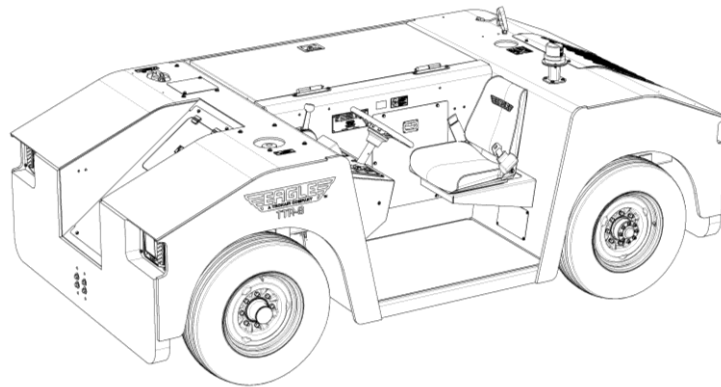




OPERATION & SERVICE MANUAL



**Model: TTR-12
Tow Tractors**

03/2023 – Rev. 13

**For Spare Parts, Operations & Service Manuals or Service Needs
Scan the QR code or visit Tronair.com/aftermarket**



REVISION	DATE	TEXT AFFECTED
01	02/2020	Original release
02	04/2020	Added 20.0 Features and Options
03	04/2020	Modified 6.1 Preventative Maintenance Schedule, 15.4 Side Engine Cover, and 15.5 Chassis Components
04	08/2020	Modified 20.12.2 Decking Option
05	10/2020	Modified 12.8 Electrical System
06	12/2020	Modified 14.7 Dash Panel Assembly
07	01/2021	Modified 14.7 Dash Panel Assembly, 21.0 Decals
08	03/2021	Modified 7.2 Ordering Spare/Service Parts, 12.8 Electrical System, 13.3 Fuel System, 17.0 Cooling System
09	03/2022	Modified 5.4.1 Starting the Unit, 5.5 Controls and Instrumentation, 12.0 Electrical, 13.0 Fuel, 14.0 Dash Panel, 20.4.2 Cap Option, Added 5.4.4 Safety Shutdown System, 7.3 Recommended Spare Parts List, 10.7 Dipstick
10	07/2022	Modified 10.6 Engine Assembly Parts List
11	10/2022	Modified 11.1 Manifold Sub
12	01/2023	Added 20.17 Plow Feature
13	03/2023	Modified 14.1 Sifter Sub



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From everyone at Eagle Tugs, we would like to say thank you for purchasing an Eagle TTR series tow tractor. We take a lot of pride in the quality of the products that we build, as well as, our continued customer service. Our goal is to build a long term relationship with our customers. We want you, the customer, to be 100% satisfied with your Eagle experience. To us, this means that your Eagle TTR series tractor is functionally superior to any other products you have used. This also means that your Eagle product is continually supported in a professional, timely manner.

WARNING!



Read this manual in its entirety before putting your Eagle tow tractor into service. This manual contains important safety instructions. Improper usage or a failure to follow the safety requirements listed in this manual could result in severe injury or death.

CALIFORNIA - Proposition 65 Warning

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm

1.0 PRODUCT INFORMATION

1.1 DESCRIPTION

This manual is designed as a reference guide to make the reader more familiar with the Eagle-specific components of the Eagle TTR series tow tractor models. This manual includes part numbers and descriptions to assist the reader in ordering component spare/service parts. The manual also outlines the Scheduled Maintenance Intervals recommended by Eagle in order to keep your vehicle running properly.

1.2 MODEL & SERIAL NUMBER

Reference nameplate on unit

1.3 MANUFACTURER

Eagle Tugs

1 Air Cargo Pkwy East
Swanton, Ohio 43558 USA

Telephone: (419) 866-6301 or 800-426-6301

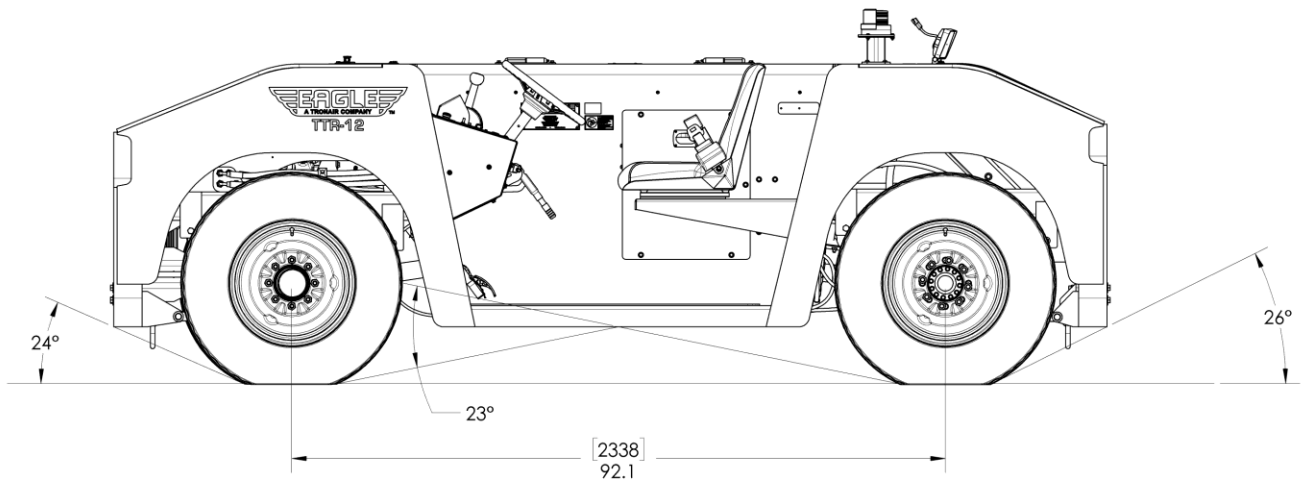
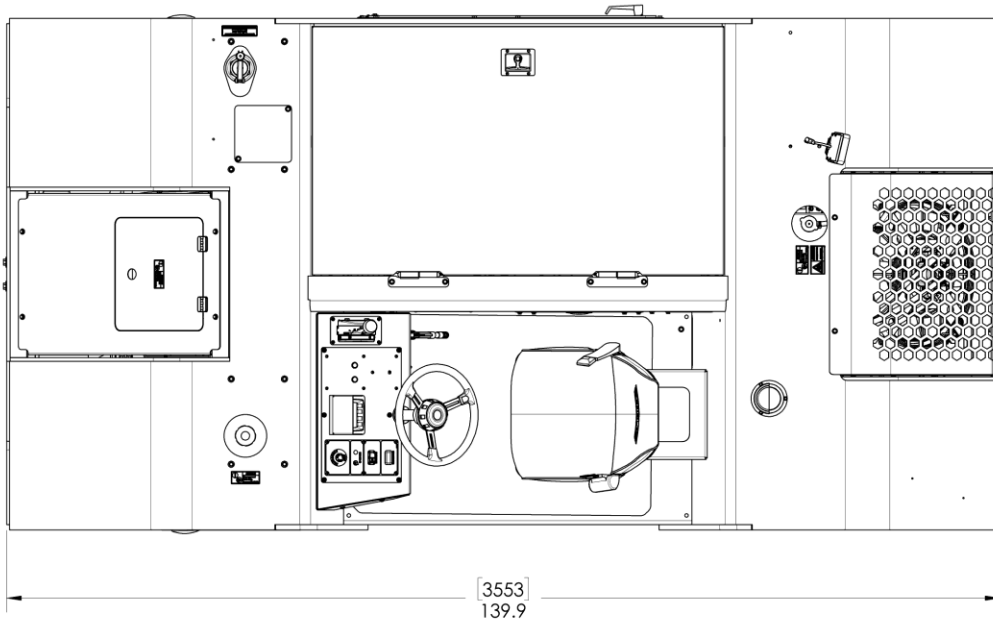
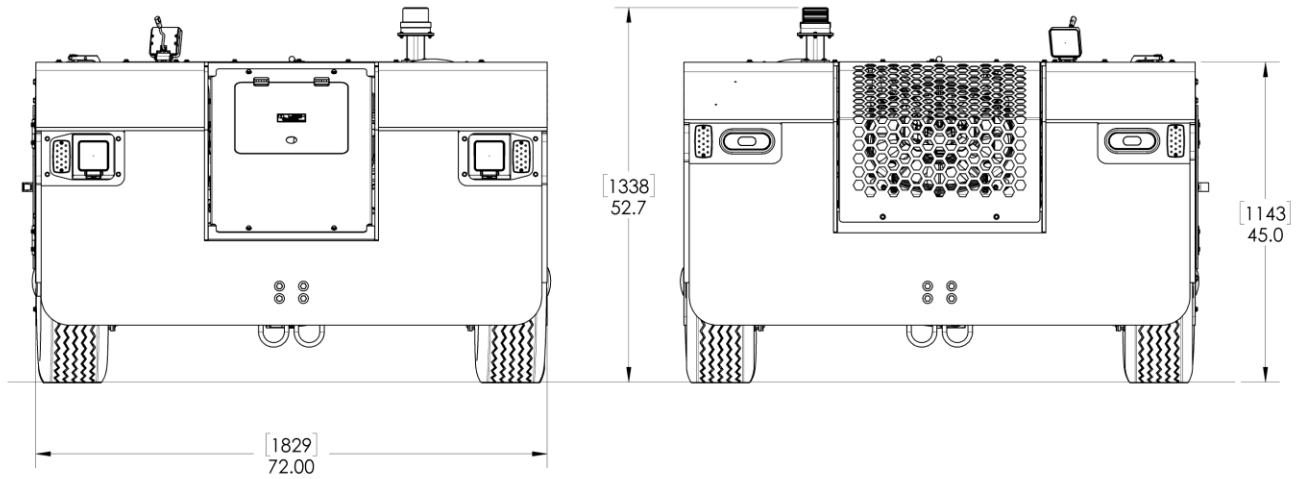
Fax: (419) 867-0634

E-mail: sales@tronair.com

Website: www.eagletugs.com

Please check www.eagletugs.com periodically for updates to this manual, operations manual, and service bulletins that affect your tractor

1.4 SPECIFICATIONS





1.4.1 Vehicle Specifications

Model	GVW lbs (kg)	Rated DBP lbf (kN)	Vertical Hitch Capacity lbf (N)	Towing Capacity † lbs (kg)
TTR-12	14,000 (6,350)	12,000 (53)	500 (2200)	130,000 (59,000)

† Towing Capacity applies to 1% grade, wet surface condition.

1.4.2 Chassis System

Length (Not Including Hitches)	139.9 in (3,553 mm)
Width	72.0 in (1,829 mm)
Height at Deck	45.0 in (1,143 mm)
Height at Beacon	52.7 in (1,338 mm)
Step-in Height	11 in (279 mm)
Ground Clearance	8 in (203 mm)

1.4.3 Vehicle Weights

Gross Vehicle Weight (without Cab)	14,000 lbs (6,350 kg)
Weight Distribution	50% Front / 50% Rear

1.4.4 Engine Specifications

Engine Model	Kohler KDI 2504 T4f
Displacement	151 cubic in (2.48 l)
Configuration	Inline Four Cylinder
Emissions Rating	EPA Tier4f/EU Stage IIIB
Power Rating	74 hp (55 kW)
Peak Torque @ 1500 rpm	221 ft-lbf (300 N-m)
Fuel Sulfur Requirement Tier4f / Stage 4	Ultra Low Sulfur Diesel, Sulfur ≤ 15 ppm
Rotation Direction	CCW Looking from Flywheel End
Lubrication Oil Volume	12.2 qt (11.5 l)
Flywheel Housing	Kohler Engine Plate

1.4.5 Transmission

Model	Ford 6F35
Type	5 Speed Electronic
Controller	Powertrain Control Solution TCM-2800

1.4.6 Axle Front

Model	Dana 70
Type	Heavy Duty Drive/Steer
Track Width	57 in (1,448 mm)
Axle Ratio	7.17
Wheel End	8 x 5/8-18 on 6.5 B.C.
Input	1350 U-Joint Yoke

1.4.7 Axle Rear

Model	Dynatrac Pro 70
Type	Heavy Duty Drive
Track Width	58 in (1,473 mm)
Axle Ratio	7.17
Wheel End	8 x 5/8-18 on 6.5 B.C.
Input	1350 U-Joint Yoke



- 1.4.8 Tires
 - Tire Size 9.5 x 16.5 Load Range E
 - Tire Capacity Rating @ 20 mph 4,217 lbs (1,912 kg)
 - Tire Inflation Pressure 75 psi (517 kPa)

- 1.4.9 Electrical
 - System Type 12 Volt Negative Ground
 - Alternator Rating 14V, 80A
 - Starter Rating 12V, 2.0 kW
 - Battery Type Group 65, 860 CCA
 - Battery Configuration..... Single Battery

- 1.4.10 Fuel Tank
 - Capacity 14.5 gal (55 l)
 - Tractor Run Time (50% of rated engine power) 9.8 hours
 - Tractor Run Time (100% of rated engine power) 4.9 hours

- 1.4.11 Performance
 - Drawbar Pull Rating (.9 COF) 12,000 lbf (53.4 kN)
 - Top Speed - Low 3.9 mph (6.3 kph)
 - Top Speed - Drive 15 mph (24 kph)
 - Outside Turning Radius..... 290 in (7,370 mm)
 - Approach Angle Without Hitch 24°
 - Departure Angle Without Hitch 26°
 - Breakover Angle..... 23°

2.0 SAFETY INFORMATION

2.1 USAGE AND SAFETY INFORMATION

To insure safe operations please read the following statements and understand their meaning. Also refer to your equipment manufacturer's manual for other important safety information. This manual contains safety precautions which are explained below. Please read carefully.



WARNING!

Warning is used to indicate the presence of a hazard that can cause **severe personal injury, death, and/or substantial property damage** if the Warning Notice is ignored.



CAUTION!

Caution is used to indicate the presence of a hazard, which will or can cause **minor personal injury or property damage** if the Caution Notice is ignored.

2.2 IMPORTANT SAFETY NOTICE

Appropriate service methods and proper repair procedures are essential for the safe and reliable operation of all industrial equipment as well as the personal safety of the individual performing the work. This service manual provides general directions for accomplishing service and repair work with tested and effective techniques. Following them will help assure reliability.

There are numerous variations in procedures, techniques, tools, and parts for servicing equipment, as well as in the skill of the individual doing the work. This manual cannot anticipate all such variations and provide advice or cautions as to each. Accordingly, anyone who departs from the instructions provided in this manual must first establish that he compromises his/her personal safety and/or the equipment integrity by his/her choice of methods, tools or parts.

2.3 GENERAL

The following list contains some general warnings that you should follow when you work on equipment:

- Always wear safety glasses for eye protection.
- Use safety stands whenever a procedure requires you to be under the equipment.
- Be sure that the ignition switch and battery is disconnected unless otherwise required by the procedure.
- Set the parking brake when working on the equipment. Place wheel chocks on the tires to provide further restraint from inadvertent equipment movement.
- Keep yourself and your clothing away from moving parts when the motor is running.
- Do not smoke while working on the equipment.
- To avoid injury, always remove rings, watches, loose hanging jewelry, and loose clothing before beginning to work on the equipment. Tie long hair securely behind the head.

For more information regarding safety please refer to the operations manual provided with your tug. This manual can also be found on the Eagle Tugs website at www.eagletugs.com.

2.4 GENERAL SAFETY

The following safety recommendations are not intended to cover all possible safety aspects of the TTR series tow tractor. Please use common sense in addition to the safety recommendations that follow.



WARNING!

Failure to comply with the following safety precautions can result in serious injury or death as well as equipment damage.

- Always do the Pre-Operation Inspection before using the tractor.
- If you have not operated this equipment previously, practice driving and operating it in a safe and clear (not congested) area until you are familiar with all aspects of its operation.
- Always operate the tractor at a speed appropriate for the environmental conditions and the towed load. Slow down in congested areas, when moving a large load, or when conditions reduce traction or visibility.
- Always take care when driving on a slope or uneven ground. Reduce speed and take turns slowly in a controlled manner.
- When working on or around the tractor, take care to keep well clear of any moving components including tires, fans, belts, and driveshafts. Also keep clear of hot surfaces such as exhaust and cooling components.
- The TTR series tractor is intended to be operated on hard improved surfaces. Never drive on soft surfaces, and avoid potholes and damaged pavement.
- The engine of the tractor emits potentially harmful gases when running. Always operate the tractor outdoors or in an environment with adequate ventilation.

3.0 TRAINING

3.1 TRAINING REQUIREMENTS

The employer of the operator is responsible for providing a training program sufficient for the safe operation of the unit.

3.2 TRAINING PROGRAM

The employer provided operator training program should cover safety procedures concerning use of the unit in and around the intended aircraft at the intended aircraft servicing location.

3.3 OPERATOR TRAINING

The operator training should provide the required training for safe operation of the unit.

NOTE: Maintenance and Trouble Shooting are to be performed by a skilled and trained technician.

4.0 PUTTING INTO SERVICE

4.1 UNPACKING AND SETTING UP

The following directions specify the correct steps that should be taken once you receive delivery of your TTR series tow tractor. These steps will ensure that the tow tractor will operate safely. Reference the Parts and Preventive Maintenance Manual for details as appropriate.

- During the unloading of your tractor, note any shipping damage and report it to Eagle Tugs and the shipping company. Verify that all components appear to be in order and undamaged.
- Remove manual and any shipped-loose components from the operator compartment.
- Install shipped-loose components per the Parts and Preventive Maintenance Manual.
- Read this manual in its entirety, paying close attention to all safety requirements.
- Verify that tires are inflated.
- Fill the fuel tank with the appropriate diesel fuel.
- Check the following fluid levels:
 - Engine Oil
 - Hydraulic Fluid
 - Transmission Fluid
 - Coolant
- Familiarize yourself with the tractor operation and control.

5.0 OPERATION

5.1 OPERATOR REQUIREMENTS

The TTR series tow tractor is a piece of industrial equipment and has inherent safety risks. As such, the operator of the tow tractor is expected to have a fork truck or similar license, or be otherwise trained in the usage of material handling equipment.

The operator should read this manual in its entirety before operating the tow tractor.

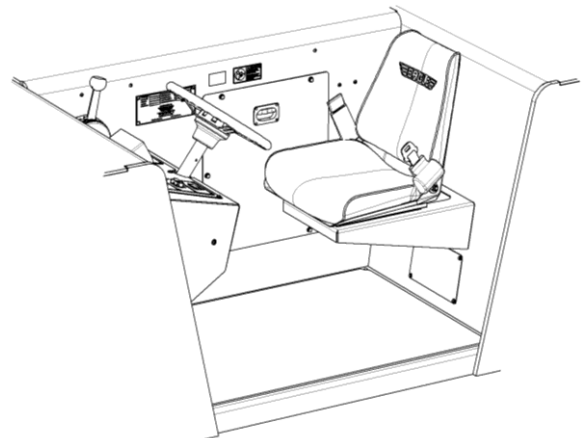
The operator should be familiar with all aspects of the tow tractor before operating it.

5.2 OPERATOR WORKSTATION

Your TTR series tow tractor features an ergonomically designed operator's workstation. This is the only operator workstation on the tractor. Do not sit on or stand on the tractor outside of this area during tractor movement.

The operator should be seated with the seatbelt secured when moving or operating the tractor.

Keep arms and legs within the perimeter of the tractor's frame to avoid injury. Always place the tractor in Neutral or Park and apply the parking brake before exiting the tractor.



5.3 PRE-OPERATION CHECKLIST

The following inspections should be conducted as stated below. Additional inspections may be required due to unusual operating conditions.

WARNING!



Any problems noted during inspection should be corrected as soon as possible. Failure to promptly attend to problems could compromise safety and/or the tractor's performance. Do not attempt to make repairs. Contact a qualified mechanic.

5.3.1 Daily Pre-Operation Checklist

Daily Pre-Operation Checklist	Satisfactory	Service Required	Not Applicable
Walk-Around Inspection			
Verify no evidence of leaks under and around the tractor			
Verify fuel cap securely in place			
Visually verify tires are fully inflated			
Verify rims and tires free from damage including tire tread			
Verify tire tread is free from debris			
Verify lights, mirrors, and reflectors are clean			
Operational Checks (tractor engine running)			
Verify that the dash LED indicators are free of errors and warnings			
Verify that battery voltage is above 12V			
Verify that horn is operational			
Verify that lights, flashers, and beacon work properly			
Cab Inspection (if equipped)			
Verify windows clean			
Verify windows free of cracks and chips			
Verify windshield wipers operate properly			
Verify heater and fans operate properly			

5.3.2 Weekly Operation Checklist

Weekly Pre-Operation Checklist	Satisfactory	Service Required	Not Applicable
Walk-Around Inspection			
Verify tire inflation pressure at 75 psi / 517 kPa			
Engine Compartment Inspection			
Check engine oil level (top off in necessary)			
Check engine coolant level (top off if necessary)			
Check hydraulic fluid level (top off if necessary)			
Drain water from fuel/water separator			
Verify wiring, hoses, and tubing free of leaks and damage			
Remove dust from air cleaner dust valve			



5.4 STARTUP/SHUTDOWN AND SAFE TOWING

5.4.1 Starting The Unit

1. With feet firmly on the floor mat, adjust the seat to a comfortable position.
2. Sit in the operator seat and buckle the seat belt.
3. Verify that the gear selector is in the park or neutral position.
4. Verify that the parking brake is set. If not, set it now.
5. Start the engine with the ignition switch.
6. Select the desired transmission gear (L or R for towing, D or R for unloaded travel)
7. While holding the service brake pedal, release the parking brake.
8. Verify that the intended path of the tractor is clear of obstructions and personnel and then proceed with driving.

5.4.2 Shutting Down The Unit

1. Bring the tractor to a complete stop with the service brake.
2. Put the tractor in park using the shift lever.
3. Set the parking brake by pulling the parking brake handle.
4. Turn the tractor off by turning the ignition switch.

5.4.3 Load Towing And Pushing Safety

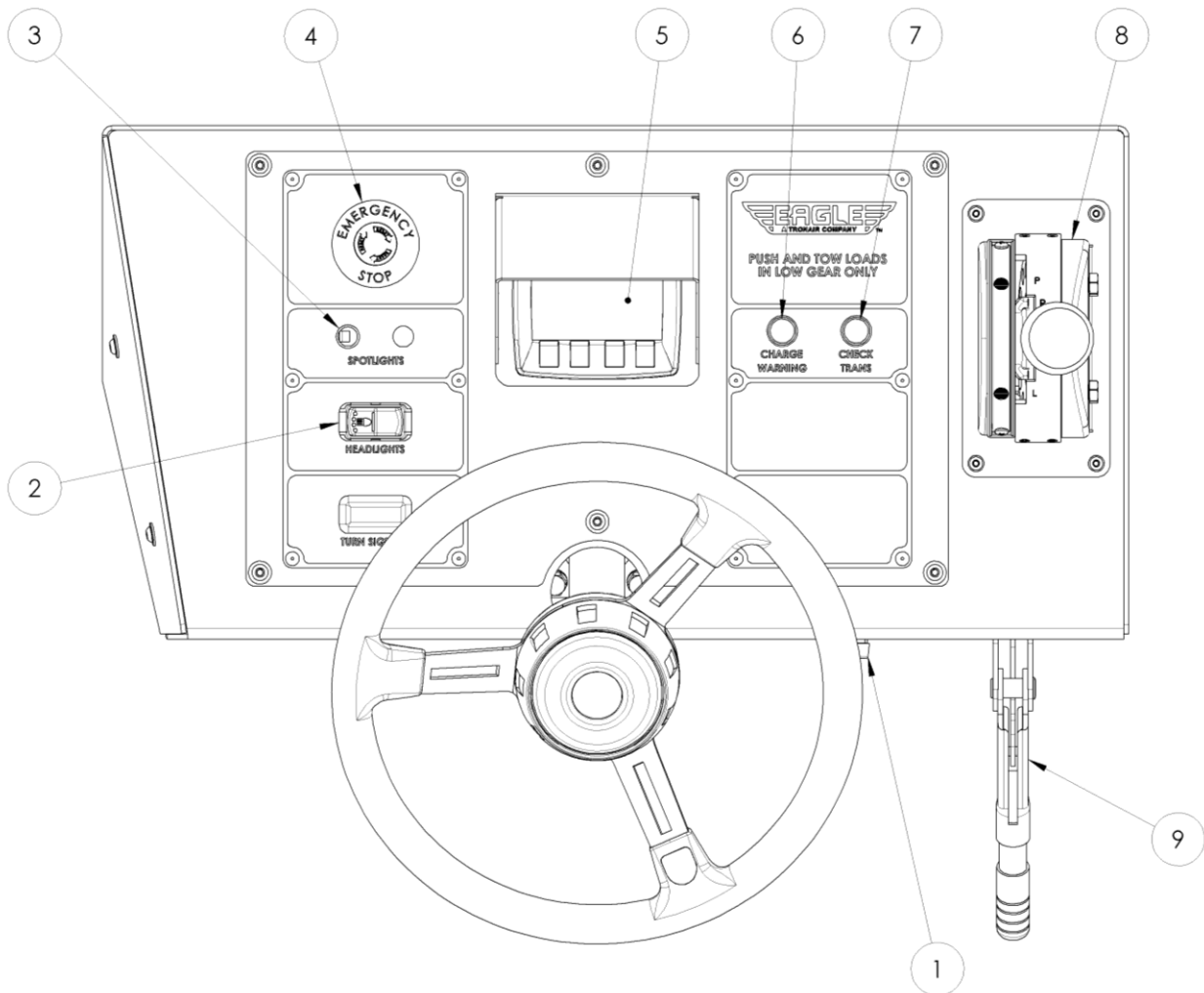
If towing or pushing a load, check to see that:

- The towed load is securely connected to the hitch of the tractor. Be sure hitch is locked/fastened into the closed position.
- For maximum tractor and load control and stability, as well as towing power, be sure the towbar is parallel to the ground when connected to the tractor's hitch.
- Ensure the plane or other towed load clears all obstacles when towing.

5.4.4 Safety Shutdown System

- The TTR is equipped with an engine shutdown system that will cut power to the engine if the system detects uncontrolled movement of the tractor.
- The truck should never be left unattended while running unless the transmission is set to the Park position and the parking brake is set.

5.5 CONTROLS AND INSTRUMENTATION



1. **Ignition Switch:** Your tractor is equipped with a keyed or keyless ignition switch. The switch provides power to the tractor and is used to crank the engine.
2. **Headlight Switch:** The headlight switch is an on/off type. There is no hi/low beam control position.
3. **Spotlight Switches:** The spotlight switches are on/off types. The rear spotlight is standard equipment. The rear and front spotlights (if equipped) are controlled independently.
4. **Emergency Stop:** In the event of an emergency, the emergency stop button will shut down the engine of the tractor. **Note that steering and braking functionality is greatly impeded when the engine is not running.**
5. **Multi-function Digital Display:** The digital display module provides critical information on the tractor operational status. The digital display module includes detailed I/O diagnostics that enable troubleshooting of various tractor systems without needing a laptop or other external device. The digital display can provide specific engine diagnostic codes that allow easy troubleshooting of engine issues.
6. **Charge Warning Lamp:** The charge warning lamp is illuminated any time the alternator is not charging properly. If the engine is running and the charge warning lamp illuminates, the charge system (alternator, battery, and battery cables) should be inspected by maintenance personnel. Continued usage with a faulty charging circuit will lead to a dead battery.
7. **Transmission Warning Lamp:** The transmission warning lamp can provide notification of an issue with the transmission, and can relay specific blink codes that allow easy troubleshooting of transmission issues.
8. **Transmission Shifter:** The transmission shifter is a cable style in a standard automotive PRNDL layout. Only use L (low) or R (reverse) for towing operations to maintain a safe tow speed. Rapid shifting between forward and reverse gears can result in a no-shift scenario due to transmission abuse protections. If the tractor refuses to shift into the selected gear, put the shift lever in Neutral and then back into the desired gear.
9. **Parking Brake Lever:** The parking brake can be engaged or released with the parking brake lever. The parking brake should never be used to stop a moving unit except in an emergency situation.

5.5.1 Multi-Function Display

Operation Screen:

The multi-function display allows for monitoring a wide range of vehicle parameters. The default running operation screen includes all of the following diagnostic information:

- Parking brake indicator
- Coolant temperature
- Vehicle speed
- Fuel level
- Oil pressure switch status
- Engine Hours
- Engine speed

Brightness/Contrast:

Press **A** from the Operation Screen. Use the **A** and **B** buttons to adjust the brightness. Use the **C** and **D** buttons to adjust the contrast.

The display will return to the Operation Screen after 5 seconds without a key press.

Imperial/Metric Units:

Press **C** then **B** at the same time for 3 seconds to toggle from Imperial to Metric Units.

Engine Fault Codes:

Press **B** to from the Operation Screen to view the Engine Fault Screen. This will show active and inactive faults that have occurred since the vehicle was turned on. If you are receiving a fault code, take careful note of it before powering down the tractor. It may not be present on the next startup.

Error Messages:

The multi-function display is capable of showing many error, warning, and informational messages such as Low Fuel Level, Drivetrain Fault, and others.

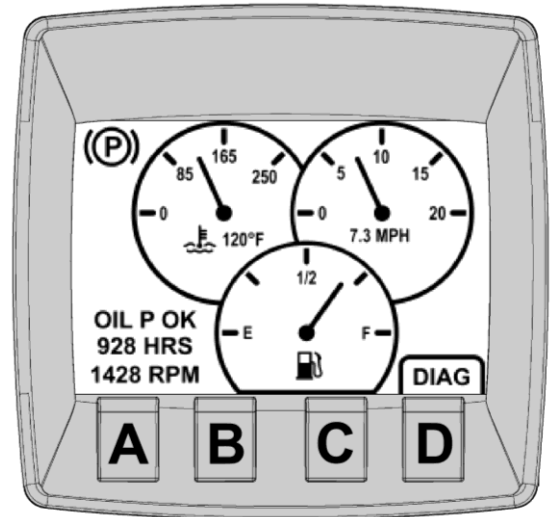
I/O Diagnostics:

Press **D** to from the Operation Screen to view the I/O diagnostics menu. This menu allows you to review a wide range of data about the vehicle. Flip between diag screens using the arrows, and use **D** to exit the diagnostics.

See below for a brief description of each parameter.

Diagnostic Screen 1 - Engine:

- ENG HRS: Engine hours as recorded on the engine ECU and broadcast over the J1939 communication bus.
- REQ SPD: The requested engine RPM as calculated by the vehicle controller and sent to the engine over the J1939 communication bus. Range is 900-2600.
- ACT SPD: The actual engine RPM as read by the engine ECU and broadcast over the J1939 communication bus.
- % LOAD: The engine power output as read by the engine ECU and broadcast over the J1939 communication bus.
- OIL P: Oil pressure status as read by the engine ECU and broadcast over the J1939 communication bus. Values are "OK" or "LOW".
- WTR TEMP: The coolant temperature as read by the engine ECU and broadcast over the J1939 communication bus.
- FUEL TEMP: The fuel temperature as read by the engine ECU and broadcast over the J1939 communication bus.
- INTK TEMP: The air intake temperature as read by the engine ECU and broadcast over the J1939 communication bus.
- WIF SENS: The status of the water-in-fuel sensor as read by the engine ECU and broadcast over the J1939 communication bus. Values are "DRY" or "DRAIN".
- FAN REQ: The requested cooling fan speed percentage as calculated by the vehicle controller and used to drive the proportional relief valve in the hydraulic manifold.



5.5.1 Multi-Function Display (*continued*)

Diagnostic Screen 2 - Transmission:

- SH IN PRCS: Whether or not the transmission is in process of shifting as recorded by the transmission TCU and broadcast over the J1939 communication bus. Values are “YES” or “NO”.
- SHTR POS: Shift lever position as recorded by the transmission TCU and broadcast over the J1939 communication bus. Valid positions are “P”, “R”, “N”, “6” (Drive), and “1” (Low).
- SEL GR: Shifter selected gear as recorded by the transmission TCU and broadcast over the J1939 communication bus.
- CUR GR: Current gear as recorded by the transmission TCU and broadcast over the J1939 communication bus.
- OIL TMP: Current transmission fluid temperature as measured by the transmission TCU and broadcast over the J1939 communication bus.
- IN SPD: Current transmission input speed as measured by the transmission TCU and broadcast over the J1939 communication bus.
- OUT SPD: Current transmission output speed (before final drive) as measured by the transmission TCU and broadcast over the J1939 communication bus.
- % SLIP: Ratio between input and output speed as measured by the transmission TCU and broadcast over the J1939 communication bus.
- TRQ C LK: Torque converter lockup status as recorded by the transmission TCU and broadcast over the J1939 communication bus. Values are “YES” or “NO”.

Diagnostic Screen 3 - TPS:

- TPS1 CAL H: Current calibrated max voltage for the primary throttle position sensor.
- TPS1 CAL L: Current calibrated min voltage for the primary throttle position sensor.
- TPS1 VALUE: Current actual voltage for the primary throttle position sensor.
- TPS2 CAL H: Current calibrated max voltage for the secondary throttle position sensor.
- TPS2 CAL L: Current calibrated min voltage for the secondary throttle position sensor.
- TPS2 VALUE: Current actual voltage for the secondary throttle position sensor.
- CMDN SPEED: The requested engine RPM as calculated by the vehicle controller based on throttle position and sent to the engine over the J1939 communication bus. Range is 900-2600.
- ACTL SPEED: The actual engine RPM as read by the engine ECU and broadcast over the J1939 communication bus.

Diagnostic Screen 4 - Inputs and Outputs:

- FL SND: Measured resistance of the fuel sender.
- FUEL LVL: Calculated fuel percent based on the resistance of the fuel sender.
- SRVC BRK: Status of the service brake pressure switch as measured by the vehicle controller. Values are “ON” or “OFF”.
- P-BRAKE: Status of the parking brake handle proximity switch as measured by the vehicle controller. Values are “ON” or “OFF”.
- NTRL SFTY: Status of the parking brake handle proximity switch as measured by the vehicle controller. Values are “ON” or “OFF”.
- KEY CRNK: Status of the crank output from the key switch. Values are “ON” or “OFF”.
- FAN PWM: The PWM duty cycle driving the proportional relief valve in the hydraulic manifold that controls cooling fan speed.
- STRT INH: The ignition crank output from the vehicle controller to the start relay. Values are “ON” or “OFF”.
- BATTERY: The system voltage as measured by the vehicle controller.

Diagnostic Screen 5 - Parameters:

- IDLE RPM: Engine RPM that the vehicle controller will command with the throttle pedal in the full up position.
- WOT RPM: Engine RPM that the vehicle controller will command with the throttle pedal in the full down position.
- AXLE GR: Gear ratio for the final drive and axle, used to calculate vehicle speed.
- TIRE RAD: Tire radius in inches, used to calculate vehicle speed.
- LOW FUEL: The fuel percentage set point below which the display will prompt with a “LOW FUEL LEVEL” warning message.
- START CUT: The engine RPM above which the starter will refuse to engage for starter protection.
- RAMP UP: The maximum speed increase rate in milliseconds from idle to WOT for smoothing of engine response.
- RAMP DWN: The maximum speed decrease rate in milliseconds from WOT to idle for smoothing of engine response.
- DISP SOFT: The current software version loaded on the display module.
- CNTL SOFT: The current software version loaded on the vehicle controller module.



6.0 MAINTENANCE
6.1 PREVENTIVE MAINTENANCE SCHEDULE

Preventive Maintenance Item	Daily	Weekly	First 150 hours	250 hours	500 hours	1000 hours or annually †	5000 hours
Perform daily pre-operation checklist	X						
Check engine oil level and top off as necessary		X					
Check coolant level and top off as necessary		X					
Check hydraulic fluid level and top off if necessary*		X					
Verify tire pressure at 75 psi / 517 kPa and add air as necessary		X					
Drain water from fuel/water separator*		X					
Re-torque axle U-bolts			X				
Check transmission oil level and top off if necessary (engine at idle)			X	X			
Adjust alternator belt tension*				X			
Replace fuel filter cartridge*					X		
Drain and replace engine oil and replace oil filter cartridge*					X		
Check axle brakes and replace pads/discs/drums if necessary					X		
Grease steering grease fittings on axles					X		
Grease driveshaft U-joints and slip shafts					X		
Inspect wheel lug nuts and tighten if necessary					X		
Check engine belt for damage/wear and replace if necessary*						X	
Drain water from charge air cooler/pipes						X	
Check all battery cable connections for tightness and corrosion						X	
Flush and replace engine coolant						X	
Check coolant hoses for damage/wear and replace if necessary						X	
Replace the air cleaner primary filter*						X	
Check/replace the air cleaner safety filter*						X	
Check tractor batteries and replace if necessary						X	
Drain hydraulic fluid from tank and replace						X	
Remove and clean hydraulic fluid magnetic drain plug						X	
Replace hydraulic filter*						X	
Re-torque axle U-bolts if they show signs of loosening						X	
Re-torque driveshaft U-joint retainers						X	



6.1 PREVENTIVE MAINTENANCE SCHEDULE (continued)

Preventive Maintenance Item	Daily	Weekly	First 150 hours	250 hours	500 hours	1000 hours or annually †	5000 hours
Inspect all hydraulic and coolant hoses for wear/damage and leaks						X	
Inspect all hydraulic tube clamps and tighten if necessary						X	
Inspect hitch pins for wear and replace if beyond specifications						X	
Inspect engine mount brackets and re-torque if necessary						X	
Inspect transmission mount brackets and re-torque if necessary						X	
Inspect engine/trans mount isolators and replace if necessary						X	
Replace the intake manifold hose (air filter to intake manifold)							X
Replace coolant hoses							X
Replace fuel hoses							X
Inspect/replace hydraulic hoses							X
Drain and replace transmission fluid							X

Any items found to be deficient during the preventive maintenance review should be repaired or replaced. All fluids found low should be topped off. Refer to section 10 for fluid and filter specifications and part numbers.

* See relevant diagrams/instruction in this section for these items.

† Whichever time period is shorter.

6.2 FLUIDS AND FILTERS

FLUID SPECIFICATIONS			
Fluid	Recommendation	Requirement	Volume approximate
Engine Oil (Tier 4f)	Shell Rotella T6 Synthetic 5W-40	API CJ4, Low SAPS	3.04 gal (11.5 l)
Transmission Fluid	Motorcraft Mercon LV	Mercon LV	2.25 gal (8.5 l)
Hydraulic Fluid	Castrol Dual Range HV 32	ISO 32 Mineral Oil Based	12 gal (45.5 l)
Front Axle Gear Oil	N/A	SAE 80W90 Hypoid Gear Oil	6.2pt (2.9 l)
Rear Axle Gear Oil	N/A	SAE 80W90 Hypoid Gear Oil	9.2 pt (4.3 l)
Coolant	N/A	50/50 Ethylene Glycol Mix	4.8 gal (18.2 l)
Brake Fluid	N/A	DOT 3	1.5 pt (0.7 l)

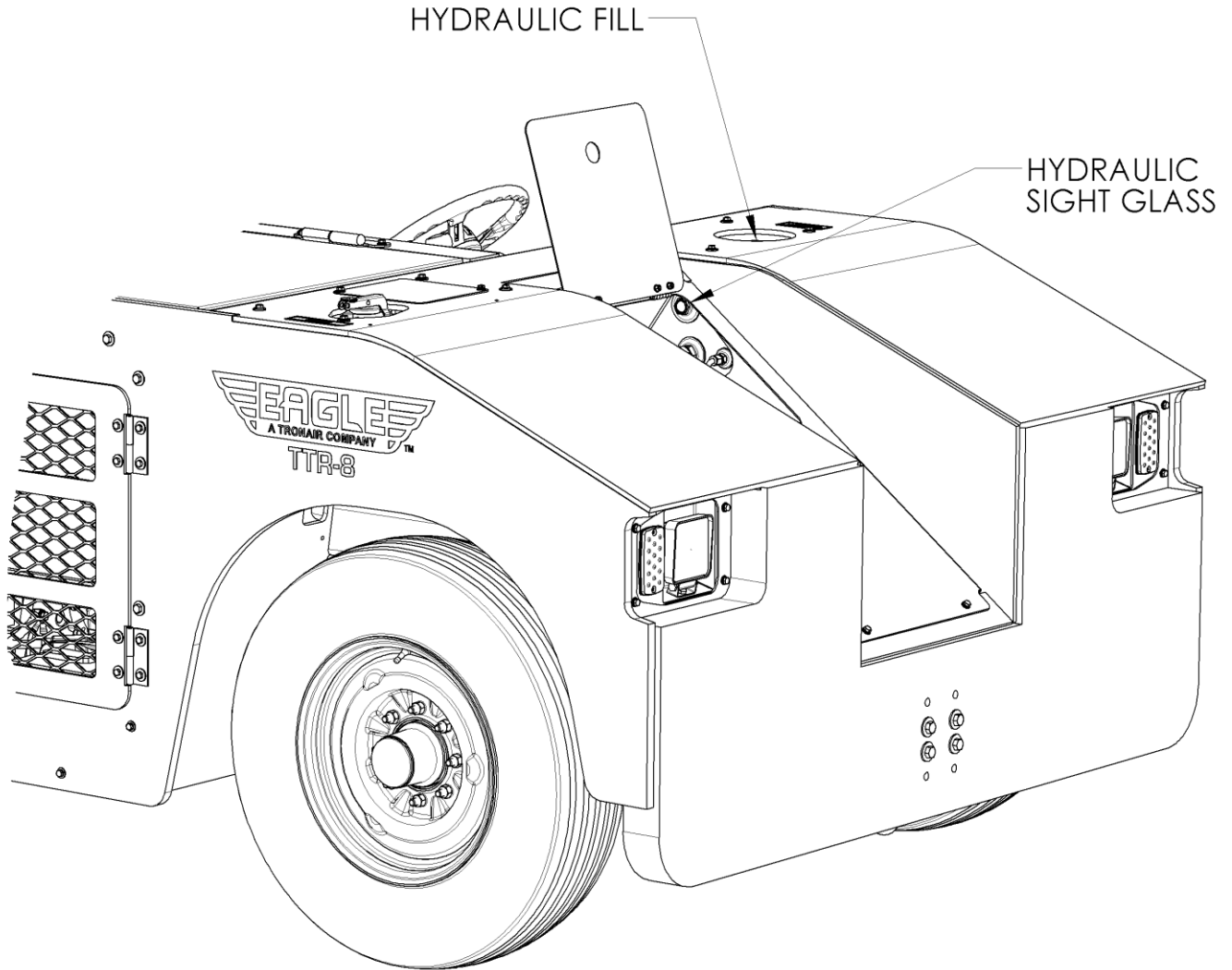
6.3 HYDRAULIC SIGHT GLASS AND FILL

Hydraulic Fluid:

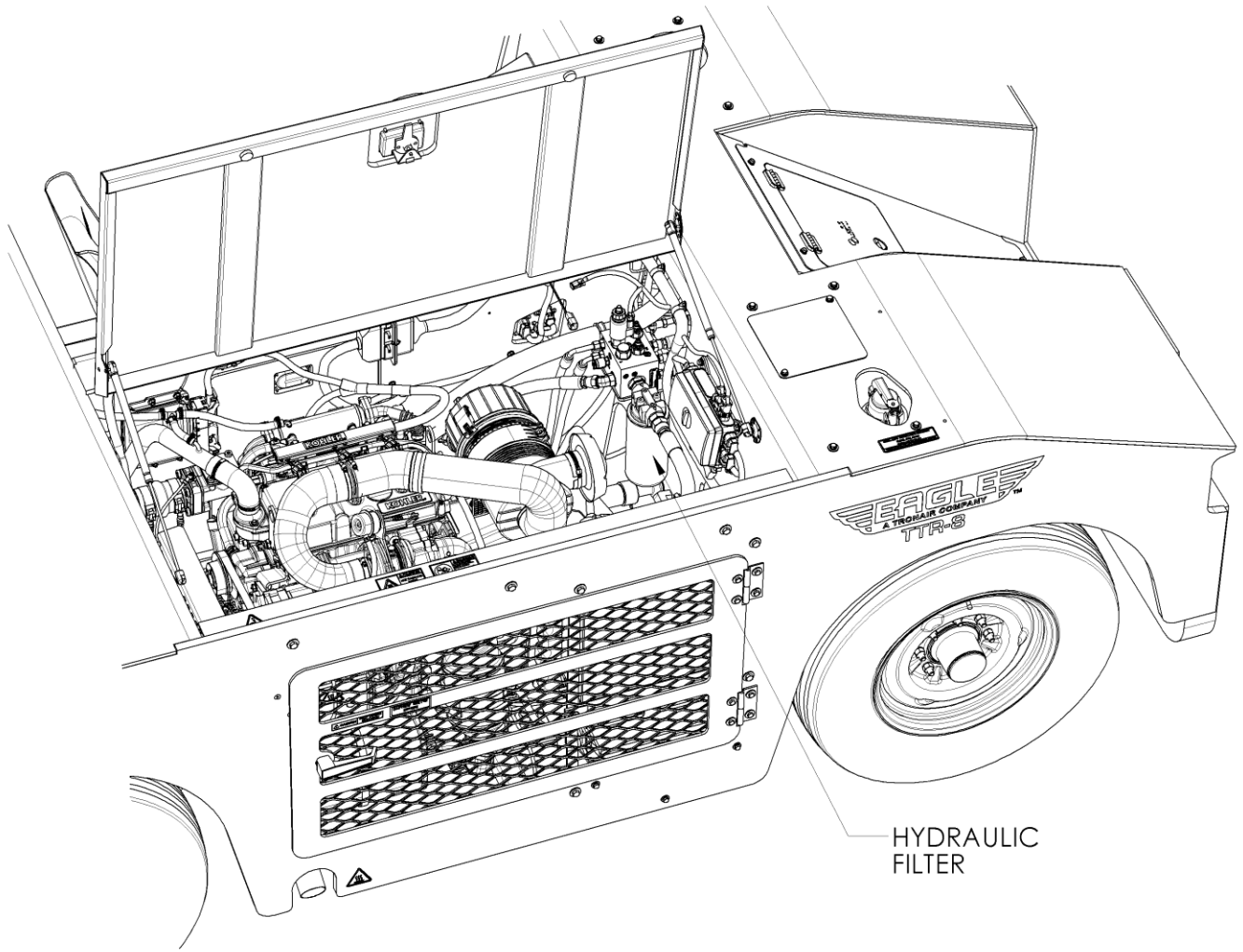
Recommendation Castrol Dual Range HV 32

Total Volume 12 gal (45 l) approximate

Tank Volume 10 gal (38 l) approximate



- 6.4 HYDRAULIC FILTER
Hydraulic Filter NVSP-09-018-CA



6.5 ENGINE OIL CHECK

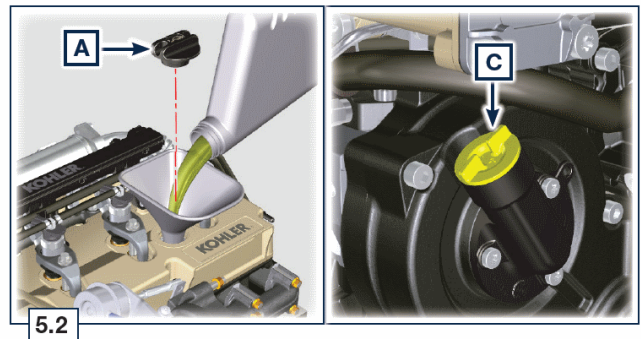
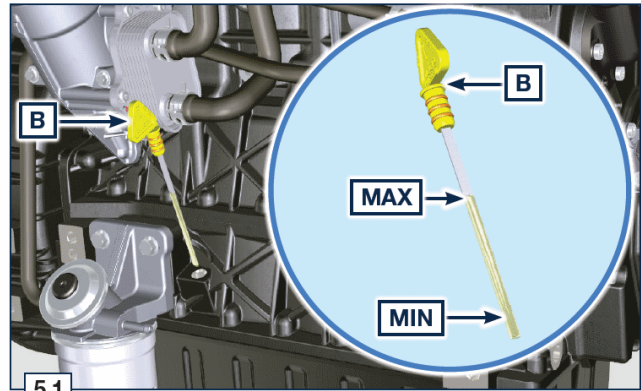
Oil level check

1. Loosen the oil filler cap A.
Remove the oil dipstick B and check that the level is up to MAX.
2. Pour in recommended oil until reaching the MAX level mark.
3. Reinstall the oil dipstick B completely.
4. Re-tighten the cap A and/or C (Fig. 5.2).



Important

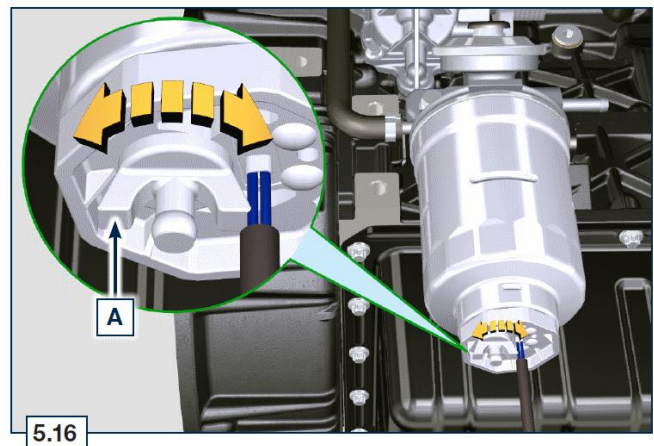
- Do not use the engine with the oil level below the minimum.



6.6 FUEL FILTER WATER DRAIN

Fuel filter water drain

1. Gently loosen the wing screw A without removing it.
2. Drain the water if present.
3. Re-tighten the wing screw A as soon as the fuel begins to flow.



6.7 ENGINE OIL REPLACEMENT

Engine oil replacement

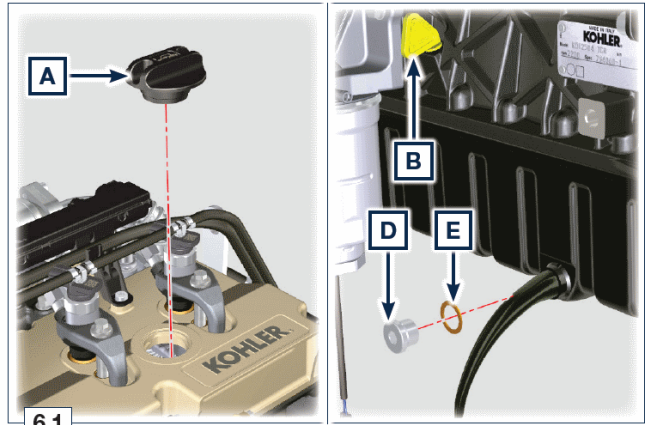


Important

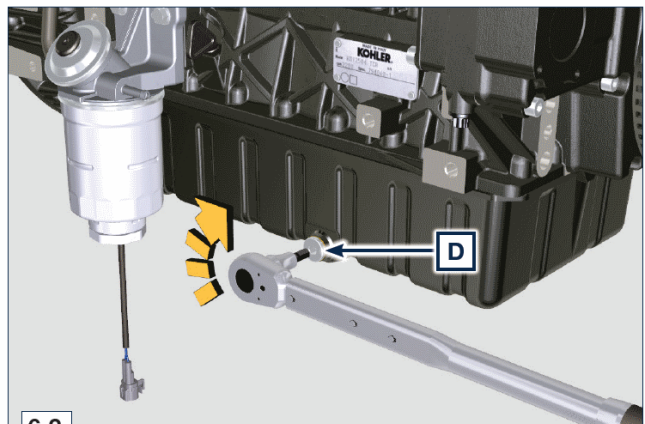
- Place engine on level surface to ensure accurate measurement of oil level.

NOTE: *Perform this operation with warm engine, to get a better fluidity of the oil and get a full discharge of oil and impurities contained in it.*

1. Unscrew the oil filter cartridge holder cover.
2. Loosen the oil filler cap A (Fig. 6.1).
3. Remove the oil dipstick B.
4. Remove the oil drain plug D and the gasket E (the oil drain plug is on both sides of the oil sump).
5. Drain oil in an appropriate container.
6. Replace gasket E.
7. Tighten the drain oil plug D (tightening torque at 35 Nm).
8. Replace the oil filter cartridge.
9. Add the type oil recommended.



6.1

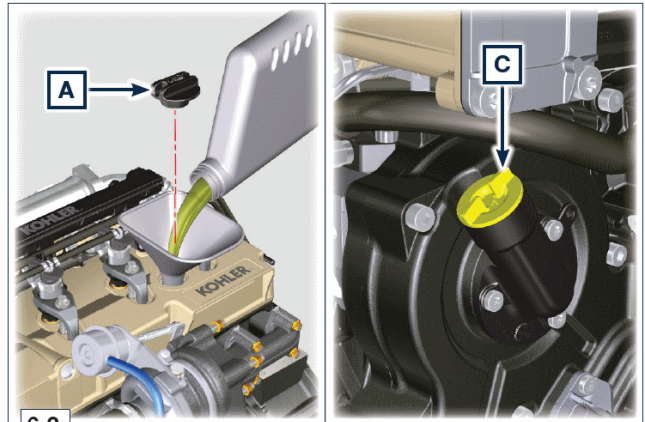


6.2



Important

- Do not exceed the MAX level on the dipstick.



6.3

6.8 ENGINE OIL FILTER CARTRIDGE REPLACEMENT

Oil Filter Cartridge Kit.....K-5303

Oil Filter Seal KitK-5304

Oil filter cartridge replacement



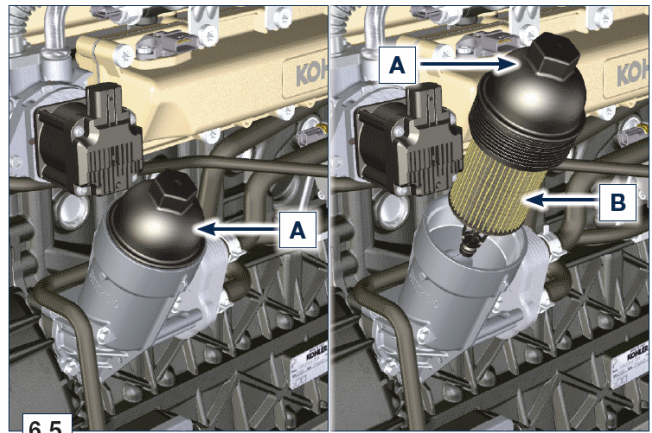
Important

- Electric/pneumatic screwdrivers are forbidden.

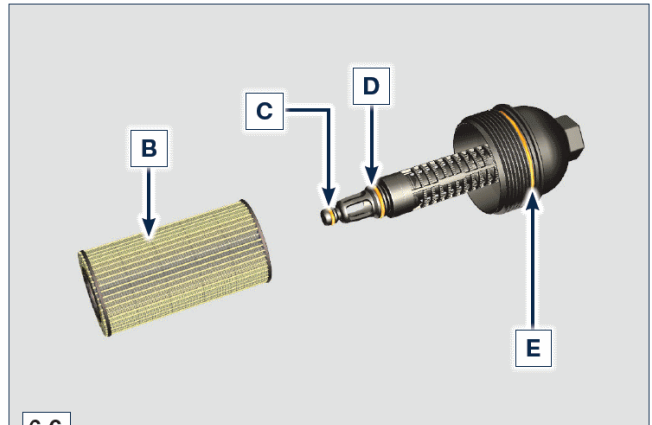
1. Unscrew cartridge holder cover A by performing three complete turns and wait 1 minute.

NOTE: *This operation allows to oil contained in the support F to flow into the oil sump in the correct way.*

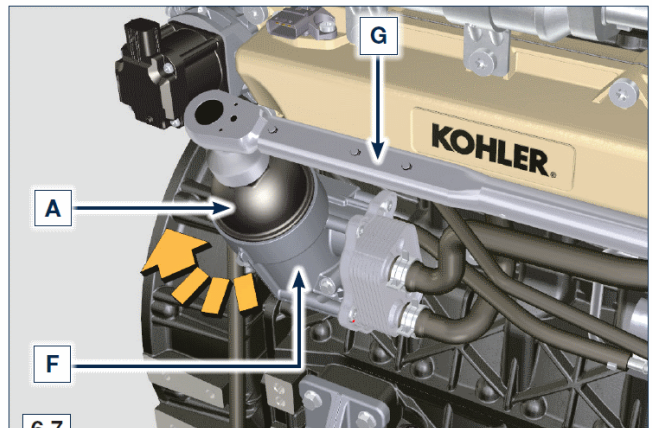
2. Unscrew cartridge holder cover A and check that the oil in the lub. oil filter support F has flowed towards the oil sump.
3. Remove the cap A as well as the oil cartridge B from the oil filter support.
4. Remove and replace the oil cartridge B with a new one. Remove and replace the gaskets C, D and E with new ones.
5. Fit and tighten the cover A on the oil filter support F, tightening it with a torque wrench G (tightening torque of 25 Nm).



6.5



6.6



6.7

6.9 ENGINE FUEL FILTER CARTRIDGE REPLACEMENT

Fuel Filter Cartridge KitK-5305

Filter cartridge and fuel pre-filter replacement

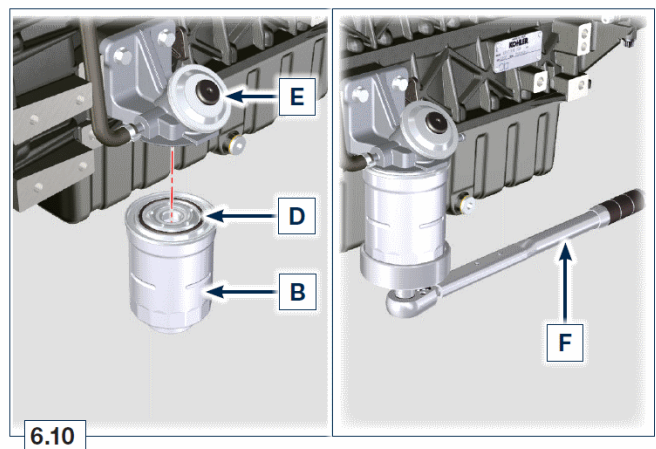
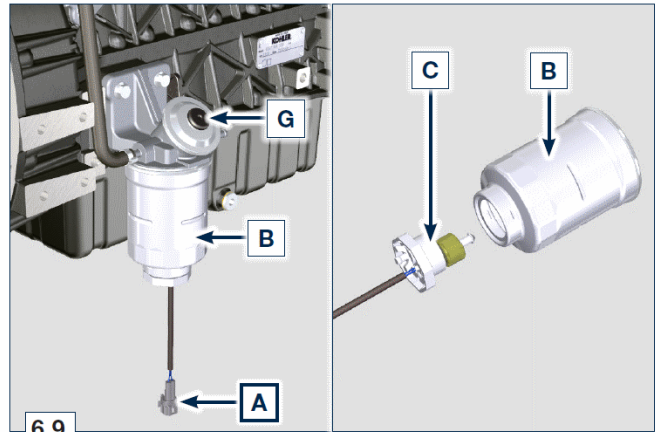
1. Disconnect the cable A of the water presence sensor C.
2. Remove the water presence sensor C from its cartridge B.
3. Loosen the cartridge B using the appropriate wrench F (Fig. 6.10).
4. Lubricate the gasket D of the new cartridge B.



Important

- Do not fill the new cartridge B with fuel.

5. Tighten the new empty cartridge B (Fig. 6.10) on the diesel fuel filter support E using the special wrench F (tightening torque of 17 Nm).
6. Tighten the water presence sensor C on the new cartridge B (tightening torque of 5 Nm).
7. Reconnect the cable A of the water presence sensor C.
8. Push repeatedly the button G in order to fill the circuit.



6.10 ENGINE AIR FILTER REPLACEMENT

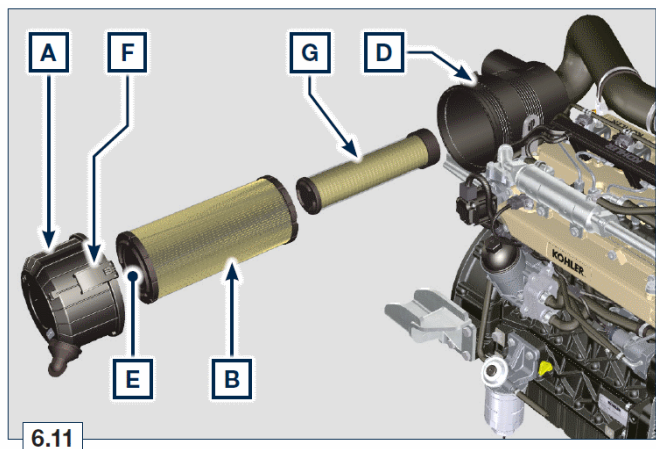
Air Filter Primary KitK-5306

Air Filter Secondary Kit.....K-5307

Air filter cartridge replacement

NOTE: *Component not necessarily supplied by KOHLER.*

1. Release the two fastenings F of the cover A.
2. Remove the cartridges B and G.
3. Reinstall:
 - the new cartridges B and G.
 - the cover A checking the right tightness of fastenings F.



6.11 ALTERNATOR BELT TENSION

Alternator Belt KitK-5312

Check and setting alternator standard belt tension

5.9.1 Check

1. Check the belt A condition, if worn out or deteriorated, replace it.
2. Check by the appropriate tool that at point p the tension value is between 80 and 85 Hz.

Using the tool F (DENSO BTG-2 or a similar one) shown in the picture, it is possible to check the corresponding value in Newtons, which should be between 350 and 450 N. Should the correct tool not be available, the belt tension can be checked by applying a force in the direction of arrow G of approx' 10kg on the point p. When correctly tensioned the belt must show a movement of less than 10 mm.

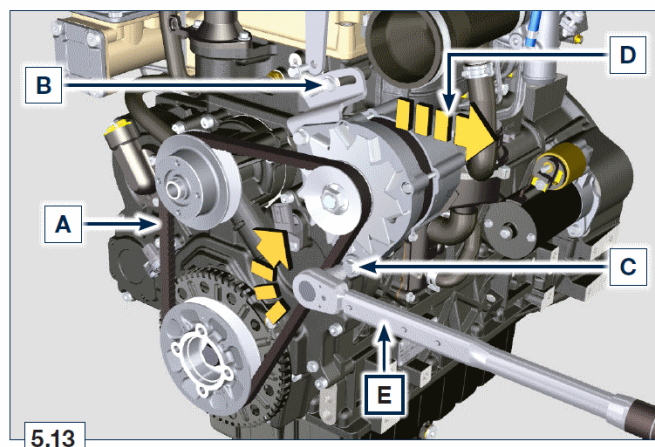
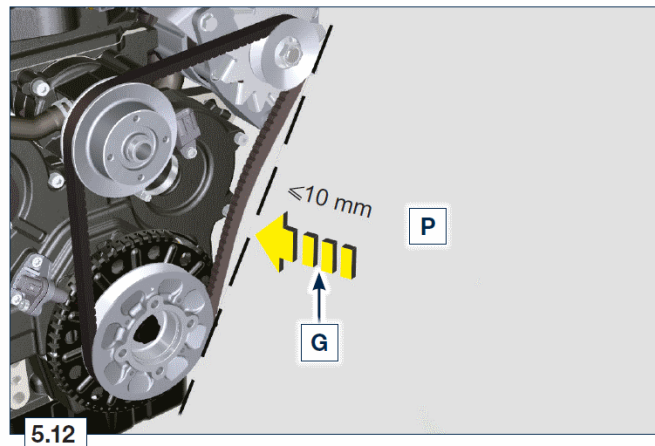
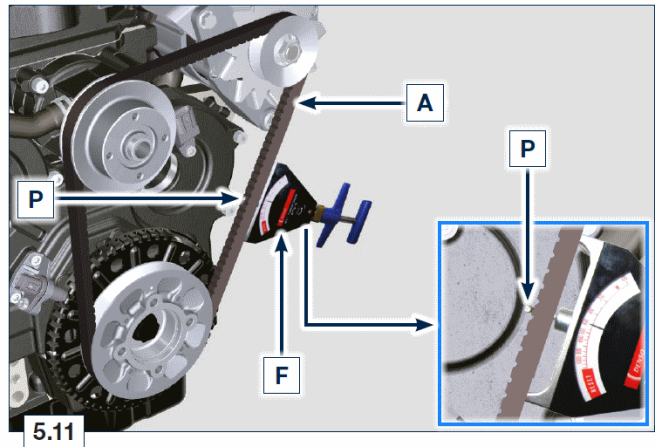
5.9.2 Adjustment

1. Loosen the fastening bolts B and C.
2. Pull the alternator outwards (in direction of the arrow D), to tension the belt.
3. Tension the belt tightening the bolts B and C.
4. Tighten bolts B (tightening torque of 25 Nm) and C (tightening torque of 69 Nm) in sequence with a torque wrench E.
5. Check by the appropriate tool that at point p the tension value is between 80 and 85 Hz.

Using the tool F (DENSO BTG-2 or a similar one) shown in the picture, it is possible to check the corresponding value in Newtons, which should be between 350 and 450 N.

Should the correct tool not be available, the belt tension can be checked by applying a force in the direction of arrow G of approx' 10kg on the point p. When correctly tensioned the belt must show a movement of less than 10mm.

Let the engine run for some minutes, then let it cool down at ambient temperature and repeat the operations 2, 3, 4 and 5 in case the belt tension results out of the above mentioned values.



6.12 TRANSMISSION FLUID LEVEL CHECK

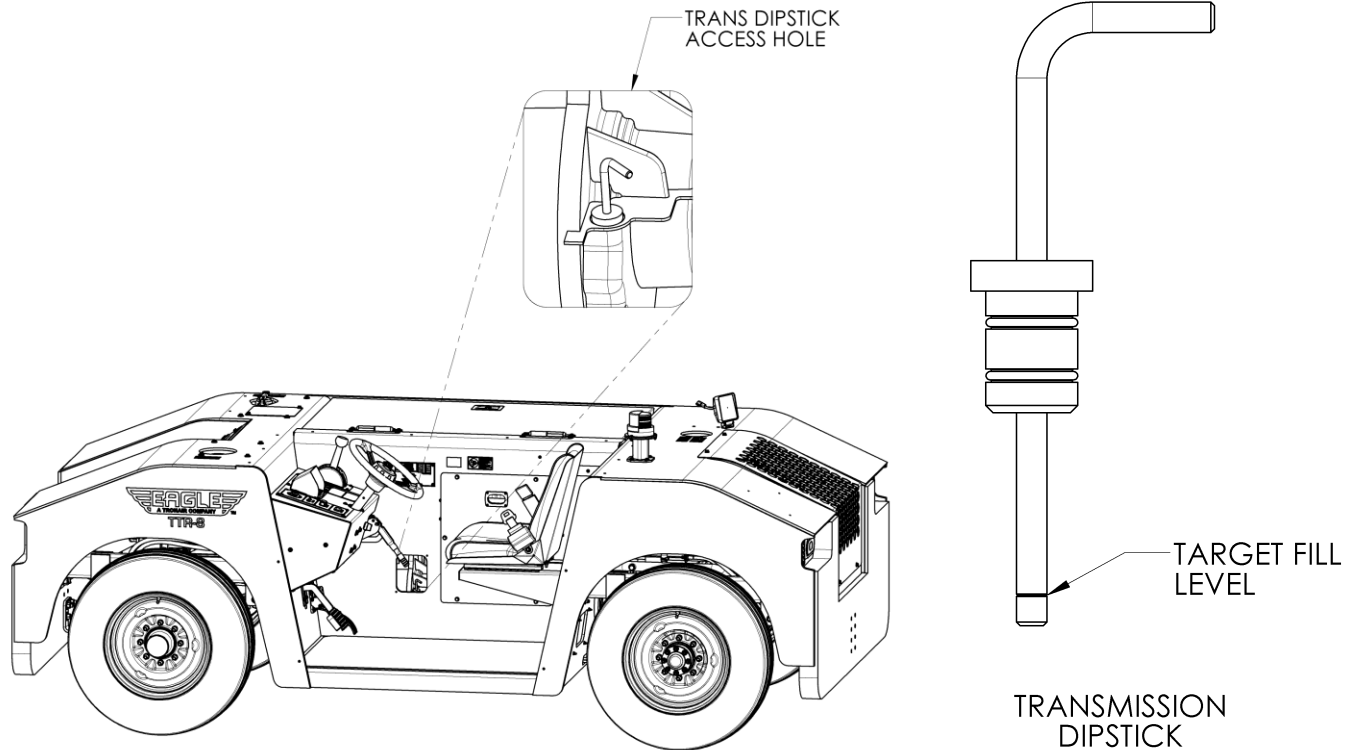
Transmission Fluid Check Process:

- Start engine, put transmission in park, and leave engine at idle.
- Remove transmission dipstick access hole cover.
- Check fluid level using the dipstick while engine is idling.
- When checked cold, the fluid level should be between the etched mark and the tip of the dipstick. The ideal fluid level is at the mark, but do not overfill.
- Add fluid if necessary, refer to section 6.2 for proper fluid type.



WARNING!

Overfilling the transmission can lead to premature transmission failure!



7.0 PROVISION OF SPARES

7.1 SOURCE OF SPARE PARTS

Spare parts may be obtained from the manufacturer:

Eagle Tugs

1 Air Cargo Pkwy East
Swanton, Ohio 43558 USA

Telephone: (419) 866-6301 or 800-426-6301

Fax: (419) 867-0634

E-mail: sales@tronair.com

Website: www.eagletugs.com

For Spare Parts, Operations & Service Manuals or Service Needs:

Scan the QR code or visit Tronair.com/aftermarket

7.2 ORDERING SPARE/SERVICE PARTS

Eagle inventories many of the spare/service parts found in its TTR series tow tractors, and most of these parts can be shipped the day after the order is received. Non-stock parts orders will be shipped as soon as the parts are available.



7.3 RECOMMENDED SPARE PARTS LIST

Description	Part Number	Suggested Replacement Interval
FUEL FILTER CARTRIDGE	K-5305	500 HRS
OIL FILTER CARTRIDGE	K-5303	500 HRS
OIL FILTER SEAL KIT	K-5304	500 HRS
FRONT BRAKE PADS	RMP-149	AS REQUIRED
REAR BRAKE PADS	TT12-54-038-CA	AS REQUIRED
ENGINE BELT	K-5312	AS REQUIRED
PRIMARY AIR FILTER	K-5306	1000 HRS / ANNUALLY
SECONDARY AIR FILTER (SAFETY FILTER)	K-5307	1000 HRS / ANNUALLY
HYDRAULIC FILTER	NVSP-09-018-CA	1000 HRS / ANNUALLY
MIDI FUSE, 23A (RELAY AND FUSE PANEL)	EC-3146-01	AS REQUIRED
MIDI FUSE, 50A (RELAY AND FUSE PANEL)	EC-3146-04	AS REQUIRED
MIDI FUSE, 60A (RELAY AND FUSE PANEL)	EC-3146-05	AS REQUIRED
MIDI FUSE, 100A (RELAY AND FUSE PANEL)	EC-3146-08	AS REQUIRED
STARTER/GRID HEAT RELAY	7A5012	AS REQUIRED
TURN INDICATOR	Z-9826	AS REQUIRED
HEADLIGHT/SPOTLIGHT	Z-9825	AS REQUIRED
TAIL LIGHT	NVSP-34-010-CA	AS REQUIRED
AMBER STROBE	AE-OPT-0007-LED	AS REQUIRED
MINI FUSE, 2A (POWER DISTRIBUTION BOX)	MIN-2	AS REQUIRED
MINI FUSE, 3A (POWER DISTRIBUTION BOX)	MIN-3	AS REQUIRED
MINI FUSE, 5A (POWER DISTRIBUTION BOX)	MIN-5	AS REQUIRED
MINI FUSE, 10A (POWER DISTRIBUTION BOX)	MIN-10	AS REQUIRED
MINI FUSE, 25A (POWER DISTRIBUTION BOX)	MIN-25	AS REQUIRED
RELAY 35A (POWER DISTRIBUTION BOX)	XL00-81-001-CA	AS REQUIRED
DASH PANEL INDICATOR LAMP	Z-10129	AS REQUIRED
E-STOP	NVSP-14-041-CA	AS REQUIRED
SPOTLIGHT SWITCH	NVSP-14-008-CA	AS REQUIRED
HEADLIGHT SWITCH BASE	NVSP-14-001-CD	AS REQUIRED
HEADLIGHT SWITCH ACTUATOR	NVSP-14-002-CD	AS REQUIRED
TURN SIGNAL SWITCH BASE	NVSP-14-001-CE	AS REQUIRED
TURN SIGNAL SWITCH ACTUATOR	NVSP-14-002-CA	AS REQUIRED
IGNITION SWITCH (KEYED)	NVSP-05-005-CA	AS REQUIRED
IGNITION SWITCH (KEYLESS)	NVSP-05-005-CB	AS REQUIRED
HORN BUTTON	A-TT10-00811	AS REQUIRED
BRAKE PRESSURE SWITCH	H-4286	AS REQUIRED



8.0 IN SERVICE SUPPORT

Contact Eagle Tugs for technical services and information. See Section 1.3 – Manufacturer.

Customer Service customerservice@eagletugs.com

Technical Support support@eagletugs.com

8.1 TECHNICAL ASSISTANCE

When addressing a repair procedure or operational problem, please remember that Eagle technical support is only a phone call away. Eagle technicians are available to assist you in vehicle diagnostics and recommended repair procedures. We encourage you to use this service to reduce machine down-time and to gain a better understanding of proper repair procedures.



9.0 GUARANTEES/LIMITATION OF LIABILITY

9.1 EAGLE 3-YEAR WARRANTY

The Eagle Tugs (Eagle) 3-Year Warranty covers all NEW TT-series, TTR-series, eTT-series, XL-series, eXL-series and USATS tow tractors, used in aviation applications. Eagle Tugs warrants that these tractors will be free from defects in material and workmanship for a period of 3 years or 3,000 operating hours from date of delivery, with the exception of the electrical system which is covered for a period of 1 year or 1,000 hours (See electrical component warranty for eTT & eXL electric tow tractors below).

Electrical Component Warranty for eTT & eXL electric tow tractors: The following electrical components will be covered under Eagle's 3-year Warranty as they are considered major drive train components: Traction & Hydraulic Pump Motors, Drive Inverter for both the Traction and Hydraulic Pump Motors, Main & Pump Contactors, High and Low Hydraulic Pressure Switches, Steer & Shift Solenoids, DC-DC Converters, and the Programmable Vehicle Controller. This warranty does not extend to the batteries and battery chargers as these are warranted directly to the user by their respective manufacturer and not by Eagle or an Authorized Service Representative.

This warranty does not apply to any Eagle tow tractor, or component part(s) that have damage caused by: misuse of the vehicle, accidents, collision or object striking the vehicle, vandalism, fire, explosion or water damage, using contaminated or improper fuel/fluids, customer-applied chemicals to painted surfaces, improper handling or application, maintenance neglect including lack of lubricants or fluids; nor does it extend to the Eagle tow tractor and/or parts which have been repaired or altered outside of Eagle's plant or the facility of an Authorized Service Representative without the permission of Eagle. Furthermore, any modification of the tow tractor's electrical system **MUST** be preapproved and documented in writing by Eagle. Failure to do so voids the unit's electrical component warranty.

This warranty does not apply to routine maintenance or wearable parts of the Eagle tow tractor such as: tires, brake pads or shoes, ball joints, kingpins, u-joints, wheel bearings, filters, seals, spark plugs, hoses, belts, light bulbs, batteries (Diesel & Gas tractors), fuses or similar items. Also snow plows and transit pro options are warranted directly to the user by their respective manufacturer and not by Eagle or an Authorized Service Representative. However, all brackets, guards, and mounts made by Eagle for these options are covered under the 3-year Warranty.

This warranty does not cover or provide credit for the following: tractor rental or other substitute equipment; lodging; loss of time, income, sales or profits; loss of the use of tractor; telephone calls or communication expense; lift truck; storage fees; injury or death to persons or damage or destruction of property; or consequential, incidental or punitive damages

Warranty Claim Procedure: When a warranty situation arises, it is essential that the customer contact Eagle's Warranty Department at +1 734-442-1000. The customer will need to provide Eagle with the tow tractor serial number and operating hours. A customer service representative will analyze the problem and determine the next steps. In many cases Eagle's technical support personnel will be able to analyze the problem and recommend a solution that will solve the problem and reduce down time. If further service is required, an Eagle customer service representative will work with customer personnel to arrange a service provider and/or will send parts to your facility for the repair as quickly as possible.

Notice of any claimed defect must be given to Eagle within the warranty period and within ten (10) days after such defect is discovered. Liability under this warranty is limited to either replacing or repairing, at Eagle's election, any part or parts deemed defective after examination by Eagle or an Authorized Service Representative. Eagle reserves the right to use remanufactured parts as replacements in warranty claims.

At Eagle's election, any part replaced under warranty as defective can be sent out for third party inspection. If the part is not found to be defective, or abuse was the cause for the failure, all associated costs related to the warranty claim may be charged to the customer. All parts returned to Eagle by a customer must be received without further damage. If returned items are not properly packaged for return shipping to Eagle or an Authorized Service Representative via prepaid transportation, the customer will be charged for the full value of the item that was damaged upon return. This warranty does not extend beyond its original term for any Eagle tow tractor or part replaced or repaired under warranty.

Labor Allowance: A labor allowance may be issued upon request at Eagle's discretion. Allowable labor hours and a per hour labor rate will be determined by Eagle according to reasonable automotive standards.

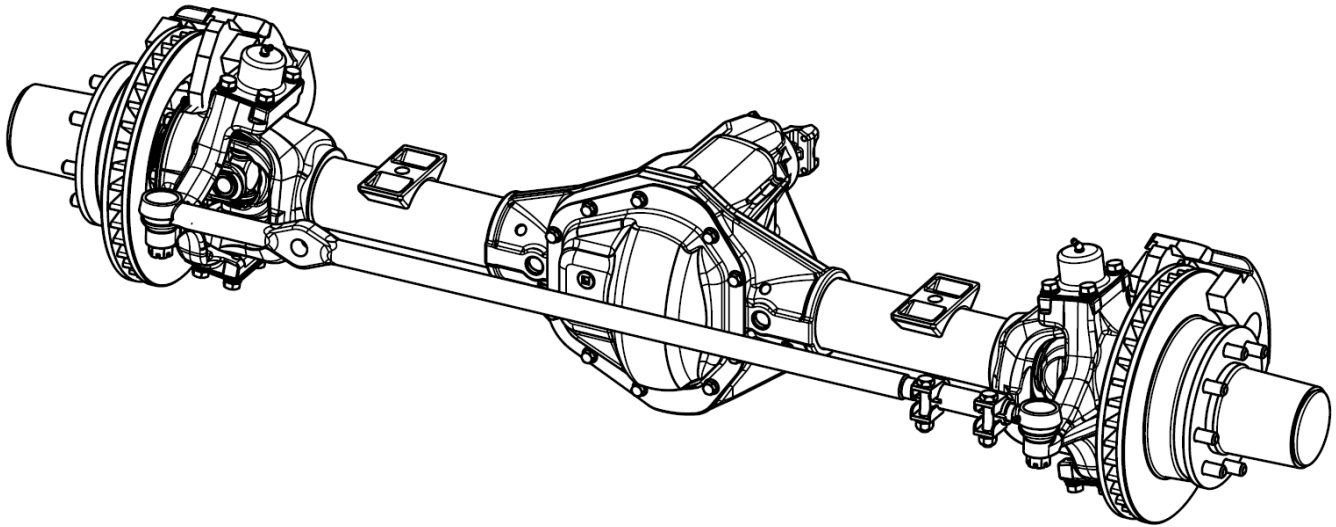
EXCEPT AS SET FORTH ABOVE, ALL WARRANTIES, CONDITIONS, REPRESENTATIONS, INDEMNITIES AND GUARANTEES, EXPRESS OR IMPLIED, WHETHER ARISING BY STATUTE, CUSTOM OF TRADE OR UNDER ORAL OR WRITTEN STATEMENTS MADE BY OR ON BEHALF OF EAGLE NEGOTIATIONS WITH CUSTOMER, DISTRIBUTOR, DEALER, OR ANY REPRESENTATIVE, ARE HEREBY OVERWRITTEN AND EXCLUDED, AND NO LIABILITY SHALL ATTACH TO EAGLE, EITHER IN CONTRACT OR IN TORT, OR STRICT LIABILITY IN TORT, FOR ANY DAMAGE TO PROPERTY, LOSS OF PROFITS, DAMAGES, COSTS, CHARGES, LIABILITY OR EXPENSES, WHETHER DIRECT OR INDIRECT, CONSEQUENTIAL OR OTHERWISE, WHICH ARISE OUT OF OR IN CONNECTION WITH THE SALE OR USE OF ANY EAGLE MACHINE OR THE SUPPLY OF SERVICES.

SUBJECT TO CHANGE WITHOUT NOTICE

Please check our website www.eagletugs.com periodically for service bulletins and updates to manuals.

*Note: The Eagle Tugs 3-Year Warranty covers TT-series, TTR-series, eTT-series, XL-series, eXL-series and USATS tow tractors used in aviation applications. All MTT, RTT-series, Transit Pro tow tractors, and all Eagle models which are used in non-aviation/industrial applications are covered under the Eagle Standard Warranty of 1 Year or 2,000 hours. Eagle Bob Tails are covered under Ford Motor Company's Standard Warranty for each respective Ford truck model.

- 10.0 DRIVETRAIN
- 10.1 FRONT AXLE SUB

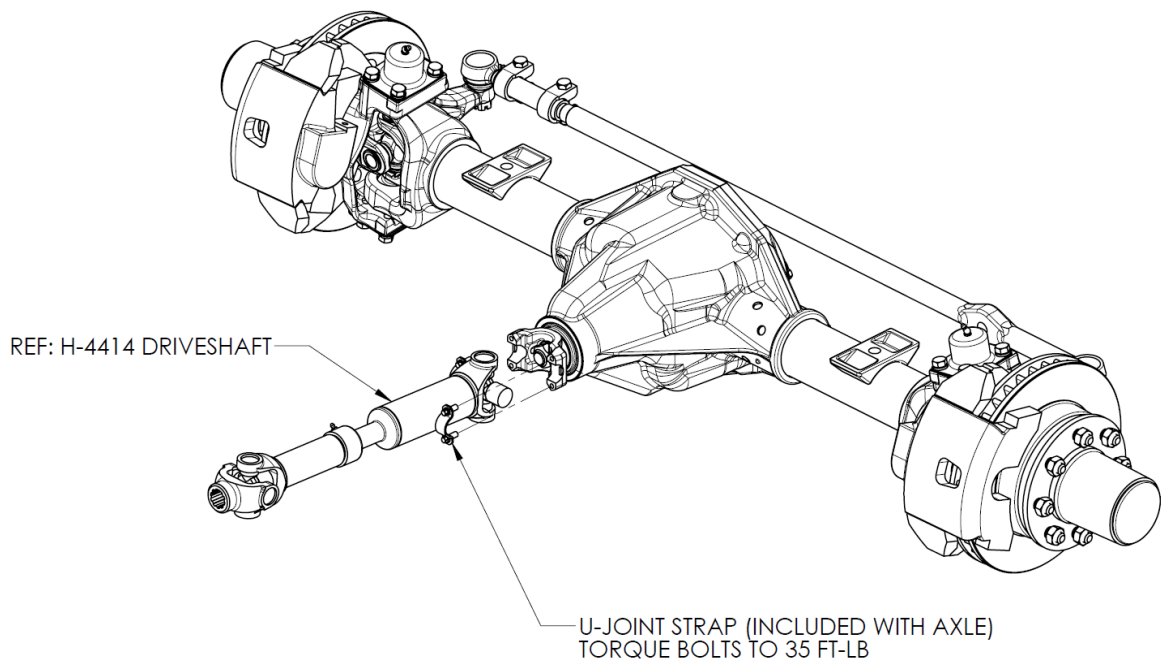
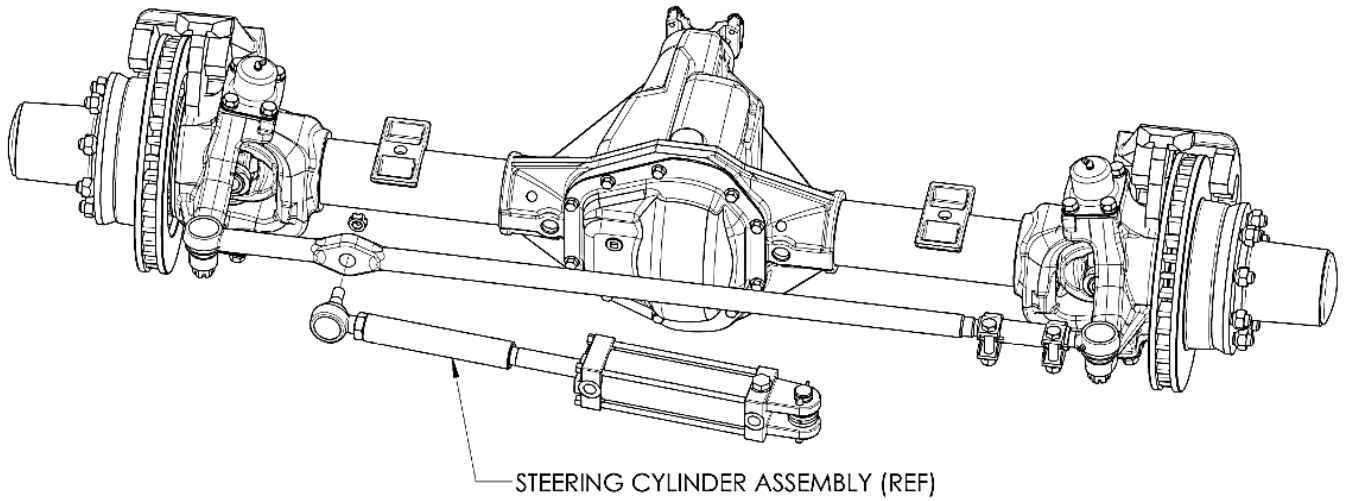


Parts List – Front Axle Sub

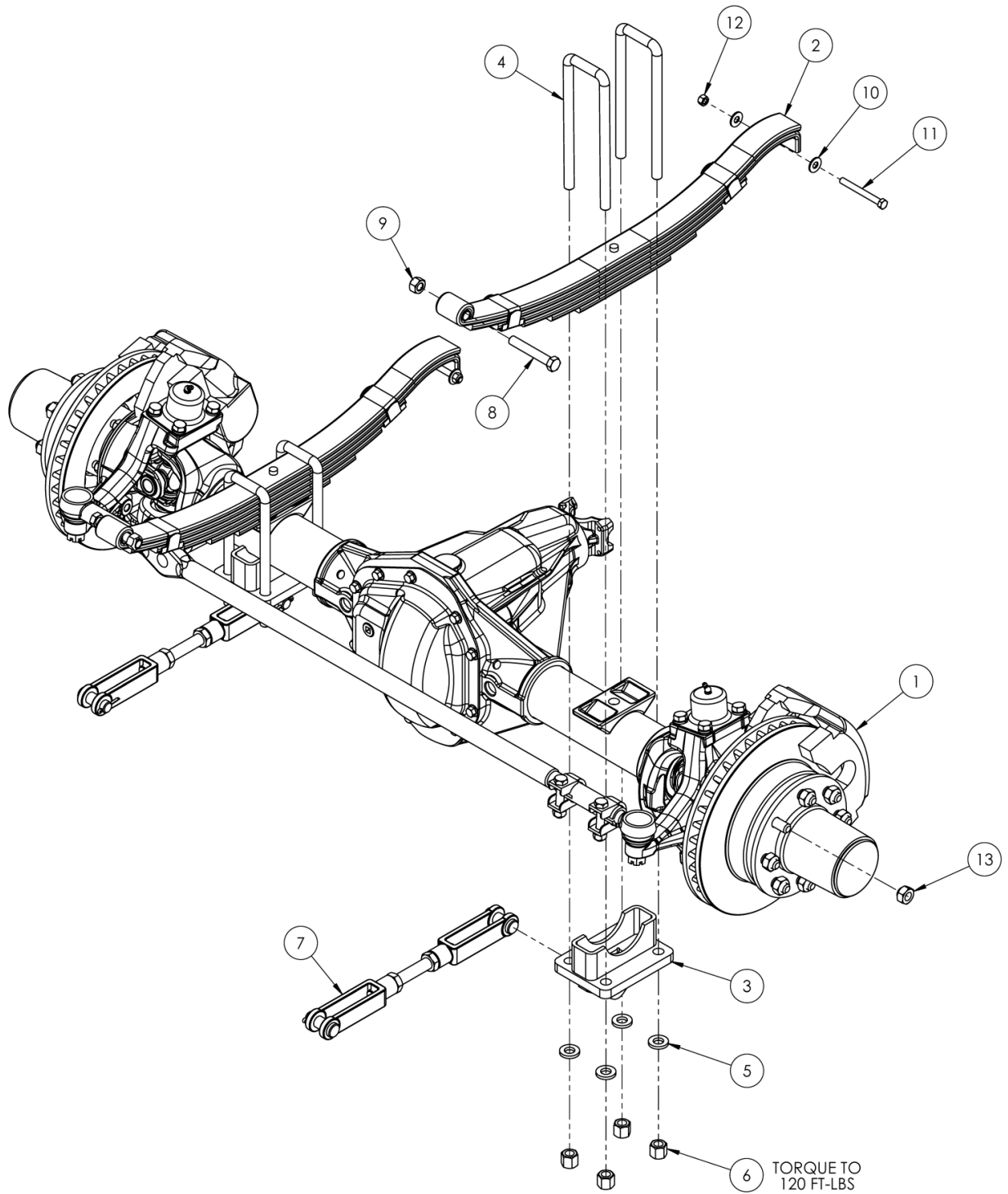
When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Part Number	Description	Qty
H-4417	FRONT DRIVE-STEER AXLE	1
L-1016	80/90 WEIGHT OIL	0.63

10.2 FRONT AXLE



10.2 FRONT AXLE (continued)





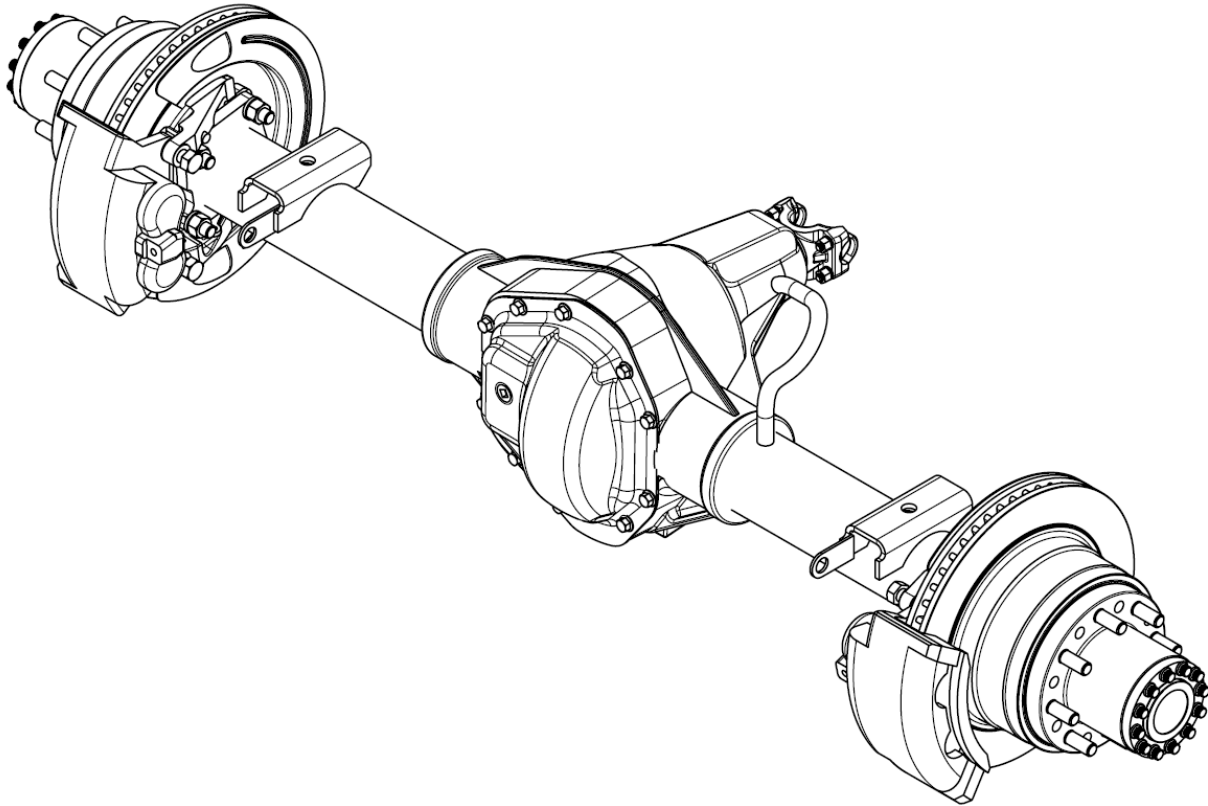
10.2 FRONT AXLE (continued)

Parts List – Front Axle

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	H-4417	WELDMENT, FRONT AXLE	1
2	A-TT10-00116	LEAF SPRING, TT12	2
3	Z-10499-00	WLD, U-BOLT CLAMP FR (P)	2
4	A-TT10-00119-1	U BOLT, TT10-12 AXLE	4
5	A-TT4-00366	WASHER, AXLE U-BOLT	8
6	A-TT4-00365	NUT, AXLE U-BOLT	8
7	Z-10412	ASY, ANTI ROTATION	2
8	G-1420-121534	BOLT, 9/16-18 HEX HD GR 8	2
9	G-1727-1210	NUT, 9/16-18 TOP LOCK ZINC	2
10	G-1250-1070W	FLATWASHER, 3/8 WIDE	4
11	G-1420-107034	BOLT, 3/8-16 X 3.5" HEX HD GR 8	2
12	G-1727-1070	NUT, 3/8-16 TOP LOCK ZINC	2
13	A-TT10-00123	.625-18 WHEEL NUT	16

10.3 REAR AXLE SUB

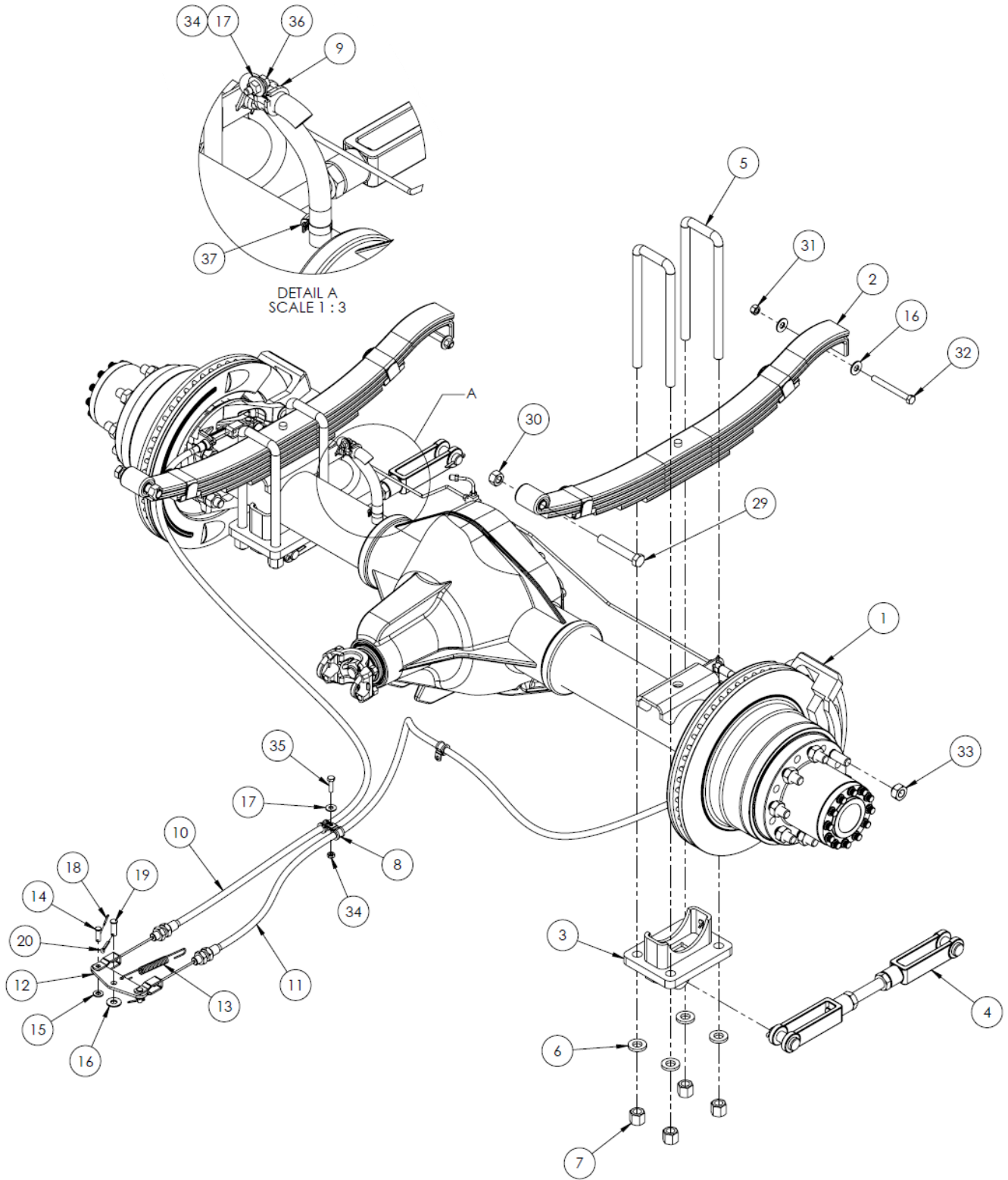


Parts List – Rear Axle Sub

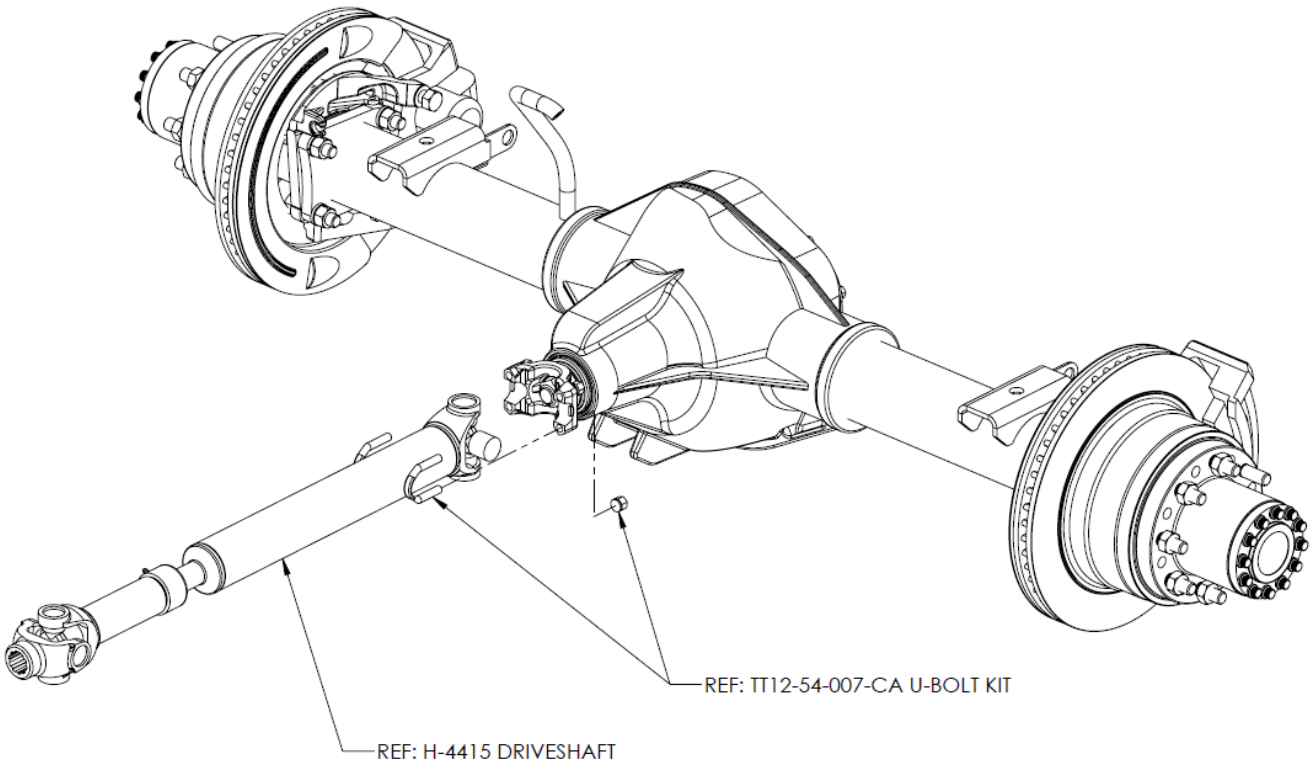
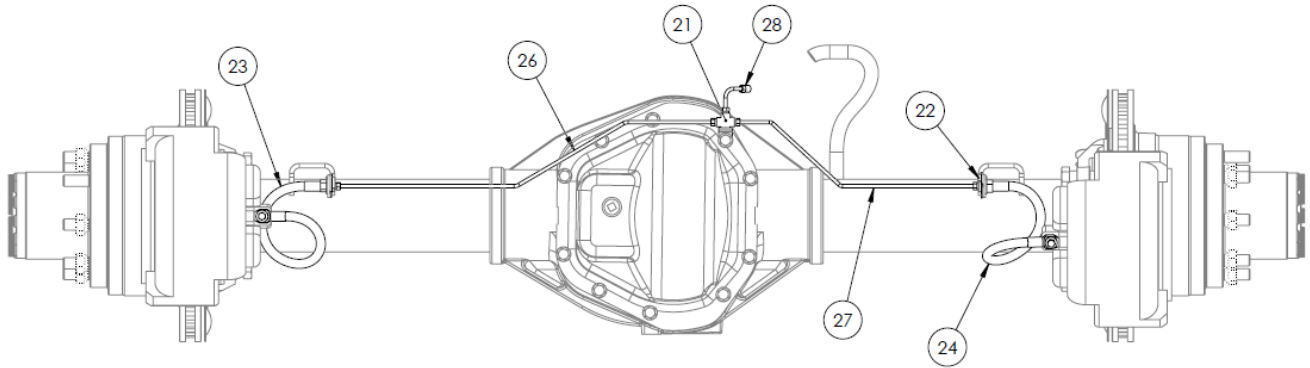
When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Part Number	Description	Qty
Z-10408	REAR AXLE	1
L-1016	80/90 WEIGHT OIL (NOT SHOWN)	0.125

10.4 REAR AXLE



10.4 REAR AXLE (continued)





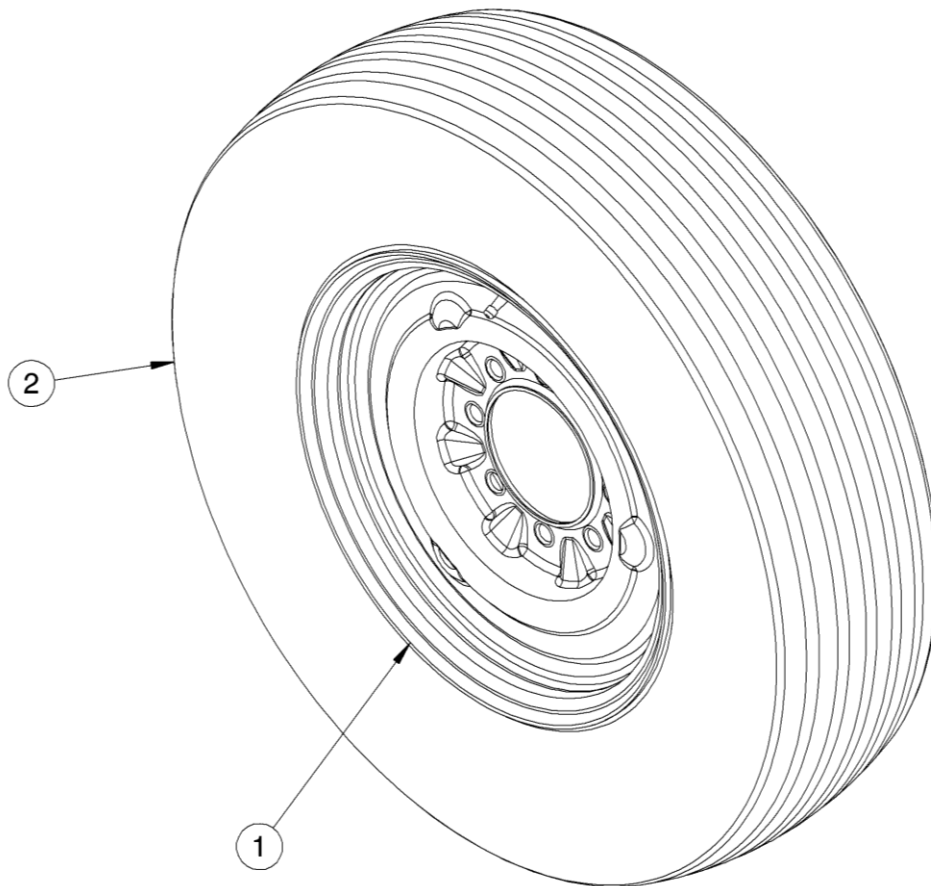
10.4 REAR AXLE (continued)

Parts List – Rear Axle

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	Z-10408	WELDMENT, REAR AXLE	1
2	A-TT10-00116	LEAF SPRING, TT12	2
3	Z-10497	WLD, U-BOLT CLAMP RR (P)	2
4	Z-10412	ASY, ANTI ROTATION	2
5	A-TT10-00119-1	U BOLT, TT10-12 AXLE	4
6	A-TT4-00366	WASHER, AXLE U-BOLT	8
7	A-TT4-00365	NUT, AXLE U-BOLT	8
8	H-3521-02	CLAMP, CUSHIONED LOOP 7/16"	3
9	H-3521-07	CLAMP, CUSHIONED LOOP 3/4"	1
10	TT12-13-002-SA	PARKING BRAKE CABLE	1
11	TT12-13-002-SA	PARKING BRAKE CABLE	1
12	J-6802-00	BRKT, PARK BRAKE EQ (P)	1
13	TT12-13-003-CA	PARKING BRAKE SPRING	1
14	G-1302-03	PIN, CLEVIS, 5/16 X 0.94" LG.	4
15	G-1250-1060N	FLATWASHER, 5/16 NARROW	4
16	G-1250-1070W	FLATWASHER, 3/8 WIDE	5
17	G-1250-1050W	FLATWASHER, 1/4 WIDE	2
18	G-1301-01	PIN, 3/32 X 1 LG COTTER	4
19	G-1302-18	PIN, 3/8 X 1.00 LG CLEVIS	1
20	G-1301-04	PIN, 5/32 X 1.0" LG. COTTER	1
21	N-3068	BRAKE T FITTING, MODIFIED	1
22	A-TT4-00165	BRAKE HOSE CLIP	2
23	A-TT4-00176-1	BRAKE HOSE	1
24	A-TT4-00176-1	BRAKE HOSE	1
25	A-TT4-00178	BANJO BOLT WITH WASHER	2
26	H-4520	BRAKE LINE, REAR LH	1
27	H-4521	BRAKE LINE, REAR RH	1
28	A-TT4-00167	BRAKE LINE SHORT ELBOW	1
29	G-1420-121534	BOLT, 9/16-18 HEX HD GR 8	2
30	G-1727-1210	NUT, 9/16-18 TOP LOCK ZINC	2
31	G-1727-1070	NUT, 3/8-16 TOP LOCK ZINC	2
32	G-1420-107034	BOLT, 3/8-16 X 3.5" HEX HD GR 8	2
33	A-TT10-00123	.625-18 WHEEL NUT	16
34	G-1727-1050	NUT, 1/4-20 TOP LOCK ZINC	2
35	G-1100-105010	BOLT, 1/4-20 X 1.0" LG HEX HD GR 5	1
36	G-1100-105006	BOLT, 1/4-20 X 3/4" LG HEX HD GR 5	1
37	H-1426-04	HOSE CLAMP - 0.50" - 1.25"	1

10.5 WHEEL AND TIRE

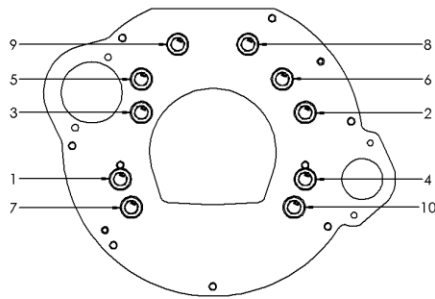
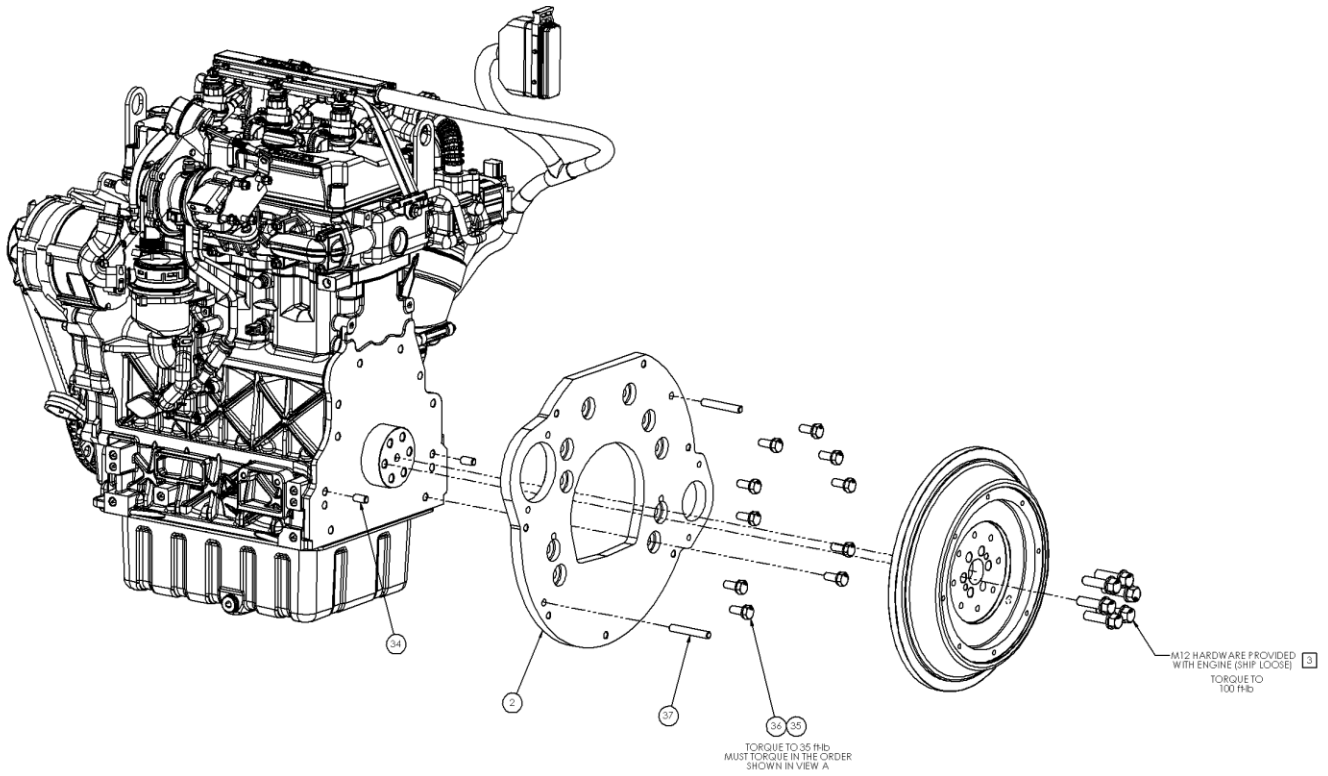


Parts List – Wheel and Tire

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
	Z-10648	ASSY, WHEEL AND TIRE; consists of:	
1	A-TT4-00122	RIM, 16.5 X 6.75, BC 8-6.5	1
2	A-TT10-00121	TIRE, 235/85 R16 LR E	1

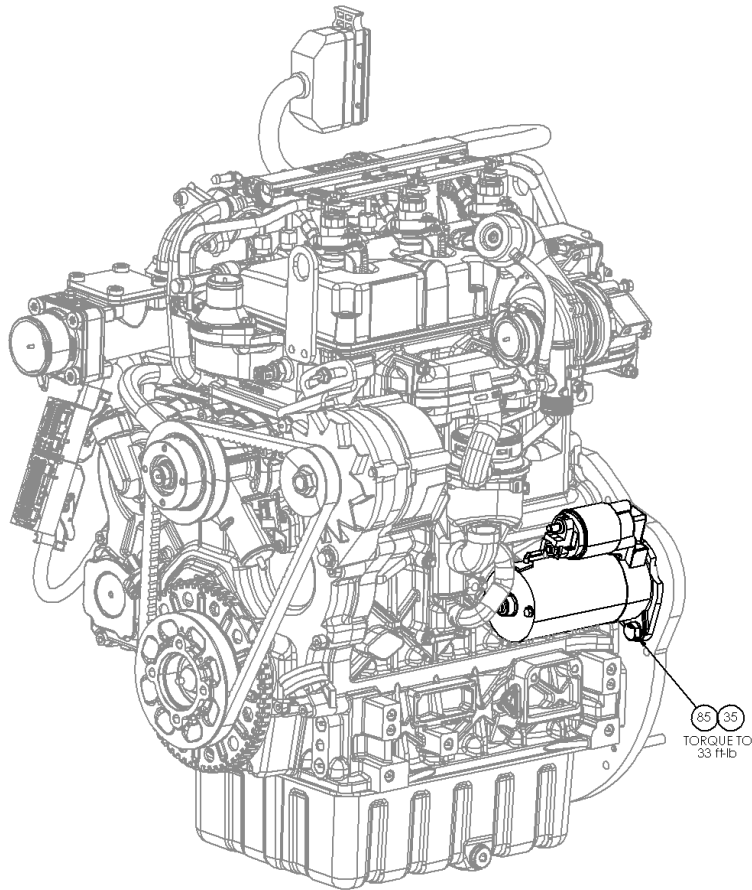
10.6 ENGINE ASSEMBLY



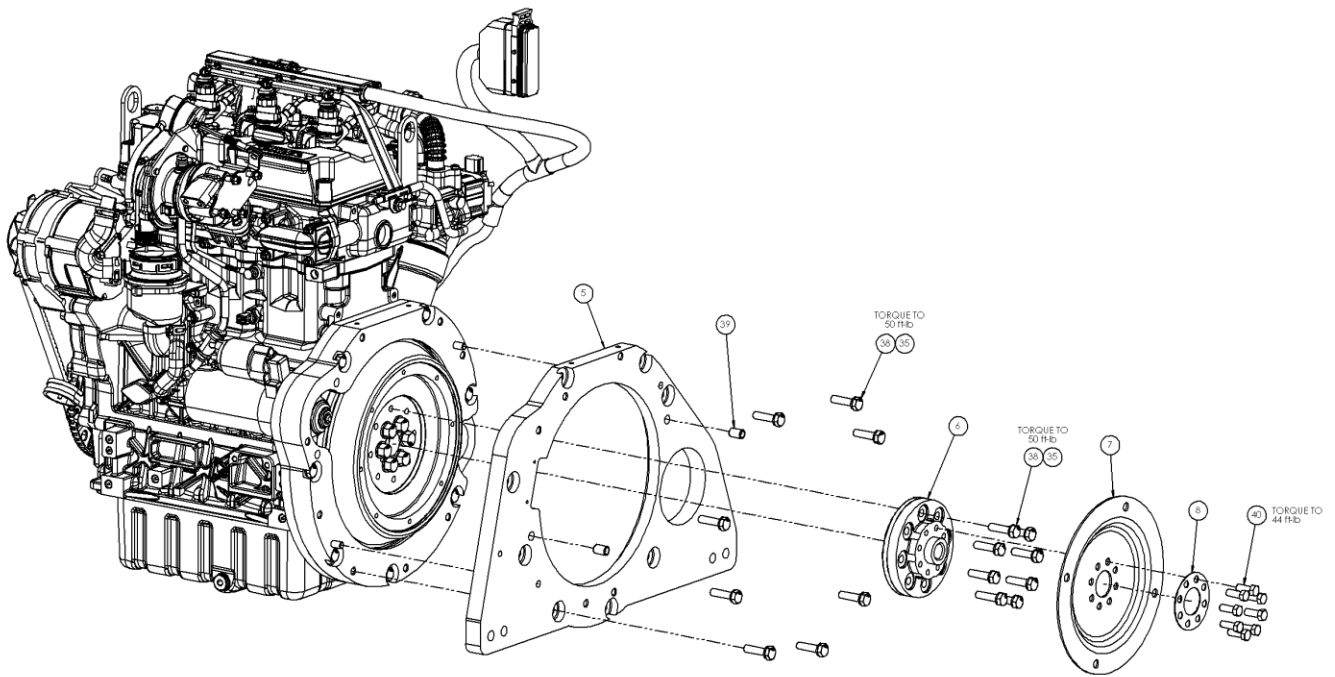
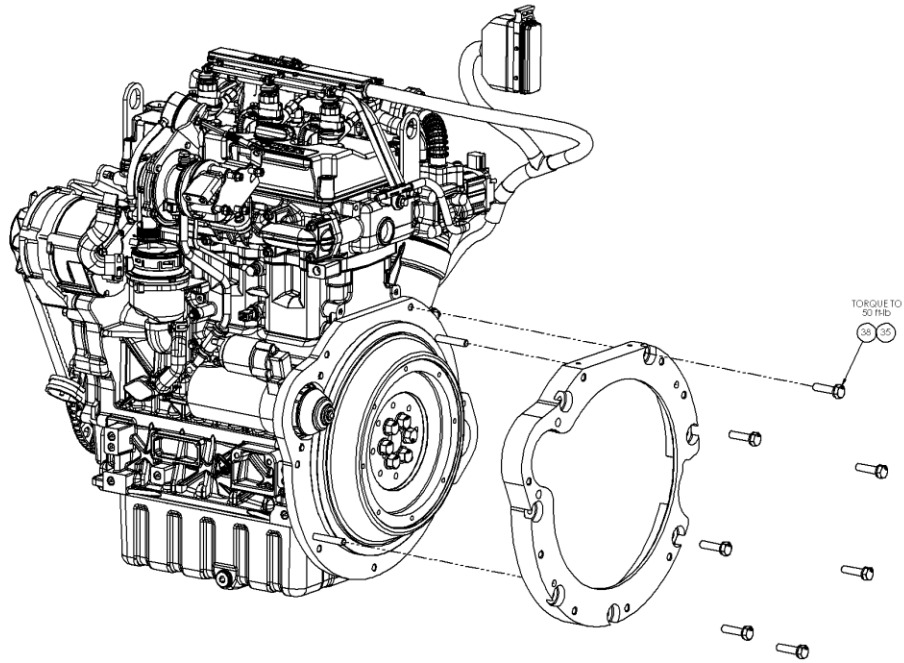
VIEW A
ENGINE PLATE
BOLT TORQUE ORDER

3 INSTALL WITH LOCTITE RED THREAD LOCKER OR EQUIVALENT

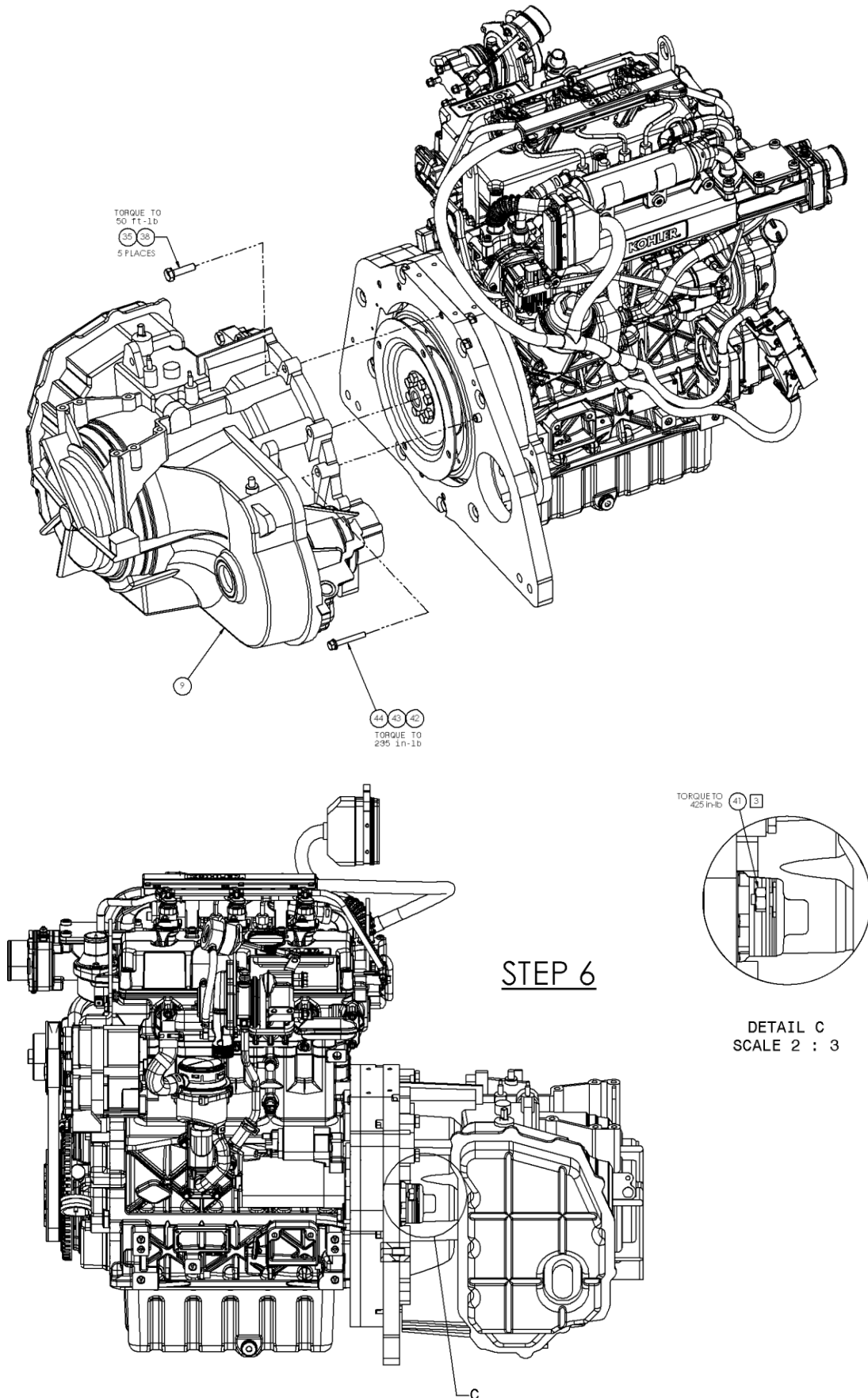
10.6 ENGINE ASSEMBLY (continued)



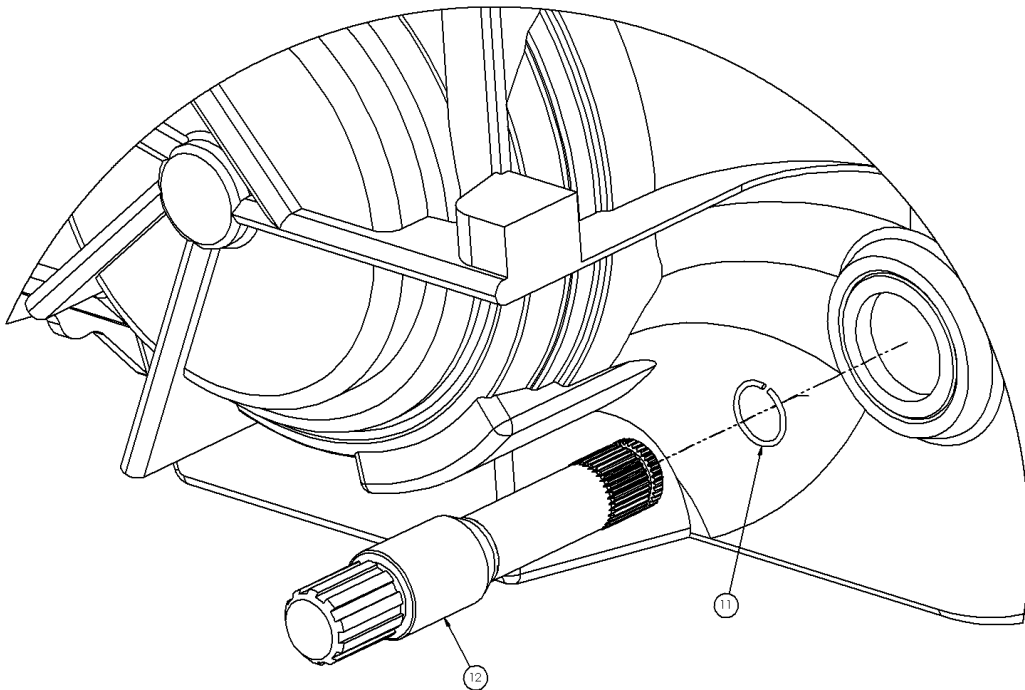
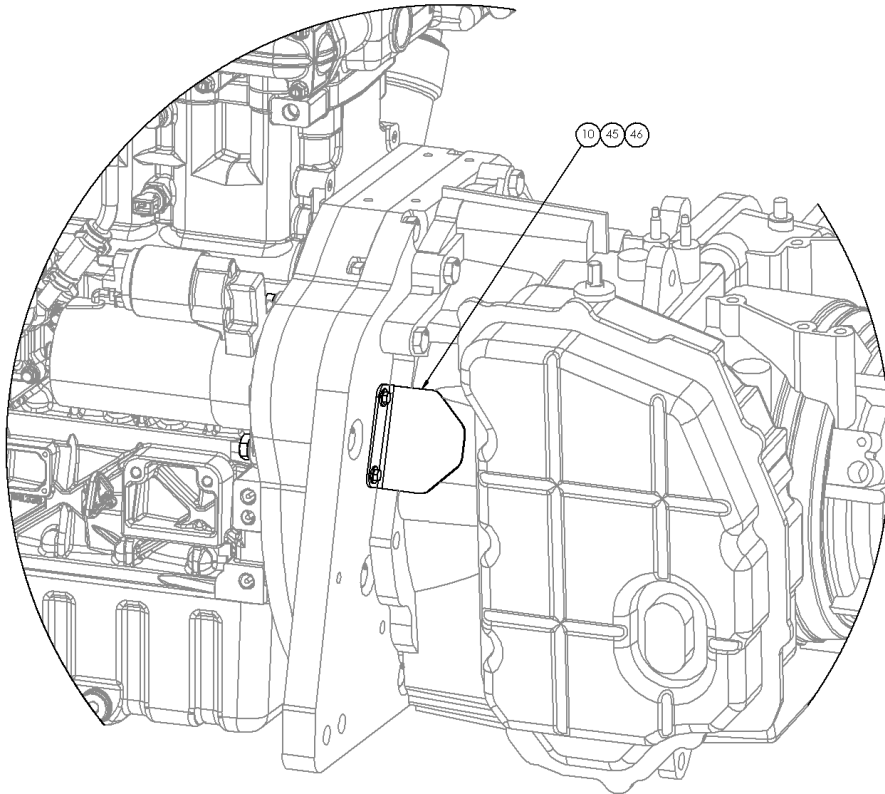
10.6 ENGINE ASSEMBLY (continued)



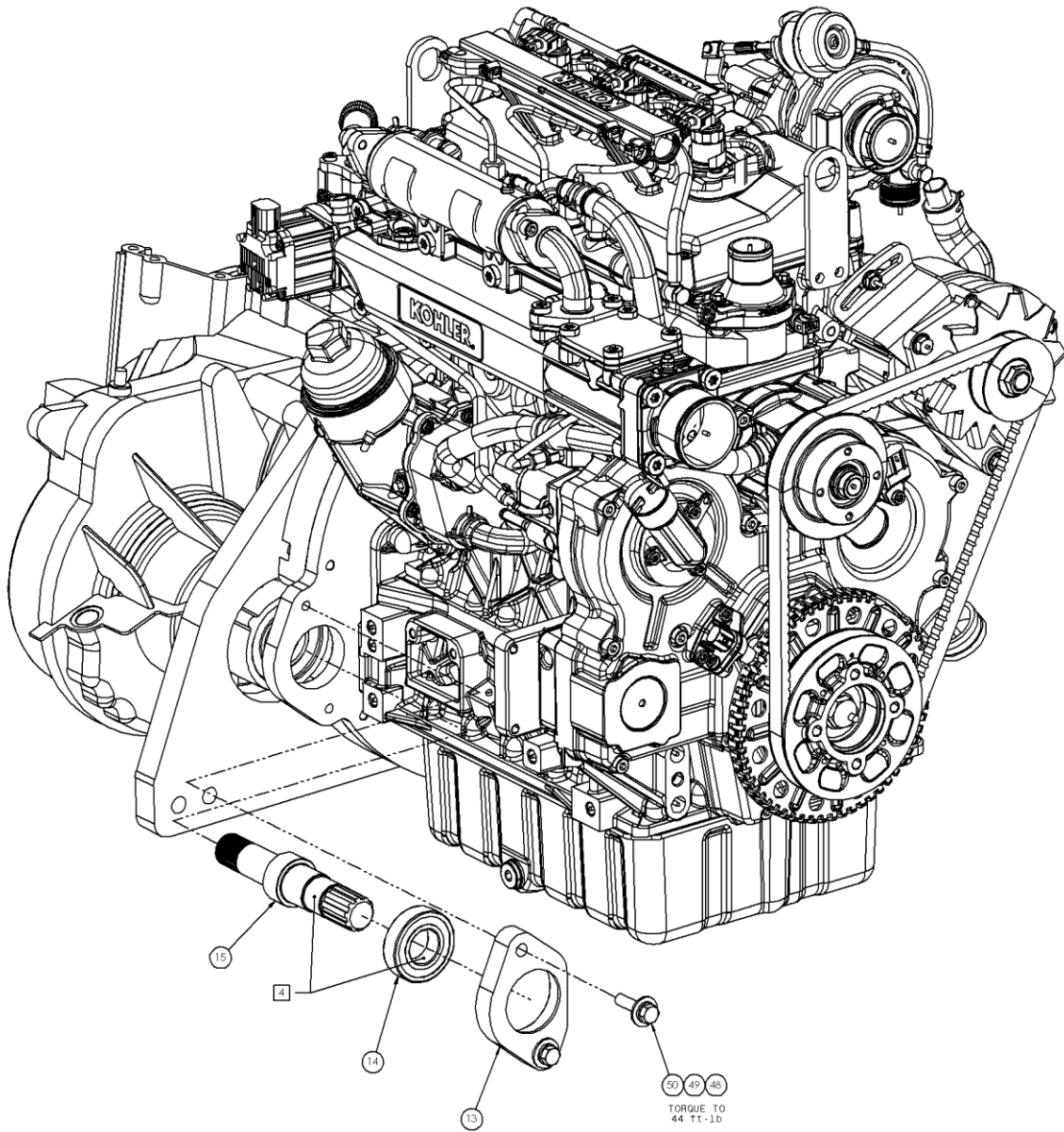
10.6 ENGINE ASSEMBLY (continued)



10.6 ENGINE ASSEMBLY (continued)

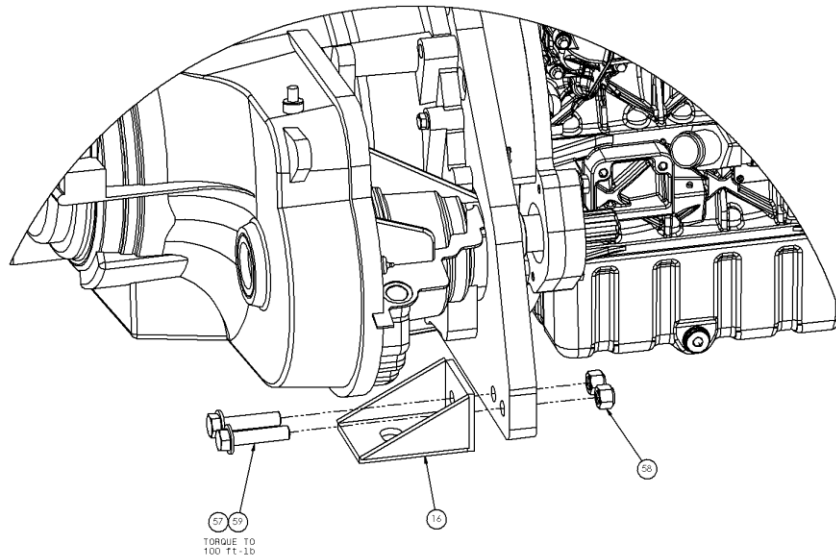
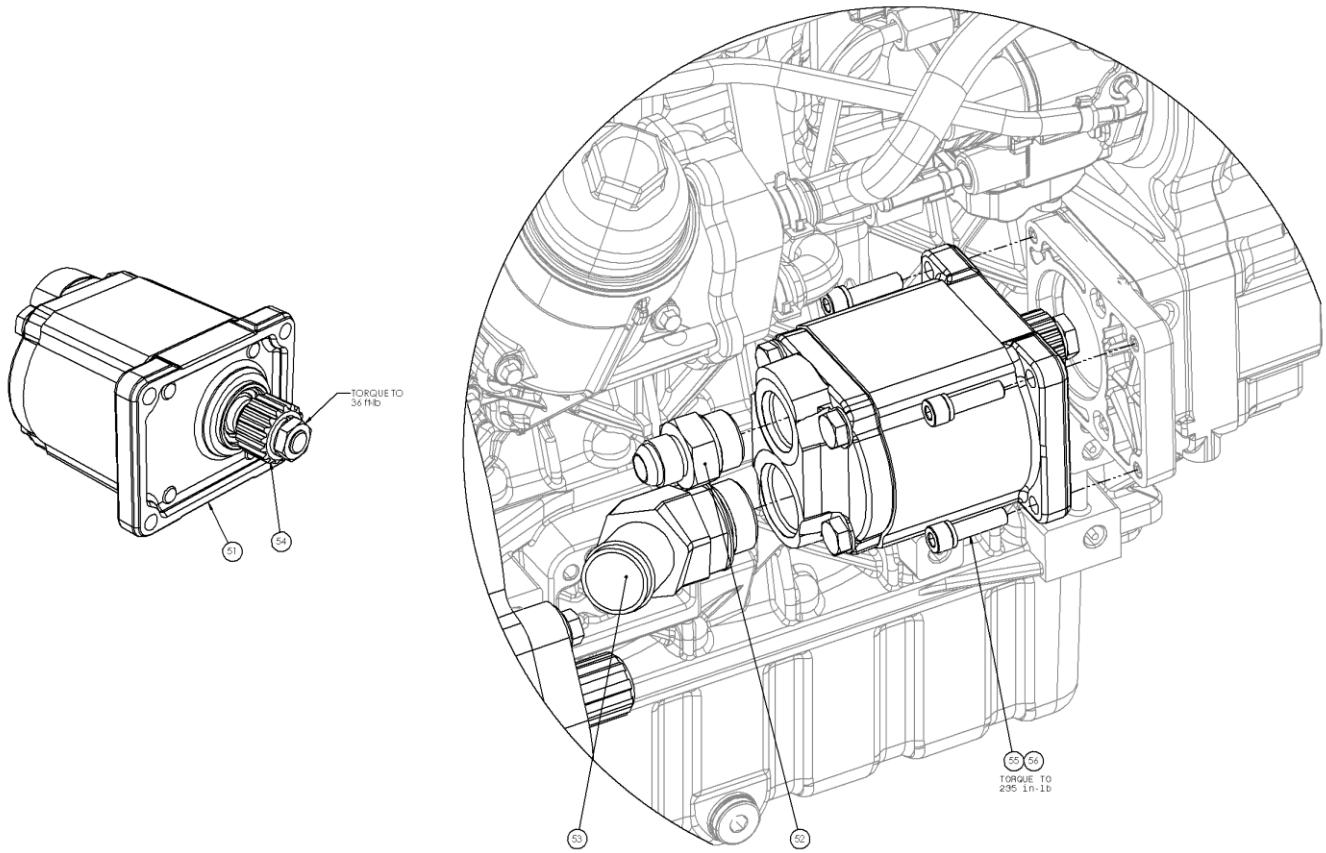


10.6 ENGINE ASSEMBLY (continued)

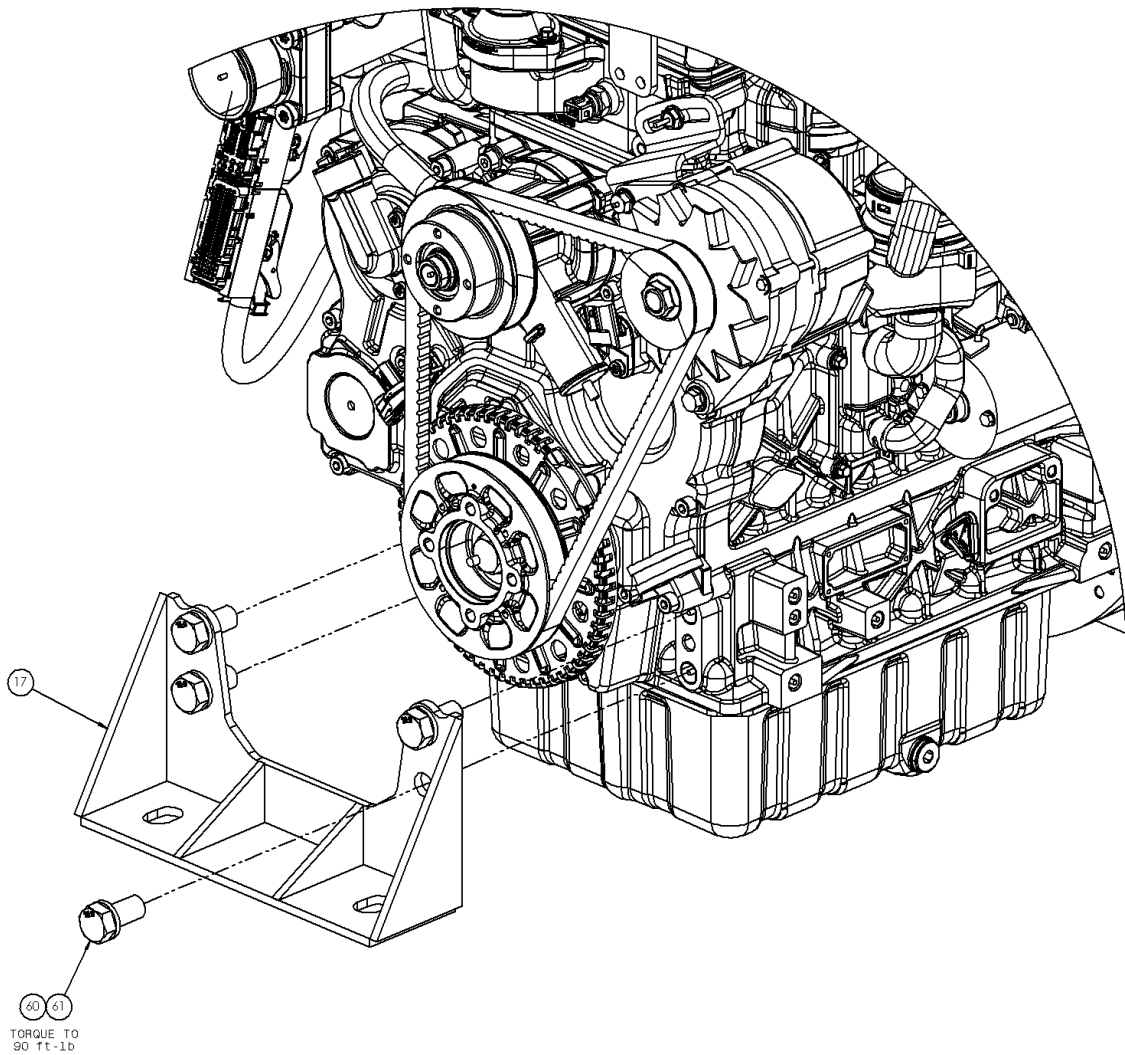


4 INSTALL WITH LOCTITE BEARING RETAINING COMPOUND OR EQUIVALENT

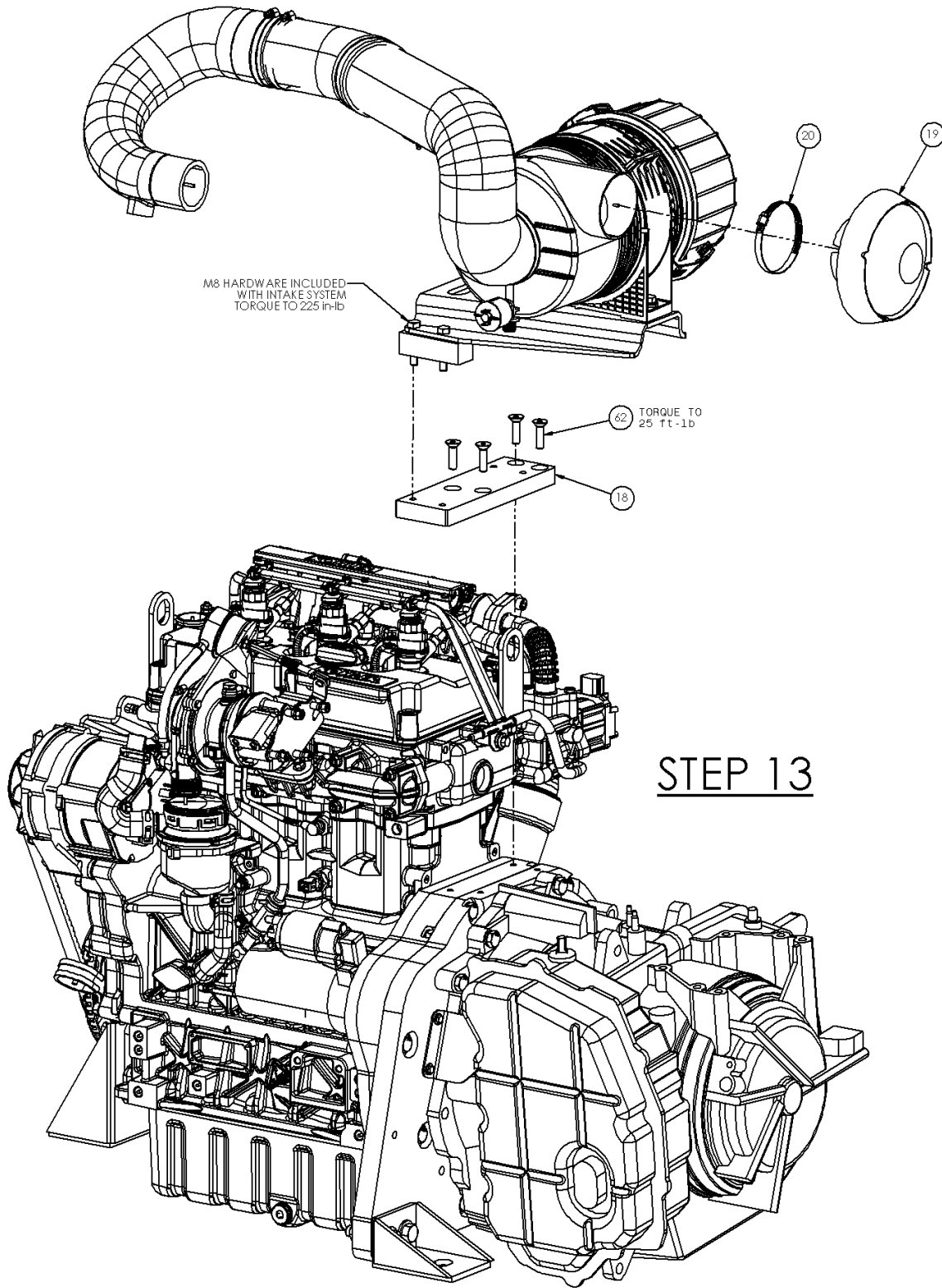
10.6 ENGINE ASSEMBLY (continued)



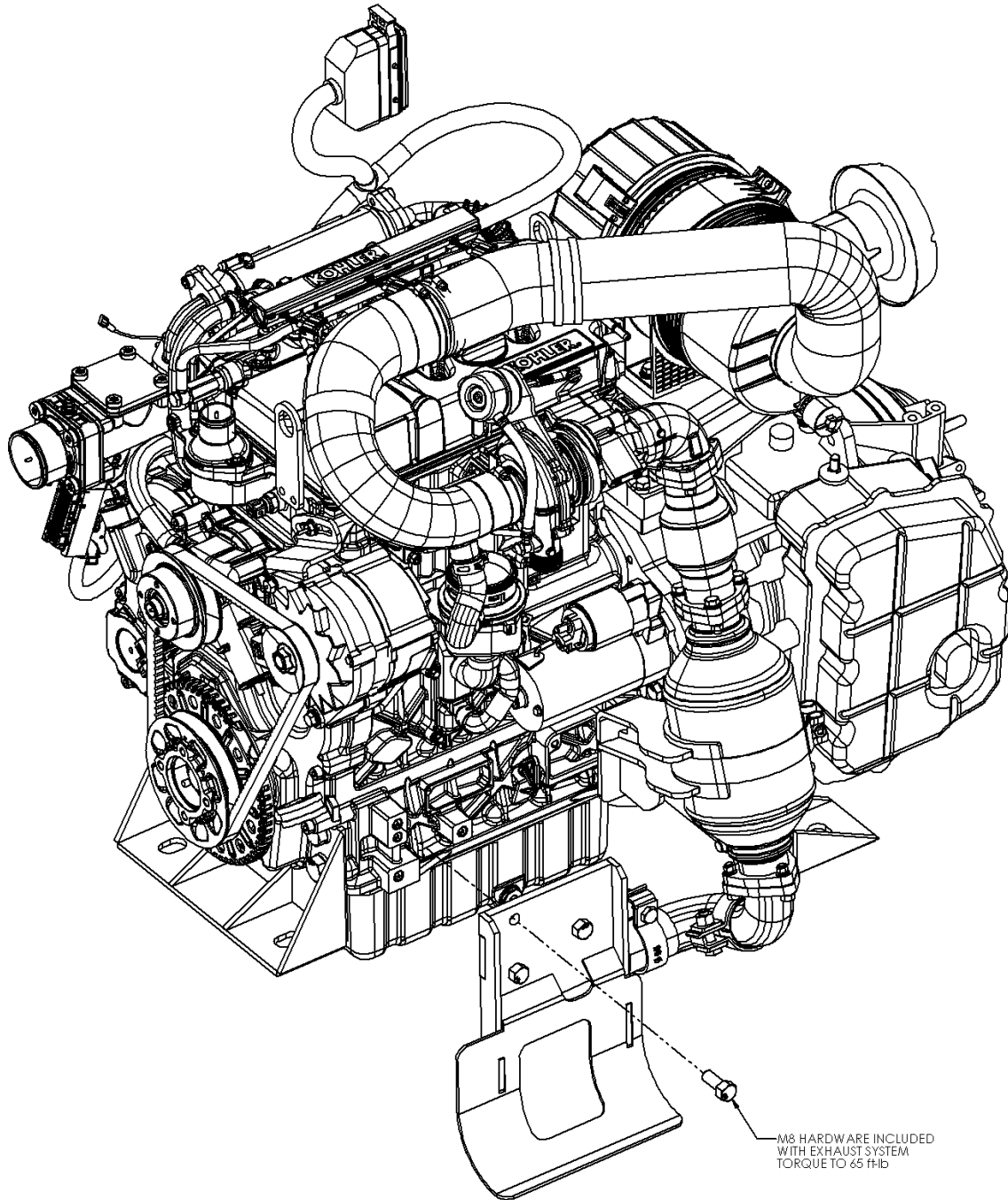
10.6 ENGINE ASSEMBLY (continued)



10.6 ENGINE ASSEMBLY (continued)

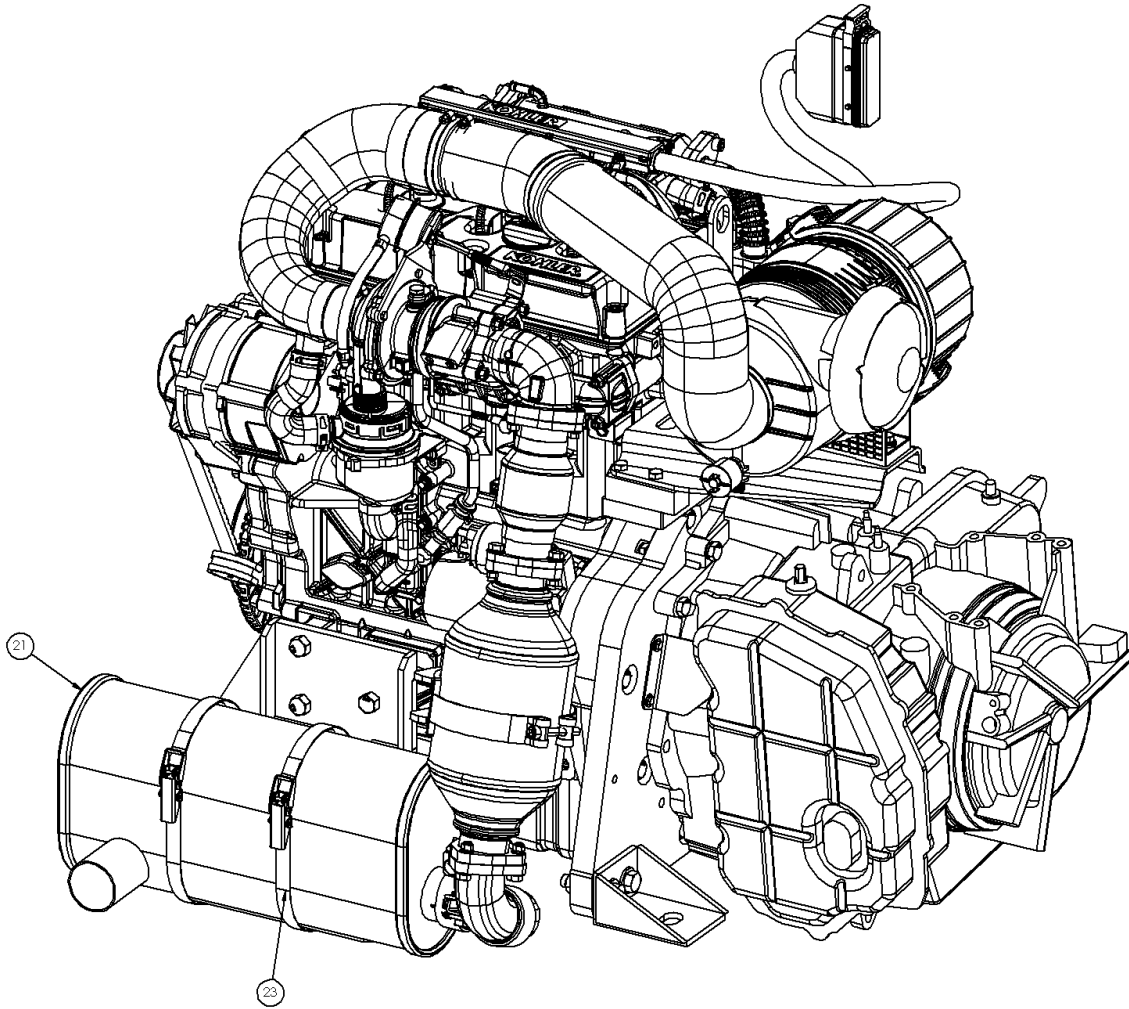


10.6 ENGINE ASSEMBLY (continued)

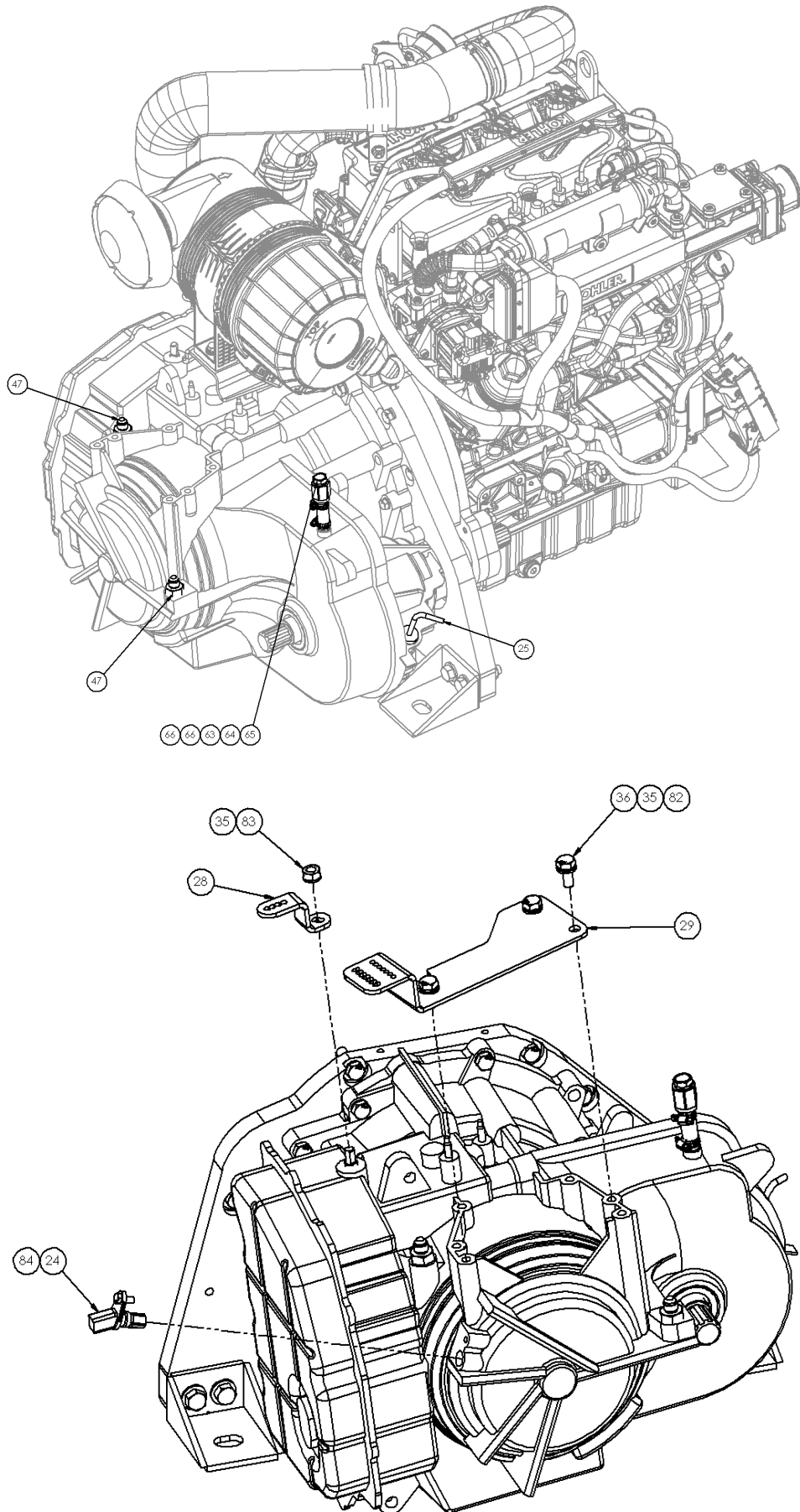


M8 HARDWARE INCLUDED
WITH EXHAUST SYSTEM
TORQUE TO 65 ft-lb

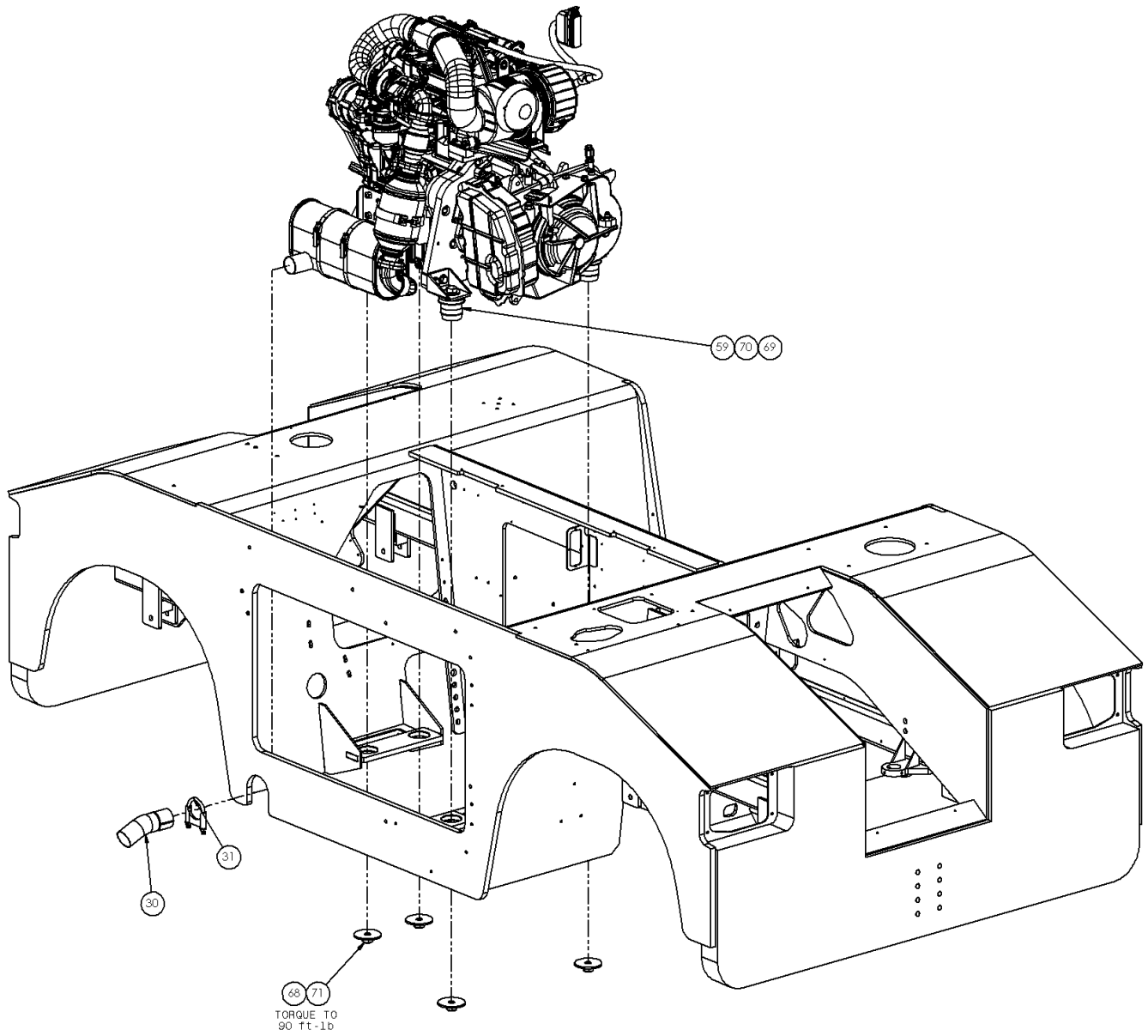
10.6 ENGINE ASSEMBLY (continued)



10.6 ENGINE ASSEMBLY (continued)



10.6 ENGINE ASSEMBLY (continued)





10.6 ENGINE ASSEMBLY (continued)

Parts List – Engine Assembly

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	H-4511	KDI 2504 ENGINE	1
2	J-6767	ENGINE PLATE	1
3	H-4245	KDI1903 FLYWHEEL	1
4	J-6768	SPACER PLATE	1
5	J-6769	TRANS PLATE	1
6	R-3199	FLEXPLATE ADAPTER	1
7	S-3326-HT	FLEXPLATE, HEAT TREATED	1
8	S-3327	FLEXPLATE WASHER	1
9	H-4239	TRANSMISSION	1
10	S-3328-00	TRANS ACCESS HOLE COVER (P)	1
11	H-4264	TRANS SHAFT RETAINER CLIP	1
12	R-3200	TRANS OUTPUT SHAFT FRONT	1
13	J-6770	TRANS SHAFT BEARING SUPPORT	1
14	H-4263	TRANS SHAFT BEARING	1
15	R-3444	TRANS OUTPUT SHAFT REAR	1
16	Z-9810-00	REAR MOTOR MOUNT (P)	2
17	Z-9811-00	FRONT MOTOR MOUNT (P)	1
18	J-6771-00	INTAKE MTG ADAPTER (P)	1
19	A-TT4-00098-1	AIR FILTER INTAKE CAP	1
20	H-1426-13	CLAMP, HOSE	1
21	H-4262	MUFFLER	1
22	Z-10077-00	WLD, MUFFLER BRACKET (WP)	1
23	XM00-07-007-SA	AFTERTREATMENT STRAP CLAMP	2
24	EC-3148	TRANSMISSION SPEED SENSOR	1
25	N/A	ASY, DIPSTICK	1
26	EC-3114	KDI1903 T4F ECU	1
27	J-7481-00	NVH BALLAST WEIGHT (P)	2
28	J-6869-00	SHIFT LEVER (P)	1
29	J-6877-00	SHIFT CABLE CLAMP BRKT (P)	1
30	TR-2614	EXHAUST PIPE, OUTLET	1
31	H-1537-02	CLAMP, MUFFLER	1
32	J-7571-00	ECU MTG ADAPTER PLATE (P)	1
33	S-3908-00	SHIELD, ENGINE ECU (P)	1
34	G-1573-1020	PIN, DOWEL Ø10MM X 32MM	2
35	G-1514-M100R	LOCKWASHER, M 10 REGULAR	44
36	G-1533-100025	BOLT M10-1.5 X 25mm LG. CLASS 10.9	13
37	G-1315-07-2.50	PIN, 3/8" X 2-1/2" STL DOWEL	2
38	G-1533-100040	BOLT M10-1.5 X 40mm LG. CLASS 10.9	28
39	G-1792	TRANSMISSION DOWEL PIN	2
40	G-1420-107010	BOLT, 3/8-16 X 1.0" HEX HD GR 8	8
41	G-1793-10	NUT, HEX CLASS 8 M10X1	4
42	G-1515-M80	FLATWASHER, M8	1
43	G-1514-M80R	SPLIT LOCK WASHER (METRIC)	1
44	G-1114-080055	BOLT M8-1.25 X 55mm LG. CLASS 8.8	1



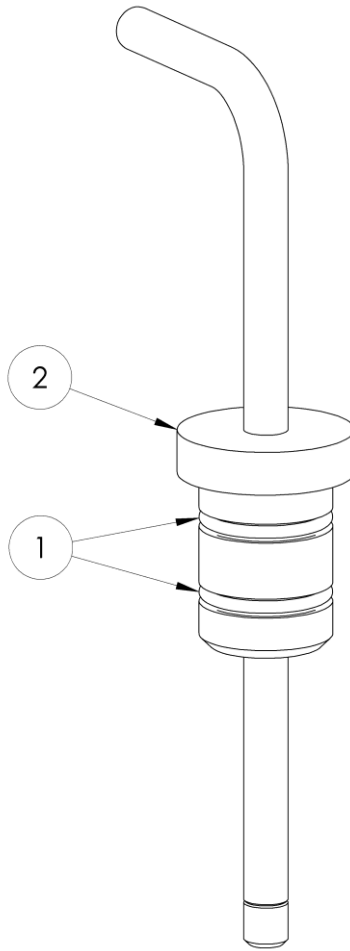
10.6 ENGINE ASSEMBLY (continued)

Parts List – Engine Assembly

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
45	G-1150-103504	SCREW, #10-32 X 1/2" LG HEX HD MACHINE	2
46	G-1250-1030N	FLATWASHER, #10 NARROW	2
47	C5315X6X8	ADAPTER, -08 M ORB X -06 M JIC	2
48	G-1250-1070W	FLATWASHER, 3/8 WIDE	2
49	G-1251-1070R	LOCKWASHER, 3/8 REGULAR	2
50	G-1420-107014	BOLT, 3/8-16 X 1.5" HEX HD GR 8	2
51	HC-2818	19CC HYD GEAR PUMP	1
52	N-2007-17-S-B	ADAPTER, -10 M JIC X -12 M ORB	1
53	4603-20-16	ELBOW 45, -16 M ORB X -20 BEAD	1
54	H-4261	KDI1903 HYD PUMP GEAR	1
55	G-1491-107015	SCR, M8-1.25 SOC HD CAP	4
56	G-1626-M8Z	LOCKWASHER, M8 HIGH COLLAR	4
57	G-1250-1090N	FLATWASHER, 1/2 NARROW	8
58	G-1727-1090	NUT, 1/2-13 TOP LOCK ZINC	4
59	G-1420-109022	BOLT, 1/2-13 X 2-1/4 H.H. GR 8	4
60	G-1514-M160R	LOCKWASHER, M16 REGULAR	4
61	G-1533-161035	BOLT M16-1.5 X 35mm LG. CLASS 10.9	4
62	G-1152-106212	82 DEG FHC, 5/16-18 X 1.25	4
63	TF-1080-06-002.00	HYD HOSE - TRANS DRAIN	1
64	N-2917-03	ADAPTER, 3/8 F NPT X -06 BARB, BRASS	1
65	H-3016	VENT, BREATHER	1
66	H-1426-01	HOSE CLAMP - .38" - .87"	2
67	A-TT5D-00013-1	ISOLATOR, ENGINE MOUNT	4
68	A-TT5D-00010	ENGINE MOUNT WASHER	4
69	G-1250-1110W	FLATWASHER, 3/4 WIDE	4
70	G-1420-111034	BOLT, 3/4-10 X 3-1/2" HEX HD GR 8	4
71	G-1727-1110	NUT, 3/4-10 TOP LOCK ZINC	4
72	H-4731	THREADED ISOLATOR	4
73	G-1152-105204	SCREW, 1/4-20 X 1/2" LG SOCKET FLAT HD CAP	4
74	H-3521-09	CLAMP, CUSHIONED LOOP 7/8"	1
75	G-1152-105210	SCREW, 1/4-20 X 1.0" LG SOCKET FLAT HD CAP	1
76	G-1250-1050W	FLATWASHER, 1/4 WIDE	7
77	G-1727-1050	NUT, 1/4-20 TOP LOCK ZINC	1
78	G-1250-1050N	FLATWASHER, 1/4 NARROW	4
79	G-1251-1050R	LOCKWASHER, 1/4 REGULAR	10
80	G-1100-105006	BOLT, 1/4-20 X 3/4" LG HEX HD GR 5	2
81	G-1154-105210	SCREW, 1/4-20 X 1" LG. SOC BUTT. HD CAP	4
82	G-1515-M100	FLATWASHER, M10	3
83	G-1793-12	NUT, HEX CLASS 8 M10X1.5	1
84	G-1114-060016	BOLT, M6X1.0 X 16 CLASS 8.8	1
85	G-1533-100035	BOLT M10-1.5 X 35mm LG. CLASS 10.9	2
86	L-1026	TRANSMISSION FLUID, MERCON LV	5
87	L-1027	ENGINE OIL, 5W40 SYNTHETIC	9.5
88	G-1100-105010	BOLT, 1/4-20 X 1.0" LG HEX HD GR 5	4

10.7 DIPSTICK

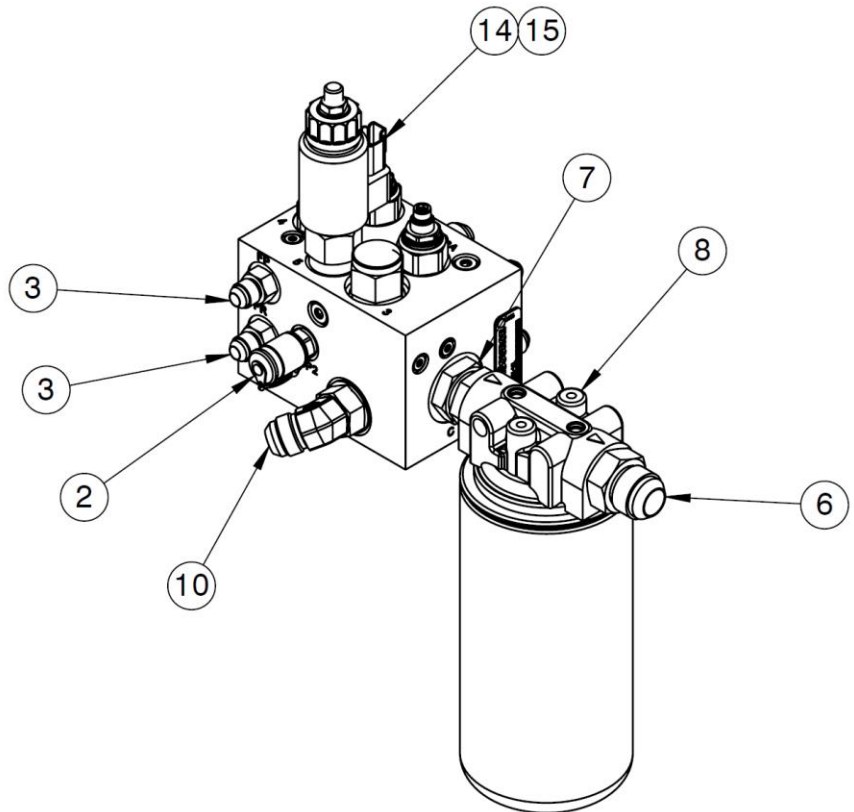
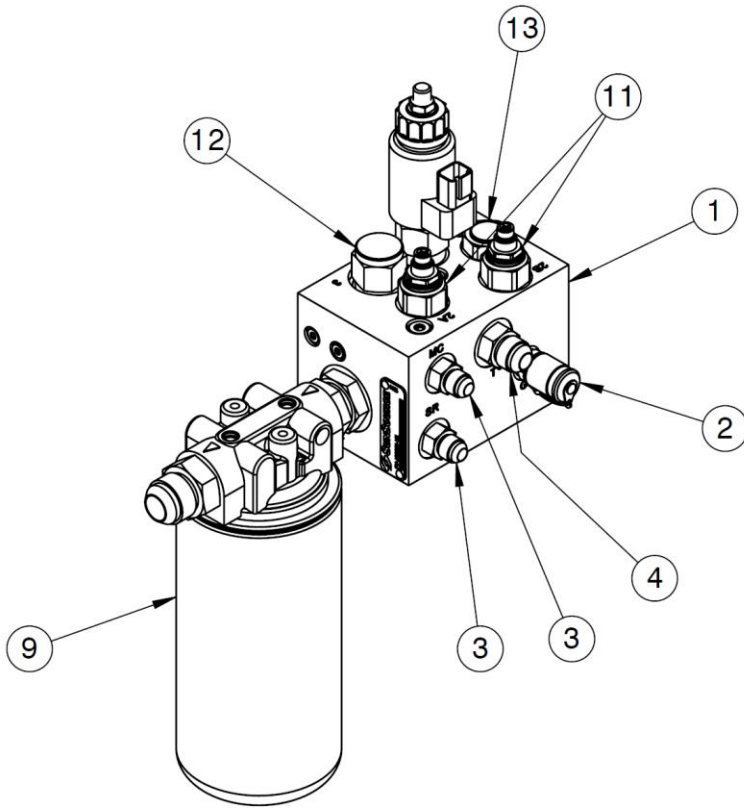


Parts List – Dip Stick

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	HC-2000-016	O-RING, SERIES 2	2
2	Z-10760-00	WLD, TRANS DIPSTICK (P)	1

11.0 HYDRAULICS
11.1 MANIFOLD SUB





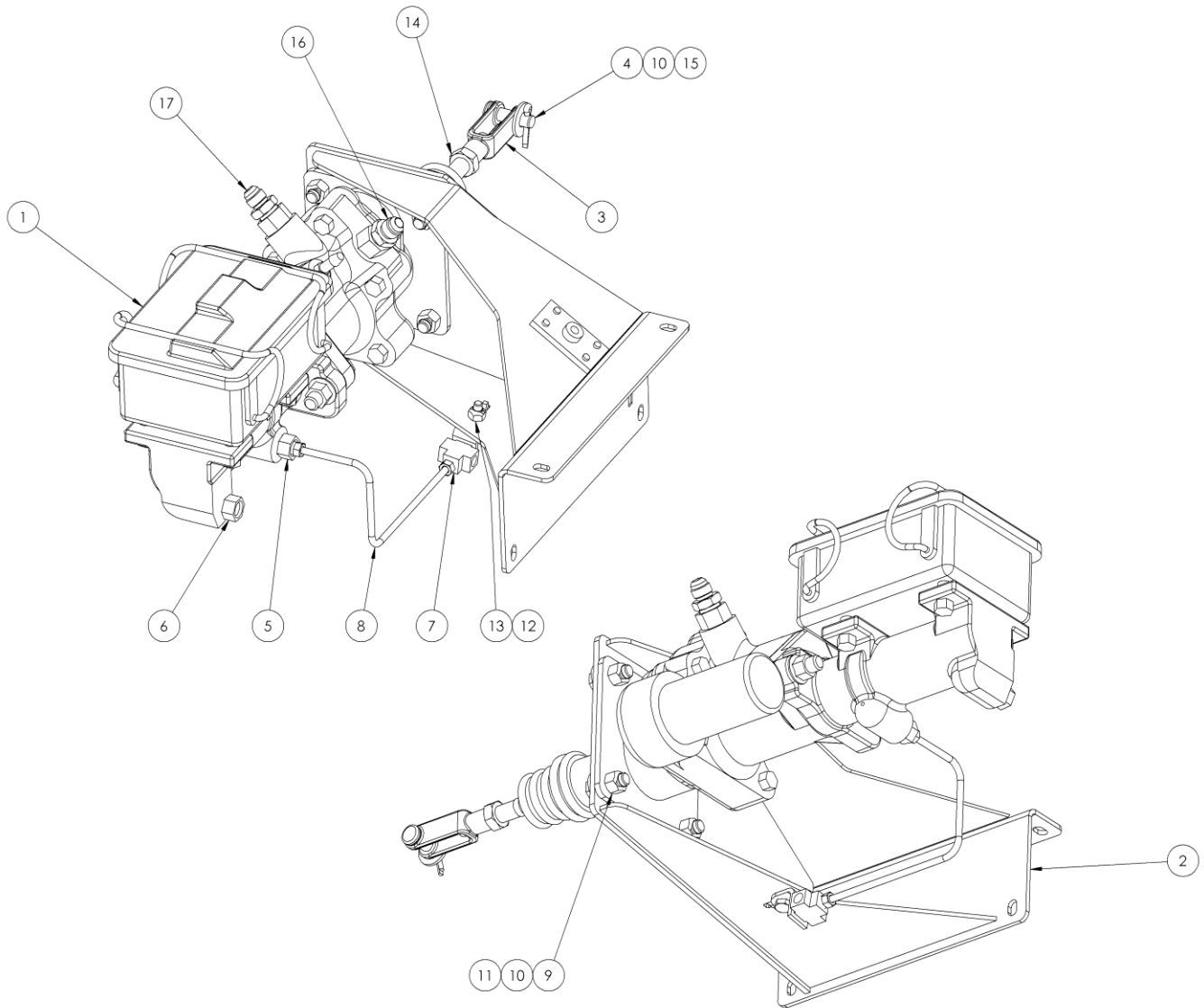
11.1 MANIFOLD SUB (continued)

Parts List – Manifold Sub

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	HC-2811	MANIFOLD ASSEMBLY (INCLUDES ITEMS 11 THROUGH 15)	1
2	N-2544-04	CPLG, QUICK DISCONNECT MB	2
3	C5315X6	ADAPTER, -06 M SAE ORB X -06 M JIC	4
4	C5315X8	ADAPTER, -08 M SAE ORB X -08 M JIC	1
6	C5315X12	ADAPTER, -12 M SAE ORB X -12 M JIC	1
7	C5314X12X12	ADAPTER, -12 M SAE ORB X -12 M SAE ORB	1
8	A-ES12-0486	HYD FILTER HEAD	1
9	NVSP-09-018-CA	SPIN-ON HYD FILTER	1
10	10 V5OX-S	HYD FITTING	1
11	HC-2974	VALVE, RELIEF (INCLUDED WITH ITEM 1)	2
12	HC-2975	VALVE, FLOW CONTROL (INCLUDED WITH ITEM 1)	1
13	HC-2976	VALVE, CHECK (INCLUDED WITH ITEM 1)	1
14	HC-2977	VALVE, PROPORTIONAL RELIEF (INCLUDED WITH ITEM 1)	1
15	HC-2978	COIL, 12V (INCLUDED WITH ITEM 1)	1

11.2 MASTER CYLINDER SUB





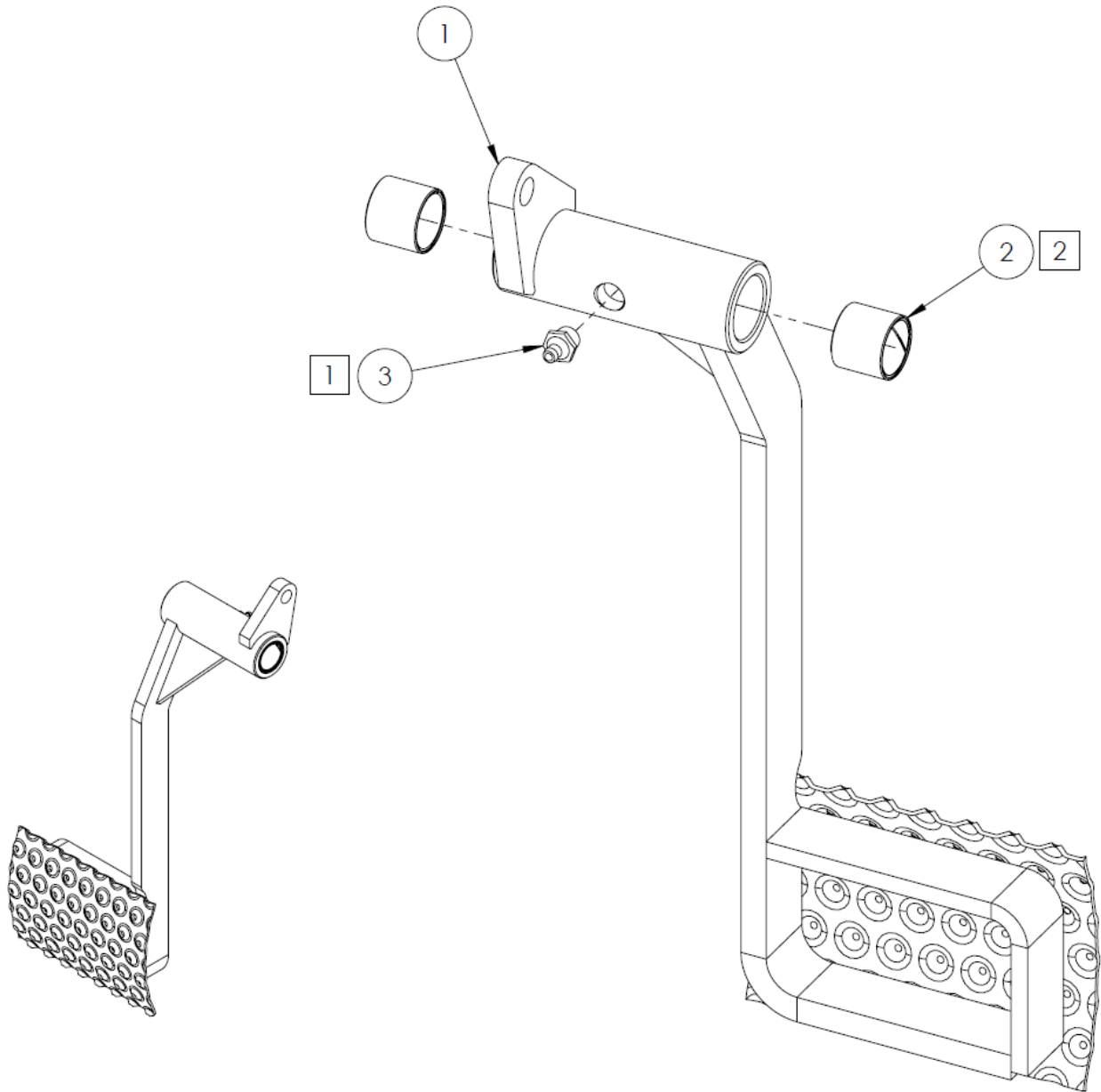
11.2 MASTER CYLINDER SUB (continued)

Parts List – Master Cylinder Sub

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	A-TT4-00161-1	BRAKE MASTER CYLINDER	1
2	Z-10508-00	WLD, MASTER CYL BRACKET (P)	1
3	A-TT4-10192	CLEVIS	1
4	A-TT4-00193	.375 CLEVIS PIN	1
5	A-TT5-00180	INVERTED FLARE ADAPTER	1
6	A-TT5-00181	INVERTED FLARE ADAPTER	1
7	A-TT4-00168	CROSS TEE REAR	1
8	H-4512	FRONT BRAKE JUMPER	1
9	G-1727-1070	NUT, 3/8-16 TOP LOCK ZINC	4
10	G-1250-1070W	FLATWASHER, 3/8 WIDE	5
11	G-1420-107010	BOLT, 3/8-16 X 1.0" HEX HD GR 8	4
12	G-1100-105006	BOLT, 1/4-20 X 3/4" LG HEX HD GR 5	1
13	G-1727-1050	NUT, 1/4-20 TOP LOCK ZINC	1
14	G-1207-1095	NUT, 1/2-20 JAM	1
15	G-1301-04	PIN, 5/32 X 1.0" LG. COTTER	1
16	N-3115-06-06	ADAPTER, 5/8-18 INV FLARE TO -6 AN	1
17	N-3115-06-07	ADAPTER, 11/16-18 INV FLARE TO -6 AN	1

11.3 BRAKE PEDAL SUB



NOTES:

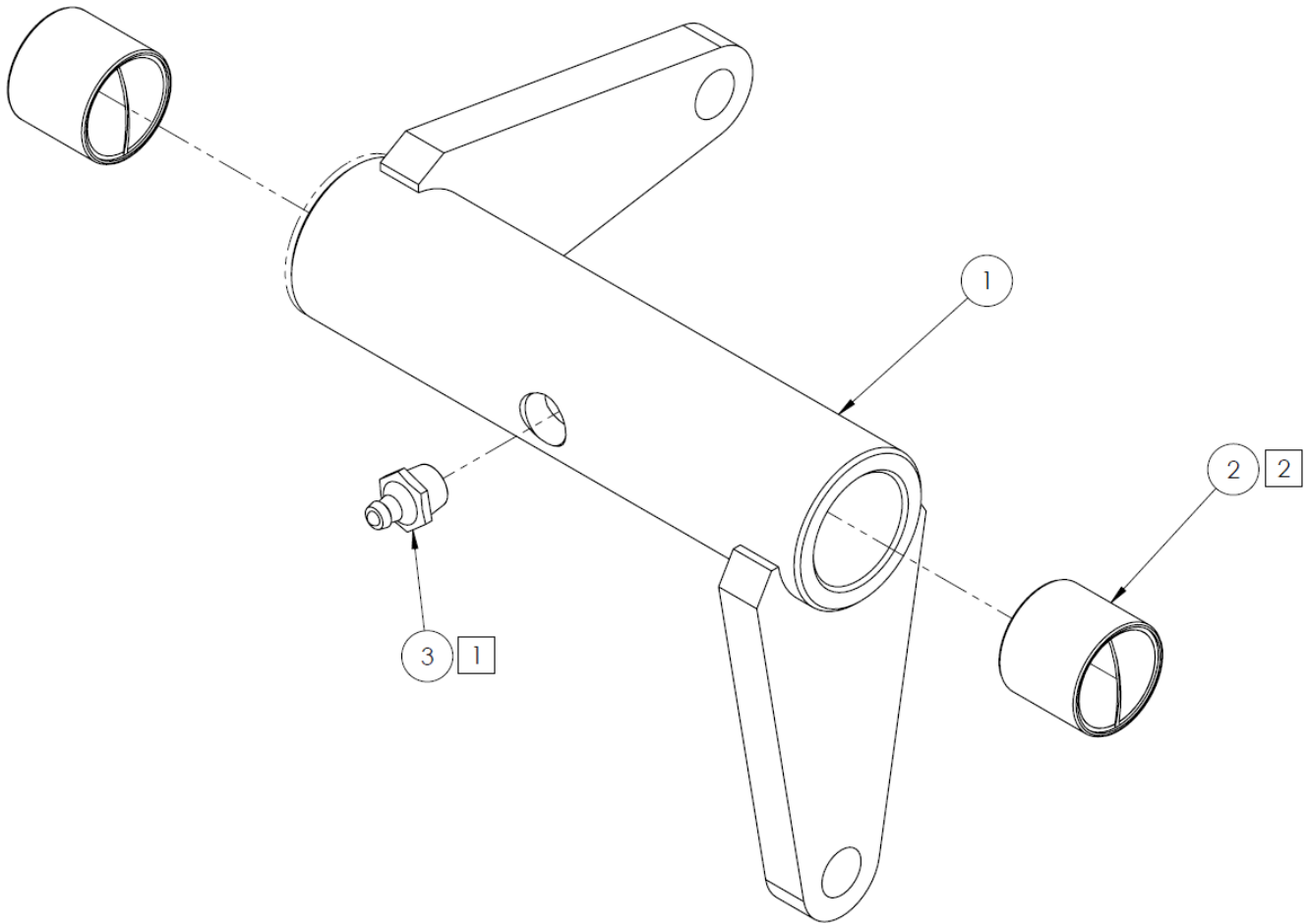
1. APPLY LOCTITE 565 THREAD SEALANT OR EQUIVALENT.
2. INSTALL BEARINGS FLUSH WITH ENDS OF TUBE. INSTALL BEARINGS WITH LOCTITE BEARING RETAINING COMPOUND OR EQUIVALENT

Parts List – Brake Pedal Sub

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
	Z-10501	ASSY, BRAKE PEDAL; consist of:	
1	Z-10503-00	WLD, BRAKE PEDAL (P)	1
2	C-TT4-10188	NYLINER BEARING	2
3	A-RTT50-0328	GREASE ZERK	1

11.4 BELL CRANK SUB



NOTES:

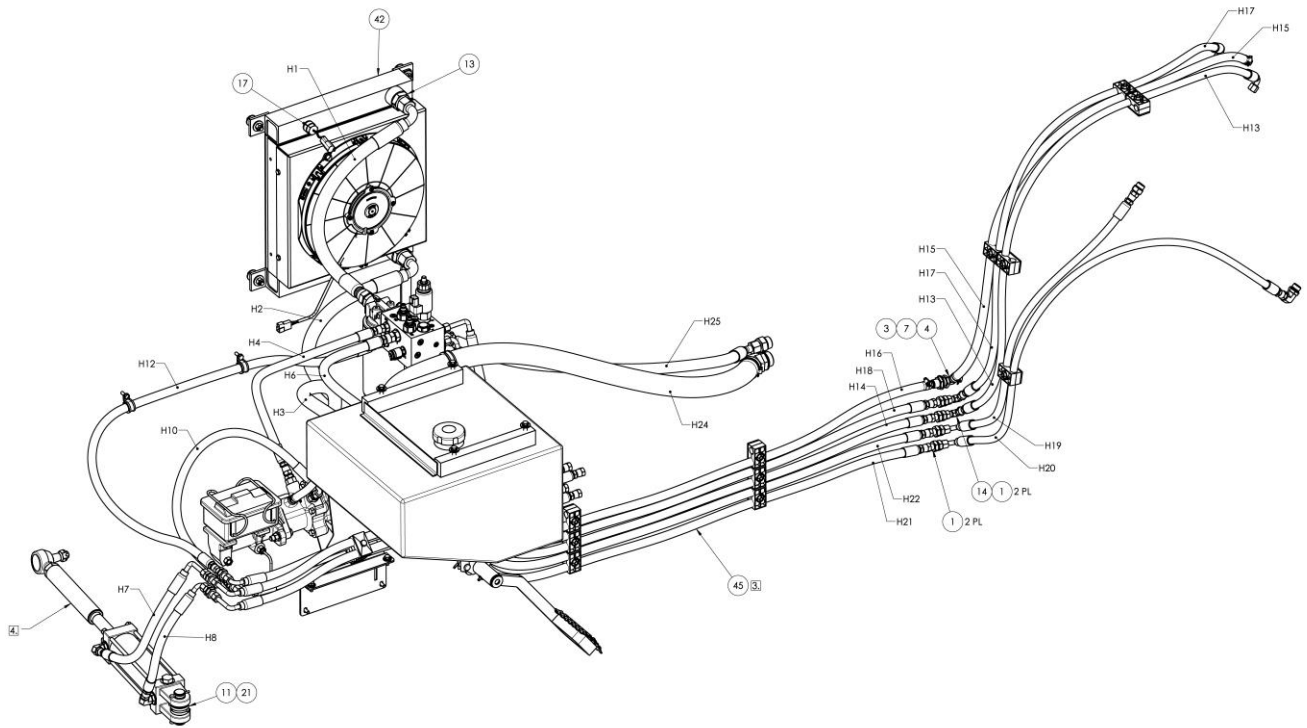
1. APPLY LOCTITE 565 THREAD SEALANT OR EQUIVALENT.
2. INSTALL BEARINGS FLUSH WITH ENDS OF TUBE. INSTALL BEARINGS WITH LOCTITE BEARING RETAINING COMPOUND OR EQUIVALENT

Parts List – Bell Crank Sub

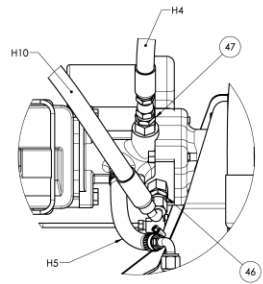
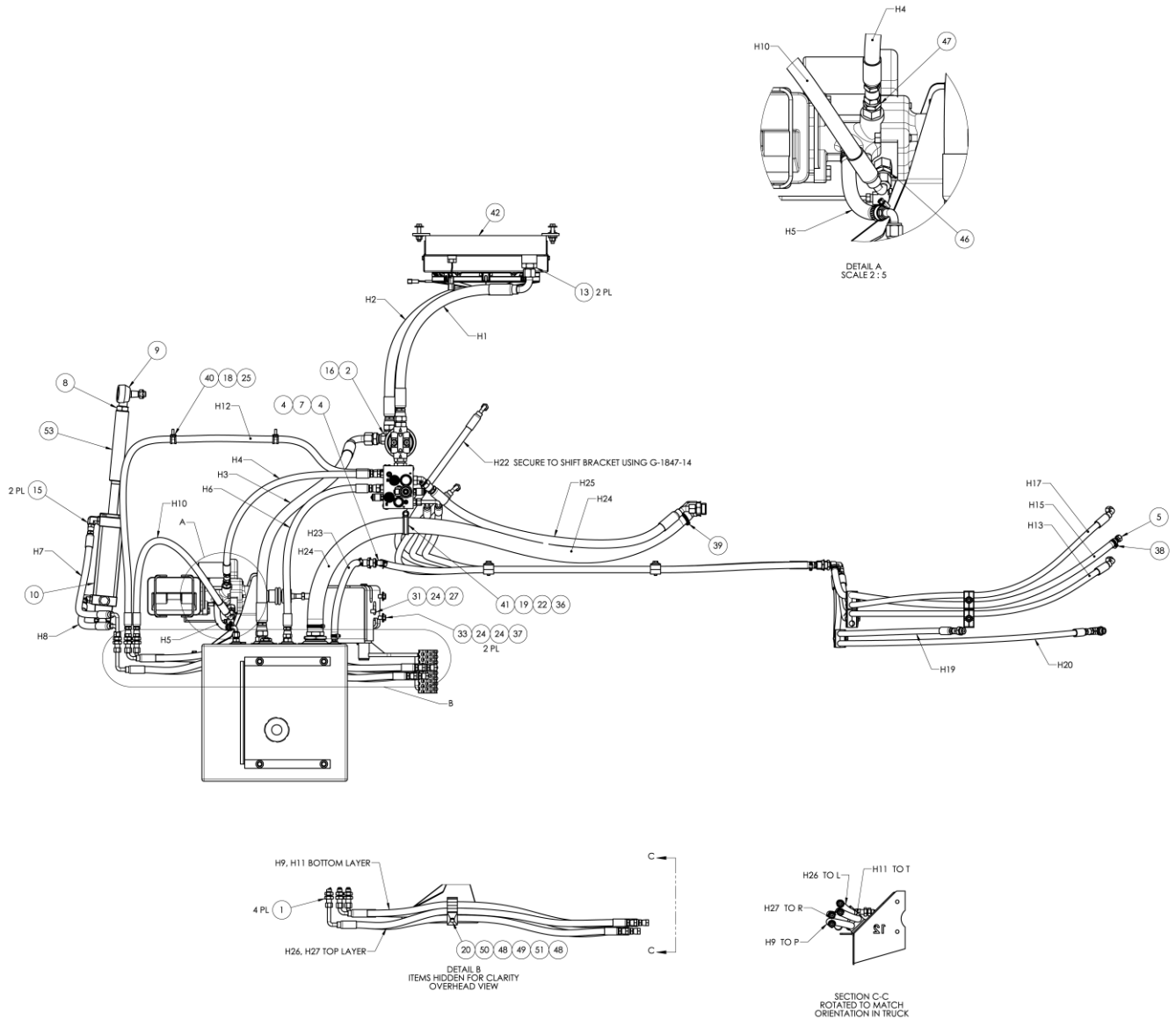
When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
	Z-10505	ASSY, BELL CRANK; consist of:	
1	Z-10507-00	WLD, BELL CRANK (P)	1
2	C-TT4-10188	NYLINER BEARING	2
3	A-RTT50-0328	GREASE ZERK	1

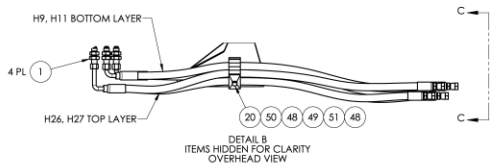
11.5 HYDRAULIC SYSTEM



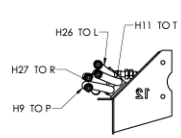
11.5 HYDRAULIC SYSTEM (continued)



DETAIL A
SCALE 2:5

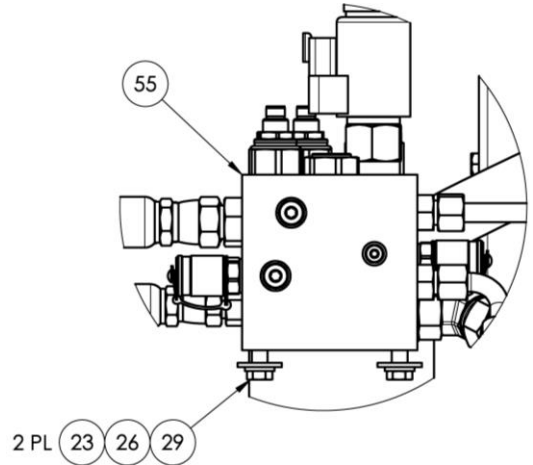


DETAIL B
ITEMS HIDDEN FOR CLARITY
OVERHEAD VIEW

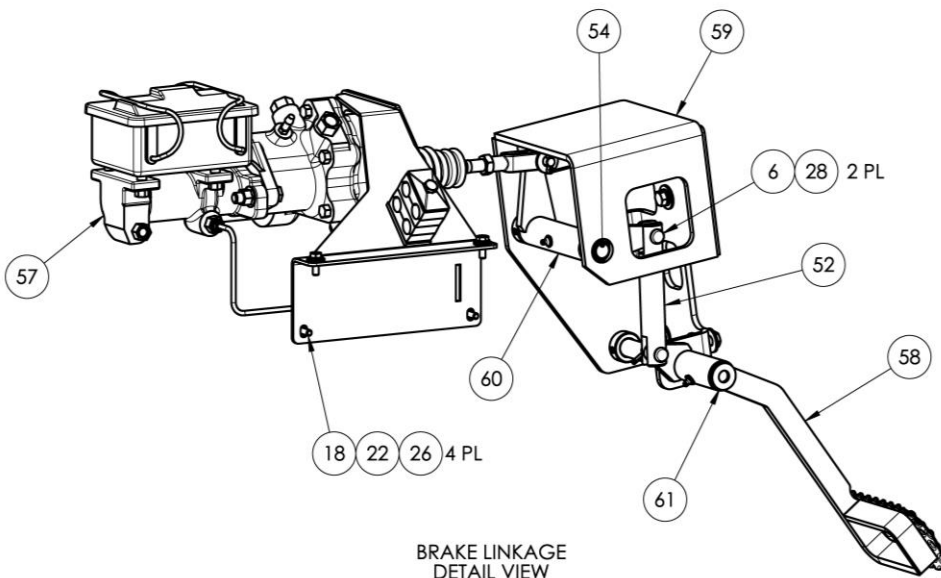
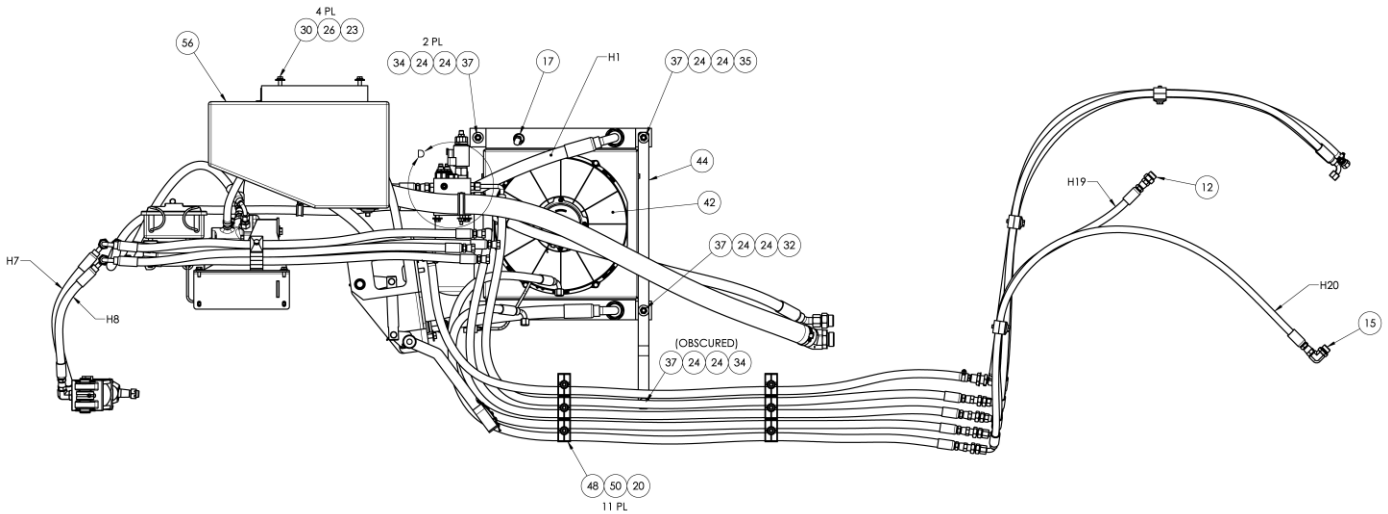


SECTION C-C
ROTATED TO MATCH
ORIENTATION IN TRUCK

11.5 HYDRAULIC SYSTEM (continued)



DETAIL D
SCALE 2 : 5
ITEMS HIDDEN FOR CLARITY



BRAKE LINKAGE
DETAIL VIEW



11.5 HYDRAULIC SYSTEM (continued)

Parts List – Hydraulic System

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	6 WTX-WLN-S	BULKHEAD, 6 JIC M	8
2	12 WETX-S	BULKHEAD ELBOW, 12 JIC M	1
3	05706B-104	ADAPTER, -06 BEAD X 1/4 M NPT	1
4	05706B-C04	ELBOW, 3/8 BARB, 1/4 NPT	3
5	30682-6-6	FITTING, 6 JIC F, -6 HOSE BARB	1
6	A-TT4-00193	.375 CLEVIS PIN	2
7	A-TT4-00280	BULKHEAD FITTING	2
8	A-TT10-00406	7/8-18 RH HEX JAM NUT	1
9	A-TT10-00407	TIE ROD END	1
10	A-TT10-00803	STEERING CYLINDER	1
11	A-TT10-00826	CYLINDER BEARING	1
12	C5315X6X8	ADAPTER, -08 M ORB X -06 M JIC	1
13	C5315X12X16	FITTING, 12 JIC, 16 O-RING	2
14	C5506X6	ELBOW, 6 JIC M, 6 JIC F	2
15	C5515X6X8	ELBOW, -06 M JIC X -08 M ORB	3
16	C5924X12	BULKHEAD NUT, 12 JIC	1
17	ET00-08-001-CA	FAN TEMP SWITCH	1
18	G-1100-105006	BOLT, 1/4-20 X 3/4" LG HEX HD GR 5	6
19	G-1100-105010	BOLT, 1/4-20 X 1.0" LG HEX HD GR 5	1
20	G-1100-106014	BOLT, 5/16-18 X 1-1/2" LG. HEX HD GR 5	12
21	G-1163-12	SCREW, 5/16-18 X 1/4" LG. HEX CUP PT SET	3
22	G-1250-1050W	FLATWASHER, 1/4 WIDE	5
23	G-1250-1060W	FLATWASHER, 5/16 WIDE	6
24	G-1250-1070W	FLATWASHER, 3/8 WIDE	15
25	G-1251-1050R	LOCKWASHER, 1/4 REGULAR	2
26	G-1251-1060R	LOCKWASHER, 5/16 REGULAR	10
27	G-1251-1070R	LOCKWASHER, 3/8 REGULAR	1
28	G-1301-04	PIN, 5/32 X 1.0" LG. COTTER	2
29	G-1420-106010	BOLT, 5/16-18 X 1.0" LG. HEX HD GR 8	2
30	G-1420-106012	BOLT, 5/16-18 X 1-1/4" LG. HEX HD GR 8	4
31	G-1420-107010	BOLT, 3/8-16 X 1.0" HEX HD GR 8	1
32	G-1420-107012	BOLT, 3/8-16 X 1.25" HEX HD GR 8	1
33	G-1420-107014	BOLT, 3/8-16 X 1.5" HEX HD GR 8	2
34	G-1420-107016	BOLT, 3/8-16 X 1.75" HEX HD GR 8	3
35	G-1420-107020	BOLT, 3/8-16 X 2.0" HEX HD GR 8	1
36	G-1727-1050	NUT, 1/4-20 TOP LOCK ZINC	1
37	G-1727-1070	NUT, 3/8-16 TOP LOCK ZINC	7
38	H-1426-04	HOSE CLAMP - 0.50" - 1.25"	8
39	H-1426-07	HOSE CLAMP - 1.00" - 2.00"	2
40	H-3521-07	CLAMP, CUSHIONED LOOP 3/4"	2
41	H-3521-23	CLAMP, CUSHIONED LOOP 1 3/4"	1



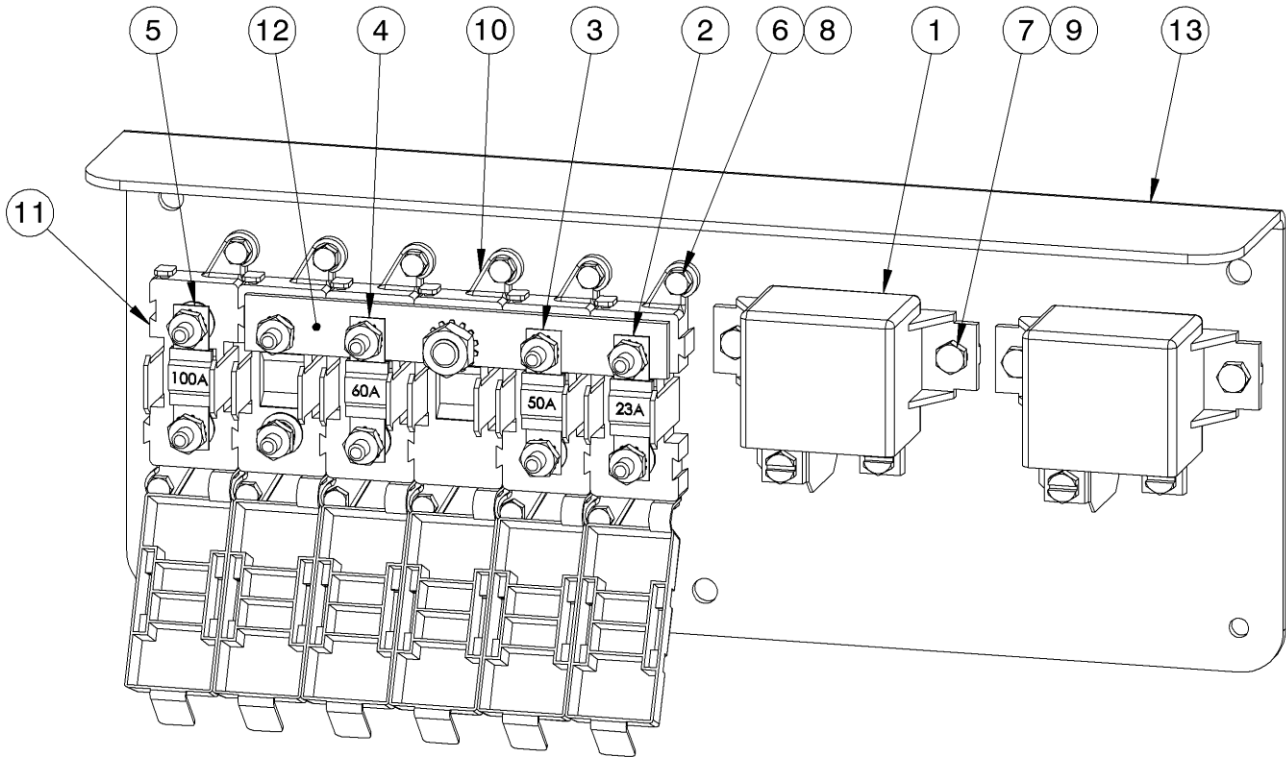
11.5 HYDRAULIC SYSTEM (continued)

Parts List – Hydraulic System

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
42	HC-2816	HYDRAULIC COOLER	1
44	J-6814-00	HYD COOLER SUPPORT BRACKET (P)	1
45	K-5315	KIT, HYDRAULIC HOSES, TTR-12	1
46	N-3115-06-06	ADAPTER, 5/8-18 INV FLARE TO -6 AN	1
47	N-3115-06-07	ADAPTER, 11/16-18 INV FLARE TO -6 AN	1
48	NVSP-24-015-CG	HYD CLAMP - DUAL 16MM SMOOTH	13
49	NVSP-24-016-CC	HYD CLAMP STACK BOLT, 5/16	1
50	NVSP-24-017-CC	HYD CLAMP - COVER PLATE	12
51	NVSP-24-018-CB	HYD CLAMP - SAFETY PLATE	1
52	R-3203-00	BRAKE LINKAGE BAR (P)	1
53	R-3251	ROD, CYLINDER ADAPTER	1
54	R-3293	BRAKE PIVOT SHAFT	1
55	Z-9818	ASY, HYDRAULIC MANIFOLD	1
56	Z-9831	ASY, HYDRAULIC TANK	1
57	N/A	ASY, MASTER CYLINDER	1
58	N/A	ASY, BRAKE PEDAL	1
59	Z-10504	WLD, BRAKE LINK BRACKET	1
60	Z-10505	ASY, BELL CRANK	1
61	Z-10519	WLD, BRAKE PEDAL PIN	1

12.0 ELECTRICAL
12.1 FUSE AND RELAY PANEL SUB

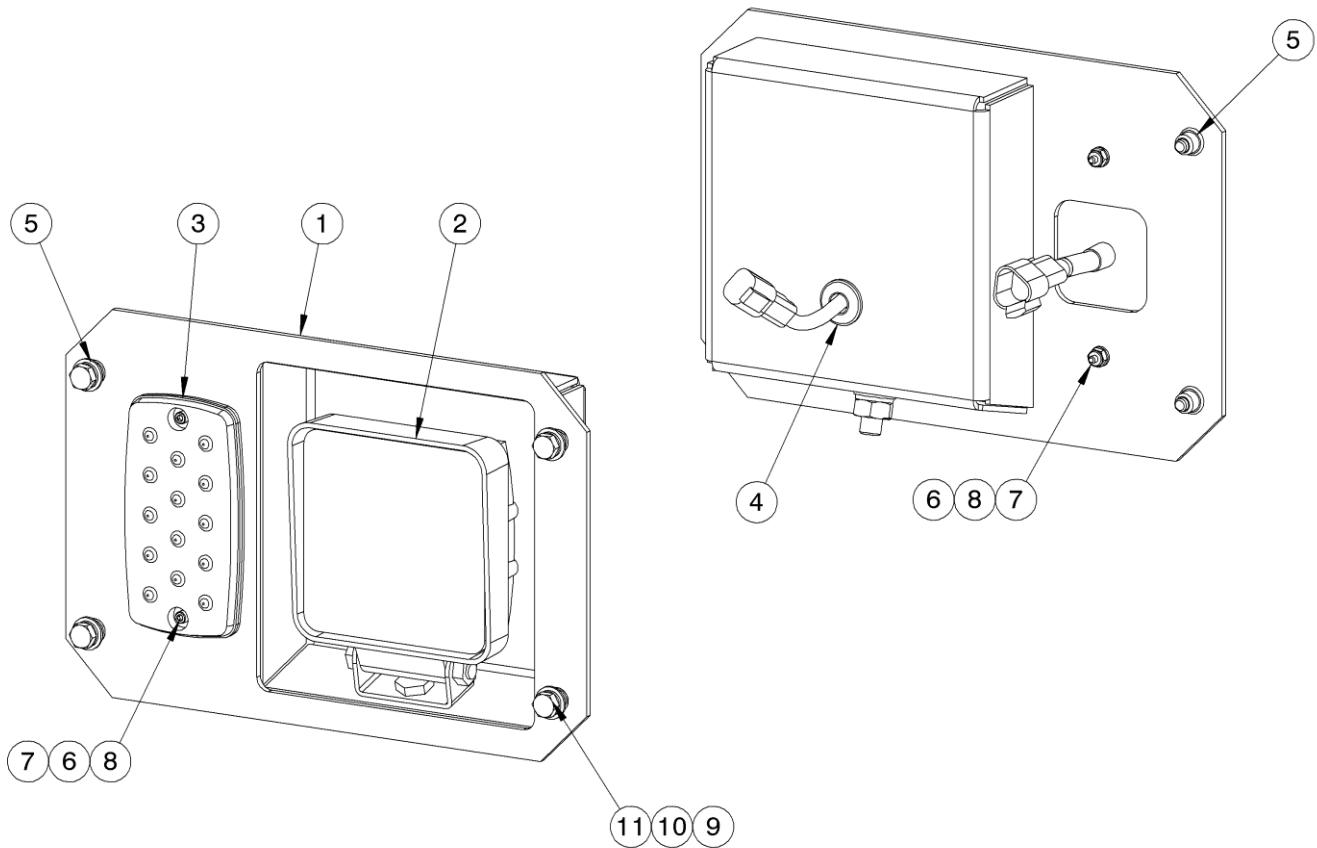


Parts List - Fuse and Relay Panel Sub

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	7A5012	ACS RELAY	2
2	EC-3146-01	23A FUSE, MIDI/AMI	1
3	EC-3146-04	50A FUSE, MIDI/AMI	1
4	EC-3146-05	60A FUSE, MIDI/AMI	1
5	EC-3146-08	100A FUSE, MIDI/AMI	1
6	G-1150-102004	SCREW, #8-32 X 1/2" LG HEX HD MACHINE	12
7	G-1150-103506	SCREW, #10-32 X 3/4" LG HEX HD MACHINE	4
8	G-1202-1020	STOPNUT, #8-32 ELASTIC	12
9	G-1202-1030	STOPNUT, #10-24 ELASTIC	4
10	NVSP-05-024-CA	INPUT LMI FUSE MODULE	1
11	NVSP-05-025-CA	LMI FUSE HOLDER	5
12	NVSP-05-026-CA	LMI BUSBAR	1
13	S-3354-00	BRKT, FUSE AND RELAY MTG	1

12.2 HEADLIGHT POCKET A

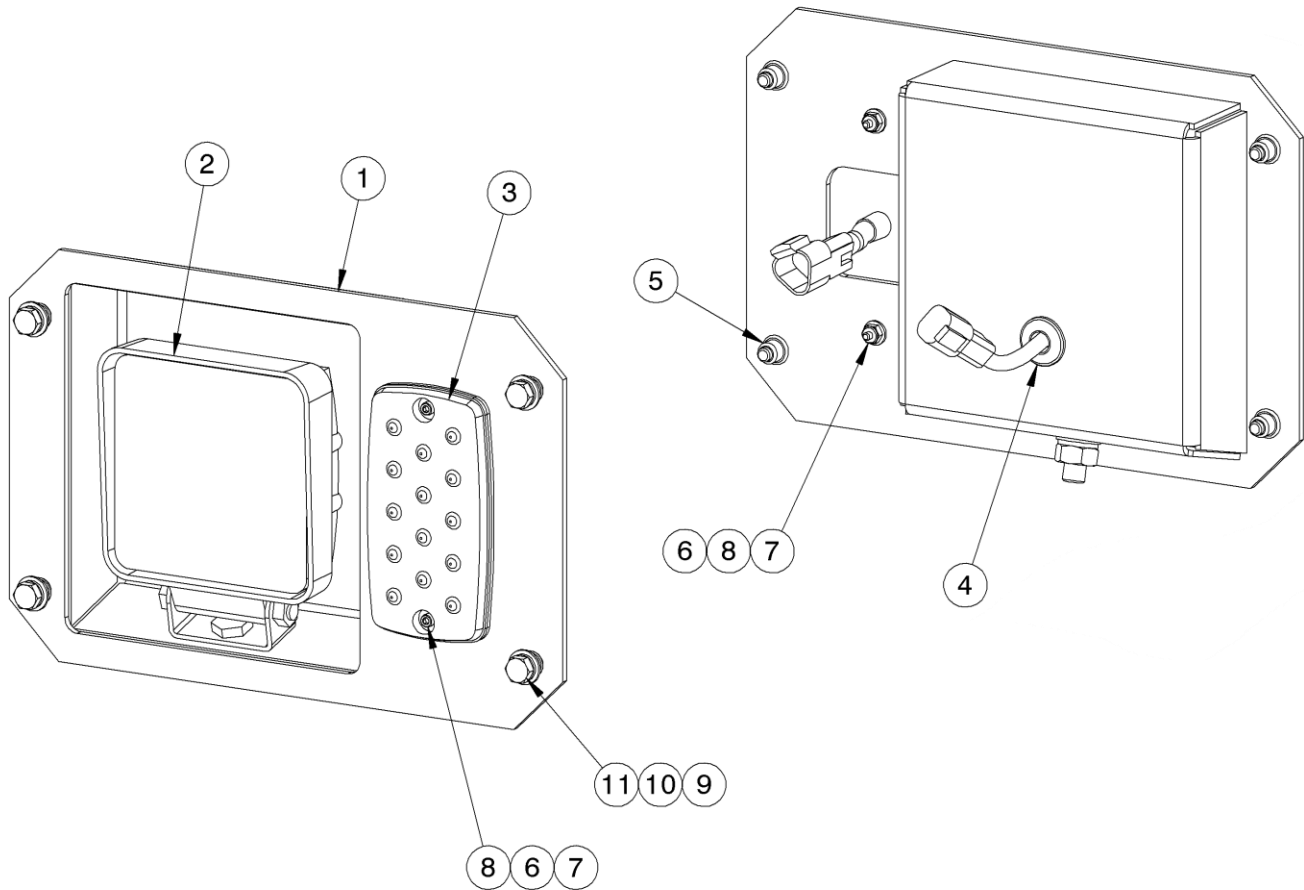


Parts List – Headlight Pocket A

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	ET12-02-001-SB	HEADLIGHT POCKET, ETT12G	1
2	Z-9825	ASY, HEADLIGHT W/CONNECTOR	1
3	Z-9826	ASY, TURN IND W/CONNECTOR	1
4	AE-OPT-0320-E	GROMMET, Ø5/8 HIGH TEMP	1
5	G-1439-1050-S	NUTSERT, THIN WALL 1/4-20	4
6	G-1250-1020N	FLATWASHER, #8 NARROW	2
7	G-1202-1020	STOPNUT, #8-32 ELASTIC	2
8	G-1151-102205	SCR, SOC HD CAP #8-32 X 5/8	2
9	G-1503-1050N	FLATWASHER. 1/4 SST NARROW	4
10	G-1502-1050R	LOCKWASHER, 1/4 SST REGULAR	4
11	G-1112-105010	BOLT, 1/4-20 X 1.0" LG SST HEX HD	4

12.3 HEADLIGHT POCKET B

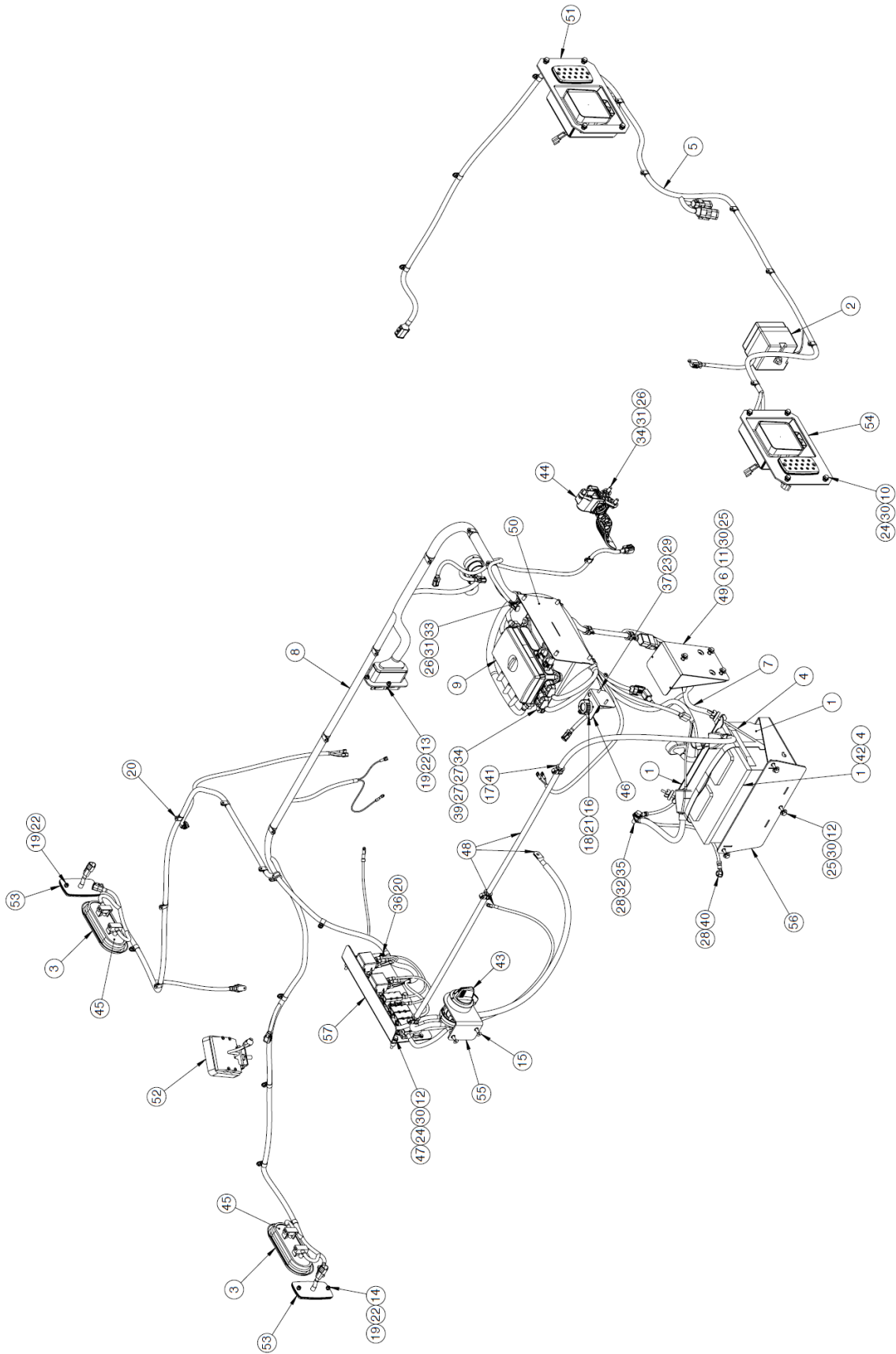


Parts List – Headlight Pocket B

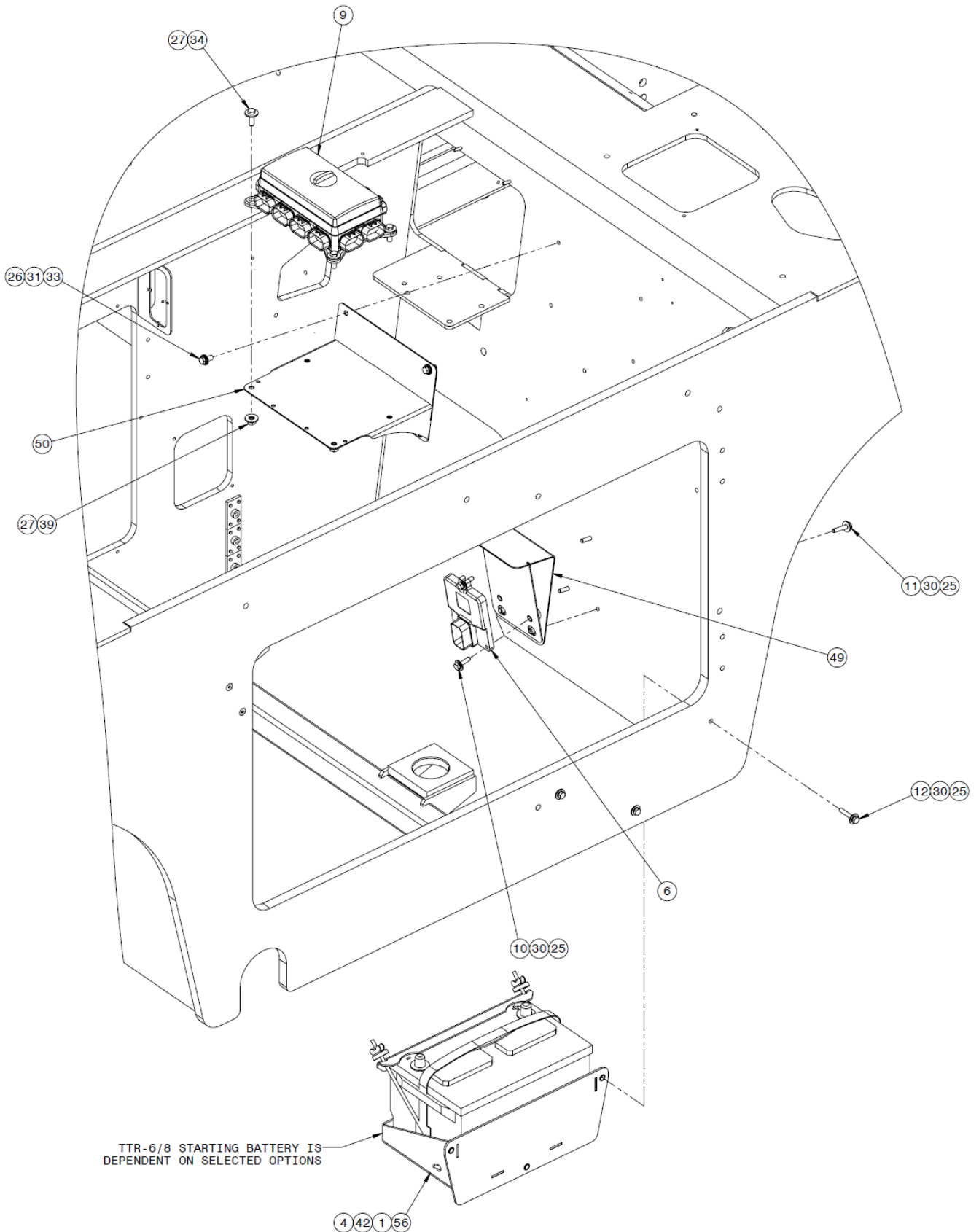
When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	ET12-02-001-SA	HEADLIGHT POCKET (WP)	1
2	Z-9825	ASY, HEADLIGHT W/CONNECTOR	1
3	Z-9826	ASY, TURN IND W/CONNECTOR	1
4	AE-OPT-0320-E	GROMMET, Ø5/8 HIGH TEMP	1
5	G-1439-1050-S	NUTSERT, THIN WALL 1/4-20	4
6	G-1250-1020N	FLATWASHER, #8 NARROW	2
7	G-1202-1020	STOPNUT, #8-32 ELASTIC	2
8	G-1151-102205	SCR, SOC HD CAP #8-32 X 5/8	2
9	G-1503-1050N	FLATWASHER. 1/4 SST NARROW	4
10	G-1502-1050R	LOCKWASHER, 1/4 SST REGULAR	4
11	G-1112-105010	BOLT, 1/4-20 X 1.0" LG SST HEX HD	4

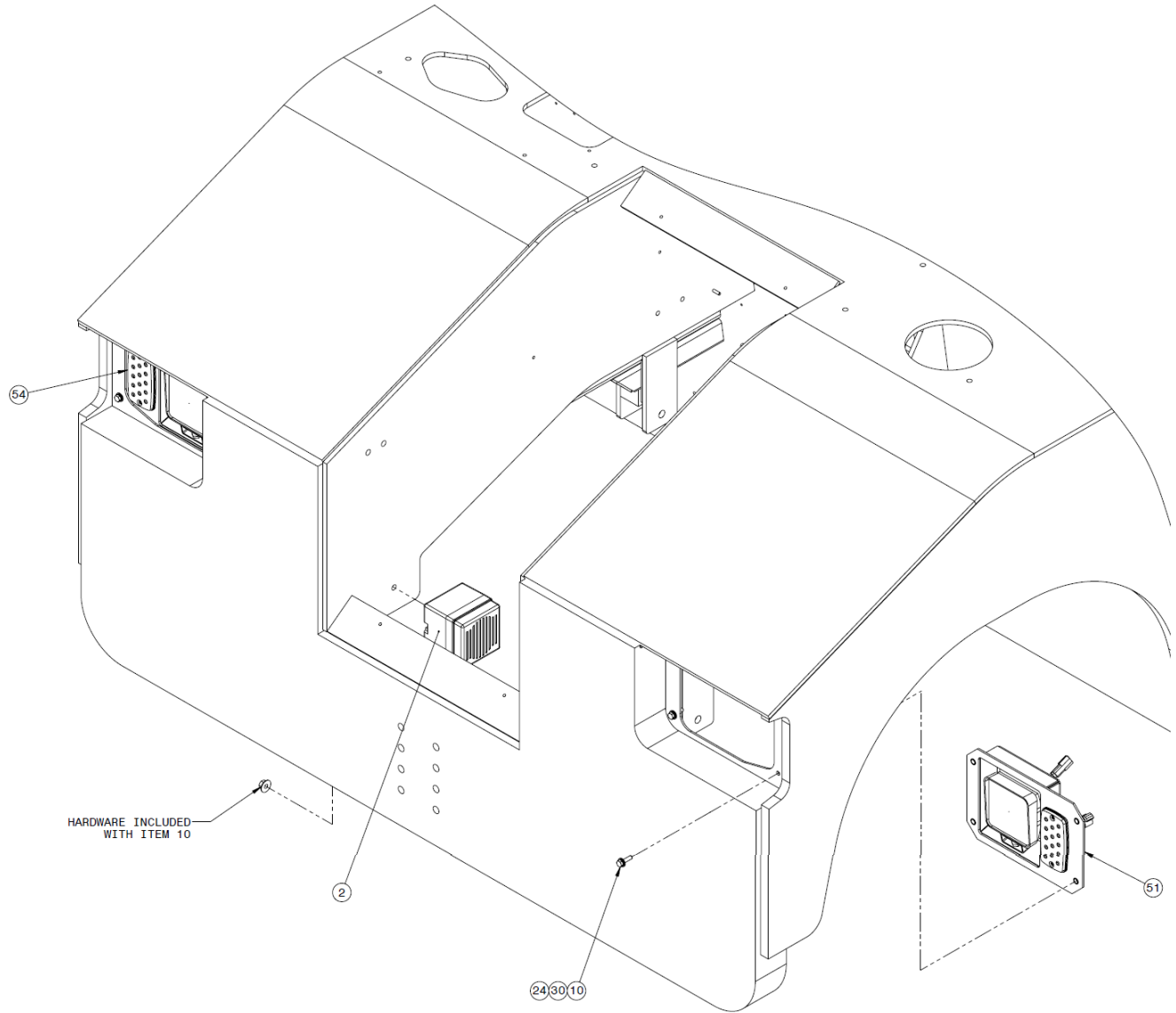
12.4 ELECTRICAL SYSTEM



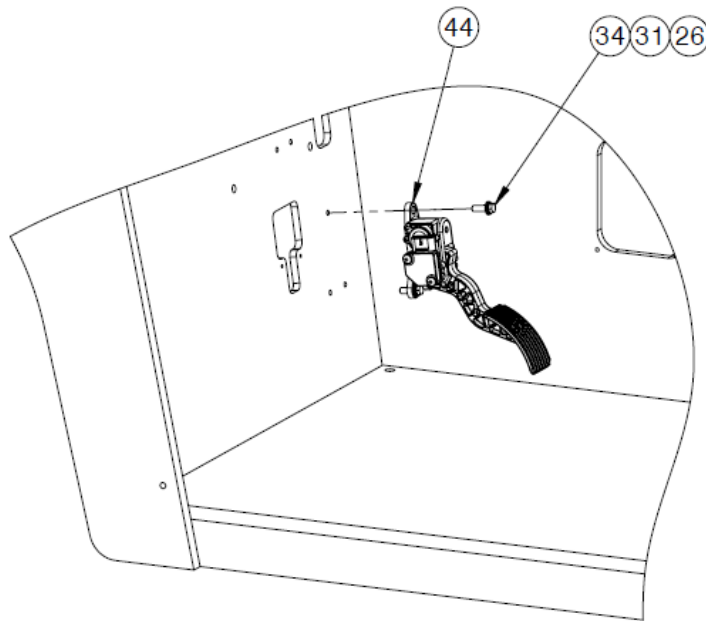
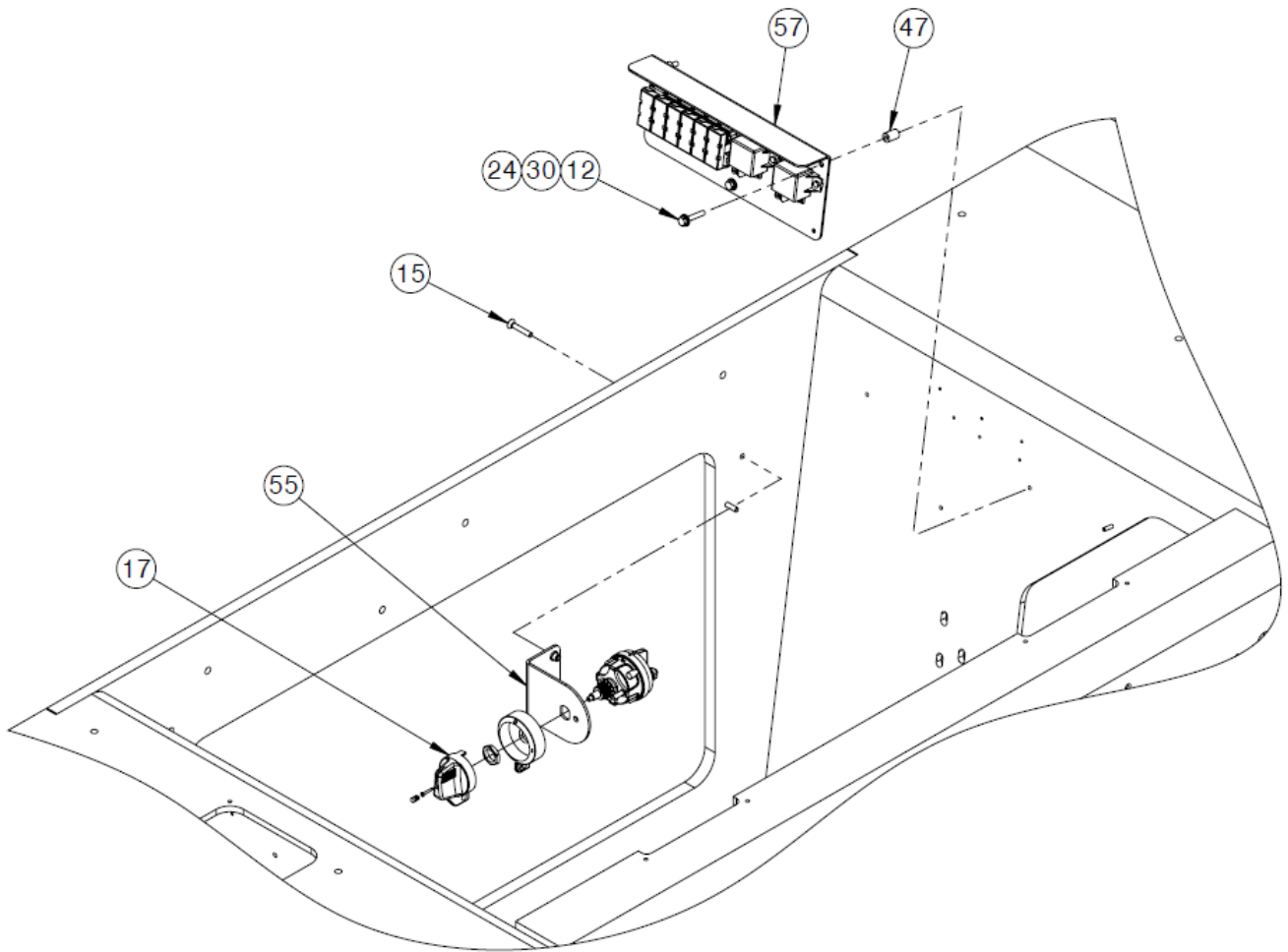
12.4 ELECTRICAL SYSTEM (continued)



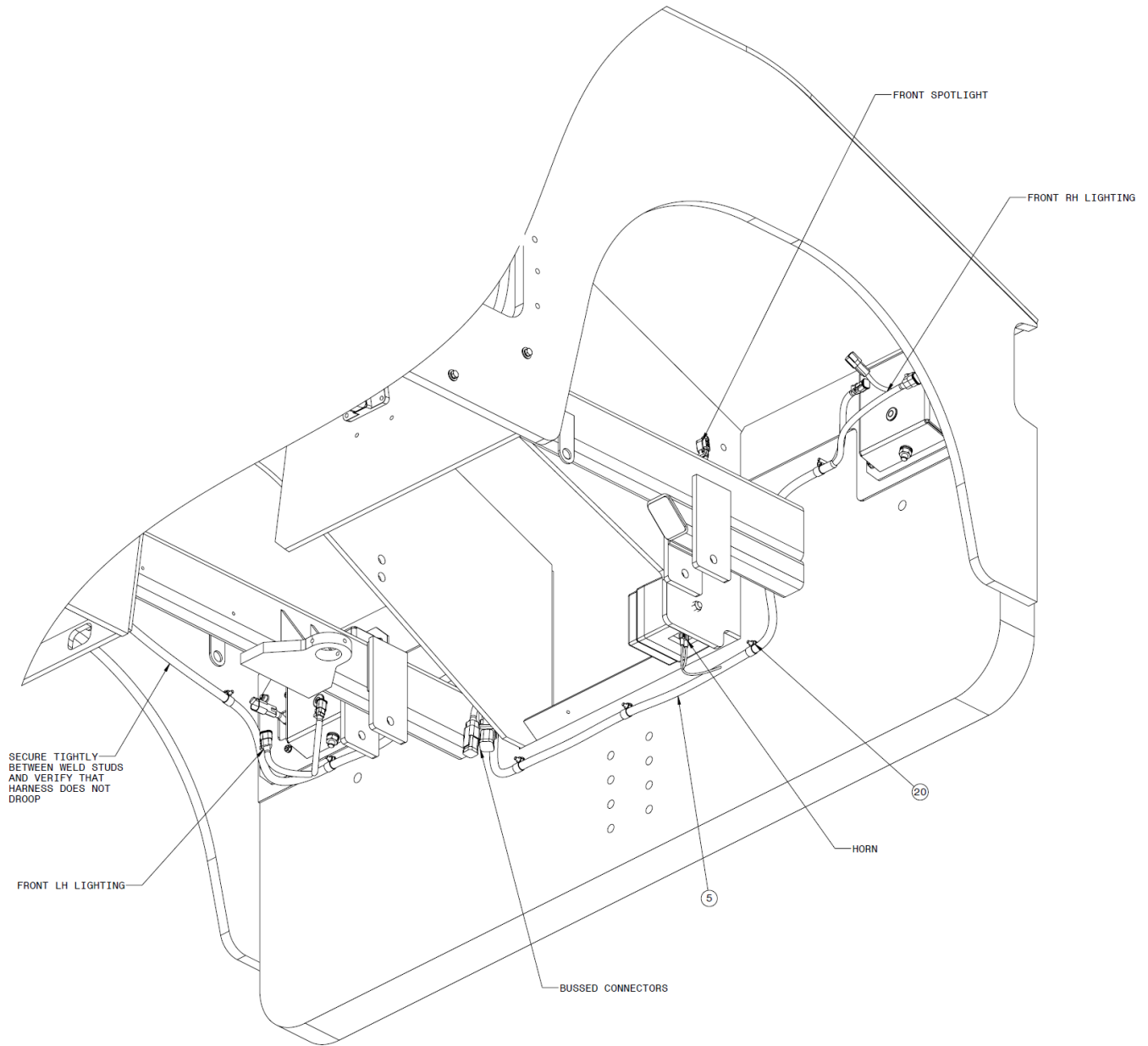
12.4 ELECTRICAL SYSTEM (continued)



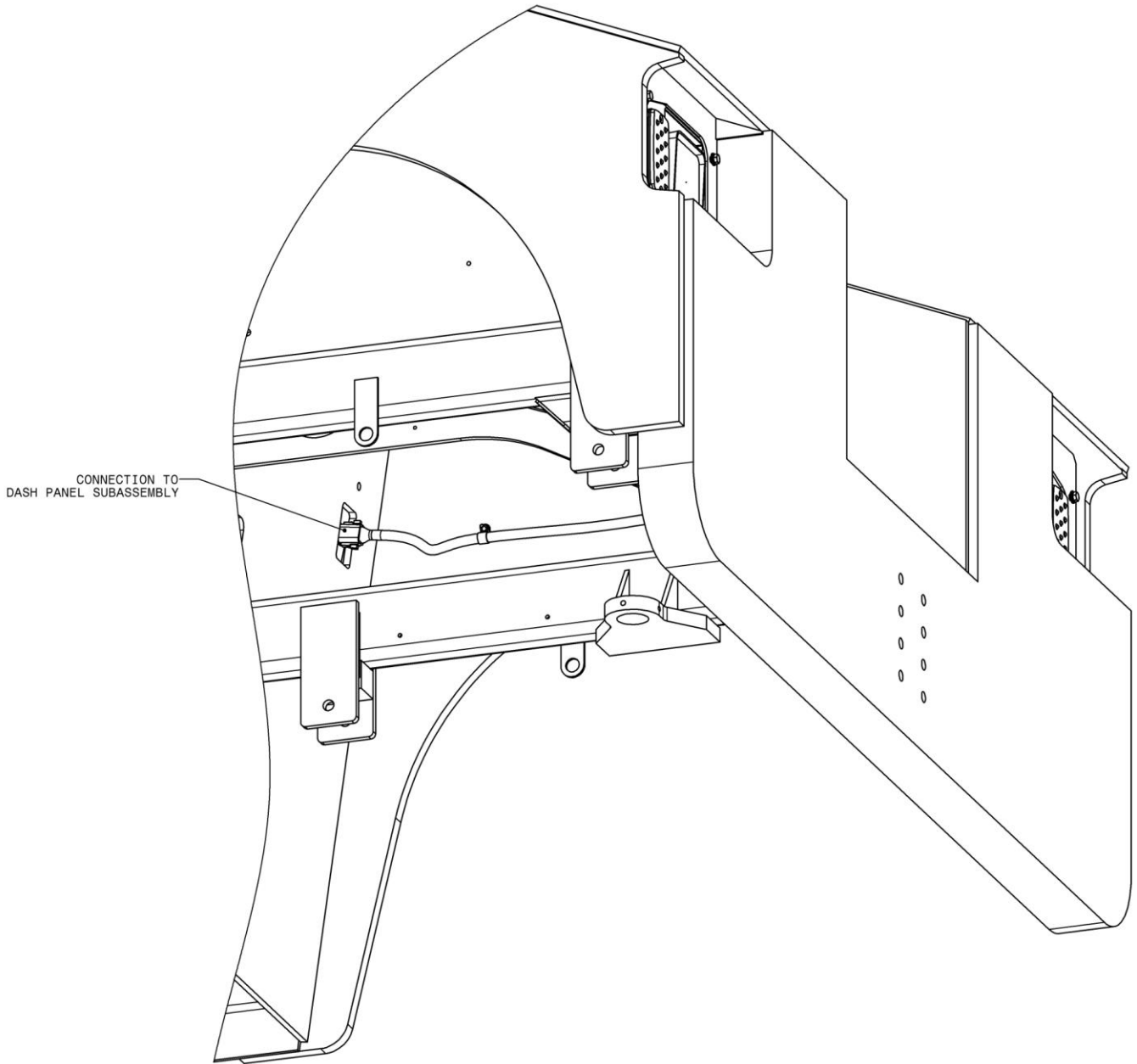
12.4 ELECTRICAL SYSTEM (continued)



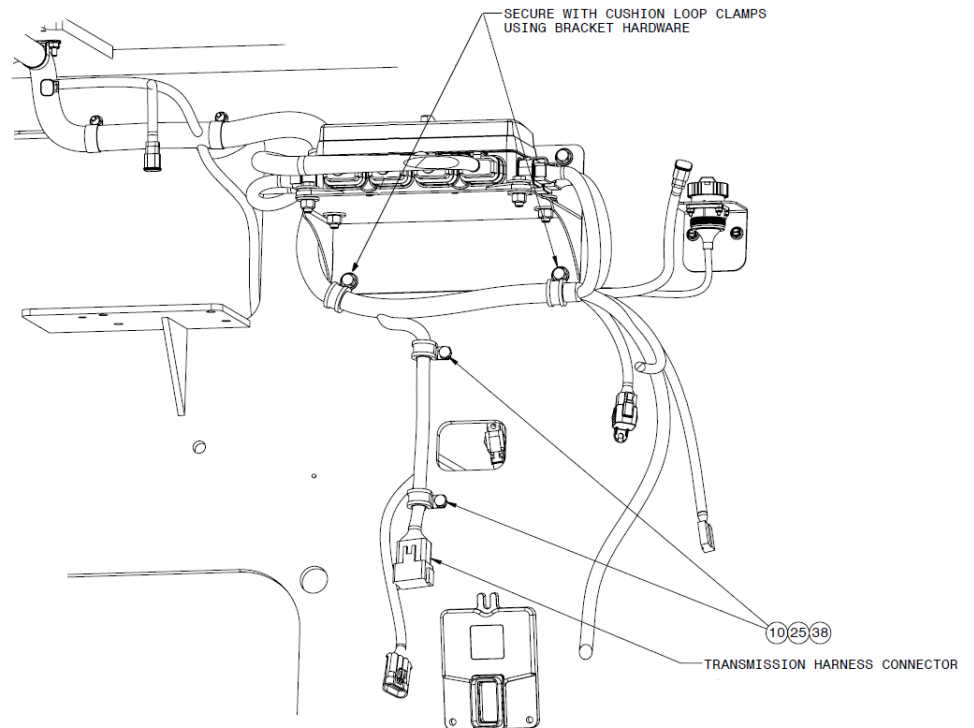
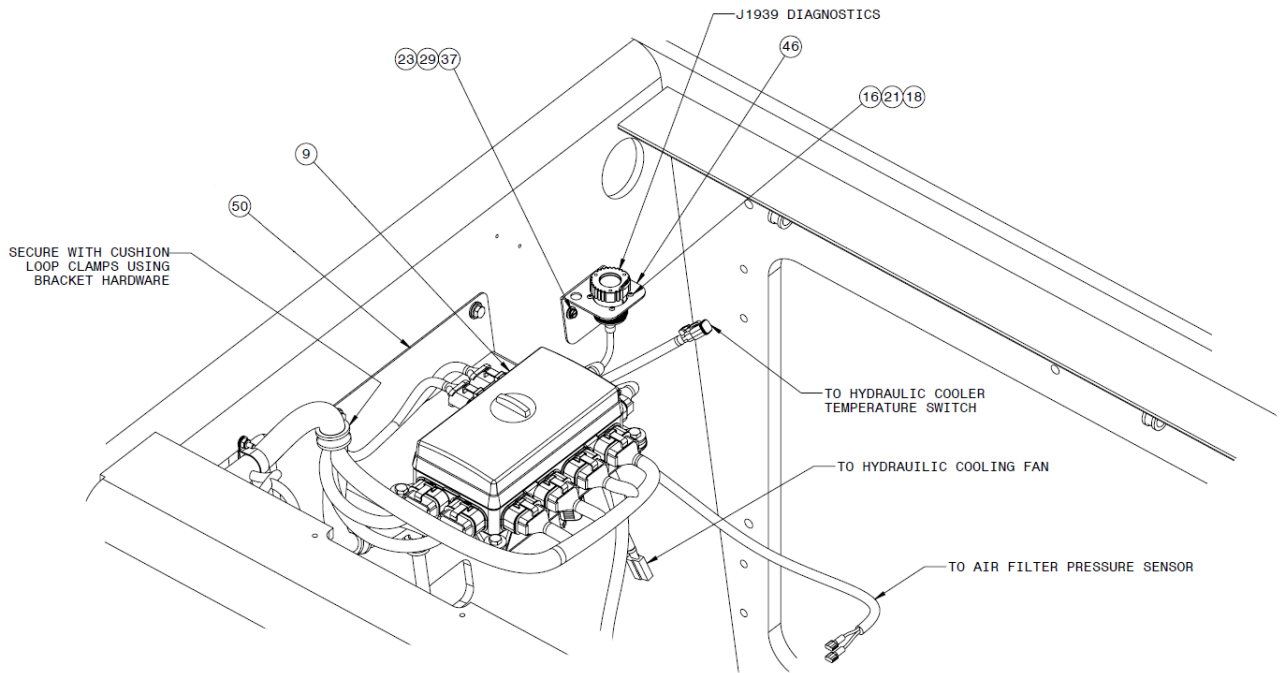
12.4 ELECTRICAL SYSTEM (continued)



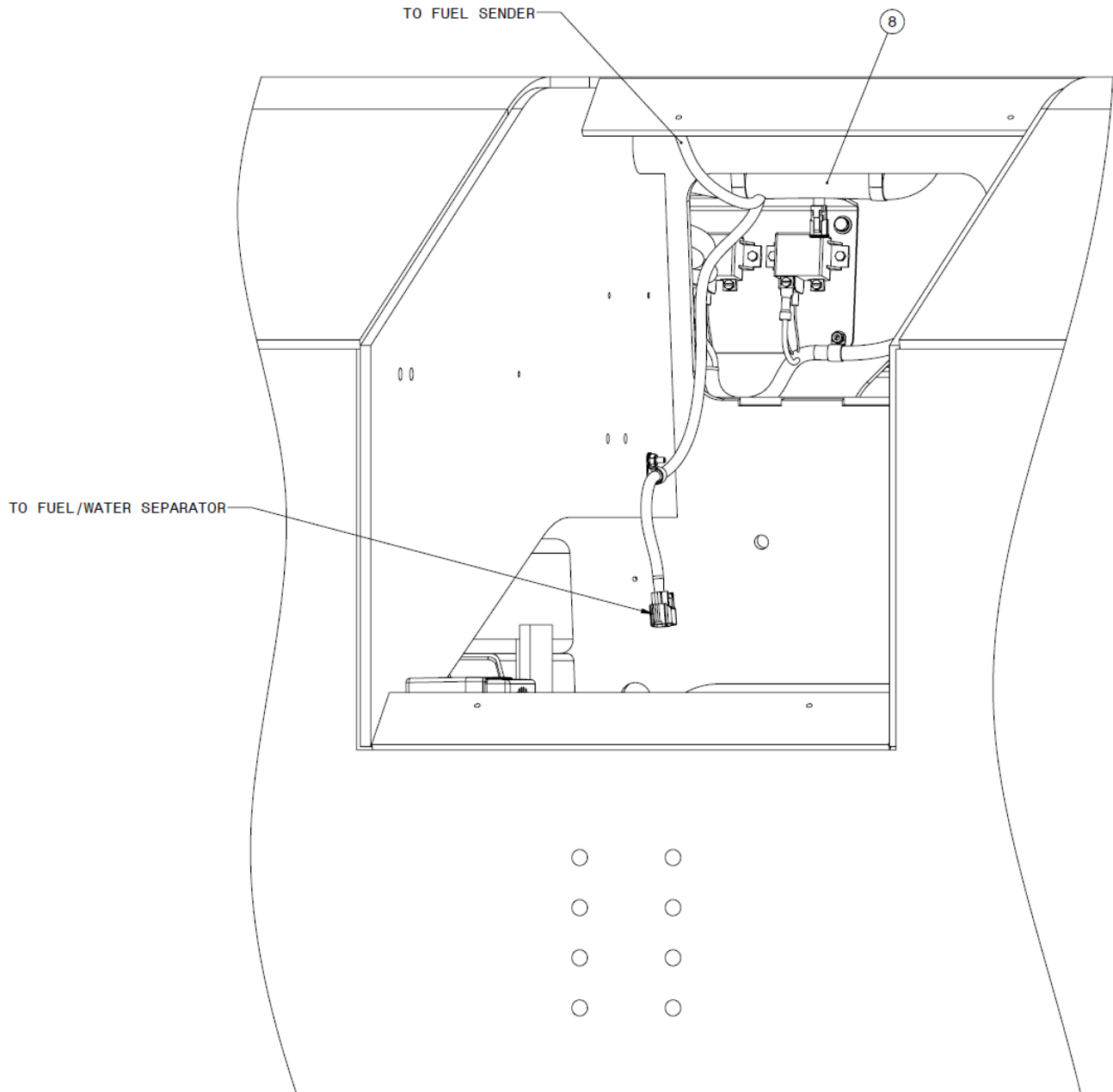
12.4 ELECTRICAL SYSTEM (continued)



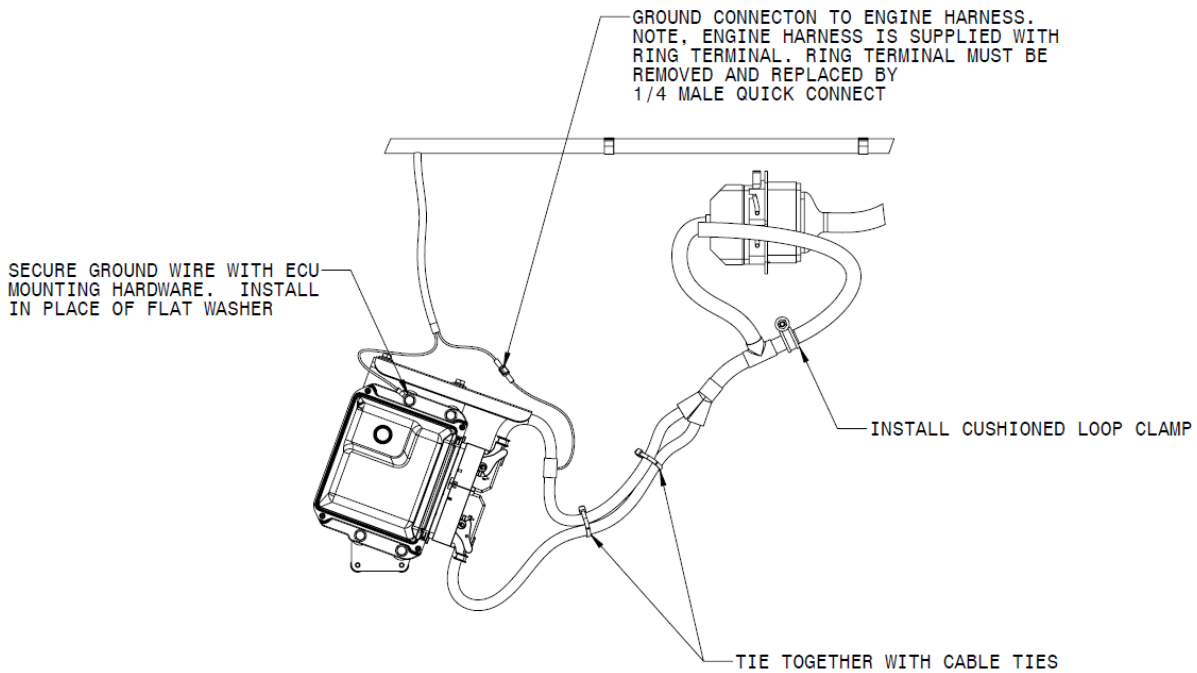
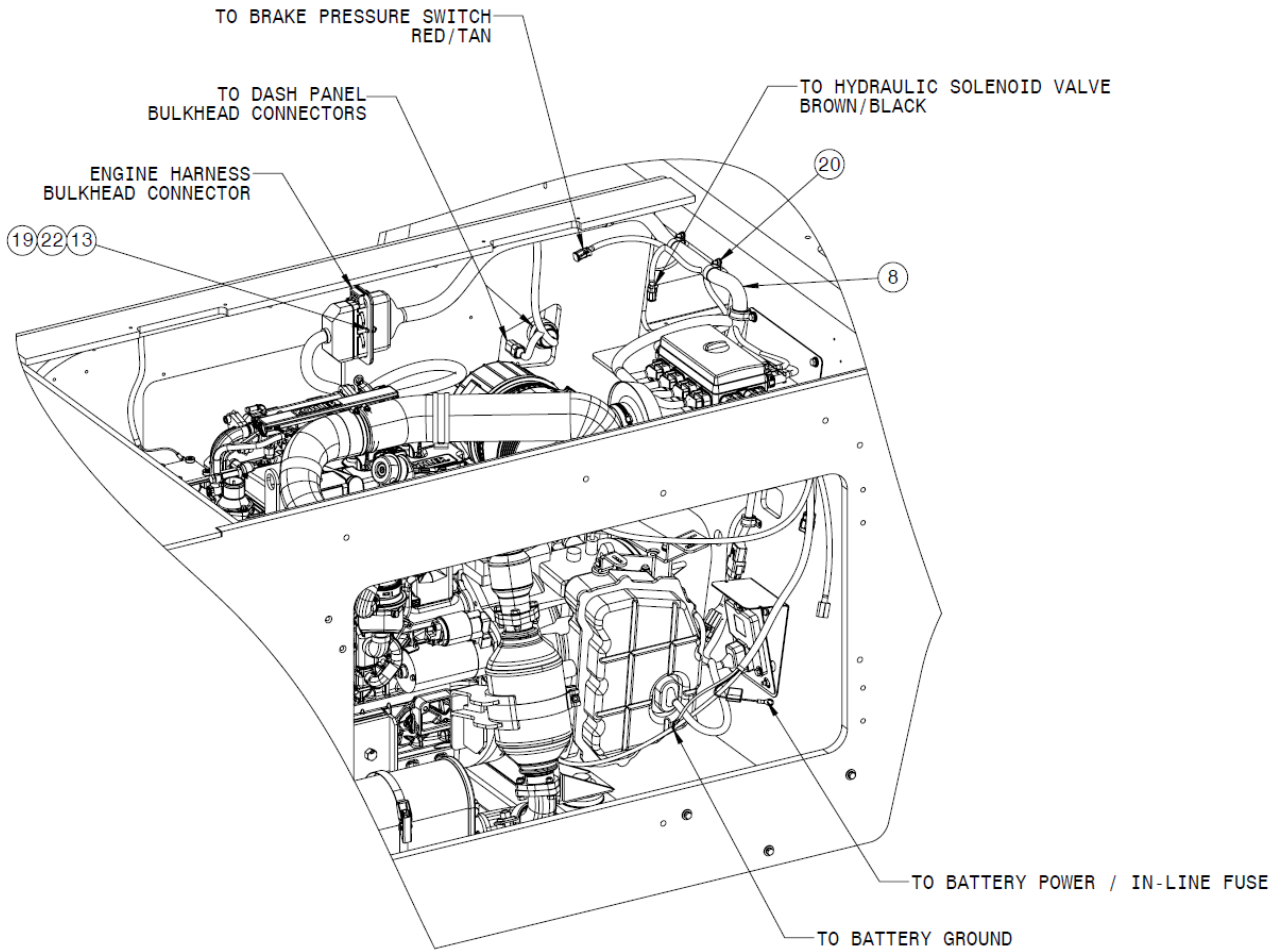
12.4 ELECTRICAL SYSTEM (continued)



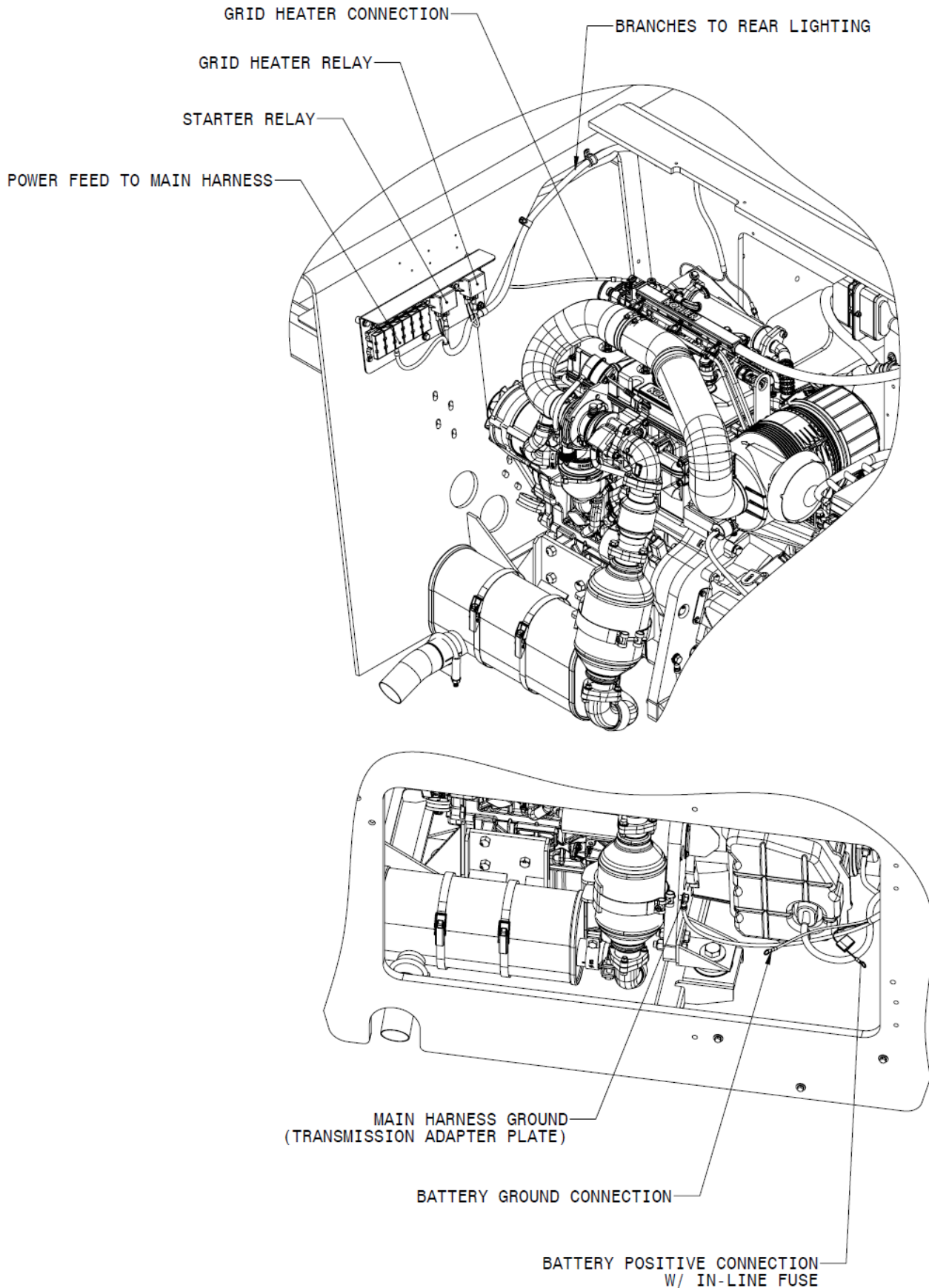
12.4 ELECTRICAL SYSTEM (continued)



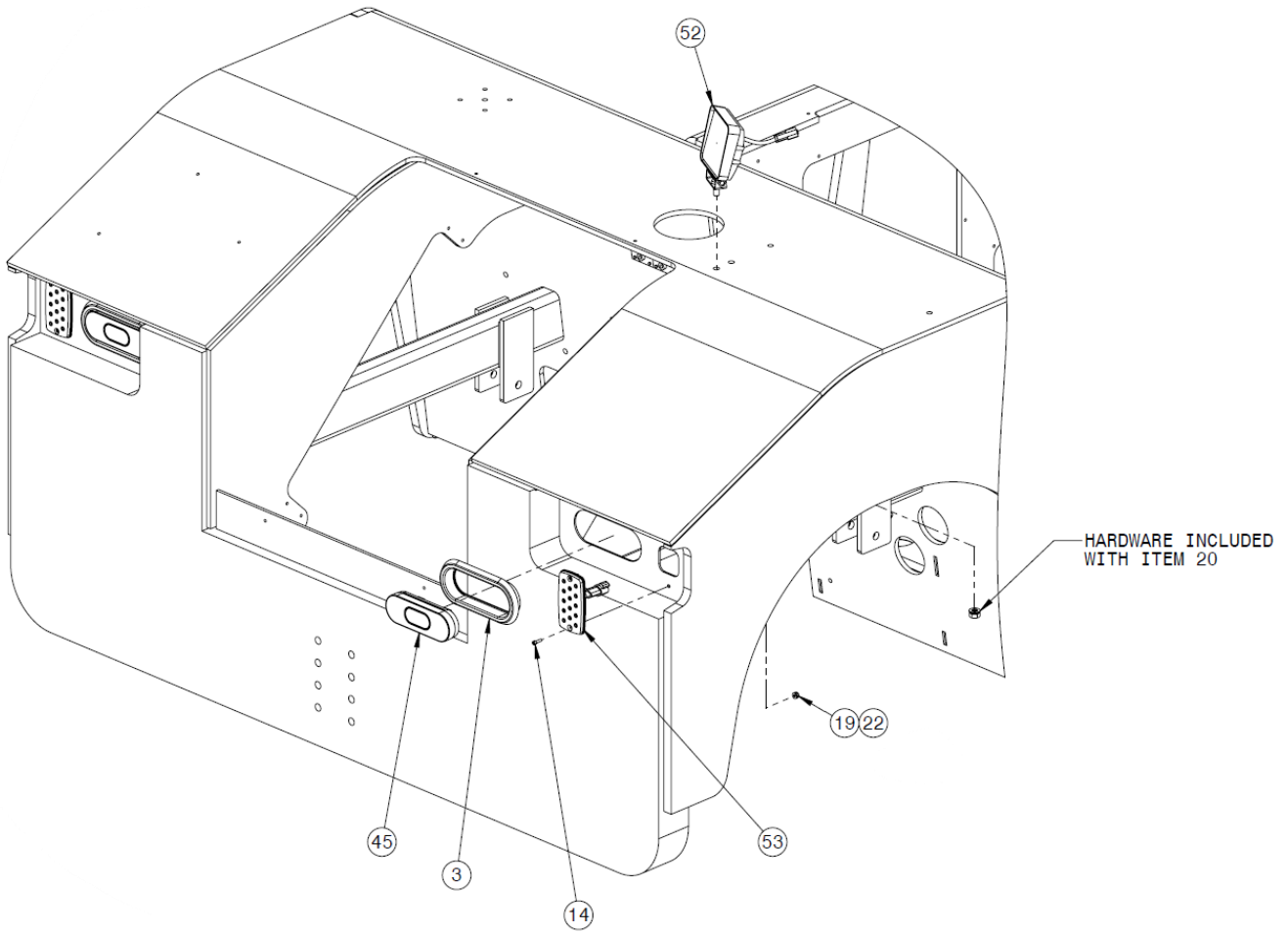
12.4 ELECTRICAL SYSTEM (continued)



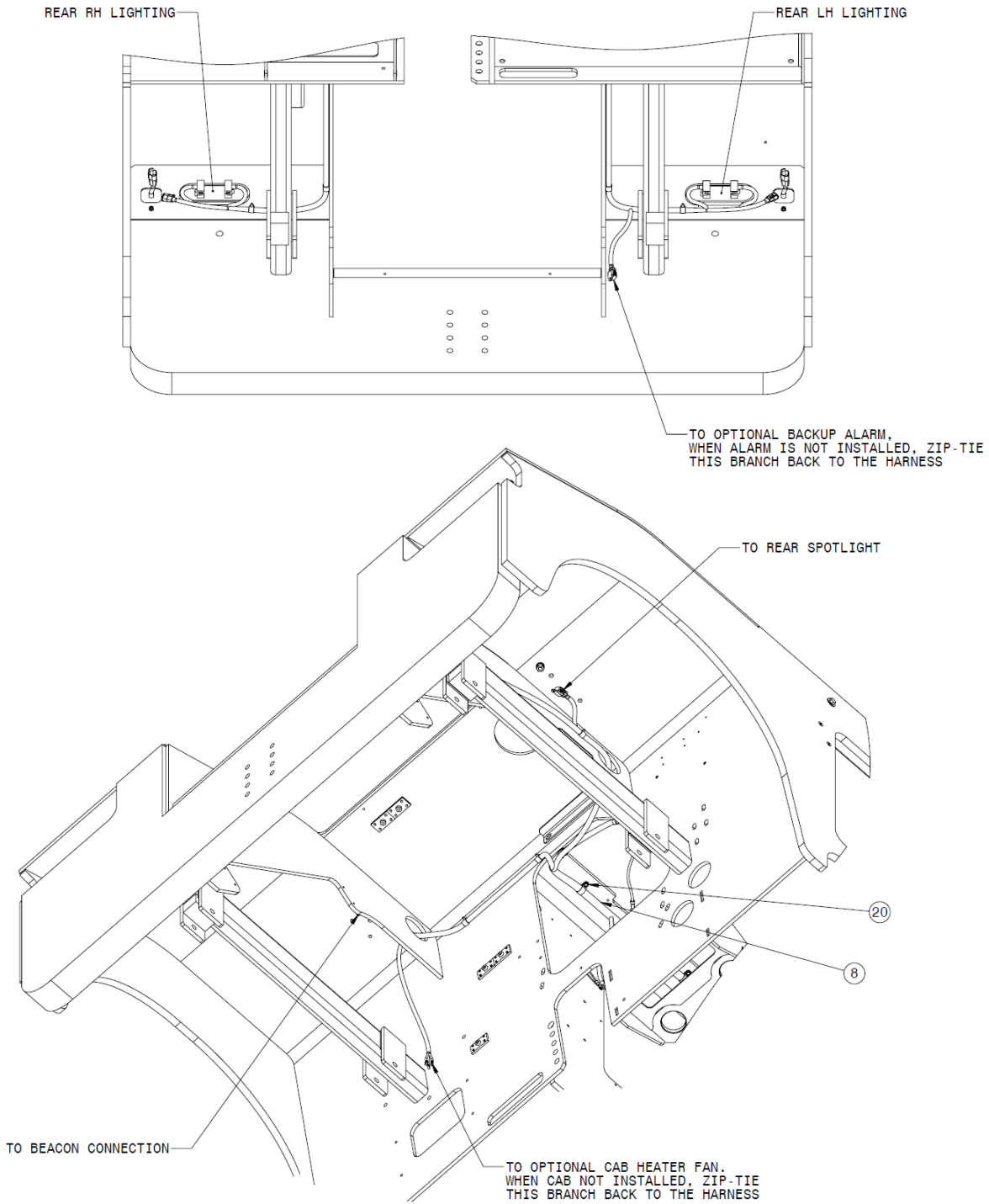
12.4 ELECTRICAL SYSTEM (continued)



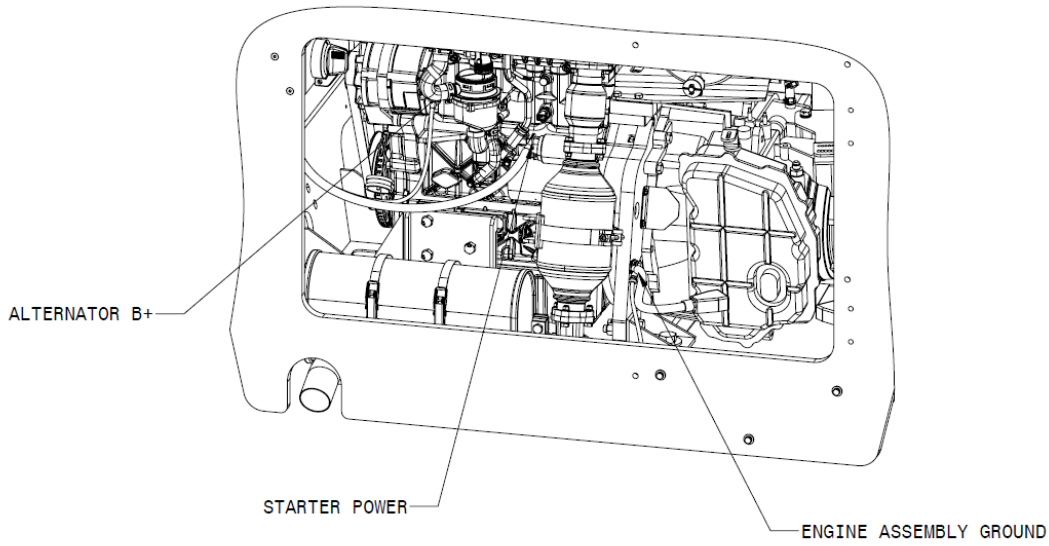
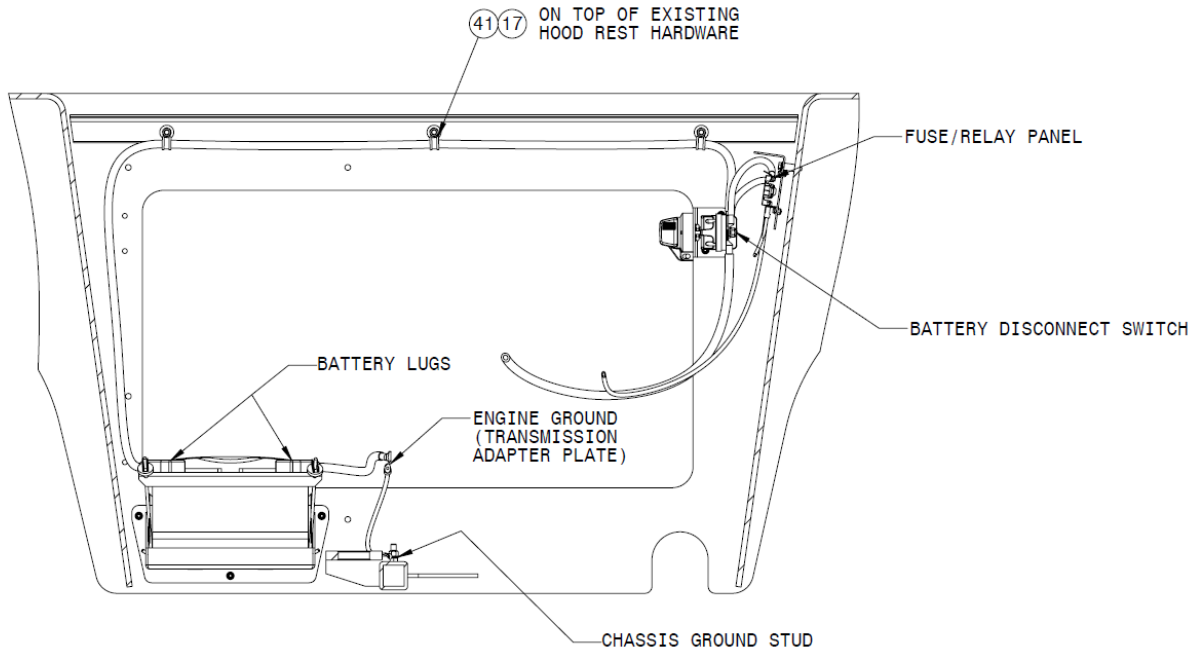
12.4 ELECTRICAL SYSTEM (continued)



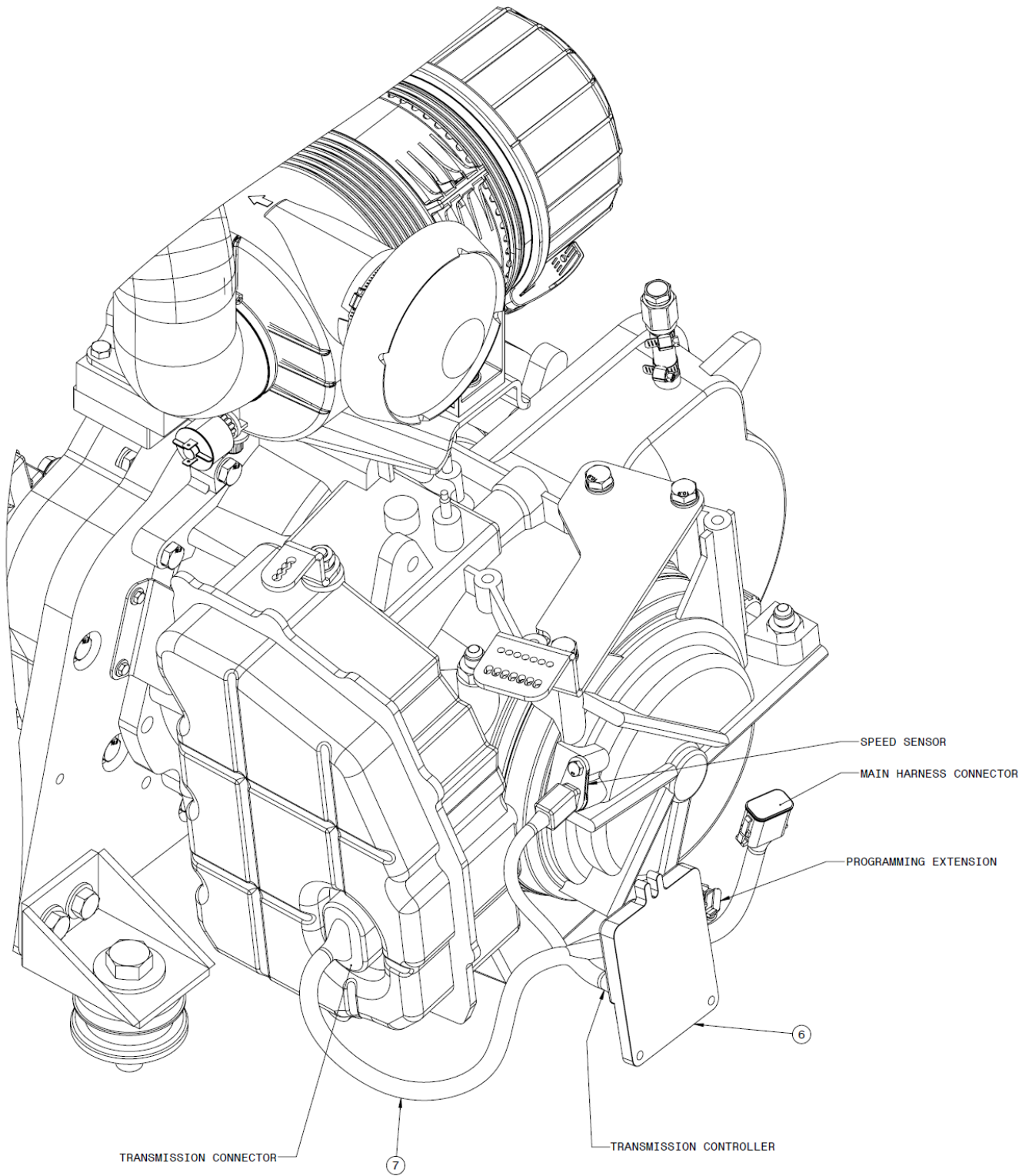
12.4 ELECTRICAL SYSTEM (continued)



12.4 ELECTRICAL SYSTEM (continued)



12.4 ELECTRICAL SYSTEM (continued)





12.4 ELECTRICAL SYSTEM (continued)

Parts List – Electrical System

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	65-72	BATTERY GRP. 65 850 CCA	-
2	A-RTT12-00052	ELECTRONIC HORN	1
3	A-RTT12E-00287	TAIL LIGHT GROMMET	2
4	A-TT3-0002	BATTERY HOLD DOWN BOLTS	-
5	EC-3116	FRONT LIGHTING HARNESS	1
6	EC-3117	TRANSMISSION CONTROLLER	1
7	EC-3147	TRANSMISSION WIRE HARNESS	1
8*	EC-3337	HARNESS, MAIN VEHICLE TTR-12	1
8*	EC-3142	HARNESS, MAIN VEHICLE	1
9*	EC-3338	POWER DISTRIBUTION BOX	1
9*	EC-3151	POWER DISTRIBUTION BOX	1
10	G-1100-105010	BOLT, 1/4-20 X 1.0" LG HEX HD GR 5	12
11	G-1100-105012	BOLT, 1/4-20 X 1-1/4" LG HEX HD GR 5	3
12	G-1100-105014	BOLT, 1/4-20 X 1-1/2" LG HEX HD GR 5	6
13	G-1150-102005	SCREW, #8-32 X 5/8" LG HEX HD MACHINE	4
14	G-1151-102205	SCREW, #8-32 X 5/8" SOCKET HD CAP	4
15	G-1152-105214	SCREW, 1/4-20 X 1-1/2" LG SOCKET FLAT HD CAP	2
16	G-1154-100004	SCREW, #4-40 X 1/2" LG. SOC BUTT. HD CAP	4
17	G-1200-1070	NUT, 3/8-16 HEX	3
18	G-1202-1000	STOPNUT, #4-40 ELASTIC	4
19	G-1202-1020	STOPNUT, #8-32 ELASTIC	8
20	G-1202-1035	STOPNUT, #10-32 ELASTIC	28
21	G-1250-1000N	FLATWASHER, #4 NARROW	4
22	G-1250-1020N	FLATWASHER, #8 NARROW	8
23	G-1250-1030N	FLATWASHER, #10 NARROW	2
24	G-1250-1050N	FLATWASHER, 1/4 NARROW	11
25	G-1250-1050W	FLATWASHER, 1/4 WIDE	10
26	G-1250-1060N	FLATWASHER, 5/16 NARROW	7
27	G-1250-1060W	FLATWASHER, 5/16 WIDE	8
28	G-1250-1070N	FLATWASHER, 3/8 NARROW	2
29	G-1251-1030R	LOCKWASHER, #10 REGULAR	2
30	G-1251-1050R	LOCKWASHER, 1/4 REGULAR	20
31	G-1251-1060R	LOCKWASHER, 5/16 REGULAR	7
32	G-1251-1070R	LOCKWASHER, 3/8 REGULAR	1
33	G-1420-106006	BOLT, 5/16-18 X 3/4" LG. HEX HD GR 8	4
34	G-1420-106010	BOLT, 5/16-18 X 1.0" LG. HEX HD GR 8	7
35	G-1420-107012	BOLT, 3/8-16 X 1.25" HEX HD GR 8	1
36	G-1720-103504	SCR,#10-32X0.5 MACH HEX WSH HD	1
37	G-1720-103506	SCR,#10-32X.75 MACH HEX WSH HD	2

* For reorder of items 8 and 9, please provide vendor part number of fuse box, which is marked in the lower left corner of the fuse box cover.

12.4 ELECTRICAL SYSTEM (continued)

Parts List – Electrical System

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
38	G-1727-1050	NUT, 1/4-20 TOP LOCK ZINC	1
39	G-1727-1060	NUT, 5/16-18 TOP LOCK ZINC	4
40	G-1727-1070	NUT, 3/8-16 TOP LOCK ZINC	1
41	G-1847-12	CUSHION LOOP CLAMP, 3/4, Ø .406 MTG HOLE	3
42	J-6805-00	BATTERY HOLD DOWN BRKT (P)	-
43	NVSP-05-021-CA	BATTERY DISCONNECT SWITCH	1
44	NVSP-14-033-CA	THROTTLE PEDAL DUAL ANALOG	1
45	NVSP-34-010-CA	6 IN OVAL COMBINATION LIGHT	2
46	S-3440-00	BRKT, CAN DIAGNOSTICS (P)	1
47	TR-2553	SPACER, 1/4 X .75 LG	3
48	Z-10538	BATTERY CABLE KIT	1
49	Z-10945	ASY, TCU BRACKET	1
50	Z-11080-00	WLD, FUSE BOX BRACKET (P)	1
51	N/A	ASY, LH HEADLIGHT POCKET	1
52	Z-9825	ASY, HEADLIGHT W/CONNECTOR	1
53	Z-9826	ASY, TURN IND W/CONNECTOR	2
54	N/A	ASY, RH HEADLIGHT POCKET	1
55	Z-9905	ASY, BATTERY DISC BRKT	1
56	Z-9910	ASY, BATTERY BRACKET	-
57	N/A	ASY, FUSE AND RELAY PANEL	1

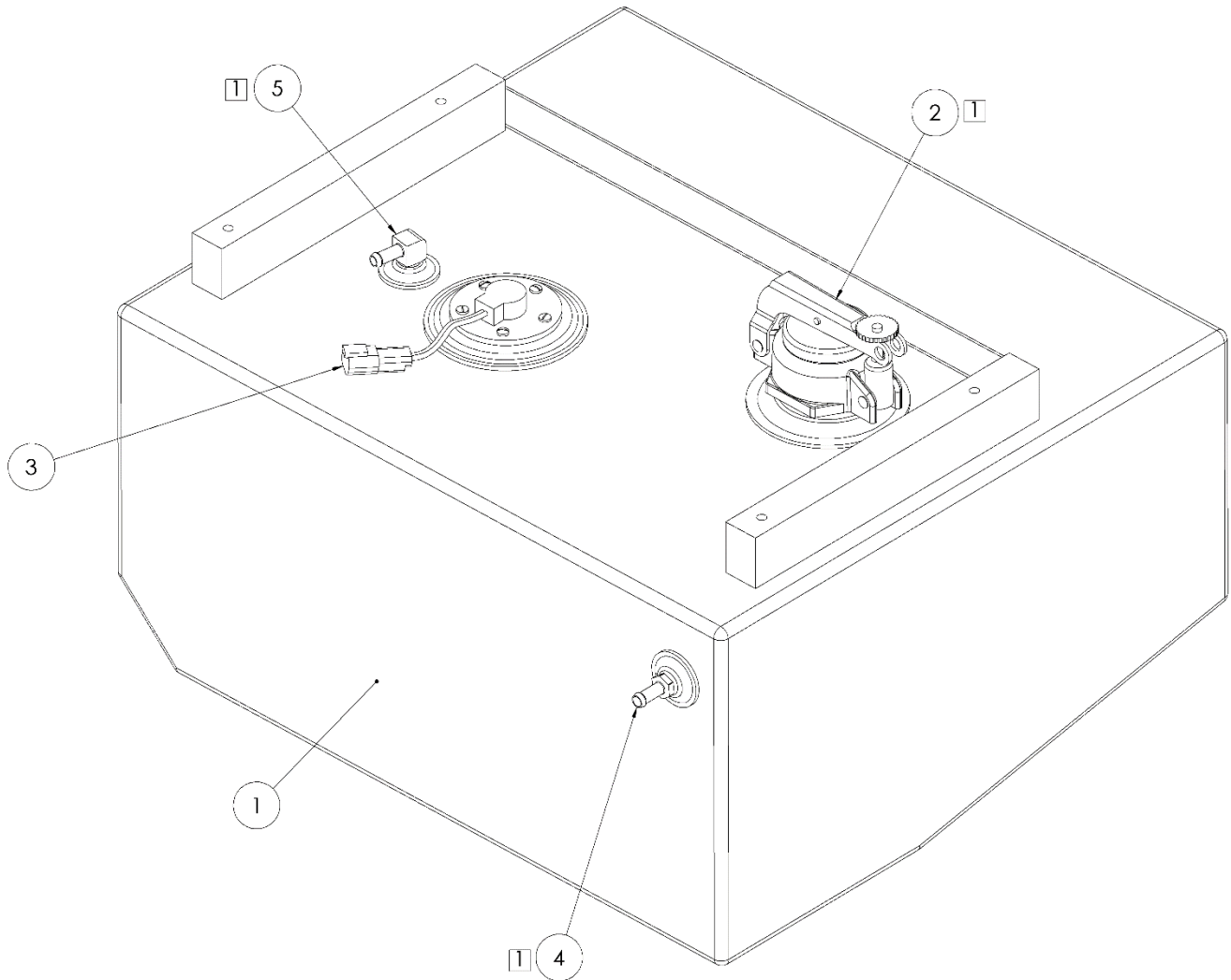
12.5 POWER DISTRIBUTION BOX SPARE PARTS

Parts List

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Part Number	Description	Qty
MIN-2	MINI FUSE, 2A (NOT SHOWN)	N/A
MIN-3	MINI FUSE, 3A (NOT SHOWN)	N/A
MIN-5	MINI FUSE, 5A (NOT SHOWN)	N/A
MIN-10	MINI FUSE, 10A (NOT SHOWN)	N/A
MIN-25	MINI FUSE, 25A (NOT SHOWN)	N/A
XL00-81-001-CA	12V 35A MICRO RELAY (NOT SHOWN)	N/A

13.0 FUEL
13.1 FUEL TANK SUB



NOTES:

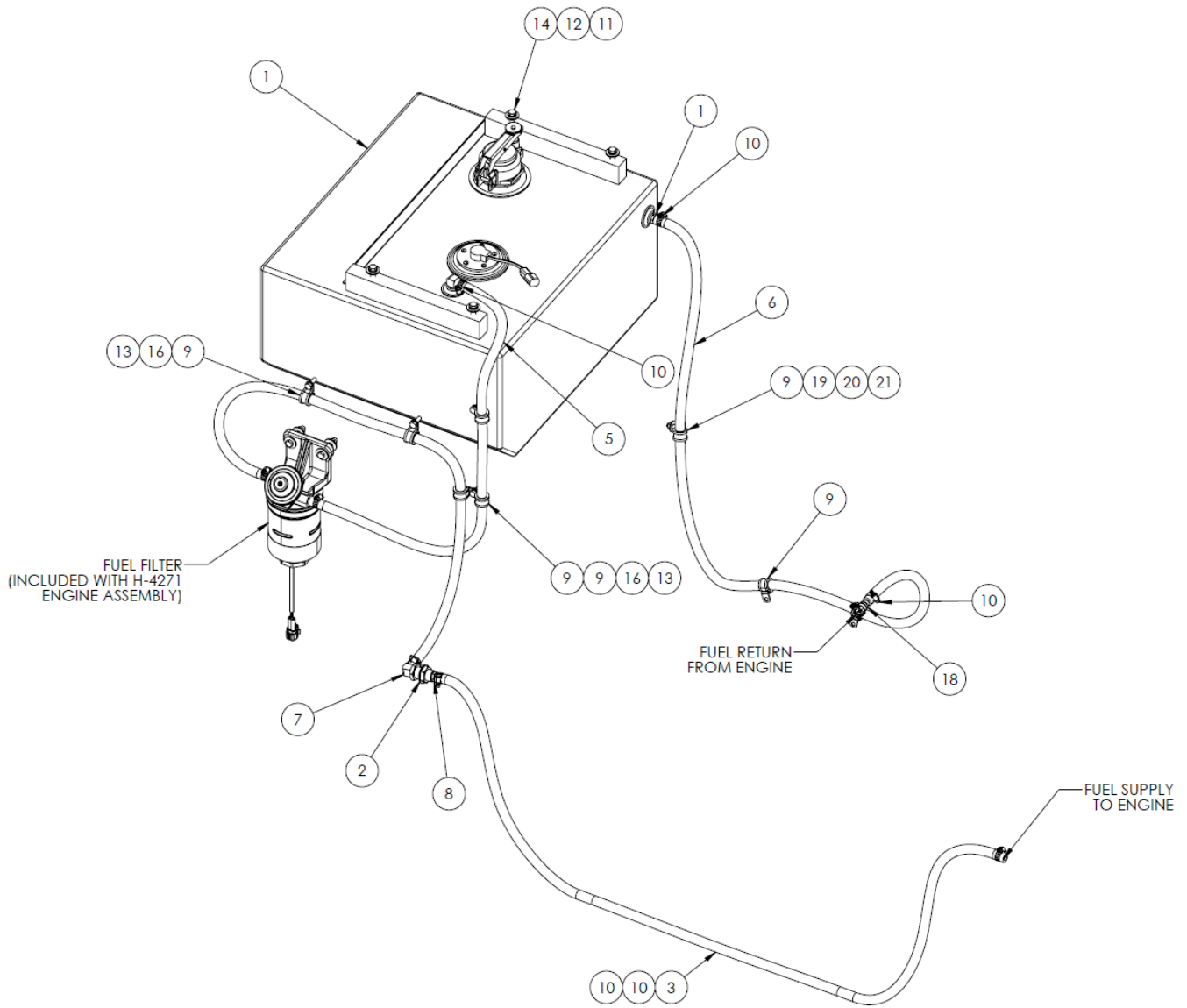
I INSTALL WITH PIPE THREAD SEALANT: LOCTITE 565 OR EQUIVALENT

Parts List – Fuel Tank Sub

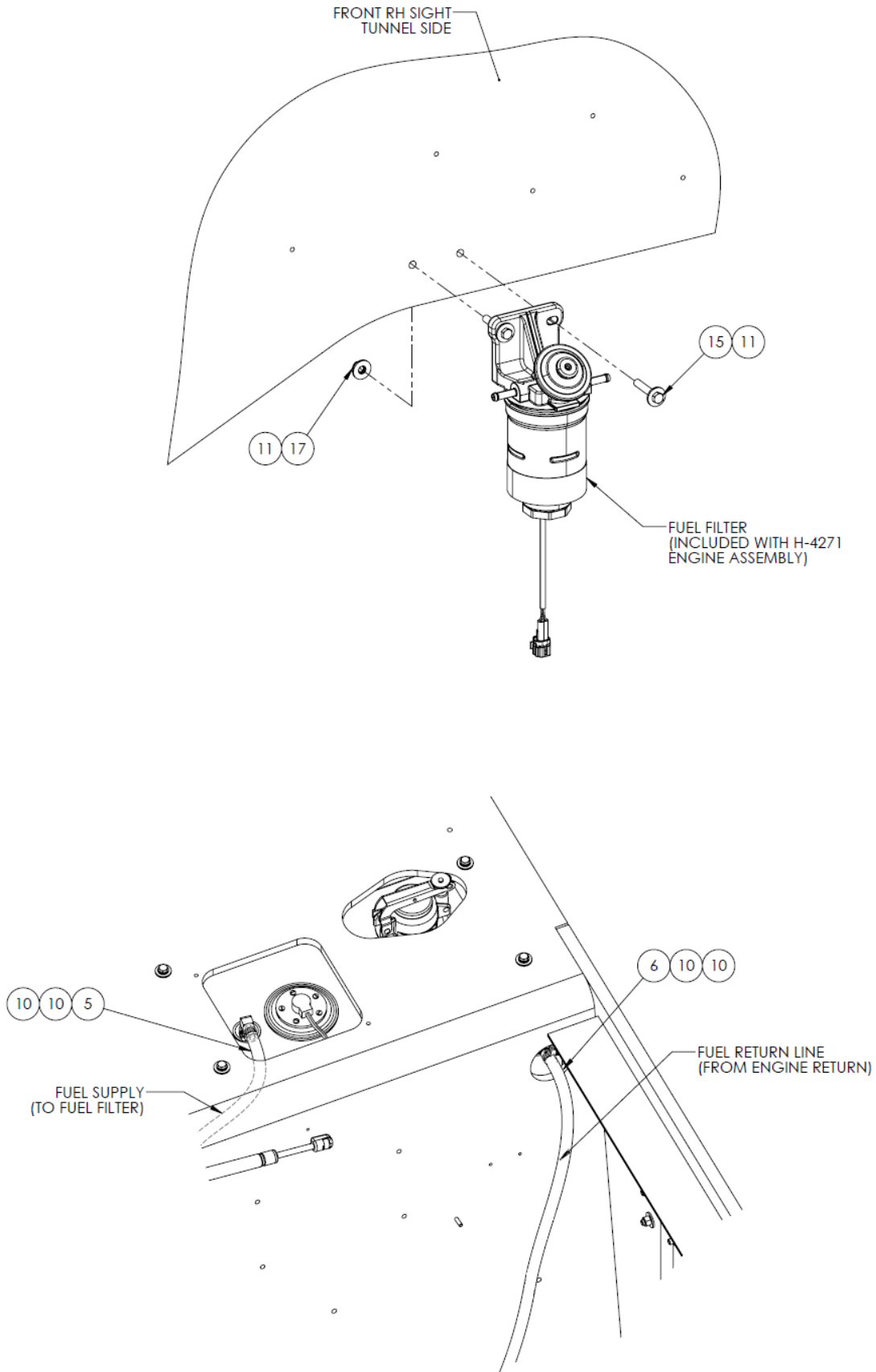
When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	H-4268	FUEL TANK	1
2	A-TT4-00271-1	FUEL CAP GREEN DIESEL	1
3	Z-9923	FUEL SENDER WITH CONNECTOR	1
4	05705B-104	BRASS BARB 1/4 M NPT X 5/16 BARB	1
5	05705B-C04	ELBOW 90, 1/4 M NPT X 5/16 BARB	1

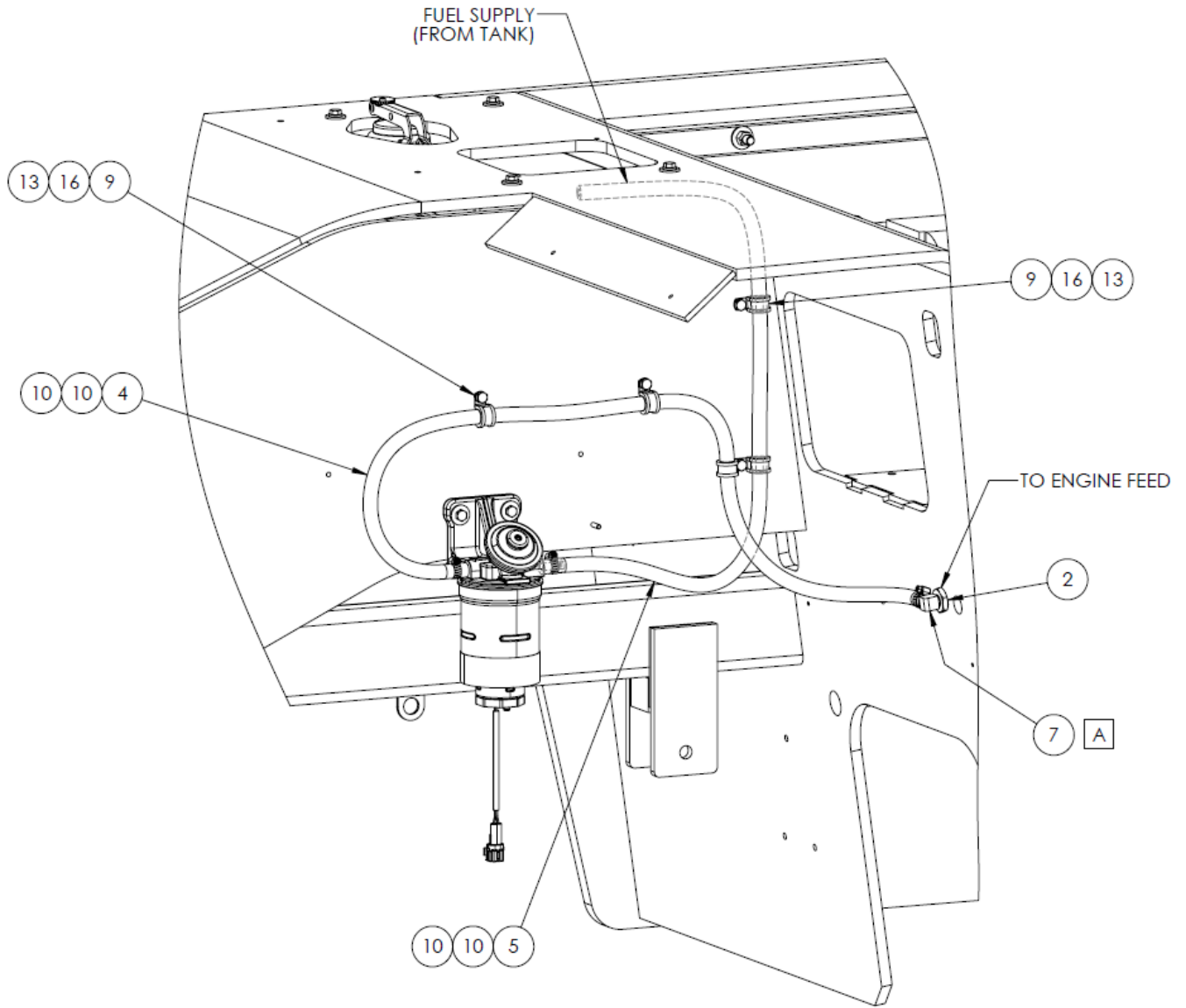
13.2 FUEL SYSTEM



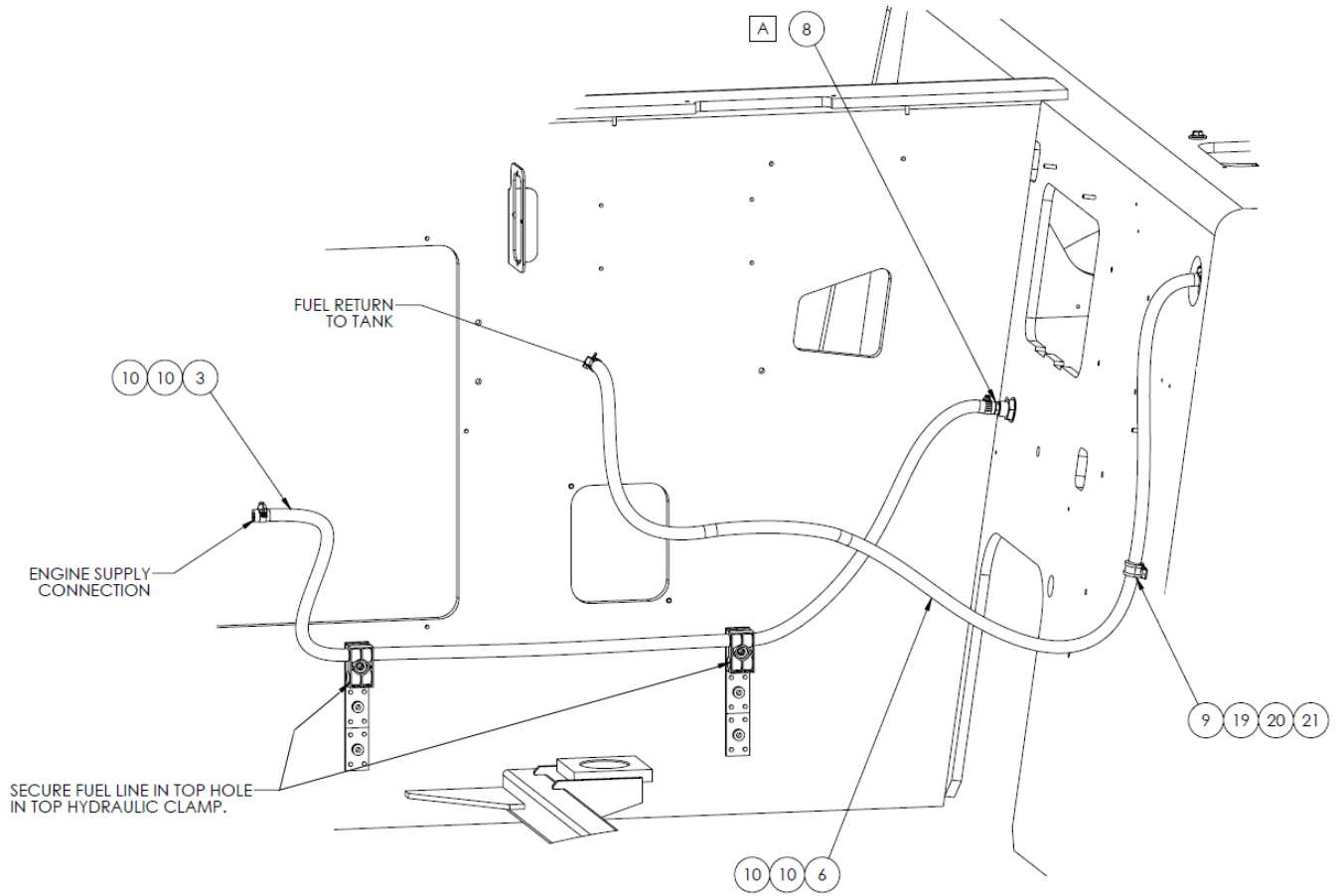
13.2 FUEL SYSTEM (continued)



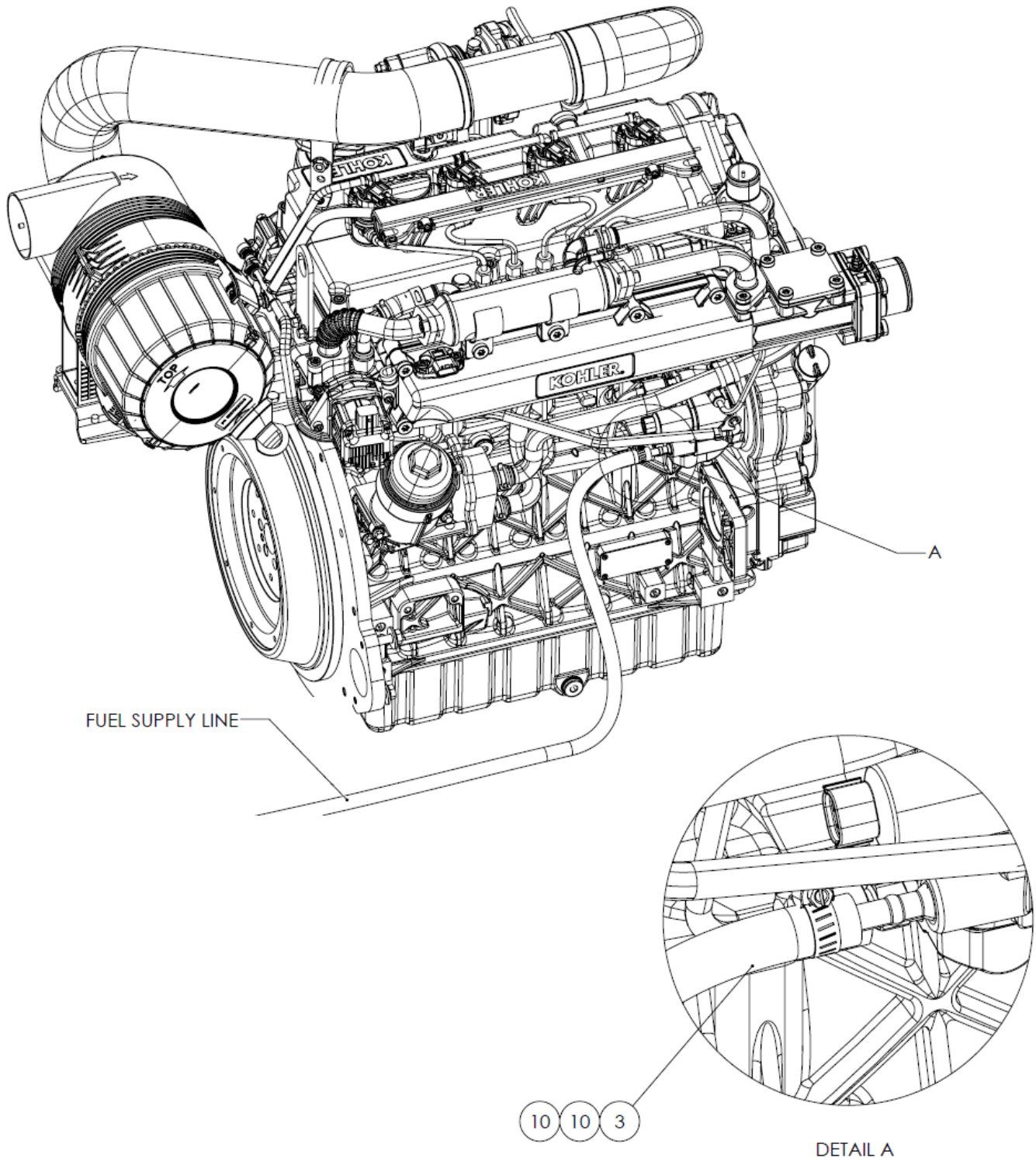
13.2 FUEL SYSTEM (continued)



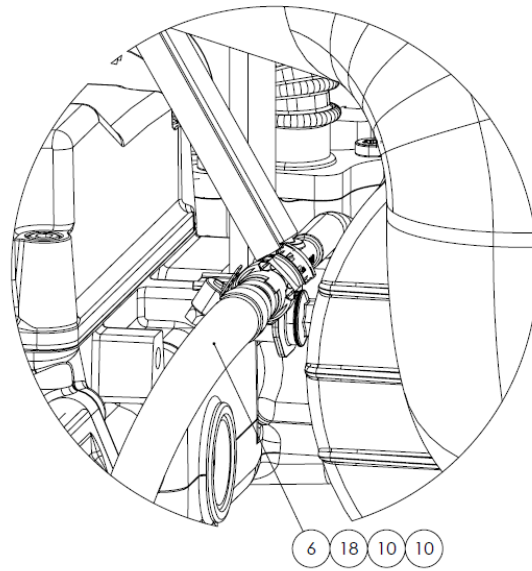
13.2 FUEL SYSTEM (continued)



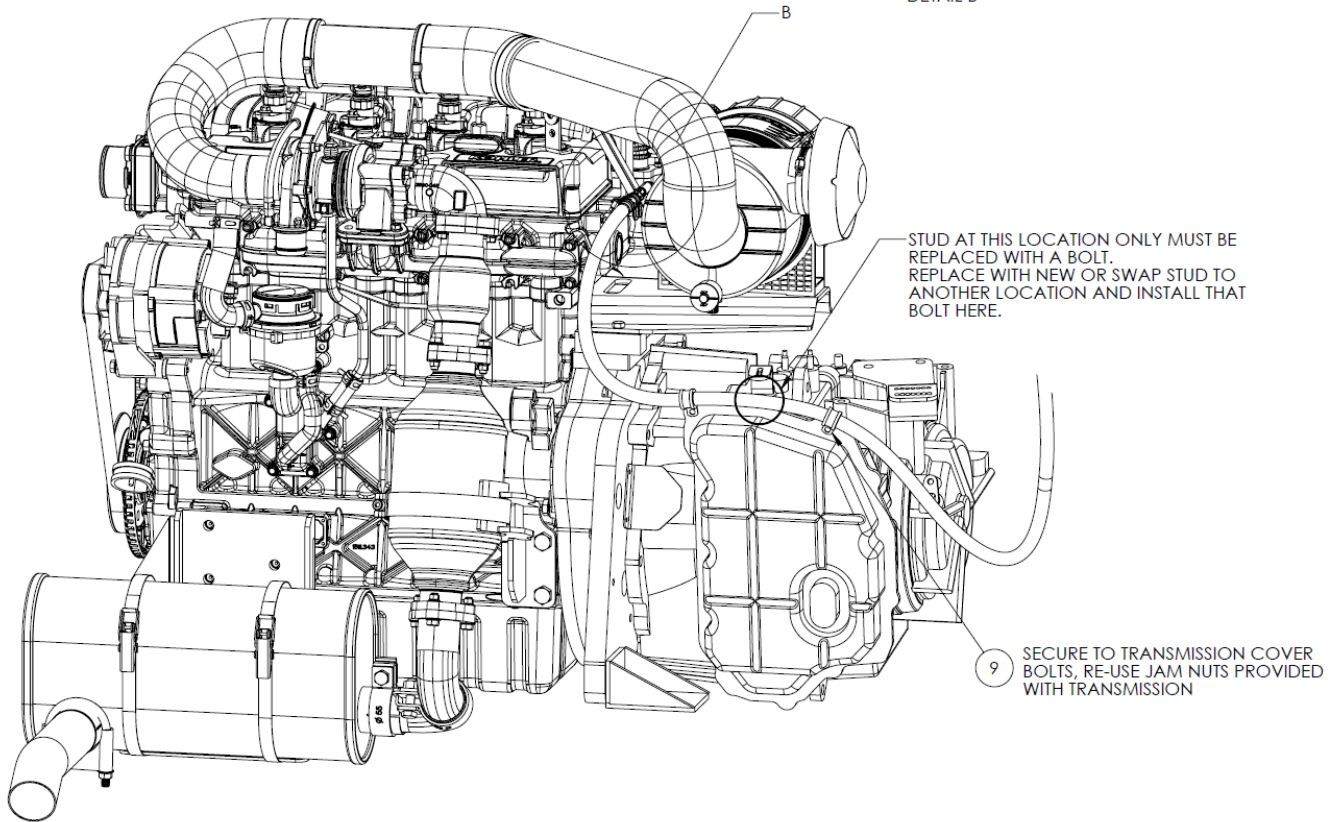
13.2 FUEL SYSTEM (continued)



13.2 FUEL SYSTEM (continued)



DETAIL B





13.2 FUEL SYSTEM (continued)

Parts List – Fuel System

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

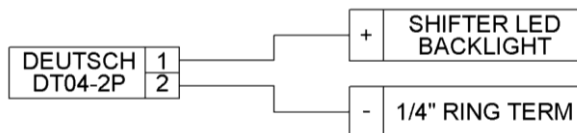
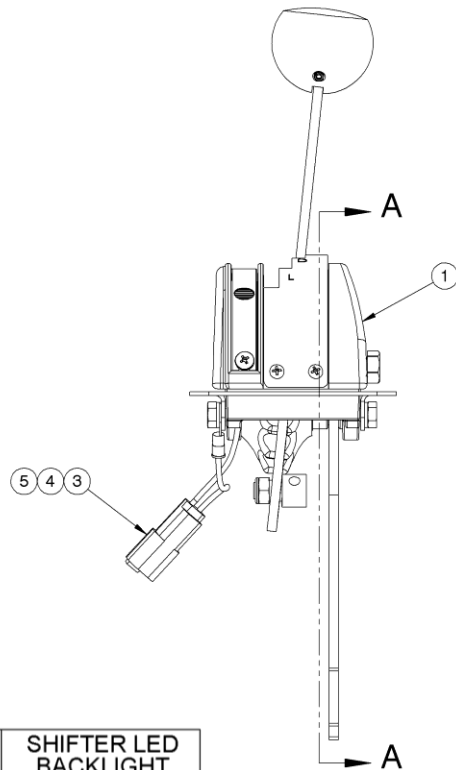
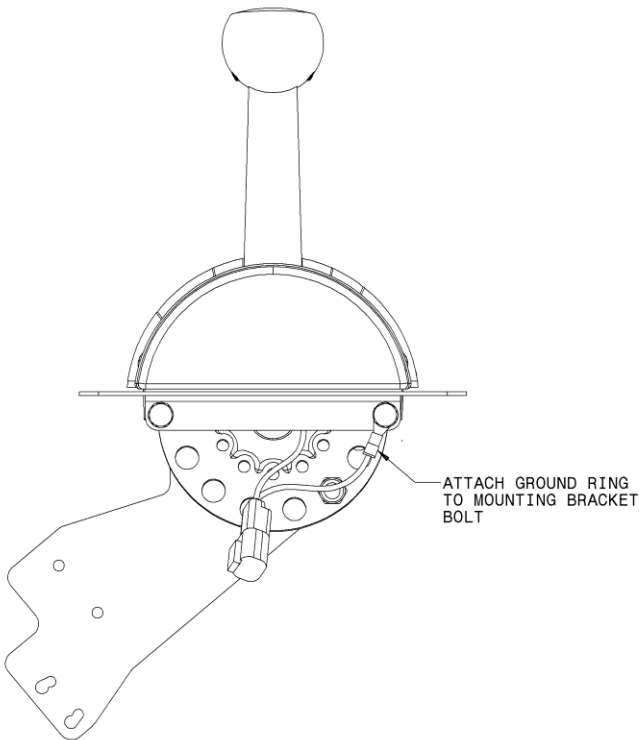
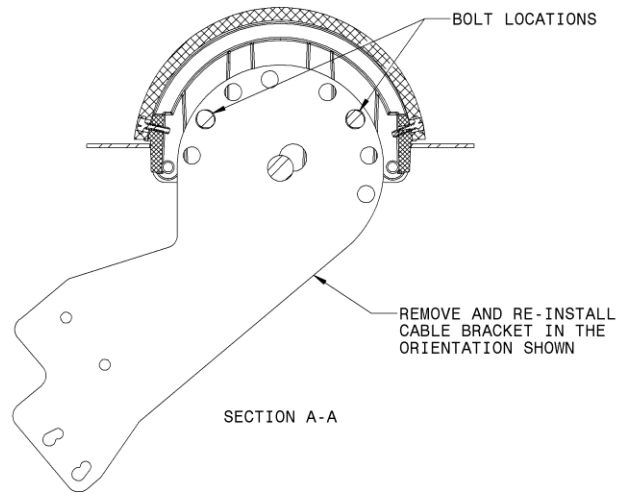
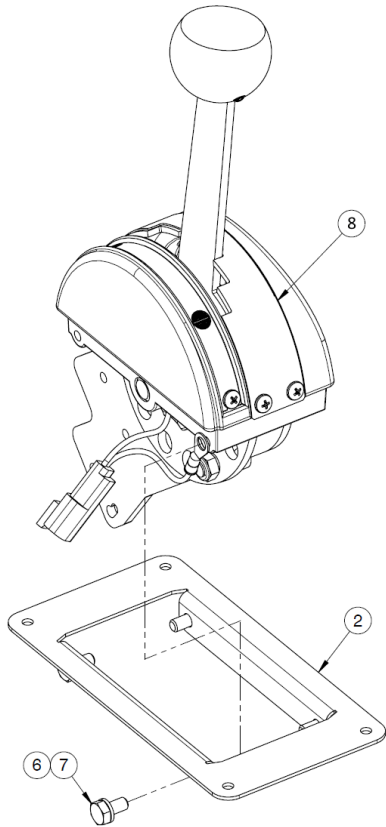
Item	Part Number	Description	Qty
1	N/A	ASY, FUEL TANK	1
2	A-TT4-00280	BULKHEAD FITTING	1
3	TF-1152-02-57.0	5/16" FUEL LINE X 57" LONG	1
4	TF-1152-02-43.5	5/16" FUEL LINE X 43.5" LONG	1
5	TF-1152-02-35.5	5/16" FUEL LINE X 35.5" LONG	1
6	TF-1152-02-62.0	5/16" FUEL LINE X 62" LONG	1
7	05705B-C04	ELBOW 90, 1/4 M NPT X 5/16 BARB	1
8	05705B-104	BRASS BARB 1/4 M NPT X 5/16 BARB	1
9	H-3521-05	CLAMP, CUSHIONED LOOP 5/8"	8
10	H-1426-04	HOSE CLAMP - 0.50" - 1.25"	8
11	G-1250-1060W	FLATWASHER, 5/16 WIDE	8
12	G-1251-1060R	LOCKWASHER, 5/16 REGULAR	4
13	G-1251-1050R	LOCKWASHER, 1/4 REGULAR	4
14	G-1420-106012	BOLT, 5/16-18 X 1-1/4" LG. HEX HD GR 8	4
15	G-1420-106016	BOLT, 5/16-18 HEX HD GR 8	2
16	G-1100-105006	BOLT, 1/4-20 X 3/4" LG HEX HD GR 5	4
17	G-1727-1060	NUT, 5/16-18 TOP LOCK ZINC	2
18	H-4627	FUEL QUICK DISCONNECT	1
19	G-1100-105010	BOLT, 1/4-20 X 1.0" LG HEX HD GR 5	1
20	G-1250-1050W	FLATWASHER, 1/4 WIDE	1
21	G-1727-1050	NUT, 1/4-20 TOP LOCK ZINC	1



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14.0 DASH PANEL

14.1 SHIFTER SUB





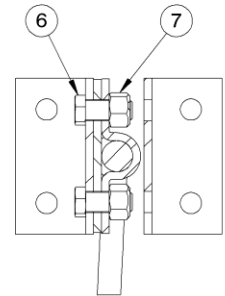
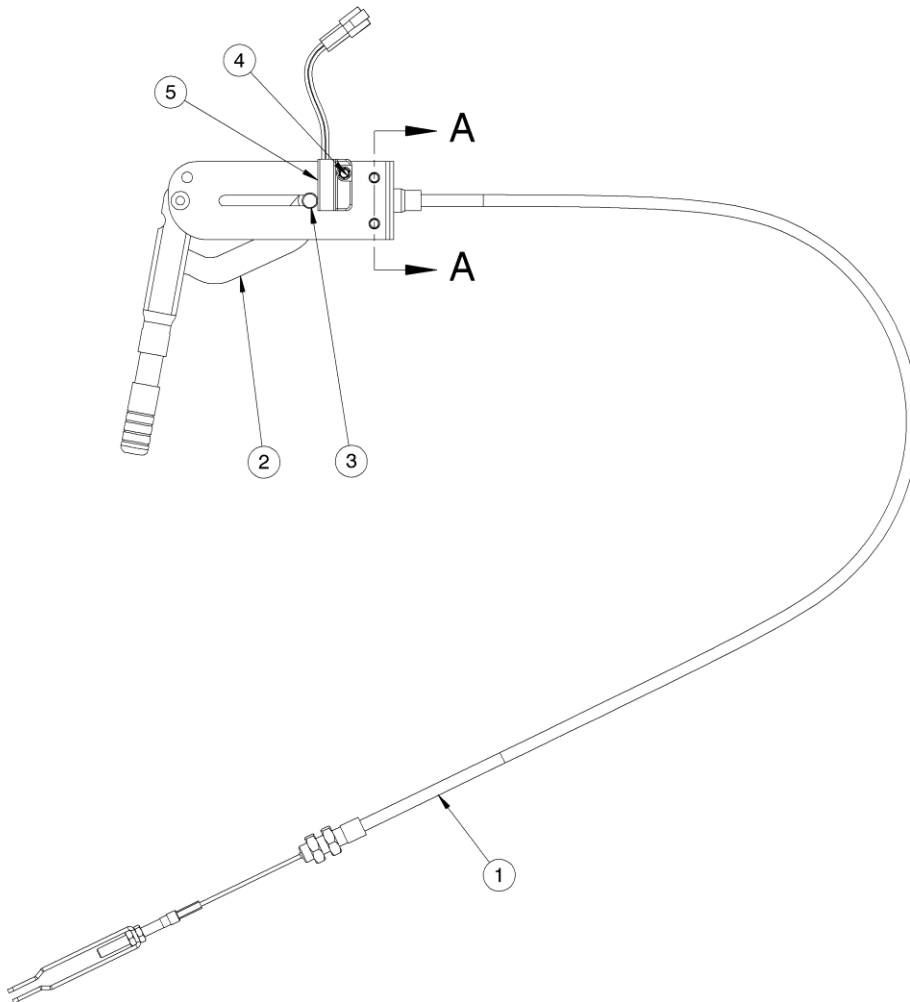
14.1 SHIFTER SUB (continued)

Parts List – Shifter Sub

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	H-4313	SHIFTER, 5-SPEED CABLE STYLE	1
2	S-3442-00	BRKT, SHIFT LEVER (P)	1
3	DT04-2P	DEUTSCH CONNECTOR	1
4	W2P	DEUTSCH LOCK	1
5	0460-215-16141	DEUTSCH TERMINAL	2
6	G-1251-1050R	LOCKWASHER, 1/4 REGULAR	4
7	G-1100-105004	BOLT, 1/4-20 X 1/2" LG. HEX HD GR 5	4
8	TR-2811	SHIFT GATE	1

14.2 PARKING BRAKE HANDLE SUB



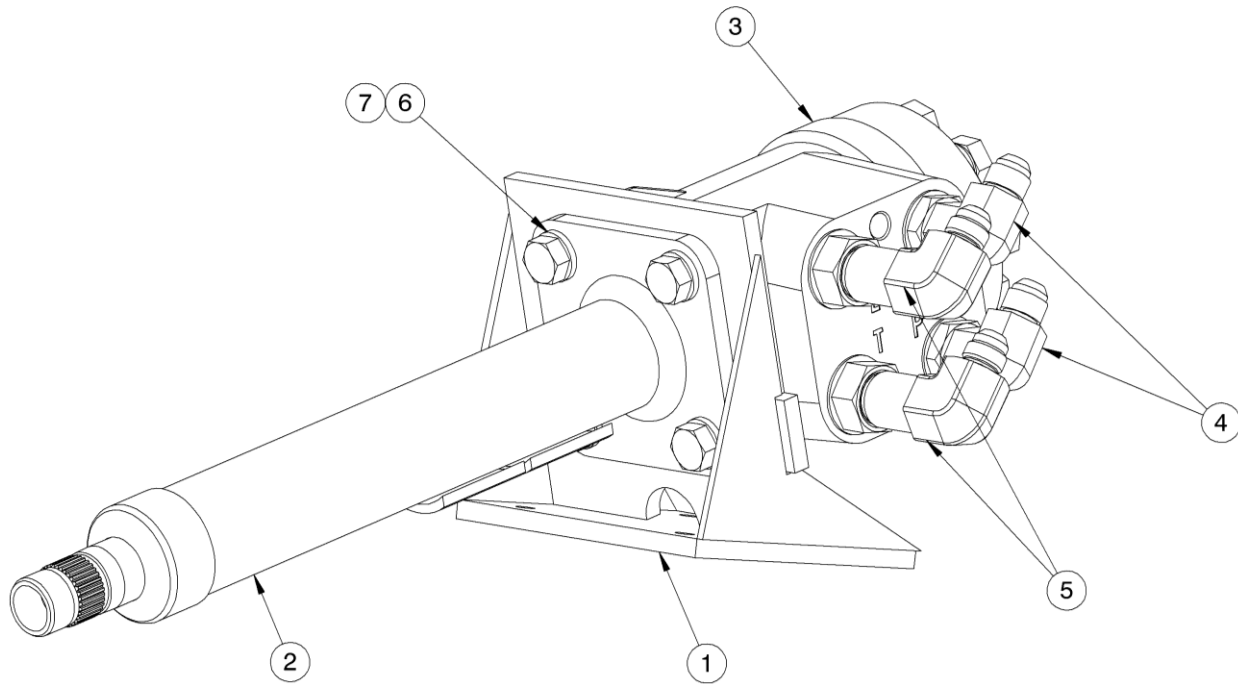
SECTION A-A
SCALE 1 : 2

Parts List – Parking Brake Handle Sub

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	B-TT4-00145	CABLE PRIMARY	1
2	A-TT4-00141	BRAKE LEVER-HAND	1
3	81008429	BUZZLITE PRK BRAKE CONTACT PIN	1
4	82066700	MOUNTING SCREW BUZZLITE	1
5	Z-9940	PRX SENSOR BUZZLITE W CONNECT	1
6	G-1420-106006	BOLT, 5/16-18 X 3/4" LG. HEX HD GR 8	2
7	G-1727-1060	NUT, 5/16-18 TOP LOCK ZINC	2

14.3 STEERING COLUMN SUB

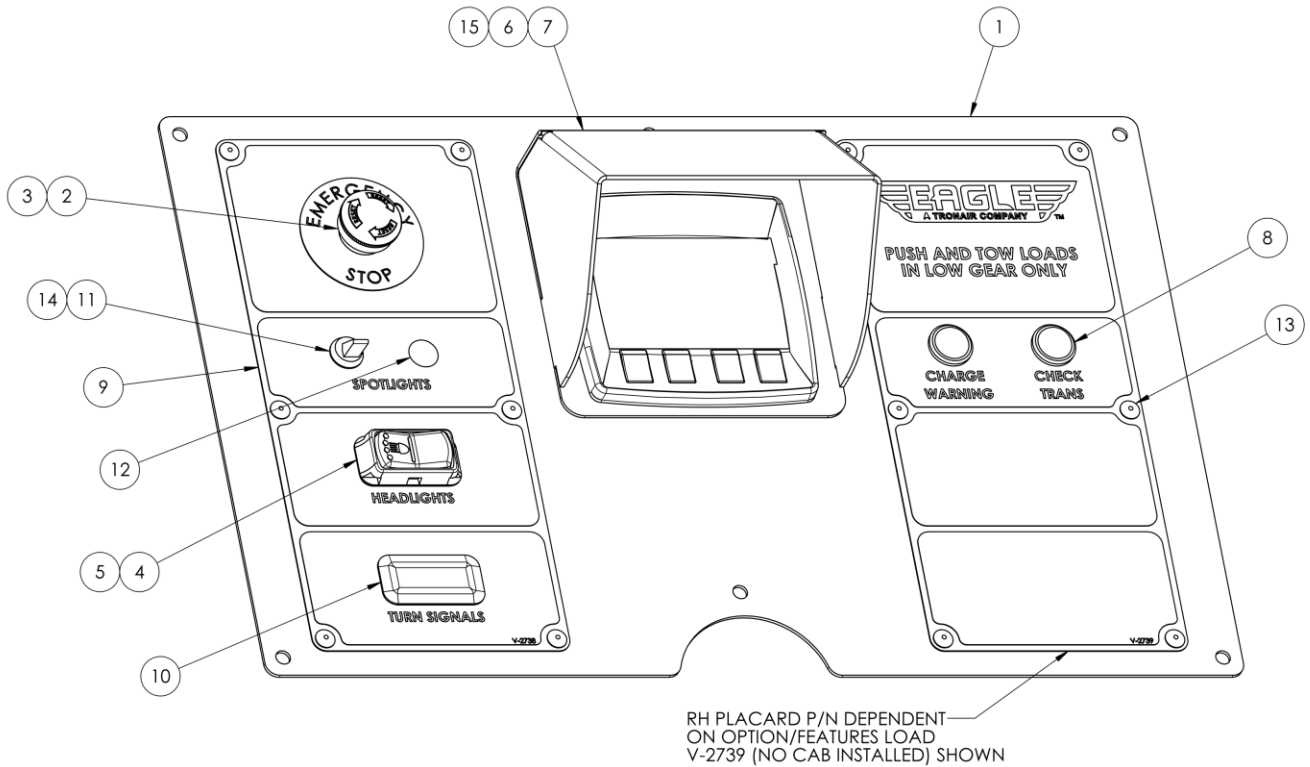


Parts List – Steering Column Sub

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	XL00-02-062-SA	WLD, STEER COLUMN BRACKET (P)	1
2	A-MTT5-0807	STEERING COLUMN	1
3	HC-2820	STEERING ORBITAL	1
4	C5515X6X8	ELBOW, -06 M JIC X -08 M ORB	2
5	6-8 CC5OX-S	ELBOW LONG, -06 M JIC X -08 M ORB	2
6	G-1251-1070R	LOCKWASHER, 3/8 REGULAR	4
7	G-1420-107010	BOLT, 3/8-16 X 1.0" HEX HD GR 8	4

14.4 INSTRUMENT PANEL SUB

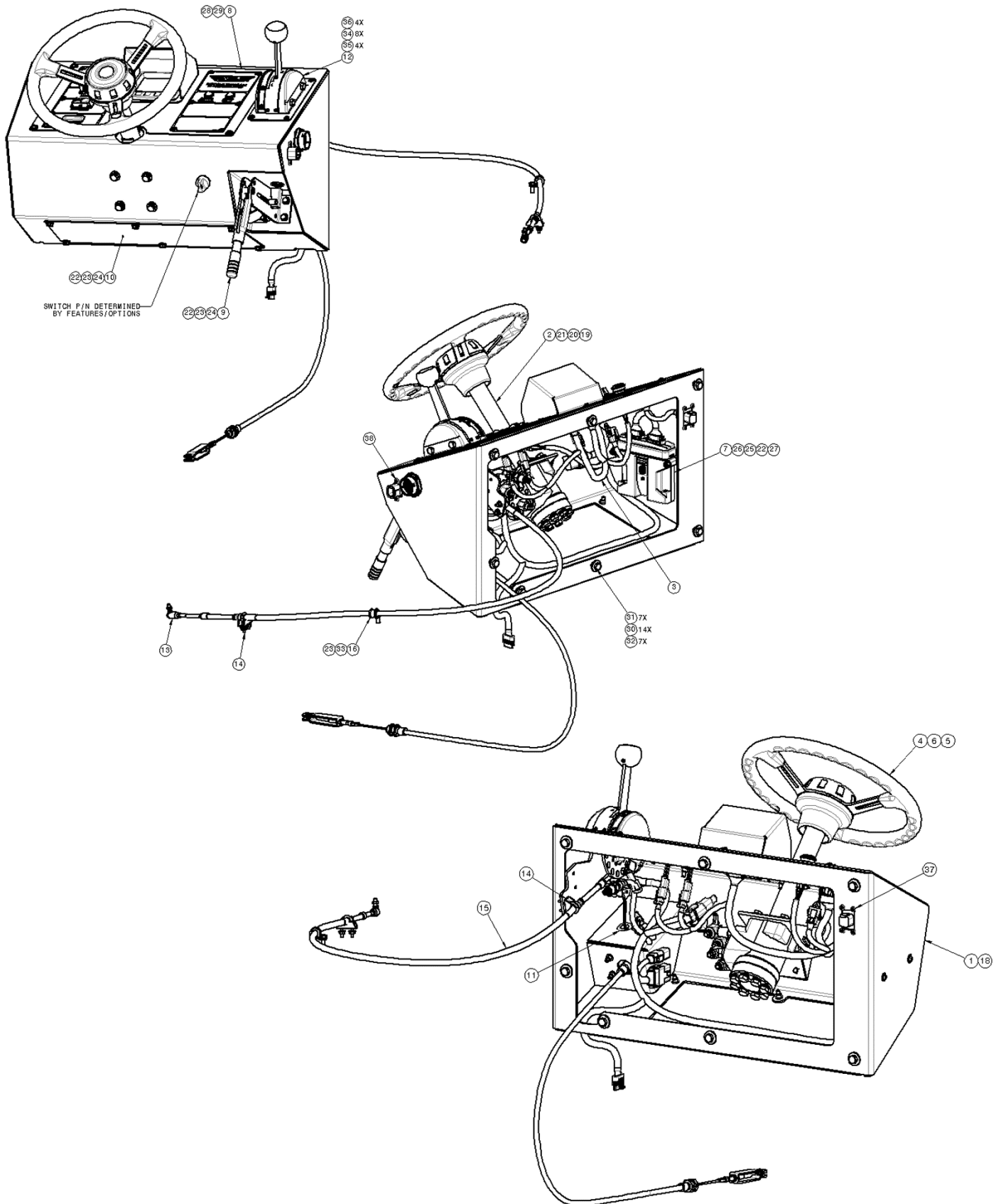


Parts List – Instrument Panel Sub

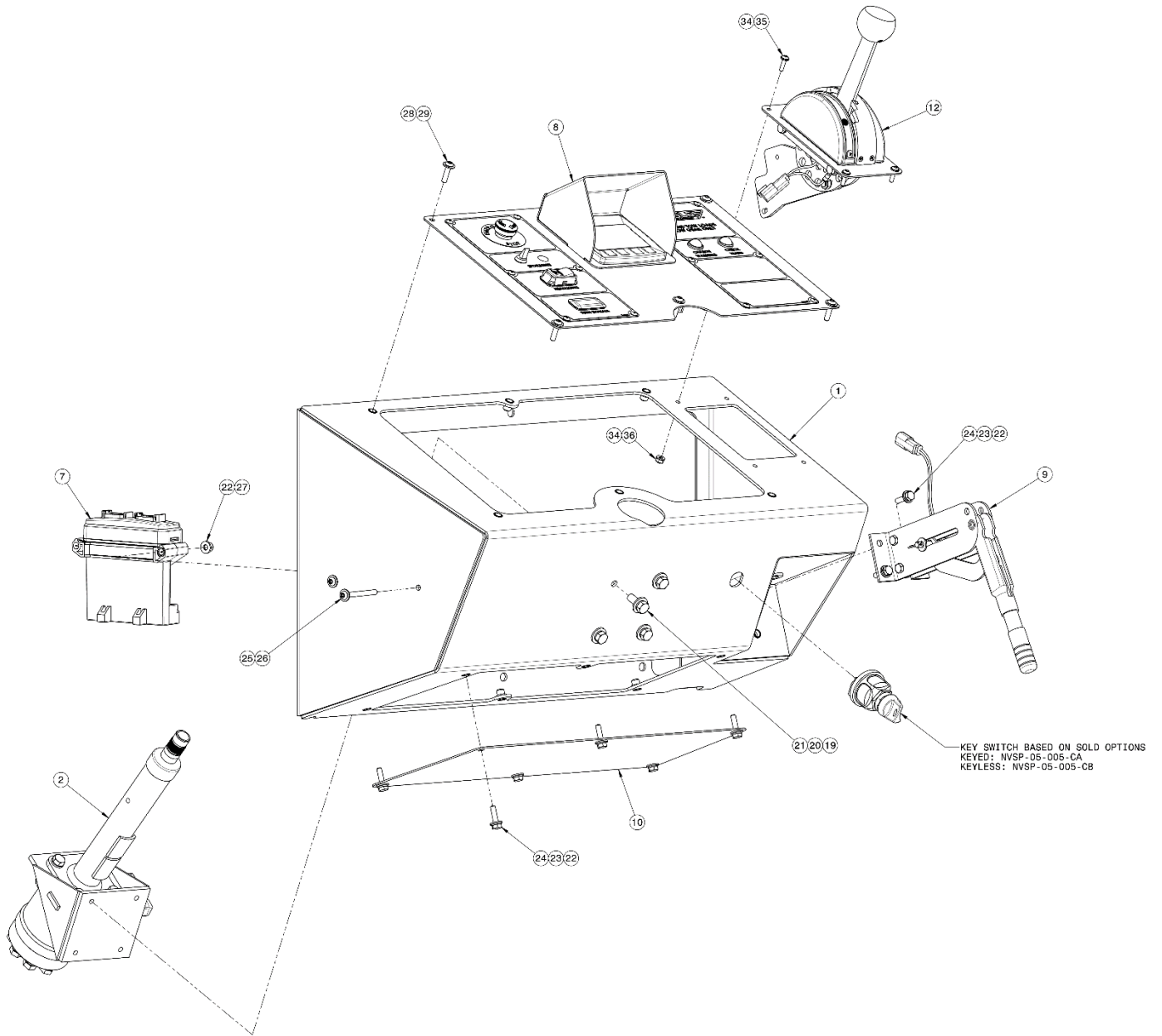
When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	S-3424-00	DASH PANEL MTG PLATE (WP)	1
2	NVSP-14-041-CA	E-STOP BUTTON	1
3	NVSP-14-042-CA	E-STOP PLACARD	1
4	NVSP-14-001-CD	ON-OFF SWITCH BASE	1
5	NVSP-14-002-CD	HEADLIGHT ROCKER	1
6	XL00-10-001-CAR	DISPLAY, PANEL PROG - TTR	1
7	S-3425-00	DASH PANEL SUN SHIELD (P)	1
8	Z-10129	ASY, IND LAMP AND CONNECTOR	2
9	V-2738	LH DASH PLACARD	1
10	NVSP-14-003-CA	NGR EMPTY SWITCH PLUG	1
11	NVSP-14-008-CA	SPOTLIGHT SWITCH DASH ILLUMINATED	1
12	NVSP-14-044-CA	.5 IN PANEL HOLE PLUG	1
13	G-1352-21	RIVET, 3/16 OPEN END ALUM	12
14	Z-10863	ASSY, SPOT SWITCH WIRING	1
15	A-TT8-00413	SCREW, THREAD FORMING, M3X20	4

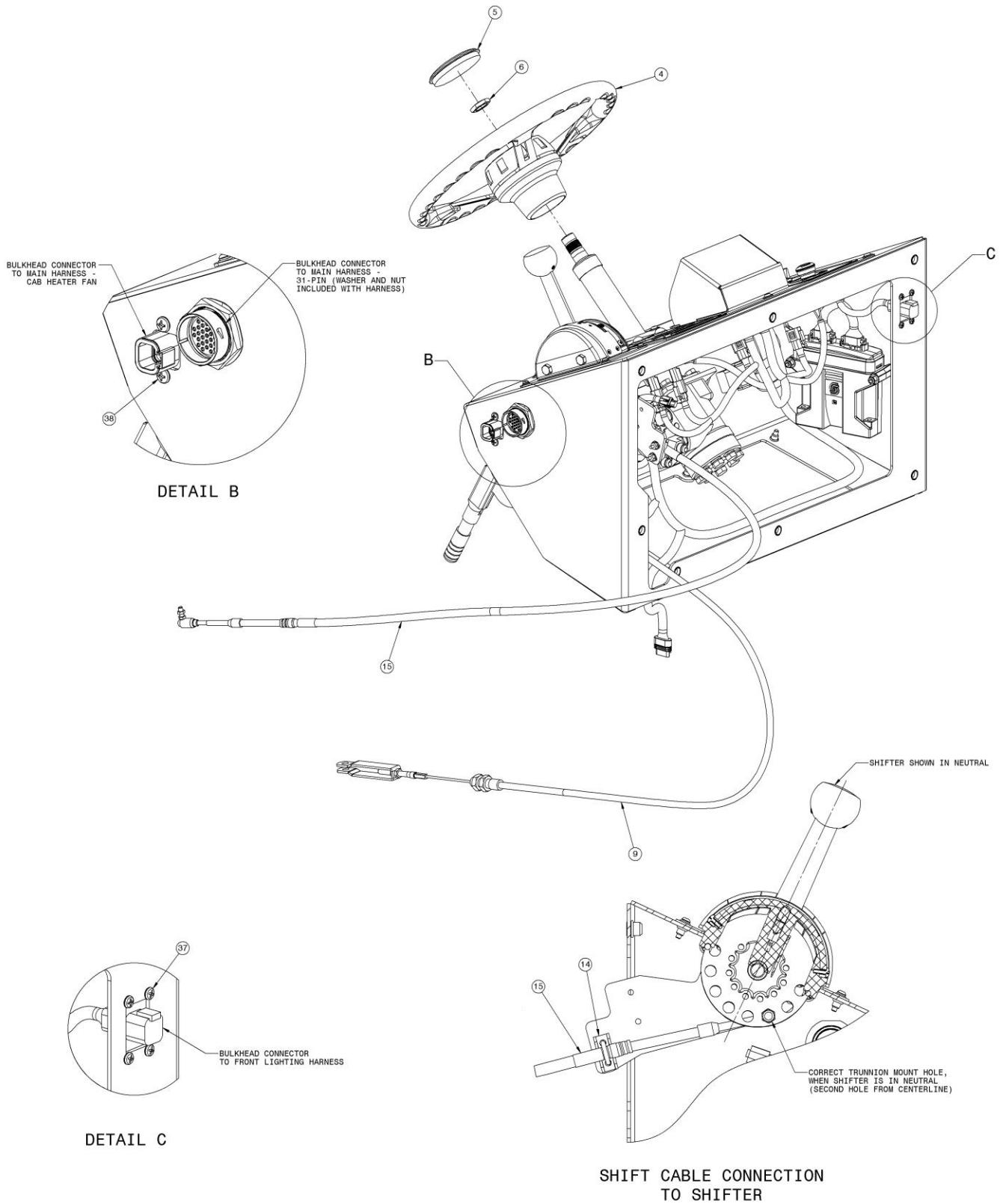
14.5 DASH PANEL ASSEMBLY



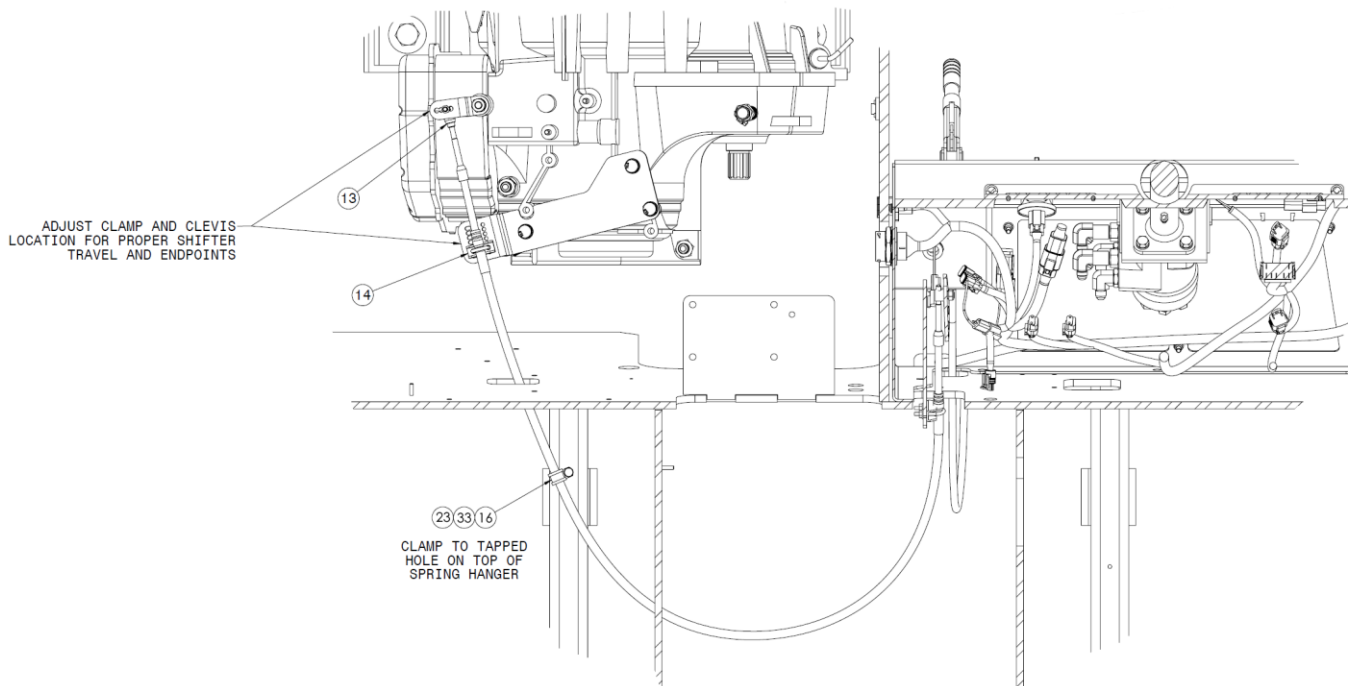
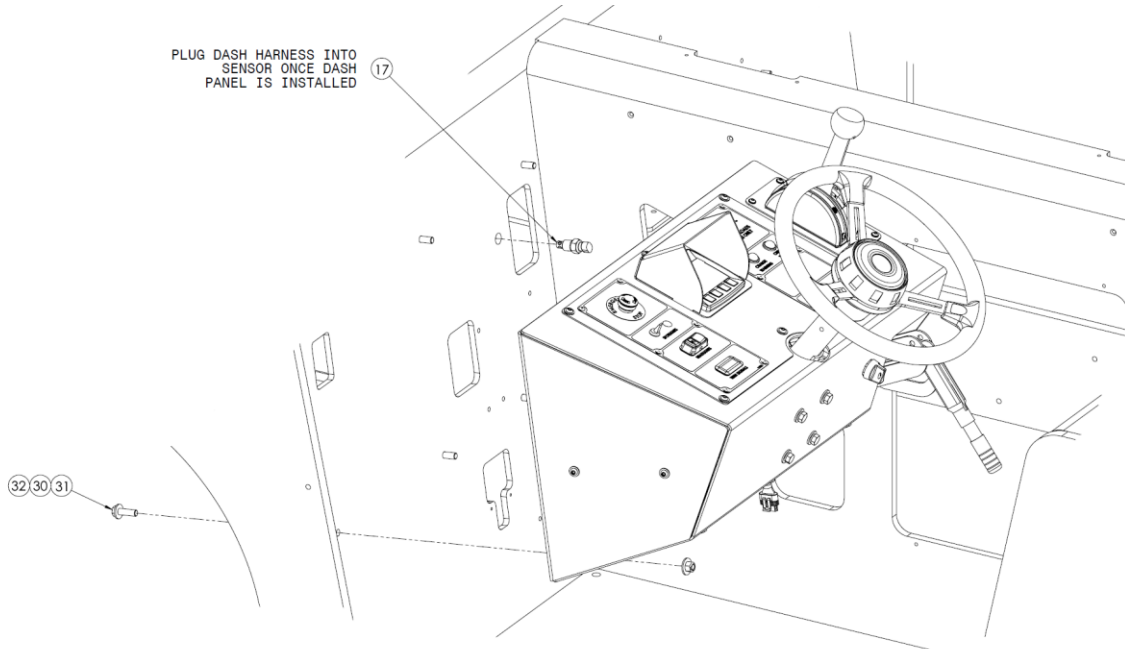
14.5 DASH PANEL ASSEMBLY (continued)



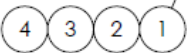
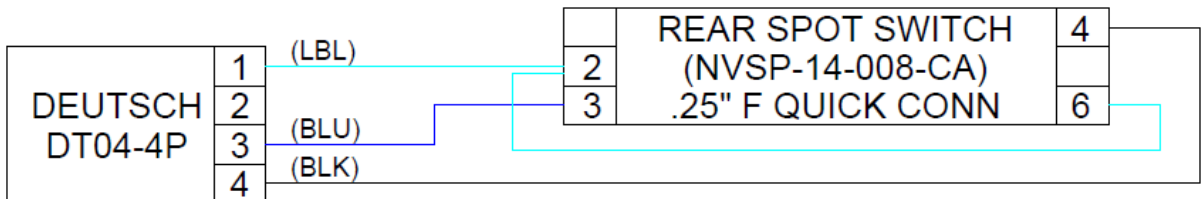
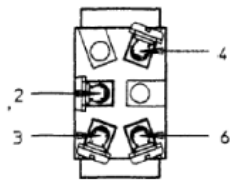
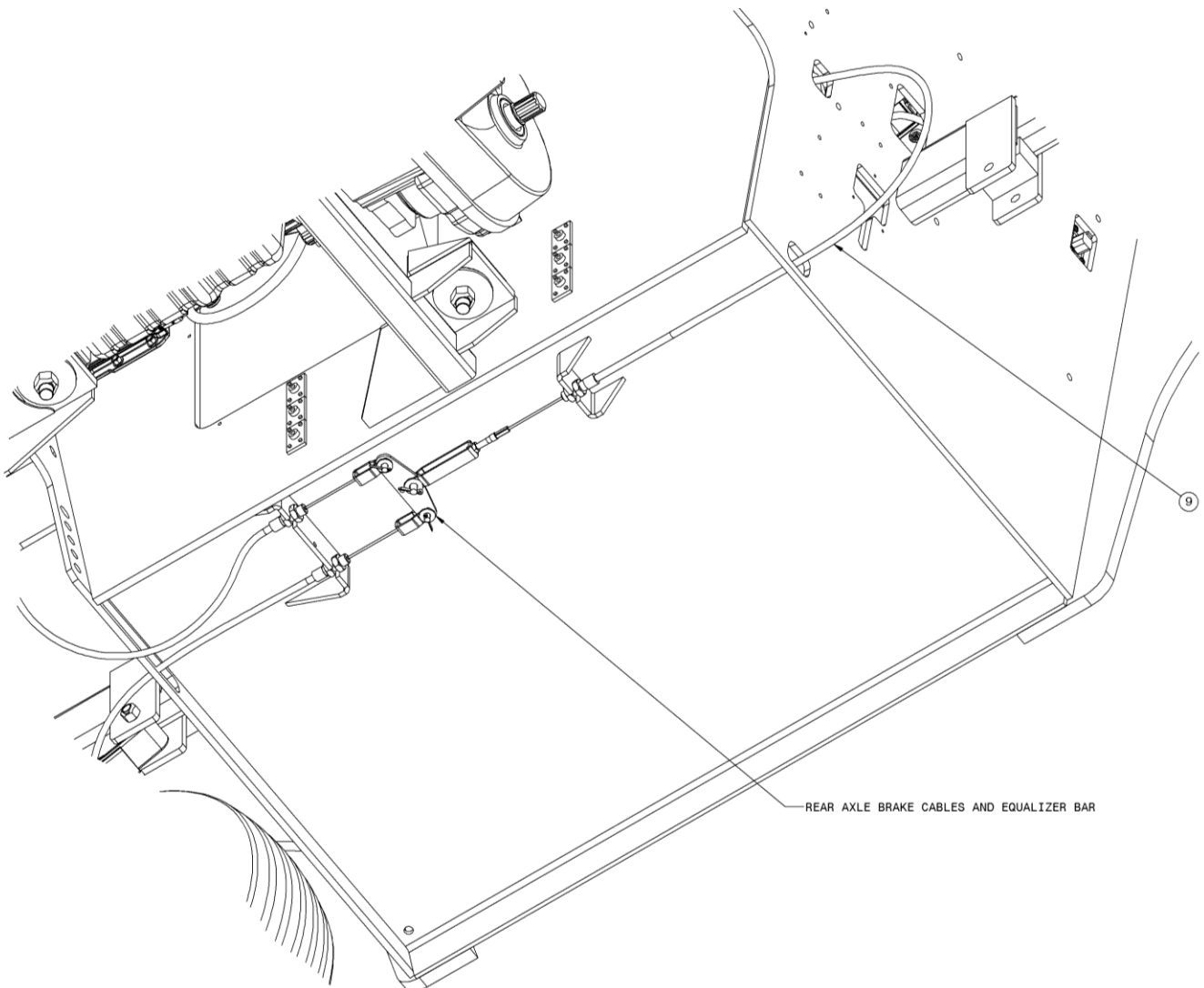
14.5 DASH PANEL ASSEMBLY (continued)



14.5 DASH PANEL ASSEMBLY (continued)



14.5 DASH PANEL ASSEMBLY (continued)





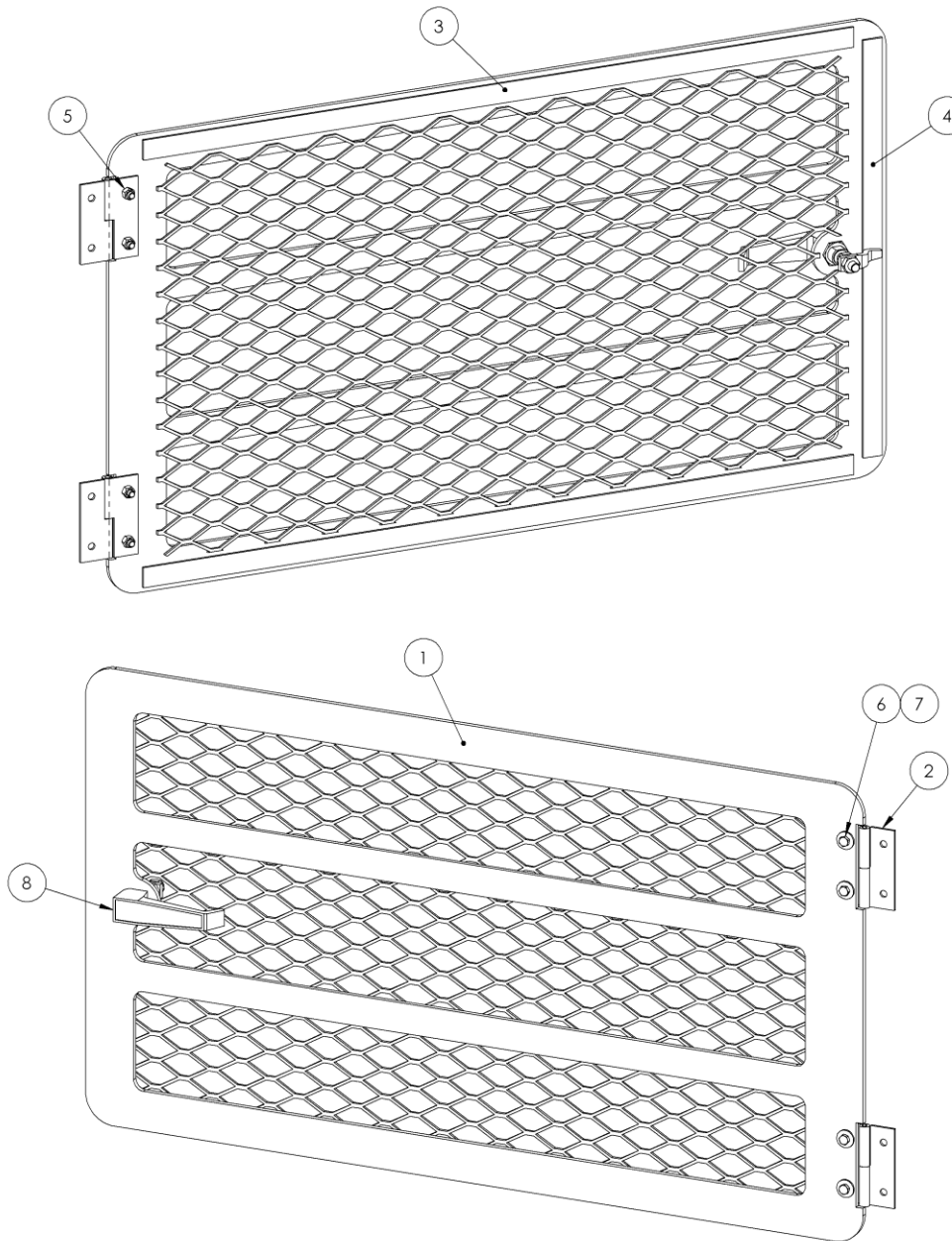
14.5 DASH PANEL ASSEMBLY (continued)

Parts List – Dash Panel Assembly

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	Z-10012-00	WLD, OPERATOR DASH PANEL (WP)	1
2	See Section 14.4	ASY, STEERING COLUMN	1
3	EC-3138	DASH PANEL HARNESS	1
4	A-TN4-00809E	STEERING WHEEL, 14"	1
5	A-TT10-00811	HORN BUTTON	1
6	A-TT10-00813	WHEEL NUT, 13/16-20 UNEF	1
7	EC-3137-P	CONTROLLER, PLUS+1 24 PIN PROG	1
8	See Section 14.6	ASY, INSTRUMENT PANEL	1
9	See Section 14.3	ASY, PARK BRAKE HANDLE	1
10	S-3426-00	COVER, UNDER DASH (P)	1
11	H-1901-22	GROMMET	1
12	See Section 14.1	ASSY, SHIFTER WITH ELEC CONN	1
13	A-TT4-00249	MORSE TRANSMISSION BALL JOINT	1
14	A-TT4-00247	TRANS CABLE U-BOLT	2
15	A-TT4-00246	MORSE TRANSMISSION SHIFT CABLE	1
16	H-3521-03	CLAMP, CUSHIONED LOOP 1/2"	1
17	H-4626	AIR TEMP SENSOR	1
18	G-1439-1050-S	NUTSERT, THIN WALL 1/4-20	16
19	G-1250-1060W	FLATWASHER, 5/16 WIDE	4
20	G-1251-1060R	LOCKWASHER, 5/16 REGULAR	4
21	G-1420-107010	BOLT, 3/8-16 X 1.0" HEX HD GR 8	4
22	G-1250-1050N	FLATWASHER, 1/4 NARROW	12
23	G-1251-1050R	LOCKWASHER, 1/4 REGULAR	11
24	G-1100-105010	BOLT, 1/4-20 X 1.0" LG HEX HD GR 5	10
25	G-1704-1050N	FLATWASHER. 1/4 SST NARROW	2
26	G-1476-105024	SCREW, 1/4-20 X 2-1/2" LG. SST SOC BUTT. HD CAP	2
27	G-1202-1050	STOPNUT, 1/4-20 ELASTIC	2
28	G-1503-1050N	FLATWASHER. 1/4 SST NARROW	6
29	G-1476-105010	SCREW, 1/4-20 X 1.0" LG. SST SOC BUTT. HD CAP	6
30	G-1250-1070W	FLATWASHER, 3/8 WIDE	14
31	G-1420-107012	BOLT, 3/8-16 X 1.25" HEX HD GR 8	7
32	G-1727-1070	NUT, 3/8-16 TOP LOCK ZINC	7
33	G-1100-105006	BOLT, 1/4-20 X 3/4" LG HEX HD GR 5	1
34	G-1503-1030N	FLATWASHER. #10 SST NARROW	8
35	G-1476-103106	SCREW, #10-32 X 3/4" LG. SST SOC BUTT. HD CAP	4
36	G-1202-1035	STOPNUT, #10-32 ELASTIC	4
37	G-1178-103005	SCREW, #10 X 5/8 PAN HEAD SELF TAPPING	4
38	G-1178-105006	SCREW, 1/4 X 3/4 PAN HEAD SELF TAPPING	2

15.0 CHASSIS
15.1 SIDE DOOR SUB

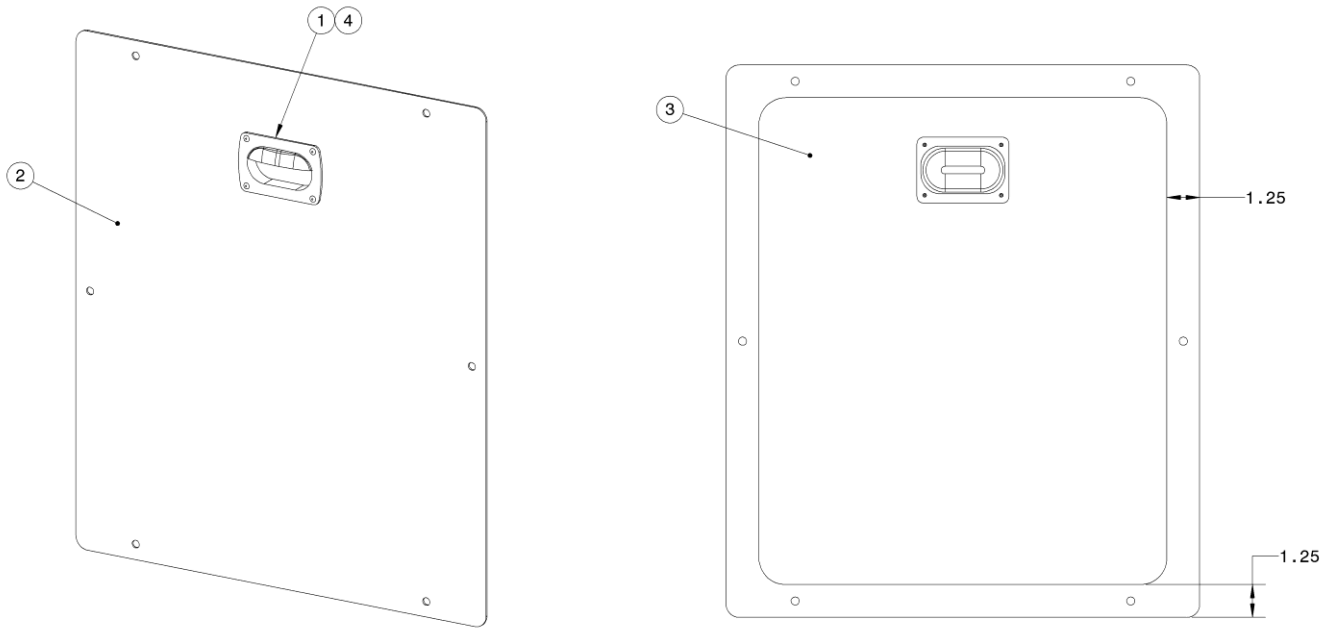


Parts List – Side Door Sub

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	Z-9803-00	SIDE DOOR WELDMENT (WP)	1
2	H-4256	SIDE DOOR HINGE	2
3	H-1204-10-037.0	TAPE, NEOPRENE FOAM SEALING	2
4	H-1204-10-021.0	TAPE, NEOPRENE FOAM SEALING	1
5	G-1727-1060	NUT, 5/16-18 TOP LOCK ZINC	4
6	G-1420-106010	BOLT, 5/16-18 X 1.0" LG. HEX HD GR 8	4
7	G-1250-1060W	FLATWASHER, 5/16 WIDE	4
8	62-10-603-20	LATCH SIDE ACCESS DOOR	1

15.2 ENGINE ACCESS PANEL SUB

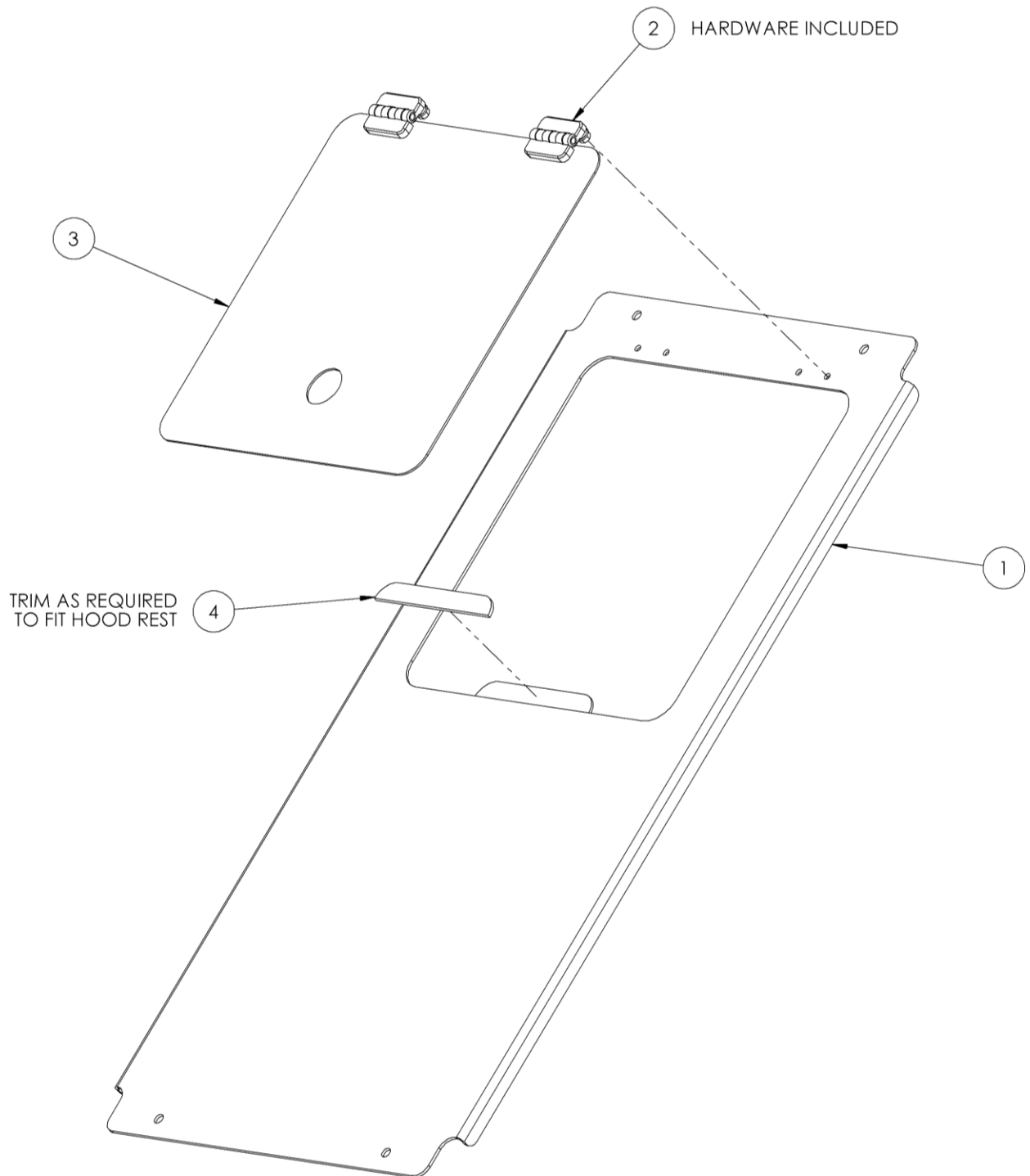


Parts List – Engine Access Panel Sub

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	ST00-14-018-CA	RECESSED HANDLE	1
2	S-3325-00	ENGINE ACCESS PANEL (WP)	1
3	H-4259	ACCESS PANEL INSULATION	1
4	G-1352-07	RIVET, 1/8 OPEN-END ALUM	4

15.3 FRONT SIGHT TUNNEL COVER SUB

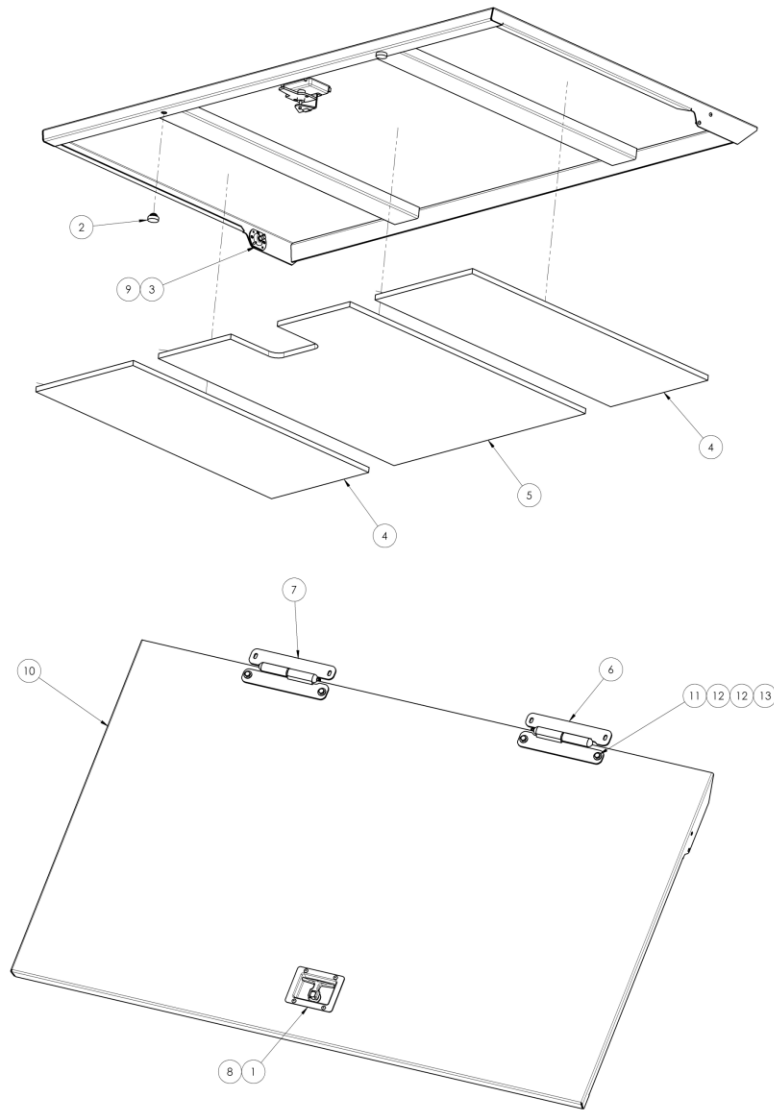


Parts List – Front Sight Tunnel Cover Sub

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	Z-10524-00	FR SIGHT TUNNEL COVER WLD (WP)	1
2	XL00-02-069-CA	SMALL HINGE	2
3	S-3599-00	FR SIGHT TUNNEL ACC COVER (WP)	1
4	H-1204-06-06.0	TAPE, NEOPRENE FOAM SEALING	1

15.4 SIDE ENGINE COVER SUB

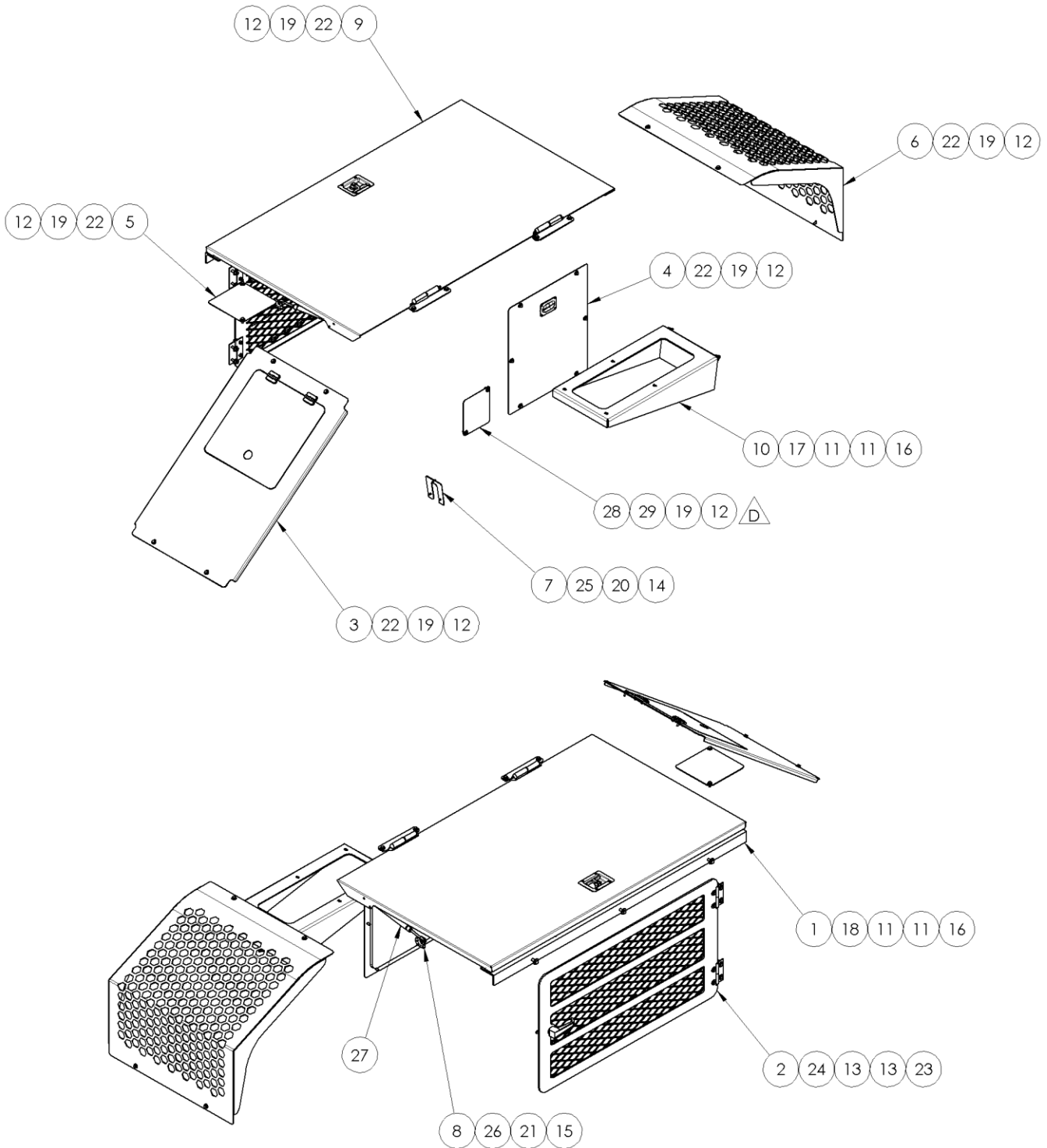


Parts List – Side Engine Cover Sub

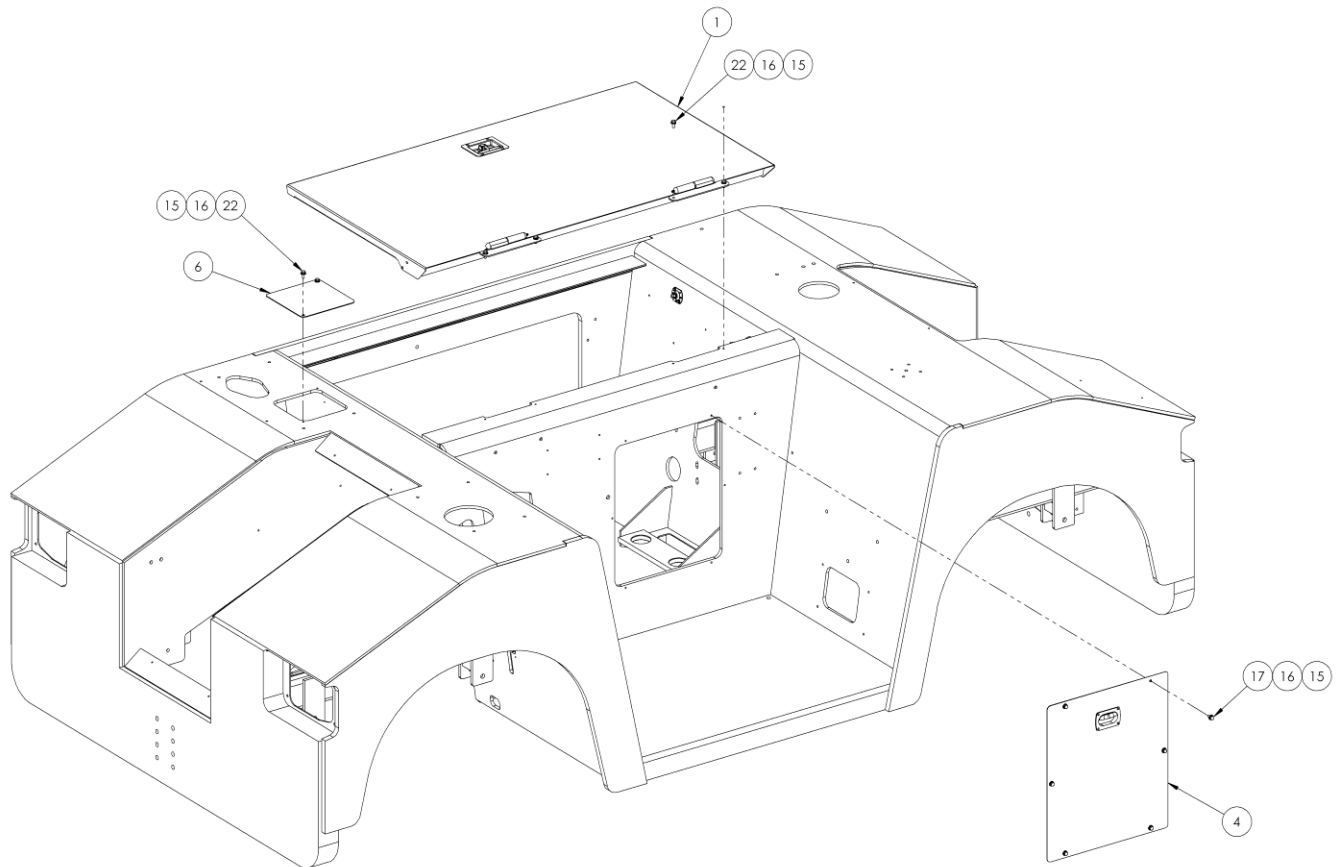
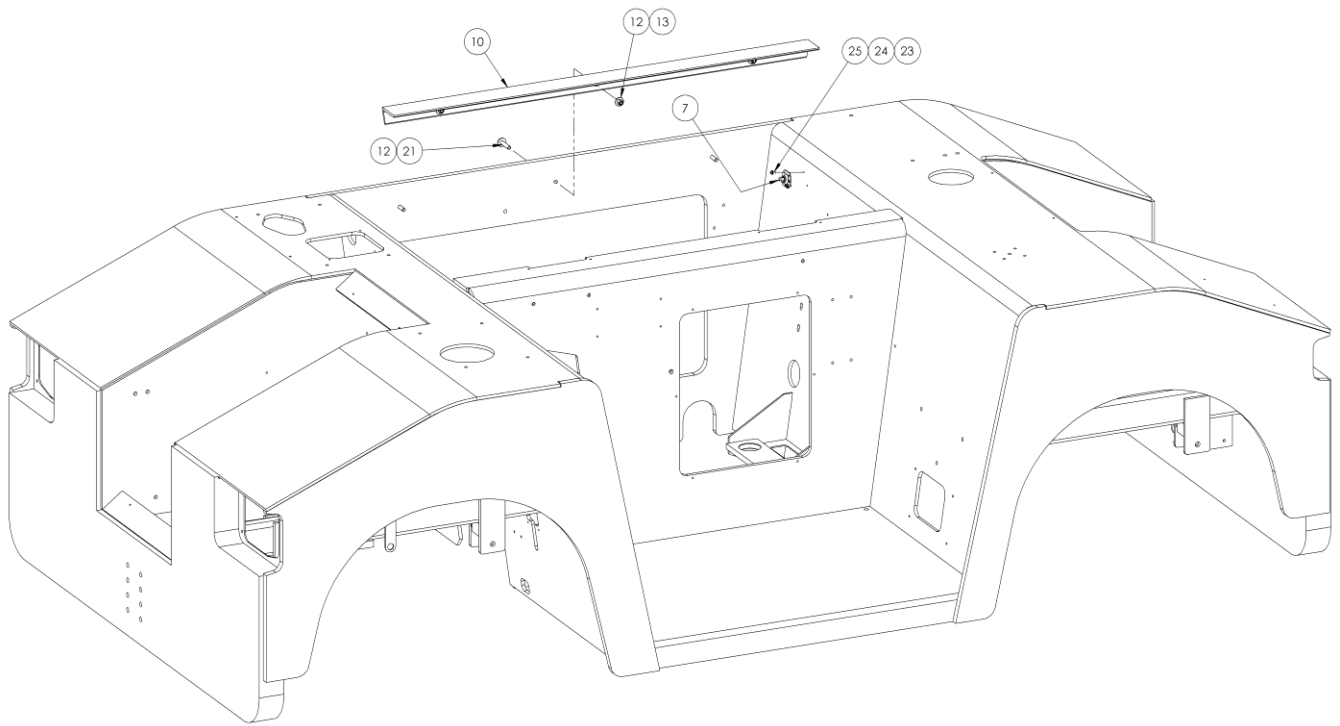
When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	C-TT4-0012-2	T HANDLE LATCH	1
2	NVSP-21-004-CA	RUBBER PRESS-IN BUMPER	2
3	SATS-14-003-CA	GAS SHOCK MOUNT	2
4	H-4525	INSULATION, SIDE HOOD	2
5	H-4526	INSULATION, SIDE HOOD	1
6	Z-9805-00	SIDE HOOD HINGE FR (WP)	1
7	Z-9806-00	SIDE HOOD HINGE RR (WP)	1
8	G-1351-18-SS	RIVET, 3/16 OPEN-END SS	4
9	G-1351-13-SS	RIVET, 5/32 OPEN-END SS	4
10	Z-10553-00	WLD, SIDE HOOD HINGE (WP)	1
11	G-1100-105010	BOLT, 1/4-20 X 1.0" LG HEX HD GR 5	4
12	G-1250-1050W	FLATWASHER, 1/4 WIDE	8
13	G-1727-1050	NUT, 1/4-20 TOP LOCK ZINC	4

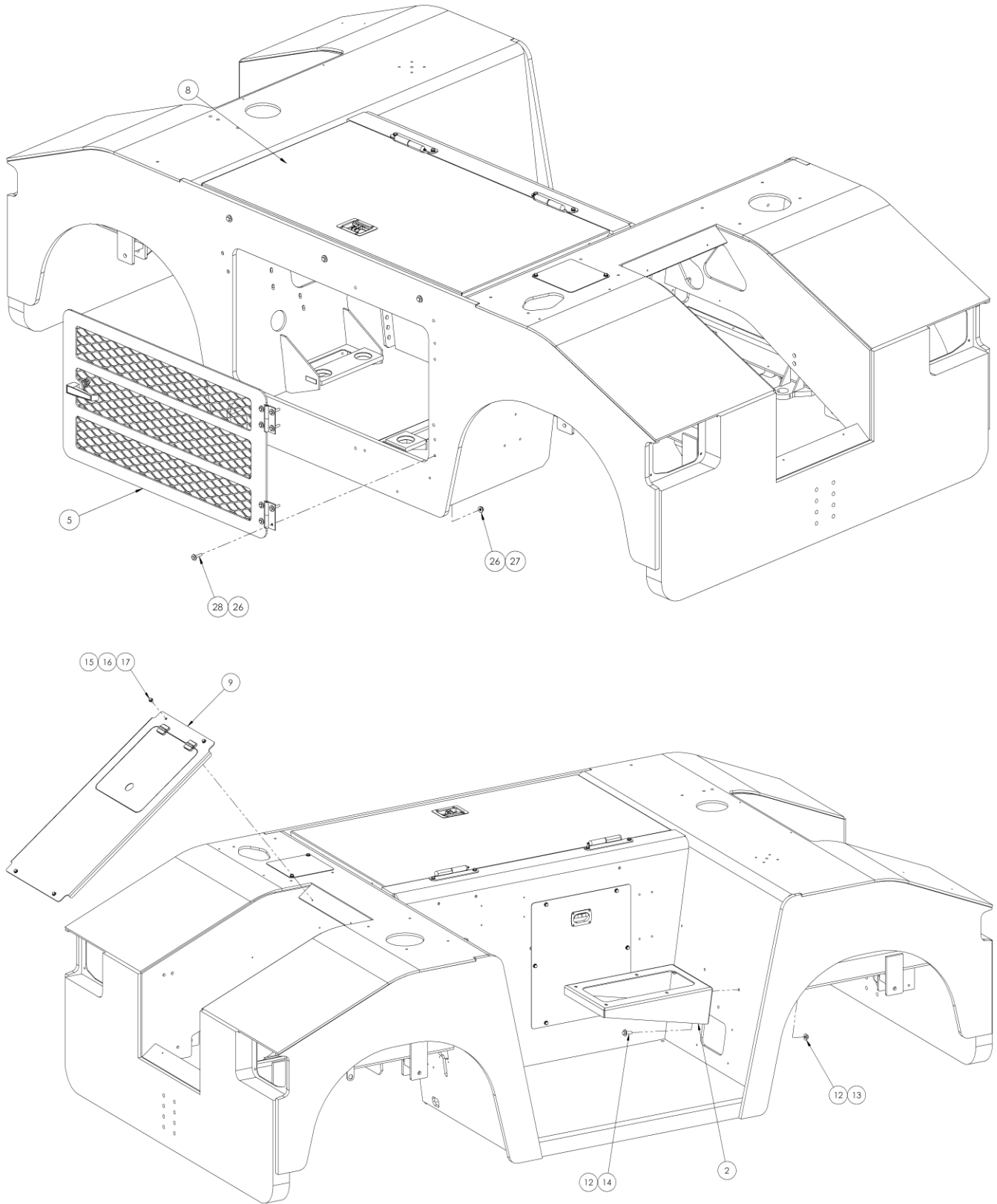
15.5 CHASSIS COMPONENTS



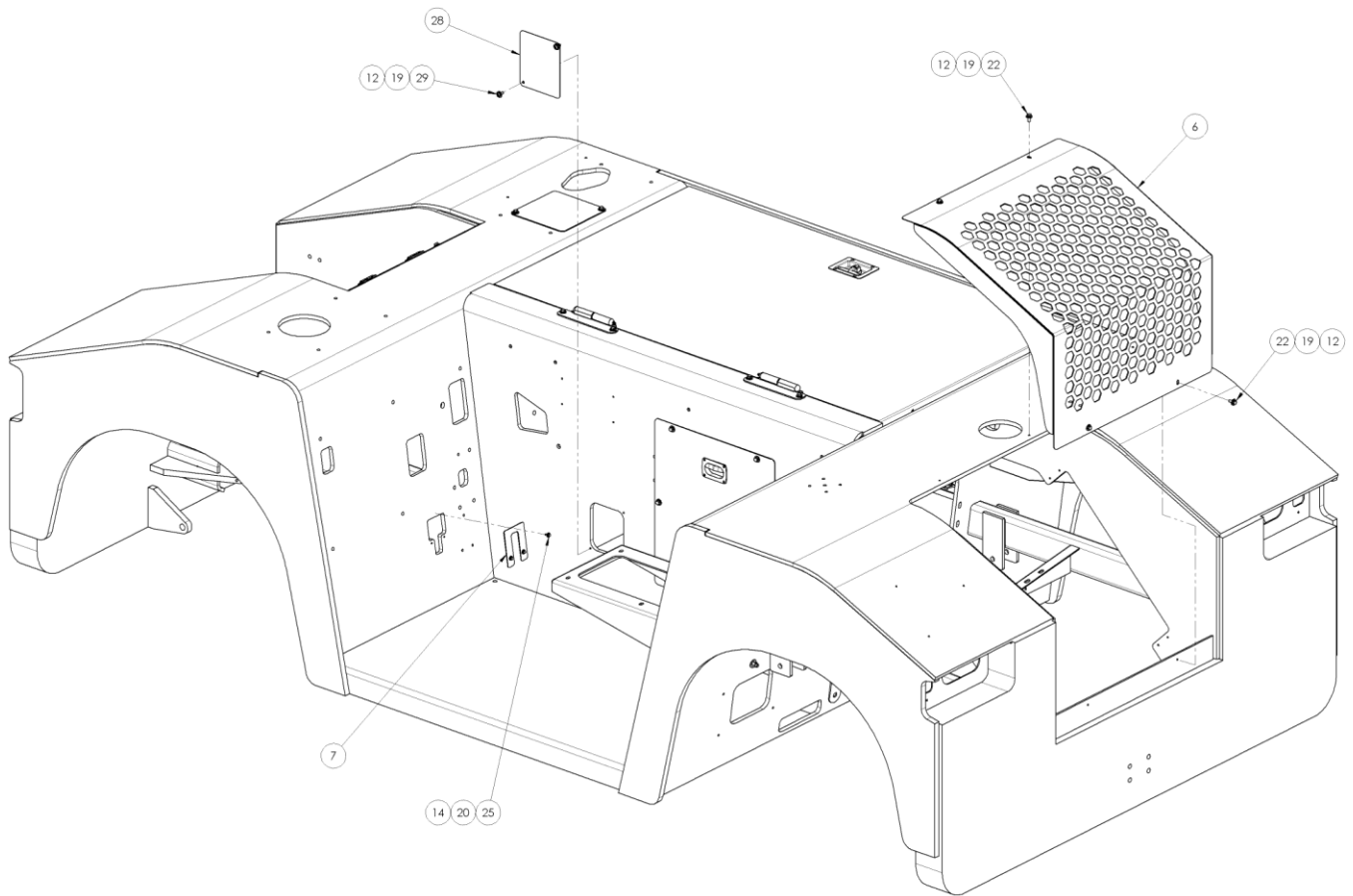
15.5 CHASSIS COMPONENTS



15.5 CHASSIS COMPONENTS



15.5 CHASSIS COMPONENTS





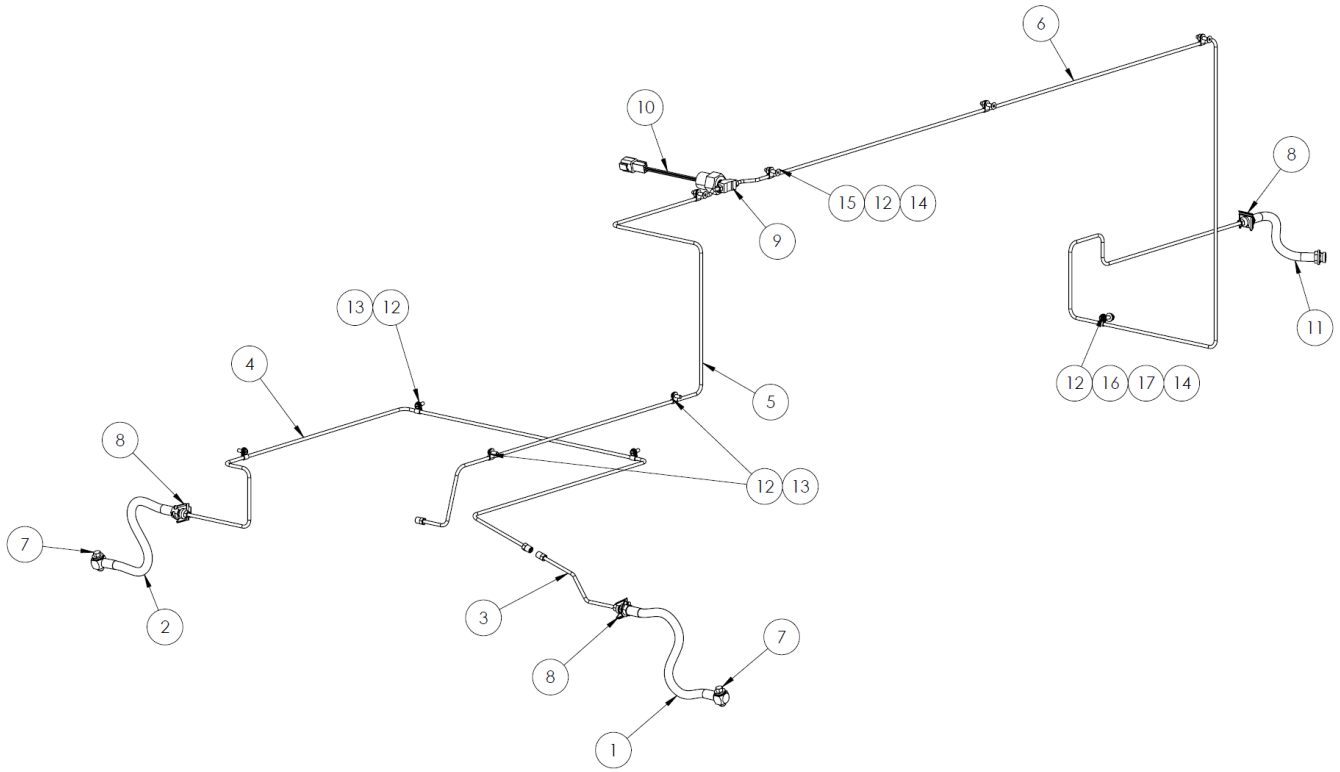
15.5 CHASSIS COMPONENTS

Parts List – Chassis Components

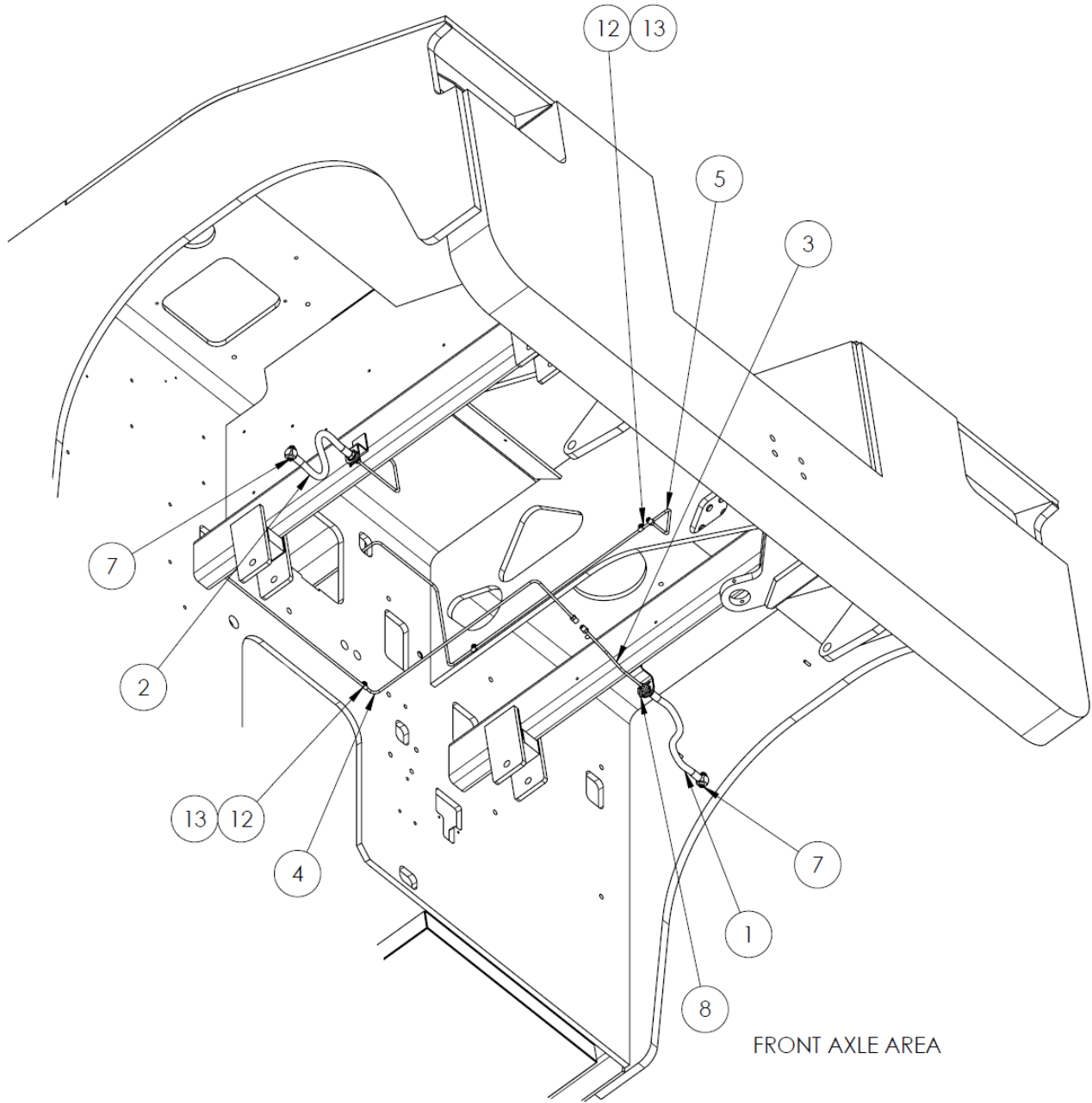
When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	A-1353-00	ANGLE, HOOD REST (WP)	1
2	See Section 15.1	SIDE DOOR ASSEMBLY	1
3	See Section 15.3	FRONT SIGHT TUNNEL COVER ASY	1
4	See Section 15.2	ENGINE ACCESS PANEL ASY	1
5	S-3323-00	FUEL TANK ACCESS PANEL (WP)	1
6	Z-10551-00	WLD, RR SIGHT TUNNEL COVER (WP)	1
7	S-3322-00	BRAKE HOLE COVER (WP)	1
8	SATS-14-003-CA	GAS SHOCK MOUNT	2
9	Z-10552	ASY, SIDE HOOD	1
10	J-7215-00	SEAT MTG BRACKET (P)	1
11	G-1250-1070W	FLATWASHER, 3/8 WIDE	12
12	G-1250-1050W	FLATWASHER, 1/4 WIDE	22
13	G-1250-1060W	FLATWASHER, 5/16 WIDE	8
14	G-1250-1030N	FLATWASHER, #10 NARROW	3
15	G-1250-1020N	FLATWASHER, #8 NARROW	4
16	G-1727-1070	NUT, 3/8-16 TOP LOCK ZINC	6
17	G-1420-107014	BOLT, 3/8-16 X 1.5" HEX HD GR 8	3
18	G-1420-107020	BOLT, 3/8-16 X 2.0" HEX HD GR 8	3
19	G-1251-1050R	LOCKWASHER, 1/4 REGULAR	22
20	G-1251-1030R	LOCKWASHER, #10 REGULAR	3
21	G-1251-1020R	LOCKWASHER, #8 REGULAR	4
22	G-1100-105006	BOLT, 1/4-20 X 3/4" LG HEX HD GR 5	20
23	G-1727-1060	NUT, 5/16-18 TOP LOCK ZINC	4
24	G-1420-106014	BOLT, 5/16-18 HEX HD GR 8	4
25	G-1150-103504	SCREW, #10-32 X 1/2" LG HEX HD	3
26	G-1150-102004	SCREW, #8-32 X 1/2" LG HEX HD MACHINE	4
27	H-4738	GAS SPRING - 120 LB 15.25 EXT X 5 STROKE	2
28	S-3912-00	ACCESS PANEL (WP)	1
29	G-1154-105006	SCREW, 1/4-20 X 3/4" LG. SOC BUTT. HD CAP	2

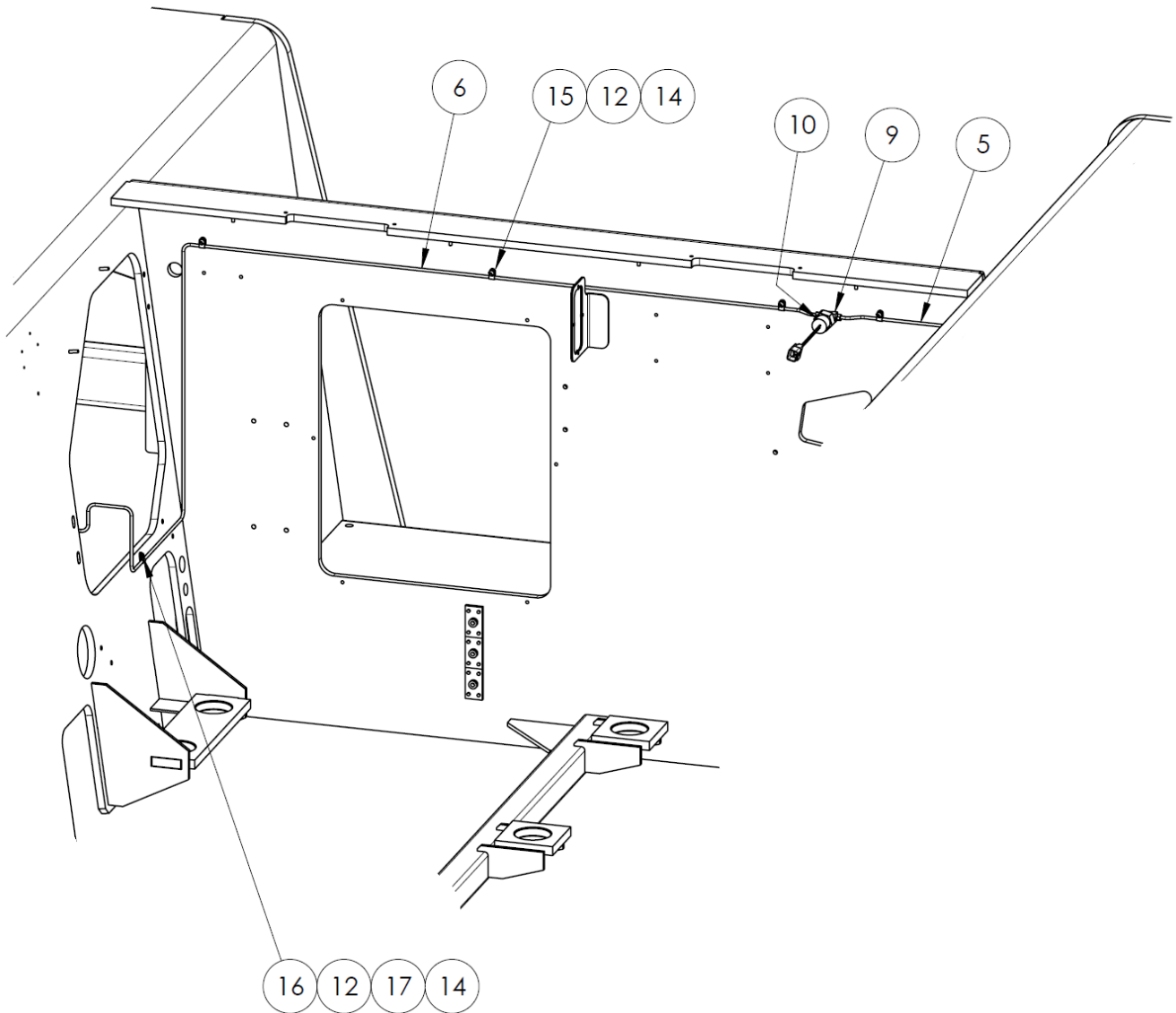
16.0 BRAKES



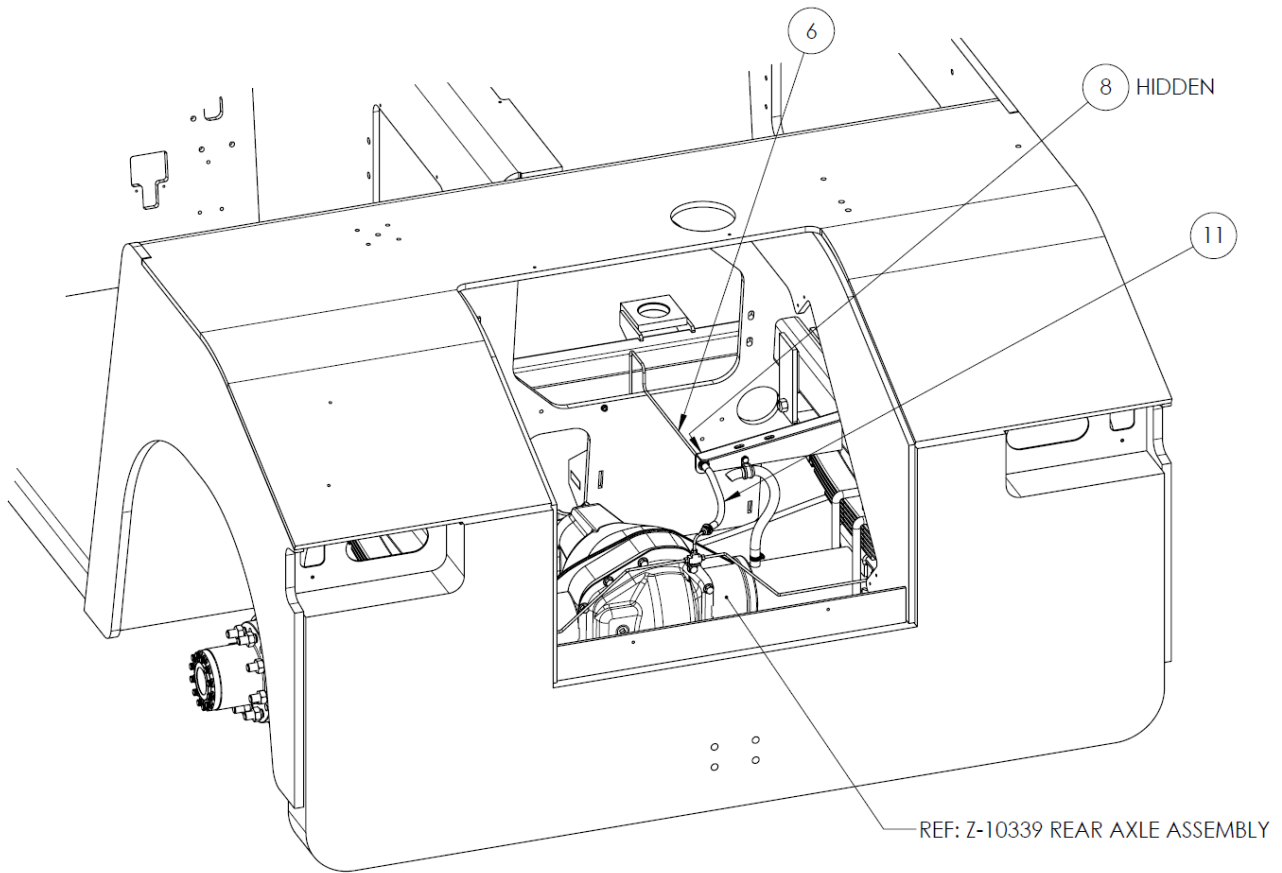
16.0 BRAKES (continued)



16.0 BRAKES (continued)

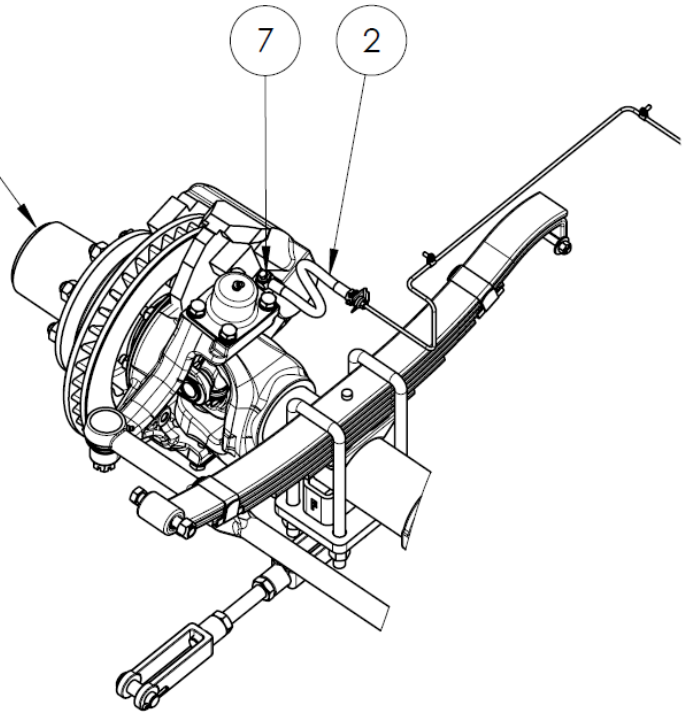


16.0 BRAKES (continued)

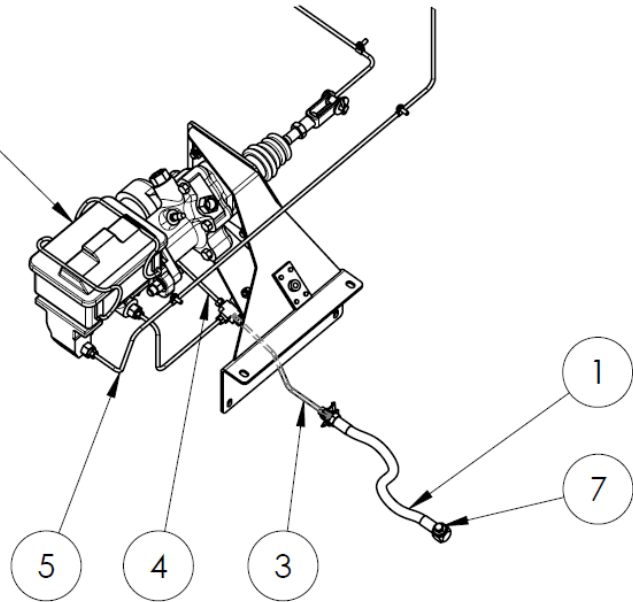


16.0 BRAKES (continued)

Z-10338 FRONT AXLE ASSEMBLY



Z-10500 MASTER CYLINDER ASSEMBLY





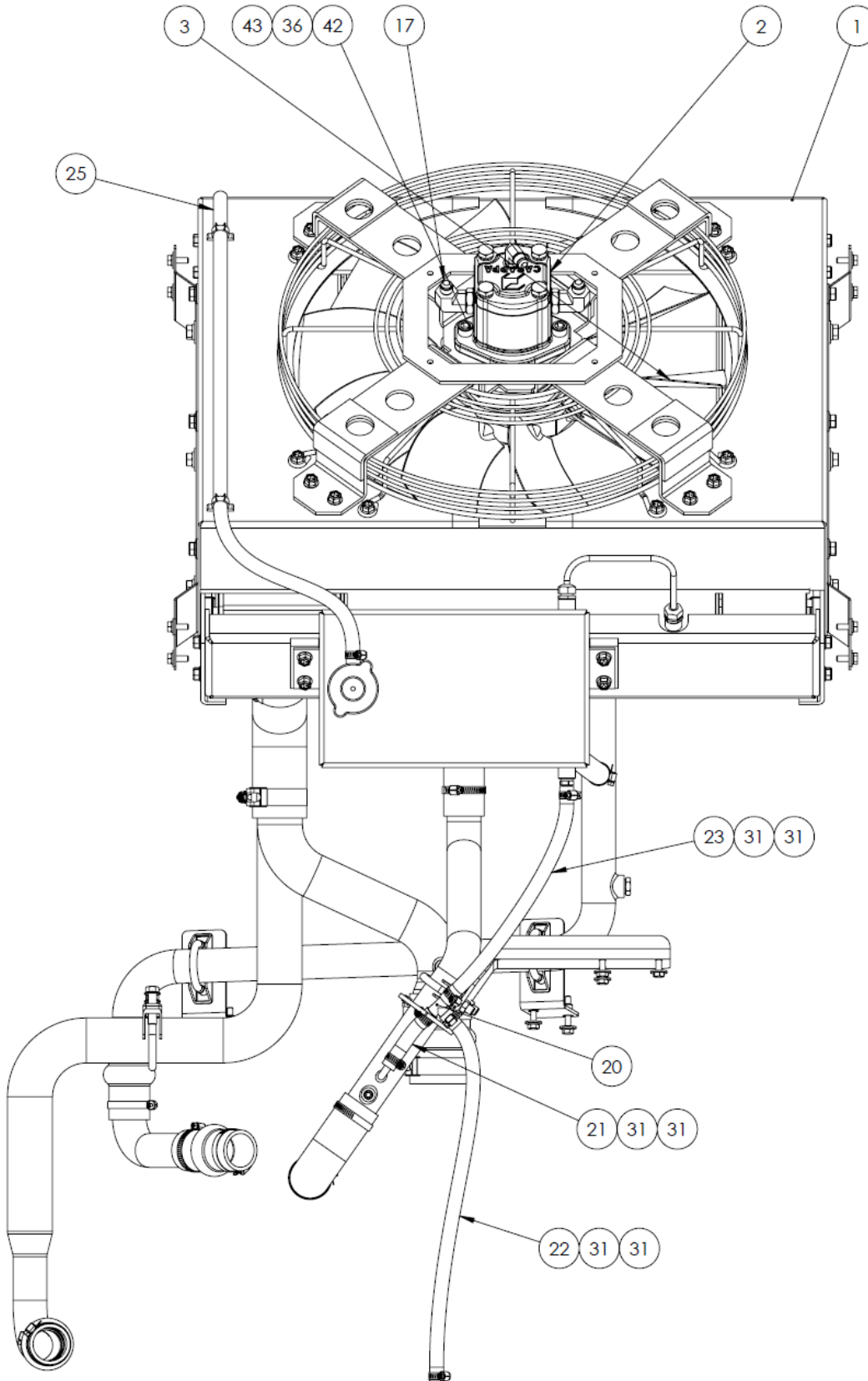
16.0 BRAKES (continued)

Parts List - Brakes

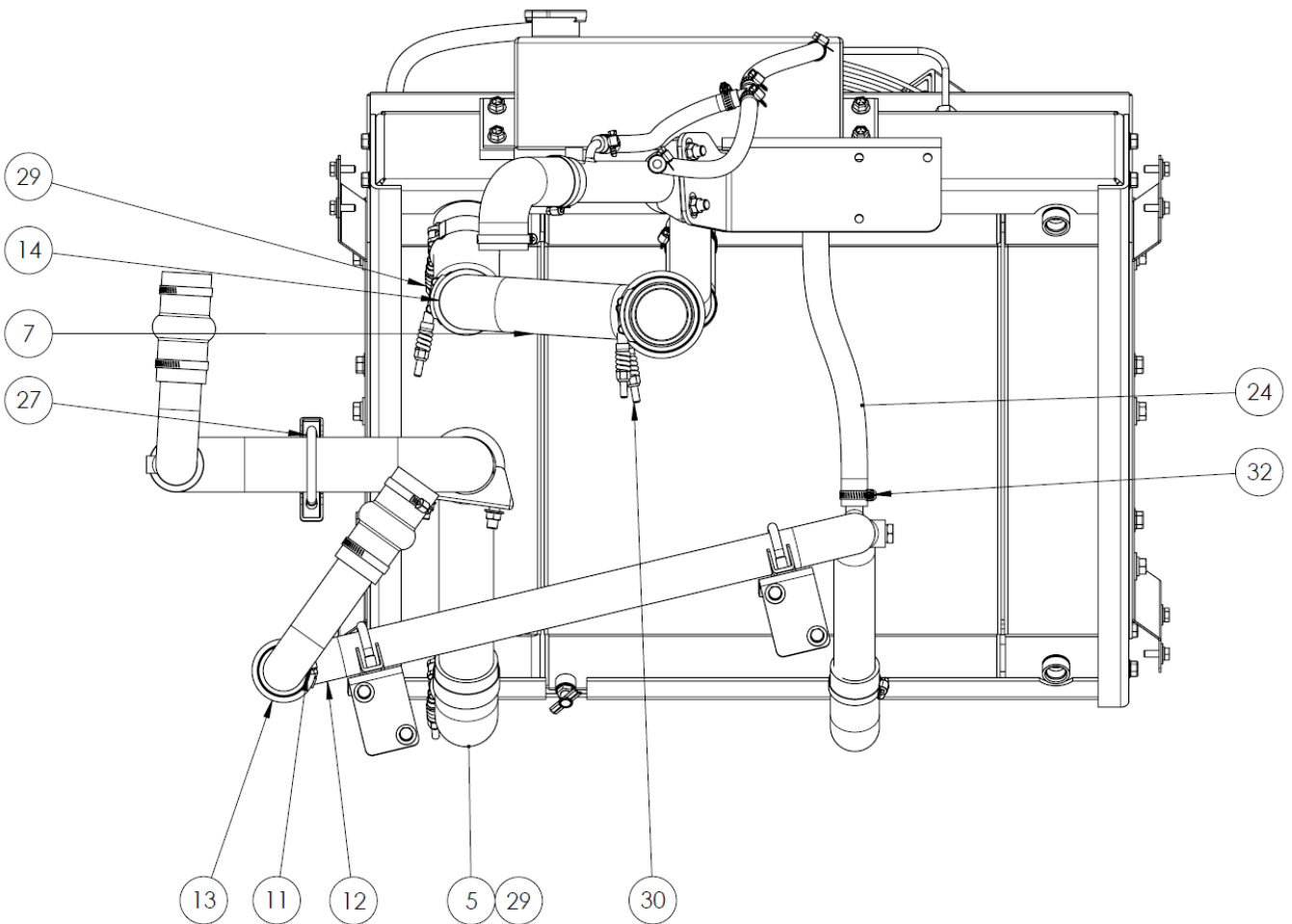
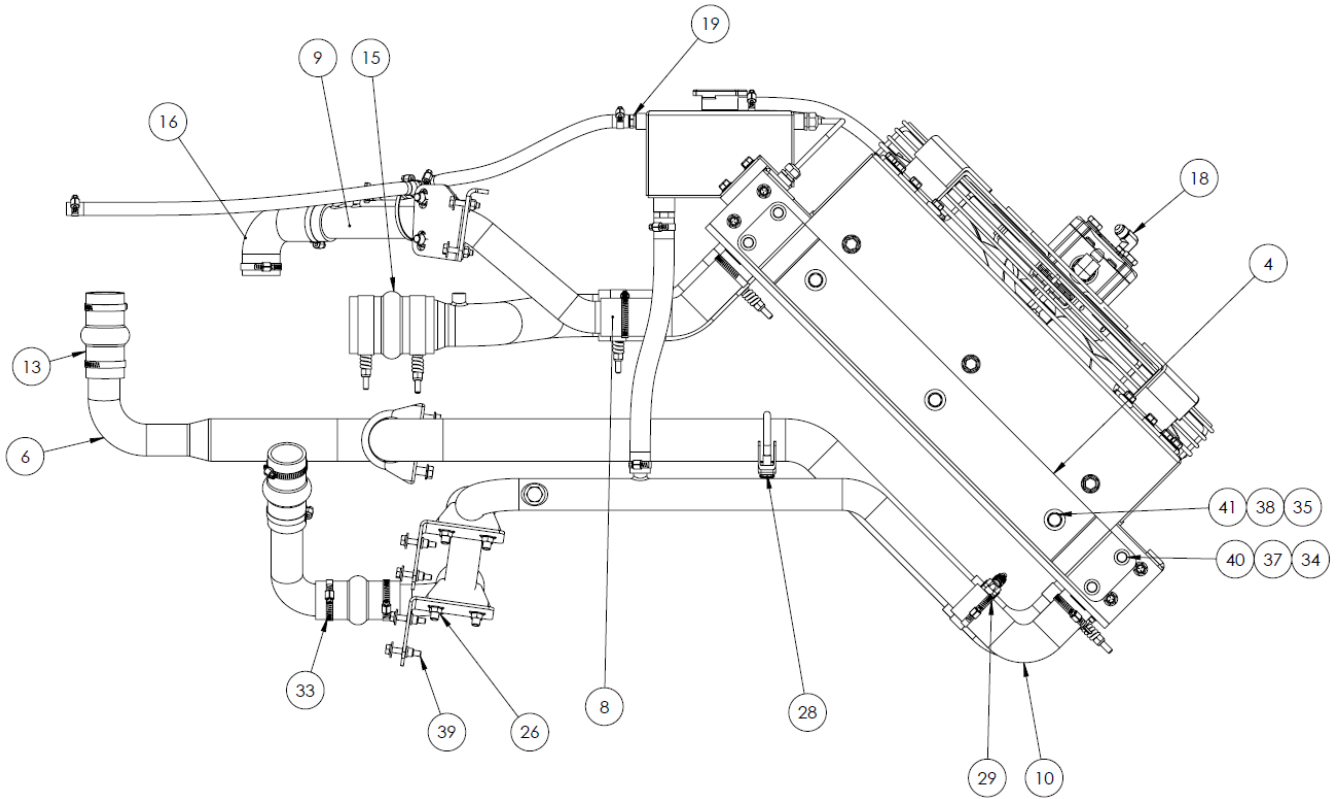
When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	A-TT4-00176-2	FRONT JOUNCE HOSE	1
2	A-TT4-00176-2	FRONT JOUNCE HOSE	1
3	H-4528	FRONT LH BRAKE LINE	1
4	H-4529	FRONT RH BRAKE LINE	1
5	H-4530	REAR BRAKE LINE A	1
6	H-4531	REAR BRAKE LINE B	1
7	A-TT4-00178	BANJO BOLT WITH WASHER	2
8	A-TT4-00165	BRAKE HOSE CLIP	3
9	A-TT4-00163	BRAKE SWITCH TEE	1
10	H-4286	BRAKE PRESSURE SWITCH - DOT 3	1
11	A-TT4-00166	BRAKE HOSE REAR	1
12	G-1417-02	CLAMP, CABLE Ø.188	10
13	G-1720-103504	SCR,#10-32X0.5 MACH HEX WSH HD	5
14	G-1202-1035	STOPNUT, #10-32 ELASTIC	5
15	G-1152-103710	SCREW, #10-32 X 1.0" LG SOCKET FLAT HD CAP	4
16	G-1720-103510	SCR,#10-32X1.0 MACH HEX WSH HD	1
17	G-1250-1030N	FLATWASHER, #10	1

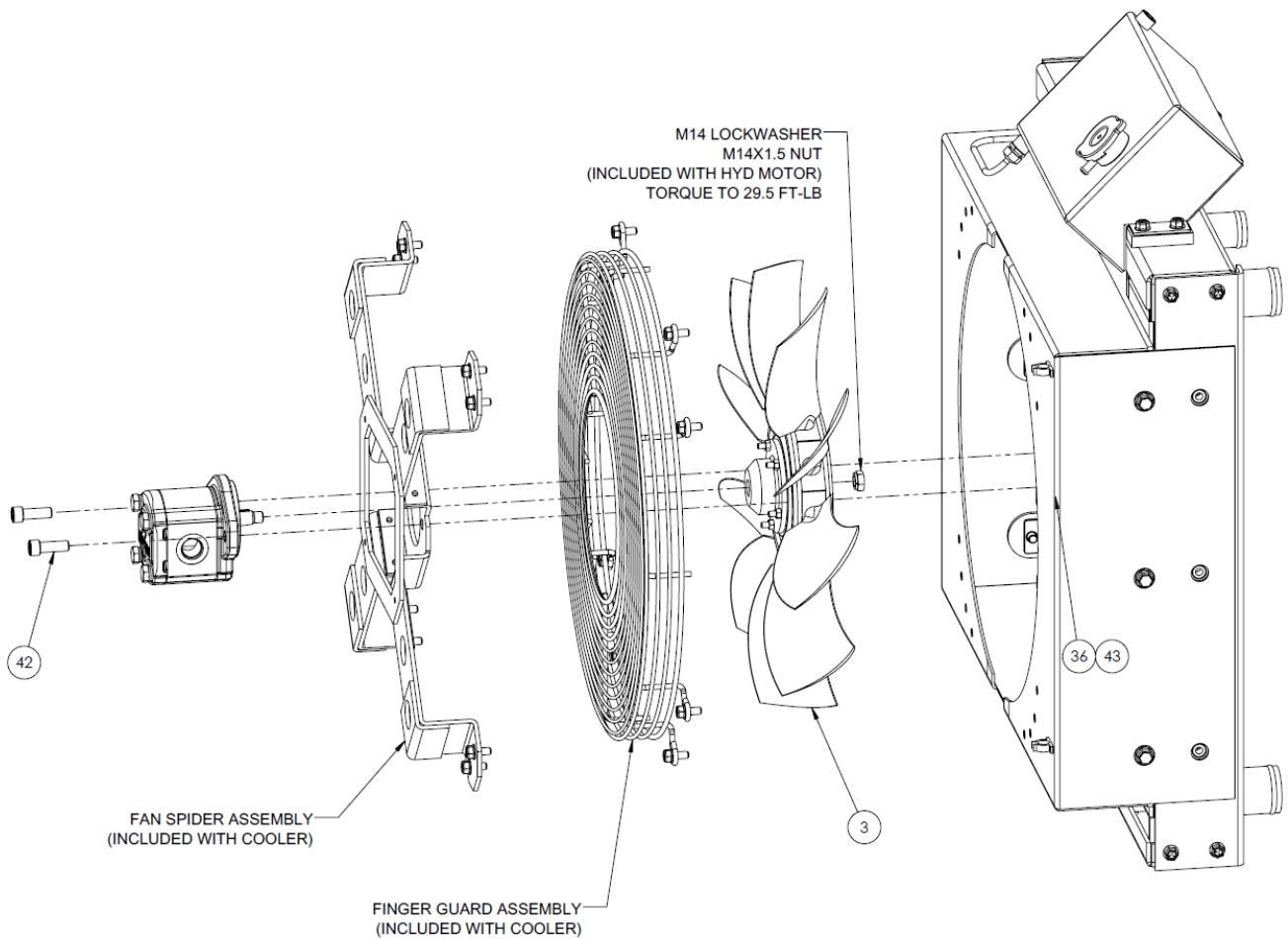
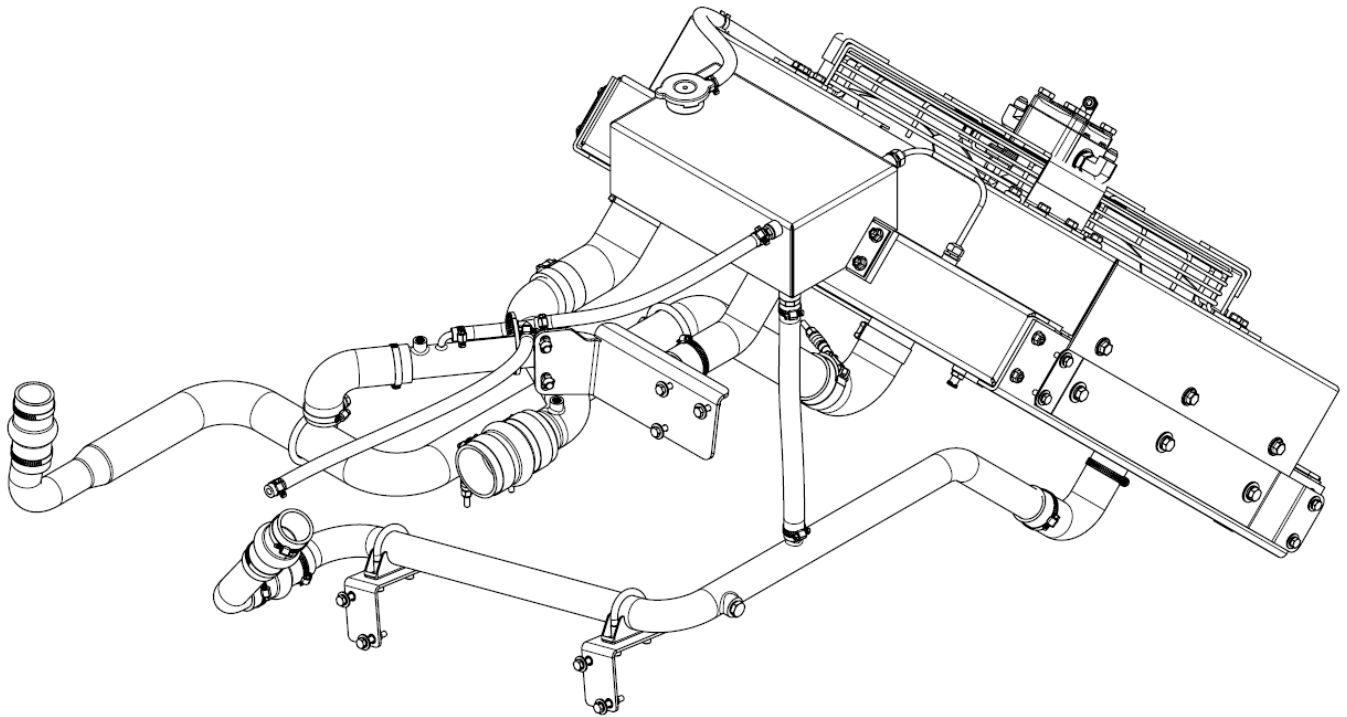
17.0 COOLING SYSTEM



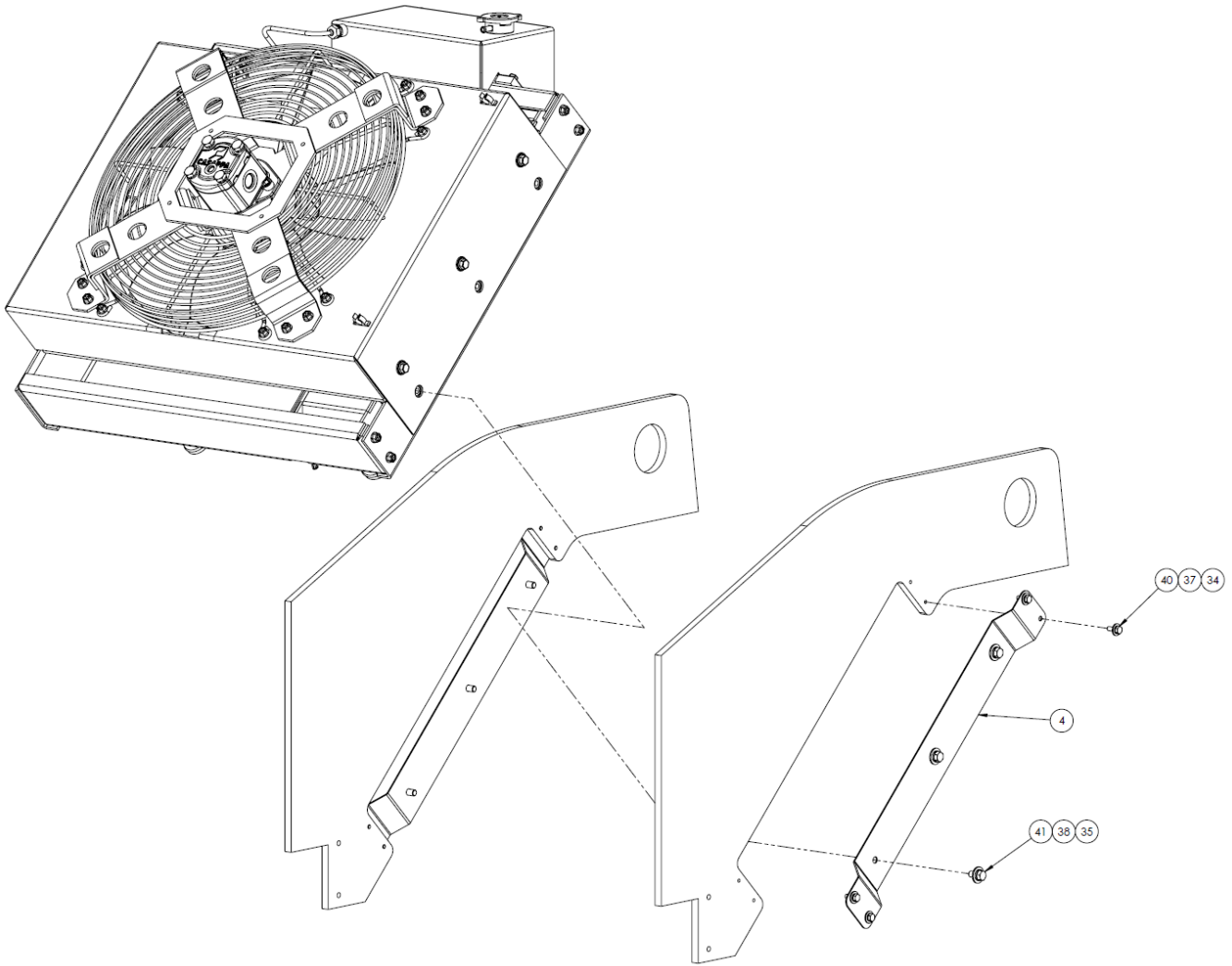
17.0 COOLING SYSTEM (continued)



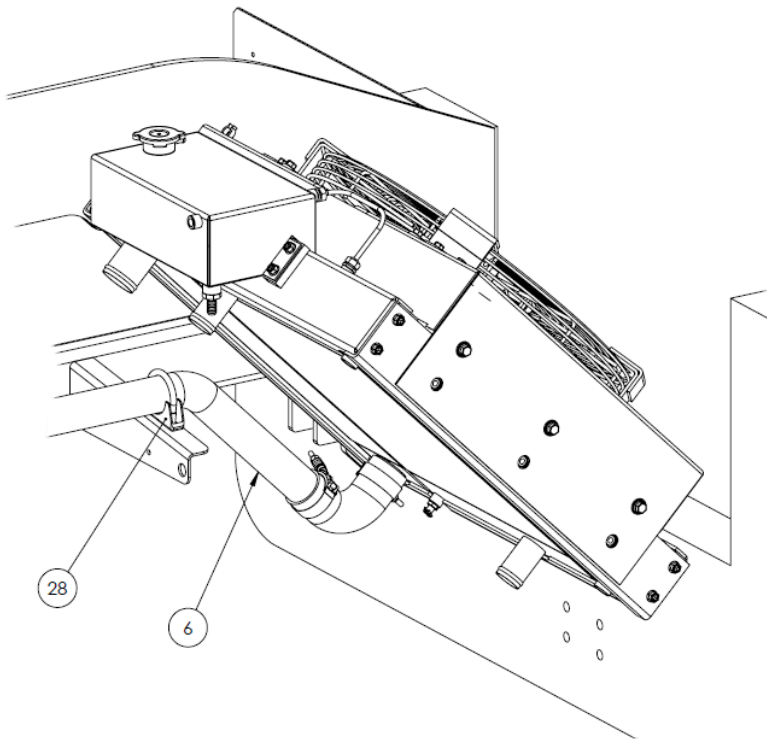
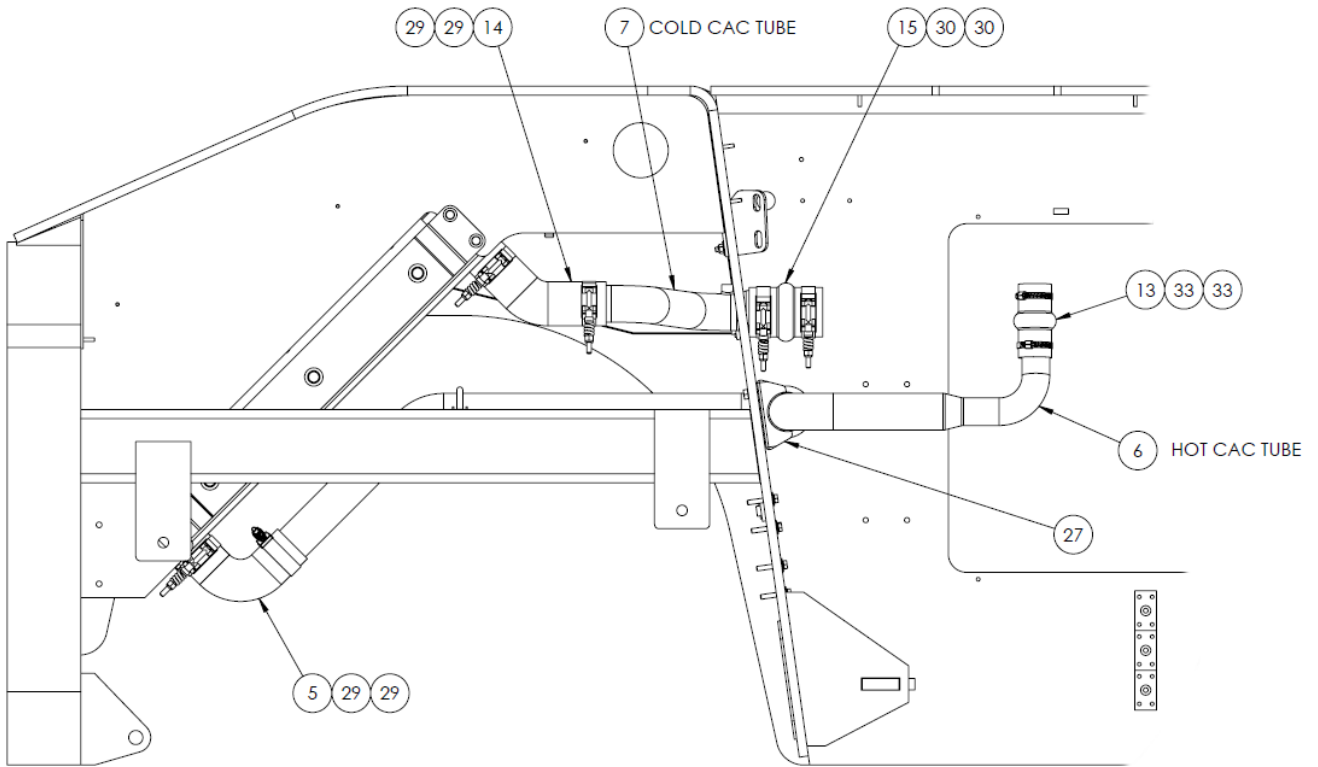
17.0 COOLING SYSTEM (continued)



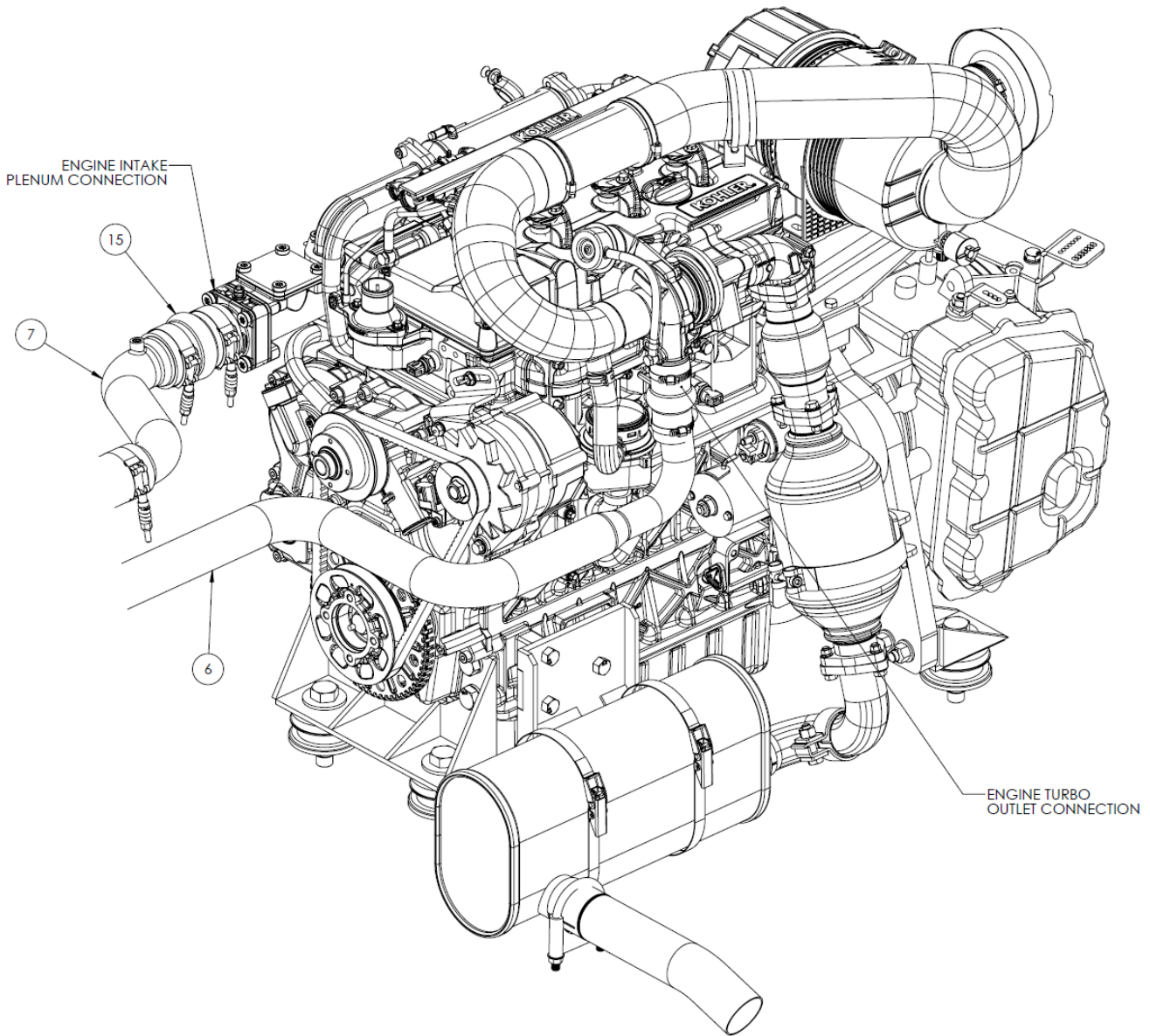
17.0 COOLING SYSTEM (continued)



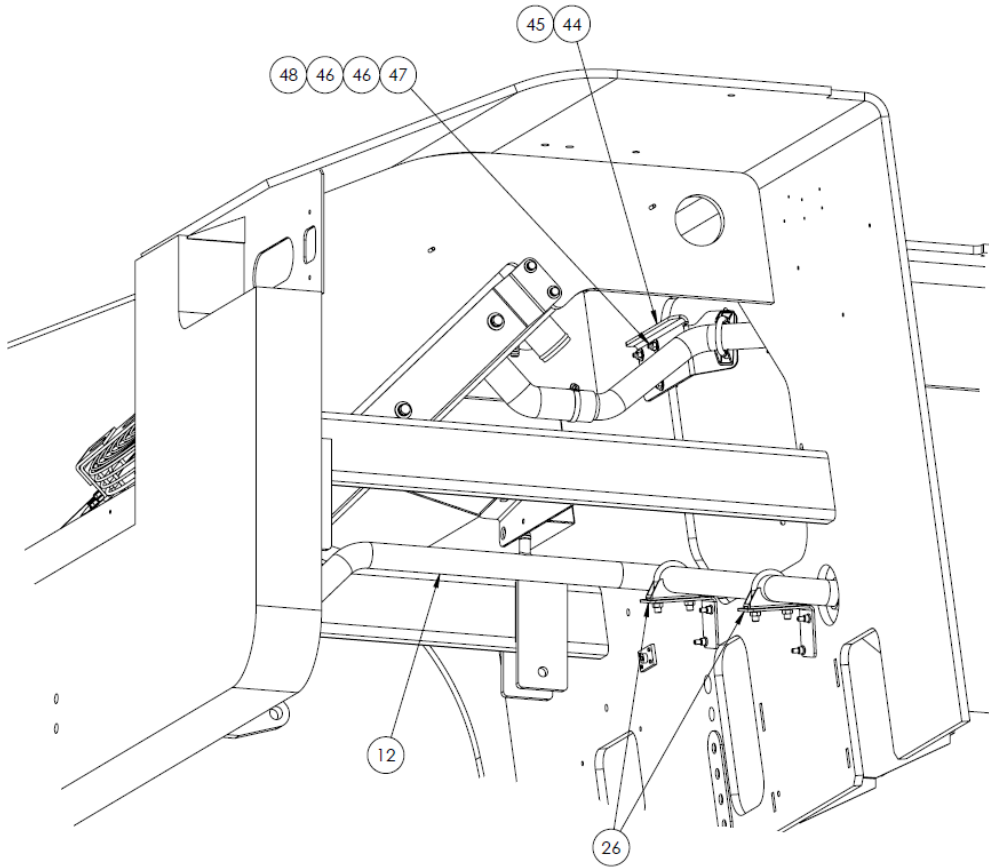
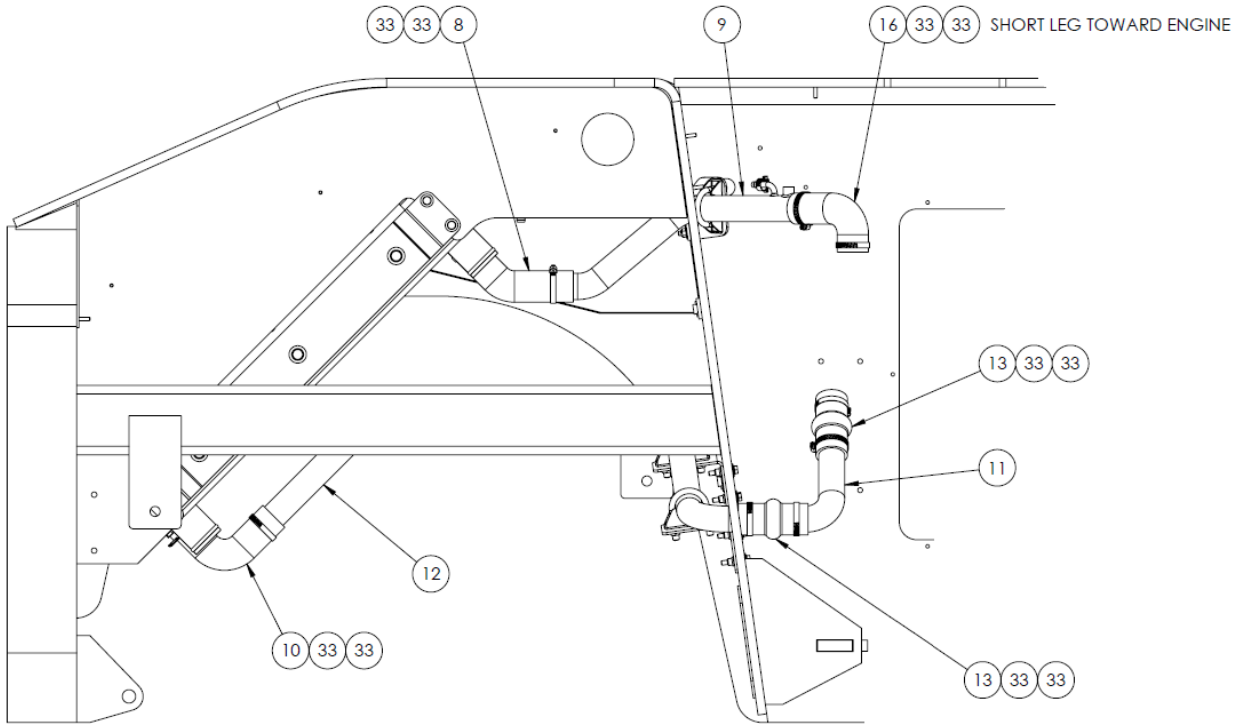
17.0 COOLING SYSTEM (continued)



17.0 COOLING SYSTEM (continued)



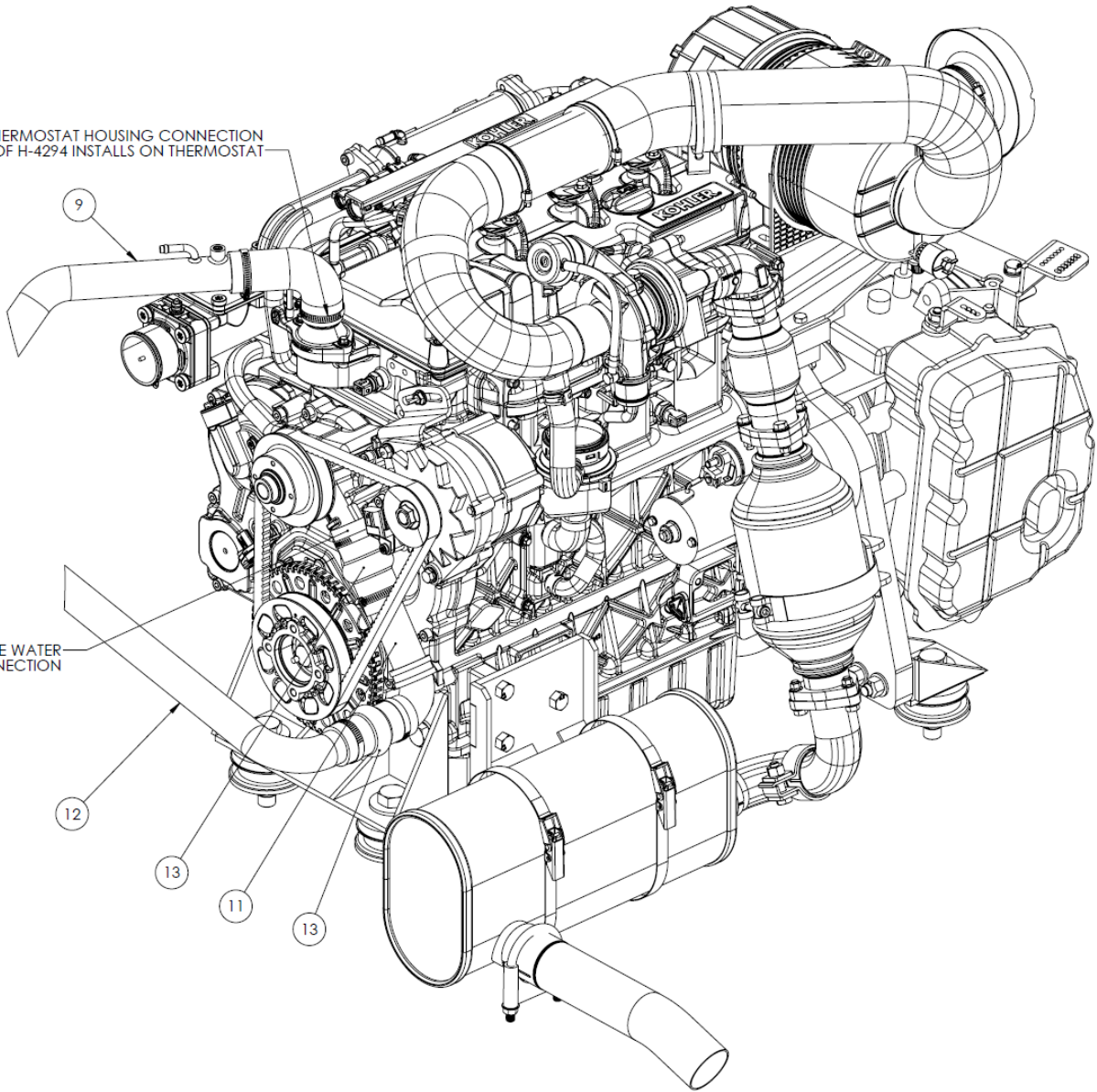
17.0 COOLING SYSTEM (continued)



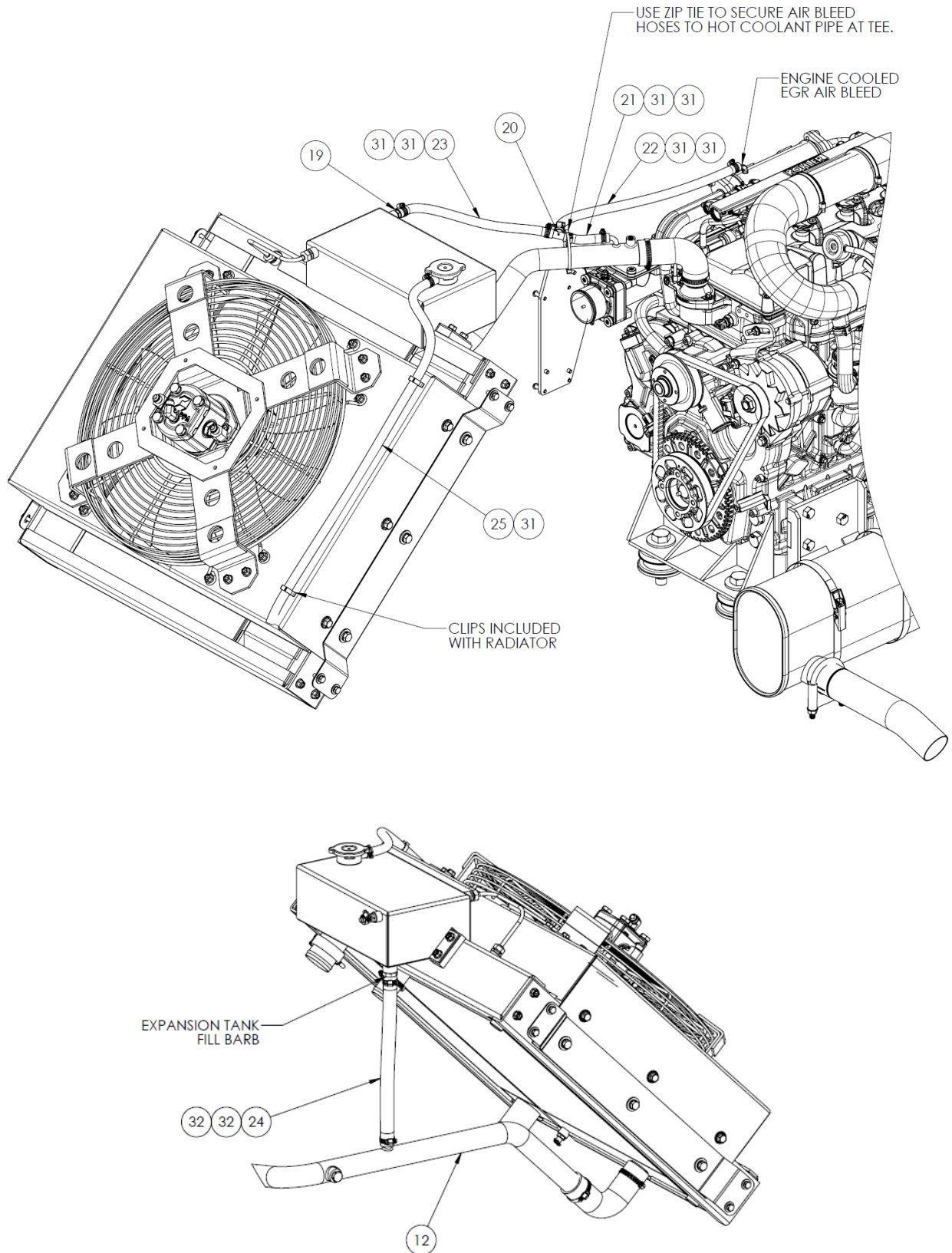
17.0 COOLING SYSTEM (continued)

ENGINE THERMOSTAT HOUSING CONNECTION
SHORT LEG OF H-4294 INSTALLS ON THERMOSTAT

ENGINE WATER
INLET CONNECTION



17.0 COOLING SYSTEM (continued)





17.0 COOLING SYSTEM (continued)

Parts List – Cooling System

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	H-4522	COMBINATION COOLER	1
2	HC-2812	HYD FAN MOTOR	1
3	H-4523	COOLING FAN	1
4	S-3356-00	RAD MTG BRACKET (P)	2
5	H-4291	CAC ELBOW 90 DEG 2.00	1
6	TR-2591	CAC TUBE HOT	1
7	TR-2592	CAC TUBE COLD	1
8	H-4295	RAD ELBOW 45 DEG 1.50	1
9	TR-2593	RAD TUBE HOT (P)	1
10	H-4293	RAD ELBOW 90 DEG 1.50	1
11	TR-2524-00	RAD TUBE COLD B (P)	1
12	TR-2594	RAD TUBE COLD A (P)	1
13	H-4296	RAD HUMP HOSE 1.50	3
14	H-4297	CAC ELBOW 45 DEG 2.00	1
15	H-4292	TURBO HUMP HOSE 2.375	1
16	H-4294	RAD ELBOW 90 DEG 1.50 MOD	1
17	C5515X6X10	HYD FITTING	2
18	N-2001-35-S-B	ELBOW, STRAIGHT THREAD	1
19	05705B-104	BRASS HOSE BARB STRAIGHT	1
20	N-3069	TEE, HOSE BARB 5/16 BRASS	1
21	TF-1106-06-03.5	COOLANT HOSE	1
22	TF-1106-06-17.3	COOLANT HOSE	1
23	TF-1106-06-11.7	COOLANT HOSE	1
24	TF-1106-12-12.50	COOLANT HOSE	1
25	TF-1106-06-31.00	COOLANT HOSE	1
26	Z-10594	ASY, RAD TUBE CLAMP	2
27	A-TT4-00254	CLAMP, 2 IN HD .375 IN THD	1
28	A-TT4-00254	CLAMP, 2 IN HD .375 IN THD	1
29	NVSP-24-038-CB	T-BOLT CLAMP, 1.75 - 2.63	4
30	NVSP-24-038-CA	T-BOLT CLAMP, 2.25-3.13	2
31	H-1426-01	HOSE CLAMP - .38" - .87"	7
32	H-1426-04	HOSE CLAMP - 0.50" - 1.25"	2
33	H-1426-07	HOSE CLAMP - 1.00" - 2.00"	12
34	G-1250-1050W	FLATWASHER, 1/4 WIDE	12
35	G-1250-1070W	FLATWASHER, 3/8 WIDE	6
36	G-1250-1080N	FLATWASHER, 7/16 NARROW	2
37	G-1251-1050R	LOCKWASHER, 1/4 REGULAR	12
38	G-1251-1070R	LOCKWASHER, 3/8 REGULAR	6
39	G-1100-105014	BOLT, 1/4-20 X 1-1/2" LG HEX HD GR 5	4
40	G-1100-105006	BOLT, 1/4-20 X 3/4" LG HEX HD GR 5	8
41	G-1420-107006	BOLT, 3/8-16 X .75" HEX HD GR 8	6



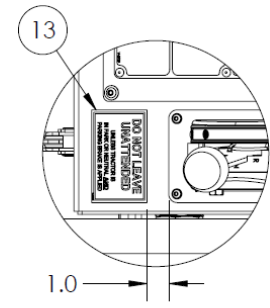
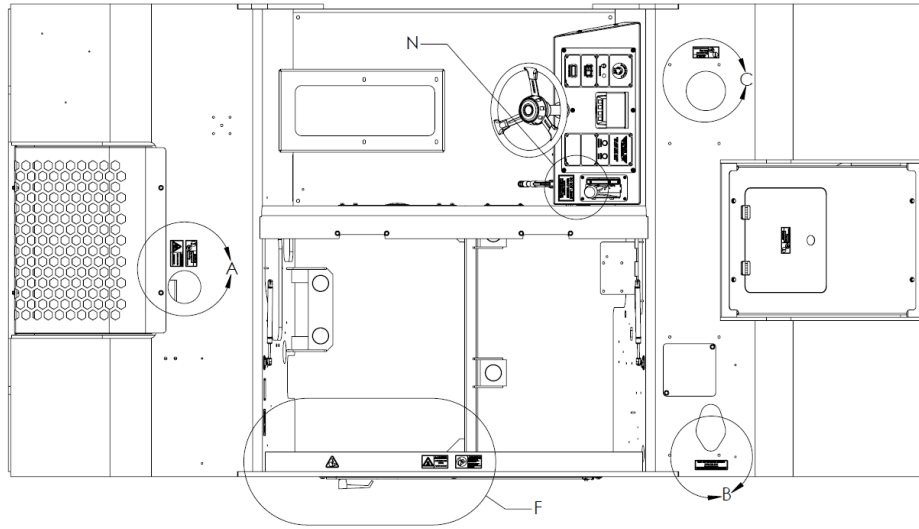
17.0 COOLING SYSTEM (continued)

Parts List – Cooling System

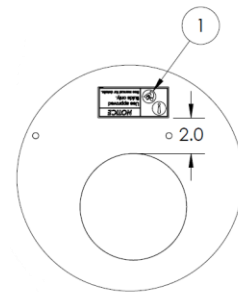
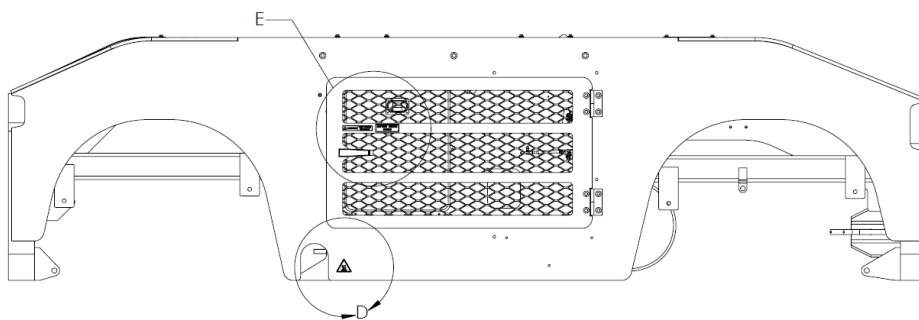
When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
42	G-1151-108212	SCREW, 7/16-14 X 1-1/4" SOCKET HD CAP	2
43	G-1727-1080	NUT, 7/16-14 TOP LOCK ZINC	2
44	J-7448-00	BRACKET, RAD PIPE (P)	1
45	A-TT4-00328	CLAMP, 1.5 IN HD .375 IN THD	1
46	G-1250-1050W	FLATWASHER, 1/4 WIDE	6
47	G-1100-105012	BOLT, 1/4-20 X 1-1/4" LG HEX HD GR 5	3
48	G-1727-1050	NUT, 1/4-20 TOP LOCK ZINC	3

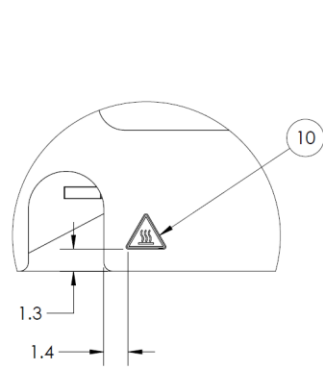
18.0 DECALS



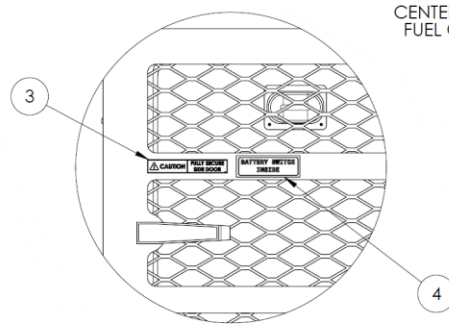
DETAIL N



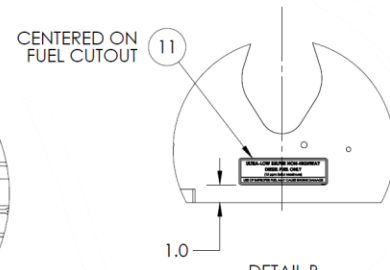
DETAIL C
SCALE 1 : 6



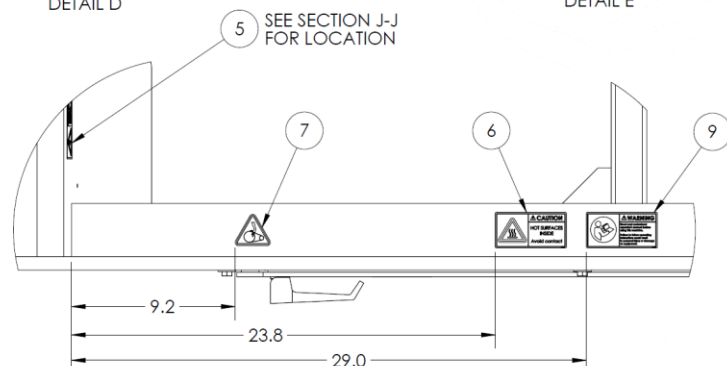
DETAIL D



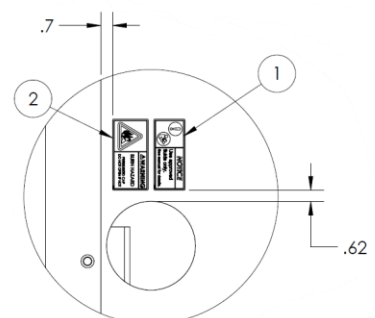
DETAIL E



DETAIL B

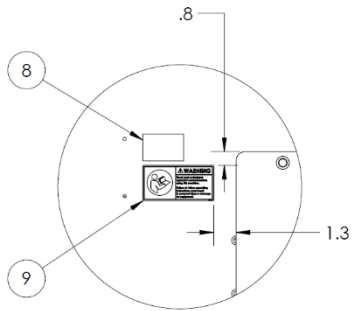
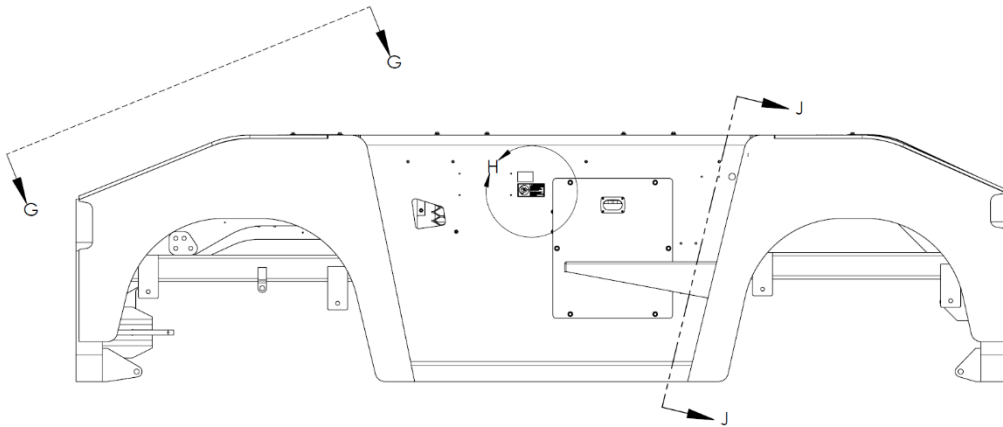
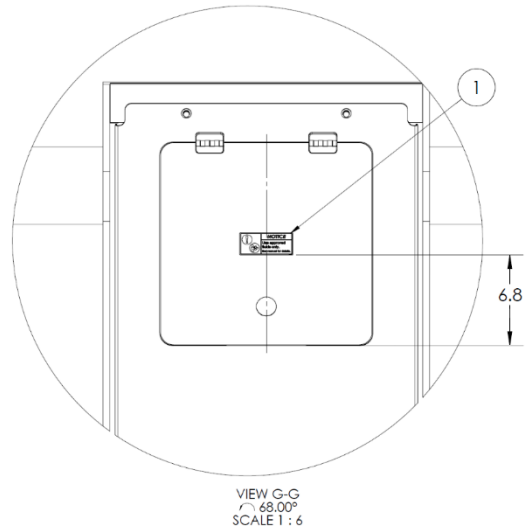
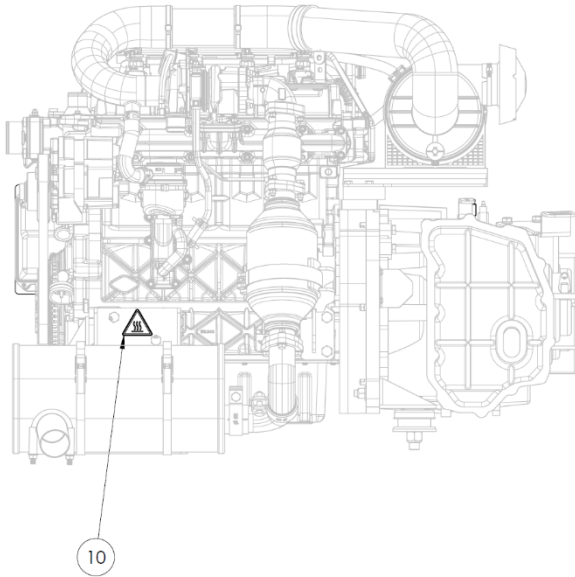


DETAIL F

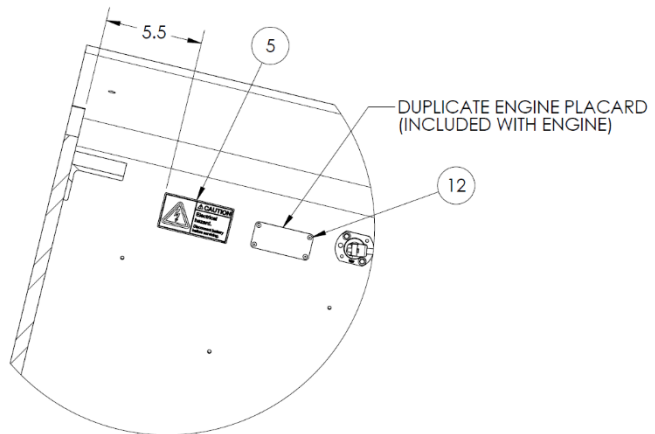


DETAIL A

18.0 DECALS (continued)



DETAIL H
SCALE 1 : 6



SECTION J-J
REAR ENGINE COMPARTMENT
SCALE 1 : 6



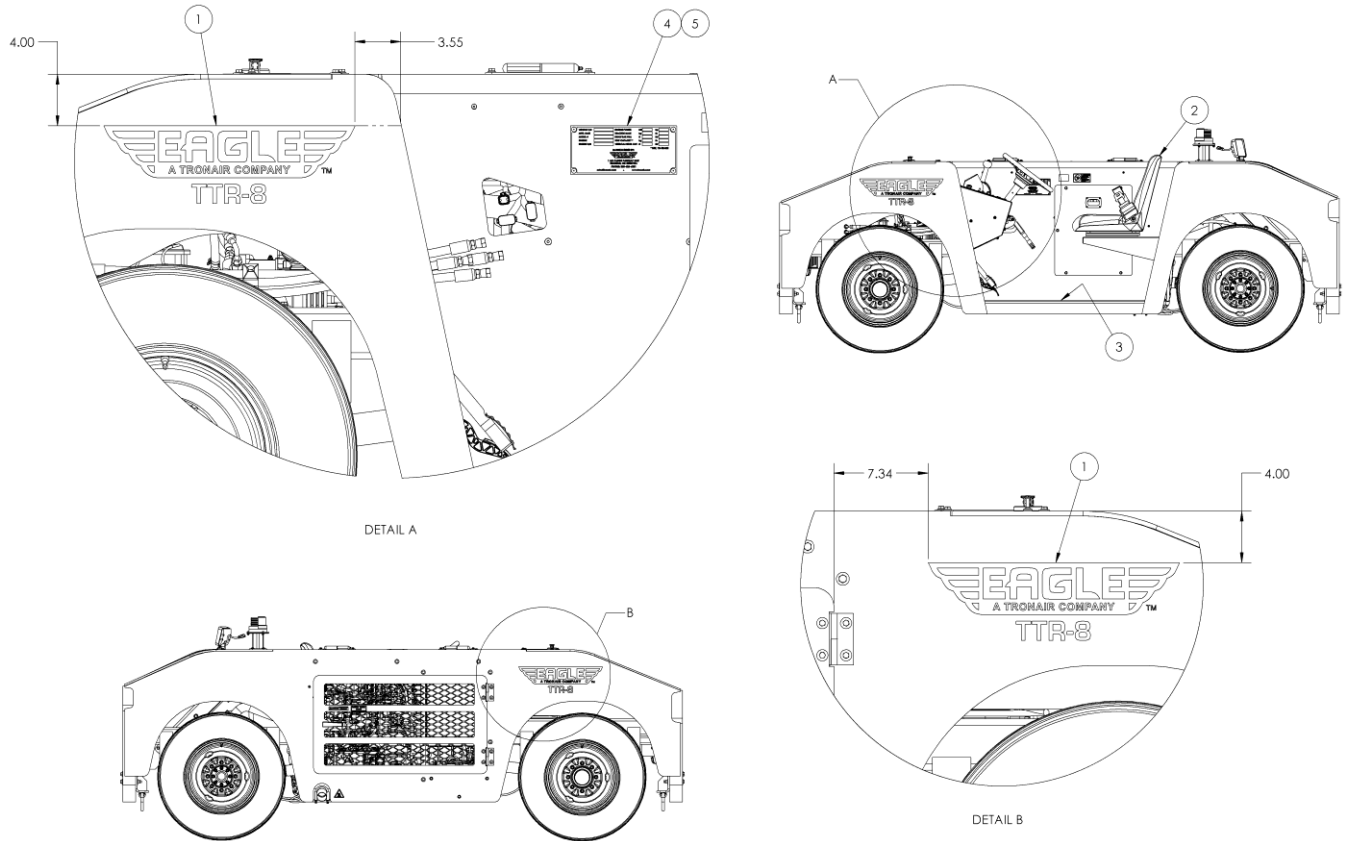
18.0 DECALS (continued)

Parts List - Decals

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	V-2745	LABEL, APPROVED FLUIDS NOTICE	3
2	V-2744	LABEL, HOT PRESSURE RELEASE	1
3	V-2743	LABEL, SECURE DOOR	1
4	V-2108	LABEL, BATTERY SWITCH	1
5	V-2746	LABEL, ELECTRICAL HAZARD	1
6	V-2747	LABEL, HOT SURFACES INSIDE	1
7	V-1984	LABEL, BELT HAZARD	1
8	V-1001	LABEL, MADE IN USA	1
9	V-2748	LABEL, READ MANUAL WARNING	2
10	V-1721	LABEL, ISO BURN HAZARD	2
11	V-2749	LABEL, ULTRA LOW SULFUR DIESEL	1
12	G-1352-11	RIVET, 1/8 OPEN-END ALUM	4

19.0 MISCELLANEOUS COMPONENTS



Parts List – Miscellaneous Components

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	V-2766	TRACTOR DECAL, TTR-12	2
2	A-TT4-0048-1	BUCKET SEAT W BELT & HARDWARE	1
3	H-4628	OPERATOR FLOOR MAT	1
4	NVSP-14-027-SAR	DATA PLATE - DIESEL GAS AND LP	1
5	G-1351-18-SS	RIVET, 3/16 OPEN-END SS	4

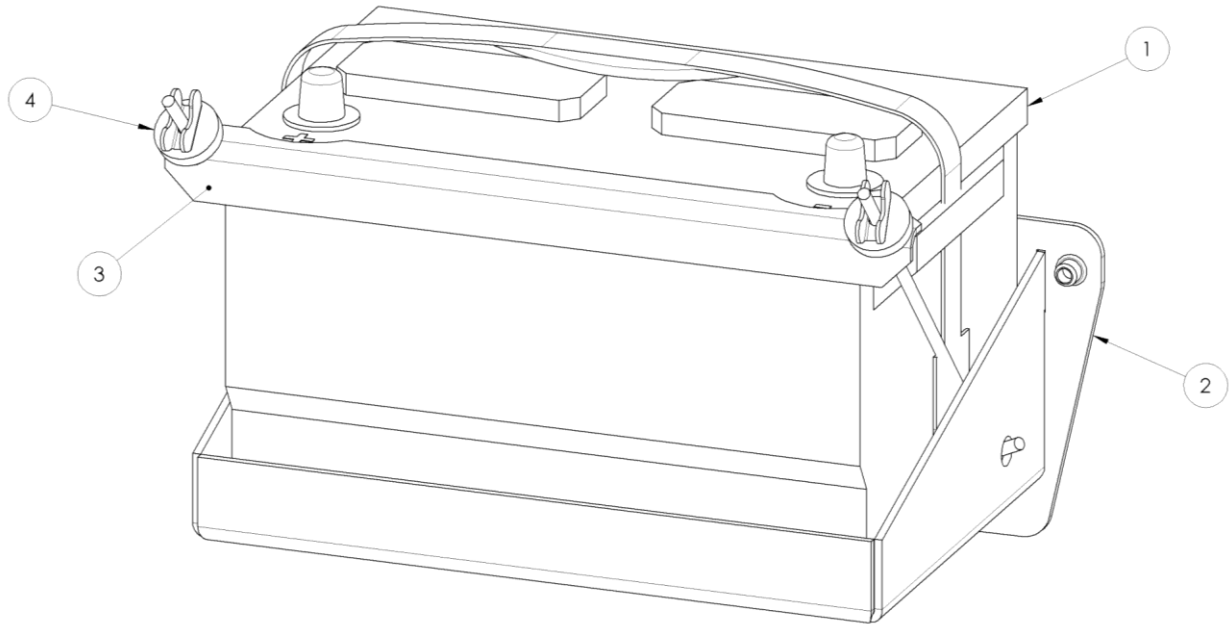
20.0 FEATURES AND OPTIONS

20.1 STARTING BATTERY FEATURE – TTR12-BATTERY

20.1.1 Standard Starting Battery – TTR12-BATT-O

DESCRIPTION: 850 CCA standard starting battery (wet cell)

COMPATIBILITY NOTES: No compatibility concerns



Parts List

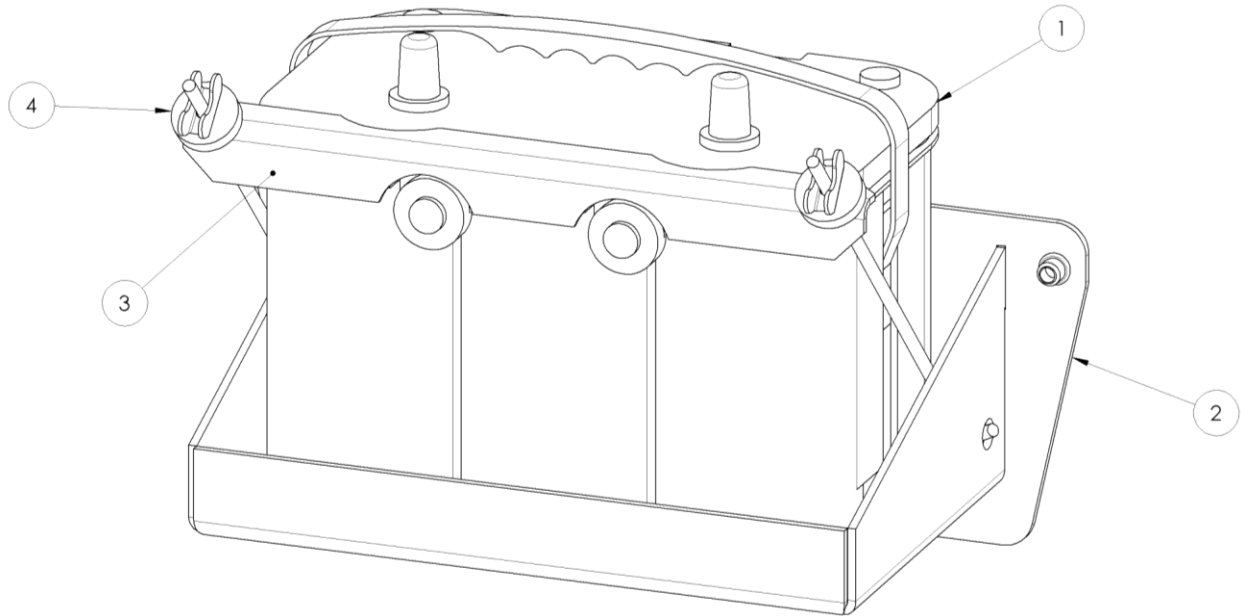
When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	65-72	BATTERY GRP. 65 850 CCA	1
2	Z-9910	ASSY, BATTERY BRACKET	1
3	J-6805-00	BATTERY HOLD DOWN BRKT (P)	1
4	A-TT3-0002	BATTERY HOLD DOWN BOLTS	1

20.1.2 Maintenance Free Starting Battery Option – TTR12-BATT-1

DESCRIPTION: 750 CCA maintenance free starting battery (spiral wound optima yellow top)

COMPATIBILITY NOTES: No compatibility concerns



Parts List

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

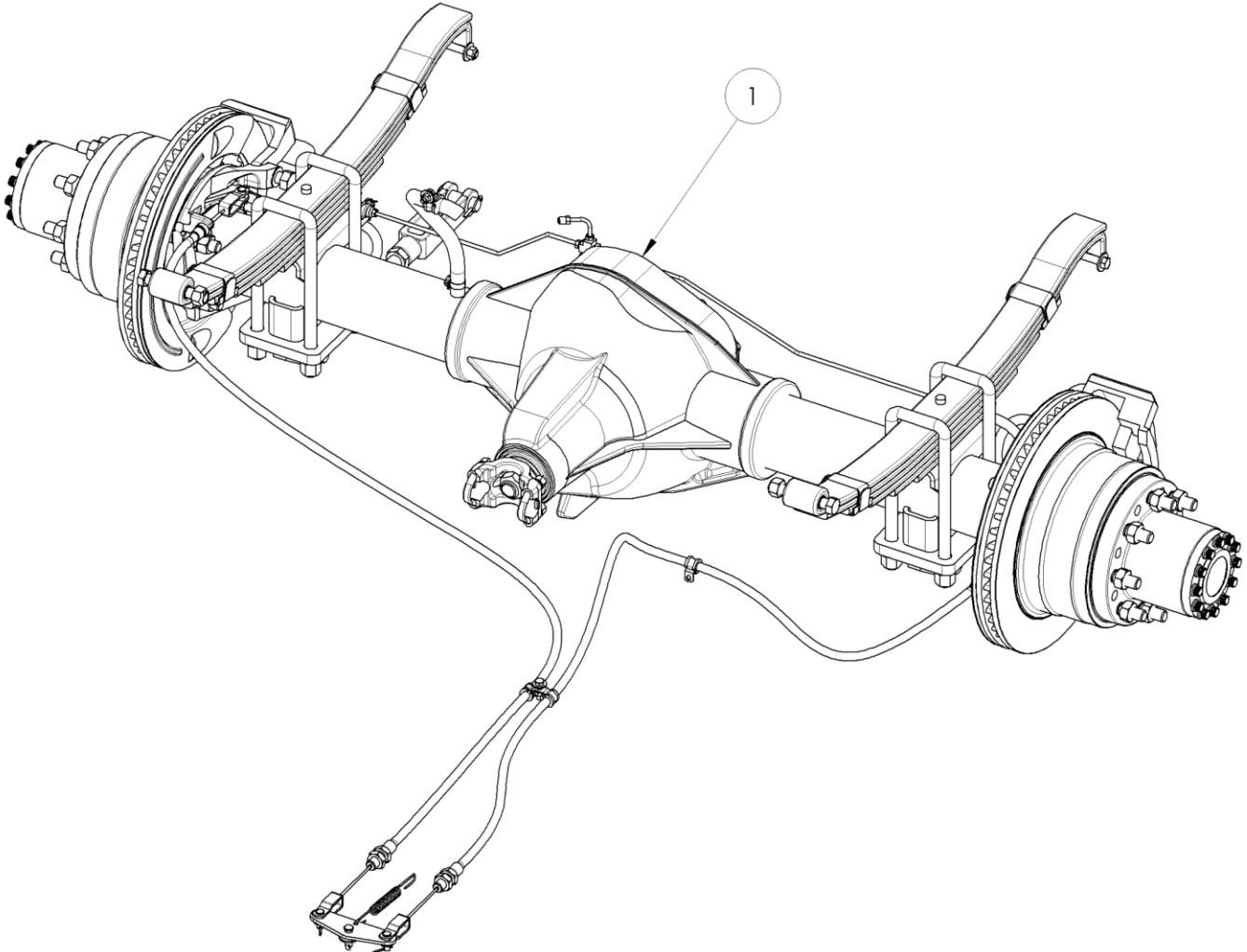
Item	Part Number	Description	Qty
1	NVSP-05-008-CA	BATTERY, MAINTENANCE FREE	1
2	Z-10890	ASSY, BATTERY BRACKET	1
3	S-3891-00	BATTERY RETAINER (P)	1
4	A-TT3-0002	BATTERY HOLD DOWN BOLTS	1

20.2 REAR AXLE DIFFERENTIAL FEATURE – TTR12-AXLE

20.2.1 Standard Differential Rear Axle – TTR12-AXLE-O

DESCRIPTION: Open differential rear axle

COMPATIBILITY NOTES: No compatibility concerns



Parts List

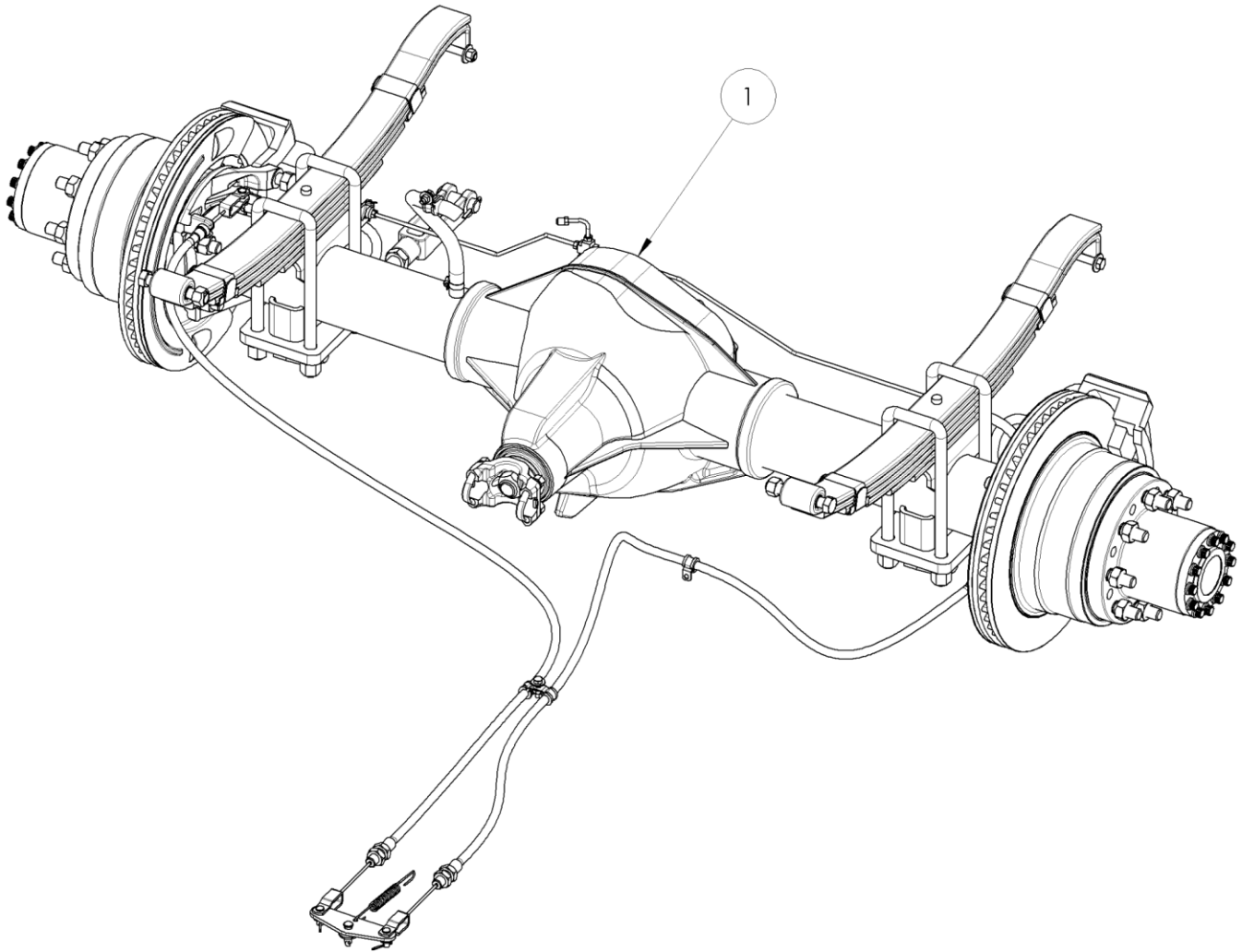
When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	Z-10339	REAR AXLE SYSTEM	1

20.2.2 Limited Slip Rear Axle Option – TTR12-AXLE-1

DESCRIPTION: This axle option can improve all-weather traction in some specific situations

COMPATIBILITY NOTES: No compatibility concerns



Parts List

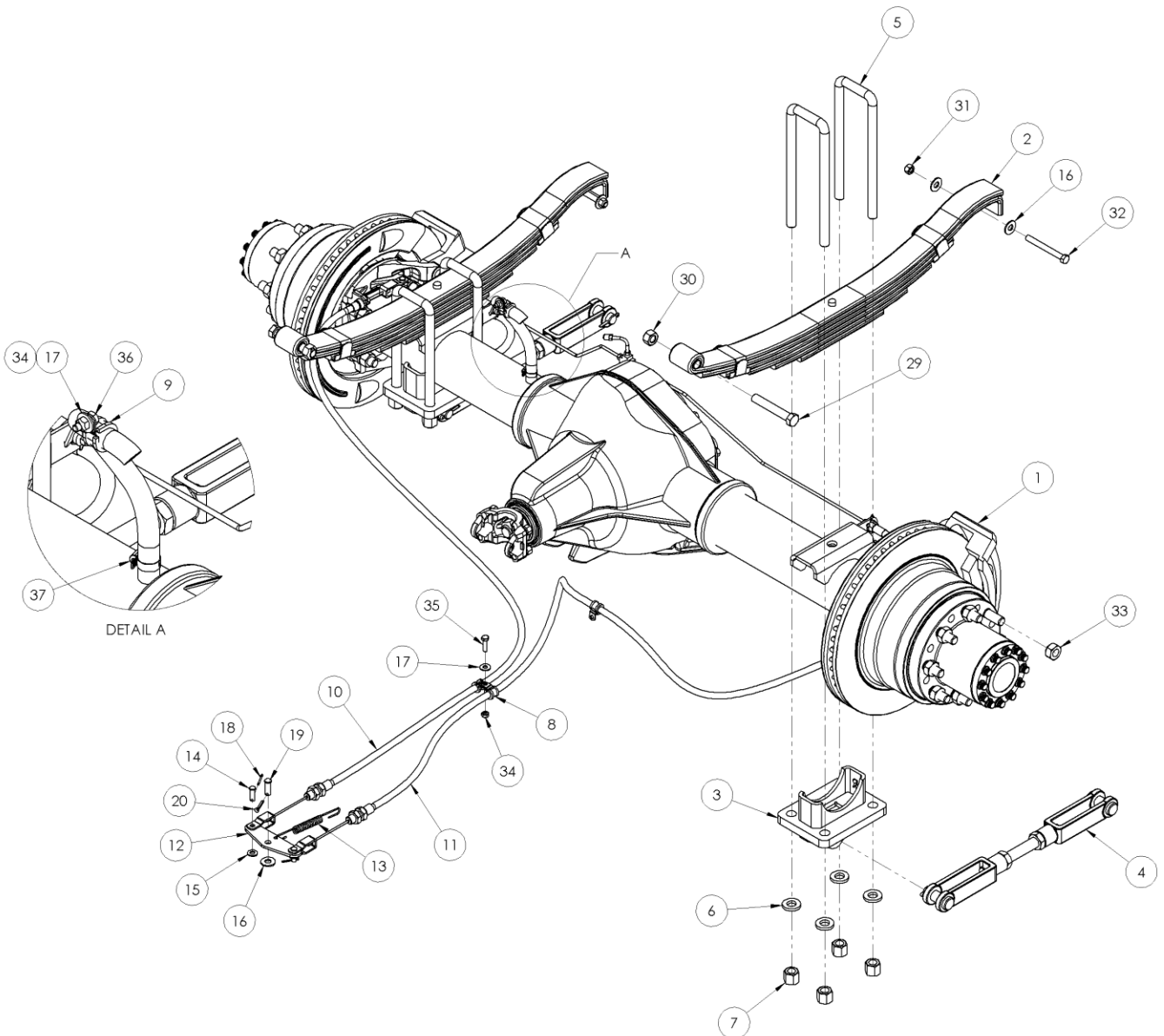
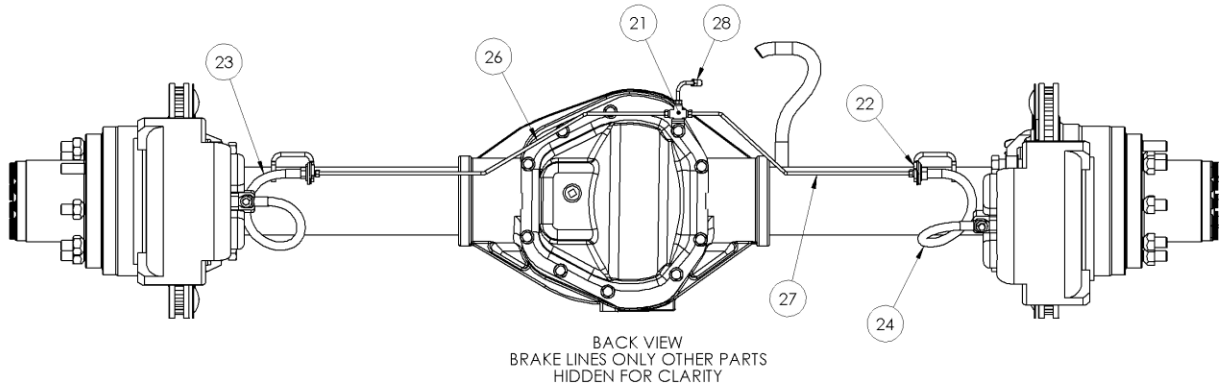
When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	Z-10930	REAR AXLE SYSTEM, LIMITED SLIP	1

20.2.2 Limited Slip Rear Axle Option – TTR12-AXLE-1 (continued)

DESCRIPTION: This axle option can improve all-weather traction in some specific situations

COMPATIBILITY NOTES: No compatibility concerns





20.2.2 Limited Slip Rear Axle Option – TTR12-AXLE-1 (continued)

DESCRIPTION: This axle option can improve all-weather traction in some specific situations

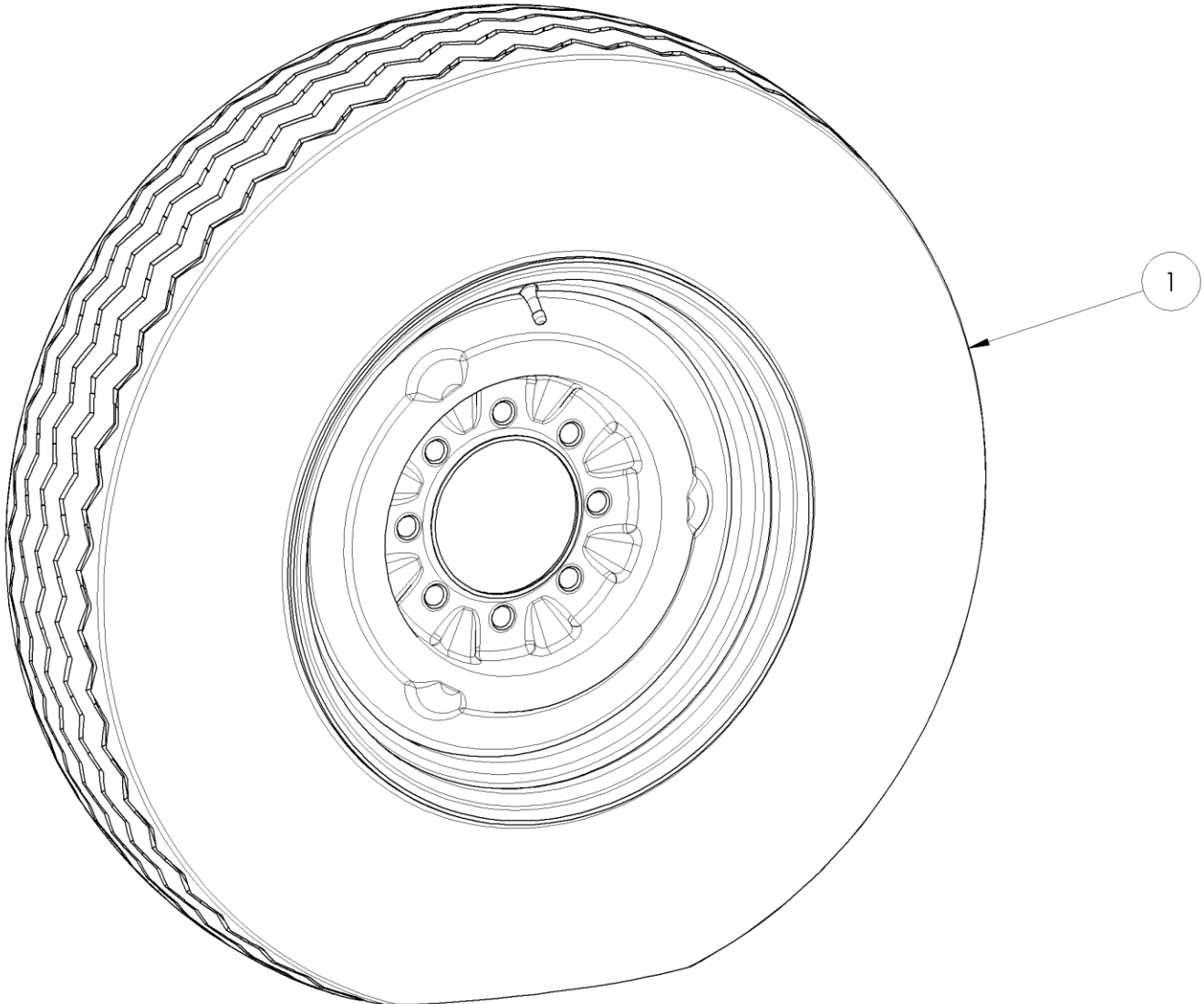
COMPATIBILITY NOTES: No compatibility concerns

Parts List

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	Z-10931	WELDMENT, REAR AXLE, LS	1
2	A-TT10-00116	LEAF SPRING, TT12	2
3	Z-10497	WLD, U-BOLT CLAMP RR (P)	2
4	Z-10412	ASSY, ANTI ROTATION	2
5	A-TT10-00119-1	U BOLT, TT10-12 AXLE	4
6	A-TT4-00366	WASHER, AXLE U-BOLT	8
7	A-TT4-00365	NUT, AXLE U-BOLT	8
8	H-3521-02	CLAMP, CUSHIONED LOOP 7/16"	3
9	H-3521-07	CLAMP, CUSHIONED LOOP 3/4"	1
10	TT12-13-002-SA	PARKING BRAKE CABLE	1
11	TT12-13-002-SA	PARKING BRAKE CABLE	1
12	J-6802-00	BRKT, PARK BRAKE EQ (P)	1
13	TT12-13-003-CA	PARKING BRAKE SPRING	1
14	G-1302-03	PIN, CLEVIS, 5/16 X 0.94" LG.	4
15	G-1250-1060N	FLATWASHER, 5/16 NARROW	4
16	G-1250-1070W	FLATWASHER, 3/8 WIDE	5
17	G-1250-1050W	FLATWASHER, 1/4 WIDE	2
18	G-1301-01	PIN, 3/32 X 1 LG COTTER	4
19	G-1302-18	PIN, 3/8 X 1.00 LG CLEVIS	1
20	G-1301-04	PIN, 5/32 X 1.0" LG. COTTER	1
21	N-3068	BRAKE T FITTING, MODIFIED	1
22	A-TT4-00165	BRAKE HOSE CLIP	2
23	A-TT4-00176-1	BRAKE HOSE	1
24	A-TT4-00176-1	BRAKE HOSE	1
25	A-TT4-00178	BANJO BOLT WITH WASHER	2
26	H-4520	BRAKE LINE, REAR LH	1
27	H-4521	BRAKE LINE, REAR RH	1
28	A-TT4-00167	BRAKE LINE SHORT ELBOW	1
29	G-1420-121534	BOLT, 9/16-18 X 3.5" HEX HD GR 8	2
30	G-1727-1210	NUT, 9/16-18 TOP LOCK ZINC	2
31	G-1727-1070	NUT, 3/8-16 TOP LOCK ZINC	2
32	G-1420-107034	BOLT, 3/8-16 X 3.5" HEX HD GR 8	2
33	A-TT10-00123	.625-18 WHEEL NUT	16
34	G-1727-1050	NUT, 1/4-20 TOP LOCK ZINC	2
35	G-1100-105010	BOLT, 1/4-20 X 1.0" LG HEX HD GR 5	1
36	G-1100-105006	BOLT, 1/4-20 X 3/4" LG HEX HD GR 5	1
37	H-1426-04	HOSE CLAMP - 0.50" - 1.25"	1

- 20.3 WHEELS AND TIRES FEATURE – TTR12-TIRES
 - 20.3.1 Standard Pneumatic Tires – TTR12-TIRES-O
- DESCRIPTION: Standard trailer style pneumatic wheels and tires
- SIZE: 950x16.5
- COMPATIBILITY NOTES: No compatibility concerns



Parts List

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

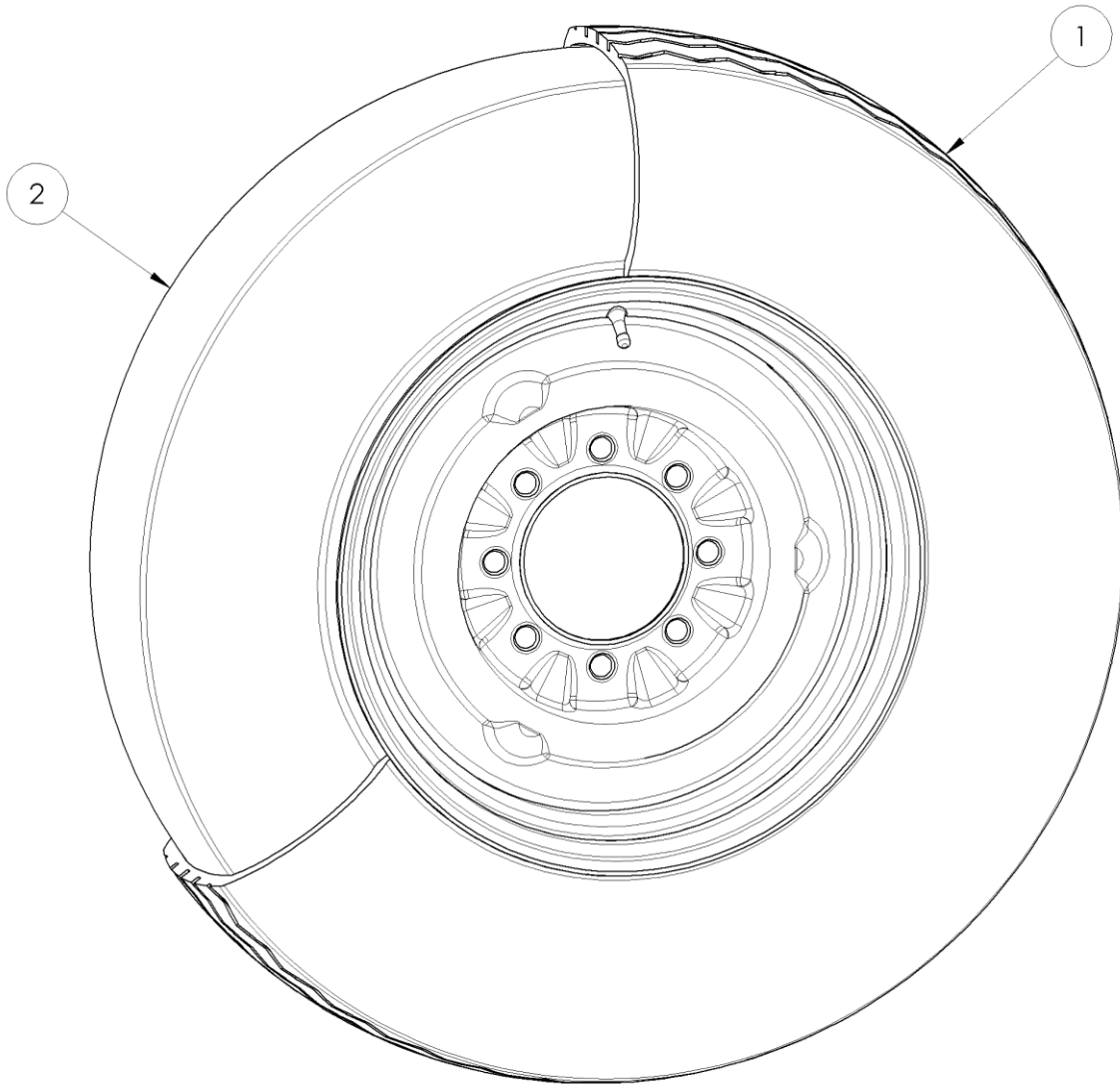
Item	Part Number	Description	Qty
1	Z-10648	WHEEL AND TIRE ASSEMBLY	4

20.3.2 Foam Filled Tires Option – TTR12-TIRES-1
DESCRIPTION: Foam filled wheels and tires
SIZE: 950x16.5

Foam filling replaces all of the air inside the tire with a flexible foam filling. The foam protects the tire against flats, and rides similar to a standard pneumatic tire

The foam filling adds roughly 150 lbs. per tire, increasing traction capabilities

COMPATIBILITY NOTES: No compatibility concerns

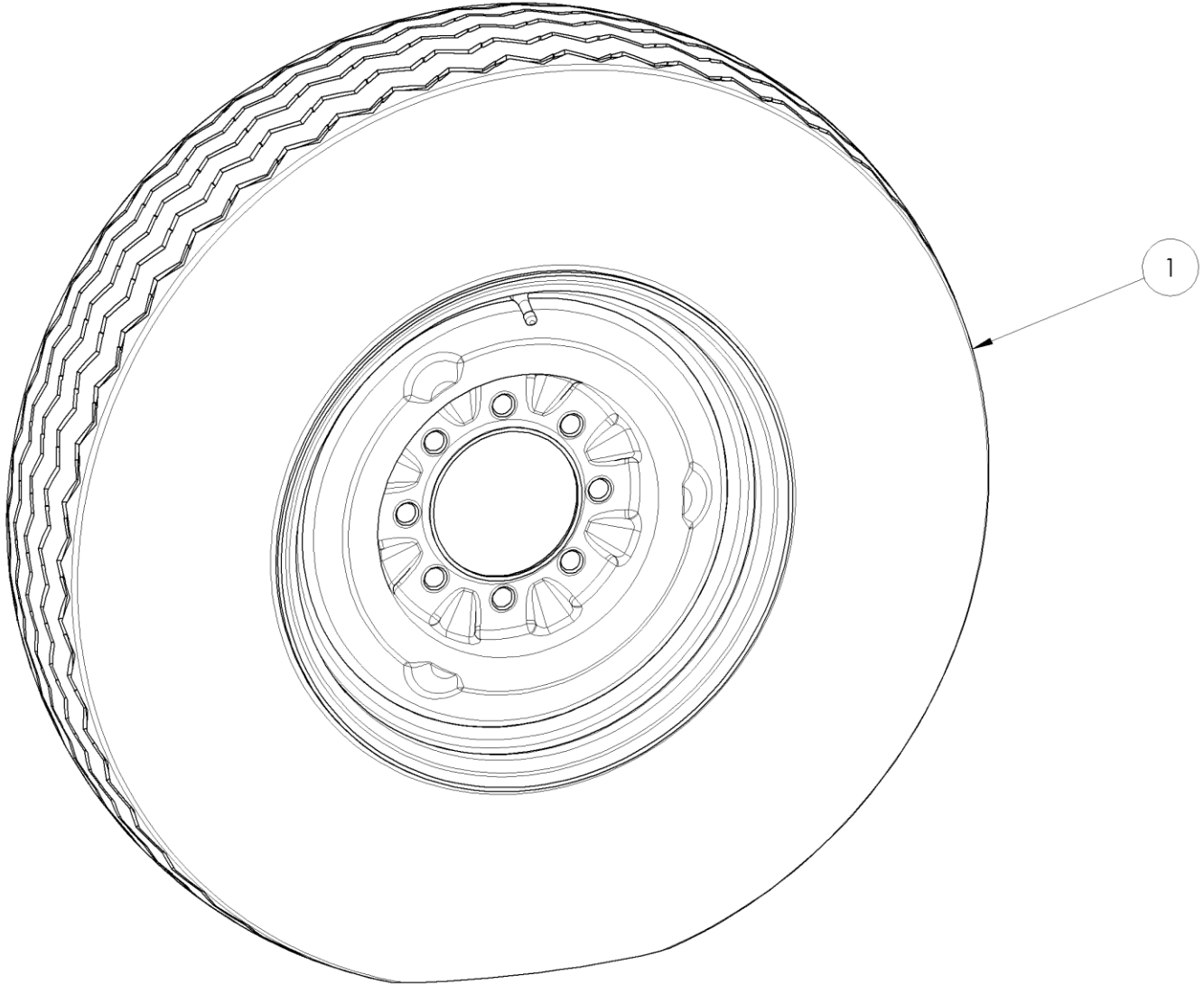


Parts List

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	Z-10648	WHEEL AND TIRE ASSEMBLY	4
2	AE-OPT-0073-A	FOAM FILLING SERVICE	4

20.3.3 Pneumatic Tires Option – TTR12-TIRES-2
 DESCRIPTION: 16" trailer style pneumatic wheels and tires
 SIZE: 235/85R16
 COMPATIBILITY NOTES: No compatibility concerns



Parts List

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

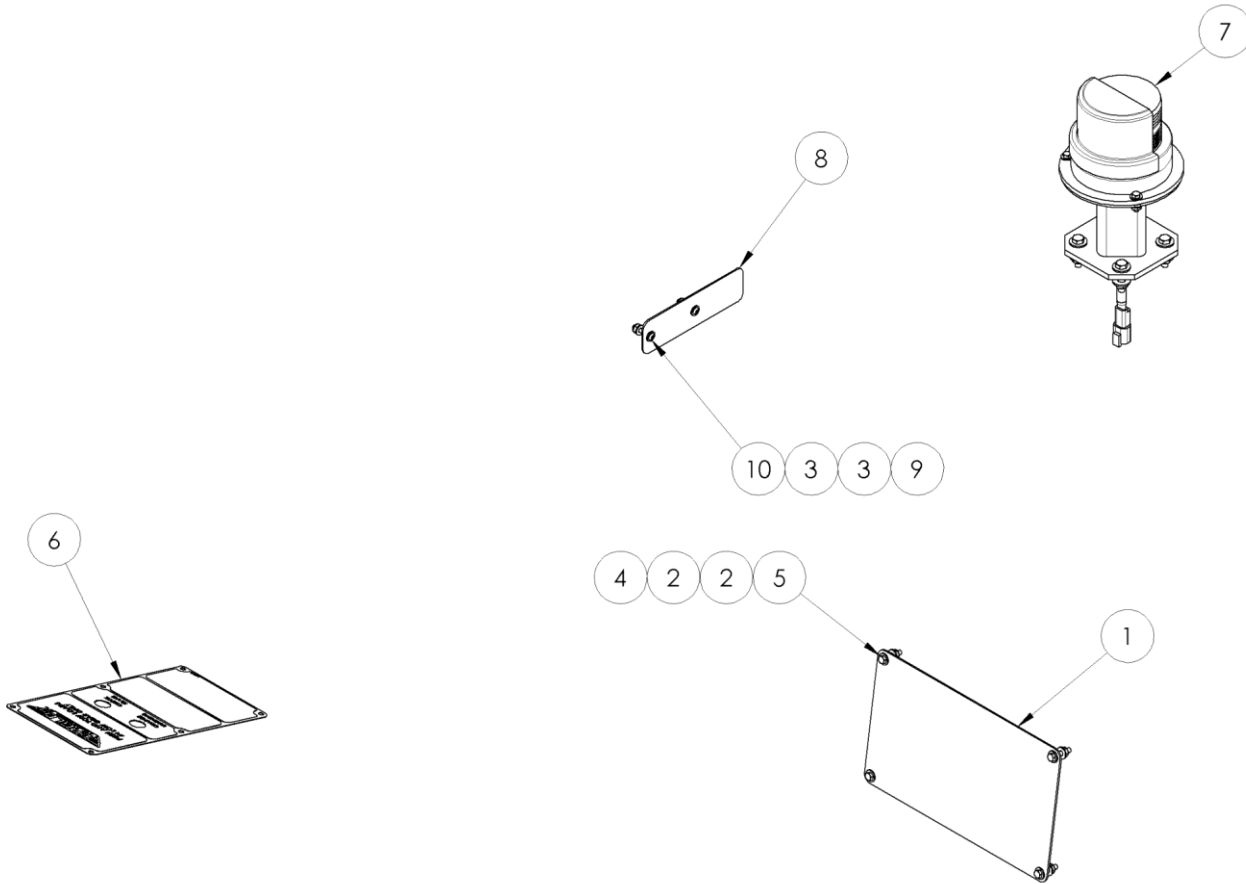
Item	Part Number	Description	Qty
1	Z-10932	WHEEL AND TIRE ASSEMBLY	4

20.4 OPERATOR CAB – TTR12-CAB

20.4.1 Standard No cab – TTR12-CAB-O

DESCRIPTION: Includes cover plates and other items required as substitutions for cab-specific parts

COMPATIBILITY NOTES: No compatibility concerns



Parts List

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	S-3378-00	HEATER CORE COVER PANEL (WP)	1
2	G-1250-1030N	FLATWASHER, #10 NARROW	8
3	G-1250-1020N	FLATWASHER, #8 NARROW	4
4	G-1202-1035	STOPNUT, #10-32 ELASTIC	4
5	G-1150-103510	SCREW, #10-32 X 1.0" LG HEX HD MACHINE	4
6	V-2739	RH DASH PLACARD, NO OPT	1
7	Z-10765	ASY, POST MOUNTED LED STROBE	1
8	S-3858-00	COVER, CAB WIRING (WP)	1
9	G-1202-1020	STOPNUT, #8-32 ELASTIC	2
10	G-1154-102210	SCREW, #8-32 X 1.00" LG. SST SOC BUTT. HD CAP	2

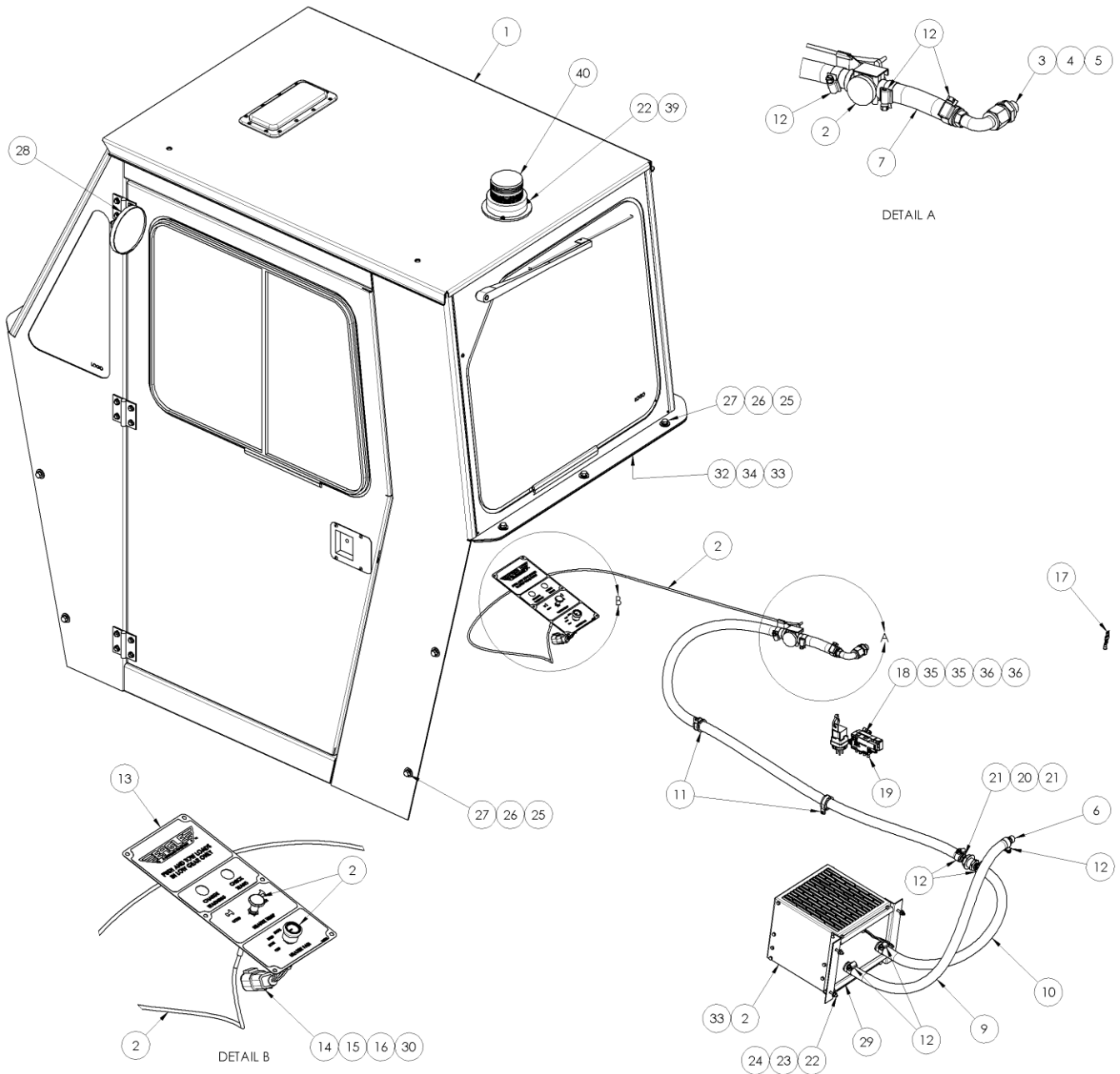
20.4.2 Cab Option – TTR12-CAB-1

DESCRIPTION: Operator cab with heater, defrost fan, front and rear wipers, dome light, and other features

NOTE: If foam tape is provided with cab, H-1204-20 is not required

NOTE: Trim foam tape to fit after applying to all mounting flanges

COMPATIBILITY NOTES: No compatibility concerns





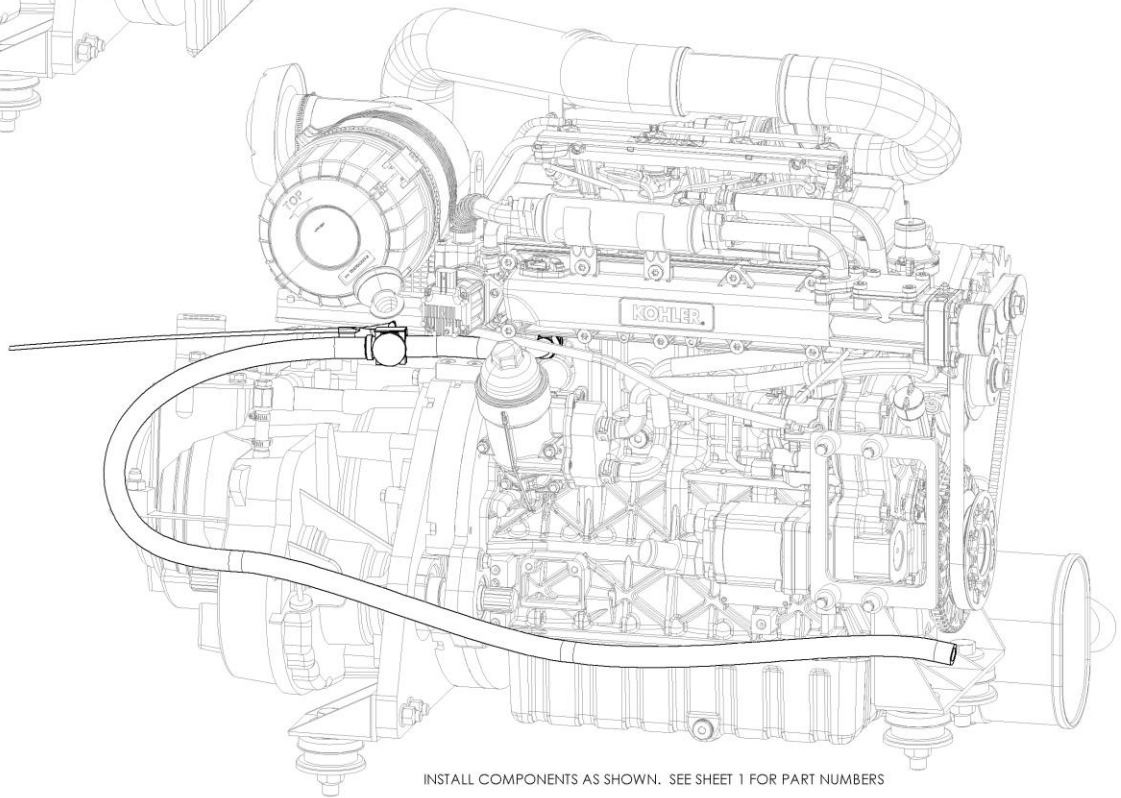
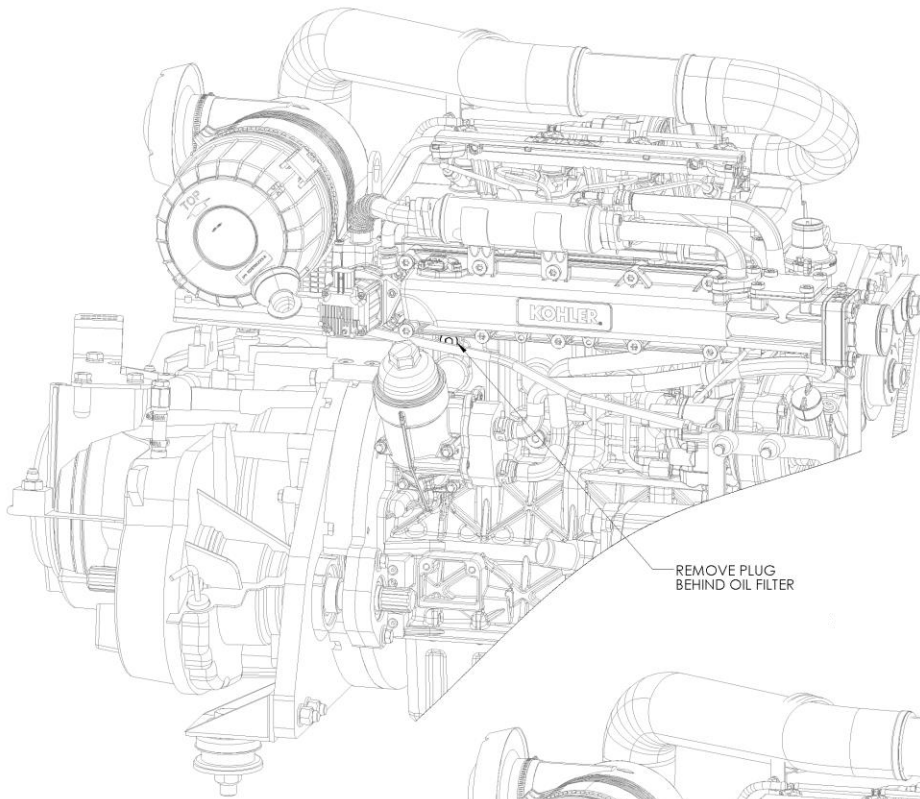
20.4.2 Cab Option (continued)

Parts List

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

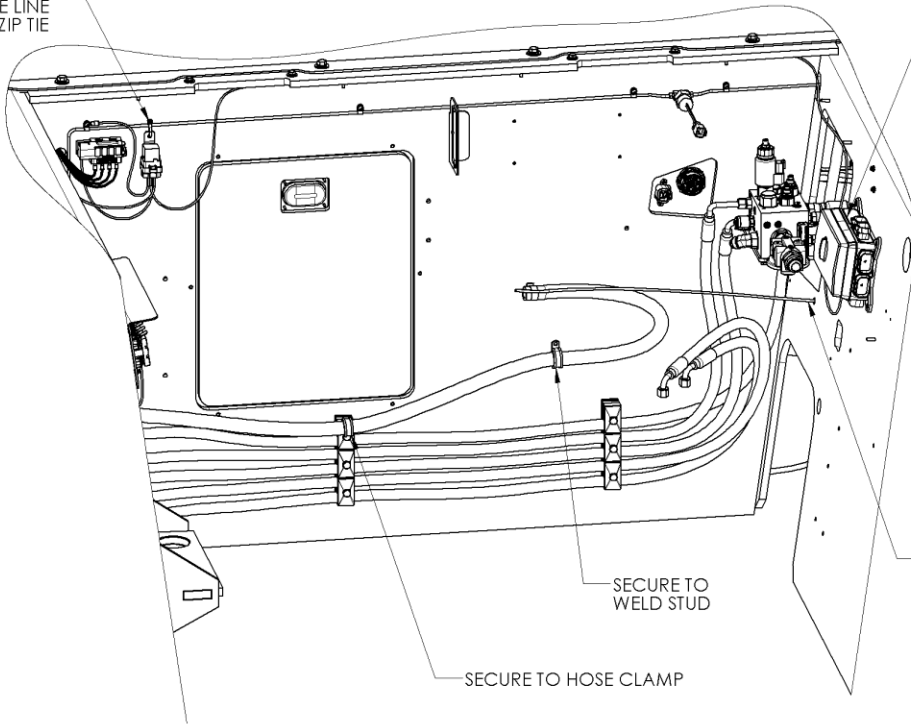
Item	Part Number	Description	Qty
1	H-4657	TTR-12 CAB - VENDOR ASSY	1
2	TT00-14-001-CA	HEATER CORE	1
3	N-3125	ADAPTER, M16 TO 5/8 JIC M	1
4	N-3126-16	WASHER, BONDED SEAL, 16MM	1
5	N-2069-05-S	ELBOW, SWIVEL, -10	1
6	05710B-106	HOSE BARB - 6 NPT M - 10 HOSE BARB	1
7	TF-1260-10-05.0	HOSE, HEATER, -10	1
8	TF-1260-10-59.0	HOSE, HEATER, -10	1
9	TF-1260-10-27.5	HOSE, HEATER, -10	1
10	TF-1260-10-23.0	HOSE, HEATER, -10	1
11	H-3521-11	CLAMP, CUSHIONED LOOP 1"	2
12	H-1426-04	CLAMP, HOSE, SAE -12	8
13	V-2825	RH DASH PLACARD, CAB OPT	1
14	DTP04-4P	DEUTSCH CONNECTOR	1
15	W4P	DEUTSCH LOCK	1
16	0460-215-16141	DEUTSCH TERMINAL	4
17	EC-3146-02	30A FUSE, MIDI/AMI	1
18	EC-3275	FUSE HOLDER, 4 PLACE	1
19	EC-1179-10	FORK TERMINAL - 8 FORK TERM - 16-14 AWG	4
20	N-3096	CONNECTOR, BULKHEAD	1
21	N-3092	HOSE BARB, 3/8 M NPT X 5/8 BARB	2
22	G-1720-103510	SCR,#10-32X1.0 MACH HEX WSH HD	7
23	G-1202-1035	STOPNUT, #10-32 ELASTIC	4
24	G-1250-1030N	FLATWASHER, #10 NARROW	4
25	G-1250-1070W	FLATWASHER, 3/8 WIDE	14
26	G-1251-1070R	LOCKWASHER, 3/8 REGULAR	14
27	G-1420-107010	BOLT, 3/8-16 X 1.0" HEX HD GR 8	14
28	AE-OPT-0051	CONVEX MIRROR, 5"	1
29	A-TT10-00314	WEATHERSTRIP, D SHAPE, 1/2x1/2	17 in
30	EC-1326-02	DISCONNECT, FEMALE BLU 1/4 F/I	4
31	EC-1327-03	DISCONNECT, MALE YELLOW 1/4	3
32	H-1204-20-033.5	TAPE, NEOPRENE FOAM SEALING	1
33	H-1204-20-033.5	TAPE, NEOPRENE FOAM SEALING	1
34	H-1204-20-061.0	TAPE, NEOPRENE FOAM SEALING	1
35	ATO-15	15 AMP 36V ATO FUSE	2
36	ATO-10	10 AMP 36V ATO FUSE	2
N/S	MIN-10	MINI AUTOMOTIVE BLADE FUSE, 10A	1
39	G-1251-1030R	LOCKWASHER, #10 REGULAR	3
40	AE-OPT-0007-LED	LED STROBE	1
41	Z-10924	ASSY, TTR-8 CAB POWER WIRING	1

20.4.2 Cab Option (continued)



20.4.2 Cab Option (continued)

ATTACH RELAY
TO BRAKE LINE
WITH ZIP TIE



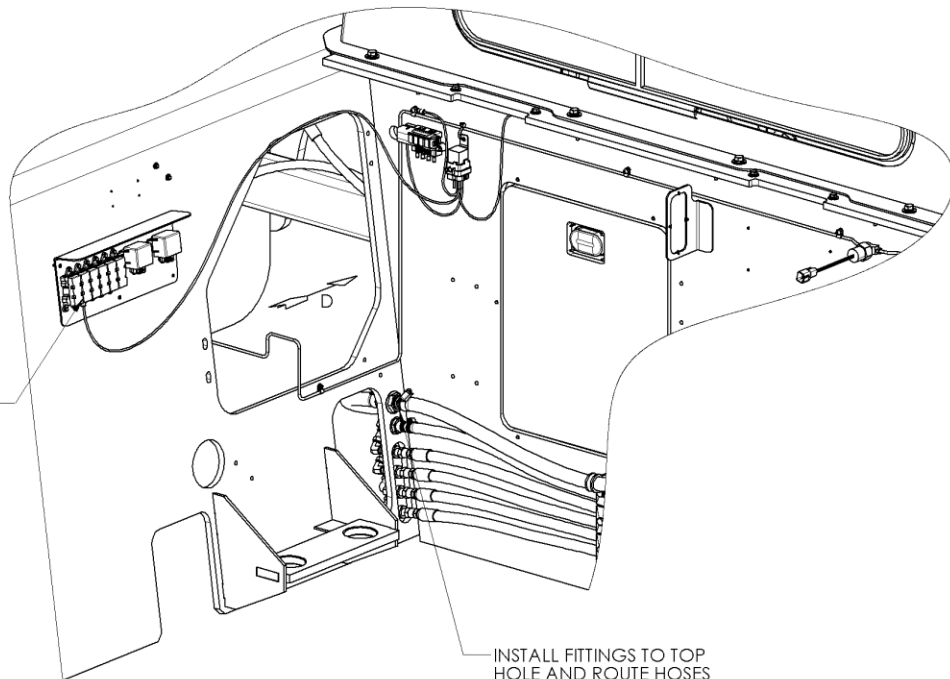
INSTALL MIN-10 FUSE IN POSITION
F-13 RUN WHITE RELAY WIRE
FROM Z-10924 TO BROWN
CONNECTOR, POSITION A

ROUTE CONTROL
CABLE THROUGH Ø.50
HOLE IN BULKHEAD

SECURE TO
WELD STUD

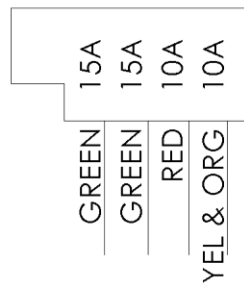
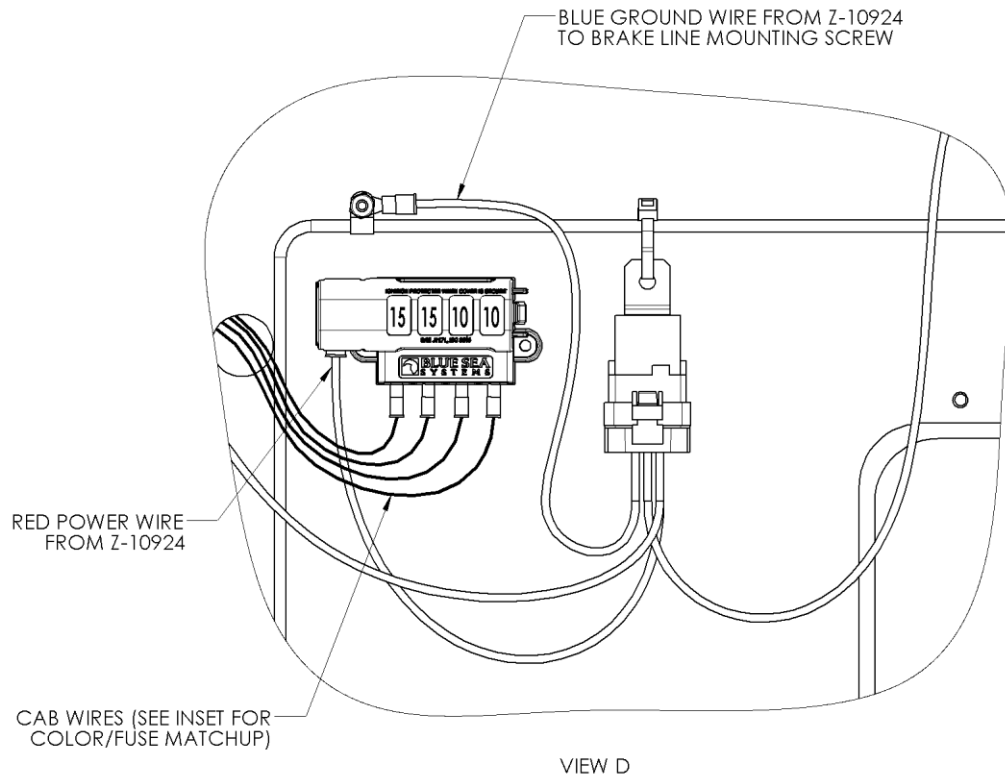
SECURE TO HOSE CLAMP

INSTALL 30A FUSE TO
SECOND LOCATION. RUN
BLACK WIRE FROM Z-10924
TO FUSE OUTPUT



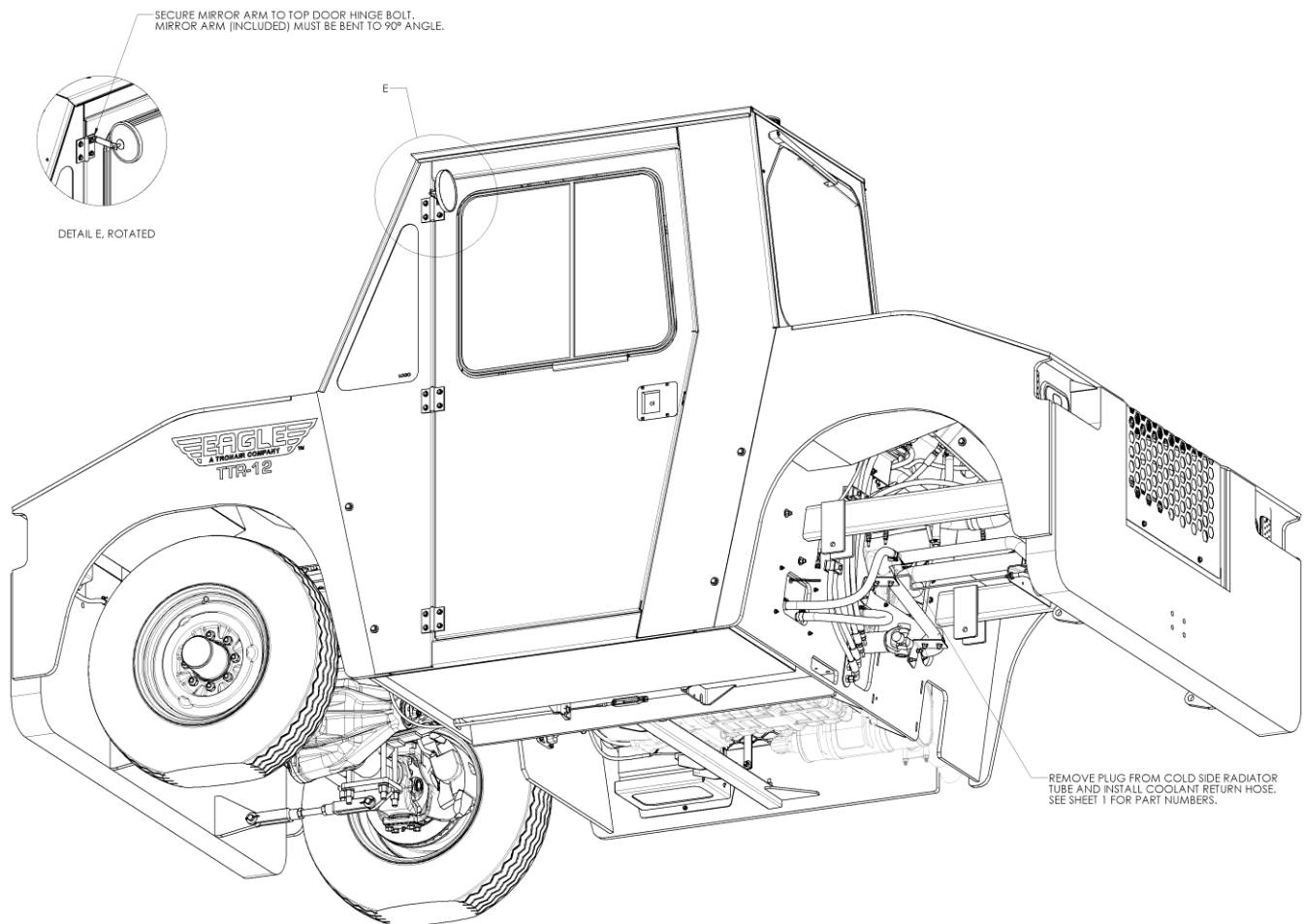
INSTALL FITTINGS TO TOP
HOLE AND ROUTE HOSES

20.4.2 Cab Option (continued)



CAB FUSE HOLDER SCHEMATIC
WIRES SHOWN ARE FROM CAB HARNESS.
GROUND BLACK WIRE TO CHASSIS

20.4.2 Cab Option (continued)



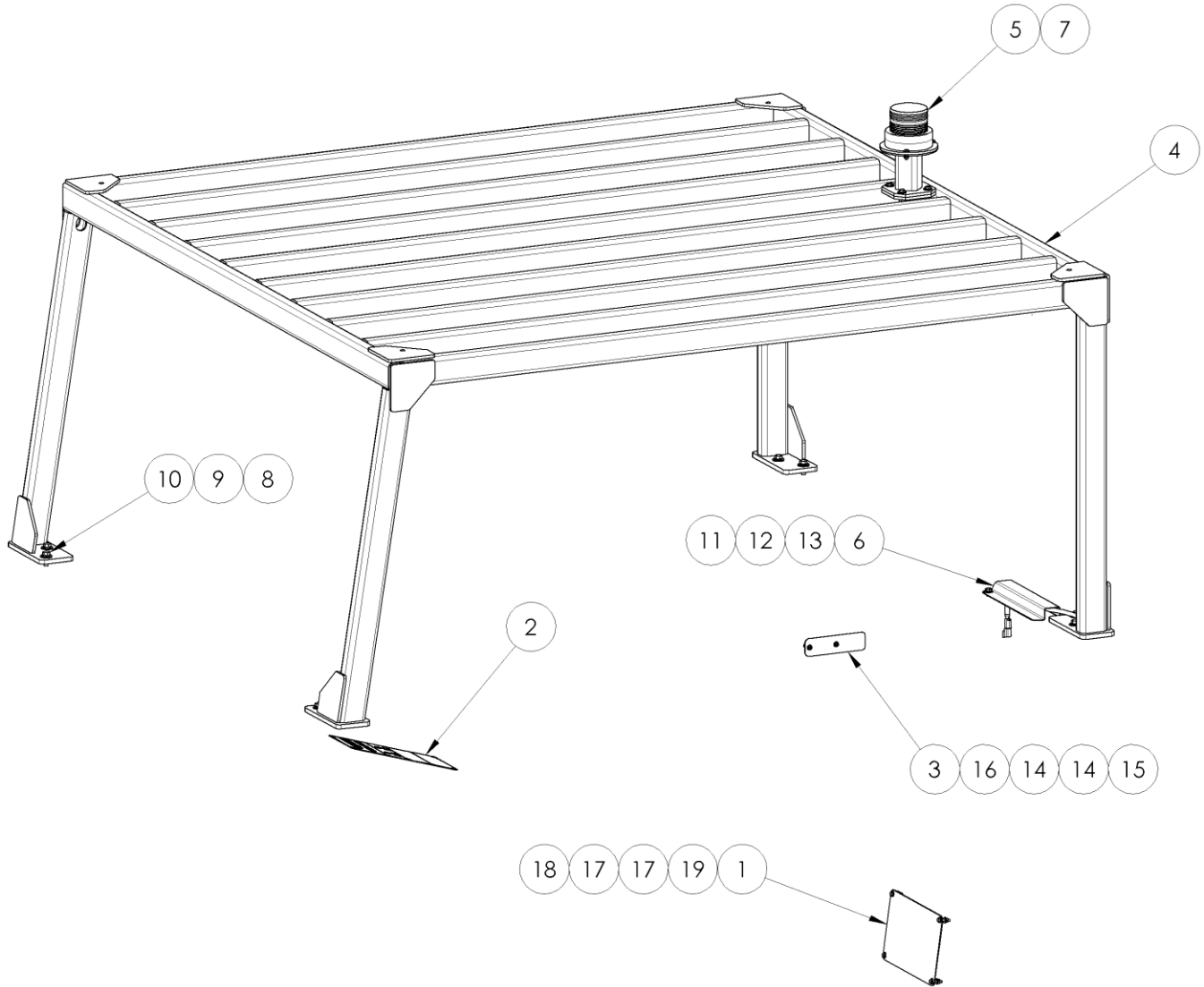
CAB HEATER OPERATING INSTRUCTIONS:

- Set heater temperature using push/pull cable control
- Set heater fan speed using dial

20.4.3 Overhead Guard Option – TTR12-CAB-2
DESCRIPTION: Includes led strobe lamp

Note: this is an operator guard, not a ROPS (rollover protection system)

COMPATIBILITY NOTES: Not compatible with the towbar storage rack Option (TTR12-TOWBAR-1)





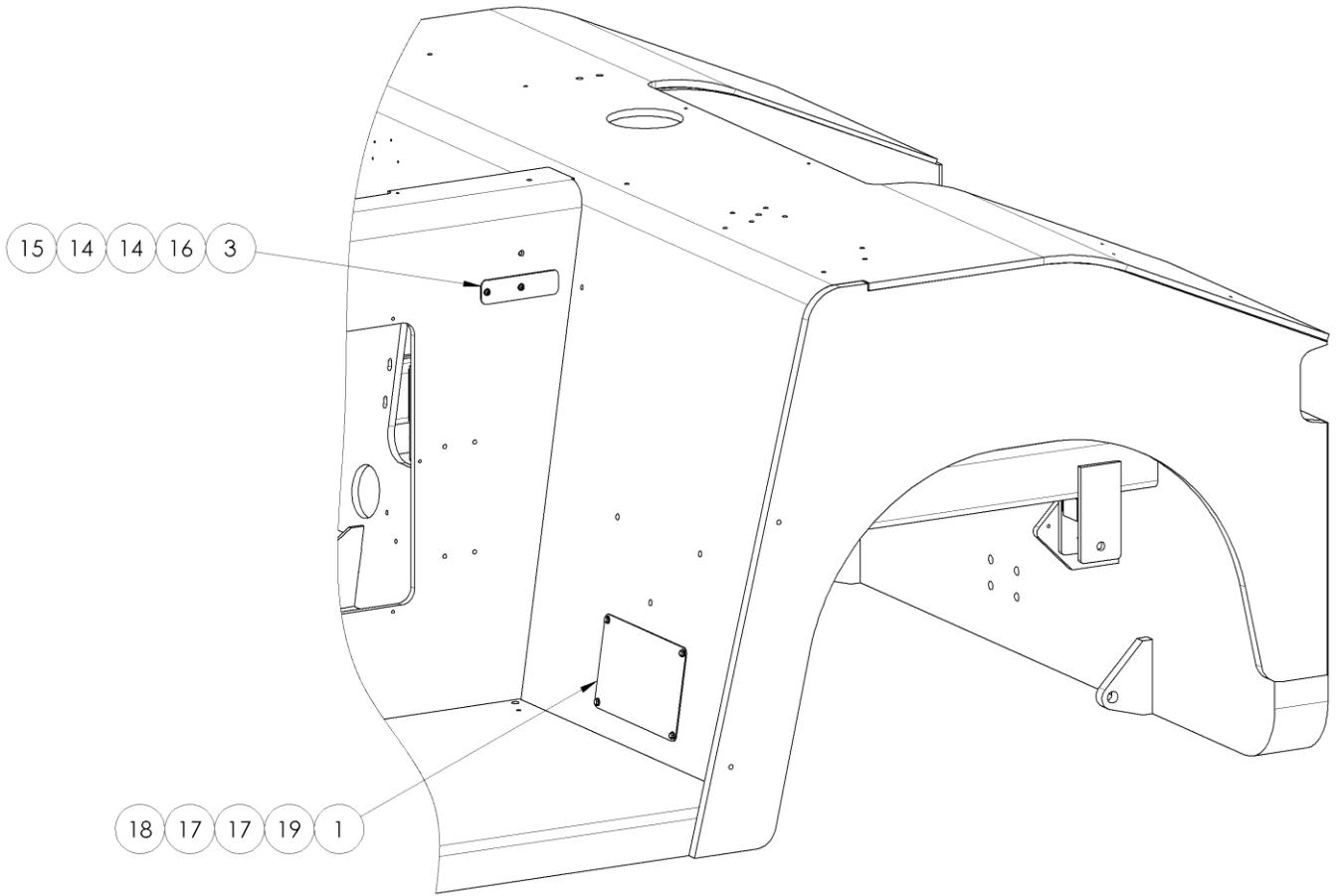
20.4.3 Overhead Guard Option (*continued*)

Parts List

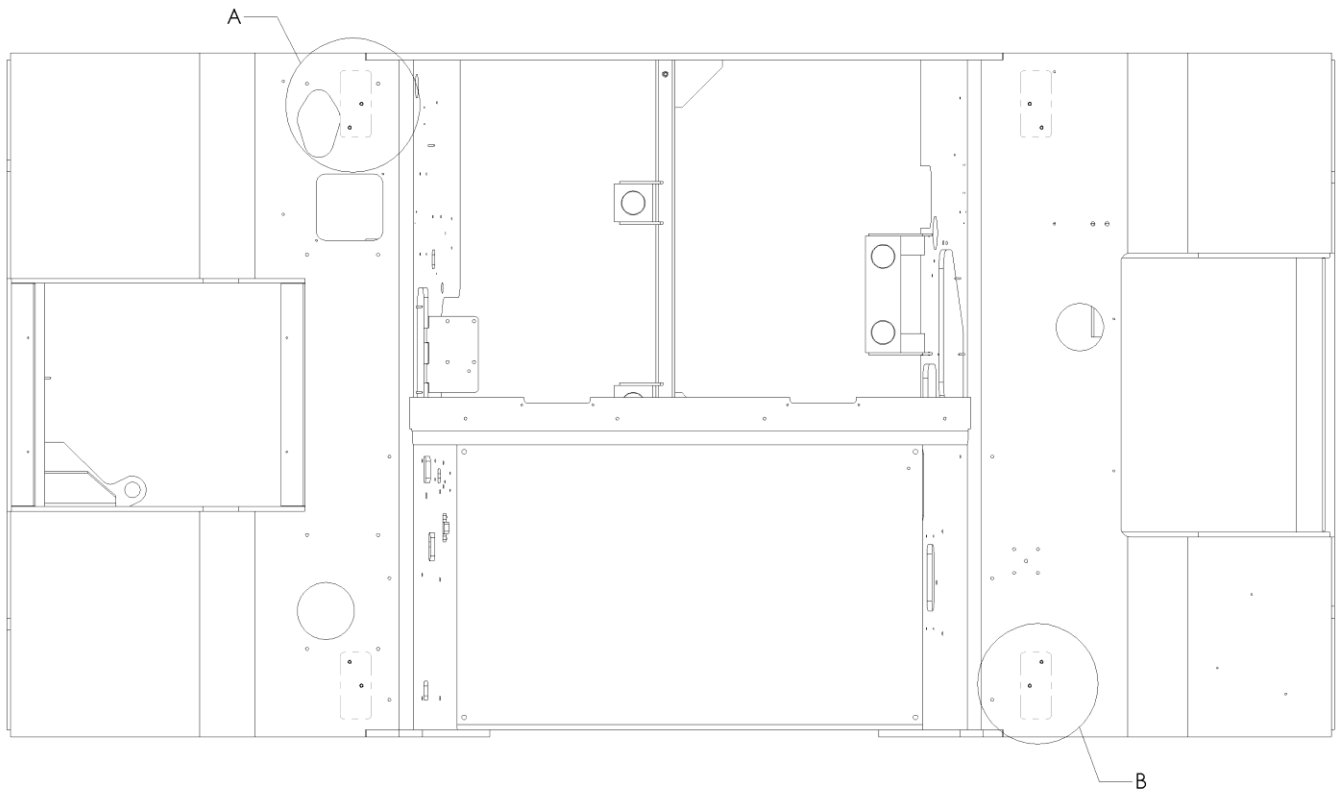
When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	S-3378-00	HEATER CORE COVER PANEL (WP)	1
2	V-2739	RH DASH PLACARD, NO OPT	1
3	S-3858-00	COVER, CAB WIRING (WP)	1
4	Z-10936-00	WLD, OVERHEAD STRUCTURE (WP)	1
5	N/A	ASSY, POST MOUNTED LED STROBE	1
6	S-3900-00	WIRING COVER (WP)	1
7	NVSP-24-022-CA	CABLE TIE ANCHOR STD (Ø.375 X .27 THK)	4
8	G-1250-1070W	FLATWASHER, 3/8 WIDE	8
9	G-1251-1070R	LOCKWASHER, 3/8 REGULAR	8
10	G-1420-107010	BOLT, 3/8-16 X 1.0" HEX HD GR 8	8
11	G-1250-1050W	FLATWASHER, 1/4 WIDE	2
12	G-1251-1050R	LOCKWASHER, 1/4 REGULAR	2
13	G-1100-105004	BOLT, 1/4-20 X 1/2" LG. HEX HD GR 5	2
14	G-1250-1020N	FLATWASHER, #8 NARROW	4
15	G-1202-1020	STOPNUT, #8-32 ELASTIC	2
16	G-1154-102210	SCREW, #8-32 X 1.00" LG. SST SOC BUTT. HD CAP	2
17	G-1250-1030N	FLATWASHER, #10 NARROW	8
18	G-1202-1035	STOPNUT, #10-32 ELASTIC	4
19	G-1150-103510	SCREW, #10-32 X 1.0" LG HEX HD MACHINE	4

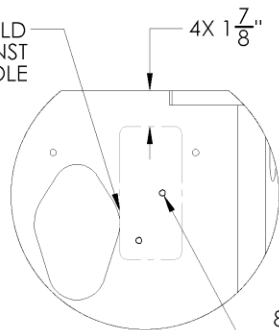
20.4.3 Overhead Guard Option (*continued*)



20.4.3 Overhead Guard Option (continued)

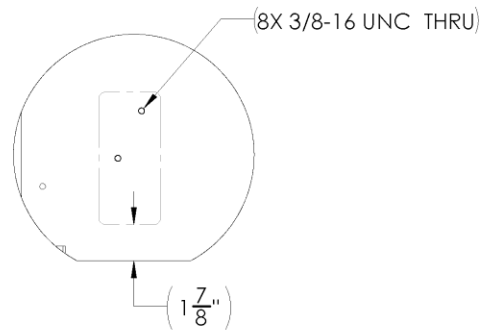


OHG FOOT SHOULD
BE TIGHT AGAINST
FUEL FILL ACCESS HOLE



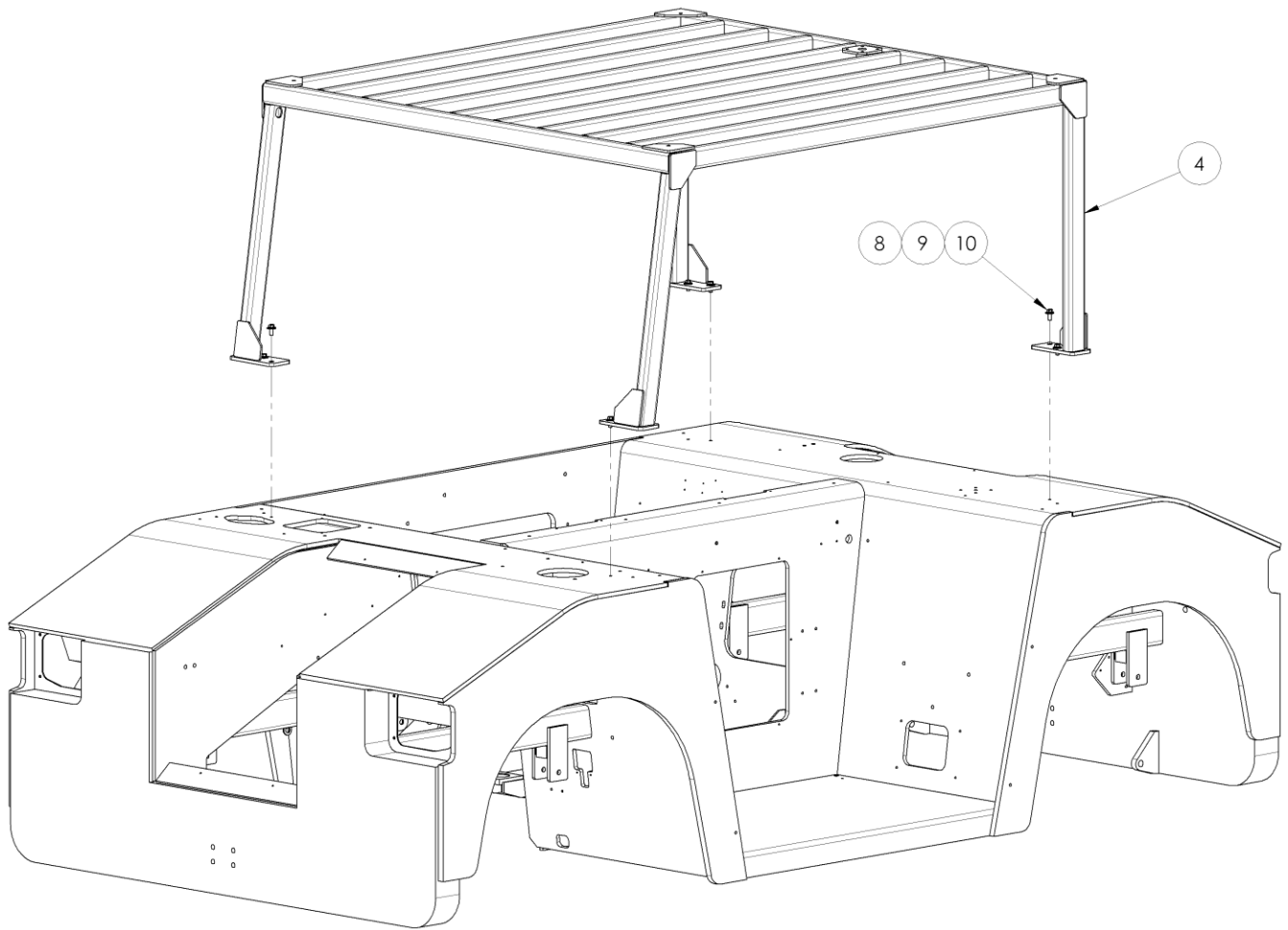
DETAIL A

8X 3/8-16 UNC THRU
MATCH-DRILL USING OHG

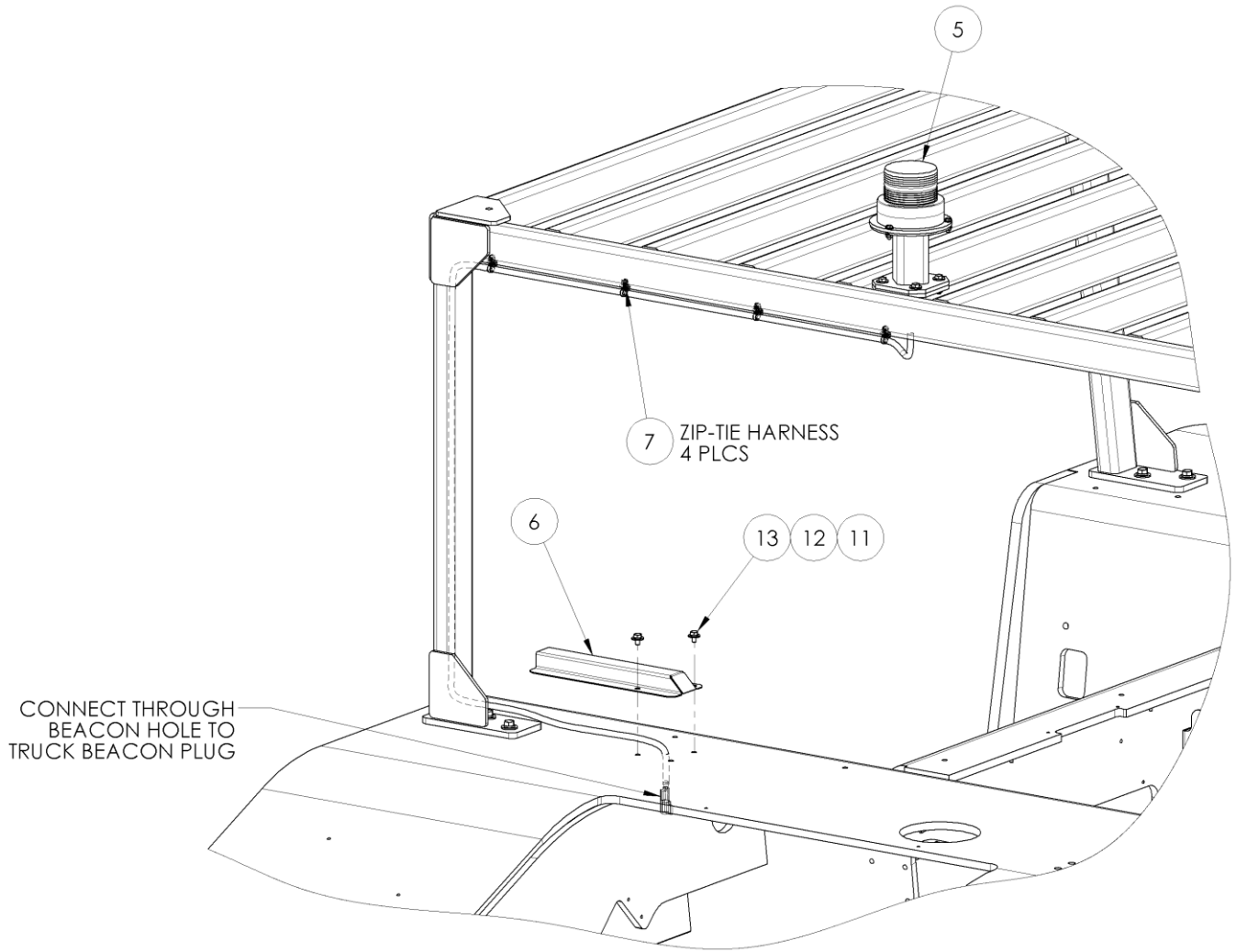


DETAIL B

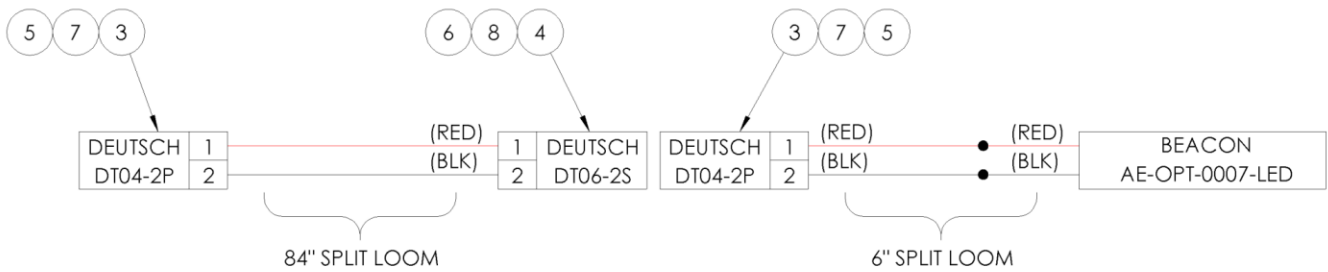
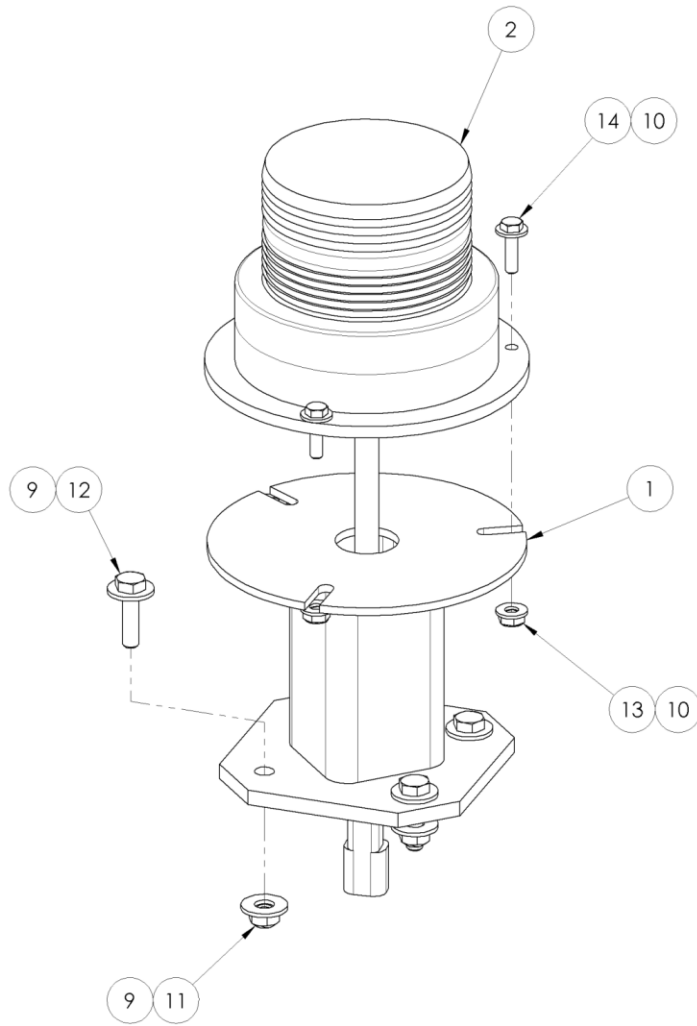
20.4.3 Overhead Guard Option (*continued*)



20.4.3 Overhead Guard Option (continued)



20.4.3 Overhead Guard Option (continued)



- NOTES:
1. WIRE EXTENSION NOT SHOWN GRAPHICALLY, BUT IS SHOWN IN SCHEMATIC
 2. COVER IN SPLIT LOOM FOR PROTECTION WHERE SHOWN.



20.4.3 Overhead Guard Option (*continued*)

Parts List

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	Z-10766-00	WLD, BEACON POST (WP)	1
2	AE-OPT-0007-LED	LED STROBE	1
3	DT04-2P	DEUTSCH CONNECTOR	2
4	DT06-2S	DEUTSCH CONNECTOR	1
5	0460-215-16141	DEUTSCH TERMINAL	4
6	0462-209-16141	DEUTSCH SOCKET	2
7	W2P	DEUTSCH LOCK	2
8	W2S	DEUTSCH LOCK	1
9	G-1250-1050W	FLATWASHER, 1/4 WIDE	8
10	G-1250-1030N	FLATWASHER, #10 NARROW	6
11	G-1727-1050	NUT, 1/4-20 TOP LOCK ZINC	4
12	G-1100-105010	BOLT, 1/4-20 X 1.0" LG HEX HD GR 5	4
13	G-1203-1035	JAMNUT, 10-32 ELASTIC	3
14	G-1150-103506	SCREW, #10-32 X 3/4" LG HEX HD MACHINE	3
-	EC-3299-18-RED	WIRE, TXL, 18 AWG RED	84
-	EC-3299-18-BLK	WIRE, TXL, 18 AWG BLACK	84



20.4.4 Cab and Overhead Guard Option – TTR12-CAB-3

DESCRIPTION:

- Operator cab includes heater, defrost fan, front and rear wipers, dome light, and other features
- Includes led strobe lamp mounted to overhead guard

NOTE: The guard is an operator guard, not a ROPS (rollover protection system)

NOTE: If foam tape is provided with cab, H-1204-20 is not required

NOTE: Trim foam tape to fit after applying to all mounting flanges

See Sections 20.4.2 and 20.4.3 for detailed installation information

COMPATIBILITY NOTES: The cab roof vent is not usable when the standard overhead guard is installed over top of the cab

Parts List

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	H-4657	TTR-12 CAB - VENDOR ASSY	1
2	TT00-14-001-CA	HEATER CORE	1
3	N-3125	ADAPTER, M16 TO 5/8 JIC M	1
4	N-3126-16	WASHER, BONDED SEAL, 16MM	1
5	N-2069-05-S	ELBOW, SWIVEL, -10	1
6	05710B-106	HOSE BARB - 6 NPT M - 10 HOSE BARB	1
7	TF-1260-10-05.0	HOSE, HEATER, -10	1
8	TF-1260-10-59.0	HOSE, HEATER, -10	1
9	TF-1260-10-27.5	HOSE, HEATER, -10	1
10	TF-1260-10-23.0	HOSE, HEATER, -10	1
11	H-3521-11	CLAMP, CUSHIONED LOOP 1"	2
12	H-1426-04	CLAMP, HOSE, SAE -12	8
13	V-2825	RH DASH PLACARD, CAB OPT	1
14	DTP04-4P	DEUTSCH CONNECTOR	1
15	W4P	DEUTSCH LOCK	1
16	0460-215-16141	DEUTSCH TERMINAL	4
17	EC-3146-02	30A FUSE, MIDI/AMI	1
18	EC-3275	FUSE HOLDER, 4 PLACE	1
19	NPN	FORK TERMINAL - 8 FORK TERM - 16-14 AWG	4
20	N-3096	CONNECTOR, BULKHEAD	1
21	N-3092	HOSE BARB, 3/8 M NPT X 5/8 BARB	2
22	G-1720-103510	SCR,#10-32X1.0 MACH HEX WSH HD	4
23	G-1202-1035	STOPNUT, #10-32 ELASTIC	4
24	G-1250-1030N	FLATWASHER, #10 NARROW	4
25	G-1250-1070W	FLATWASHER, 3/8 WIDE	22
26	G-1251-1070R	LOCKWASHER, 3/8 REGULAR	22
27	G-1420-107010	BOLT, 3/8-16 X 1.0" HEX HD GR 8	22
28	AE-OPT-0051	CONVEX MIRROR, 5"	1
29	A-TT10-00314	WEATHERSTRIP, D SHAPE, 1/2x1/2	2



20.4.4 Cab and Overhead Guard Option (continued)

Parts List

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
30	EC-1326-02	DISCONNECT, FEMALE BLU 1/4 F/I	4
31	EC-1327-03	DISCONNECT, MALE YELLOW 1/4	3
32	H-1204-20-033.5	TAPE, NEOPRENE FOAM SEALING	1
33	H-1204-20-033.5	TAPE, NEOPRENE FOAM SEALING	1
34	H-1204-20-061.0	TAPE, NEOPRENE FOAM SEALING	1
35	ATO-15	15 AMP 36V ATO FUSE	2
36	ATO-10	10 AMP 36V ATO FUSE	2
38	Z-10924	ASY, TTR-8 CAB POWER WIRING	1
39	MIN-10	MINI AUTOMOTIVE BLADE FUSE, 10A	1
40	Z-10936-00	WLD, OVERHEAD STRUCTURE (WP)	1
41	N/A	ASY, POST MOUNTED LED STROBE	1
42	S-3900-00	WIRING COVER (WP)	1
43	NVSP-24-022-CA	CABLE TIE ANCHOR STD (Ø.375 X .27 THK)	4

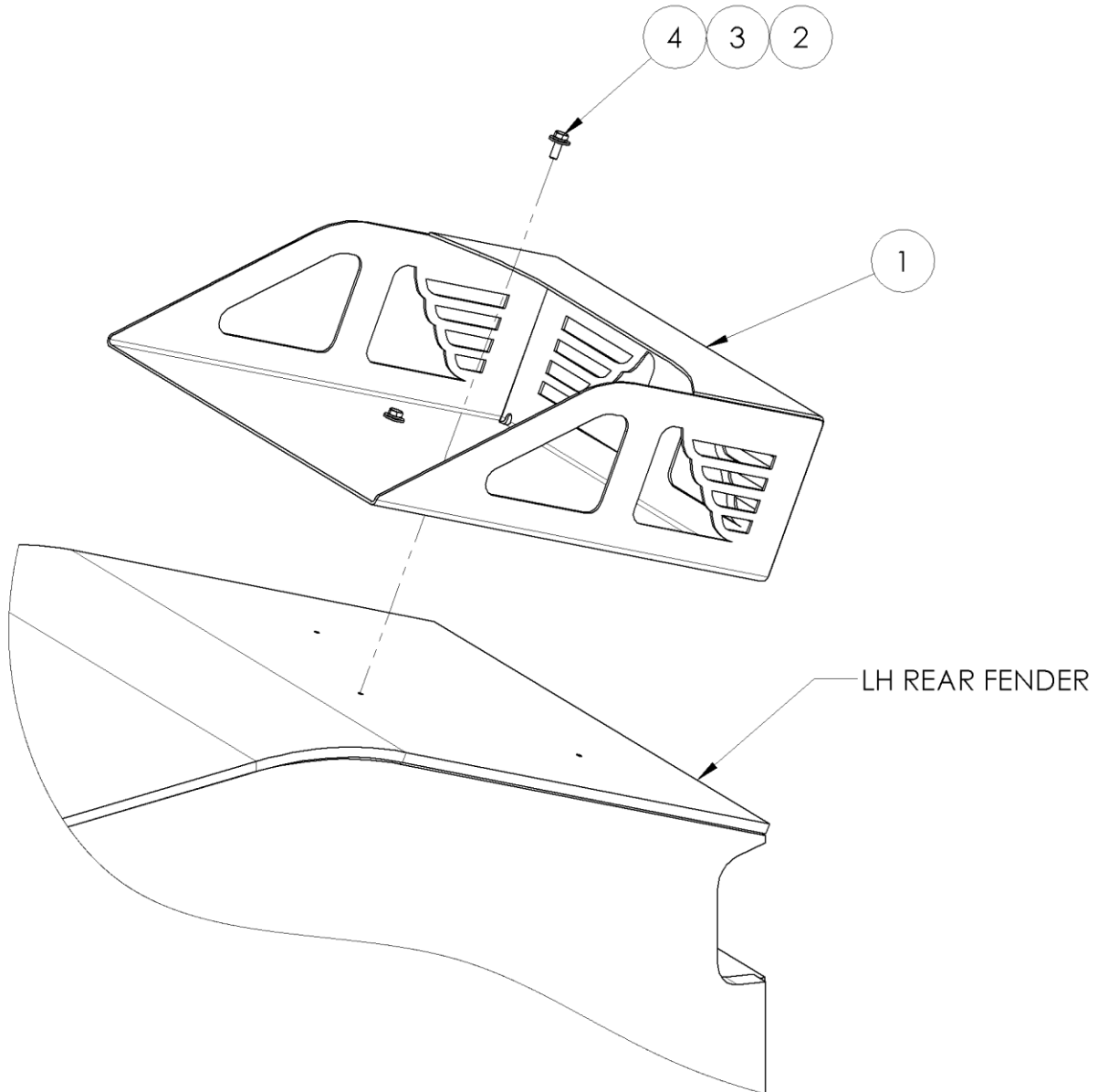


- 20.5 CHOCK BASKET FEATURE – TTR12-CHOCK
- 20.5.1 Standard No Chock Basket – TTR12-CHOCK-O
DESCRIPTION: Contains no parts or assemblies

COMPATIBILITY NOTES: No compatibility concerns

20.5.2 Chock Basket Option – TTR12-CHOCK-1
DESCRIPTION: Chock basket, located on the rear left fender

COMPATIBILITY NOTES: The mounting location is used for both the chock basket and the fire extinguisher. If the unit is equipped with both options, the fire extinguisher must be relocated to the rear right fender

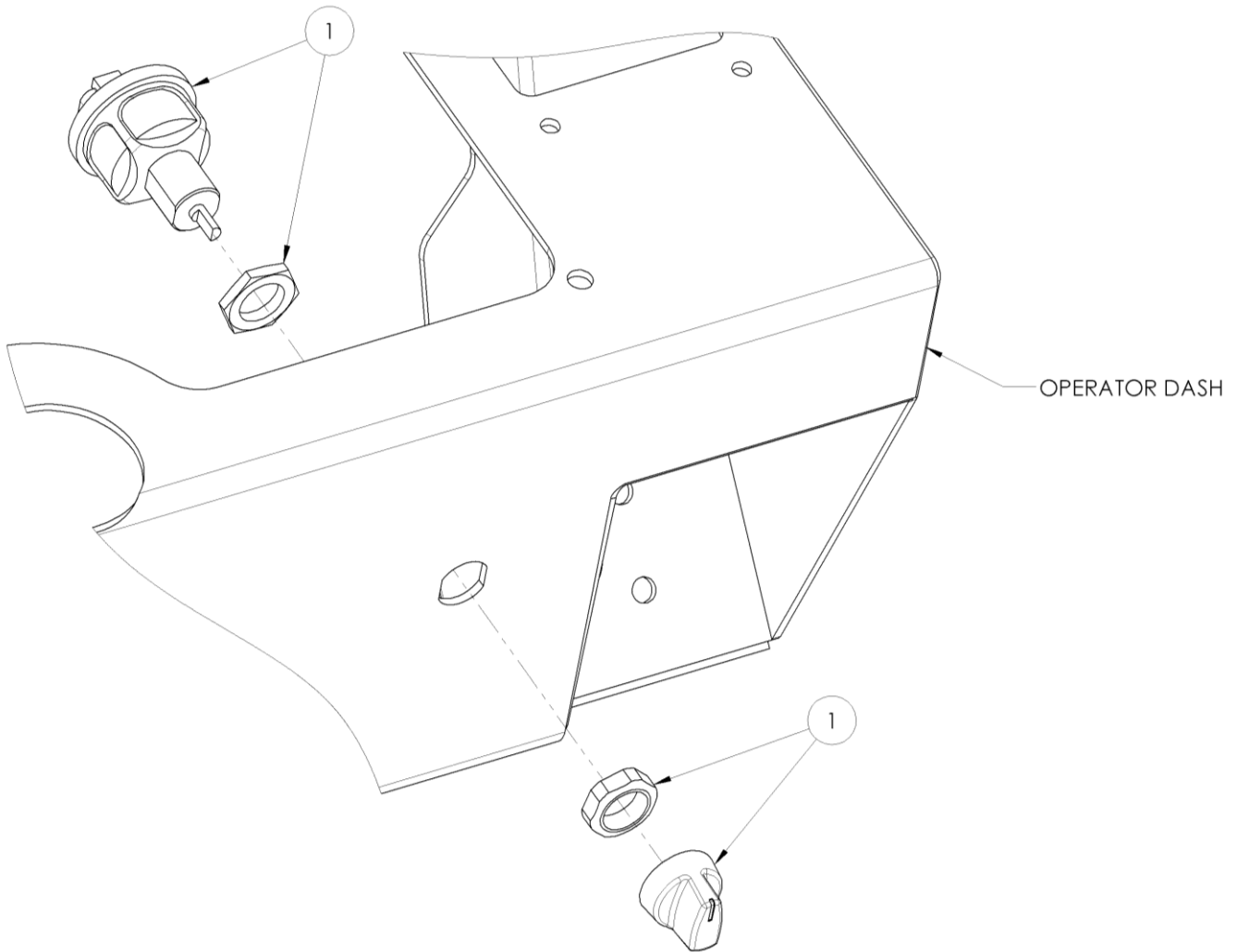


Parts List

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	Z-10980-00	CHOCK BASKET, TTR (P)	1
2	G-1250-1050W	FLATWASHER, 1/4 WIDE	3
3	G-1251-1050R	LOCKWASHER, 1/4 REGULAR	3
4	G-1100-105006	BOLT, 1/4-20 X 3/4" LG HEX HD GR 5	3

- 20.6 IGNITION SWTCH FEATURE – TTR12-IGNITION
 - 20.6.1 Standard Keyless Ignition – TTR12-IGN-O
- COMPATIBILITY NOTES: No compatibility concerns

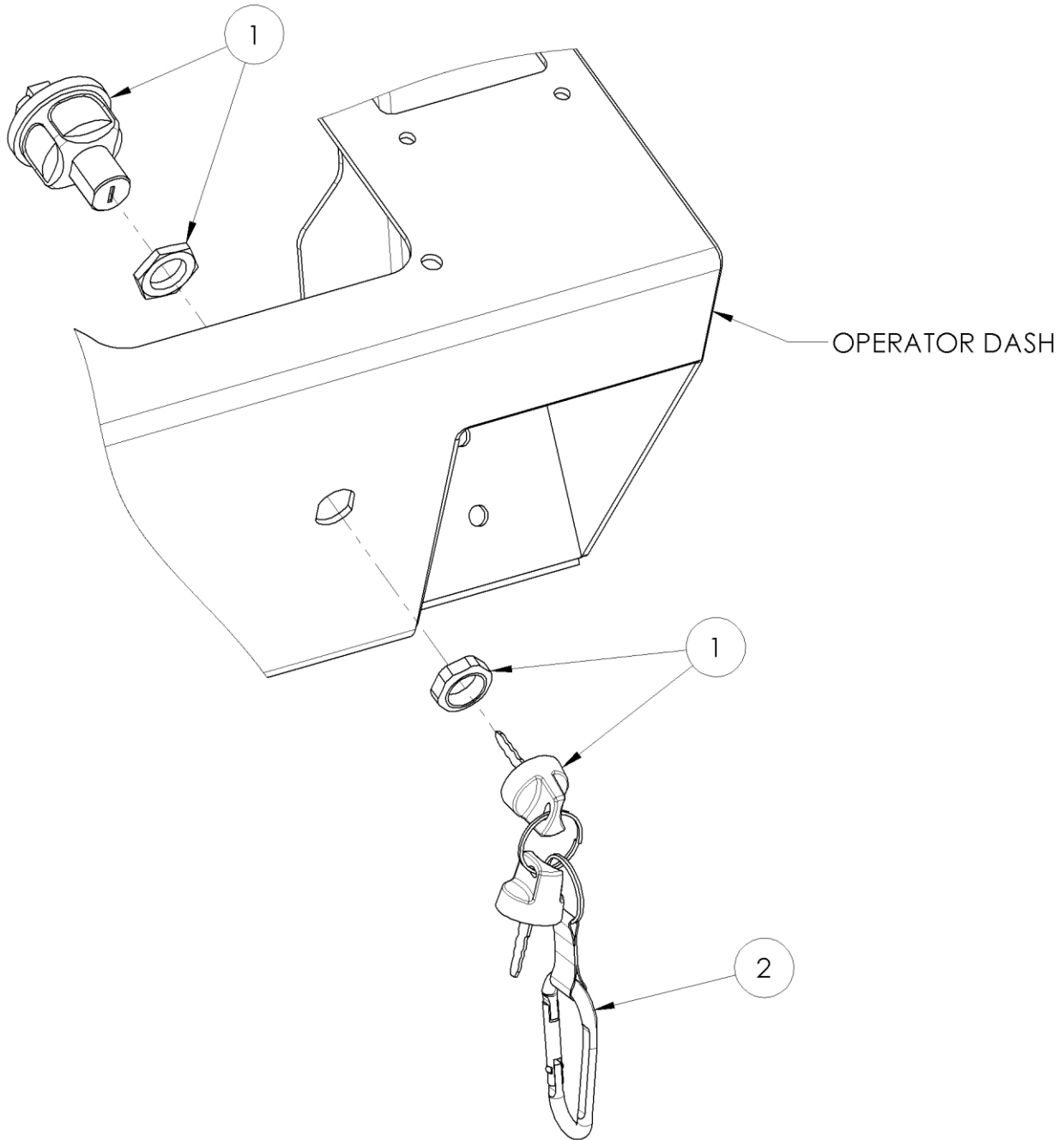


Parts List

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	NVSP-05-005-CB	KEYLESS IGNITION SWITCH, 3-POS	1

20.6.2 Keyed Ignition Option – TTR12-IGN--1
COMPATIBILITY NOTES: No compatibility concerns



Parts List

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	NVSP-05-005-CA	IGNITION SWITCH, 3-POS, KEYED	1
2	H-4725	CARABINER, EAGLE KEYCHAIN	1

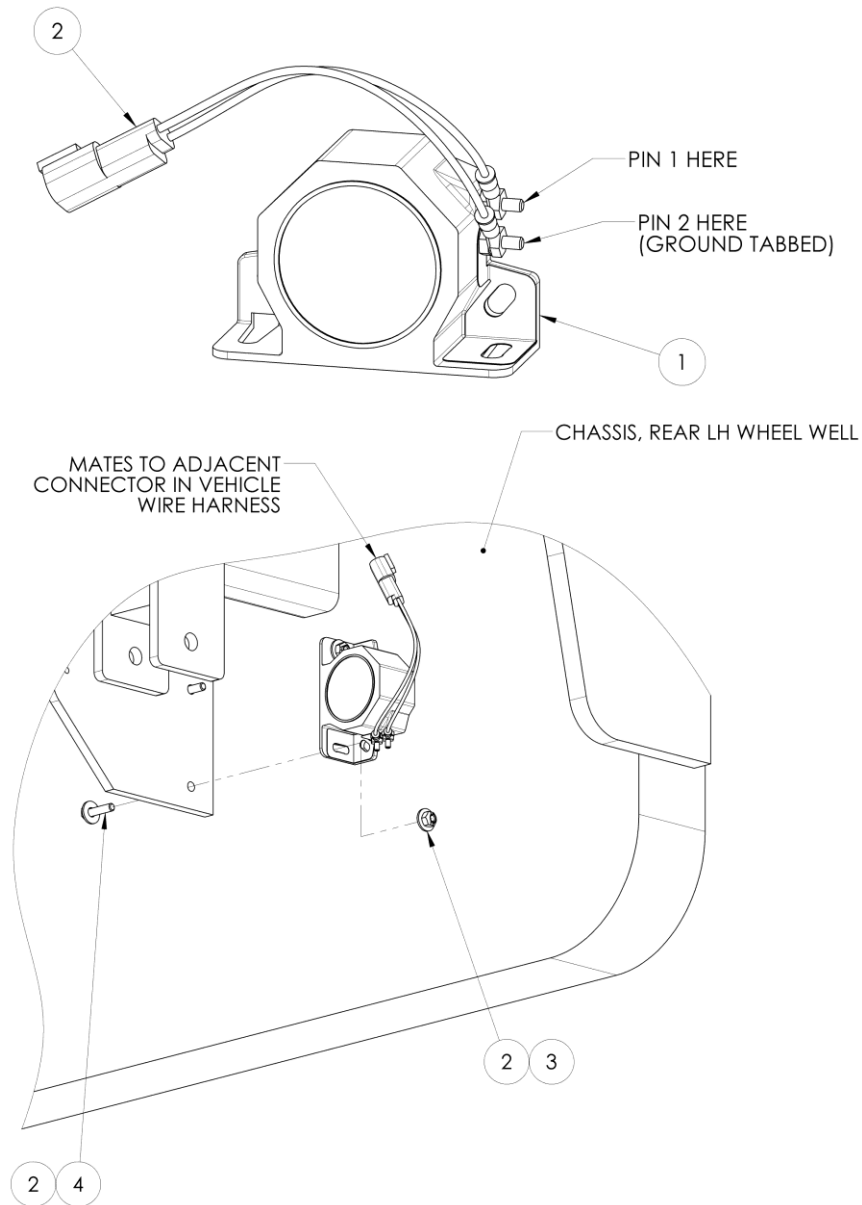


- 20.7 BACKUP ALARM FEATURE – TTR12-BACKUP
 - 20.7.1 Standard No Backup Alarm – TTR12-BACKUP-O
- DESCRIPTION: Contains no parts or assemblies
- COMPATIBILITY NOTES: No compatibility concerns

20.7.2 Backup Alarm Option – TTR12-BACKUP-1

DESCRIPTION: Backup alarm sounds audibly when the vehicle shifter is set to reverse. 97 dB

COMPATIBILITY NOTES: No compatibility concerns



Parts List

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	AE-OPT-0001	BACKUP ALARM	1
2	Z-11174	BACKUP ALARM PIGTAIL	1
3	G-1100-105012	BOLT, 1/4-20 X 1 1/4" LG HEX HD GR 5	2
4	G-1250-1050W	FLATWASHER, 1/4 WIDE	4
5	G-1727-1050	NUT, 1/4-20 TOP LOCK ZINC	2



20.8 LIGHTING FEATURE – TTR12-LIGHTING

20.8.1 Standard No Added Lighting – TTR12-LIGHTING-O

NOTE: headlights, S/T/T lamps, front and rear orange running-light lamps, rear spotlight, and flashing amber beacon are standard equipment

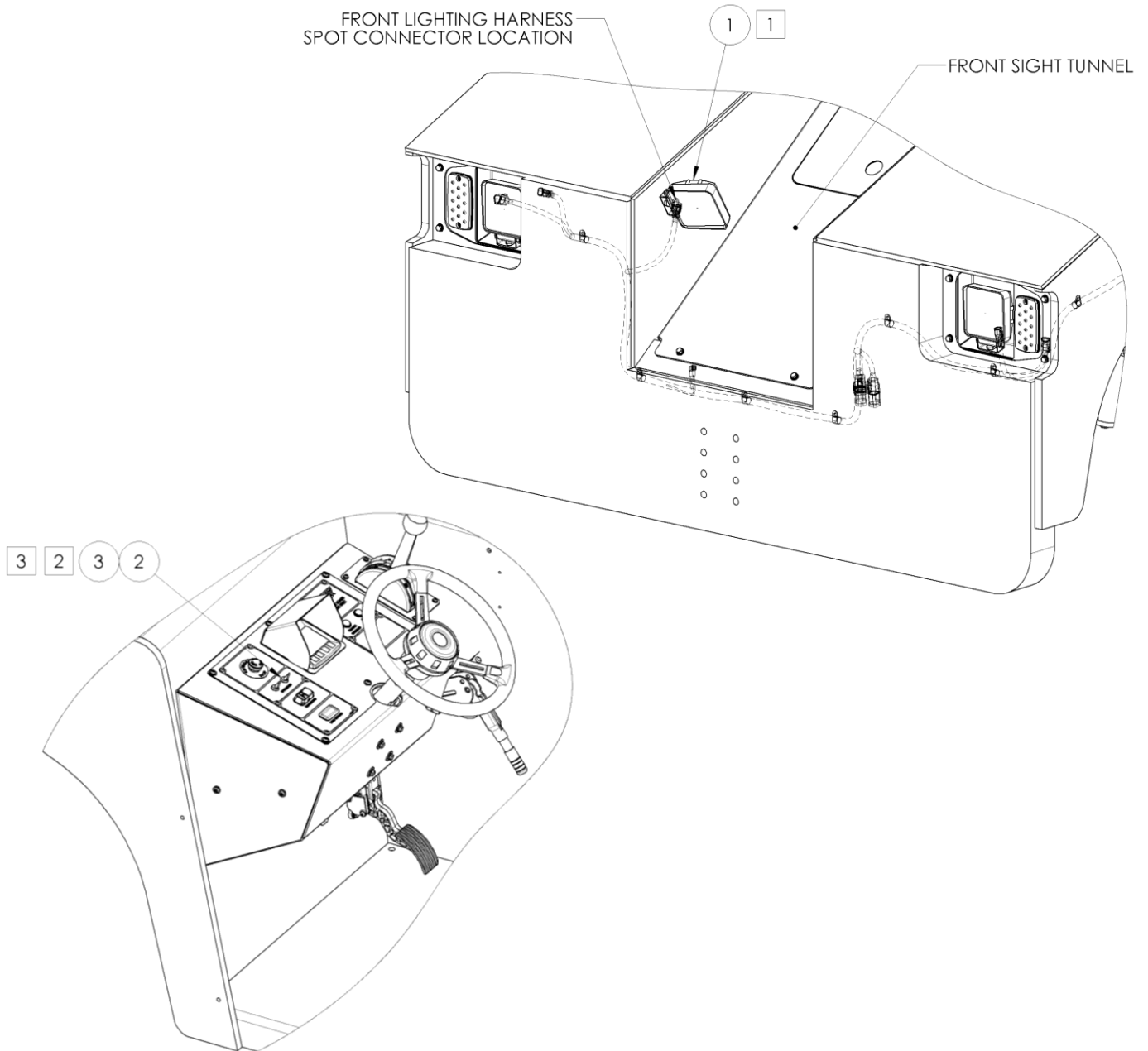
COMPATIBILITY NOTES: No compatibility concerns

20.8.2 Front Spotlight Option – TTR12-LIGHTING-1

NOTE: headlights, S/T/T lamps, front and rear orange running-light lamps, rear spotlight, and flashing amber beacon are standard equipment

COMPATIBILITY NOTES: No compatibility concerns

- 1 Discard mating connector dust cover
- 2 Discard stock part NVSP-14-044-CA, panel plug
- 3 Discard stock part Z-10863, single spotlight wiring assembly



Parts List

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	Z-9825	ASSY, HEADLIGHT W/CONNECTOR	1
2	NVSP-14-008-CA	SPOTLIGHT SWITCH DASH ILLUMINATED	1
3	Z-10911	ASSY, SPOT SWITCH WIRING	1



20.8.3 Turn Signal Option – TTR12-LIGHTING-2
DESCRIPTION: Self-cancelling turn signals.

FUNCTIONALITY:

MODE 1: press turn signal button for 1 second, turn signal light will flash for 7 seconds, then self-cancel. This mode is usually used when changing lanes.

MODE 2: press turn signal button for 2 seconds, turn signal light will flash for 20 seconds, then self-cancel. This mode is usually used when slowing down to go around a corner.

MODE 3: press turn signal button for 4 seconds, turn signal light will flash for 75 seconds, then self-cancel. This mode is usually used when stopping at a signal light and turn will be made after stopping.

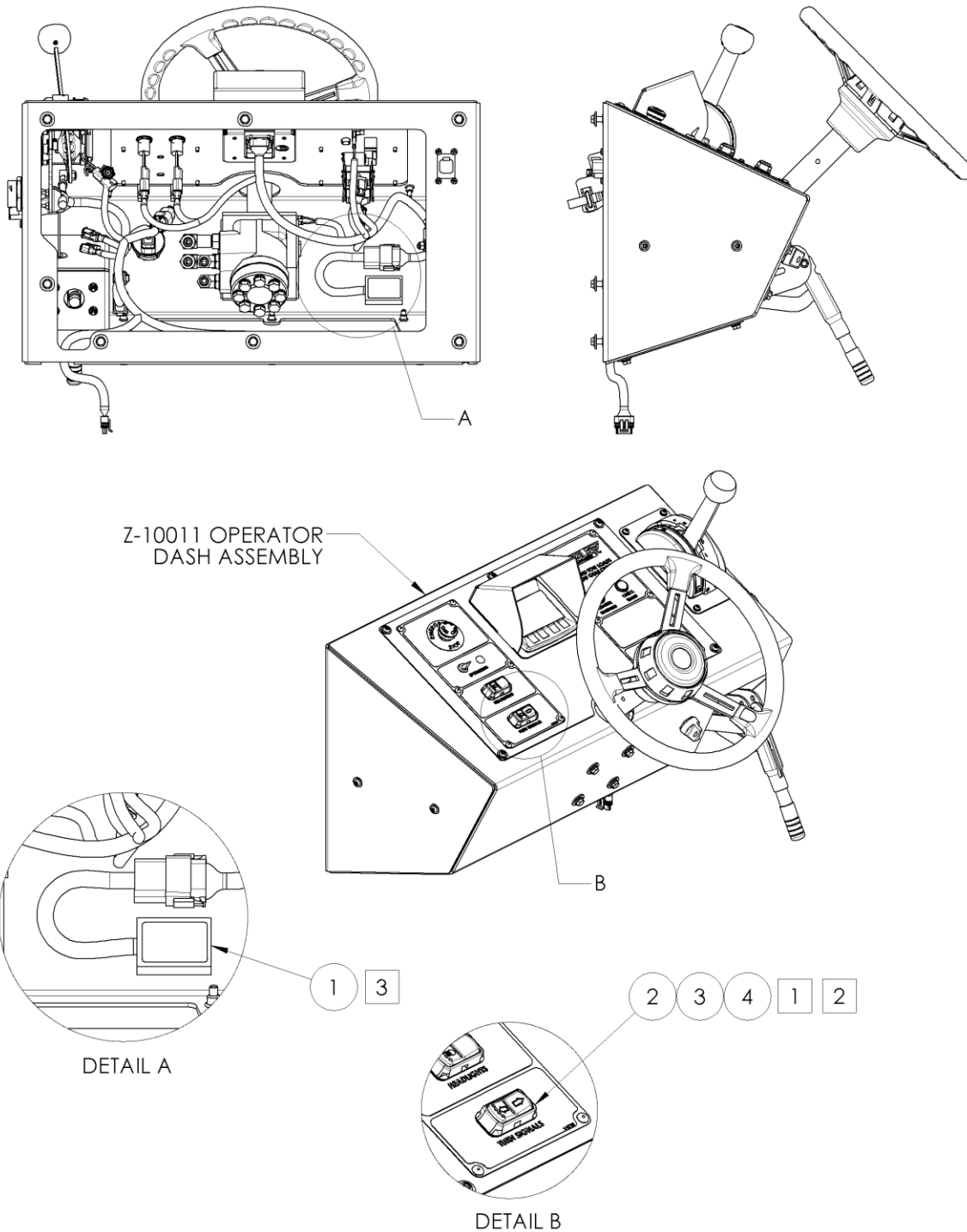
NOTE: ALL three modes above can be cancelled by pressing the same turn signal button a second time.

NOTE: headlights, S/T/T lamps, front and rear orange running-light lamps, rear spotlight, and flashing amber beacon are standard equipment.

COMPATIBILITY NOTES: No compatibility concerns

- 1 Discard stock parts NVSP-14-003-CA, NGR empty switch plug
- 2 Discard mating connector dust cover
- 3 Discard mating connector jumper plug

20.8.3 Turn Signal Option (continued)



Parts List

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	Z-10836	ASSY, TURN SIG MODULE WITH CONN	1
2	NVSP-14-001-CE	(ON)-OFF-(ON) SWITCH BASE	1
3	NVSP-14-002-CA	FWD-REV / TS ROCKER	1
4	Z-10912	ASSY, TURN SIGNAL SW WIRING	1

20.8.4 Turn Signal and Front Spotlight Option – TTR12-LIGHTING-3

TURN SIGNAL FUNCTIONALITY:

MODE 1: press turn signal button for 1 second, turn signal light will flash for 7 seconds, then self-cancel. This mode is usually used when changing lanes.

MODE 2: press turn signal button for 2 seconds, turn signal light will flash for 20 seconds, then self-cancel. This mode is usually used when slowing down to go around a corner.

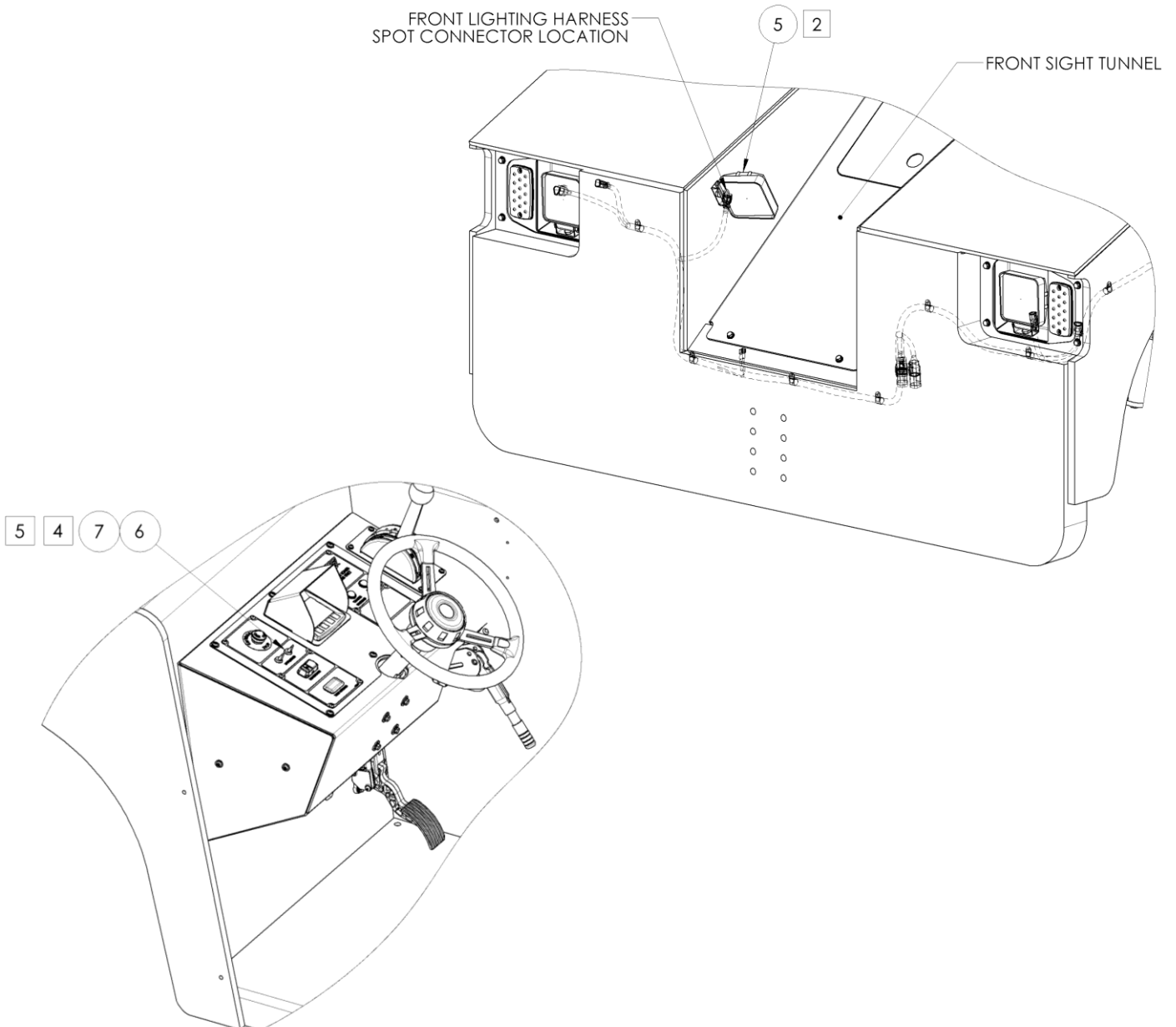
MODE 3: press turn signal button for 4 seconds, turn signal light will flash for 75 seconds, then self-cancel. This mode is usually used when stopping at a signal light and turn will be made after stopping.

NOTE: all three modes above can be cancelled by pressing the same turn signal button a second time.

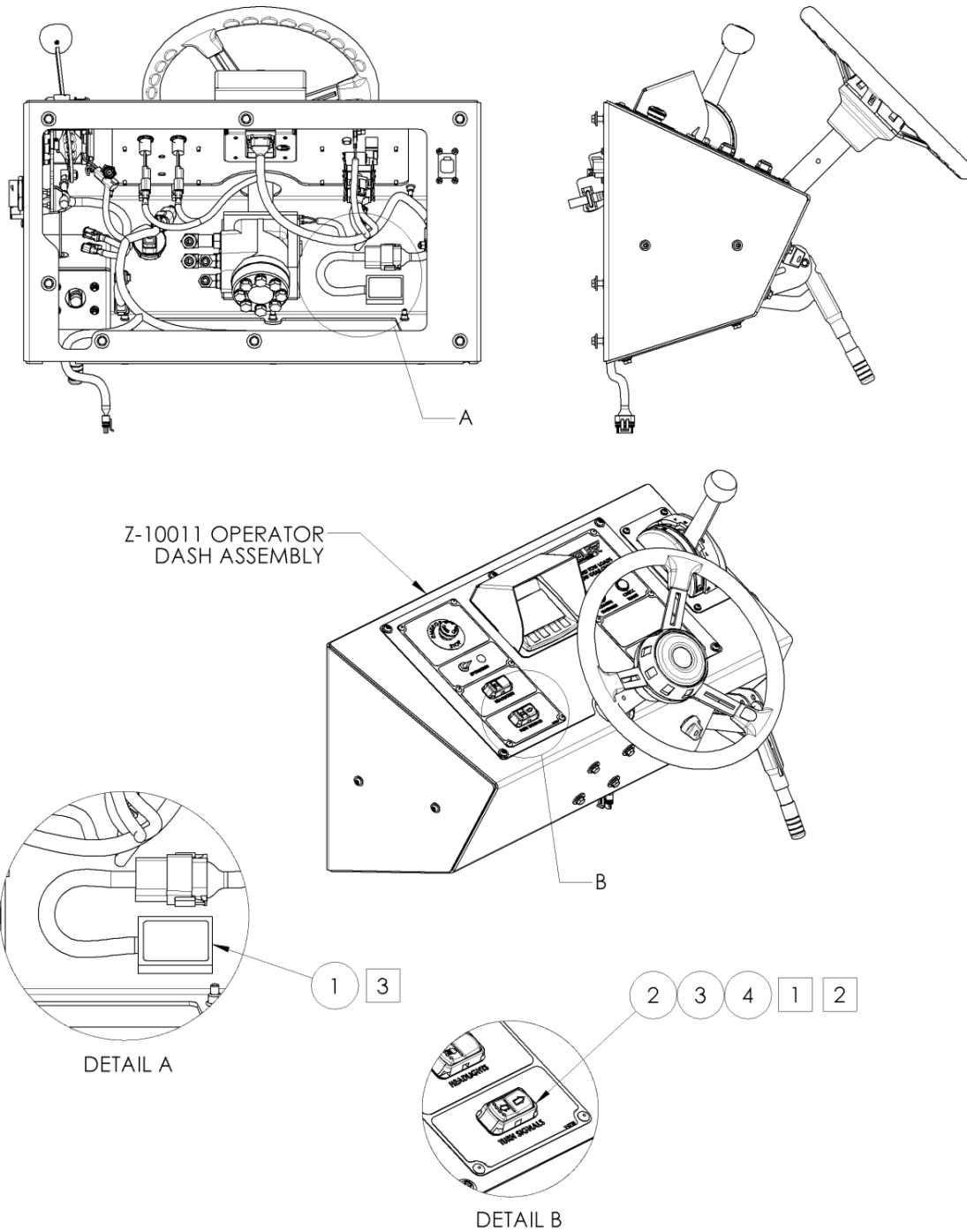
NOTE: headlights, S/T/T lamps, front and rear orange running-light lamps, rear spotlight, and flashing amber beacon are standard equipment.

COMPATIBILITY NOTES: No compatibility concerns

- 1 Discard stock parts NVSP-14-003-CA, NGR empty switch plug
- 2 Discard mating connector dust cover
- 3 Discard mating connector jumper plug
- 4 Discard stock part NVSP-14-044-CA, panel plug
- 5 Discard stock part Z-10863, single spotlight wiring assembly



20.8.4 Turn Signal and Right Rear Spotlight Option (continued)

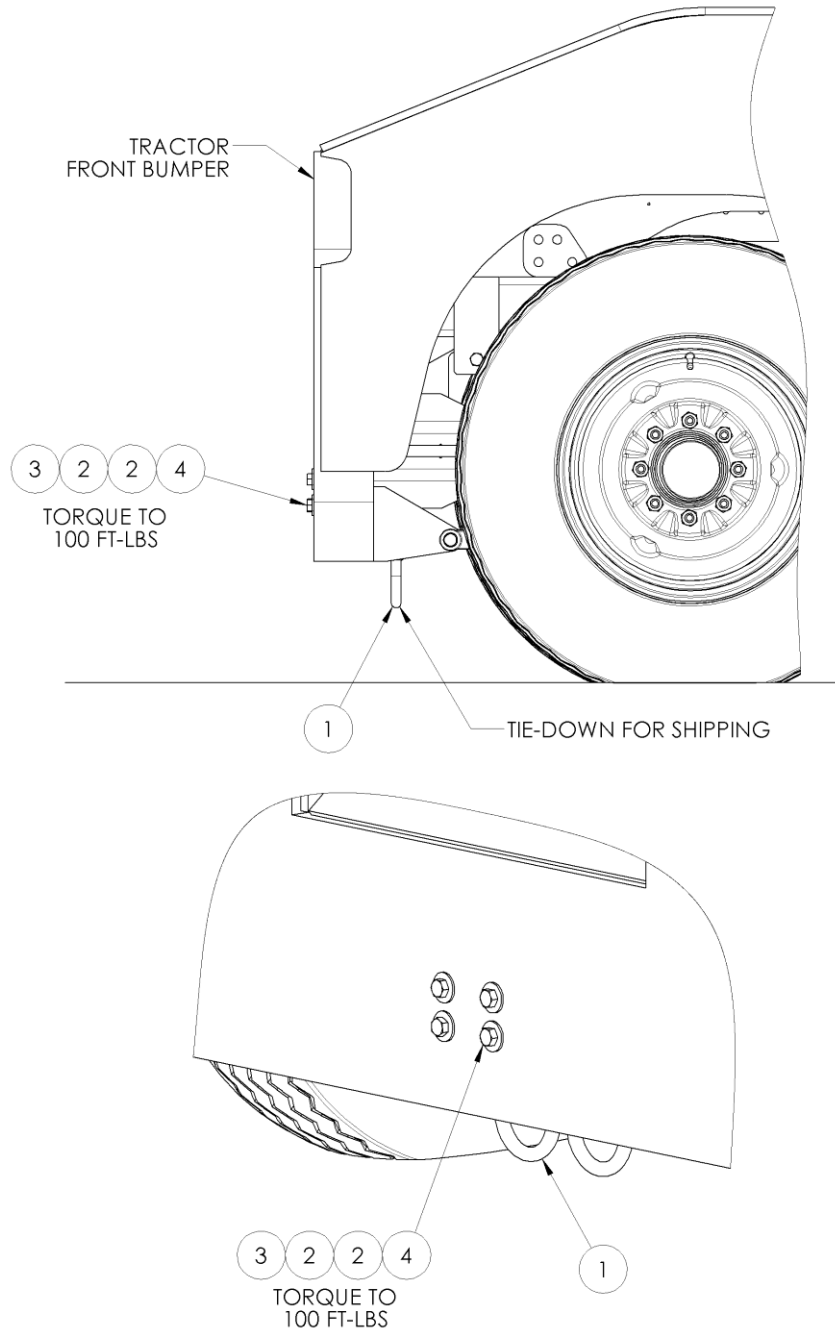


Parts List

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	Z-10836	ASSY, TURN SIG MODULE WITH CONN	1
2	NVSP-14-001-CE	(ON)-OFF-(ON) SWITCH BASE	1
3	NVSP-14-002-CA	FWD-REV / TS ROCKER	1
4	Z-10912	ASSY, TURN SIGNAL SW WIRING	1
5	Z-9825	ASSY, HEADLIGHT W/CONNECTOR	1
6	NVSP-14-008-CA	SPOTLIGHT SWITCH DASH ILLUMINATED	1
7	Z-10911	ASSY, SPOT SWITCH WIRING	1

- 20.9 FRONT HITCH FEATURE – TTR12-FRHITCH
 20.9.1 Standard No Front Hitch – TTR12-FRHITCH-O
 COMPATIBILITY NOTES: No compatibility concerns



Parts List

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

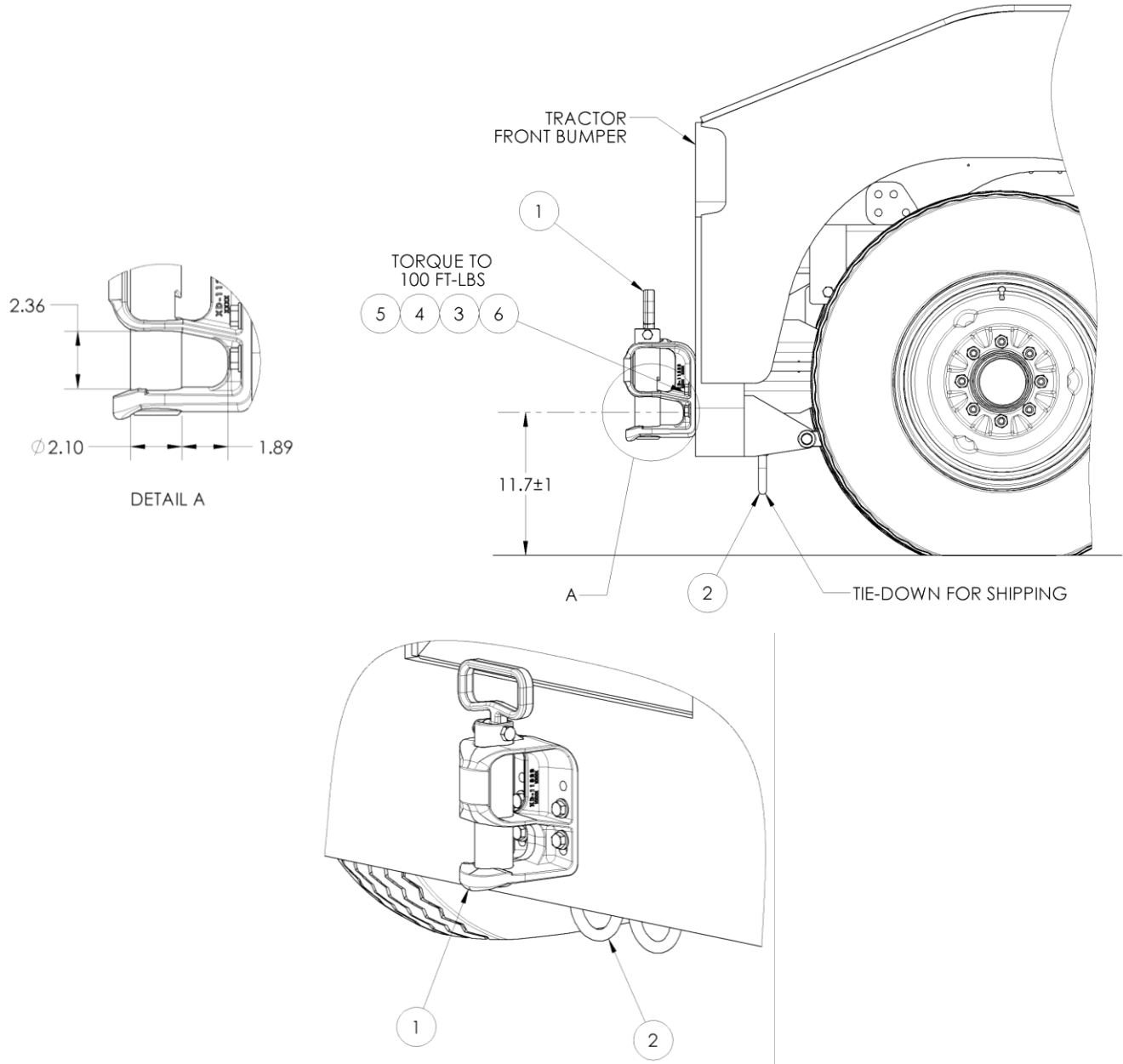
Item	Part Number	Description	Qty
1	Z-10536-00	WLD, TIE DOWN	1
2	G-1250-1090W	FLATWASHER, 1/2 WIDE	8
3	G-1727-1090	NUT, 1/2-13 TOP LOCK ZINC	4
4	G-1420-109054	BOLT, 1/2-13 X 5-1/2" HEX HD GR 8	4

20.9.2 Holland E-Hitch, Ø 2-1/8" Pin Option – TTR12-FRHITCH-A

DESCRIPTION:

- Cast steel construction
- Spring loaded hitch pin with retention capability in the up position.

COMPATIBILITY NOTES: No compatibility concerns



Parts List

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

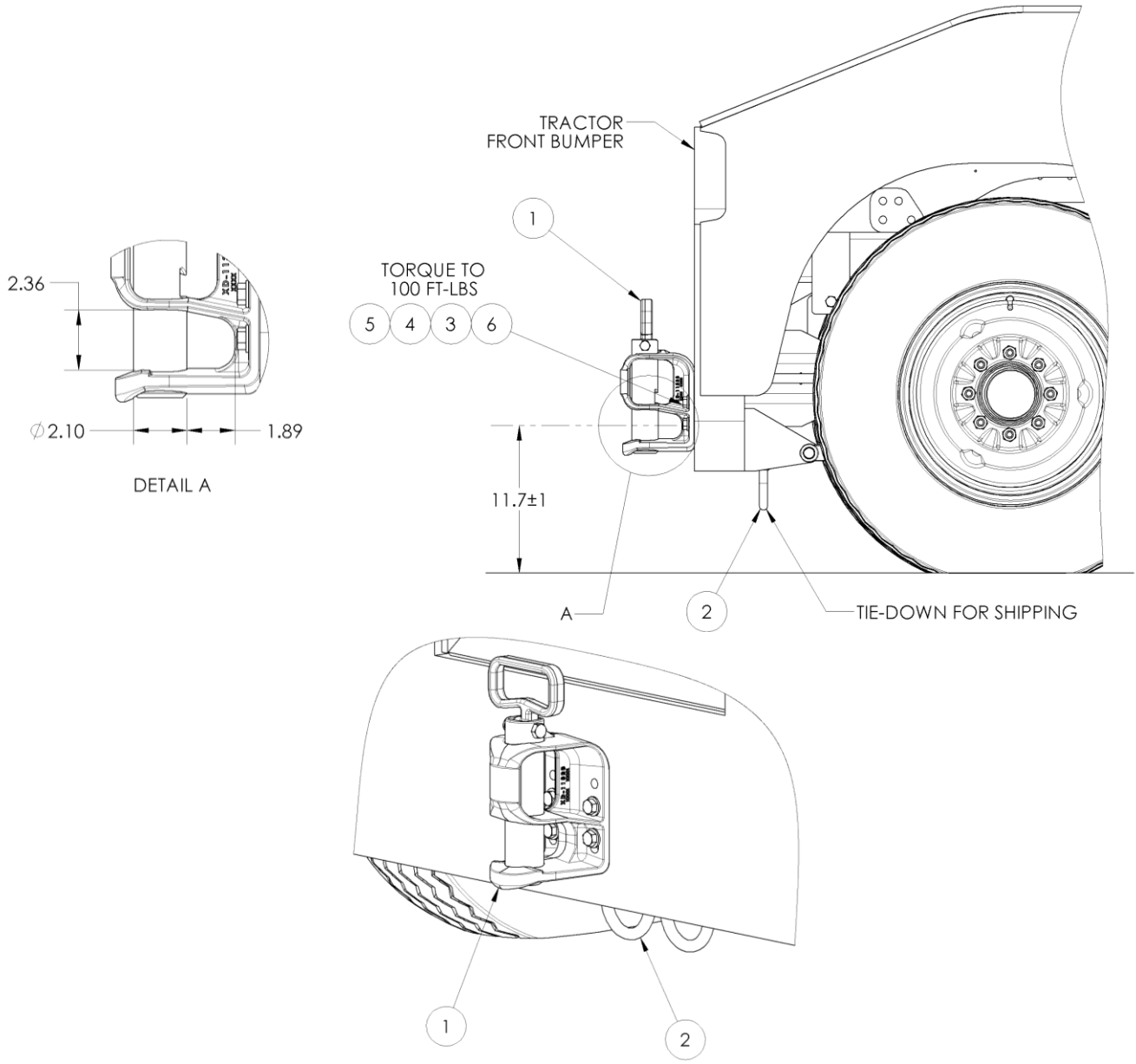
Item	Part Number	Description	Qty
1	AE-OPT-0033-1	E HITCH 2 1/8" PIN YELLOW	1
2	Z-10536-00	WLD, TIE DOWN	1
3	G-1250-1090N	FLATWASHER, 1/2 NARROW	4
4	G-1250-1090W	FLATWASHER, 1/2 WIDE	4
5	G-1727-1090	NUT, 1/2-13 TOP LOCK ZINC	4
6	G-1420-109054	BOLT, 1/2-13 X 5-1/2" HEX HD GR 8	4

20.9.3 Holland E-Hitch, Ø 2-1/8" Pin with Auto Lock Option – TTR12-FRHITCH-B

DESCRIPTION:

- Cast steel construction
- Spring loaded hitch pin with retention capability in the up position. The auto lock feature automatically locks the pin the down position and requires 1/8" twist before it can be raised

COMPATIBILITY NOTES: No compatibility concerns



Parts List

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

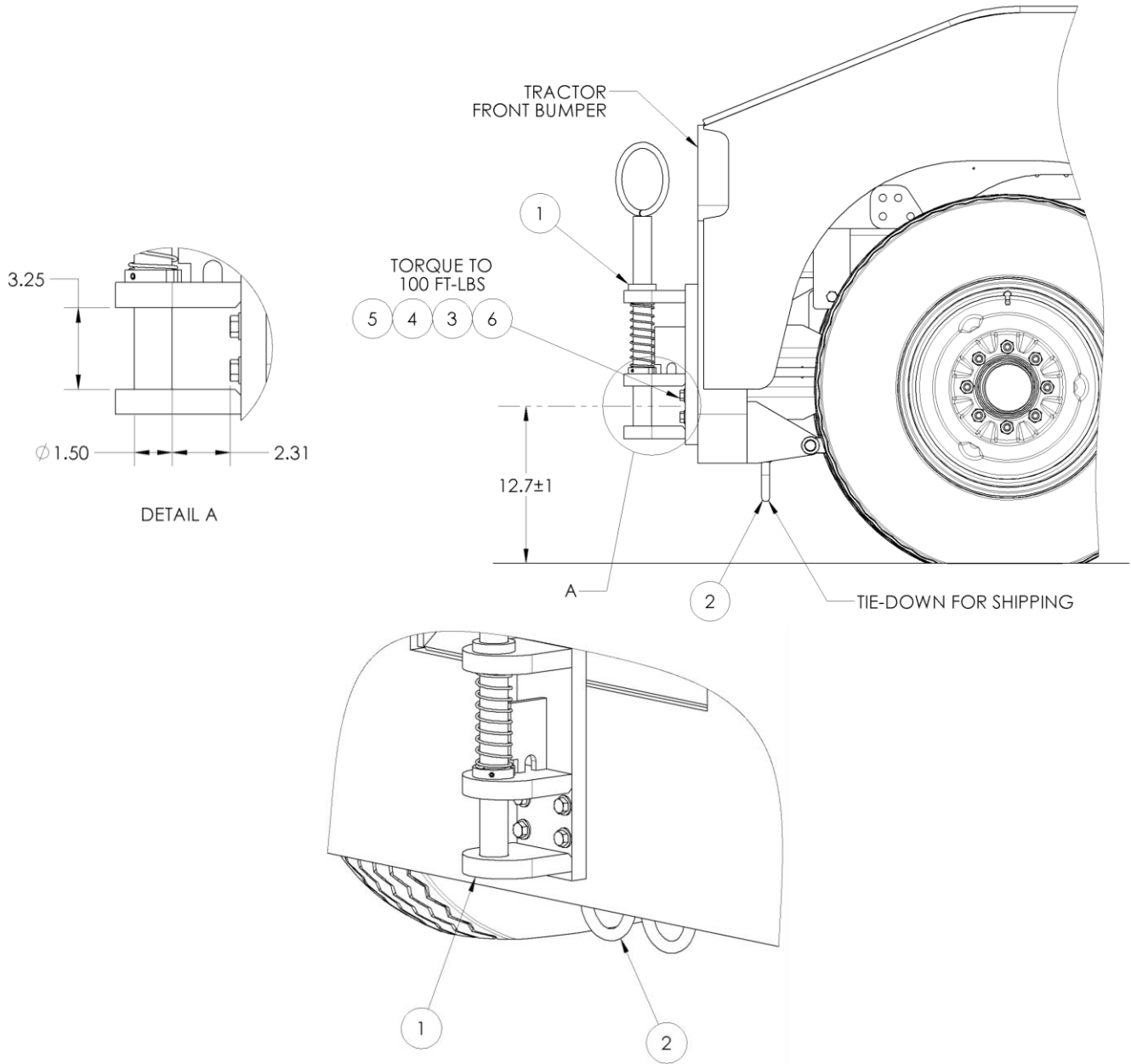
Item	Part Number	Description	Qty
1	OPT-NVSP-034-A	E HITCH 2 1/8" PIN WITH AUTOLOCK	1
2	Z-10536-00	WLD, TIE DOWN	1
3	G-1250-1090N	FLATWASHER, 1/2 NARROW	4
4	G-1250-1090W	FLATWASHER, 1/2 WIDE	4
5	G-1727-1090	NUT, 1/2-13 TOP LOCK ZINC	4
6	G-1420-109054	BOLT, 1/2-13 X 5-1/2" HEX HD GR 8	4

20.9.4 E-Hitch, Ø 1-1/2" Pin Option – TTR12-FRHITCH-C

DESCRIPTION:

- Fabricated steel plate construction
- Spring loaded hitch pin with retention capability in the up and down positions

COMPATIBILITY NOTES: No compatibility concerns



Parts List

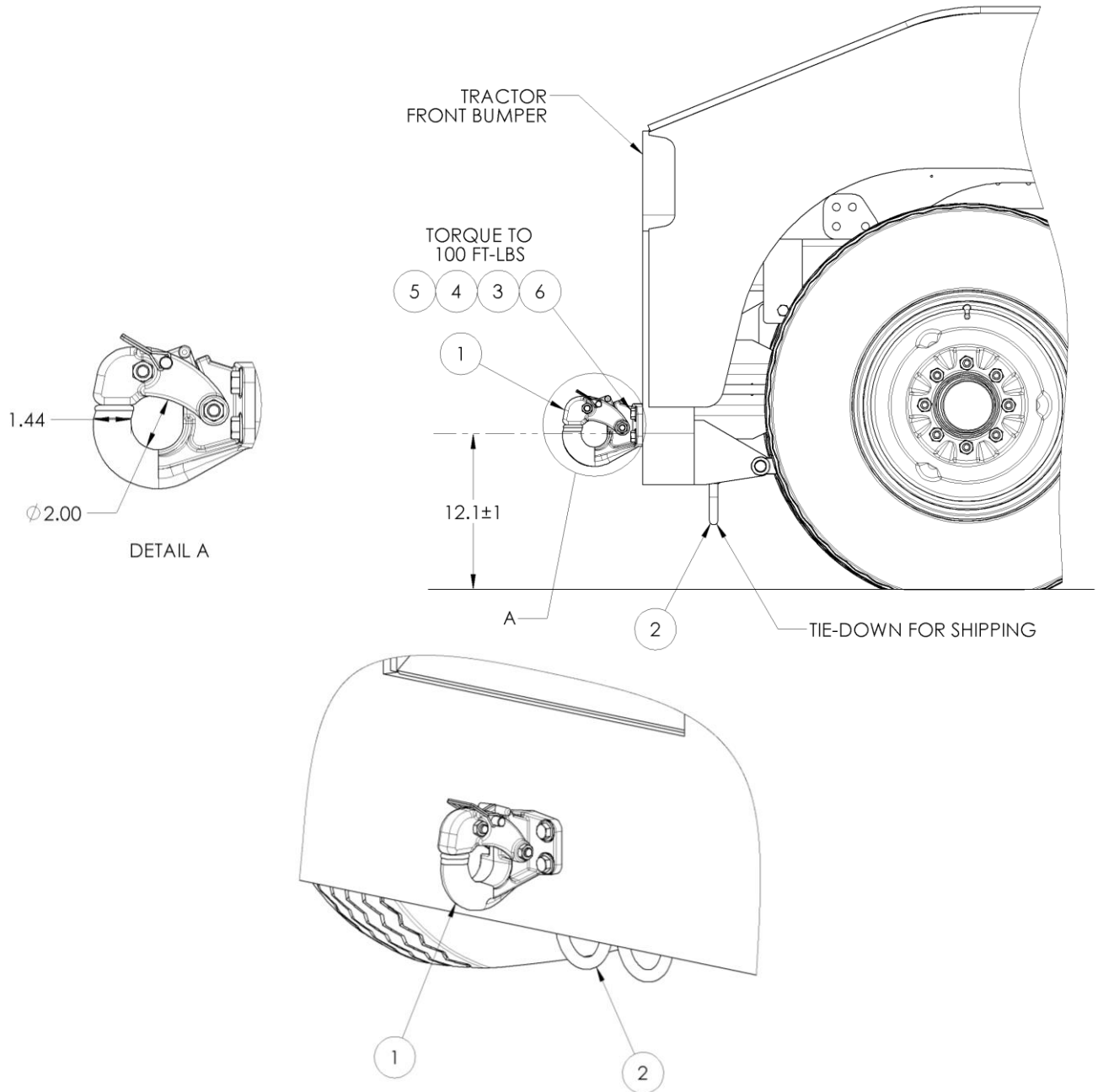
When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	AE-OPT-0033	E-HITCH, Ø1 1/2" PIN	1
2	Z-10536-00	WLD, TIE DOWN	1
3	G-1250-1090N	FLATWASHER, 1/2 NARROW	4
4	G-1250-1090W	FLATWASHER, 1/2 WIDE	4
5	G-1727-1090	NUT, 1/2-13 TOP LOCK ZINC	4
6	G-1420-109064	BOLT, 1/2-13 HEX HD GR 8	4

20.9.5 Pintle Hook Hitch Option – TTR12-FRHITCH-D

DESCRIPTION: Forged steel construction

COMPATIBILITY NOTES: No compatibility concerns

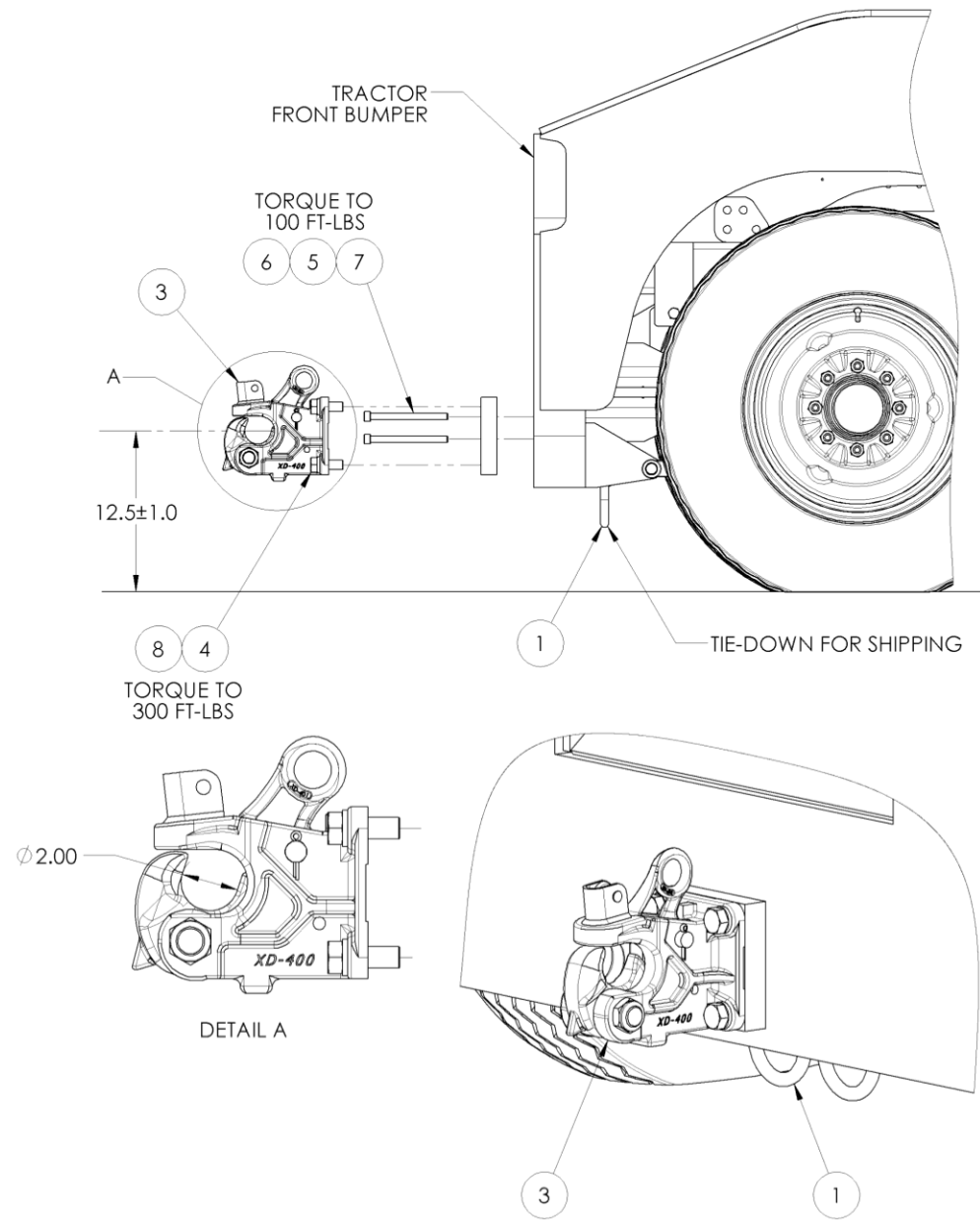


Parts List

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	AE-OPT-0028	PINTLE HOOK	1
2	Z-10536-00	WLD, TIE DOWN	1
3	G-1250-1090N	FLATWASHER, 1/2 NARROW	4
4	G-1250-1090W	FLATWASHER, 1/2 WIDE	4
5	G-1727-1090	NUT, 1/2-13 TOP LOCK ZINC	4
6	G-1420-109060	BOLT, 1/2-13 HEX HD GR 8	4

20.9.6 Pintle Hook Hitch, Heavy Duty Option – TTR12-FRHITCH-F
 DESCRIPTION: Forged steel construction with cable release pulley
 COMPATIBILITY NOTES: No compatibility concerns



Parts List

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

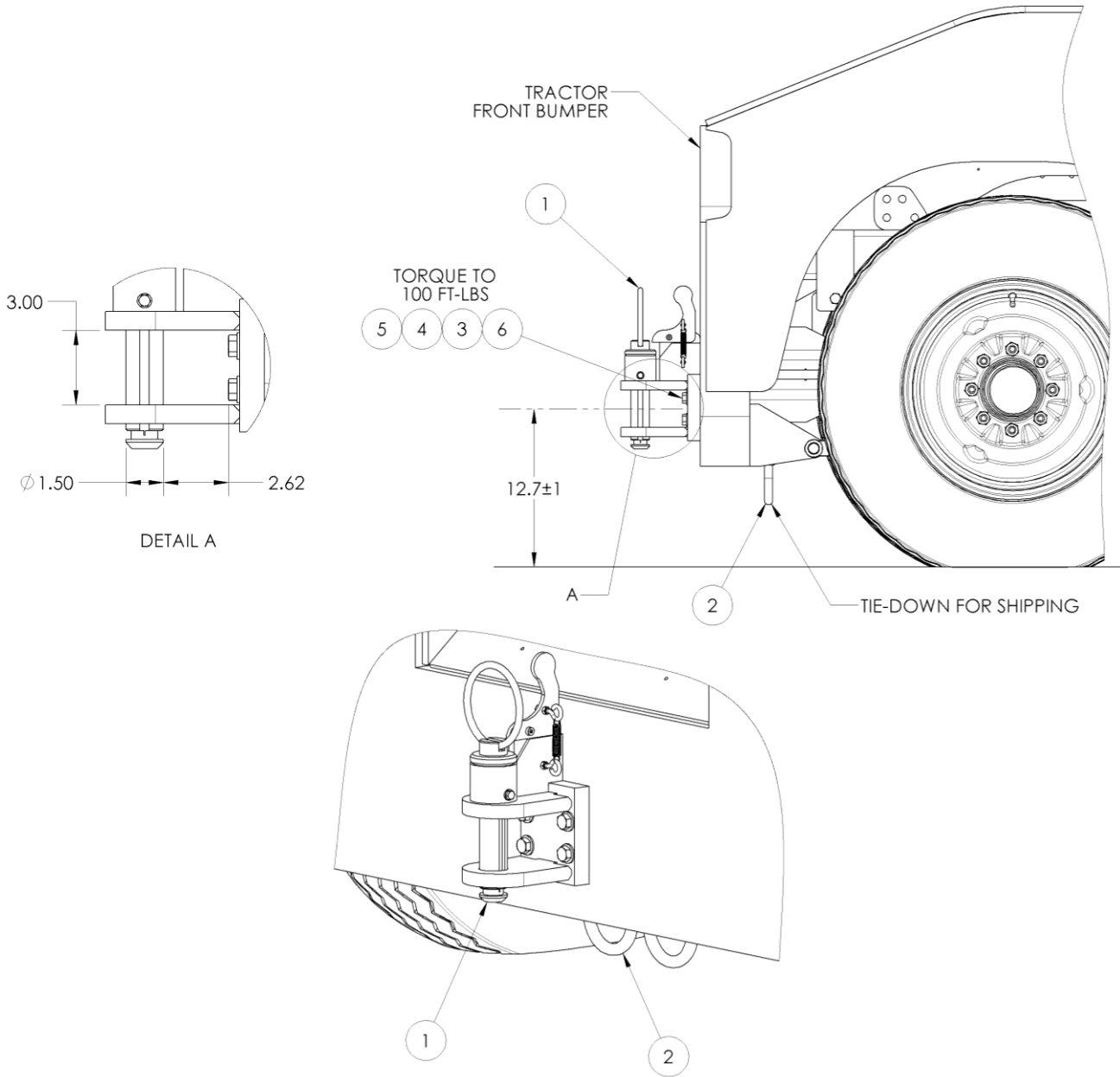
Item	Part Number	Description	Qty
1	Z-10536-00	WLD, TIE DOWN	1
2	SATS-02-002-SA	CP400 REAR HITCH ADAPTER, RETROFIT	1
3	AE-OPT-0030	HD PINTLE HITCH WITH RELEASE	1
4	G-1420-111020	BOLT, 3/4-10 X 2" HEX HD GR 8	4
5	G-1250-1090W	FLATWASHER, 1/2 WIDE	4
6	G-1727-1090	NUT, 1/2-13 TOP LOCK ZINC	4
7	G-1151-109760	SCR, 1/2-13 HEX SOC HD CAP	4
8	G-1251-1110R	LOCKWASHER, 3/4 REGULAR	4

20.9.7 Single Level Hitch, Ø 1-1/2" Pin Option – TTR12-FRHITCH-G

DESCRIPTION:

- Fabricated steel plate construction
- Retention capability in the up and down positions

COMPATIBILITY NOTES: No compatibility concerns



Parts List

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	K-5267	KIT, SINGLE LEVEL HITCH, 1.5IN	1
2	Z-10536-00	WLD, TIE DOWN	1
3	G-1250-1090N	FLATWASHER, 1/2 NARROW	4
4	G-1250-1090W	FLATWASHER, 1/2 WIDE	4
5	G-1727-1090	NUT, 1/2-13 TOP LOCK ZINC	4
6	G-1420-109064	BOLT, 1/2-13 HEX HD GR 8	4



20.9.8 Three Level Hitch, Ø 1-1/2" Pin Option – TTR12-FRHITCH-H

DESCRIPTION: Fabricated steel plate construction

CAPACITY:

Bottom lunette location: 120,000 tow capacity

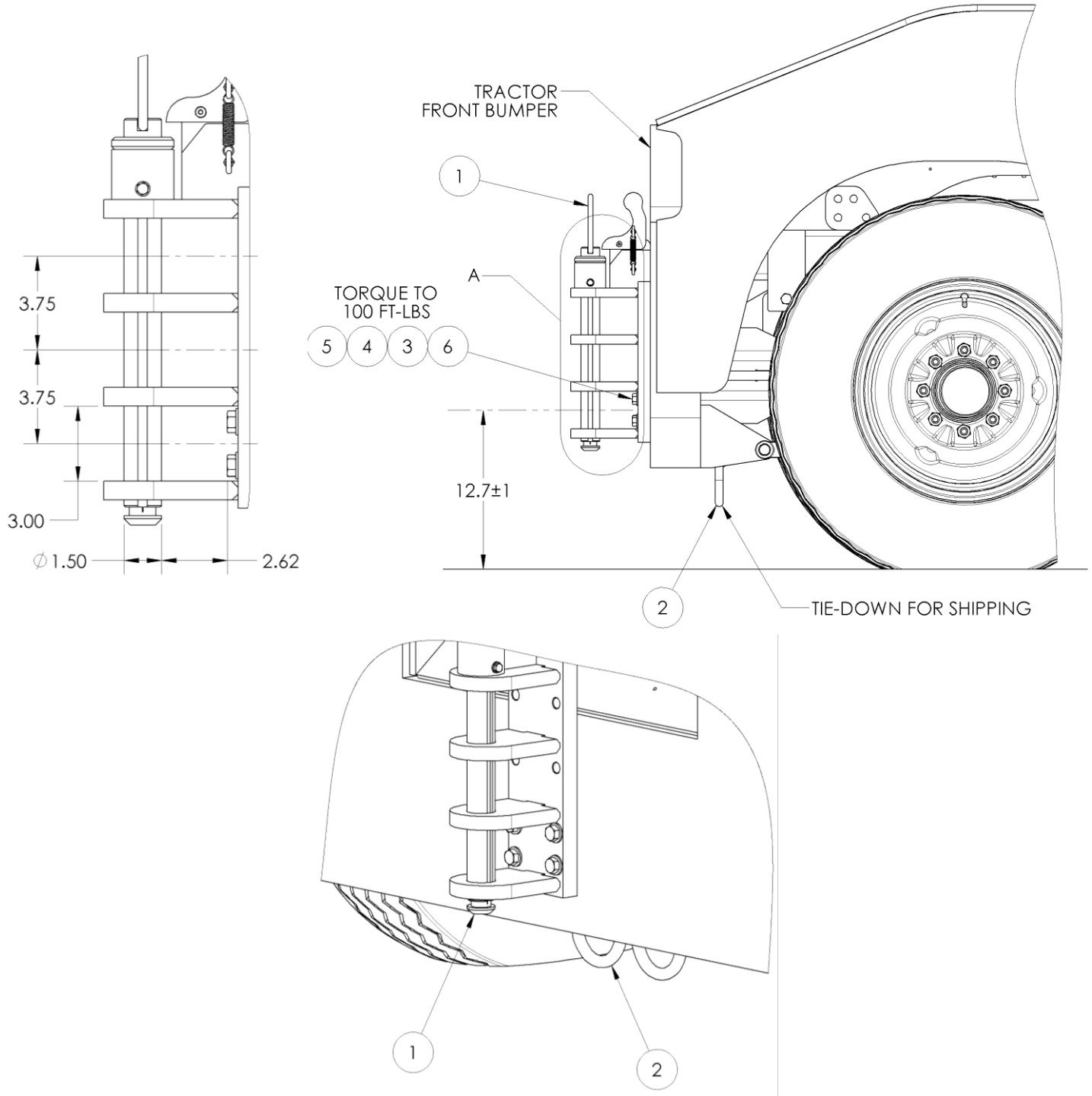
Center lunette location: 90,000 tow capacity

Top lunette location: 60,000 tow capacity

Retention capability in the up position

COMPATIBILITY NOTES: No compatibility concerns

20.9.8 Three Level Hitch, \varnothing 1-1/2" Pin Option (continued)

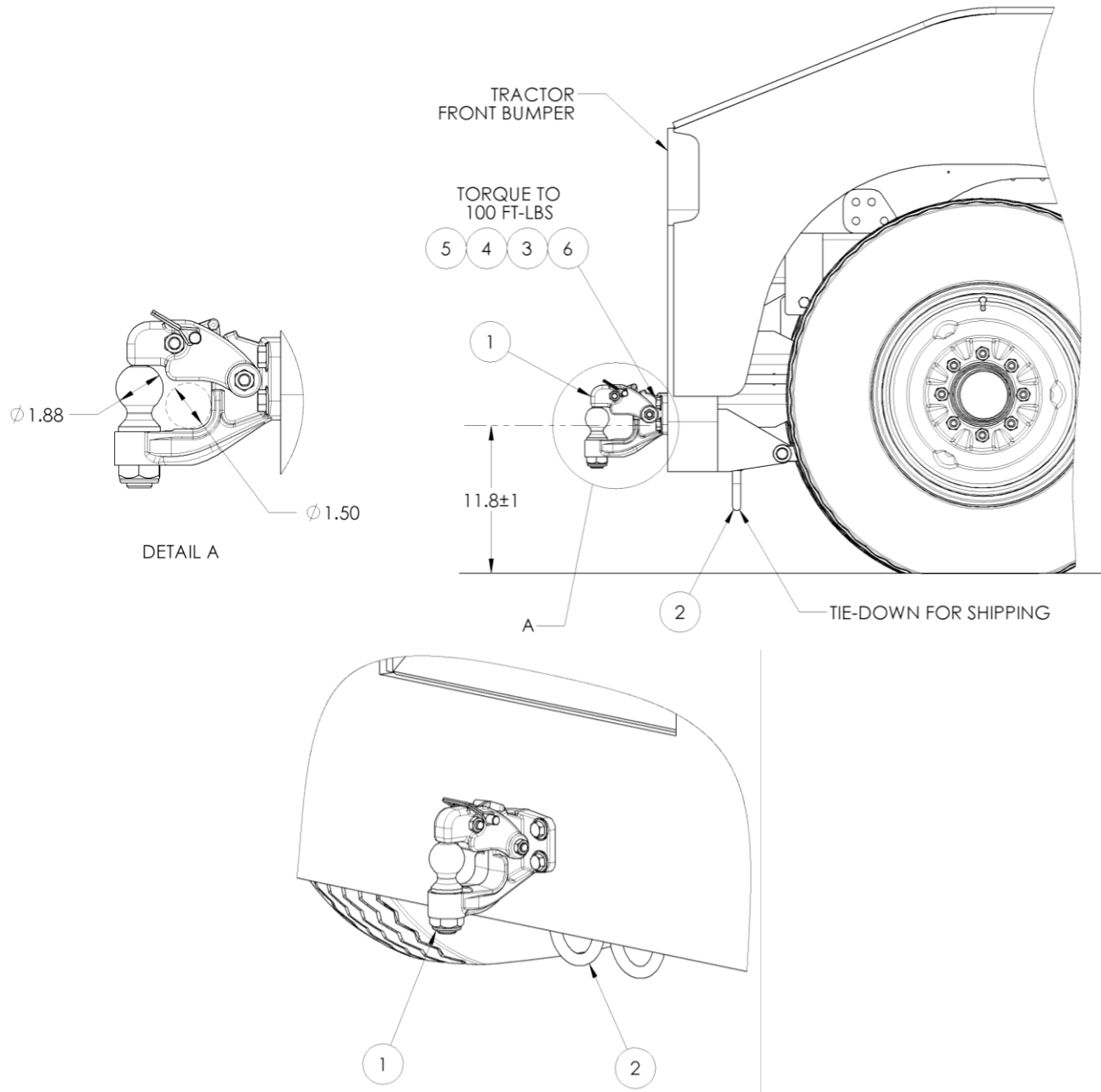


Parts List

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	K-5266	KIT, THREE LEVEL HITCH, 1.5IN	1
2	Z-10536-00	WLD, TIE DOWN	1
3	G-1250-1090N	FLATWASHER, 1/2 NARROW	4
4	G-1250-1090W	FLATWASHER, 1/2 WIDE	4
5	G-1727-1090	NUT, 1/2-13 TOP LOCK ZINC	4
6	G-1420-109064	BOLT, 1/2-13 HEX HD GR 8	4

20.9.9 Combo Pintle Ball Hitch 1-7/8" Ball Option – TTR12-FRHITCH-J
 DESCRIPTION: Forged steel construction with tethered lock pin
 COMPATIBILITY NOTES: No compatibility concerns

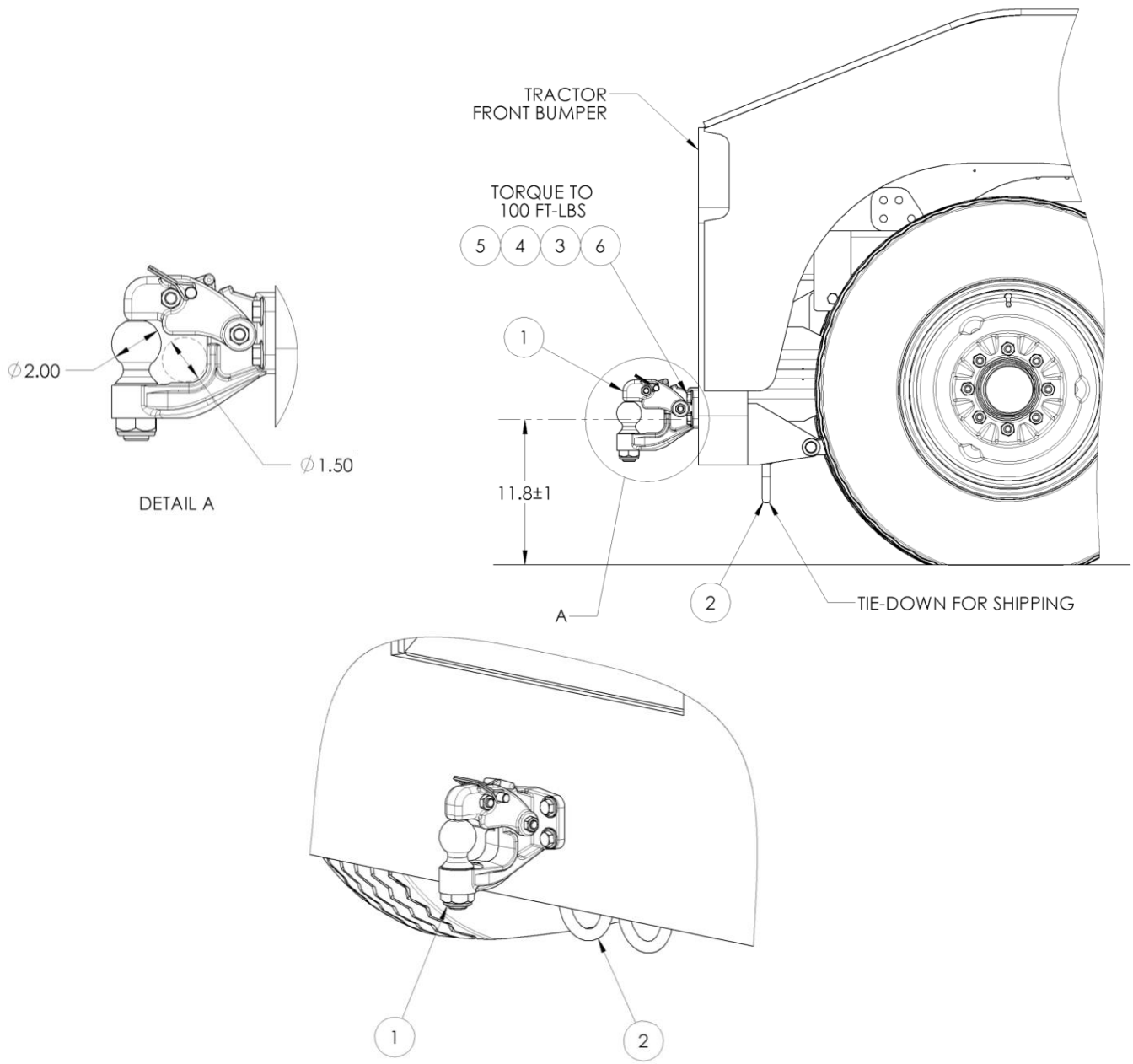


Parts List

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	AE-OPT-0040	COMBO PINTLE/BALL HITCH 1 7/8" BALL	1
2	Z-10536-00	WLD, TIE DOWN	1
3	G-1250-1090N	FLATWASHER, 1/2 NARROW	4
4	G-1250-1090W	FLATWASHER, 1/2 WIDE	4
5	G-1727-1090	NUT, 1/2-13 TOP LOCK ZINC	4
6	G-1420-109060	BOLT, 1/2-13 HEX HD GR 8	4

20.9.10 Combo Pintle Ball Hitch 2" Ball Option – TTR12-FRHITCH-K
 DESCRIPTION: Forged steel construction with tethered lock pin
 COMPATIBILITY NOTES: No compatibility concerns



Parts List

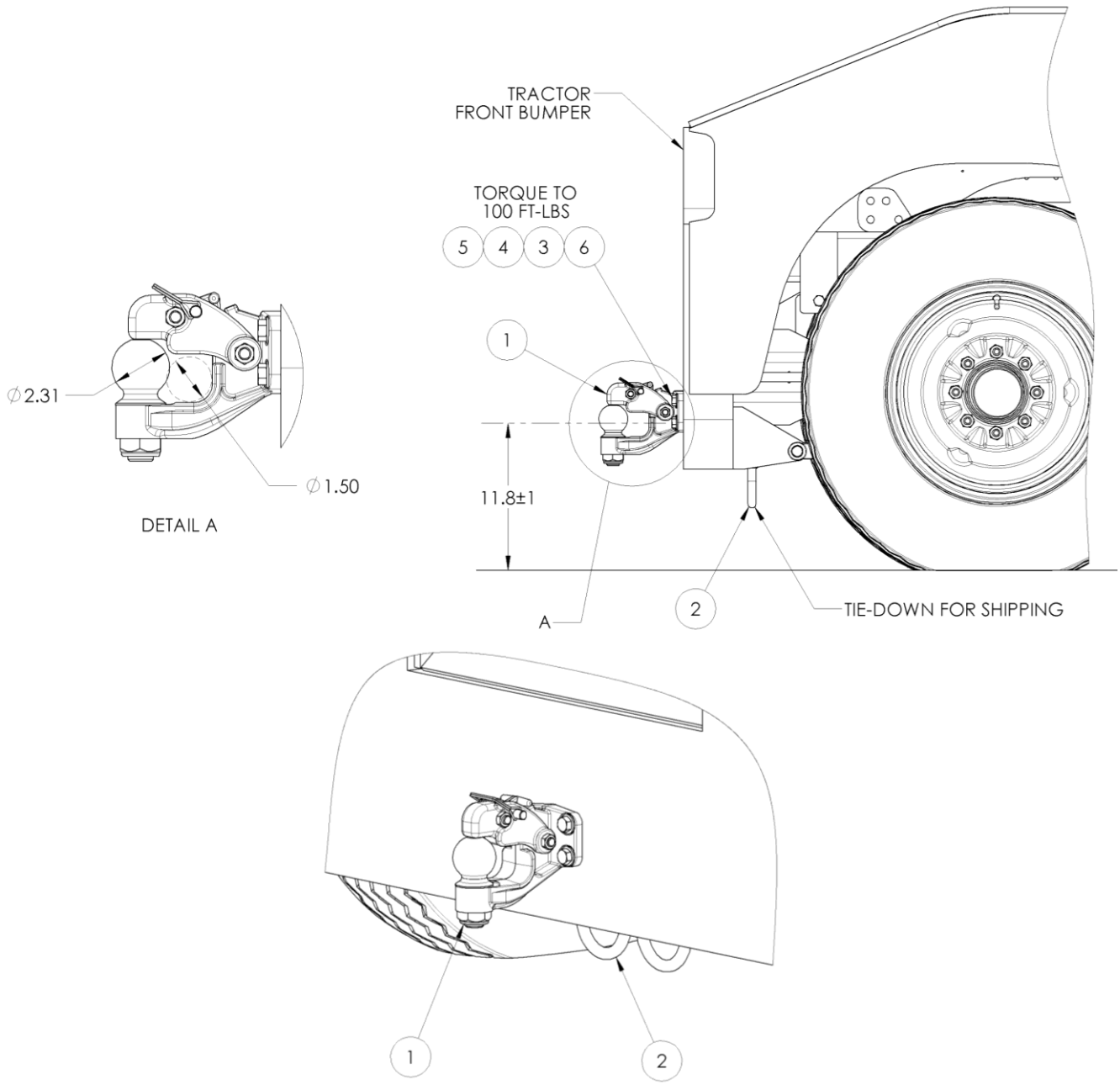
When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	AE-OPT-0045	COMBO PINTLE/BALL HITCH 2" BALL	1
2	Z-10536-00	WLD, TIE DOWN	1
3	G-1250-1090N	FLATWASHER, 1/2 NARROW	4
4	G-1250-1090W	FLATWASHER, 1/2 WIDE	4
5	G-1727-1090	NUT, 1/2-13 TOP LOCK ZINC	4
6	G-1420-109060	BOLT, 1/2-13 HEX HD GR 8	4

20.9.11 Combo Pintle Ball Hitch 2-5/16" Ball Option – TTR12-FRHITCH-L

DESCRIPTION: Forged steel construction with tethered lock pin

COMPATIBILITY NOTES: No compatibility concerns



Parts List

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

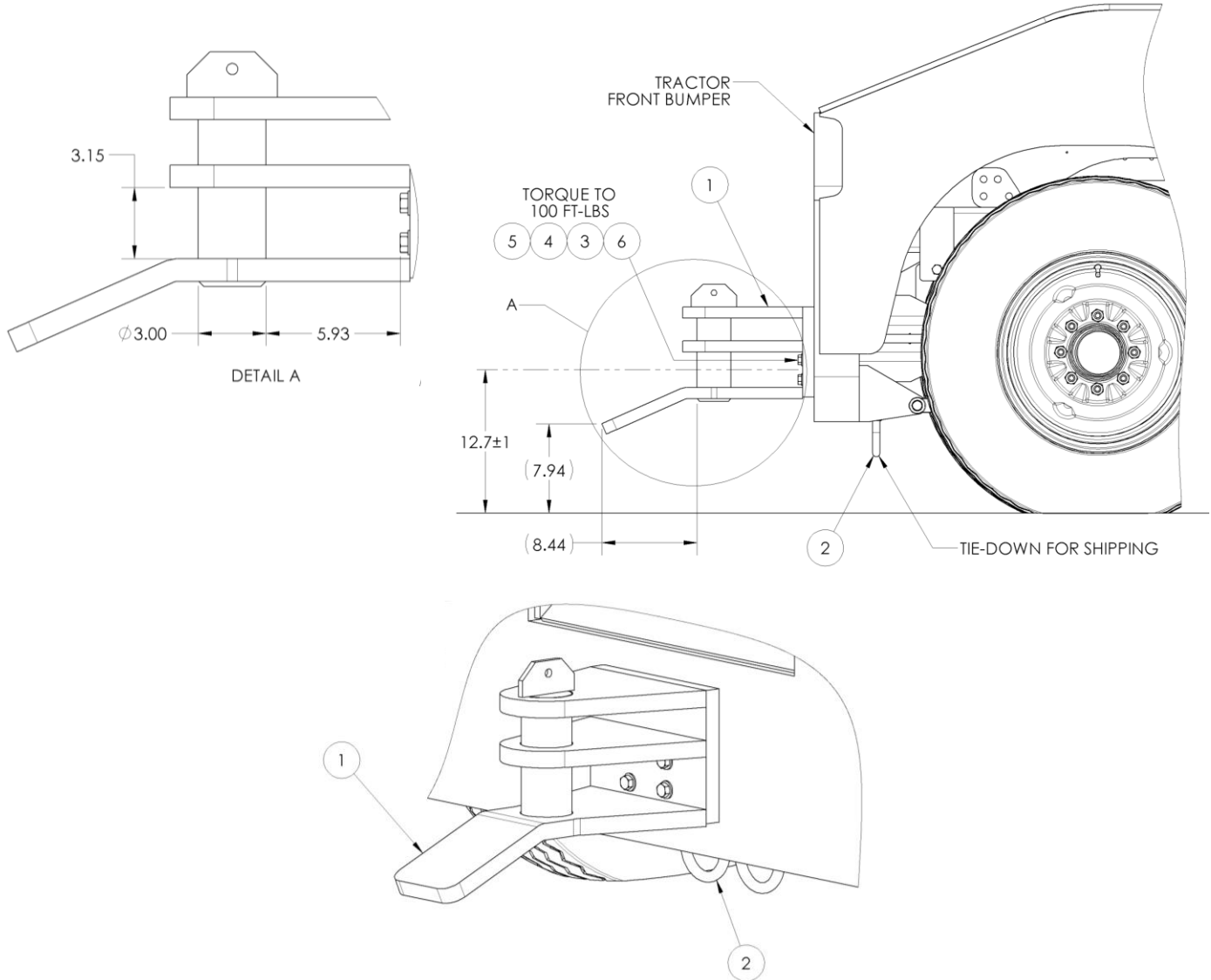
Item	Part Number	Description	Qty
1	OPT-NVSP-038-A	COMBO PINTLE/BALL HITCH 2 5/16" BALL	1
2	Z-10536-00	WLD, TIE DOWN	1
3	G-1250-1090N	FLATWASHER, 1/2 NARROW	4
4	G-1250-1090W	FLATWASHER, 1/2 WIDE	4
5	G-1727-1090	NUT, 1/2-13 TOP LOCK ZINC	4
6	G-1420-109060	BOLT, 1/2-13 HEX HD GR 8	4

20.9.12 Airline Hitch with 3" Pin Option – TTR12-FRHITCH-P

DESCRIPTION:

- Fabricated steel plate construction
- No pin retention included

COMPATIBILITY NOTES: No compatibility concerns



Parts List

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

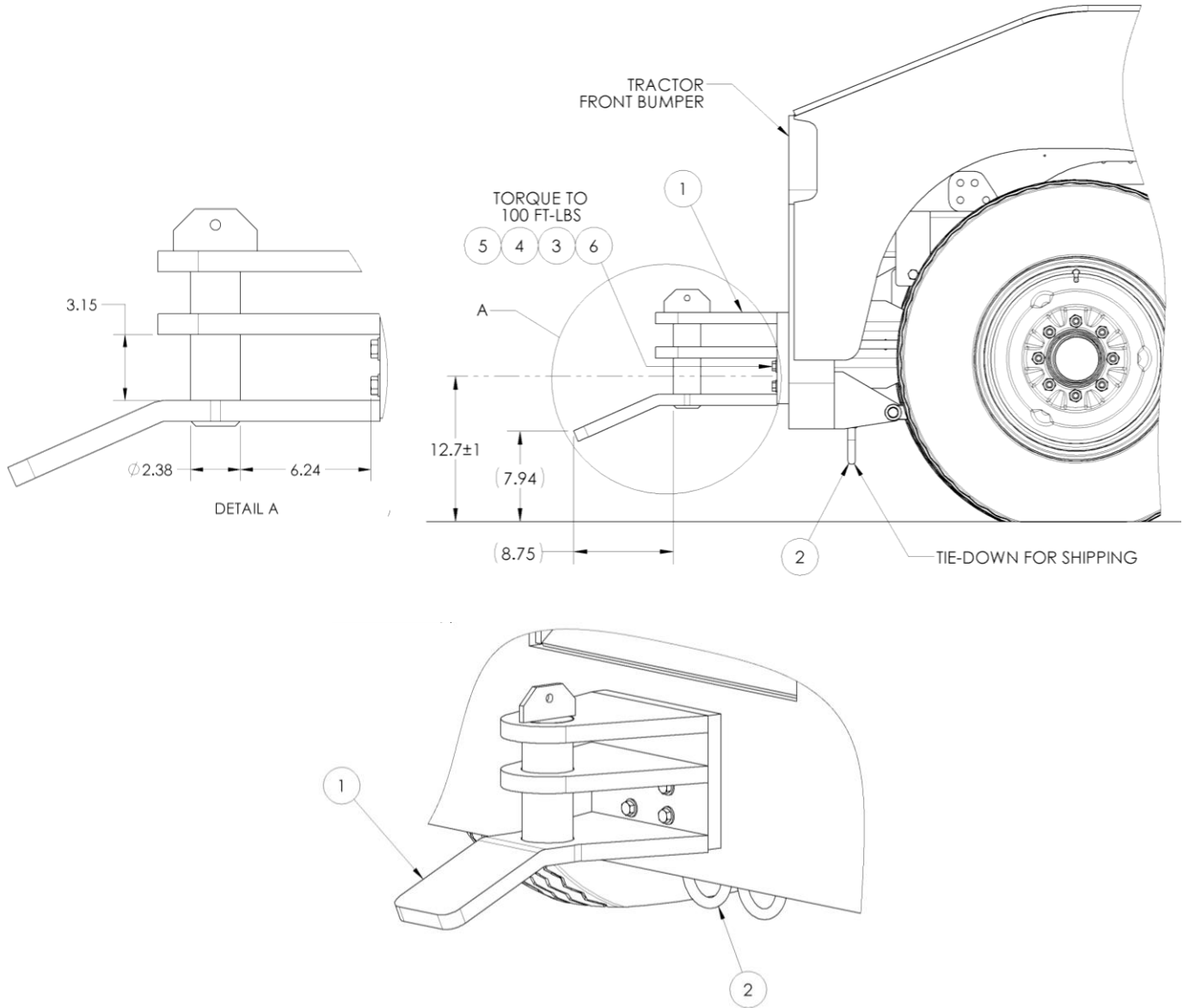
Item	Part Number	Description	Qty
1	AE-OPT-0026	3" E-HITCH ASSEMBLY	1
2	Z-10536-00	WLD, TIE DOWN	1
3	G-1250-1090N	FLATWASHER, 1/2 NARROW	4
4	G-1250-1090W	FLATWASHER, 1/2 WIDE	4
5	G-1727-1090	NUT, 1/2-13 TOP LOCK ZINC	4
6	G-1420-109064	BOLT, 1/2-13 HEX HD GR 8	4

20.9.13 Airline Hitch with 2-3/8" Pin Option – TTR12-FRHITCH-Q

DESCRIPTION:

- Fabricated steel plate construction
- No pin retention included

COMPATIBILITY NOTES: No compatibility concerns

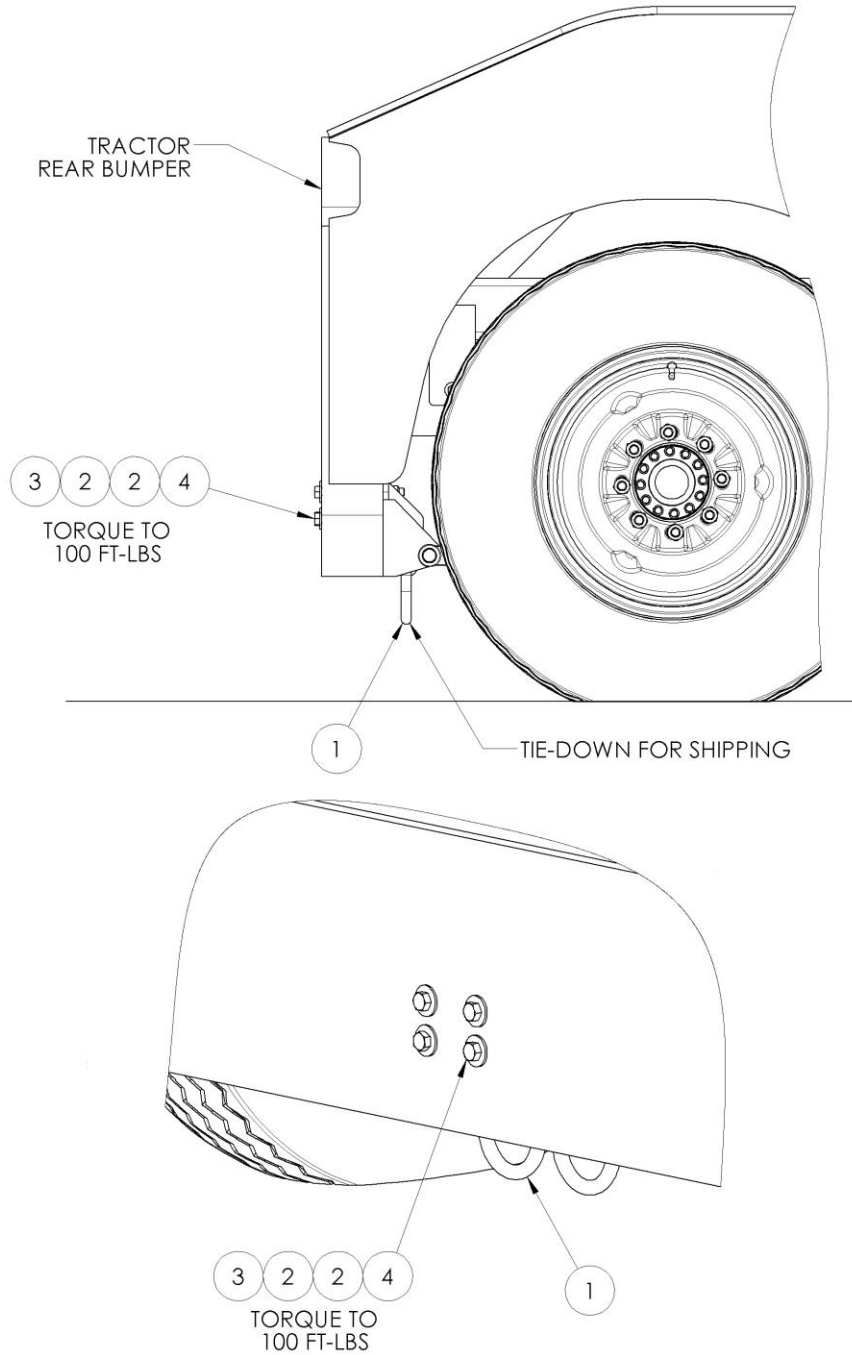


Parts List

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	AE-OPT-0093	2 3/8" E-HITCH ASSEMBLY	1
2	Z-10536-00	WLD, TIE DOWN	1
3	G-1250-1090N	FLATWASHER, 1/2 NARROW	4
4	G-1250-1090W	FLATWASHER, 1/2 WIDE	4
5	G-1727-1090	NUT, 1/2-13 TOP LOCK ZINC	4
6	G-1420-109064	BOLT, 1/2-13 HEX HD GR 8	4

- 20.10 REAR HITCH FEATURE – TTR12-RRHITCH
 20.10.1 Standard No Rear Hitch – TTR12-RRHITCH-O
 COMPATIBILITY NOTES: No compatibility concerns



Parts List

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

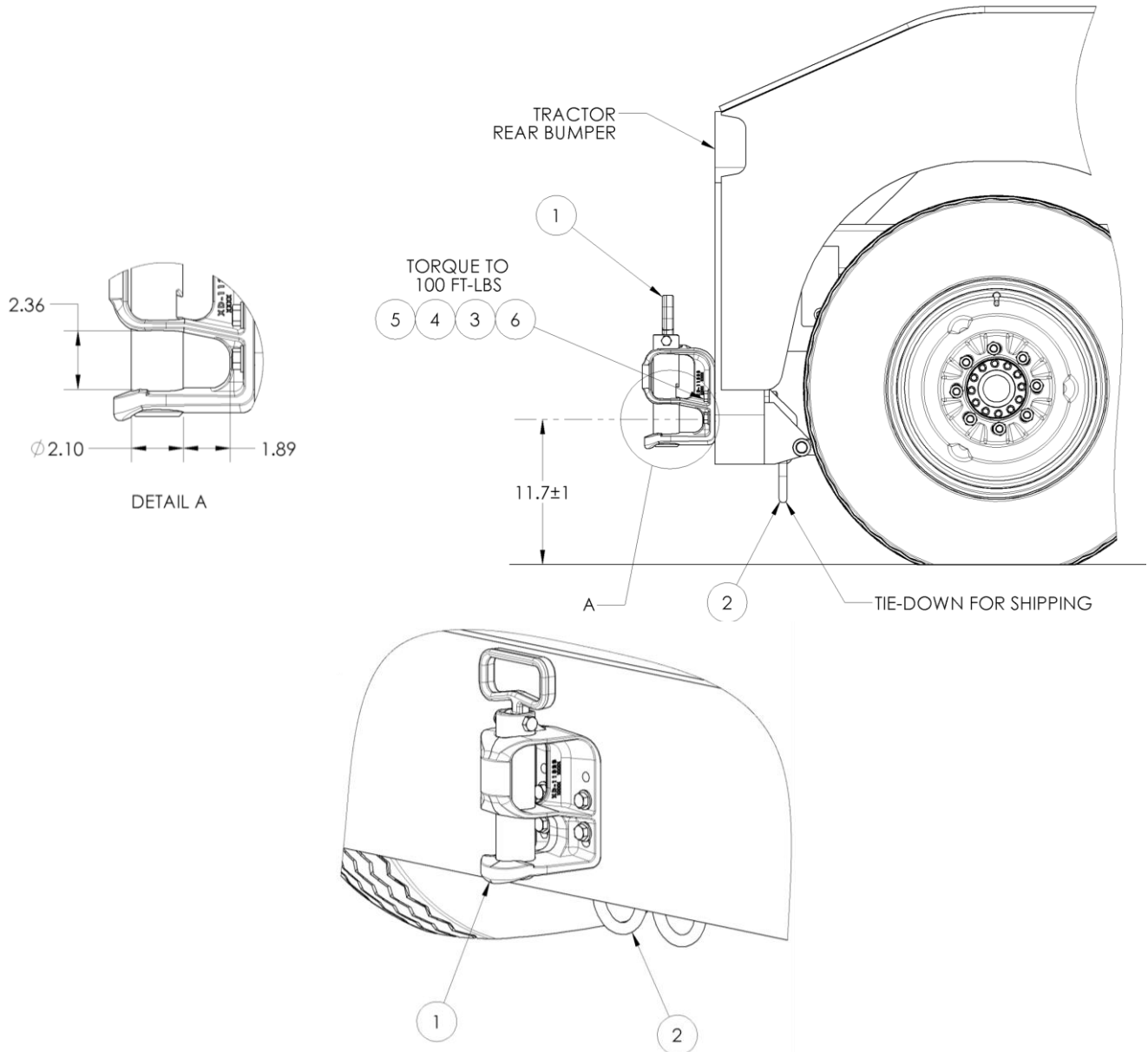
Item	Part Number	Description	Qty
1	Z-10536-00	WLD, TIE DOWN	1
2	G-1250-1090W	FLATWASHER, 1/2 WIDE	8
3	G-1727-1090	NUT, 1/2-13 TOP LOCK ZINC	4
4	G-1420-109054	BOLT, 1/2-13 HEX HD GR 8	4

20.10.2 Holland E-Hitch, Ø 2-1/8" Pin Option– TTR12-RRHITCH-A

DESCRIPTION:

- Cast steel construction
- Spring loaded hitch pin with retention capability in the up position

COMPATIBILITY NOTES: No compatibility concerns



Parts List

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

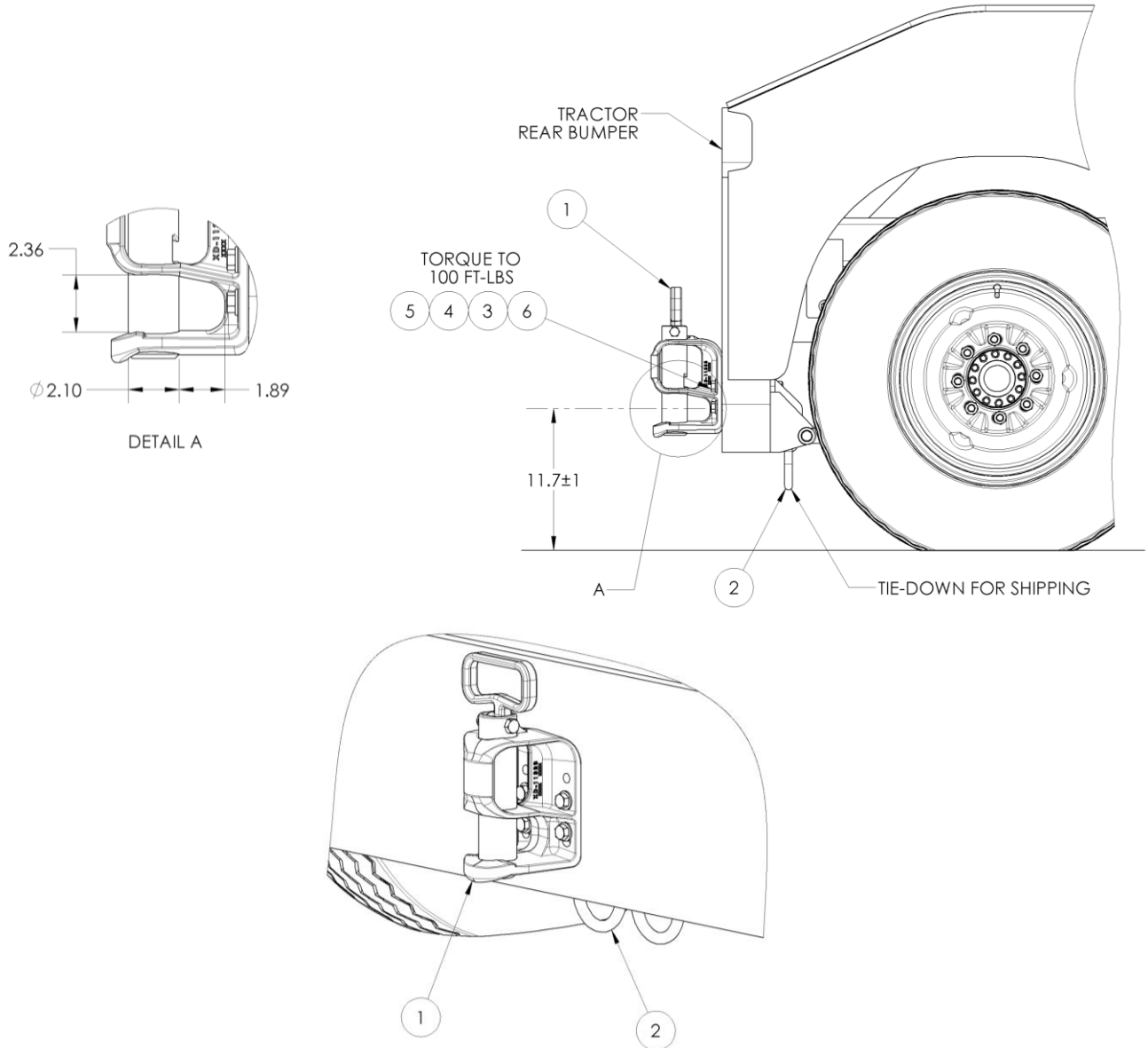
Item	Part Number	Description	Qty
1	AE-OPT-0033-1	E HITCH 2 1/8" PIN YELLOW	1
2	Z-10536-00	WLD, TIE DOWN	1
3	G-1250-1090N	FLATWASHER, 1/2 NARROW	4
4	G-1250-1090W	FLATWASHER, 1/2 WIDE	4
5	G-1727-1090	NUT, 1/2-13 TOP LOCK ZINC	4
6	G-1420-109054	BOLT, 1/2-13 X 5-1/2" HEX HD GR 8	4

20.10.3 Holland E-Hitch, Ø 2-1/8" Pin with Auto Lock Option – TTR12-RRHITCH-B

DESCRIPTION:

- Cast steel construction
- Spring loaded hitch pin with retention capability in the up position. The auto lock feature automatically locks the pin the down position and requires 1/8" twist before it can be raised

COMPATIBILITY NOTES: No compatibility concerns



Parts List

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

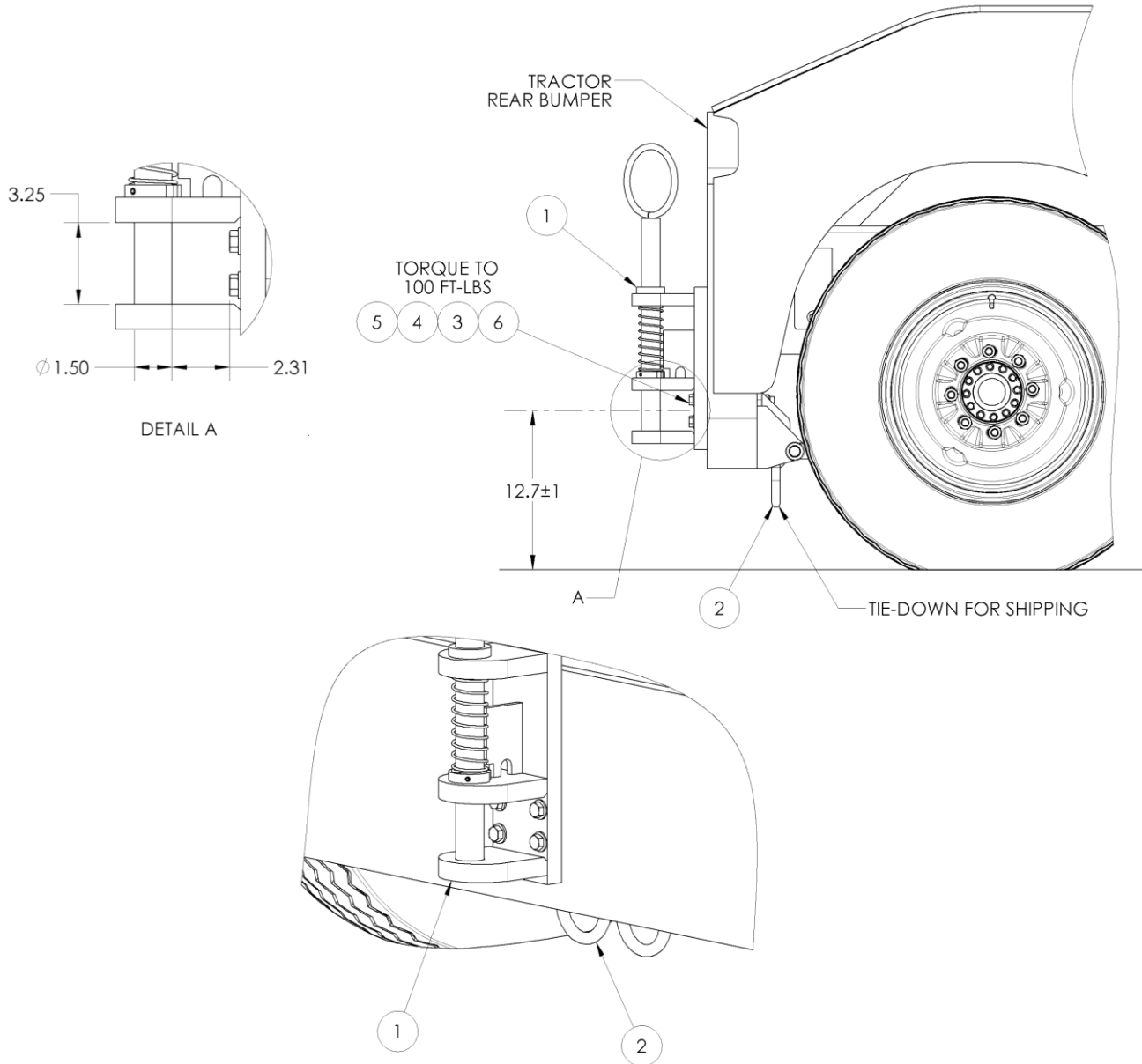
Item	Part Number	Description	Qty
1	OPT-NVSP-034-A	E HITCH 2 1/8" PIN WITH AUTOLOCK	1
2	Z-10536-00	WLD, TIE DOWN	1
3	G-1250-1090N	FLATWASHER, 1/2 NARROW	4
4	G-1250-1090W	FLATWASHER, 1/2 WIDE	4
5	G-1727-1090	NUT, 1/2-13 TOP LOCK ZINC	4
6	G-1420-109054	BOLT, 1/2-13 X 5-1/2" HEX HD GR 8	4

20.10.4 E-Hitch, Ø 1-1/2" Pin Option – TTR12-RRHITCH-C

DESCRIPTION:

- Fabricated steel plate construction
- Spring loaded hitch pin with retention capability in the up and down positions

COMPATIBILITY NOTES: No compatibility concerns

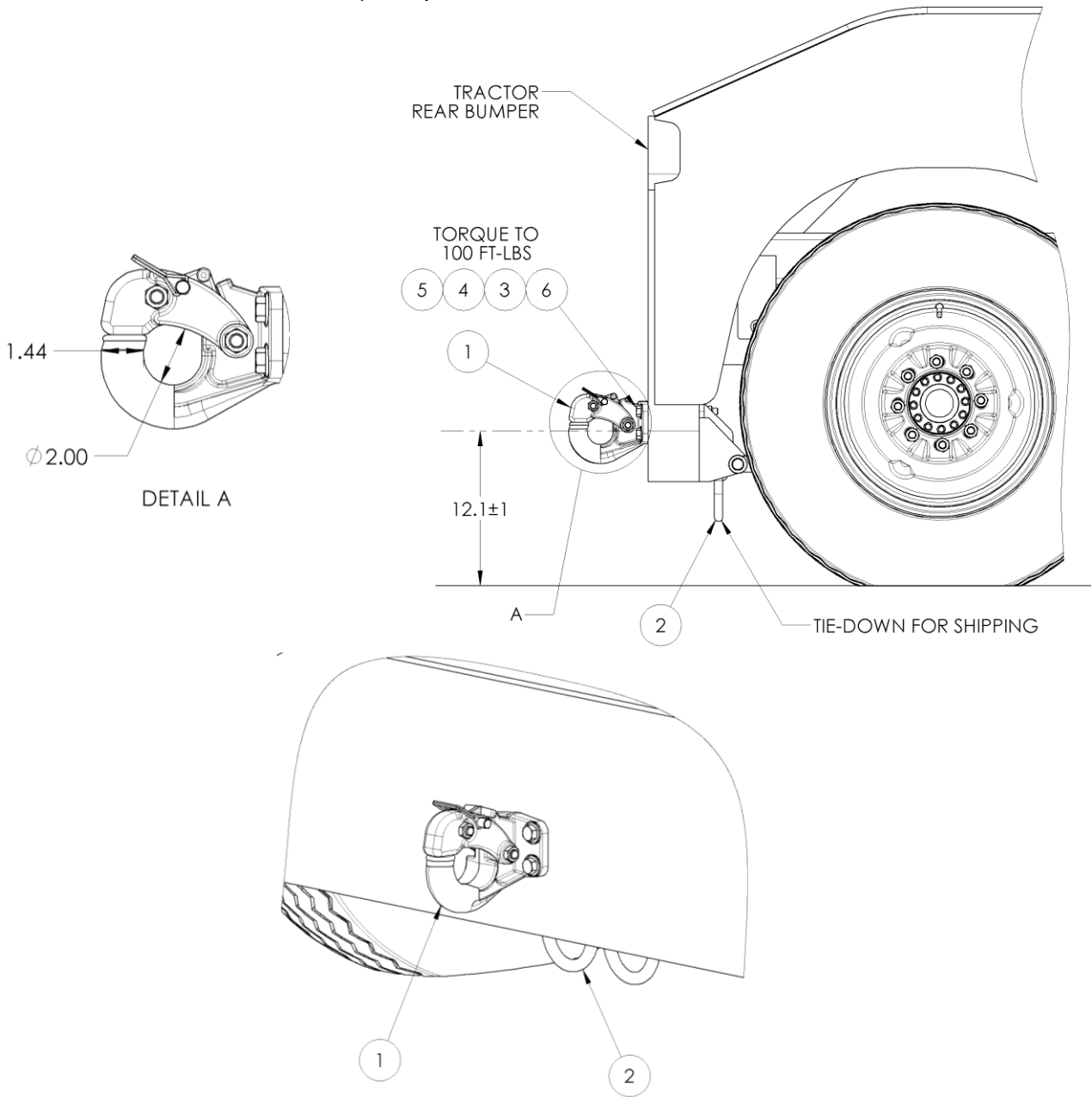


Parts List

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	AE-OPT-0033	E-HITCH, Ø1 1/2" PIN	1
2	Z-10536-00	WLD, TIE DOWN	1
3	G-1250-1090N	FLATWASHER, 1/2 NARROW	4
4	G-1250-1090W	FLATWASHER, 1/2 WIDE	4
5	G-1727-1090	NUT, 1/2-13 TOP LOCK ZINC	4
6	G-1420-109064	BOLT, 1/2-13 HEX HD GR 8	4

20.10.5 Pintle Hook Hitch Option – TTR12-RRHITCH-D
 DESCRIPTION: Forged steel construction with tethered lock pin
 COMPATIBILITY NOTES: No compatibility concerns

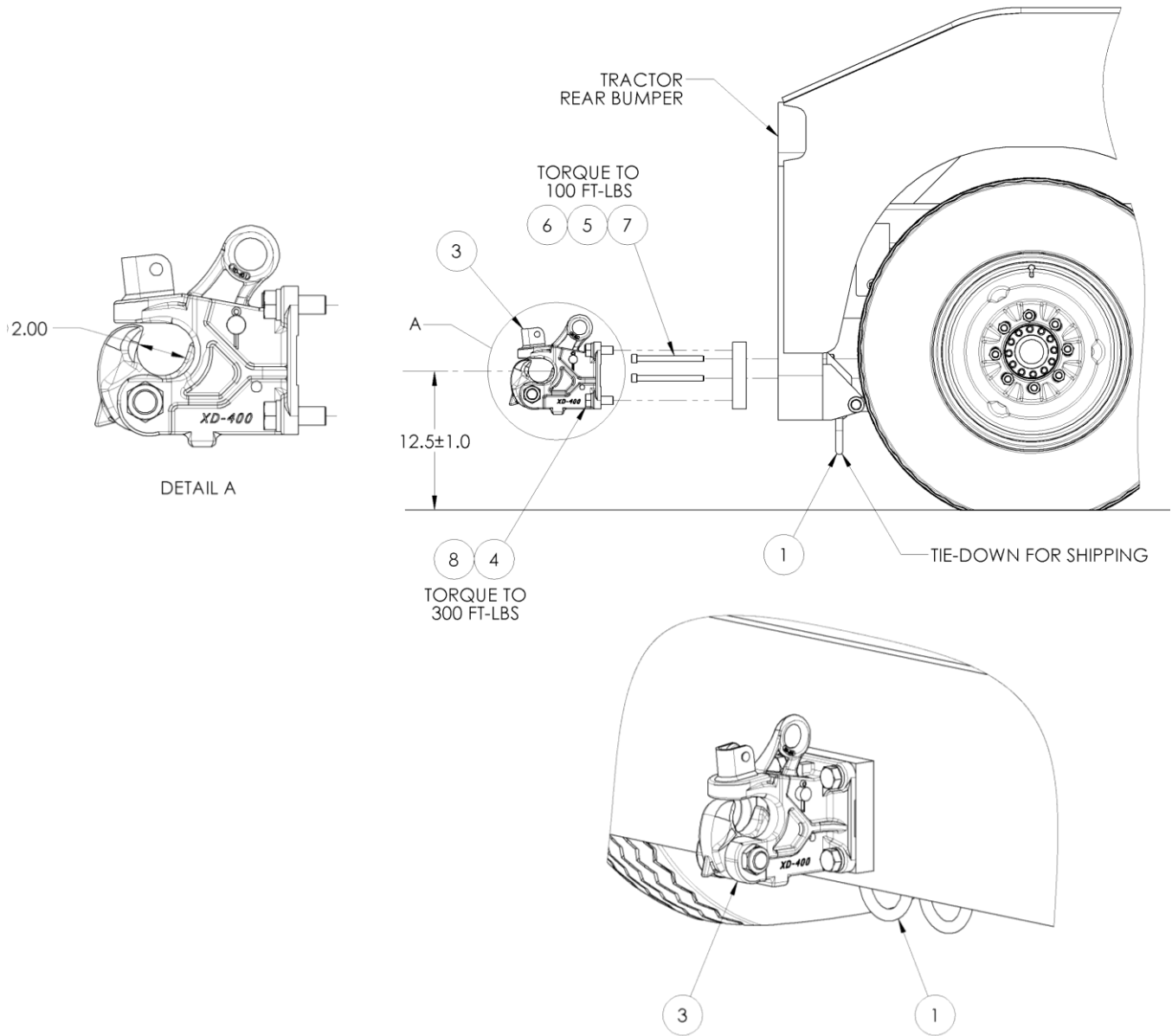


Parts List

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	AE-OPT-0028	PINTLE HOOK	1
2	Z-10536-00	WLD, TIE DOWN	1
3	G-1250-1090N	FLATWASHER, 1/2 NARROW	4
4	G-1250-1090W	FLATWASHER, 1/2 WIDE	4
5	G-1727-1090	NUT, 1/2-13 TOP LOCK ZINC	4
6	G-1420-109060	BOLT, 1/2-13 HEX HD GR 8	4

20.10.6 Pintle Hook Hitch, HD Option – TTR12-RRHITCH-F
 DESCRIPTION: Forged steel construction with cable release pulley
 COMPATIBILITY NOTES: No compatibility concerns



Parts List

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

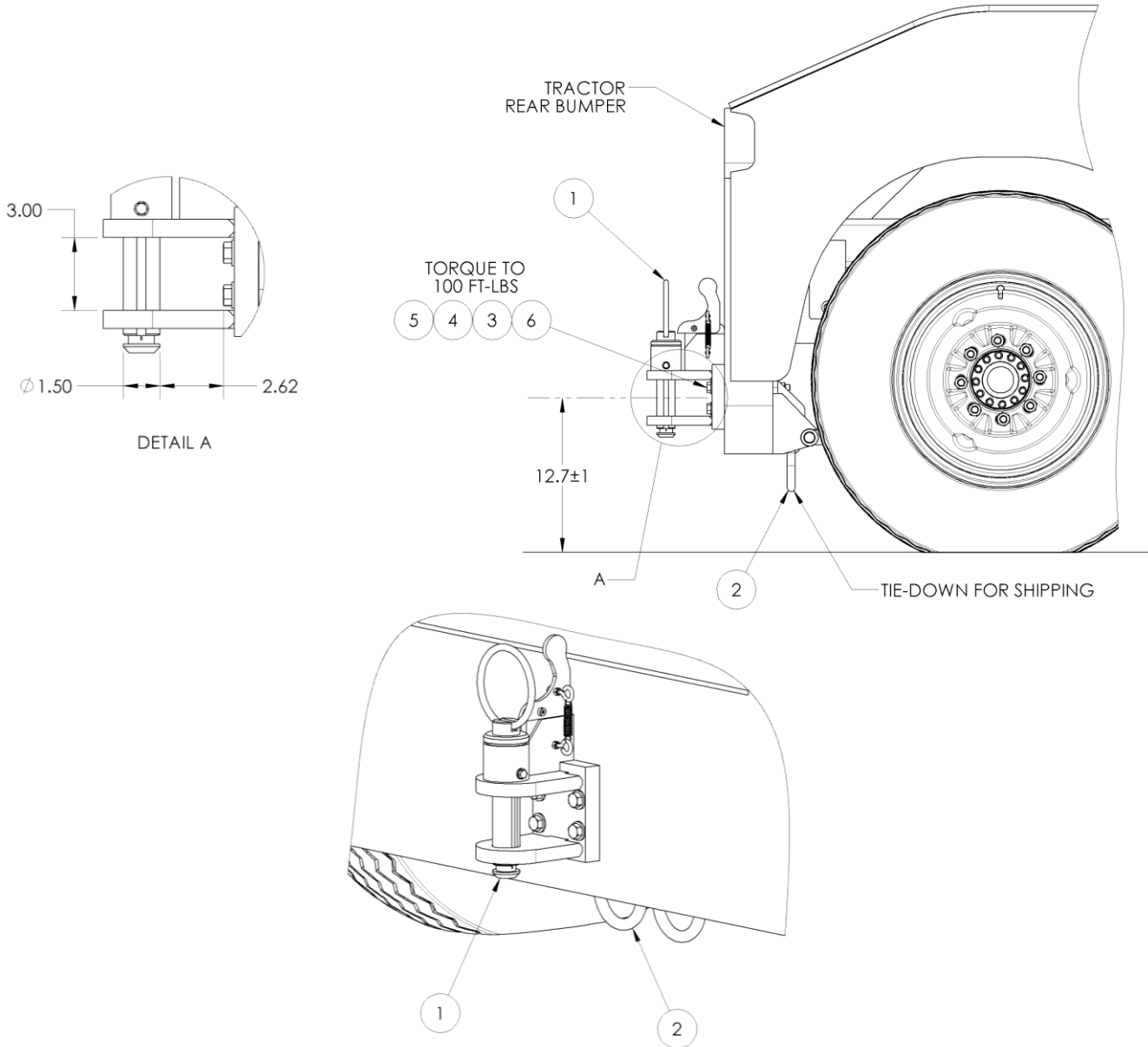
Item	Part Number	Description	Qty
1	Z-10536-00	WLD, TIE DOWN	1
2	SATS-02-002-SA	CP400 REAR HITCH ADAPTER, RETROFIT	1
3	AE-OPT-0030	HD PINTLE HITCH WITH RELEASE	1
4	G-1420-111020	BOLT, 3/4-10 X 2" HEX HD GR 8	4
5	G-1250-1090W	FLATWASHER, 1/2 WIDE	4
6	G-1727-1090	NUT, 1/2-13 TOP LOCK ZINC	4
7	G-1151-109760	SCR, 1/2-13 HEX SOC HD CAP	4
8	G-1251-1110R	LOCKWASHER, 3/4 REGULAR	4

20.10.7 Single Level Hitch, Ø 1-1/2" Pin Option – TTR12-RRHITCH-G

DESCRIPTION:

- Fabricated steel plate construction
- Retention capability in the up position

COMPATIBILITY NOTES: No compatibility concerns



Parts List

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	K-5267	KIT, SINGLE LEVEL HITCH, 1.5IN	1
2	Z-10536-00	WLD, TIE DOWN	1
3	G-1250-1090N	FLATWASHER, 1/2 NARROW	4
4	G-1250-1090W	FLATWASHER, 1/2 WIDE	4
5	G-1727-1090	NUT, 1/2-13 TOP LOCK ZINC	4
6	G-1420-109064	BOLT, 1/2-13 HEX HD GR 8	4

20.10.8 Three Level Hitch, \varnothing 1-1/2" Pin Option – TTR12-RRHITCH-H

DESCRIPTION: Fabricated steel plate construction

CAPACITY:

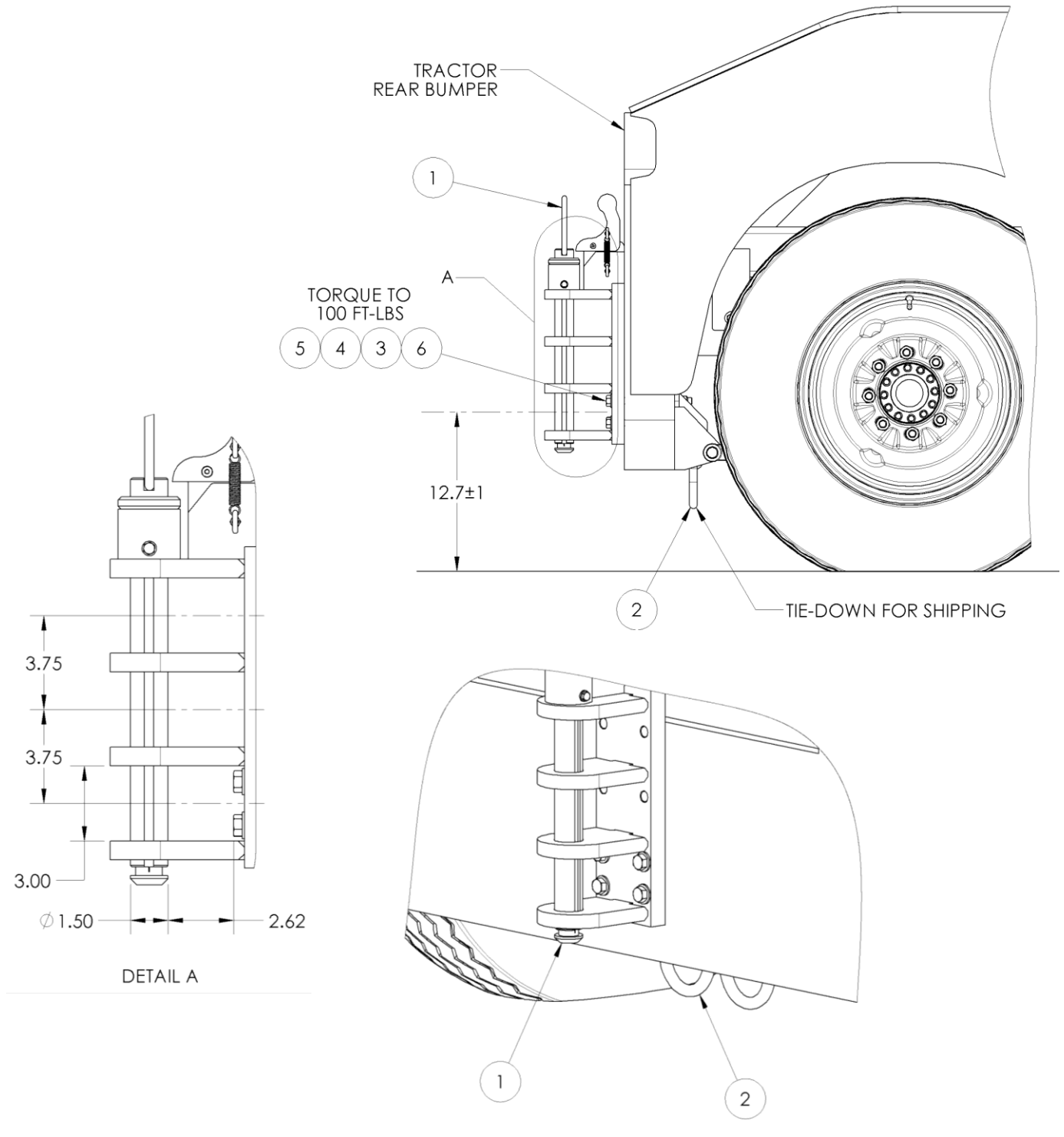
Bottom lunette location: 120,000 tow capacity

Center lunette location: 90,000 tow capacity

Top lunette location: 60,000 tow capacity

Retention capability in the up and down positions

COMPATIBILITY NOTES: No compatibility concerns





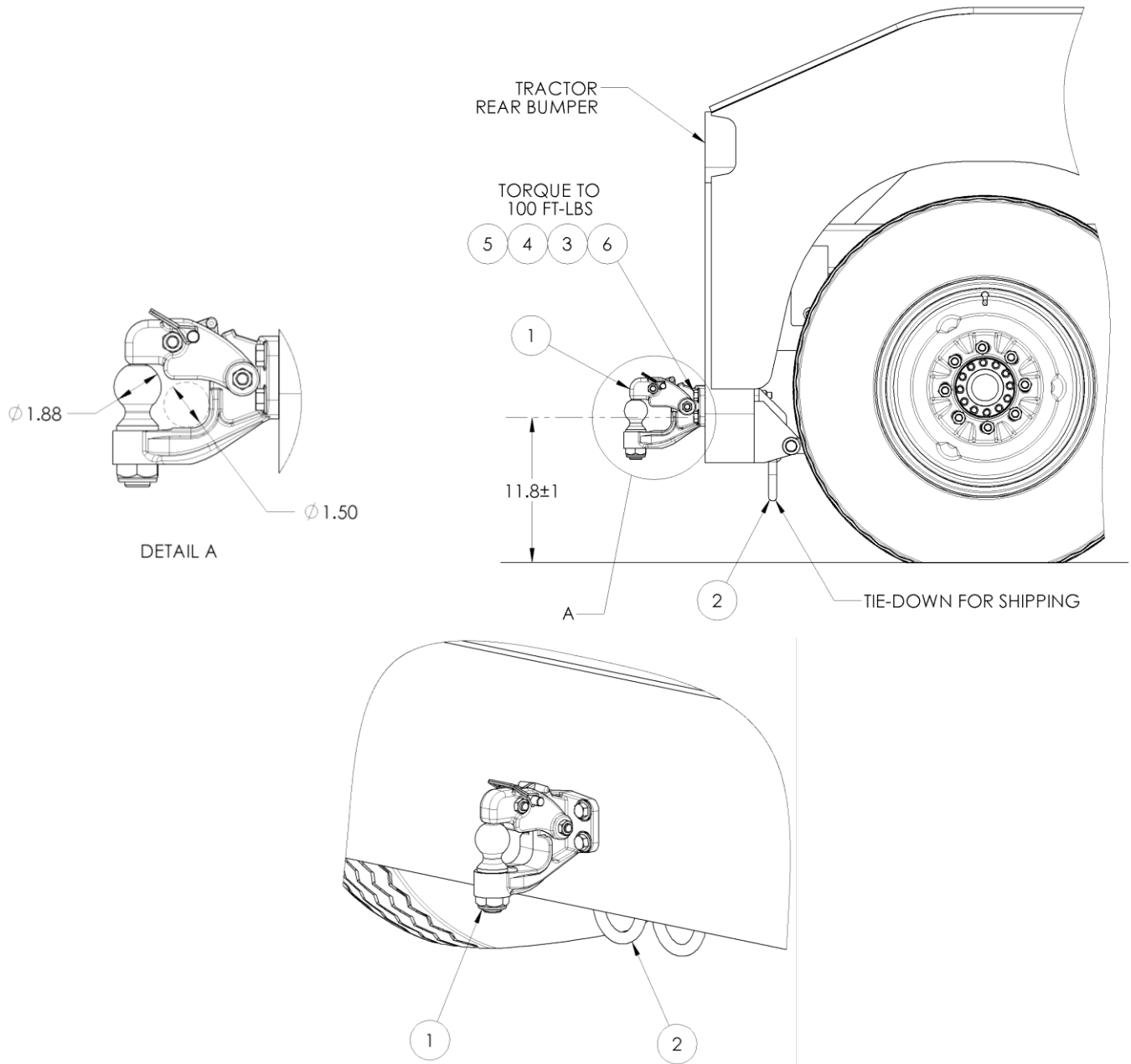
20.10.8 Three Level Hitch, Ø 1-1/2" Pin Option (continued)

Parts List

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	K-5266	KIT, THREE LEVEL HITCH, 1.5IN	1
2	Z-10536-00	WLD, TIE DOWN	1
3	G-1250-1090N	FLATWASHER, 1/2 NARROW	4
4	G-1250-1090W	FLATWASHER, 1/2 WIDE	4
5	G-1727-1090	NUT, 1/2-13 TOP LOCK ZINC	4
6	G-1420-109064	BOLT, 1/2-13 HEX HD GR 8	4

20.10.9 Combo Pintle Ball Hitch 1-7/8" Ball Option – TTR12-RRHITCH-J
 DESCRIPTION: Forged steel construction with tethered lock pin
 COMPATIBILITY NOTES: No compatibility concerns

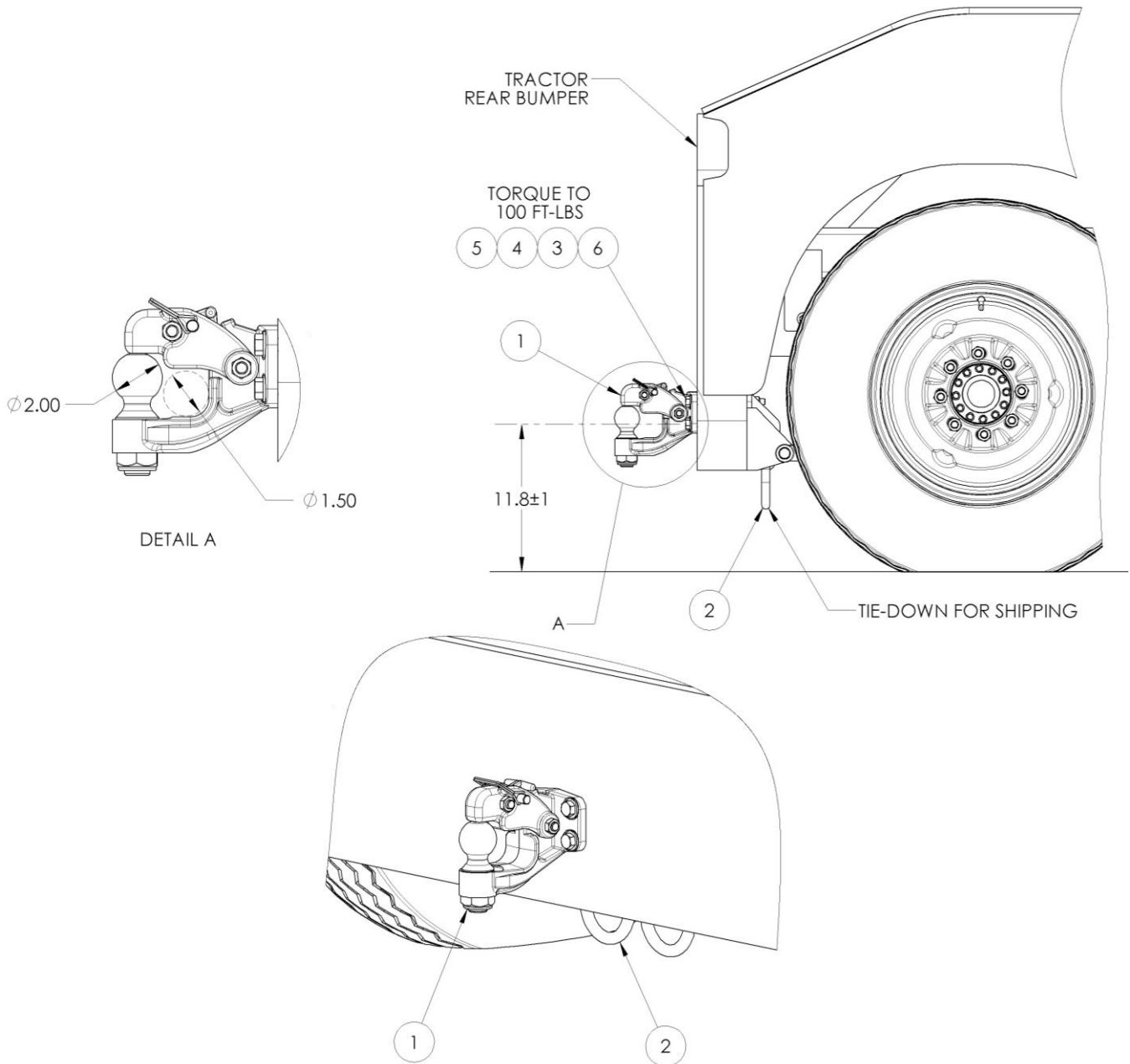


Parts List

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	AE-OPT-0040	COMBO PINTLE/BALL HITCH 1 7/8" BALL	1
2	Z-10536-00	WLD, TIE DOWN	1
3	G-1250-1090N	FLATWASHER, 1/2 NARROW	4
4	G-1250-1090W	FLATWASHER, 1/2 WIDE	4
5	G-1727-1090	NUT, 1/2-13 TOP LOCK ZINC	4
6	G-1420-109060	BOLT, 1/2-13 HEX HD GR 8	4

20.10.10 Combo Pintle Ball Hitch 2" Ball Option – TTR12-RRHITCH-K
 DESCRIPTION: Forged steel construction with tethered lock pin
 COMPATIBILITY NOTES: No compatibility concerns



Parts List

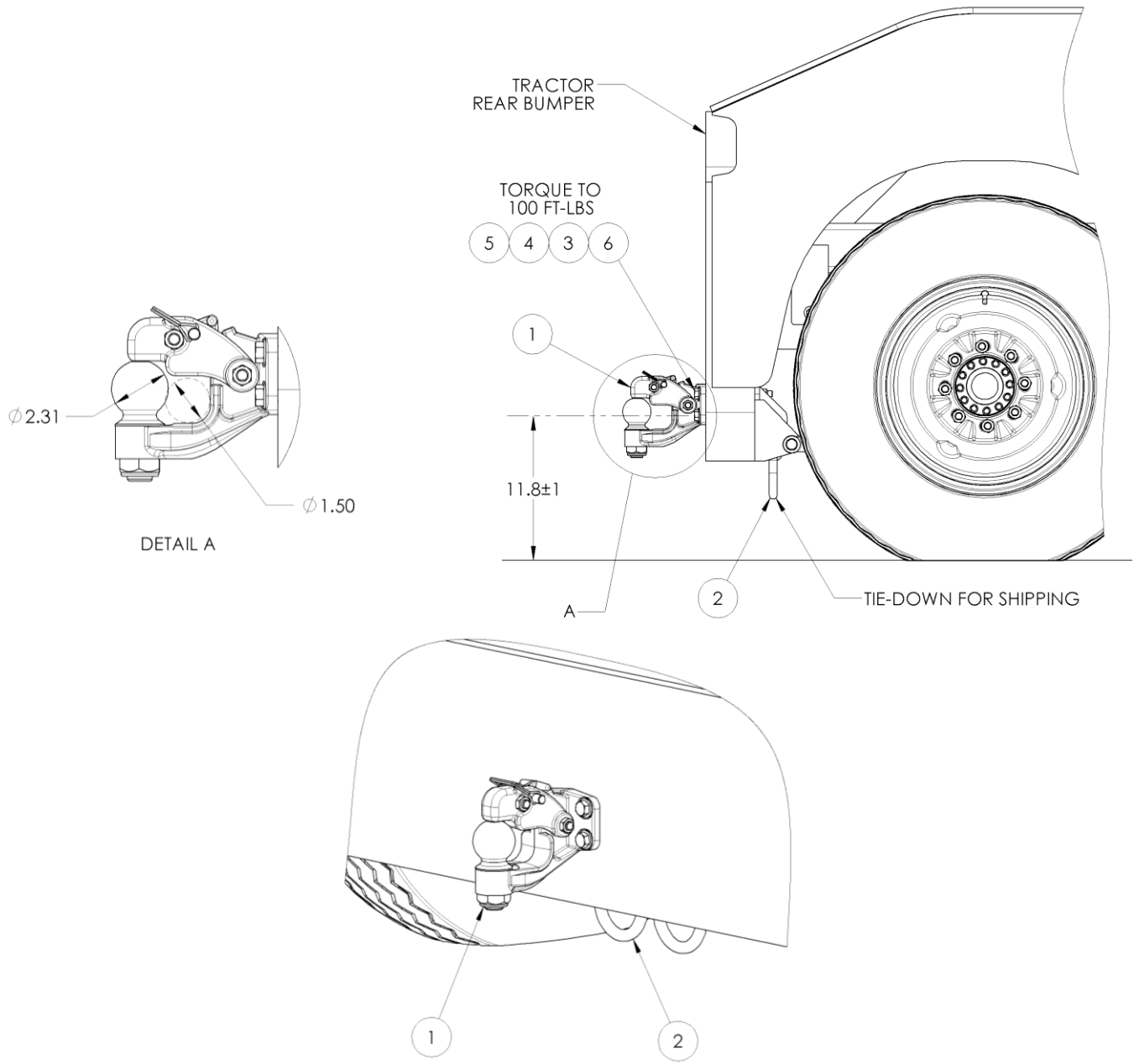
When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	AE-OPT-0045	COMBO PINTLE/BALL HITCH 2" BALL	1
2	Z-10536-00	WLD, TIE DOWN	1
3	G-1250-1090N	FLATWASHER, 1/2 NARROW	4
4	G-1250-1090W	FLATWASHER, 1/2 WIDE	4
5	G-1727-1090	NUT, 1/2-13 TOP LOCK ZINC	4
6	G-1420-109060	BOLT, 1/2-13 HEX HD GR 8	4

20.10.11 Combo Pintle Ball Hitch 2-5/16" Ball Option – TTR12-RRHITCH-L

DESCRIPTION: Forged steel construction with tethered lock pin

COMPATIBILITY NOTES: No compatibility concerns



Parts List

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

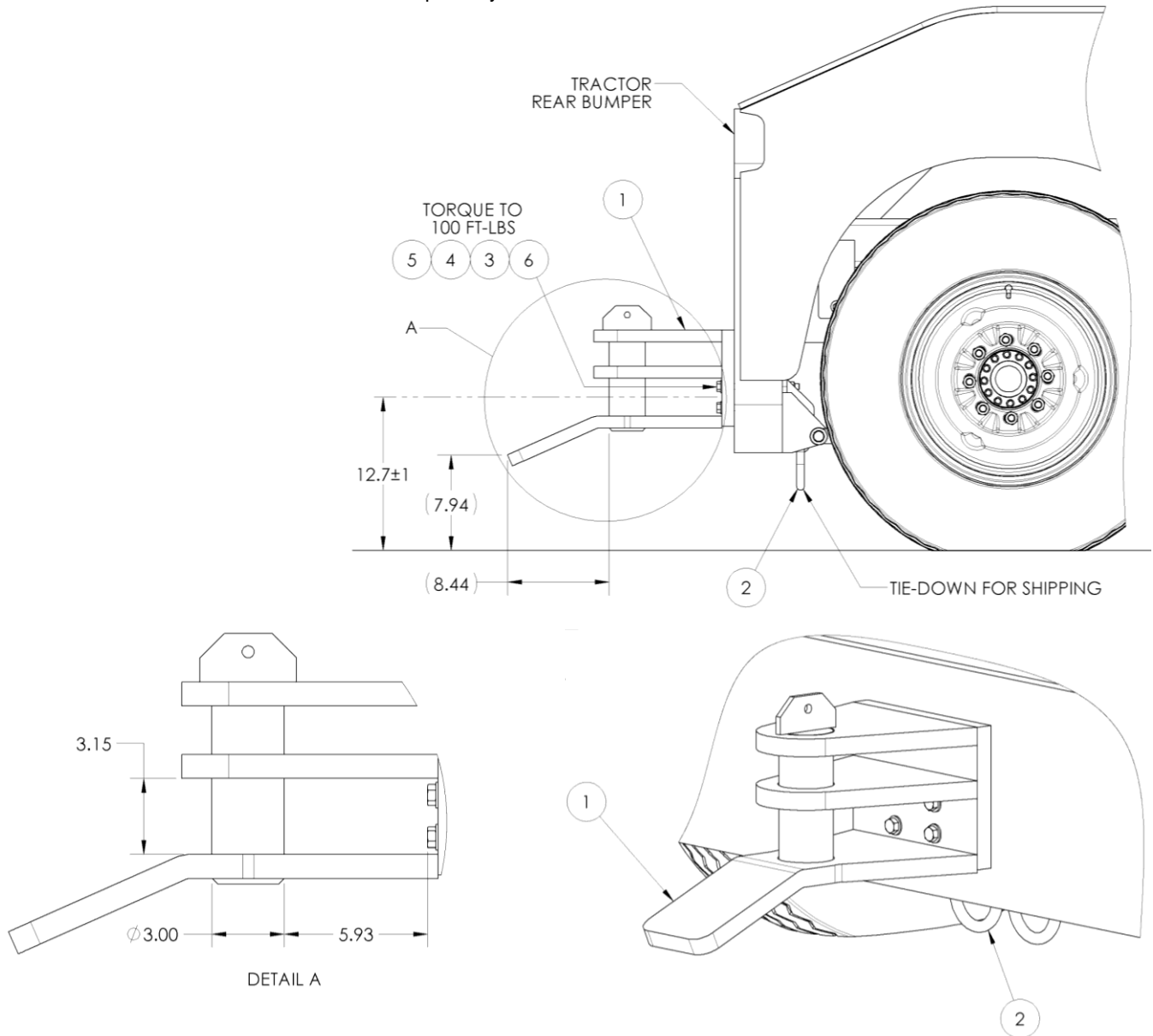
Item	Part Number	Description	Qty
1	OPT-NVSP-038-A	COMBO PINTLE/BALL HITCH 2 5/16" BALL	1
2	Z-10536-00	WLD, TIE DOWN	1
3	G-1250-1090N	FLATWASHER, 1/2 NARROW	4
4	G-1250-1090W	FLATWASHER, 1/2 WIDE	4
5	G-1727-1090	NUT, 1/2-13 TOP LOCK ZINC	4
6	G-1420-109060	BOLT, 1/2-13 HEX HD GR 8	4

20.10.12 Airline Hitch with 3" Pin Option – TTR12-RRHITCH-P

DESCRIPTION:

- Fabricated steel plate construction
- No pin retention included

COMPATIBILITY NOTES: No compatibility concerns



Parts List

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

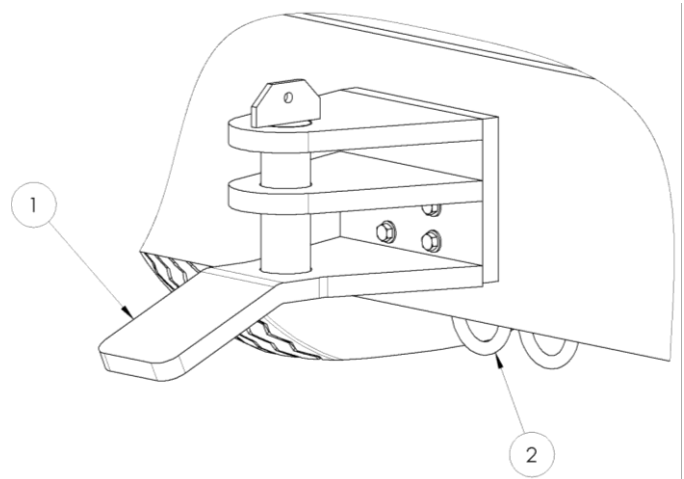
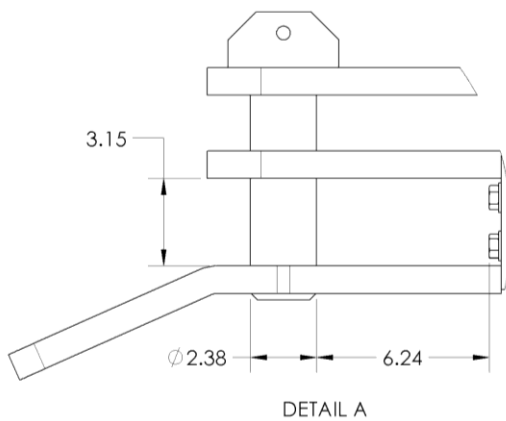
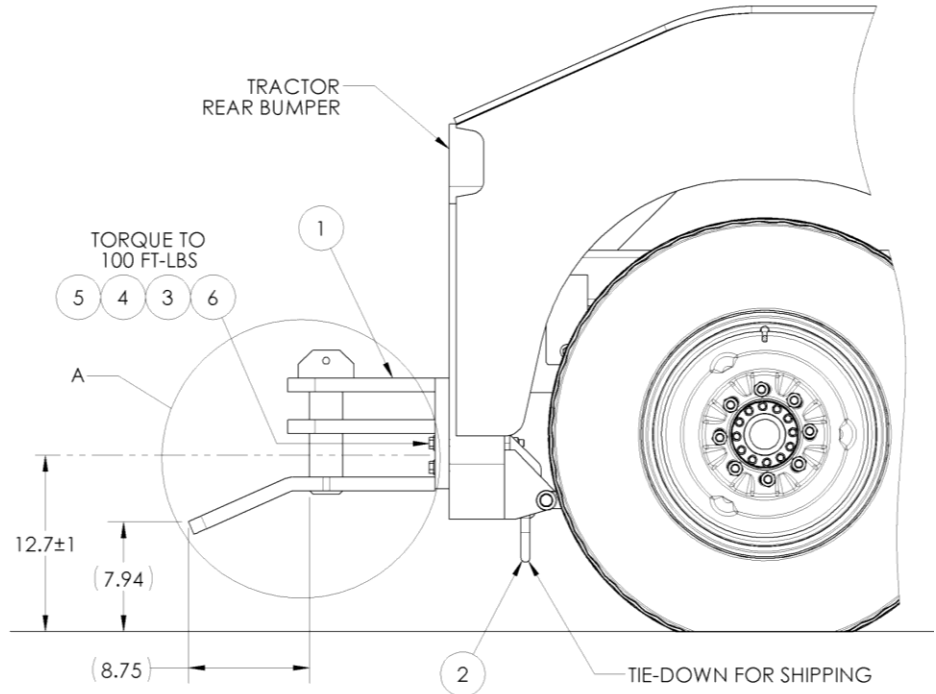
Item	Part Number	Description	Qty
1	AE-OPT-0026	3" E-HITCH ASSEMBLY	1
2	Z-10536-00	WLD, TIE DOWN	1
3	G-1250-1090N	FLATWASHER, 1/2 NARROW	4
4	G-1250-1090W	FLATWASHER, 1/2 WIDE	4
5	G-1727-1090	NUT, 1/2-13 TOP LOCK ZINC	4
6	G-1420-109064	BOLT, 1/2-13 HEX HD GR 8	4

20.10.13 Airline Hitch with 2-3/8" Pin Option – TTR12-RRHITCH-Q

DESCRIPTION:

- Fabricated steel plate construction
- No pin retention included

COMPATIBILITY NOTES: No compatibility concerns



Parts List

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	AE-OPT-0093	2 3/8" E-HITCH ASSEMBLY	1
2	Z-10536-00	WLD, TIE DOWN	1
3	G-1250-1090N	FLATWASHER, 1/2 NARROW	4
4	G-1250-1090W	FLATWASHER, 1/2 WIDE	4
5	G-1727-1090	NUT, 1/2-13 TOP LOCK ZINC	4
6	G-1420-109064	BOLT, 1/2-13 HEX HD GR 8	4

- 20.11 TRACTOR PAINT FEATURE – TTR12-PAINT
- 20.11.1 Standard White Paint – TTR12-PAINT-O
 COLOR: Bright White
 PRIMER/UNDERCOAT: Two-component high solids epoxy coating
 TOPCOAT: Two-component high solids polyurethane

COMPATIBILITY NOTES: No compatibility concerns

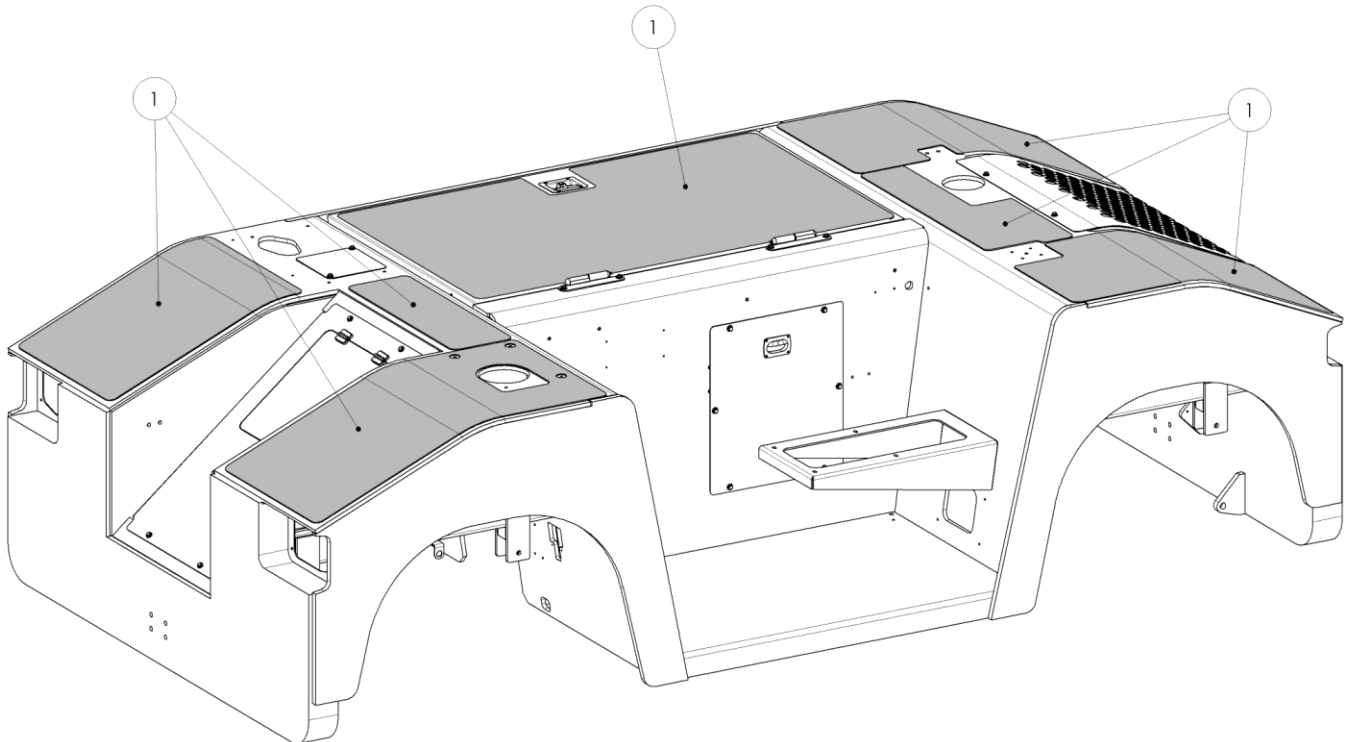
- 20.12 DECK PROTECTION FEATURE – TTR12-DECK

- 20.12.1 Standard No Deck Protector – TTR12-DECK-O
 DESCRIPTION: Contains no parts or assemblies

COMPATIBILITY NOTES: No compatibility concerns

- 20.12.2 Decking Option – TTR12-DECK-1

COMPATIBILITY NOTES: No compatibility concerns, but may need to be trimmed for clearance and fitment depending on other options load



Parts List

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	K-5341	KIT, DECKING TTR-12	1

20.13 TOWBAR RACK FEATURE – TTR12-TOWBAR

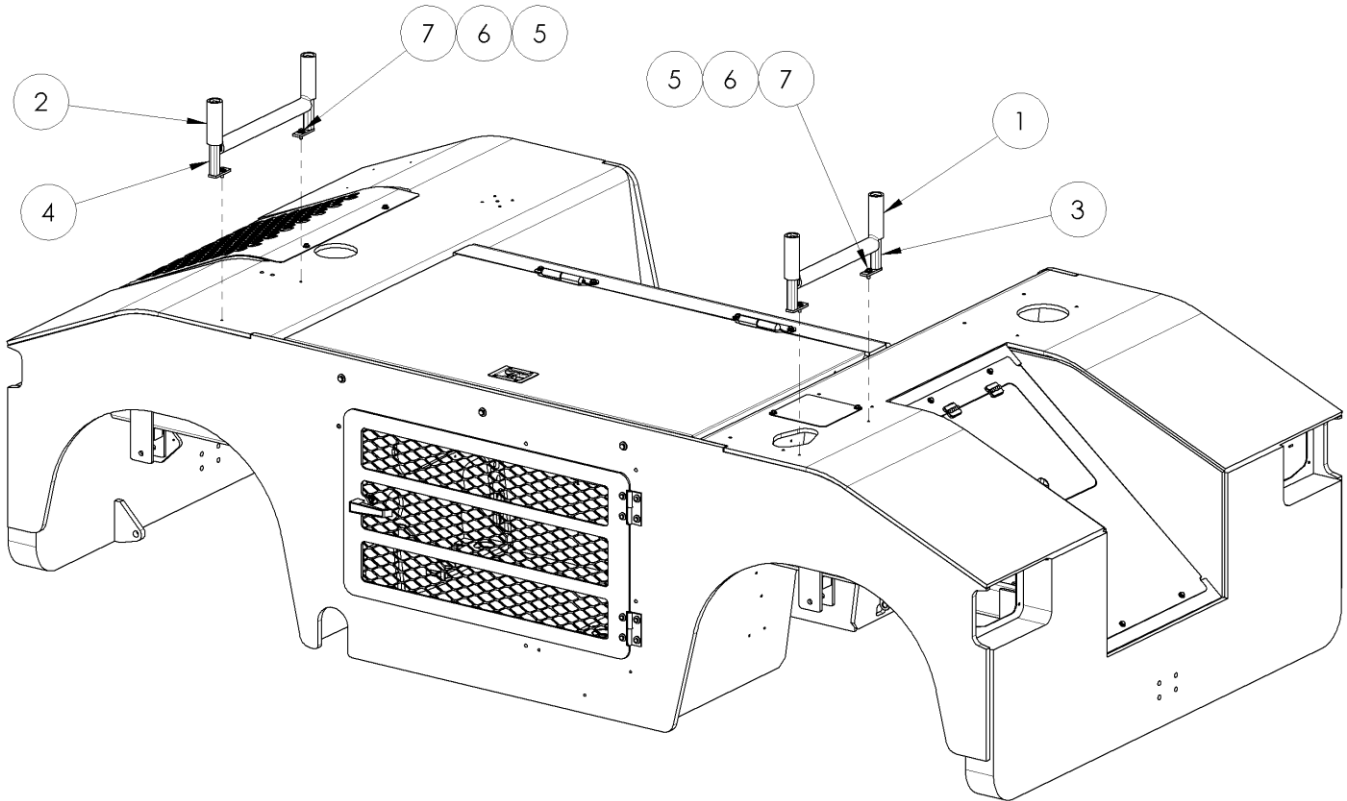
20.13.1 Standard No Towbar Rack – TTR12-TOWBAR-O
DESCRIPTION: Contains no parts or assemblies

COMPATIBILITY NOTES: No compatibility concerns

20.13.2 Towbar Storage Rack Option – TTR12-TOWBAR-1

DESCRIPTION: This option provides a location to store a towbar during vehicle usage

COMPATIBILITY NOTES: The towbar rack interferes with the standard rear spotlight location. Depending on usage, the customer may want to remove the rear spotlight when the towbar storage rack option is installed



Parts List

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	TF-1262-FR	CUSHION, TOWBAR RACK	1
2	TF-1262-RR	CUSHION, TOWBAR RACK	1
3	Z-10922-00	WELDMENT, TOWBAR RACK FR	1
4	Z-10923-00	WELDMENT, TOWBAR RACK RR	1
5	G-1250-1060W	FLATWASHER, 5/16 WIDE	4
6	G-1251-1060R	LOCKWASHER, 5/16 REGULAR	4
7	G-1420-106010	BOLT, 5/16-18 X 1.0" LG. HEX HD GR 8	4

20.14 FIRE EXTINGUISHER FEATURE – TTR12-FIREEXT

20.14.1 Standard No Fire Extinguisher – TTR12-FIREEXT-O
DESCRIPTION: Contains no parts or assemblies

COMPATIBILITY NOTES: No compatibility concerns

20.14.2 Fire Extinguisher, 10 lb ABC Option – TTR12-FIREEXT-1

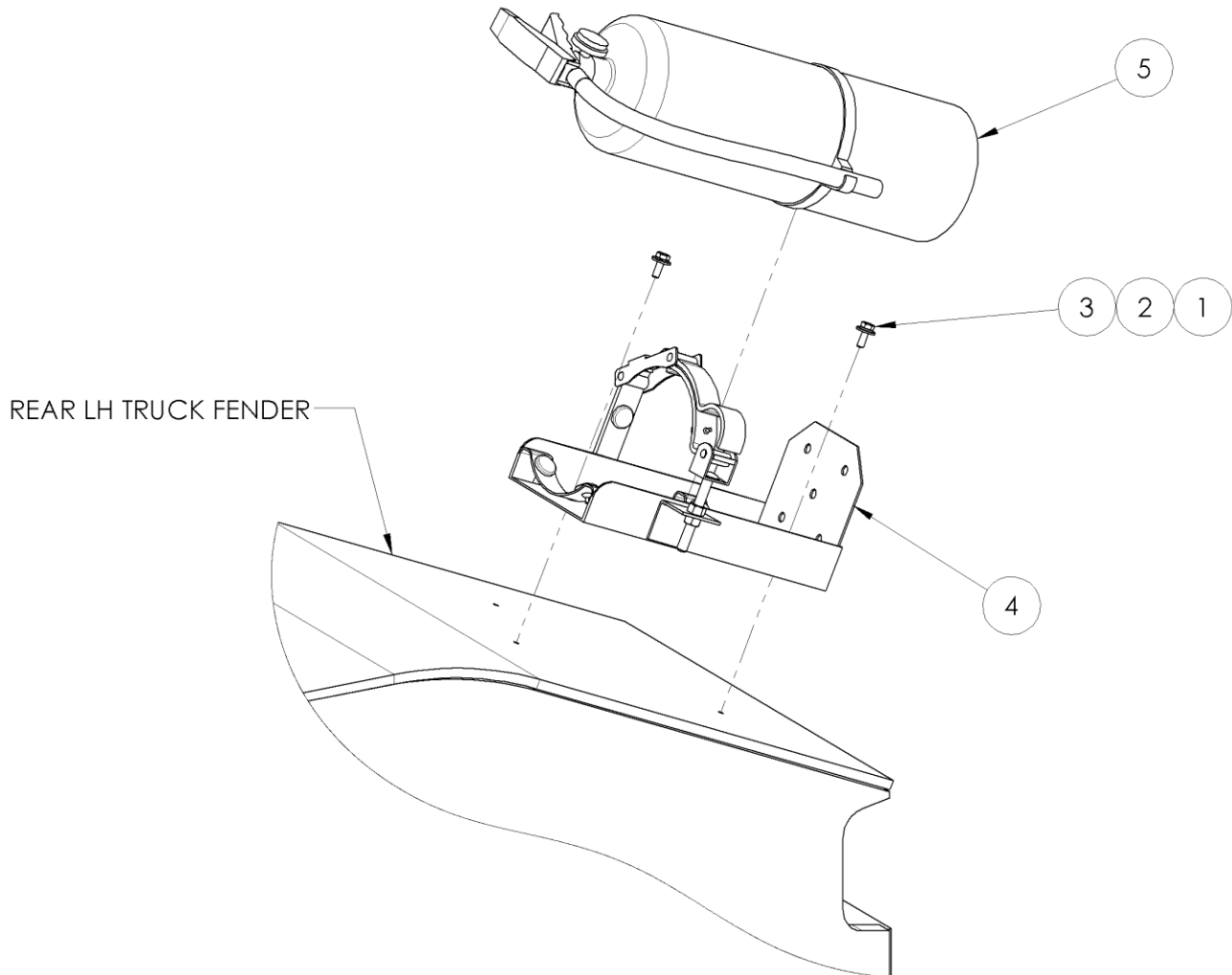
ABC RATED:

A - Trash / Wood / Paper

B - Liquids and Gases

C - Energized Electrical Sources

COMPATIBILITY NOTES: Both the fire extinguisher and chock basket occupy the same spot on the rear left fender. If both are equipped, the fire extinguisher should be relocated to the rear right fender.



Parts List

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	G-1250-1050W	FLATWASHER, 1/4 WIDE	2
2	G-1251-1050R	LOCKWASHER, 1/4 REGULAR	2
3	G-1100-105006	BOLT, 1/4-20 X 3/4" LG HEX HD GR 5	2
4	E-OPT-0081	FIRE EXTINGUISHER BRACKET	1
5	E-OPT-0080	FIRE EXTINGUISHER, 10# ABC	1

20.14.3 Fire Extinguisher, 10 lb BC Option – TTR12-FIREEXT-2

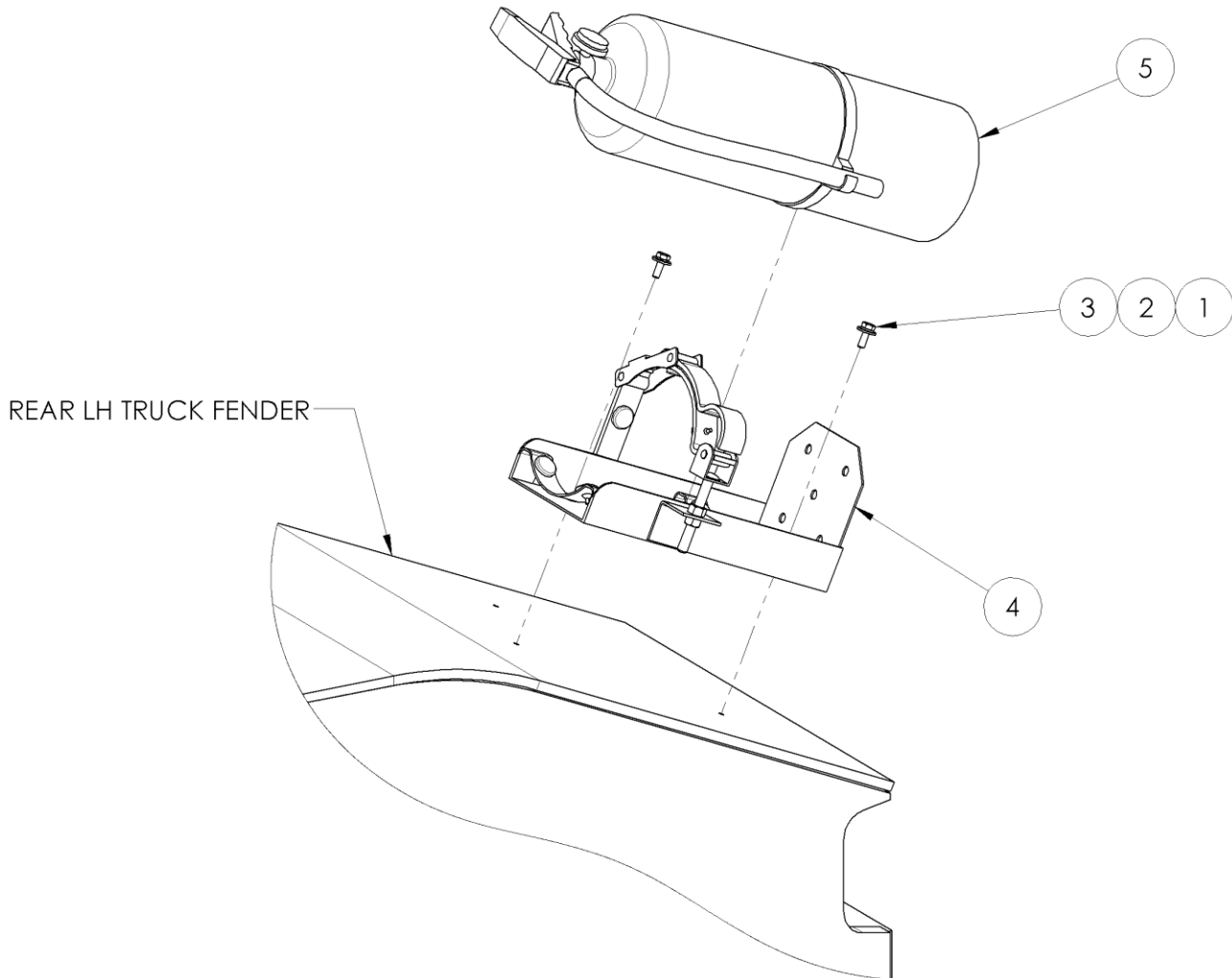
BC RATING:

- B - Liquids And Gases
- C - Energized Electrical Sources

EXTINGUISHING AGENT: Sodium Bicarbonate

- Sodium bicarbonate is less corrosive than the monoammonium phosphate used in most abc fire extinguishers, but is less effective at extinguishing paper/wood/trash fires.

COMPATIBILITY NOTES: Both the fire extinguisher and chock basket occupy the same spot on the rear left fender. If both are equipped, the fire extinguisher should be relocated to the rear right fender.



Parts List

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	G-1250-1050W	FLATWASHER, 1/4 WIDE	2
2	G-1251-1050R	LOCKWASHER, 1/4 REGULAR	2
3	G-1100-105006	BOLT, 1/4-20 X 3/4" LG HEX HD GR 5	2
4	E-OPT-0081	FIRE EXTINGUISHER BRACKET	1
5	E-OPT-0018	FIRE EXTINGUISHER, 10# BC	1



- 20.15 WING WAKER FEATURE – TTR12-WING
- 20.15.1 Standard No Wing Walker – TTR12-WING-O
DESCRIPTION: Contains no parts or assemblies

COMPATIBILITY NOTES: No compatibility concerns

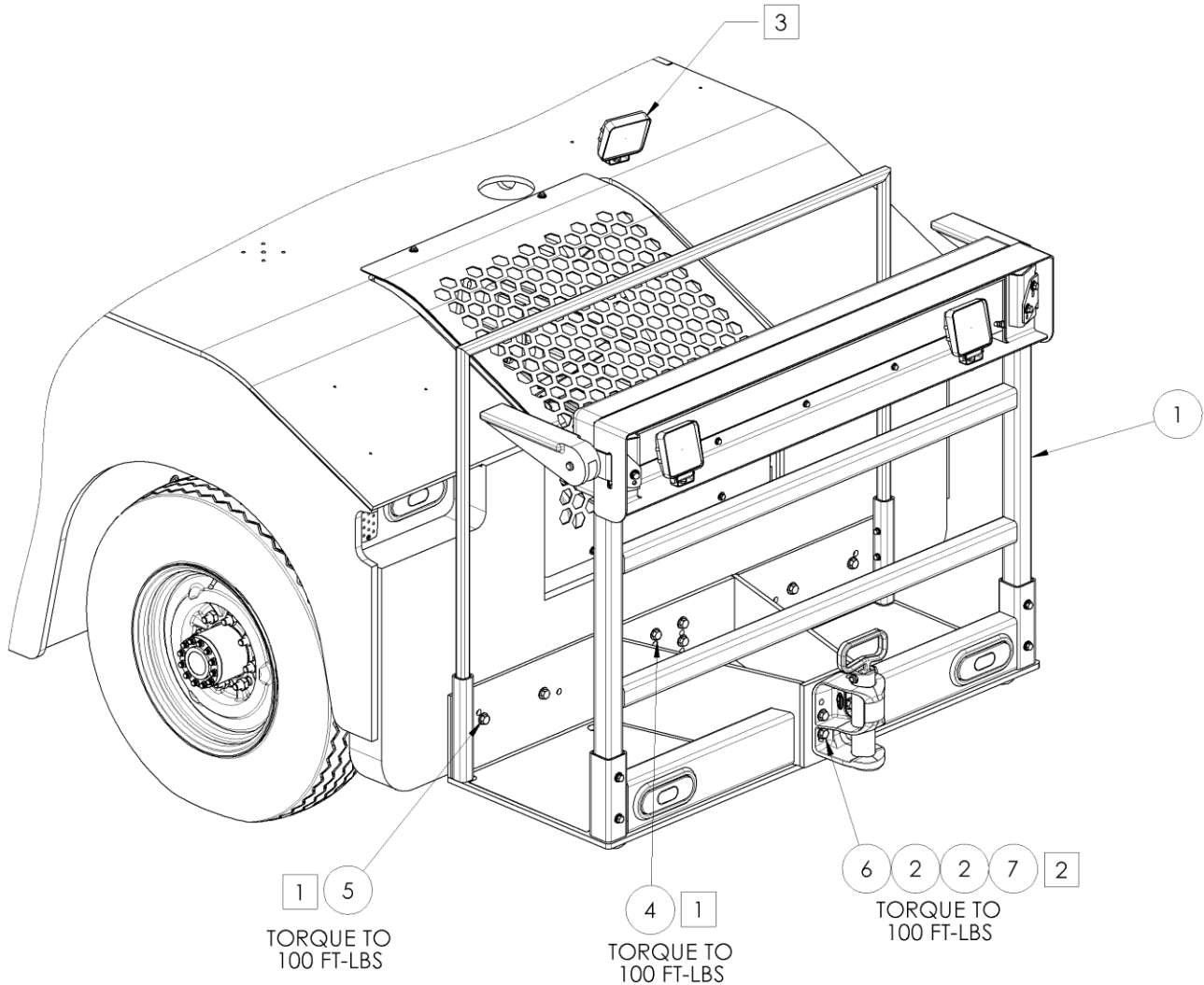
20.15.2 Wing Walker Option – TTR12-WING-1

DESCRIPTION: Wing walker platform. Allows two people to ride along on the tractor

See print AE-OPT-FBO-TT8 and INS-2458 for additional information

COMPATIBILITY/INSTALL NOTES:

- 1 Discard item 1 bolt and use the longer bolt from this assembly
- 2 Hardware stack should only be used if a rear hitch is installed. Rear hitch not included and shown for reference only
- 3 Standard rear spot should be omitted, the spots located at the rear of the wing walker platform supersede the standard spot
- 4 Egress angle is affected (reduced) as shown
- 5 Hole pattern as shown (refer to INS-2458)

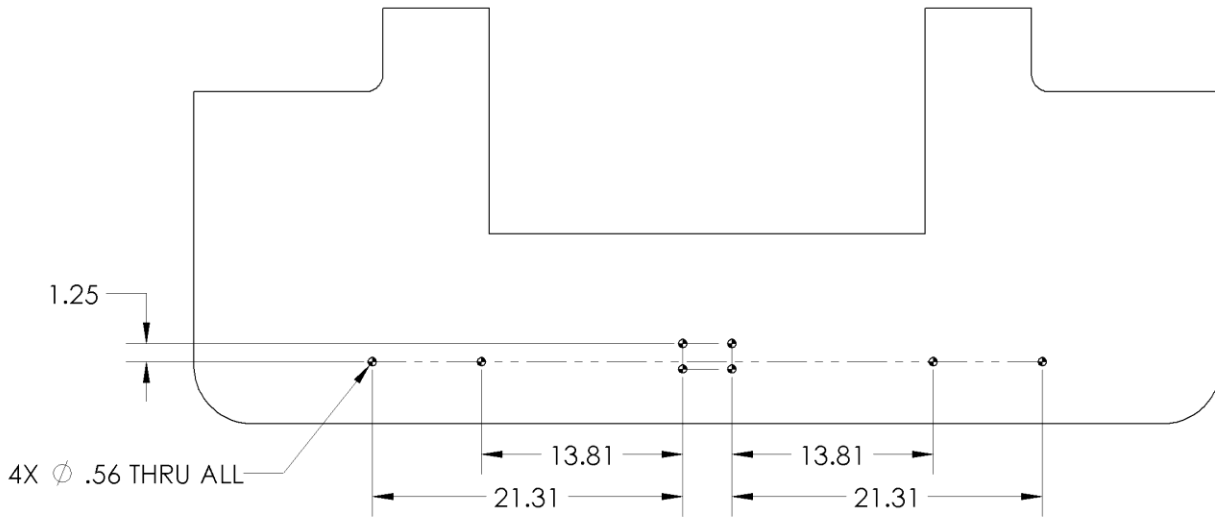


Parts List

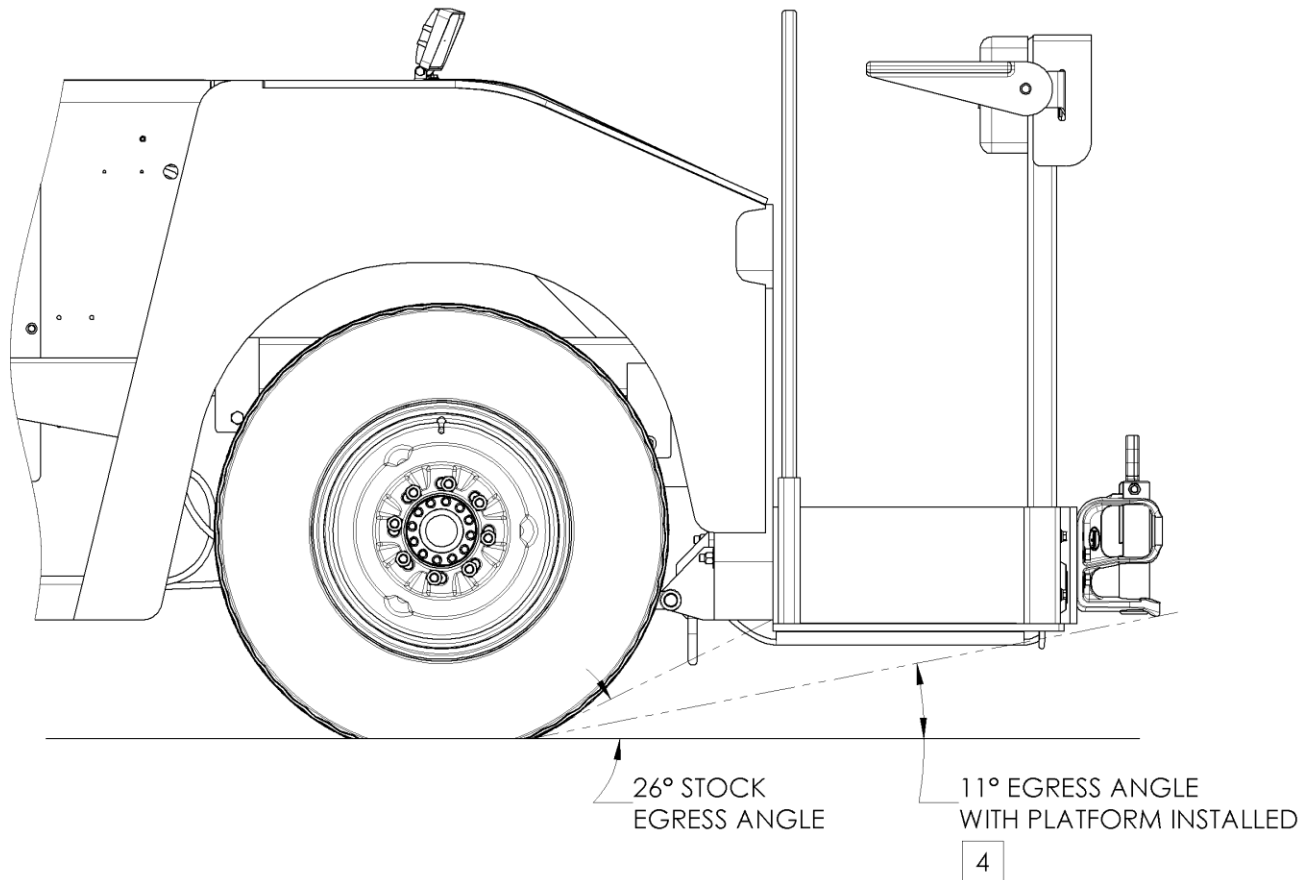
When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	AE-OPT-FBO-TT8	WING WALKER PLATFORM	1
2	G-1250-1090N	FLATWASHER, 1/2 NARROW	12
3	G-1250-1090W	FLATWASHER, 1/2 WIDE	4
4	G-1420-109060	BOLT, 1/2-13 HEX HD GR 8	4
5	G-1420-109054	BOLT, 1/2-13 X 5-1/2" HEX HD GR 8	4
6	G-1420-109020	BOLT, 1/2-13 X 2.00" HEX HD GR 8	4
7	G-1727-1090	NUT, 1/2-13 TOP LOCK ZINC	4

20.15.2 Wing Walker Option (continued)



REAR BUMPER
HOLE DRILL PATTERN

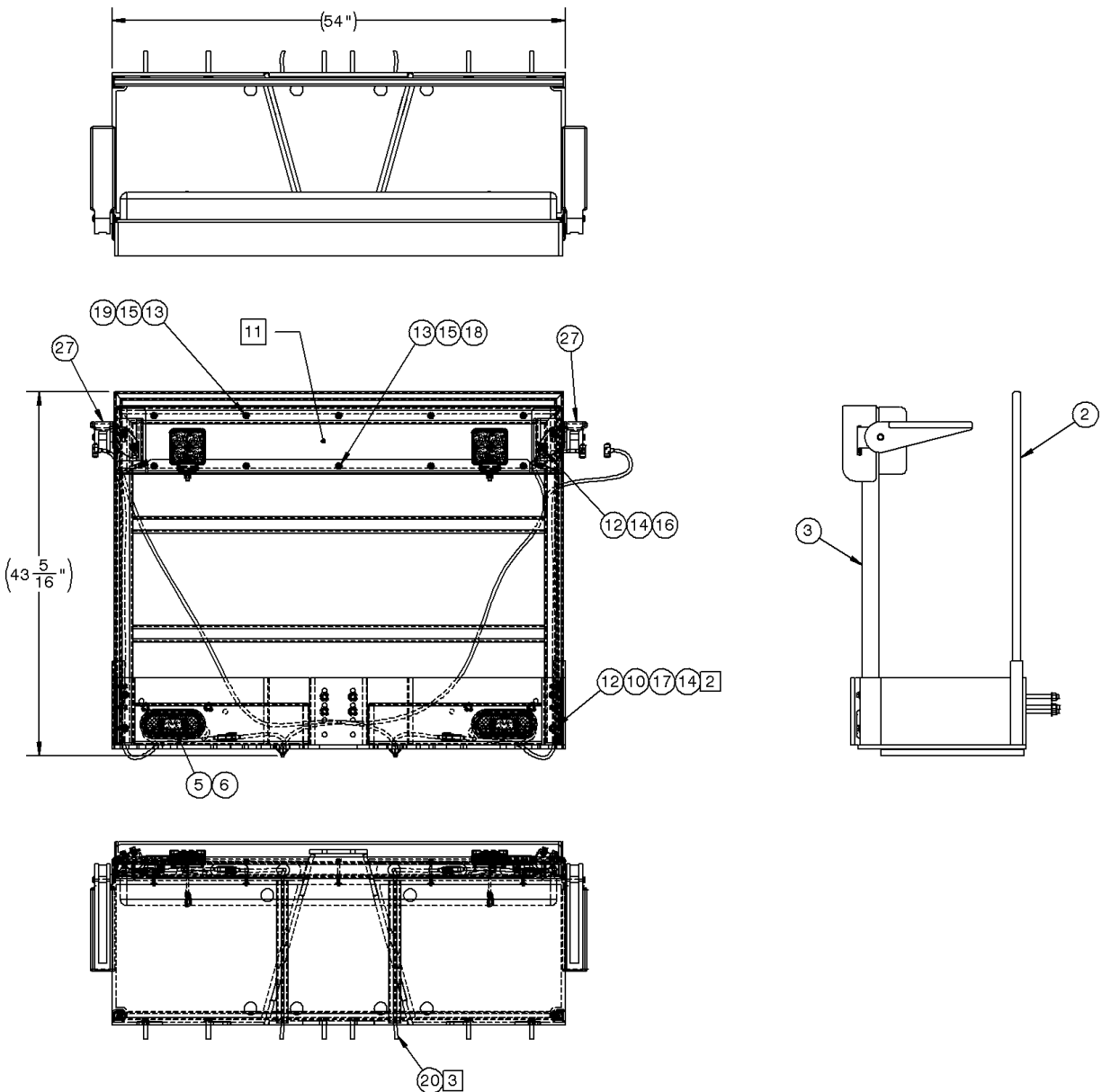


EGRESS ANGLE MODIFICATION

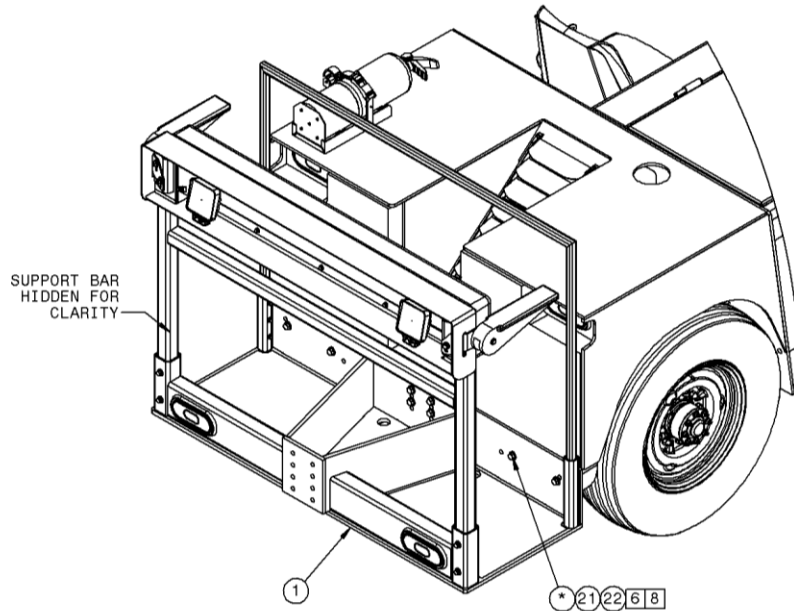
20.15.2 Wing Walker Option (continued)

NOTES:

- 1 Install nutserts, Item 9, into handle, Item 2, prior to handle installation.
- 2 Install nutserts, Item 10, into back support, Item 3, prior to support installation.
- 3 Carefully remove necessary connectors to feed harness through respective guards on bottom. Reinstall connectors as necessary.
- 4 Separate connectors if necessary to ease harness installation. Reconnect harness within tube. Connect respective connectors to brake/tail/reverse lights, Item 5, as shown.
- 5 Feed harness with spotlight connectors thru vertical tubes as shown. Connect spot assemblies, Item 11, to harness.
- 6 Match drill 4x ϕ .563 holes thru tug to bolt platform using INS-2458.
- 7 Disconnect and reconnect respective electrical connectors to truck and platform harness as necessary. See harness ins-2455, term sheet INS-2456, and layout EC-3162 if necessary.
- 8 Item is replaceable with Items 24 and 25 depending on length of bolt needed. Return unused bolts to stock.
- 9 Item 26 is to be inserted into the spotlight hole on the dash of the vehicle and wired to the spotlights harness.
- 10 Use F-3495 as template to cut Items 7 and 8.
- 11 Spray-paint exposed surface of cushion plywood black.



20.15.2 Wing Walker Option (continued)

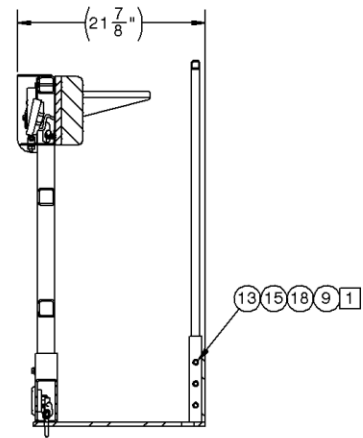
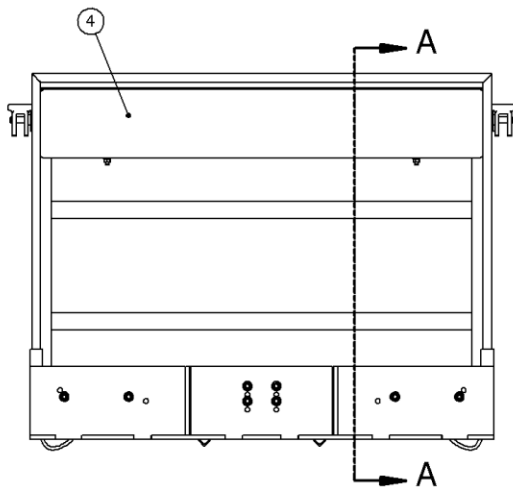
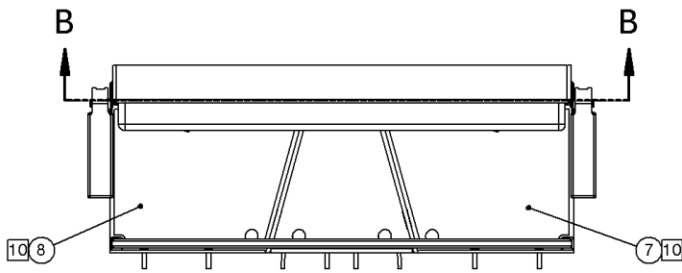
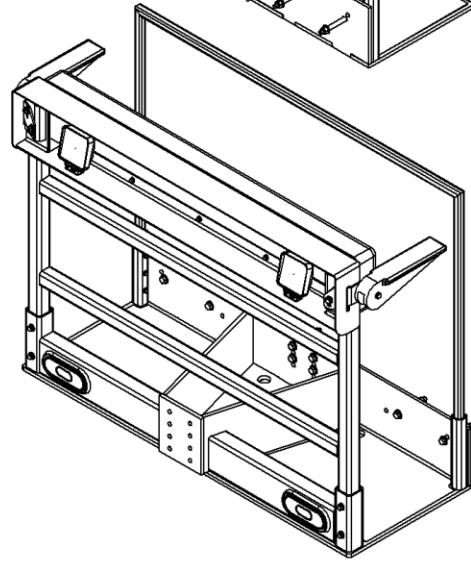
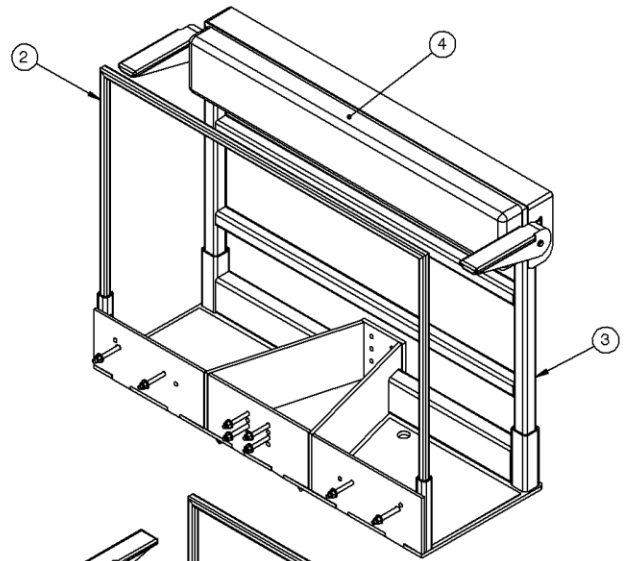
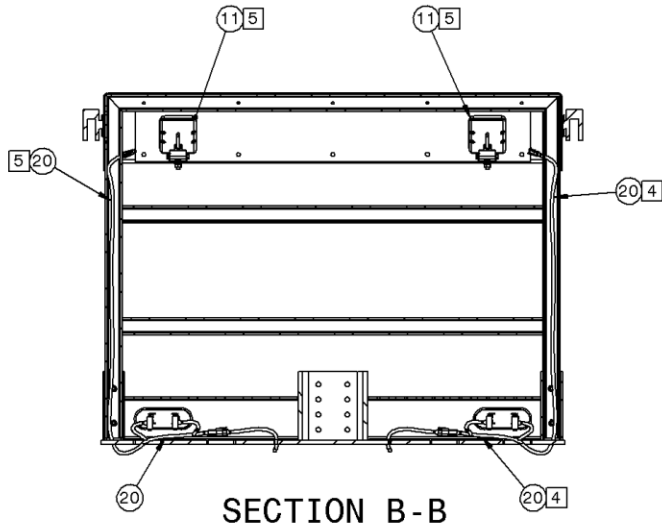


Parts List

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	Z-10262-00	WLD, BASE PLATFORM (P)	1
2	Z-10232-00	WELDMENT, HANDLE (P)	1
3	Z-10231-00	WLD, BACK SUPPORT (P)	1
4	H-4311	BACKREST, PADDED	1
5	NVSP-34-010-CA	6 IN OVAL COMBINATION LIGHT	2
6	A-RTT12E-00287	TAIL LIGHT GROMMET	2
7	H-4349	LH ANTISLIP MAT	1
8	H-4350	RH ANTISLIP MAT	1
9	G-1439-1050-S	NUTSERT, THIN WALL 1/4-20	6
10	G-1440-1070-S	NUTSERT, THICK WALL 3/8-16	4
11	Z-9825	ASY, HEADLIGHT W/CONNECTOR	2
12	G-1503-1070N	FLATWASHER. 3/8 SST NARROW	8
13	G-1503-1050N	FLATWASHER. 1/4 SST NARROW	16
14	G-1502-1070R	LOCKWASHER, 3/8 SST REGULAR	8
15	G-1502-1050R	LOCKWASHER, 1/4 SST REGULAR	16
16	G-1112-107006	BOLT, 38-16 X 3/4" SST HEX HD	4
17	G-1112-107012	BOLT, 38-16 X 1-1/4" SST HEX HD	4
18	G-1112-105010	BOLT, 1/4-20 X 1.0" LG SST HEX HD	11
19	G-1112-105030	BOLT, 1/4-20 X 3.0" LG SST HEX HD	5
20	EC-3162	LIGHTING HARNESS	1
21	G-1513-1090N	FLATWASHER, THRU HARD N	16
22	G-1727-1090	NUT, 1/2-13 TOP LOCK ZINC	8
30	G-1420-109044	BOLT, 1/2-13 HEX HD GR 8	8
24	G-1420-109024	BOLT, 1/2-13 X 2-1/2" HEX HD GR 8	8
31	G-1420-109034	BOLT, 1/2-13 X 3-1/2 H.H. GR 8	8
26	NVSP-14-008-CA	TOGGLE SWITCH (NOT SHOWN)	1
27	JP-228	ARMREST, PAIR	1
29	TS-2916	TUBE, LH TAIL LIGHT	1

20.15.2 Wing Walker Option (continued)

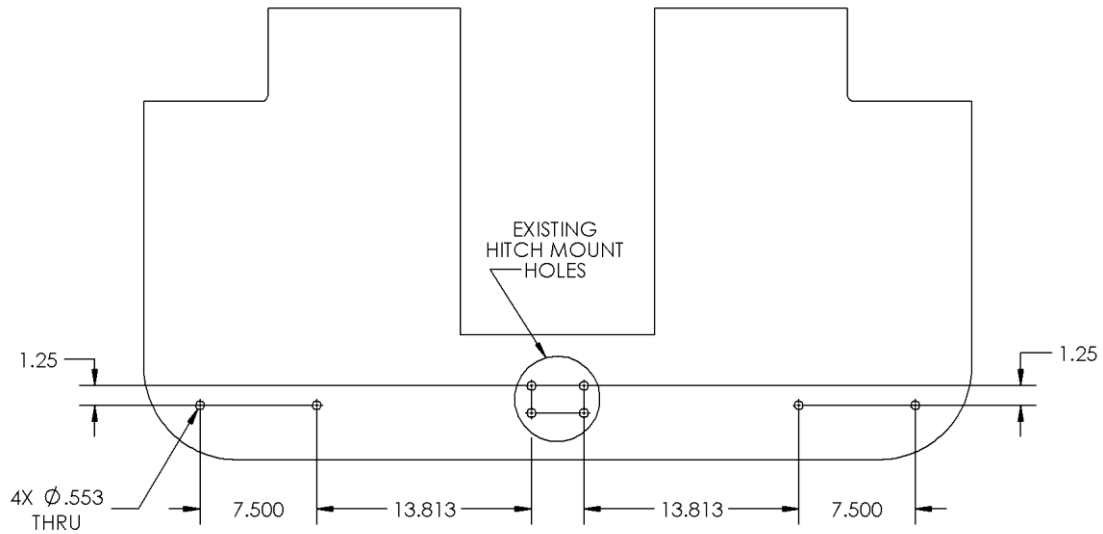


SECTION A-A

20.15.2 Wing Walker Option (continued)

NOTES:

1. Using existing hitch mount holes, attach the wingwalker to the tug with 4 bolts.
2. Center punch the 4 new wingwalker holes that need to be drilled out.
3. Remove the wingwalker from tug.
4. Magdrill the center punched holes all the way through.
5. Reinstall wingwalker on the tug using the bolts supplied with the wingwalker kit.



AE-OPT-FBO-TT8
HOLE LAYOUT

20.16 SEAT STANCHION FEATURE – TTR12-SEAT

20.16.1 Standard Seat – TTR12-SEAT-O

DESCRIPTION:

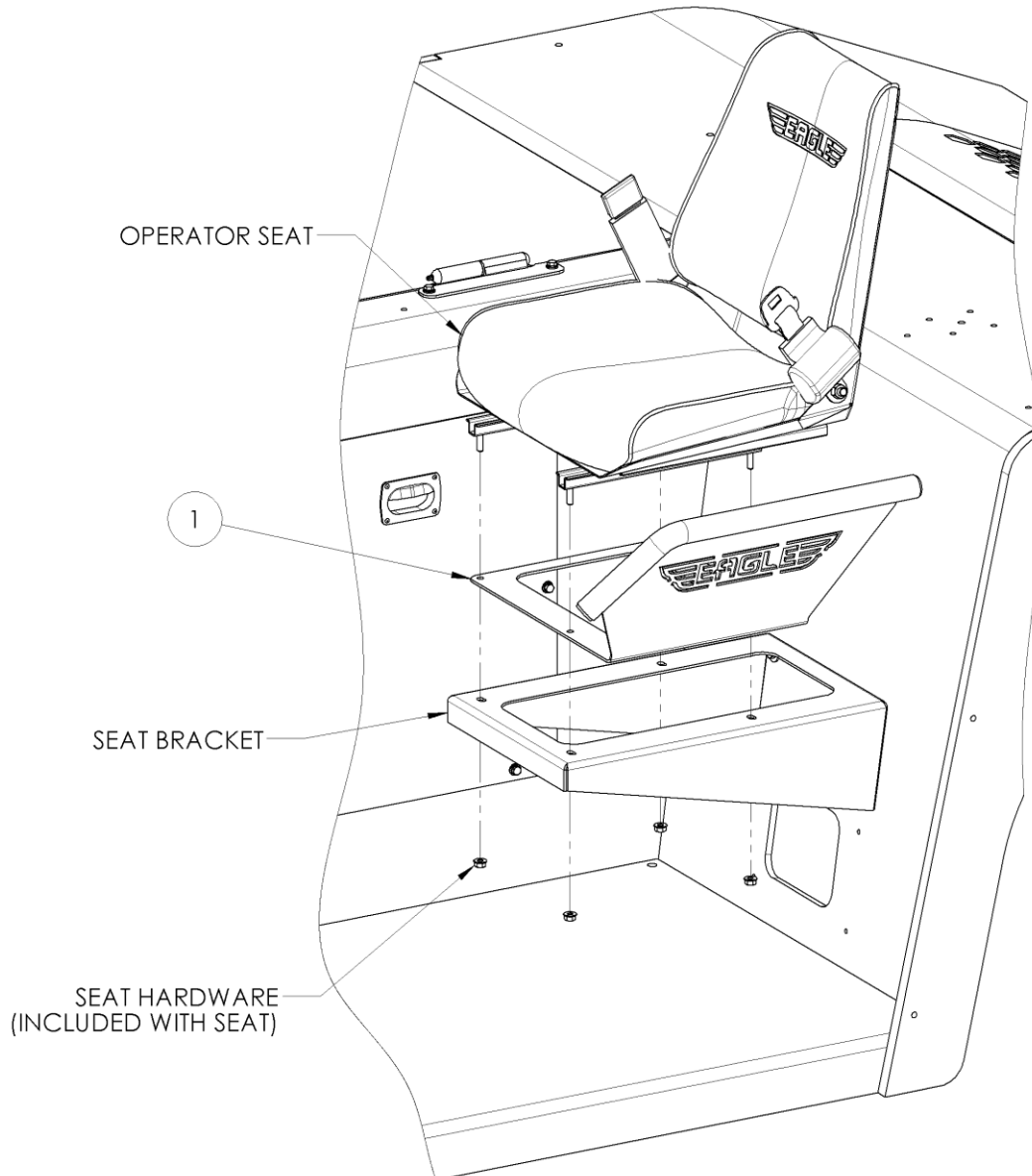
- Black vinyl seat with black seatbelt. No seat stanchion. Refer to Section 19.0.
- Contains no parts or assemblies

COMPATIBILITY NOTES: No compatibility concerns

20.16.2 Standard Seat with Stanchion Option – TTR12-SEAT-1

DESCRIPTION: Seat stanchion to help prevent operator from being able to slide off the seat.

COMPATIBILITY NOTES: No compatibility concerns



Parts List

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	Z-10905-00	WLD, SEAT STANCHION (P)	1

- 20.17 PLOW FEATURE – TTR12-PLOW
20.17.1 Standard No Plow – TTR12-PLOW-O
DESCRIPTION: Contains no parts or assemblies.

COMPATIBILITY NOTES: No compatibility concerns.

- 20.17.2 Plow Option – TTR12-PLOW-A
DESCRIPTION: Quick attach snow plow, 90" wide.

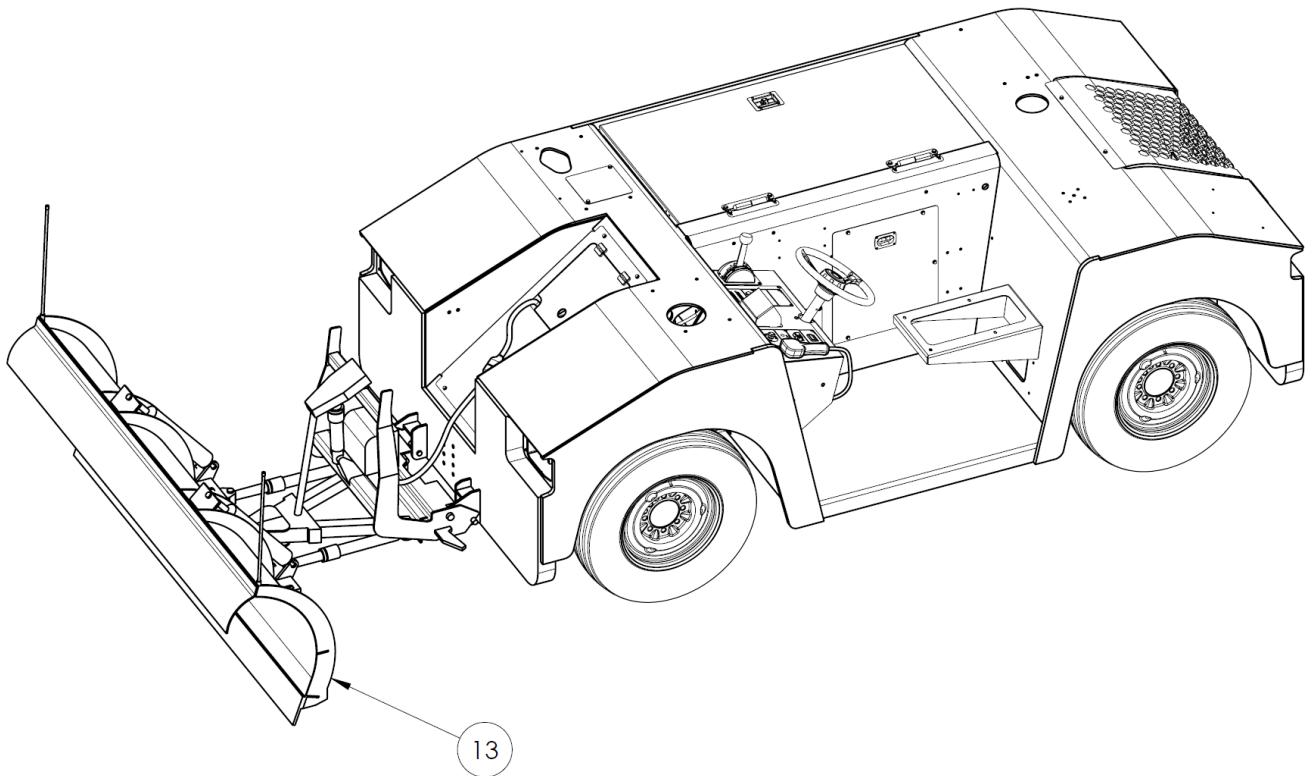
COMPATIBILITY NOTES: Not compatible with some front hitch options. Hitch may need to be removed to install plow.

NOTES:

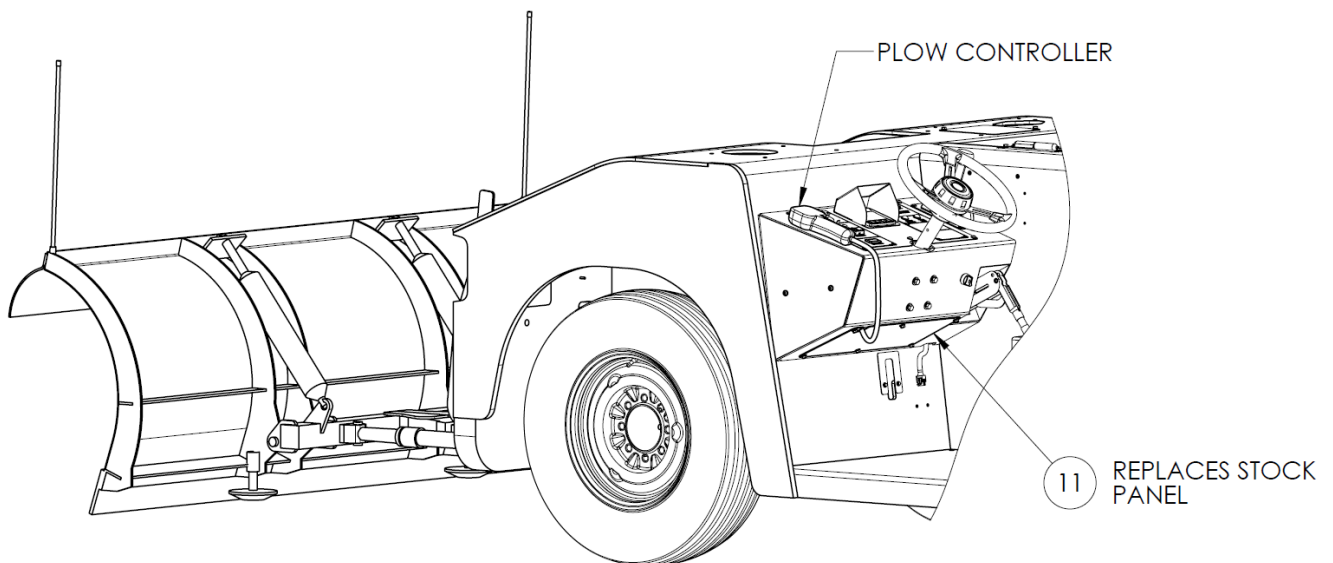
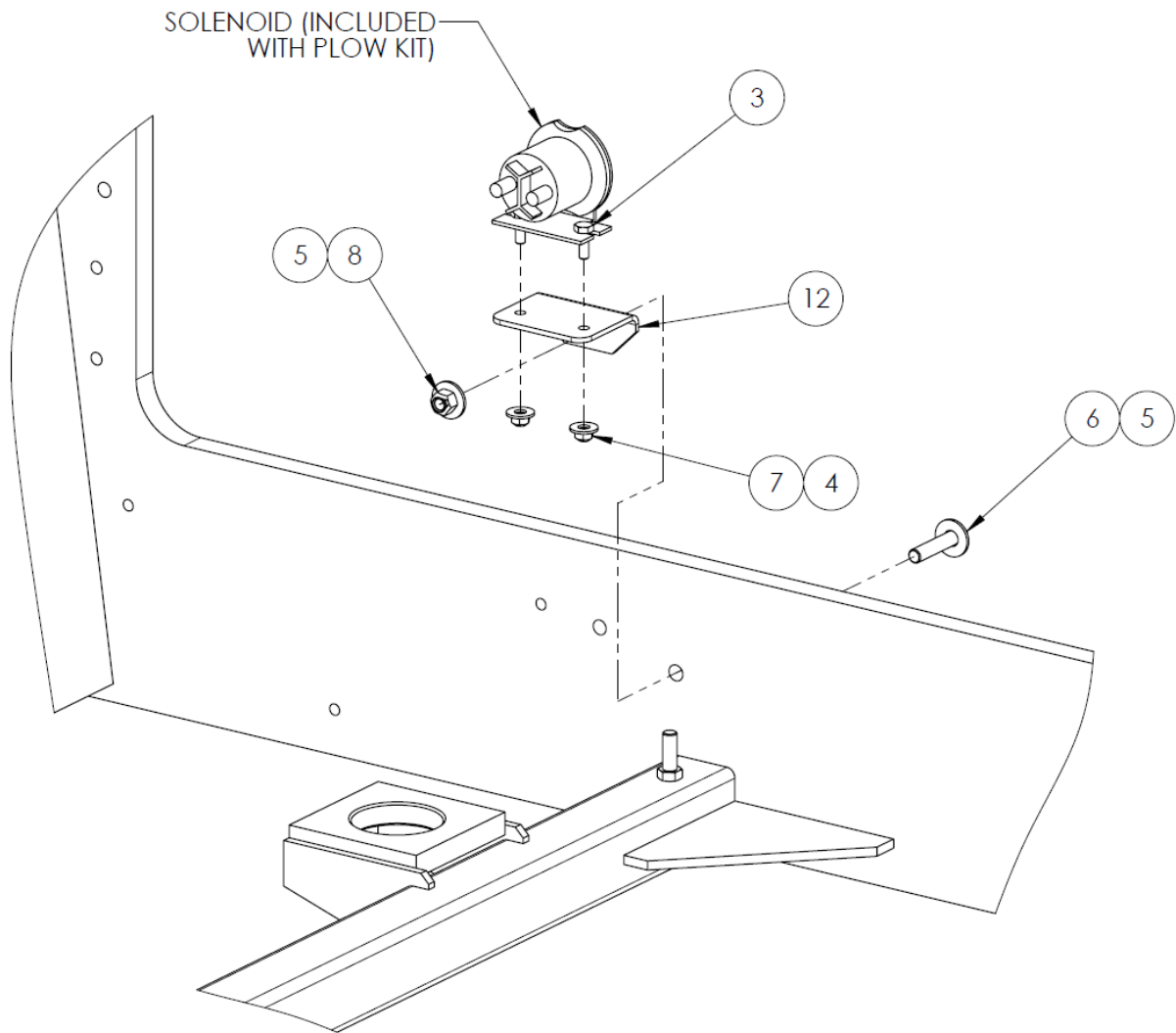
Plow wiring should enter the tug through the notch in the access panel and exit through the notch in the under-dash cover after passing through the parking brake cable hole.

Secure wiring to prevent chafing.

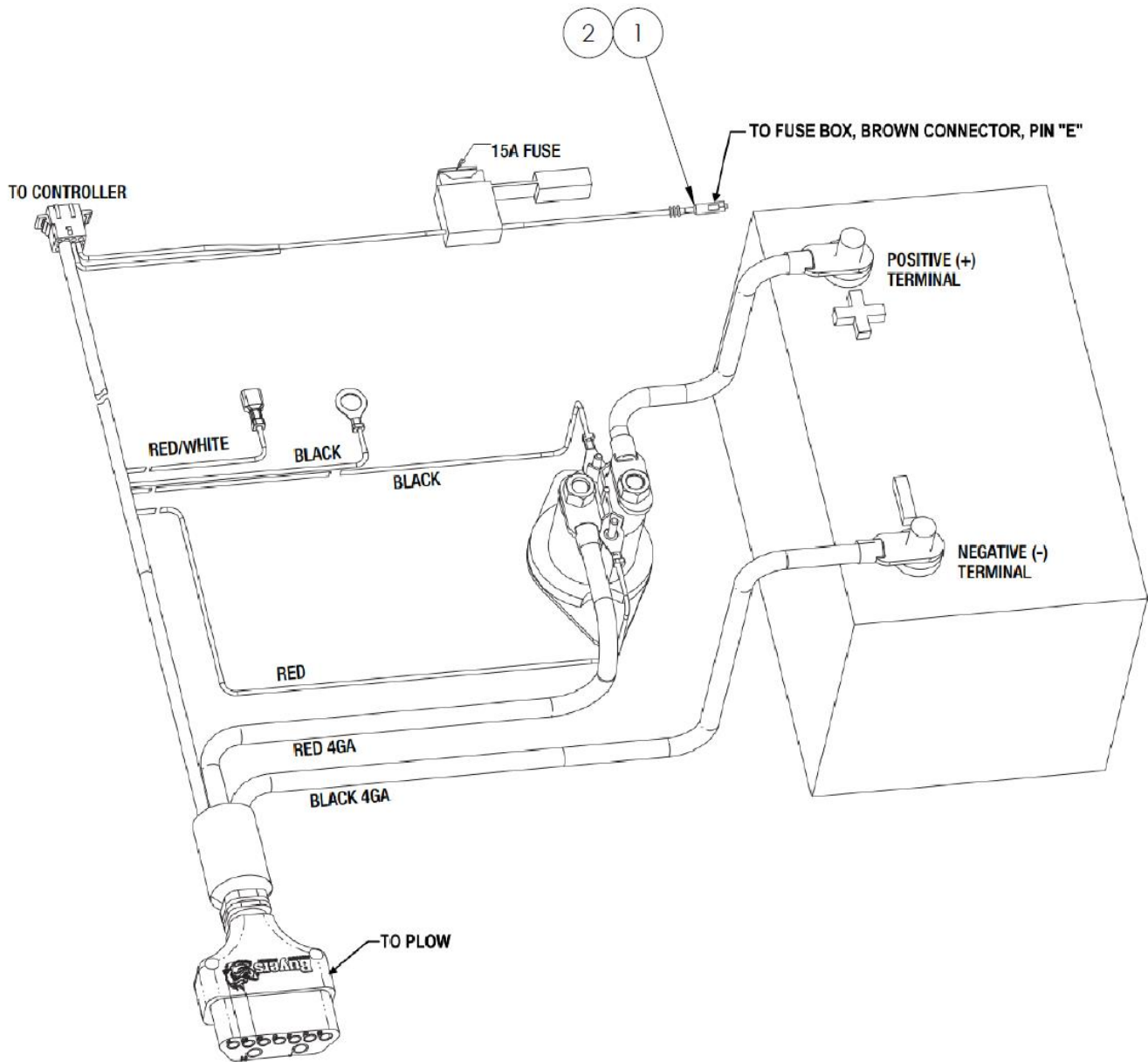
Plow controller shall be secured to the dash using the upper left dash mounting screw.



20.17.2 Plow Option – TTR12-PLOW-A (continued)

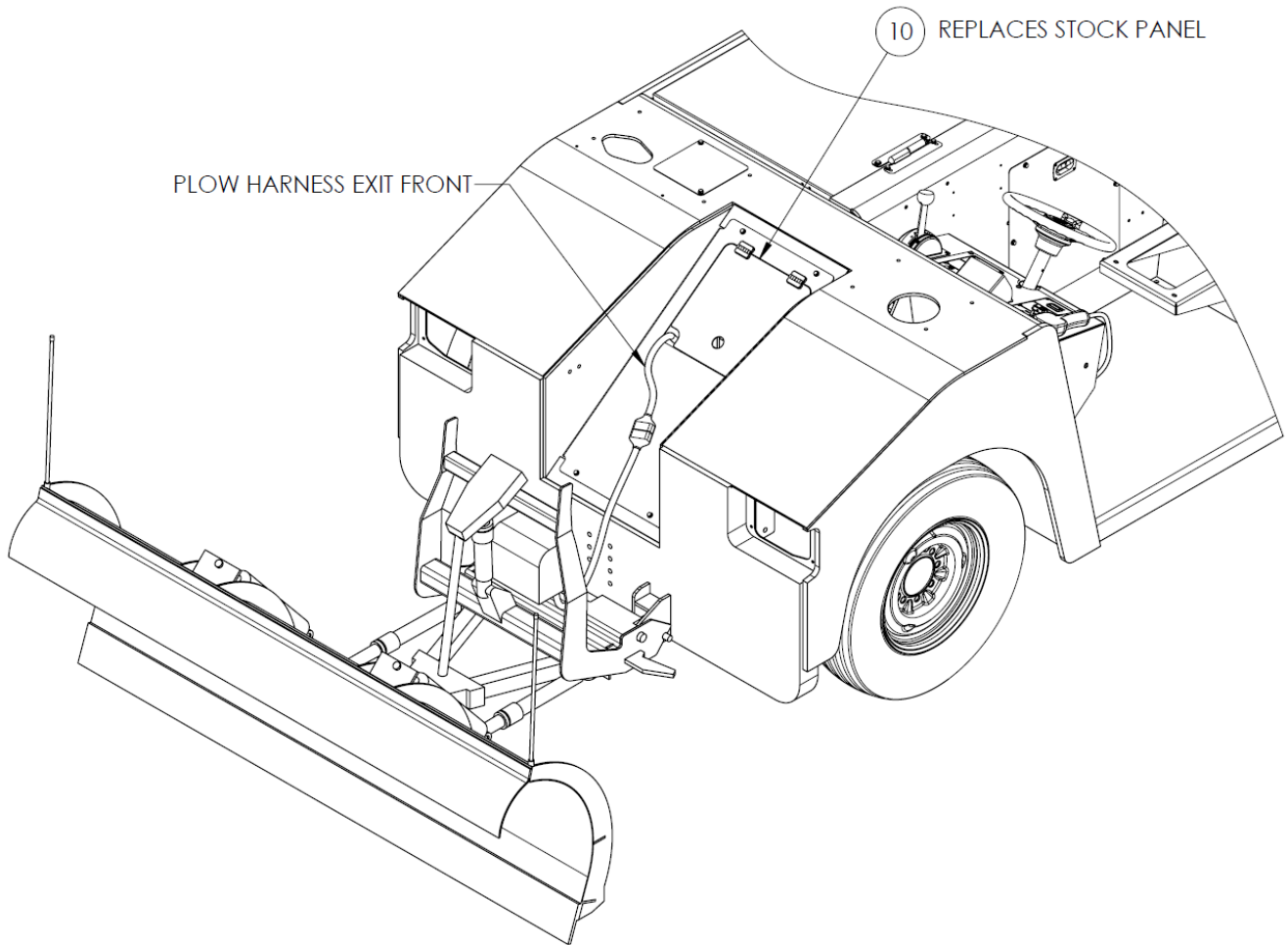


20.17.2 Plow Option – TTR12-PLOW-A (continued)



Wiring should be completed per the plow manufacturer's instructions with a couple notes:
 The black and red/white wires for lighting are not used on the eagle tractor.
 The "ACC power" connection should be tied into the vehicle fuse box. Brown connector, pin E.
 A 10 amp mini fuse must be installed to the fuse box, location F9.
 The chassis ground ring terminal should be installed on the chassis ground stud under the transmission.
 Mount the motor relay as shown on the previous sheet.

20.17.2 Plow Option – TTR12-PLOW-A (continued)



Parts List

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	12077411	DELPHI TERMINAL	1
2	15324984	CONNECTOR WIRE SEAL	1
3	G-1100-105006	BOLT, 1/4-20 X 3/4" LG HEX HD GR 5	2
4	G-1250-1050W	FLATWASHER, 1/4 WIDE	2
5	G-1250-1070W	FLATWASHER, 3/8 WIDE	2
6	G-1420-107016	BOLT, 3/8-16 X 1.75" HEX HD GR 8	1
7	G-1727-1050	NUT, 1/4-20 TOP LOCK ZINC	2
8	G-1727-1070	NUT, 3/8-16 TOP LOCK ZINC	1
9	MIN-10	MINI AUTOMOTIVE BLADE FUSE, 10A	1
10	S-4384-00	FR SIGHT TUNNEL ACC COVER (WP)	1
11	S-3932-00	COVER, UNDER DASH (WP)	1
12	S-4165-00	BRACKET, PLOW SOLENOID (P)	1
13	Z-11924-00	MOD, PLOW W HITCH CLEARANCE (WP)	1



21.0 APPENDICIES

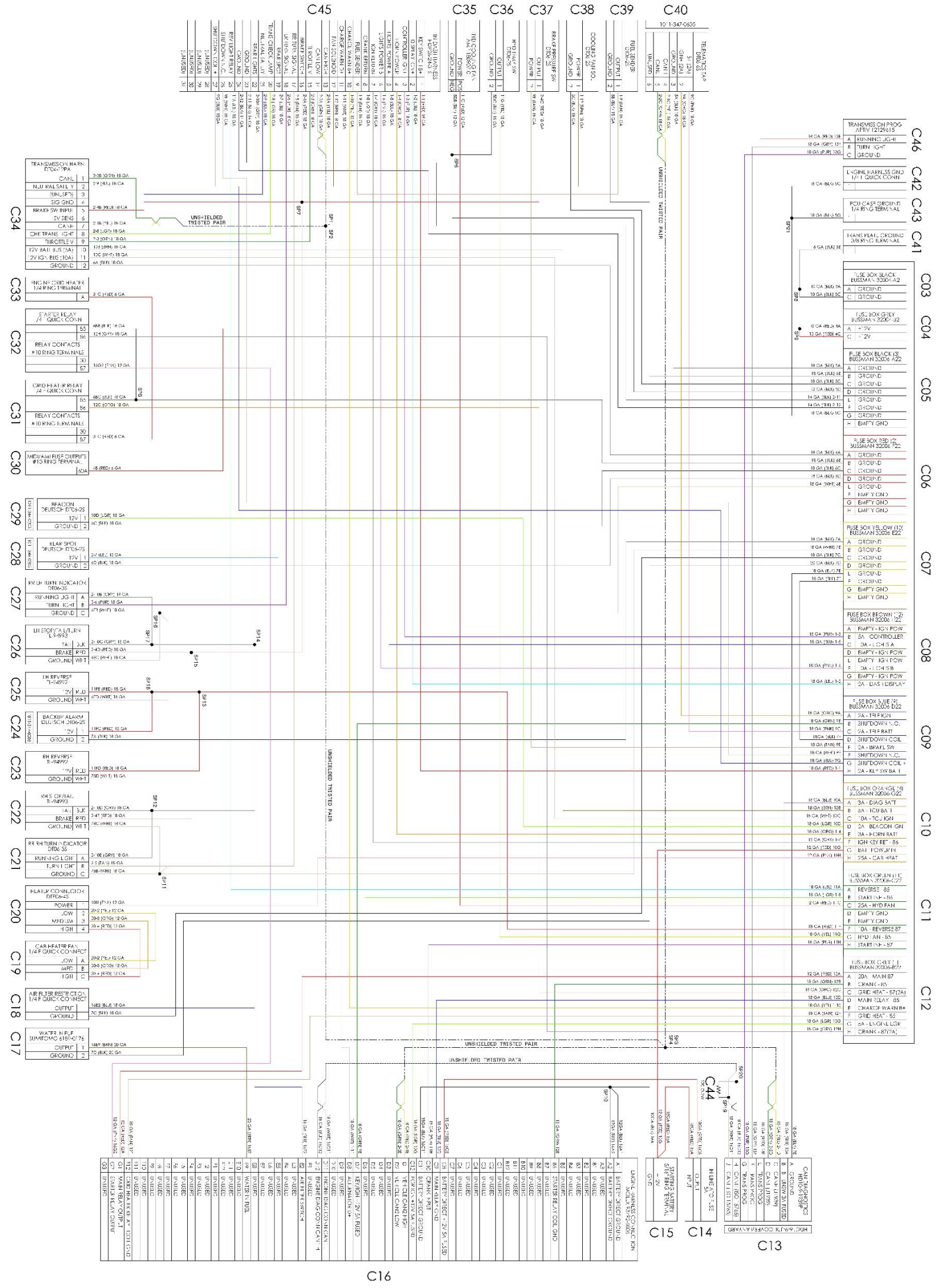
- APPENDIX I Schematics
- APPENDIX II Axle Service Parts
- APPENDIX III J1939 Engine Codes



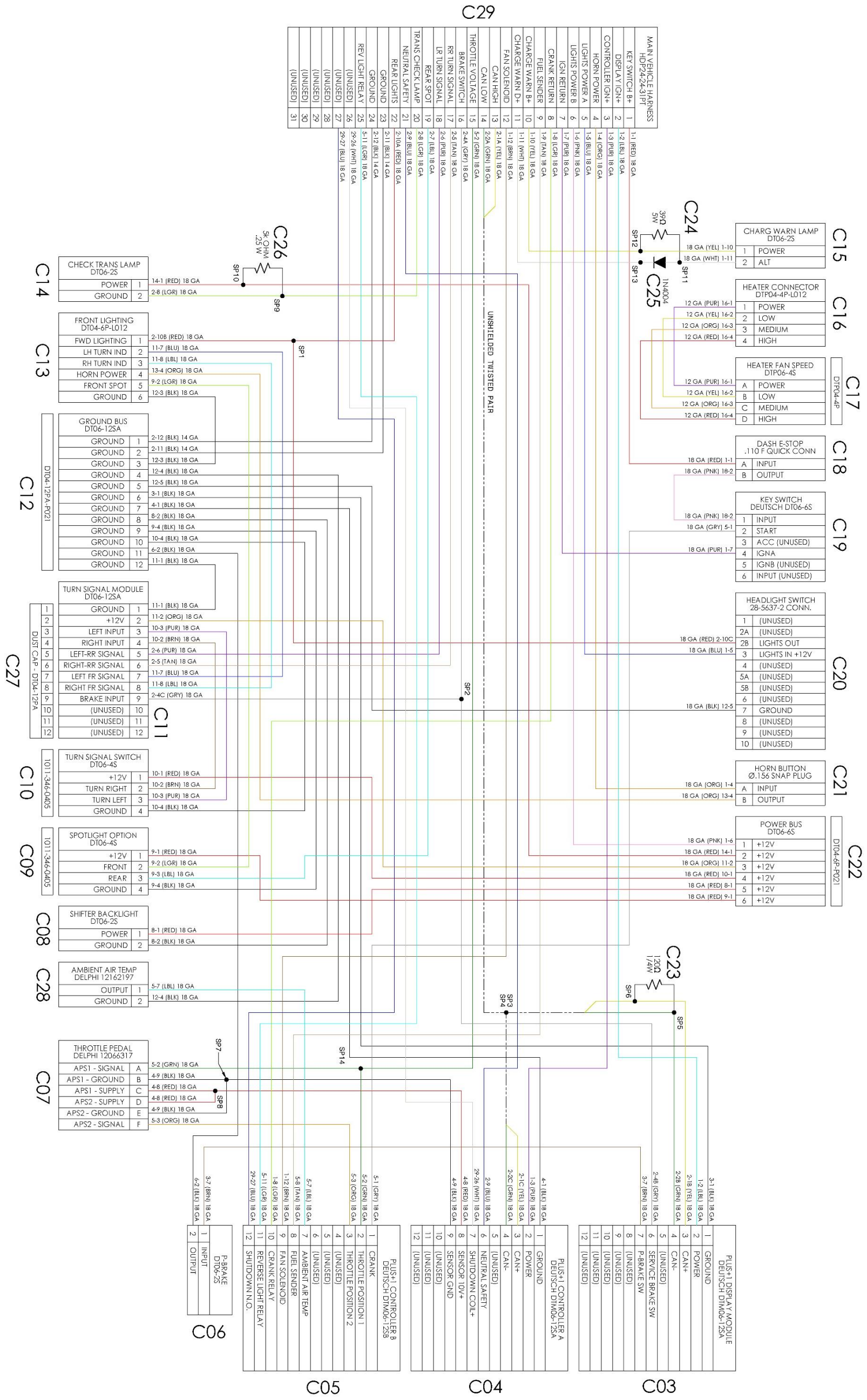
APPENDIX I

Schematics

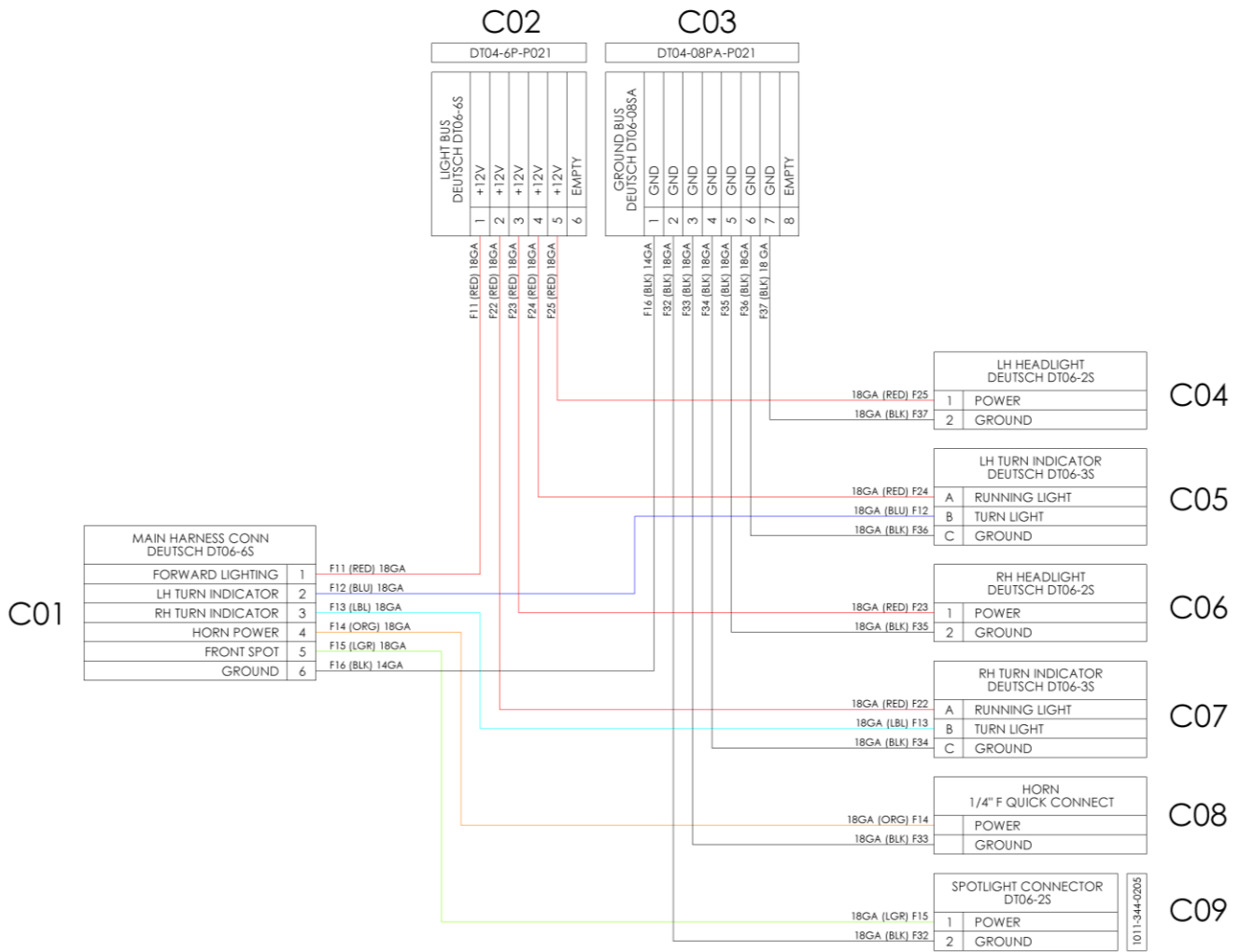
Main Wiring Harness Schematic



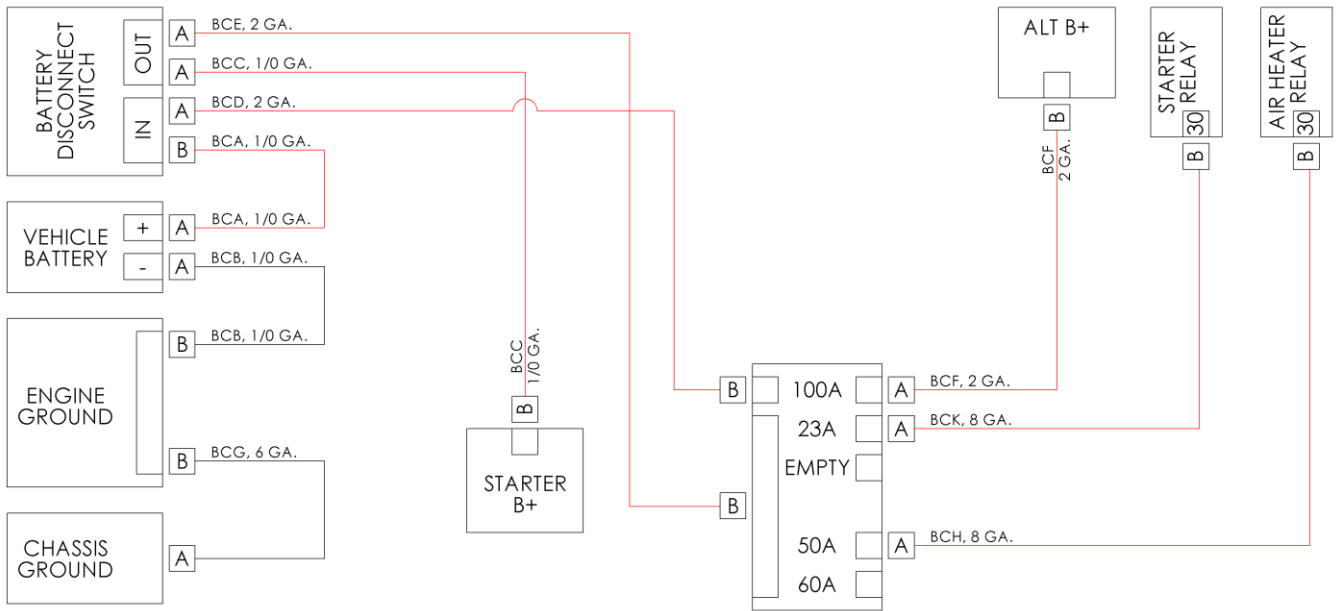
Dash Panel Wiring Harness Schematic



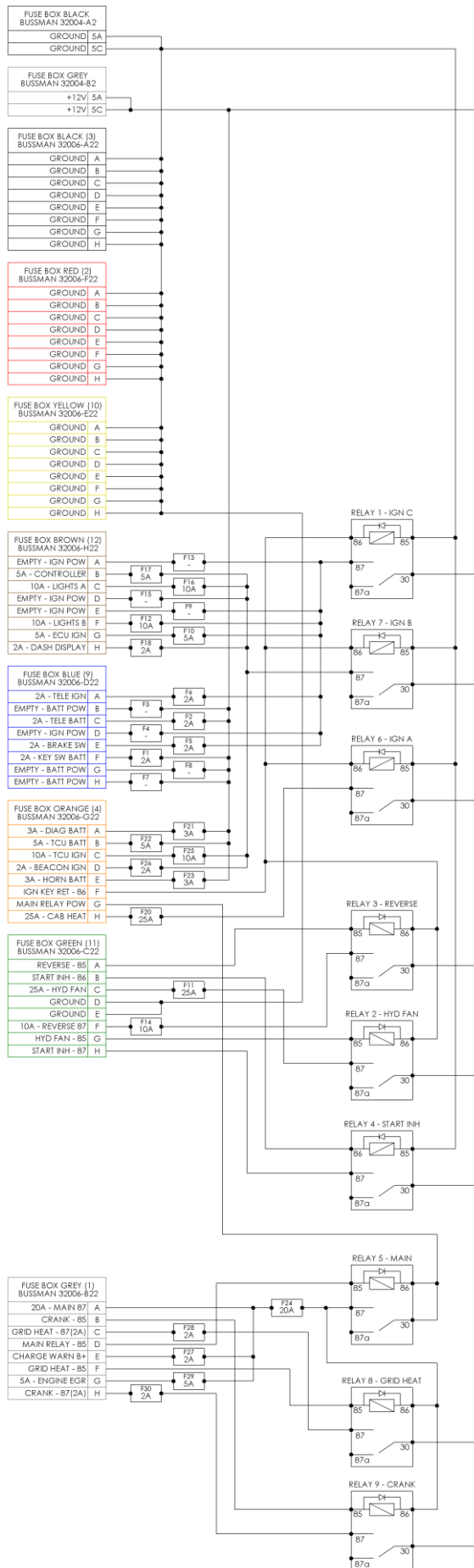
Front Wiring Harness Schematic



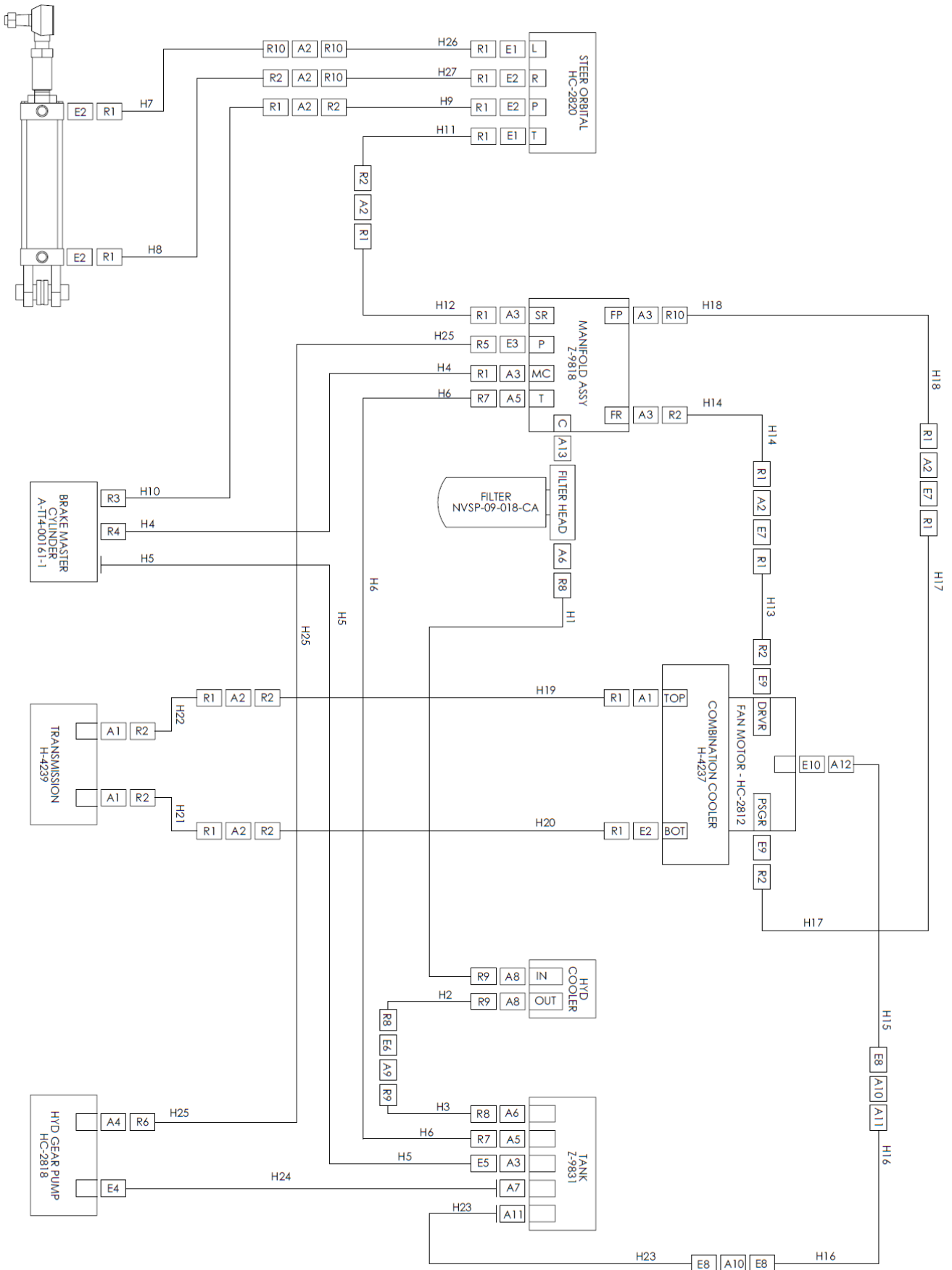
Battery Cable Schematic



Power Distribution Box Schematic



Hydraulic Schematic



ADAPTERS

ID	Description	Part Number	Qty
A1	ADAPTER, -8 SAE ORB M, -6 JIC M	C5315X6X8	1
A2	ADAPTER, -6 JIC M, -6 JIC M, BULKHEAD	6 WTX-WLN-S	8
A3	ADAPTER, -6 SAE ORB M, -6 JIC M	C5315X6	5
A4	ADAPTER, -12 SAE ORB M, -10 JIC M	N-2007-17-S-B	1
A5	ADAPTER, -8 SAE ORB M, -8 JIC M	C5315X8	2
A6	ADAPTER, -12 SAE ORB M -12 JIC M	C5315X12	2
A7	-20 NPT M, -20 HOSE BARB STRAIGHT	4404-20-20	1
A8	ADAPTER, -16 SAE ORB M, -12 JIC M	C5315X12X16	2
A9	-12 BULKHEAD NUT	C5924X12	1
A10	ADAPTER, -4 NPT BULKHEAD FITTING	A-TT4-00280	2
A11	ADAPTER, -4 NPT M, -6 HOSE BARB	05706B-104	2
A12	ADAPTER, -6 JIC F, -6 HOSE BARB	30682-6-6	1
A13	ADAPTER, -12 SAE ORB M, -12 SAE ORB M	C5314X12X12	1
A14	ADAPTER, -06 AN, -06 INVERTED FLARE	N-3115-06-06	1
A15	ADAPTER, -06 AN, -07 INVERTED FLARE	N-3115-06-07	1
E1	ELBOW 90° LONG -8 SAE ORB M, -6 JIC M	6-8 CC5OX-S	2
E2	ELBOW 90° -8 SAE ORB M, -6 JIC M	C5515X6X8	5
E3	ELBOW 45° -10 SAE ORB M, -10 JIC M	10 V5OX-S	1
E4	ELBOW 45°, -16 SAE ORB M, -20 HOSE BARB	4603-20-16	1
E5	ELBOW 90° -6 JIC F, -6 HOSE BARB	33982-6-6	1
E6	ELBOW 90° -12 JIC M, -12 JIC M	12 WETX-S	1
E7	ELBOW 90° -6 JIC F, -6 JIC M	C5506X6	2
E8	ELBOW 90° -4 NPT M, -6 HOSE BARB	05706B-C04	3
E9	ELBOW 90° -10 SAE ORB M, -6 JIC M	C5515X6X10	2
E10	ELBOW 90° -4 SAE ORB M, -6 JIC M	N-2001-35-S-B	1

HOSE ENDS	
ID	Description
R1	-6 JIC, STRAIGHT FEMALE SWIVEL
R2	-6 ELBOW 90° SHORT JIC FEMALE SWIVEL
R5	-10 JIC, STRAIGHT FEMALE SWIVEL
R6	-10 ELBOW 45° JIC FEMALE SWIVEL
R7	-8 JIC, STRAIGHT FEMALE SWIVEL
R8	-12 JIC, STRAIGHT FEMALE SWIVEL
R9	-12 ELBOW 90° SHORT JIC FEMALE SWIVEL
R10	-6 ELBOW 90° LONG JIC FEMALE SWIVEL

HOSES		
ID	Part Number	Qty
H1	TF-1038-07-27.3	HOSE ASY, COOLER INLET
H2	TF-1038-07-28.3	HOSE ASY, COOLER OUTLET
H3	TF-1038-07-34.0	HOSE ASY, COOLER OUT TO TANK
H4	TF-1038-04-27.8	HOSE ASY, MASTER CYL PRESS
H5	TF-1080-06-06.5	HOSE, MASTER CYL RETURN
H6	TF-1038-23-25.5	HOSE ASY, MANIFOLD TANK
H7	TF-1038-18-21.3	HOSE ASY, CYLINDER LEFT
H8	TF-1038-42-14.3	HOSE ASY, CYLINDER RIGHT
H9	TF-1038-42-34.8	HOSE ASY, STEER PRESSURE
H10	TF-1038-42-30.3	HOSE ASY, MASTER CYL POWER BEYOND
H11	TF-1038-42-36.8	HOSE ASY, STEER TANK
H12	TF-1038-04-54.5	HOSE ASY, MAN STEER RET
H13	TF-1038-42-61.5	HOSE ASY, FAN RETURN R
H14	TF-1038-42-66.5	HOSE ASY, FAN RETURN F
H15	TF-1080-06-56.5	HOSE, FAN DRAIN R
H16	TF-1080-06-59.0	HOSE, FAN DRAIN M
H17	TF-1038-42-61.5	HOSE ASY, FAN PRESS R
H18	TF-1038-18-65.8	HOSE ASY, FAN PRESS F
H19	TF-1038-42-34.5	HOSE ASY, TRANS COOL TOP
H20	TF-1038-42-54.5	HOSE ASY, TRANS COOL BOTTOM
H21	TF-1038-42-66.5	HOSE ASY, TRANS COOLING RETURN
H22	TF-1038-42-75.8	HOSE ASY, TRANS COOLING OUTLET
H23	TF-1080-06-15.5	HOSE, FAN DRAIN F
H24	TF-1143-20-56.0	HOSE, SUCTION
H25	TF-1038-48-36.0	HOSE ASY, PUMP PRESSURE
H26	TF-1038-18-36.8	HOSE ASY, STEER LEFT
H27	TF-1038-18-35.5	HOSE ASY, STEER RIGHT



APPENDIX II

Axle Service Parts

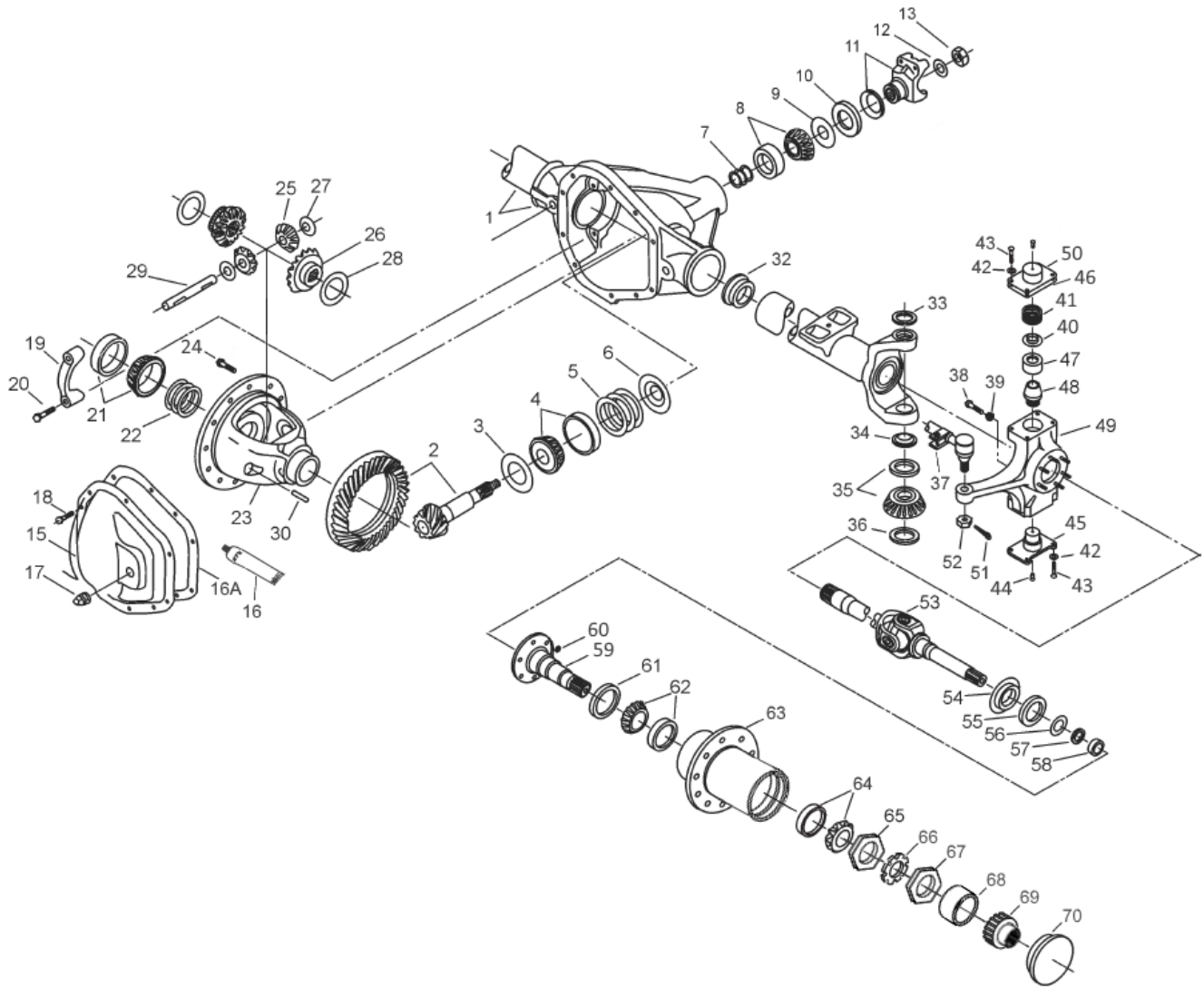
Axle - Front

AXLE ASSEMBLY BREAKDOWN – FRONT DRIVE

Item	Part Number	Qty	Description
1	H-4417	1	COMPLETE AXLE ASSEMBLY
2	706999-14X	1	GEAR & PINION ASSEMBLY
3	SEE KIT ITEM 71 OR 72	1	SLINGER-PINION OIL INNER
4	706060X	KIT	INNER PINION BEARING
5	SEE KIT ITEM 71, 76 OR 78	KIT	SHIM-PINION ADJUSTING
6	SEE KIT ITEM 71	1	BAFFLE-PINION OIL
7	SEE KIT ITEM 71, 76 OR 78	KIT	SHIM-PINION BEARING ADJUSTING
8	706045X	KIT	OUTER PINION BEARING
9	SEE KIT ITEM 71	1	SLINGER-PINION OIL OUTER
10	35725	1	SEAL-OIL
11	345731X	1	END YOKE ASSY
12	30275	1	WASHER-PINION NUT
13	30271	1	NUT-PINION
14	39697	2	AXLE GASKET
15	73591X	1	COVER - CARRIER
16	82180	1	RTV SEALANT
16A	34687	1	COVER GASKET
17	36472	1	PLUG-PIPE SQ DRIVE
18	34822	10	SCREW-FLANGE HD
19	NOT SOLD SEPERATELY	2	CAP DIFFERENTIAL BEARING
20	500400-20	2	1/2-13 X 2.25 GRD8 HEX BOLT
21	706047X	KIT	DIFFERENTIAL BEARING
22	SEE KIT ITEM 71, 76 OR 78	KIT	DIFFERENTIAL SHIM
23	706625X	1	CASE-DIFFERENTIAL ASSY(STANDARD)
24	30266	10	SCREW-HEX
25	SEE KIT ITEM 73	2	PINION-DIFFERENTIAL
26	SEE KIT ITEM 73	2	GEAR-DIFFERENTIAL KIT
27	SEE KIT ITEM 73	2	THRUST WASHER DIFFERENTIAL PINION
28	SEE KIT ITEM 73	2	THRUST WASHER DIFFERENTIAL GEAR
29	SEE KIT ITEM 73	1	SHAFT-DIFFERENTIAL
30	500598-22	1	PIN-ROLL
31	16979	1	VENT PLUG
32	37275	2	SEAL & GUIDE-SHAFT
33	SEE KIT ITEM 81	2	SEAL-KING PIN
34	SEE KIT ITEM 81	2	RETAINER
35	SEE KIT ITEM 81	2	BEARING KING PIN
36	41777	1	OIL SEAL
37	044TR115-24X	2	TIE ROD ASSY

Axle - Front

AXLE ASSEMBLY BREAKDOWN – FRONT DRIVE



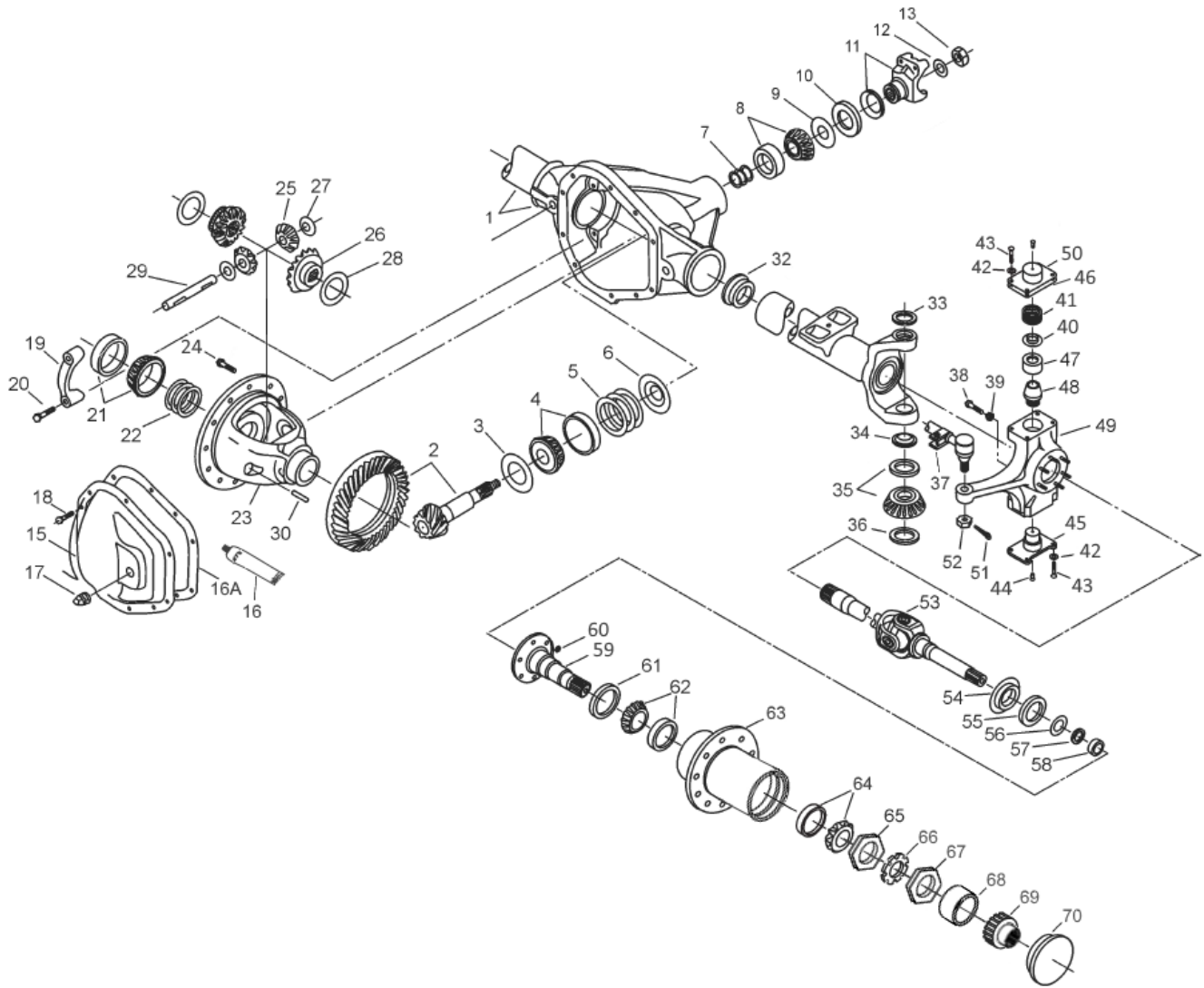
Axle - Front

AXLE ASSEMBLY BREAKDOWN – FRONT DRIVE

Item	Part Number	Qty	Description
38	31026-3	2	BOLT STOP
39	05QE	2	JAM NUT
40	620180	2	RETAINER- COMPRESSION SPRING
41	37300	2	COMPRESSION SPRING
42	500357-13	8	LOCK WASHER
43	500412-12	8	BOLT-KING PIN BEARING CAP
44	500175-1	2	FITTING - LUBRICATION
45	37299	2	KING PIN CAP FIN
46	37307	2	GASKET-KING PIN CAP
47	41886	2	BUSHING - KING PIN
48	37302	2	KING PIN
49	73948-X	1	(3)RIGHT HAND STEERING KNUCKLE
49	070SK193-X	1	(3)LEFT HAND STEERING KNUCKLE
50	620132	2	CAP - KING PIN
51	500024-5	2	COTTER PIN
52	34800	2	NUT
53	10123980	2	(1) SHAFT AND JOINT ASSY 30 TOOTH
54	37308	2	SLINGER
55	37311	2	OIL SEAL
56	SEE KIT ITEM 79 OR 80	2	SPACER
57	SEE KIT ITEM 79 OR 80	2	SEAL
58	SEE KIT ITEM 79 OR 80	2	BEARING ASSY - NEEDLE
59	SEE KIT ITEM 79	2	WHEEL BEARING SPINDLE ASSY
60	36880	12	SPINDLE NUT
61	37729	2	SEAL
62	706411X	2	INNER WHEEL BEARING
63	060HU109-X	2	WHEEL HUB
64	706074X	2	OUTER WHEEL BEARING
65	35270	2	NUT
66	35269	2	LOCK-WHEEL BEARING ADJUSTING NUT
67	35270	2	NUT
68	37997	2	SPACER - DRIVE GEAR
69	620861	2	GEAR - DRIVE 35 TOOTH
69	37994	2	GEAR - DRIVE 30 TOOTH
70	37996	2	HUB CAP
71	706999-14X	KIT	DRIVE GEAR AND PINION ASSY INCLUDES ITEMS 2-10, 12,13,16,22,24

Axle - Front

AXLE ASSEMBLY BREAKDOWN – FRONT DRIVE



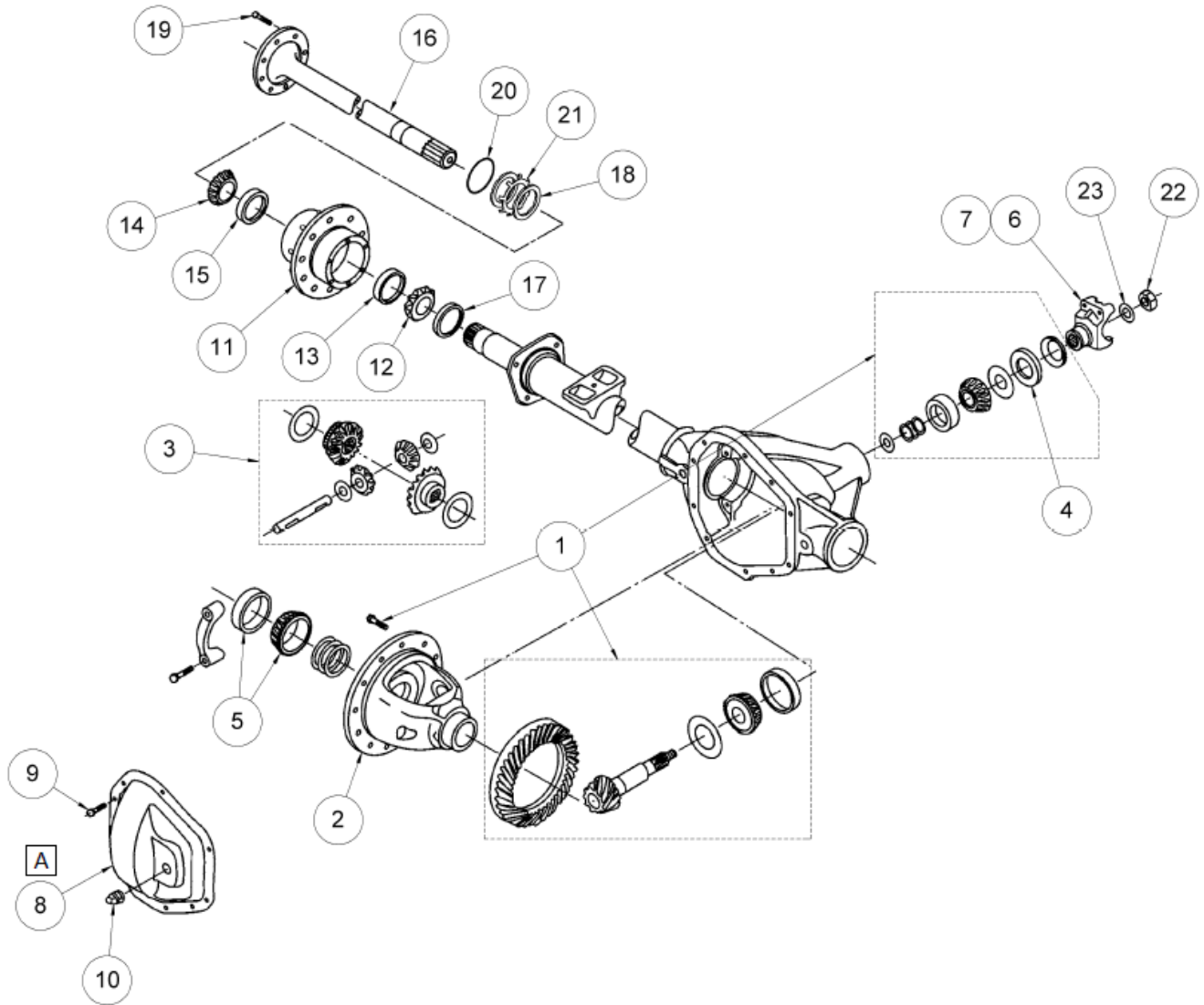
Axle - Front

AXLE ASSEMBLY BREAKDOWN – FRONT DRIVE

Item	Part Number	Qty	Description
72	72162X	KIT	DRIVE GEAR AND PINION INCLUDES ITEMS 2,13
73	706602X	KIT	DIFFERENTIAL PARTS (STANDARD) INCLUDES ITEMS 16,24-30
74	706601X	KIT	DIFFERENTIAL PARTS (LIMITED SLIP) INCLUDES ITEMS 16,24,74-81
75	706354X	KIT	DIFFEREN. DISC & PLATES(LIMITED SLIP) INCLUDES ITEMS 78-81
76	706603X	KIT	PINION AND BEARING ADJUSTING SHIMS INCLUDES ITEMS 5,7,12,13,16
77	706604X	KIT	DIFFERENTIAL ADJUSTING SHIMS INCLUDES ITEMS 16,22
78	706605X	KIT	DIFFERENTIAL AND PINION SHIMS INCLUDES ITEMS 5,7,12,13,16,22
79	700013	KIT	SPINDLE ASSY - INCLUDES ITEMS 55-59
80	700014	KIT	SPINDLE SEAL & BEARING KIT INCLUDES ITEMS 55-58
81	660202-38	KIT	GEAR COVER ASSY - INCLUDES ITEMS 15-18
82	706395X	KIT	KING PIN PARTS KIT - INCLUDES ITEMS 33-36
83	500412-12	4	BOLT 1/2-20 X 2.25

When replacing steering knuckles be sure that upon installation your steering cylinders must be adjusted so when in full turn to the right and then full turn to the left the cylinder does not pull steering arm more than 3/16 of an inch. If you have any questions please call Eagle Tugs technical department.

Axle – Rear Single Wheel



A Install cover using Red RTV High Temp Gasket Silicone, Permatex brand or equivalent.

Axle – Rear Single Wheel

Item	Part Number	Qty	Description
1	706999-15X	1	Pinion and Ring Complete Set
2	TT12-54-002-CA	1	Open Differential
2	706050-X	1	Limited Slip Differential, Carrier with Internals
3	TT12-54-003-CA	1	Differential Internals, Open Differential only
4	TT12-54-004-CA	1	Pinion Seal
5	TT12-54-005-CA	1	Carrier Bearing (RH and LH bearings included)
6	TT12-54-006-CA	1	Yoke (1350 U-bolt)
7	TT12-54-007-CA	1	1350 U-bolt kit
8	TT12-54-008-CA	1	Cover
9	TT12-54-009-CA	10	Cover Bolts
10	TT12-54-010-CA	1	Cover Plug
11	TT12-54-011-CA	2	Hub
N/S	TT12-54-012-CA	16	Wheel Studs
12	TT12-54-013-CA	2	Inner Wheel Bearing
13	TT12-54-014-CA	2	Inner Wheel Race
14	TT12-54-015-CA	2	Outer Wheel Bearing
15	TT12-54-016-CA	2	Outer Wheel Race
16	TT12-54-017-CA	2	Axle Shaft (RH and LH are identical)
17	TT12-54-018-CA	1	Grease Seal
18	TT12-54-019-CA	4	Spanner Nut Inner and Outer
19	TT12-54-020-CA	24	Axle Shaft Bolts
20	TT12-54-021-CA	2	Axle Shaft O-Ring
21	TT12-54-022-CA	2	Lock Washer
22	30271	1	Pinion Nut
23	30275	1	Pinion Washer
N/S	TT12-54-025-CA	1	Axle Vent Fitting

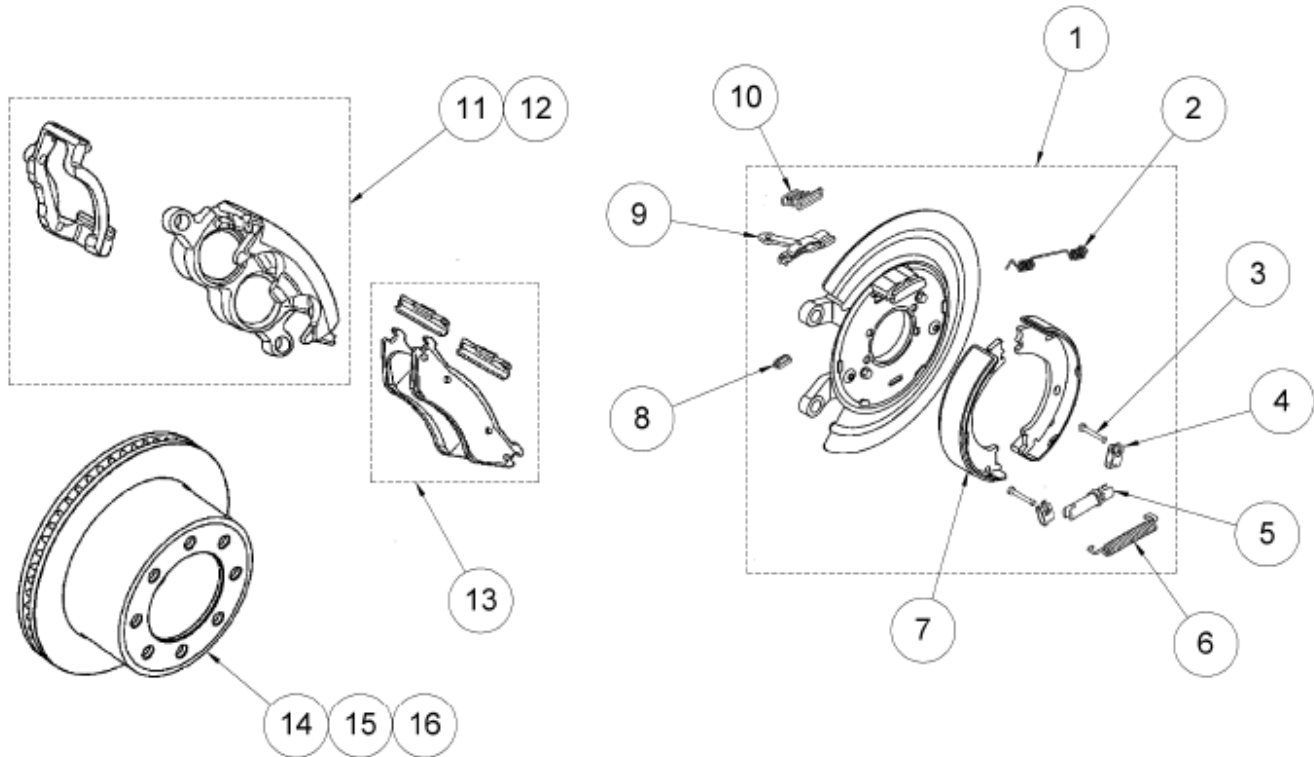
Axles - General

Recommended torque specifications dana 70 axle

POSITION	THREAD	WRENCH TORQUE (LBS-FT)
Drive Pinion Nut	7/8 - 14	240-300
Differential Bearing Cup Cap Screws	1/2 - 13	70-90
Ring Gear Cap Screws	1/2 - 20	100-120
Cover Screws	3/8 - 16	30-40
Differential Case Cap Screws	7/16 - 14	55-75
Brake Retainer Nuts	1/2 - 20	100-110
Axle Shaft Flange Nuts	7/16 - 20	64-70
Upper Kingpin	1 1/8 - 12	500-600
Kingpin Cap Cap Screws	1/2 - 20	70-90
Spindle Mounting Nuts	1/2 - 20	60-80
Tie Rod Stud Nut	5/8 - 18	70 Min (2)
Tie Rod Clamp Nuts	1/2 - 20	35-45

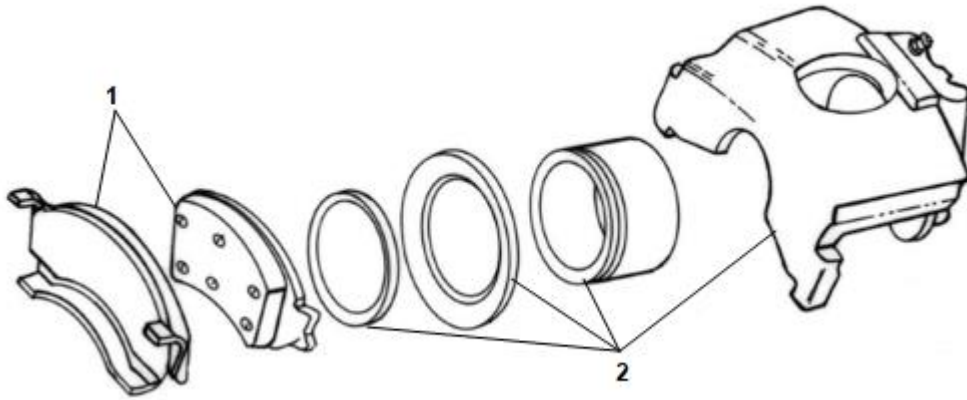
When replacing steering knuckles be sure that upon installation your steering cylinders must be adjusted so when in full turn to the right and then full turn to the left the cylinder does not pull steering arm more than 3/16 of an inch. If you have any questions please call Eagle Tugs technical department.

Brakes – Rear Single Wheel



Item	Part Number	Qty	Description
1	TT12-54-026-CA	2	Parking Brake Assembly
2	TT12-54-027-CA	2	Upper Shoe Return Spring
3	TT12-54-028-CA	2	Brake Shoe Hold-Down Pin (2 pins)
4	TT12-54-029-CA	2	Brake Shoe Hold-Down Clip (2 clips)
5	TT12-54-030-CA	2	Brake Adjuster
6	TT12-54-031-CA	2	Lower Shoe Return Spring
7	TT12-54-032-CA	1	Brake Shoes
8	TT12-54-033-CA	2	Plug
9	TT12-54-034-CA	2	Link and Lever Assembly
10	TT12-54-035-CA	2	Dust Boot
11	TT12-54-036-CA	1	RH Brake Caliper Assembly
12	TT12-54-037-CA	1	LH Brake Caliper Assembly
13	TT12-54-038-CA	1	Brake Pad Set
14	TT12-54-039-CA	2	Rotor
15	TT12-54-040-CA	16	Rotor Bolts
16	TT12-54-041-CA	16	Rotor Washers
N/S	TT12-54-042-CA	8	Parking Brake Assembly Nut
N/S	TT12-54-043-CA	8	Parking Brake Assembly Washer

Brakes – Caliper Brake Assembly - Front



Item	Part Number	Qty	Description
1	RMP-149	2	Front Brake Pads
2	18-4166	1	Caliper (Unloaded) Right
2	18-4167	1	Caliper (Unloaded) Left



APPENDIX III

J1939 Engine Codes

Below is the list of common diagnostic codes that the engine can transmit. Please cross reference the SPN (Suspect Parameter Number), and FMI (Failure Mode Identifier) from the vehicle display module with this list.

SPN	FMI	P Code	Name	Description
168	3	P0563	VBBH	Vehicle system voltage too high (> 16 V)
168	4	P0562	VBBL	Vehicle system voltage too low (< 8 V)
3509	3	P0643	VCC1H	Battery 5V reference 1 circuit high (5V power supply for sensor)
3509	4	P0642	VCC1L	Battery 5V reference 1 circuit low (5V power supply for sensor)
3510	3	P0653	VCC2H	Battery 5V reference 2 circuit high (5V power supply for sensor)
3510	4	P0652	VCC2L	Battery 5V reference 2 circuit low (5V power supply for sensor)
110	3	P0118	THWH	Coolant temperature sensor signal too high
110	4	P0117	THWL	Coolant temperature sensor signal too low
110	2	P0116	THWP	Coolant temperature sensor performance invalid
105	3	P0113	THAH	Air temperature sensor signal too high
105	4	P0112	THAL	Air temperature sensor signal too low
174	3	P0183	THFH	Fuel temperature (w/pump) sensor signal too high
174	4	P0182	THFL	Fuel temperature (w/pump) sensor signal too low
157	9	P0191	PCP	C/Rail press. Sensor signal keeping the middle range
157	2	P0191	PCO	PC sensor offset diagnosis (drifted high or low)
157	14	P0191	PCONOX	PC sensor offset diagnosis for NOX requirement (drifted high or low)
157	20	P0191	PCOH	PC sensor high offset
157	3	P0193	PCH	C/Rail pressure sensor signal too high
157	4	P0192	PCL	C/Rail pressure sensor signal too low
108	3	P2229	PATMH	Atmosphere pressure sensor signal too high
108	4	P2228	PATML	Atmosphere pressure sensor signal too low
102	3	P0238	PIMH	Boost pressure sensor signal too high
102	4	P0237	PIML	Boost pressure sensor signal too low
102	2	P0236	PIMP1	Boost pressure sensor performance invalid
91	3	P0123	ACCP1H	Accelerator pedal sensor No.1 signal too high
91	4	P0122	ACCP1L	Accelerator pedal sensor No.1 signal too low
29	3	P0223	ACCP2H	Accelerator pedal sensor No.2 signal too high
29	4	P0222	ACCP2L	Accelerator pedal sensor No.2 signal too low
28	3	P0228	PTOPH	Accelerator pedal for ASC (PTO) sensor signal too high
28	4	P0227	PTOPL	Accelerator pedal for ASC (PTO) sensor signal too low
2791	3	P0406	LEGRH	EGR (exhaust gas recirculation) lift sensor signal too High
2791	4	P0405	LEGRL	EGR (exhaust gas recirculation) lift sensor signal too low
84	8	P0503	SPDH	Vehicle speed sensor frequency too high
84	5	P0502	SPDL	Vehicle speed sensor input open/ short
84	2	P0501	SPDSG	Vehicle speed sensor signal invalid
249	8	P0337	NENOP	Crank position (CKP) sensor no pulse
249	2	P0336	NEPUM	Crank position (CKP) sensor performance invalid
637	8	P0342	GNOP	Camshaft position (CMP) sensor no pulse
637	2	P0341	GPUM	Camshaft position (CMP) sensor performance invalid
190	9	P0385	NEGNON	Crank position and camshaft position sensor no pulse
1397	3	P2148	BSTWV1	COM1 Injector drive system output short to BATT Injector1 or Injector3 (4cyl engine)/Injector2 (3cyl engine) output short to BATT
1397	4	P2147	GSTWV1	COM1 Injector drive system output short to GND Injector1 or Injector3 (4cyl engine)/Injector2 (3cyl engine) output short to GND

SPN	FMI	P Code	Name	Description
1397	5	P2146	NCCOM1	COM1 Injector drive system output open load both Injector1 and Injector4 (4cyl engine)/Injector2 (3cyl engine) open load
1393	5	P0201	NCTWV1	Injector1 output open load injector coil open
1394	5	P0205	NCTWV2	Injector3 output open load injector coil open
1395	5	P0203	NCTWV3	Injector4 (4cyl engine)/Injector2 (3cyl engine) output open load injector coil open
1396	5	P0206	NCTWV4	Injector2 (4cyl engine) output open load injector coil open
167	31	P0611	LCHG	Capacitor charge-up circuit malfunction injector (insufficient charge) within ECU
167	1	P0200	OCHG	Capacitor charge-up circuit malfunction injector (excessive charge)
1393	2	P0263	ANGSPD1	Engine angle speed error1 (Injector1)
1394	2	P0275	ANGSPD2	Engine angle speed error2 (Injector3)
1395	2	P0269	ANGSPD3	Engine angle speed error3 (Injector4 (4cyl engine)/Injector2 (3cyl engine))
1396	2	P0278	ANGSPD4	Engine angle speed error4 (Injector2)
2802	13	P1602	QRNOT	QR data is not written
2802	11	P0602	QRERR	QR data error
2802	9	P1601	ABNQR	QR definition error (definition concerning QR correction is not right)
94	3	P0629	BSSCV	SCV(+) output short to BATT SCV(-) output short to BATT
94	6	P0627	DRSCV	SCV(+) output open load/short to GND SCV(-) output open load/short to GND SCV coil open/short
157	0	P0088	PCEX3	C/Rail pressure exceeds hi upper limit3
157	31	P1220	PCOVR	C/Rail pressure control cannot achieve target fuel
157	1	P1221	PCUND	C/Rail pressure falls below the control limit of the target pressure
157	16	P2293	PCEX2	C/Rail pressure exceeds hi upper limit2
157	15	P1217	PCEX1	C/Rail pressure exceeds hi upper limit1
156	14	P1219	PLACT	P/L (pressure limiter) activated
97	2	P2269	WGTHR	Water in fuel filter failure
1382	16	P1222	FIPRES1	Fuel filter diagnosis level
1382	0	P1223	FIPRES2	Fuel filter diagnosis level 2
1127	0	P0234	TBOPH	Boost pressure sensor exceeds upper limit
1127	1	P0299	TBOPL	Boost pressure sensor exceeds lower limit
626	4	P0541	GRELGD	Glow relay output open load/short to GND
626	3	P0542	GRELBT	Glow relay output short to BATT
430	3	P0615	STSWBT	Starter switch short to BATT
598	2	P0704	CLSW	Clutch switch circuit malfunction (manual transmission only)
604	2	P0850	NEUTSW	Neutral switch circuit malfunction (manual transmission only)
100	1	P0524	POILDN	Engine oil pressure low
110	0	P0217	THWOT	Coolant temperature exceeds upper limit
190	0	P0219	NEOR	Engine over speed condition
2802	31	P0607	SCPU	CPU fault watchdog IC fault
2802	12	P0606	MCPU	CPU fault main CPU fault
2802	14	P0601	FROM	Check sum error - flash area
1083	31	U0101	CANOPENGENU	CAN bus-line open from general unit
1083	19	U0073	CANB1	CAN1 node error
1084	19	U1001	CANB2	CAN2 node error
1639	5	P0694	CFANLBT	Coolant fan low speed relay short to battery

SPN	FMI	P Code	Name	Description
1639	6	P0693	CFANLGD	Coolant fan low speed relay short to GND
1639	3	P0696	CFANHBT	Coolant fan high speed relay short to battery
1639	4	P0695	CFANHGD	Coolant fan high speed relay short to GND
1639	31	P0480	EFAN	Electric fan open load/short to GND/short to battery
107	2	P2280	AFC	Air filter clogging error
107	3	P2280	PAFDFH	Air filter differential pressure sensor signal too high
107	4	P2280	PAFDL	Air filter differential pressure sensor signal too low
96	3	P0463	FLEVH	Fuel level sensor signal too high
96	4	P0462	FLEVL	Fuel level sensor signal too low
1762	3	P0935	PHYDH	Hydraulic pressure sensor signal too high
1762	4	P0934	PHYDL	Hydraulic pressure sensor signal too low
156	2	P1219	PLVHIRP	Multiple high rail pressure error/ Engine stall after PLV opening
1349	2	P268B	IPMPSTDYNOT	Pump learning uncompleted
2791	14	P0404	EGRBM	EGR battery/motor failure (for CAN)
27	7	P0400	EGRFPD	EGR feedback/position sensor/Dynamic range failure (for CAN)
2791	2	U0411	EGRNTR	EGR no transmission/not received failure (for CAN)
2791	31	P2425	EGRT	EGR valve temperature failure (for CAN)
2791	7	P0488	EGRVI	EGR valve stuck/initialization failure (for CAN)
28	20	P2123	PTOP2H	Accelerator pedal for ASC (PTO) sensor 2 signal too high
28	21	P2122	PTOP2L	Accelerator pedal for ASC (PTO) sensor 2 signal too low
2791	13	P0403	EGRCLEAN	EGR Cleaning failure (valve stuck open/poppet much lower than normal)
3349	9	U0107	TSC1TMERR	TSC1 Time out error
3349	10	U0408	TSC1RC	TSC1 Rolling count test
3349	2	U0408	TSC1CS	TSC1 Checksum test
4082	3	P0232	ELPUMPBT	Electric lift pump relay short to battery
4082	4	P0231	ELPUMPGD	Electric lift pump relay short to GND
430	5	P0617	STARELBT	Starter relay short to battery
430	4	P0616	STARELGD	Starter relay short to GND
190	2	P0016	NEGUM	Crankshaft and Camshaft synchronous error

