Damage to components can occur.

Caution: Axle press plugs are not reuseable. New axle press plugs must be installed. Damage to system components can occur.

Insert the axle press plug into the spindle bore by hand until the plug stops squarely in the bore as illustrated in Figure 22 below.

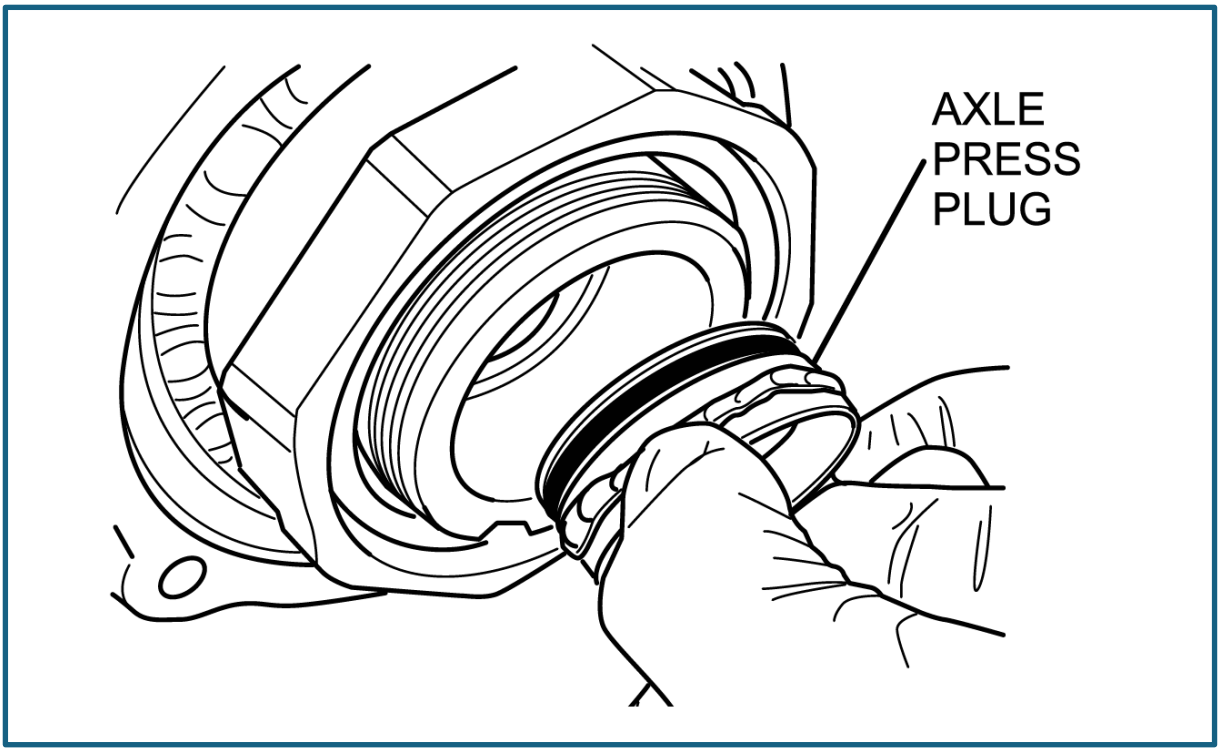
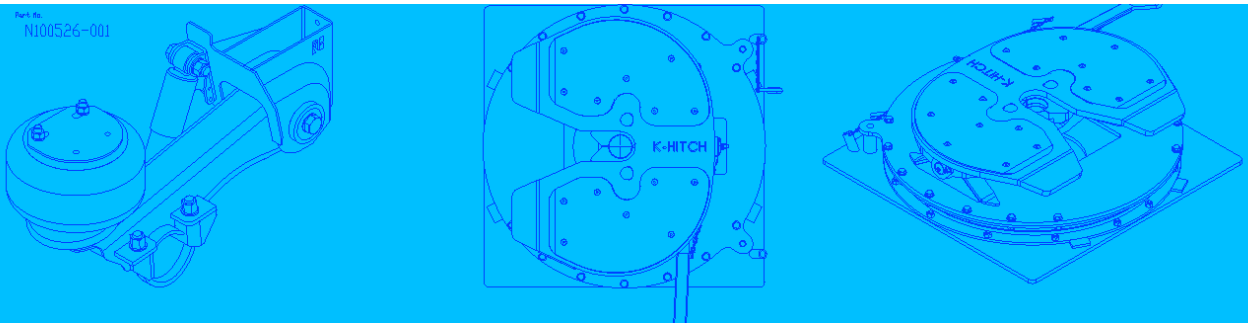


Figure 22: Place Axle Press Plug In Spindle by Hand



Install the axle press plug for the ThermALERT™ system with a thermal screw orientated in the 12 o'clock position *(±15°)* when the axle is sitting in the running position. See Figure 23 below.

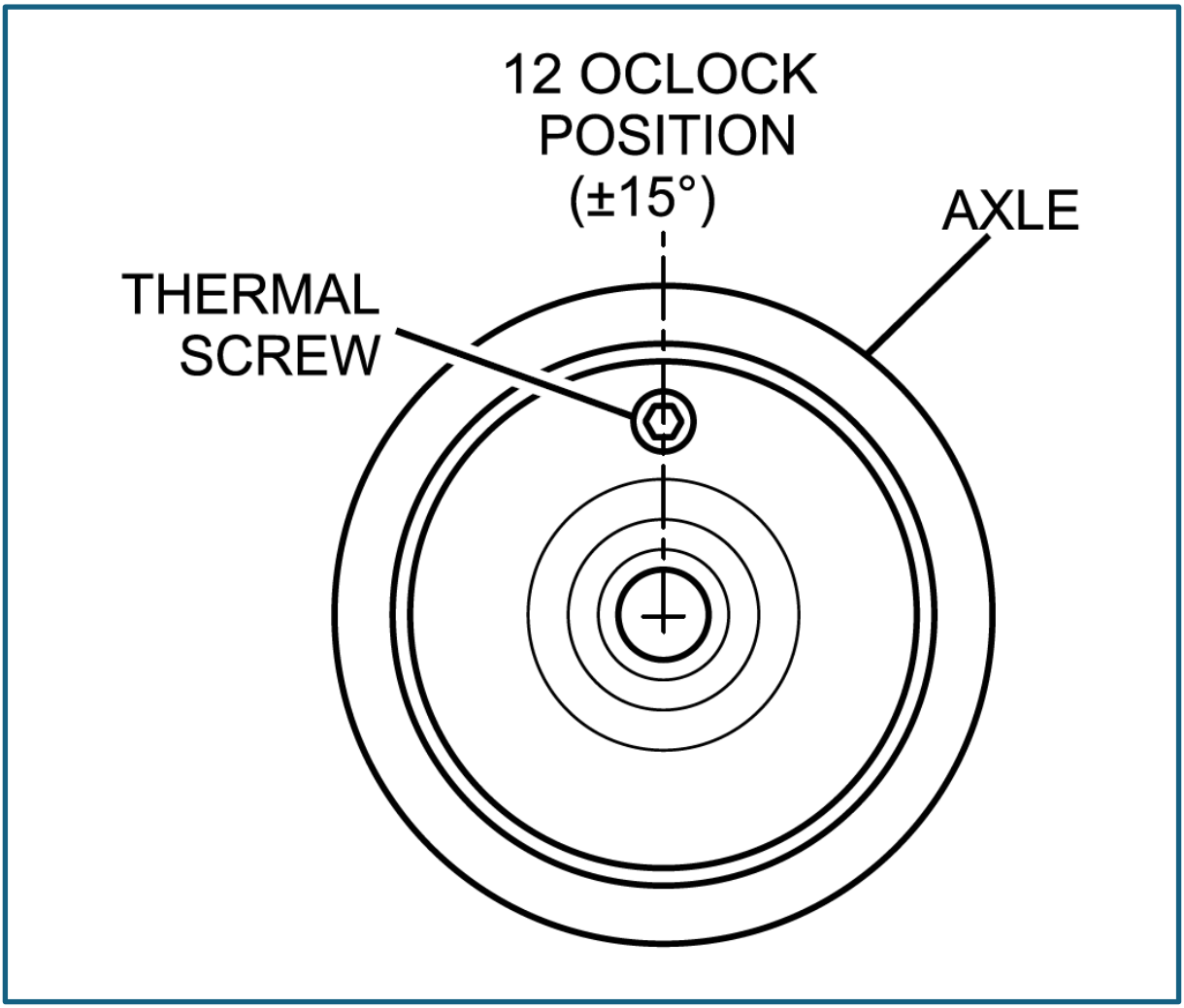
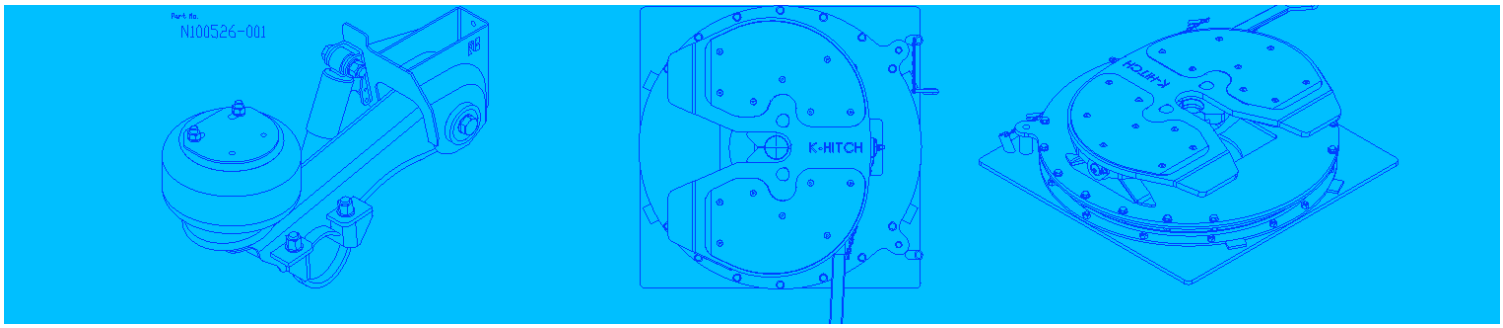


Figure 23: Axle Press Plug Orientation in the Spindle

Make sure the axle press plug protrudes from the end of the spindle 3.18mm to 6.35 mm *(1/8" to ¼")*. See Figure 24 below.

NOTE: Contact your FUWA K-Hitch supplier if the axle press plug protrudes outside the acceptable limits.



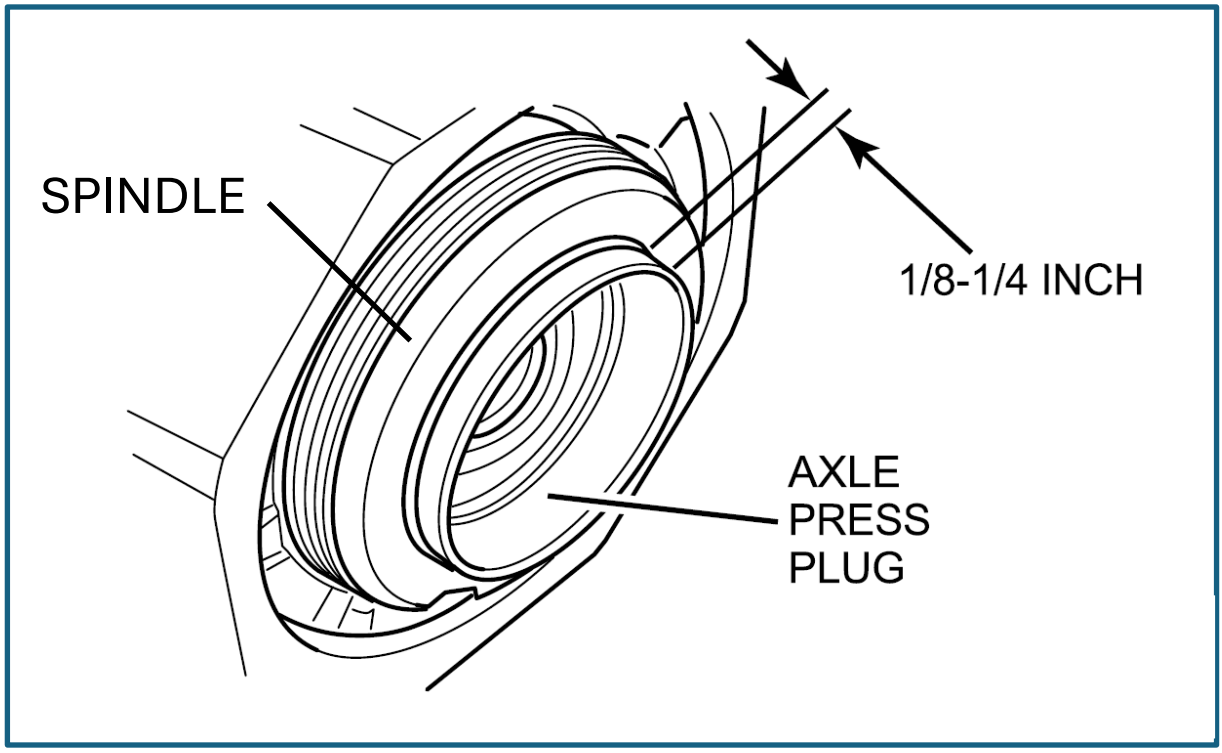


Figure 24: Axle Press Plug Protrusion from Spindle

Insert the axle press-plug drive-adapter into the axle press plug as shown in Figure 25 below.

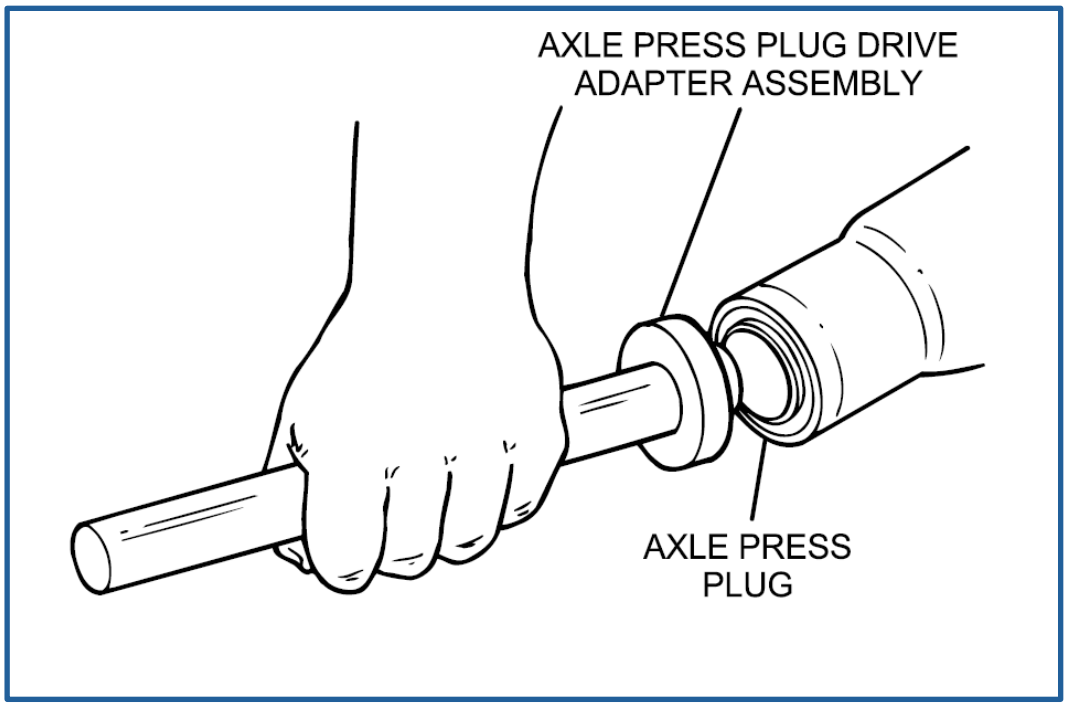
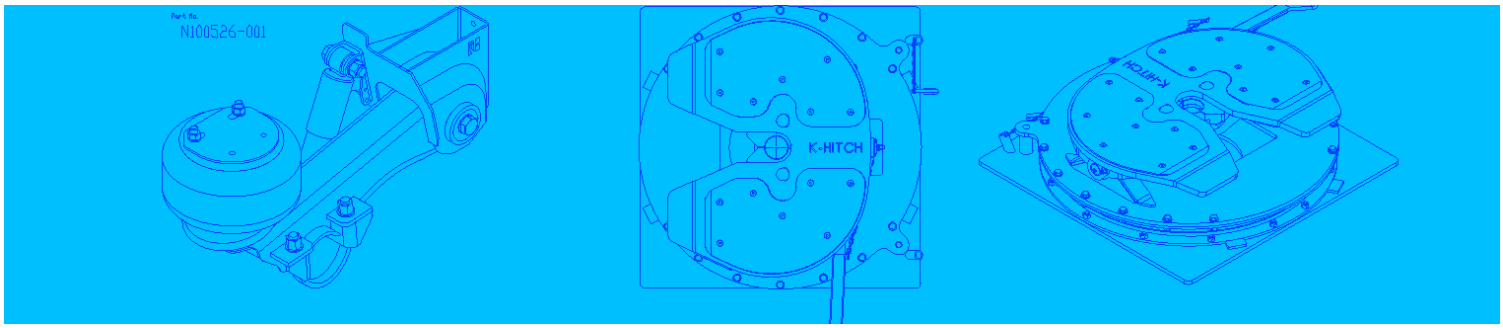


Figure 25: Place Press Plug Installation Tool In Place



Use a four-pound brass or synthetic mallet to drive the axle press plug into the spindle bore until the drive adapter bottoms out squarely on the end of the spindle. See Figure 26 below.

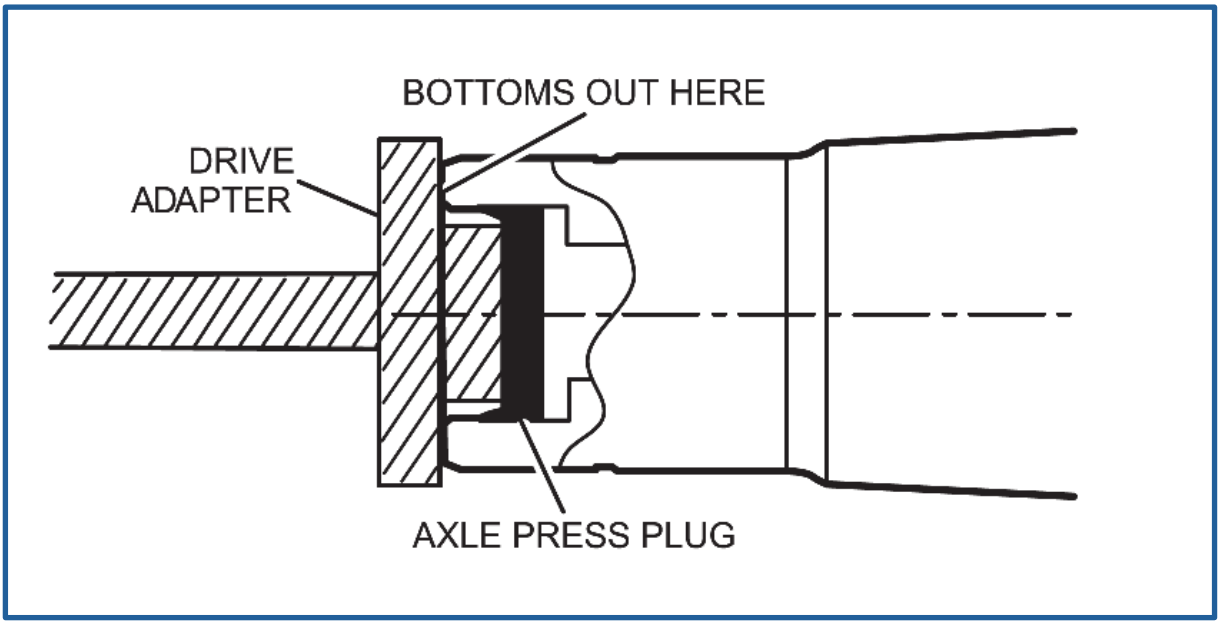


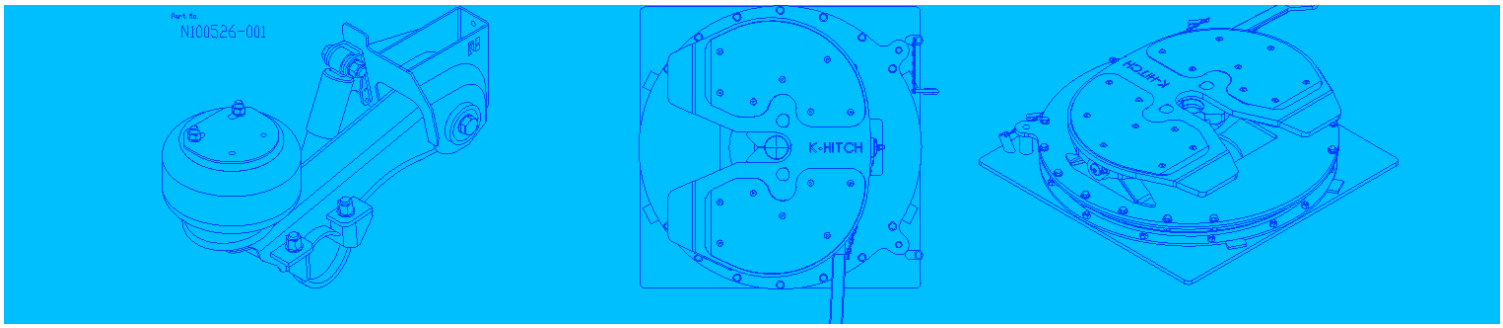
Figure 26: Install Pess Plug To Correct Depth

NOTE: An axle press plug that is flush with the end of the spindle is not seated correctly. The drive adapter sets the axle press plug installation depth. The sound and feel of the hammering will change when the drive adapter bottoms out.

WARNING: EYE PROTECTION MUST BE WORN WHEN PERFORMING VEHICLE MAINTENANCE OR SERVICE. EYE INJURY OR DAMAGE CAN OCCUR. GET MEDICAL ATTENTION IMMEDIATELY.

WARNING: DO NOT HIT STEEL PARTS WITH A STEEL HAMMER. PIECES OF THE PART CAN BREAK OFF. PERSONAL INJURY AND DAMAGE TO COMPONENTS CAN OCCUR.

Caution: The installed axle press plug must be seated square to the end of the spindle and inset at or below any chamfer in the axle spindle bore. Damage to components can occur.



Make sure the axle press plug is seated beyond the chamfer of the spindle bore.

Remove excess retaining compound from the spindle and axle press plug drive adapter. See Figure 27 below.

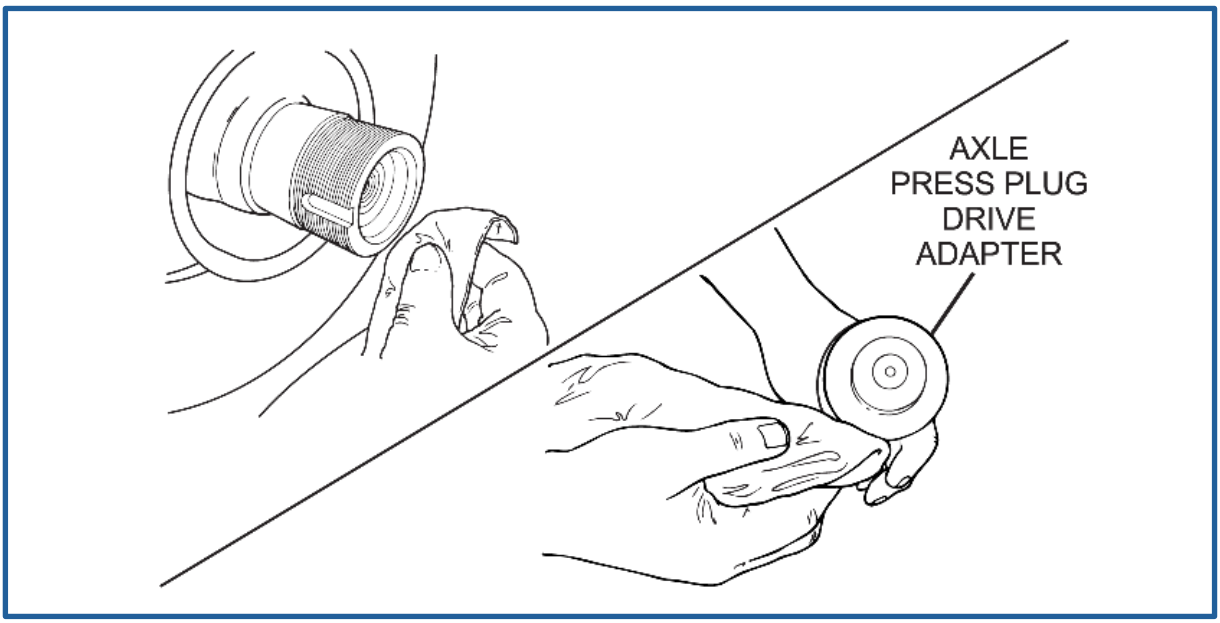


Figure 27: Remove Excess Sealing Compound

Wait at least 30 minutes after installing the axle press plugs to pressurize the system. This will allow the retaining compound to properly cure.

3.2.3 - Install the Stator

NOTE: Current production stators have sealant pre-applied to the stator threads. If the stator is removed from the spindle, apply sealant to the threads again as shown in Figure 28 below.

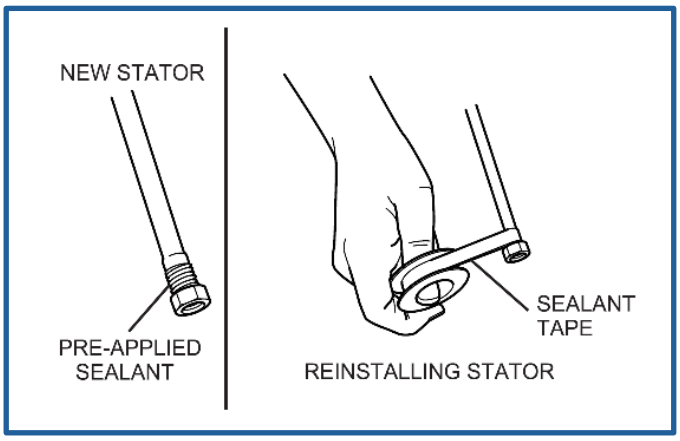
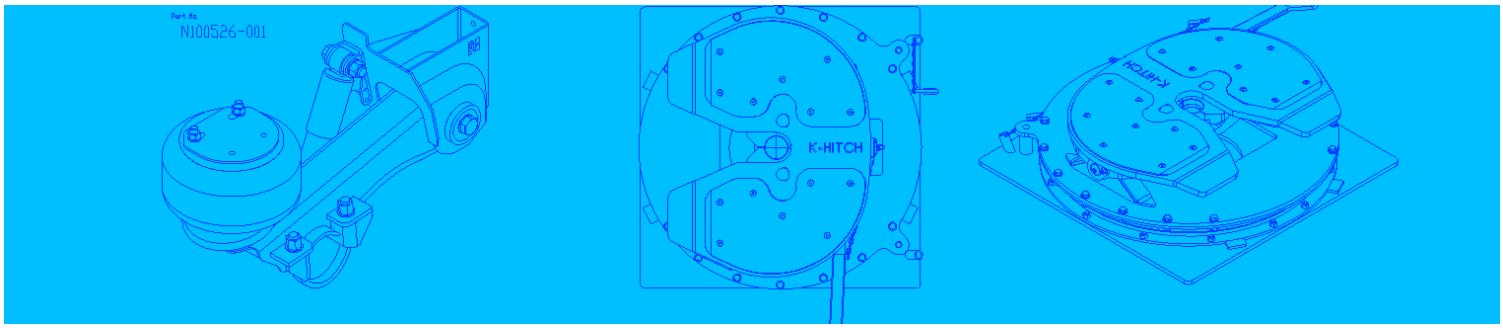


Figure 28: Stator Sealing Options



Insert the stator into the Axle Press Plug and start the thread by hand as shown in Figure 29 below.

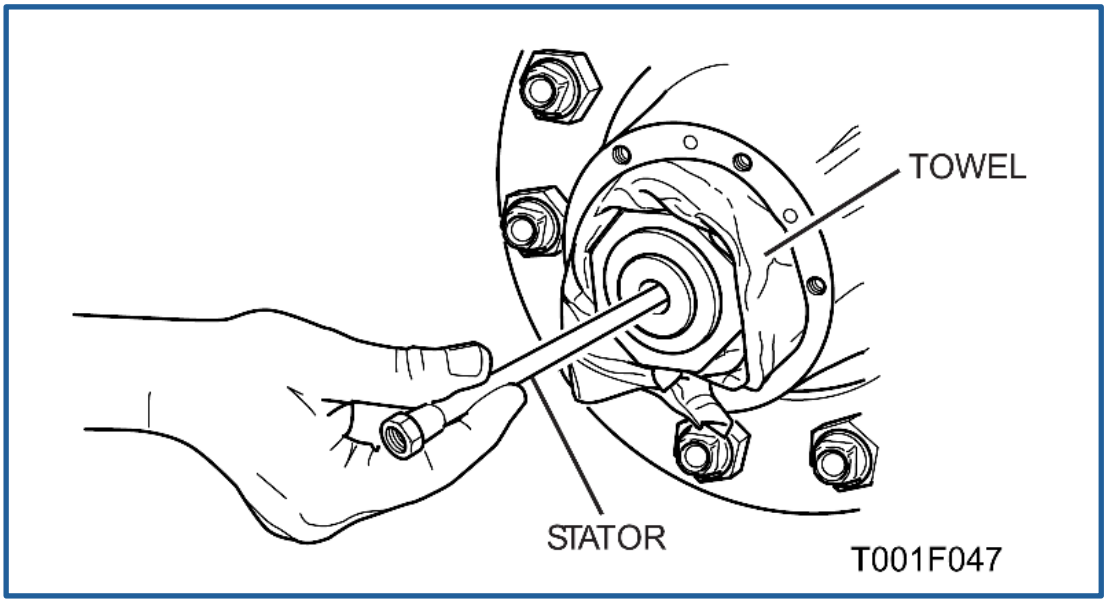


Figure 29: Insert Stator into Axle Press Plug

Use a 5/8” socket to tighten the stator approximately 2-1/2 turns or torque the stator to 31 - 38 Nm *(23-28 lb-ft)* refer to Figure 43.

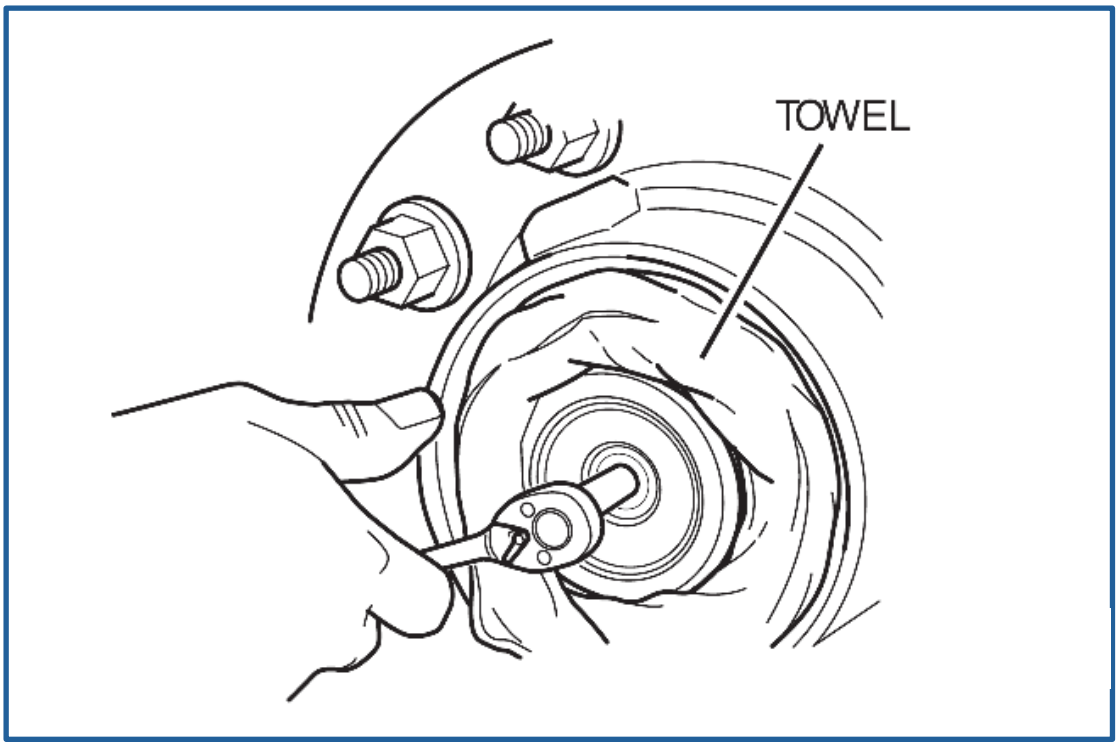
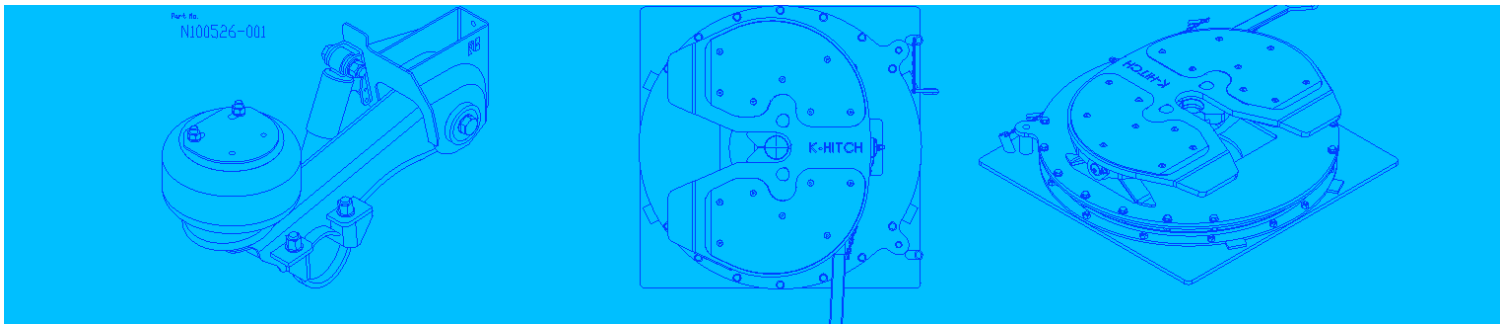


Figure 30: Torque Stator into Axle Press Plug



Perform a pressure check on the axle installation to ensure there are no air leaks.

Seal open end of Stators on both wheel-ends. See figure 31 below.

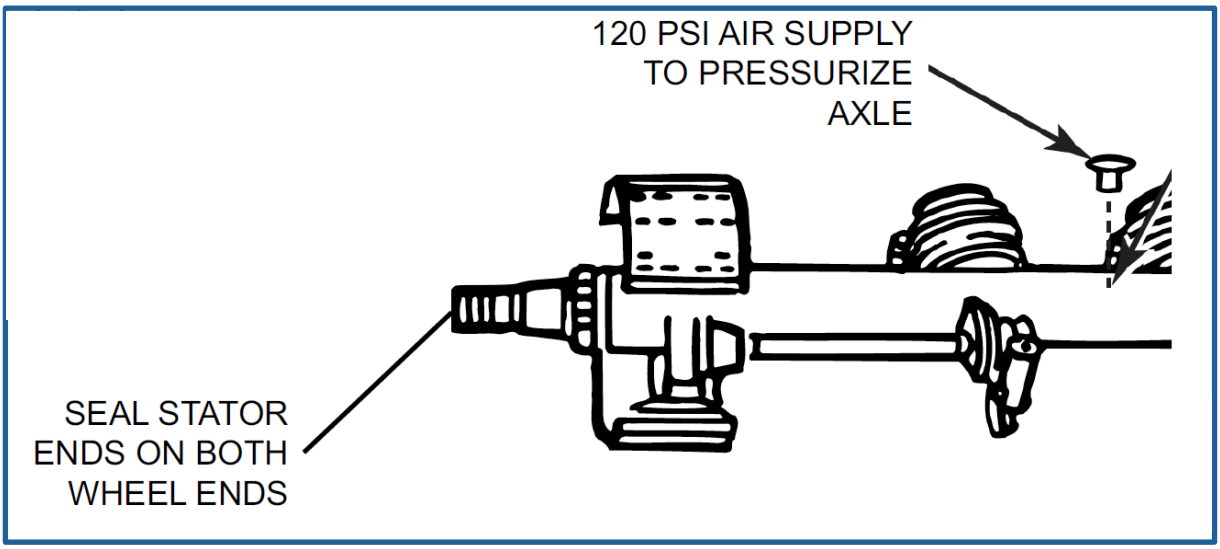


Figure 31: Pressure Test Axle

Using 120 psi clean air source, pressurize axle through air inlet air fitting already installed.

Check for leaks using a non-corrosive leak detecting solution. Checking press plug circumference, stator threads and the air inlet fitting for air leaks. Example shown in Figure 32 below.

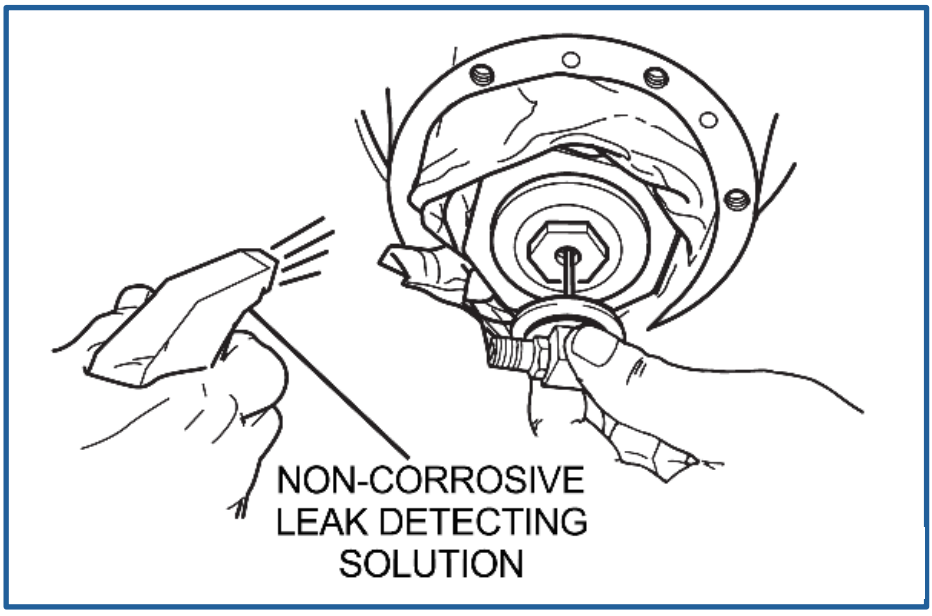
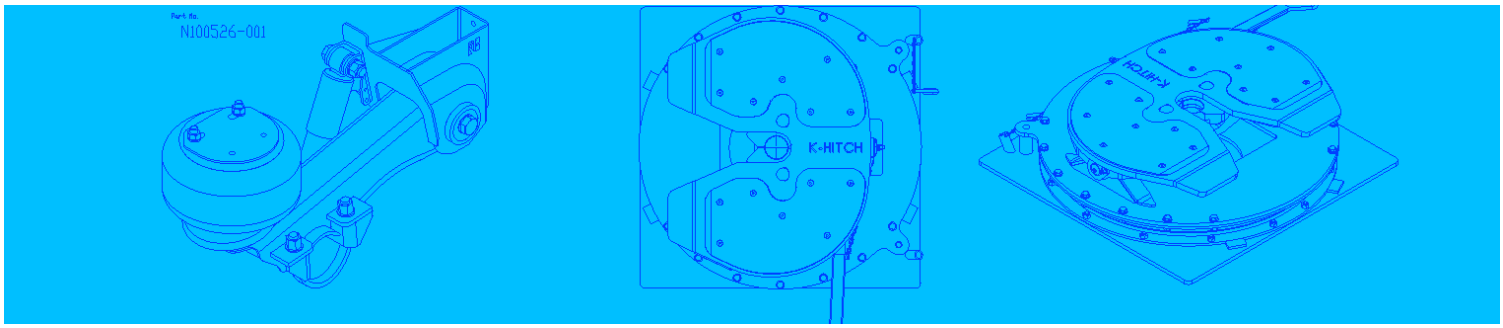


Figure 32: Leak Inspection



3.2.4 - Install the Wheel-End Components

The correct ATIS die cast aluminum hubcap needs to be supplied with the ATIS kit to suit the axle being worked on. Refer to table 2 & 3.

WARNING: DO NOT BLOCK THE VENT TUBES IN A GREASED WHEEL-END WITH GREASE. BLOCKED VENT TUBE HOLES WILL PREVENT SYSTEM AIR FROM VENTING FROM THE WHEEL- END. PERSONAL INJURY OR DAMAGE TO COMPONENTS CAN OCCUR.

NOTE: Confirm that the valve stems are oriented 180º from each other. Refer to Figure 31 below.

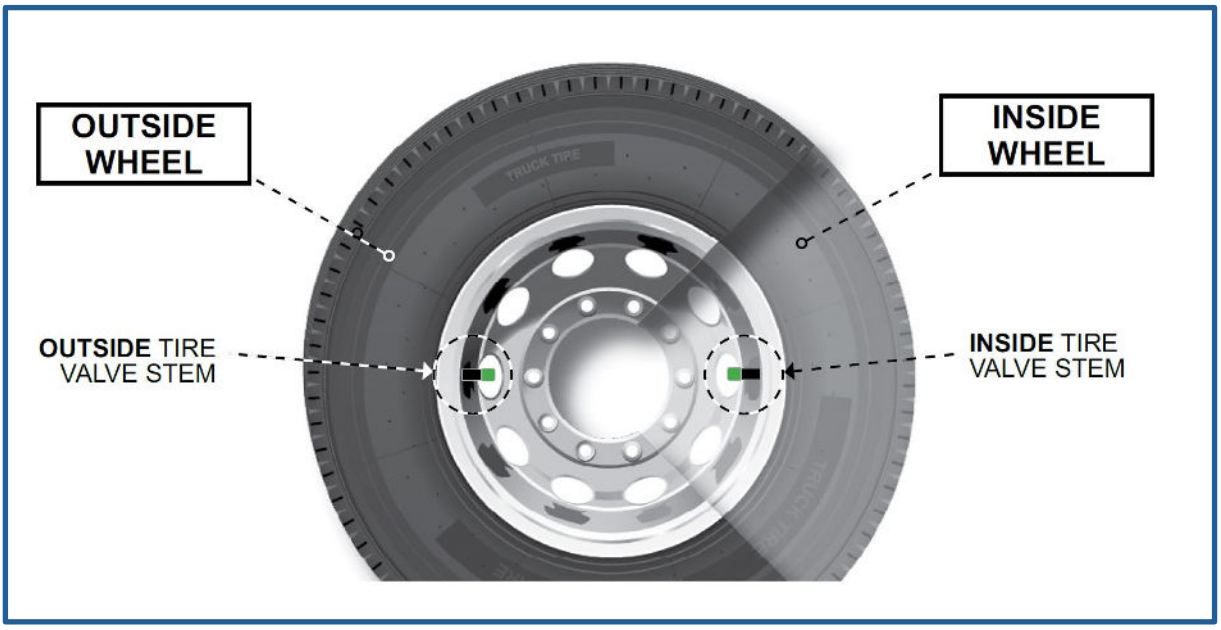
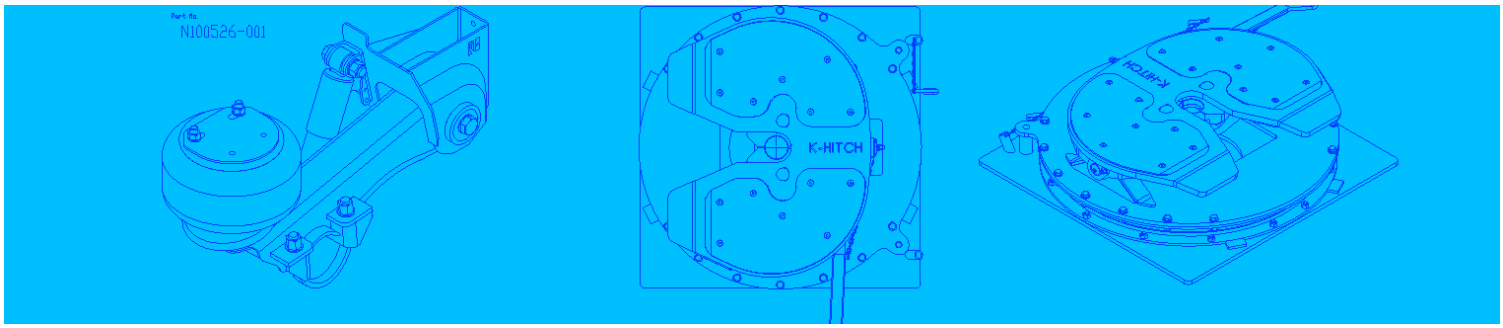


Figure 33: Required Tyre Valve Orientation

Using a new hubcap gasket or "O" Ring, use the hubcap bolts that were set aside earlier and fit the new ATIS hubcap.

Tighten the fasteners in stages following the sequence shown in Figure32 below and using the torque setting from section "7.0 – Torque Settings".



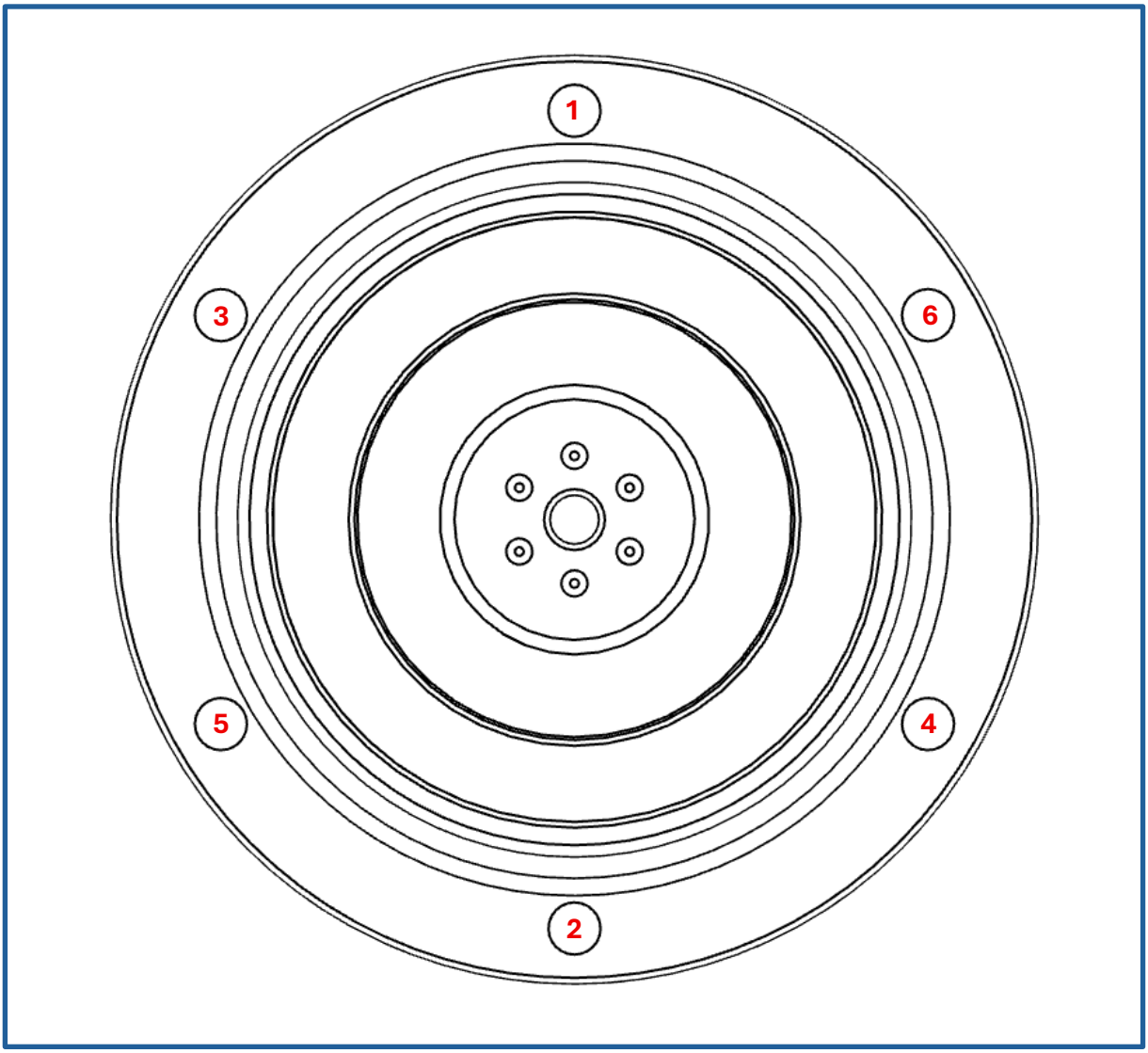
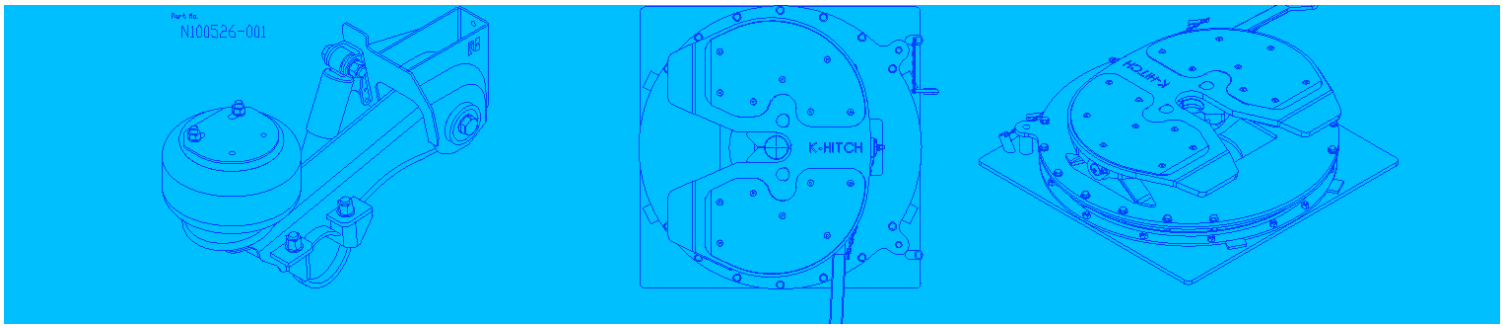


Figure 34: Hubcap Fastener Torquing Sequence

Install the Thri-Tee carefully into the hubcap as shown in Figure 33 below. Make sure that the tube on the Thru-Tee extends above the hubcap by at least 6.3 mm *(1/4")* when it contacts the stators seal.

Caution: Do not exceed 5.08 Nm *(3.75 ft-lbs)* when tightening the thru-tee. Damage to the component or threads can occur.



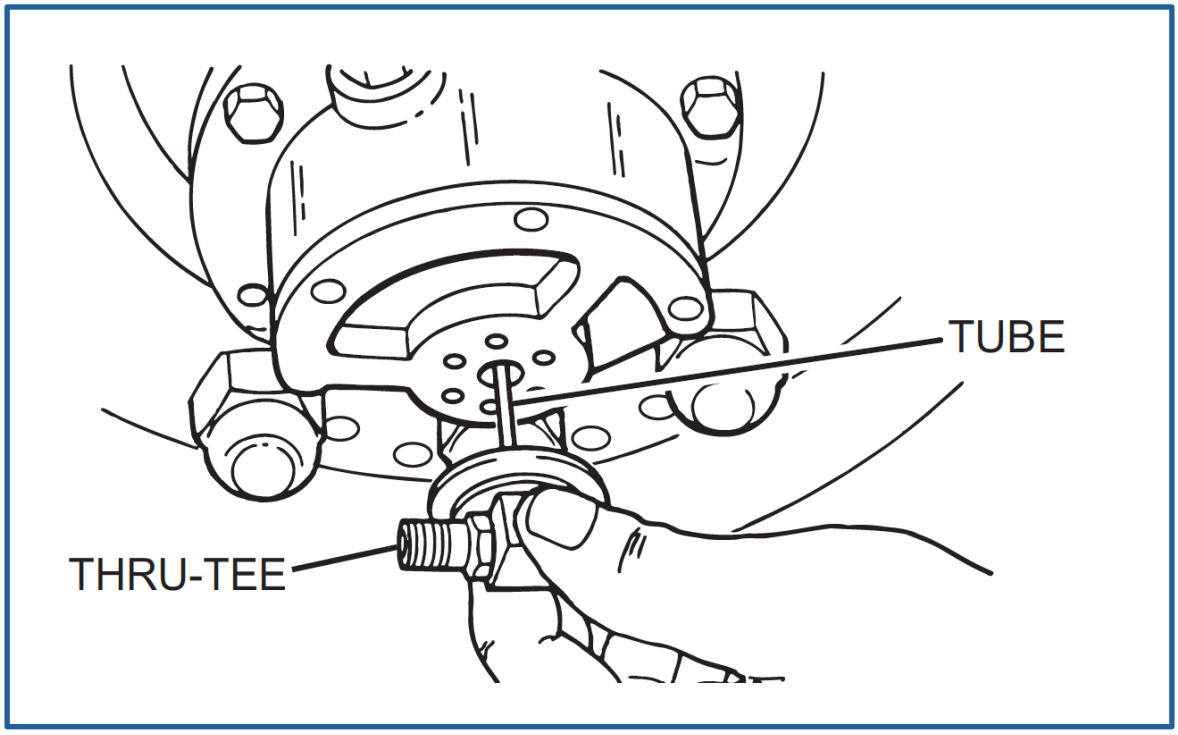


Figure 35: Installing the Tru-Tee into the Hubcap

Pushing the Thru-Tee tube carefully through the stator seal, hand tighten the Thru-Tee onto the hubcap. Then use a suitable torque wrench to achieve the very small torque required to tighten the Thru-Tee to the hubcap, initially 5.08 Nm *(3.7 ft-lbs)*. Refer to Figure 34 below.

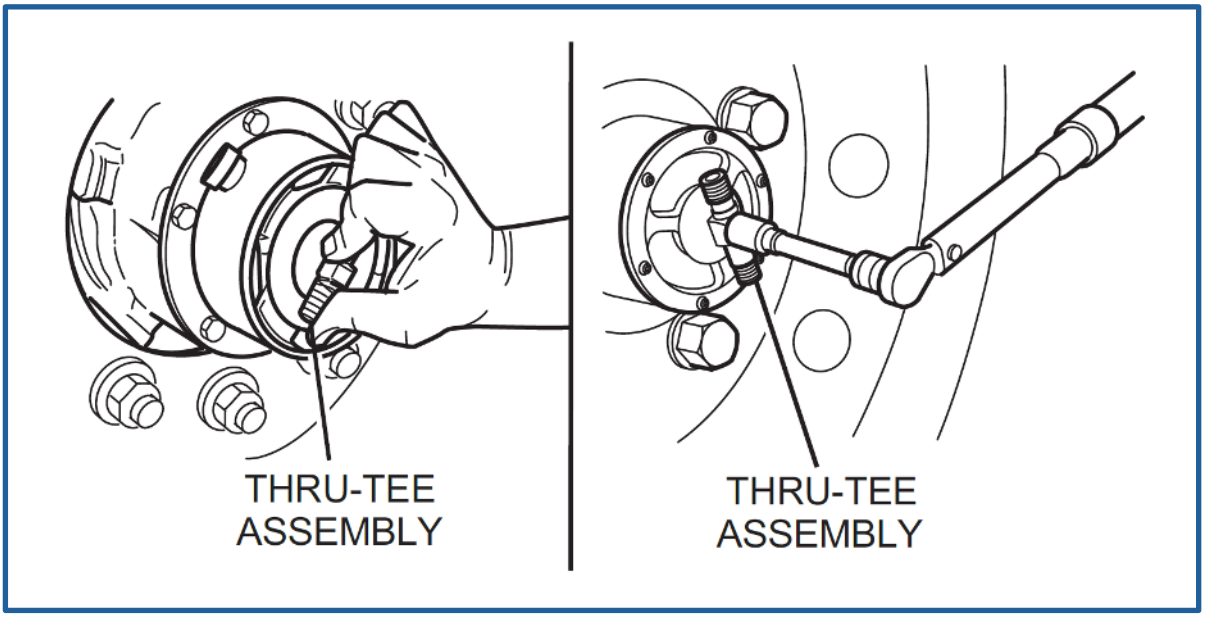
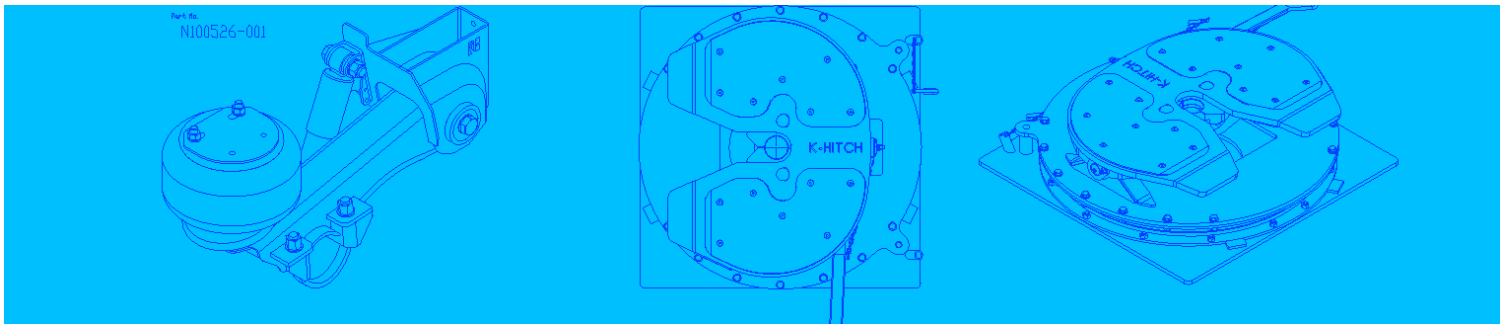


Figure 36: Tighten the Tru-Tee to the ATIS Hubcap



NOTE: Ensure there is no gap between the deflector shield and hubcap.

Confirm the thru-tee fitting aligns with the tyre valve stem then re-torque the Tru-Tee to the hubcap with the final torque setting, 6.2 Nm *(4.6 ft-lbs)*.

Confirm that the Thru-Tee aligns with the tyre valves if the installation is being carried out on an in-service trailer. Reposition the wheels or hubcap to achieve the correct alignment.

Connect the tyre hoses to the inboard and outboard tyre valves with the correct hoses. Refer to Figure 7, until the hose is hand tighten.

Use a 7/16” ring spanner and tighten the hose to the valve stem with ½ turn as shown in Figure 35 below.

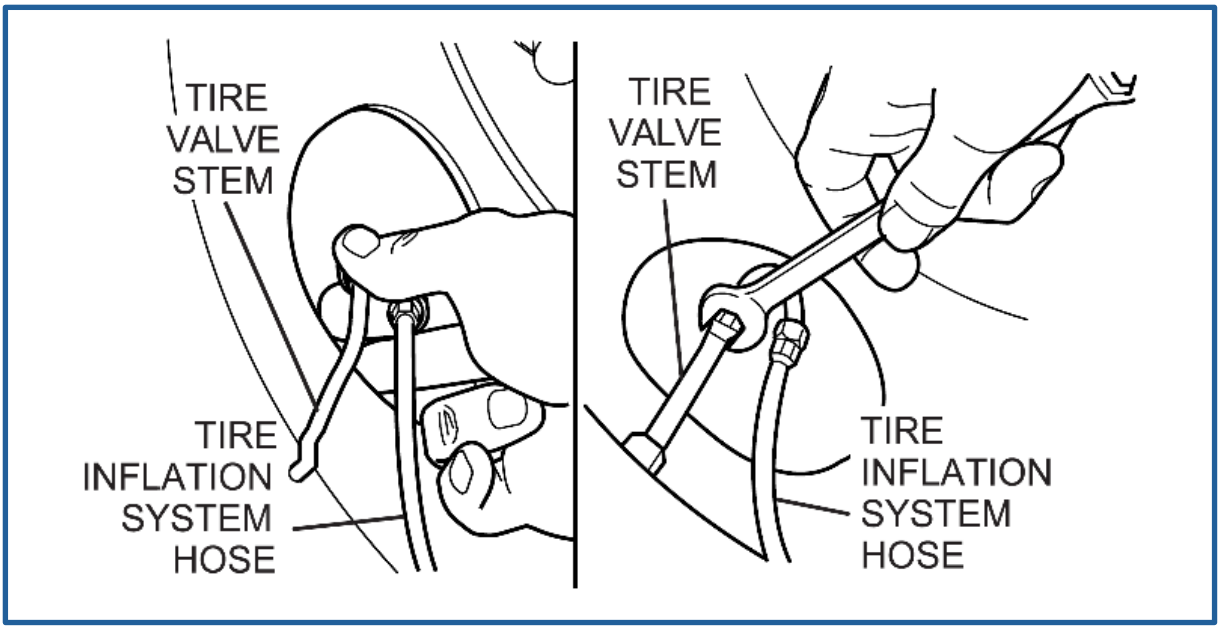


Figure 37: Installation of hose to Tyre Valve

Perform a system check before connecting the hoses to the Thru-tee.

After the system check attach the tyre hoses to the Thru-tee at all tyre positions. See Figure 38 below.

Caution: Knurls on tyre hoses are to be hand tightened to the Thru-tee only. Do not use tools. Damage to the knurls can occur.

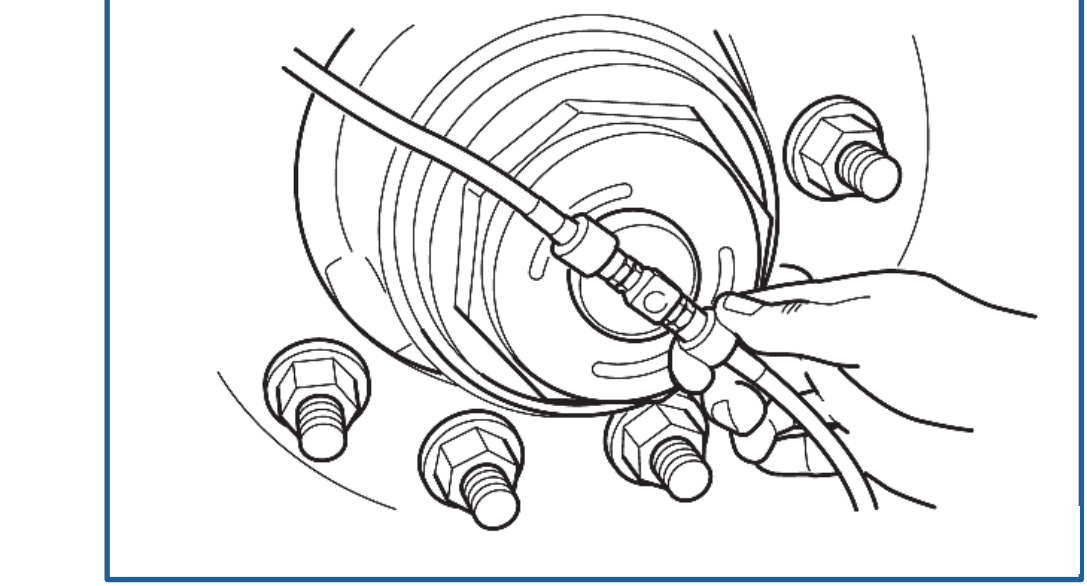


Figure 38: Fitting tyre hoses to Thru-Tee

Caution: The system valve stems and hoses must not contact the wheels and brake drums. Damage to components can occur. See Figure 39 Below.

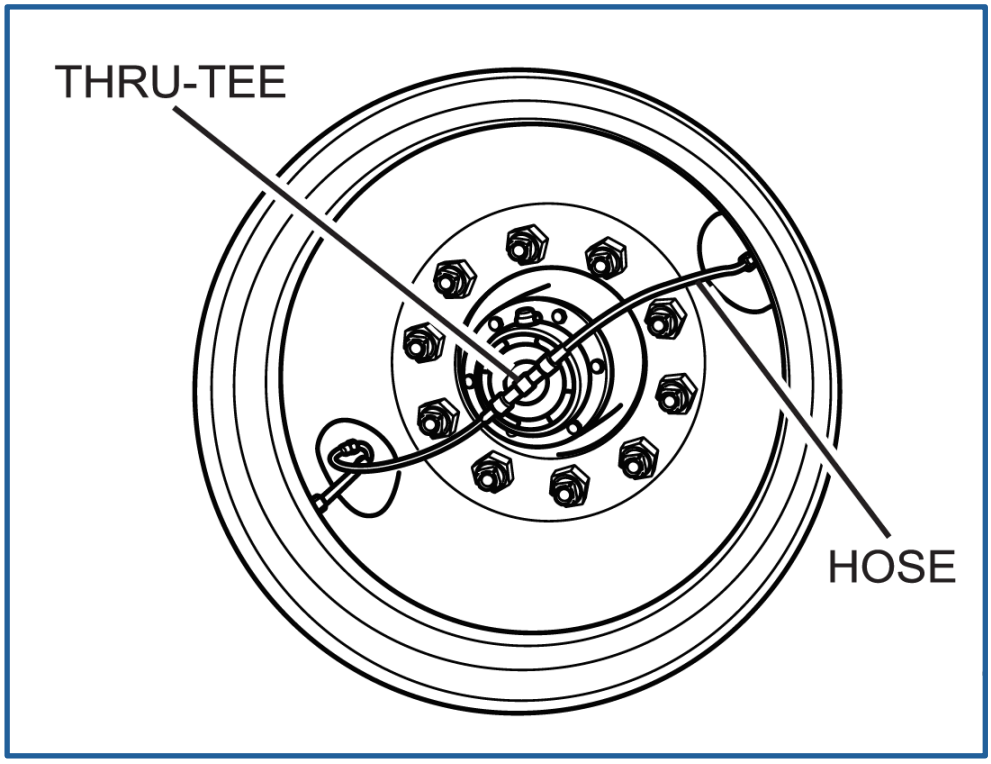
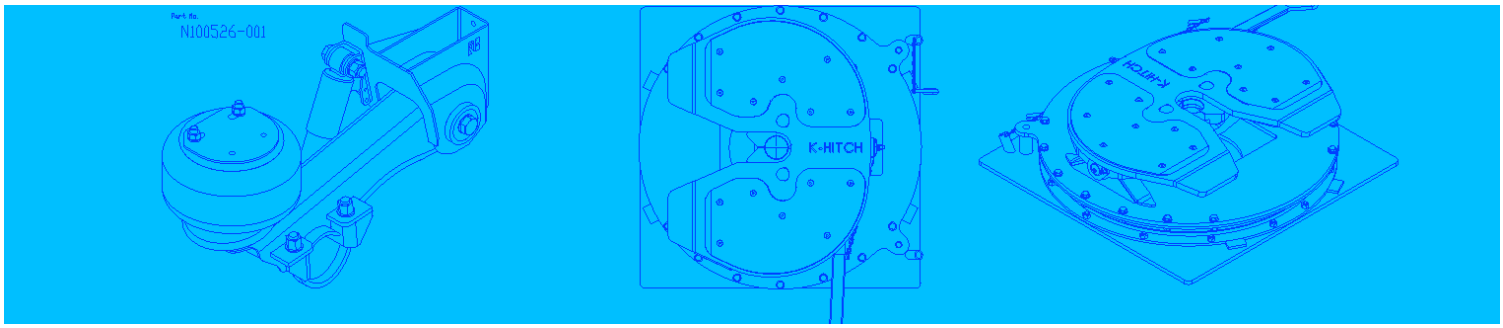


Figure 39: Tyre Hoses Clear of Brake Components



3.3 – Installation Pressure Protection Valve *(PPV)*

The Pressure Protection Valve *(PPV)* is fitted to the one of the trailers air tanks, in an air port that is not on the bottom of the air tank.

Drain the air from the trailer air system service tank.

Apply thread sealant to the fittings used in the PPV installation, if necessary. See Figure 40 below.

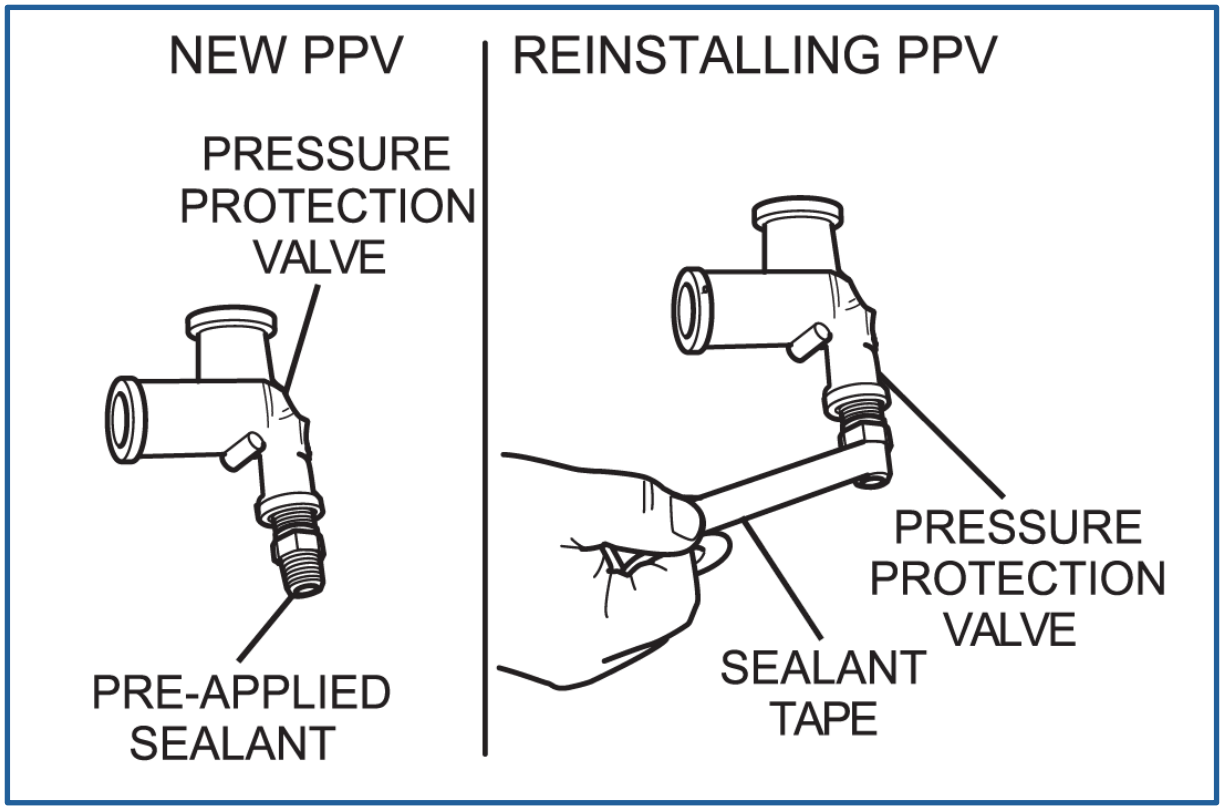
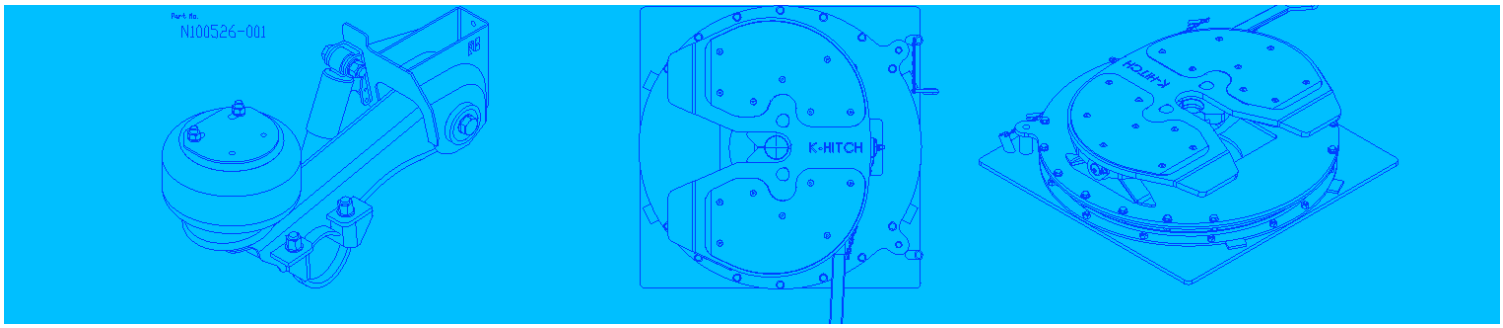


Figure 40: Sealing the PPV

Install the PPV and fittings as close to the top of the air tank as possible.

Tighten the PPV and fittings by hand.

Using a wrench, tighten the PPV and fittings a minimum of two turns. Continue tightening until the drain hole is pointing downward. See Figure 56.



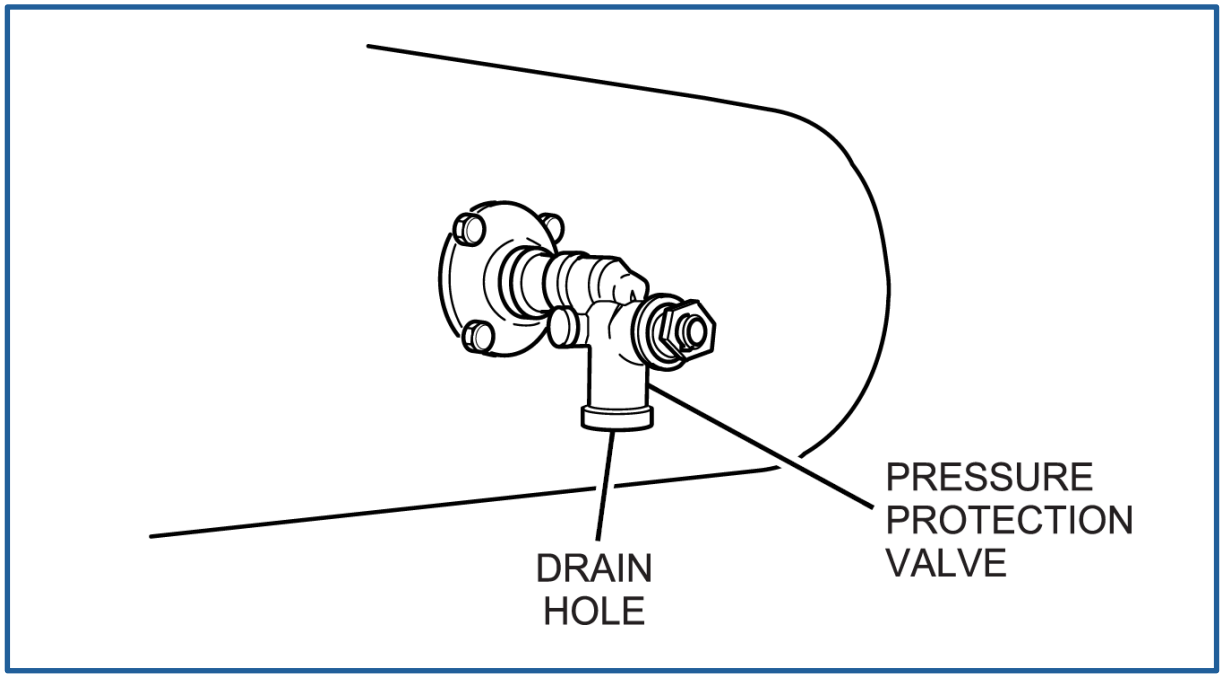


Figure 41: Installing the Pressure Protection Valve in the Air Tank

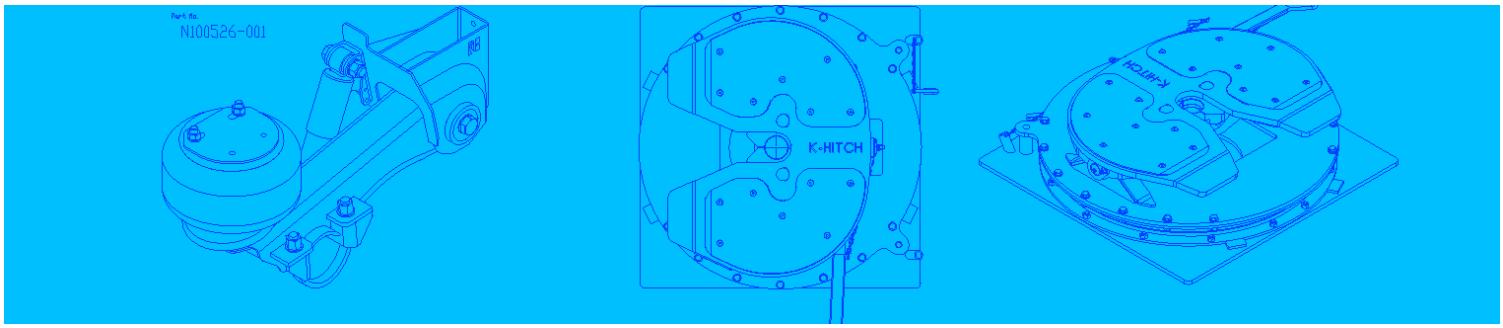
3.4 - Installation Control Box

The FUWA K-Hitch ATIS control box can be mounted by one of two methods. Firstly, using the control box mounting bracket supplied with the ATIS kit. Secondly, by mounting the control box directly to the trailers chassis. It is up to the ATIS system installer to decide the optimum solution for their product and application.

Using either mounting method the location of the control box is the same. Locate the control box in a location on the trailer that is easily accessible for maintenance, free from hazards that may damage the control box, has room to fully open the control box door and routing the pneumatic pipe & electrical cables will be clear of hazards that may damage them.

WARNING: PERSONAL PROTECTIVE EQUIPMENT (PPE) MUST BE WORN WHEN USING WELDING EQUIPMENT. PERSONAL INJURY AND DAMAGE TO EQUIPMENT CAN OCCUR.

WARNING: REFER TO THE TRAILER OR SUSPENSION RECOMMENDED WELDING LOCATIONS AND PROCEDURES.



WARNING: EYE PROTECTION MUST BE WORN WHEN PERFORMING VEHICLE MAINTENANCE OR SERVICE. EYE INJURY OR DAMAGE CAN OCCUR. GET MEDICAL ATTENTION IMMEDIATELY.

Caution: Welding equipment safety procedures and operating instructions must be followed at all times. Injury and damage to equipment can occur.

3.4.1 - Mounting Bracket

3.4.1.1 – Bolting the Control Box Mounting Bracket to The Chassis

Identify a suitable mounting location for the control box bracket on the trailer subframe with consultation with the trailer manufacturer.

Use the mounting bracket as a template to drill the mounting holes for the mounting bracket to the chassis.

Use a 7.93 mm *(5/16")* drill bit and drill two holes on the trailer subframe. In a location recommended by the trailer manufacturer. See Figure 42 below. Paint the holes to stop corrosion.

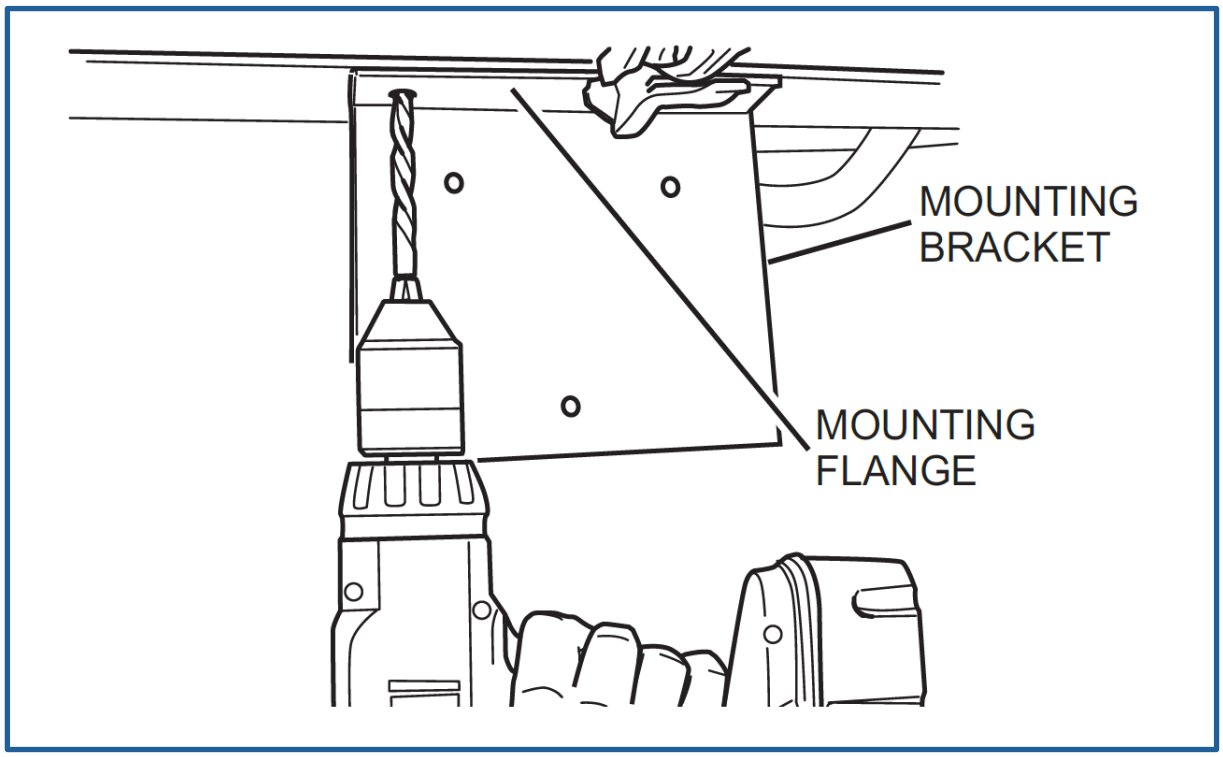
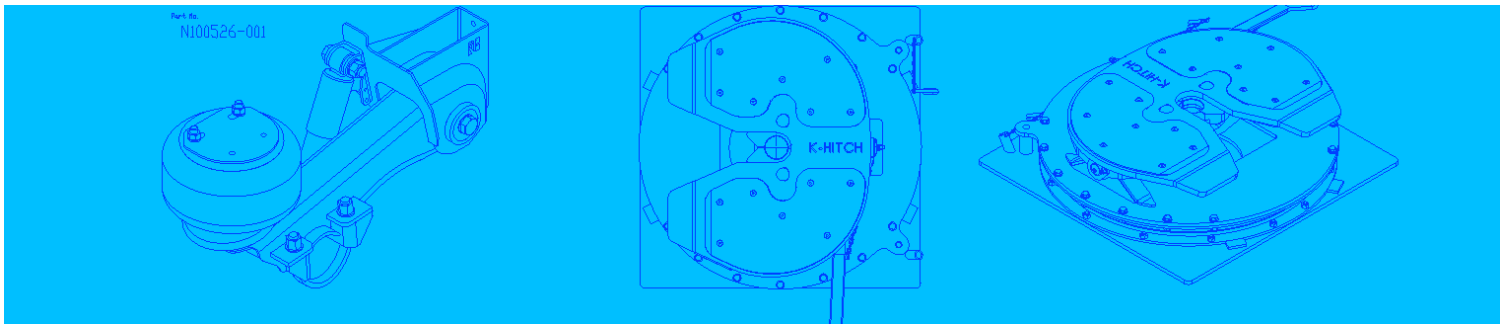


Figure 42: Affixing Mounting Bracket to Chassis

NOTE: The mounting bracket flange must contact the surface area completely.



Use the bolt, washers and locknut to attach the mounting bracket to the trailer subframe. See Figure 43 below. Torque the fasteners to the recommended torque setting in the section “7.0 - TORQUE SETTINGS”.

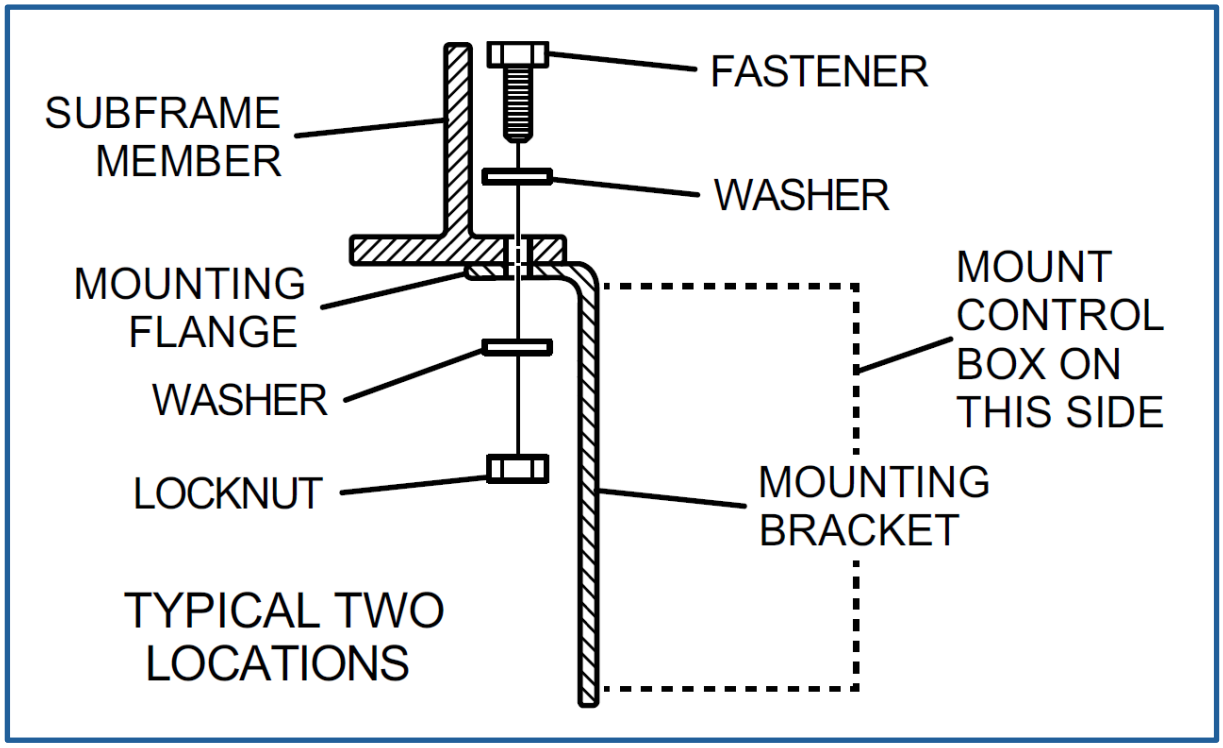


Figure 43: Assembling Mounting Bracket to Chassis Fasteners

Use the bolts, washers and locknuts supplied in the ATIS kit to attach the control box to the mounting flange of the mounting bracket as shown in Figure 43 above.

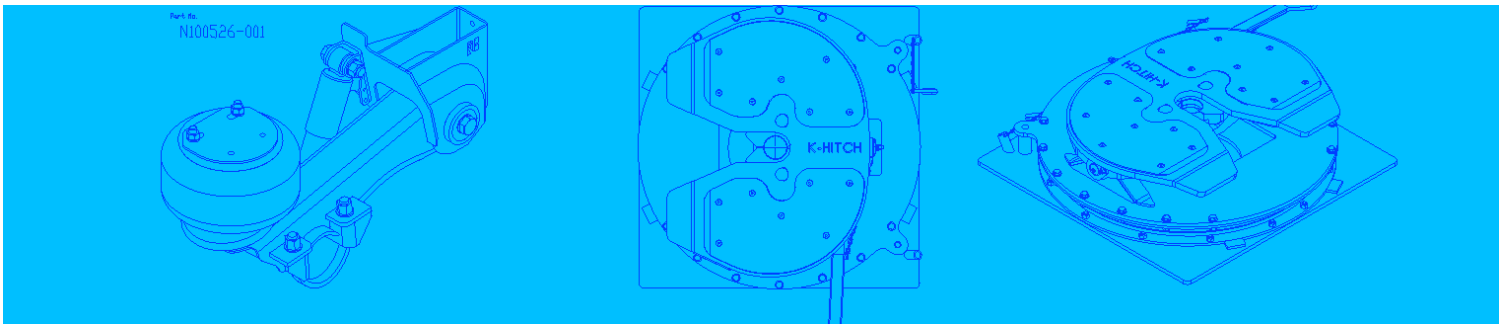
3.4.1.2 – Welding the Control Box Mounting Bracket to the Chassis

Identify a suitable mounting location for the control box bracket on the trailer subframe with consultation with the trailer manufacturer.

Follow industry best practice and follow the trailer manufacturers’ recommendations. Weld the ATIS control box mounting bracket directly to the chassis.

Caution: Make sure no welding splatter can fall on and damage any trailer pneumatic pipes or electrical cables.

Prime and paint over the welds to stop corrosion.



3.4.1.3 – Bolting the Control Box Directly to the Chassis

Identify a suitable mounting location for the control box bracket on the trailer subframe with consultation with the trailer manufacturer.

Mark out the ATIS control box mounting holes directly on the chassis member. *(The control box mounting bracket can be used as a template)*

Then drill the three 6.35 mm *(1/4")* mounting holes through the chassis member. Paint the holes to stop corrosion as illustrated in Figure 44 below.

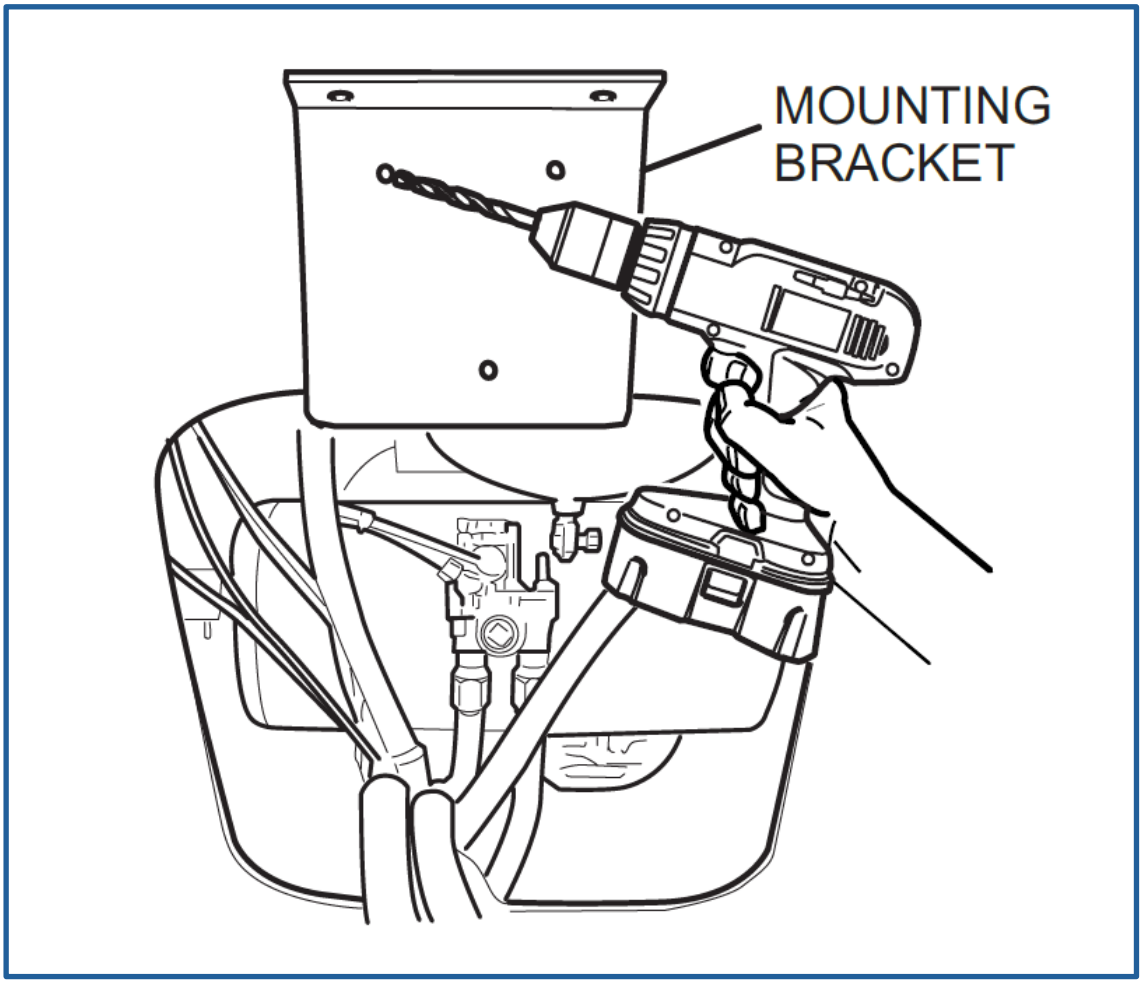
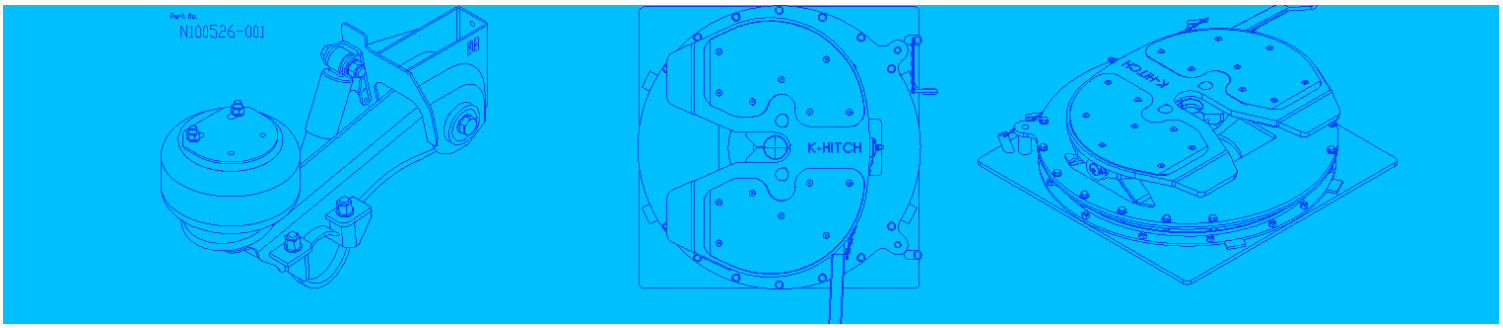


Figure 44: Drill Control Box Mounting Holes Directly into Chassis Member



3.4.2 – Bolting on Control Box

Use the bolts, washers and locknuts supplied in the FUWA ATIS kit to attach the control box as Illustrated in Figure 45 below. Torque the fasteners to the recommended setting from section “7.0 - TORQUE SETTINGS”.

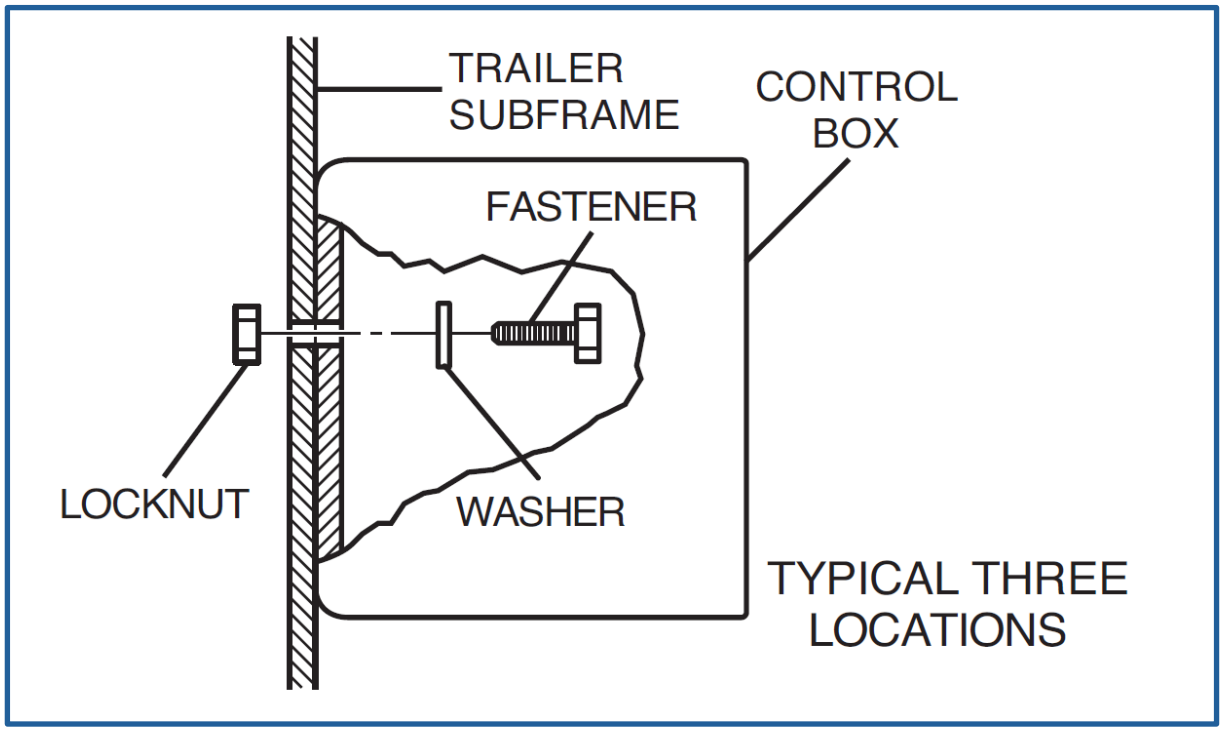


Figure 45: Bolting up Control Box

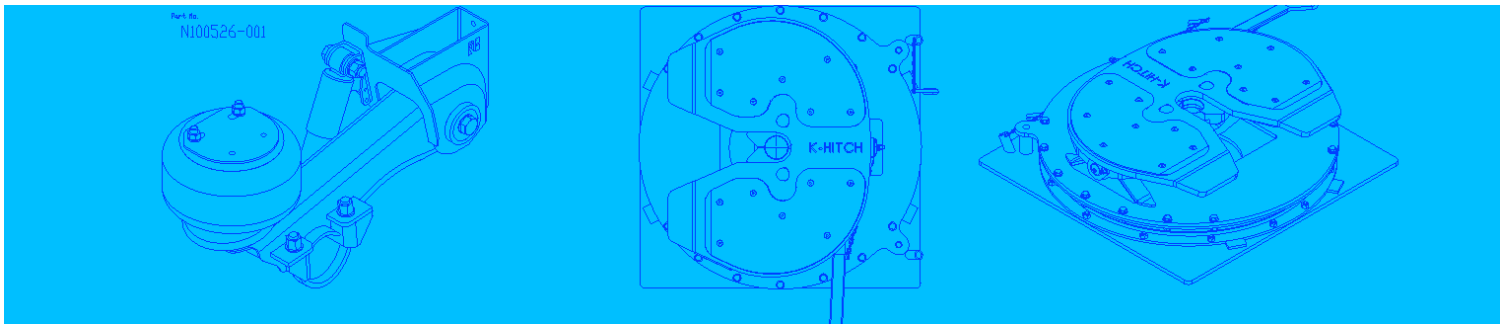
3.5 - Routing of Pneumatic Tube

The FUWA K-Hitch ATIS kit is supplied with 2 lengths of green ¼” Nylon air tube, 7.6 m long *(25 feet)* for all plumbing requirements.

Caution: Use grommets to protect the system air lines from sharp edges at hole locations.

Caution: Use cable ties to secure the pneumatic lines about every 300 mm along its length, to limit damage from fretting.

Caution: Use a sharp pipe cutter to cut the pneumatic tube giving a clean cut at 90° to the length of tube.



Install the air line into the air fitting of the PPV valve and then route the air line to the inlet air fitting of the control box as shown in Figure 46 below. Cut the air line to length and insert the air line into the control box inlet air fitting.

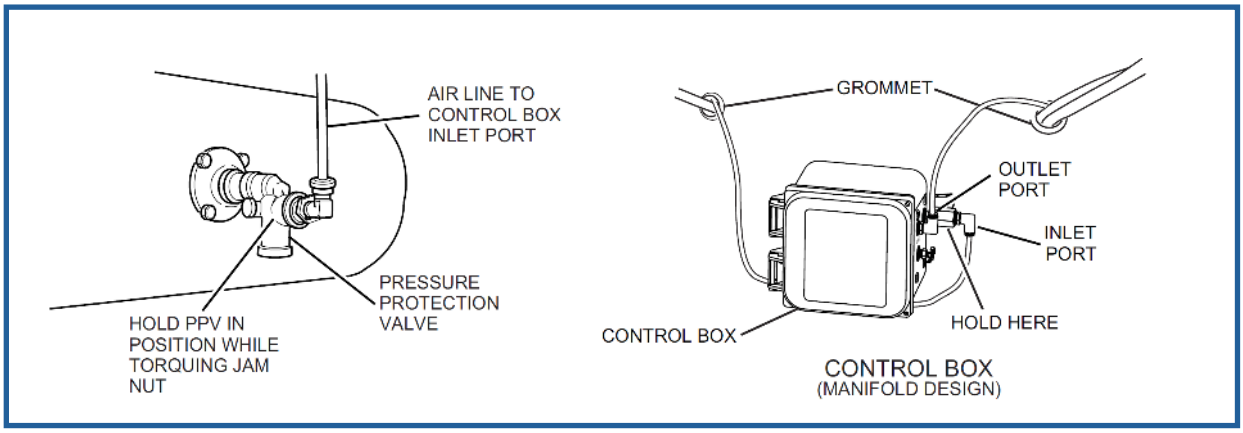


Figure 46: Routing Air Line From PPV to Control Box

Install the air line into the outlet air fitting of the control box and route the air line to the brake chamber air hoses of the first axle. Cut the ¼" Nylon air tube and fit in a tee air fitting as shown in Figure 47 below.

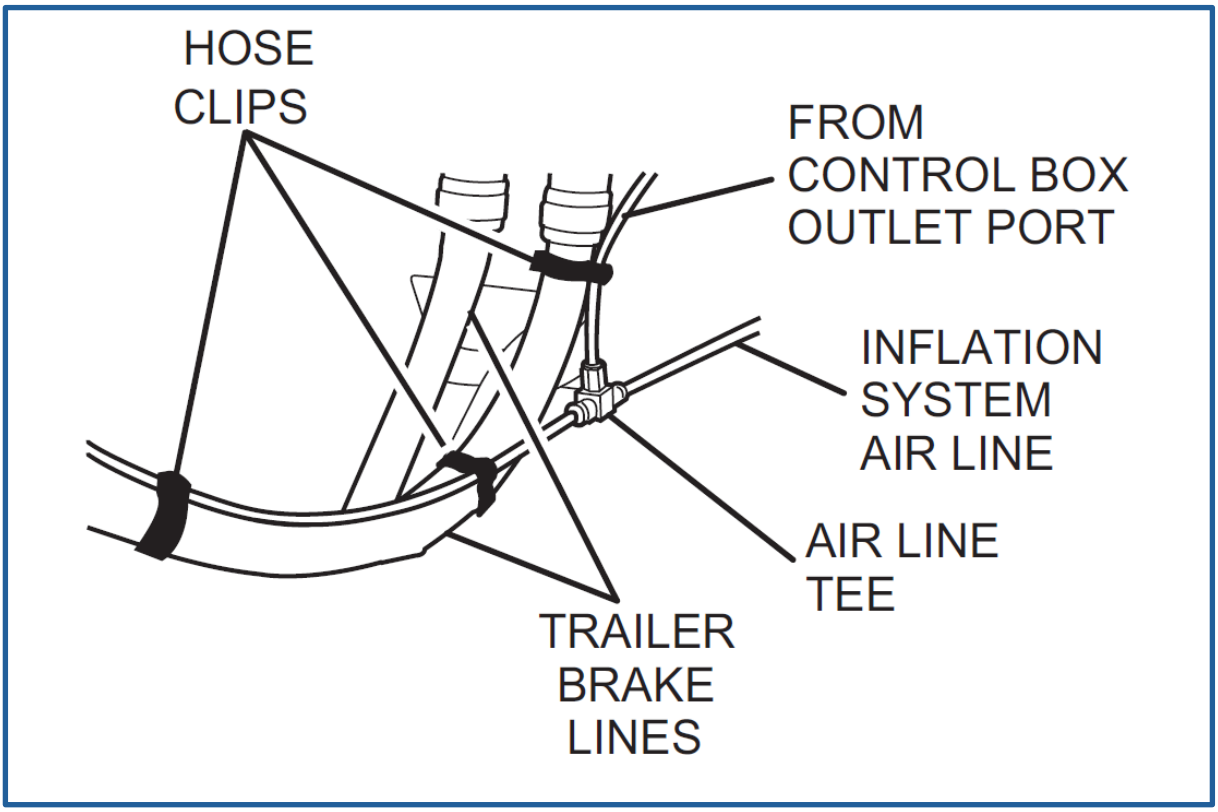
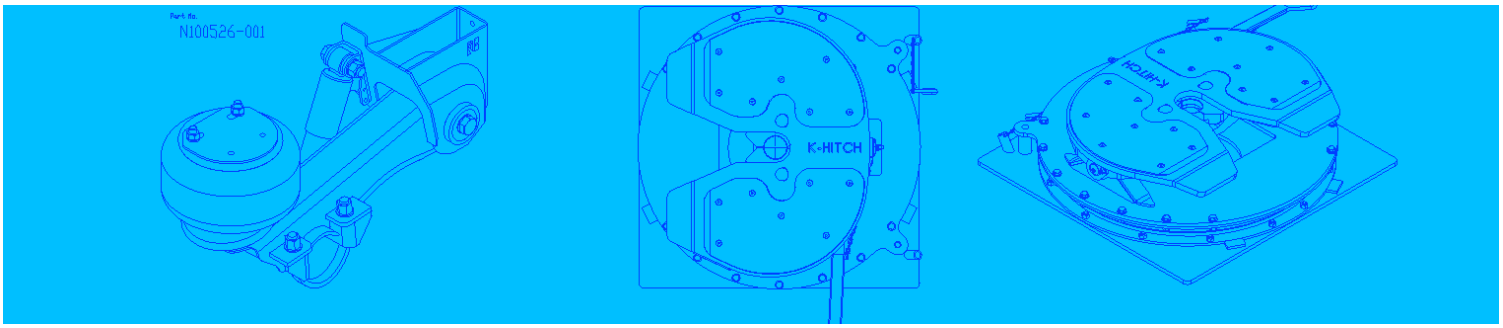


Figure 47: Install Air Line Tee Fitting



Install some air line into the tee air fitting and route the air line down the brake chamber air hose to the axle inlet air fitting as shown in Figure 48 below.

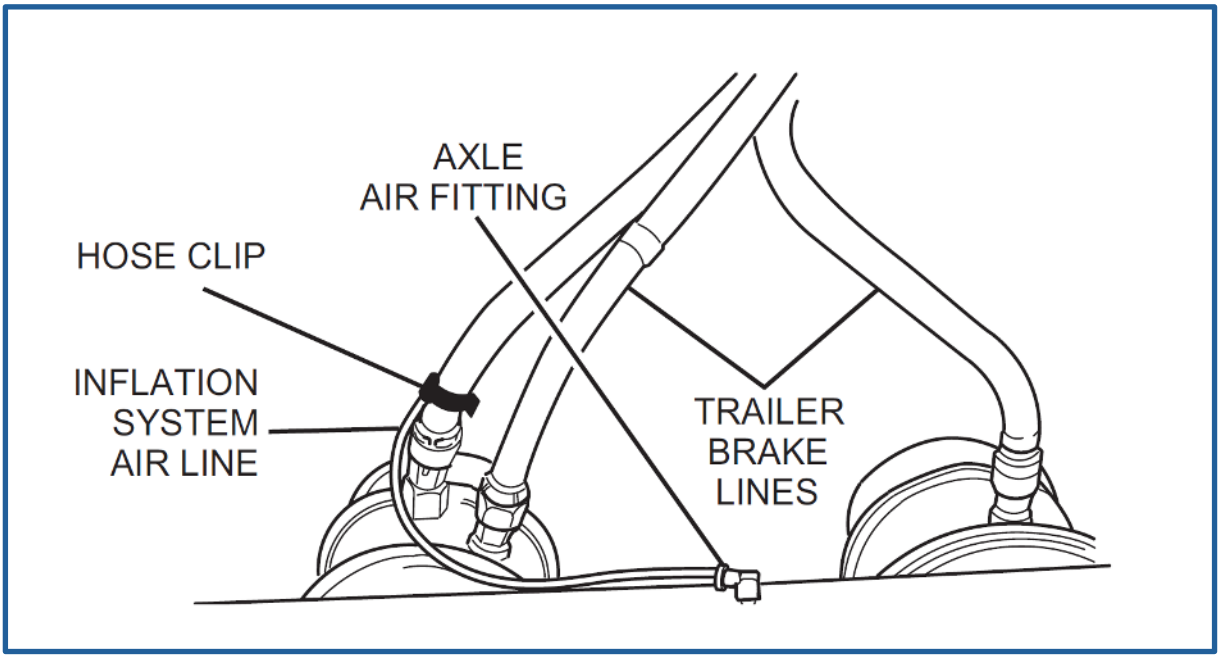
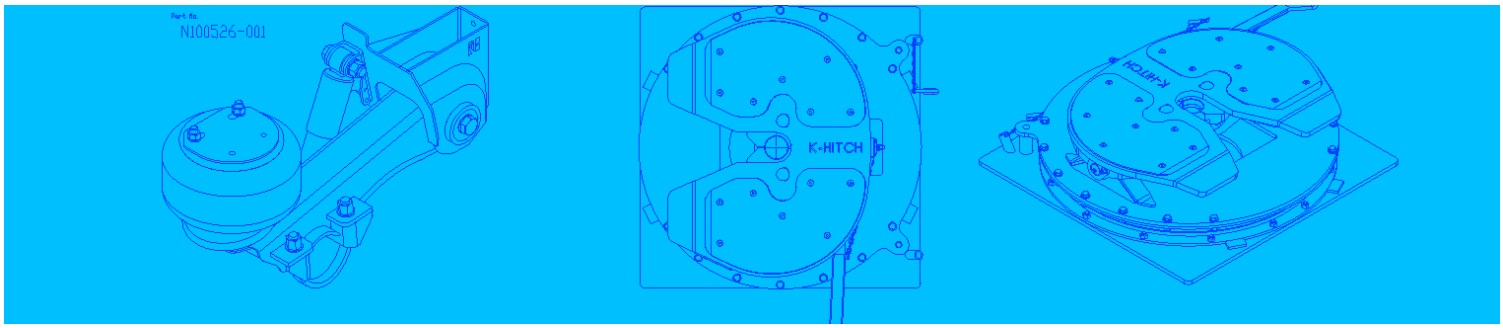


Figure 48: Route Air Line to Axle Inlet Air Fitting

NOTE: Provide sufficient slack in the lines to allow for suspension movement. Use the slack in the existing trailer brake lines as a guide. Use hose clips to suspend the air line tee away from the trailer brake lines to protect them from damage and secure the air line.

Repeat the last two steps as required for the axles fitted to the trailer until all axle have air routed to them from the outlet of the control box air fitting to the axle inlet air fitting.



3.5 Installation of Electrical Components

The FUWA K-Hitch ATIS kit is supplied with one length of two core electrical cable, 21 meters *(70 feet)* long. With the electrical terminals to connect to the indicator light, bullet connector at one end and spade terminals to connect to the flow switch at the other end.

Make the necessary modification to allow the indicator light to be mounted vertically on the driver's side front of the trailer, approximately 762 mm *(30 inches)* from the bottom of the coupler, as close to the outside of the trailer as possible. Follow the recommendations of the trailer manufacturer for mounting the indicator light and routing the electrical cable. Confirm the indicator light can be seen from the roadside rear-view mirror.

Plug the electrical cable bullet connectors onto the indicator lights bullet connectors, black wire to black wire and white wire to white wire as shown in Figure 49 below.

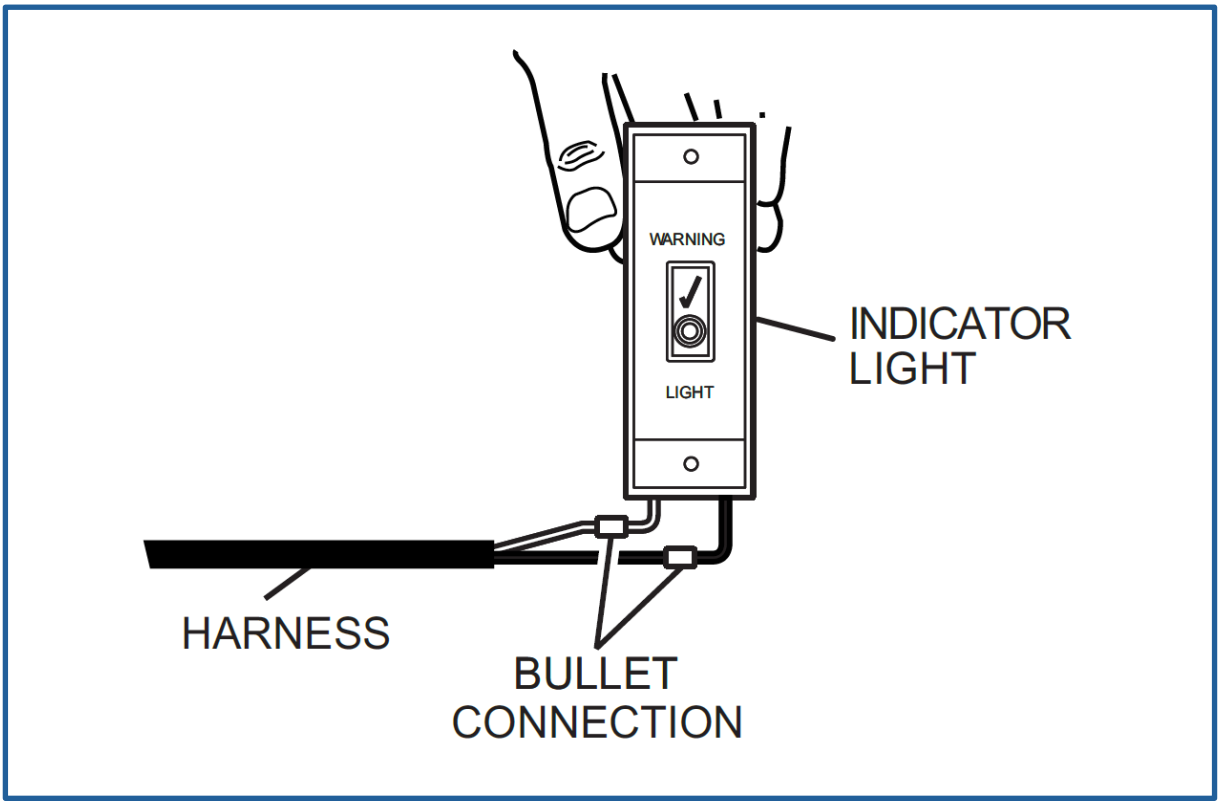
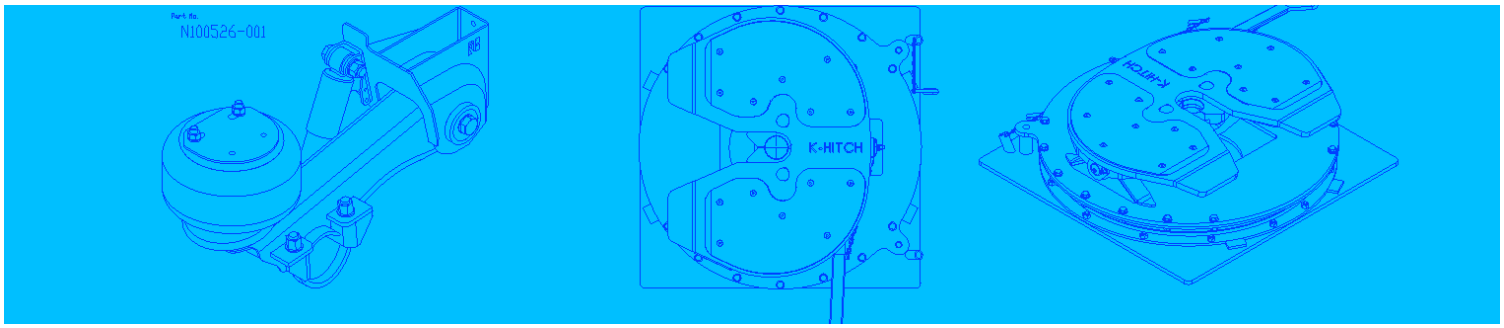


Figure 49: Connect Electrical Cable to Indicator Light

Then route the electrical cable through the indicator lights mounting bracket and install the indicator light securely.



Then fit the warning decal supplied in the ATIS kit next to the indicator light as shown in Figure 50 below.

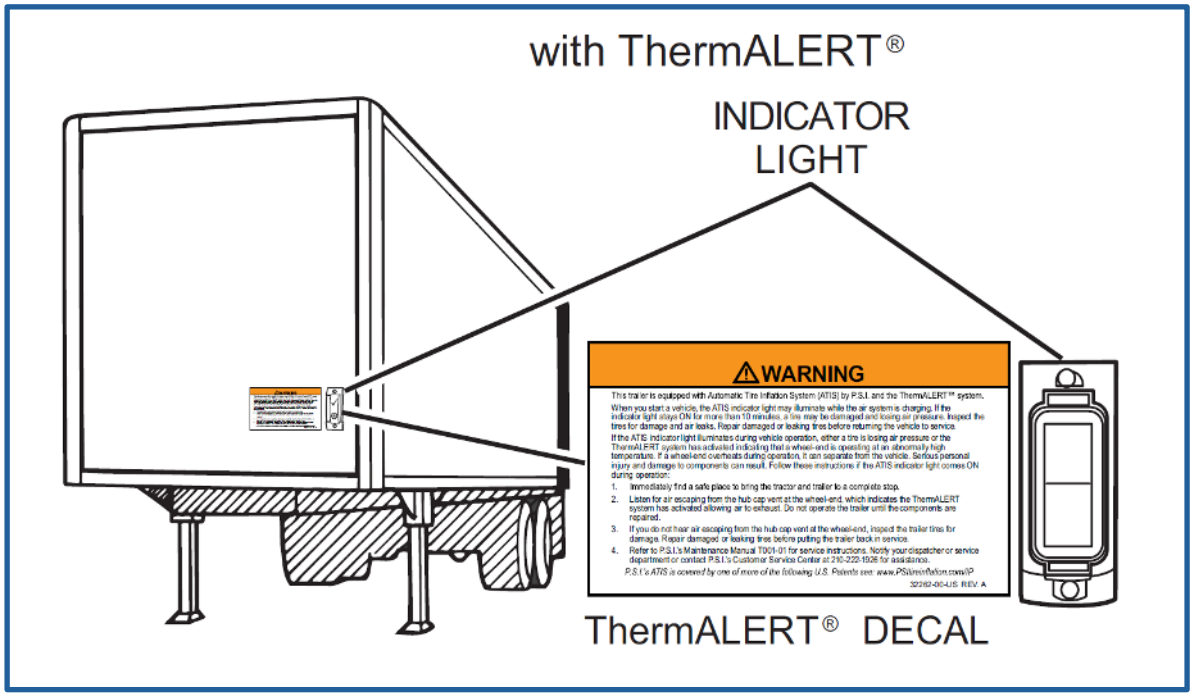


Figure 50: Fit ThermALERT™ Warning Decal

Route the electrical cable carefully along the trailer to the control box. Secure the electrical cable to stop chafing and keep it clear of hazards that may damage it. Refer to Figure 51 below.

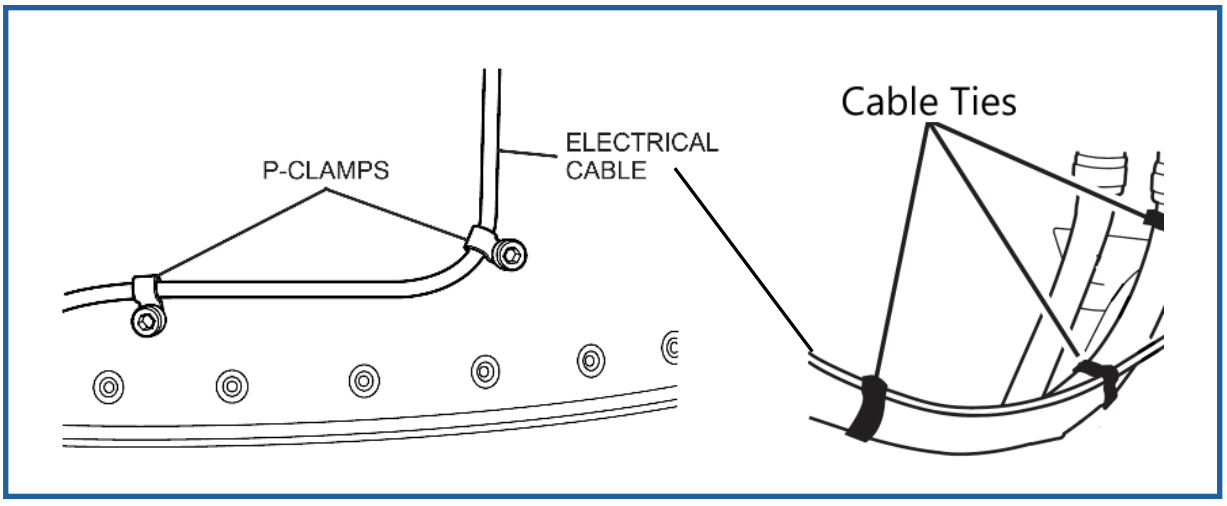
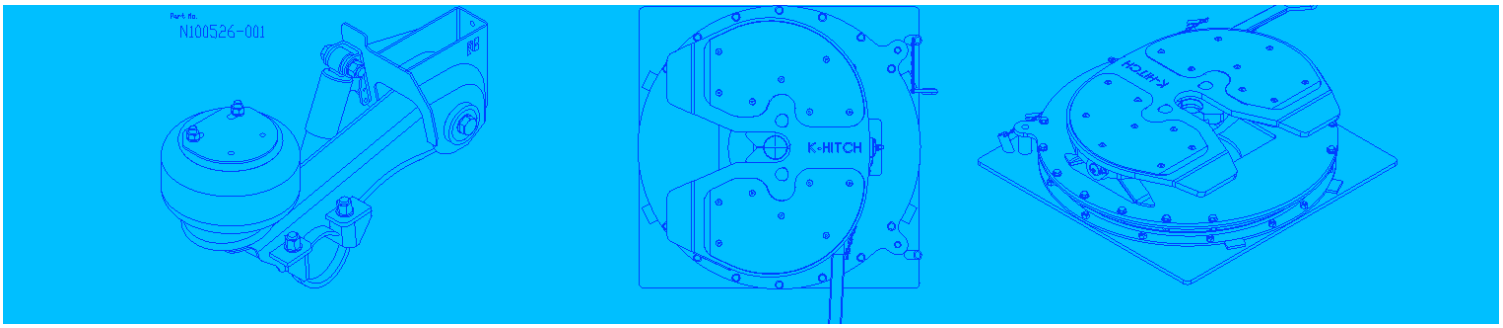


Figure 51: Electrical Cable Routing



Run the spade terminal end of the electrical cable through the watertight gland fitting on the side of the control box and plug the spade terminals onto the flow sensing switch. Refer to Figure 52 below.

NOTE: The black or white wire can be connected to either terminal on the flow sensing switch and are interchangeable.

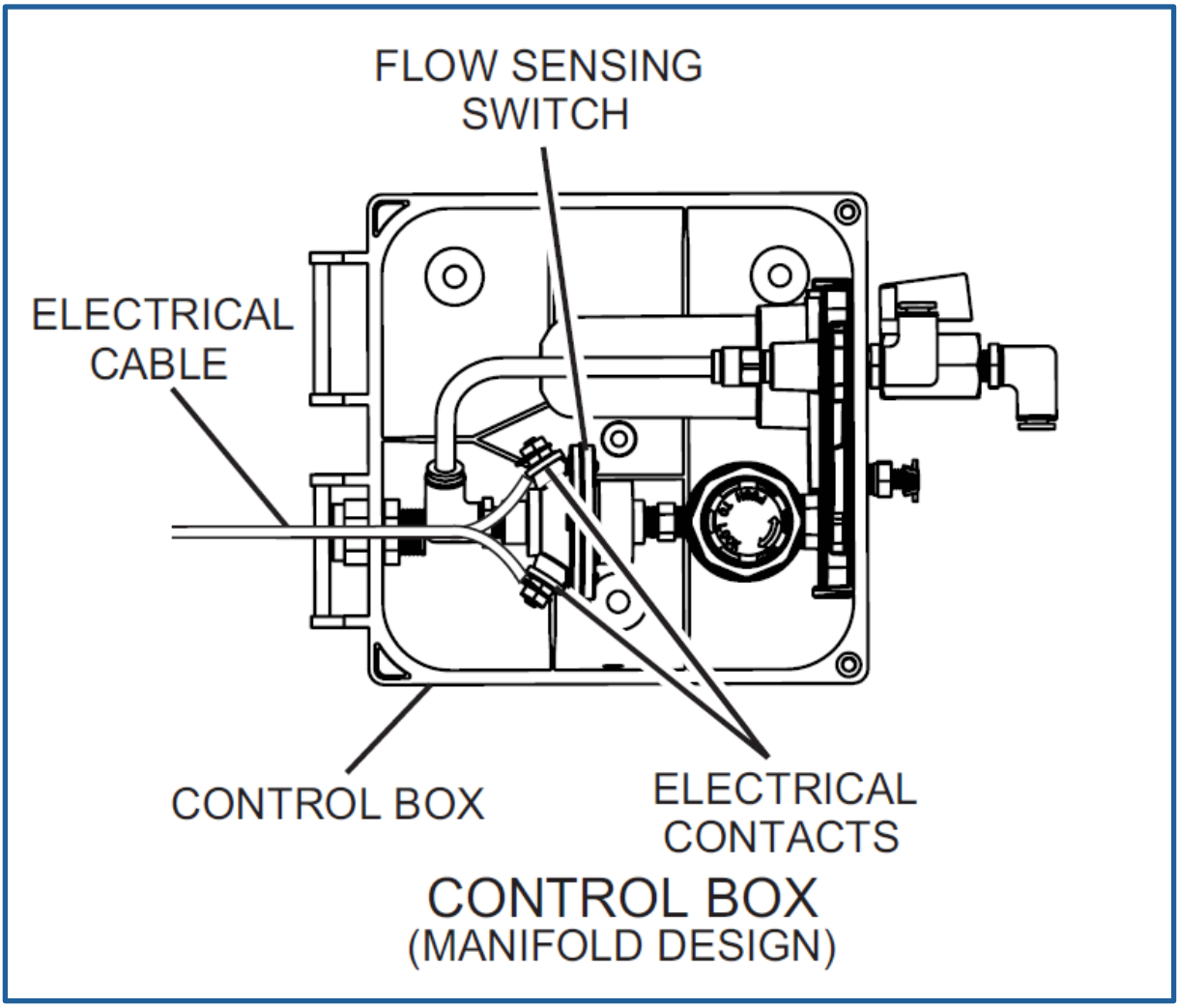
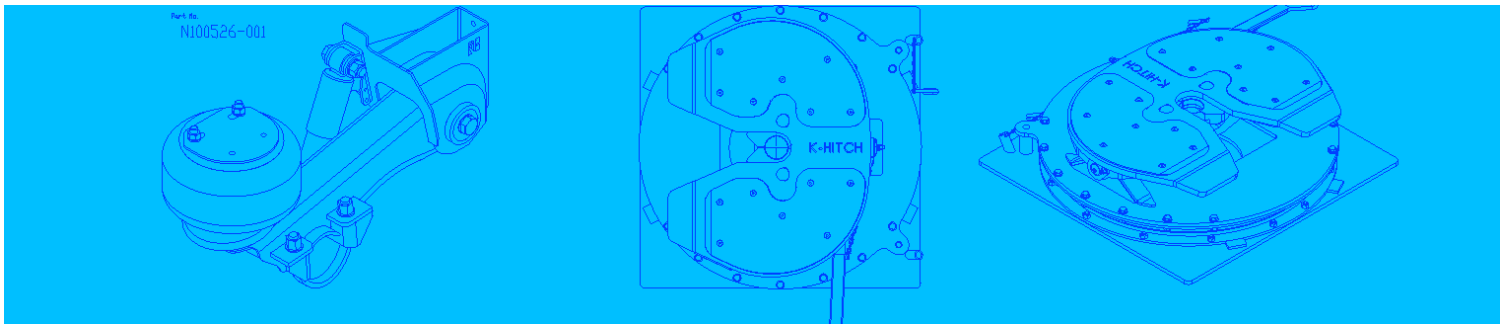


Figure 52: Electrical Connection to Flow Sensing Switch

Excess electrical cable needs to be secured.

Power and an earth needs to be supplied from the trailers electrical circuit to the ATIS indicator light circuit. Figure 53 below illustrates a sample electrical circuit. Consult with the trailer manufacturer for their recommendations on breaking into their electrical circuits.



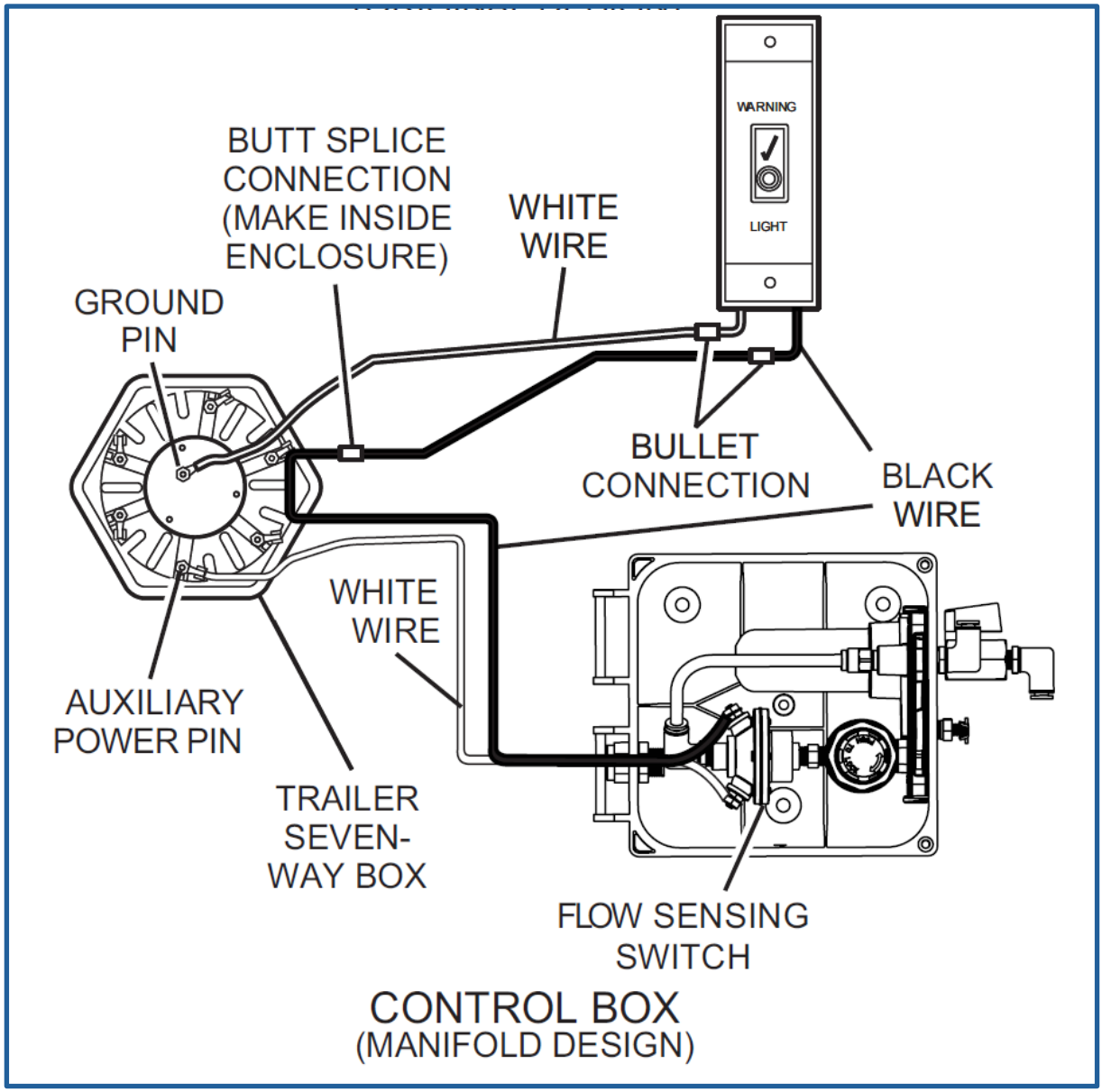
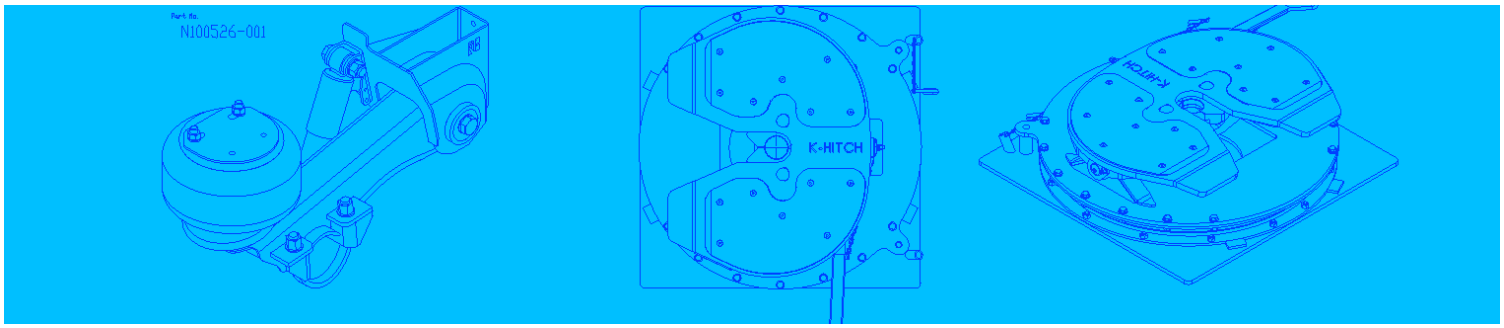


Figure 53: Sample Indicator Light Electrical Circuit

3.6 – Identification Decal

Install an identification and hose installation decal supplied in the ATIS kit on each side of the trailer above the suspension system. See figure 54 below.



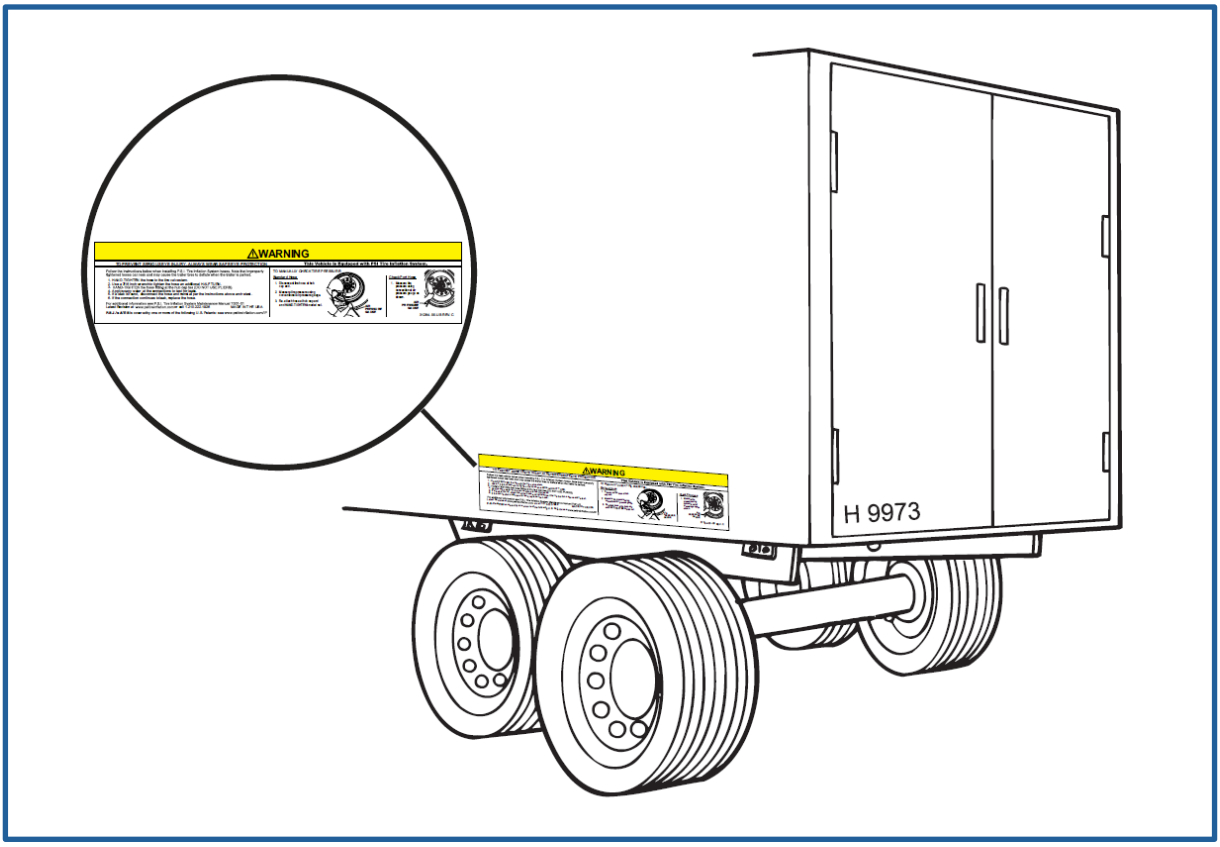
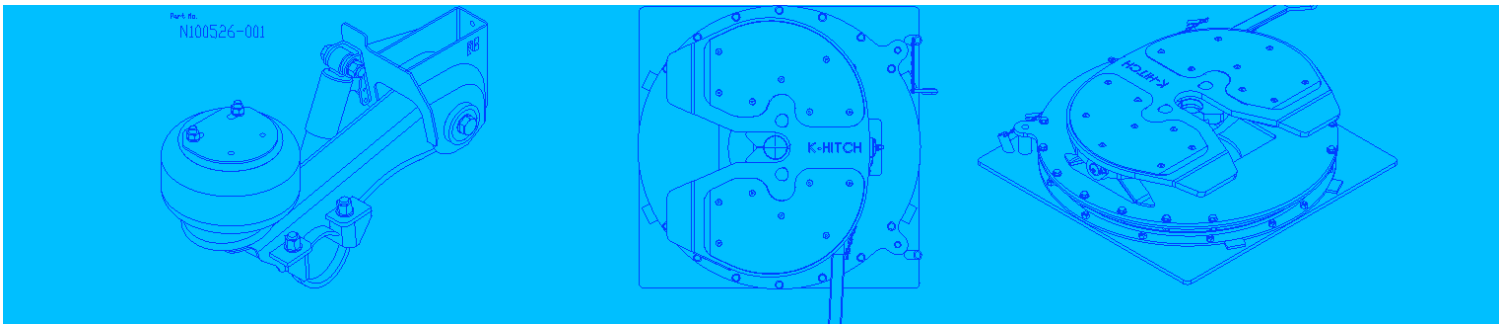


Figure 54: Identification Decal Location



4.0 – SYSTEM CHECK AND OPERATION

Use the following procedure to check the system for correct operation. This inspection ensures that the system is activated, the indicator light works, the hoses are installed correctly and that the system delivers the correct pressure to the tyres.

Confirm the system On/Off valve is in the **ON** position. The knob aligns with the valve body.

Make sure the maintenance drain valve is **closed**. Refer to Figure 55 below.

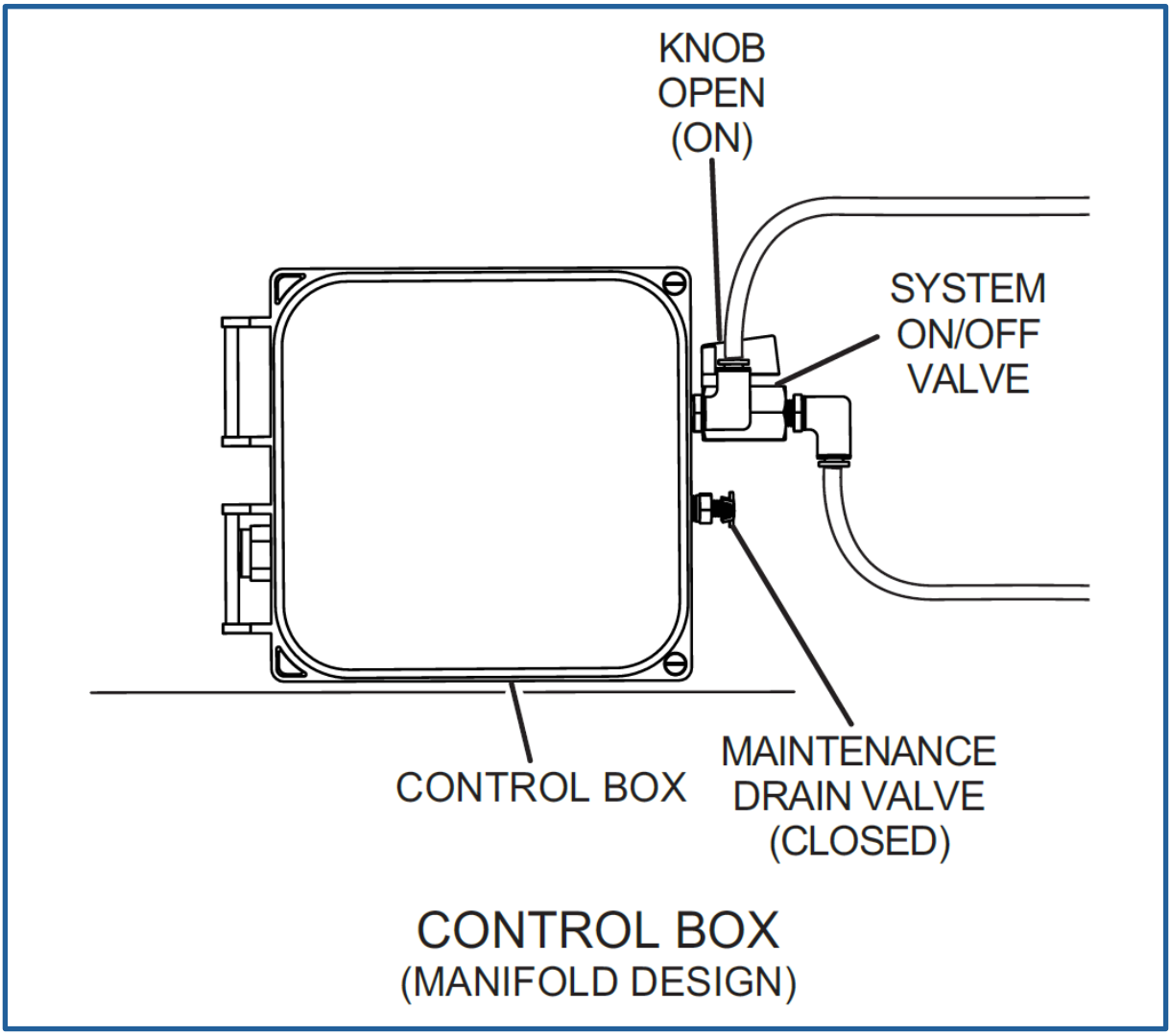
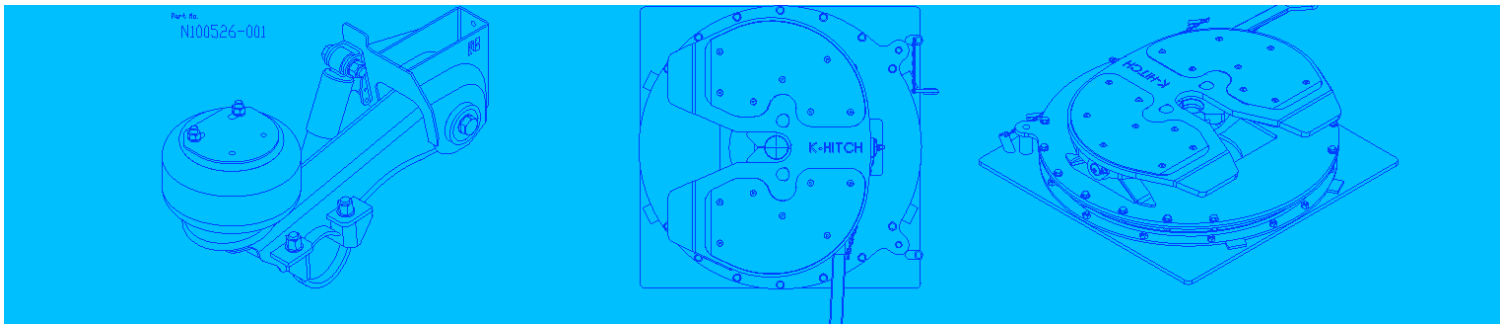


Figure 55: Starting Status of Control Box

Pressurize the system to 137.90 kPa (20 psi) above the control box setting.

Allow at least 10 minutes for the air pressure source to pressurize the system.



Use a non-corrosive leak detecting solution to check all fittings, hose connections and Thru-tee relief valves for air leaks. Refer to Figure 56 below for examples. Rectify any leaks identified.

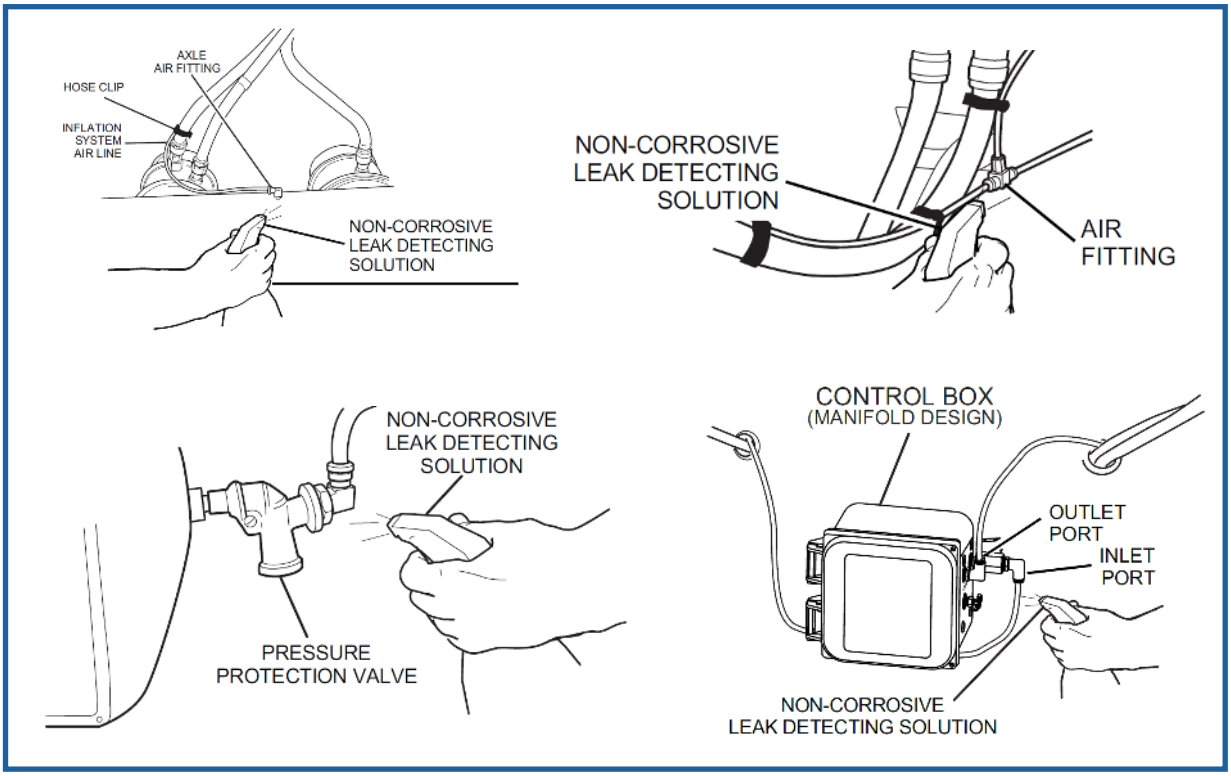


Figure 56: Leak Test all Pneumatic Connections

Push a short piece of the ¼" air line into the Thru-Tee fitting, check all of the male hose connections at the Thru-tee assemblies. Air should flow from the male hose connection. See Figure 57 below.

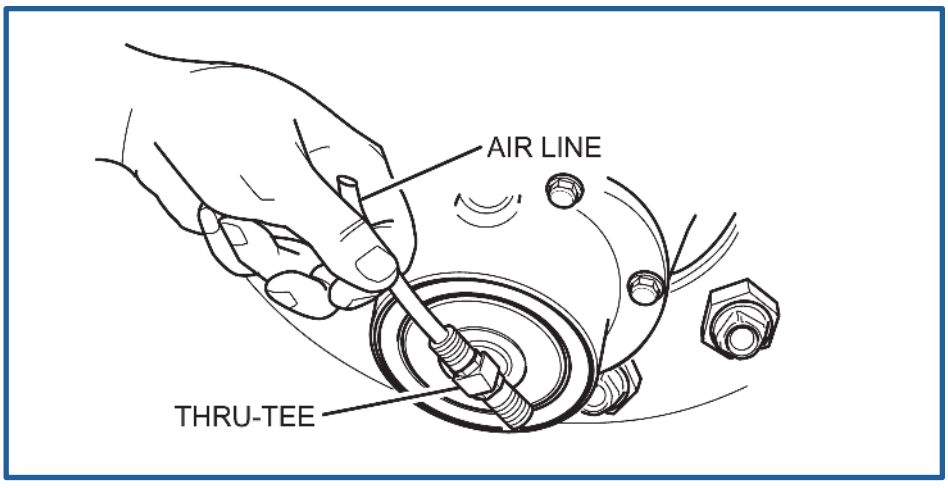
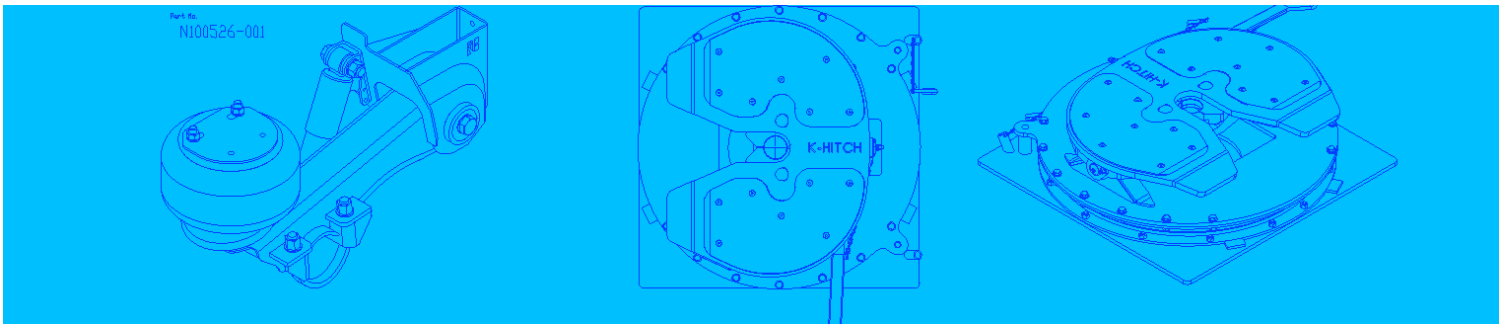


Figure 57: Check Tru-Tee Ports For Airflow



Ensure the electrical system of the trailer is **powered** up and **open** the maintenance drain valve on the control box. The indicator light will come **ON**. See Figure 58 below.

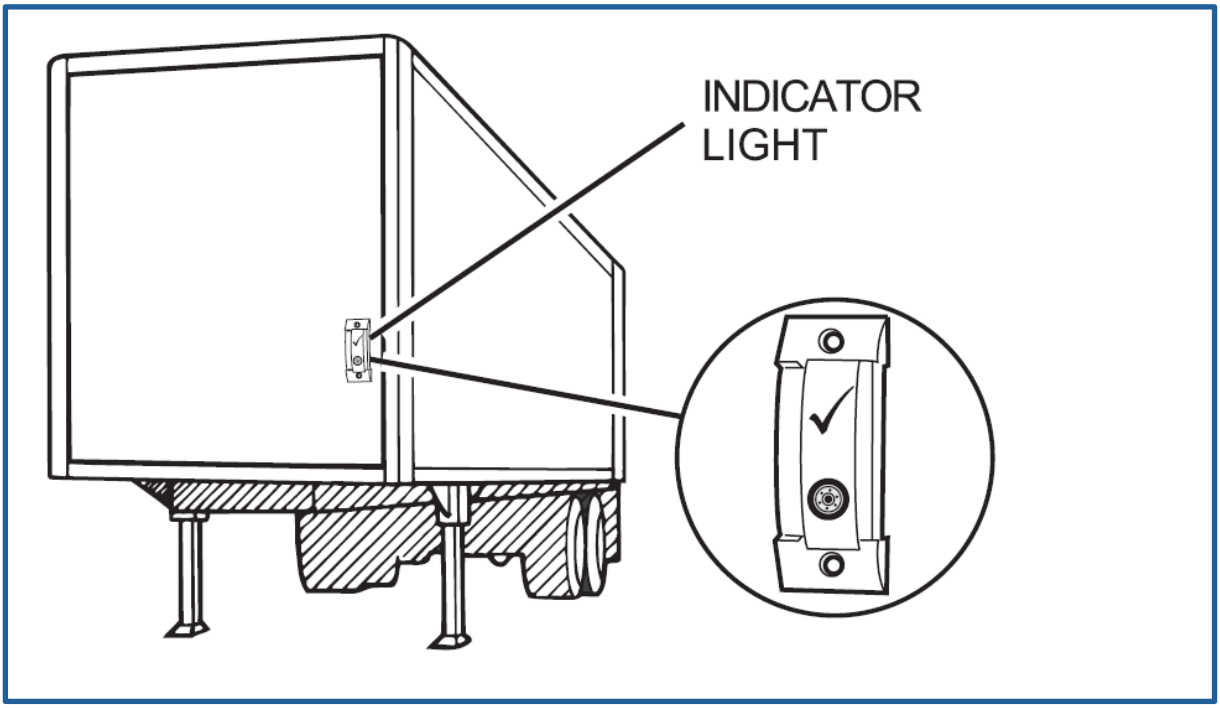


Figure 58: Check Indicator Light Function

Close the maintenance drain valve on the control box. The indicator light will go **OFF**. See Figure 58 above.

Push the check valves at the ends of the hoses attached to the tyres. Air should flow from the tyres. See Figure 59 below.

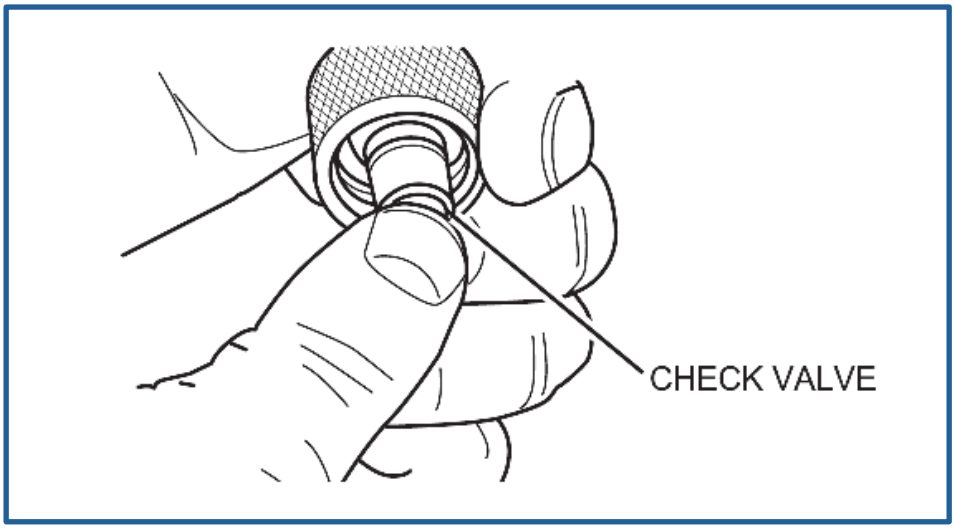
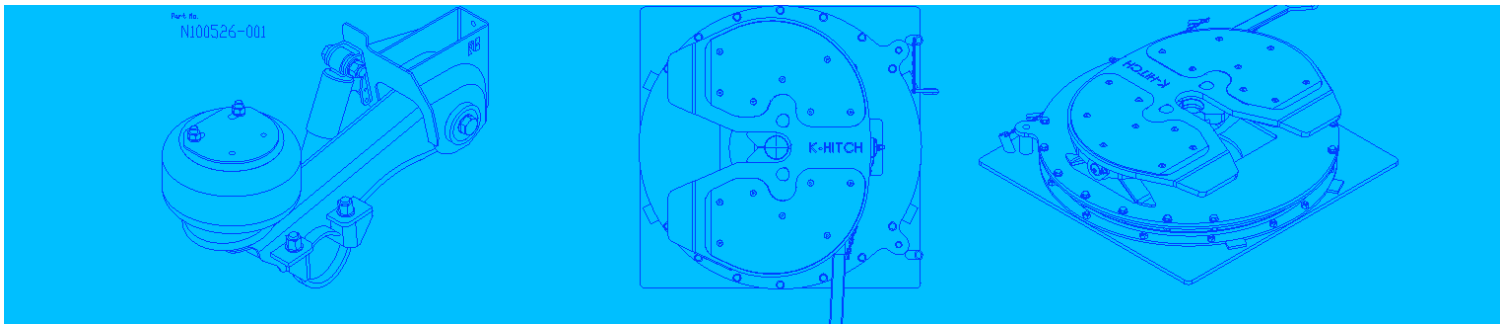


Figure 59: Check that Tyre Hoses Have Air Pressure



Reduce the pressure in all tyres 34.5 – 69.0 kPa *(5-10 psi)* below the pressure indicated in the control box. See Figure 60.

NOTE: A sticker located inside the control box door shows the tyre pressure that the system will deliver.

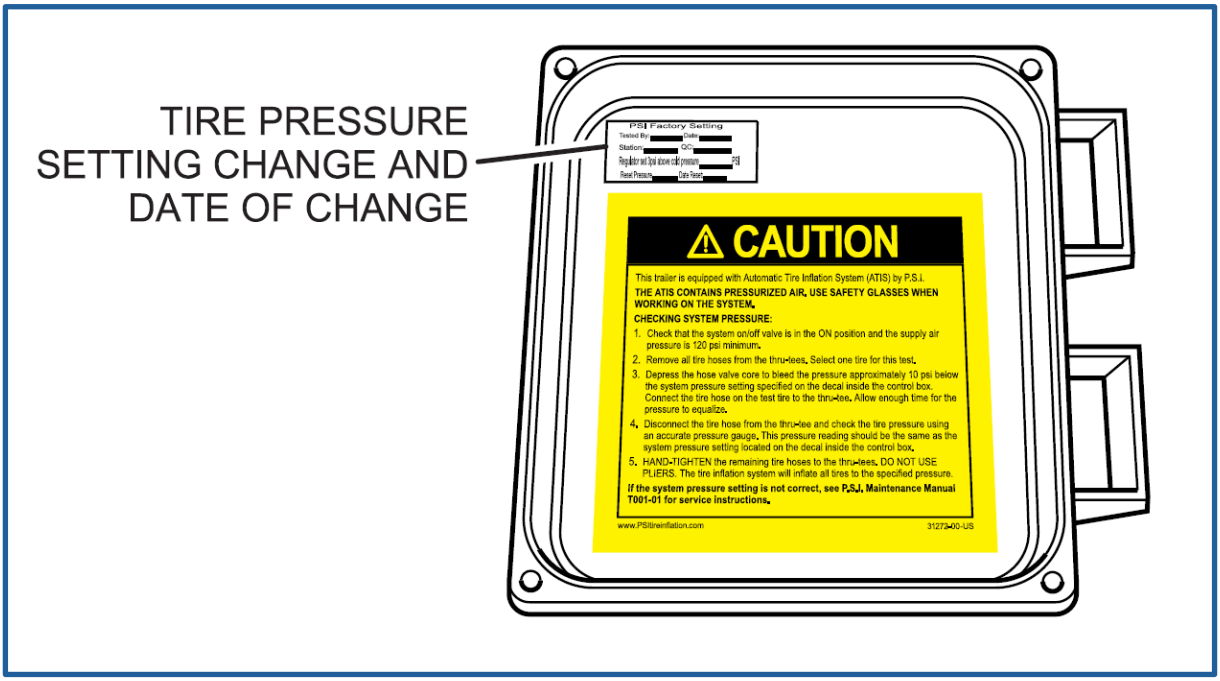


Figure 60: ATIS Set Pressure When Manufactured

Caution: Knurls on tyre hoses are to be hand tightened to the Thru-tee only. Do not use tools. Damage to the knurls can occur.

Attach the tyre hoses to the Thru-Tee at all tyre positions. See Figure 61 below.

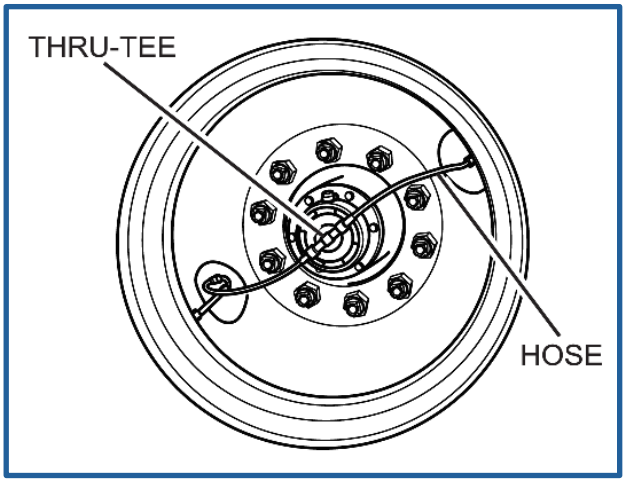
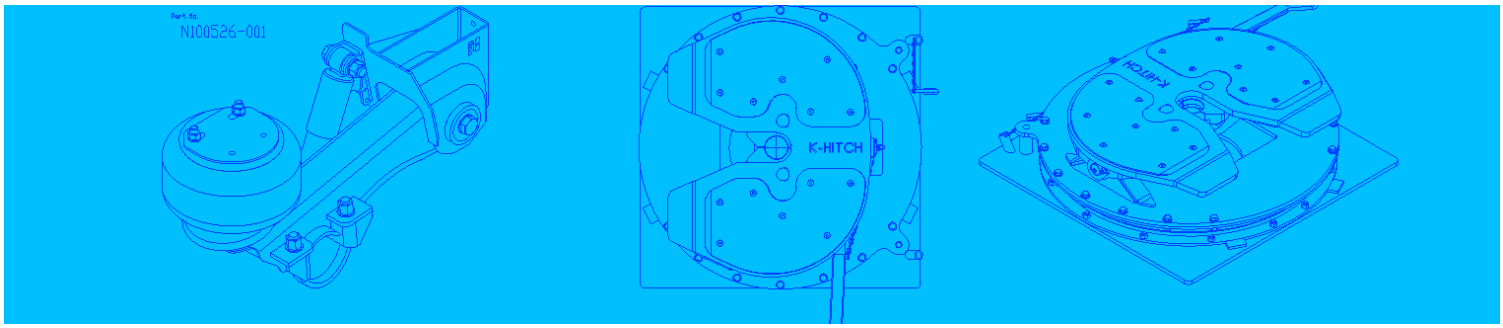


Figure 61: Install Tyre Hoses to Thru-Tee



Allow the pressure to build up in the tyres.

NOTE: Depending on system pressure and other vehicle air requirements, it can take up to 30 minutes for pressure to increase.

Use a calibrated gauge to check the tyre pressure. See Figure 62 below.

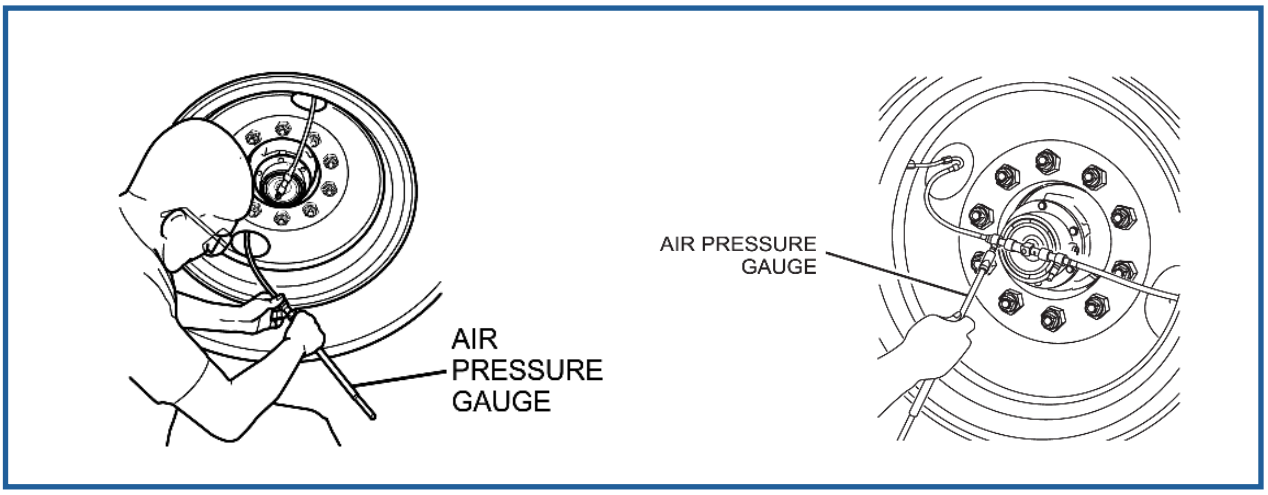


Figure 62: Check Tyre Pressure

After 30 minutes, if the tyre pressures are not correct check the control box setting. See next section.

Spray a non-corrosive leak detecting solution on the wheel end components and connections to check for leaks. See Figure 63 below. Rectify any leaks detected.

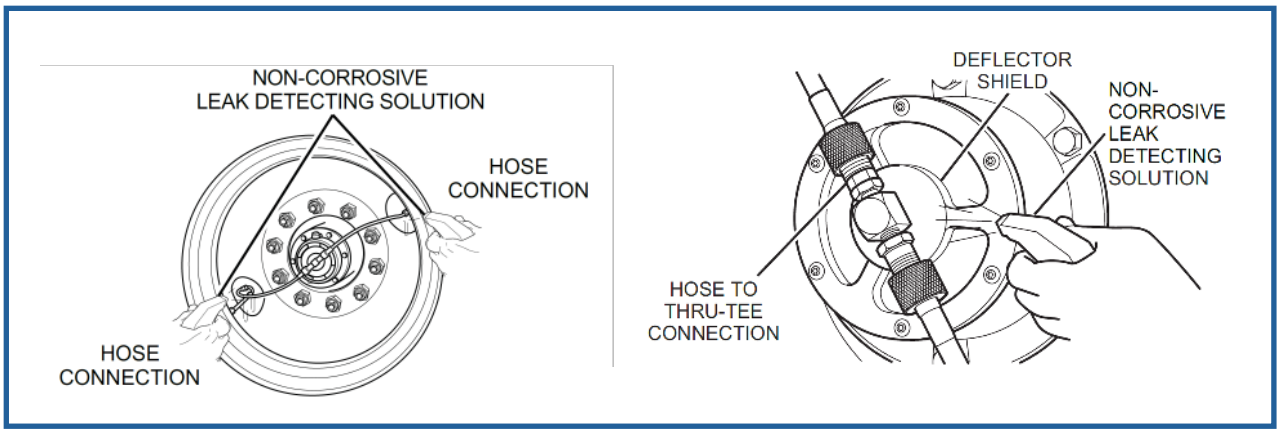
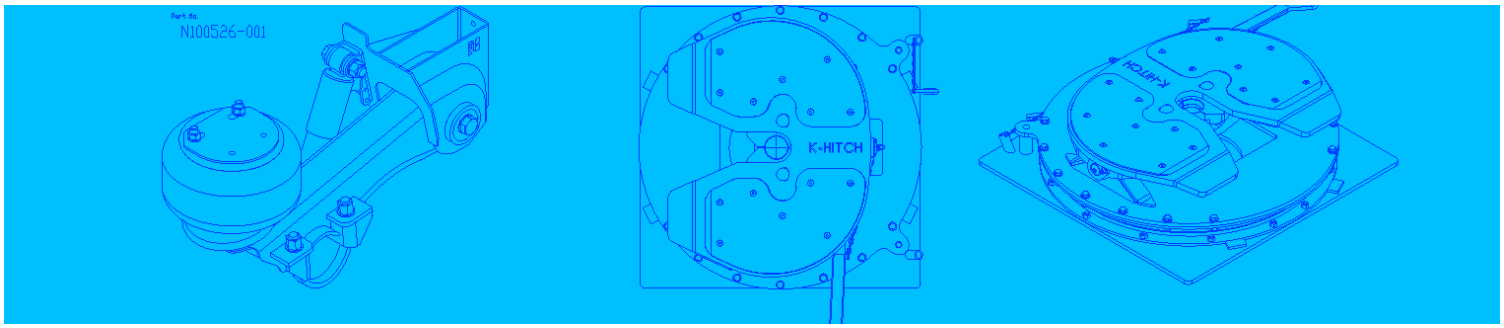


Figure 63: Checking Wheel End Components for Air Leaks



4.1 – Control Box Pressure Check

NOTE: For correct adjustment of the control box pressure make sure that the air supply of the trailer is a minimum of 137.90 kPa *(20 psi)* above the target tyre pressure.

NOTE: Use a test set consisting of a calibrated pressure gauge, a fitting or tubing to attach to the control box and valve to bleed off pressure. See Figure 64 below.

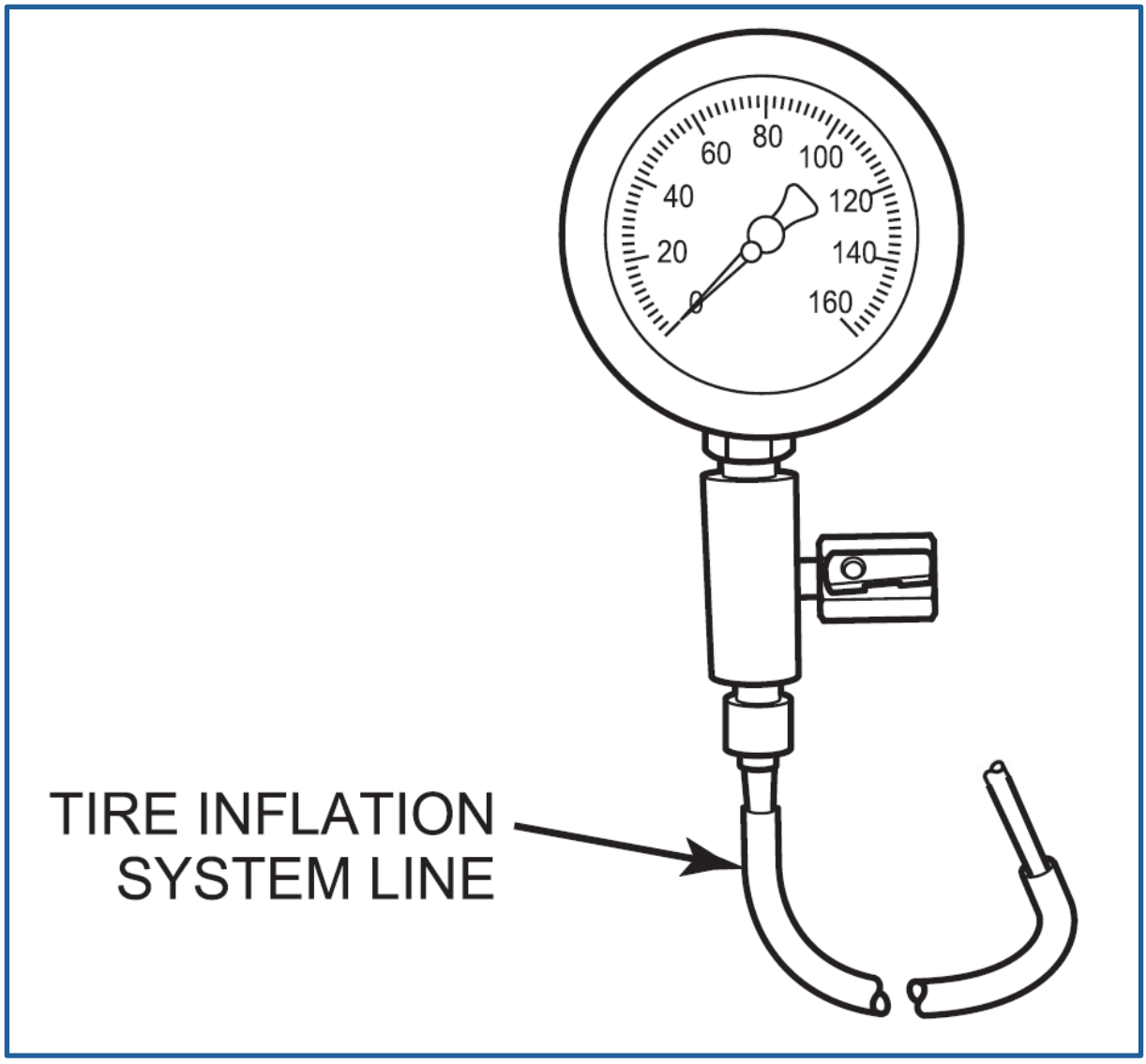
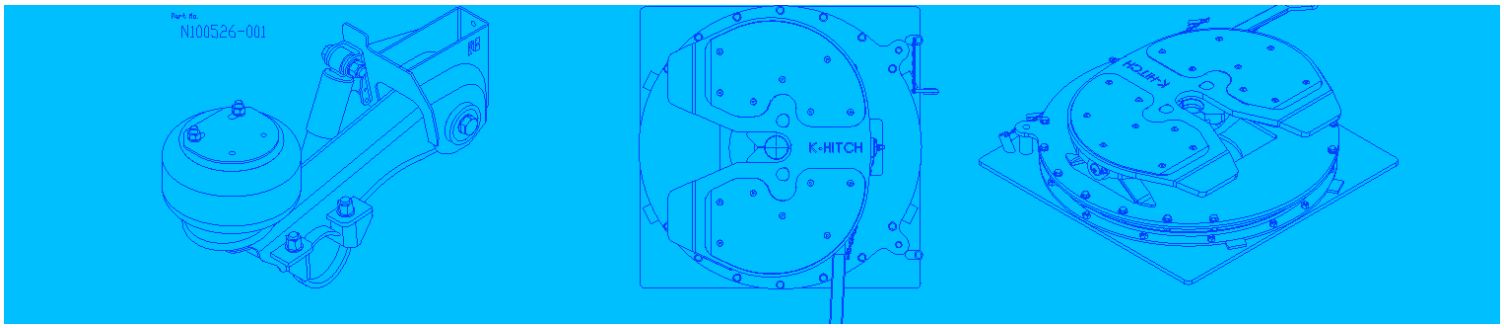


Figure 64: System Pressure Test Gauge Setup



Turn the system On/Off valve to the **CLOSED** position. See Figure 55.

Open the maintenance drain valve to deplete all air pressure from the system then **close** the maintenance drain valve. See Figure 55.

Remove the outlet air supply line from the fitting on the air pressure outlet side of the control box.

Connect the system pressure test gauge to the outlet air supply fitting ensuring the bleed-off valve is in the **closed** position. See Figure 65 below.

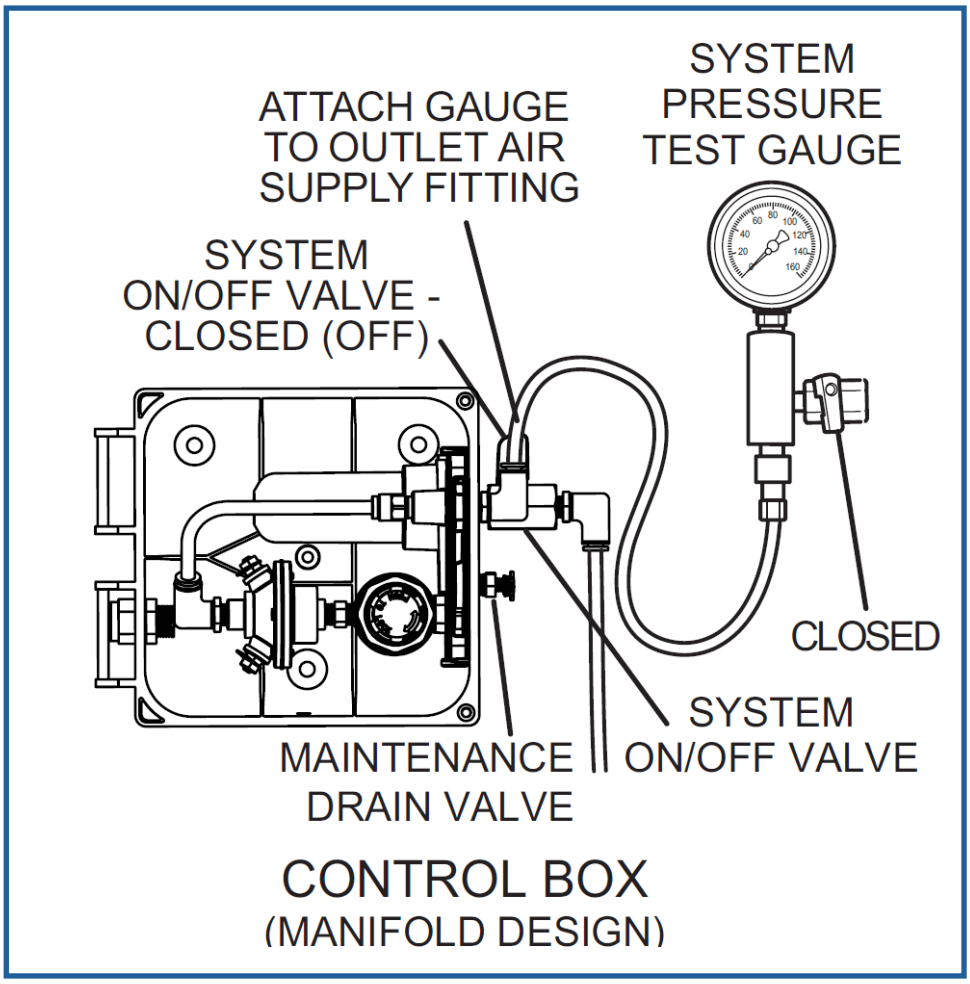
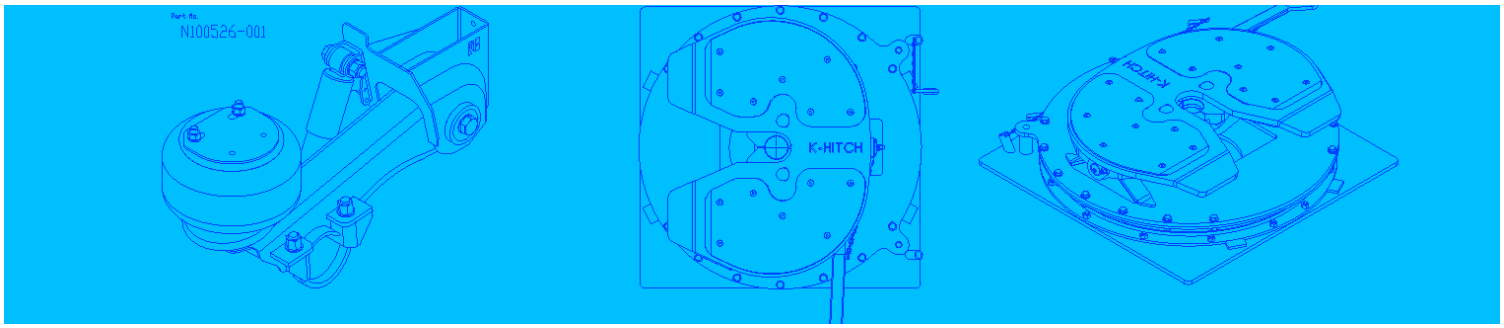


Figure 65: Connecting System Pressure Test Gauge

Turn the system On/Off valve to the **ON** position to charge the control box system.

Confirm the pressure setting on the gauge is approximately 20 kPa *(3 psi)* above the target tyre pressure.



Turn the system On/Off valve to the **CLOSED** position.

Open the system pressure test gauge bleed-off valve to relieve the pressure.

Disconnect the system pressure test gauge.

Connect the outlet air supply line.

Close the Control box door and screw shut.

Turn the system On/Off valve to the **ON** position. See Figure 66 below.

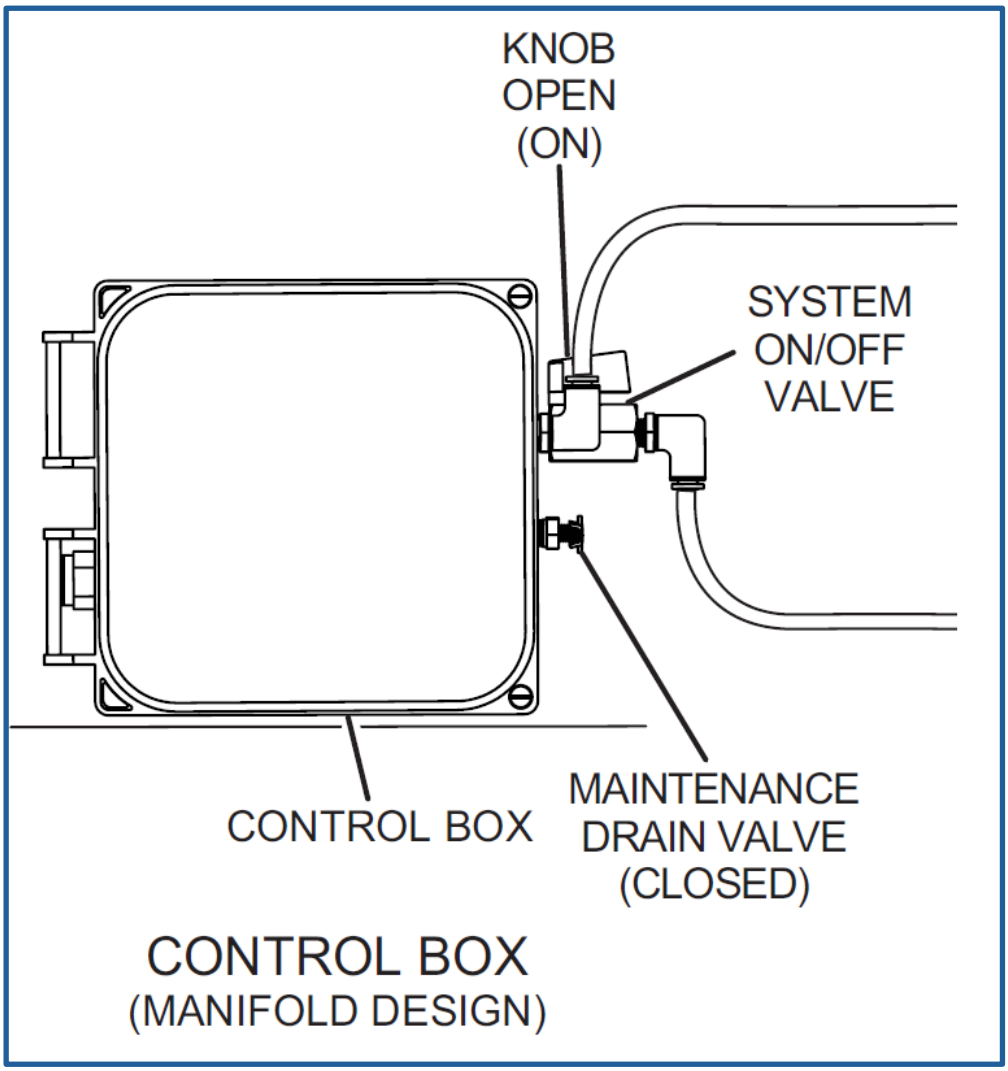
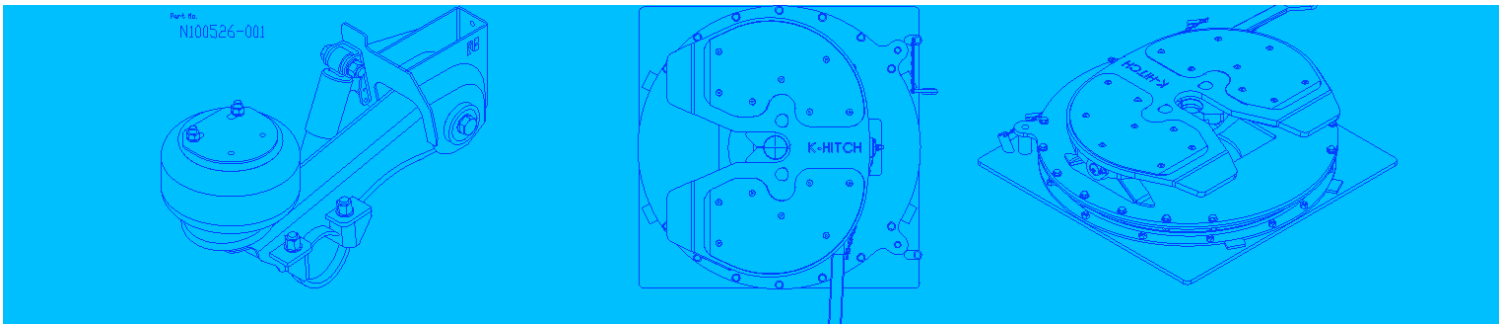


Figure 66: Control Box Set to Serviceable

The system is now checked and confirmed operational.



4.2 – Control Box Pressure Adjustment Instructions

NOTE: During the adjustment process the test gauge needle should react simultaneously to the regulator knob movement. If you go beyond the desired target pressure, the pressure must be returned to approximately 413.7 kPa *(60 psi)*, then increased slowly until the desired target pressure has been reached.

Pull outward to unlock the regulator knob until a slight click is felt and heard. See Figure 67 below.

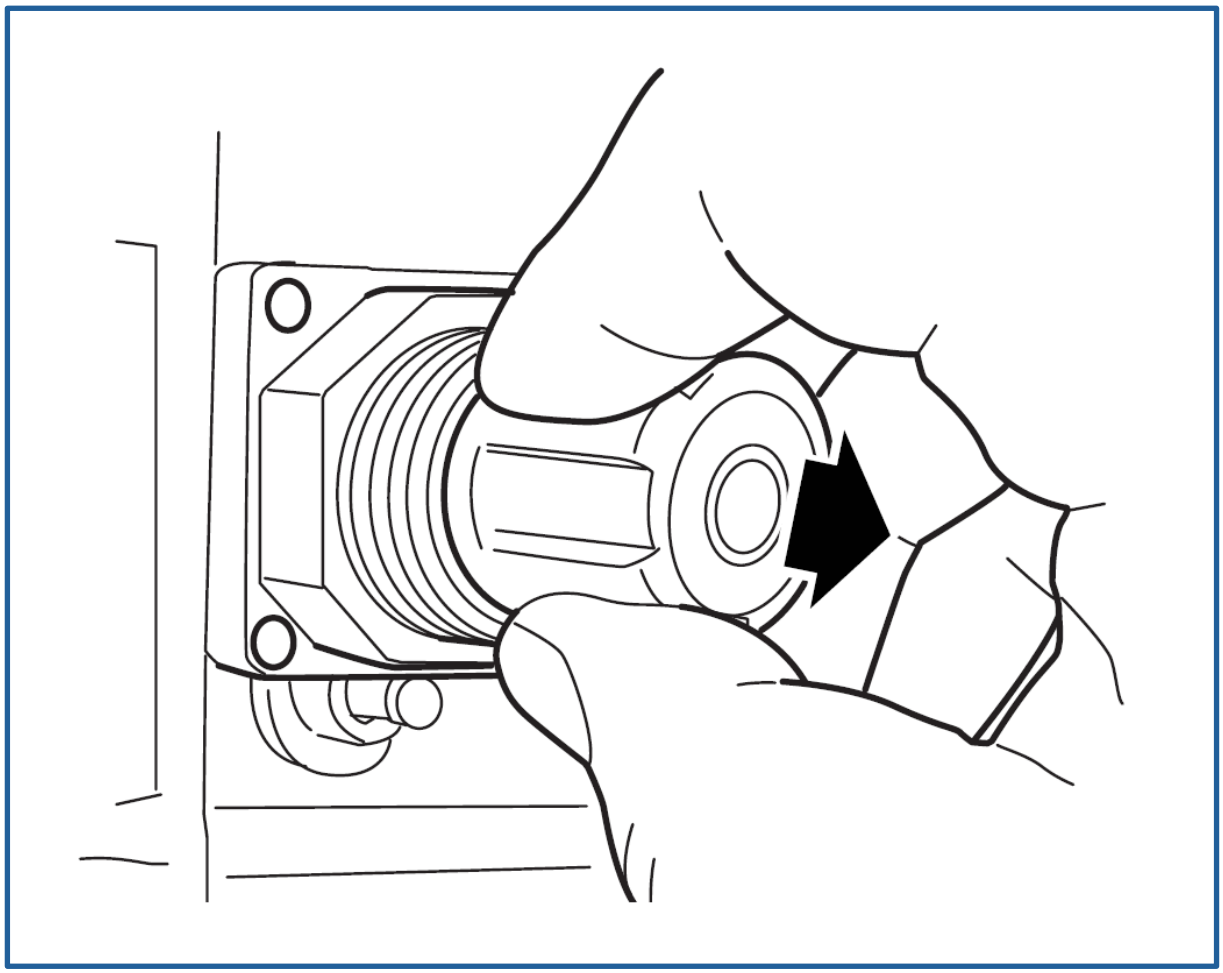
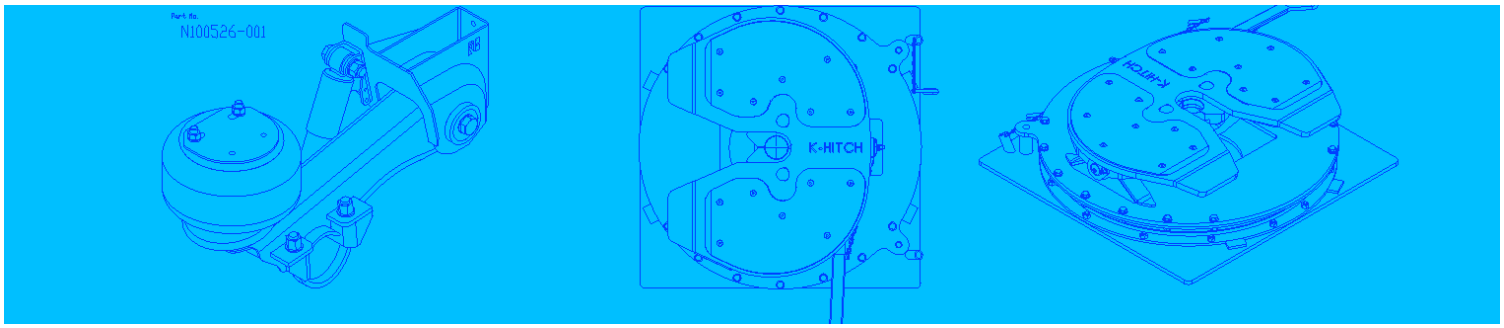


Figure 67: Pressure Regulator Adjuster Unlocking

Turn the regulator knob counter-clockwise until the pressure on the system pressure test gauge decreases to approximately 413.7 kPa *(60 psi)*.



Increase the pressure slowly by turning the regulator knob clockwise until the system pressure test gauge has reached 20.7 kPa *(3 psi)* above the desired target tyre pressure.

Push the regulator knob inward until a slight click is felt and heard indicating it is locked.

CYCLE the regulator and bleed the system pressure test gauge as follows:

a. **Close** the system On/Off valve.

b. **Open** the bleed-off valve to relieve the pressure. See Figure 68 below.

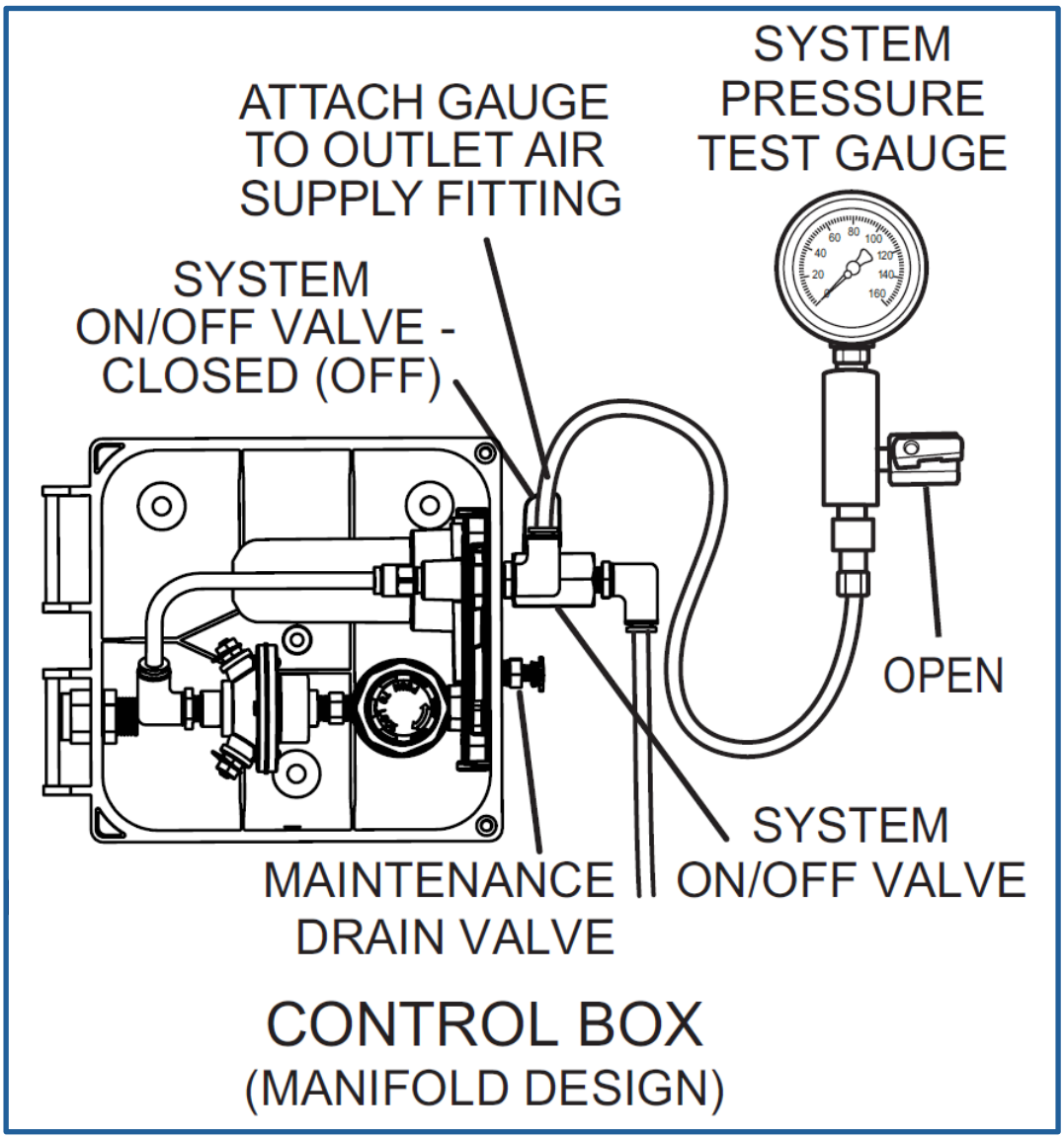
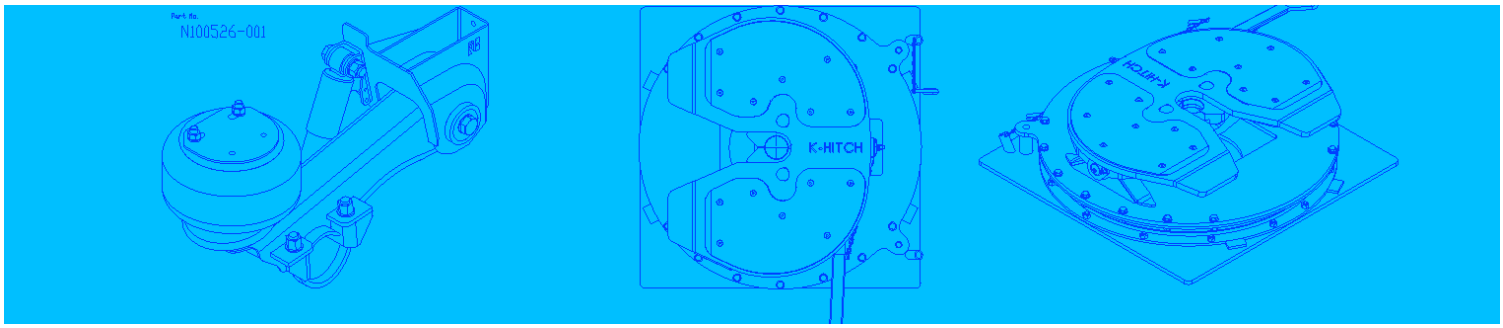


Figure 68: Control Box Pressure Cycle Test - Bleed



Charge the system pressure test gauge as follows:

a. **Close** the system On/Off valve.

b. **Open** the bleed-off valve to relieve the pressure. See Figure 69 below.

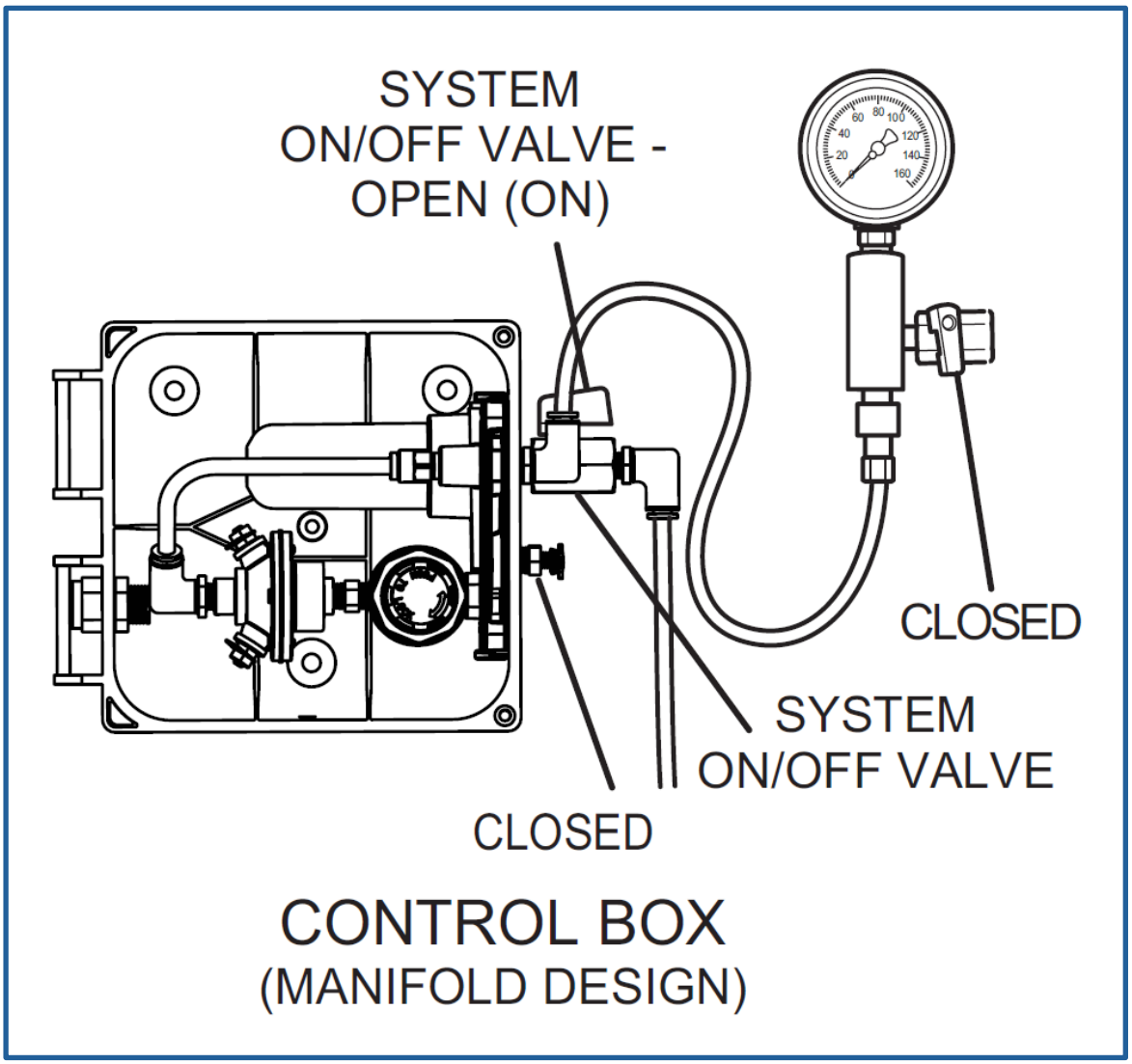
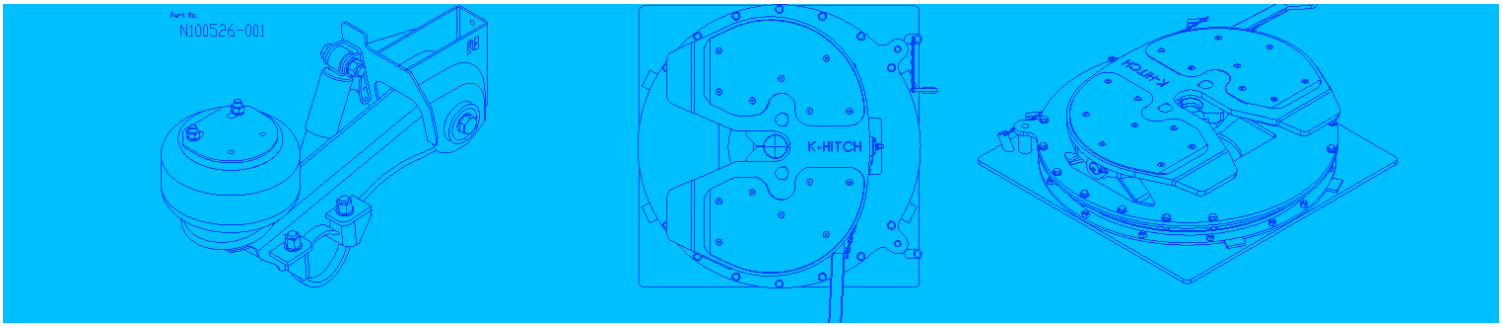


Figure 69: Control Box Pressure Cycle Test - Pressurise

Observe the system pressure test gauge needle during the cycling process.

NOTE: The test gauge needle should **NOT** move sluggishly towards the target pressure setting and should **NOT** go past the target pressure.



Repeat the pressure cycling process for a minimum of **two** more cycles. The system pressure test gauge pressure reading reaching the target pressure each time.

Turn the system On/Off valve to the **OFF** position.

Open the system pressure test gauge bleed-off valve to relieve the pressure.

Disconnect the system pressure test gauge.

Connect the outlet air supply line

Turn the system On/Off valve to the **ON** position.

Ensure that all tyre pressures are reduced 34.5 -69.0 kPa *(5-10 psi)* below the target tyre pressure.

Install a decal inside the control box lid to record the tyre pressure change and date of change. See Figure 70 below.

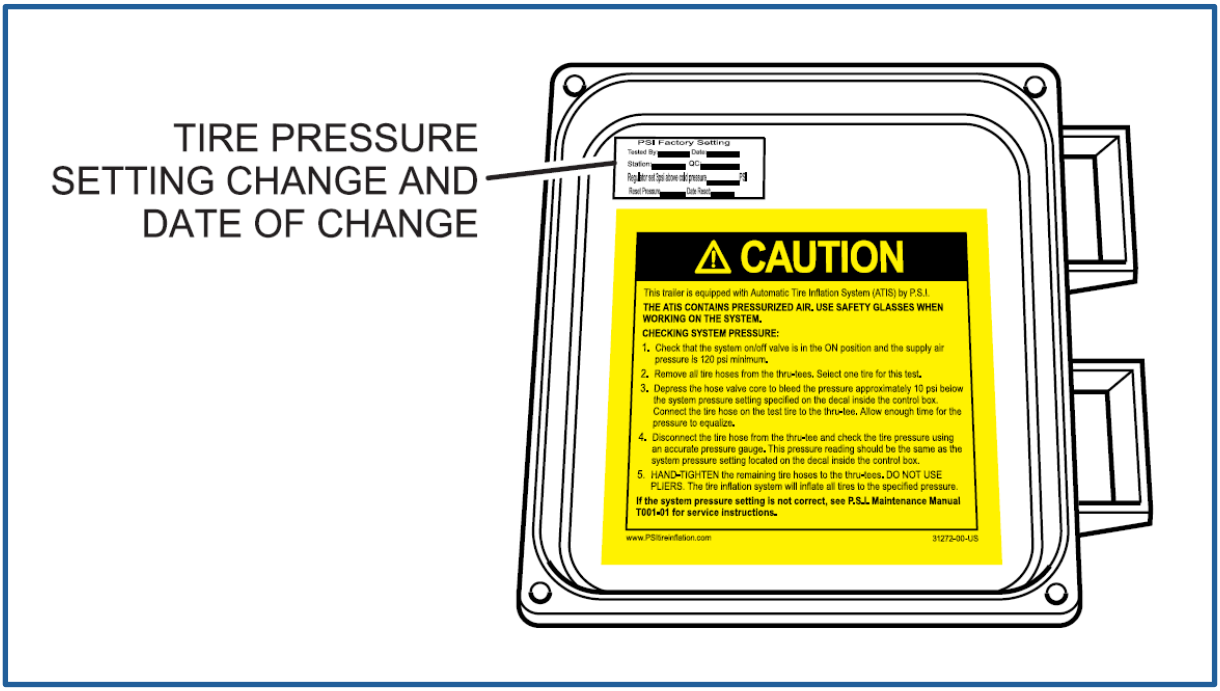
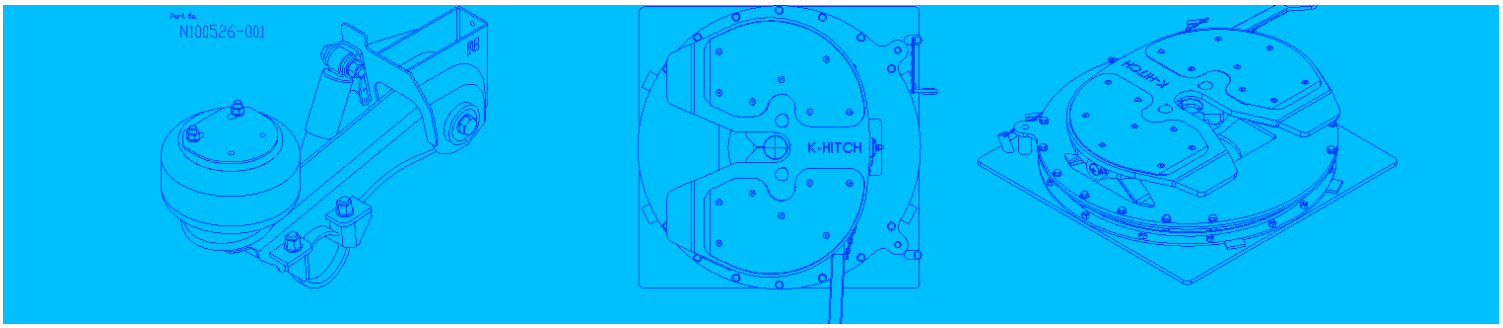


Figure 70: Tyre Pressure Decal - Inside Control Box Lid

Close the control box lid and tighten the screws. The ATIS system is now in a serviceable configuration again with the adjusted operating tyre pressure.



4.3 – System Leak Rate Test

All pneumatic systems on commercial vehicles such as brake systems, controls and so on, have allowable leak rates. When the system is isolated from all other trailer pneumatic components the allowable leak rate is as follows:

- A 6.9 kPa *(1 psi)* drop in system pressure over one-minute is acceptable.
- A pressure loss greater than 6.9 kPa *(1 psi)* in one minute is not acceptable.

The following is the step-by-step procedure to carry out an ATIS system leak rate test.

Disconnect all tyre hoses from the Thru-Tees.

Turn the system On/Off valve at the control box assembly to the **CLOSED** position.

Open the maintenance drain valve to deplete all pressure from the system then **close** the valve.

Install a ¼" air line fitting tee and a small section of ¼" air line to the control box outlet port. See Figure 71 below.

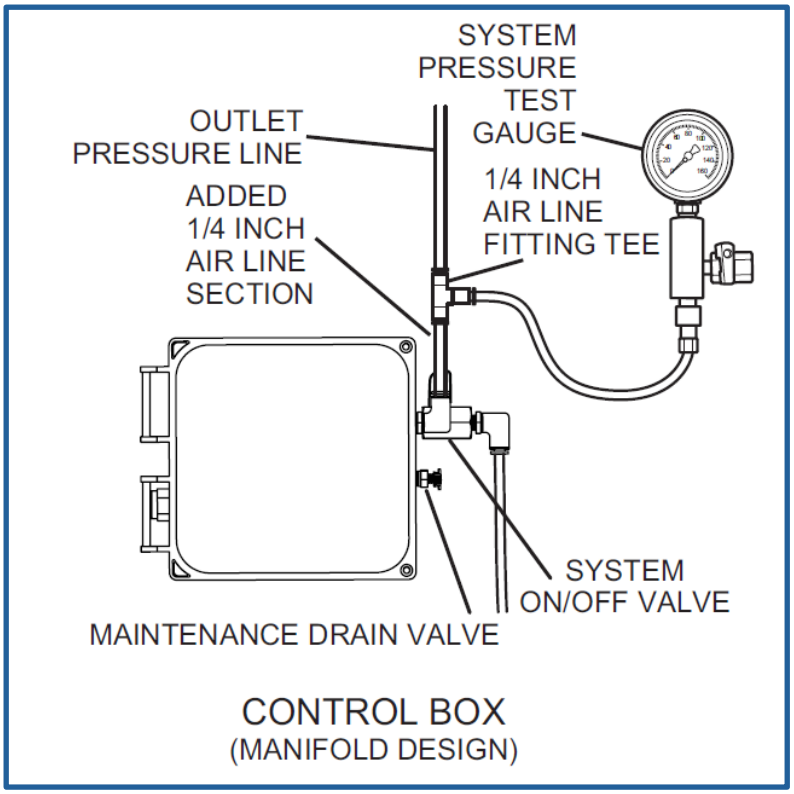
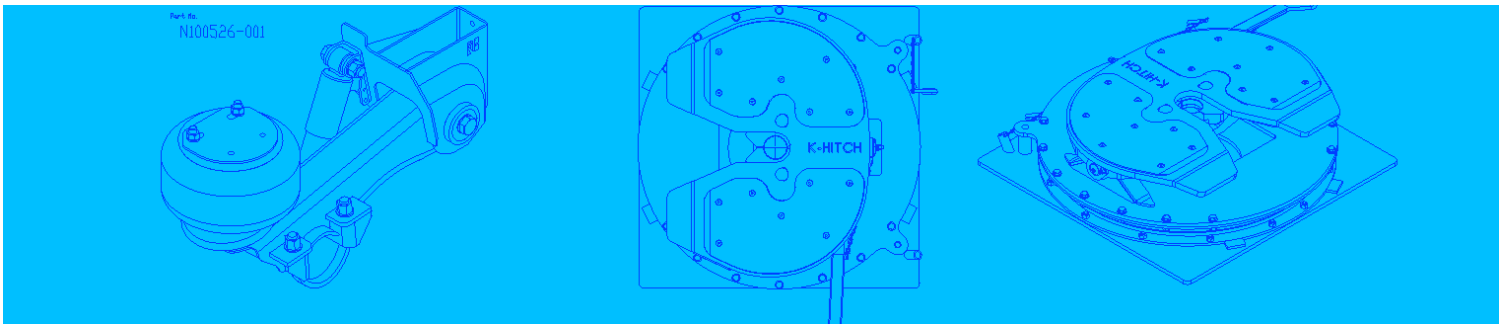


Figure 71: Control Box Leak Test



Install a system pressure test gauge to the ¼” air line fitting tee. See Figure 71 above.

Turn the system On/Off valve to the **OPEN** position and fully charge the system.

Turn the system On/Off valve to the **CLOSED** position.

Record the pressure drop at the system pressure test gauge over one minute.

If the pressure drop is less than 6.9 kPa *(1 psi)* over one minute then the system is acceptable. If the pressure drop is greater than 6.9 kPa *(1 psi)* over one minute then the source of the leak needs to be identified and rectified.

Apply a non-corrosive leak detecting solution to all the tyre inflation system fittings outside the control box and check for leaks if the pressure drop exceeds the acceptable leak rate.

NOTE: It is not necessary to use leak detecting solution on any of the internal control box assembly components. All control box assemblies are tested 100% by the manufacturer. Contact your FUWA K-Hitch supplier if leaks are suspected in the control box.

Look for bubbling and listen for audible air leaks.

Tighten or replace fittings that leak.

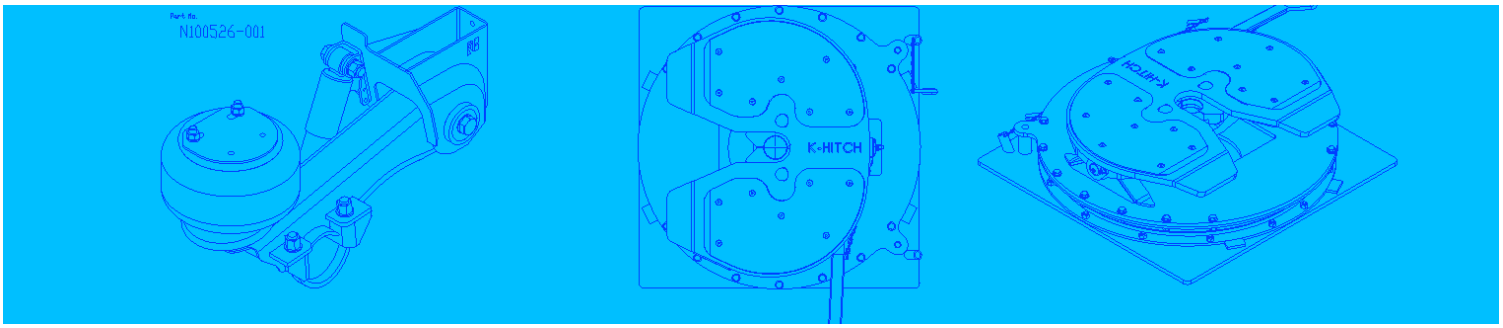
Drain the system at the system pressure test gauge bleed-off valve.

Remove the system pressure test gauge, the ¼” airline fitting tee and the small section of ¼” airline.

Reinstall the air supply line to the outlet on the control box.

Turn the system On/Off valve to the **ON** position.

Reconnect all tyre hoses from the Thru-Tees.



5.0 – SYSTEM INSPECTION AND MAINTENANCE

WARNING: EYE PROTECTION MUST BE WORN WHEN PERFORMING VEHICLE MAINTENANCE OR SERVICE. EYE INJURY OR DAMAGE CAN OCCUR. GET MEDICAL ATTENTION IMMEDIATELY.

NOTE: Installation of a ThermALERT ™ system does not eliminate the need to perform recommended wheel-end maintenance. Inspect the tyre inflation system components for correct operation.

The tyre inflation system inspection intervals vary due to the environment, mileage and loading. For example, light-duty applications require extended inspection intervals. Container chassis service is a light-duty application because it usually involves an on-highway environment and low mileage. Heavy-duty applications require reduced inspection intervals. Dump trailer servicing is regarded as a heavy-duty application because it usually involves an off-highway environment and heavy loads.

5.1 – General Inspections

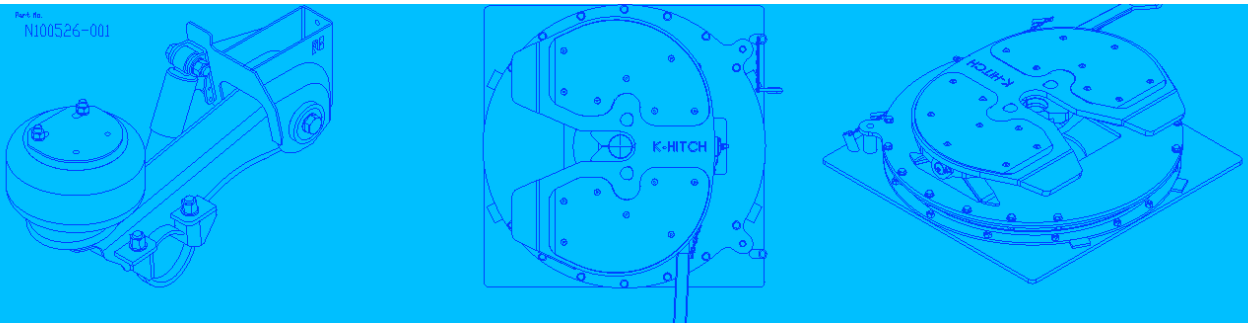
Inspect the tyre inflation system wheel-end components whenever a tyre is removed.

The control box pressure setting must be inspected and adjusted. if necessary after the initial 6 months of service.

Inspect the control box pressure setting every 6-12 months of normal operation.

Inspect the following components for correct operation at the recommended inspection intervals:

- Indicator light
- Tyre hose check valves
- Tyre pressure
- Tyre hose-to-wheel interference
- Tyre hose-to-valve stem connections
- All air fitting connections from the pressure protection valve (PPV) to the axle air fitting
- Hubcap relief valves
- Particulate filter. See Figure 72 below.



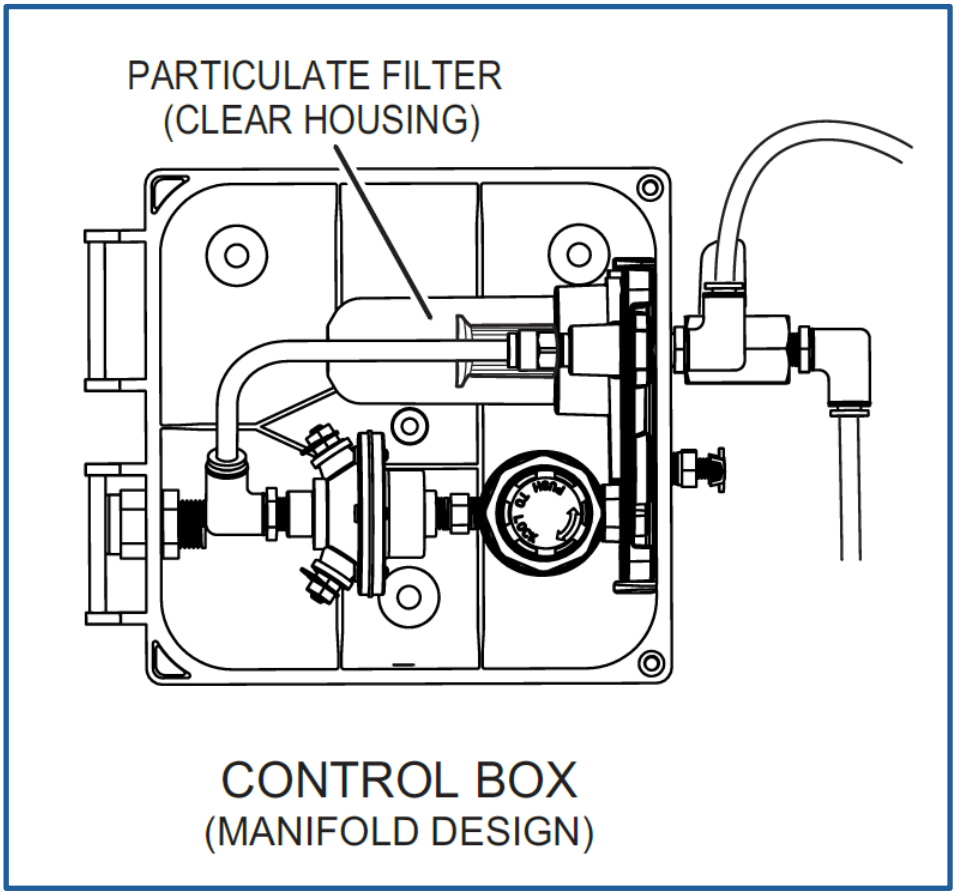


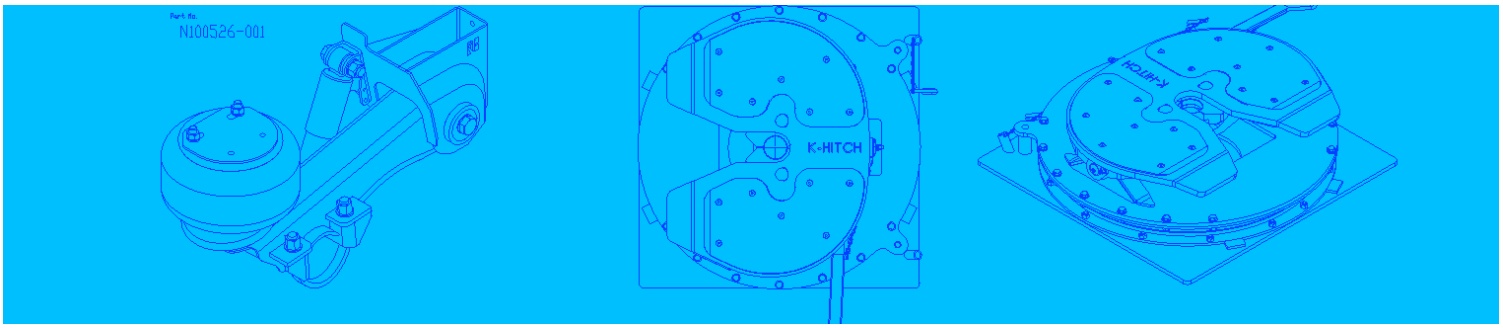
Figure 72: Particulate Filter Location

5.1.1 – System Inspection Intervals

Light-duty Service Inspection: Inspect the tyre inflation system every 160,000 km *(100,000 miles)* or 12 months, whichever comes first.

Standard-duty Service Inspection: Inspect the tyre inflation system every 160,000 km *(100,000 miles)* or 12 months, whichever comes first.

5.1.4 Heavy-duty Service Inspection: Inspect the tyre inflation system every 120,000 km *(50,000 miles)* or six months, whichever comes first.



5.2 – System Component Inspections

5.2.1 – Indicator Light Inspection

During initial system charging, the indicator light will come ON and remain ON for up to 10 minutes depending on the system pressure setting and other vehicle air requirements.

If the indicator light remains ON for more than 10 minutes during initial system charging, troubleshoot the system and tyres.

Inspect the tyres and system components for leaks if the indicator light comes ON during system operation.

The indicator light illumination can be caused by one or more of the following conditions:

- Damaged inflation system components
- The system unable to keep up with a leaking tyre
- System is supplying air to one or more tyres that is below the cold pressure setting
- A ThermALERT™ activation

5.2.2 – Tyre Pressure Inspection Check

Although the system can charge a leaking tyre during vehicle operation, P.S.I.™ recommends inspecting the tyres for wear and damage at regular intervals and check tyre pressure at regular intervals as follows:

Remove the tyre hose at the Thru-tee fitting. See Figure 73 below.

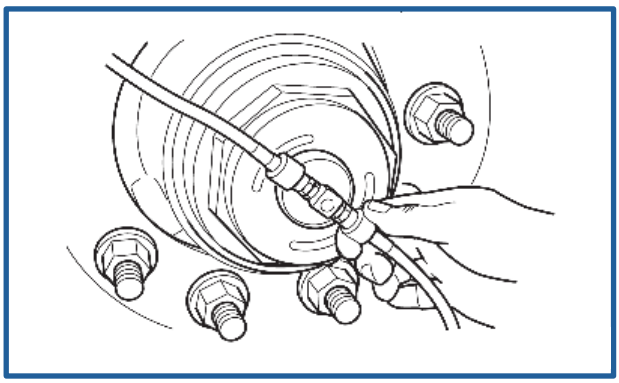
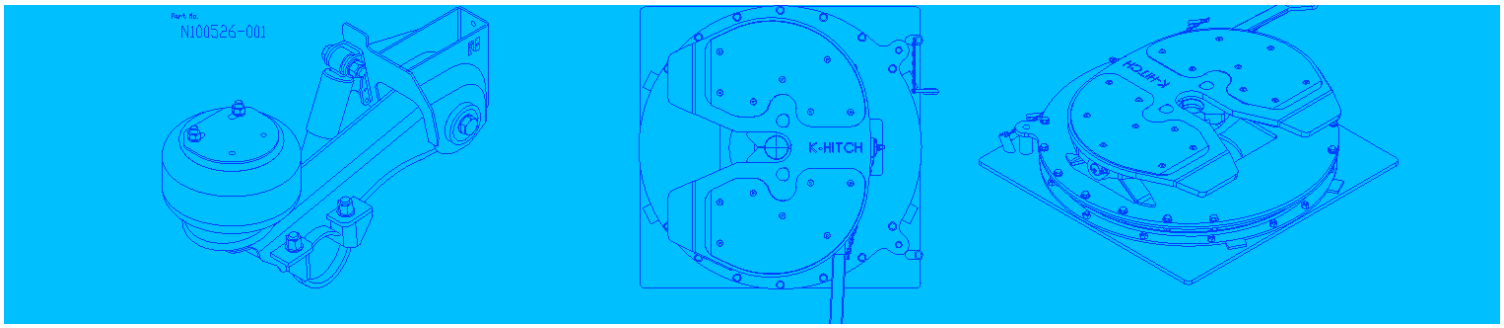


Figure 73: Remove Tyre Air Hose From Thru-Tee



Press the pressure gauge to the tyre hose and read the pressure. See Figure 74 below.

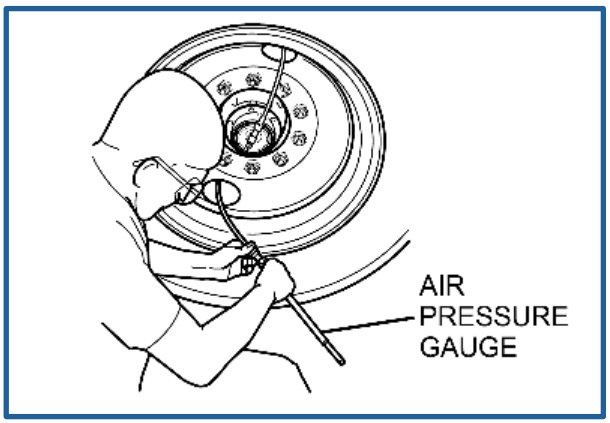


Figure 74: Use Pressure Gauge to Measure Tyre Pressure

Replace the tyre hose at the Thru-tee fitting. See Figure 73 above.

5.3 – Component Removal and Installation

5.3.1 – Turn the System Off

Turn the system On/Off valve to the **OFF** position.

Open the maintenance drain valve in order to bleed the pressure from the system. See Figure 75 below.

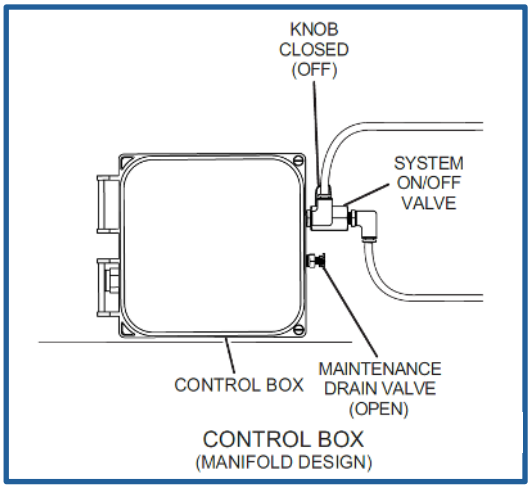
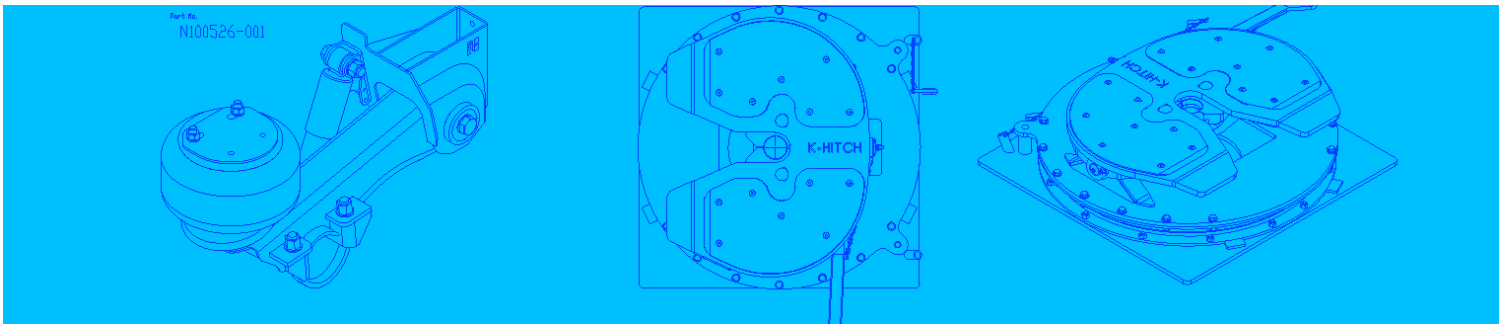


Figure 75: Turning System Off



5.3.2 – Removing and Installing Tyres

Caution: You must follow the manufacturer's instructions, company procedure and safety policy if it is necessary to remove or install a tyre for any reason.

Caution: a wheel dolly must be used when the tyres are removed or installed. damage to the thru-tee fitting can occur if assembly is not pulled straight off the wheel hub.

During the wheel and tyre installation onto the wheel hub, ensure the following:

- Confirm that the thru-tee fittings point toward the valve stem see Figure 76 below.
- Reduce tyre pressure 34.5-69.0 kPa *(5-10 psi)* below the cold tyre pressure setting.
- Re-install system tyre hoses and check for leaks.

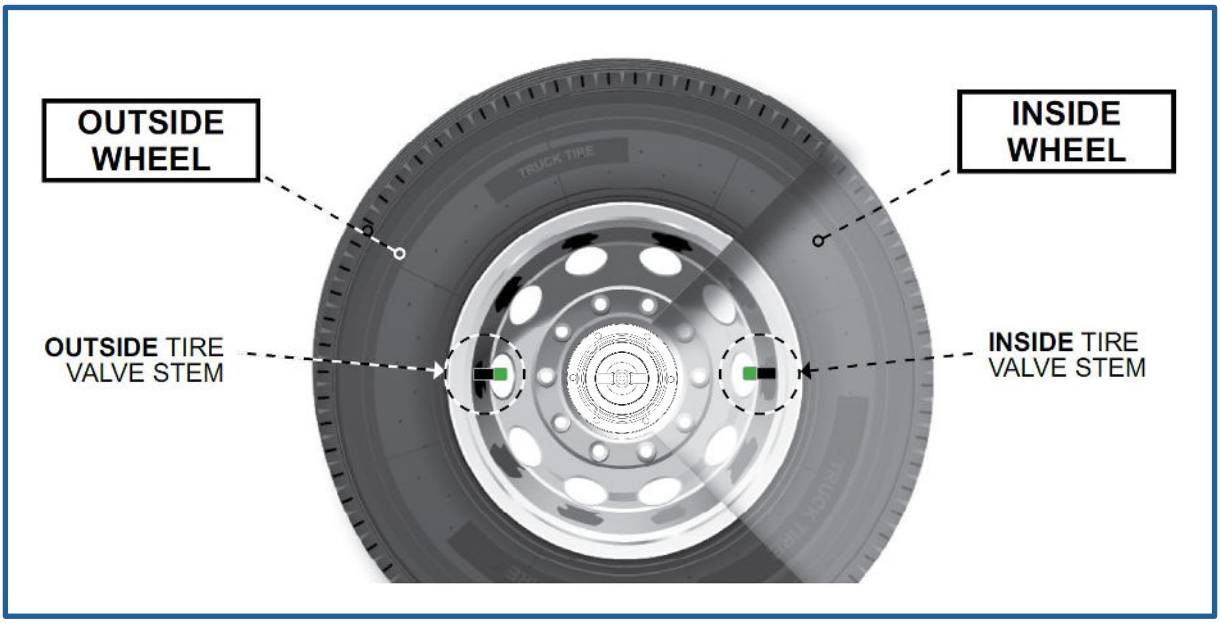
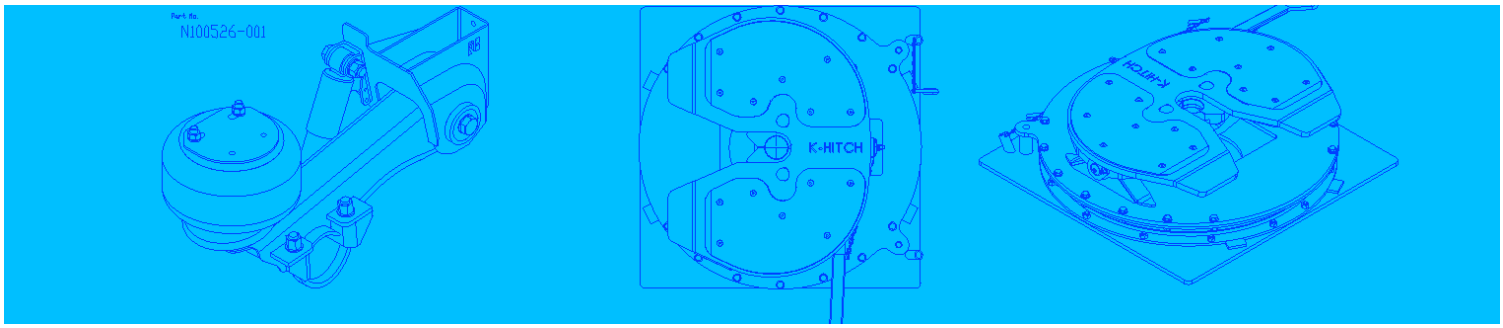


Figure 76: Tyre Valve Orientation

5.3.3 – Removing and Installing the Thermal Screw

WARNING: DO NOT OPERATE THE VEHICLE IF THE THERMALERT™ SYSTEM ACTIVATES. FIND A SAFE PLACE TO BRING THE TRACTOR AND TRAILER TO A COMPLETE STOP TO PREVENT PERSONAL INJURY OR DAMAGE TO THE VEHICLE. DO NOT IGNORE THE INDICATOR LIGHT.



WARNING: THERMAL SCREWS ARE NOT REUSABLE. ALWAYS INSTALL A NEW THERMAL SCREW. PERSONAL INJURY OR DAMAGE TO COMPONENTS CAN OCCUR.

Use a 5/32” Allen wrench to remove the activated thermal screw. See Figure 77 below.

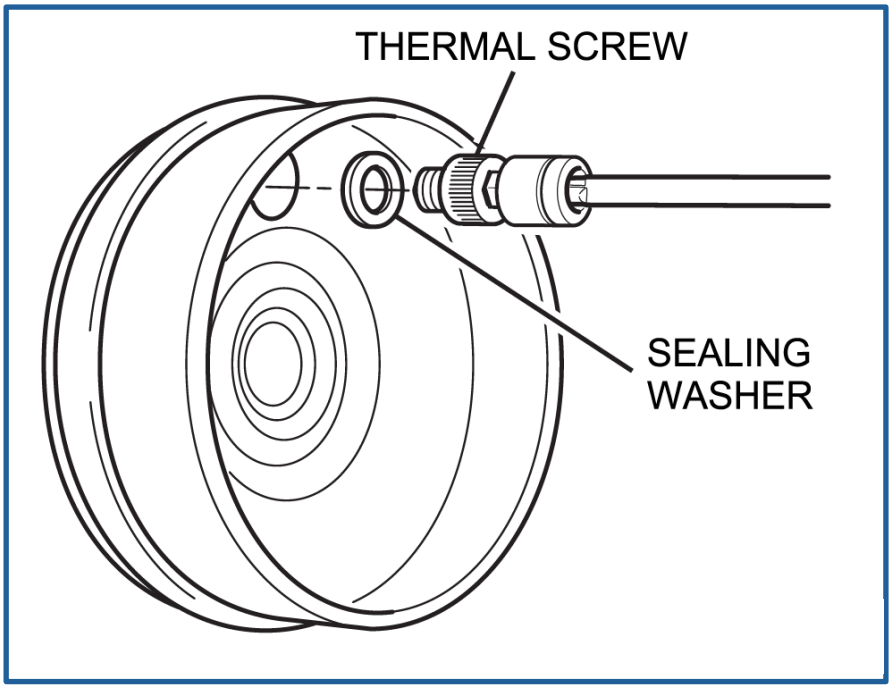


Figure 77: Thermal Screw Installation

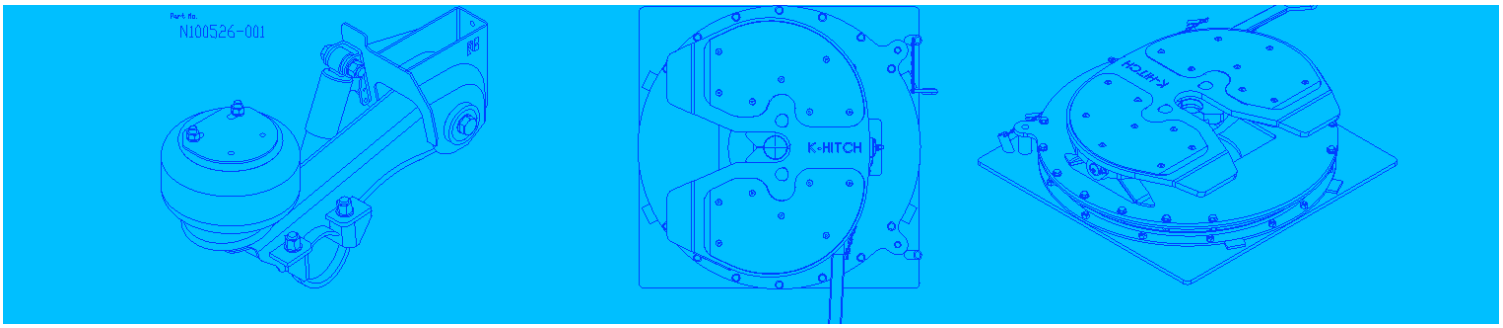
Remove the sealing washer.

Inspect the sealing surface in the spindle plug for unwanted material and debris.

Install a new sealing washer on a new thermal screw.

Install the thermal screw into the axle plug.

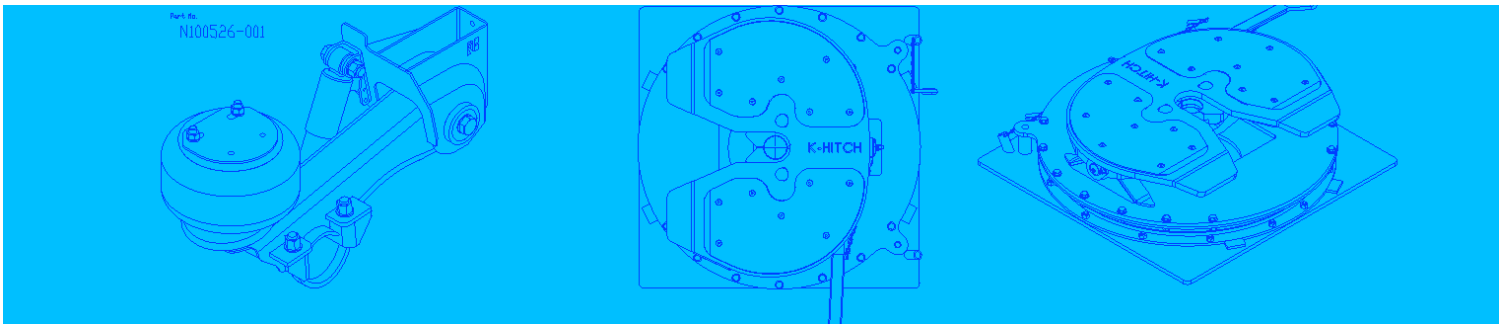
Torque the thermal screw to 2.82-3.39 Nm (2.08 ft-lbs to 2.5 ft-lbs).



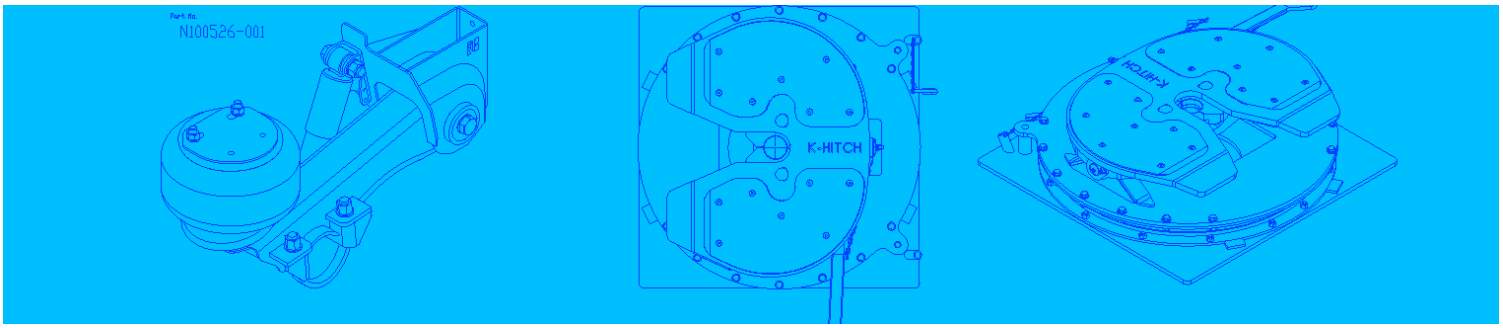
6.0 - SYSTEM TROUBLESHOOTING

Table 5: System Troubleshooting Table

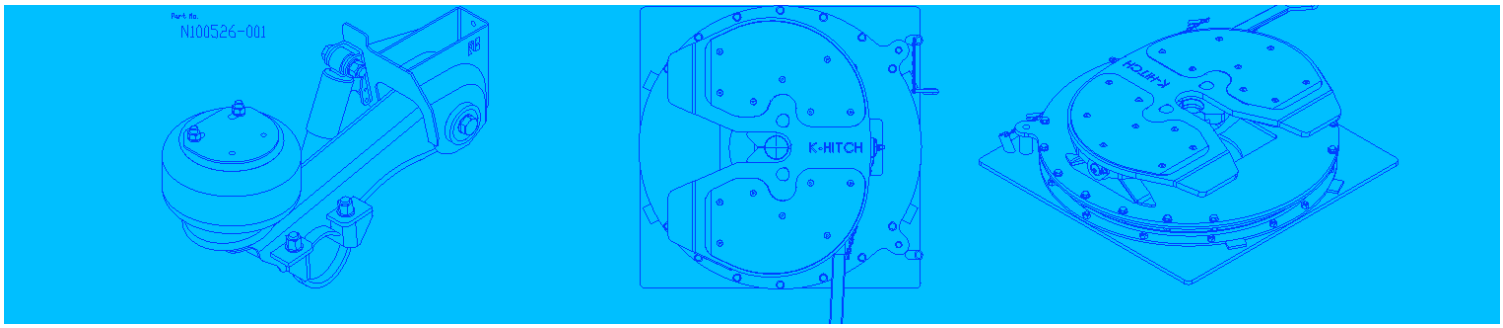
ISSUE	POSSIBLE CAUSE	CORRECTIVE ACTION
The indicator light is ON.	The system is delivering air during initial system charging.	The system is functioning correctly.
	The system is delivering air to a leaking tyre.	Repair the tyre.
	The system is delivering air to a leaking system component.	Replace the system component.
	The system is delivering air to a cracked axle.	Replace the axle.
	The system wiring is incorrect.	Correct the system wiring.
The indicator light is ON and air is leaking from the wheel-end Thru-tee fitting.	The trailer is equipped with ThermALERT™ system and the wheel-end is hot.	The system is functioning correctly. Repair and replace wheel-end components.
	The system is delivering air to a leaking system component.	Replace the system component.
	The Thru-tee fitting is leaking.	Replace the Thru-tee fitting.
	The stator seal is leaking.	Replace the stator.
	The stator threads are leaking.	Seal the stator threads.
	The axle press plug is leaking.	Replace the axle press plug.



The indicator light is OFF during system operation with air flowing through the control box.	The trailer is not supplied with 12/24 VDC electrical power.	Supply 12/24 VDC electrical power to the trailer.
	The indicator light is inoperative.	Replace the indicator light.
	The flow sensing switch is inoperative.	Replace the flow sensing switch.
	The system wiring is damaged.	Repair the system wiring.
	The system wiring is incorrect.	Correct the system wiring.
	The system air line routing is incorrect.	Check that the system “IN” and “OUT” air line routing at the Control Box is not reversed.
The indicator light is OFF during system operation and air is leaking from the wheel-end Thru-Tee fitting.	The trailer is equipped with ThermALERT™ system. The wheel-end is hot and the control box has an incorrect flow switch.	Repair and replace the wheel-end components. Replace the flow switch in the control box with a grey colour flow switch.
Air is leaking from the wheel-end Thru-tee fitting.	The Thru-tee fitting is leaking.	Replace the Thru-tee fitting.
	The stator seal is leaking.	Replace the stator.
	The stator threads are leaking.	Seal the stator threads.
	The axle press plug is leaking.	Replace the axle press plug.
Tyre pressure is low.	The shut-off valve is off.	Turn on the shut-off valve.
	The system pressure setting is too low.	Increase the system pressure setting.
	The incorrect valve cores are installed.	Replace the valve cores with the P.S.I.® original equipment.



Lubricant is leaking from the wheel-end vent.	The wheel-end is overfilled with lubricant.	Fill the wheel-end to the correct level.
	A hubcap without vent extensions is installed onto an oil-lubricated wheel-end.	Install a hubcap with vent extensions.
	The thru-tee fitting is leaking.	Replace the Thru-tee fitting.
	The stator seal is leaking.	Replace the stator.
	The stator threads are leaking.	Seal the stator threads.
	The axle press plug is leaking.	Replace the axle press plug.
Tyre pressure is high.	The tyre is manually over inflated.	Reduce the tyre pressure. The system will inflate to the correct level.
	The system pressure setting is too high.	Lower the system pressure setting.
The trailer tyre deflates when parked.	The system hose or tyre valve stem is leaking.	Correctly tighten the connection or replace the seals.
	The hose valve core is leaking.	Clean or replace the hose valve core.
	The tyre is leaking.	Repair the tyre.
The tyre is slow to inflate or no air flows to the tyre.	The hose connection to the valve stem may have been overtightened, blocking air flow.	Correctly tighten the connection or replace the hose or seal if it is damaged.



7.0 - TORQUE SETTINGS

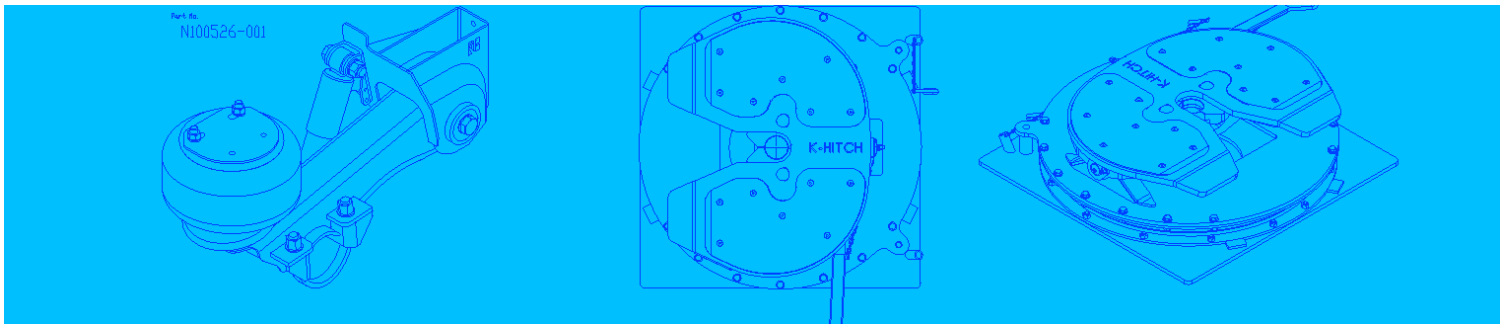
This is not an exhaustive list of torque specifications. If different fasteners are used, please use the torque recommendation from that supplier.

All torque settings are dry with surface finishes as supplied.

Ensure the correct torque type is used i.e.... Metric, Nm or Imperial ft-lbs.

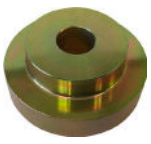
Table 6:Recommended Torque Settings

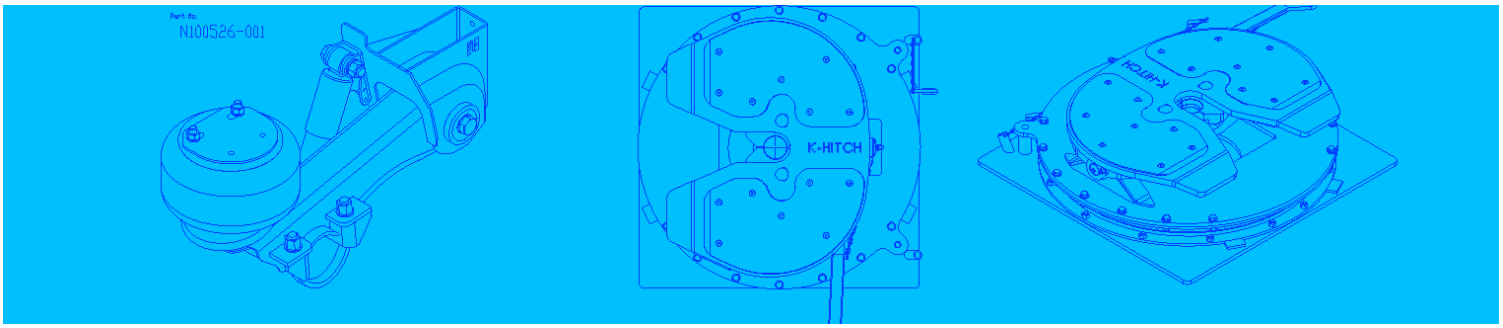
ATIS Installation Torque Settings				
Item	**Description**	**Fastener**	**Torque Setting Nm**	**Torque Setting ft-lbs**
Wheel Nut	Fasten wheel rim to hub	M22x1.5	610 - 680	450 - 500
Wheel Nut	Fasten wheel rim to hub	M24x1.5	820 - 900	605 - 665
Hub Cap	Fastens the hub cap to the hub	M8 or 5/16	16 - 22	12 - 16
Hub Cap	Fastens the hub cap to the hub	61/4" x 8 TPI	70 - 100	51 - 74
Inlet Fitting	Air inlet fitting into axle	1/8 - 27 NPT	31 - 38	23 - 28
Stator	Air fitting in spindle plug	1/8 - 27 NPT	31 - 38	23 - 28
Thru-Tee	Air fitting in hub cap	1/8 BSPF	6.2	4.6
Hose Fitting	Tyre inflation to Thru-Tee & Tyre Valve	9/16 CEI	1/2 Turn, from first contact	
Mounting Bolts	Mounts bracket to chassis	5/16 UNC	23	17
Mounting Bolts	Mounts Control Box to bracket	1/4 UNC	11	8
Thermal Screw	eutectic screw in axle press plug	N/A	2.82 – 3.39	2.08 – 2.50



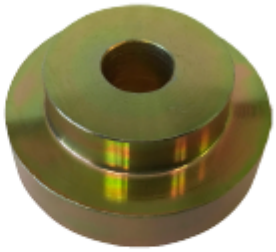
8.0 - SPARE PARTS AND ACCESSORIES

These tools are not stocked by FUWA K-Hitch but may be ordered by indent with a suitable order quantity. Please contact your FUWA K-Hitch supplier for further information.

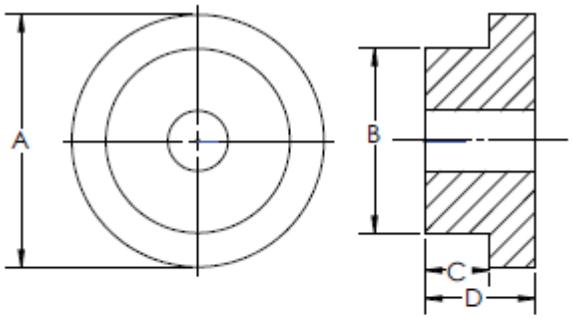
Part Number	Description	Image
51032-00	System Pressure Test Gauge	
81044-00	Slide Hammer Kit • Used to remove axle plugs, press plugs • Includes 81044-01 Removal Spear • Includes 81044-02 Plug Remover	
81044-01	Spindle Plug Removal Spear • Used on 81044-00	
81044-02	Press Plug Remover • Used on 81044-00	
51011-10	Drive Handle • Used on press plug installation • Includes O-ring (size -111)	
51032-10	Valve Core Installation Tool • Myers 27144 or equivalent • Preset @ 4 in. lb.	
51032-20	Thru-tee Installation Socket • 3/8” drive	
51011-01 to 51011-21	Sample Driver Head • See Next Page	



NOTE: The following driver heads are used with drive handle 51011-10.



Example Driver Head Shown



			DRIVER HEAD DIMENSIONS (inches)			
	PART NUMBER	DRIVER HEAD APPLICATION	"A"	"B"	"C"	"D"
	51011-01	Holland ProPar	3.25	2.40	0.62	1.00
	51011-02	Meritor TN/TQ, Hendrickson HN, SAF, Dana/ Eaton D22, Ingersoll F22 (starting Aug. 2017)	2.50	1.51	0.50	1.00
	51011-03	Sudisa 12-R	2.75	2.00	0.60	1.00
	51011-04	Sudisa 11-M	2.50	1.26	0.57	1.00
	51011-05	Holland TransTrade	2.50	1.69	0.44	1.00
	51011-06	Meritor TP/TB, SAF, Hendrickson HP (after 2002) (w/out cotter pin holes)	3.25	2.51	0.49	1.00
Parallel	51011-07	Meritor WP, SAF, AXN, HDNABI, Ridewell, Hendrickson (w/cotter pin holes)	3.25	2.51	1.06	1.50
	51011-08	Ingersoll F22 (prior to Aug. 2017)	2.50	1.20	0.57	1.00
	51011-09	Sudisa 9-M	2.50	1.38	0.56	1.00
	51011-11	Hendrickson ProPar (2.50 inch bore)	3.25	2.19	0.56	1.00
	51011-13	Dana P22, Hendrickson HP (prior to 2002)	3.25	2.30	0.40	1.00
	51011-14	Meritor TB (2.95 inch, oversized bore)	3.25	2.68	0.45	1.00
	51011-15	Dana Modified P22	3.25	2.30	0.937	1.562
	51011-16	Meritor TL/LM (2.468 inch)	3.25	2.21	0.685	1.125
Tapered	51011-17	AXN, HDNABI, Ridewell N-series	2.50	1.51	0.625	1.00
	51011-18	AXN, HDNABI, Ridewell P-series (w/out cotter pin holes)	3.25	2.51	0.615	1.00
	51011-19	Meritor MTec6™ TP	3.25	2.642	1.125	1.625
	51011-20	Meritor MTec6™ TN	2.50	1.775	0.430	1.00
	51011-21	Valx 35mm	2.50	1.125	0.50	1.00