

TRIPLE ROLLER TUBE PAVERS

TRTP275



OPERATIONS & PARTS MANUAL

Manual Part #: 068136 | Revision: 08.2026
Language: English | Original Instructions



ALLEN
CONCRETE PAVERS

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Triple Roller Tube Paver

OPERATIONS - PARTS

MANUAL

This manual covers the products listed below:

<u>Part No.</u>	<u>Description</u>
068130	ASSY, 275 16' TRTP WITH HATZ POWER
068000	ASSY, 275 18' TRTP WITH HATZ POWER
068131	ASSY, 275 20' TRTP WITH HATZ POWER
068132	ASSY, 275 22' TRTP WITH HATZ POWER
068133	ASSY, 275 24' TRTP WITH HATZ POWER
068134	ASSY, 275 26' TRTP WITH HATZ POWER
068001	ASSY, 275 28' TRTP WITH HATZ POWER
068100	ASSY, 275 30' TRTP WITH HATZ POWER
068135	ASSY, 275 32' TRTP WITH HATZ POWER

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Allen Products are covered under one or more of the following patent numbers:

U.S. Design Patents: 6,582,153; 6,857,815 B2; 6,955,404 B1; 7,108,449 B1; 7,114,876 B1; 7,316,523 B1;
7,690,864 B2; 8,360,680 B2; 9,068,301; 10,100,537 B1; 11,619,010

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Printed in U.S.A.

Limited Warranty

I. LIMITED WARRANTY & LIMITATION OF LIABILITY

Allen Engineering Corporation ("Allen") warrants its products to be free of defects in material or workmanship for: TWO YEARS FROM END USER'S DATE OF PURCHASE, SUBJECT TO THE EXCEPTIONS AND SHORTER WARRANTY PERIODS DESCRIBED HEREIN.



The warranty period begins on the date of purchase by the End User of the product. All warranty is based on the following limited warranty terms and conditions, including the disclaimer of all implied warranties of any type and the disclaimer of consequential damages.

1. Allen's obligation and liability under this warranty are limited to repairing or replacing parts if, after Allen's inspection, there is determined to be a defect in material or workmanship. Allen reserves the choice to repair or replace.
2. All warranty-related parts must be purchased in advance through an Allen dealer. The parts will be made available to the Allen Distributor, Dealer, or Rental Center from whom the End User purchased the product.
For machines being prepared, a warranty request form and/ or RGA request form must be submitted to AEC after the repairs are completed.
3. Replacement warranty parts, installed in the product, are warranted only for the remainder of the warranty period of the product as though they were the original parts.
4. BATTERY POWERED PRODUCTS ARE WARRANTED FOR ONE YEAR FROM END USER'S DATE OF PURCHASE.
5. Allen does not warranty engines or batteries. Engine warranty claims should be made directly to an authorized factory service center for the particular engine manufacturer. Batteries are not warranted due to unknown treatment during transport, etc., and any battery claims should be directed to the battery manufacturer.
6. Allen's warranty does not cover the normal maintenance of products or their components (such as engine tune-ups and oil & filter changes). The warranty also does not cover normal wear and tear items (such as belts, tires, blades, pans and other consumables).
7. Hydraulic Component's are required to be maintained per Allen's mandatory service intervals in each machine's owner's manual. OEM Allen hydraulic filters and consumables are required to service machines during the warranty period. Failure to use OEM Allen hydraulic filters will result in denied warranty.
8. Allen's warranty will be void if it is determined that the defect resulted from operator abuse, failure to perform normal maintenance on the product, modification to product, alterations, or repairs made to the product without the written approval of Allen. Allen specifically excludes from warranty any damage to any trowels resulting from a drop or impact to the rotors.
9. Impact damage to gearboxes is not covered under the Allen warranty and is deemed customer abuse.
10. Impact damage to trowels in any way is not covered under the Allen Warranty and is deemed customer abuse. (Example: Dropping a machine)
11. Allen will pay shop labor on warranty items at the Allen Shop Labor Rate in existence on the date of the warranty claim. An Allen labor chart will determine the time allowed to complete a repair and will govern the shop labor hours that will be allowed.
12. Allen will credit the cost of ground freight on warranty replacement parts after approval of the warranty claim. No warranty replacement parts will be shipped air-freight at the expense of Allen. Allen does not pay any inbound freight.
13. ALLEN ENGINEERING CORPORATION'S WARRANTY POLICY WILL NOT COVER THE FOLLOWING: TAXES; SHOP SUPPLIES; ENVIRONMENTAL SURCHARGES; AIR FREIGHT; TRAVEL TIME; LOSS OF TIME; INCONVENIENCE; LOSS OF RENTAL REVENUE; RENTAL COSTS OF EQUIPMENT USED TO REPLACE THE PRODUCT BEING REPAIRED; LOSS OF USE OF THE PRODUCT; COMMERCIAL LOSS; OR ANY OTHER CHARGES WHATSOEVER OR ANY LIABILITIES FOR DIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGE OR DELAY.
14. ALLEN ENGINEERING CORPORATION MAKES NO OTHER WARRANTY, EXPRESSED OR IMPLIED. THIS LIMITED WARRANTY IS IN LIEU OF THE WARRANTY OF MERCHANTABILITY AND FITNESS. THERE ARE NO OTHER WARRANTIES THAT EXTEND BEYOND THE DESCRIPTION ON THIS DOCUMENT.
15. No Allen employee or representative is authorized to change this warranty in any way or grant any other warranty unless such change is made in writing and signed by an officer of Allen Engineering Corporation.
16. Warranty claims must be submitted within 30 days from the date of failure.
17. Once a warranty claim has been submitted, AEC has up to 90 business days to process the request.
18. Standard service part warranty will not exceed 90 days from the date of purchase. Exceptions to this are:
#1 Gearboxes: 1 year warranty from date of purchase.
#2 Electrical Components: 30 day warranty from date of purchase. This applies to wiring harnesses, transmitters, ECUs, display screens, and toggle switches.
19. All purchased components are subject to the inspection and warranty of the respective manufacturer. This inspection may extend beyond 90 days.
20. If warranty is suspected do not disassemble any hydraulic or electrical components. Failure to comply with this instruction will lead to denial of a warranty claim.

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Information Contained in this Manual



This manual provides information and procedures to safely operate and maintain the Allen Machine.

For your own safety and protection from personal injury, carefully read, understand, and observe the safety instructions described in this manual. Keep this manual or a copy of it with the machine at all times.

Always operate this machine in accordance with the instructions described in this manual. A well maintained piece of equipment will provide many years of trouble free operation.

This manual is divided into the following sections:

SECTION 1 SAFETY

SECTION 2 OPERATIONS

SECTION 3 SERVICE

SECTION 4 PARTS

Complete any warranty requirements as specified by the engine manufacturer in their instructions found inside the manual box located on the operator's control panel.

Your engine is not manufactured by Allen Engineering Corporation, Inc, and therefore is not covered under Allen Engineering Corporation, Inc warranty.

Your engine manufacturer should be contacted if you wish to purchase a parts manual or a repair manual for your engine.

Refer to enclosed owners engine manual for complete O&M instructions. See your battery manufacturer for battery warranty.

Dealer Information

Your Dealer has Allen Engineering Corporation trained mechanics and original Allen replacement parts. Always contact the Allen Dealer who sold you this machine for Allen Certified repairs and replacement parts.

Place Allen Dealer information below for future reference.

Dealer Name: _____

Phone #: (____) - ____ - _____

Address: _____

City: _____ State: _____ Zip: _____

Salesman: _____ Mobile Phone _____

Additional Comments: _____



Section 4 contains illustrated parts lists for help in ordering replacement parts for your machine. Follow the instructions below when ordering parts to insure prompt and accurate delivery:

1. All orders for service parts - include the serial number for the machine. Shipment will be delayed if this information is not available.
2. Include correct description and part number from the "PARTS" section of this manual.
3. Specify exact shipping instructions, including the preferred routing and complete destination address.
4. DO NOT return parts to AEC without receiving written authorization from AEC. All authorized returns must be shipped pre-paid.
5. When placing an order, please contact the AEC dealer nearest you.



All information, specifications, and illustrations in this manual are subject to change without notice and are based on the latest information at the time of publication.

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www.youtube.com/AllenMachinery

Model Number - Serial Number Codes

Manufacturer's Codes:

When ordering parts or requesting service information, you will always be asked to specify the model and serial numbers of the machine. The legends below specifically defines each significant character or group of characters of the Model Number and Serial Number codes.

Model Number

275

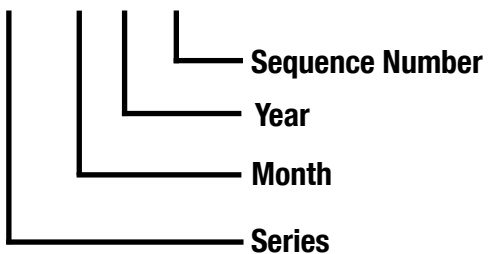


Serial Number

The serial number found on the identification plate is a ten digit format. The model number identifies your machine and will ensure that you receive the correct replacement parts.

Serial Number Example

T275 03 18 01



Unit Identification

Unit Identification Plate Location:

An identification plate listing the model number and the serial number is attached to each unit and is located on the top left corner of the operator end handle. See image below for serial number plate location. This plate should not be removed at any time.

Please record the information found on this plate below so it will be available should the identification plate become lost or damaged. When ordering parts or requesting service information, you will always be asked to specify the model and serial numbers of the machine.

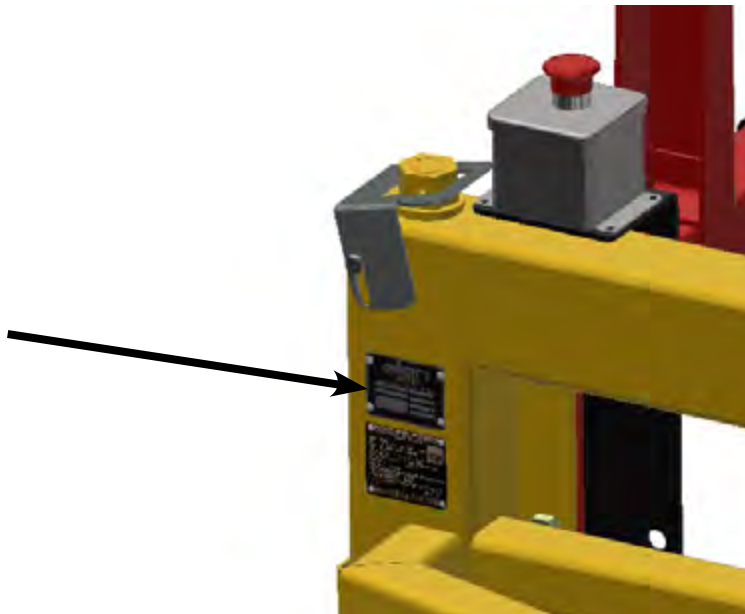
FILL IN FOR FUTURE REFERENCE

Model Number: _____

Serial Number: _____

Date Purchased: _____

Purchased From: _____



Technical Specifications

Engine Power unit:

- Hatz Turbo Diesel 4 cylinder (74 HP)
- 29 Gal (109.7 Lit) Fuel Tank Capacity
- Fuel Consumption =?
- Battery Lock Out Switch

Machine Dimensions:

- Weight 8,700 lbs. estimated at 18' length
- Tube length plus 28" (2'-4") (Example 18' machine plus 2'-4" = 20'-4" long)
- 90 1/4" width at shipping width (Gang Vibration folded in for transport)
- 80" tall

Features:

- Operator console positioned inside of main frame (engine control and machine operation located here)
- Adjustable frame sections to allow for frame deflection adjustment on longer machines.
- Sectional frame length for ease of machine length change over.
- Screed and Finish Tubes made of Ø10" x 1/4 wall thickness DOM tubing with built-in water ballast.
- Paving Tube modular scraper system
- Hydraulic driven water spray system and steering leg with 110-gallon tank.
- Fog bar is made with Quick-Disconnect couplings for ease of assembly for machine reconfiguration
- Patented vertical adjustable front concrete roller
- Rear access platform with hand rail and toe kick with grab hand rails
- Ø10" Counter Ballast Tube
- 5 Emergency Stop Push Button Switches (2 at operator end, 2 on power unit end and 1 center of rear of machine.
- Audible horn
- Strobe light
- Four - 35W LED flood lights with adjustable height

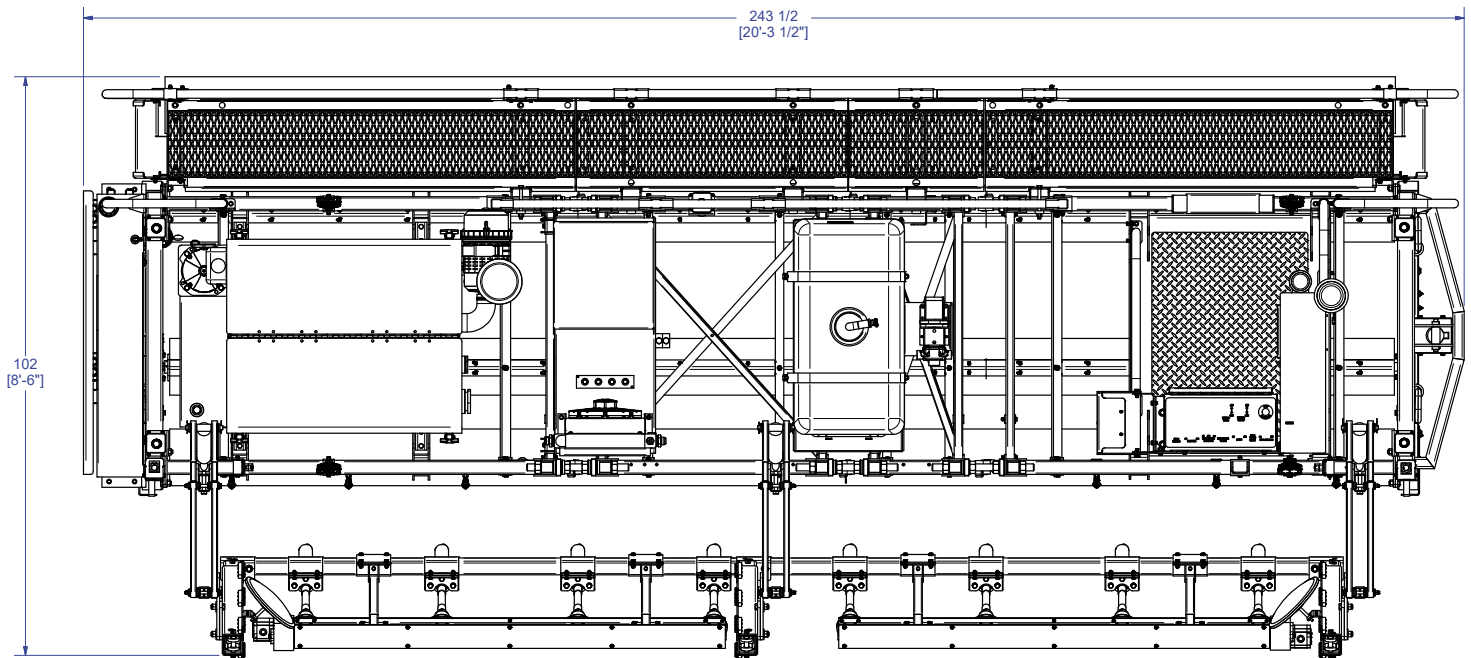
Gang Vibration Features:

- Pendulous Vibrators (2-3/8" dia.) spaced at 24" on-center beginning at 12" from form edge
- Vibrators are raised and lowered from operator console
- Gang rack system lowers with hydraulic cylinders for transportation. Only Vibrator is removed for transportation.

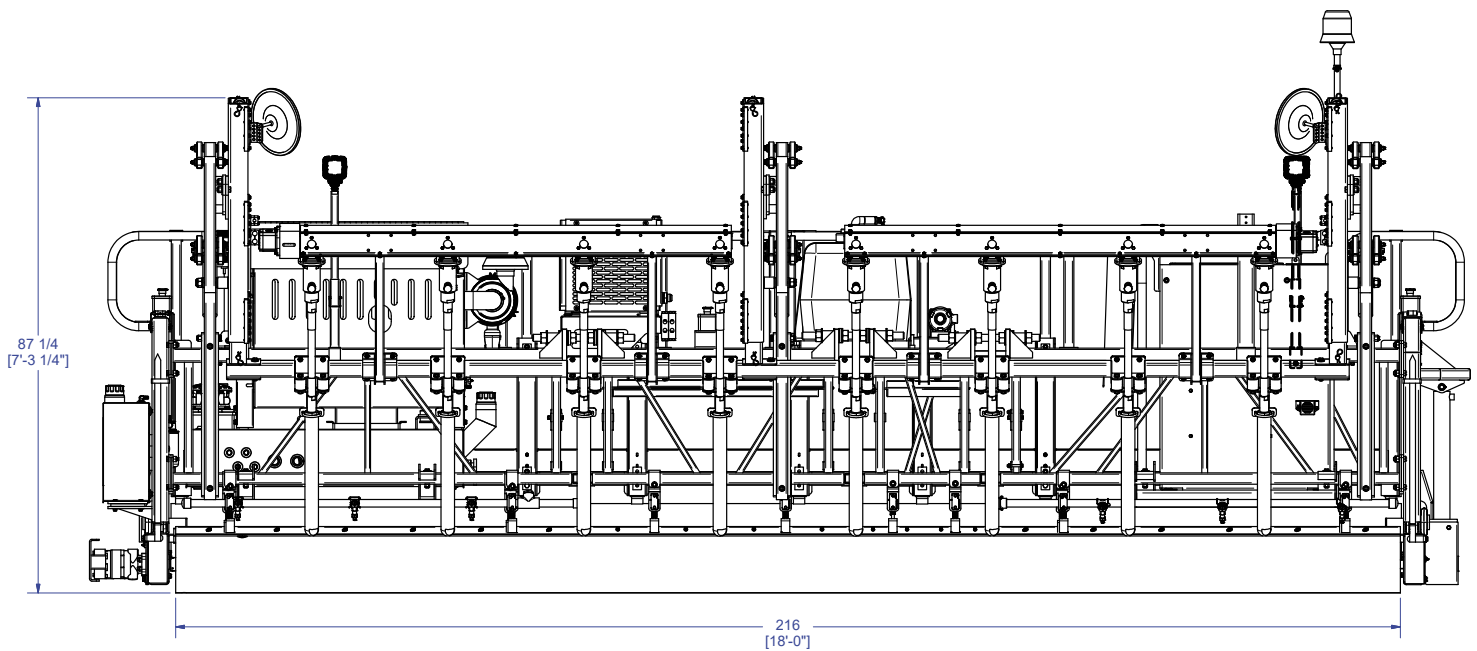
Hydraulic Components:

- 60 Gal (227.1 Lit) hydraulic reservoir
- Suction strainer with return filtration
- Electric over hydraulic valving
- Gerotor Hydraulic Motor that power the Screed and Finish Tubes

Machine Dimensions



18' SETUP SHOWN



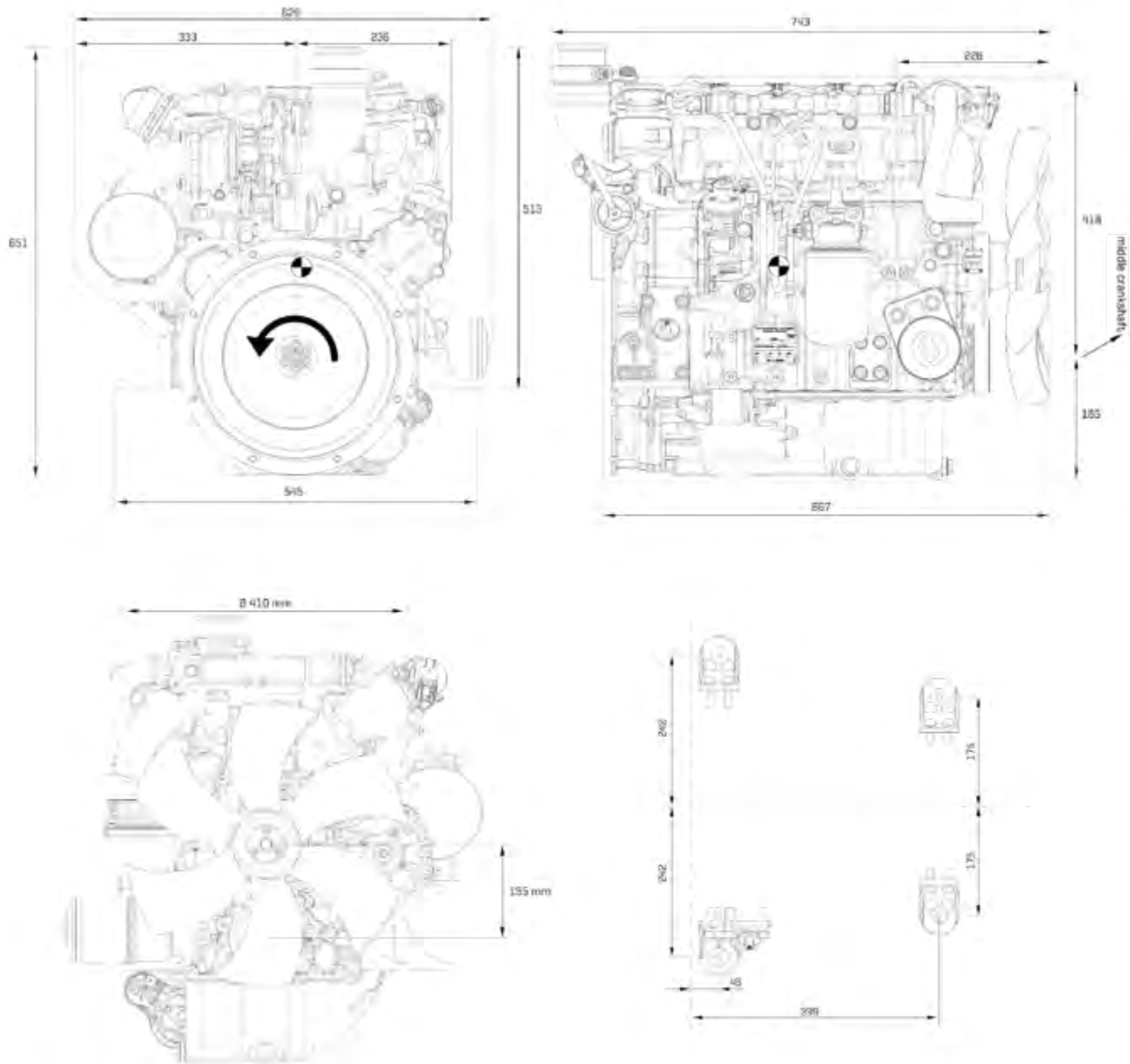
Engine Specifications

Technical data		4H50TIC .DPF	4H50TIC	4H50TI
Type		Water-cooled 4-cylinder turbo engine with BOSCH common rail DHR, 1800 bar, charge air cooling		
Exhaust emission after-treatment		EGR, DDC, DPF	EGR, DDC	—
Bore x stroke [mm / inches]		84 x 86 / 3.31 x 3.46		
Displacement [l / cu.in.]		1.952 / 119.12		
Mean piston speed at 3000 rpm [m/s / ft/min]		8.8 / 1.732		
Compression ratio		17.5:1		
Lub. oil consumption, related to full load		max. 0.5 % of fuel consumption		
Oil filling	max [l / US qts] min [l / US qts]	7.0 / 7.4 6.0 / 6.3		
Speed control				
• Lowest idle speed		900 r.p.m.		
• Static speed droop		adjustable (0, 3, 5, 10 %)		
Amount of combustion air at 2800 rpm approx. ¹⁾ [kg/h]		319		
Amount of cooling air at 2800 rpm approx. ¹⁾ [kg/h]		352		
Mass moment of inertia J [kgm ² / lb.ft ²]		J _{engine} 0.234 / 5.553		
Starter		12 V - 2.2 kW [-25°] — 24 V - 2.0 kW [-32°] ²⁾		
Alternator charging		14 V - 110 A / 28 V - 65 A		
Battery capacity (max)		12 V - 110 Ah / ISOA DIN — 24 V - 56 Ah / 300A DIN		
Weight				
Weight [kg / lbs.]		1.73 / 381 [inclusive catalyst]		158 / 348
		255 / 562 [as Open Power Unit]		

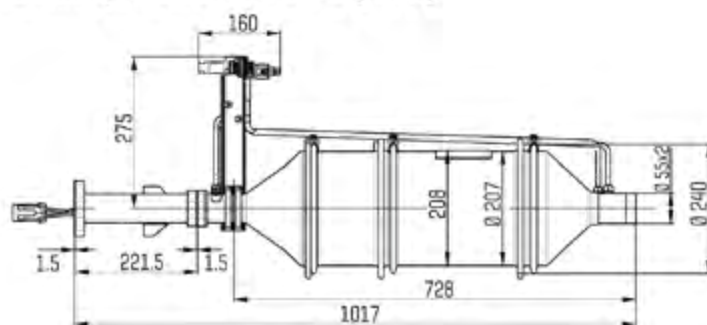
¹⁾ For other speeds there is a linear reduction in the air requirement. ²⁾ -40 °C with special approval possible.

Engine output [max]		4H50TIC .DPF	4H50TIC	4H50TI
	[r.p.m.]	kW / HP	kW / HP	kW / HP
Blocked ISO brake horsepower [IFN] for intermittent loading according to ISO 3046-1.	2600	55.0 / 74.8	55.0 / 74.8	62.0 / 84.3
	2600	54.9 / 74.6	54.9 / 74.6	62.0 / 84.3
	2300	54.0 / 73.4	54.0 / 73.4	61.2 / 83.2
	2000	50.3 / 68.4	50.3 / 68.4	55.3 / 75.2
	1800	45.2 / 61.5	45.2 / 61.5	49.7 / 67.6
	1500	37.1 / 50.4	37.1 / 50.4	40.8 / 55.5
Blocked ISO standard power output (no overload permissible) acc. to ISO 3046-1. For constant load [ICFN].	2600	49.5 / 67.3	49.5 / 67.3	—
	2600	49.4 / 67.2	49.4 / 67.2	—
	2300	48.6 / 66.1	48.6 / 66.1	—
	2000	45.2 / 61.5	45.2 / 61.5	—
	1800	40.7 / 55.3	40.7 / 55.3	—
	1500	33.4 / 45.4	33.4 / 45.4	—
Blocked ISO standard power output (no overload permissible) acc. to ISO 3046-1. For constant speed and constant load [ICFN]. - e.g. power generators	3000	50.0 / 68.0	50.0 / 68.0	50.0 / 68.0
	1800	36.4 / 49.5	36.4 / 49.5	36.4 / 49.5
	1500	28.7 / 39.0	28.7 / 39.0	28.7 / 39.0

Engine Specifications (cont'd)



Diesel particulate filter (DPF)

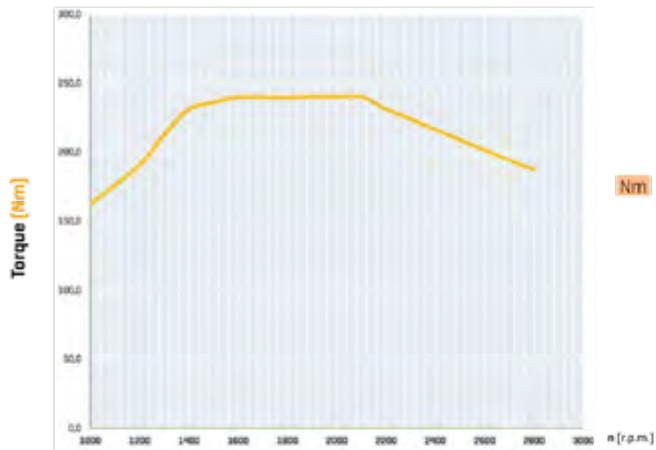


Spread at box dimensions ± 3 mm due to tolerance.
 Drawings with detail and connection dimensions as PDF resp. DXF can be found at www.HATZ-DIESEL.com.

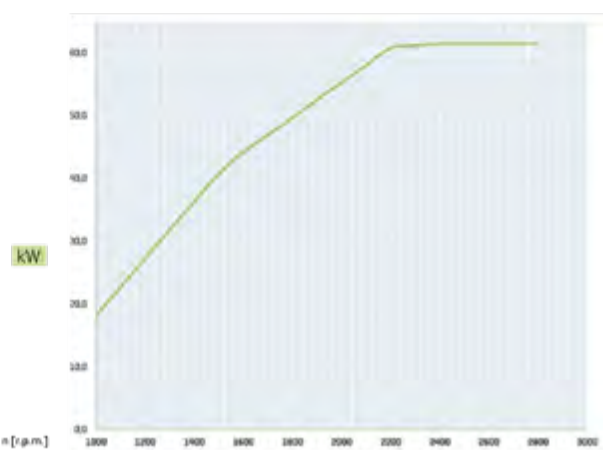
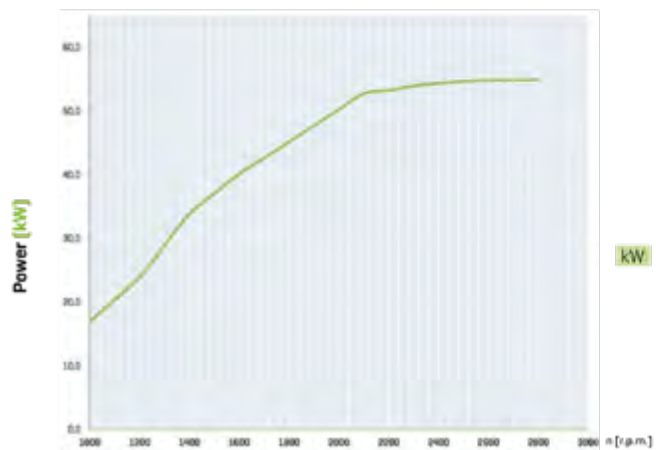
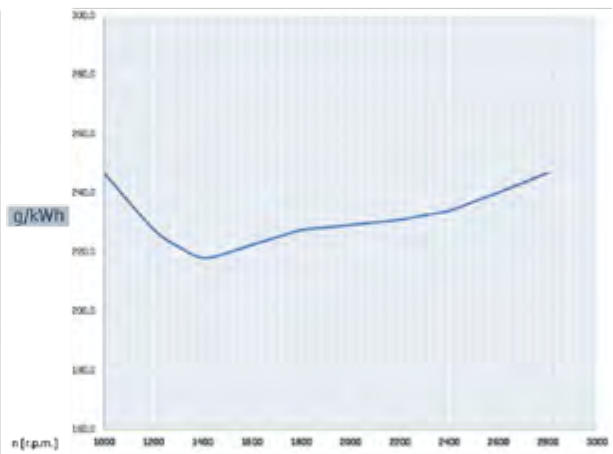
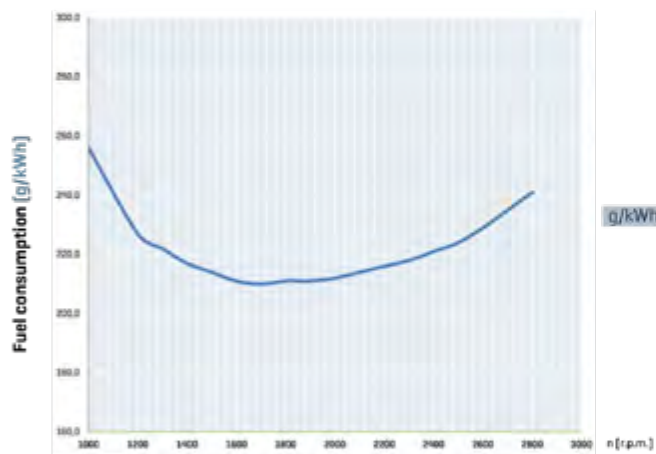
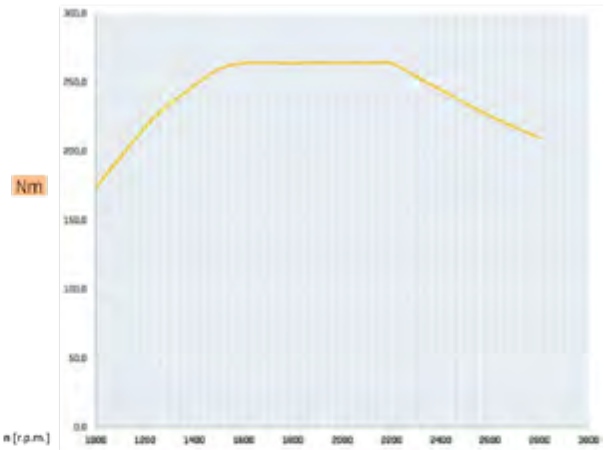
Engine Specifications (cont'd)

Power output, torque und fuel consumption

4H50TIC, 4H50TIC DPF

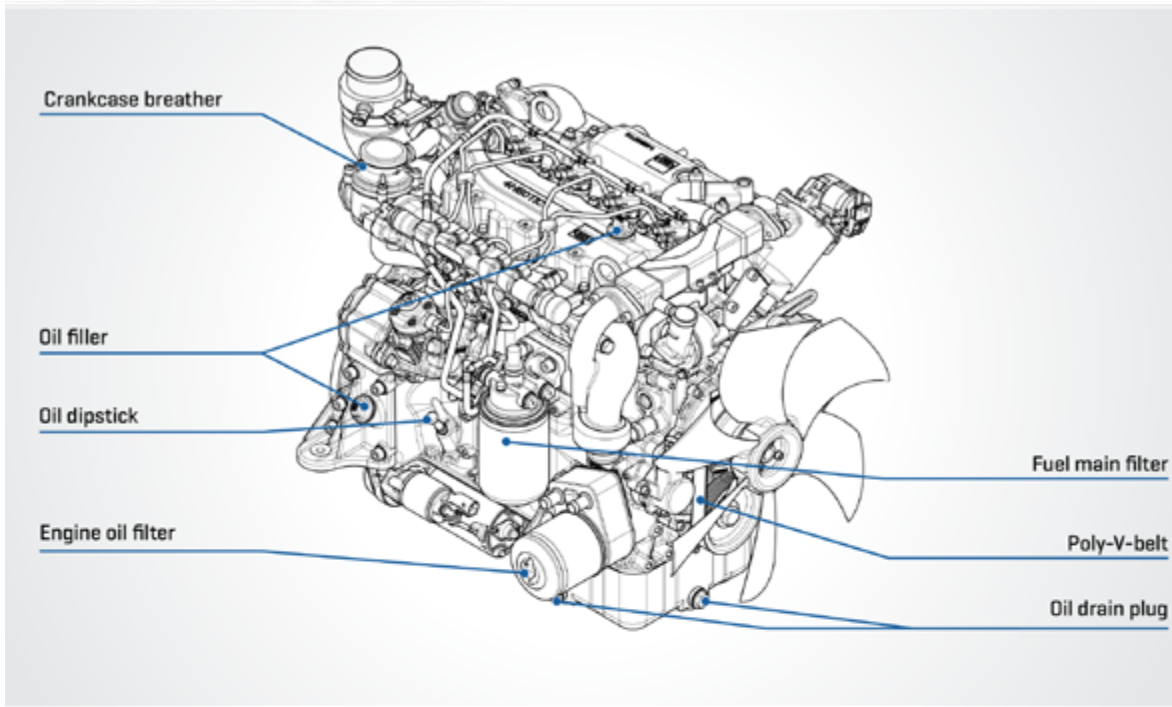


4H50TI

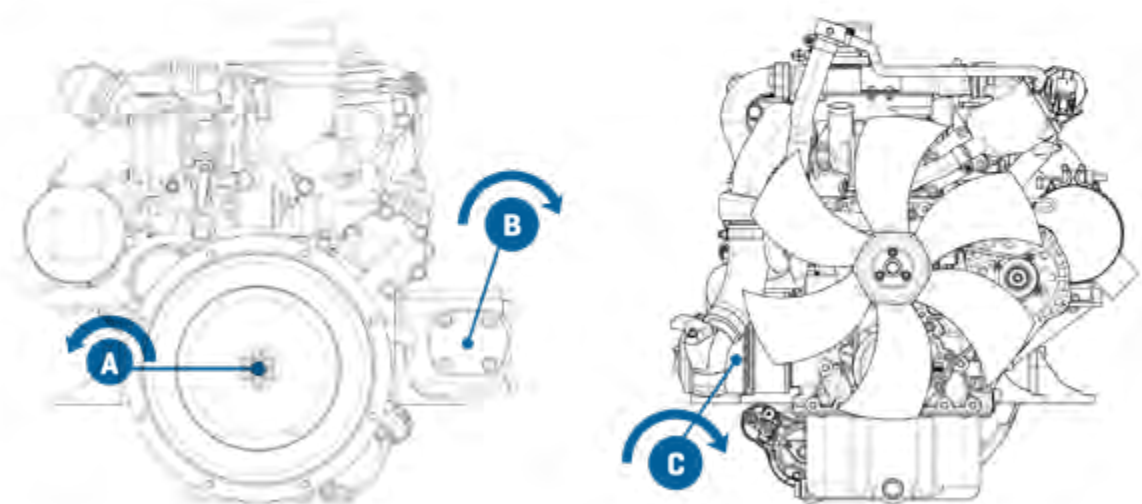


Engine Specifications (cont'd)

Maintenance and operating points

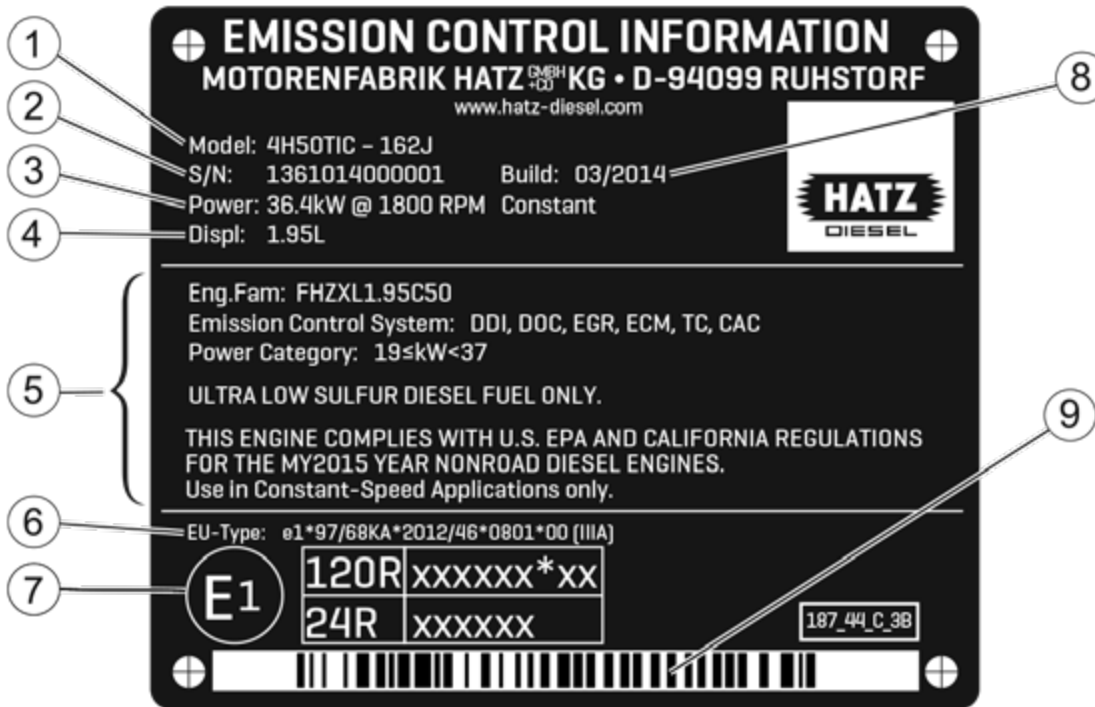


Power take off



Power take off		4H50TIC
Transmittable torque	A	100%
	B	$\Sigma = 100 \text{ Nm}$
	C	

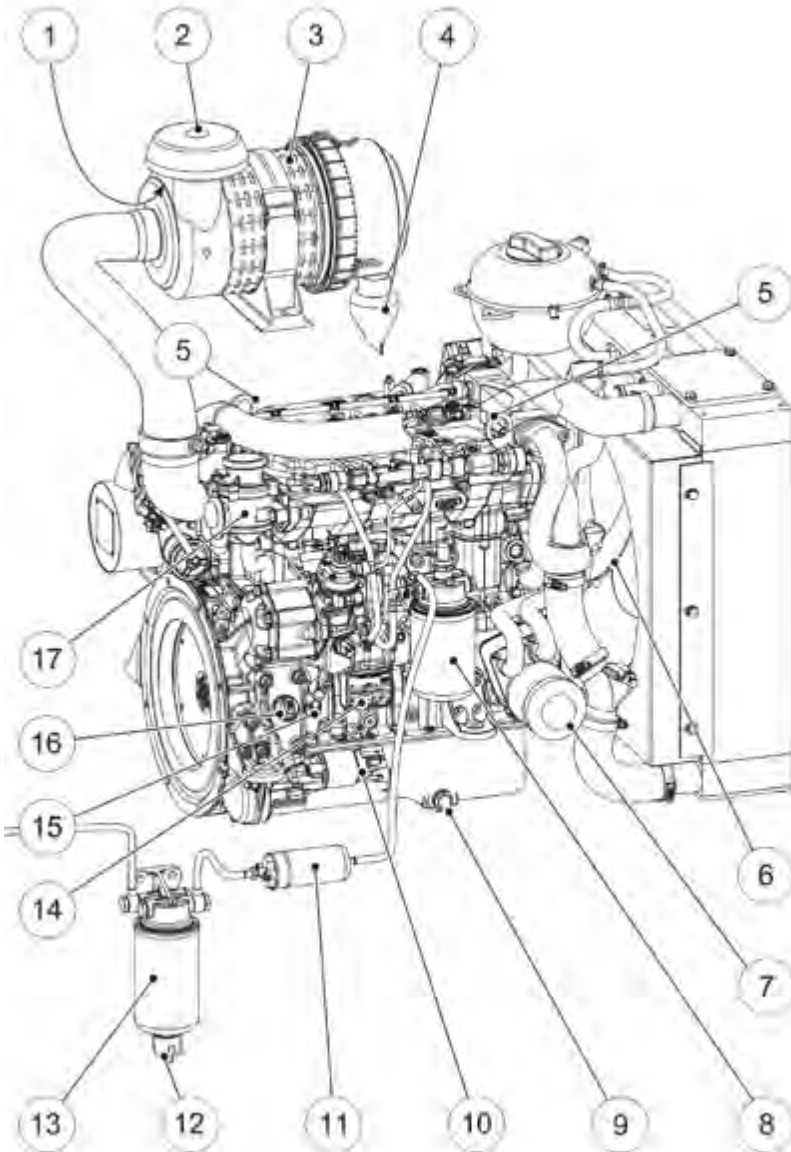
Engine Specifications (cont'd)



The engine type plate is located on the crankcase and contains the following engine information:

1	Model designation of the engine
2	Engine serial number
3	Serial rating (kW) at nominal speed (rpm)
4	Displacement (liters)
5	Information for US emission certification (EPA/CARB)
6	EU type approval
7	EU country of origin (Germany)
8	Model year (month/year)
9	Bar code (engine serial number)

Engine Specifications (cont'd)



1	Intake opening for combustion air
2	Rain cap
3	Air filter (optional)
4	Dust discharge valve
5	Lifting eyes
6	Fan
7	Oil filter
8	Fuel fine filter
9	Side oil drain screw
10	Starter (low mounting position)
11	Electric fuel pump
12	Drain plug on fuel prefilter
13	Fuel prefilter
14	Engine type plate
15	Dipstick
16	Oil filler plug, bottom
17	Crankcase ventilation

IN PROCESS

Declaration of Conformity

IN PROCESS

Declaration of Conformity Hatz Engine

Extended Declaration of Incorporation EC Machinery Directive 2006/42/EC

The manufacturer: **Motorenfabrik Hatz GmbH & Co.KG**
Ernst-Hatz-Straße 16
D-94099 Ruhstorf a. d. Rott

hereby declares that the incomplete machine: product description: **Hatz diesel engine**

Type designation and as of serial number:

3H50TIC = 13510, 3H50TI = 16310

4H50TIC = 13610, 4H50TI = 16110

satisfies the following basic safety and health protection requirements in acc. with Annex I to the above-mentioned Directive.

- Annex I, General principles no. 1
- Nr. 1.1.2., 1.1.3., 1.1.5., 1.2.1., 1.2.2., 1.2.3., 1.2.4.1., 1.2.4.2., 1.3.1., 1.3.2., 1.3.3., 1.3.4., 1.3.7., 1.3.8.1., 1.4.1., 1.5.1., 1.5.2., 1.5.8., 1.5.9., 1.6.1., 1.6.2., 1.6.4., 1.7.

All relevant basic safety and health protection requirements down to the interfaces described

☒ in the manual for diesel engine

☒ in the enclosed data sheets

☒ in the enclosed technical documents

have been complied with.

The special technical documents in acc. with Annex VII B of the Directive 2006/42/EC have been prepared.

Conformity with the provisions of the following, other EC Directives, i.e.

- **2014/30/EU Electromagnetic Compatibility (EMC)**, dated 26.02.2014

(was tested in association with a generator)

The following standards have been used (completely or partially):

- EN 1679-1: 092011

- EN ISO 12100: 032011

- EN ISO 13857: 062008

- EN 60204-1: 062007

- EN ISO 13849-1: 062016

The manual for diesel engine has been enclosed to the incomplete machine and the Assembly Instructions have been provided to the customer electronically together with the order confirmation.

Commissioning has been prohibited until it has been established, if applicable, that the machine into which the above-mentioned incomplete machine is to be incorporated, satisfies the provisions of the Machinery Directive.

Wolfgang Krautloher / see "Manufacturer"

Name / address of EC documentation officer

03.07.2017

Date

Krautloher / Directives official

Signature and information on the undersigned



Signature



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**WARNING**

CALIFORNIA — Proposition 65 Warning

Engine exhaust and some of its constituents, and some dust created by power sanding, sawing, grinding, drilling and other construction activities contains chemicals known to the State of California to cause cancer, birth defects and other reproductive harm. Some examples of these chemicals are:

- Lead from lead-based paints.
- Crystalline silica from bricks.
- Cement and other masonry products.
- Arsenic and chromium from chemically treated lumber.

Your risk from these exposures varies, depending on how often you do this type of work. To reduce your exposure to these chemicals: **ALWAYS** work in a well ventilated area, and work with approved safety equipment, such as dust masks that are specially designed to filter out microscopic particles.



⚠ WARNING

RESPIRATORY HAZARDS

Grinding/cutting/drilling of masonry, concrete, metal and other materials can generate dust, mists and fumes containing chemicals known to cause serious or fatal injury or illness, such as respiratory disease, cancer, birth defects or other reproductive harm. If you are unfamiliar with the risks associated with the particular process and/or material being cut or the composition of the tool being used, review the material safety data sheet and/or consult your employer, the material manufacturer/supplier, governmental agencies such as OSHA and NIOSH and other sources on hazardous materials. California and some other authorities, for instance, have published lists of substances known to cause cancer, reproductive toxicity, or other harmful effects.

Control dust, mist and fumes at the source where possible. In this regard use good work practices and follow the recommendations of the manufacturers or suppliers, OSHA/NIOSH, and occupational and trade associations. Water should be used for dust suppression when wet cutting is feasible. When the hazards from inhalation of dust, mists and fumes cannot be eliminated, the operator and any bystanders should always wear a respirator approved by NIOSH/MSHA for the materials being used.

⚠ WARNING

SILICOSIS WARNING

Grinding/cutting/drilling of masonry, concrete, metal and other materials with silica in their composition may give off dust or mists containing crystalline silica. Silica is a basic component of sand, quartz, brick clay, granite and numerous other minerals and rocks. Repeated and/or substantial inhalation of airborne crystalline silica can cause serious or fatal respiratory diseases, including silicosis. In addition, California and some other authorities have listed respirable crystalline silica as a substance known to cause cancer. When cutting such materials, always follow the respiratory precautions mentioned above.

SECTION 1 SAFETY

Safety Information

Do not operate or service the equipment before reading the entire manual. Safety precautions should be followed at all times when operating this equipment. Failure to read and understand the safety messages and operating instructions could result in injury to yourself and others.

SAFETY NOTES

The four safety notes shown below will inform you about potential hazards that could injure you or others. The safety notes specifically address the level of exposure to the operator and are preceded by one of four words: DANGER, WARNING, CAUTION or NOTICE.



Indicates a hazardous situation which, if not avoided, **will** result in death or serious injury.



Indicates a hazardous situation which, if not avoided, **could** result in death or serious injury.



Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.



Addresses practices not related to personal injury.



Potential hazards associated with the operation of this equipment will be referenced with hazard symbols which may appear throughout this manual in conjunction with safety notes.

Symbol	Safety Hazard
	Lethal exhaust gas hazards
	Explosive fuel hazards
	Burn hazards
	Rotating parts/crush hazards
	Pressurized fluid hazards
	Hydraulic fluid hazards

SECTION 1 SAFETY

General Safety

- **NEVER** operate this equipment without proper protective clothing, shatterproof glasses, respiratory protection, hearing protection, steel-toed boots and other protective devices required by the job or city and state regulations.



- **ALWAYS** avoid wearing jewelry or loose fitting clothes that may snag on the controls or moving parts as this can cause serious injury.

- **NEVER** operate this equipment when not feeling well due to fatigue, illness or when under medication.



- **NEVER** operate this equipment under the influence of drugs or alcohol.



- **ALWAYS** clear the work area of any debris, tools, etc. that would constitute a hazard while the equipment is in operation.

- No one other than the operator is to be in the working area when the equipment is in operation.
- DO NOT use the equipment for any purpose other than its intended purposes or applications.
- This equipment should only be operated by trained and qualified personnel 18 years of age and older.
- Whenever necessary, replace nameplate, operation and safety decals when they become difficult to read.
- AEC does not assume responsibility for any accident due to equipment modifications. Unauthorized equipment modification will void all warranties.
- **NEVER** use accessories or attachments that are not recommended by AEC for this equipment. Damage to the equipment and/or injury to user may result.

- **ALWAYS** know the location of the nearest fire extinguisher.

- **ALWAYS** know the location of the nearest first aid kit.



- **ALWAYS** know the location of the nearest phone or keep a phone on the job site. Also, know the phone numbers of the nearest ambulance, doctor and fire department. This information will be invaluable in the case of an emergency.



- Engine fuel exhaust gases contain poisonous carbon monoxide. This gas is colorless and odorless, and can cause death if inhaled.

- The engine of this equipment requires an adequate free flow of cooling air. never operate this equipment in any enclosed or narrow area where free flow of the air is restricted. If the air flow is restricted it will cause injury to people and property and serious damage to the equipment or engine.

- **NEVER** operate the equipment in an explosive atmosphere or near combustible materials. An explosion or fire could result causing severe bodily harm or even death.



- If applicable, never use your hand to find hydraulic leaks. Use a piece of wood or cardboard. Hydraulic fluid injected into the skin must be treated by a knowledgeable physician immediately or severe injury or death can occur.



- **ALWAYS** keep clear of rotating or moving parts while operating the paver.



- **NEVER** disconnect any emergency or safety devices. These devices are intended for operator safety. Disconnection of these devices can cause severe injury, bodily harm or even death. Disconnection of any of these devices will void all warranties.



- **NEVER** allow passengers or riders on the riding trowel during operation.
- **NEVER** lubricate components or attempt service on a running machine.

SECTION 1 SAFETY

General Safety (cont'd)

NOTICE

- **ALWAYS** keep the machine in proper running condition.
- Fix damage to machine and replace any broken parts immediately.
- **ALWAYS** store equipment properly when it is not being used. Equipment should be stored in a clean, dry location out of the reach of children and unauthorized personnel.

WARNING

- **DO NOT** place hands or fingers inside engine compartment when engine is running.
- **NEVER** operate the engine with heat shields or guards removed.
- Keep fingers, hands hair and clothing away from all moving parts to prevent injury.
- **DO NOT** remove the engine oil drain plug while the engine is hot. Hot oil will gush out of the oil tank and severely scald any persons in the general area of the paver.



CAUTION

- **NEVER** touch the hot exhaust manifold, muffler or cylinder. Allow these parts to cool before servicing equipment.



NOTICE

- **NEVER** run engine without an air filter or with a dirty air filter. Severe engine damage may occur. Service air filter frequently to prevent engine malfunction.
- **NEVER** tamper with the factory settings of the engine or engine governor. Damage to the engine or equipment can result if operating in speed ranges above the maximum allowable.





- **DO NOT** start the engine near spilled fuel or combustible fluids. Fuel is extremely flammable and its vapors can cause an explosion if ignited.
- **ALWAYS** refuel in a well-ventilated area, away from sparks and open flames.
- **ALWAYS** use extreme caution when working with flammable liquids.
- **DO NOT** fill the fuel tank while the engine is running or hot.
- **DO NOT** overfill tank, since spilled fuel could ignite if it comes into contact with hot engine parts or sparks from the ignition system.
- Store fuel in appropriate containers, in well-ventilated areas and away from sparks and flames.
- **NEVER** use fuel as a cleaning agent.
- **DO NOT** smoke around or near the equipment. Fire or explosion could result from fuel vapors or if fuel is spilled on a hot engine.



- **DO NOT** drop the battery. There is a possibility that the battery will explode.
- **DO NOT** expose the battery to open flames, sparks, cigarettes, etc. The battery contains combustible gases and liquids. If these gases and liquids come into contact with a flame or spark, an explosion could occur.



- **ALWAYS** wear safety glasses when handling the battery to avoid eye irritation. The battery contains acids that can cause injury to the eyes and skin.
- Use well-insulated gloves when picking up the battery.
- **ALWAYS** keep the battery charged. If the battery is not charged, combustible gas will build up.
- **DO NOT** charge battery if frozen. Battery can explode. When frozen, warm the battery to at least 61°F (16°C).



SECTION 1 SAFETY

General Safety (cont'd)

- **ALWAYS** recharge the battery in a well-ventilated environment to avoid the risk of a dangerous concentration of combustible gases.

- If the battery liquid (dilute sulfuric acid) comes into contact with clothing or skin, rinse skin or clothing immediately with plenty of water.



- If the battery liquid (dilute sulfuric acid) comes into contact with eyes, rinse eyes immediately with plenty of water and contact the nearest doctor or hospital to seek medical attention.

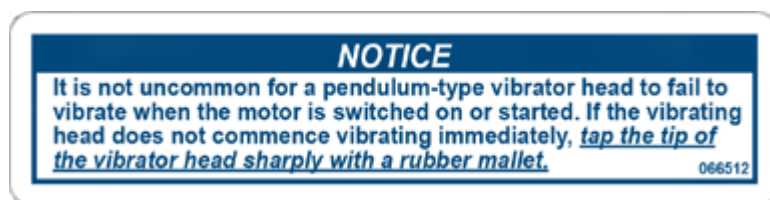
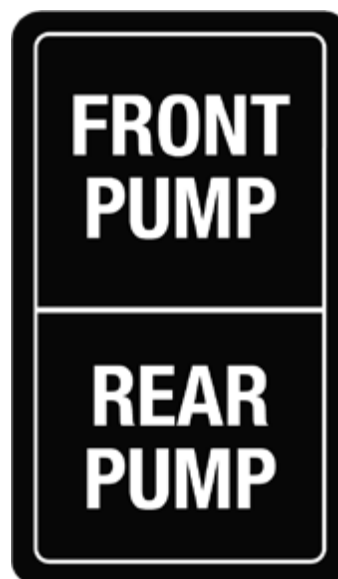


- **ALWAYS** disconnect the negative battery terminal before performing service on the equipment.
- **ALWAYS** keep battery cables in good working condition. Repair or replace all worn cables.
- Side slope operation is not permitted.
- Walk around the riding trowel before starting it to see if any items are worn, damaged, leaking, etc. that may make the riding trowel dangerous to operate.
- Stop and inspect the equipment if you strike an object. If necessary, make repairs before restarting.
- **ALWAYS** check that all controls are functioning properly immediately after start-up!
- **DO NOT** operate machine unless all controls operate correctly.



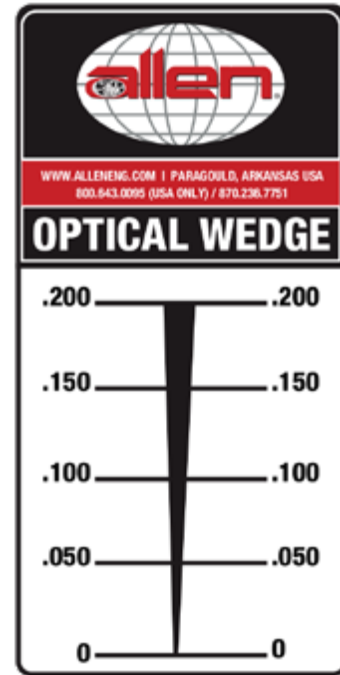
SECTION 1 SAFETY

Safety Labels and Decals (cont'd)



DIRECTIONS

- Attach the optical wedge decal to the barrel of the vibrator as close to the nose as possible
- Hang vibrator vertically in the air
- Run vibrator and observe the optical wedge
(The image on the wedge will change with the pointed end of the wedge become pale and appearing to visually move up the scale)
- Touch optical wedge with a pen where wedge image turns from pale to dark. Stop vibrator and note the measurement
- The measurement will reflect the fullwave amplitude in inches



OUR VISION, MISSION & CORE VALUES

// OUR VISION

To be the premier, global provider of concrete and related equipment solutions for professional contractors.

// OUR MISSION STATEMENT

We provide innovative concrete and related equipment that solves professional contractor's major quality and productivity issues on their jobsites.

// OUR CORE VALUES

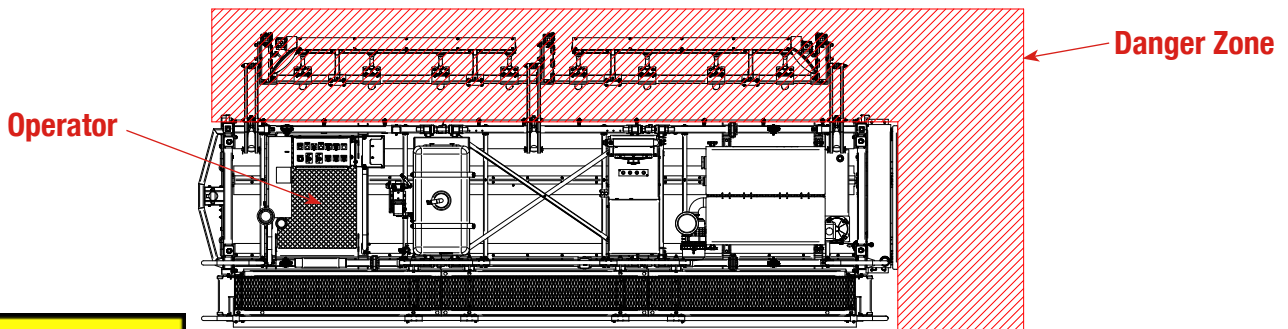
Safety: Priority One // People: Our most valuable asset // Quality: Our most important attribute // Innovation: Our focus with our products and processes // Teamwork: The way we work and think // Customer/Contractor Focused: Our key driver // Honestly: The only way we do business

SECTION 1 SAFETY

Operational Safety



Before starting up and during operation of the paver, the operator must make sure that there are no persons in the “danger zone”. He must give a warning signal whenever a situation presenting danger to persons might develop. He must immediately stop work if any person, although asked, does not leave the danger zone. All persons that are in the vicinity of the paver must be informed of the dangers that can result from the operation of the paver.



Only mount or dis-mount the machine while the machine is stationary. Use the handles and retaining fixtures provided.

The operator must look in the direction of travel and must always have a clear view of the route ahead. Especially when operating in the reverse direction, he must ensure that his path and the working area are clear.

Do not attempt to operate the paver unless fully trained in the machine operation, only authorized personnel should operate the paver. All instructions provided in this manual and on the machine operating and warning decals must be followed to prevent damage to the equipment and/or injury to operating personnel.

Check paver for proper functioning of controls before operating. Observe all gauges and instruments, and correct any malfunctions before operating.

Do not attempt to loosen or disconnect any hydraulic lines, hoses or fittings without first relieving hydraulic circuit pressure. Also, be careful not to touch any hydraulic components that have been in recent operation, because they can be extremely hot and can cause burns.

Always wear personal protective equipment (PPE) appropriate for the job and working conditions. Hard hats, safety glasses, protective shoes, gloves, reflective vests, respirators and ear protection are examples of types of equipment that may be required. Do not wear loose-fitting clothing, long hair, jewelry or loose personal items while operating or servicing the paver.

Always check the job site for obstructions and bystanders.

Always perform a daily inspection of the paver before using it. Look for damage, loose or missing parts, leaks, etc.

Walk around the paver and warn all nearby personnel before starting the paver.

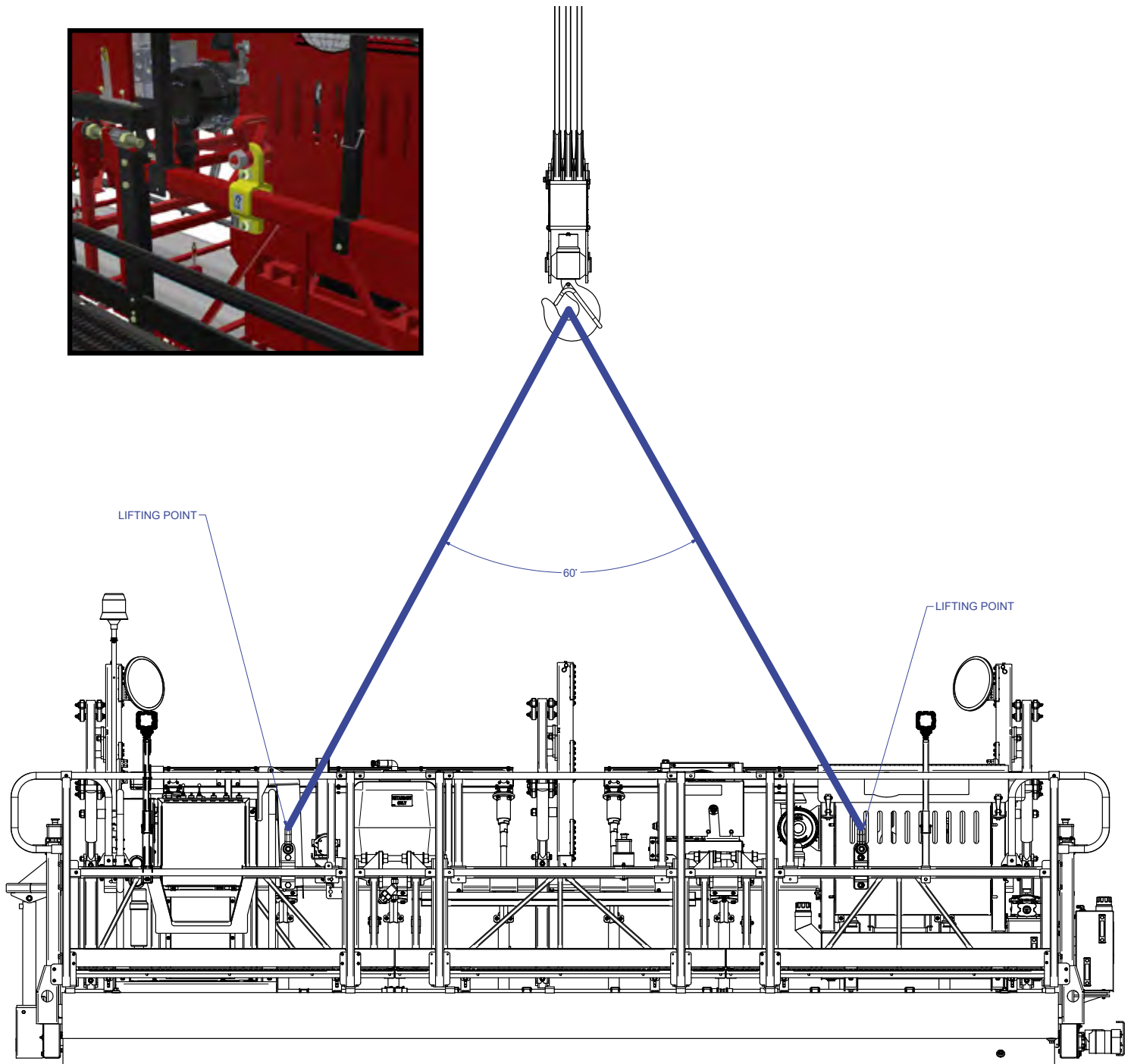
Pressing the emergency stop button (e.g. when someone enters the danger zone, when the machine is no longer under control, etc.) causes the drive motors, the screed motor and the steering system to be switched off. The paver brakes to a standstill. Before the paver can be started up again, the cause of the malfunction must be determined and the malfunction eliminated. The machine must then be started up again as described in the operating instructions.

Regular maintenance of the hydraulic system is important. These machines operate with high oil pressure. Minor damage or a crack in a hose or connection can have devastating consequences. Bear in mind that hydraulic hoses are made of rubber, which means that they age over time and that this can cause cracks to start forming. If there is the least doubt about the durability of hoses, or if damage is detected caused by mechanical wear, replace the hoses using genuine AEC hoses. Never store hoses for excessively long periods: hoses need to be used while still relatively new.

Bear in mind that the hydraulic system may be pressurized even after the machine has been shut down and parked. Always work on completely depressurized systems. During any inspection of the hydraulic system, you must wear protective goggles and gloves at all times. You are advised to use a piece of cardboard to find any signs of leakage – never reach in with your hand to feel for leaks.

SECTION 1 SAFETY

Transportation Safety/Machine Lifting



Before driving, make sure your vehicle maintenance and trailer maintenance are current. This is very important because towing puts additional stress on the tow vehicle.

- Check and correct tire pressure on the tow vehicle and trailer, including the spare tire.
- Make sure the wheel lug nuts/bolts on the tow vehicle and trailer are tightened to the correct torque.
- Be sure the hitch, coupler, draw bar and other equipment that connect the trailer and the tow vehicle are properly secured and adjusted.
- Make sure the safety chains are properly criss-crossed and connected, not touching the road but with enough slack to make turns.
- Check that the wiring is properly connected; not touching the road, but loose enough to make turns without disconnecting or damaging the wires.
- Make sure all running lights, brake lights, turn signals and hazard lights are working.
- Verify that the brakes on the tow vehicle and trailer are operating correctly.
- Ensure the breakaway system lanyard is connected to the tow vehicle but not to the safety chains or ball mount.
- Check that all items are securely fastened on and in the trailer.
- Be sure the trailer jack, tongue support and any attached stabilizers are raised and locked in place.
- Check load distribution to make sure the tow vehicle and trailer are properly balanced front to back and side to side.
- Check side and rear-view mirrors to make sure you have good visibility.
- Check routes and restrictions on bridges and tunnels.
- Make sure you have wheel chocks and jack stands.
- Match the maximum trailer weight allowed for the tow vehicle to the GVWR of the trailer.
- Match the hitch weight carrying capacity of the tow vehicle with the loaded tongue weight of the trailer. This is generally 10% of GVWR on tag models and 20% of GVWR on 5th wheels and Goosenecks. Tag models may require a weight distributing hitch with sway controls. Contact your hitch specialist to properly set up your tow vehicle/trailer combination.
- Match the size of the brake controller to the number of braking wheels on your trailer. These are sold usually as 2 to 4 wheel brake or 2 to 6 wheel brake units. For proper controller adjustment, see your brake controller manual.
- Match the wiring of the tow vehicle to the wiring code on the trailer. Ensure your tow vehicle does have a ground wire running from the receptacle to the frame.
- Match the ball size to the coupler size.
- Match your Fifth Wheel or Gooseneck trailer to a correct and compatible hitch provided by your hitch specialist. Then consult your hitch specialist for proper maintenance of the hitch assembly.
- Match your rear vehicle suspension to the loaded hitch weight of the rear axle of the tow vehicle. All marginal situations should be corrected for safe trailering. Remember, you are the one that will be trying to control a large combination of weight and size at high speeds. It is your responsibility to set up tow vehicle/trailer properly. Contact or confirm your set up with a local hitch company professional.

Hazards of using lifting equipment

The hazards: associated with the use of lifting equipment in construction are:

- Hazards related to the loads, e.g. crushing due to impact of moving objects or loads falling from vehicles because they are not slinged properly or the wrong type of slings were used.
- Hazards from moving vehicles or collapsing structures [Safety | Workplace transport | In house transport and handling], i.e. cranes falling over because of improper fixation or strong wind, unsafe loads, loads exceeding the safe weight limits, trapping/crushing risk in the use of MEWPs (Mobile Elevated Work Platforms) while working at height, falling from height, limbs or bodies caught in machinery
- Falling from lifting platforms or being crushed when the platform moves
- Musculoskeletal hazards related to force exertions, poor working postures and/or repetitive work
- Hazards related to poor environment that may interfere with communication between workers or concentration needed for the task (noise) or cause sweaty, slippery objects (heat, poor ventilation)
- Contact with overhead electrical cables.

Possible causes of these hazards may be: poor mechanical design (breaks in use, not powerful enough, components fracture or malfunction), poor workplace design, malfunction of the (manual, mechanical, electronic) signaling system, not using the proper equipment for the purpose or misuse (not using as designed, e.g. the load was too heavy), loads insecurely attached, poor maintenance (breaks or emits noxious gases) or untidy workplace, human error when operating machines or erecting scaffolding.

Requirements for lifting equipment

The employer shall ensure that lifting equipment provided for use at work is safe, i.e. that it is:

- sufficiently strong, stable and suitable for the proposed use. Similarly, the load and anything attached (e.g. timber pallets, lifting points) must be suitable
- positioned or installed to prevent the risk of injury, e.g. from the equipment or the load falling or striking people
- visibly marked with any appropriate information to be taken into account for its safe use, e.g. safe working loads. Accessories, e.g. slings, clamps etc., should be similarly marked
- where equipment is used for lifting people it is marked accordingly, and it should be safe for such a purpose, e.g. all necessary precautions have been taken to eliminate or reduce any risk.

Before using mobile lifting equipment the following safety precautions should be taken:

- The working environment: Routes should be leveled, marked and planned in such a way as to avoid potential hazards such as overhead power lines and steeply sloping ground. Where possible a one-way system should be used. Speed limits should be required and clearly displayed, they should be reduced for adverse site conditions and for areas near work in progress. The working environment should be kept clean and tidy, with floors and access routes clear of obstacles. Good lighting levels are needed to ensure that all potential hazards, e.g. obstructions and spills can be clearly seen. All stairs, ramps and other level changes should be clearly visible and slip resistant; safety signs should be used where appropriate.
- Check machines on fuel, oil, and water levels, water, fuel, and hydraulic lines for leaks, the condition of the tracks or tires, the condition of attachment cutting edges and teeth, visibility from the cab, windows, mirrors and lights, worn or slippery surfaces, etc.
- If vehicles drive backwards when the driver's rear view is obscured, the help of another worker is required. If no one is available, the driver must walk round to the rear of the vehicle themselves to see that all is clear and give a sound signal before starting to reverse. Additionally, these vehicles should use an audible warning device such as a horn when driving in reverse.
- A crane operator should always move loads according to the established code of signals, and use a signaler. Hand signals are preferred and commonly used. A signaler may be required by law if the operator's view of the intended path of travel is obstructed. The assistance of a trained and authorized signaler should be available when the view of the driver or operator is restricted. The signaler must be in clear view of the operator, have a clear view of the load and equipment and keep other persons out of the machine's operating area.
- An unattended vehicle should have the engine switched off, and unless the vehicle is on a marked incline the gear should be left in neutral and the handbrake on; on sloping ground the wheels should also be chocked. Tipping bodies should be lowered when the machine is unattended, but if it is occasionally necessary to leave them in the raised position they should be blocked to prevent their fall.
- Drivers and their assistants should wear safety shoes during loading and unloading.

Maintenance and inspection

Accidents may happen because lifting equipment is not inspected and maintained regularly. All equipment should be thoroughly examined prior to it being put into service and after there has been any major alteration that could affect its operation. Lifting equipment may need to be thoroughly examined at intervals laid down in an examination scheme drawn up by a competent person, taking into account the manufacturer's recommendations. If equipment is intended to carry people, a thorough examination must be undertaken every six months. Lifting equipment for all other purposes should be tested at least every twelve months unless a specific inspection regime is implemented by the examining engineer. Lifting accessories do not normally need formal inspection, provided that proper pre-use checks are made and they undergo their standard thorough examination. All examinations must be undertaken by a competent person who is sufficiently independent and impartial in order that an objective decision can be made.

SECTION 1 SAFETY

Transportation Safety (cont'd): Lifting

What needs to be examined depends on the professional judgment of the competent person undertaking the examination. For most common lifting equipment and accessories, there are standard procedures and criteria. Methods include a visual examination and functional checks, measurements of wear, traditional non-destructive testing and load testing.

Where an examination scheme has been drawn up, this should identify and specify the parts to be thoroughly examined, the methods of examination and testing and the intervals for examination (and testing of the different parts, where appropriate).

General Requirements

- A. Manufacturer's labels, e.g. operating instructions, hazard warnings, and rated load capacities, shall not be defaced.
- B. Guards and other safety devices shall be in place and operable before any lifting device is used.
- C. All personnel performing work on behalf of USPL have the responsibility and authority to stop any lifting operation they consider to be unsafe.
- D. People shall not stand, pass, or work directly under a suspended load.
- E. The operator shall always stop the engine(s) on any mobile crane before leaving it unattended.
- F. Wherever a lift could endanger personnel, a horn or similar warning device shall be sounded to warn personnel in the area that a lift is taking place.
- G. Any crane or mechanical equipment capable of having parts of its structure elevated near energized overhead electrical lines shall be operated so that a clearance of 20 feet is maintained or a Critical Lift Permit is required.
- H. While making lifts, cranes equipped with outriggers shall have them deployed according to the manufacturer's instructions.
- I. On truck-mounted cranes, no loads shall be lifted over the front area except as approved by the crane manufacturer.
- J. Signal Persons shall be utilized in the following situations:
 - 1. The Lift Operator cannot see the load.
 - 2. The Lift Operator cannot see the path of travel of either the load or the crane.
 - 3. The Lift Operator cannot see the load landing area.
 - 4. The Lift Operator is too far from the load to judge distance accurately.
 - 5. The lifting device is working within 20 feet of live power lines or equipment.
- K. Signal Persons or Riggers shall control access to lift areas when lifts could endanger personnel. No one, except those directly involved with performing the lift, is permitted to enter the area without notifying and receiving acknowledgment from the Signal Person or Rigger.
- L. When Signal Persons use hand signals, the hand signals shall be those prescribed by the applicable ANSI standard, and an illustration shall be posted at the job site.
 - 1. The crane operator shall provide and post the hand signal chart.
- M. When Signal Persons are used with operators of lift devices other than cranes, the Lift Operator and Signal Person shall agree on the type of hand signals or verbal commands to be used. If a movement is to take place for which a signal or command has not been discussed prior to the operation, the lift shall stop and the appropriate signal or command shall be agreed upon before the lifting operations may resume.
- N. When traveling or rotating a crane with a load, a tag or restraint line shall be used if swinging of the load is hazardous, e.g. the load could contact another object or swing out beyond the radius at which it can be controlled. When used near electrical equipment, tag lines shall be a nonconductive type.
- O. When other mobile equipment is used for lifting, commercially available or built from an approved engineering design attachment devices shall be used.

P. Free rigging is prohibited. If the lift equipment has the manufacturer approved lifting attachment installed on the tines/forks, it is not free rigging.

Q. Personnel-elevating work platforms shall not be used as cranes.

R. In no case shall the lift exceed 90% of the charted capacity of the crane except when load testing a crane is conducted by or under the direction of a qualified third-party lifting equipment vendor, which does not require a critical lift permit.

S. Cranes in marine terminals shall be fitted with a load indicating device with a direct means to prevent an overload from occurring. This requirement excludes cranes:

1. While used to handle or hold hoses in connection with transfer of bulk liquids or other hose handled products.
2. While used to handle equipment with an actual gross weight less than 11,200 lbs.

The Dangers of Heavy Lifting with Cranes

In this article we cover some of the best 'top tips' when using cranes for lifting heavy loads. Firstly the most important tip to remember is – Safety is paramount!

Extend extra care not carelessness

For any kind of lifting due care and consideration of risks should never be disregarded; as loads increase so to do the risks and level of care required to manage safely with crane operation being one of the most precarious examples.

Heavy lifting operations are considered to be complex for a reason and will require specialist safe systems of work to be introduced in order to maintain the safety of people, equipment and property.

BS7121 Standard

BS7121 safe use of cranes is an approved code of practice to ensure safe complex heavy lifting operations using cranes.

The following category of competent persons need to be employed to ensure that safe heavy lifting operations can be carried out such as;

- Appointed person.
- Crane operator.
- Rigger/slinger/banksmen.
- Crane supervisor.

Safe systems of work

The following safe systems of work must be in place prior to carrying out any lifting operation.

- Pre-site inspection – Ground stability conditions / access / egress, weather conditions etc.
- Suitable cranes – Lifting accessories.
- Pre-Inspection of the lifting equipment / testing / examination / certification.
- Risk assessment / method statement.
- Lift plan.

SECTION 1 SAFETY

Transportation Safety (cont'd): Lifting

General tips for crane operation

Additionally, a few key points always worth keeping in mind during crane operation:

- Once a load is in the air, don't leave the controls – While a load is suspended the operator should not leave the controls.
- Stay focused, stay on task – An operator should never multitask to fulfil other roles such as signalling or heed distractions such as a mobile phone.
- Stop means STOP – If an emergency stop signal is given the operator should do so regardless of who gives it.
- Keep it clear – Heavy loads should never be moved directly over people and all nearby personnel should be kept clear of areas they may be hit should it swing, shift or fall.
- Look around you – A broad awareness of surroundings should be maintained at all times with specific attention given to overhead hazards such as power lines and potentially dangerous weather conditions warranting suspension of operations.

While you don't need to be a mechanical engineer to operate cranes safely, the following basic steps will help to ensure that you don't encounter any safety issues.

1. Have a certified operator. A crane in the hands of an unqualified operator can be a deadly weapon. Riggers should also be properly trained on setting the crane up for the specific load and circumstances.

2. Inspect, inspect and inspect. Verifying that the crane has received its annual inspection is only the beginning. It's important to check the operating functions daily to ensure that everything is working properly and that there are no defects or cracks in the support members. The cranes of a generation ago were made with alloys that could handle overloading and other abuse. Today's cranes use materials that are less tolerant of mishandling. Longtime operators are often surprised to discover that the tricks they used to push cranes beyond the limits in the past can easily create very dangerous situations with newer cranes.

Overhead cranes used in heavy industrial applications such as steel making need to be inspected just as carefully. Many of these cranes spend decades working in extreme environments such as melt shops. That constant exposure to intense heat and temperature swings can cause the beam and other structural members to become brittle and lose strength or even fail.

3. Know what's below. The most powerful, carefully rigged crane is only as strong and stable as the surface upon which it stands. You need to know the classification for the soil or other material under the crane, and adjust your setup and load limits accordingly. While many cranes are equipped with outriggers, extending them doesn't necessarily mean that you've provided a stable surface. Outriggers displace the weight on the lift much the way that snowshoes spread your weight out so you don't sink into the snow. The pad and float at the end of the outrigger carry a great deal of compression force when the crane is under load. Too much force can cause them to punch through the ground, causing the entire crane to tip.

It's important to know the load weight and how that is affected by the conditions of your job site. The crane's load chart can help you determine whether your lift will be safe. The allowable load will depend on whether the tires or outriggers are being used, along with other factors. For example, asphalt may seem to be a stable surface, but on a warm day, it may become very flexible. Even concrete may not provide enough strength if there is a void beneath it.

4. Plan for swing. The counterweight and boom travel within a specific arc that's called the swing radius. It's important to ensure that the area within that radius is barricaded off, and to establish a control zone for those authorized to work in the immediate area. Also check the area every day to ensure that there are no objects the boom might strike, such as power lines. If such obstacles exist, be sure that the operator and other workers are aware of the plan for avoiding them.

5. Use cranes properly. Cranes are engineered for vertical lifting. That doesn't stop some crews from trying to use them for side loading or other improper activities. Using a crane to drag something across the ground or from under an obstacle puts extreme stress on the boom, the turntable, and all the structural members. It could potentially weaken key components and lead to their failure. If someone on the site has used a crane improperly, be sure to inspect it thoroughly to ensure that its integrity has not been impaired.

6. Stay in touch. Whether you use radios, air horns, or hand signals, there needs to be clear communication between the operator and the other workers. That's especially critical when a crane is making a lift in which the operator cannot see the load, such as when air handling equipment is being delivered through an opening on another side of a structure. Don't assume that everyone knows how instructions will be communicated. Follow OSHA's specific guidelines, and make sure that everyone on the site knows exactly what each signal means.

7. Pay attention. Everyone associated with a crane needs to stay alert and focused on the job at hand – especially on critical or difficult lifts.

8. Avoid man-baskets. Sometimes it looks like the easiest way to put employees where they're needed is to lift a man-basket to the work area. However, that approach creates hazards that must be tested and addressed before work begins, such as providing proper fall protection, verifying basket capacity, and checking that the basket is properly attached. In addition, the safety of the employees in the basket is entirely dependent on the skill of the operator, and a simple mistake could have tragic consequences. Before using a man-basket, consider whether an articulating boom lift or a scissor lift might provide a safer alternative.

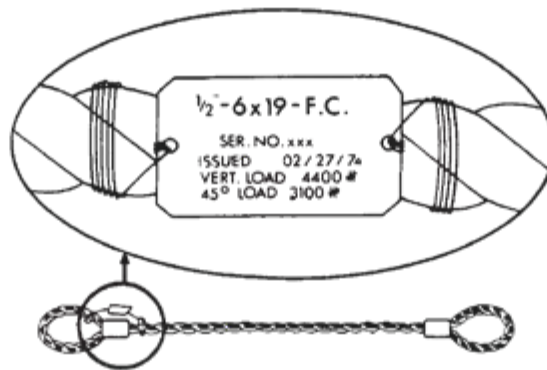
9. Don't use cranes for storage. In areas where site security is a concern, it's not unusual to see laborers end the workday by attaching a compressor or similar piece of equipment to the crane and suspending it for safekeeping. It's a common practice, but one that's very risky. In addition to the danger that someone could walk beneath it, a strong wind could cause the load to sway – perhaps to the point of toppling the crane. But an even better reason not to do this is that most of today's newer cranes are hydraulically-operated. A small leak anywhere in the system will eventually reduce the hydraulic pressure to the point where the boom will drop, and the suspended load will fall on whatever is below it – maybe a more expensive piece of equipment.

10. Start with a plan. Each lift is different from another, and it's important to review load weight capacities, the integrity of the equipment, the possible effect of wind, and other factors. The operator, riggers, and other workers involved with the lift should be part of that planning process.

SECTION 1 SAFETY

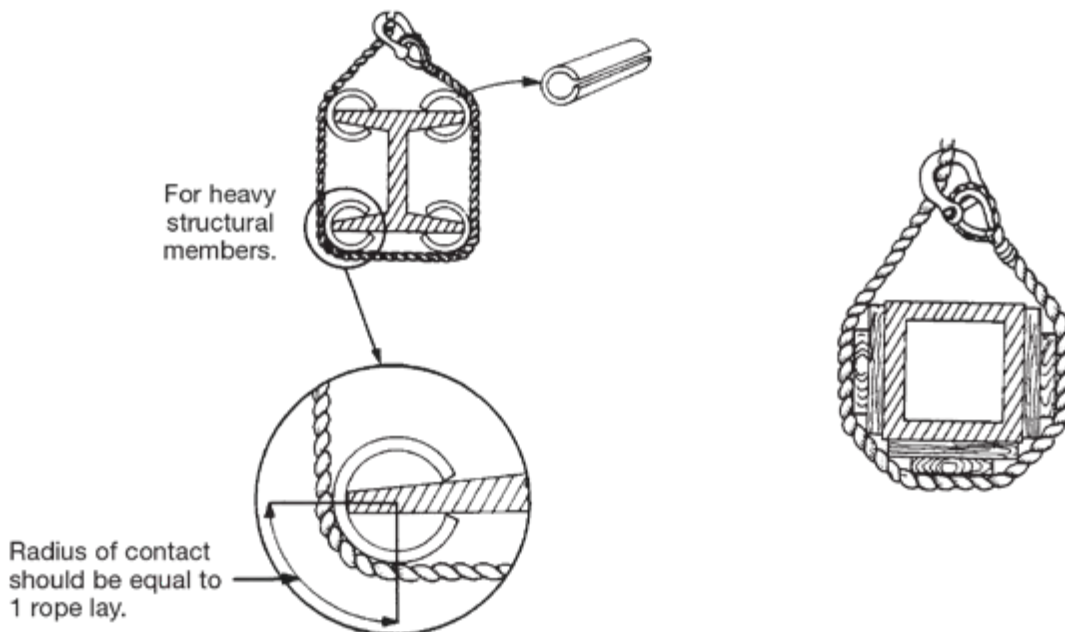
Transportation Safety (cont'd): Rigging

- Never use damaged slings. Inspect slings regularly to ensure their safety. Check wire rope slings for kinking, wear, abrasion, broken wires, worn or cracked fittings, loose seizings and splices, crushing, flattening, and rust or corrosion. Pay special attention to the areas around thimbles and other fittings.
- Slings should be marked with an identification number and their maximum capacity on a flat ferrule or permanently attached ring. Mark the capacity of the sling for a vertical load or at an angle of 45°. Ensure that everyone is aware of how the rating system works.

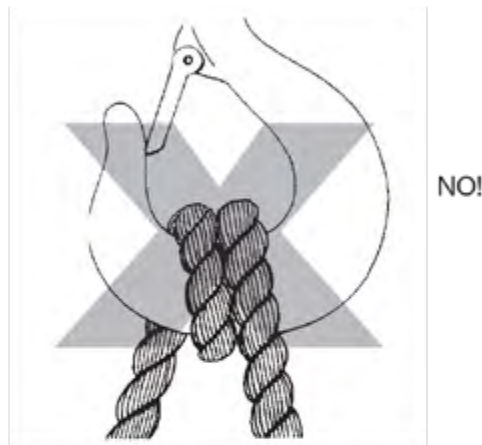


- Avoid sharp bends, pinching, and crushing. Use loops and thimbles at all times. Corner pads that prevent the sling from being sharply bent or cut can be made from split sections of large-diameter pipe, corner saddles, padding, or blocking.

Ensure that Slings are Protected at All Sharp Corners on Heavy Items

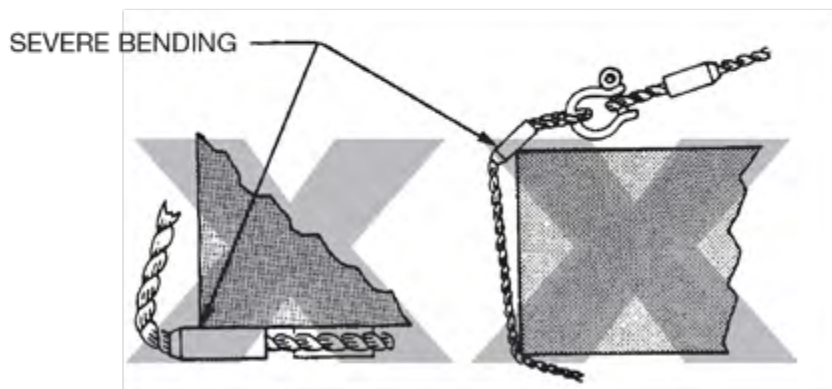


- Never allow wire rope slings, or any wire rope, to lie on the ground for long periods of time or on damp or wet surfaces, rusty steel, or near corrosive substances.
- Avoid dragging slings out from underneath loads.
- Keep wire rope slings away from flame cutting and electric welding.
- Never make slings from discarded hoist rope.
- Avoid using single-leg wire rope slings with hand-spliced eyes. The load can spin, causing the rope to unlay and the splice to pull out. Use slings with Flemish Spliced Eyes.



Never Wrap a Sling Around a Hook

- Never wrap a wire sling completely around a hook. The sharp radius will damage the sling. Use the eye.

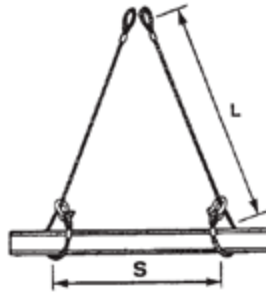


Do Not Permit Bending Near Any Splice or Attached Fitting

- Avoid bending the eye section of wire rope slings around corners. The bend will weaken the splice or swaging. There must be no bending near any attached fitting.

SECTION 1 SAFETY

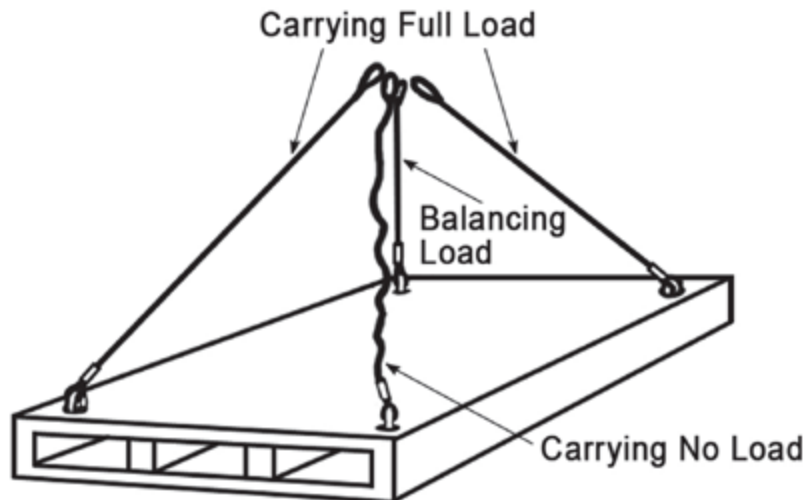
Transportation Safety (cont'd): Rigging



If L is greater than S then sling angle is OK.

Check on Sling Angle

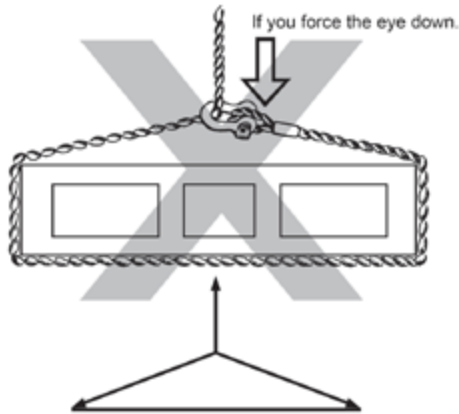
- Ensure that the sling angle is always greater than 45° and preferably greater than 60° . When the horizontal distance between the attachment points on the load is less than the length of the shortest sling leg, then the angle is greater than 60° and generally safe.
- **Multi-leg slings.** With slings having more than two legs and a rigid load, it is possible for some of the legs to take practically the full load while the others merely balance it. There is no way of knowing that each leg is carrying its fair share of the load.



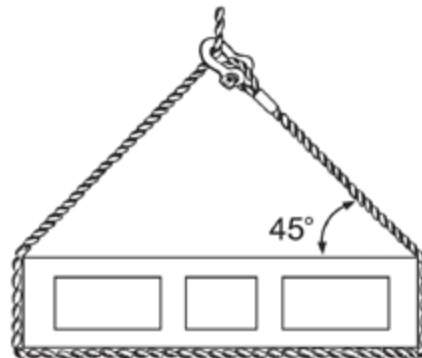
As a result, when lifting rigid objects with three- or four-leg bridle slings, make sure that at least two of the legs alone can support the total load. In other words, consider multi-leg slings used on a rigid load as having only two legs.

When using multi-leg slings to lift loads in which one end is much heavier than the other (i.e., some legs simply provide balance), the tension on the most heavily loaded leg(s) is more important than the tension on the more lightly loaded legs. In these situations, slings are selected to support the most heavily loaded leg(s). Do not treat each leg as equally loaded (i.e., do not divide the total weight by the number of legs.) Keep in mind that the motion of the load during hoisting and travel can cause the weight to shift into different legs. This will result in increases and decreases on the load of any leg.

- When using choker hitches, forcing the eye down towards the load increases tension in the sling, which can result in rope damage. Use thimbles and shackles to reduce friction on the running line.



Low sling angles create severe loading on the sling.



Let the eye ride higher and keep this angle approx. 45° or more.



Incorrect – Cutting action of eye splice on running line.



Correct – Use thimbles in the eyes.



Incorrect – Shackle pin bearing on running line can work loose.



Correct – Shackle pin cannot turn.

- Whenever two or more rope eyes must be placed over a hook, install a shackle on the hook with the shackle pin resting in the hook and attach the rope eyes to the shackle. This will prevent the spread of the sling legs from opening up the hook and prevent the eyes from damaging each other under load.



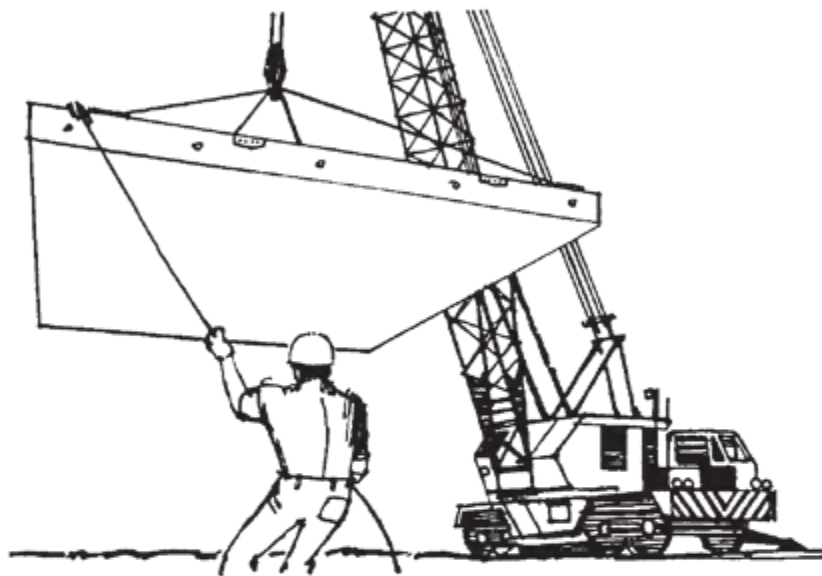
Whenever 2 or more ropes are to be Placed Over a Hook – Use a Shackle

SECTION 1 SAFETY

Transportation Safety (cont'd): Rigging

Rigging, Lifting, and Landing Loads

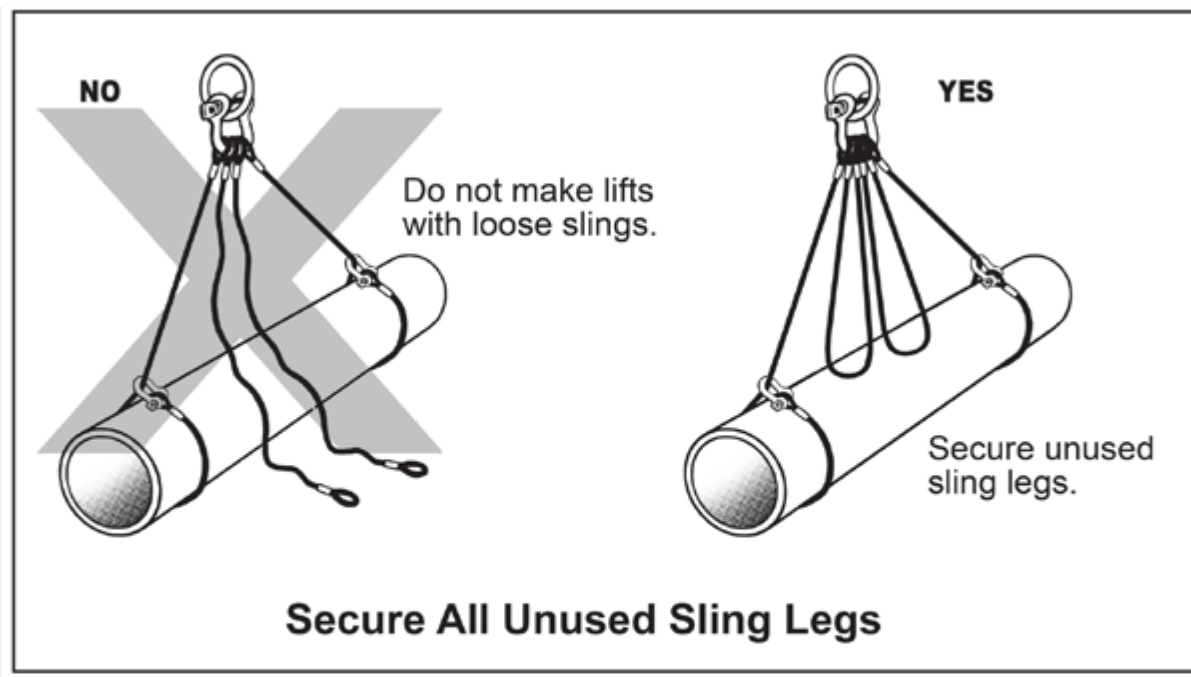
- Rig loads to prevent any parts from shifting or dislodging during the lift. Suspended loads should be securely slung and properly balanced before they are set in motion.
- Keep the load under control at all times. Use one or more taglines to prevent uncontrolled motion.



Use Tag Lines to Control All Loads

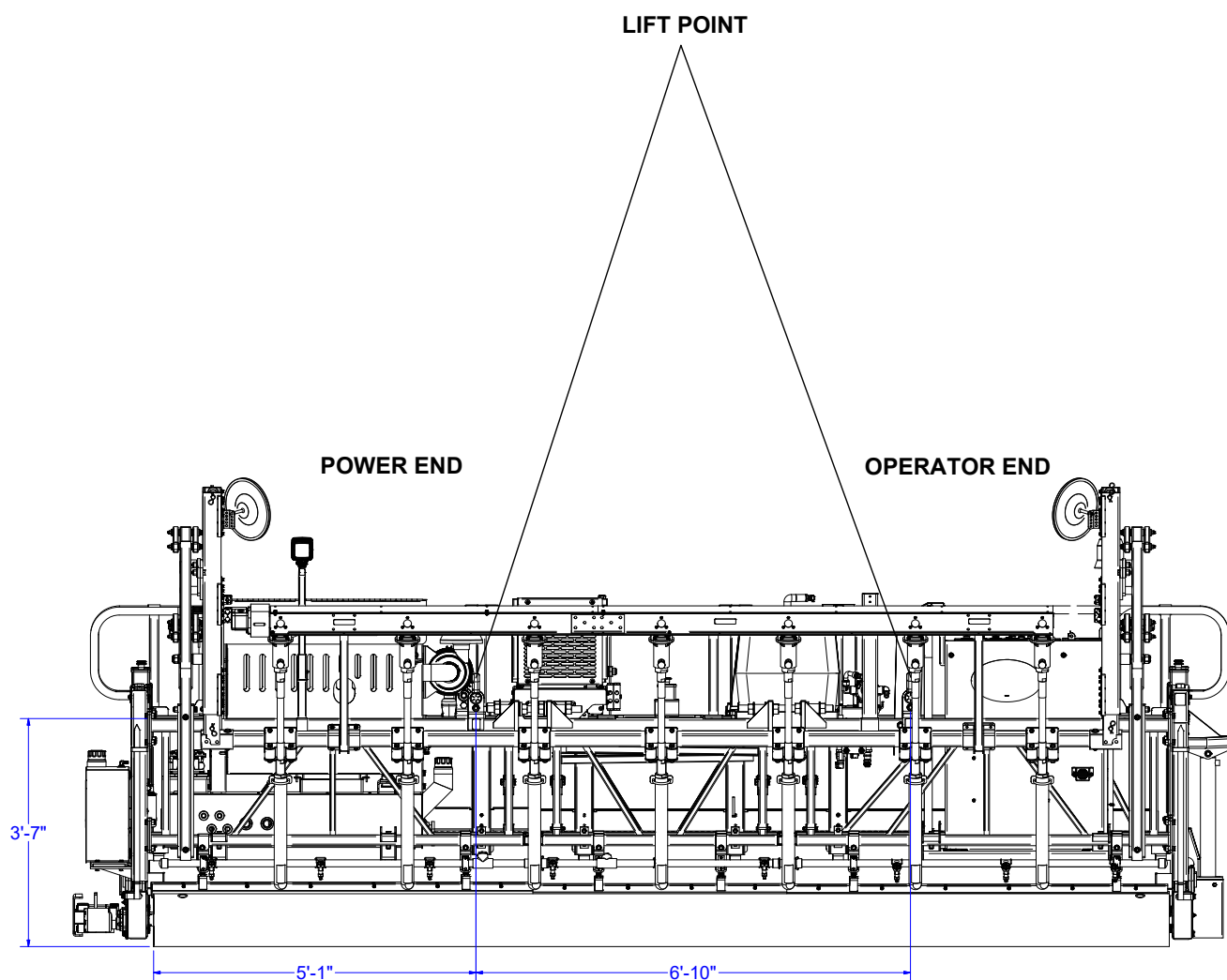
- Loads must be safely landed and properly blocked before being unhooked and unslung.
- Lifting beams should be plainly marked with their weight and designed working loads, and should only be used for their intended purpose.
- Never wrap the hoist rope around the load. Attach the load to only the hook, with slings or other rigging devices.
- The load line should be brought over the load's centre of gravity before the lift is started.
- Keep hands away from pinch points as slack is being taken up.
- Wear gloves when handling wire rope.
- Make sure that everyone stands clear when loads are being lifted, lowered, and freed of slings. As slings are being withdrawn, they may catch under the load and suddenly fly loose.

- Before making a lift, check to see that the sling is properly attached to the load.
- Never work under a suspended load.
- Never make temporary repairs to a sling. Procedures for proper repair should be established and followed.
- Secure or remove unused sling legs of a multi-leg sling before the load is lifted.

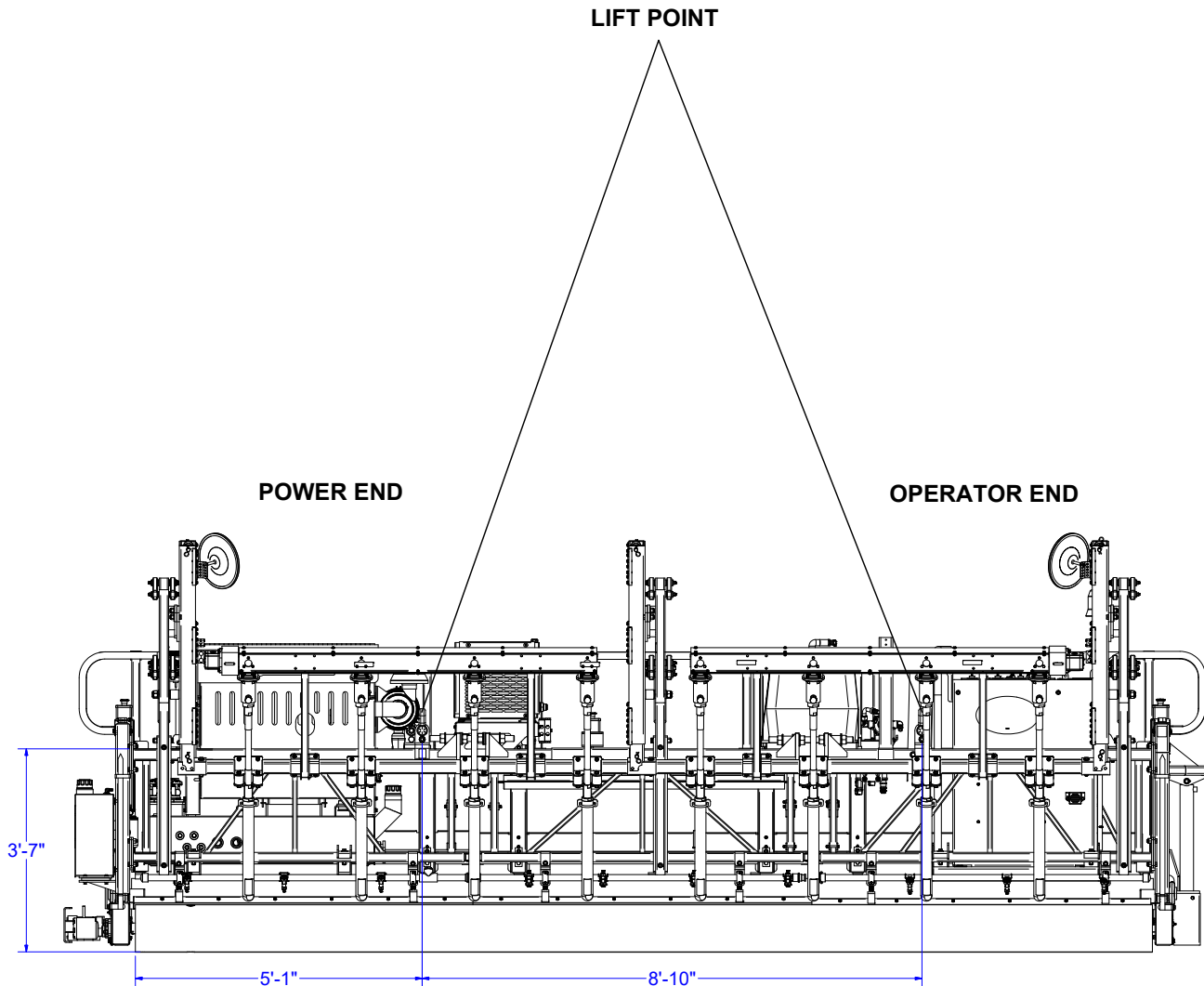


- Never point-load a hook unless it is designed and rated for such use.
- Begin a lift by raising the load slightly to make sure that the load is free and that all sling legs are taking the load.
- Avoid impact loading caused by sudden jerking during lifting and lowering. Take up slack on the sling gradually. Avoid lifting or swinging the load over workers below.
- When using two or more slings on a load, ensure that they are all made from the same material.
- Prepare adequate blocking before loads are lowered. Blocking can help prevent damage to slings.

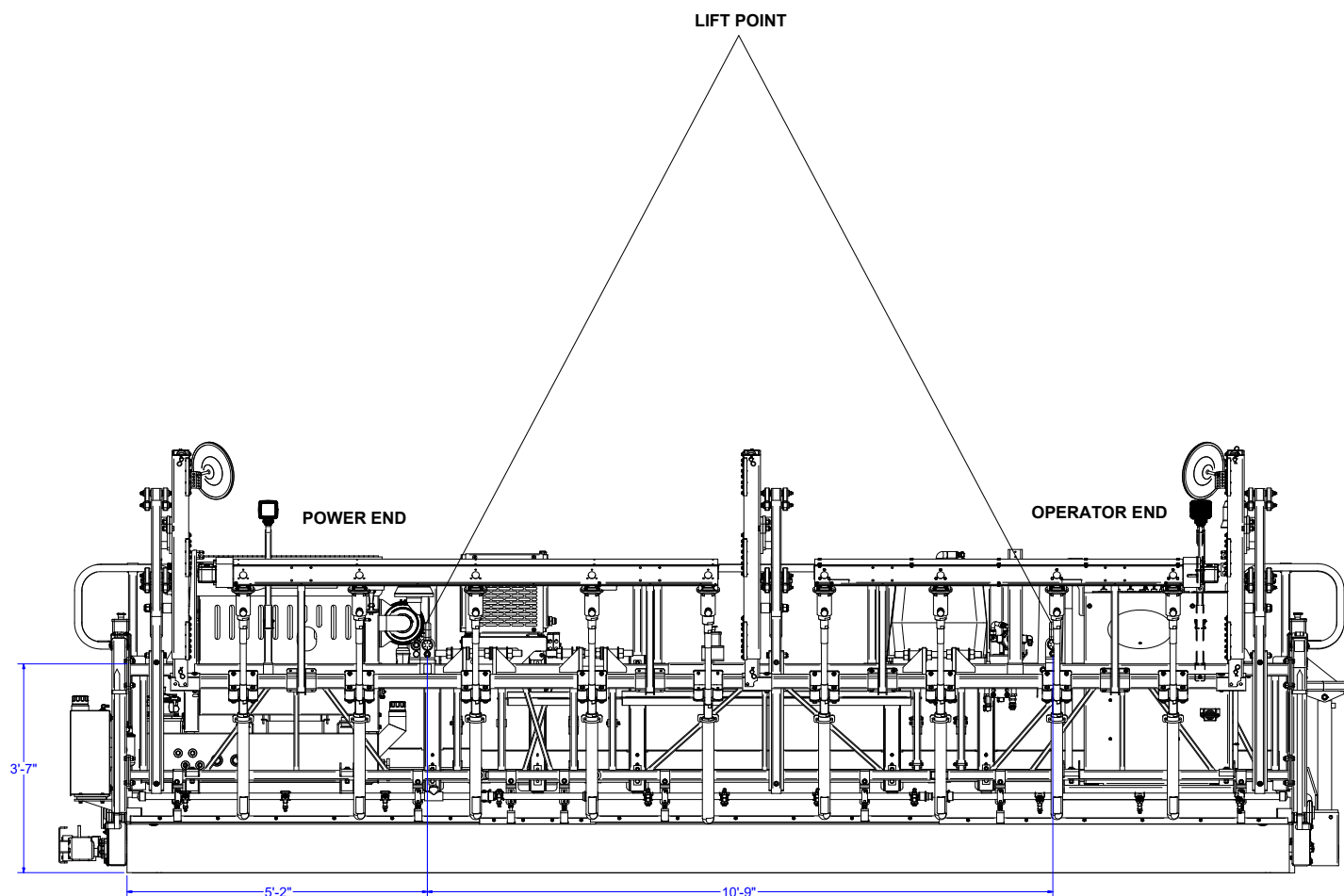
068130 - 16' T275 TRIPLE TUBE LIFTING LOCATION



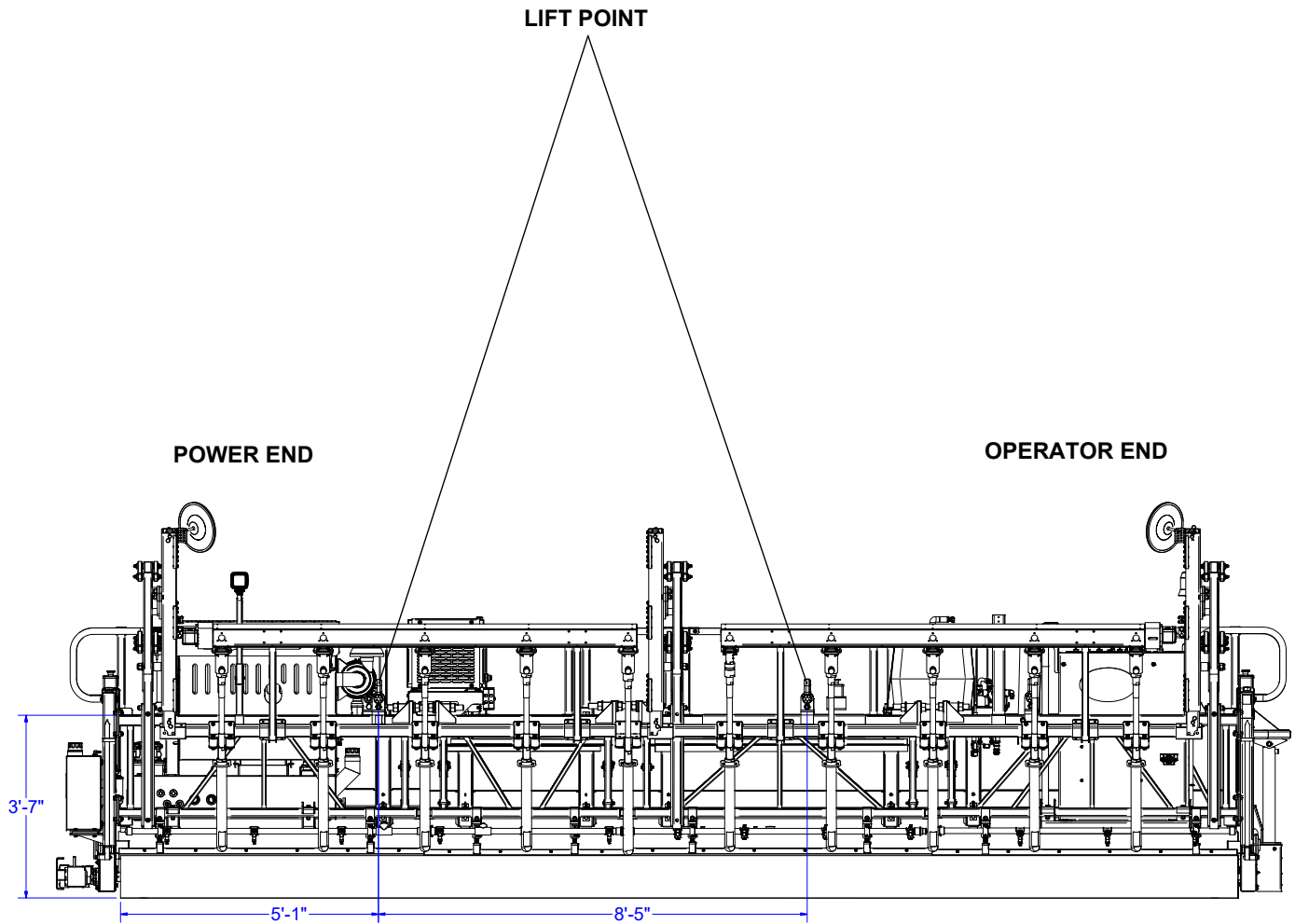
068000 - 18' T275 TRIPLE TUBE LIFTING LOCATION



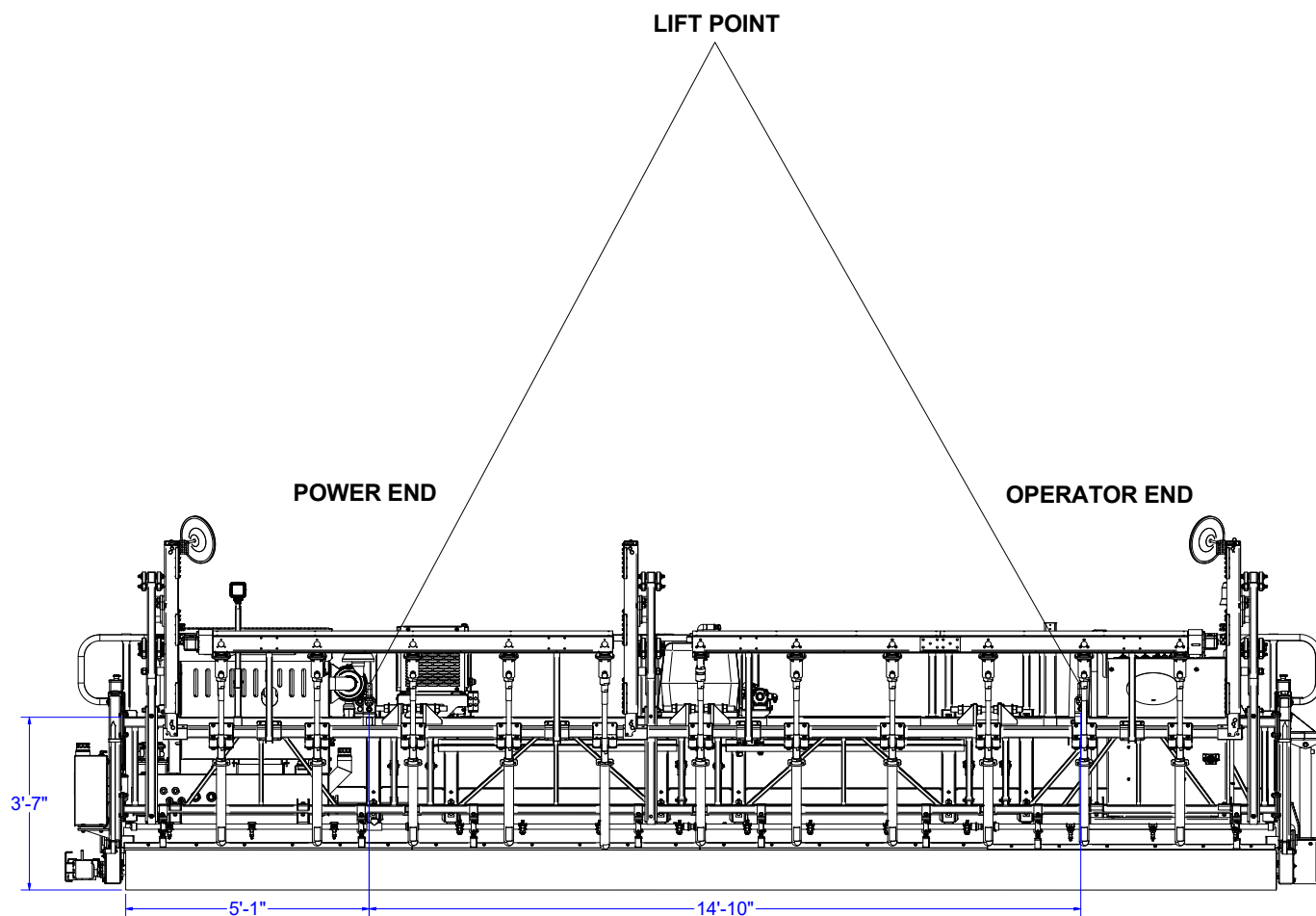
068131 - 20' T275 TRIPLE TUBE LIFTING LOCATION



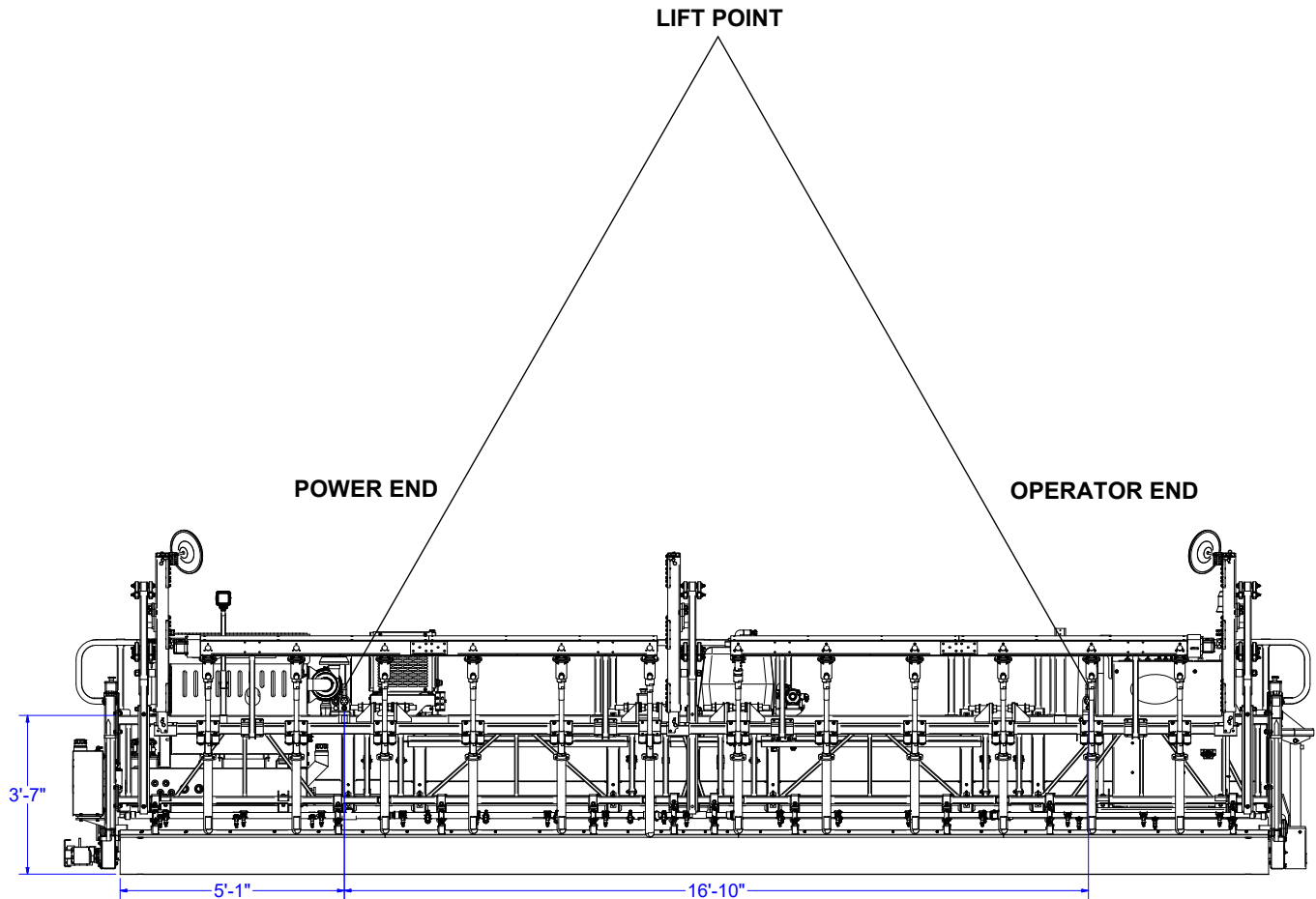
068132 - 22' T275 TRIPLE TUBE LIFTING LOCATION



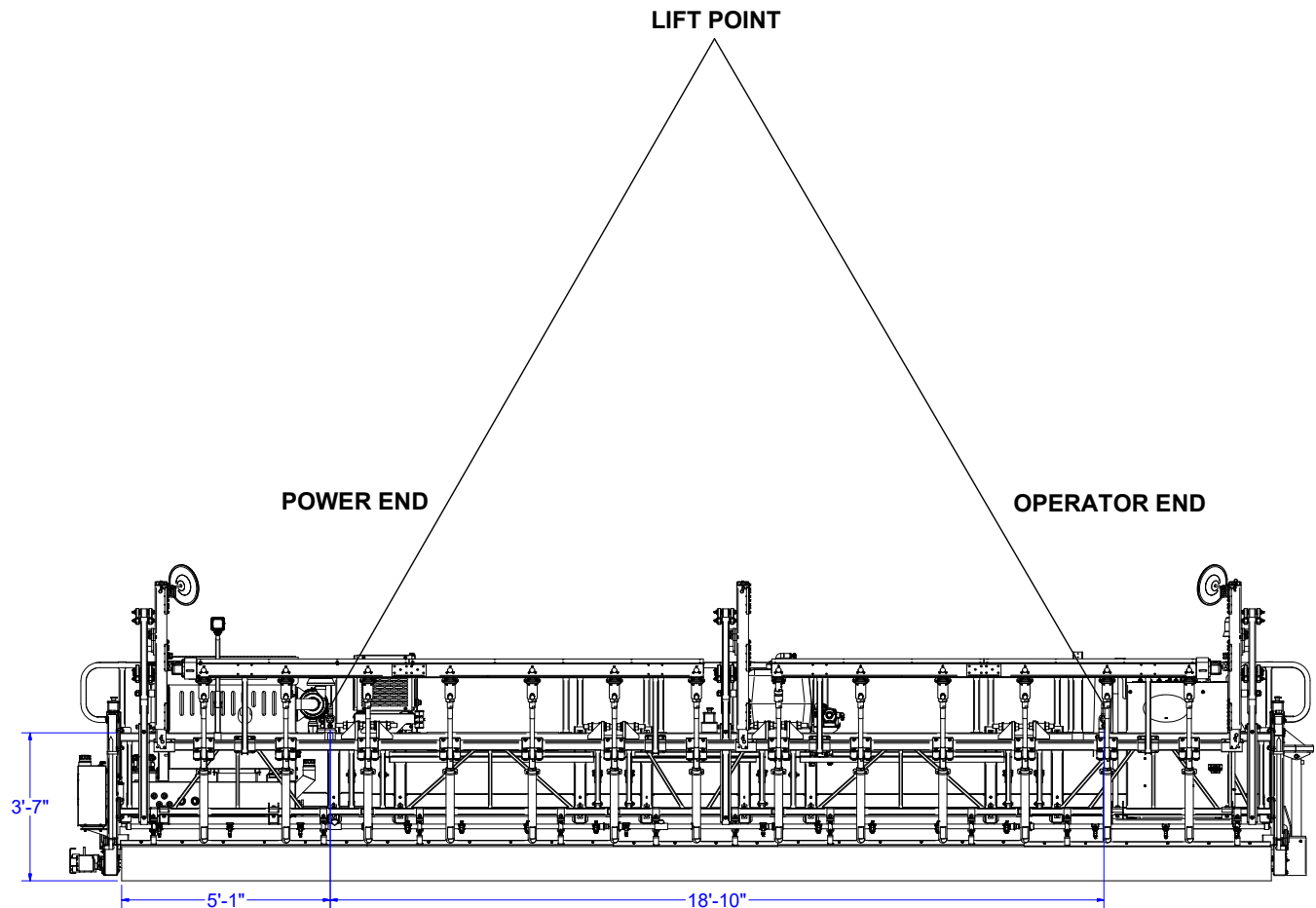
068133 - 24' T275 TRIPLE TUBE LIFTING LOCATION



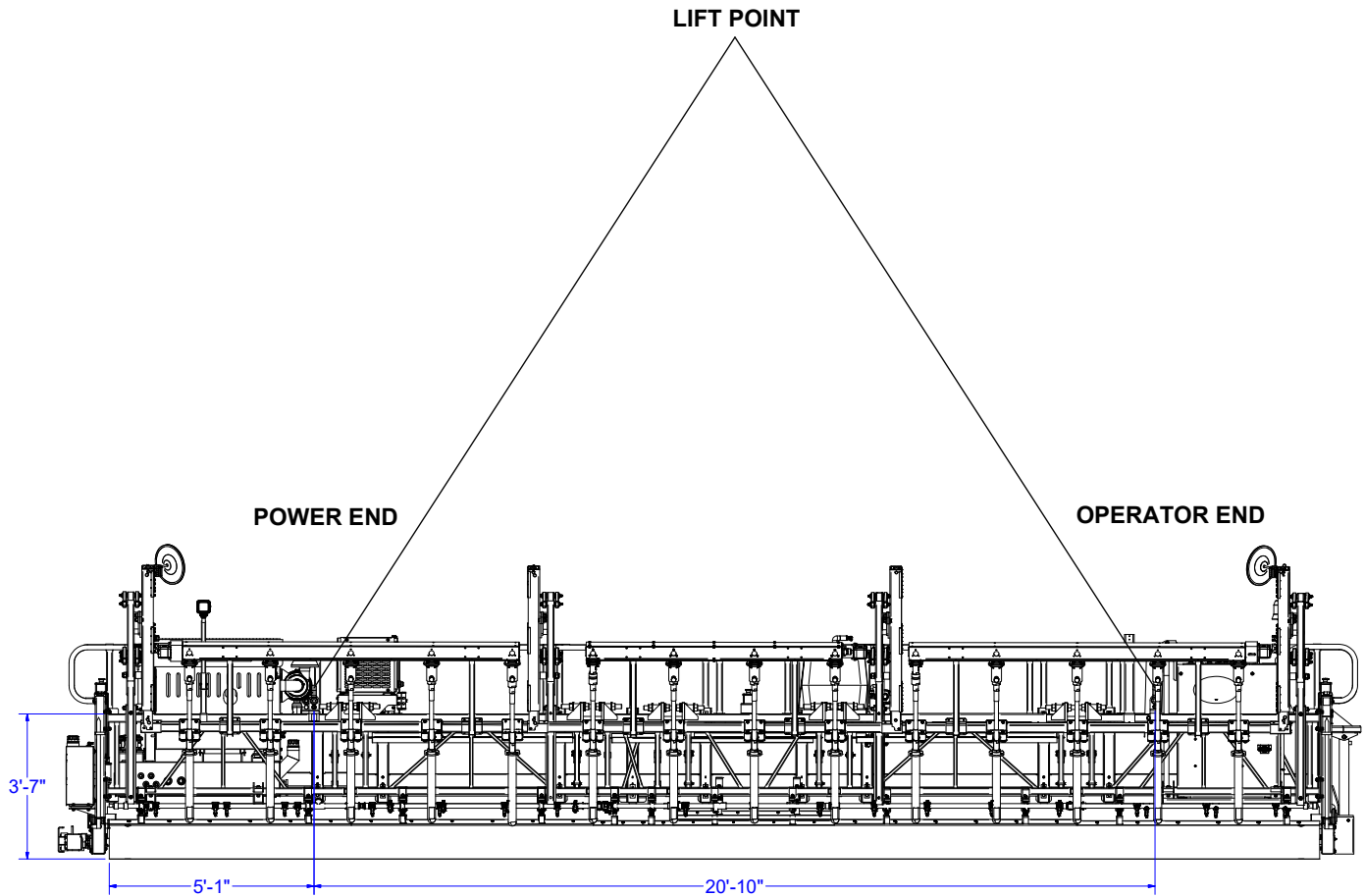
068134 - 26' T275 TRIPLE TUBE LIFTING LOCATION



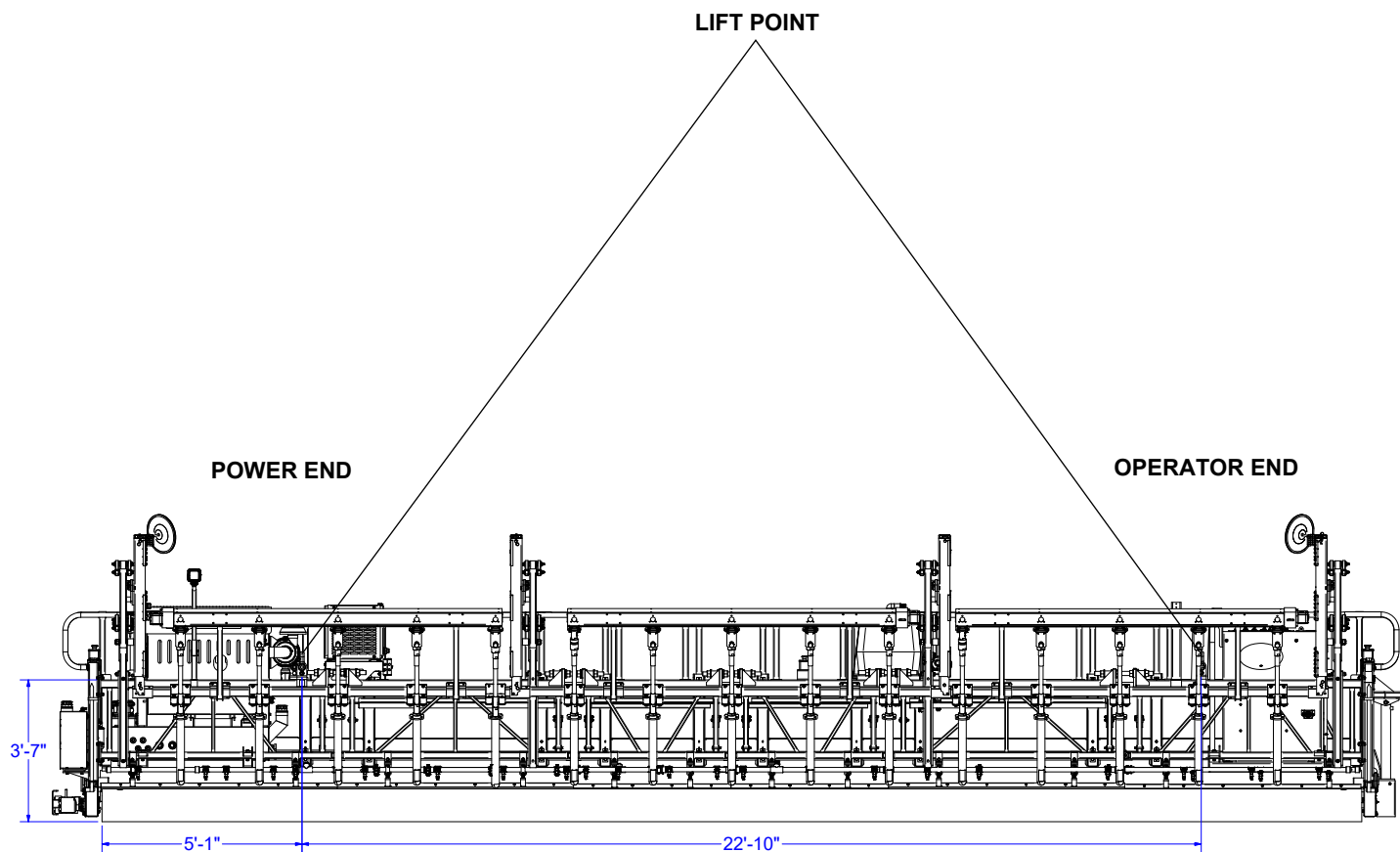
068001 - 28' T275 TRIPLE TUBE LIFTING LOCATION



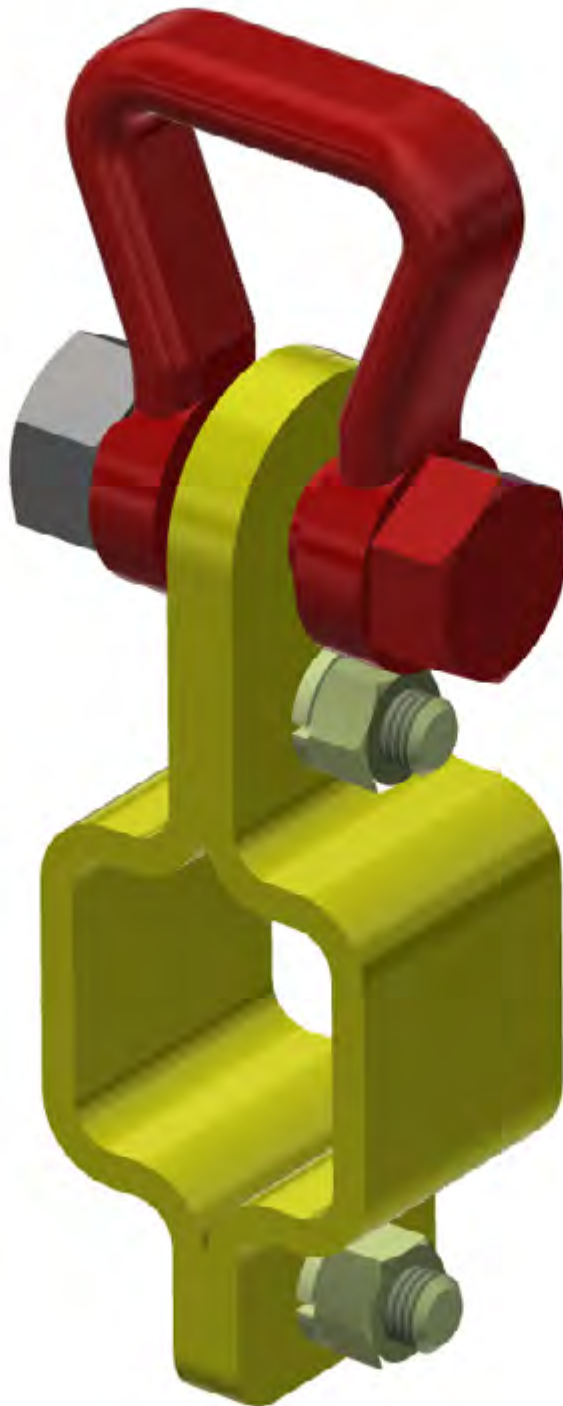
068100 - 30' T275 TRIPLE TUBE LIFTING LOCATION



068135 - 32' T275 TRIPLE TUBE LIFTING LOCATION



068058 - ASSEMBLY, LIFT HOIST 275 TRTP
12-1/2 TON (25,000lbs) LIFTING CAPACITY



SECTION 2 OPERATIONS

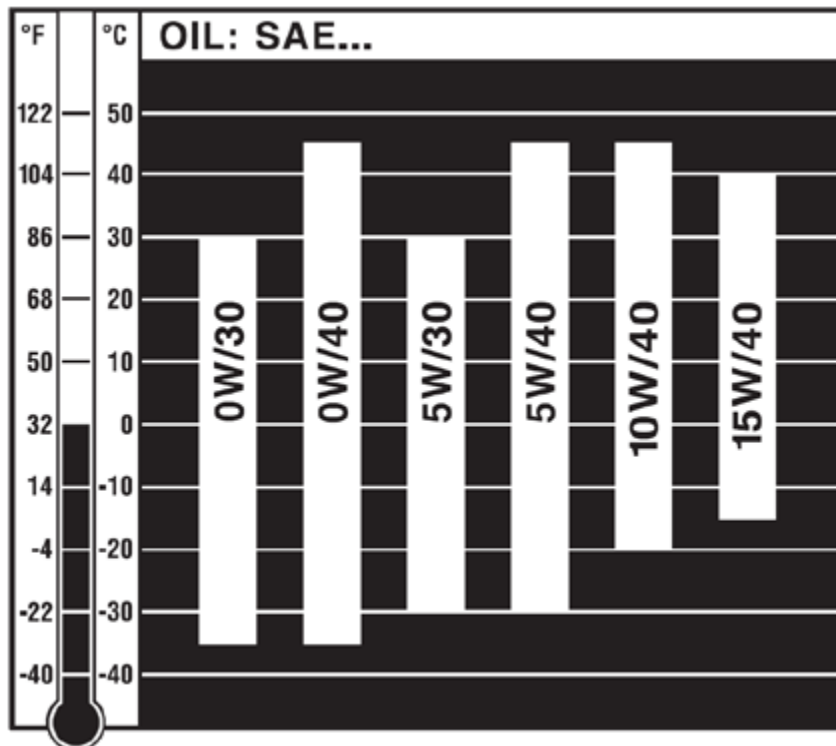
Pre Operating Instructions

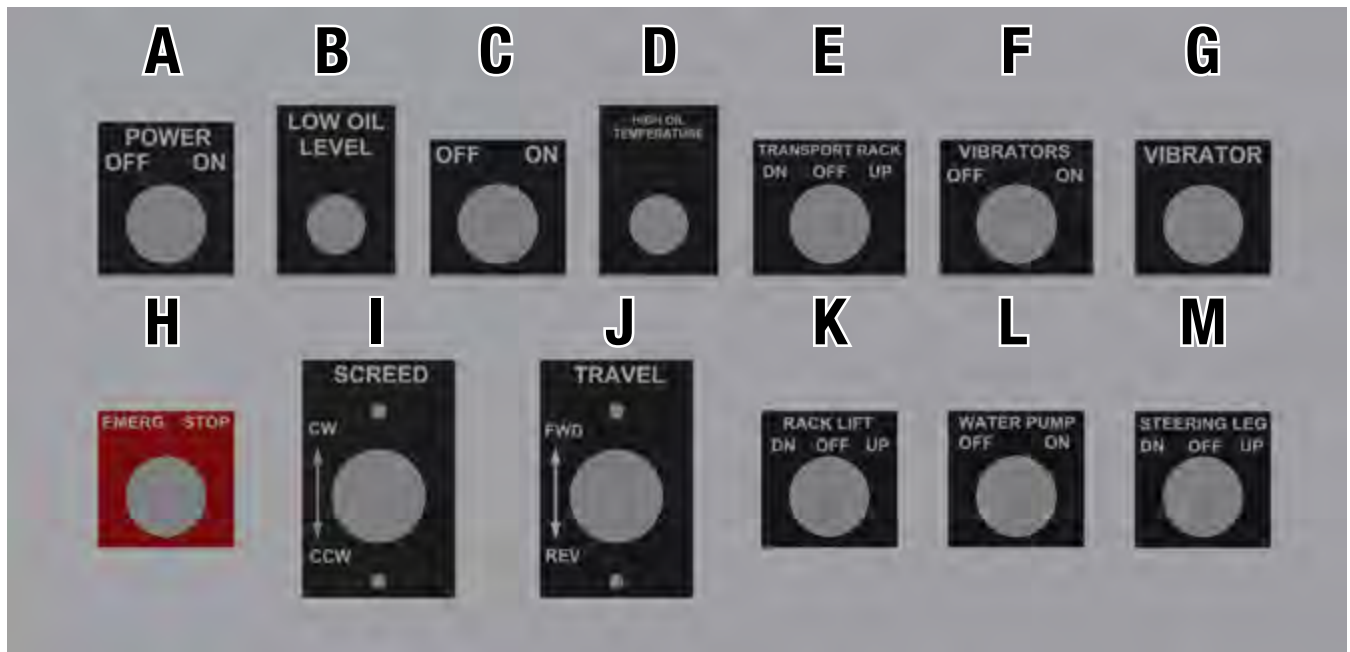
Before operation each day ensure the following:

- All guards, side screens and panels are in place.
- All safety and information signs are in place and legible.
- Engine and hydraulic oil levels are correct.
- Check battery level
- Check for hydraulic leaks.
- Check all operating controls for proper operation and adjustment.
- Check speed control operation before and after starting engine for proper operation.

Note: If there is any indication that faulty equipment exists, shutdown safely, inform the proper authority and **DO NOT** operate the riding trowel until the problem has been fixed.

- Remove loose objects that could interfere with operation.





SECTION 2 OPERATIONS

Operating Instructions

Refer to images on **Page 53** for controls.

Step 1) Pull up on both the **Emergency Stop Switch (H and P)** on the engine control panel and the operator control panel.

- Power light (A) is on
- Low hydraulic oil light (B) is off
- High Temperature (D) light is off

Step 2) Start Engine - REFER TO ENGINE MANUAL FOR MORE DETAILS

- Turn engine keyswitch (N) to **“RUN”**
- Start Engine and bring to full RPM with switch (O) (2700 RPM)

Step 3) Lift Transportation Rack **“UP”** (E) to “Operating Height” (All the way up)

NOTICE

NEVER LOWER TRANSPORTATION RACK CYLINDERS WITH THE VIBRATORS INSTALLED. THEY MUST BE REMOVED TO PREVENT THE VIBRATORS FROM BEING DESTROYED DUE TO IMPACT WITH THE GROUND.

Step 4) Turn Vibrators **“ON”** (F)

- Adjust speed with the Vibrator Adjustment knob (G).

NOTICE

NEVER OPERATE THE VIBRATORS WITHOUT THE PRESENCE OF CONCRETE. “DRY-RUNNING” THEM WILL CAUSE PREMATURE FAILURE.

Step 5) Lower the Vibrator Rack (K) into the concrete. (**NOTE:** Be aware of rebar and lift up to clear when moving forward)

Step 6) Turn the Screed Tube Control (I) on into the **“CW”** direction

Step 7) To begin paving, utilize the Travel Control (J) to slowly move forward while striking off the concrete.

Step 8) Turn spray pump on to mist the screed tube as needed (L)

Step 9) To turn the paver, utilize the steering leg (M) (**NOTE:** Be aware of surroundings and crush hazards)

Machine Cleaning Procedure

When cleaning the machine, please adhere to the following information to ensure proper cleaning and to keep the machine in the best condition possible.

Power Washing Procedure:

NOTICE

- Ensure that the water pressure is below 2000 PSI (14 MPa)
- Always keep the water temperature below 180°F (80°C)
- Use a spray nozzle with at minimum 40° wide spray angle
- Keep the nozzle at least 1 foot (300mm) away from the machine
- Avoid spraying water on the engine and electronic components. Examples include electronic displays, lights, switches, wiring, etc. The electronic components may be damaged if water is sprayed on them.
- Keep a perpendicular angle (90°) when cleaning over a decal.
 - Holding nozzle of a pressure washer at an angle different from 90° may lift the decal from the machine.
- Recommended using a safe cement dissolver, **BACK-SET** or similar, to remove hardened concrete.
- It is **NOT** recommended to use chemicals such as:
 - Muriatic Acid
 - Hydrochloric Acid
 - Hydrofluoric Acid
 - Sulfuric Acid
 - Phosphoric Acid
- To prevent build-up of concrete on the machine, use **BODY GUARD** or similar protection wax.

Filter Cleaning Procedure:

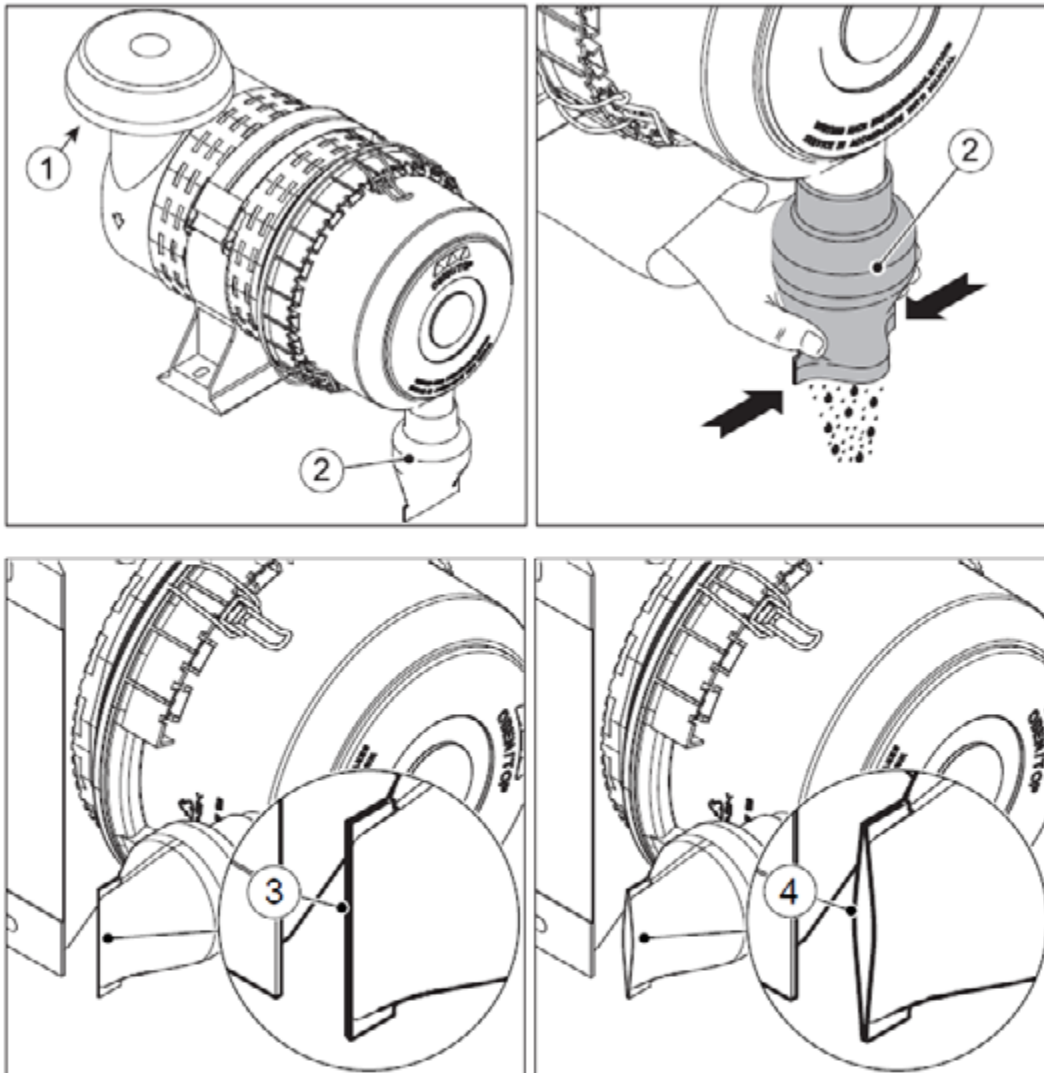
- Remove air filters and blow out with compressed air, **NOT** to exceed 80 PSI.

SECTION 3 SERVICE

Engine Maintenance Schedule

Symbol	Maintenance interval	Maintenance activity/check
8-15h	Every 8–15 operating hours or every day before starting	Check the oil level.
		Check the intake area of the combustion air.
		Check the radiator fins for dirt accumulation.
		Check the cooling system
500h	Every 500 operating hours or every 2 years	Change the engine oil and oil filter ^{*)}
		Change the fuel prefilter ^{*)}
		Replace the main fuel filter ^{*)}
		Check the poly v belt ^{*)}
		Change the oil separator of the crankcase ventilation ^{*)}
		Check the screw connections ^{*)}
	Every 500 operating hours or when indicated, at least every 2 years	Clean the engine ^{*)}
	When indicated, at least every 2 years	Change the air filter cartridge
	Every 4 years	Drain the water separator ^{*)}
	Every 4 years	Change the coolant
	If necessary, but every 3,000 operating hours at the latest	Replace the poly v belts
	Every 4,000 operating hours	Clean the entire exhaust gas recirculation section (EGR pre- cooler, EGR valve, EGR main cooler as well as EGR mixing nozzle) (to be carried out by a trained specialist)

- Maintenance tasks may only be performed by trained personnel.
- Accident prevention measures must be in accordance with the local accident prevention regulations.
- Perform setting and maintenance work at the specified intervals.
- Replace faulty machine parts as soon as possible.
- Always wear personal protection equipment.
- Only use fully functional tools.
- Installation of unsuitable spare parts can lead to problems. We cannot accept responsibility for direct damage or secondary damage that results from this. We therefore recommend the use of Hatz original spare parts.
- Closely adhere to the maintenance conditions prescribed in this manual.
- Only make changes to the machine in agreement with the manufacturer.
- Only perform maintenance work when the engine is stopped.
- Protect the starting key from unauthorized access.
- Disconnect the negative battery terminal before carrying out maintenance work.
- Adhere to legal regulations when handling and disposing of used oil, filters, coolants, and cleaning agents.
- After completing maintenance work, check that all tools, bolts, aids, and other objects are removed from the machine, and that all safety equipment has been replaced.



1	Intake opening for combustion air
2	Dust discharge valve
3	Rubber lips OK
4	Rubber lips deformed

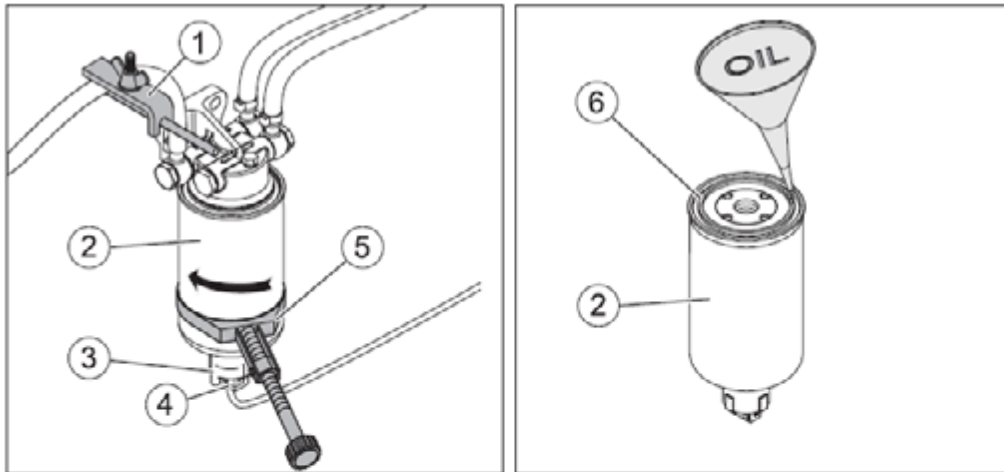
Step Activity

1. Check the intake opening (1) for coarse contamination such as leaves, heavy dust deposits, etc., and clean if necessary.
2. Check that the dust discharge valve (2) is clear. Remove dust seals by pressing them together.
3. Make sure that the rubber lips (3) run parallel to each other. The gap between the rubber lips must be a maximum of 2 mm. Deformed rubber lips (4) impair the function of the precleaner, thus shortening the maintenance interval of the air filter. Replace the dust discharge valve if required.

SECTION 3 SERVICE

TRTP Maintenance Schedule

CHECK LIST					
ITEM	DAILY	EVERY 20 HRS	EVERY 50 HRS	EVERY 100 HRS	EVERY 300 HRS
Hydraulic Oil Level	✓				
Fuel Level	✓				
Hoses and Fittings	✓				
External Hardware	✓				
Change Engine Oil				✓	
Grease Bearings		✓			
Replace Fuel Filter					✓
Replace Oil Filter				✓	
Check Valve Clearance			✓		
Air Filter	✓				
Hydraulic Motors			✓		
Steering Leg			✓		
Hydraulic Filters	✓				



1	Hose clip on fuel feed line
2	Fuel prefilter
3	Drain plug with integrated water level sensor
4	Water level sensor cable
5	Strap wrench
6	Gasket

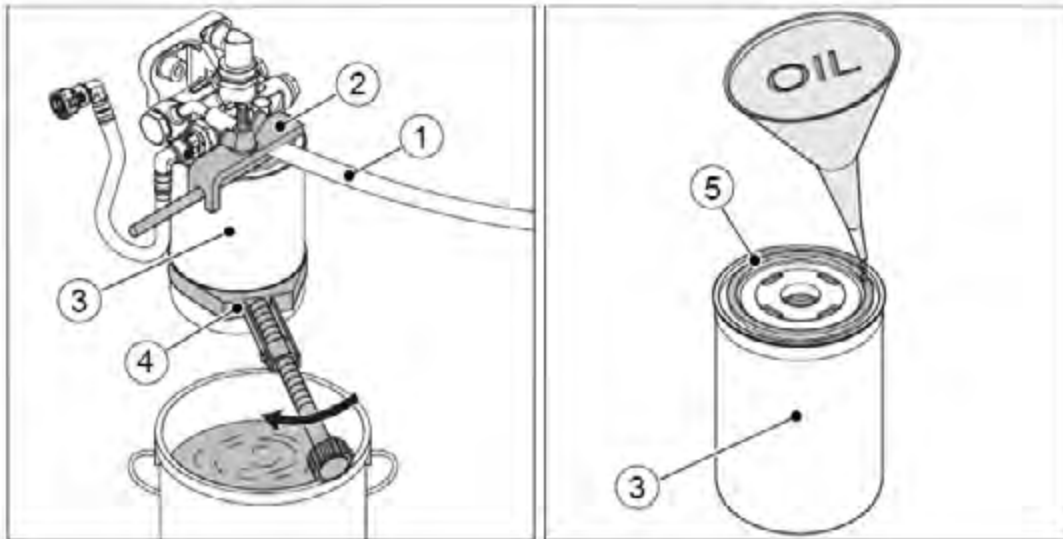
Step Activity

1. Lock the fuel supply line on the fuel prefilter.
2. Place a suitable container under the filter to collect emerging fuel.
3. Disconnect the water level sensor cable (4) from the drain plug (3).
4. Release the drain screw (3) and drain the fuel.
5. Unscrew the fuel prefilter. Completely unscrew the drain plug with integrated water level sensor
6. Dispose of the used fuel prefilter according to local environmental regulations.
7. Clean the drain plug with integrated water level sensor and lightly oil the sealing surfaces. Screw the drain plug into the new fuel prefilter.
8. Lightly oil the gasket (6) of the new fuel prefilter, fit the dry filter and tighten it by hand.
9. Release the fuel feed line and connect the cable of the water level sensor.
10. Start the engine and perform a test run.
11. After the test run, check the fuel prefilter and drain plug for leaks, tighten by hand if necessary.

PRE-FUEL FILTER PART NUMBER: 065851

SECTION 3 SERVICE

Filter Replacement (Cont'd) Fuel Filter

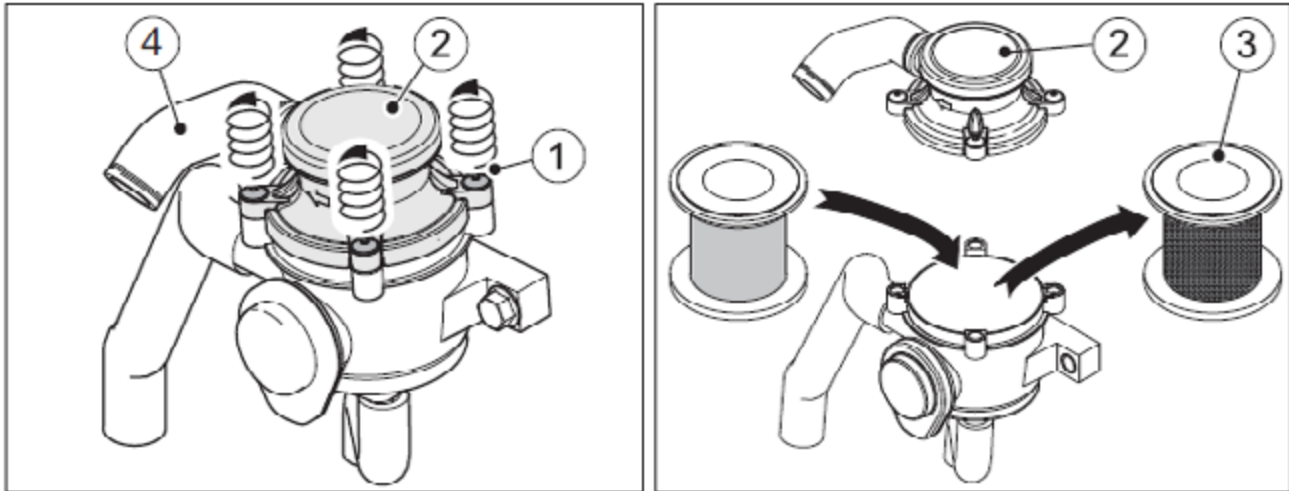


1	Fuel feed line
2	Hose clip
3	Main fuel filter
4	Strap wrench
5	Gasket

Step Activity

1. Block the fuel feed line (1) using the hose clip (2).
2. Place a suitable container under the filter to collect emerging fuel.
3. Unscrew the main fuel filter (3) and dispose of it according to local environmental regulations.
4. Lightly oil the gasket (5) of the new main fuel filter.
5. Fit the filter and tighten it by hand.
6. Release the fuel feed line.
7. Start the engine and perform a test run.
8. After the test run, check the main fuel filter for leaks and tighten by hand if necessary.

FUEL FILTER PART NUMBER: 065852

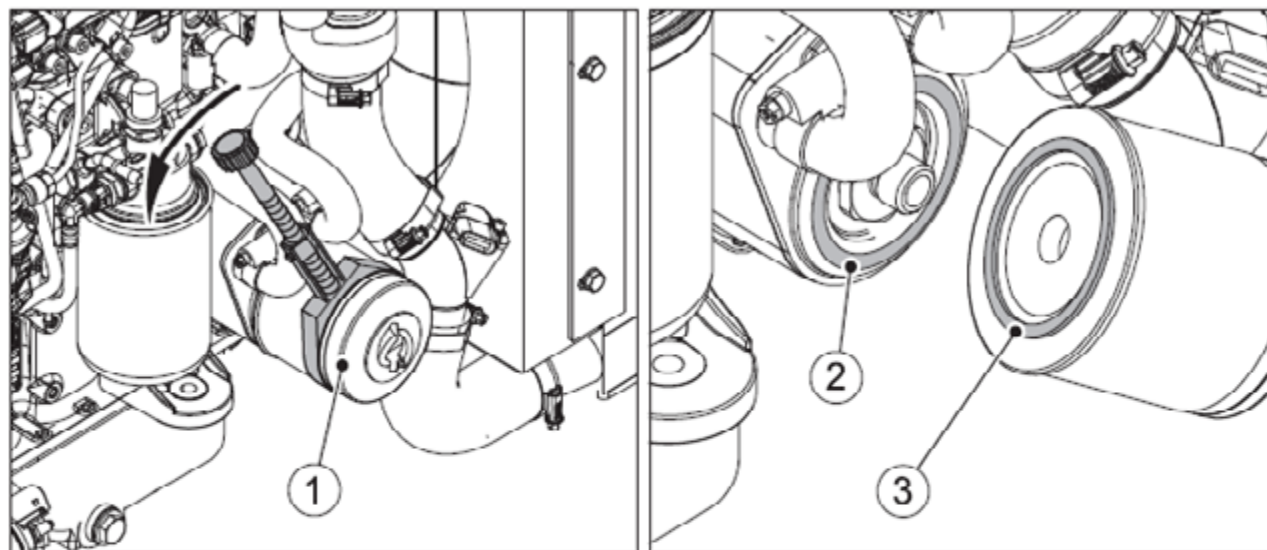


1	Mounting bolts (captive)
2	Breather cap
3	Oil separator cartridge
4	Vent hose

Step Activity

1. Release the four mounting bolts (1) on the breather cap (2).
2. Carefully lift the breather cap. If necessary, release the vent hose (4).
3. Remove the used oil separator cartridge and dispose of it according to local environmental regulations.
4. Wipe out the breather housing with a clean cleaning cloth. Make sure that dirt is not brought into the breather housing.
5. Insert a new oil separator cartridge.
6. Put on the breather cap and tighten the four mounting bolts (max. 4 Nm). If necessary, reattach the vent hose.

OIL SEPARATOR PART NUMBER: 065853

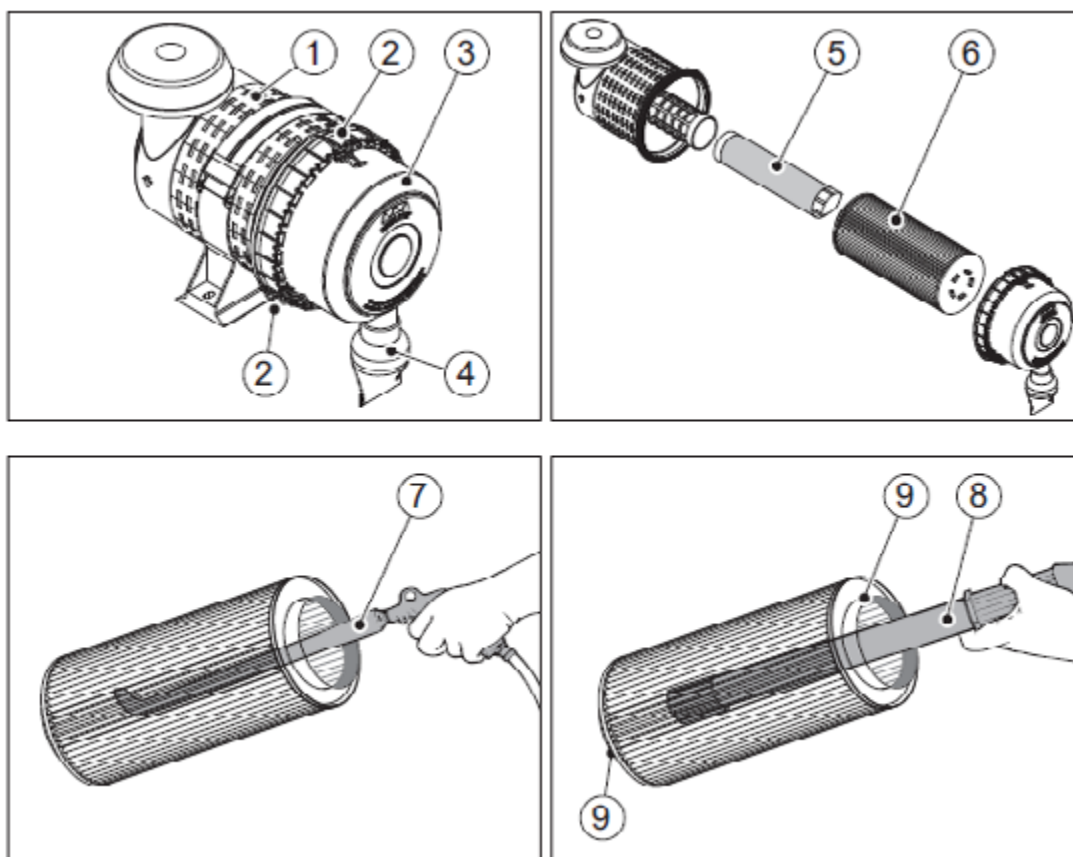


1	Oil filter
2	Sealing surface
3	Gasket

Step Activity

1. Keep a container ready for collecting the used oil.
2. Loosen the oil filter (1) with a strap wrench or similar and unscrew it.
3. Dispose of the old filter in accordance with local environmental regulations.
4. Thoroughly clean the sealing surface (2).
5. Lightly oil the sealing lip (3) of the new oil filter.
6. Screw in the oil filter and tighten it by hand.

OIL FILTER PART NUMBER: 065854



- | | |
|---|--|
| 1 | Air filter housing |
| 2 | Retaining clips |
| 3 | Air filter cover |
| 4 | Dust discharge valve |
| 5 | Secondary filter |
| 6 | Primary filter |
| 7 | Air gun with extension tube (tip bent) |
| 8 | Lamp |
| 9 | Sealing surfaces |

Replacing the primary/secondary filters**Step Activity**

1. Open the retaining clips (2) and remove the air filter cover (3).
2. Pull out the primary filter (6) and either replace (recommended) or clean (see below). Replace or clean the primary filter according to the service interval indicator. The primary filter must be replaced every two years at the latest however, cleaning is no longer possible after this time.
3. Remove dirt adhering to the inside of the air filter housing (1), air filter cover (3), and dust discharge valve (4).
4. Pull out and check the secondary filter (5), replace if required. The secondary filter can not be cleaned. The secondary filter must be replaced after every fifth replacement of the primary filter, though no later than every two years.
5. Carefully insert new filter elements.
6. Place the air filter cover on the air filter housing and lock all retaining clips making sure that the dust discharge valve points vertically downwards.

Cleaning the primary filter**Step Activity**

1. Blow out the primary filter (6) with dry compressed air from the inside to the outside until dust no longer emerges. Use an air gun with an extension tube (7) with the end bent by approx. 90°. The end of the extension tube must not touch the filter paper.
2. Check the sealing surfaces (9) of the filter cartridge for damage.
3. Check the filter cartridge for tears or other damage in the filter paper by holding it against the light at a slant or shining light from a lamp (8) through it. In case of doubt, always replace the primary filter.

NOTE: The primary filter may only be cleaned once, then it must be replaced.

SECONDARY AIR FILTER PART NUMBER: 065855

PRIMARY AIR FILTER PART NUMBER: 065856

TMF-50-5 PART NUMBER: 057661

TMF-25-5 PART NUMBER: 049357

SECTION 3 SERVICE

Troubleshooting

Area	Malfunction	Possible Cause	Corrective Measure	Ref.
Engine	Engine does not start, or is difficult to start	Battery is discharged	- Add battery fluid - Charge the battery - Replace the battery	
		Battery cable is disconnected	- Connect battery cable	
		Blown fuse	- Replace fuse	
		Bad connection or breakage in the wiring	- Contact your AEC dealer	
		Out of fuel	- Fill fuel	
		Air is in fuel	- Contact your AEC dealer	
		Engine fouled	- Wait a while and try starting again	
		Insufficient or wrong oil	- Fill or change oil	
		Dirty or damaged spark plug	- Clean or replace spark plug	
		Contamination in fuel system	- Contact your AEC dealer	
		Other (other than above)	- Contact your AEC dealer	
	Engine stalls	Out of fuel	- Fill fuel	
		Cold engine	- Warm up the engine	
		Other (other than above)	- Contact your AEC dealer	
	Engine stops abruptly	Out of fuel	- Fill fuel	
		Piston seizure due to insufficient or bad oil	- Contact your AEC dealer	
		Other (other than above)	- Contact your AEC dealer	
	Engine does not stop	Electrical malfunction	- Contact your AEC dealer	
		Other (other than above)	- Contact your AEC dealer	
	Idling is not stable	Insufficient intake air (clogged air cleaner)	- Clean or replace the air cleaner	
		Other (other than above)	- Contact your AEC dealer	
	Poor power or acceleration	Bad fuel	- Change fuel	
		Wrong oil (improper viscosity)	- Change to suitable oil	
		Accelerator (throttle) is not properly adjusted	- Contact your AEC dealer	
		Insufficient intake air (clogged air cleaner)	- Clean or replace the air cleaner	
		Excessive load	- Reduce load	
		Loose drive belt	- Adjust	
		Other (other than above)	- Contact your AEC dealer	
	Irregular noise or vibration from or around the engine		- Contact your AEC dealer	
	Excessive oil consumption		- Contact your AEC dealer	
	Engine overheats	Insufficient amount of engine oil	- Fill oil	
		Cooling fan is clogged or blocked	- Clean	
		Other (other than above)	- Contact your AEC dealer	
	Excessive fuel consumption	Clogged air cleaner	- Clean or replace air cleaner	
		Other (other than above)	- Contact your AEC dealer	

Area	Malfunction	Possible Cause	Corrective Measure	Ref.
Engine	Black smoke comes out of exhaust	Bad fuel	- Change fuel	
		Clogged air cleaner	- Clean or replace the air cleaner	
		Choke is not fully open	- Open the choke fully	
		Other (other than above)	- Contact your AEC dealer	
	White or blue smoke comes out of exhaust	Engine oil level is too high	- Adjust the oil level	
		Other (other than above)	- Contact your AEC dealer	
Safety Devices	Lamp does not light	Blown bulb	- Replace	
		Blown fuse	- Replace	
		Other (other than above)	- Contact your AEC dealer	
Hydraulic System	Pump does not work	Insufficient or deteriorated hydraulic fluid	- Add or change fluid	
		Other (other than above)	- Contact your AEC dealer	

SECTION 3 SERVICE

Fault Codes

SPN Code	FMI Code	Fault Check Description	Fault Detection Condition	Possible Causes
29	3	Signal Range Check High for APP2	If the signal exceeds the applicable threshold APP_uRaw2SRCHigh_C (2388mV) a signal range violation is detected after the debouncing.	Wiring Harness or Component
	4		If the signal is below the applicable threshold APP_uRaw2SRCLow_C (280mV) a signal range violation is detected after debouncing.	
91	3	Signal Range Check High for APP1	If the signal exceeds the applicable threshold APP_uRaw1SRCHigh_C (4775mV) a signal range violation is detected after debouncing.	
	4		If the signal is below the applicable threshold APP_uRaw1SRCLow_C (740mV) a signal range violation is detected after the debouncing.	
	11	In case of dual analog accelerator pedal, it is the plausibility check between APP1 and APP2 and in case of potentiometer switch accelerator pedal, it is the plausibility check between APP1 and idle switch	If the permitted maximum for the difference of both the input signals APP_uDiffMax_mp is exceeded this is reported in the DFC_st.DFC_Syn-cAPP via the DSM.	
95	3	SRC High for Environment Pressure	The sensor raw value is lesser than or equal to FI_SRCFuelP.uMax_C	
	4	SRC low for Environment Pressure	The sensor raw value is lesser than or equal to FI_SRCFuelP.uMin_C	
	17	Low fuel pressure error monitoring	Engine speed Epm_nEng greater or equal to FI_nStrtMonFuelP_C, and Fuel pressure value FI_pFuelP is lesser than the curve output FI_pFuel-Spd_CUR	fuel tank empty, fuel filter blocked, wiring harness or pre supply pump itself defective
97	15	Water in Fuel Detected		Water in Fuel Detected
	17	Fuel Level Un-plausible		
100	0	Maximum Oil Pressure Error in Plausibility Check	The oil temperature Oil_tSwmp is equal to or greater than the limit Oil_tLimP_C and the oil pressure Oil_pSwmp is greater than the threshold Oil_pMaxP_mp.	Wiring Harness or Component
	1	Minimum Oil Pressure Error in Plausibility Check	The oil pressure Oil_pSwmp is less than the threshold Oil_pMinP_mp.	
	3	Oil_uRawPSwmp < Oil_SRCPSwmp.uMax_C (4772mV)	Oil_uRawPSwmp > Oil_SRCPSwmp.uMax_C (4772mV)	
	4	Oil_uRawPSwmp < Oil_SRCPSwmp.uMin_C (234mV)	Oil_uRawPSwmp < Oil_SRCPSwmp.uMin_C (234mV)	
102	0	Physical Range Check high for air pressure at the upstream of intake valve sensor	If the signal Air_pSensPlntkVUs is greater than Air_PhysRngPlntkVUs.Max_C for a duration DDRC_DurDeb.Air_tiPhysRngHiPlntkVUsDebDef_C, then a physical range check high error is reported.	Over boost condition, Possible Blocked Waste Gate
	1	Physical Range Check low for air pressure at the upstream of intake valve sensor	If the signal Air_pSensPlntkVUs is less than Air_PhysRngPlntkVUs.Min_C for a duration DDRC_DurDeb.Air_tiPhysRngLoPlntkVUsDebDef_C, then a physical range check low error is reported.	Under Boost, Possible Turbo-Charger Defective
	3	Diagnostic fault check for SRC high in air pressure upstream of intake valve sensor	The sensor raw signal Air_uRawPlntkVUs (voltage) is above Air_SRCPlntkVUs.uMax_C	Wiring Harness or Component
	4	Diagnostic fault check for SRC low in air pressure upstream of intake valve sensor	The sensor raw signal Air_uRawPlntkVUs (voltage) is below Air_SRCPlntkVUs.uMin_C	

Fault Codes

SECTION 3 SERVICE

SPN Code	FMI Code	Fault Check Description	Fault Detection Condition	Possible Causes
105	0	Physical Range Check high for Charged Air cooler down stream temperature		Physical Range Check high for Charged Air cooler down stream temperature
	1	Physical Range Check low for Charged Air cooler down stream temperature		
	3	The sensor raw signal Air_uRawTCACDs (voltage) is above Air_SRCTCACDs.uMax_C (4803mV).	The sensor raw signal Air_uRawTCACDs (voltage) is above Air_SRCTCACDs.uMax_C (4803mV).	wiring harness or component
	4	The sensor raw signal Air_uRawTCACDs (voltage) is above Air_SRCTCACDs.uMax_C (318mV).	The sensor raw signal Air_uRawTCACDs (voltage) is above Air_SRCTCACDs.uMax_C (318mV).	
107	3	SRC High for Controller Mode Switch		Wiring Harness or Component
	4	SRC Low for Controller Mode Switch		Wiring Harness or Component
	14	Error Path for Clog Detection in Air Filter		Air Filter Clogged / Sensor Value Okay?
108	0	Ambient Air Pressure Sensor Range Check Max-Error		Wiring Harness or Component
	1	Ambient Air Pressure Sensor Range Check Min-Error		
	3	Fault Check Max Signal Range Violated for Ambient Air Pressure Sensor		
	4	Fault Check Min Signal Range Violated for Ambient Air Pressure Sensor		
110	0	Physical Range Check High for CEngDsT	The sensed sensor signal CEngDsT_tSens is greater than CEngDsT_PhysRng.Max_C	Wiring Harness or Component
	1	Physical Range Check Low for CEngDsT	The sensed sensor signal CEngDsT_tSens is less than CEngDsT_PhysRng.Min_C	
	3	The Sensor Raw Signal: CEngDsT_uRaw (Voltage) is Above CEngDsT_SRC.uMax_C (4957mV)	The sensor raw signal CEngDsT_uRaw (voltage) is above CEngDsT_SRC.uMax_C.	
	4	The Sensor Raw Signal: CEngDsT_uRaw (Voltage) is Below CEngDsT_SRC.uMin_C (359mV)	The sensed raw voltage value CEngDsT_uRaw is less than CEngDsT_SRC.uMin_C.	
	15	Engine Coolant Temp Too High Plausibility Error	An "ERROR" is reported if the engine coolant temperature CEngDsT_t is greater than an threshold CEngDsT_tMaxT_C.	Less Cooling Water, Water Pump Defective, Water Cooler Blocked
	17	Defect Fault Check for Absolute Plausibility Test	coolant temperature did not reach the threshold temperature	Sensor Value Problem
	18	Defect Fault Check for Dynamic Plausibility Test	rise in coolant is not reached the minimum rise of coolant temperature	
111	17	Low Coolant Level Error	If the Coolant Level is Low, i.e. if the message CIntLv_st is set.	Low Coolant Level; Coolant Level Sensor Defective; Wiring Harness Defective

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Fault Codes

SPN Code	FMI Code	Fault Check Description	Fault Detection Condition	Possible Causes
157	3	Sensor Voltage Above Upper Limit	If the raw sensor voltage RailP_uRaw exceeds the limiting value RailP_SRC.uMax_C (4662,30mV) a fault will be detected. If the uncorrected raw sensor voltage RailP_uRawNoCor_mp exceeds the limiting value RailP_AdcMaxVal_C (4900mV) a fault will be detected.	Wiring Harness or Component
	4	Sensor Voltage Below Lower Limit	If the raw sensor voltage RailP_uRaw falls below the limiting value RailP_SRC.uMin_C (250mV) a fault will be detected.	
168	0	Physical Range Check High For Fuel Temperature	The sensor raw signal BattU_uRaw (voltage) is above BattU_uHiBatt_C.	High Engine Load with Low Fuel Level and High Ambient Temperature
	1	Physical Range Check Low For Fuel Temperature	The sensor raw signal BattU_uRaw (voltage) is below BattU_uLoBatt_C.	Very Cold Ambient Temperature
	3	SRC High for Fuel Temperature Sensor	The sensor raw signal BattU_uRaw (voltage) is above BattU_uSRCMa_C.	Wiring Harness or Component
	4	SRC Low for Fuel Temperature Sensor	The sensor raw signal BattU_uRaw (voltage) is below BattU_uSRCMin_C.	
174	0	Physical Range Check High for Fuel Temperature	The sensed sensor signal FuelT_tSens is greater than FuelT_PhysRng.Max_C	High Engine Load with Low Fuel Level and High Ambient Temperature
	1	Physical Range Check Low for Fuel Temperature	The sensed sensor signal FuelT_tSens is less than FuelT_PhysRng.Min_C	Very Cold Ambient Temperature
	3	SRC High for Fuel Temperature Sensor	The sensor raw signal voltage FuelT_uRaw is above FuelT_SRC.uMax_C (4933mV).	Wiring Harness or Component
	4	SRC Low for Fuel Temperature Sensor	The sensor raw signal FuelT_uRaw (voltage) is below FuelT_SRC.uMin_C (310mV).	
175	0	Physical Range Check High for Oil Temperature	If the signal Oil_tSensSwmp is greater than Oil_PhysRngT.Max_C for a duration DDRC_DurDeb.OilT_tiPhysRngHiTDebDef_C , then a physical range check high error is reported	Too high load on engine; Sensor mis-adjusted or wiring harness
	1	Physical Range Check Low Oil Temperature	If the signal Oil_tSensSwmp is smaller than Oil_PhysRngT.Min_C for a duration DDRC_DurDeb.OilT_tiPhysRngLoTDebDef_C , then a physical range check low error is reported	Sensor Mis-adjusted or Wiring Harness
	3	SRC High for Oil Temperature	The sensor raw signal Oil_uRawTSwmp (voltage) is above Oil_SRCT.uMax_C (5200.4mV)	Wiring Harness or Component
	4	SRC Low for Oil Temperature	The sensor raw signal Oil_uRawTSwmp (voltage) is below Oil_SRCT.uMin_C (0mV)	
	15	Oil Temperature too High Plausibility Error	The Oil temperature Oil_tSwmp is greater than the threshold Oil_tMax-T_C .	oil extremely hot, maybe misuse of engine (tuning) wiring harness or component

SPN Code	FMI Code	Fault Check Description	Fault Detection Condition	Possible Causes
190	2	DFC for camshaft offset angle exceeded	DFC for camshaft offset angle exceeded	Wiring Harness or Camshaft Sensor Defect or Wrong Mounting Position or Tone Wheel Mis-adjusted
	8	In between of several camshaft revolutions there are too many or too less camshaft edges present or the distance or the series of the camshaft edges is unplausible. The defect debounce counter EpmCaS_ctErrSigDef is incremented at each implausible camshaft revolution, reaches the counter the threshold EpmCaS_numErrSigDef_C the error is set. If the monitoring range is left, the debounce counter is reseted.	In between of several camshaft revolutions there are too many or too less camshaft edges present or the distance or the series of the camshaft edges is unplausible. The defect debounce counter EpmCaS_ctErrSigDef is incremented at each implausible camshaft revolution, reaches the counter the threshold EpmCaS_numErrSigDef_C the error is set. If the monitoring range is left, the debounce counter is reseted.	Tone Wheel Defective
	12	In between of several crankshaft revolutions there is not any camshaft edge present. The defect debounce counter EpmCaS_ctNoSig reaches the threshold EpmCaS_numNoSigDef_C. If the monitoring range is left, the debounce counter is reseted.	In between of several crankshaft revolutions there is not any camshaft edge present. The defect debounce counter EpmCaS_ctNoSig reaches the threshold EpmCaS_numNoSigDef_C. If the monitoring range is left, the debounce counter is reseted.	Wiring Harness or Component
652	3	General Short Circuit	Short Circuit of an Injector	Wiring Harness or Injector Cylinder
	3			
653	5	Open Load	Open Load Error of an Injector (Interruption of an electric connection)	Wiring Harness or Injector Load Drop Cylinder
654	3	General Short Circuit	Short Circuit of an Injector	Wiring Harness or Injector Cylinder
	5	Open Load	Open Load Error of an Injector (interruption of an electric connection)	Wiring Harness or Injector Load Drop Cylinder
677	3	Short Circuit to Battery Error		Wiring Harness or Component
	4	Short Circuit to Ground Error		
	5	No Load Error		
	6	Over Temperature Error on ECU Power-stage for Starter		Over Temperature Error on ECU Power-stage for Starter
976	2	Diagnostic fault check non plausibility of COM message	The sensed raw value PTOSwt_uSens is less than the minimum threshold MoFPTO_uThresCalMsgA[n] or PTOSwt_uSens is more than the maximum threshold MoFPTO_uThresCalMsgA[n+1] (wherein n=0,2,4,6), whenever MoFPTO_swtSigSelCalMsg is equal to 0.	Wiring Harness or Component
	3	Diagnostic fault check for max error of COM message	The sensed raw value PTOSwt_uRaw is more than PTOSwt_SRC.uMax_C when MoFPTO_swtSigSelCalMsg is equal to 0.	
	4	Diagnostic fault check for min error of COM message	The sensed raw value PTOSwt_uRaw is less than PTOSwt_SRC.uMin_C when MoFPTO_swtSigSelCalMsg is equal to 0.	

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Fault Codes

SPN Code	FMI Code	Fault Check Description	Fault Detection Condition	Possible Causes
1076	5	Open Load of Metering Unit Input	Detecting on Open Load Fault in the Metering Unit	Wiring Harness or Component
	12	Over Temperature of Device Driver of metering Unit	Detection of a Metering Unit Power Stage Over-temperature	Output Stage of ECU Defect or Wiring Harness
	15	Short Circuit to Battery in the High Side of the MeUn		Wiring Harness or Component
	16	Short Circuit to Battery of Metering Unit Output	Detecting a Short Circuit Low Side to Battery Voltage in the Metering Unit	
	17	Short Circuit to Ground in the High Side of the MeUn		
	18	Short Circuit to Ground of Metering Unit Output	Detecting a Short Circuit Low Side to Ground in the Metering Unit	
1108	15	Diagnostic Fault Check to Report the Error Due to Cooling Injection in Over Run	Error in the plausibility of Current Energizing Time when Over Heat Protection Injection Active with maximum Permitted Energizing Time	ECU Internal Fault
	16	Diagnostic Fault Check to Report the Error Due to Over Run	The current energizing time is greater than the maximum permitted energizing time after overrun demand by the driver.	ECU Internal Fault
1109	11	Injection Cut Off Demand (ICO) for Shut Off Coordinator	The un-debounced defect detection takes place in the standard ICO mode (EnglICO_stMode_C=0) with an ICO (Mo_stlCOMsg) requested and an engine speed Epm_nEng greater than EnglICO_nCtOffStdICO_C (1700rpm). The un-debounced defective detection takes place in the comfortable ICO mode (EnglICO_stMode_C = 1) with requested ICO (Mo_stlCOMsg) and an engine speed Epm_nEng greater than EnglICO_nCtOffCmftlCOHard_C (1700rpm).	ECU Internal Defect
1136	3	SRC high for ECU temperature sensor	The Sensed raw voltage value TECU_uRaw_[%] is greater than TECU_SRC%.uMax_C	ECU Internal Fault
	4	SRC low for ECU temperature sensor	The Sensed raw voltage value TECU_uRaw_[%] is less than TECU_SRC%.uMin_C	
1244	3	Signal range check low error of pressure control valve AD-channel		Wiring Harness or Component
	4	signal range check high error of pressure control valve AD-channel		
	5	open load of pressure control valve output		
	11	Over speed detection in component engine protection		
	12	Over temperature of device driver of pressure control valve		
	15	Short circuit to battery in the high side of the pressure control valve		
	16	Short circuit to battery of pressure control valve output		
	17	Short circuit to ground in the high side of the pressure control valve		
	18	Short circuit to ground of the pressure control valve output		

Fault Codes

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SPN Code	FMI Code	Fault Check Description	Fault Detection Condition	Possible Causes
1769	11	Over-speed Detection in Component Engine Protection	Exceeding of the Engine-Speed Threshold EngPrt_nOvrSpd_C	Over-speed Caused By Driver
2791	13	DFC for Valve Position Sensor Voltage SRC High		
	14	DFC for Valve Position Sensor Voltage SRC Low		
	16	Permanent Governor Deviation for Valve	The negative limit for the governor deviation EGRVlv_GovDvtMonCal.rDvtMin_C has been exceeded and the governor deviation has been persistent longer than the applicable time from EGRVlv_tiDebGovDvt-Def_CUR. - The control valve has not been detected as jammed. - The position governor is active. - The control valve is not set to a mechanical stop. - No system error is reported, i.e. the bit DINH_stFld.Fld_EGRVlvGovOn.5 is set.	ECR Valve Dirty or Defective
	18	Permanent Governor Deviation for Value	The negative limit for the governor deviation EGRVlv_GovDvtMonCal.rDvtMin_C has been exceeded and the governor deviation has been persistent longer than the applicable time from EGRVlv_tiDebGovDvt-Def_CUR. - The control valve has not been detected as jammed. - The position governor is active. - The control valve is not set to a mechanical stop. - No system error is reported, i.e. the bit DINH_stFld.Fld_EGRVlvGovOn.5 is set.	EGR Valve Dirty or Defective
	20	DFC for Valve Position Sensor Physical SRC High	$EGRVlv_SensCal.uRawMaxOpn_C / EGRVlv_SensCal.uRawMaxClsd_C < EGRVlv_uRaw < EGRVlv_SensCal.uMax_C$	EGRVlv Mis-sadjusted or Dirty
	21	DFC for Valve Position Sensor Physical SRC Low	$EGRVlv_SensCal.uRawMinClsd_C / EGRVlv_SensCal.uRawMinOpn_C > EGRVlv_uRaw > EGRVlv_SensCal.uMin_C$	
2802	11	EEP Read Error Based on the Error for more Blocks	If Selector Erase (Only Flash) Cannot be performed or successfully completed an error will be registered	ECM Fault
3509	2	Error Sensor Supplies 1	The sensor supply voltage is monitored by an HW comparator. If the sensor supply voltage lies outside of the switching thresholds a fault is output. The detection thresholds are defined by the hardware and cannot be calibrated.	1.) Wiring harness 2.) Component defect 3.) ECU internal defect
3510	2	Error Sensor Supplies 2	The sensor supply voltage is monitored by an HW comparator. If the sensor supply voltage lies outside of the switching thresholds a fault is output. The detection thresholds are defined by the hardware and cannot be calibrated.	1.) Wiring harness 2.) Component defect 3.) ECU internal defect
3511	2	Error Sensor Supplies 3	The sensor supply voltage is monitored by an HW comparator. If the sensor supply voltage lies outside of the switching thresholds a fault is output. The detection thresholds are defined by the hardware and cannot be calibrated.	1.) Wiring harness 2.) Component defect 3.) ECU internal defect
3597	3	Short Circuit to Battery Error at Actuator Relay		ECU Internal Fault
	4			
3598	3			
	4			

SECTION 3 SERVICE

Fault Codes

SPN Code	FMI Code	Fault Check Description	Fault Detection Condition	Possible Causes
5324	11	Array of DFC's for Failure in i+1 th Glow Plug		Glowing Problems
5325	4	Array of DFC's for Short Circuit in i+1 th Glow Plug		
	11	Array of DFC's for Failure in i+1 th Glow Plug		
5326	4	Array of DFC's for Short Circuit in i+1 th Glow Plug		
	11	Array of DFC's for Failure in i+1 th Glow Plug		
5327	4	Array of DFC's for Short Circuit in i+1 th Glow Plug		
	11	Array of DFC's for Failure in i+1 th Glow Plug		
20201	19	SPI/COM-Errors of the Cy320	When Any Peripheral Monitoring Function Reports an Error	ECU Internal Fault
20220	2	Diagnostic Fault Check to Report the NTP Error in ADC Monitoring	Error in the check with the No-Load Test Pulse Operation.	
	11	Diagnostic Fault Check to Report the ADC Test Error	Implausible ADC test errors It is checked whether MoCADC_ctDebTst >= MoCADC_ctDebTst_C (15 Events). If yes the error is set. The diagnosis is carried out in the 40-ms interval.	
	14	Diagnostic Fault Check to Report the Error in Voltage Ratio in ADC Monitoring	It is checked whether MoCADC_ctDebVltgRatio >= MoCADC_ctDebVltgRatio_C (15 Events). If yes the error is set. The diagnosis is carried out in the 40-ms interval.	
20221	11	Diagnostic Fault Check to Report Errors in Query-/Response-Communication	If there is no active shut-off path test (MoCSOP_stRdyMsg == TRUE) and the error counter MoCCom_ctErrMM or MoCCom_ctErrFC is >= MOCCOM_MM_STATUS_LIMIT_ERRORS (5) there is an undebounced defect detection	
20222	11	Diagnostic Fault Check to Report Errors in SPI-Communication	If there is no active shut-off path test (MoCSOP_stRdyMsg == TRUE) and the error counter MoCCom_ctErrMM or MoCCom_ctErrFC is >= MOCCOM_MM_STATUS_LIMIT_ERRORS (5) there is an undebounced defect detection	
20223	11	Diagnostic Fault Check to Report Multiple Error While Checking the Complete ROM-Memory	If multiple errors are detected while testing the complete ROM-memory (irreversible error bit 2 in MoCMem_st is set) there is an undebounced defect detection.	
20224	11	Diagnostic Fault Check to Report the Accelerator Pedal Position Error	Implausible accelerator pedal voltage. The two voltage values (ADC_VAL1 ADC_VAL2) detected by the accelerator pedal are not plausible to each other.	
20225	11	Diagnostic Fault Check to Report the Engine Speed Error	Implausible engine speed. The engine speed value calculated in level 2 (MoFESpd_nEngL2_mp) and Epm_nEngLRes (engine speed from level 1) are not plausible to each other.	
20226	11	Diagnostic Fault Check to Report the Plausibility Error Between Level 1 Energizing Time and Level 2 Information	Implausible injection quantity. It is tested if MoFlnjDat_ctDebETerr >= MoFlnjDat_ctDebETerr_C (5 Events). In case of this the error is set. This diagnosis is processed in the 40ms interval.	
20227	11	Diagnostic Fault Check to Report the Error Due to Plausibility Between the Injection Begin v/s Injection Type	Implausible start of energizing angles. It is tested if MoFlnjDat_ctDebPhiErr >= MoFlnjDat_ctDebPhiErr_C (5 Events). In case of this the error is set. This diagnosis is processed in the 40ms interval.	

Fault Codes

SECTION 3 SERVICE

SPN Code	FMI Code	Fault Check Description	Fault Detection Condition	Possible Causes
20228	11	Diagnostic Fault Check to Report the Error Due to Non-Plausibility in ZFC	Implausible energising times. The energising times of the zero fuel quantity calibration ZFC MoFlnjDat_tiPi-11ZFCETCorMoFlnjDat_tiPi12ZFCETCor and MoFlnjDat_tiPi13ZFCETCor are tested on their plausible value ranges.	ECU Internal Fault
20229	11	Diagnosis Fault Check to Report the Demand for Normal Mode Due to an Error in the Pol2 Quantity	Implausible Pol2 efficiencies. The efficiency of Pol2 MoFMode_facPol2Eff_mp is tested of its plausible value range. Or an unplausibility is detected during monitoring of the operation mode resp. ramp time counter transgression.	
	14	Diagnosis Fault Check to Report the Error to Demand for an ICO Due to an Error in the Pol2 shut-off	Error in the Pol2 shut-off. The quantity MoFQntCor_qPol2 is tested of its shut-off value in normal mode.	
20230	11	Diagnosis Fault Check to Report the Error to Demand for an ICO due to an error in the Pol3 Efficiency Factor	Implausible Pol3 efficiencies. The efficiency of Pol3 MoFlnjDat_facPol3EffSet is tested of its plausible value range.	
20231	11	Diagnostic Fault Check to Report the Error Due to Injection Quantity Correction	Implausible wave correction parts of the injection quantity correction. The plausibility is displayed by the measuring points MoFQntCor_stPi1ErrAct_mp MoFQntCor_stMI1ErrAct_mp and MoFQntCor_stPol2ErrAct_mp.	
20232	11	Diagnostic Fault Check to Report the Plausibility Error in Rail Pressure Monitoring	The rail pressure of level 1 is checked after a calibratable ramp debounce of MoFRailP_ctRmp_C (240ms) in case of a SRC error. If the value lies outside a calibratable window an irreversible error is detected and reported to the DSM after an error debouncing of MoFRailP_ctDebErr_C (760ms). Also in case of a rail pressure gradient error reported by the level 1 The error is reported after a debounce time MoFRailP_ctDebGradMax_C (2550ms). Additionally the error will be reported after a debounce time MoFRailP_ctDebGradMax_C if level 2 detects a gradient error and level 1 is not reporting it.	
20233	11	Diagnostic Fault Check to Report the Error Due to Torque Comparison	FStSys_stStrtRlsCAN_mp = TRUE).	
20234	11	Diagnosis of Curr Path Limitation Forced by ECU Monitoring Level 2	The setpoint path of the rail pressure control (PthLead_trqInrCurr) is limited by the limitation torque (EngTrqPtd_trqLim) of the functional control unit monitoring.	
	20	Diagnosis of Lead Path Limitation Forced by ECU Monitoring Level2	The setpoint path of the air system (PthLead_trqInrLead) is limited by the limitation torque (EngTrqPtd_trqLim) of the functional control unit monitoring.	
	21	Diagnosis of set Path Limitation Forced by ECU Monitoring Level 2	The quantity setpoint path (PthLead_trqInrSet) is limited by the limitation torque (EngTrqPtd_trqLim) of the functional control unit monitoring.	
20238	3	Diagnostic Fault Check to Report "ABE Active" Due to over-voltage detection	In the case of a non active shut-off path test (MoCSOP_stActMsg == FALSE) whose debounce OCWDA_CTDEBSOPNOTACTV* 10ms has expired (counter OCWDA_ctDebSOPNotActv = 0) and an active ABE wire due to over-voltage a defect detection takes place.	
	4	Diagnostic Fault Check to Report "ABE Active" due to under-voltage detection	In the case of a non active shut-off path test (MoCSOP_stActMsg == FALSE) whose debounce OCWDA_CTDEBSOPNOTACTV* 10ms has expired (counter OCWDA_ctDebSOPNotActv = 0) and an active ABE wire due to undervoltage there is an undebounced defect detection after the battery voltage BattU_u keeps greater than OCWDA_uBattMin_C (8V) longer than the debounce time OCWDA_CTUBATTMX(100ms).	
	11	Diagnostic Fault Check to Report "WDA Active" due to Errors in Query-/Response Communication	In the case of a non active shut-off path test (MoCSOP_stActMsg == FALSE) whose debounce OCWDA_CTDEBSOPNOTACTV* 10ms has expired (counter OCWDA_ctDebSOPNotActv = 0) and an active WDA wire a defect detection takes place.	

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Fault Codes

SPN Code	FMI Code	Fault Check Description	Fault Detection Condition	Possible Causes
20238	14	Diagnostic Fault Check to Report "WDA/ ABE Active" due to unknown reason	In the case of a non active shut-off path test (MoCSOP_stActMsg == FALSE) whose debounce OCWDA_CTDEBSOPNOTACTV* 10ms has expired (counter OCWDA_ctDebSOPNotActv = 0) and an active ABE wire due to undervoltage there is an undebounced defect detection after the battery voltage BattU_u keeps greater than OCWDA_uBattMin_C (8V) longer than the debounce time OCWDA_CTUBATTMX (100ms).	ECU Internal Fault
20251	11	Visibility of Software Resents in DSM	The evaluation of the reset reason will be done after every reset. Depending on the configured visibility of the current reset one of the fault checks in the array will be set.	
	20		The evaluation of the reset reason will be done after every reset. Depending on the configured visibility of the current reset one of the fault checks in the array will be set.	
	21		The evaluation of the reset reason will be done after every reset. Depending on the configured visibility of the current reset one of the fault checks in the array will be set.	
20276	11	Diagnostic Fault Check to Report the Remote Accelerator Pedal Position Error	Implausible accelerator pedal voltage. The two voltage values (ADC_VAL1, ADC_VAL2), detected by the accelerator pedal, are not plausible to each other. If RMTAPP with LIS is used, defect is detected if there is a implausibility with LIS and RMTAPP1 voltage.	
20282	3	Short Circuit to Battery on Out1 Error for H-Bridge	Short Circuit to Battery at Out1 of TLE7209/CJ230 Error	Wiring Harness or Component
		Short Circuit to Battery on Out2 Error for H-Bridge	Short Circuit to Battery at Out2 of TLE7209/CJ230 Error	
	4	Short Circuit to Ground on Out1 Error for H-Bridge	Short Circuit to Ground at Out1 of TLE7209/CJ230 Error	
		Short Circuit to Ground on Out2 Error for H-Bridge	Short Circuit to Ground at Out2 of TLE7209/CJ230 Error	
	5	Open Load Error for Power-stage	Open Load Error Monitoring for TLE7209/CJ230	Wiring Harness Component for ECU Internal Fault
	12	Over Temperature Error for H-Bridge	Over Temperature Error Monitoring for TLE7209/CJ230	
20288	2	DFC for Coding Error when Different Coding Words were Received in a coding cycle		Glowing Problems
		No Load Error for Low Voltage System		
	3	Short Circuit to Battery Error for Low Voltage System		
	4	Short Circuit to Ground Error for Low Voltage System		
	5	Over Temperature Error on ECU Power-stage for Glow Plug Low voltage System		
	14	DFC for T30 Missing Error in GCU-T		
	21	DFC for Coding Error when Selected Coding is not working		
	22	DFC for faulty Diagnostic Data Transmission or Protocol Error		
	23	DFC for glow Module Error in GCU-T		

Fault Codes

SECTION 3 SERVICE

SPN Code	FMI Code	Fault Check Description	Fault Detection Condition	Possible Causes
20290	3	Diagnostic Fault Check to Report the Error in Over-Voltage Monitoring	Irreversible error bit 2 set in MoCSOP_st (counter MoCSOP_ctDebPSDia >= MoCSOP_ctDebPSDia_C (2 Events) during over voltage detection of the SOP test).	ECU Internal Fault
	11	Loss of Synchronization Sending Bytes to the MM from CPU	Irreversible error bit 5 set in MoCSOP_st (counter MoCSOP_ctErrMMRespByte > MOCSOP_MM_RESPBYTE_RESET_ERROR(10) within the SOP test) and state MOCSOP_STEP_ERROR reached due to time out.	
	20	DFC to set a Torque Limitation once an Error in Detected Before MoCSOP's Error Reaction is set	If an error was found by the SOP test but additionally the injector diagnose reported an error (Fld_Mo-CSOPInjDiagErr or Fld_MoCSOPInjDiagDeb are blocking) then only the test flag of every MoCSOP DFC will be set. Besides the error bits of DFC_MoCSOPErrNoChk will be set.	
	21	Wrong Set Response Time	Irreversible error bit 8 set in MoCSOP_st (counter MoCSOP_ctErrRespTime > MOCSOP_MM_RESPTIME_RESET_ERRORS(2) within the SOP test) and state MOCSOP_STEP_ERROR reached due to time out.	
	22	Too Many SPI Errors During CoCSOP Execution	Irreversible error bit 6 set in MoCSOP_st (counter MoCSOP_ctErrSPI >= MOCSOP_SPI_RESET_ERRORS(16) within the SOP test) and state MOCSOP_STEP_ERROR reached due to time out.	
	23	Diagnostic Fault Check to Report the Error in Under-voltage Monitoring	Irreversible error bit 3 set in MoCSOP_st (counter MoCSOP_ctDebPSDia >= MoCSOP_ctDebPSDia_C during under voltage detection of the SOP test).	
		Diagnostic Fault Check to Report that WDA is not working correct	Irreversible error bit 1 set in MoCSOP_st (for example counter MoCSOP_ctDebSOPTst >= MoCSOP_ctDebSOPTst_C (66 Events) or (MoCSOP_ctDebPSDia < MoCSOP_ctDebPSDia_C (2 Events)) AND (MoCSOP_ctCylNum >= MoFlnjDat_numCyl_C (4)) during the MM SOP test).	
	25	OS Timeout in the Shut Off Path Test. Failure Setting the Alarm Task Period	Irreversible error bit 7 set in MoCSOP_st (counter MoCSOP_ctErrOSTimeout > MOCSOP_MM_OSTIMEOUT_RESET_ERRORS(2) within the SOP test) and state MOCSOP_STEP_ERROR reached due to time out.	
		Diagnostic Fault Check to Report that the Positive Test Failed	Irreversible error bit 10 set in MoCSOP_st (bit MOCSOP_RSLTRDY_BP(0) of the return value from InjVlv_SOPTst() set to one, and bit MOCSOP_SUCCESS_BP(1) set to zero).	
		Diagnostic Fault Check to Report the Timeout in the Shut Off Path Test	Irreversible error bit 0 set in MoCSOP_st (counter MoCSOP_ctDebSOPTst > MoCSOP_ctDebSOPTst_C (66 Events) during SOP test).	
22040	19	Timeout Error on CAN-Receive-Frame TSC1TE	Timeout of TSC1_TE message. The message is not received for 40 ms (TimeoutCount = 4, selected task cycle = 10 ms, FRMSCH_RXMODE1) and the defect debouncing time DDRC_DurDeb.Com_tiTSC1TET0DebDef_C is passed and the TSC1 message is enabled and there is no busoff (i.e Com_stSAEJ1939RxEnbl[12].6 is set to 1)	CAN Transmitter DPF System
22058	19	Reported SPI and COM-Errors of a Cy146		ECU Internal Fault
23350	4	Short Circuit	Short circuit in injection bank 0 (all injectors of the same bank can be affected)	Wiring Harness or Injector Short Circuit
23352	4	Short Circuit	Short circuit in injection bank 1 (all injectors of the same bank can be affected)	
23354	12	CY33X is Defect	Chip Error in the CY33x Power Stage Component	ECU Internal Fault
23550	12	Defective T50 Switch	The debounced signal is high (T50_st == 1) for a period longer than DDRC_DurDeb.T50_tiErrDebDef_C (50ms)	Switch Defective or is Active for a Long time

SECTION 3 SERVICE

Fault Codes

SPN Code	FMI Code	Fault Check Description	Fault Detection Condition	Possible Causes
23613	0	Maximum Positive Deviation of Rail Pressure Exceeded	If the rail pressure governor deviation Rail_pDvt exceeds the limiting value based on the engine speed Rail_pMeUnDvtMax_CUR an error will be detected.	1. Leakage in the high pressure section 2. Injection nozzle stuck in open position 3. Worn high pressure pump 4. Worn injector (to high injector back flow quantity) 5. Fuel filter clogged up 6. PSP (electric pre-supply pump) output too low
	1	If the rail pressure governor deviation Rail_pDvt falls below the limiting value Rail_pMeUnDvtMin_CUR and if the CP3 delivery quantity MeUn_dvolSet falls to the threshold Rail_MeUnMon.dvolSetMin_C (-350 mm ³ /s) an error will be detected.	If the rail pressure governor deviation Rail_pDvt falls below the limiting value Rail_pMeUnDvtMin_CUR and if the CP3 delivery quantity MeUn_dvolSet falls to the threshold Rail_MeUnMon.dvolSetMin_C an error will be detected.	1. Metering unit is stuck in open position 2. Zero delivery throttle clogged up 3. Metering unit without power due to electrical error. 4. Pressure after zero-delivery throttle too high.
	2	If the rail pressure RailP_pFlt exceeds the limiting value Rail_MeUnMon.pFltMax_C (1.750.000 hPa) an error will be detected.	If the rail pressure RailP_pFlt exceeds the limiting value Rail_MeUnMon.pFltMax_C an error will be detected.	1. Metering unit is stuck in open position 2. Zero delivery throttle clogged up 3. Metering unit without power due to electrical error. 4. Pressure after zero-delivery throttle too high.
	24	Leakage is detected based on fuel quantity balance	If the high pressure pump delivery quantity (MeUn_dvolSet) exceeds the plausibility limit of the volume flow balance (evaluated over the product life and supplemented to include tolerances) Rail_dvolMonMax_mp, an error will be detected.	Maladjusted rail pressure sensor, defective high pressure pump, leakage, Possible error in the low pressure stage, Back flow too low

SPN Code	FMI Code	Fault Check Description	Fault Detection Condition	Possible Causes
23614	0	Maximum Rail Pressure Exceeded		Maximum Rail Pressure Exceeded
	1	Maximum Rail Pressure Exceeded (Second Stage)		Maximum Rail Pressure Exceeded (Second Stage)
	20	Maximum Positive Deviation of Rail Pressure Exceeded		Maximum Positive Deviation of Rail Pressure Exceeded
	22	Maximum Negative Rail Pressure Deviation with Closed Pressure Control Valve Exceeded		Maximum negative Rail Pressure Deviation with Closed Pressure Control Valve Exceeded
23895	13	Check of Missing injector Adjustment Value Programming	Detection if the monitoring for missing or faulty programming of the injector adjustment values is active and: - the checksum of the injector adjustment code words is not correct or - the basic correction quantity in at least one injector checkpoint has exceeded the admissible limits or - no injector adjustment values could be read due to faulty EEPROM access.	IMA not programmed
23896	13	Check Of Missing Injector Adjustment Value Programming		IMA Not Programmed
23897	13			
23898	13			
23906	3	Short Circuit to Battery of Pre-Supply Pump Output		Wiring Harness or Component
	4	Short Circuit to Ground of Pre-Supply Pump Output		
	5	Open Load of Pre-Supply Pump Output		Wiring harness or Component
	12	Over Temperature Error on ECU Powerstage for Pre-Supply Pump		ECU Internal Fault
24000	0	Error Path SPN1 Matching of DM1DCU Message	The error is set in this DFC if received SPN number match with Com_numDM1DCUSPN1_CA	CAN Transmitter
	11	Function Monitoring: Fault in the Monitoring of the Start Control		ECU Internal Fault

This is not an exhaustive list of the error codes that are available. If an alternate code is shown that is not on this list, please contact Allen Engineering Service Department for details.

SECTION 4 PARTS

Factory Service Information

This section contains the illustrated drawings and parts list for help in identifying and/or ordering replacement parts for your machine. Follow the instructions in the front section of this manual “Ordering Parts” when ordering replacement parts to insure prompt and accurate delivery.

The FRONT and/or REAR orientations are defined from the operator’s view of sitting on machine (SOM).



! NOTE

All set screws have blue (LOC-TITE™) applied at the factory. If set screw is removed or loosened for any reason re-apply blue (LOC-TITE™).



! NOTE

All grease fittings are capped with CAP PLUG GC-5 (AEC PN 015692) to protect the fitting. If cap becomes missing or damaged replace it as soon as possible.



! NOTE

Anti-Seize is applied at the factory to drive line couplings, and moving components. If these parts are disassembled re-apply a light coat of a graphite based anti-seize.

We recommend AEC quality replacement parts, available from the AEC Customer Service Department or your nearest AEC Dealer.

Part numbers are subject to change without notice. Part numbers might be different outside of the United States of America. Use part numbers listed in the applicable parts list table when you place your order. If a part number changes, the AEC Customer Service Department or your nearest AEC dealer will have the latest part number for the replacement part.

Remember when you order replacement parts, you will need your model number and serial number. These are the numbers that you have recorded on *Page 11* of this manual. Please order replacement parts by the appropriate part number, not the key number.

This manual contains an illustrated parts list for help in ordering replacement parts for your machine. Follow the instructions below when ordering parts to insure prompt and accurate delivery:

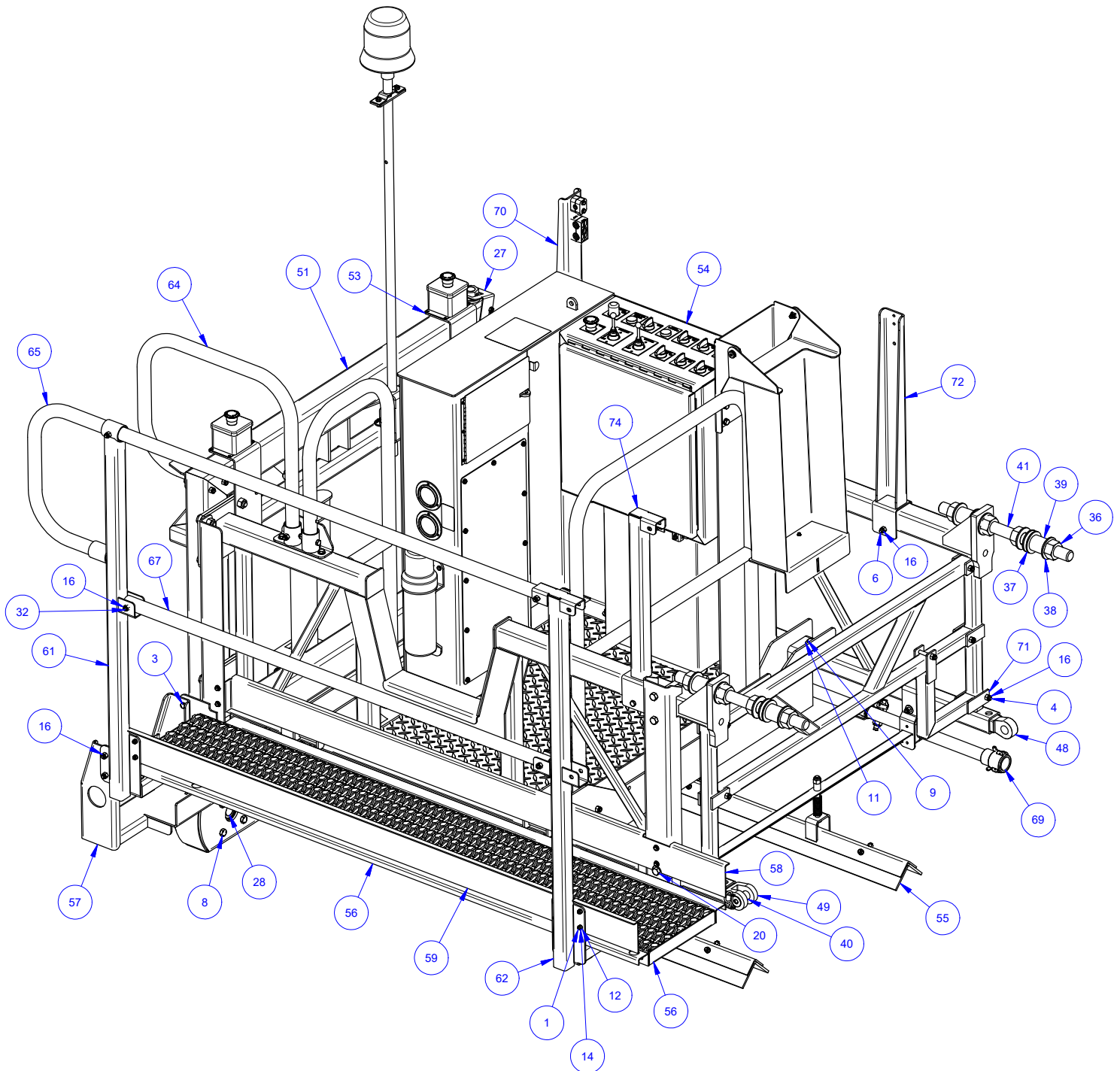
1. All orders for service parts - include the serial number for the machine. Shipment will be delayed if this information is not available.
2. Include correct description and part number from the "PARTS" Section 4.
3. Specify exact shipping instructions, including the preferred routing and complete destination address.
4. DO NOT return parts to AEC without receiving written authorization from AEC. All authorized returns must be shipped pre-paid.
5. When placing an order, please contact the AEC Dealer nearest you.



All information, specifications, and illustrations in this manual are subject to change without notice and are based on the latest information at the time of publication.

SECTION 4 PARTS

Operator End Assembly - Illustration 068101



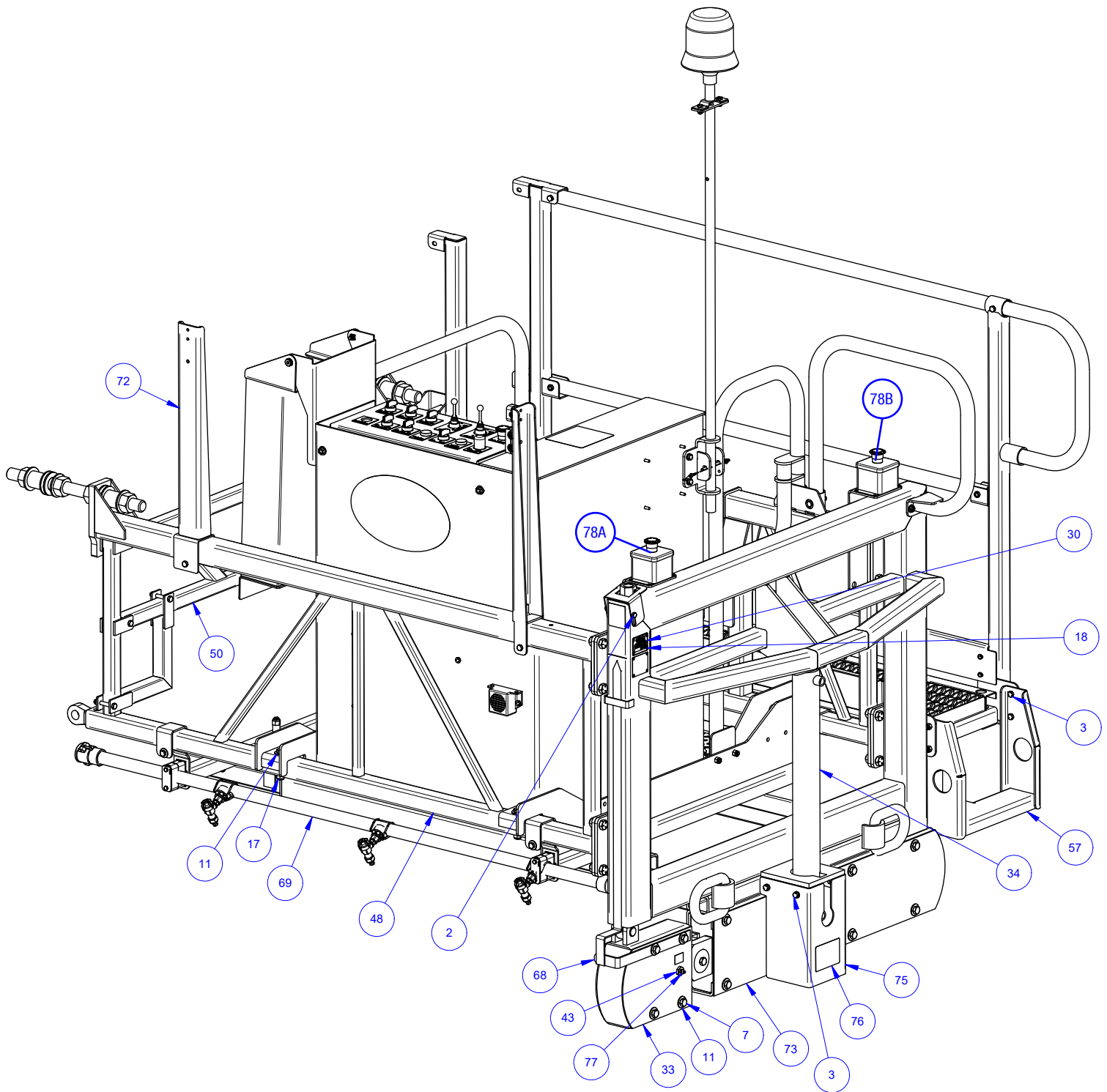
Operator End Assembly - Parts List 068101

SECTION 4 PARTS

ITEM	PART NO.	DESCRIPTION	QTY
1	010002	FSTN, HHCS 1/4-20 X 3/4	10
2	010031	FSTN HHCS 5/16-18 X 3-3/4 GRD8	1
3	010036	FSTN, HHCS 3/8-16 X 1 GR 8	8
4	010042	FSTN, HHCS 3/8-16 X 2-1/2 GR 8	10
5	010045	FSTN, HHCS 3/8-16 X 3-1/4	2
6	010046	FSTN, HHCS 3/8-16 X 3-1/2	3
7	010067	FSTN, HHCS 1/2-13 X 1 GR8	12
8	010069	FSTN, HHCS 1/2-13 X 1-1/2 GRADE 8	12
9	010075	FSTN, HHCS 1/2-13 X 3 GR 8	4
10	010081	FSTN, FW 1/4	8
11	010085	FSTN, FW 1/2 GR8	16
12	010089	FSTN, LW 1/4	6
13	010091	FSTN, LW 3/8	4
14	010098	FSTN, NUT HEX 1/4-20	10
15	010110	FSTN, NUT HEX 5/8-11 GR 8	16
16	010464	FSTN, NUT NYLOK 3/8-16 GR 8	23
17	011238	FSTN, NUT HEX NYLOK 1/2-13	20
18	012994	RIVET, 1/8x3/8 ALUM DOME HD [closed]	8
19	017751	FSTN, FW HARD A325 3/8 (p)	4
20	019541	FSTN, HHCS 1/2-13 X 5"	2
21	020915	SCR, 5/16-11x1-1/2 HHC	8
22	022110	COTTERS, HAIRPIN	1
23	027882	FSTN, HHCS 3/8-16 X 3-3/4 LONG GRADE 8 YELLOW ZINC	2
24	028287	PAD, FOOT F/CYLINDER TRTF	1
25	028291-1	PIN, SHORT F/ CYLINDER TRTF	1
26	028291-2	PIN, LONG F/ CYLINDER TRTF	1
27	029136	ENDHANDLE LOCK	1
28	029222	IDLE END BEARING	3
29	029311	FSTN, HHCS 5/8-11 X 1 3/4 GR 8 YELLOW ZINC	8
30	032097	DECAL, SERIAL NUMBER PLATE	1
31	040004	FSTN, 5/16-18 GR-C STOVER HEX NUT	1
32	040637	BOLT, 3/8-16 X 2-1/4 GR 8 HHC	2
33	042006	COVER, BASE FORWARD IDLE END (SMALL) 255 TRTF	1
34	045136	CYLINDER, STEERING F/ TRTP	1
35	051013	FSTN, HHCS 1/2-13 x 5-1/2 GR 5	2
36	052156	HEX NUT, 1 1/4-7	8
37	052168	SPHERICAL WASHER SET, 1 1/4	4
38	052169	FLAT WASHER, 1 1/4	12
39	052171	SPACER, 1 1/2 X 3/16 X 2	4
40	052233	PIN, 1"	1
41	052472	ALL THREAD, 1 1/4-7 X 18	2
42	-	-	1
43	062423	FTG, BULK HEAD 1/8" NPT X 5/8-18 OD THREADS BRASS	3

SECTION 4 PARTS

Operator End Assembly - Illustration 068101 - (Cont'd)



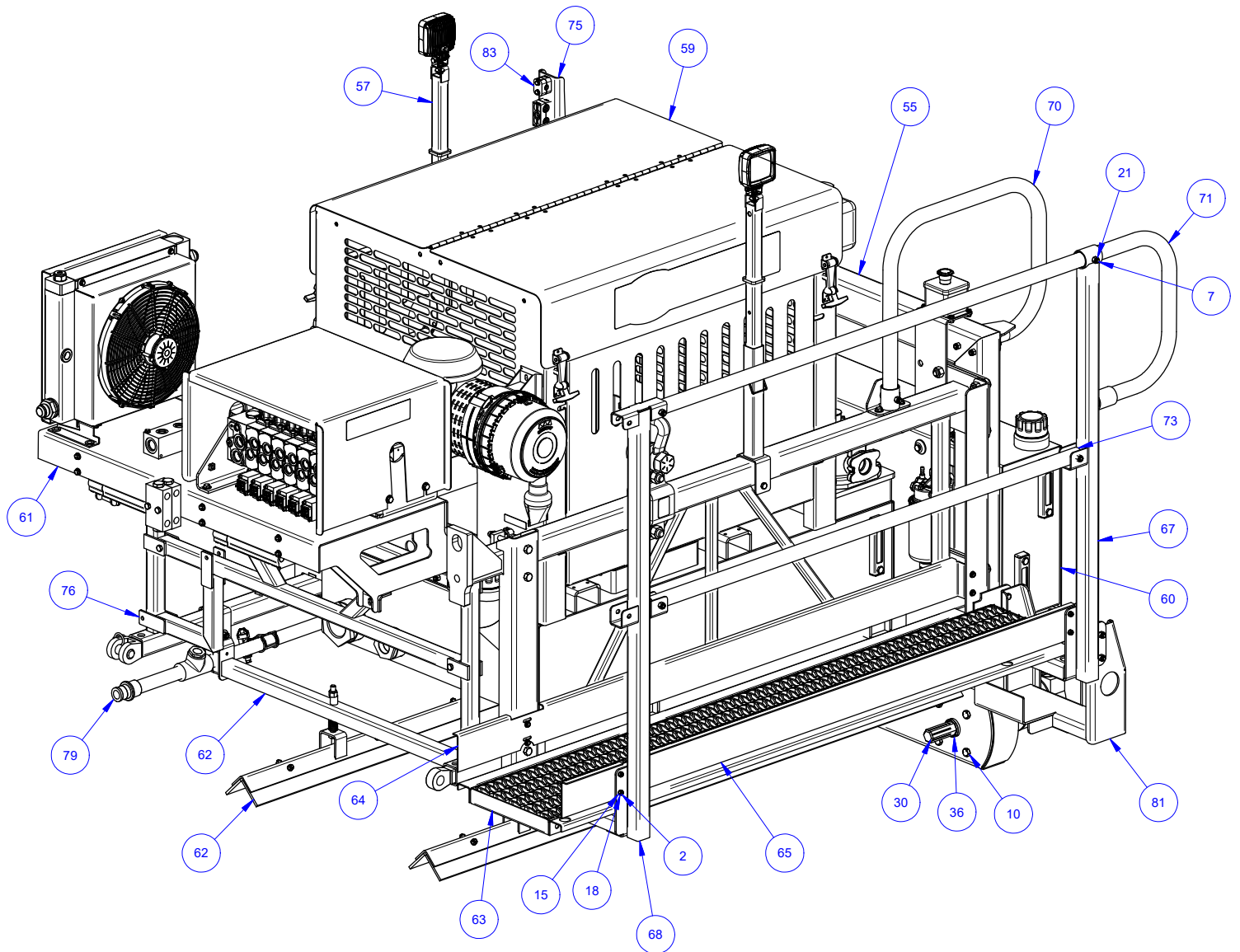
Operator End Assembly - Parts List 068101 - (Cont'd)

SECTION 4 PARTS

ITEM	PART NO.	DESCRIPTION	QTY
44	063085	HOSE, 18" LONG FLEXIBLE GREASE W/ 1/8	2
45	063085	HOSE, 18" LONG FLEXIBLE GREASE WITH 1/8" NPT FTG'S	3
47	066497	DECAL, FINISH TUBE VERTICAL ADJUSTER	1
48	067470	FRAME WMTN, 6' END LH FRONT & RH REAR 275 TRTP	1
49	067480	FRAME WMTN, 6' END REAR LH FOR 275 TRTP	1
50	067497	END FRAME, FOR 275 TRTP FRAME ASSEMBLIES	1
51	067522	END HANDLE, LH FOR 275 TRTP	1
52	067592	ASSEMBLY, LIGHT AND MOUNT FOR 275 TRTP	1
53	067595	BRACKET, E STOP MOUNT FOR 275 TRTP	2
54	067805	OPERATOR CONTROL PANEL ASSEMBLY 275 TRTP	1
55	067842	SCRAPER ASSEMBLY, LH 6' END FOR 275 TRTP	1
56	067848	WALKWAY, REAR LH END FOR 275 TRTP	1
57	067865	STEP FOR WALKWAY 275 TRTP	1
58	067869	INSIDE TOE KICK, LH END FOR 275 TRTP	1
59	067874	OUTSIDE TOE KICK, LH END FOR 275 TRTP	1
60	067880	MOUNT, LH END INSIDE HAND RAIL MOUNT	1
61	067885	SUPPORT, REAR LH END WALKWAY 275 TRTP	1
62	067895	SUPPORT, REAR CENTER WALKWAY 275 TRTP	1
63	067897	PLATE, TO FOR WALKWAY MOUNING 275 TRTP	1
64	067900	INNER GRAB HANDLE FOR 275 TRTP	1
65	067901	TOP RAIL FOR 275 TRTP END ASSEMBLY WALKWAY	1
66	067906	PLATE, BOTTOM WALKWAY MOUNT 275 TRP	1
67	067916	TUBE, MIDDLE RAIL F/ END WALKWAY 275 TRTP	1
68	067943	WELD'T POINTER LH END 275 TRTP	1
69	067947	SPRAY BAR, LH END FOR 275/255 TRTP	1
70	067969	HOSE MOUNTING BRACKET FOR GANG ASSEMBLY 275 TRTP	1
71	067970	HANGER, HOSE FOR 275 TRTP	1
72	067976	BRACKET, HOSE MOUNTING OPERATOR END GANG 275 TRTP	1
73	067979	COVER, BASE FORWARD FOR IDLE END HANDLE 275 TRTP	1
74	068003	WELDMENT, INSIDE HANDRAIL UPRIGHT END SECTIONS 275 TRTP	1
75	068231	COVER, CYLINDER F/ 275 TRTP	1
76	075405	DECAL, FOOT CRUSH HAZARD	1
77	201163	FITTING, 1/8-27 PTF STR GREASE	3
78A	082330	E-STOP, FRONT LEFT FOR TRTP275	1
78B	082333	E-STOP, REAR LEFT FOR TRTP275	1
78C	082332	E-STOP, WALKWAY FOR TRTP275 (NOT SHOWN)	1

SECTION 4 PARTS

Idle End Assembly - Illustration 068102



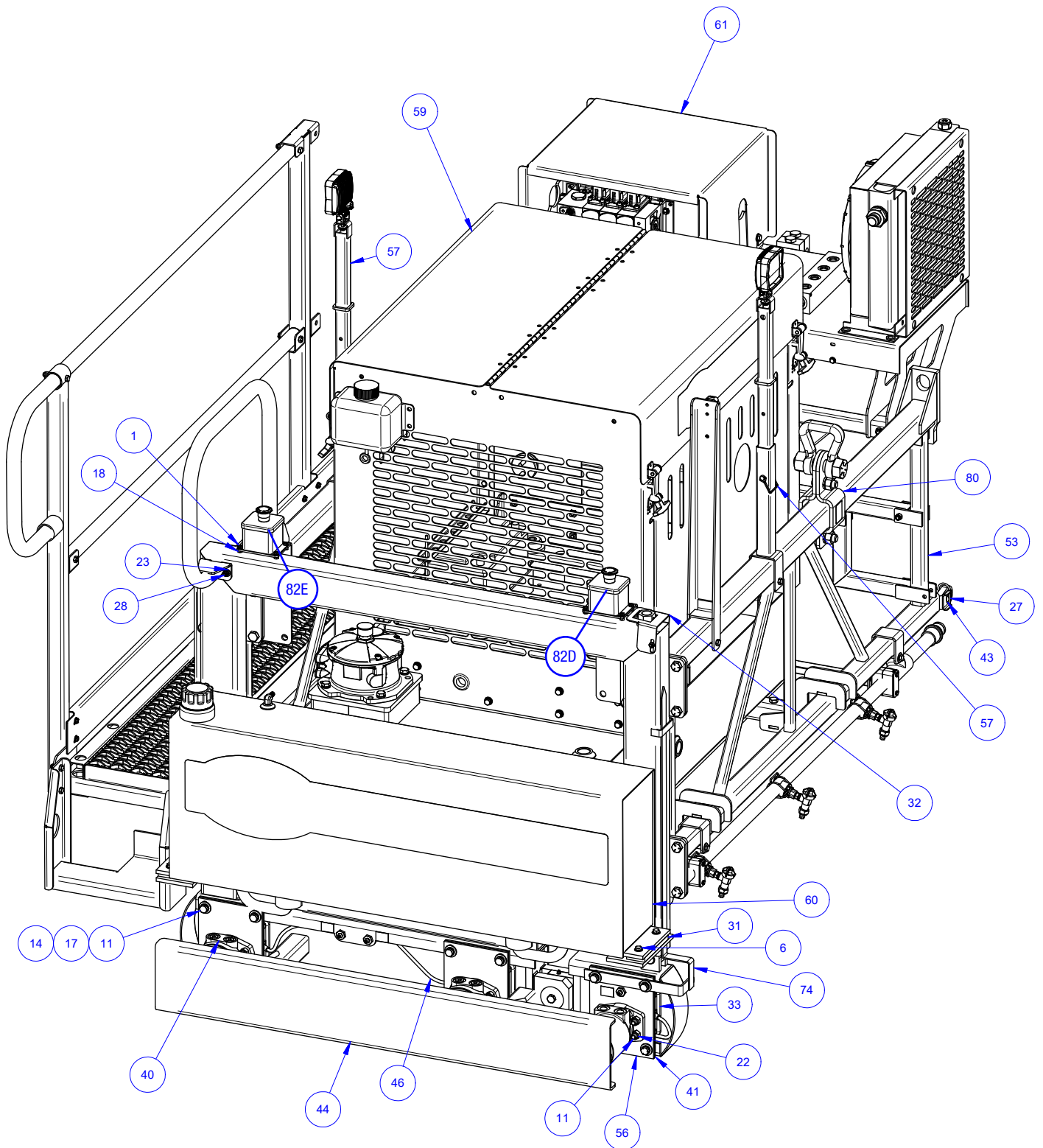
Idle End Assembly - Parts List 068102

SECTION 4 PARTS

ITEM	PART NO.	DESCRIPTION	QTY
1	010001	FSTN, HHCS 1/4-20 X 1/2 GR 5	8
2	010002	FSTN, HHCS 1/4-20 X 3/4	10
3	010031	FSTN HHCS 5/16-18 X 3-3/4 GRD8	1
4	010035	FSTN, HHCS 3/8-16 X 3/4	4
5	010036	FSTN, HHCS 3/8-16 X 1 GR 8	4
6	010039	FSTN, HHCS 3/8-16 X 1 3/4" LONG GR8	4
7	010042	FSTN, HHCS 3/8-16 X 2-1/2 GR 8	7
8	010045	FSTN, HHCS 3/8-16 X 3-1/4	2
9	010046	FSTN, HHCS 3/8-16 X 3-1/2	1
10	010069	FSTN, HHCS 1/2-13 X 1-1/2 GRADE 8	13
11	010070	FSTN, HHCS 1/2-13 X 2-1/4 GR 5	23
12	010075	FSTN, HHCS 1/2-13 X 3 GR 8	4
13	010081	FSTN, FW 1/4	10
14	010085	FSTN, FW 1/2 GR8	16
15	010089	FSTN, LW 1/4	10
16	010091	FSTN, LW 3/8	4
17	010093	FSTN, LW 1/2 GR8	12
18	010098	FSTN, NUT HEX 1/4-20	18
19	010102	FSTN, NUT HEX 3/8-16	4
20	010110	FSTN, NUT HEX 5/8-11 GR 8	14
21	010464	FSTN, NUT NYLOK 3/8-16 GR 8	20
22	011238	FSTN, NUT HEX NYLOK 1/2-13	32
23	017751	FSTN, FW HARD A325 3/8 (p)	18
24	019430	FSTN, CLAMP SIZE 4 MINI	2
25	019541	FSTN, HHCS 1/2-13 X 5"	2
26	020915	SCR, 5/16-11x1-1/2 HHC	6
27	022110	COTTERS, HAIRPIN	1
28	027882	FSTN, HHCS 3/8-16 X 3-3/4 LONG GRADE 8 YELLOW ZINC	2
29	028279	MOTOR MOUNT PLATE	2
30	028292	SHAFT, HEX TRIPLE RTF	3
31	029098	BUSHING, F/HYD TANK TRTF	2
32	029136	ENDHANDLE LOCK	1
33	029223	BEARING, 1 3/4" 4 BOLT FLANGE	3
34	029311	FSTN, HHCS 5/8-11 X 1 3/4 GR 8 YELLOW ZINC	8
35	029387	PIN, MOTOR PROTECTOR TRTP 255	2
36	037560	O-RING, HEX COUPLER ASSY (318)	3
37	040004	FSTN, 5/16-18 GR-C STOVER HEX NUT	1
38	040068	MOTOR, FINISH 10" TRTP (STRIKE OFF)	1
39	040637	BOLT, 3/8-16 X 2-1/4 GR 8 HHC	4
40	044652	MOTOR, 10" TRTP HD HYDR TRAVEL	2
41	049322	PLATE, SPACER F/ TRTP DRIVE MOTORS	3
42	051013	FSTN, HHCS 1/2-13 x 5-1/2 GR 5	2
43	052233	PIN, 1"	1
44	053017	MOTOR PROTECTOR REVERSED END HANDLES	1

SECTION 4 PARTS

Idle End Assembly - Illustration 068102 (Cont'd)



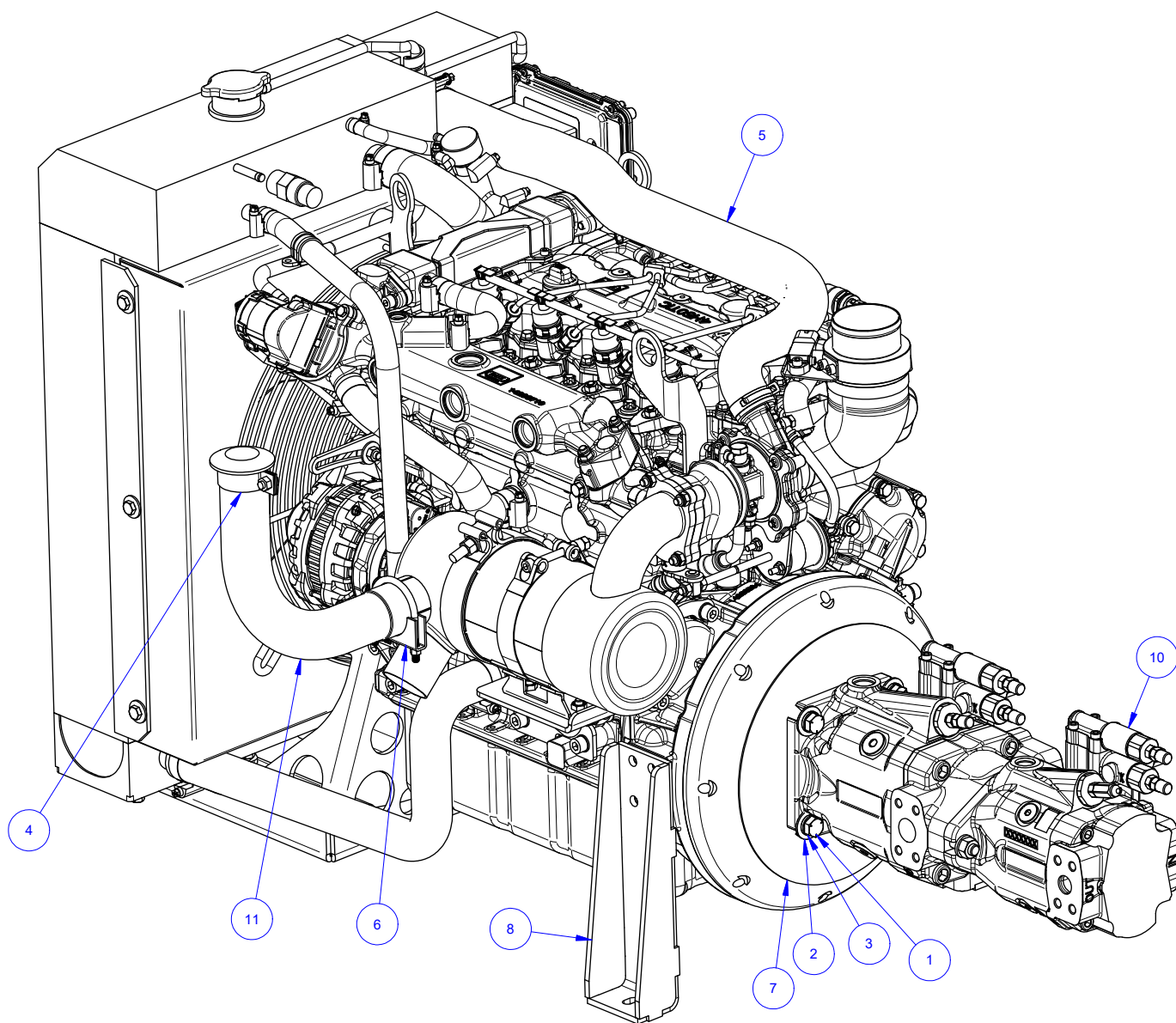
Idle End Assembly - Parts List 068102 (Cont'd)

SECTION 4 PARTS

ITEM	PART NO.	DESCRIPTION	QTY
45	062423	FTG, BULK HEAD 1/8" NPT X 5/8-18 OD THREADS BRASS	3
46	063085	HOSE, 18" LONG FLEXIBLE GREASE W/ 1/8	3
49	065653	DECAL "LIFT HOOK"	2
50	075277	DECAL "ALLEN MADE IN USA"	1
51	067057	PLUG, 9283K34 F/ RAIL TUBES (AUS)	2
52	067470	FRAME WMTN, 6' END LH FRONT & RH REAR 275 TRTP	1
53	067477	FRAME WMTN, FRONT RH FOR 275 TRTP	1
54	067500	END FRAME, ENGINE END FOR 275 TRTP FRAME ASSEMBLY	1
55	067523	END HANDLE, RH FOR 275 TRTP	1
56	067591	MOTOR MOUNT PLATE	1
57	067592	ASSEMBLY, LIGHT AND MOUNT FOR 275 TRTP	2
58	067595	BRACKET, E STOP MOUNT FOR 275 TRTP	2
59	067730	ENGINE POWER UNIT ASSEMBLY 275 TRTP	1
60	067783	ASSEMBLY, FUEL TANK 275 TRTP	1
61	067784	ASSEMBLY, HYDRAULIC MOUNTING TRAY 275 TRTP	1
62	067841	SCRAPER ASSEMBLY, RH 6' END FOR 275 TRTP	1
63	067849	WALKWAY, RH END FOR 275 TRTP	1
64	067870	INSIDE TOE KICK, RH END FOR 275 TRTP	1
65	067875	OUTSIDE TOE KICK, RH END FOR 275 TRTP	1
66	067881	MOUNT, RH END INSIDE HAND RAIL MOUNT	1
67	067890	WELD'T REAR LH END WALKWAY 275 TRTP	1
68	067895	SUPPORT, REAR CENTER WALKWAY 275 TRTP	1
69	067897	PLATE, TO FOR WALKWAY MOUNING 275 TRTP	1
70	067900	INNER GRAB HANDLE FOR 275 TRTP	1
71	067901	TOP RAIL FOR 275 TRTP END ASSEMBLY WALKWAY	1
72	067906	PLATE, BOTTOM WALKWAY MOUNT 275 TRP	1
73	067916	TUBE, MIDDLE RAIL F/ END WALKWAY 275 TRTP	1
74	067942	WELD'T RH POINTER IDLE END 275 TRTP	1
75	067969	HOSE MOUNTING BRACKET FOR GANG ASSEMBLY 275 TRTP	1
76	067970	HANGER, HOSE FOR 275 TRTP	1
77	068002	TUBE, POWER END WITH HAND RAIL FOR WALKWAY 275 TRTP	1
78	068003	WELDMENT, INSIDE HANDRAIL UPRIGHT END SECTIONS 275 TRTP	1
79	068055	SPRAY BAR, RH END FOR 275/255 TRTP	1
80	068058	ASSEMBLY, LIFT HOIST F/ 275 TRTP	2
81	068150	STEP, RH FOR WALKWAY 275 TRTP	1
82C	082332	E-STOP, WALKWAY FOR TRTP275 (NOT SHOWN)	1
82D	082331	E-STOP, FRONT RIGHT FOR TRTP275	1
82E	082334	E-STOP, REAR RIGHT FOR TRTP275	1
83	068392	CLAMP, SINGLE FOR 1/4" HOSE	1
84	068393	CLAMP, DOUBLE FOR 3/8" HOSE	1
85	201163	FITTING, 1/8-27 PTF STR GREASE	3

SECTION 4 PARTS

Engine Assembly - Illustration 067770



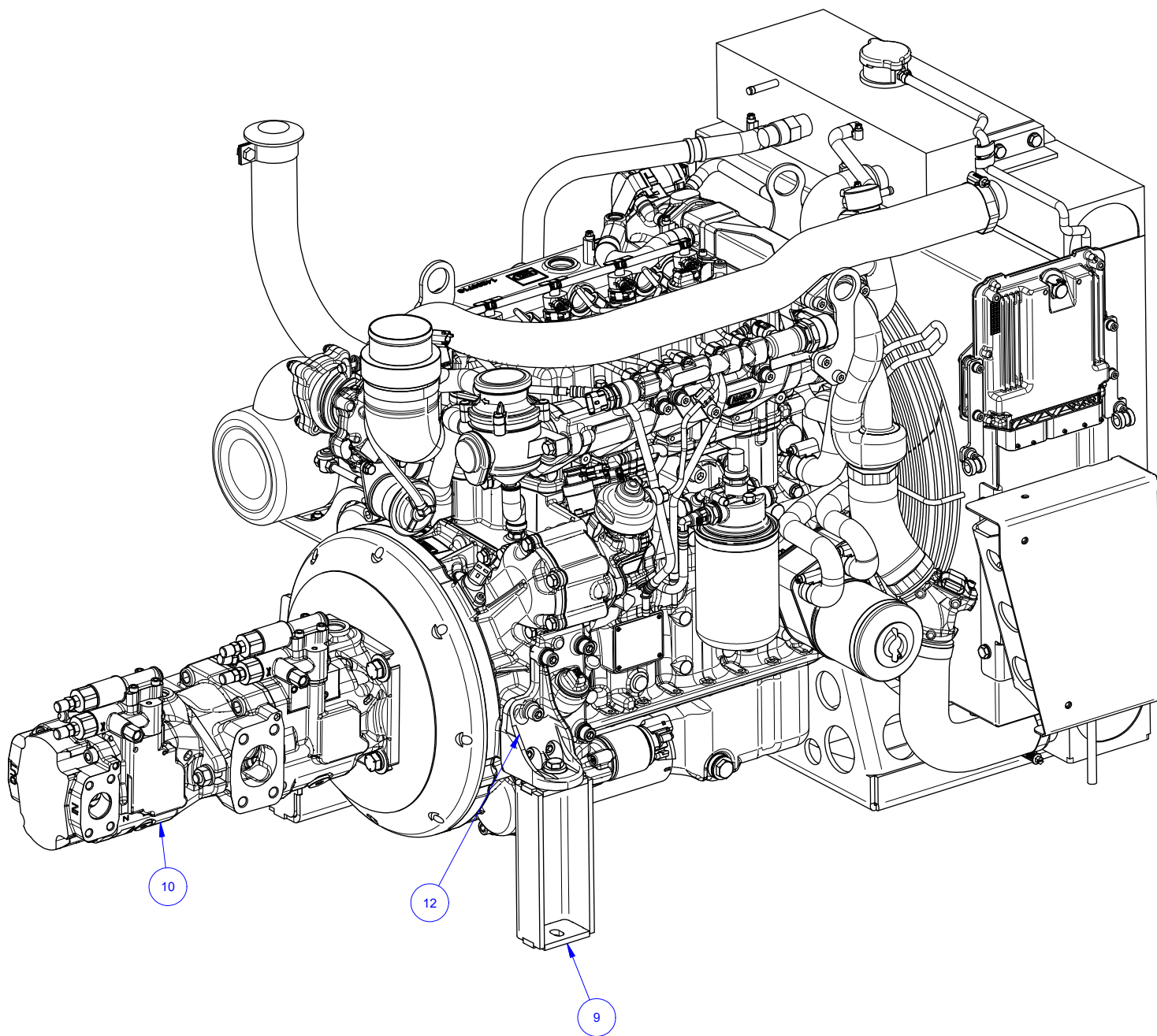
Engine Assembly - Parts List 067770

SECTION 4 PARTS

ITEM	PART NO.	DESCRIPTION	QTY
1	010069	FSTN, HHCS 1/2-13 X 1-1/2 GRADE 8	4
2	010085	FSTN, FW 1/2 GR8	4
3	010093	FSTN, LW 1/2 GR8	4
4	059580	STACK CAP, 2" (P270532)	1
5	064286	HATZ ENGINE H50 1800 RPM	1
6	064535	MUFFLER CLAMP, 2 3/16" ZINC PLATED	1
7	065455	HOUSING AND COUPLING ASSEMBLY 275 TRTP HATZ	1
8	067742	ENGINE MNT, REAR LH FOR 275TRTF WITH HATZ	1
9	067743	ENGINE MOUNT, REAR FRONT FOR HATZ ENGINE ON 275 TRTP	1
10	067774	PUMP TANDEM FOR 275 TRTP (PISTON)	1
11	067984	ELBOW, EXHAUST 90 DEGREE 2"OD X 2" ID 9" CENTERLINE LEG LENGTH (10" LONG LEG) P207333	1
12	068363	FOOT, ENGINE MOUNT FOR ENGINE 064286	1

SECTION 4 PARTS

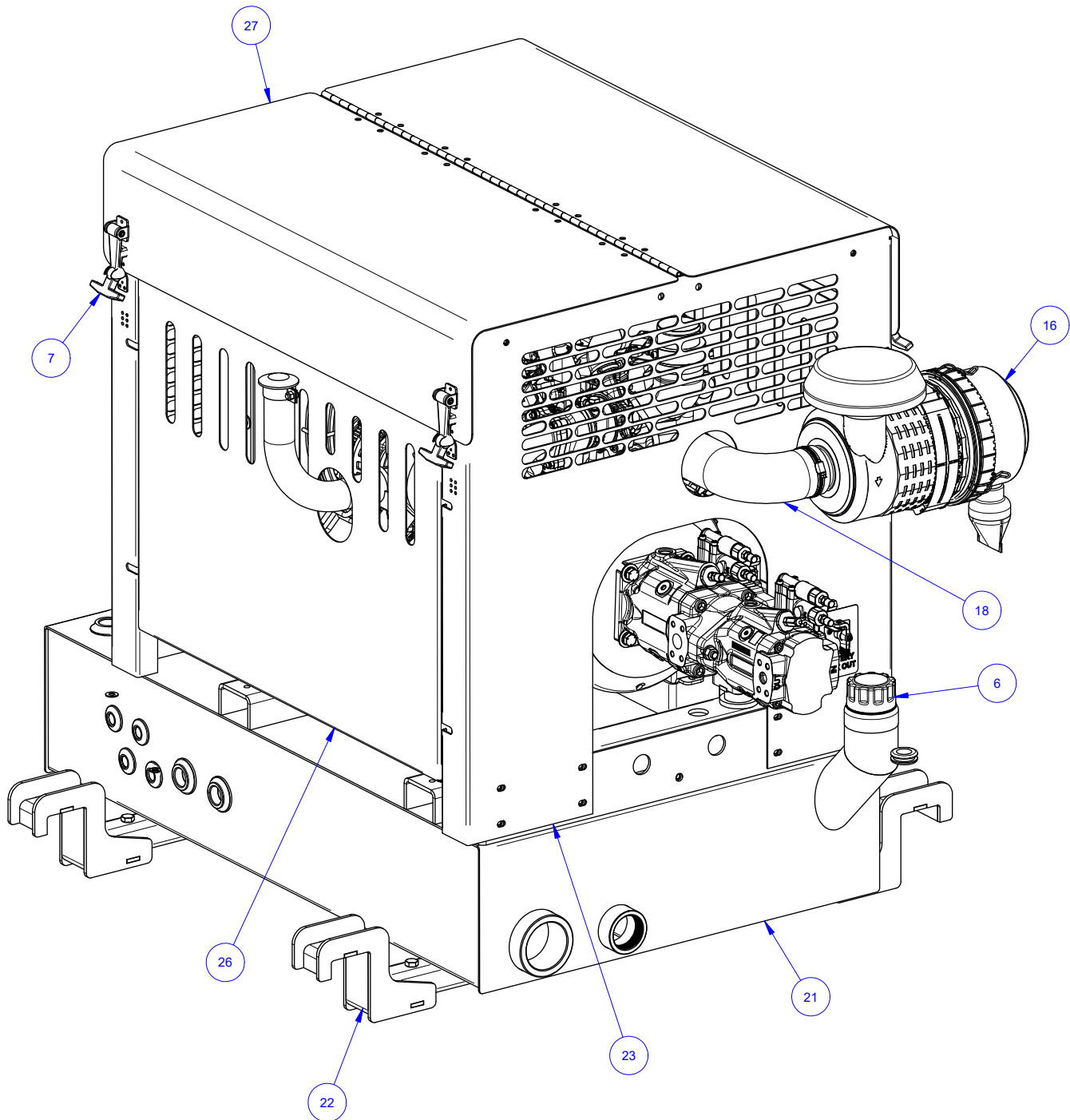
Engine Assembly - Illustration 067770 - Cont'd



ITEM	PART NO.	DESCRIPTION	QTY
1	010069	FSTN, HHCS 1/2-13 X 1-1/2 GRADE 8	4
2	010085	FSTN, FW 1/2 GR8	4
3	010093	FSTN, LW 1/2 GR8	4
4	059580	STACK CAP, 2" (P270532)	1
5	064286	HATZ ENGINE H50 1800 RPM	1
6	064535	MUFFLER CLAMP, 2 3/16" ZINC PLATED	1
7	065455	HOUSING AND COUPLING ASSEMBLY 275 TRTP HATZ	1
8	067742	ENGINE MNT, REAR LH FOR 275TRTF WITH HATZ	1
9	067743	ENGINE MOUNT, REAR FRONT FOR HATZ ENGINE ON 275 TRTP	1
10	067774	PUMP TANDEM FOR 275 TRTP (PISTON)	1
11	067984	ELBOW, EXHAUST 90 DEGREE 2"OD X 2" ID 9" CENTERLINE LEG LENGTH (10" LONG LEG) P207333	1
12	068363	FOOT, ENGINE MOUNT FOR ENGINE 064286	1

SECTION 4 PARTS

Engine Cabinet Assembly - Illustration 067730



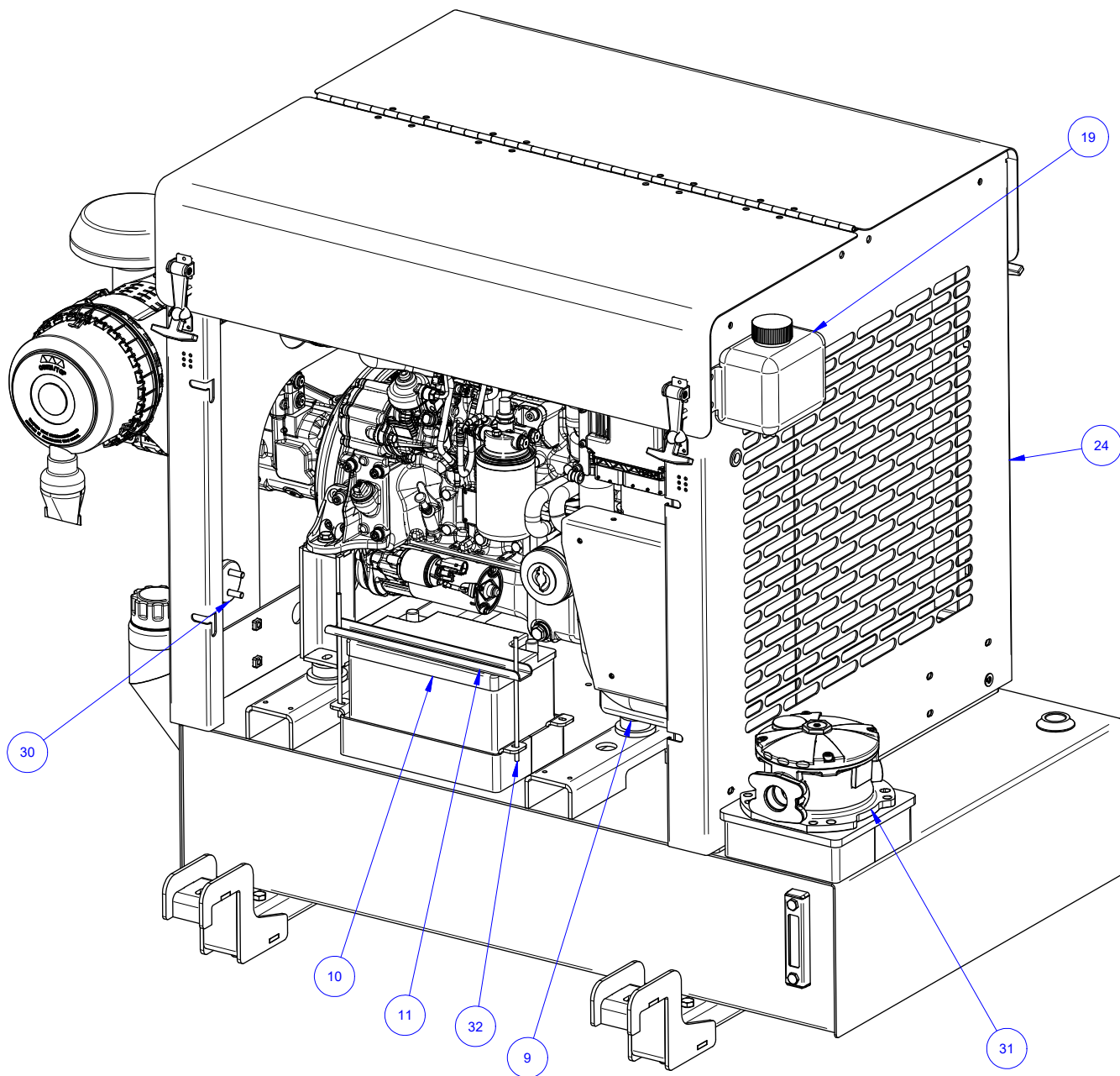
Engine Cabinet Assembly - Parts List 067730

SECTION 4 PARTS

ITEM	PART NO.	DESCRIPTION	QTY
1	010075	FSTN, HHCS 1/2-13 X 3 GR 8	8
2	010085	FSTN, FW 1/2 GR8	8
3	010091	FSTN, LW 3/8	1
4	011238	FSTN, NUT HEX NYLOK 1/2-13	8
5	017751	FSTN, FW HARD A325 3/8 (p)	2
6	032268	UNIT, CHROME LOCKABLE GAS-HYDRA TANK CAP	1
7	042260	LATCH, T-HANDLE EXTRA-LARGE DRAW	4
8	042844	GAUGE, SNA HYDR LEVEL	1
9	045757	MOTOR MOUNT ISOLATOR	4
10	047604	BATTERY, 700CCA 12V 48-B	1
11	048563	CHANNEL, BATTERY HOLD-DOWN X1	1
12	048681	RUBBER GROMMET	1
13	064723	GROMMET, 1 X 1/4	2
14	065188	AIR BONNET, FOR HATZ H50	1
15	065189	HATZ AIR CLEANER 4H50 BAND	1
16	065190	HATZ AIR CLEANER 4H50 BREATHER	1
17	065570	Hose Clamp	2
18	065991	ELBOW,90 DEGREE AIR INTAKE HATZ ENGINE	1
19	066028	COOLANT RECOVERY BOTTLE F/ HATZ ENG.	1
20	075404	DECAL, BATTERY LOCK OUT	1
21	067729	TANK WELDMNT FOR 275 TRTP	1
22	067740	MOUNT, HYD TANK TO FRAME 275 TRTP	4
23	067744	REAR ENGINE ENCLOSURE FOR 275 TRTP	1
24	067745	FRONT ENGINE ENCLOSURE FOR 275 TRTP	1
25	067746	LOWER REAR, ENGINE SIDE PANEL WELDMNT 275 TRTP	1
26	067748	FRONT, ENGINE SIDE PANEL WELDMNT 275 TRTP	1
27	067765	TOP ENGINE COVER WELDMNT, FOR 275 TRTP ENGINE POWER UNIT	1
28	067770	ASSEMBLY, ENGINE FOR 275 TRTP	1
29	067775	LOCK OUT LEVER KIT 24505	1
30	067776	BATTERY SHUT OFF SWITCH	1
31	067777	RETURN FILTER, HF554-40.239-AS-FG010-B17-OG-B-H-Z-XD-GA-G-YN-K	1
32	068556	ROD ALL THREAD, 1/4-20 BATTERY HOLD DOWN 275 TRTP	2
33	068563	BRACE, ENGINE ENCLOSURE BRACE FOR 275 TRTP	2

SECTION 4 PARTS

Engine Cabinet Assembly - Illustration 067730 - Cont'd



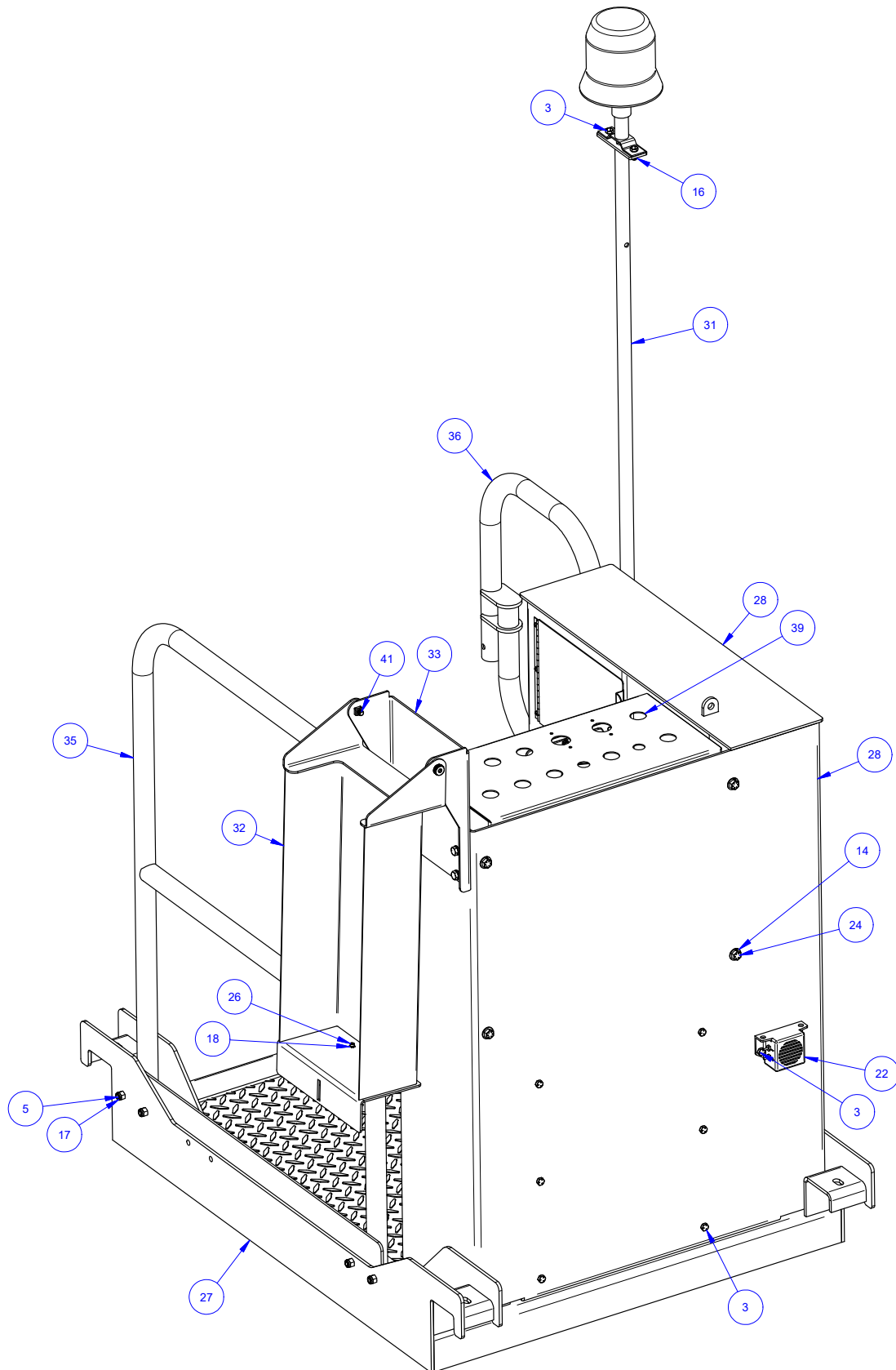
Engine Cabinet Assembly - Parts List 067730 - Cont'd

SECTION 4 PARTS

ITEM	PART NO.	DESCRIPTION	QTY
1	010075	FSTN, HHCS 1/2-13 X 3 GR 8	8
2	010085	FSTN, FW 1/2 GR8	8
3	010091	FSTN, LW 3/8	1
4	011238	FSTN, NUT HEX NYLOK 1/2-13	8
5	017751	FSTN, FW HARD A325 3/8 (p)	2
6	032268	UNIT, CHROME LOCKABLE GAS-HYDRA TANK CAP	1
7	042260	LATCH, T-HANDLE EXTRA-LARGE DRAW	4
8	042844	GAUGE, SNA HYDR LEVEL	1
9	045757	MOTOR MOUNT ISOLATOR	4
10	047604	BATTERY, 700CCA 12V 48-B	1
11	048563	CHANNEL, BATTERY HOLD-DOWN X1	1
12	048681	RUBBER GROMMET	1
13	064723	GROMMET, 1 X 1/4	2
14	065188	AIR BONNET, FOR HATZ H50	1
15	065189	HATZ AIR CLEANER 4H50 BAND	1
16	065190	HATZ AIR CLEANER 4H50 BREATHER	1
17	065570	Hose Clamp	2
18	065991	ELBOW,90 DEGREE AIR INTAKE HATZ ENGINE	1
19	066028	COOLANT RECOVERY BOTTLE F/ HATZ ENG.	1
20	075404	DECAL, BATTERY LOCK OUT	1
21	067729	TANK WELDMNT FOR 275 TRTP	1
22	067740	MOUNT, HYD TANK TO FRAME 275 TRTP	4
23	067744	REAR ENGINE ENCLOSURE FOR 275 TRTP	1
24	067745	FRONT ENGINE ENCLOSURE FOR 275 TRTP	1
25	067746	LOWER REAR, ENGINE SIDE PANEL WELDMNT 275 TRTP	1
26	067748	FRONT, ENGINE SIDE PANEL WELDMNT 275 TRTP	1
27	067765	TOP ENGINE COVER WELDMNT, FOR 275 TRTP ENGINE POWER UNIT	1
28	067770	ASSEMBLY, ENGINE FOR 275 TRTP	1
29	067775	LOCK OUT LEVER KIT 24505	1
30	067776	BATTERY SHUT OFF SWITCH	1
31	067777	RETURN FILTER, HF554-40.239-AS-FG010-B17-OG-B-H-Z-XD-GA-G-YN-K	1
32	068556	ROD ALL THREAD, 1/4-20 BATTERY HOLD DOWN 275 TRTP	2
33	068563	BRACE, ENGINE ENCLOSURE BRACE FOR 275 TRTP	2

SECTION 4 PARTS

Operator Platform - Illustration 067805



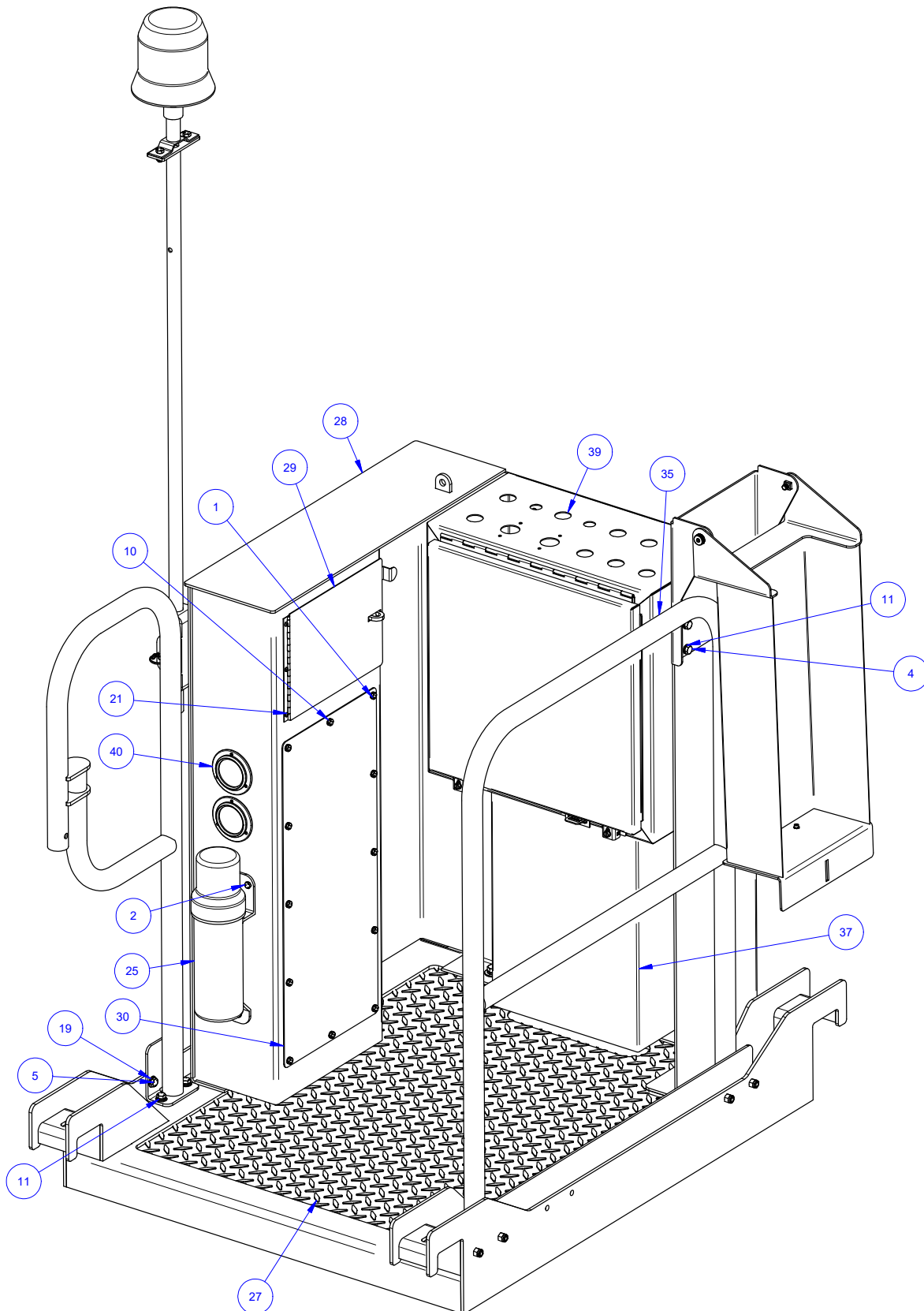
Operator Platform - Parts List 067805

SECTION 4 PARTS

ITEM	PART NO.	DESCRIPTION	QTY
1	010001	FSTN, HHCS 1/4-20 X 1/2 GR 5	12
2	010002	FSTN, HHCS 1/4-20 X 3/4	3
3	010019	FSTN, HHCS 5/16-18 X 3/4 GR 5	10
4	010035	FSTN, HHCS 3/8-16 X 3/4	4
5	010036	FSTN, HHCS 3/8-16 X 1 GR 8	14
6	010067	FSTN, HHCS 1/2-13 X 1 GR8	6
7	010081	FSTN, FW 1/4	1
8	010082	FSTN, FW 5/16	6
9	010085	FSTN, FW 1/2 GR8	6
10	010089	FSTN, LW 1/4	12
11	010091	FSTN, LW 3/8	12
12	010092	FSTN, LW 7/16 GR 8	4
13	010093	FSTN, LW 1/2 GR8	6
14	010096	FSTN, Ø7/16 ID Y-ZINC HRDND FLAT	6
15	010104	FSTN, HEX NUT 7/16-14 GR 8	4
16	010109	FSTN, NUT HEX NYLON 5/16-18	8
17	010464	FSTN, NUT NYLOK 3/8-16 GR 8	6
18	013740	FSTN, LW STAR #10	2
19	017751	FSTN, FW HARD A325 3/8 (p)	12
20	029671	FSTN, NUT HEX 1/4-20 NYLOC	3
21	043994	FSTN, SELF TAPING SCREW #8 X 1/2	3
22	052957	BACKUP ALARM (PRECO MODEL 250)	1
23	065515	CONTROL PANEL, HATZ 85250208 FOR TRTP	1
24	065694	BOLT, 7/16-14x1" GR 8 Y-Z HHC	4
25	066255	MANUAL TUBE	1
26	066816	FSTN, 10-24 X 1/2" SHCS ZINC PLATED	2
27	067804	WELD'T, CONTROL PANEL STAND 275 TRTP	1
28	067808	WELDT. CONTROL PANEL 275 TRTP	1
29	067813	COVER, ENGINE CONTROL BOX 275 TRTP	1
30	067816	COVER, LH SIDE FOR CONTROL PANEL 275	1
31	067820	ASSEMBLY, STROBE FOR APSFP800	1
32	067822	CONTROL PANEL COVER 275 TRTP	1
33	067826	CHANNEL, HINGE PLATE FOR CONTROL PANEL COVER	1
34	067828	LATCH, ROUND MAGNETIC 02-20-413-10	2
35	067830	RAIL RH SIDE OPERATOR CONSOLE 275 TRTP	1

SECTION 4 PARTS

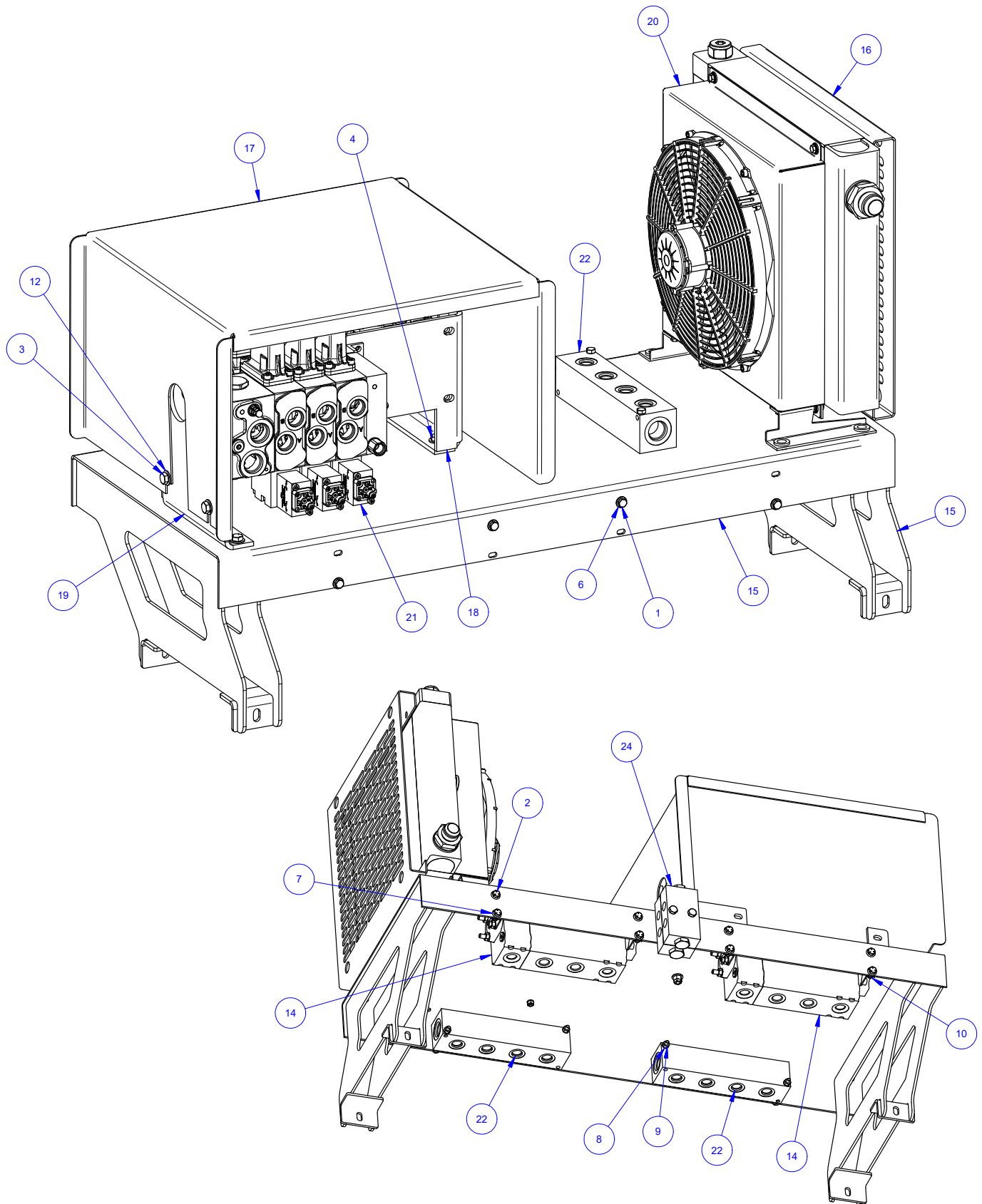
Operator Platform - Illustration (cont'd) 067805



ITEM	PART NO.	DESCRIPTION	QTY
36	067835	HAND RAIL, LH OPERATOR CONSOLE 275TRTP	1
37	067917	COVER, CONTROL PANEL 275 TRTP	1
38	067990	HANDLE, PLASTIC PULL WITH THREADED HOLES 4" CENTERS	1
39	067992	CONTROL PANEL ASSEMBLY, FOR 275 TRTP	1
40	068167	GAUGE, CHARGE SYSTEM FILTER	2
41	068362	FSTN, SHLD 1/2 X 1/2	2

SECTION 4 PARTS

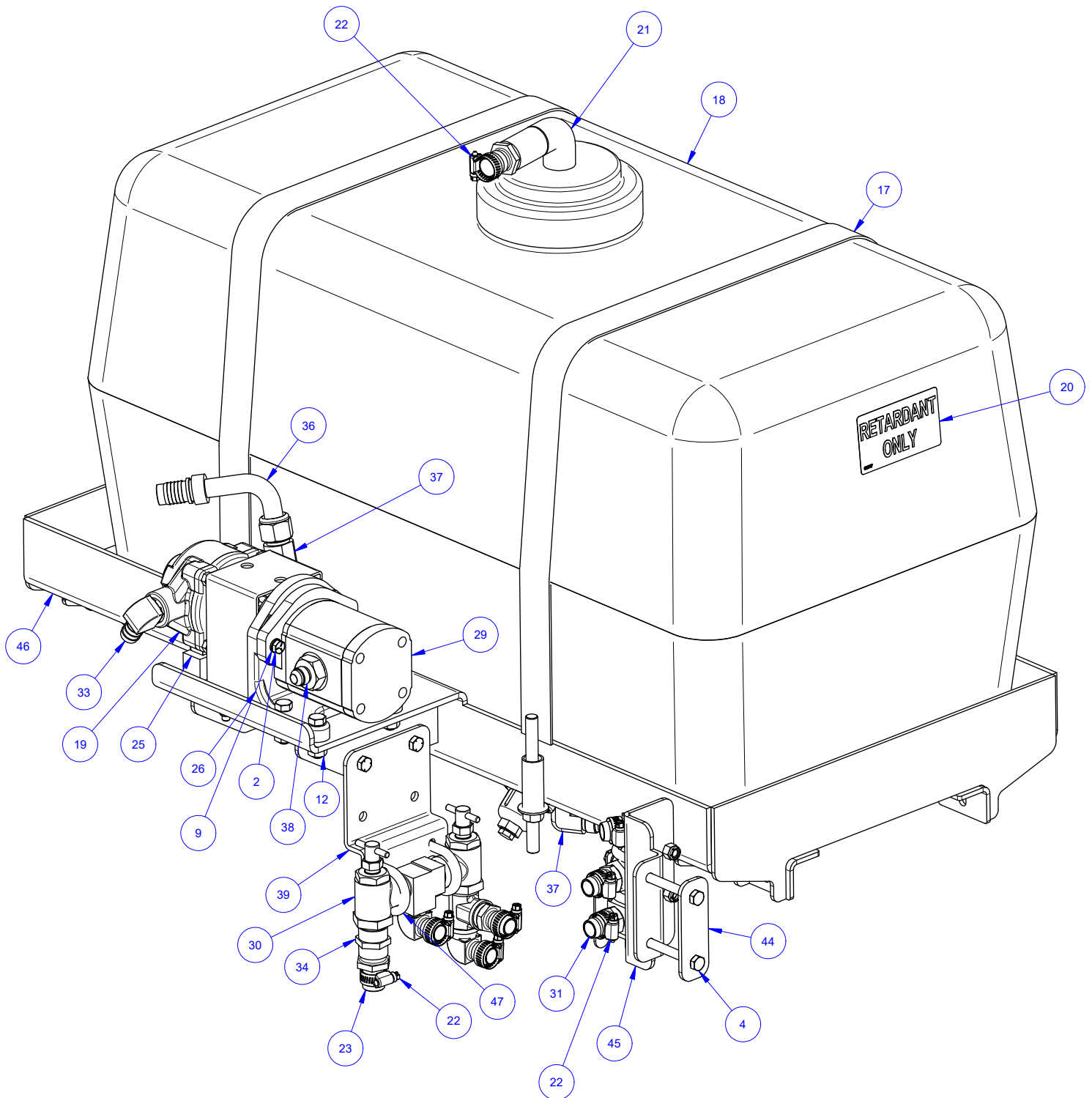
Hydraulic Tray Assembly - Illustration 067784



ITEM	PART NO.	DESCRIPTION	QTY
1	010011	FSTN, HHCS 1/4-20 X 3	4
2	010019	FSTN, HHCS 5/16-18 X 3/4 GR 5	8
3	010035	FSTN, HHCS 3/8-16 X 3/4	4
4	010036	FSTN, HHCS 3/8-16 X 1 GR 8	4
5	010045	FSTN, HHCS 3/8-16 X 3-1/4	2
6	010081	FSTN, FW 1/4	4
7	010082	FSTN, FW 5/16	8
8	010089	FSTN, LW 1/4	6
9	010098	FSTN, NUT HEX 1/4-20	6
10	010109	FSTN, NUT HEX NYLON 5/16-18	8
11	010464	FSTN, NUT NYLOK 3/8-16 GR 8	6
12	017751	FSTN, FW HARD A325 3/8 (p)	12
13	033711	FSTN, HHCS 1/2-13 X 4 1/2"	2
14	064626	4 SECTION SPLITTER FOR 275 TRTP	2
15	067785	TRAY, HYDRAULIC FOR 275 TRTP	1
16	067789	COVER, COOLER FOR 275 TRTP	1
17	067790	COVER, FOR CONTROL VALVE 275 TRTP	1
18	067791	FRONT VALVE MOUNT BRACKET 275 TRTP	1
19	067793	REAR VALVE MNT BRACKET 275 TRTP	1
20	068169	COOLER, HYDRAULIC FOR 275 TRTP	1
21	068170	HYD. VALVE 3 SECTION FOR 275 TRTP	1
22	068171	BLOCK, HEADER ALUMN 4 PORTS #8 AH0000408S	3
23	068173	HYD. VALVE 6 SECTION FOR 275 TRTP	1
24	068174	CHECK VALVE, PILOT OPERATED FOR 275 TRTP	2

SECTION 4 PARTS

Water Spray Assembly - Illustration 067795



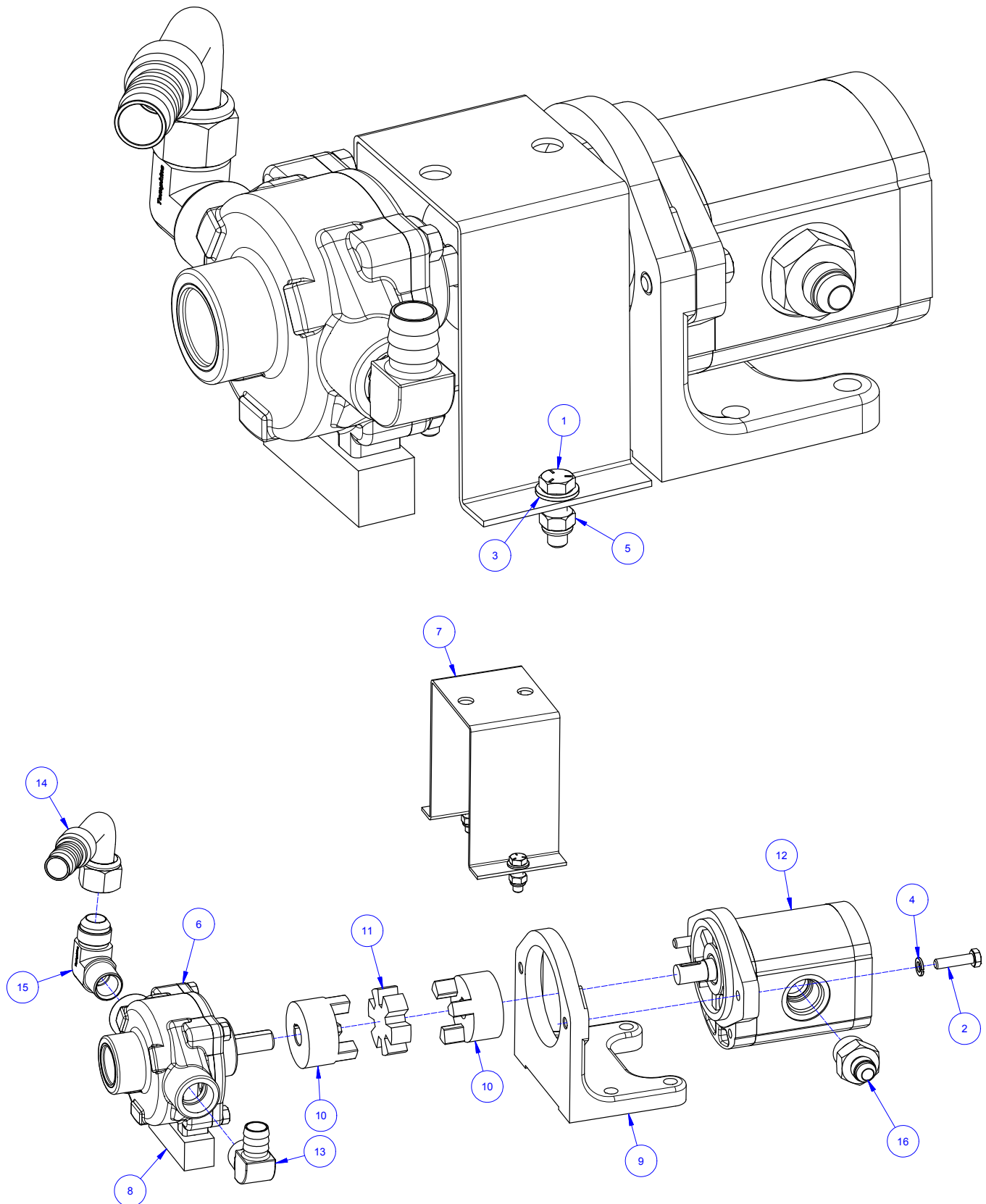
Water Spray Assembly - Parts List 067795

SECTION 4 PARTS

ITEM	PART NO.	DESCRIPTION	QTY
1	010020	FSTN, HHCS 5/16-18 X 1	2
2	010021	FSTN, HHCS 5/16-18 X 1-1/4 GR5	2
3	010036	FSTN, HHCS 3/8-16 X 1 GR 8	2
4	010045	FSTN, HHCS 3/8-16 X 3-1/4	2
5	010054	FSTN, HHCS 7/16-14 X 1 1/2" LONG GR	4
6	010082	FSTN, FW 5/16	2
7	010083	FSTN, FW 3/8	4
8	010085	FSTN, FW 1/2 GR8	2
9	010090	FSTN, LW 5/16	2
10	010092	FSTN, LW 7/16 GR 8	4
11	010102	FSTN, NUT HEX 3/8-16	2
12	010104	FSTN, HEX NUT 7/16-14 GR 8	4
13	010106	FSTN, NUT HEX 1/2-13 GR8	2
14	010125	FSTN, PIN CLEVIS 1/2 SAE PLN	2
15	010464	FSTN, NUT NYLOK 3/8-16 GR 8	10
16	012612	FSTN, NUT HEX NYLOCK 5/16-18	2
17	029139	STRAP, BARREL BRACKET TRTF	2
18	029317	TANK, WATER 55 GAL W/ HOLE IN CAP	1
19	029418	PUMP, 6500C-R	1
20	-	-	1
21	038233	ASSEMBLY, RETURN TUBE F/ TRTP	1
22	038664	#10 HOSE CLAMP	8
23	038971	FITTING, 3/4 NPT X 3/4 HOLES BARB (OPEN) 9910 (CLOSED)	1
24	039788	GUARD, F/HYD. WATER PUMP TRTP	1
25	039789	SPACER, BLOCK F/WATER PUMP F/TRTP	1
26	040059	FOOT BRACKET, WATER PUMP TRTP	1
27	040060	COUPLER, JAW F/ WATER PUMP (TRTP)	2
28	040061	INSERT, JAW COUPLER WATER PUMP TRTP	1
29	040065	MOTOR, WATER PUMP (TRTP)	1
30	040107	RELIEF VALVE, TRTP SPRAY SYSTEM	2
31	040108	FTG, 3/4 MPT x 3/4 HOSE BARB	3
32	040109	FTG, 3/4 MPT x 3/4 GARDEN	1
33	040110	FTG, 3/4 MPT x 3/4 90° HOSE BARB	4
34	040115	FTG, 3/4 COUPLER	1
35	040116	FTG, 3/4 CLOSE NIPPLE	2
36	044654	FITTING, 212-S-672	1
37	045137	FTG., F2501-12-12-0	2
38	045951	FTG, F6400-8-12-0 STR	2
39	046373	BRACKET, WATER VALVE MNT PLATE	1
40	047412	3/4 NPT Ball Valve	1
41	048382	Y-STRAINER, POLY 3/4 NPT F/ TRTP	1
42	057914	FTG. 100F 3/4 FGD TEE-3 ENDS FEM PIP	1
43	057930	3/4 ML RUN TEE (FEM X ML X FEM PIPE)	2
44	067610	PLATE, CLAMPING FOR VALVE MOUNTING FOR WATER SYSTEM 275 TRTP	1
45	067612	BRACKET, FOR VALVE MOUNTING FOR WATER SYSTEM 275 TRTP	1
46	067796	TANK STAND FOR 275 TRTP	1
47	116008	U-BOLT CLAMP	4

SECTION 4 PARTS

Spray Pump Assembly - Illustration



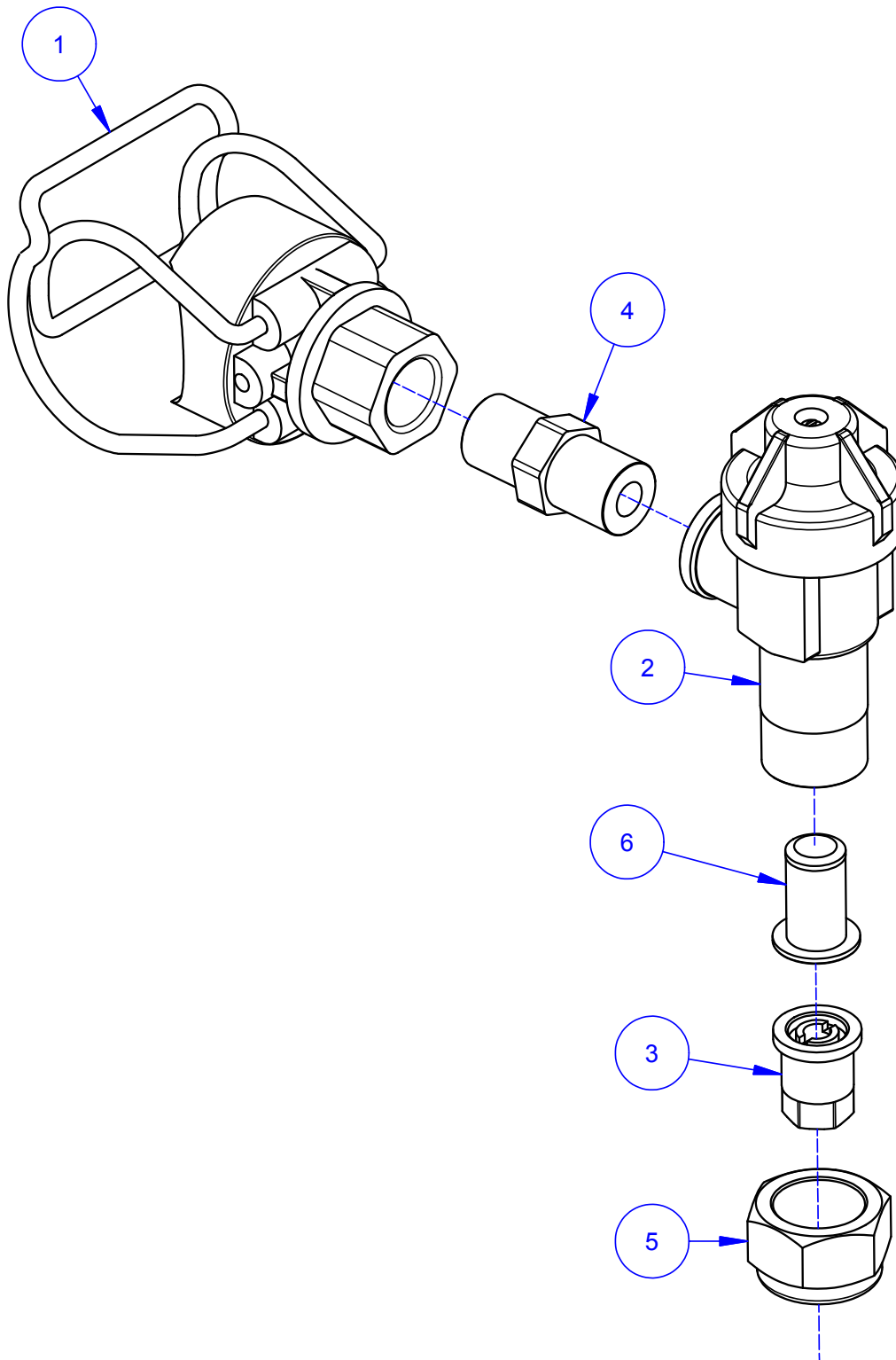
Spray Pump Assembly - Parts List

SECTION 4 PARTS

ITEM	PART NO.	DESCRIPTION	QTY
1	010020	FSTN, HHCS 5/16-18 X 1	2
2	010021	FSTN, HHCS 5/16-18 X 1-1/4 GR5	2
3	010082	FSTN, FW 5/16	2
4	010090	FSTN, LW 5/16	2
5	012612	FSTN, NUT HEX NYLOCK 5/16-18	2
6	029418	PUMP, 6500C-R	1
7	039788	GUARD, F/HYD. WATER PUMP TRTP	1
8	039789	SPACER, BLOCK F/WATER PUMP F/TRTP	1
9	040059	FOOT BRACKET, WATER PUMP TRTP	1
10	040060	COUPLER, JAW F/ WATER PUMP (TRTP)	2
11	040061	INSERT, JAW COUPLER WATER PUMP TRTP	1
12	040065	MOTOR, WATER PUMP (TRTP)	1
13	040110	FTG, 3/4 MPT x 3/4 90° HOSE BARB	1
14	044654	FITTING, 212-S-672	1
15	045137	FTG., F2501-12-12-0	1
16	045951	FTG, F6400-8-12-0 STR	2

SECTION 4 PARTS

Spray Nozzle Assembly - Illustration 044914



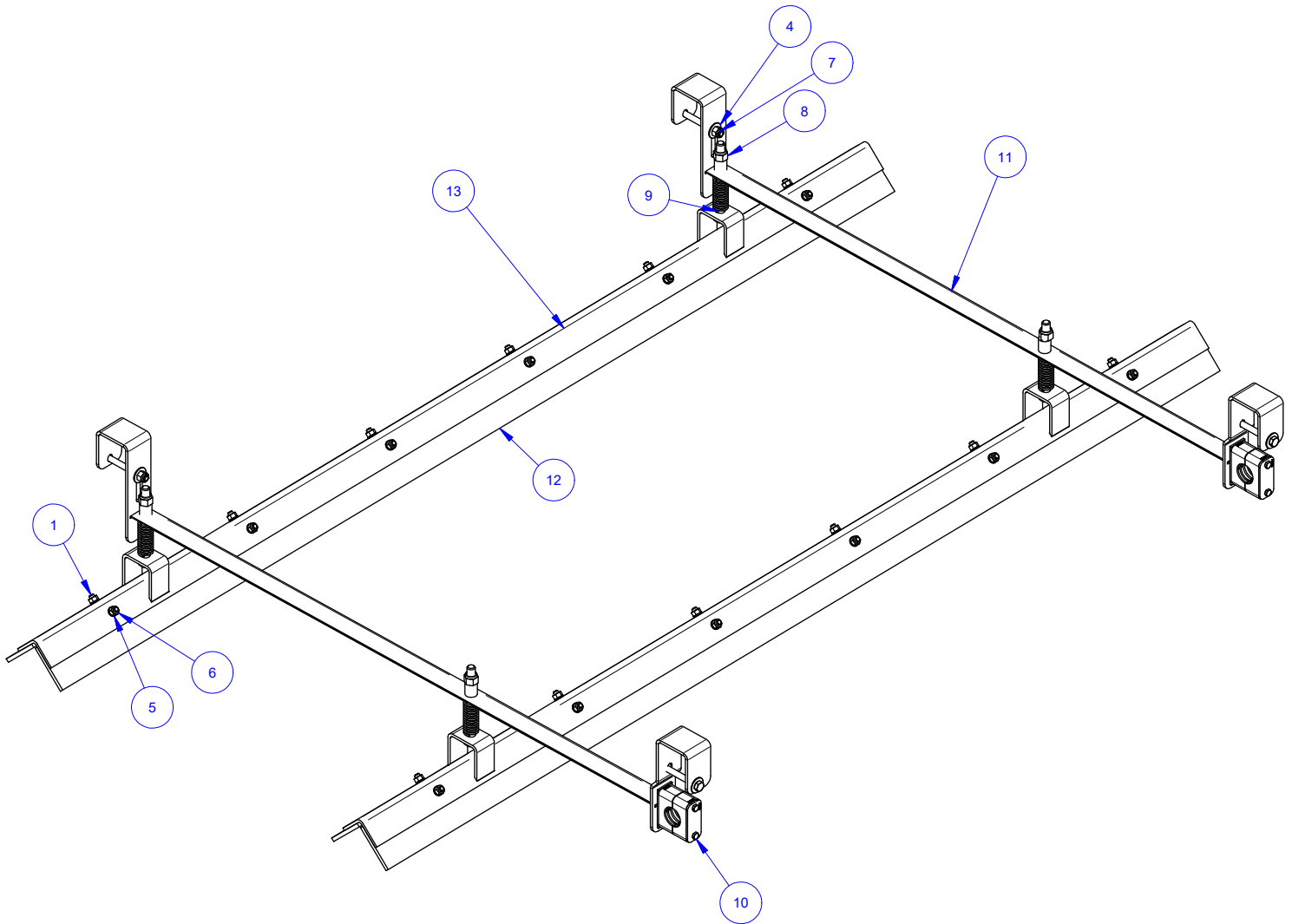
Spray Nozzle Assembly - Parts List 044914

SECTION 4 PARTS

ITEM	PART NO.	DESCRIPTION	QTY
-	044914	ASSY, TRTP PLASTIC SPRAY NOZZLE	-
1	041603	ADAPTOR, 1/4 CLAMP-ON	1
2	041604	VALVE, CHECK BODY	1
3	041605	SPRAY TIP F/TRTP (PLASTIC)	1
4	041606	PLASTIC 1/4 NPT CLOSE NIPPLE	1
5	041624	RETAINER, NYLON SPRAY TIP	1
6	047579	STRAINER, POLY 100 MESH	1

SECTION 4 PARTS

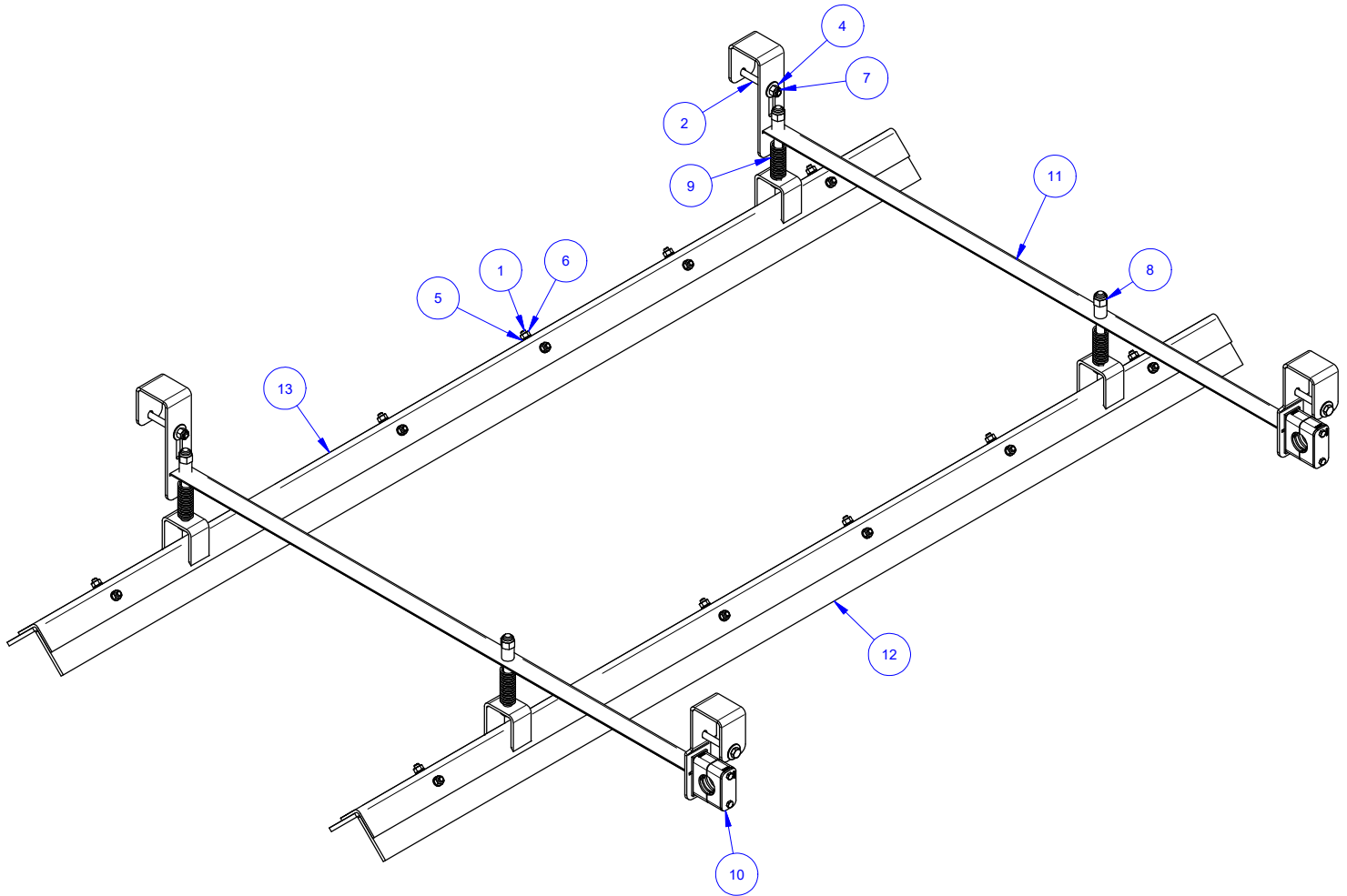
RH 6' End Scraper Assembly - Illustration 067841



ITEM	PART NO.	DESCRIPTION	QTY
1	010020	FSTN, HHCS 5/16-18 X 1	24
2	010045	FSTN, HHCS 3/8-16 X 3-1/4	4
3	010082	FSTN, FW 5/16	24
4	010083	FSTN, FW 3/8	8
5	010090	FSTN, LW 5/16	24
6	010100	FSTN, NUT HEX 5/16-18 GR8	24
7	010464	FSTN, NUT NYLOK 3/8-16 GR 8	4
8	011238	FSTN, NUT HEX NYLOK 1/2-13	4
9	033936	SPRING, SCRAPER ASSEMBLY TRTP	4
10	051299	CLAMP, POLY F/ CURE SPRAY BAR PWB18	2
11	051652	WELD'T, SCRAPER MOUNT F/ 255CD	2
12	051655	SCRAPER, 6' TIVAR F/ 255CD	4
13	067908	WELD'T, 6' END SCRAPER FOR 275 TRTP	2

SECTION 4 PARTS

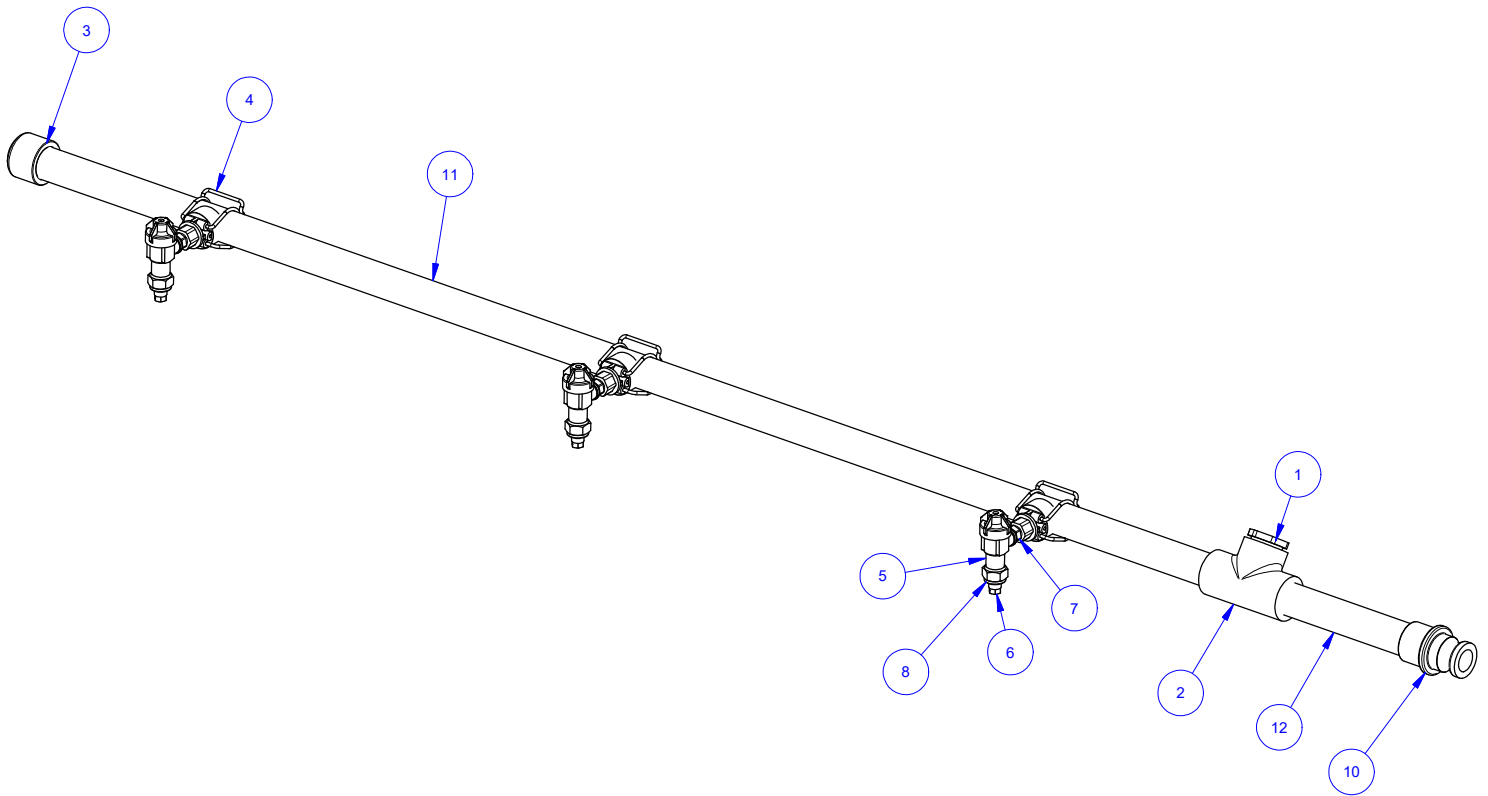
LH 6' End Scraper Assembly - Illustration 067842



ITEM	PART NO.	DESCRIPTION	QTY
1	010020	FSTN, HHCS 5/16-18 X 1	24
2	010045	FSTN, HHCS 3/8-16 X 3-1/4	4
3	010082	FSTN, FW 5/16	24
4	010083	FSTN, FW 3/8	8
5	010090	FSTN, LW 5/16	24
6	010100	FSTN, NUT HEX 5/16-18 GR8	24
7	010464	FSTN, NUT NYLOK 3/8-16 GR 8	4
8	011238	FSTN, NUT HEX NYLOK 1/2-13	4
9	033936	SPRING, SCRAPER ASSEMBLY TRTP	4
10	051299	CLAMP, POLY F/ CURE SPRAY BAR PWB18	2
11	051652	WELD'T, SCRAPER MOUNT F/ 255CD	2
12	051655	SCRAPER, 6' TIVAR F/ 255CD	4
13	067908	WELD'T, 6' END SCRAPER FOR 275 TRTP	2

SECTION 4 PARTS

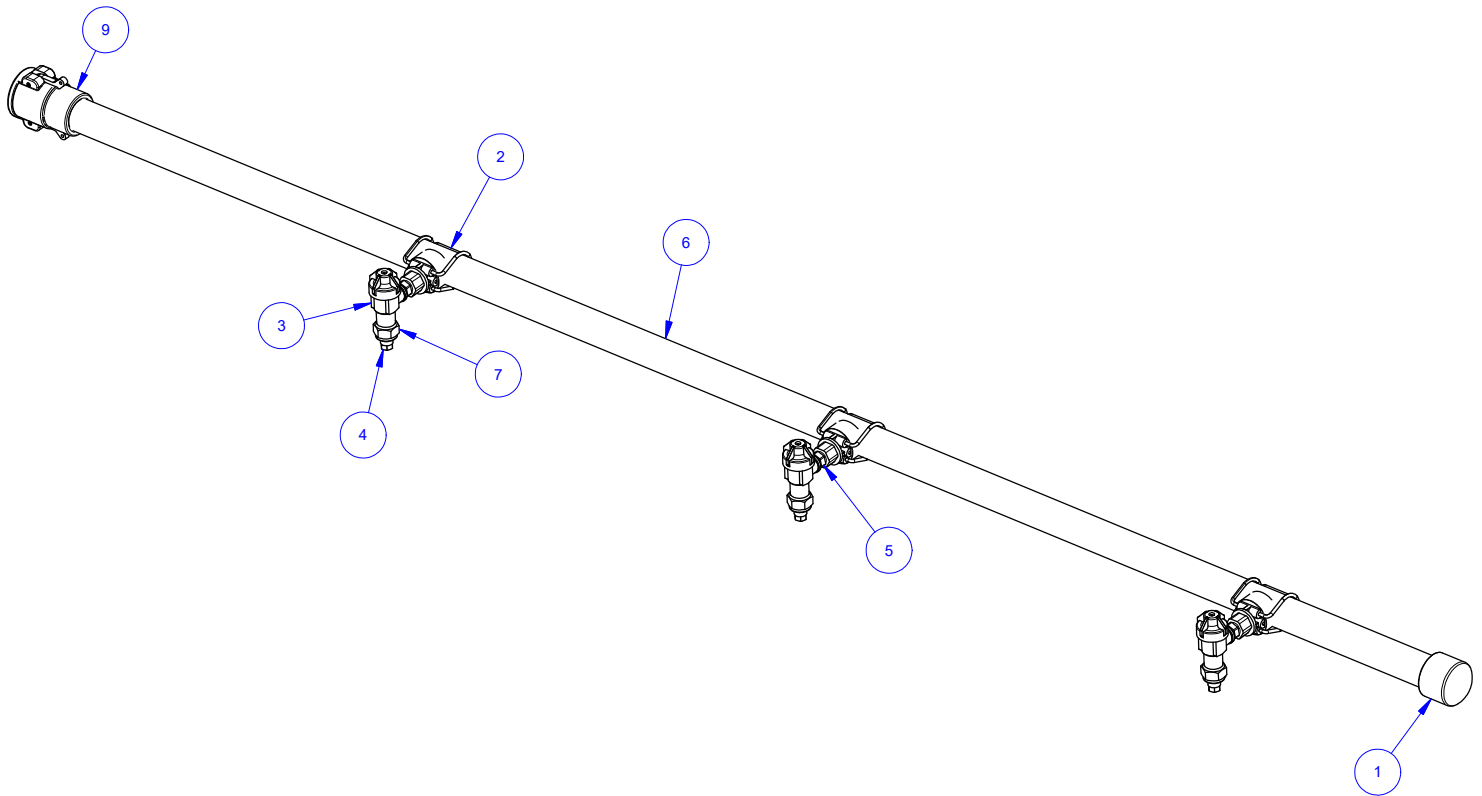
RH 6' Spray Bar Assembly - Illustration 068055



ITEM	PART NO.	DESCRIPTION	QTY
1	041598	BUSHING 1 x 3/4 SCH 80 PVC THREADED	1
2	041599	TEE 1" SCH 80 PVC	1
3	041602	CAP, 1" SCH 80 PVC	1
4	041603	ADAPTOR, 1/4 CLAMP-ON	3
5	041604	VALVE, CHECK BODY	3
6	041605	SPRAY TIP F/TRTP (PLASTIC)	3
7	041606	PLASTIC 1/4 NPT CLOSE NIPPLE	3
8	041624	RETAINER, NYLON SPRAY TIP	3
9	065244	STRAINER, POLY 100 μ MESH, W/ CHECK VALVE	3
10	067944	1" MALE PVC QUICK COUPLER SLIP FIT X100	1
11	068056	1" SCH 80 PVC x 66.688	1
12	068057	1" SCH 80 PVC x 66.688	1

SECTION 4 PARTS

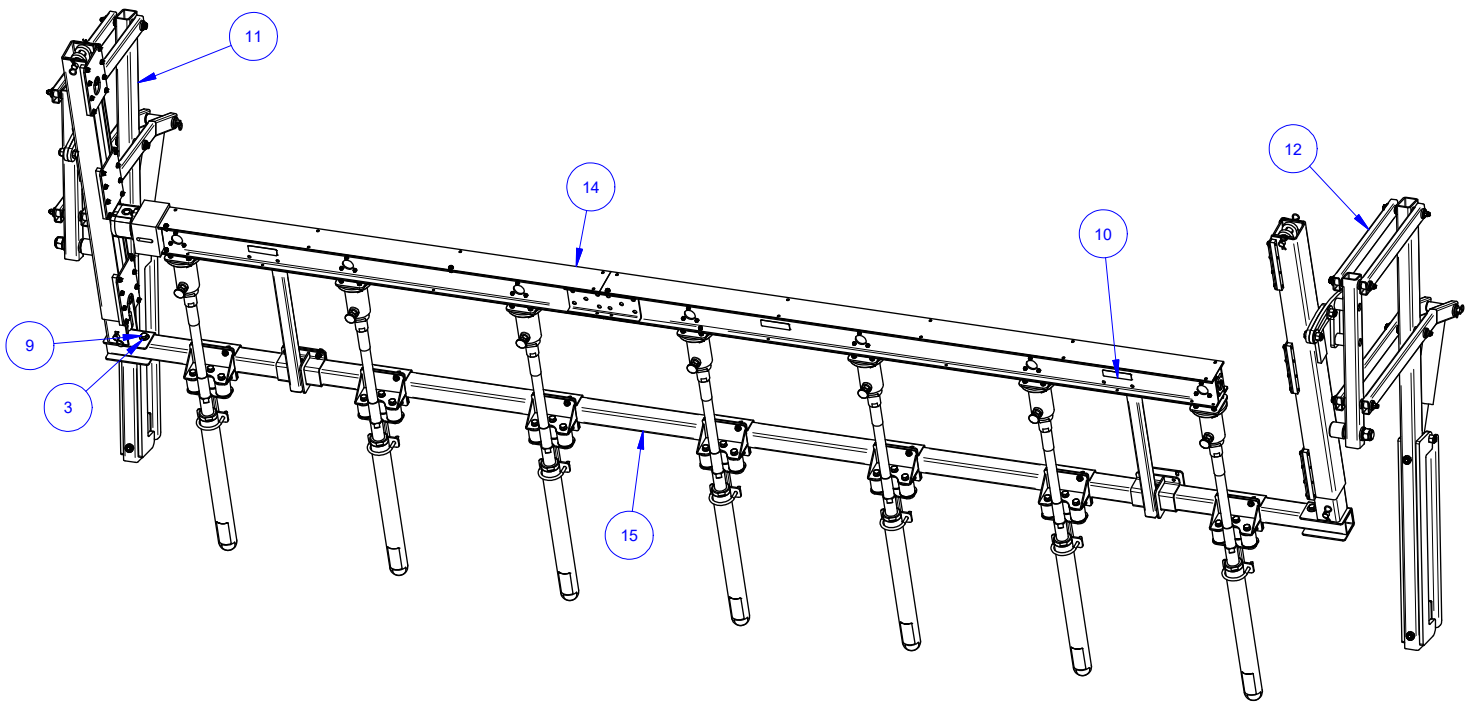
LH 6' Spray Bar Assembly - Illustration 067947



ITEM	PART NO.	DESCRIPTION	QTY
1	041602	CAP, 1" SCH 80 PVC	1
2	041603	ADAPTOR, 1/4 CLAMP-ON	3
3	041604	VALVE, CHECK BODY	3
4	041605	SPRAY TIP F/TRTP (PLASTIC)	3
5	041606	PLASTIC 1/4 NPT CLOSE NIPPLE	3
6	041610	1" SCH 80 PVC x 68.688	1
7	041624	RETAINER, NYLON SPRAY TIP	3
8	065244	STRAINER, POLY 100 μ MESH, W/ CHECK VALVE	3
9	067945	1" FEMALE PVC QUICK COUPLER SLIP FIT X100	1

SECTION 4 PARTS

16' Gang Vibration Assembly - Illustration 069269



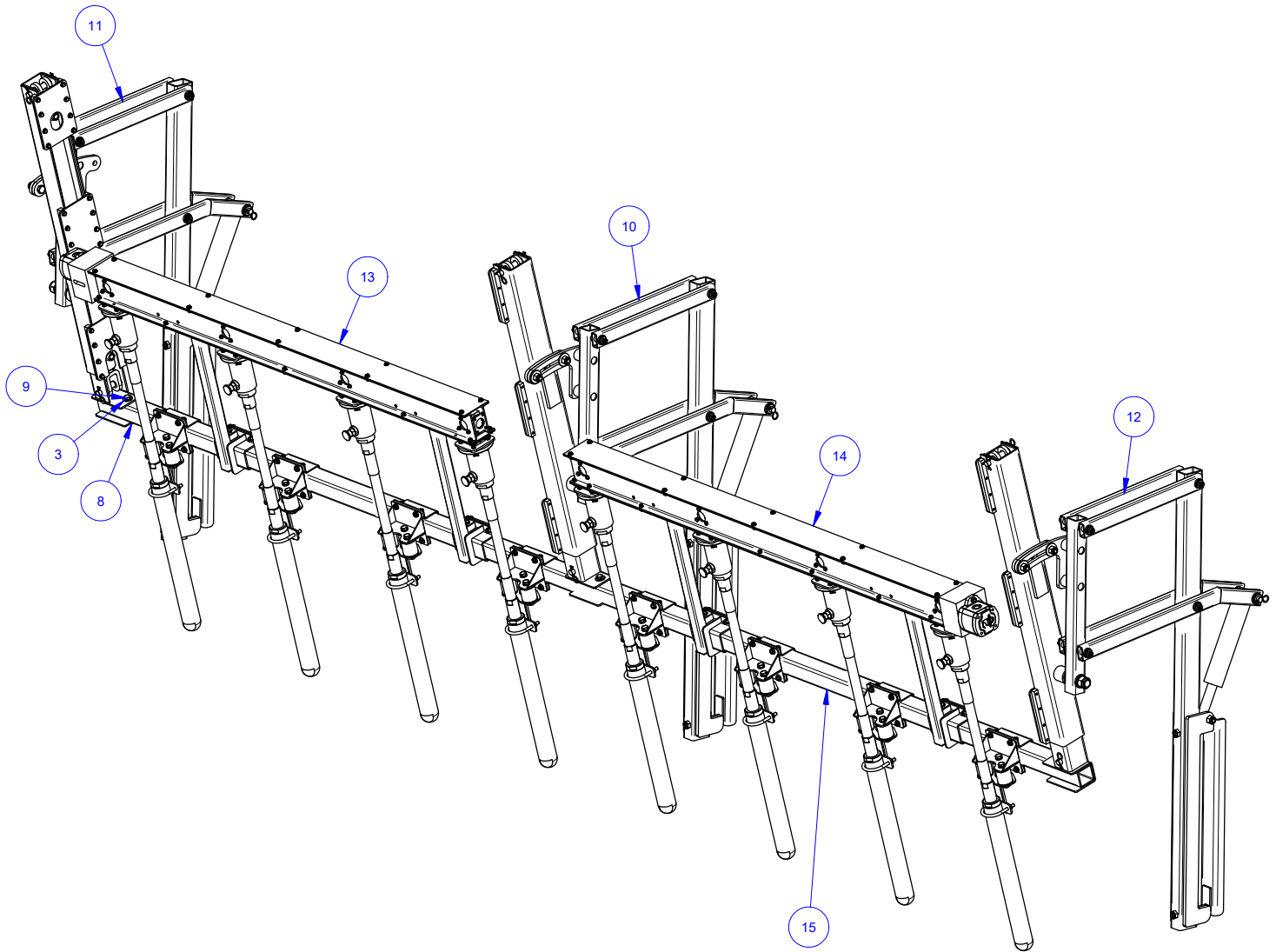
16' Gang Vibration Assembly - Parts List 069269

SECTION 4 PARTS

ITEM	PART NO.	DESCRIPTION	QTY
1	010002	FSTN, HHCS 1/4-20 X 3/4	2
2	010081	FSTN, FW 1/4	2
3	010085	FSTN, FW 1/2 GR8	5
4	010089	FSTN, LW 1/4	2
5	010095	FSTN, LW 5/8	4
6	010098	FSTN, NUT HEX 1/4-20	2
7	010110	FSTN, NUT HEX 5/8-11 GR 8	4
8	011238	FSTN, NUT HEX NYLOK 1/2-13	3
9	038781	FSTN, HHCS 1/2-13 X 3 3/4 GR 8	2
10	066512	DECAL, NOTICE ITS OT UNCOMMON FOR	4
11	067616	RH GANG LIFT ASSEMBLY 275 TRTP	1
12	067617	LH GANG LIFT ASSEMBLY 275 TRTP	1
13	068228B	FSTN, HHCS 5/8-11 X 7" GRADE 8	4
14	068773	RH 7 BANK GANG RACK ASSEM. 275 TRTP	1
15	069273	TUBING, 16' BOTTOM VIB. RACK SUPPORT 275 TRTP	1

SECTION 4 PARTS

18' Gang Vibration Assembly - Illustration 068165



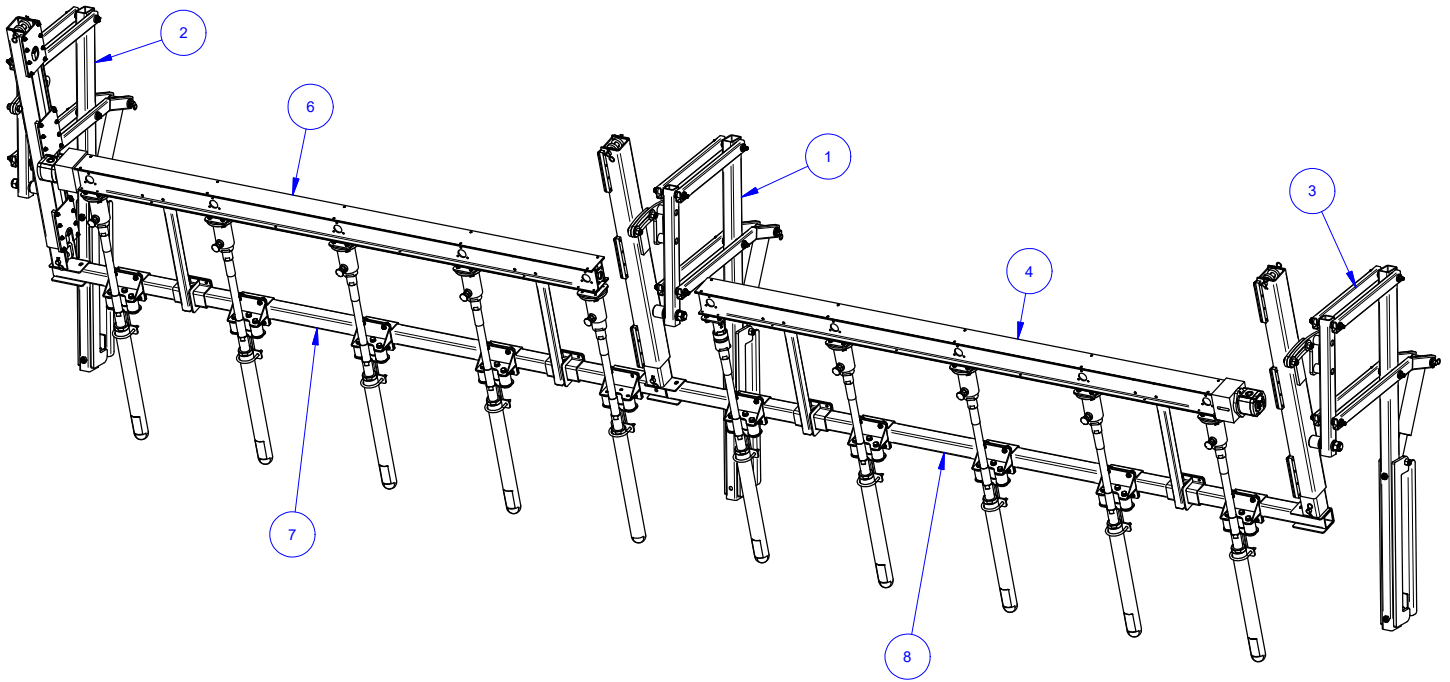
18' Gang Vibration Assembly - Parts List 068165

SECTION 4 PARTS

ITEM	PART NO.	DESCRIPTION	QTY
1	010002	FSTN, HHCS 1/4-20 X 3/4	2
2	010081	FSTN, FW 1/4	2
3	010085	FSTN, FW 1/2 GR8	6
4	010089	FSTN, LW 1/4	2
5	010095	FSTN, LW 5/8	6
6	010098	FSTN, NUT HEX 1/4-20	2
7	010110	FSTN, NUT HEX 5/8-11 GR 8	6
8	011238	FSTN, NUT HEX NYLOK 1/2-13	3
9	038781	FSTN, HHCS 1/2-13 X 3 3/4 GR 8	3
10	067615	CENTER LH GANG LIFT ASSEM. 275 TRTP	1
11	067616	RH GANG LIFT ASSEMBLY 275 TRTP	1
12	067617	LH GANG LIFT ASSEMBLY 275 TRTP	1
13	067706	RH 4 BANK GANG RACK ASSEM. 275 TRTP	1
14	067707	4 BANK VIBRATOR GANG ASSEMBLY 275 TRTP	1
15	067709	TUBING, 18' BOTTOM VIB. RACK SUPPORT 275 TRTP	1
16	068228	FSTN, HHCS 5/8-11 X 7" GRADE 8	6

SECTION 4 PARTS

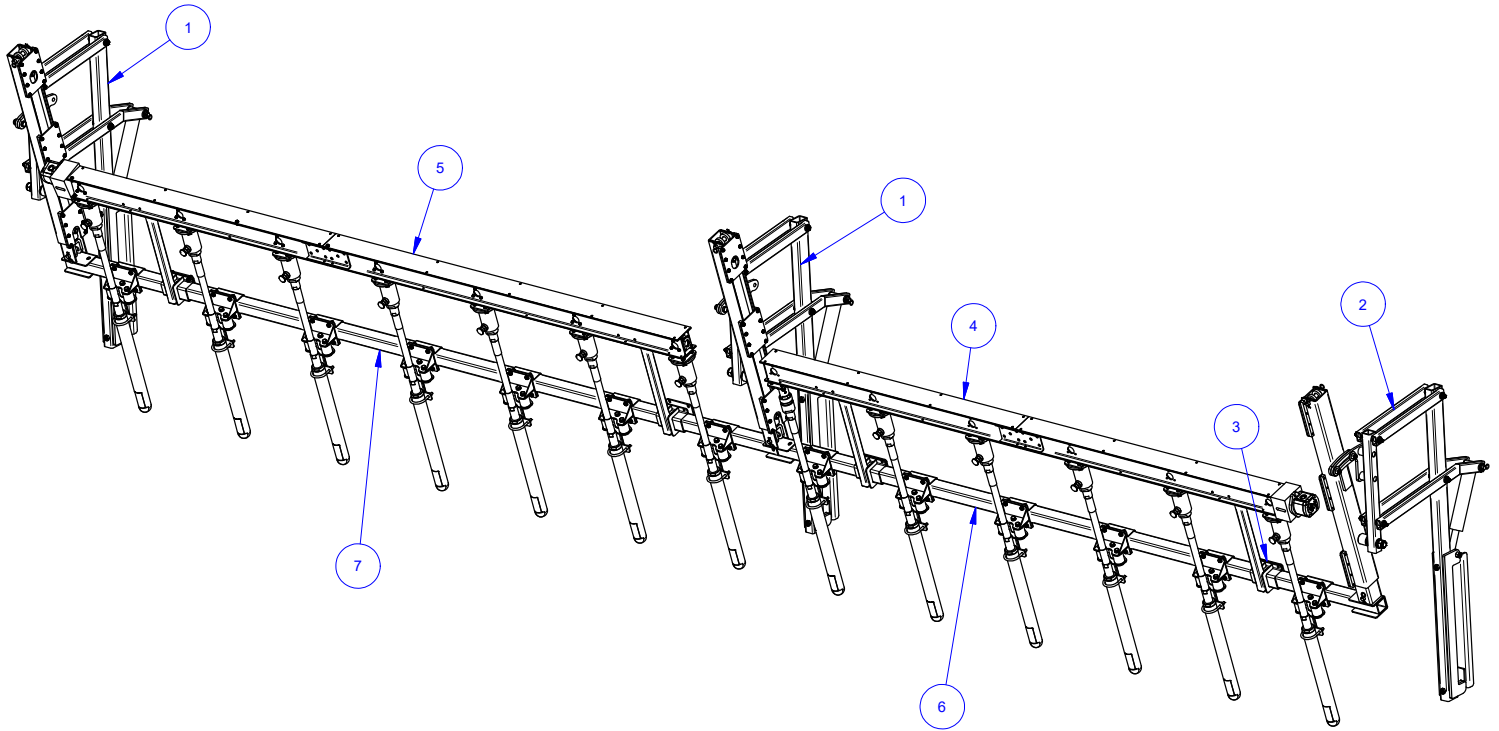
22' Gang Vibration Assembly - Illustration 069265



ITEM	PART NO.	DESCRIPTION	QTY
1	067615	CENTER LH GANG LIFT ASSEM. 275 TRTP	1
2	067616	RH GANG LIFT ASSEMBLY 275 TRTP	1
3	067617	LH GANG LIFT ASSEMBLY 275 TRTP	1
4	067708	LH 5 BANK GANG RACK ASSEM. 275 TRTP	1
5	067717	PLATE, BACK FOR GANG RACK UPRIGHT MONTING 275 TRTP	4
6	068108	RH 5 BANK GANG RACK ASSEM. 275 TRTP	1
7	069213	TUBING, 24' AND 22' BOTTOM RH VIB. RACK SUPPORT 275 TRTP	1
8	069266	TUBING, 22' BOTTOM VIB. RACK LH SUPPORT 275 TRTP	1

SECTION 4 PARTS

28' Gang Vibration Assembly - Illustration 069224



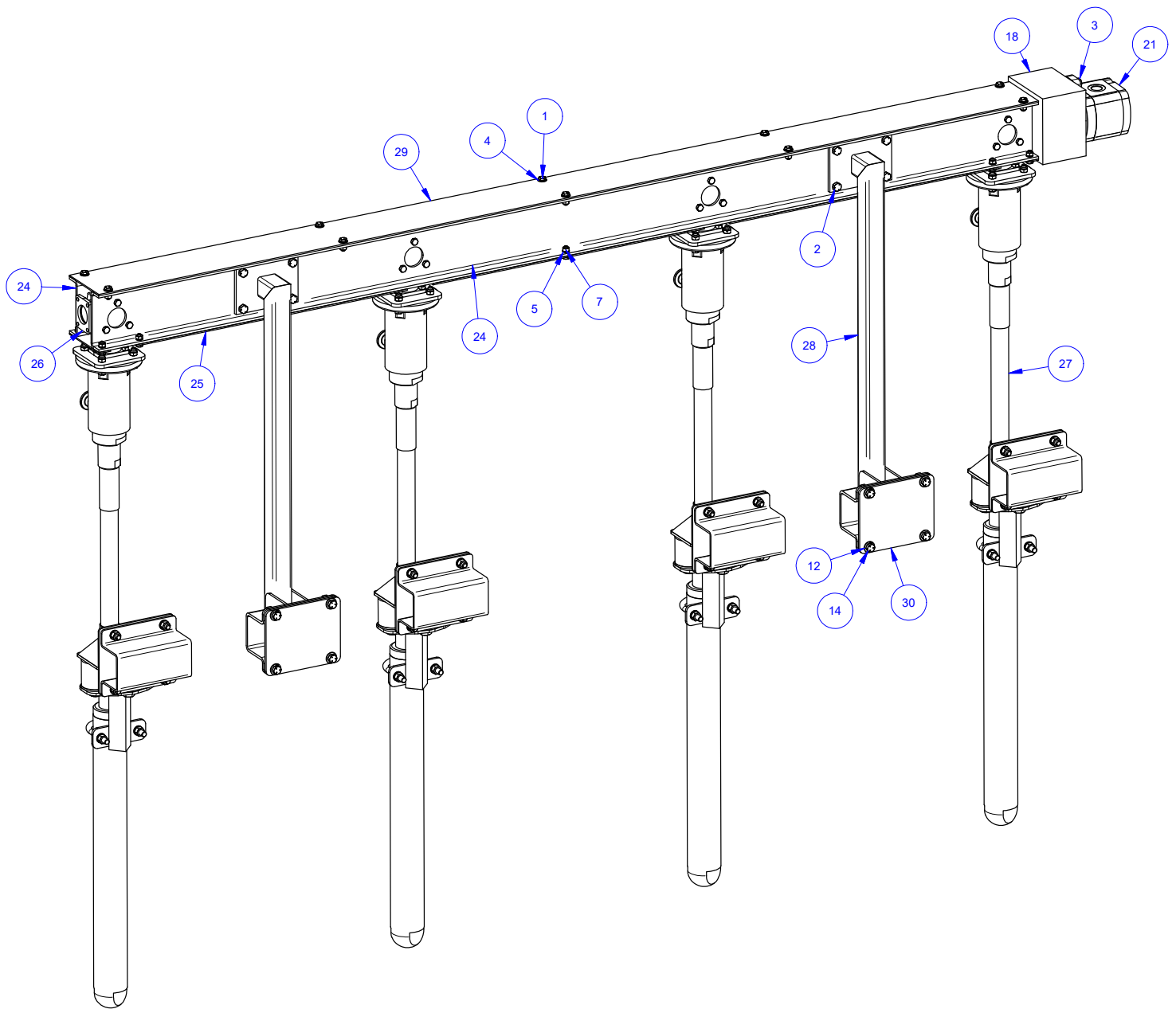
28' Gang Vibration Assembly - Parts List 069224

SECTION 4 PARTS

ITEM	PART NO.	DESCRIPTION	QTY
1	067616	RH GANG LIFT ASSEMBLY 275 TRTP	2
2	067617	LH GANG LIFT ASSEMBLY 275 TRTP	1
3	067717	PLATE, BACK FOR GANG RACK UPRIGHT MONTING 275 TRTP	2
4	068140	LH 6 BANK GANG RACK ASSEM. 275 TRTP	1
5	068773	RH 7 BANK GANG RACK ASSEM. 275 TRTP	1
6	068776	TUBING, 28' (2 BANK)BOTTOM VIB. RACK LH SUPPORT 275 TRTP	1
7	068876	TUBING, 28' (2 BANK)BOTTOM RH VIB. RACK SUPPORT 275 TRTP	1

SECTION 4 PARTS

RH Rack Assembly - Illustration 067706



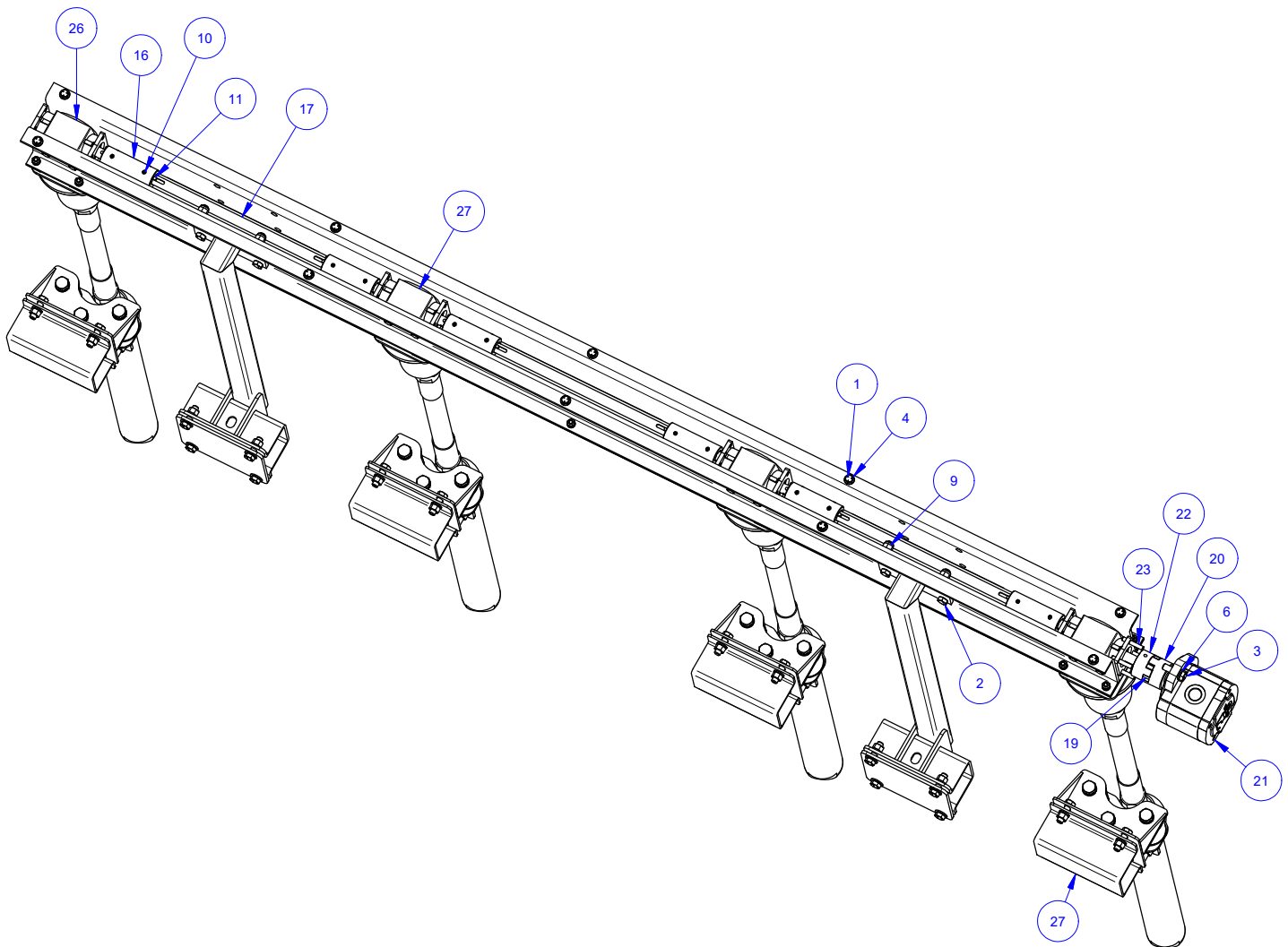
RH Rack Assembly - Parts List 067706

SECTION 4 PARTS

ITEM	PART NO.	DESCRIPTION	QTY
1	010002	FSTN, HHCS 1/4-20 X 3/4	22
2	010036	FSTN, HHCS 3/8-16 X 1 GR 8	8
3	010037	FSTN, HHCS 3/8-16 X 1-1/4 GR 5	2
4	010081	FSTN, FW 1/4	22
5	010089	FSTN, LW 1/4	22
6	010091	FSTN, LW 3/8	10
7	010098	FSTN, NUT HEX 1/4-20	22
8	010102	FSTN, NUT HEX 3/8-16	8
9	010464	FSTN, NUT NYLOK 3/8-16 GR 8	8
10	012869	SCR, 1/4-20x3/8 BO SKT SET	24
11	015813	KEY, 3/16" SQ X 1" LG WITH RADI ENDS	16
12	017751	FSTN, FW HARD A325 3/8	8
13	020542	FSTN, NUT STOVER LOCK 1/4-20	12
14	032875	FSTN, HHCS 3/8-16 X 1-1/4 GR 8	8
15	033711	FSTN, HHCS 1/2-13 X 4 1/2"	12
16	044859	COUPLER, DRIVE SHAFT F/ VIB RACK	6
17	044860	SHAFT, 15 1/2" DRIVE	3
18	044889	ADAPTER BLOCK FOR GEARBOX	1
19	049327	SPIDER, LOVEJOY HYD MOTOR (L-075)	1
20	049345	COUPLER, JAW (685144-37240)	1
21	049367	MOTOR, HYD F/ GANG VIB 255CD	1
22	049416	COUPLER, JAW (685144-10688)	1
23	049959	Stud, 1/4-20 x 1 7/16" long	4
24	067674	CHANNEL, VIBRATOR GEARBOX MOUNT 4 BANK FRONT RH 275 TRTP	2
25	067675	COVER, BOTTOM FOR 4 BANK GANG DRIVE ASSEMBLY	1
26	067688	ASSEMBLY, RH END VIBRATOR FOR 275 TRTP GANG	1
27	067689	ASSEMBLY, VIBRATOR FOR 275 TRTP GANG	3
28	067692	BRACKET, GANG RACK SUPPORT FOR 275 TRTP	2
29	067693	COVER, TOP FOR 4 BANK GANG DRIVE ASSEMBLY	1
30	067717	PLATE, BACK FOR GANG RACK UPRIGHT MONTING 275 TRTP	2

SECTION 4 PARTS

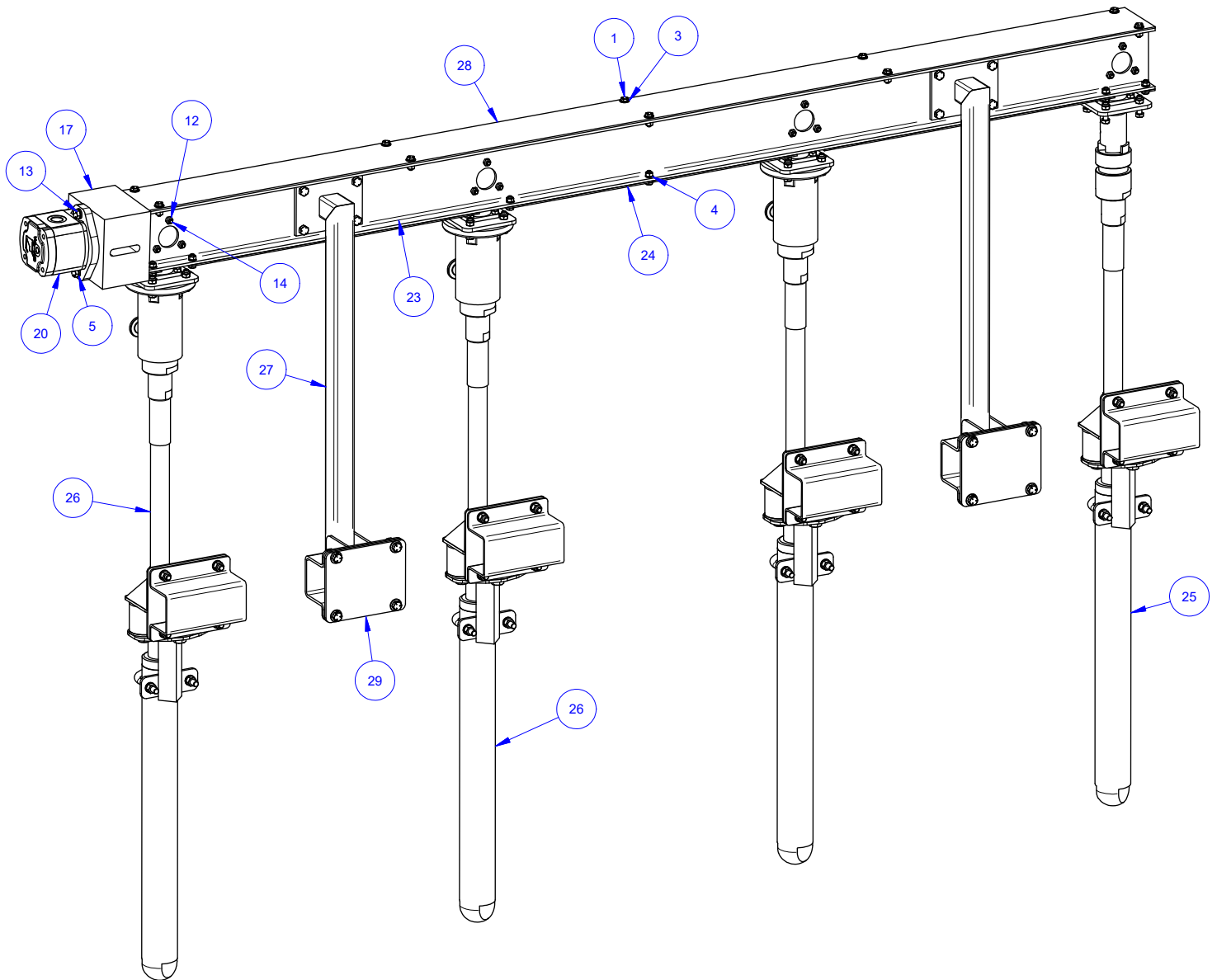
RH Rack Assembly - Illustration (cont'd) 067706



ITEM	PART NO.	DESCRIPTION	QTY
1	010002	FSTN, HHCS 1/4-20 X 3/4	22
2	010036	FSTN, HHCS 3/8-16 X 1 GR 8	8
3	010037	FSTN, HHCS 3/8-16 X 1-1/4 GR 5	2
4	010081	FSTN, FW 1/4	22
5	010089	FSTN, LW 1/4	22
6	010091	FSTN, LW 3/8	10
7	010098	FSTN, NUT HEX 1/4-20	22
8	010102	FSTN, NUT HEX 3/8-16	8
9	010464	FSTN, NUT NYLOK 3/8-16 GR 8	8
10	012869	SCR, 1/4-20x3/8 BO SKT SET	24
11	015813	KEY, 3/16" SQ X 1" LG WITH RADI ENDS	16
12	017751	FSTN, FW HARD A325 3/8	8
13	020542	FSTN, NUT STOVER LOCK 1/4-20	12
14	032875	FSTN, HHCS 3/8-16 X 1-1/4 GR 8	8
15	033711	FSTN, HHCS 1/2-13 X 4 1/2"	12
16	044859	COUPLER, DRIVE SHAFT F/ VIB RACK	6
17	044860	SHAFT, 15 1/2" DRIVE	3
18	044889	ADAPTER BLOCK FOR GEARBOX	1
19	049327	SPIDER, LOVEJOY HYD MOTOR (L-075)	1
20	049345	COUPLER, JAW (685144-37240)	1
21	049367	MOTOR, HYD F/ GANG VIB 255CD	1
22	049416	COUPLER, JAW (685144-10688)	1
23	049959	Stud, 1/4-20 x 1 7/16" long	4
24	067674	CHANNEL, VIBRATOR GEARBOX MOUNT 4 BANK FRONT RH 275 TRTP	2
25	067675	COVER, BOTTOM FOR 4 BANK GANG DRIVE ASSEMBLY	1
26	067688	ASSEMBLY, RH END VIBRATOR FOR 275 TRTP GANG	1
27	067689	ASSEMBLY, VIBRATOR FOR 275 TRTP GANG	3
28	067692	BRACKET, GANG RACK SUPPORT FOR 275 TRTP	2
29	067693	COVER, TOP FOR 4 BANK GANG DRIVE ASSEMBLY	1
30	067717	PLATE, BACK FOR GANG RACK UPRIGHT MONTING 275 TRTP	2

SECTION 4 PARTS

LH Rack Assembly - Illustration 067707



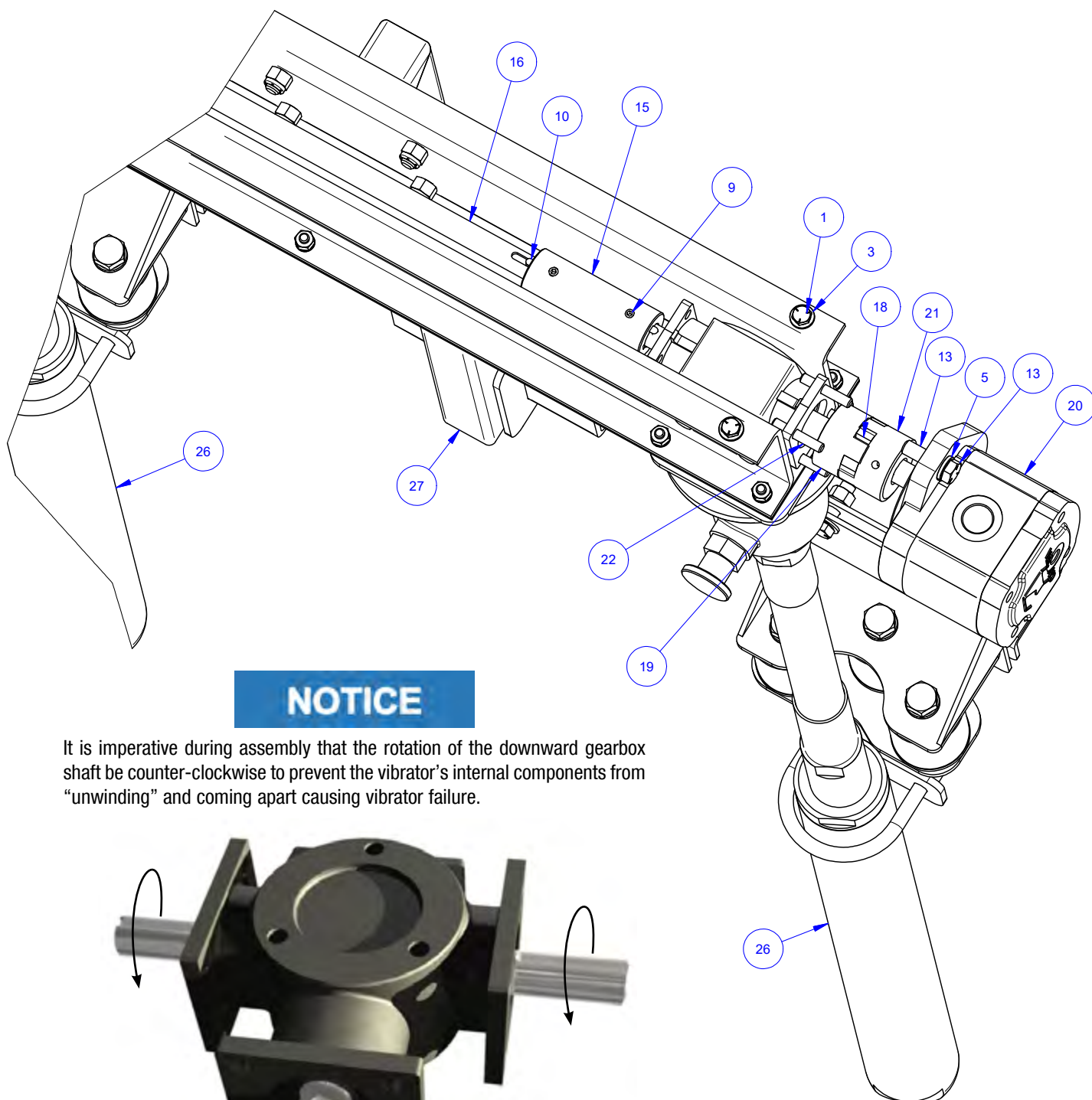
LH Rack Assembly - Parts List 067707

SECTION 4 PARTS

ITEM	PART NO.	DESCRIPTION	QTY
1	010002	FSTN, HHCS 1/4-20 X 3/4	28
2	010036	FSTN, HHCS 3/8-16 X 1 GR 8	8
3	010081	FSTN, FW 1/4	28
4	010089	FSTN, LW 1/4	28
5	010091	FSTN, LW 3/8	10
6	010098	FSTN, NUT HEX 1/4-20	28
7	010102	FSTN, NUT HEX 3/8-16	8
8	010464	FSTN, NUT NYLOK 3/8-16 GR 8	8
9	012869	SCR, 1/4-20x3/8 BO SKT SET	24
10	015813	KEY, 3/16" SQ X 1" LG WITH RADI ENDS	12
11	017751	FSTN, FW HARD A325 3/8	8
12	020542	FSTN, NUT STOVER LOCK 1/4-20	12
13	032875	FSTN, HHCS 3/8-16 X 1-1/4 GR 8	10
14	033711	FSTN, HHCS 1/2-13 X 4 1/2"	12
15	044859	COUPLER, DRIVE SHAFT F/ VIB RACK	6
16	044860	SHAFT, 15 1/2" DRIVE	3
17	044889	ADAPTER BLOCK FOR GEARBOX	1
18	049327	SPIDER, LOVEJOY HYD MOTOR (L-075)	1
19	049345	COUPLER, JAW (685144-37240)	1
20	049367	MOTOR, HYD F/ GANG VIB 255CD	1
21	049416	COUPLER, JAW (685144-10688)	1
22	049959	Stud, 1/4-20 x 1 7/16" long	4
23	067674	CHANNEL, VIBRATOR GEARBOX MOUNT 4 BANK FRONT RH 275 TRTP	2
24	067675	COVER, BOTTOM FOR 4 BANK GANG DRIVE ASSEMBLY	1
25	067687	ASSEMBLY, LH END VIBRATOR FOR 275 TRTP GANG	1
26	067689	ASSEMBLY, VIBRATOR FOR 275 TRTP GANG	3
27	067692	BRACKET, GANG RACK SUPPORT FOR 275 TRTP	2
28	067693	COVER, TOP FOR 4 BANK GANG DRIVE ASSEMBLY	1
29	067717	PLATE, BACK FOR GANG RACK UPRIGHT MONTING 275 TRTP	2

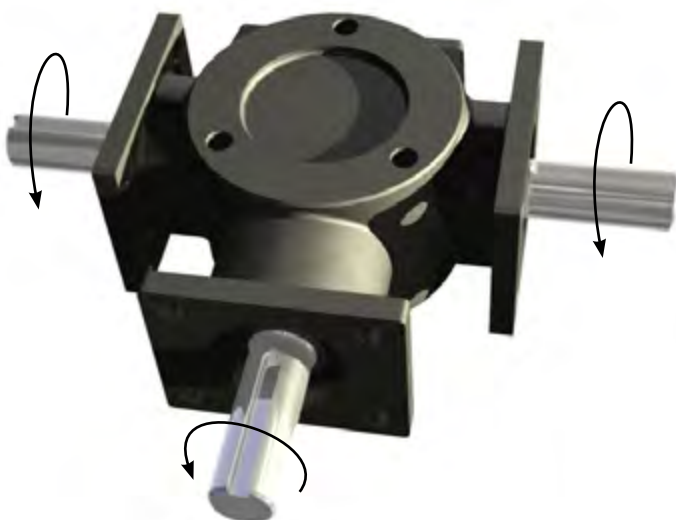
SECTION 4 PARTS

LH Rack Assembly - Illustration (cont'd) 067707



NOTICE

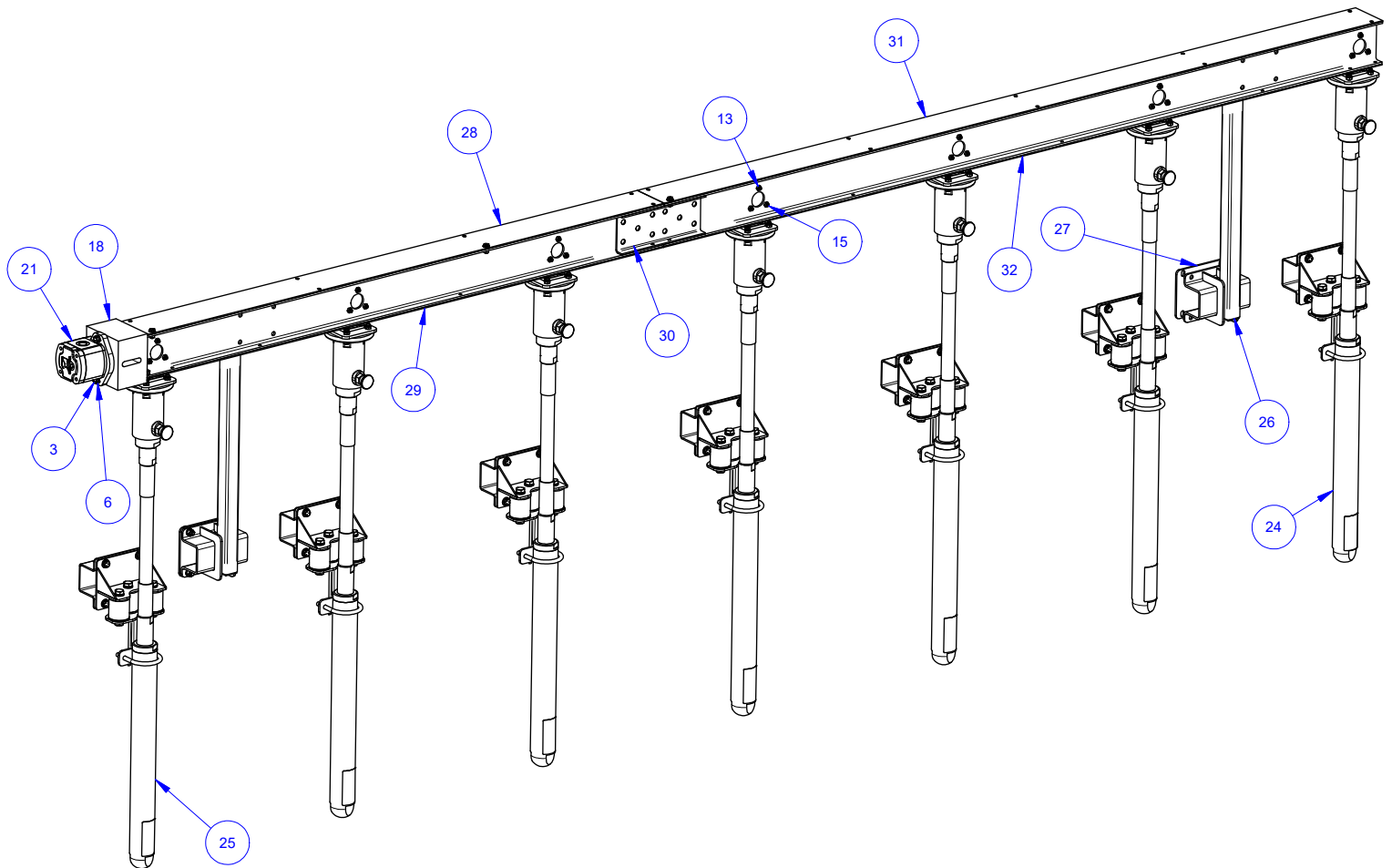
It is imperative during assembly that the rotation of the downward gearbox shaft be counter-clockwise to prevent the vibrator's internal components from "unwinding" and coming apart causing vibrator failure.



ITEM	PART NO.	DESCRIPTION	QTY
1	010002	FSTN, HHCS 1/4-20 X 3/4	28
2	010036	FSTN, HHCS 3/8-16 X 1 GR 8	8
3	010081	FSTN, FW 1/4	28
4	010089	FSTN, LW 1/4	28
5	010091	FSTN, LW 3/8	10
6	010098	FSTN, NUT HEX 1/4-20	28
7	010102	FSTN, NUT HEX 3/8-16	8
8	010464	FSTN, NUT NYLOK 3/8-16 GR 8	8
9	012869	SCR, 1/4-20x3/8 BO SKT SET	24
10	015813	KEY, 3/16" SQ X 1" LG WITH RADI ENDS	12
11	017751	FSTN, FW HARD A325 3/8	8
12	020542	FSTN, NUT STOVER LOCK 1/4-20	12
13	032875	FSTN, HHCS 3/8-16 X 1-1/4 GR 8	10
14	033711	FSTN, HHCS 1/2-13 X 4 1/2"	12
15	044859	COUPLER, DRIVE SHAFT F/ VIB RACK	6
16	044860	SHAFT, 15 1/2" DRIVE	3
17	044889	ADAPTER BLOCK FOR GEARBOX	1
18	049327	SPIDER, LOVEJOY HYD MOTOR (L-075)	1
19	049345	COUPLER, JAW (685144-37240)	1
20	049367	MOTOR, HYD F/ GANG VIB 255CD	1
21	049416	COUPLER, JAW (685144-10688)	1
22	049959	Stud, 1/4-20 x 1 7/16" long	4
23	067674	CHANNEL, VIBRATOR GEARBOX MOUNT 4 BANK FRONT RH 275 TRTP	2
24	067675	COVER, BOTTOM FOR 4 BANK GANG DRIVE ASSEMBLY	1
25	067687	ASSEMBLY, LH END VIBRATOR FOR 275 TRTP GANG	1
26	067689	ASSEMBLY, VIBRATOR FOR 275 TRTP GANG	3
27	067692	BRACKET, GANG RACK SUPPORT FOR 275 TRTP	2
28	067693	COVER, TOP FOR 4 BANK GANG DRIVE ASSEMBLY	1
29	067717	PLATE, BACK FOR GANG RACK UPRIGHT MONTING 275 TRTP	2

SECTION 4 PARTS

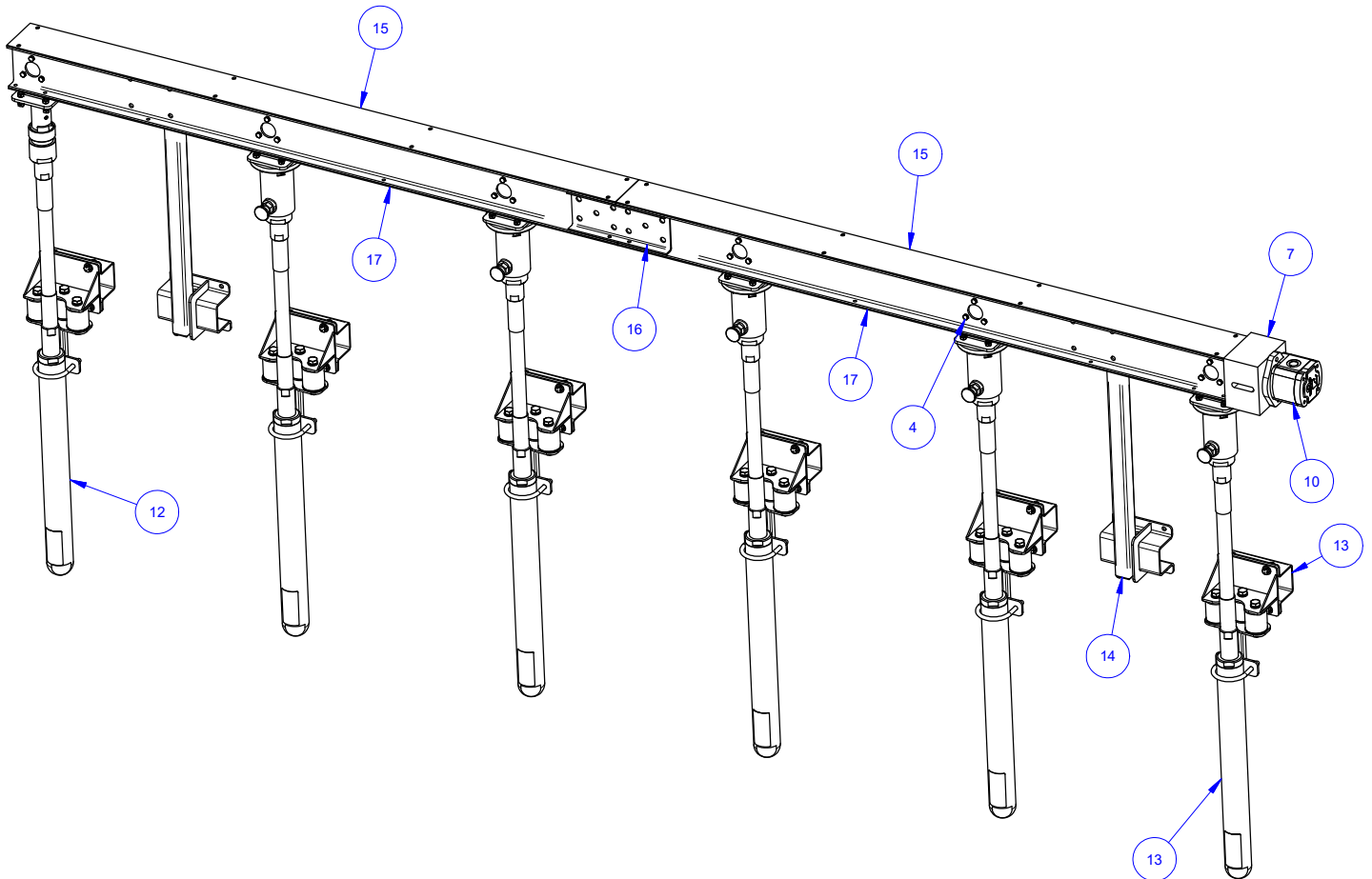
RH Rack 7-Bank Assembly - Illustration 068773



ITEM	PART NO.	DESCRIPTION	QTY
1	010002	FSTN, HHCS 1/4-20 X 3/4	8
2	010036	FSTN, HHCS 3/8-16 X 1 GR 8	8
3	010037	FSTN, HHCS 3/8-16 X 1-1/4 GR 5	2
4	010081	FSTN, FW 1/4	8
5	010089	FSTN, LW 1/4	8
6	010091	FSTN, LW 3/8	6
7	010098	FSTN, NUT HEX 1/4-20	8
8	010102	FSTN, NUT HEX 3/8-16	4
9	010464	FSTN, NUT NYLOK 3/8-16 GR 8	10
10	012869	SCR, 1/4-20x3/8 BO SKT SET	28
11	015813	KEY, 3/16" SQ X 1" LG WITH RADI ENDS	9
12	017751	FSTN, FW HARD A325 3/8 (p)	4
13	020542	FSTN, NUT STOVER LOCK 1/4-20	24
14	032875	FSTN, HHCS 3/8-16 X 1-1/4 GR 8	4
15	033711	FSTN, HHCS 1/2-13 X 4 1/2"	48
16	044859	COUPLER, DRIVE SHAFT F/ VIB RACK	12
17	044860	SHAFT, 15 1/2" DRIVE	6
18	044889	ADAPTER BLOCK FOR GEARBOX	1
19	049327	SPIDER, LOVEJOY HYD MOTOR (L-075)	1
20	049345	COUPLER, JAW (685144-37240)	1
21	049367	MOTOR, HYD F/ GANG VIB 255CD	1
22	049416	COUPLER, JAW (685144-10688)	1
23	049959	Stud, 1/4-20 x 1 7/16" long	4
24	067688	ASSEMBLY, RH END VIBRATOR FOR 275 TRTP GANG	1
25	067689	ASSEMBLY, VIBRATOR FOR 275 TRTP GANG	6
26	067692	BRACKET, GANG RACK SUPPORT FOR 275 TRTP	2
27	067717	PLATE, BACK FOR GANG RACK UPRIGHT MONTING 275 TRTP	2
28	068139	COVER, TOP FOR 6 BANK VIBRATOR RACK 275 TRTP	1
29	068145	COVER, BOTTOM FOR 6 BANK VIBRATOR RACK 275 TRTP	1
30	068771	7 BANK CHANNEL WELDMENT 275 GANG MOUNT	2
31	068774	COVER, TOP SECOND FOR 7 BANK VIBRATOR RACK 275 TRTP	1
32	068775	COVER, SECOND BOTTOM FOR 7 BANK VIBRATOR RACK 275 TRTP	1

SECTION 4 PARTS

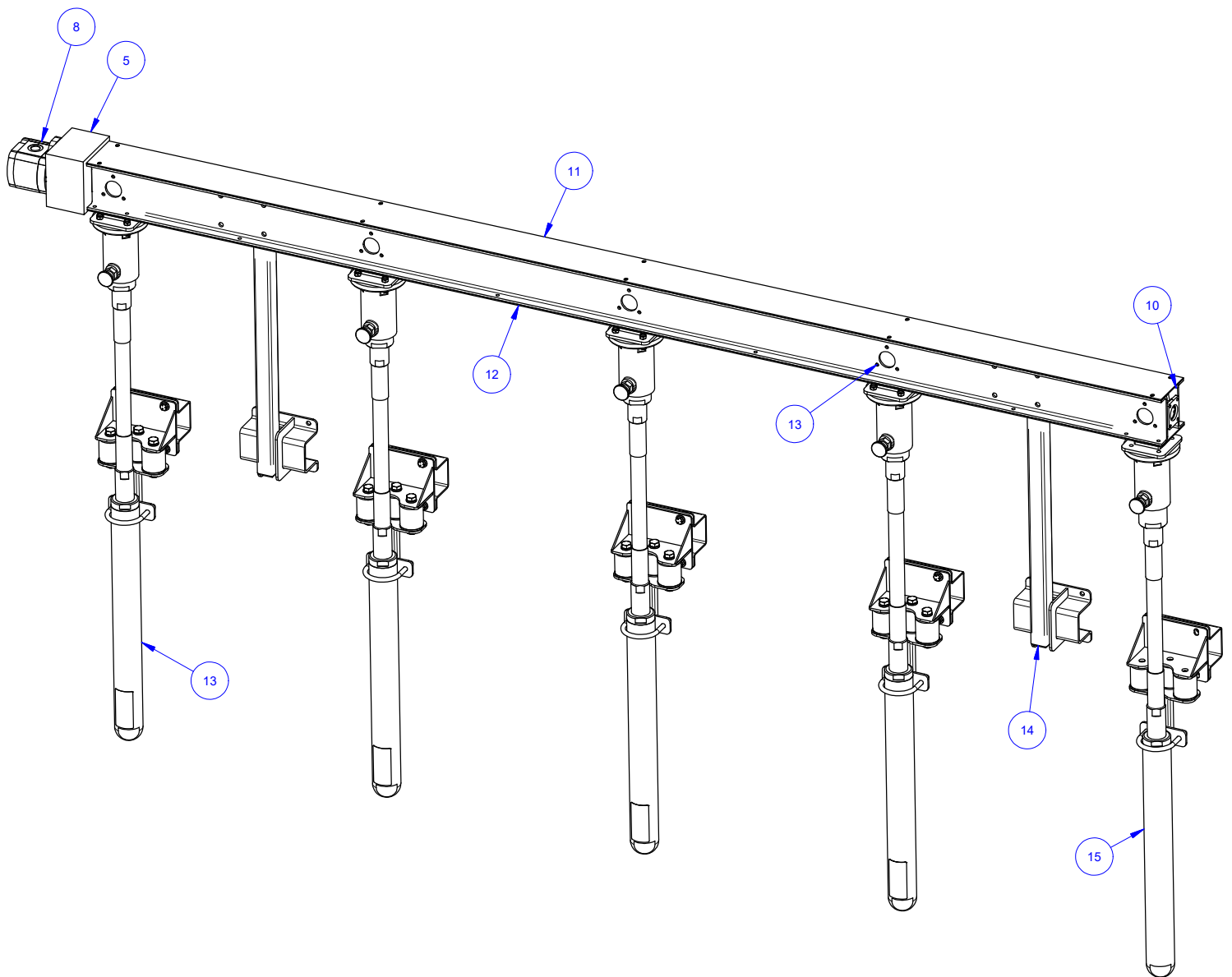
LH Rack 6-Bank Assembly - Illustration 068140



ITEM	PART NO.	DESCRIPTION	QTY
1	012869	SCR, 1/4-20x3/8 BO SKT SET	36
2	015813	KEY, 3/16" SQ X 1" LG WITH RADI ENDS	20
3	020542	FSTN, NUT STOVER LOCK 1/4-20	18
4	033711	FSTN, HHCS 1/2-13 X 4 1/2"	18
5	044859	COUPLER, DRIVE SHAFT F/ VIB RACK	10
6	044860	SHAFT, 15 1/2" DRIVE	5
7	044889	ADAPTER BLOCK FOR GEARBOX	1
8	049327	SPIDER, LOVEJOY HYD MOTOR (L-075)	1
9	049345	COUPLER, JAW (685144-37240)	1
10	049367	MOTOR, HYD F/ GANG VIB 255CD	1
11	049416	COUPLER, JAW (685144-10688)	1
12	067687	ASSEMBLY, LH END VIBRATOR FOR 275 TRTP GANG	1
13	067689	ASSEMBLY, VIBRATOR FOR 275 TRTP GANG	5
14	067692	BRACKET, GANG RACK SUPPORT FOR 275 TRTP	2
15	068139	COVER, TOP FOR 6 BANK VIBRATOR RACK 275 TRTP	2
16	068142	6 BANK CHANNEL WELDMENT 275 GANG MOUNT	2
17	068145	COVER, BOTTOM FOR 6 BANK VIBRATOR RACK 275 TRTP	2

SECTION 4 PARTS

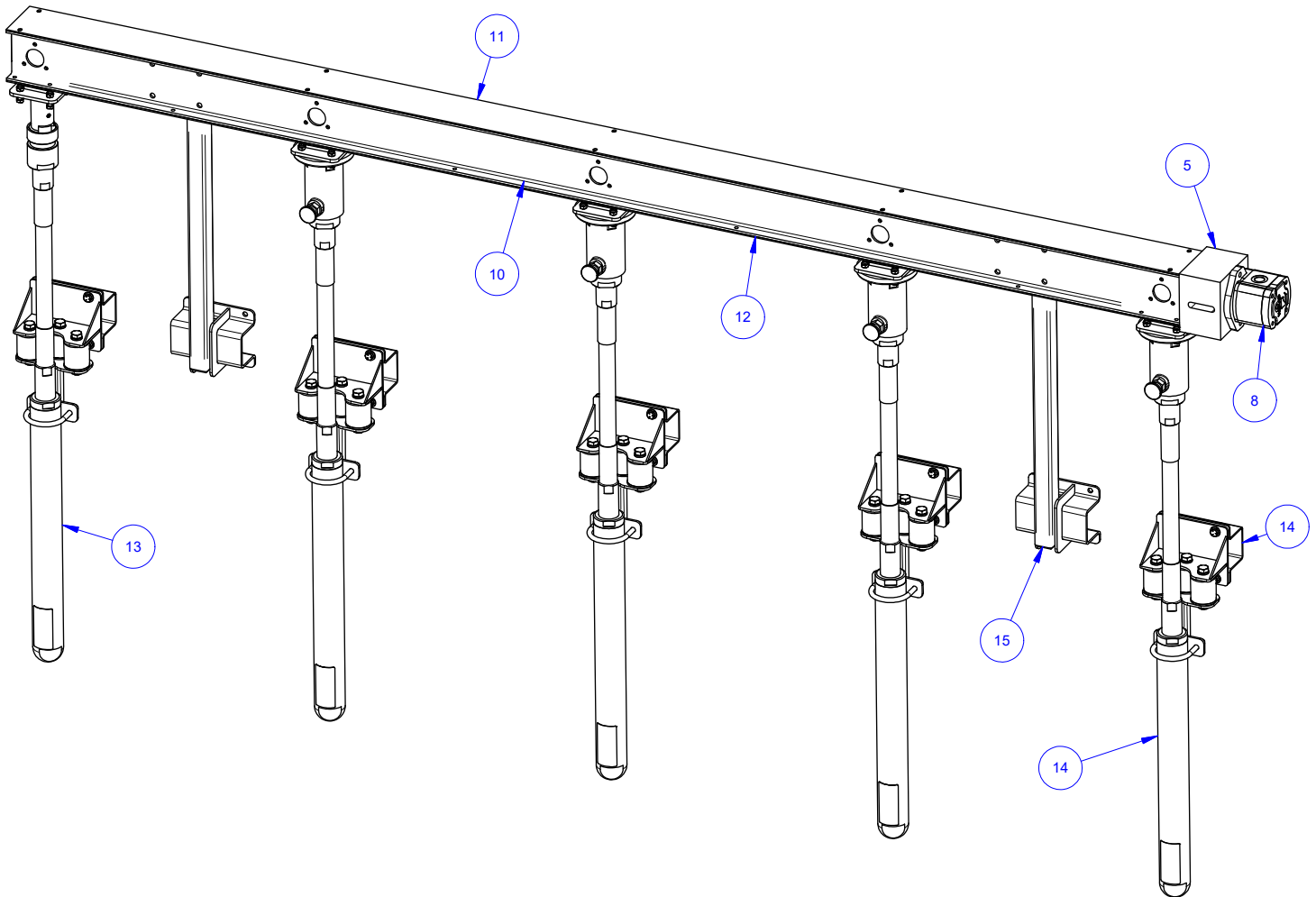
RH Rack 5-Bank Assembly - Illustration 068108



ITEM	PART NO.	DESCRIPTION	QTY
1	012869	SCR, 1/4-20x3/8 BO SKT SET	32
2	015813	KEY, 3/16" SQ X 1" LG WITH RADI ENDS	16
3	044859	COUPLER, DRIVE SHAFT F/ VIB RACK	8
4	044860	SHAFT, 15 1/2" DRIVE	4
5	044889	ADAPTER BLOCK FOR GEARBOX	1
6	049327	SPIDER, LOVEJOY HYD MOTOR (L-075)	1
7	049345	COUPLER, JAW (685144-37240)	1
8	049367	MOTOR, HYD F/ GANG VIB 255CD	1
9	049416	COUPLER, JAW (685144-10688)	1
10	067678	CHANNEL, 5 BANK VIB RACK FOR 275 TRTP	2
11	067679	COVER, TOP FOR 5 BANK VIBRATOR RACK 275 TRTP	1
12	067680	COVER, BOTTOM FOR 5 BANK VIBRATOR RACK 275 TRTP	1
13	067689	ASSEMBLY, VIBRATOR FOR 275 TRTP GANG	4
14	067692	BRACKET, GANG RACK SUPPORT FOR 275 TRTP	2
15	068109	ASSEMBLY, RH END VIBRATOR FOR 275 TRTP GANG	1

SECTION 4 PARTS

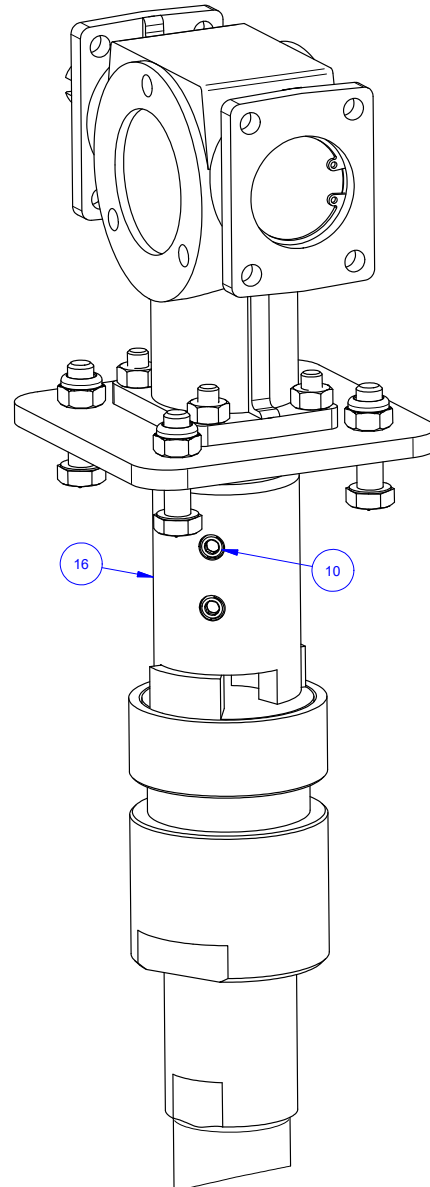
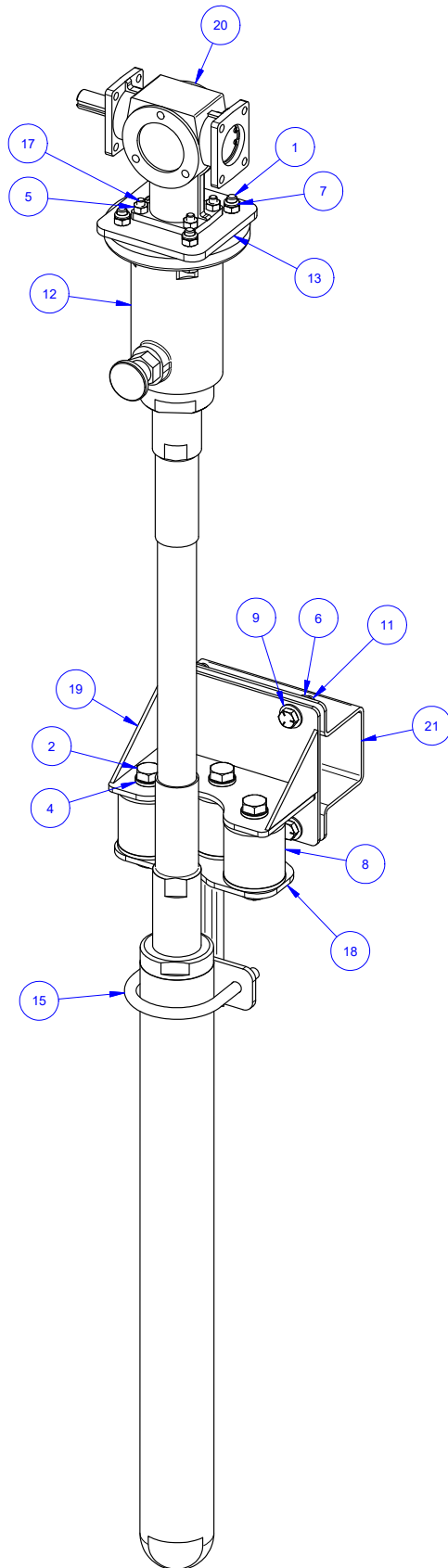
LH Rack 5-Bank Assembly - Illustration 067708



ITEM	PART NO.	DESCRIPTION	QTY
1	012869	SCR, 1/4-20x3/8 BO SKT SET	32
2	015813	KEY, 3/16" SQ X 1" LG WITH RADI ENDS	16
3	044859	COUPLER, DRIVE SHAFT F/ VIB RACK	8
4	044860	SHAFT, 15 1/2" DRIVE	4
5	044889	ADAPTER BLOCK FOR GEARBOX	1
6	049327	SPIDER, LOVEJOY HYD MOTOR (L-075)	1
7	049345	COUPLER, JAW (685144-37240)	1
8	049367	MOTOR, HYD F/ GANG VIB 255CD	1
9	049416	COUPLER, JAW (685144-10688)	1
10	067678	CHANNEL, 5 BANK VIB RACK FOR 275 TRTP	2
11	067679	COVER, TOP FOR 5 BANK VIBRATOR RACK 275 TRTP	1
12	067680	COVER, BOTTOM FOR 5 BANK VIBRATOR RACK 275 TRTP	1
13	067687	ASSEMBLY, LH END VIBRATOR FOR 275 TRTP GANG	1
14	067689	ASSEMBLY, VIBRATOR FOR 275 TRTP GANG	4
15	067692	BRACKET, GANG RACK SUPPORT FOR 275 TRTP	2

SECTION 4 PARTS

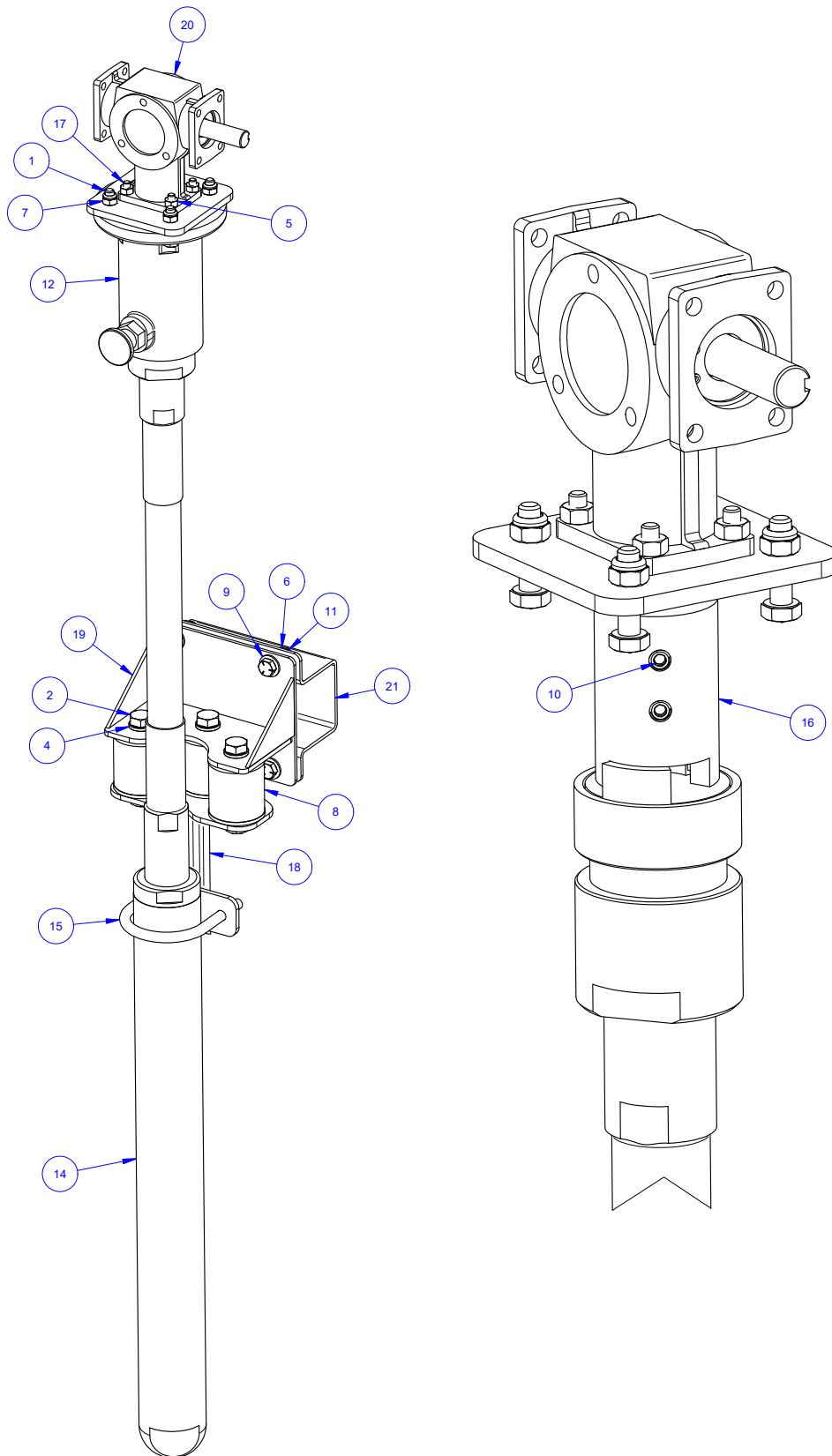
RH End Vibrator Assembly - Illustration 067688



ITEM	PART NO.	DESCRIPTION	QTY
1	010021	FSTN, HHCS 5/16-18 X 1-1/4 GR5	4
2	010066	FSTN, HHCS 1/2-13 X 3/4 GR 5	6
3	010091	FSTN, LW 3/8	6
4	010093	FSTN, LW 1/2 GR8	6
5	010098	FSTN, NUT HEX 1/4-20	4
6	010102	FSTN, NUT HEX 3/8-16	6
7	012612	FSTN, NUT HEX NYLOCK 5/16-18	4
8	012725	RUBBER ISOLATOR, 2" WITH 1/2-13 UNC	3
9	017751	FSTN, FW HARD A325 3/8	4
10	032000	FSTN, 5/16-18 X 3/8" LONG SHSS	2
11	032875	FSTN, HHCS 3/8-16 X 1-1/4 GR 8	4
12	044861	POWER TAKE-OFF F/ VWU60 VIB (PT01)	1
13	044862	QUICK DISCONNECT ADAPTOR PLATE	1
14	044893	VIBRATOR, GANG VIB TRTP VWU60	1
15	045876	U-BOLT 2 1/2"	1
16	048345	COUPLER, DRIVE FOR VIB TECH VIBRATOR	1
17	049352	SCREW, 1/4-20x1 SKT FLT HD CAP	4
18	067681	BRACKET, BOTTOM VIBRATOR SUPPORT 275 TRTP	1
19	067683	BRACKET, VIB CONNECTION TO BAR 275TRTP	1
20	067690	GEARBOX AD5 1:1 D/E STYLE	1
21	067691	CHANNEL, VIB RACK MOUNT FOR VIB ASSEMBLY 275 TRTP	1

SECTION 4 PARTS

LH End Vibrator Assembly - Illustration 067687



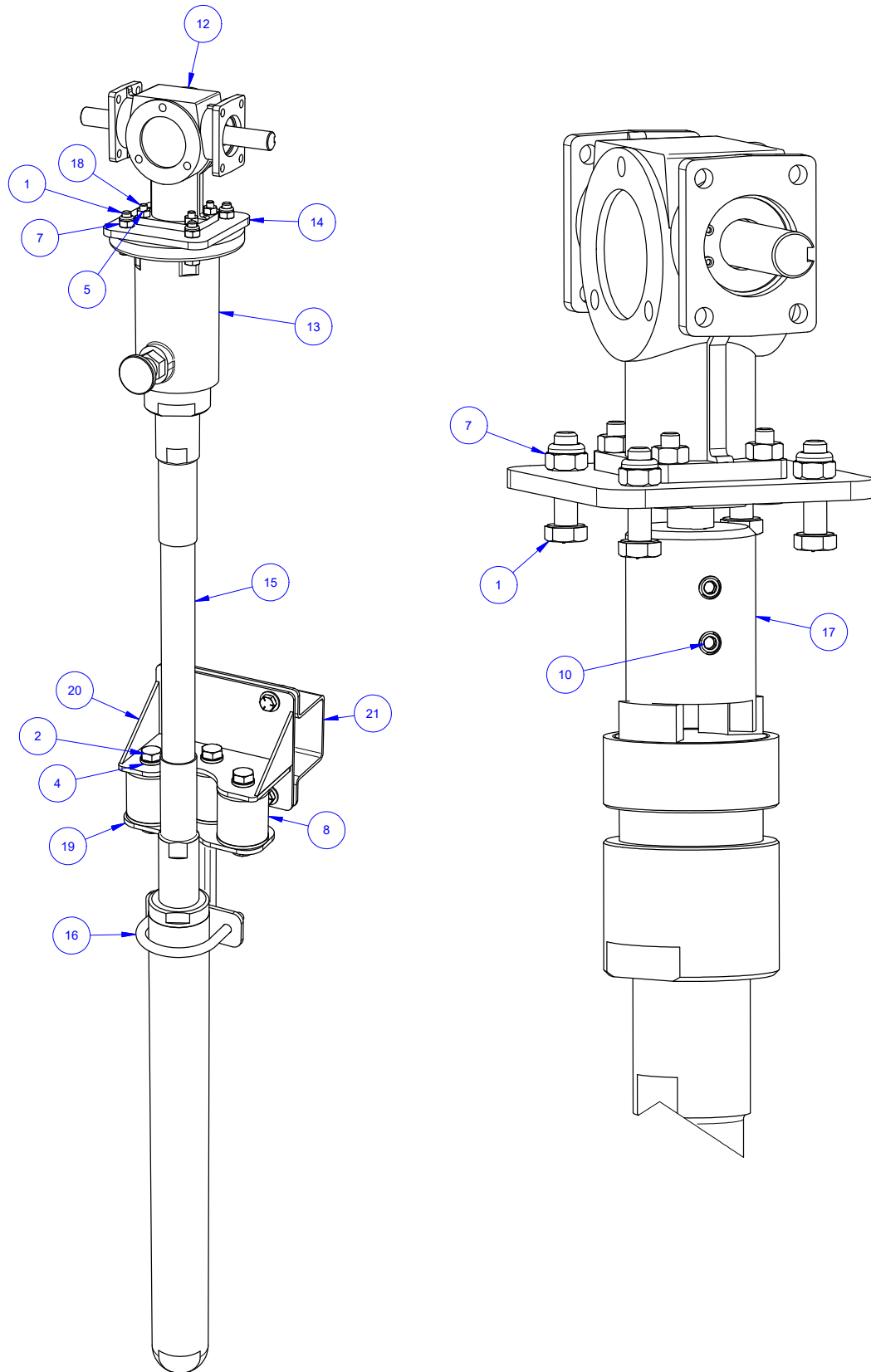
LH End Vibrator Assembly - Parts List 067687

SECTION 4 PARTS

ITEM	PART NO.	DESCRIPTION	QTY
1	010021	FSTN, HHCS 5/16-18 X 1-1/4 GR5	4
2	010066	FSTN, HHCS 1/2-13 X 3/4 GR 5	6
3	010091	FSTN, LW 3/8	6
4	010093	FSTN, LW 1/2 GR8	6
5	010098	FSTN, NUT HEX 1/4-20	4
6	010102	FSTN, NUT HEX 3/8-16	6
7	012612	FSTN, NUT HEX NYLOCK 5/16-18	4
8	012725	RUBBER ISOLATOR, 2" WITH 1/2-13 UNC	3
9	017751	FSTN, FW HARD A325 3/8	4
10	032000	FSTN, 5/16-18 X 3/8" LONG SHSS	2
11	032875	FSTN, HHCS 3/8-16 X 1-1/4 GR 8	4
12	044861	POWER TAKE-OFF F/ VWU60 VIB (PT01)	1
13	044862	QUICK DISCONNECT ADAPTOR PLATE	1
14	044893	VIBRATOR, GANG VIB TRTP VWU60	1
15	045876	U-BOLT 2 1/2"	1
16	048345	COUPLER, DRIVE FOR VIB TECH VIBRATOR	1
17	049352	SCREW, 1/4-20x1 SKT FLT HD CAP	4
18	067681	BRACKET, BOTTOM VIBRATOR SUPPORT 275 TRTP	1
19	067683	BRACKET, VIB CONNECTION TO BAR 275TRTP	1
20	067690	GEARBOX AD5 1:1 D/E STYLE	1
21	067691	CHANNEL, VIB RACK MOUNT FOR VIB ASSEMBLY 275 TRTP	1

SECTION 4 PARTS

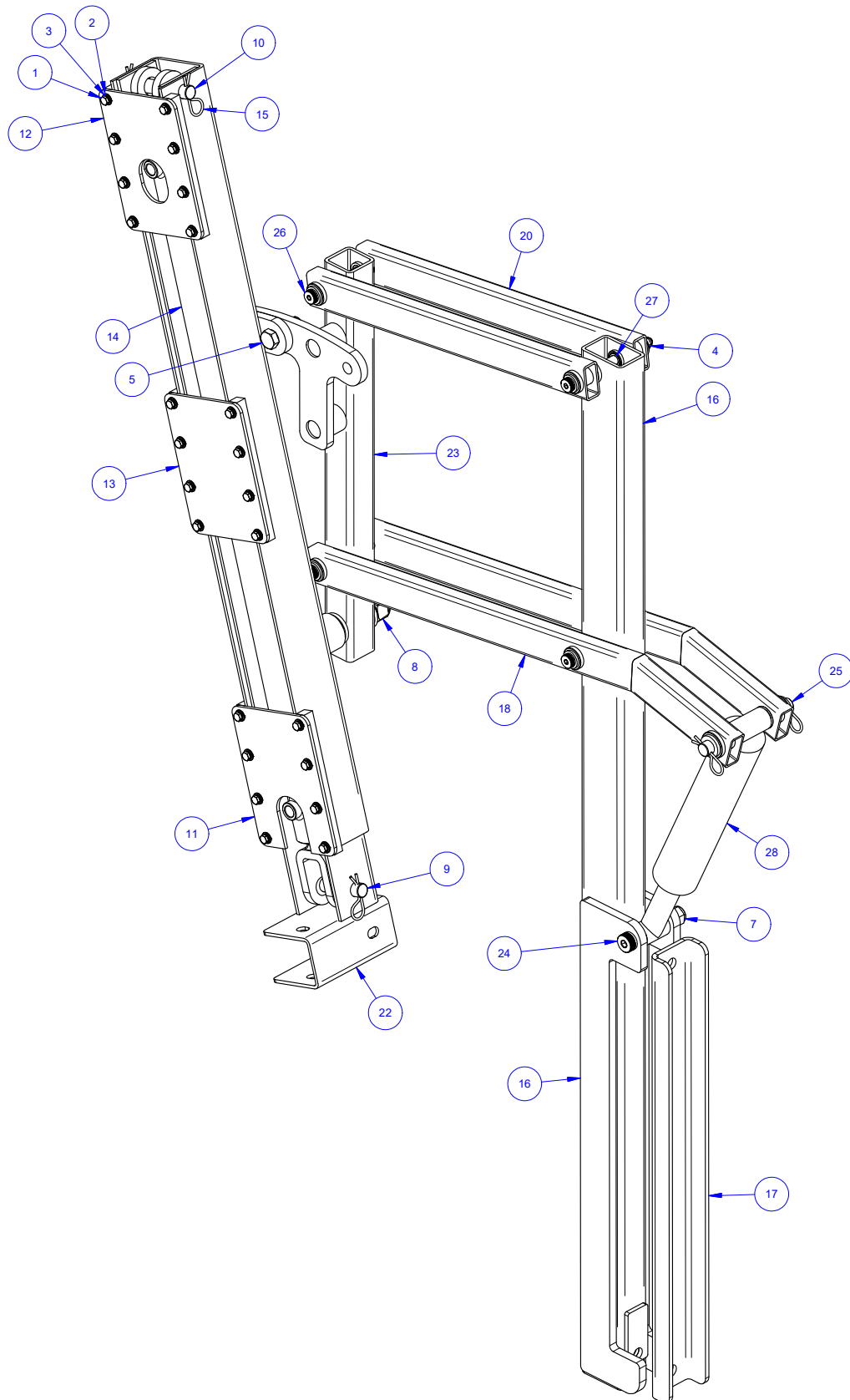
Center Vibrator Assembly - Illustration 067689



ITEM	PART NO.	DESCRIPTION	QTY
1	010021	FSTN, HHCS 5/16-18 X 1-1/4 GR5	4
2	010066	FSTN, HHCS 1/2-13 X 3/4 GR 5	6
3	010091	FSTN, LW 3/8	6
4	010093	FSTN, LW 1/2 GR8	6
5	010098	FSTN, NUT HEX 1/4-20	4
6	010102	FSTN, NUT HEX 3/8-16	6
7	012612	FSTN, NUT HEX NYLOCK 5/16-18	4
8	012725	RUBBER ISOLATOR, 2" WITH 1/2-13 UNC	3
9	017751	FSTN, FW HARD A325 3/8	4
10	032000	FSTN, 5/16-18 X 3/8" LONG SHSS	2
11	032875	FSTN, HHCS 3/8-16 X 1-1/4 GR 8	4
12	044858	GEARBOX, AD5 F/ VIBRATORS	1
13	044861	POWER TAKE-OFF F/ VWU60 VIB (PT01)	1
14	044862	QUICK DISCONNECT ADAPTOR PLATE	1
15	044893	VIBRATOR, GANG VIB TRTP VWU60	1
16	045876	U-BOLT 2 1/2"	1
17	048345	COUPLER, DRIVE FOR VIB TECH VIBRATOR	1
18	049352	SCREW, 1/4-20x1 SKT FLT HD CAP	4
19	067681	BRACKET, BOTTOM VIBRATOR SUPPORT 275 TRTP	1
20	067683	BRACKET, VIB CONNECTION TO BAR 275TRTP	1
21	067691	CHANNEL, VIB RACK MOUNT FOR VIB ASSEMBLY 275 TRTP	1

SECTION 4 PARTS

Right Rack Lift Assembly - Illustration 067616



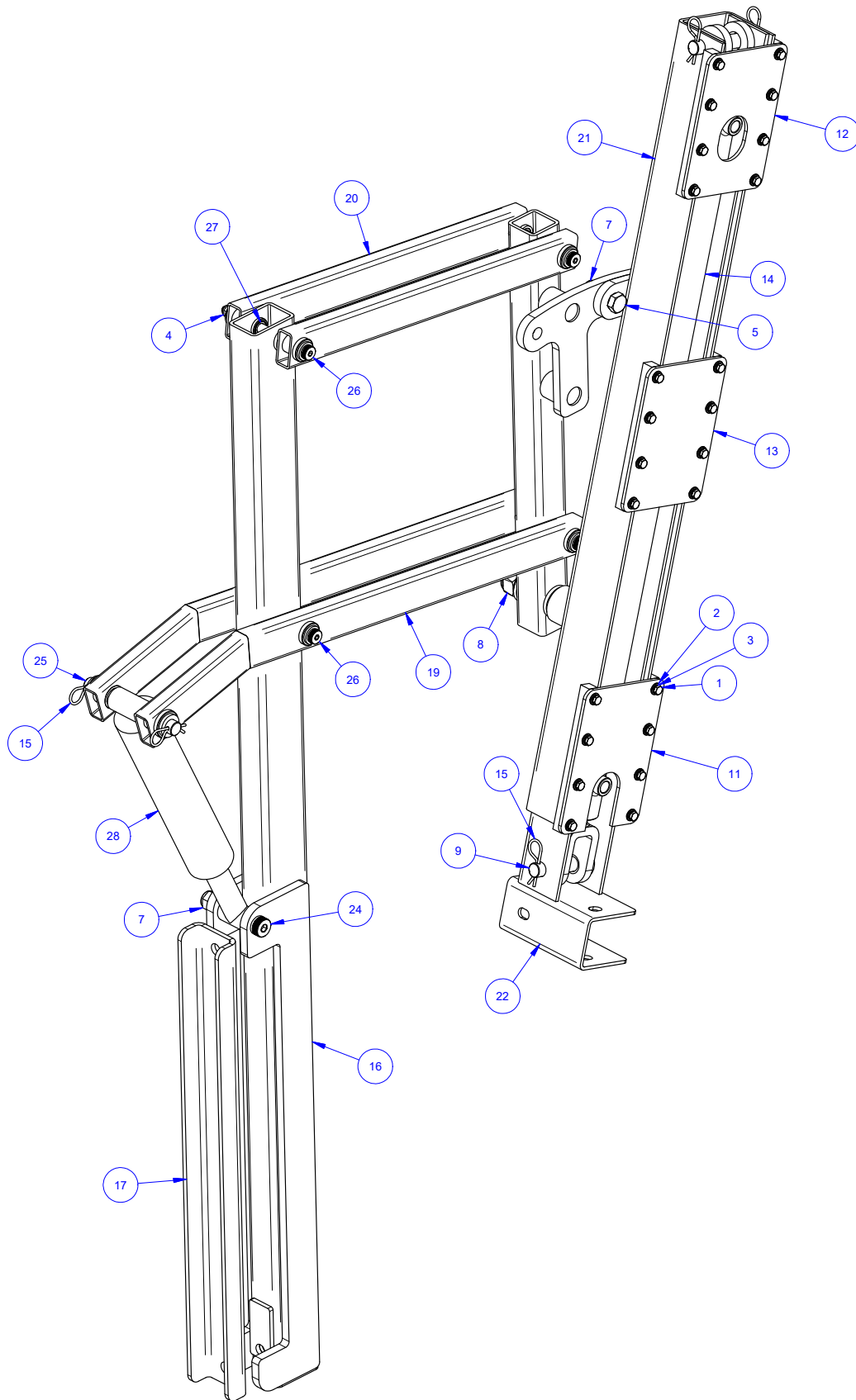
Right Rack Lift Assembly - Parts List 067616

SECTION 4 PARTS

ITEM	PART NO.	DESCRIPTION	QTY
1	010003	FSTN, HHCS 1/4-20 X 1	24
2	010081	FSTN, FW 1/4	24
3	010089	FSTN, LW 1/4	24
4	010464	FSTN, NUT NYLOK 3/8-16 GR 8	4
5	010632	FSTN, HHCS 5/8-11 X 2 GR 8	2
6	012982	FSTN, FW 5/8" ZINC PLATED	2
7	037139	FSTN, NUT NYLOC 5/8-18 GR 8	3
8	038783	FSTN, NUT NYLOK 1"-8	1
9	048255	PIN, CYLINDER SHORT F/ GANG VIB	1
10	048256	PIN, CYLINDER LONG F/ GANG VIB	1
11	049318	PLATE, TOP HOLDING HYD CYL	1
12	049319	PLATE, BOTTOM HOLDING HYD CYL	1
13	049320	PLATE, MIDDLE HOLDING HYD CYL	1
14	049366	CYLINDER, LIFT F/ GANG RACK 255CD	1
15	051629	HAIR PIN, 1/2" TO 3/4" SHAFT SIZE	6
16	067625	UPRIGHT BEAM FOR GANG LIFT ASSEMBLY 275 TRTP	1
17	067627	CLAMP, FOR GANG RACK ASSEM. 275TRTP	1
18	067634	LH LOWER ARM ASSEMBLY FOR 275 GANG LIFT	1
19	067635	RH LOWER ARM ASSEMBLY FOR 275 GANG LIFT	1
20	067637	TOP ARM ASSEMBLY, FOR GANG LIFT 275 TRTP	2
21	067668	CHANNEL, FRONT FEMALE HYD CYL WELD'T 275 TRTP	1
22	067670	CHANNEL, RH OUTSIDE MALE CYL. LIFT WELD'T 275 TRTP	1
23	067720	ASSEMBLY, FRONT LH UPRIGHT FOR GANG LIFT 275 TRTP	1
24	067721	FSTN, SHLDR 3/4" DIA X 3" LONG	1
25	067722	PIN, CYLINDER LIFT FOR GANG LIFT 275 TRTP	1
26	068155	FSTN, SHLDR 1/2 DIA. X 5 1/2" LONG	4
27	068156	FLANGED BUSHING BRONZE OIL-EMBEDED 1/2" ID X 3/4 OD	4
28	068172	2" BORE 10" STROKE CHIEF 300PSI WELDED CYL	1

SECTION 4 PARTS

Left Rack Lift Assembly - Illustration 067617



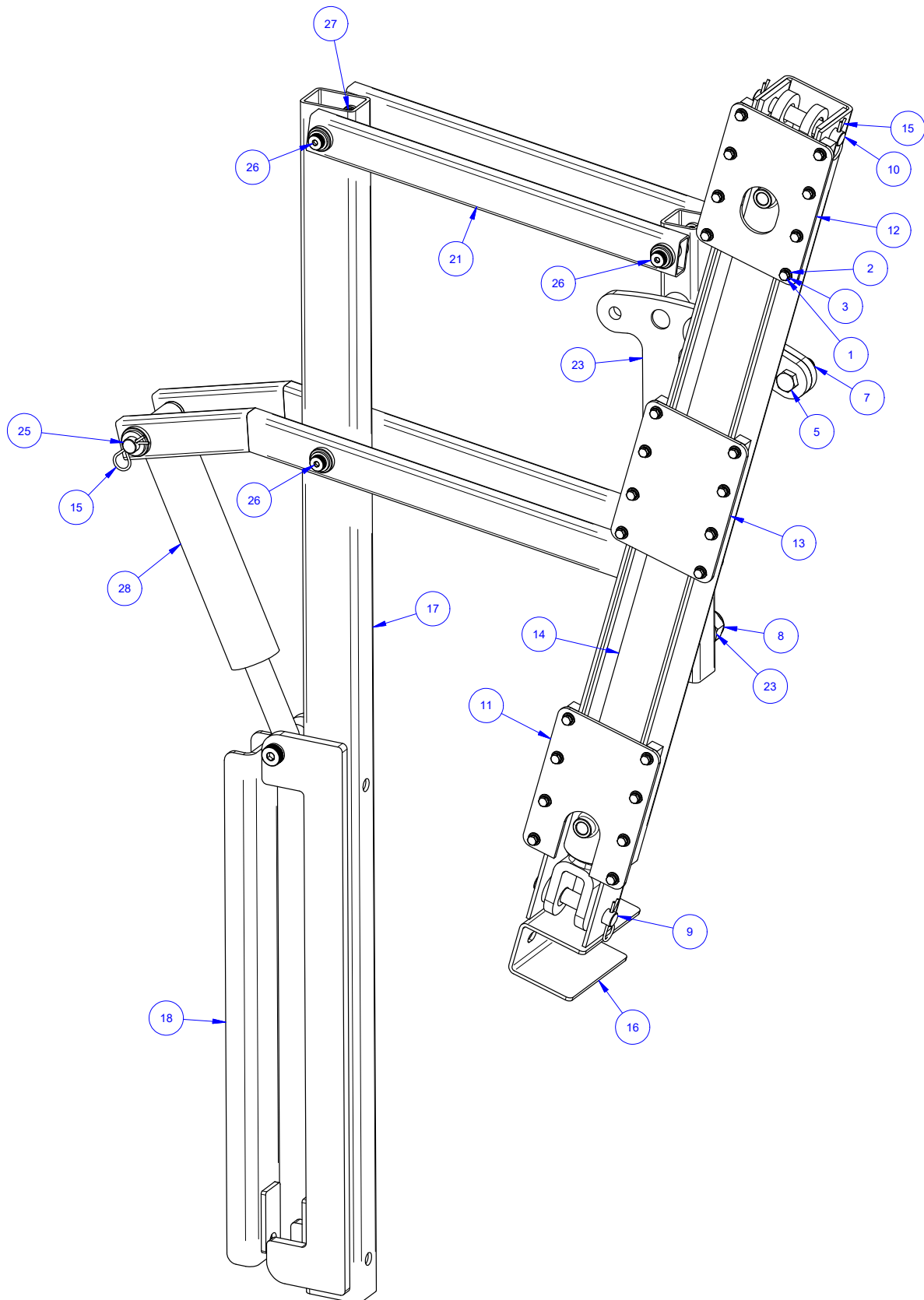
Left Rack Lift Assembly - Parts List 067617

SECTION 4 PARTS

ITEM	PART NO.	DESCRIPTION	QTY
1	010003	FSTN, HHCS 1/4-20 X 1	24
2	010081	FSTN, FW 1/4	24
3	010089	FSTN, LW 1/4	24
4	010464	FSTN, NUT NYLOK 3/8-16 GR 8	4
5	010632	FSTN, HHCS 5/8-11 X 2 GR 8	2
6	012982	FSTN, FW 5/8" ZINC PLATED	2
7	037139	FSTN, NUT NYLOC 5/8-18 GR 8	3
8	038783	FSTN, NUT NYLOK 1"-8	1
9	048255	PIN, CYLINDER SHORT F/ GANG VIB	1
10	048256	PIN, CYLINDER LONG F/ GANG VIB	1
11	049318	PLATE, TOP HOLDING HYD CYL	1
12	049319	PLATE, BOTTOM HOLDING HYD CYL	1
13	049320	PLATE, MIDDLE HOLDING HYD CYL	1
14	049366	CYLINDER, LIFT F/ GANG RACK 255CD	1
15	051629	HAIR PIN, 1/2" TO 3/4" SHAFT SIZE	6
16	067625	UPRIGHT BEAM FOR GANG LIFT ASSEMBLY 275 TRTP	1
17	067627	CLAMP, FOR GANG RACK ASSEM. 275TRTP	1
18	067634	LH LOWER ARM ASSEMBLY FOR 275 GANG LIFT	1
19	067635	RH LOWER ARM ASSEMBLY FOR 275 GANG LIFT	1
20	067637	TOP ARM ASSEMBLY, FOR GANG LIFT 275 TRTP	2
21	067668	CHANNEL, FRONT FEMALE HYD CYL WELD'T 275 TRTP	1
22	067672	CHANNEL, MALE CYLINDER MNT WELD'T FOR LH OUTSIDE	1
23	067719	ASSEMBLY, FRONT LH UPRIGHT FOR GANG LIFT 275 TRTP	1
24	067721	FSTN, SHLDR 3/4" DIA X 3" LONG	1
25	067722	PIN, CYLINDER LIFT FOR GANG LIFT 275 TRTP	1
26	068155	FSTN, SHLDR 1/2 DIA. X 5 1/2" LONG	4
27	068156	FLANGED BUSHING BRONZE OIL-EMBEDDED 1/2" ID X 3/4 OD	4
28	068172	2" BORE 10" STROKE CHIEF 300PSI WELDED CYL	1

SECTION 4 PARTS

Center Rack Lift Assembly - Illustration 067615



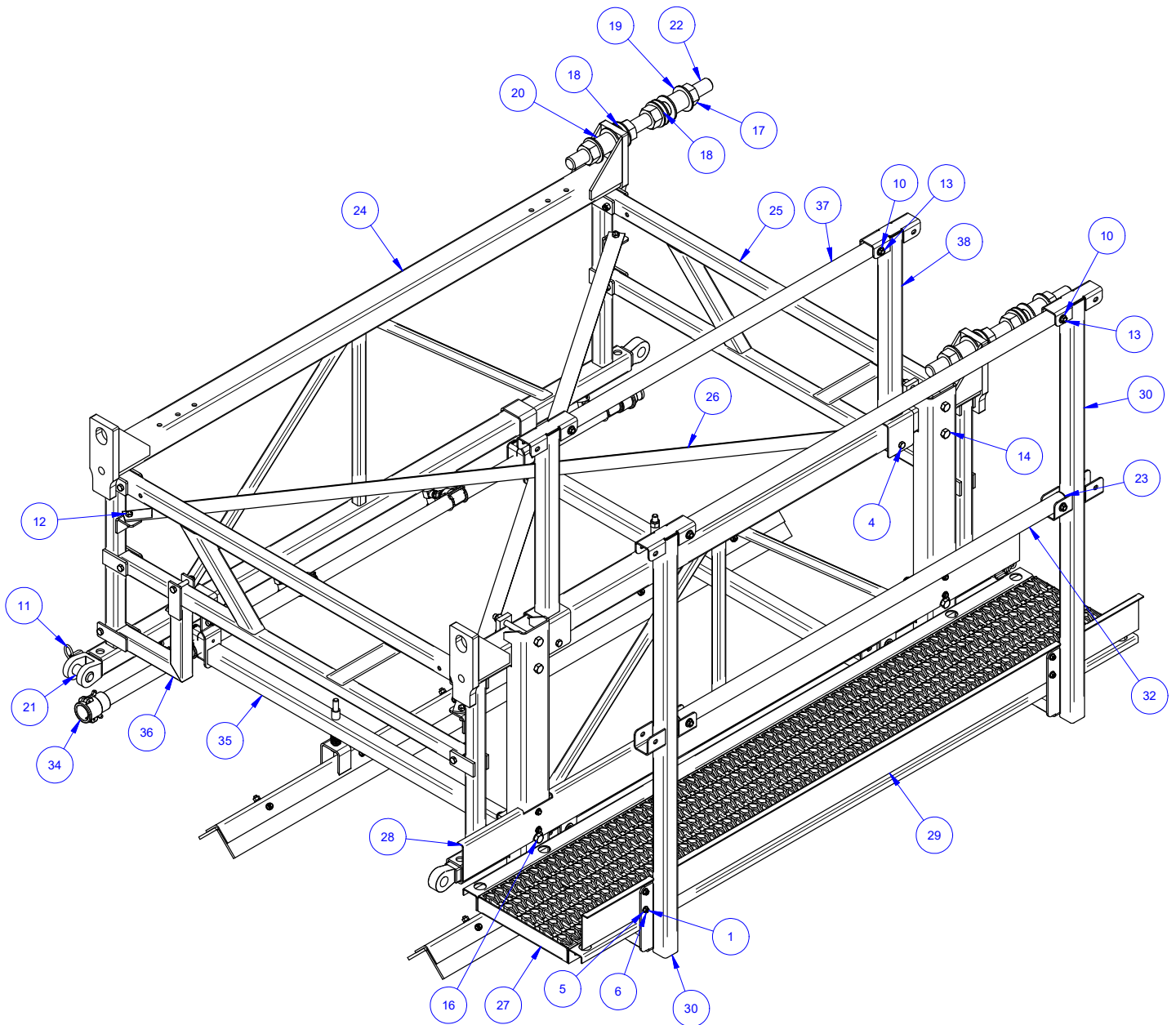
Center Rack Lift Assembly - Parts List 067615

SECTION 4 PARTS

ITEM	PART NO.	DESCRIPTION	QTY
1	010003	FSTN, HHCS 1/4-20 X 1	24
2	010081	FSTN, FW 1/4	24
3	010089	FSTN, LW 1/4	24
4	010464	FSTN, NUT NYLOK 3/8-16 GR 8	4
5	010632	FSTN, HHCS 5/8-11 X 2 GR 8	2
6	012982	FSTN, FW 5/8" ZINC PLATED	2
7	037139	FSTN, NUT NYLOC 5/8-18 GR 8	3
8	038783	FSTN, NUT NYLOK 1"-8	1
9	048255	PIN, CYLINDER SHORT F/ GANG VIB	1
10	048256	PIN, CYLINDER LONG F/ GANG VIB	1
11	049318	PLATE, TOP HOLDING HYD CYL	1
12	049319	PLATE, BOTTOM HOLDING HYD CYL	1
13	049320	PLATE, MIDDLE HOLDING HYD CYL	1
14	049366	CYLINDER, LIFT F/ GANG RACK 255CD	1
15	051629	HAIR PIN, 1/2" TO 3/4" SHAFT SIZE	6
16	067619	CHANNEL, MALE JACK WELD'T FOR CENTER RH	1
17	067625	UPRIGHT BEAM FOR GANG LIFT ASSEMBLY 275 TRTP	1
18	067627	CLAMP, FOR GANG RACK ASSEM. 275TRTP	1
19	067634	LH LOWER ARM ASSEMBLY FOR 275 GANG LIFT	1
20	067635	RH LOWER ARM ASSEMBLY FOR 275 GANG LIFT	1
21	067637	TOP ARM ASSEMBLY, FOR GANG LIFT 275 TRTP	2
22	067668	CHANNEL, FRONT FEMALE HYD CYL WELD'T 275 TRTP	1
23	067719	ASSEMBLY, FRONT LH UPRIGHT FOR GANG LIFT 275 TRTP	1
24	067721	FSTN, SHLDR 3/4" DIA X 3" LONG	1
25	067722	PIN, CYLINDER LIFT FOR GANG LIFT 275 TRTP	1
26	068155	FSTN, SHLDR 1/2 DIA. X 5 1/2" LONG	4
27	068156	FLANGED BUSHING BRONZE OIL-EMBEDED 1/2" ID X 3/4 OD	4
28	068172	2" BORE 10" STROKE CHIEF 300PSI WELDED CYL	1

SECTION 4 PARTS

6' Center Section - Illustration 068103



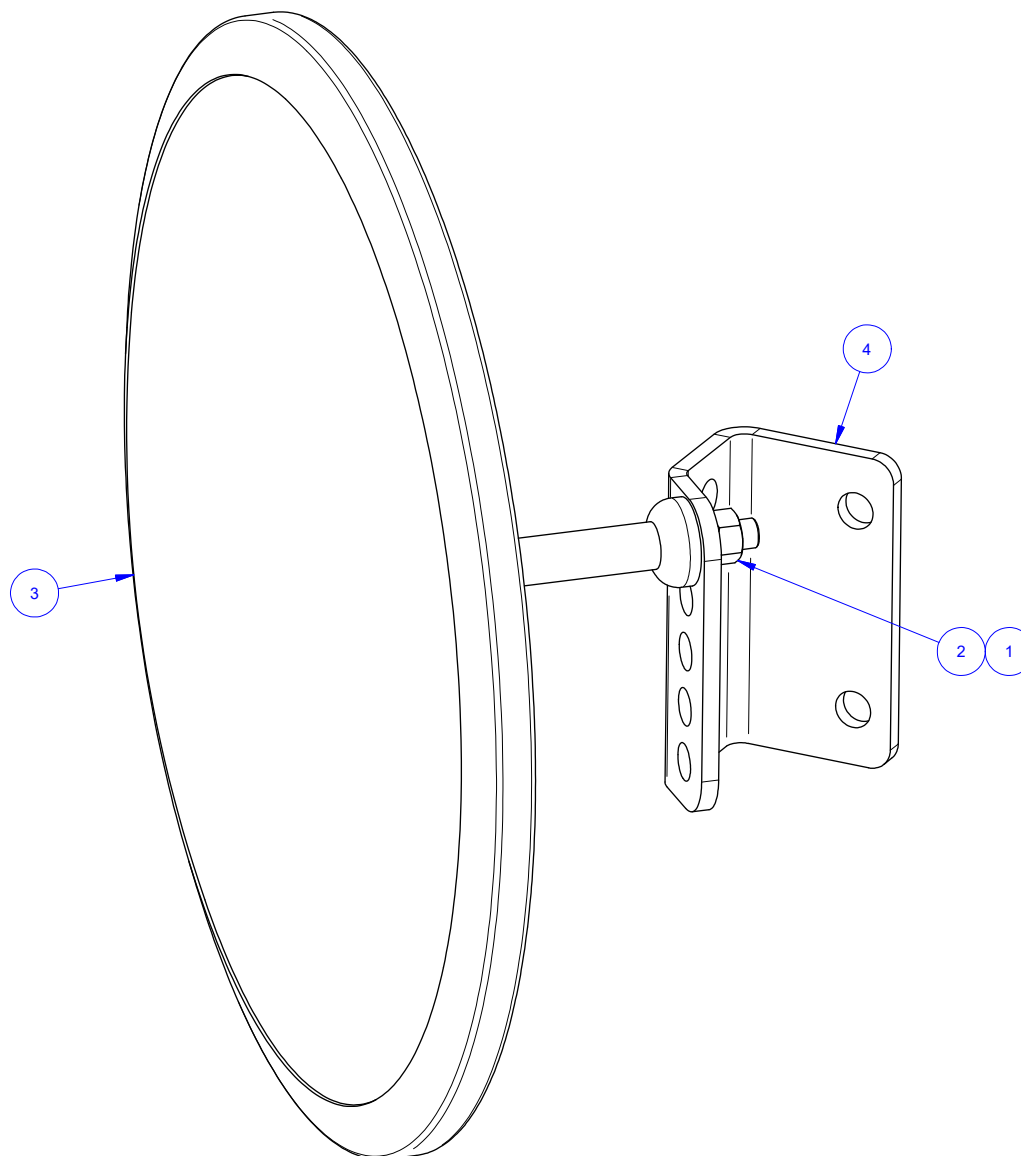
6' Center Section - Parts List 068103

SECTION 4 PARTS

ITEM	PART NO.	DESCRIPTION	QTY
1	010002	FSTN, HHCS 1/4-20 X 3/4	12
2	010036	FSTN, HHCS 3/8-16 X 1 GR 8	1
3	010042	FSTN, HHCS 3/8-16 X 2-1/2 GR 8	10
4	010046	FSTN, HHCS 3/8-16 X 3-1/2	2
5	010081	FSTN, FW 1/4	24
6	010098	FSTN, NUT HEX 1/4-20	12
7	010102	FSTN, NUT HEX 3/8-16	6
8	010464	FSTN, NUT NYLOK 3/8-16 GR 8	17
9	011238	FSTN, NUT HEX NYLOK 1/2-13	8
10	017751	FSTN, FW HARD A325 3/8 (p)	12
11	022110	COTTERS, HAIRPIN	2
12	032875	FSTN, HHCS 3/8-16 X 1-1/4 GR 8	4
13	040637	BOLT, 3/8-16 X 2-1/4 GR 8 HHC	6
14	051013	FSTN, HHCS 1/2-13 x 5-1/2 GR 5	4
15	051299	CLAMP, POLY F/ CURE SPRAY BAR PWB18	2
16	051762	FSTN, HHCS 1/2-13 X 5"	4
17	052156	HEX NUT, 1 1/4-7	8
18	052168	SPHERICAL WASHER SET, 1 1/4	4
19	052169	FLAT WASHER, 1 1/4	12
20	052171	SPACER, 1 1/2 X 3/16 X 2	4
21	052233	PIN, 1"	2
22	052472	ALL THREAD, 1 1/4-7 X 18	2
23	067057	PLUG, 9283K34 F/ RAIL TUBES (AUS)	2
24	067492	FRAME WMTN, 6' FOR 275 TRTP	2
25	067500	END FRAME, ENGINE END FOR 275 TRTP FRAME ASSEMBLY	2
26	067503	ANGLE BRACE, 6' CENTER FOR 275 TRTP	2
27	067851	WALKWAY, REAR 6' FOR 275 TRTP	1
28	067872	INSIDE TOE KICK FOR 6' WALKWAY 275 TRTP	1
29	067877	OUTSIDE TOE KICK, FOR 6' WALKWAY 275 TRTP	1
30	067895	SUPPORT, REAR CENTER WALKWAY 275 TRTP	2
31	067897	PLATE, TO FOR WALKWAY MOUNING 275 TRTP	2
32	067903	TUBE, 6' HAND RAIL FOR WALKWAY 275 TRTP	2
33	067906	PLATE, BOTTOM WALKWAY MOUNT 275 TRP	2
34	067949	ASSY, SPRAY BAR 6' RH FOR 275/255 TRTP	1
35	067952	SCRAPER ASSEMBLY, 6' FOR THE 275 TRTP	1
36	067970	HANGER, HOSE FOR 275 TRTP	1
37	067986	TUBE, 6' WITH INSIDE HAND RAIL FOR WALKWAY 275 TRTP	1
38	067996	WELDMENT, INSIDE HANDRAIL UPRIGHT 275 TRTP	2

SECTION 4 PARTS

Mirror Assembly Illustration and Parts List



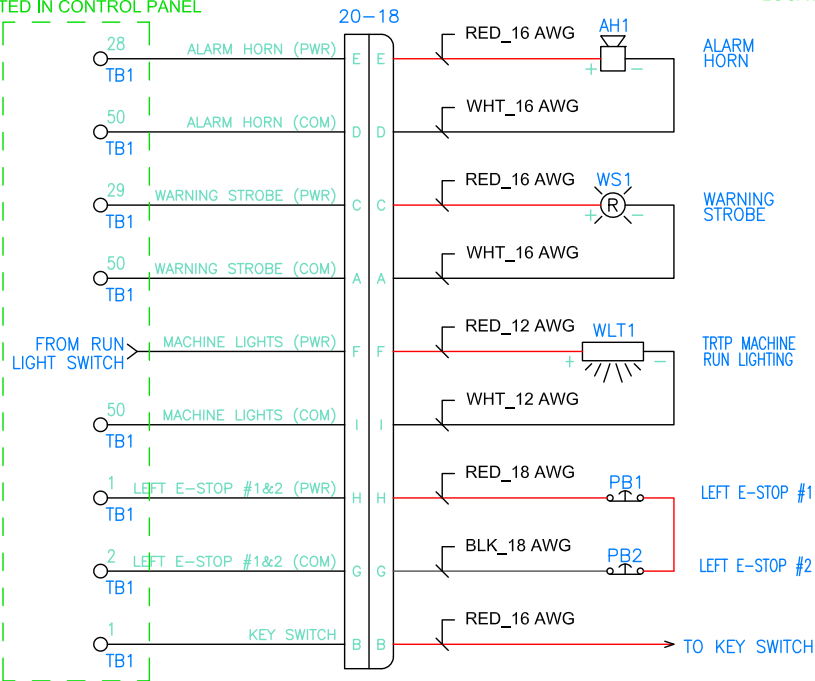
ITEM	PART NO.	DESCRIPTION	QTY
1	010090	FSTN, LW 5/16	1
2	010100	FSTN, NUT HEX 5/16-18 GR8	1
3	068051	12" DOME MIRROR FOR 275 TRTP	1
4	068052	BRACKET, MIRROR MOUNT FOR 275 TRTP	1

SECTION 4 PARTS

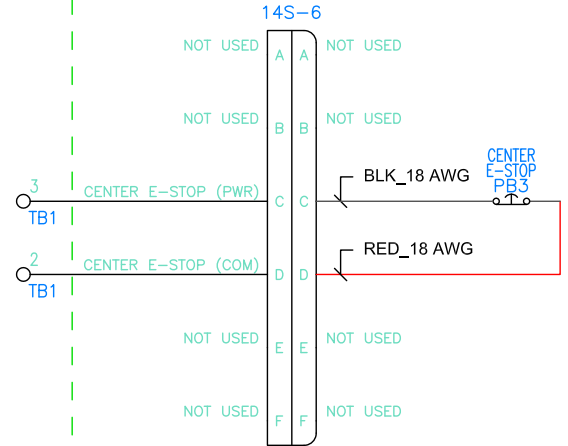
SECTION 4 PARTS

Electrical Schematics Plug 20-18 & 14S-6

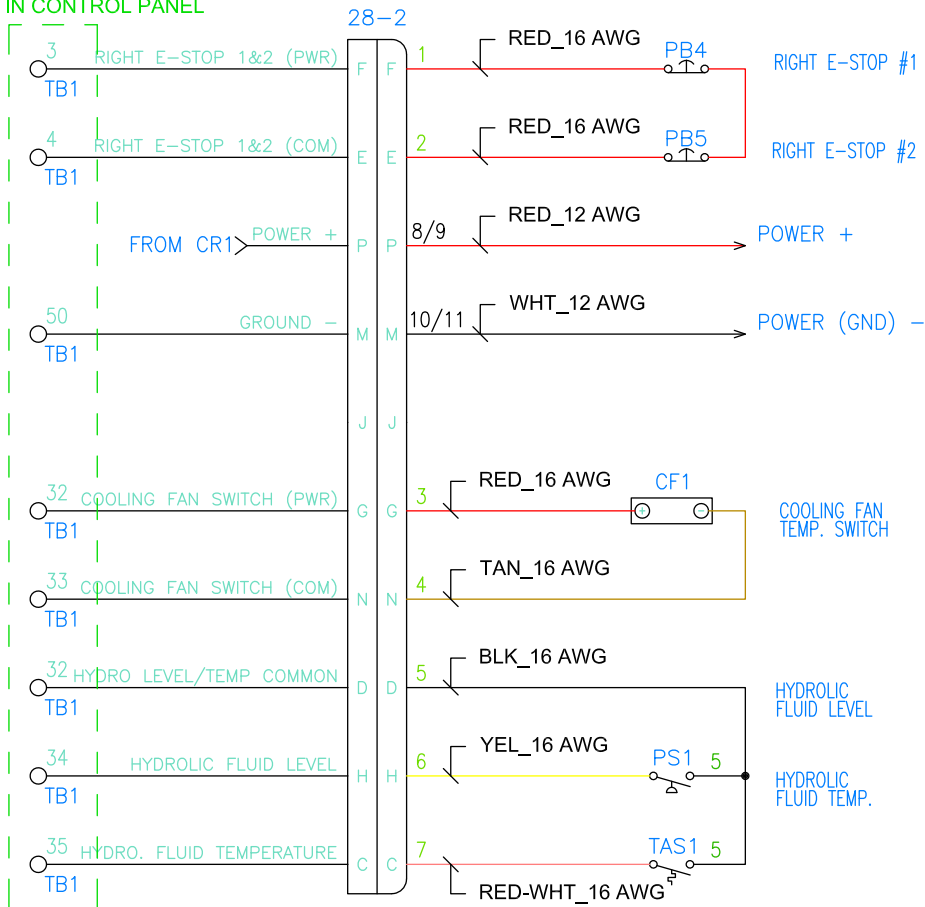
LOCATED IN CONTROL PANEL



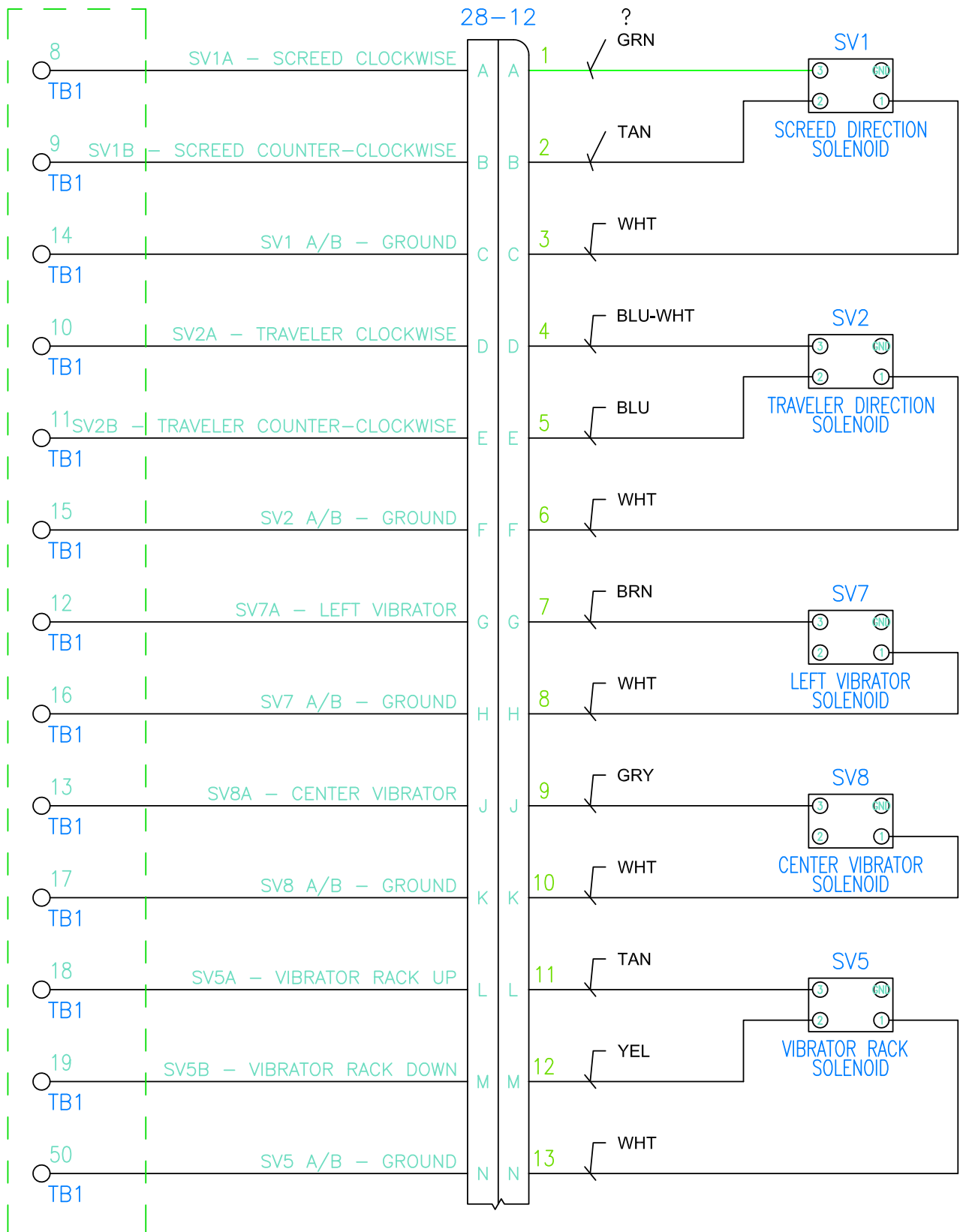
LOCATED IN CONTROL PANEL



LOCATED IN CONTROL PANEL



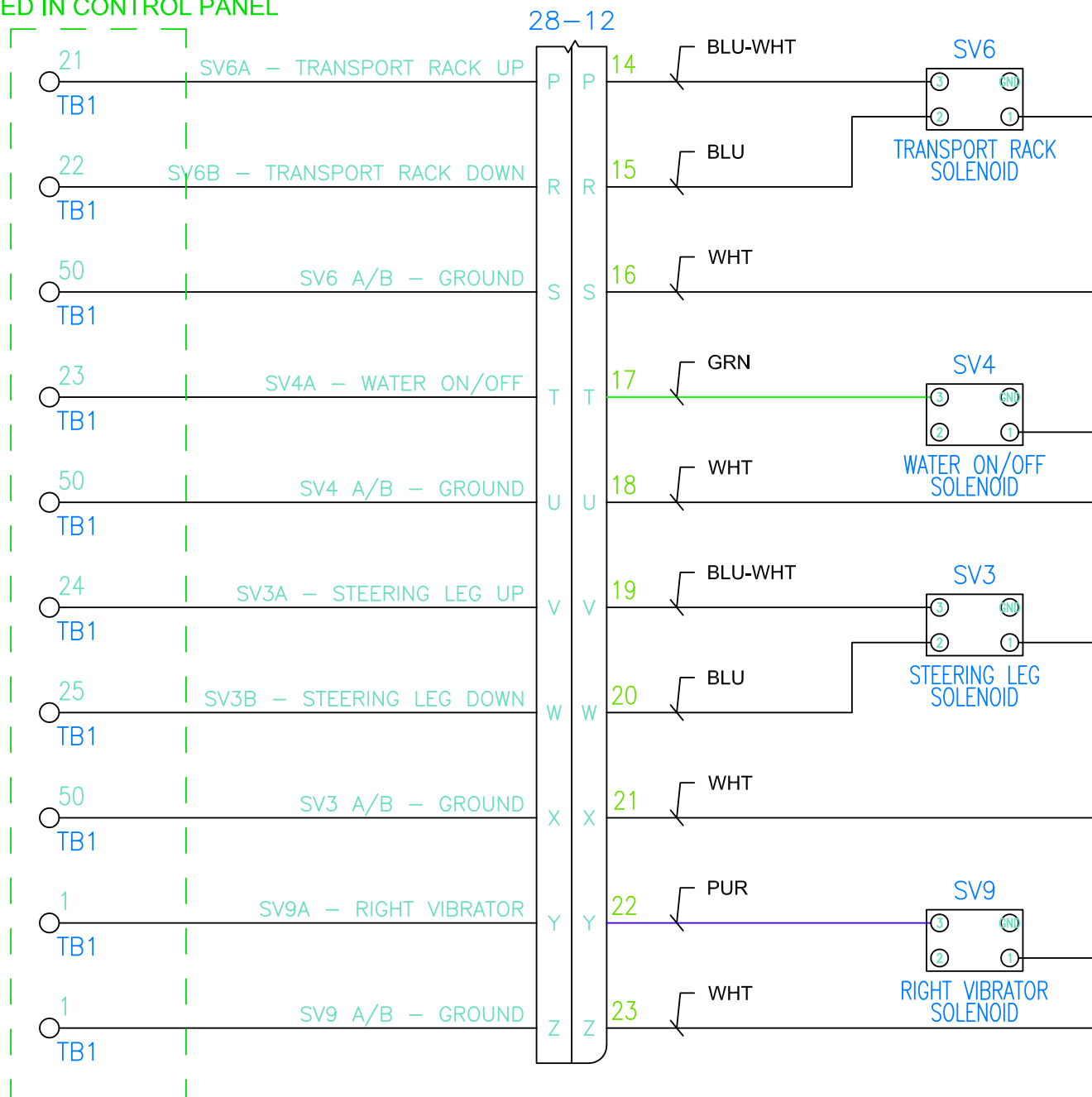
LOCATED IN CONTROL PANEL



SECTION 4 PARTS

Electrical Schematics (Cont'd) Plug 28-12 (Part 2)

LOCATED IN CONTROL PANEL



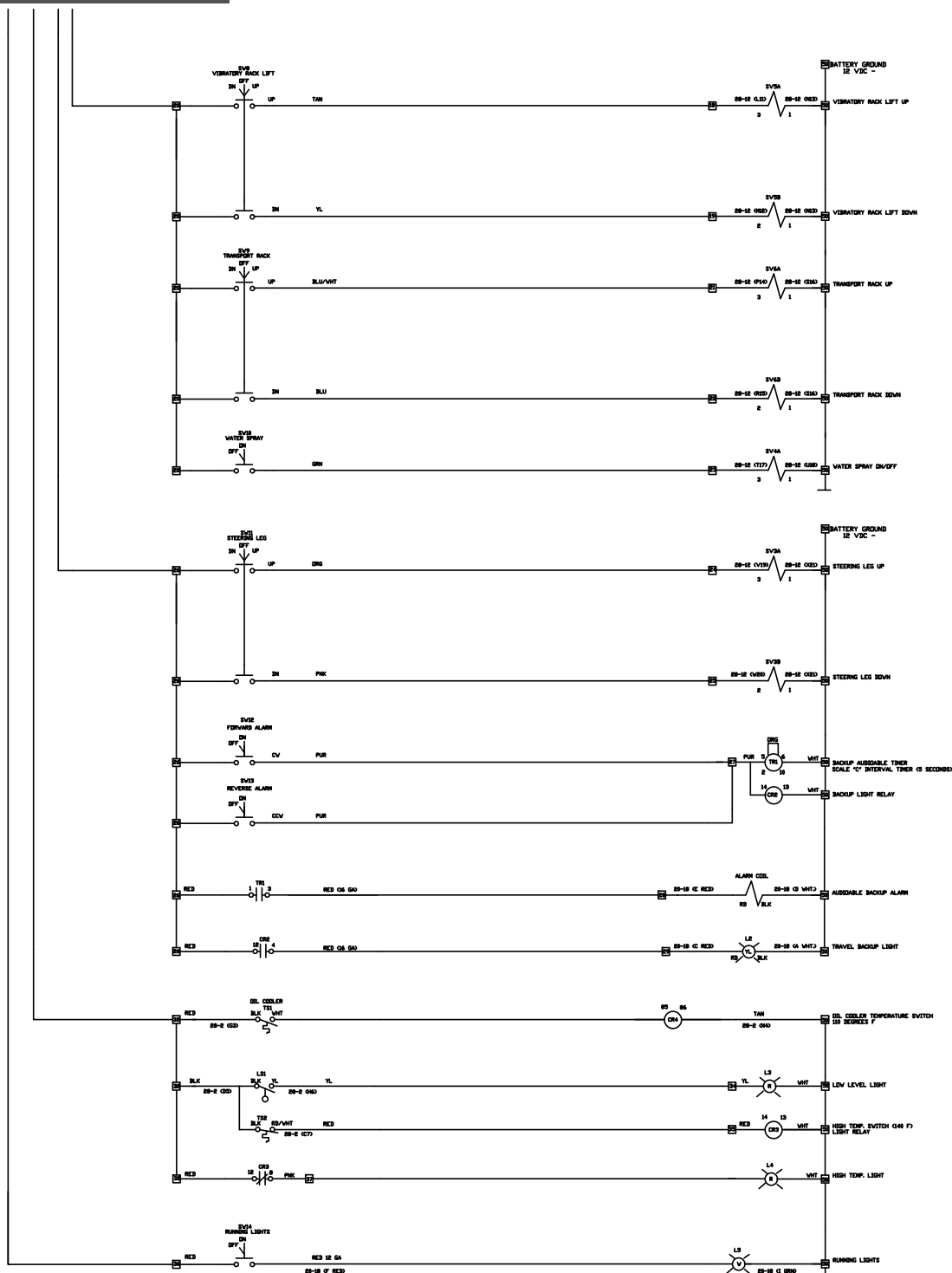
SECTION 4

PARTS

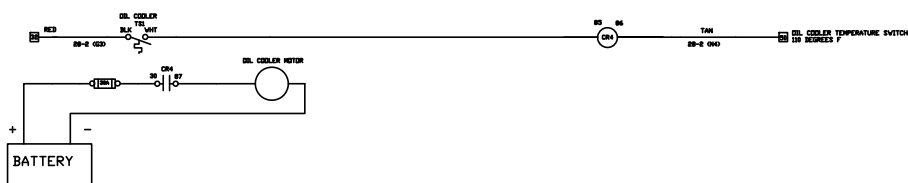


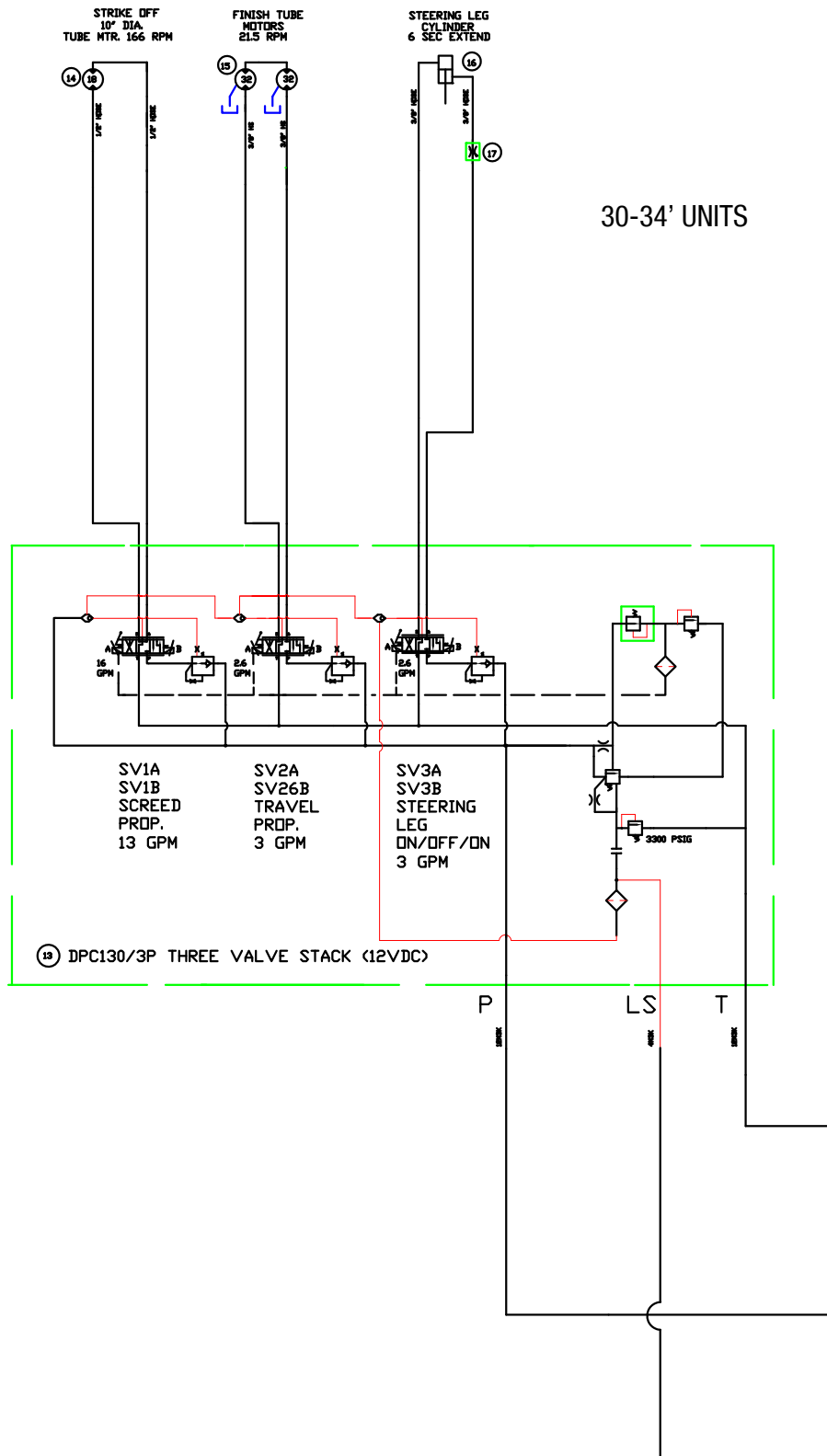
SECTION 4 PARTS

Electrical Schematics (Cont'd)



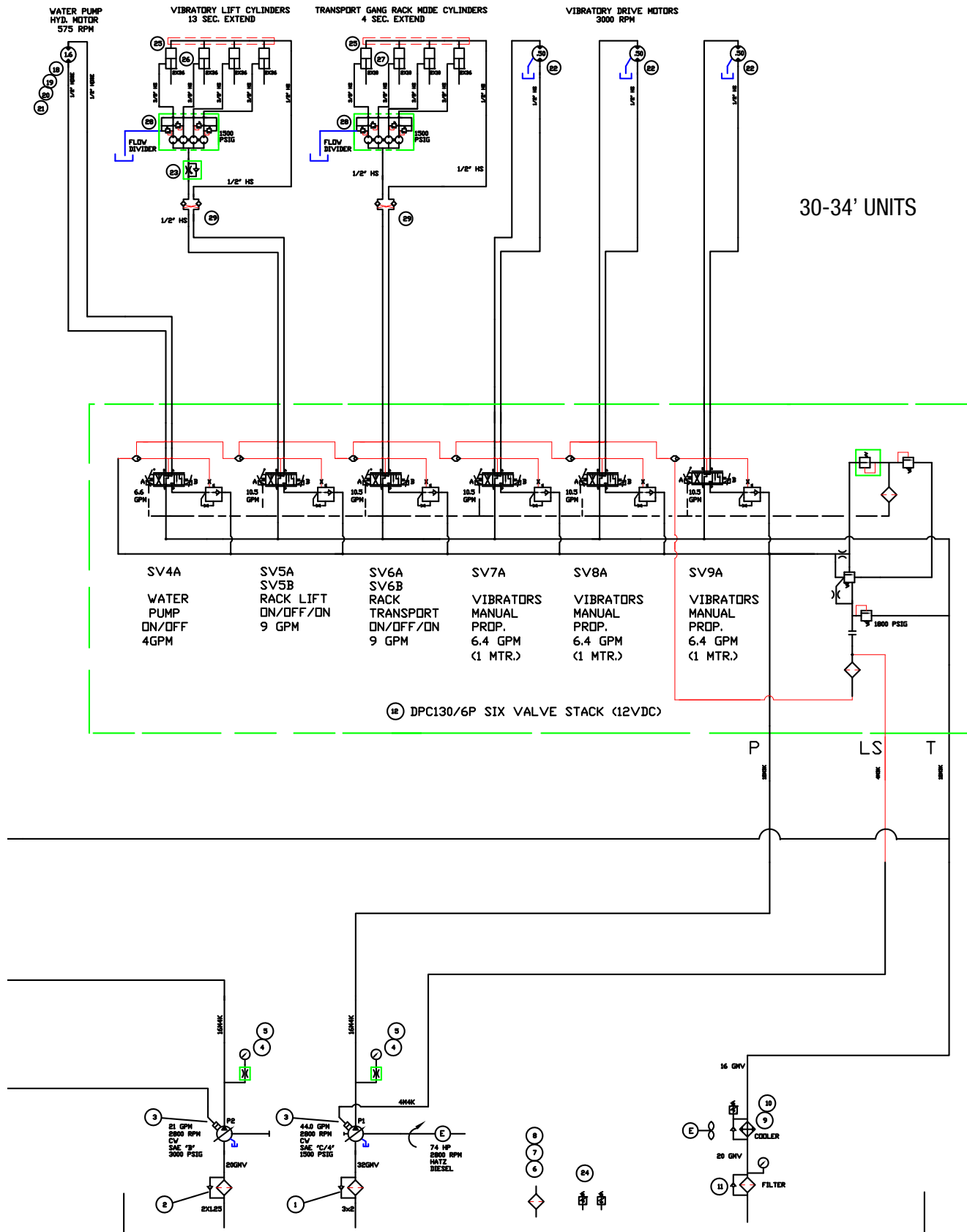
FIELD WIRING OF COOLER MOTOR

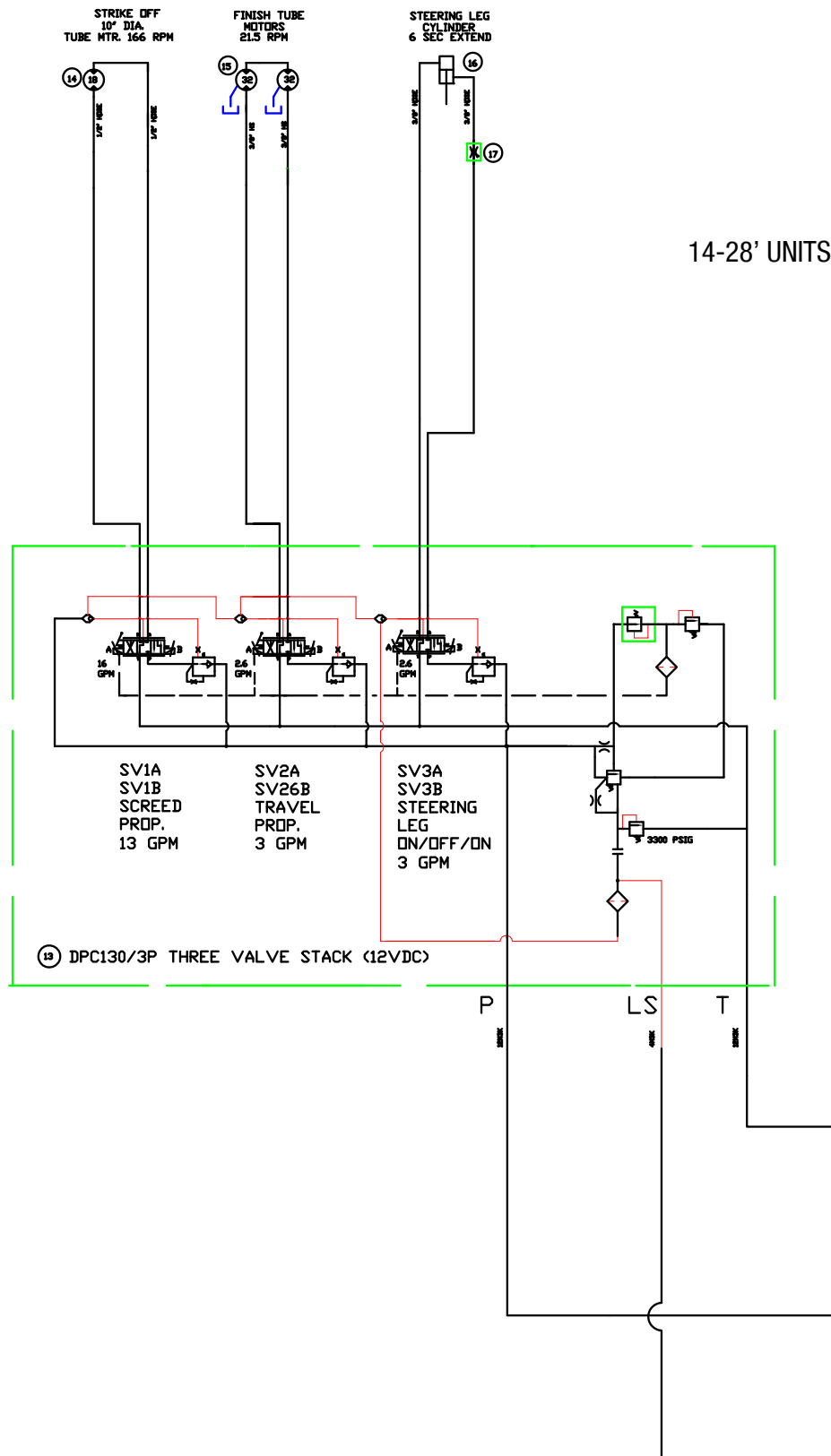




SECTION 4 PARTS

Hydraulic Schematics (Cont'd)





SECTION 4 PARTS

Hydraulic Schematics (Cont'd) 14-28' Bill of Material

ITEM	PART #	DESCRIPTION	QTY
1	057661	TMF-50-5 SUCTION STRAINER (3X2)	1
2	049357	TMF-25-5 SUCTION STRAINER (2x1.25)	1
3	067774	TANDEM PUMP	1
4	068167	PRESSURE GAUGE	2
5	043472	GAUGE SNUBBER	2
6	032960	WELD RING	2
7	068048	PRESSURIZED AIR/FILLER BREATHER CAP	2
8	068168	TEMPERATURE/LEVEL GAUGE ASSY.	1
9	066143	COOLER TEMPERATURE SWITCH	1
	058380	METRIPACK KIT	1
10	068169	AIR/OIL COOLER	1
11	067730	TANK MOUNT FILTER	1
	046241	FILTER GAUGE	1
12	068173	SIX SECTION PROPORTIONAL DIRECTIONAL VALVE	1
13	068170	THREE SECTION PROPORTIONAL DIRECTIONAL VALVE	1
14	029231	SCREED TUBE HYDRAULIC MOTOR	1
15	044652	FINISH TUBE/ TRAVEL HYDRAULIC DRIVE MOTORS	2
16	029238	STEERING CYLINDER	1
17	068327	NEEDLE VALVE	1
18	040065	HYDRAULIC MOTOR	1
19	040059	FOOT BRACKET	1
20	040060	COUPLING HALVES	2
21	040061	COUPLING INSERT	1
22	049367	VIBRATORY DRIVE MOTOR	2
23	049089	FLOW CONTROL	1
24	053952	LOW OIL/HIGH TEMPERATURE 160°F ALARM	1
25	068171	HEADER MANIFOLD	2
26	049366	VIBRATORY LIFT CYLINDERS	3
27	068172	TRANSPORT GANG RACK MODE CYLINDERS	3
28	068361	THREE SECTION FLOW DIVIDER	2
29	068174	PILOT OPERATED CHECK VALVE PACKAGE	2
30	-	ELECTRICAL CONTROL PANEL	1
31	-	CONTROL WIRE CABLING	1

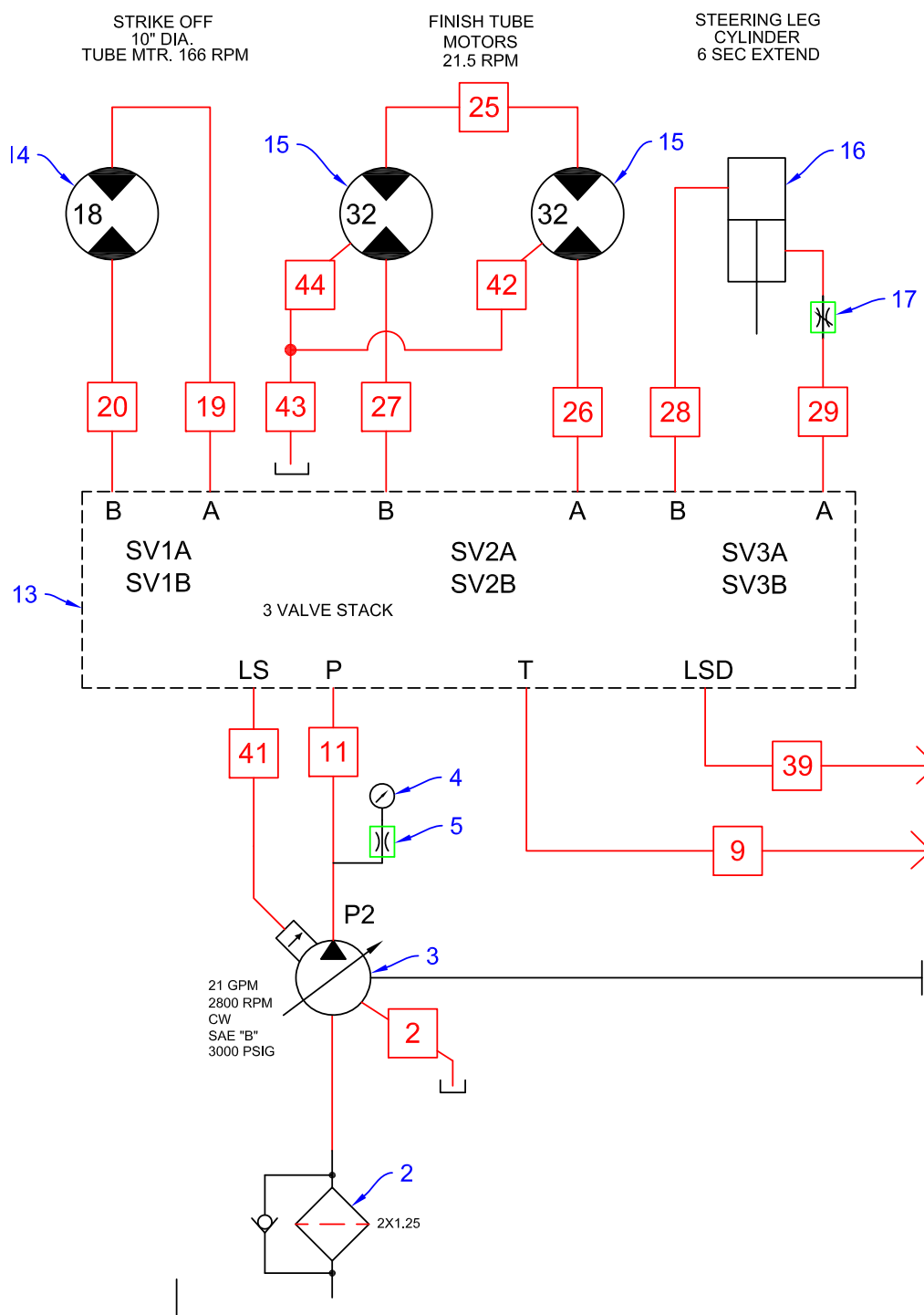
Hydraulic Schematics (Cont') 30-34' Bill of Material

SECTION 4 PARTS

ITEM	PART #	DESCRIPTION	QTY
1	057661	TMF-50-5 SUCTION STRAINER (3X2)	1
2	049357	TMF-25-5 SUCTION STRAINER (2x1.25)	1
3	067774	TANDEM PUMP	1
4	068167	PRESSURE GAUGE	2
5	043472	GAUGE SNUBBER	2
6	032960	WELD RING	2
7	068048	PRESSURIZED AIR/FILLER BREATHER CAP	2
8	068168	TEMPERATURE/LEVEL GAUGE ASSY.	1
9	066143	COOLER TEMPERATURE SWITCH	1
	058380	METRIPACK KIT	1
10	068169	AIR/OIL COOLER	1
11	067730	TANK MOUNT FILTER	1
	046241	FILTER GAUGE	1
12	068173	SIX SECTION PROPORTIONAL DIRECTIONAL VALVE	1
13	068170	THREE SECTION PROPORTIONAL DIRECTIONAL VALVE	1
14	029231	SCREED TUBE HYDRAULIC MOTOR	1
15	044652	FINISH TUBE/ TRAVEL HYDRAULIC DRIVE MOTORS	2
16	029238	STEERING CYLINDER	1
17	068327	NEEDLE VALVE	1
18	040065	HYDRAULIC MOTOR	1
19	040059	FOOT BRACKET	1
20	040060	COUPLING HALVES	2
21	040061	COUPLING INSERT	1
22	049367	VIBRATORY DRIVE MOTOR	3
23	049089	FLOW CONTROL	1
24	053952	LOW OIL/HIGH TEMPERATURE 160°F ALARM	1
25	068171	HEADER MANIFOLD	2
26	049366	VIBRATORY LIFT CYLINDERS	4
27	068172	TRANSPORT GANG RACK MODE CYLINDERS	4
28	068361	THREE SECTION FLOW DIVIDER	2
29	068174	PILOT OPERATED CHECK VALVE PACKAGE	2
30	-	ELECTRICAL CONTROL PANEL	1
31	-	CONTROL WIRE CABLING	1

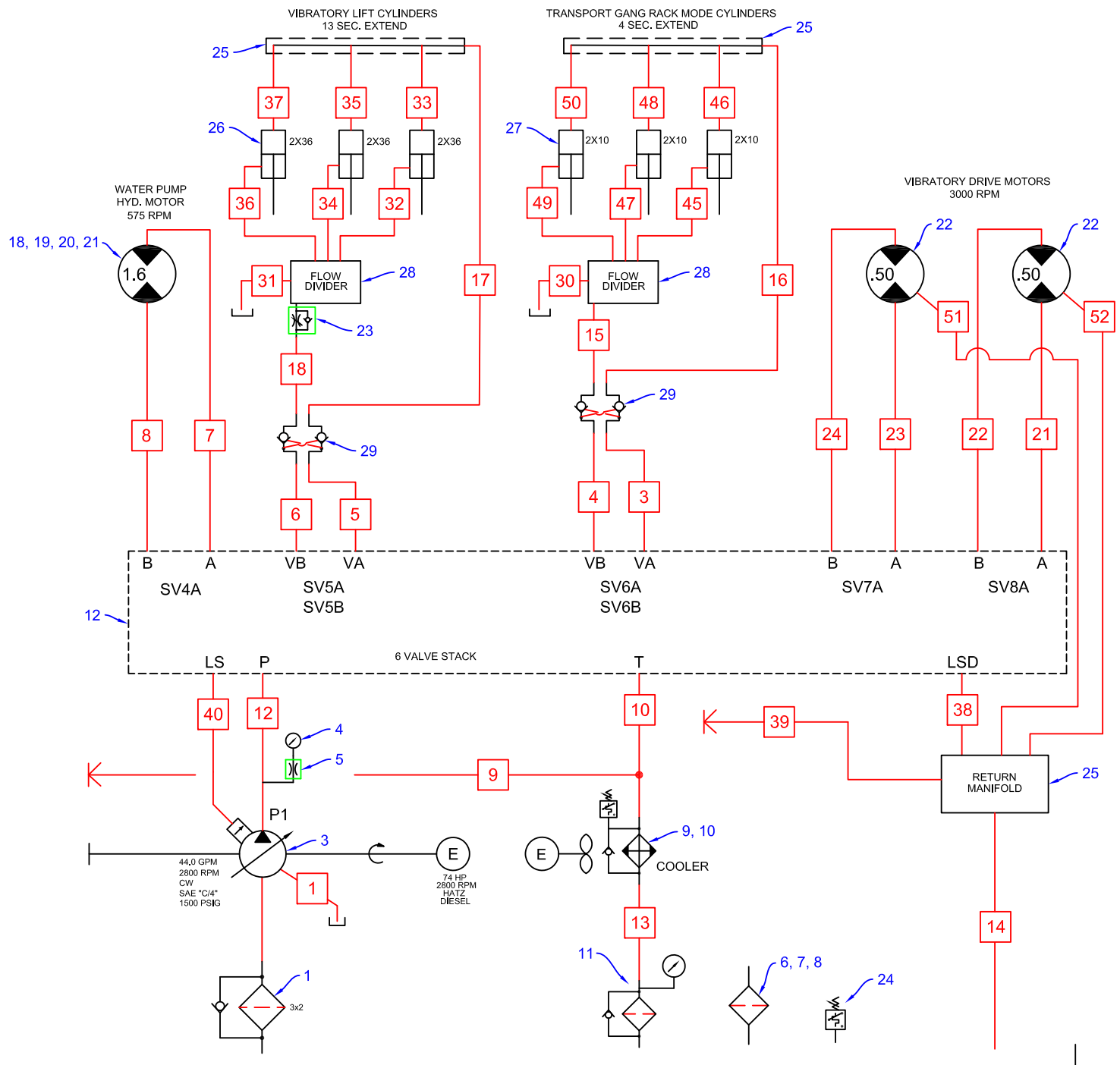
SECTION 4 PARTS

Hydraulic Schematics (Cont'd) Block and Hose Diagram



Hydraulic Schematics (Cont') Block and Hose Diagram

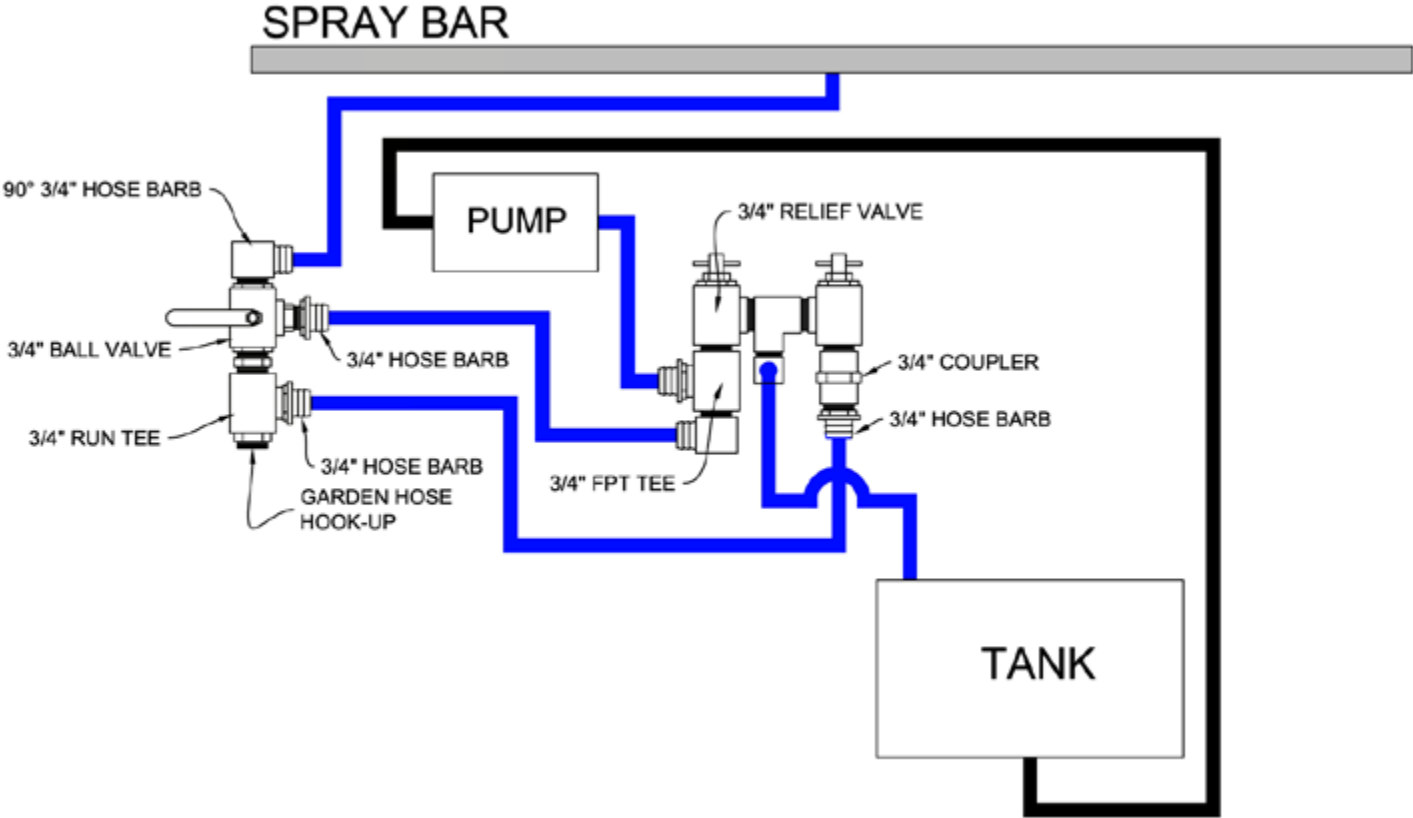
SECTION 4 PARTS



SECTION 4 PARTS

Hydraulic Schematics (Cont'd) 18' Hose List

MODEL 275 GANG VIBRATION 18 FOOT MACHINE HOSE LIST 5.23.18				
ITEM #	AEC PART #	P/N	QTY	ROUTING
1	068693	HS-275GV-1	1	Case drain on front pump to tank
2	068694	HS-275GV-2	1	Case drain on rear pump to tank
3	068695	HS-275GV-3	1	A Port on Transport Valve to VA Port on Block
4	068696	HS-275GV-4	1	B Port on Transport Valve to VB Port on Block
5	068697	HS-275GV-5	1	A Port on Vibrator Lift Valve to VA Port on Block
6	068698	HS-275GV-6	1	B Port on Vibrator Lift Valve to VB Port on Block
7	068699-NL	HS-275GV-7/18	1	A Port on Water Spray Valve to Water Pump Motor
8	068700-NL	HS-275GV-8/18	1	B Port on Water Spray Valve to Water Pump Motor
9	068701	HS-275GV-9	1	T Port on 3-Stack Valve to Cooler Tee
10	068702	HS-275GV-10	1	T Port on 6-Stack Valve to Cooler Tee
11	068707	HS-275GV-11	1	P Port on Rear Pump to P Port on 3-Stack Valve
12	068708	HS-275GV-12	1	P Port on Front Pump to P Port on 6-Stack Valve
13	068709	HS-275GV-13	1	Outlet on Cooler to Return Filter on Tank
14	068710	HS-275GV-14	1	Outlet on Return Manifold to Tank
15	068715-NL	HS-275GV-15/18	1	Transport Gang Rack Flow Divider to Check Valve
16	068716-NL	HS-275GV-16/18	1	Transport Gang Rack Manifold to Check Valve
17	068717	HS-275GV-17	1	Vibratory Lift Cylinder Manifold to Check Valve
18	068718	HS-275GV-18	1	Vibratory Lift Cylinder Flow Divider to Check Valve
19	068719	HS-275GV-19	1	A Port on Finish Tube Motor to A Port on Finish Tube Valve
20	068720	HS-275GV-20	1	B Port on Finish Tube Motor to B Port on Finish Tube Valve
21	068721	HS-275GV-21	1	SV8A "A" Port to Inlet of RH Vibrator Motor
22	068722	HS-275GV-22	1	SV8A "B" Port to Outlet of RH Vibrator Motor
23	068723-NL	HS-275GV-23/18	1	SV7A "A" Port to Inlet of LH Vibrator Motor
24	068724-NL	HS-275GV-24/18	1	SV7A "B" Port to Outlet of LH Vibrator Motor
25	068725	HS-275GV-25	1	Finish Tube Motor Outlet to Inlet
26	068726	HS-275GV-26	1	SV2AB "A" Port to Inlet of Finish Tube Motor
27	068727	HS-275GV-27	1	SV2AB "B" Port to Outlet of Finish Tube Motor
28	068728-NL	HS-275GV-28/18	1	SV3AB "B" Port to Cap End of Steering Leg Cylinder
29	068729-NL	HS-275GV-29/18	1	SV3AB "A" Port to Rod End of Steering Leg Cylinder
30	068730	HS-275GV-30	1	Transport Gang Rack Flow Divider Case Drain
31	068731	HS-275GV-31	1	Vibratory Lift Cylinder Flow Divider Case Drain
32	068732-NL	HS-275GV-32/18	1	Vibratory Lift Cylinder Flow Divider to Rod End of RH Lift Cylinder
33	068733-NL	HS-275GV-33/18	1	Vibratory Lift Cylinder Flow Divider to Cap End of RH Lift Cylinder
34	068734-NL	HS-275GV-34/18	1	Vibratory Lift Cylinder Flow Divider to Rod End of Center Lift Cylinder
35	068735-NL	HS-275GV-35/18	1	Vibratory Lift Cylinder Flow Divider to Cap End of Center Lift Cylinder
36	068736-NL	HS-275GV-36/18	1	Vibratory Lift Cylinder Flow Divider to Rod End of LH Lift Cylinder
37	068737-NL	HS-275GV-37/18	1	Vibratory Lift Cylinder Flow Divider to Cap End of LH Lift Cylinder
38	068738	HS-275GV-38	1	LSD Port on 6 Valve Stack to Return Manifold
39	068739	HS-275GV-39	1	LSD Port on 3 Valve Stack to Return Manifold
40	068740	HS-275GV-40	1	LS Port on 6 Valve Stack to Case Drain of Front Pump
41	068741	HS-275GV-41	1	LS Port on 3 Valve Stack to Case Drain of Rear Pump
42	068742	HS-275GV-42	1	Case Drain on Finish Motor to Tee
43	068743	HS-275GV-43	1	Finish Motor Case Drain Tee to Tank
44	068744	HS-275GV-44	1	Case Drain on Finish Motor to Tee
45	068745-NL	HS-275GV-45/18	1	Transport Gang Rack Flow Divider to Rod End of RH Cylinder
46	068746-NL	HS-275GV-46/18	1	Transport Gang Rack Manifold to Cap End of RH Cylinder
47	068747-NL	HS-275GV-47/18	1	Transport Gang Rack Flow Divider to Rod End of Center Cylinder
48	068748-NL	HS-275GV-48/18	1	Transport Gang Rack Manifold to Cap End of Center Cylinder
49	068749-NL	HS-275GV-49/18	1	Transport Gang Rack Flow Divider to Rod End of LH Cylinder
50	068750-NL	HS-275GV-50/18	1	Transport Gang Rack Manifold to Cap End of LH Cylinder
51	068751-NL	HS-275GV-51/18	1	Case Drain LH Vibrator Drive Motor to Return Manifold
52	068752-NL	HS-275GV-52/18	1	Case Drain RH Vibrator Drive Motor to Return Manifold
53	068753-NL	HS-275GV-53/18	1	
54	068754-NL	HS-275GV-54/18	1	





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