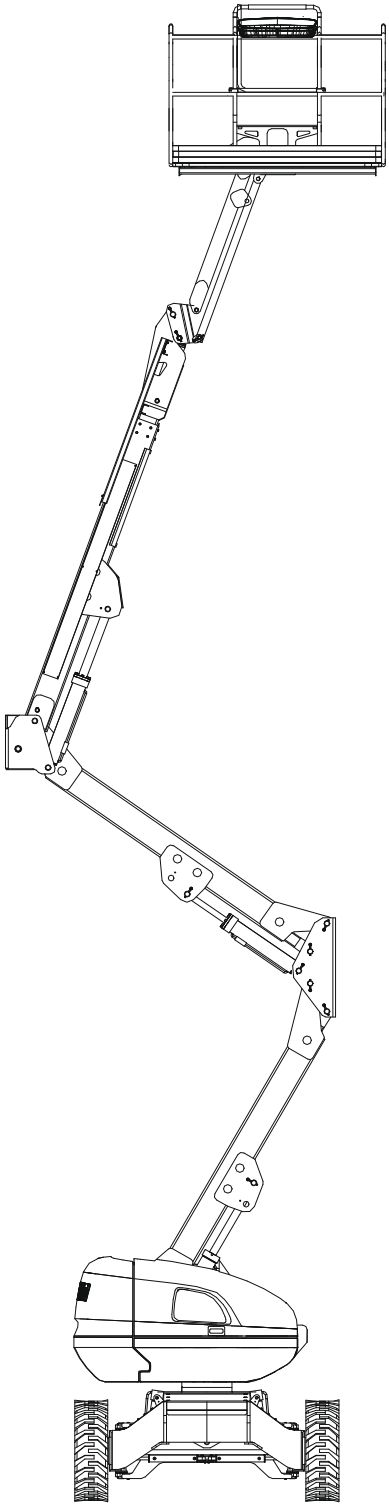
Service & Parts Manual

45-AJ Diesel



Serial Number Range
14600001 - Up

Part # 94534
October 2024

Revision History

Date	Reason for Update
December 2017	New Release
July 2018	Continuous Improvement Update
May 2019	Hydraulic Tank Assembly Correction Platform Assembly Correction Hydraulic Schematics Correction
August 2019	Added Electrical Harness
October 2019	Added Limit Switch And Sensor Detail
November 2019	Platform Deck Plate Correction

MEC Aerial Work Platforms

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Table of Contents

Service Introduction

This Service section is designed to provide you, the customer, with the instructions needed to properly maintain the MEC self-propelled aerial work platform. When used in conjunction with the illustrated Parts section in this manual and the Operator's Manual (provided separately), this manual will assist you in making necessary adjustments and repairs, and identifying and ordering the correct replacement parts.

All parts represented here are manufactured and supplied in accordance with MEC quality standards. We recommend that you use genuine MEC parts to ensure proper operation and reliable performance.

To obtain maximum benefits from your MEC Aerial Work Platforms, always follow the proper operating and maintenance procedures. Only trained authorized personnel should be allowed to operate or service this machine. Service personnel should read and study the Operator's, and the Service and Parts Manuals in order to gain a thorough understanding of the unit prior to making any repairs.

MEC Operator Policy

Note: *The best method to protect yourself and others from injury or death is to use common sense. If you are unsure of any operation,* ***don't start*** *until you are satisfied that it is safe to proceed and have discussed the situation with your supervisor.*

Service personnel and machine operators must understand and comply with all warnings and instructional decals on the body of the machine, at the ground controls, and platform control console.

DANGER

MODIFICATIONS OF THIS MACHINE FROM THE ORIGINAL DESIGN AND SPECIFICATIONS WITHOUT WRITTEN PERMISSION FROM MEC ARE STRICTLY FORBIDDEN. A MODIFICATION MAY COMPROMISE THE SAFETY OF THE MACHINE, SUBJECTING OPERATOR(S) TO SERIOUS INJURY OR DEATH.

MEC's policies and procedures demonstrate our commitment to Quality and our relentless ongoing efforts towards Continuous Improvement, due to which product specifications are subject to change without notice.

Any procedures not found within this manual must be evaluated by the individual to assure oneself that they are "proper and safe."

Your MEC Aerial Work Platform has been designed, built, and tested to provide many years of safe, dependable service. Only trained, authorized personnel should be allowed to operate or service the machine.

MEC, as manufacturer, has no direct control over machine application and operation. Proper safety practices are the responsibility of the user and all operating personnel.

If there is a question on application and/or operation, contact MEC Aerial Work Platforms:

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Safety Symbols & General Safety Tips

MEC manuals and decals use symbols, colors and signal words to help you recognize important safety, operation and maintenance information.

RED and the word DANGER – Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

ORANGE and the word WARNING – Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

YELLOW with alert symbol and the word CAUTION – Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

YELLOW without alert symbol and the word CAUTION – Indicates a potentially hazardous situation which, if not avoided, may result in property damage.

GREEN and the word NOTICE – Indicates operation or maintenance information.

Regular inspection and constant maintenance is the key to efficient economical operation of your aerial work platform. It will help to assure that your equipment will perform satisfactorily with a minimum of service and repair.

The actual operating environment of the machine governs the inspection schedule. Correct lubrication is an essential part of the preventative maintenance to minimize wear on working parts and ensure against premature failure. By maintaining correct lubrication, the possibility of mechanical failure and resulting downtime is reduced to a minimum.

- Never leave hydraulic components or hoses open. They must be protected from contamination (including rain) at all times.
- Never open a hydraulic system when there are contaminants in the air.
- Always clean the surrounding area before opening hydraulic systems.
- Use only recommended lubricants. Improper lubricants or incompatible lubricants may be as harmful as no lubrication.
- Watch for makeshift “fixes” which can jeopardize safety as well as lead to more costly repair.

Machine Specifications

Stowed Dimension		
Length (Transport Position)	16 ft 10 in	5.15 m
Overall Length	22 ft 9 in	6.94 m
Overall Width	7 ft 6 in	2.3 m
Overall Height	8 ft 1 in	2.48 m
Machine Gross Weight	16380 lbs	7430 kg
Ground Clearance	11 in	0.30 m
Operation Dimension		
Maximum Platform Height	45 ft 11 in	14 m
Maximum Working Height	52 ft 5 in	16 m
Maximum Up and Over Height	25 ft 1 in	7.67 m
Maximum Horizontal Reach	24 ft 6 in	7.47 m
Main Boom Up Angle	75°	
Main Boom Down Angle	-10°	
Maximum Turntable Tail swing	0	
Wheelbase	7 ft 2 in	2.2 m
Minimum Turning Circle Inside	7 ft	2.1 m
Minimum Turning Circle Outside	17 ft	5.1 m
Turntable Rotation	360 continuous	
Platform Rotation	180°	
Platform Capacity	2 person 500 lbs (227 kg)	
Tire and Wheels		
Solid Tire and Wheel		
Size	33*12-20	
Outer Diameter	33 in	838 mm
Width	11.3 in	287 mm
Airborne Noise Emission:		
Maximum Sound Level at 1.5 Meters From the Engine	81.3 db	

Performance Specifications

Operation	Speed
Boom Stowed, high range	3.7 mph 6 km/h
Boom Raised or Extended	0.68 mph 1.1 km/h
Grade ability (Stowed)	40%
Main Lift Up	25 - 30 sec
Main Lift Down	25 - 30 sec
Swing Right & Left	40 - 50 sec
Telescope Extent Out	10 - 15 sec
Telescope Retract In	10 - 15 sec
Platform Rotate R & L	12 - 16 sec
Jib Up	16 - 20 sec
Jib Down	16 - 20 sec
Lower and Mid Boom Up	25 - 30 sec
Lower and Mid Boom Down	25 - 30 sec

Bolt Torque Specification - American Standard

Fasteners

Use the following values to apply torque unless a specific torque value is called out for the part being used.

American Standard Cap Screws								
SAE Grade	**5**				**8**			
Cap Screw Size (inches)								
	Torque				**Torque**			
	Ft.	**Lbs**	**Nm**		**Ft.**	**Lbs**	**Nm**	
	Min	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**
1/4 - 20	6.25	7.25	8.5	10	8.25	9.5	11	13
1/4 - 28	8	9	11	12	10.5	12	14	16
5/16 - 18	14	15	19	20	18.5	20	25	27
5/16 - 24	17.5	19	12	26	23	25	31	34
3/8 - 16	26	28	35	38	35	37	47.5	50
3/8 - 24	31	34	42	46	41	45	55.5	61
7/16- 14	41	45	55.5	61	55	60	74.5	81
7/16 - 20	51	55	69	74.5	68	75	92	102
1/2 - 13	65	72	88	97.5	86	96	116	130
1/2 - 20	76	84	103	114	102	112	138	152
9/16 - 12	95	105	129	142	127	140	172	190
9/16 - 18	111	123	150	167	148	164	200	222
5/8 - 11	126	139	171	188	168	185	228	251
5/8 - 18	152	168	206	228	203	224	275	304
3/4 - 10	238	262	322	255	318	350	431	474
3/4 - 16	274	302	371	409	365	402	495	544
7/8 - 9	350	386	474	523	466	515	631	698
7/8 - 14	407	448	551	607	543	597	736	809
1- 8	537	592	728	802	716	790	970	1070
1 - 14	670	740	908	1003	894	987	1211	1137

Torque values apply to fasteners as received from the supplier, dry or when lubricated with normal engine oil.

If special graphite grease, molydisulphide grease, or other extreme pressure lubricants are used, these torque values do not apply.

Bolt Torque Specification - Metric Standard

Fasteners

Use the following values to apply torque unless a specific torque value is called out for the part being used

Metric Cap Screws								
Metric Grade	**8.8**				**10.9**			
Cap Screw Size (Millimeters)								
	Torque				**Torque**			
	Ft.	**Lbs**	**Nm**		**Ft.**	**Lbs**	**Nm**	
	Min	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**
M6 × 1.00	6	8	8	11	9	11	12	15
M8 × 1.25	16	20	21.5	27	23	27	31	36.5
M10 × 1.50	29	35	39	47	42	52	57	70
M12 × 1.75	52	62	70	84	75	91	102	123
M14 × 2.00	85	103	115	139	120	146	163	198
M16 × 2.50	130	158	176	214	176	216	238	293
M18 × 2.50	172	210	233	284	240	294	325	398
M20 × 2.50	247	301	335	408	343	426	465	577
M22 × 2.50	332	404	450	547	472	576	639	780
M24 × 3.00	423	517	573	700	599	732	812	992
M27 × 3.00	637	779	863	1055	898	1098	1217	1488
M30 × 3.00	872	1066	1181	1444	1224	1496	1658	2027

Torque values apply to fasteners as received from the supplier, dry or when lubricated with normal engine oil.

If special graphite grease, molydisulphide grease, or other extreme pressure lubricants are used, these torque values do not apply.

Machine Configuration When Performing Speed Tests

WARNING **Watch out for overhead power lines and obstacles.**

Lift: Boom Retracted. Telescope Retracted. Lift Up, Record Time, Lift Down, Record Time.

Swing: Boom at Full Elevation. Telescope Retracted. Swing the Turntable a full revolution. Swing the Opposite Direction, Record Time.

Telescope: Boom at Full Elevation; Telescope Retracted; Telescope Out, Record Time. Telescope In, Record Time.

Drive: Test to be done on a smooth level surface. Engine Speed Switch should be set to Rabbit (Fast) at High Engine. Start approximately 25 ft. (7.62 m) from starting point so that the unit is at maximum speed when starting the test. Results should be recorded for a 40 ft. (12.2 m) course. Drive Forward, record time. Drive Reverse, Record Time.

Drive (Above Horizontal): Test should be done on a smooth level surface. Drive Select Switch should be set to High Engine. This verifies that the switches are working when the boom is above horizontal. Results should be recorded for a 40 ft. course. Drive Forward, Record Time. Drive Reverse, Record Time.

Platform Rotate: Platform level and completely rotated one direction. Rotate the opposite direction, Record Time. Rotate the other direction, Record Time.

Articulating Jib: Start with the Jib down. Jib Up, Record Time. Jib Down, Record Time.

Lower Lift: Upper Boom horizontal. Telescoped In. Lower Lift Up, Record Time. Lower Lift Down, Record Time.

Test Notes

1. Stop watch should be started with the function, not with the controller or switch.
2. Drive test results reflect 12×16.5 tires.
3. All speed tests are run from the platform. These speeds do not reflect the ground control operation.
4. Function speeds may vary due to cold, thick hydraulic oil. Test should be run with the oil temperature above 100° F (38° C).

Hydraulic System Specification

Drive Pump		
Type	Bi-directional Variable Displacement piston pump, EDC control	
Displacement per revolution	46 cc	
Maximum Peak Pressure	4200 psi	290 bar
Maximum Continuous Working Pressure	3625 psi	250 bar
Hydraulic Filter	10 um	
Drive Motor		
Type	Two Speed Variable Displacement Motor	
Displacement per revolution	38/14.36 cc	
Rated Working Pressure	3625 psi	250 bar
Function Pump		
Type	Gear Pump	
Rated Working Pressure	3500 psi	240 bar
Displacement per revolution	14 cc	
Hydraulic Tank Return Filter	10 um	
Dive Manifold		
Motor Shift/Brake Release Pressure	290 psi	20 bar
Function Manifold		
Function Main Relief Pressure used for Main Boom Up and Down	2550 psi	175 bar
Function Main Relief Pressure, used for Lower & Mid Boom Up and Down; Main Boom Up and Down	3050 psi	210 bar
Turntable Swing Pressure Setting	1000 psi	70 bar
Main Boom Telescopic Extend and Retract Pressure Setting	2600 psi	180 bar
Jib Up and Down Pressure Setting Platform Rotate R & L Pressure Setting	1800 psi	124 bar
Platform Level Up Pressure Setting	2750 psi	190 bar
Platform Level Down Pressure Setting	1800 psi	124 bar
Steering Pressure Setting	1800 psi	124 bar
Hydraulic Reservoir		
Maximum Capacity	32 gallons	120 L
Auxiliary Pump Unit		
Electric Motor	12V/1.5 kW/2800rpm	
Displacement per revolution	2.3 cc	

Kubota V2403-M Engine Specification

Displacement	2.434 L
Number of Cylinder	4
Bore & Stoke	87×102.4 (mm)
Rated Power	48 hp @ 2600 (rpm)
Firing Order	1-3-4-2
Low Idle	1150-1250 (rpm)
High Idle	Less than 2645 (rpm)
Governor	Centrifugal ball type all speed governor
Compression Ratio	20.5
Valve Clearance, Cold	
Intake Resistance	≤ 2.45 (250) kPa (mmAq)
Exhaust Gas Volume	7.64 (m^3/min)
Lubrication System	
Oil Pressure Switch	0.5kgf/cm^2
Lube Oil Capacity	9.5 L
Oil Viscosity Requirements	Better than API CD class 10W-30
Use Oil Meeting API Classification SF (labeled SF/CC or SF/CD) for Improved Wear protection.	
Starter Motor	12 V-2.0 kW
Cooling System	Pressurized Radiator, forced Circulation with Water Pump
Alternator	
Output	12V-40A
Fan belt Deflection	10 mm
Battery	To Serial # 14600119 - Group 24 750A
	From Serial # 1460020 - Group 31 950A

Description

This machine is a self-propelled hydraulic lift equipped with a work platform on the end of an elevating, articulating and rotating boom. Vibrations emitted by these machines are not hazardous to an operator in the work platform. The machine can be used to position personnel with their tools and supplies at position above ground level and can be used to reach work areas located above and over machinery or equipment.

The primary operator control station is in the platform. From this control station, the operator can drive and steer the machine in both forward and reverse directions. The operator can raise or lower the boom or swing the boom to the left or right. Standard boom swing is 360 degree continuous left and right of the stowed position. The machine has a **Ground Control Station** which will override the Platform Control Station. Ground Controls operate boom lift and swing, and are to be used in an emergency to lower the platform to the ground should the operator in the platform be unable to do so. The Ground Control is also to be used in Pre-Start Inspection.

Instruction and hazard warnings are posted adjacent to both operator control stations and at other places on the machine. It is extremely important that operators know what instructions and warnings are placed on the machine, and review these periodically so that they are fresh in their minds.

There are efficient and safe operation instructions in accordance with warnings on the machine, in the Operator's Manual, and all job site and government rules and regulations. It is necessary that the machine be regularly maintained in accordance with this manual and that any evidence of lack of maintenance, malfunction, excessive wear, damage or modification to the machine be reported immediately to the machine owner or the job site supervisor or safety manager and that the machine be taken out of service until all discrepancies are corrected.

The machine is not intended to be used to lift material other than supplies which personnel in the platform require to do their job. Supplies or tools which extend outside the platform are prohibited. It must not be used as a forklift, crane, and support for overhead structure, or to push or pull another object.

The machine is equipped with an auxiliary battery operated power unit which will provide hydraulic power in the event of a primary engine power loss. Auxiliary power can be controlled from either the Platform Control Station or the Ground Control Station. Follow the instructions placed at the control stations.

The machine is hydraulically powered using hydraulic motors and cylinders for various machine motions. The hydraulic components are controlled by electrically activated hydraulic valves using switches and control levers. The speeds of functions controlled by control levers are variable from zero to maximum speed depending upon the position of the control lever. Functions controlled by toggle switches are either on or off. An enable switch in the platform must be depressed before any controls will function.

The machine is a four wheel drive with drive power being supplied by a hydraulic motor for each drive wheel. Each drive wheel is supplied with a hydraulically released, spring-applied brake. These brakes are automatically applied any time the Drive Control lever is returned to the neutral position

The unrestricted capacity of the machine is 500 lbs (230 kg). This means that with a platform load of 500 lbs (230 kg) or less, the platform may be positioned anywhere the boom will reach.

Operating Characteristics and Limitations

Capacities

The boom can be raised above horizontal with or without any load in platform, if:

1. Machine is positioned on a smooth, firm and level surface.
2. Load is within manufacturer's rated capacity.
3. All machine systems are functioning properly.

TO AVOID FORWARD OR BACKWARD TIPPING, DO NOT OVERLOAD MACHINE OR OPERATE THE MACHINE ON AN OUT OF LEVEL SURFACE.

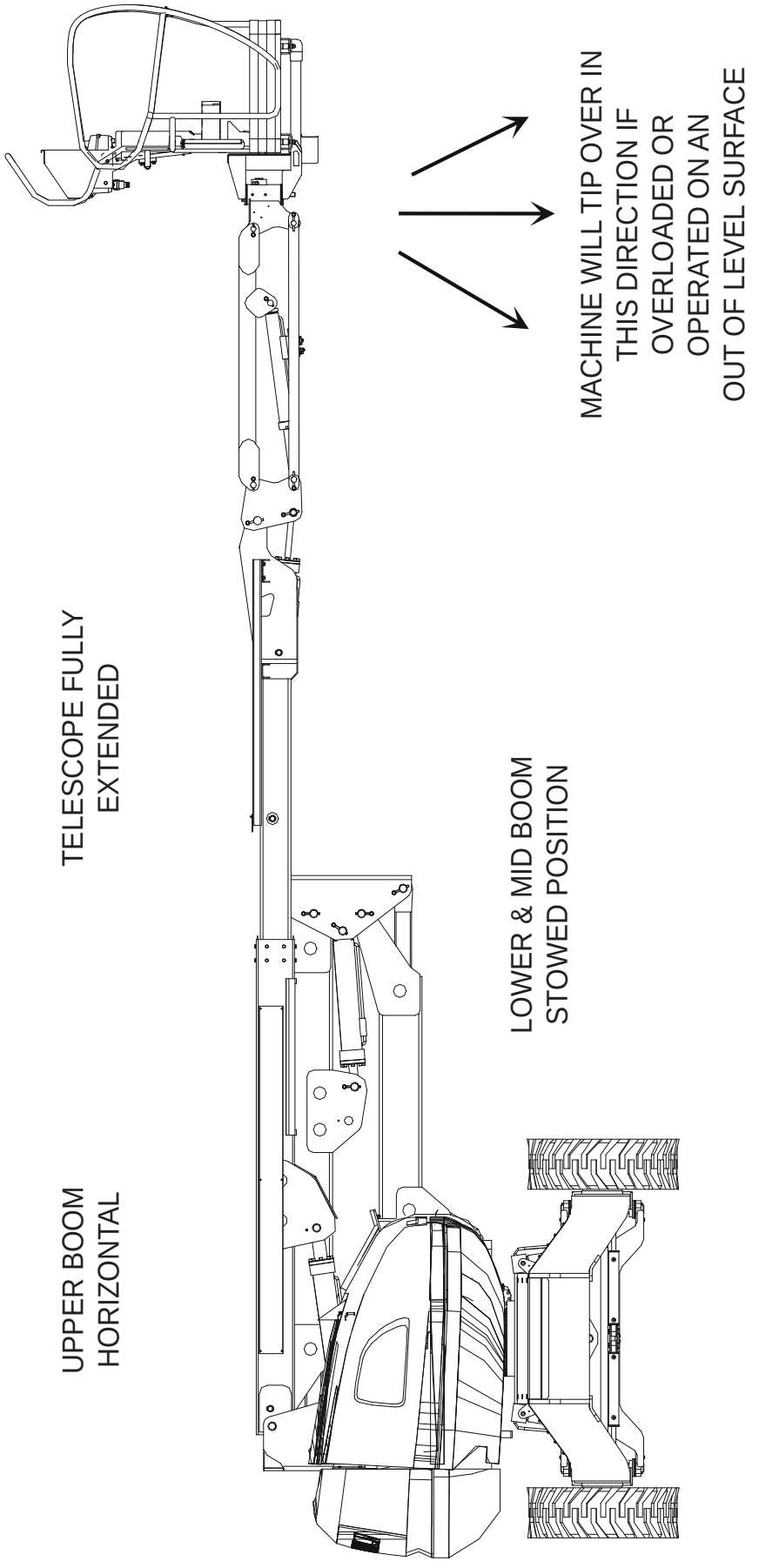


ILLUSTRATION No. Art_5309

45 - AJ

Position of Least Forward Stability

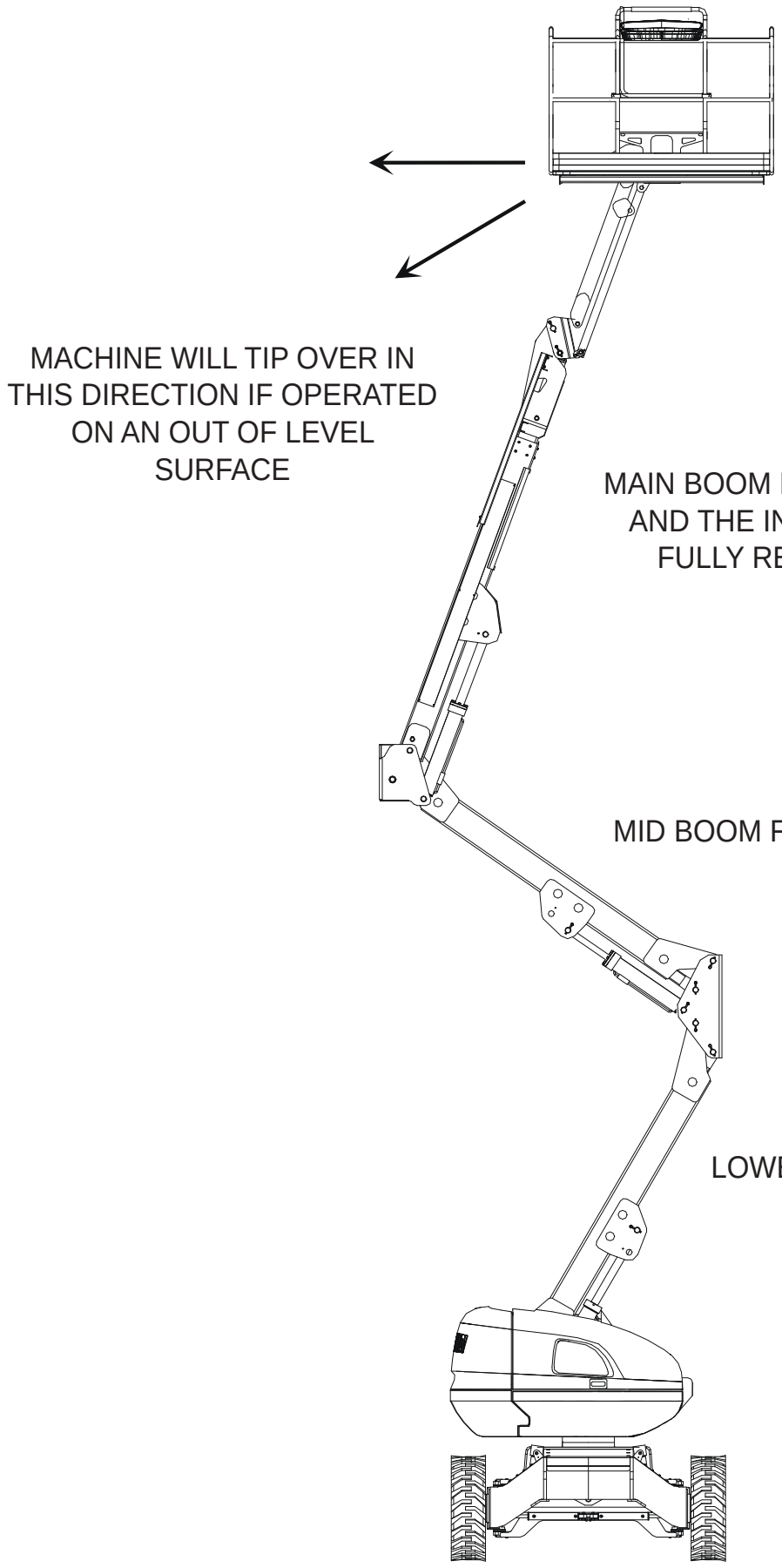


ILLUSTRATION No. Art_5310

45 - AJ

Position of Least Backward Stability

Engine Operation

NOTICE

INITIAL STARTING SHOULD ALWAYS BE PERFORMED FROM THE GROUND CONTROL STATION.

CAUTION

IF ENGINE FAILS TO START PROMPTLY, DO NOT CRANK FOR AN EXTENDED TIME. SHOULD ENGINE FAIL TO START AGAIN, ALLOW STARTER TO “COOL OFF” FOR 2-3 MINUTES. IF ENGINE FAILS AFTER SEVERAL ATTEMPTS, REFER TO ENGINE MAINTENANCE MANUAL.

Starting Procedure

1. Turn key switch to ON. Push the glow plug toggle switch for the appropriate time and then push the ENGINE START switch.

CAUTION

ALLOW ENGINE TO WARM-UP FOR A FEW MINUTES AT LOW SPEED BEFORE APPLYING ANY LOAD.

2. After engine has had sufficient time to warm up, shut engine off.
3. Turn SELECT switch to PLATFORM.
4. From Platform, pull the mushroom of POWER/EMERGENCY STOP switch out, then push the ENGINE START switch until engine starts.

Shutdown Procedure

CAUTION

IF AN ENGINE MALFUNCTION CAUSES AN UNSCHEDULED SHUTDOWN, DETERMINE THE CAUSE AND CORRECT IT BEFORE RESTARTING THE ENGINE.

1. Remove all loads and allow engine to operate at low speed for 3-5 minutes; this allows further reduction of internal engine temperature.
2. Push POWER/EMERGENCY STOP switch in.
3. Turn MASTER switch to off.

Refer to Engine Manufacturer’s manual for detailed information.

Operating Instructions & Pre-Operation Function Tests

DO NOT operate this machine until you have read and understood the Operator's manual, have performed the Workplace Inspection, Pre-Start Inspection, Routine Maintenance, and have completed all the test operations detailed in this Operating Instructions section.

This section provides instructions and tests for each function of machine operation. Follow all safety rules and instructions. The operator must conduct inspections and a Functions Test of the machine before each work shift to check that all machine systems are working properly.

Test the machine on a firm level surface with no debris, drop-offs, potholes or overhead obstructions. Perform each step outlined in this section.

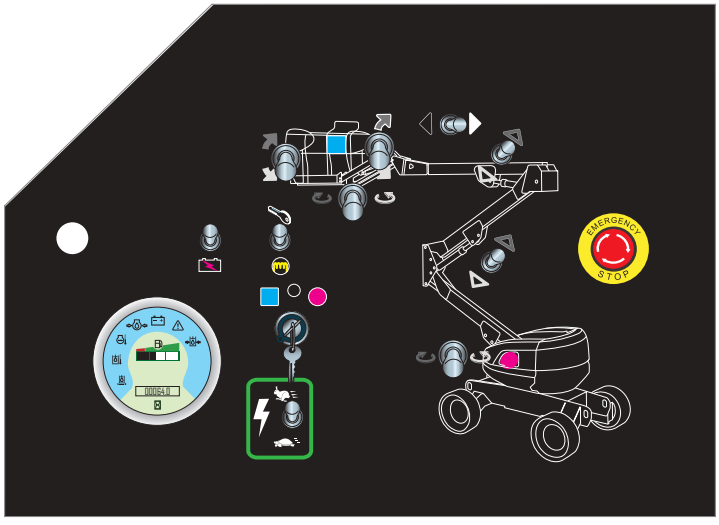
This machine shall only be operated by trained and authorized personnel. If multiple operators use this machine, all must be trained, qualified and authorized to use it. New operators must perform a Pre-Start Inspection and Functions Test prior to operating the machine.

Operators must comply with all employer and job site rules and governmental regulations regarding the use of personal protective equipment.

DO NOT use a machine that is malfunctioning. If any function does not perform as described, tag the machine and remove for repair by a qualified service technician. After repairs are completed, a Pre-Start Inspection and Functions Test must be performed before using the machine.

WARNING

ALWAYS check over, under and around the machine for personnel, structures and obstructions before activating any control function and continue to watch for hazards while operating the machine.



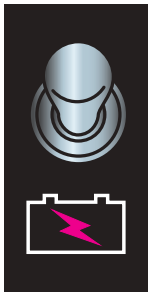
Art_5312

Emergency Stop

ART_3353

- Perform Pre-Start Inspection
- Check Emergency Stop Switches at both the base and platform controls - turn clockwise to reset.
- Depress the EMERGENCY STOP switch whenever the machine is not in operation. Turn switch clockwise to reset.

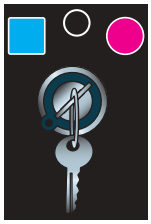
Auxiliary Power Switch



Art_5314

- Push and hold the Toggle Switch to battery direction; The Auxiliary power will be selected
- Operation of the Auxiliary Power also acts as an enable switch to enable machine operation.

Ground and Platform Selection Switch



Art_5315

- Normally, it is in Center, the Power is cut off
- Turn the Key Switch Counter-clockwise to the Blue Square Position, the machine would be controlled by the Platform Controls.
- Turn the Key Switch Clockwise to the Red Circle Position, the machine would be controlled by the Ground Controls.

Function Enable Switch

ART_4715

- Press and hold this switch to enable boom, turntable and platform operations.
- Press down to operate the controls at slow speed.
- Press up to operate the controls at higher speed.

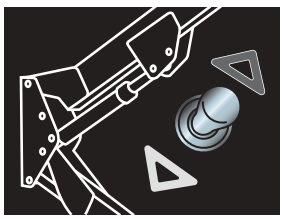
Engine Start Switch

Art_5316

A three position Toggle Switch, it is used to start the engine or power the glow plug to assist to start the engine in cold weather.

- To start engine, push the toggle switch Up to the Key Icon, until the engine starts running, release the switch once the engine starts. It will return back to Neutral position once be released.
- In cold weather, first push the toggle switch lever down to Glow Plug Icon for about 5-20 seconds. Colder temperatures require longer glow times.
- The glow plug will be energized, then push the toggle switch up to Key Icon to start the engine.

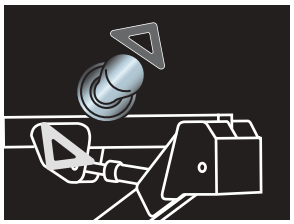
Riser Boom UP and DOWN



Art_5317

- Push and hold the High Engine Speed Enable Switch.
- Push the Toggle lever Up according to UP Arrow Direction, the Riser Booms will be raised simultaneously.
- Push the Toggle lever down will lower the Riser Booms simultaneously.
- Releasing the switch will stop Riser Boom Up and Down function.
- Pressing the Emergency Stop Switch will stop Riser Boom function.

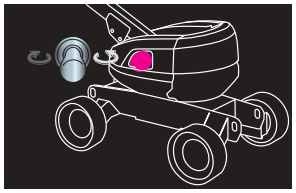
Main Boom UP and Down



Art_5318

- Push and hold the High Engine Speed Enable Switch.
- Push the Toggle lever Up to raise the Main Boom.
- Push the Toggle Lever Down to lower the Main Boom
- Releasing the switch will stop Main Boom Up and Down function.
- Pressing the Emergency Stop Switch will stop Main Boom function.

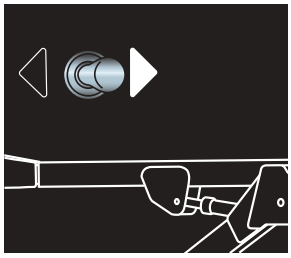
Turntable Swing



Art_5319

- Push and hold the High Engine Speed Enable Switch.
- Push the switch to the left and right. The turntable should swing accordingly.
- Releasing the switch will stop Turntable Swing
- Pressing the Emergency Stop Switch will stop Turntable Swing function.

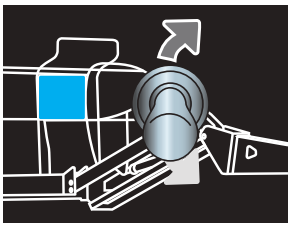
Main Boom Telescope



Art_5320

- Push and hold the High Engine Speed Enable Switch.
- Push the Toggle Lever LEFT to telescope the Main Boom out.
- Push the toggle lever to the right to retract the Main Boom in.
- Extend Boom until it stops. Boom should extend to maximum length.
- Retract Boom until it stops. Boom should retract to minimum length.
- Releasing the switch will stop Main Boom Telescope.
- Pressing the Emergency Stop Switch will stop Main Boom Telescope function.

Jib Boom UP and DOWN

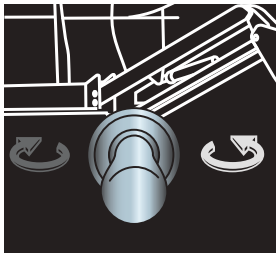


Art_5321

Test Operation

- Press and hold the High Engine Speed Enable Switch
- Push the Jib Boom UP/DOWN switch on the base control panel to lift or lower the Jib.
- Raise the Jib until it stops.
- Lower the Jib until it stops.
- Releasing the switch will stop Jib Boom UP and DOWN function.
- Pressing the Emergency Stop Switch will stop Jib Boom UP/DOWN function.

Platform Rotate

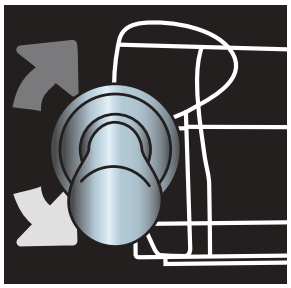


Art_5322

Test Operation

- Press and hold the High Engine Speed Enable Switch.
- Press and hold the Platform Rotate Switch on the base control panel to rotate the platform.
- Push the switch left and right. The platform should rotate accordingly.
- Releasing the switch will stop platform rotate function.
- Pressing the Emergency Stop Switch will stop platform rotate function.

Platform Leveling Trim



Art_5323

The platform will automatically level as the boom is lifted or lowered. The platform Level function allows manual level adjustment of the platform. Manual leveling may be used to adjust the platform within 5 Degrees of Level.

- Press and hold the Platform Level switch on the base control panel to manually adjust the level of the platform.

Test Operation

- Press and hold the High Engine Speed Enable Switch.
- Push the switch up and down. The platform level should change accordingly.
- Releasing the switch will stop platform level function.
- Pressing the Emergency Stop Switch will stop platform level function.

WHEN RAISING AND LOWERING BOOM, CHECK FOR SMOOTH OPERATION.

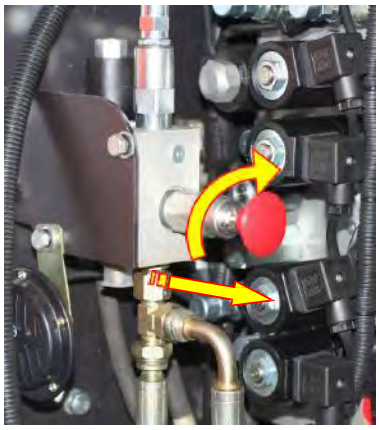
WARNING

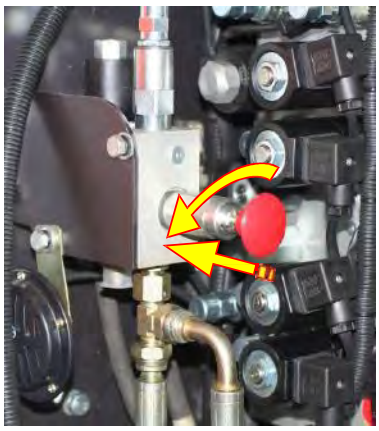
CHECK BOOM UPRIGHT TILTING FOR PROPER SYNCHRONIZATION. IF THE UPRIGHT IS TILTED OR THE BOOM WILL NOT FULLY LOWER, ADJUSTMENTS SHOULD BE DONE ACCORDING TO THE BOOM SYNCHRONIZING PROCEDURE BELOW:

Boom Synchronizing Procedure

If the lower boom does not fully lower, use the following procedure.

1. Remove all personnel from the platform.
2. Pull out the red EMS (Emergency Stop) knob located on the ground control station.
3. Turn the Platform/Ground Select Switch to the ground control position.
4. If applicable, start the engine.
5. Pull and hold out the red re-level knob on the synchronizing valve located beside the main control valve.
6. From the ground controls, activate the Lift Control Switch, and raise the lower boom approximately 6 feet (2 m).
7. After raising the lower boom, release the red knob.
8. Activate the Lift Control Switch and fully lower the boom and continue to hold down the switch for an additional 5 seconds.
9. Repeat steps 5 thru 8 if necessary.





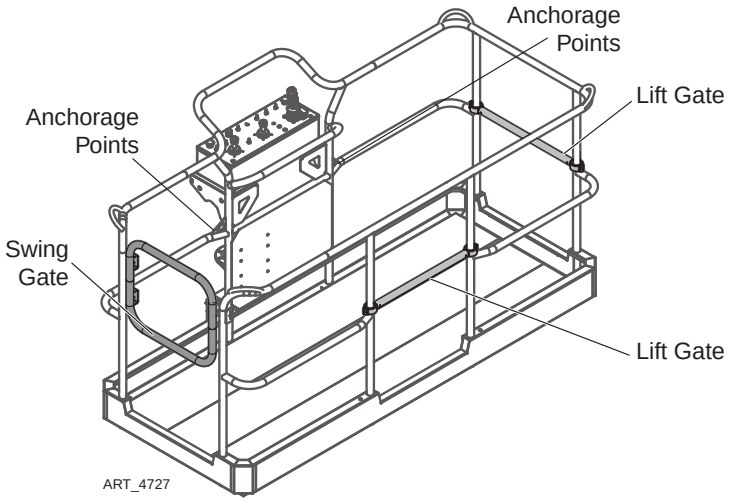
Platform Control Operation & Pre-Operation Functions Test

Entering The Platform

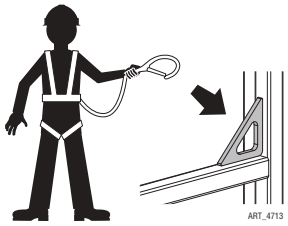
Personnel shall enter and exit the platform only at the Personnel Entry Gates, and only when the boom is fully retracted and lowered.

Ensure that all Personnel Entry Gates are properly closed and that the Swing Gate is latched in the closed position before operating the machine.

Personnel Entry Gates



Fall Protection



Personal fall protection equipment (PFPE) is required when operating this machine.

All PFPE must comply with employer and job site rules and applicable governmental regulations, and must be inspected and used in accordance with the PFPE manufacturer's instructions.

ALWAYS wear approved fall protection, properly attached to a designated anchor point, when operating the machine.

DO NOT attach more than one lanyard per anchor point.

Platform Drift Down: It is important to test for Platform Drift Down during scheduled maintenance inspections. If Platform Drift Down becomes apparent, it is very important to first identify the specific cylinder that is causing the platform to drift down as many models have multiple cylinders. Then, measure the speed-over-time at which the cylinder is drifting in. It will also be necessary to record the following important information that must be gathered from the machine.

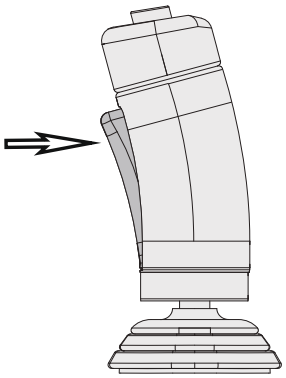
- Location of the specific cylinder found to be drifting in
- Amount of weight in the platform
- Hydraulic oil temperature
- Hydraulic oil viscosity (if known)

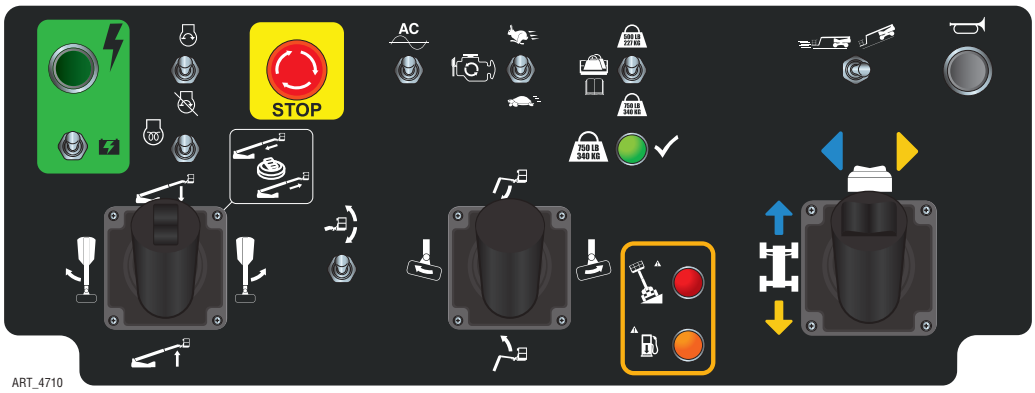
Once a thorough examination has been performed and numbers recorded, contact the MEC Aerials Technical Support department for conformance information. For further information, please contact MEC Technical Support at 877-632-5438.

Function Enable At Platform Controls

Note: If any Function Enable trigger or button is depressed for seven (7) seconds without any function being activated, the Enable System times out and deactivates. Release the trigger or button and reengage to activate the Function Enable System.

The Drive function and most boom functions are enabled by squeezing the trigger at the front of the appropriate control handle.


ART_4729



ART_4710

WARNING

ALWAYS check over, under and around the machine for personnel, structures and obstructions before activating any control function and continue to watch for hazards while operating the machine.

DO NOT hang anything over any control handle at any time.

Platform Operations Test

Emergency Stop

ART_3353

- Press the EMERGENCY STOP switch at any time to stop all machine functions.
- Turn switch *clockwise* to reset.
- Depress the EMERGENCY STOP switch whenever the machine is not in operation. Turn switch *clockwise* to reset.

Activation of the EMERGENCY STOP switch will apply brakes immediately.

WARNING

This will cause sudden platform movement as the machine comes to an abrupt stop.

Brace yourself and secure objects on the platform during operation of machine.

Select PLATFORM Operation

Art_5315

- **Base Controls:** Turn the selector switch counterclockwise to PLATFORM.

Operate from Platform

ART_4725

ART_3359

- Enter the platform through one of the personnel entry gates. Close and secure the entry.
- Press the Start/Stop switch UP to start. Release the switch when the engine starts.
- Press the Horn Button to verify proper operation.

Tilt Indicator Light

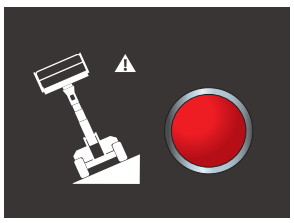
DANGER

STOP ALL MOVEMENT if Tilt Alarm sounds.

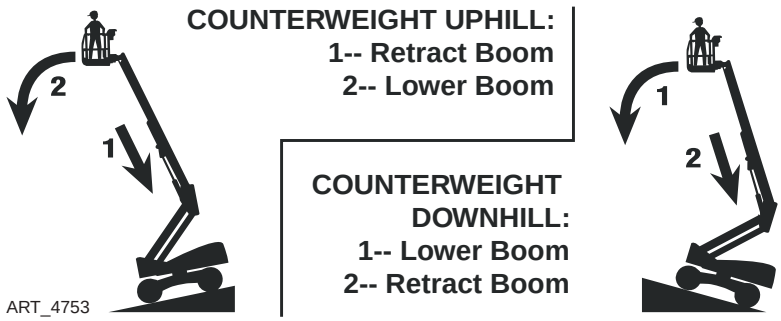
Death or Serious Injury may occur.

Light ON and alarm sounding indicates an unsafe condition.

- STOP ALL MOVEMENT. The machine is not level.
- Look at the diagram to determine the condition of the counterweight as it relates to the slope, then use extreme caution while following the instructions. DO NOT rotate the turntable while lowering.



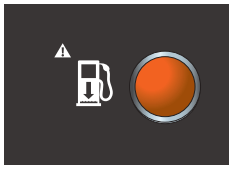
ART_3363b



ART_4753

- If the Tilt Alarm sounds while the counterweight is uphill, first retract the boom, then lower the boom.
- If the Tilt Alarm sounds while the counterweight is downhill, first lower the boom, then retract the boom.
- Move the machine to a firm, level surface before continuing operation.

Low Fuel Indicator Light



ART_3363

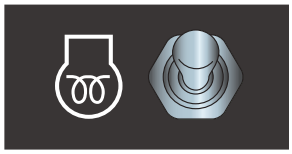
Light ON indicates a low-fuel alert condition.

- Refuel soon.

Cold Start: Move and hold the Glow Switch up as indicated in the Preheat table.

With the Glow switch held up, press and hold the Start/Stop switch UP until the engine starts.

Release both switches once the engine starts.



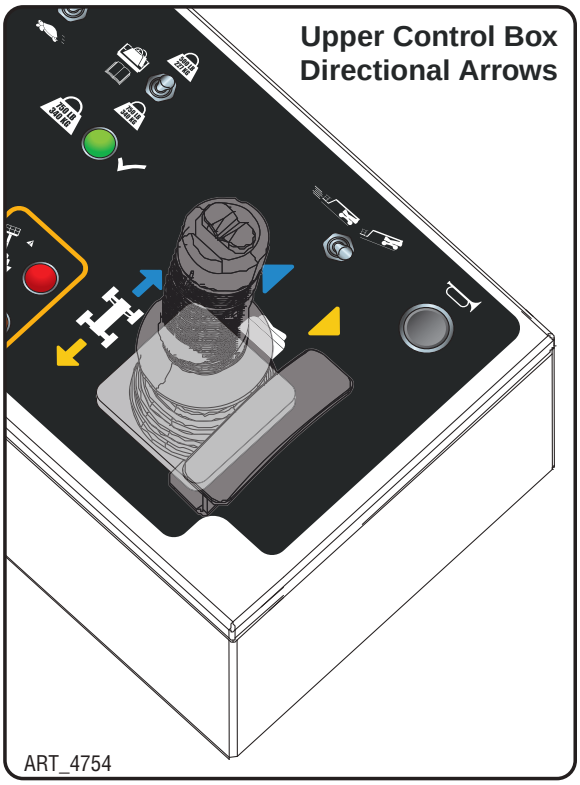
ART_4726

Preheat Table

Ambient Temperature	Preheat Time
Above 50°F (10°C)	5 Seconds
50°F to 23°F (10°C to –5°C)	10 Seconds
Below 23°F (–5°C)	20 Seconds
20 Seconds = Limit of Continuous Use	

To protect the starter motor, power will cut off to the starter circuit when the starter motor has run continuously for 15 seconds without starting the engine. The Starter Circuit Cutout indicator light will turn on at the Base Control panel and power to the starter circuit will cut out for 30 seconds.

Drive Control Lever Operation



Depending on the orientation of the boom and chassis, the Drive and Steer functions may move the machine in directions opposite of the motion of the control lever. The color- and shape-coded arrows on the control lever decal correspond to similar arrow decals on the machine chassis (see illustrations). Be sure to check the arrows on the chassis before activating and using the Drive or Steer functions.

- Drive Function speed is proportional and is controlled by the positional of the control lever. The further it is moved from the neutral (center) position, the faster the speed will be.
- When the boom is elevated out of the stowed position, the maximum drive speed is reduced to 0.5 mph (0.8 km/h). Drive function speed is still fully proportional to the position of the drive control handle.
- The control lever returns to the neutral (center) position when released.
- Steering Function is not proportional.

Note: The Steering Function **does not** automatically return the steering wheels to the centered position. Always check the position of the steering wheels before and during machine operation.

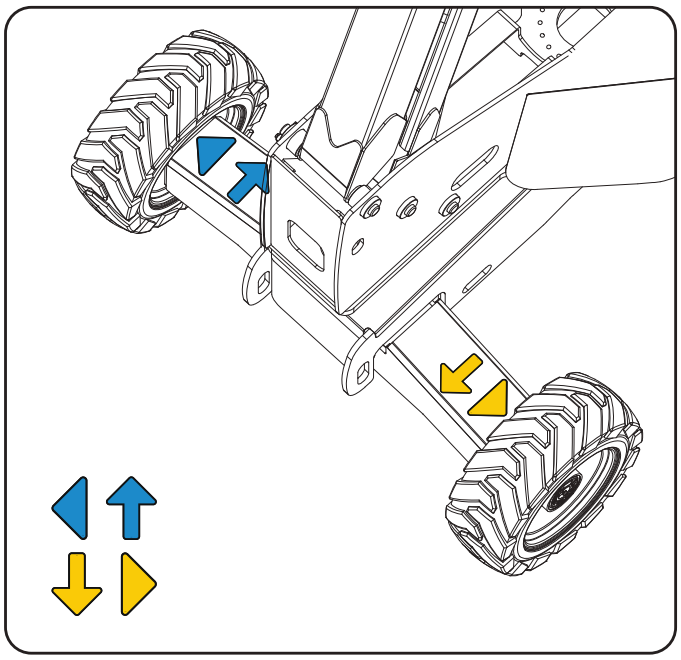
Test Operation

- **Drive:** Squeeze the enable trigger, then move the control lever in the desired direction of movement. The further it is moved from the neutral (center) position, the faster the speed will be.
- **Stop:** Return the control lever to the neutral (center) position. Releasing the control lever will also stop the machine. Releasing the trigger will result in a rapid stop.
- Extend the boom approximately 3 feet (1 m), then drive the machine. Speed should be reduced significantly from the fully-retracted, fully-lowered speed. Retract the boom.
- Elevate the boom approximately 10°, then drive the machine. Speed should be reduced significantly from the fully-retracted, fully-lowered speed. Lower the boom.
- **Steering:** Squeeze the enable trigger, then press the thumb switch on top of the control lever to steer in the desired direction.

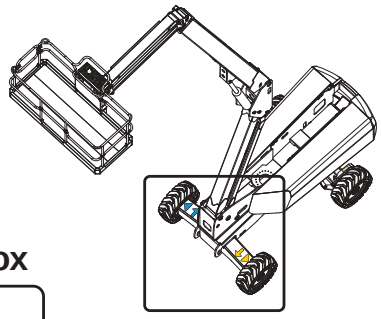
Note: The Steering Function **does not** automatically return the steering wheels to the centered position. Stay alert to the position of the steering wheels before and during machine operation.

Drive & Steer Directional Arrows

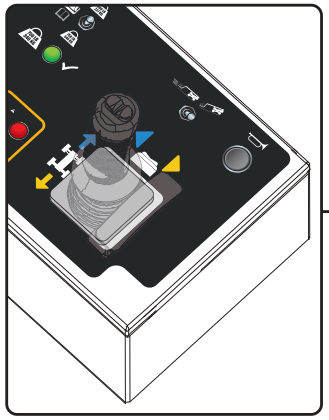
Pay careful attention to the Chassis Drive & Steer arrows for machine direction.



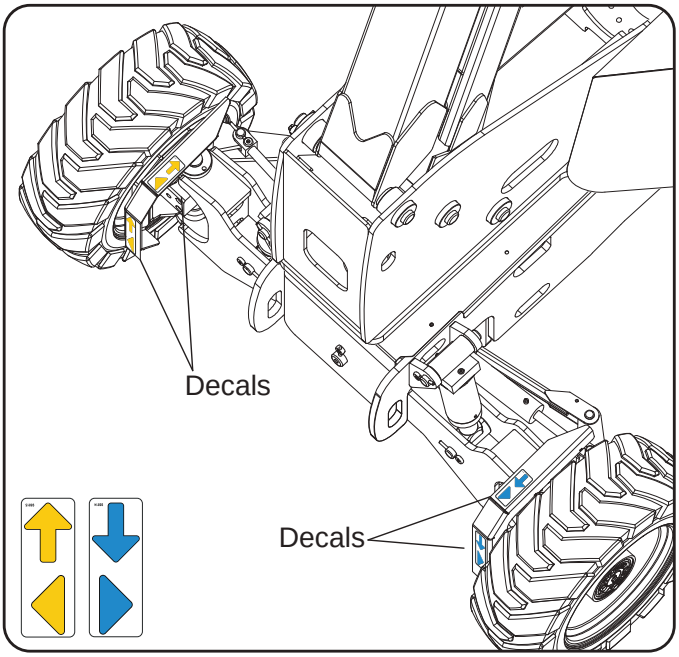
Platform over non-steering wheels

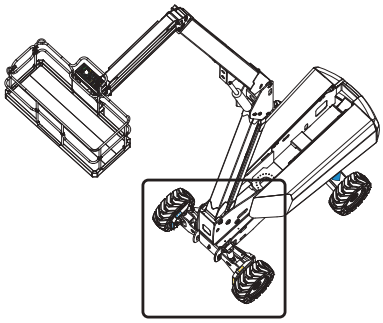


Upper Control Box



Platform over steering wheels

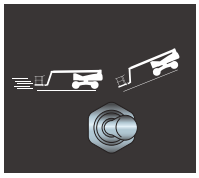




When the platform is over the steering wheels, the machine moves in the opposite direction of the Control Lever.

ART_4747

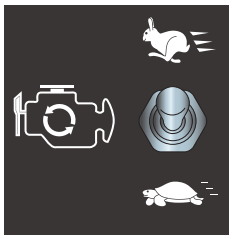
Speed/Torque Switch



ART_4757

- Move this switch to the left for high speed drive. Push this switch to the right for high torque drive.

Engine Speed Select



ART_4755

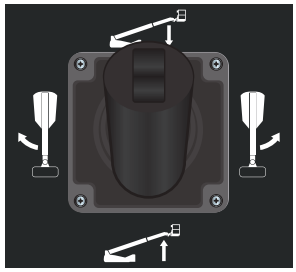
- Use this switch to set the engine speed when functions are enabled. Setting this switch to low idle speed allows the operator to move the machine slowly and precisely.
- Move this switch up for high idle speed and fast function speed.
- Move this switch down for low idle speed and slow function speed.

Boom Functions Control Lever

This control lever controls the Boom Extend/Retract, Boom Lift/Lower and Turntable Rotate functions. The control lever is fully proportional for the Boom Lift/Lower and Turntable Rotate functions.

These functions are enabled by pressing the trigger on the front of the control lever.

Test Operation



ART_5373

To test the Boom Extend/Retract function:

- Squeeze the enable trigger, then press and hold the thumb switch on top of the control lever rearward until the boom reaches full extension.
- Squeeze the enable trigger, then press and hold the thumb switch forward to retract the boom.

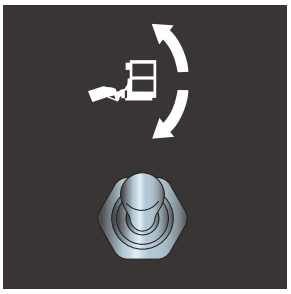
To test the Boom Lift/Lower function:

- Squeeze the enable trigger, then pull the control handle back to lift the boom. Lift the boom completely.
- Squeeze the enable trigger, then push the control handle forward to lower the boom. Lower the boom to its stowed position.

To test the Turntable Rotate function:

- Squeeze the enable trigger, then push the control handle to the left to rotate the turntable clockwise.
- Squeeze the enable trigger, then push the control handle to the right to rotate the turntable counterclockwise.

Platform Level Switch



ART_4732

The platform will automatically level as the boom is lifted or lowered. The Platform Level function allows manual level adjustment of the platform. Manual leveling may be used to adjust the platform within 5° of level.

Test Operation

- Press and hold any Function Enable button.
- Push the Platform Level switch up or down to adjust the position of the platform.
- Platform Level power is disabled upon exceeding 5° out of level when out of the stowed position. Power is allowed only to the direction that returns the platform toward level.

WARNING

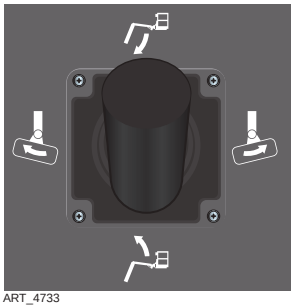
ONLY USE THE PLATFORM LEVELING OVERRIDE FUNCTION FOR SLIGHT LEVELING OF THE PLATFORM. INCORRECT USE COULD CAUSE THE LOAD/OCCUPANTS TO SHIFT OR FALL. FAILURE TO DO SO COULD RESULT IN DEATH OR SERIOUS INJURY.

Platform/Jib/Riser Functions Control Lever

The Platform/Jib/Riser Functions control lever controls the Platform Rotate, Jib Lift/ Lower functions, and Riser Boom Lift/Lower functions. The control lever is fully proportional for platform rotate and jib functions.

These functions are enabled by pressing the trigger on the front of the control lever.

Test Operation


ART_4733

To test the Jib Lift/Lower function:

- Squeeze the enable trigger, then pull the control lever back to raise the jib.
- Squeeze the enable trigger, then push the control lever forward to lower the jib.

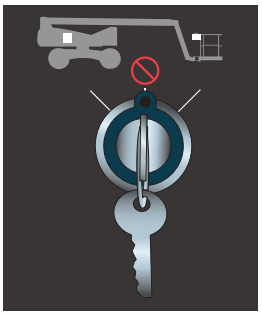
To test the Platform Rotate function:

- Squeeze the enable trigger, then push the control lever left to turn the platform clockwise.
- Squeeze the enable trigger, then push the control lever right to turn the platform counter clockwise.

To test the Riser Lift/Lower Function

- Squeeze the enable trigger, then push the thumb switch on top of the control lever back to raise the Riser Boom.
- Depress forward to lower the the Riser Boom.

Shutdown Procedure


ART_4734

- When finished with the machine, place the platform in the stowed position.
- Park the machine on a level surface.
- Carefully exit the platform using a constant three (3) point dismount/grip.
- Turn the Selector Key Switch to the OFF position and remove the key to prevent unauthorized use. Always put the switch in OFF position when leaving the machine at the end of the work day.

Auxiliary Power System & Test

If primary power fails while the platform is elevated, use the Auxiliary Power System to safely lower the platform.

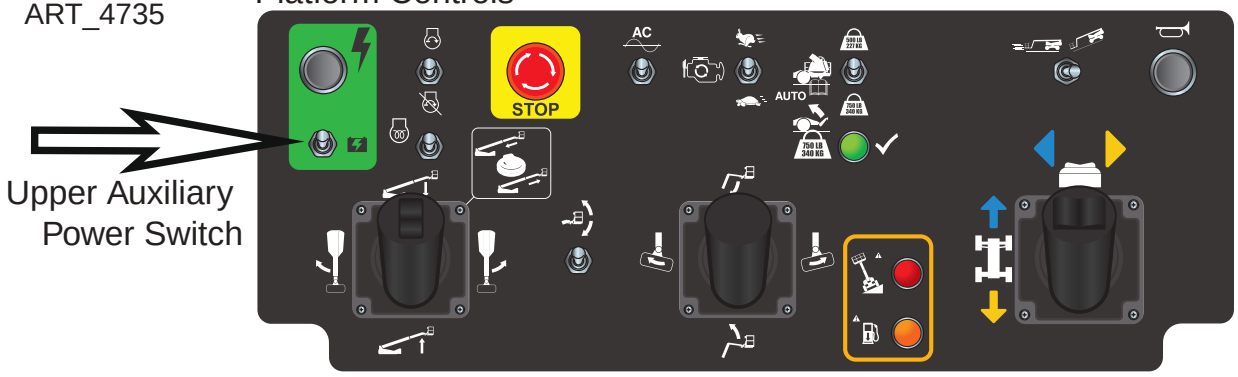
WARNING

Do not climb down the boom assembly or exit the platform while elevated.

ALWAYS check over, under and around the machine for personnel, structures and obstructions before activating any control function and continue to watch for hazards while operating the machine

ART_4735

Platform Controls



Auxiliary Power

A toggle type auxiliary power control switch is located on the platform control station and another is located on the ground control station. Operation of either switch turns on the electrically driven auxiliary hydraulic pump. This should be used in case of failure of the main power. When platform control is chosen, the auxiliary pump will operate boom lift down, main boom retract, jib lift up and down, turntable swing, platform rotate and level. Otherwise, when ground control is chosen, the auxiliary pump will not operate jib lift up and platform rotate.

NOTICE

WHEN OPERATING ON AUXILIARY POWER, DO NOT OPERATE MORE THAN ONE FUNCTION AT THE SAME TIME. SIMULTANEOUS OPERATION CAN OVERLOAD THE AUXILIARY PUMP MOTOR.

The main function of auxiliary power is to lower the platform in the event of primary power failure. Determine the reason for primary power failure and have the problem corrected by a certified service technician. Operate as follows:

To activate auxiliary power from the platform control station:

1. Position PLATFORM/GROUND SELECT KEY SWITCH to PLATFORM.
2. Position EMERGENCY STOP switch to ON.
3. Position AUXILIARY POWER switch to ON and hold.
4. Operate appropriate control switch, lever or controller for desired function and hold.
5. Release AUXILIARY POWER switch, selected control switch, lever or controller.
6. Position POWER/EMERGENCY STOP switch to OFF.

To activate auxiliary power from the ground control station:

1. Position PLATFORM/GROUND SELECT KEY SWITCH to GROUND.
2. Position EMERGENCY STOP switch to ON.
3. Position AUXILIARY POWER switch to ON and hold.
4. Operate appropriate control switch or controller for desired function and hold.
5. Release AUXILIARY POWER switch, and appropriate control switch or controller.
6. Position EMERGENCY STOP switch to OFF.

Emergency Procedures & Transportation Instructions

This section provides information on the procedures to be followed and on the systems and controls to be used in the event an emergency situation is encountered during machine operation. Prior to operation of the machine and periodically thereafter, the Operator's Manual and this section, should be reviewed by all personnel whose responsibilities include any work or contact with the machine.

Emergency Towing Procedures

Towing this machine is prohibited, unless properly equipped. However, provisions for moving the machine, in case of a malfunction or power failure, have been incorporated. The following procedures are to be used ONLY for emergency movement to a suitable maintenance area.

Safety Information

WARNING

This section is provided for reference and does not supersede any government or company policy regarding the loading, transport or lifting of MEC machinery.

Truck drivers are responsible for loading and securing machines, and should be properly trained and authorized to operate MEC machinery. Drivers are also responsible for selecting the correct and appropriate trailer according to government regulations and company policy. Drivers must ensure that the vehicle and chains are strong enough to hold the weight of the machine (see the serial number plate for machine weight).

ONLY properly trained and qualified operators shall load and unload this machine.

Free-wheel configuration for Winching or Towing.

DANGER

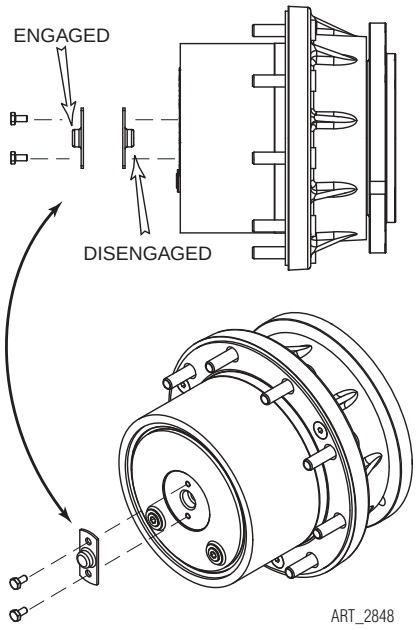
RUNAWAY HAZARD!

After releasing the brakes there is nothing to stop machine travel. Machine will roll freely on slopes.

ALWAYS chock the wheels before manually releasing the brakes.

The machine can be winched or towed short distances at speeds not to exceed 5 MPH (8 km/h).

Before towing or winching the machine, it is necessary to release the brakes. Reset the brakes after towing or winching.



Disengage Brakes before Towing or Winching

- Chock the wheels.
- Remove the Torque Engage Cap and reinstall with the bump facing inward on all four (4) hubs.

Engage Brakes before Driving

- Remove the Torque Engage Cap and reinstall with the bump facing outward on all four (4) hubs.

Emergency Controls and Their Locations

Power/Emergency Stop Switches

1. There is one of these red mushroom shaped switches at both the Ground Controls and Platform Controls. When it is depressed it will immediately stop the machine.

WARNING **CHECK MACHINE DAILY TO MAKE SURE THAT GROUND CONTROL INSTRUCTIONS ARE IN PLACE AND LEGIBLE.**

---

2. In an emergency, push the button down and the machine will stop. To release turn the button clockwise.

Ground Control Station

The Ground Control Station is located on the right front side of the turntable. The controls on this panel provide the means for overriding the platform controls, and for controlling the boom and swing functions from the ground. Place the KEY SELECT switch to GROUND position and operate the proper switch to lift, swing, or telescope the boom, or level the platform.

Auxiliary Power

A toggle type auxiliary power control switch is located on the platform control station and another is located on the ground control station. Operation of either switch turns on the electrically driven auxiliary hydraulic pump. This should be used in case of failure of the main power plant. When platform control chosen, the auxiliary pump will operate boom lift down, main boom retract, jib lift up and down, turntable rotate, platform swing and level. Otherwise, when ground control chosen, the auxiliary pump will not operate jib lift up and platform swing.

NOTICE **WHEN OPERATING ON AUXILIARY POWER, DO NOT OPERATE MORE THAN ONE FUNCTION AT THE SAME TIME. SIMULTANEOUS OPERATION CAN OVERLOAD THE AUXILIARY PUMP MOTOR.**

Emergency Operation

Use of Ground Controls

Know how to use the ground controls in an emergency situation.

Ground personnel must be thoroughly familiar with the machine operating characteristics and the ground control functions. Training should include operation of the machine, review and understanding of this section and hands-on operation of the controls in simulated emergencies.

Operator Unable to Control Machine

If the Platform Operator Is Pined, Trapped or Unable to Operate or Control the Machine

WARNING

DO NOT OPERATE WITH PRIMARY POWER SOURCE (ENGINE OR ELECTRIC MOTOR) IF PERSONS ARE PINNED OR TRAPPED. USE AUXILIARY POWER INSTEAD.

1. Operate the machine from ground controls ONLY with the assistance of other personnel and equipment (cranes, overhead hoists, etc.) as may be required to safely remove the danger or emergency condition.
2. Other qualified personnel on the platform may use the platform controls with regular or auxiliary power. **DO NOT CONTINUE OPERATION IF CONTROLS DO NOT FUNCTION NORMALLY.**
3. Cranes, forklift trucks or other equipment which may be available are to be used to remove platform occupants and stabilize motion of the machine in case machine controls are inadequate or malfunction when used.

Platform or Boom Caught Overhead

If the platform or boom becomes jammed or snagged in overhead structures or equipment, do not continue operation of the machine from either the platform or the ground until the operator and all personnel are safely moved to a secure location. Only then should an attempt be made to free the platform using any necessary equipment and personnel. Do not operate controls to cause one or more wheels to leave the ground.

General Maintenance

This section of the manual provides additional necessary information to the operator for proper operation and maintenance of this machine. The maintenance portion of this section is intended as information to assist the machine operator to perform daily maintenance tasks only, and it does not replace the more thorough Preventive Maintenance and Inspection Schedule. Refer to the Kubota Engine Operation and Maintenance Manual for detailed maintenance information about the diesel engine.

Lubrication Specification

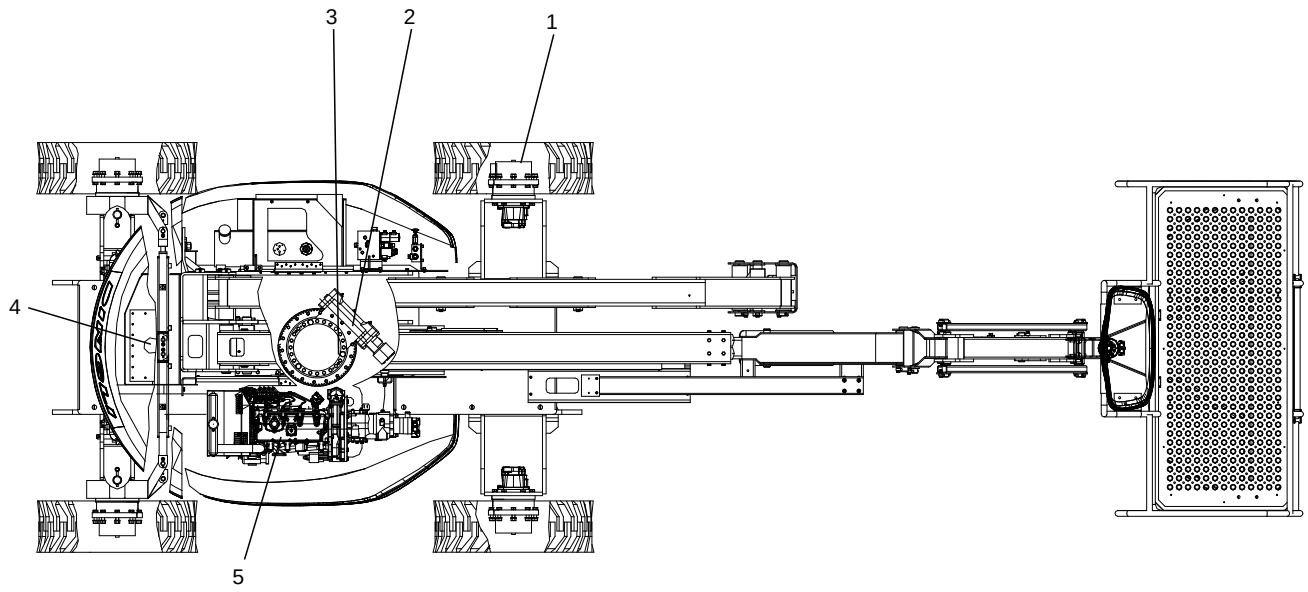
Lubrication Specifications

#	Key	Specifications
1	EPGL	Extreme Pressure Gear Lube (oil) EP90 Grade
2	OGL	Open Gear Lubricant - Mobiltac 375 or equivalent.
3	MPG	Multipurpose Grease has a minimum flash point of 350° F (177° C). Excellent water resistance, adhesive qualities and being of extreme pressure type.
4	HO	Hydraulic Oil. AW 32 or Chevron Rando Premium MV
5	EO	Engine (crankcase) Oil. IOW/30 Normal. OW/30 Cold/ Arctic. Better than API Class CD.

Note: It is recommended as good practice to replace all filters at the same time.

Lubrication Diagram

Refer to the diagram below for normal lubrication points and item.



NOTICE

LUBRICATION INTERVALS ARE BASED ON MACHINE OPERATION UNDER NORMAL CONDITIONS. FOR MACHINES USED IN MULTI-SHIFT OPERATIONS AND/OR EXPOSED TO HOSTILE ENVIRONMENTS OR CONDITIONS, LUBRICATION FREQUENCIES MUST BE INCREASED ACCORDINGLY.

Operator Maintenance

Wheel Bearings

Wheel Drive Hub

Lube Point(s)	Level/Fill Plug
Oil Capacity	Per Hub about - 17 oz. - 1/2 Full
Lube	EPGL, SAE 90 multipurpose hypoid gear oil - API service classification GL5, Mobile HD85W-90 is recommended.
Interval	Check level every 3 months or 150 hours of operation; change every 2 years or 1200 hours of operation.

Replacing the torque hub oil is essential for good machine performance and service life. Failure to replace the torque hub oil at yearly intervals may cause the machine to perform poorly and continued use may cause component damage.

1. Select the drive torque hub to be serviced. Then drive the machine until one of the two draining plugs is at the lowest point.
2. Remove both plugs and drain the oil.
3. Drive the machine until one plug is at the top and the other is at 90 degrees.
4. Fill the hub with oil from the top hole until the oil level is even with the bottom of the side hole.
5. Apply pipe thread sealant to the plugs then install the plugs.
6. Repeat this procedure for each torque hub.

Lubrication for the Swing Bearing and Worm Gear

Quarterly application of lubrication to the turntable bearing (Swing Bearing) and worm drive gear is essential to good machine performance and service life. Continued use of an improperly greased gear will result in component damage.

1. Raise the secondary boom and place a safety chock on the secondary boom lift cylinder. Carefully lower the boom onto the lift cylinder safety chock.

WARNING

CRUSHING HAZARDS.

KEEP HANDS AWAY FROM CYLINDER AND ALL MOVING PARTS WHEN LOWERING THE SECONDARY BOOM.

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2. Locate the grease fitting on the inside of the bearing in the middle of the turntable.
3. Pump grease into the turntable rotation bearing. Rotate the turntable in increments of 4 to 5 inches (10-13 cm) at a time and repeat this step until the entire bearing has been greased.

CAUTION

DO NOT OVERGREASE END BEARINGS.

OVERGREASING END BEARINGS WILL RESULT IN BLOWING THE OUTER SEAL IN HOUSING.

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4. Remove the safety chock then lower the boom to the stowed position.
5. Locate the grease on the worm drive housing.
6. Pump grease into the gear until you see it coming out of the side of the gear housing.
7. Grease each tooth on the outside of the turntable rotation bearing.

Lubrication for Swing Bearing (Refer to the Lubrication Diagram #3)

Lube Point(s)	4 Grease Fittings
Capacity	A/R
Lube	MPG
Interval	Every 3 months or 150 hours of operation

Lubrication for the Outer Gear Teeth (Refer to the Lubrication Diagram #2)

Lube Point(s)	The Outer Gear Teeth
Capacity	A/R
Lube	OGL
Interval	Every one month or 50 hours of operation

Lubrication for the Worm Gear (Refer to the Lubrication Diagram #3)

Lube Point(s)	2 Grease Fittings
Capacity	A/R
Lube	MPG
Interval	Every year or 1,000 hours of operation

Comments - Remove grease fittings and install plugs after greasing

Test and Replace the Hydraulic Oil

Replacement and testing of the hydraulic oil is essential for good machine performance and service life. Dirty oil and suction strainers may cause the machine to function poorly and continued use may cause component damage. Extremely dirty conditions may require oil changes to be performed more often.

Perform this procedure with the boom in the stowed position.

1. Remove the plug from the drain hose on the hydraulic reservoir.
2. Completely drain the tank into a suitable container. See capacity specifications listed below.
3. Rinse out the inside of the tank with a mild solvent. Remove all races of solvent once the tank is clean.
4. Change the Suction Port Filter. (Refer to Replace the Suction Filter)
5. Change the Return Filter. (Refer to Replace the Return Filter)
6. Change the Charge Filter. (Refer to Replace the Charge Filter)
7. Install the plug on the drain port.
8. Fill the tank with the correct filtered hydraulic oil, top 2 inches of the upper sight gauge. Do not overfill.

Replace the Hydraulic Filters

Replacement of the hydraulic filters is essential for good machine performance and service life. A dirty or clogged filter may cause the machine to perform poorly and continued used may cause component damage. Operation in extremely dirty conditions may require that the filter be replaced more often.

Replace the Suction Filter procedure:

1. Drain oil from hydraulic reservoir.
2. Clean the area around the cover of the hydraulic oil reservoir.
3. Use a wrench to loosen and remove the 10 bolts from the hydraulic oil reservoir cover. Move the cover away from the reservoir
4. Unscrew the filter element from the adaptor.
5. Take a new filter element to screw it onto the filter adaptor.
6. Install the cover on to the hydraulic oil reservoir and screw down the 10 bolts.
7. The suction filter element MEC Part Number is 42054
8. Interval — Every 2 years or 1,200 hours of operation. Remove and clean/replace at time of hydraulic oil change.

Replace the Charge Filter procedure:

1. Clean the area around the oil filter and then remove the filter assembly cover.
2. Pull out the filter element from the filter assembly chamber.
3. Install the new filter element to the filter assembly chamber.
4. Install the filter assembly cover and tighten it. Clean up any oil that may have spilled during the replacement procedure.
5. The charge filter element MEC Part Number is 92169.
6. Interval — Change after the first 50 hours, then every 6 months or 300 hours afterwards or as indicated by the Condition Indicator.

Replace the Return Filter procedure:

1. Clean the area around the oil filter and then remove the filter assembly cover. Use a 4mm hex wrench.
2. Pull out the filter element from the filter assembly chamber.
3. Install the new filter element to the filter assembly chamber.
4. Install the filter assembly cover and tighten it. Clean up any oil that may have spilled during the replacement procedure.
5. The return filter assembly MEC Part Number is 42052 and the return filter element MEC Part Number is 42053.
6. Interval — Change after the first 50 hours then every 6 months or 300 hours afterwards.

Replace the Engine Oil

Refer to the Engine Operation and Maintenance Manual for detailed information.

The MEC Part Number for the Oil Filter is 92180. Refer to Engine Oil Filter Manufacturer’s manual for detailed information on how often to replace.

Replace the Engine Fuel Filter

Replacing the diesel fuel filter MEC Part Number 92182 is essential to good engine performance and service life. A dirty or clogged filter may cause the engine to perform poorly and continued use may cause component damage. Extremely dirty conditions may require that the filer be replaced more often. Refer to the Engine Operation and Maintenance Manual for detailed information. Water separator MEC Part Number is 42388.

ENGINE FUEL IS COMBUSTIBLE.

DANGER

REPLACE THE FUEL FILTER IN AN OPEN, WELL-VENTILATED AREA AWAY FROM HEATERS, SPARKS, FLAMES AND LIGHTED TOBACCO. ALWAYS HAVE AN APPROVED FIRE EXTINGUISHER WITHIN EASY REACH.

NEVER FILL THE FUEL TANK WITH THE ENGINE RUNNING, WHILE SMOKING OR WHEN NEAR AN OPEN FLAME.

NEVER OVERFILL THE TANK OR SPILL FUEL.
IF FUEL IS SPILLED, CLEAN IT UP IMMEDIATELY.

WARNING

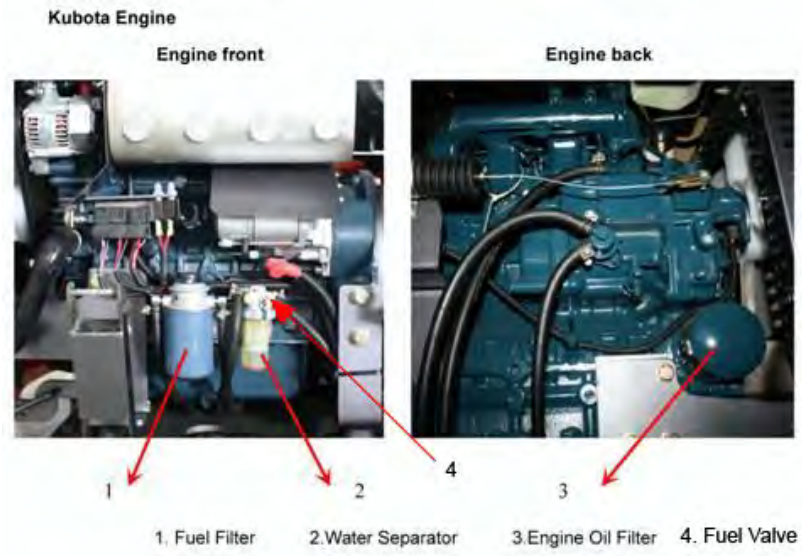
BE SURE TO USE THE CORRECT TYPE AND GRADE OF FUEL.

BE SURE TO REPLACE THE FUEL TANK CAP AND GROUND THE FUEL

FUNNEL OR NOZZLE AGAINST THE FILTER NECK TO PREVENT SPARKS.

Drain the Water Separator

To drain the water separator, turn fuel valve off. Remove separator bowl from housing by rotating collar counter clockwise until free. Drain water and clean bowl. Reinstall bowl in the reverse order as removed. Turn fuel valve on.



Tires & Wheels Maintenance

Tire Replacement

MEC recommends a replacement tire be the same size and brand as originally installed on the machine. Please refer to the Parts Manual for the part number of the approved tires for a particular machine model. If not using an approved replacement tire, we recommend that replacement tires have the following characteristics:

- Equal or greater load rating and size of original.
- Tire tread contact width equal or greater than original.
- Wheel diameter, width, and offset dimensions equal to the original.

Wheel Replacement

The rims installed on each product model have been designed for stability requirements which consist of track width and load capacity. Size changes such as rim width, center piece location, larger or smaller diameter, etc., without written factory recommendations, may result in an unsafe condition regarding stability.

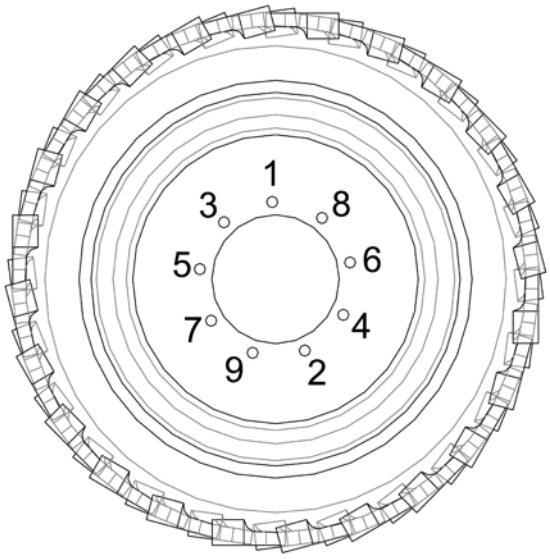
Wheel Installation

It is extremely important to apply and maintain proper mounting torque.

WARNING **WHEEL NUTS MUST BE INSTALLED AND MAINTAINED AT TORQUE TO PREVENT LOOSE WHEELS. USE ONLY THE NUTS MATCHED TO THE CONE ANGLE WHEEL.**

Tighten the lug nuts to the proper torque to prevent it from coming loose. Use a torque wrench to tighten fasteners. If you do not have a torque wrench, tighten the fasteners with a lug wrench, then immediately have a service garage tighten the lug nuts to the proper torque. Over-tightening may result in breaking the studs or permanently deforming mounting stud holes in the wheels. The proper procedure attaching wheels is as follows:

1. Start all nuts by hand to prevent cross threading. Do NOT use a lubricant on threads or nuts.
2. Tighten nuts in the following sequence:
3. The tightening of the nuts should be done in stages. Following the recommended sequence tighten nuts per wheel torque chart.



TORQUE SEQUENCE		
1st Stage	**2nd Stage**	**3rd Stage**
40 ft. Lbs. (55 N•m)	100 ft. Lbs. (130 N•m)	170 ft. Lbs. (255 N•m)

4. Wheel nuts should be torque after first 50 hours of operation and after each wheel removal. Check torque every 3 months or 150 hours of operation.

Battery Maintenance

WARNING

LEAD ACID BATTERIES CAN PRODUCE FLAMES AND EXPLOSIONS. TO AVOID INJURY FROM AN EXPLOSION, DO NOT SMOKE OR ALLOW SPARKS OR A FLAME NEAR THE BATTERY DURING SERVICING. ALWAYS WEAR EYE PROTECTION WHEN SERVICING BATTERIES.

1. Remove the cell inspection covers and ensure that the electrolyte level is covered by the plates.
2. Remove battery cables from each battery post one at a time, negative first. Clean cables with acid neutralizing solution (e.g. Baking soda and water or ammonia) and wire brush. Replace cables and/or cable clamp bolts as required.
3. Clean battery post with wire brush then re-connect cable to post. Coats non-contact surfaces with mineral grease or petroleum jelly (Vaseline).
4. When all cables and terminal posts have been cleaned, ensure all cables are properly positioned and are not pinched. Close battery compartment cover.

WARNING

LEAD ACID BATTERIES CAN PRODUCE FLAMES AND EXPLOSIONS. TO AVOID INJURY FROM AN EXPLOSION, DO NOT SMOKE OR ALLOW SPARKS OR A FLAME NEAR THE BATTERY DURING SERVICING. ALWAYS WEAR EYE PROTECTION WHEN SERVICING BATTERIES.

NEVER WORK ON THE ELECTRICAL SYSTEM OF ANY EQUIPMENT UNLESS YOU ARE THOROUGHLY FAMILIAR WITH SYSTEM DETAIL.

NEVER CHECK THE BATTERY BY PLACING A METAL OBJECT ACROSS THE POSTS.

SERIOUS BURNS OR AN EXPLOSION CAN RESULT.

NEVER CHARGE A FROZEN BATTERY; IT CAN EXPLODE.

CAUTION

LEAD ACID BATTERIES CONTAIN SULFURIC ACID WHICH WILL DAMAGE EYES OR SKIN ON CONTACT. WHEN WORKING AROUND BATTERIES ALWAYS WEAR A FACE SHIELD TO AVOID ACID IN EYES. IF ACID CONTACTS EYES, FLUSH IMMEDIATELY WITH CLEAR WATER AND GET MEDICAL ATTENTION. WEAR RUBBER GLOVES AND PROTECTIVE CLOTHING TO KEEP ACID OFF SKIN. IF ACID CONTACTS SKIN, WASH OFF IMMEDIATELY WITH CLEAN WATER.

DISCONNECT THE BATTERY BEFORE WORKING ON THE ELECTRICAL SYSTEM. REMOVE THE GROUND TERMINAL FIRST. WHEN RECONNECTING THE BATTERY, RECONNECT THE GROUND TERMINAL LAST.

CAUTION

WHEN USING AN EXTRA BATTERY TO JUMP START AN ENGINE, BEFORE MAKING CONNECTIONS, YOU SHOULD BE SURE OF THE BATTERY POLARITY AND THE CORRECT CONNECTIONS. WHEN USING AN EXTRA BATTERY, ALWAYS MAKE LAST CONNECTION TO THE ENGINE OR THE GROUND (NEVER WITH THE BATTERY). WHEN REMOVING THE JUMP START CABLES, ALWAYS REMOVE THE CONNECTION FROM THE ENGINE OR THE GROUND FIRST.

FOLLOW THE MANUFACTURER'S DIRECTIONS FOR JUMP STARTING OF ENGINES WITH AID OF AN EXTRA BATTERY. OPERATOR MUST BE AT A CONTROL STATION WHEN JUMP STARTING ENGINE SO THAT THE MACHINE WILL BE UNDER CONTROL WHEN THE ENGINE STARTS. JUMP STARTING IS A TWO-PERSON OPERATION.

Limit Switch And Sensor Detail

The MEC 45-AJ (Articulated with Jib) boom uses three boom segments to provide enhanced access in tight areas with superior 'up and over' capability. The three-booms are described as follows:

- Lower boom section
- Mid boom section
- Upper boom section

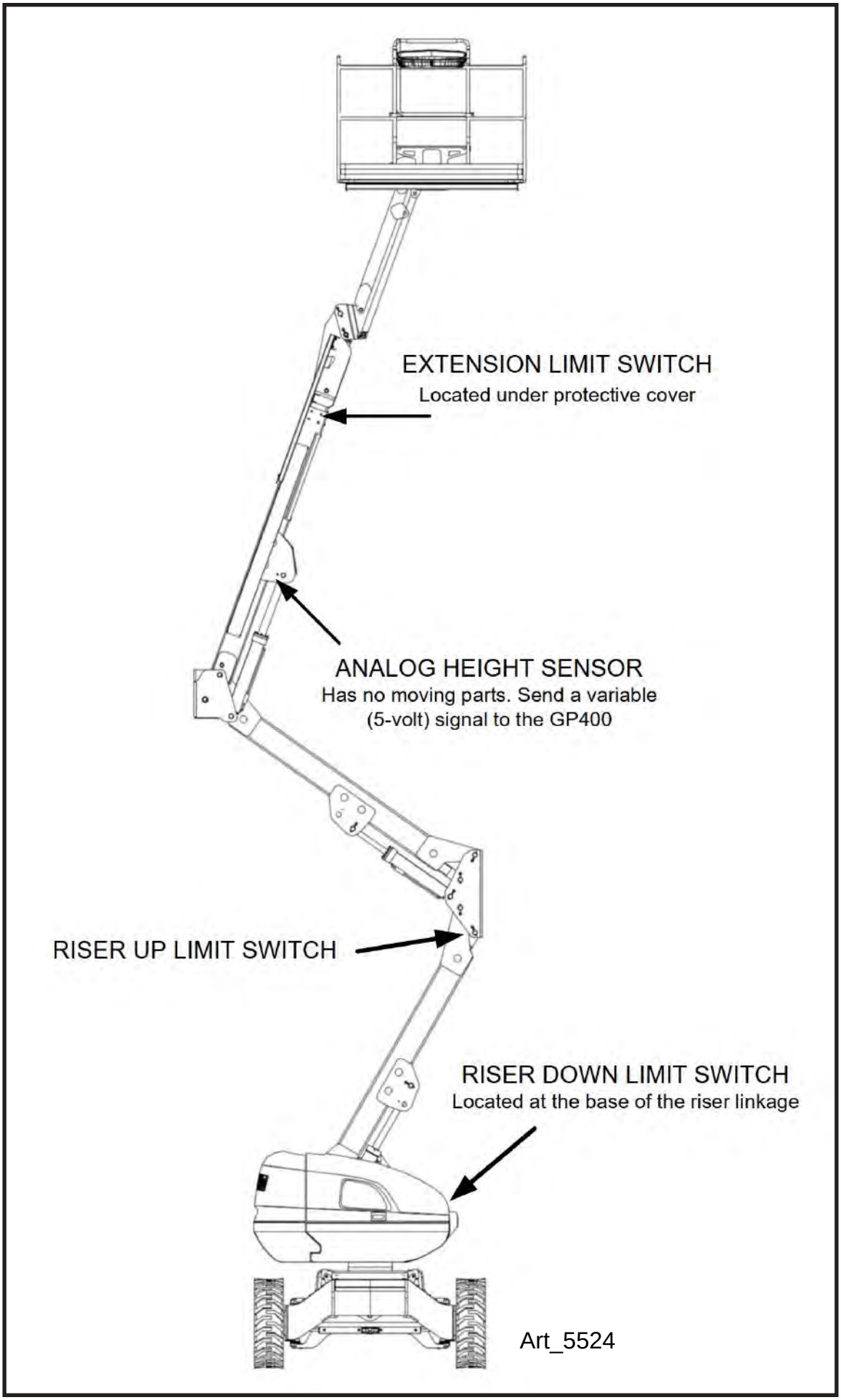
The lower and mid boom sections move in sequence with each other to make up the 'Riser' section which moves only in a vertical path. The upper boom section is operated separately from the Riser and incorporates an extendable boom and jib sections.

The Control System employs 3 mechanical (limit) switches plus an analog sensor to monitor boom, riser and extension boom positions. The following artwork identifies limit switch location.

- **Riser Down Limit Switch** – Switch contacts open when the riser elevates above 10 inches (0.25M)
- **Riser Up Limit Switch** – Switch contacts open when the riser reaches full elevation thereby canceling the riser lift signal.
- **Boom Extend Limit Switch** – Switch contacts open when the boom is extended beyond 10 inches foot (0.25m)
- **Upper Boom Analog Sensor** – monitors the height of the upper boom section with infinite variability.

When the Limit Switches open electrical input, to the GP400 Control Module, the GP400 reacts to the elevated or extended booms by reducing Drive speed, locking the Axle Oscillation, and it stops all Lift, Extend and Drive operation when the machine is out of level. An audible alarm will sound when the machine functions are interlocked.

Switch operation must be inspected during the "Frequent Inspection". Switch operation can be monitored using the On-board Diagnostic Display or the hand-held EZ-Cal scan tool together with the Diagnostic Flow Charts found in the Troubleshooting section of this manual.


EXTENSION LIMIT SWITCH
Located under protective cover
ANALOG HEIGHT SENSOR
Has no moving parts. Send a variable
(5-volt) signal to the GP400
RISER UP LIMIT SWITCH
RISER DOWN LIMIT SWITCH
Located at the base of the riser linkage
Art_5524

General Troubleshooting Tips

Hydraulic Fluid Pump

The hydraulic Drive Pump and Primary Functions Pump used in this model are variable displacement, axial piston type pumps. Proper adjustment is critical for normal operation of the machine. Refer to the Hydraulic System Specification on page 9 of this manual.

The Secondary Functions pump without the 7.5 kW Generator is a fixed-displacement gear-type pump attached to the rear of the Drive Pump.

The Secondary Function pump on units equipped with a 7.5 kW Generator is a variable displacement type pump mounted to the rear of the Drive Pump.

Common Causes of Electrical System Malfunctions:

- Battery switch is turned OFF (located at the front of the engine module).
- Battery connections are loose or corroded.
- Battery is not fully charged.
- Emergency Stop buttons are pushed (OFF position).
- Circuit breaker is tripped (OFF position).

Common Causes of Hydraulic System Malfunctions:

- Hydraulic fluid level is too low.
- Incompatible hydraulic fluids mixed, destroying the additives and causing varnish build up, resulting in the valves sticking.
- Water in the hydraulic fluid due to a damp climate.
- Improper hydraulic fluid used. Viscosity too high in cold climates. Viscosity too low in warm climates.
- Hydraulic fluid contaminated with debris - filter change interval neglected.

Note: MEC uses a multiple viscosity fluid that is light enough for cold climates and resists thinning in warm climates. Use only the recommended hydraulic fluid. Substituting a lower grade fluid will cause the machine to operate incorrectly and may lead to pump and drive motor failure. Refer to Section 3 regarding lubrication.

Note: Contamination always causes failure in any hydraulic system. It is very important to be careful not to introduce any contamination into hydraulic system during the assembly procedures. Make sure all ports and cavities of the manifold and cylinders are properly covered/plugged during maintenance activities.

Electrical System Troubleshooting

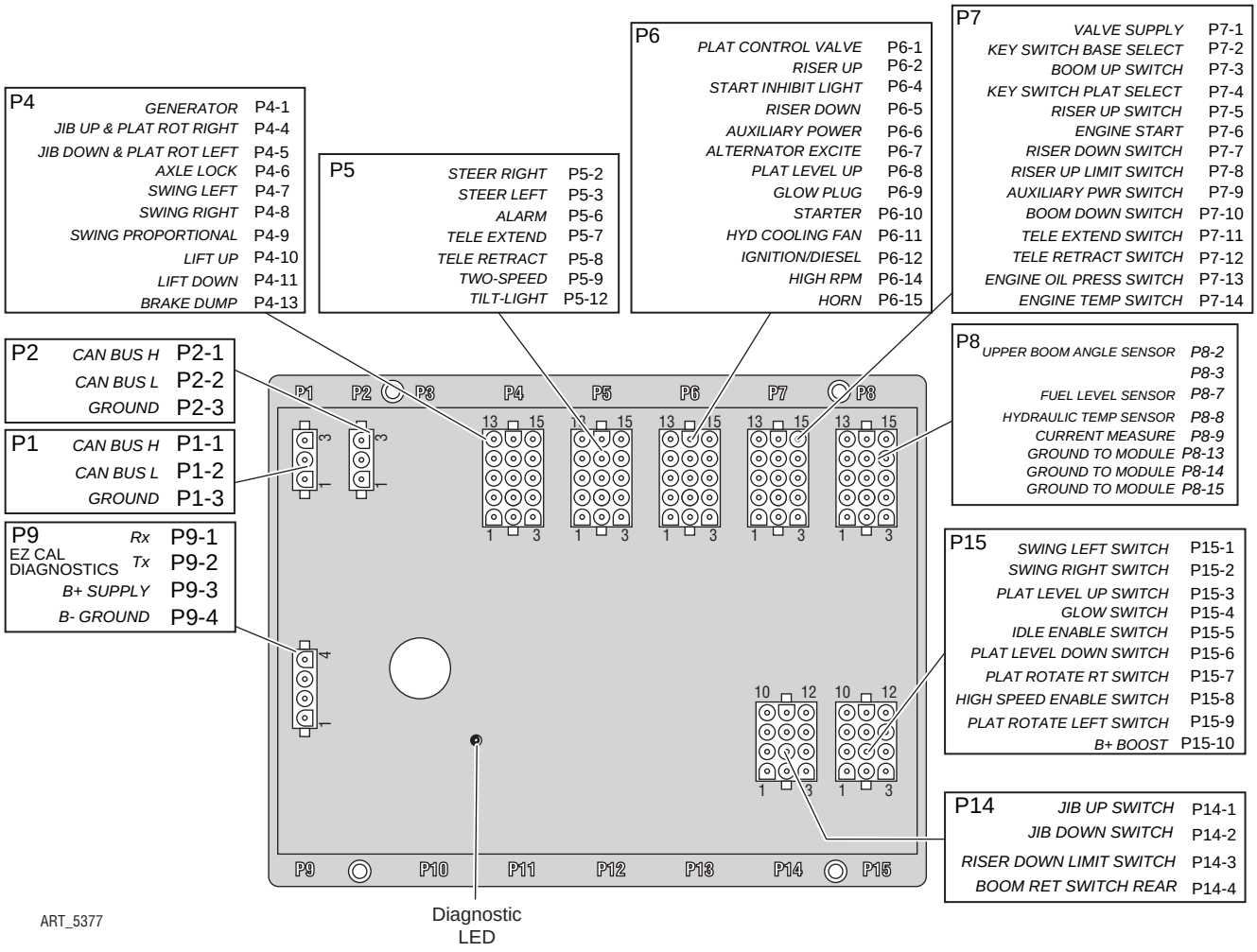
The electronic control system used on this machine was designed for low maintenance and long, trouble-free operation. The system consists of two microprocessor based modules: the GP440 Module in the upper controls box and the GP400 Processor, located in the lower controls box. They communicate through a low voltage digital signal called CAN-Bus communication.

To protect against part failure or incorrect plug connections, the modules are fully short circuit and reverse polarity protected. All electrical plug connections are waterproof to promote longer trouble free operation and to increase terminal life.

NEVER ATTEMPT TO SUPPLY BATTERY POWER, OR VOLTAGE HIGHER THAN 12 VOLTS TO ANY PART OR MODULE IN THIS SYSTEM, AS CATASTROPHIC FAILURE OF THE MODULES MAY RESULT.

USE OF HIGH PRESSURE WASHING EQUIPMENT DIRECTLY ON THE MODULES CAN FORCE WATER INTO SEALED CONNECTION AND CAN CAUSE A TEMPORARY SYSTEM SHUT-DOWN. HIGH PRESSURE WASHING WITHIN THE VICINITY OF THE MODULES IS HIGHLY DISCOURAGED.

GP400 Module

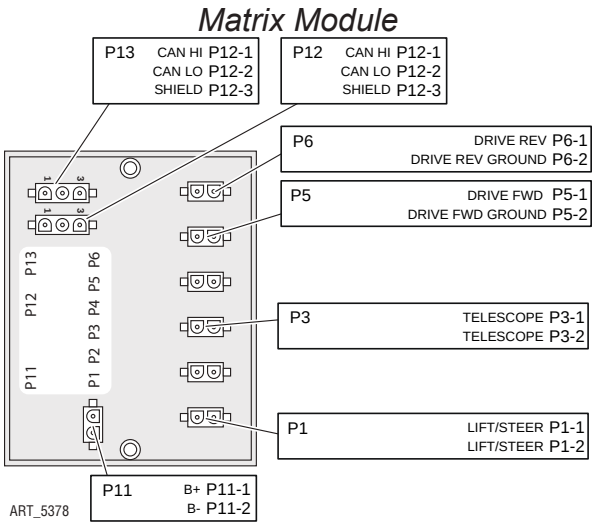


The GP400 module is “the brains” of the system. It receives and processes a variety of inputs both from the machine and the operator, then controls all the operative functions of the machine. It also has a feature that allows the technician to access and monitor all functionality of the system, along with a technician-friendly series of fault messages that can be accessed through the use of the onboard EZ-Cal scan tool. Flash codes are also provided in case an EZ-Cal scan tool is not available.

Such information can be used for preventative maintenance and troubleshooting should a problem arise. A comprehensive list of EZ-Cal accessible information can be found later in this section.

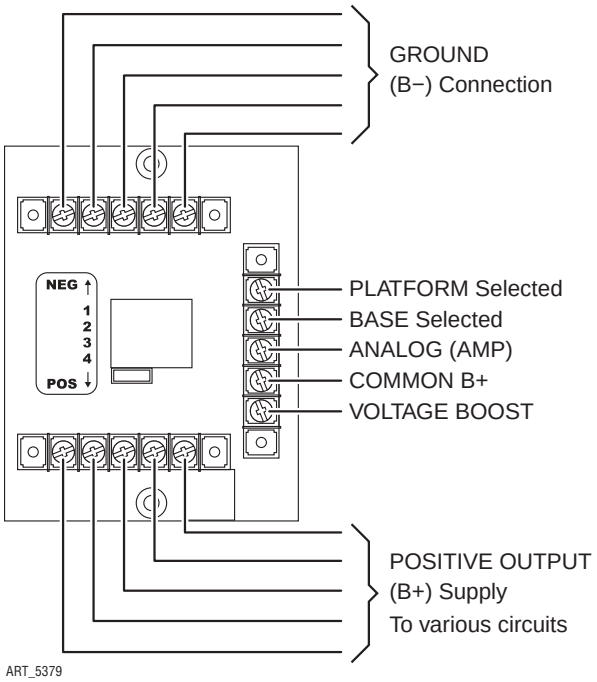
The GP400 operates on 12 Volts DC and should never be probed or operated with voltage higher than 14 Volts DC.

Valve Constant Current Module (VCCM)



The Valve Constant Current Module is an auxiliary module located inside the lower control box. It controls certain proportional functions of the machine.

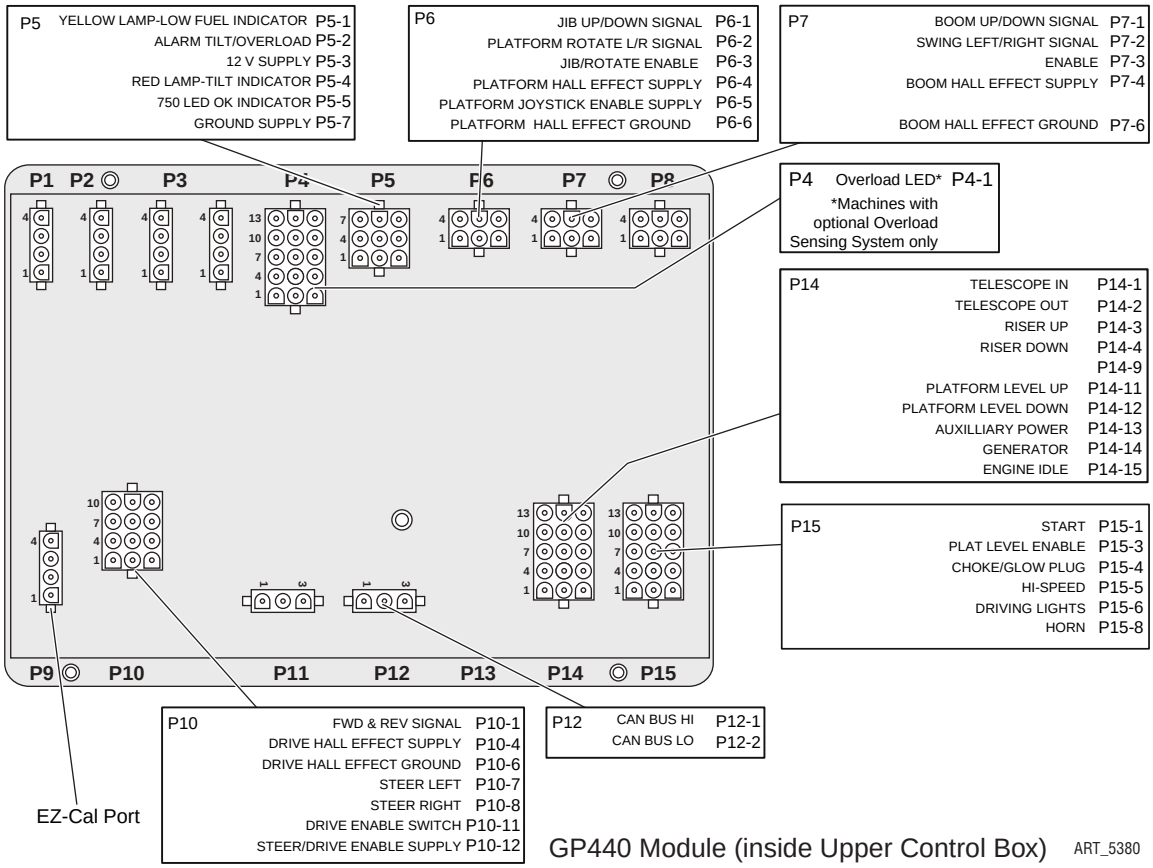
Terminal Block Module (TBM)



The Terminal Block Module (TBM) is a module inside the lower and upper control box that provides terminal point connections for both positive and ground circuits.

A signal from the Emergency Stop circuit activates a load-reduction relay within the TBM that provides ample power to the B+ (positive) terminal strip. This arrangement protects the system against voltage drop conditions that can be detrimental to the electrical system.

GP440 Module

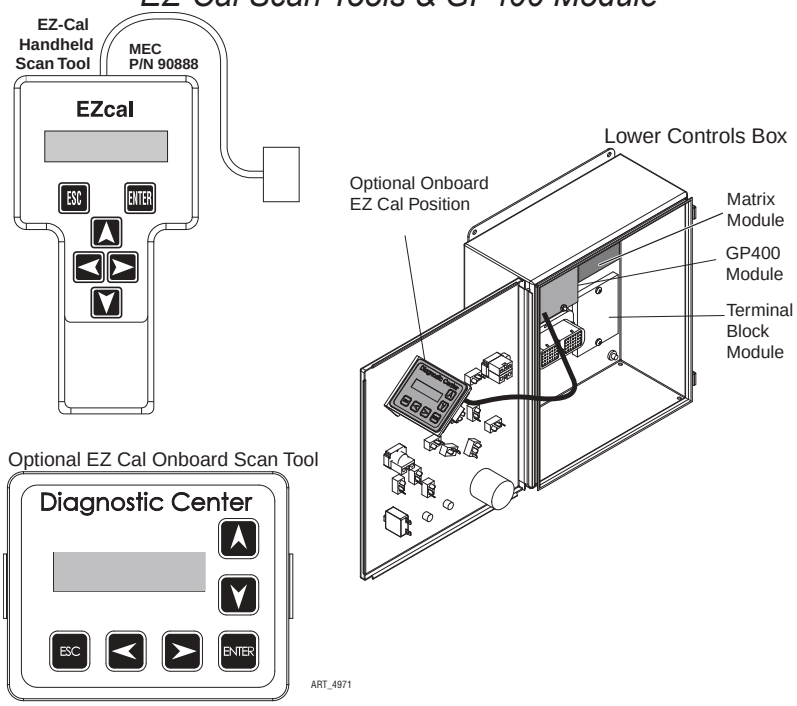


GP440 Module (inside Upper Control Box) ART_5380

The GP440 Module is the remote module located inside the upper control box. It receives inputs from the operator and relays them to the GP400.

EZ-Cal Scan Tools

EZ-Cal Scan Tools & GP400 Module



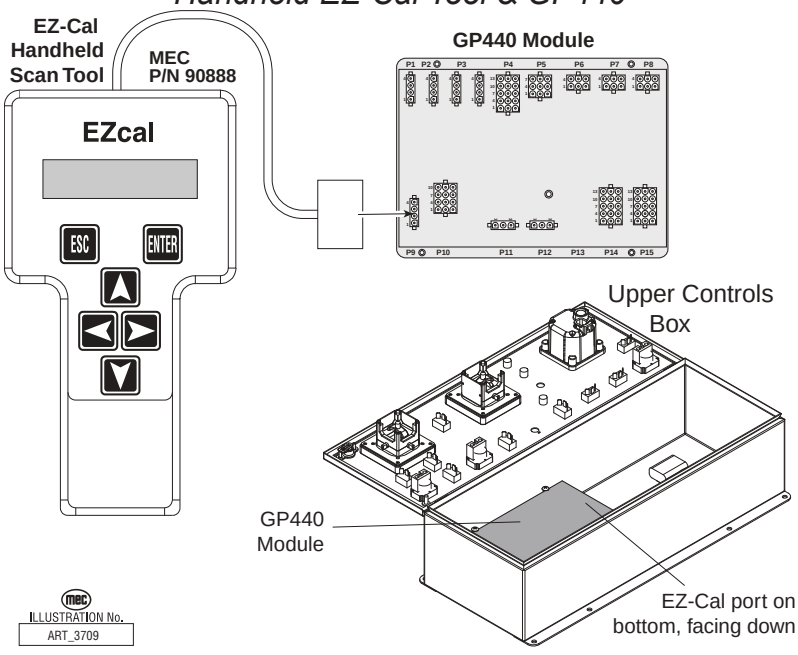
Onboard EZ-Cal Option

To use and operate the onboard EZ-Cal, set the Base/Platform Key switch to Base, then open the door to the Lower Controls Box. The onboard EZ-Cal scan tool provides the same functionality as the hand-held unit.

Handheld EZ-Cal

Can be used with the GP400 or GP440.

Handheld EZ-Cal Tool & GP440



The handheld EZ-Cal is not provided with the machine and is available from the MEC Parts Department (Part #90888).

To use and operate the handheld EZ-Cal at the upper controls station:

- Set the Base/Platform Key Switch to Platform.
- Open the lid to the Upper Controls Box.
- Plug the EZ-Cal into port P9 of the GP440 module. This plug is on the right side of the module, facing down.

Using The EZ-Cal Scan Tool & Onboard EZ-Cal

EZ-Cal Buttons

SYMBOL	KEY FUNCTIONS
ESC ENTER	**ESC/ENTER BUTTONS** To move back and forth between menu and sub-menu
◀ ▶	**LEFT/RIGHT BUTTONS** Select menus and setting to be adjusted
▲ ▼	**UP/DOWN BUTTONS** Adjust setting values

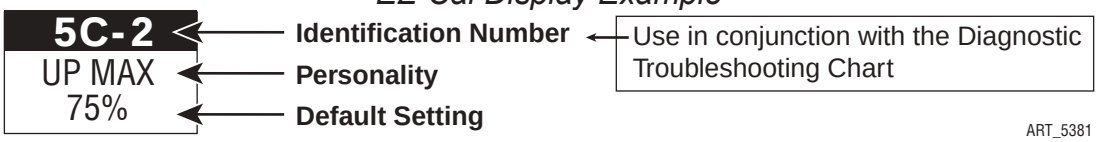
ART_3710

- Once, powered up, the EZ-Cal display will illuminate and read “HELP: PRESS ENTER”. From this point, use the right and left arrows to scroll through the base menus.
- Once the desired base menu is obtained (i.e. ADJUSTMENTS) press Enter to access sub menus.
- Use the right and left arrows to scroll through sub menus, then press Enter again to choose a sub menu.
- The up/down arrows are used to change settings only.
- Press ESC to back up one level.

Using The EZ-Cal With The Flow Charts

Use the EZ-Cal Flow Charts as a guide to locate diagnostic information and make adjustments. Each box in the flow chart will have 3 bits of information.

EZ-Cal Display Example



ART_5381

The IDENTIFIER (5c2):

- Use in conjunction with Diagnostic Trouble Shooting Chart.

The PERSONALITY (Up Max):

- Identifies the individual personalities.

The DEFAULT SETTING:

- The factory setting. If adjustments are made, they must be returned to default setting.

WARNING

ACCESS LEVEL 1 PROVIDES ACCESS TO CHANGE PERSONALITIES NORMALLY PRESET AT THE FACTORY TO PROVIDE PROPER MACHINE MOVEMENT AT SAFE SPEEDS. PERSONALITIES MUST NOT BE CHANGED WITHOUT PRIOR AUTHORIZATION FROM MEC AND MAY ONLY

BE RETURNED TO FACTORY SPECIFICATION AS LISTED IN THE FOLLOWING TABLES.

Error Messages

To obtain error messages from the EZ-Cal, access the EZ-Cal as mentioned above. The display will read, “HELP:PRESS ENTER”. Press Enter to display the current error message. If an error message is present, use the following list of error messages to better understand the fault. If an error message is not present, the display will show the last operation performed.

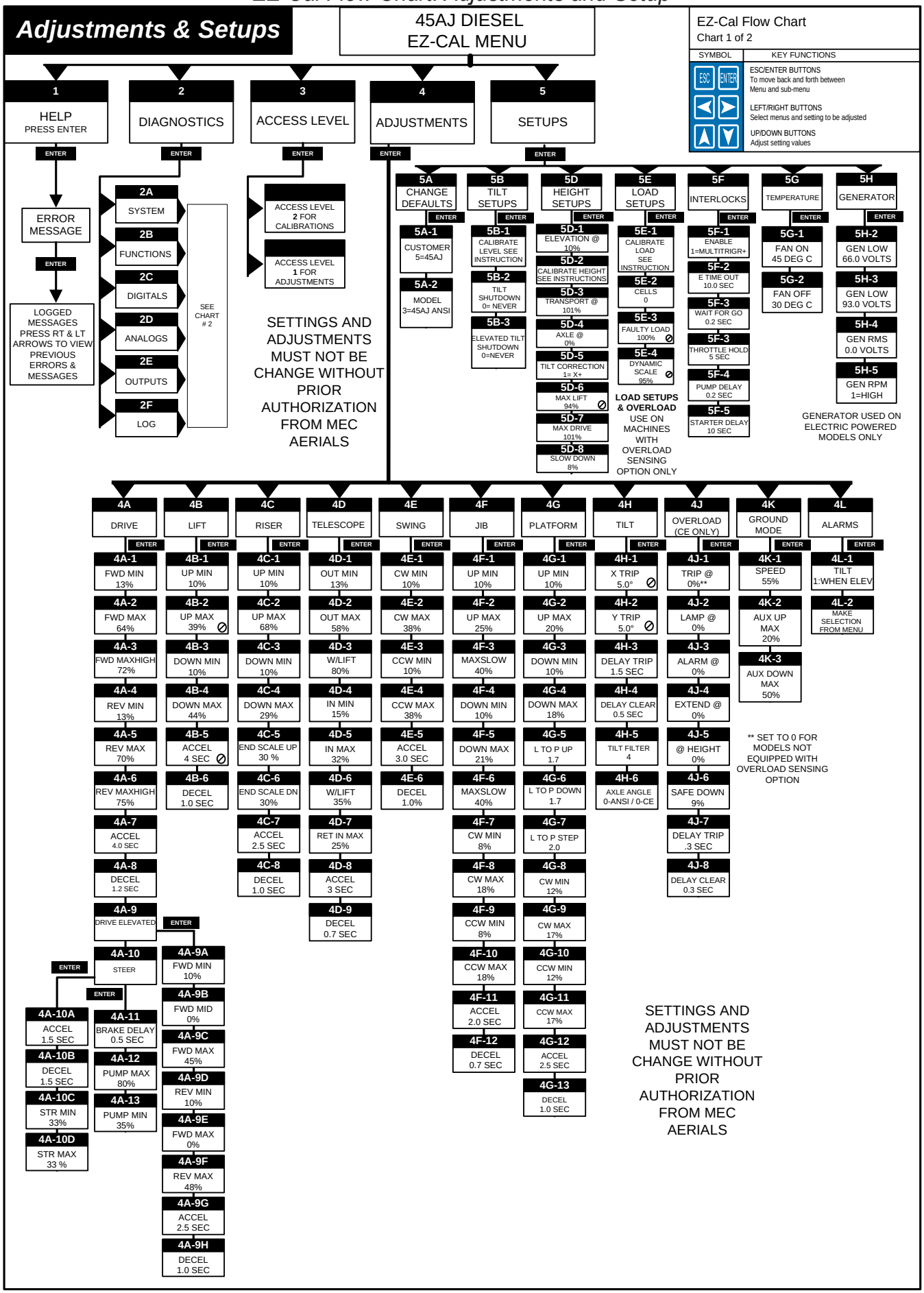
Pressing Enter twice will provide a log of previous errors and operations that may have occurred within recent operation. The first message will be the most recent.

Flash Codes

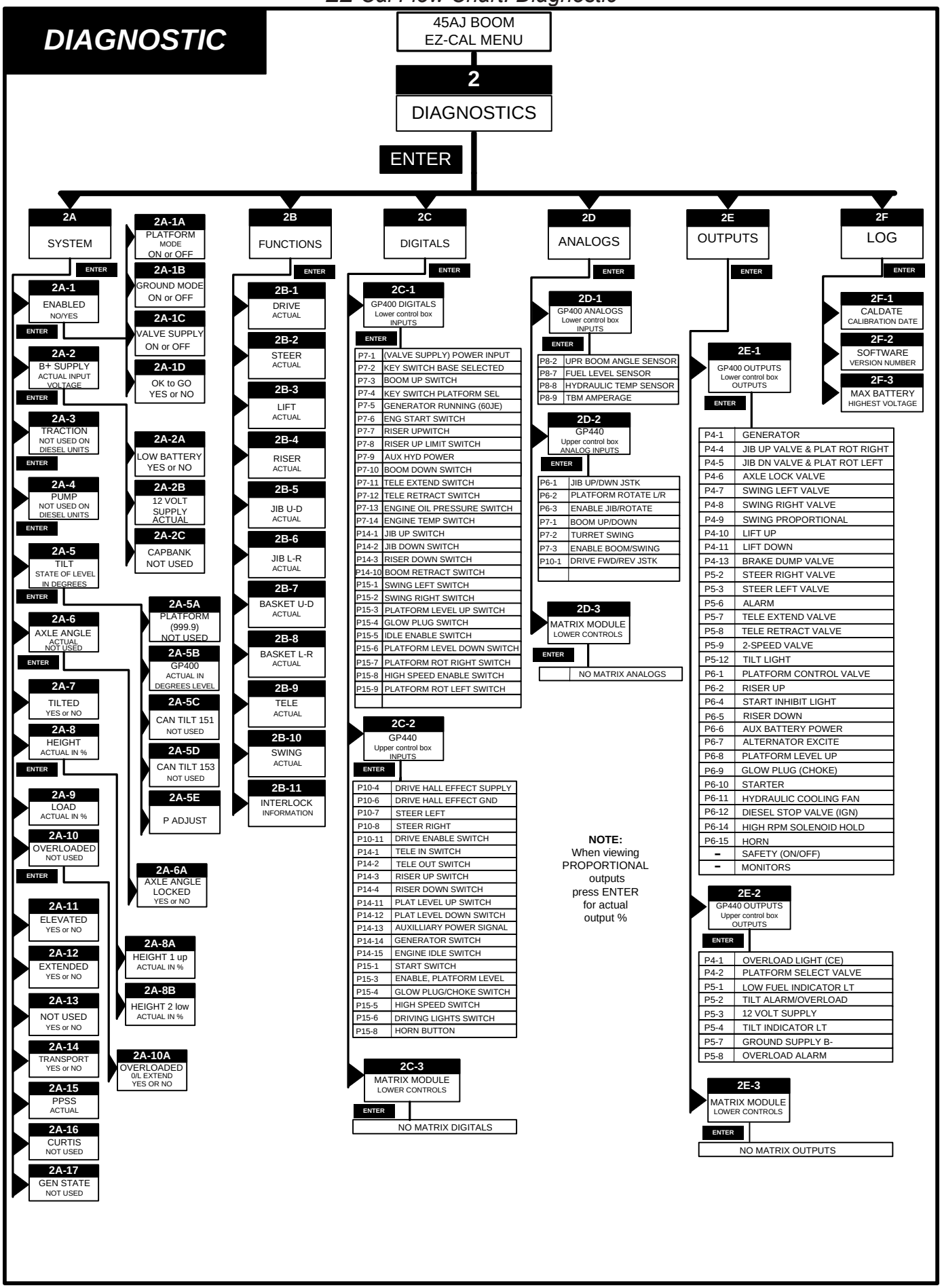
Flash Codes, provided from the GP400 red LED, will also assist in the event an EZ-Cal is not available. However, the EZ-Cal yields considerably more relevant information.

Refer to EZ-Cal Messages on pages 54-60 for flash coded error messages.

EZ-Cal Flow Chart: Adjustments and Setup



EZ-Cal Flow Chart: Diagnostic



EZ-Cal Operational Messages

“Help Messages” will appear on the EZ-Cal scan tool as a means of explaining operating and non-operating function(s) and system errors or interruptions that are accompanied by flash codes. It can also be used for verifying system operation. Refer to the EZ-Cal Instruction page for additional help with EZ-Cal operation.

To access messages, power the system up, (it is not necessary to have the engine running) the EZ-Cal display will illuminate and read “HELP - PRESS ENTER”. Press ENTER to view current message. Press ENTER a second time then use right and left arrow buttons to access up 30 logged messages from the memory. Many messages simply detail operations being performed by the GP400; other messages detail occurrences that also take place during operation either normal or may be symptomatic of a malfunction.

Operational Messages

The following messages appear as result of normal operation and usually do not represent a problem.

EVERYTHING OK_____ Flash Code: None
- All circuits performing properly, no current operation performed.

GROUND MODE ACTIVE_____ Flash Code: None
- Base/Platform selector switch set to base control station.

STARTUP_____ Flash Code: None
- GP400 performing start up procedure, normally a short sequence.

MOVING FRAME_____ Flash Code: None
- Chassis level in progress.

MOVING PLATFORM_____ Flash Code: None
- Platform level in progress

TELESCOPING_____ Flash Code: None
- Boom extend/retract (telescope) in progress

LIFTING_____ Flash Code: None
- Boom lift up in progress

LOWERING_____ Flash Code: None
- Boom Lower down in progress

DRIVING_____ Flash Code: None
- Drive forward or reverse in progress

VEHICLE TILTED_____ Flash Code: None
- Chassis is tilted beyond pre-set maximum. Use auto-level feature to level chassis or re-position the machine.

EZ-Cal CAN Bus Messages

CAN bus communication system is the network by which the control modules and CAN Tilt modules communicate with the GP400.

NO DATA FROM CAN TILT #1_____ Flash Code: None

- CAN Tilt module mounted to front of main boom (located behind panel, Left Module) has malfunctioned or wiring is damaged.

NO DATA FROM CAN TILT #2_____ Flash Code: None

- CAN Tilt module mounted to Front axle has malfunctioned or wiring is damaged.

NO DATA FROM CAN TILT #3_____ Flash Code: None

- CAN Tilt module mounted to front of main boom (located behind panel, Right Module) has malfunctioned or wiring is damaged.

NO DATA FROM CAN TILT #4_____ Flash Code: None

- CAN Tilt module mounted to Rear axle has malfunctioned or wiring is damaged.

FAULT: CAN BUS!_____ Flash Code: 6/6

- The CAN bus cable may be damaged or disconnected from one or more of the modules. All modules must be connected to the CAN bus for machine operation.

EZ-Cal Calibration Messages

The following messages appear when the GP400 microprocessor has not been calibrated or was improperly calibrated.

FACTORY OVERRIDE_____ FAST FLASH

- GP400 is shipped in this condition to allow temporary operation of the machine without interruption from the safety system so that calibration procedures can be performed. The GP400 must be prepared for the machine to which it will be installed, including calibration and Customer/ model selection. See “GP400 Setup” for instructions. Once Calibrated, Factory Override is gone forever.

WARNING

ALL SAFETY SETTINGS ARE INACTIVE WHEN THE GP400 IS IN FACTORY OVERRIDE, NEVER OPERATE MACHINE IN FACTORY OVERRIDE EXCEPT TO CALIBRATE THE GP400.

NOT CALIBRATED_____ Flash Code: 1/1

- The GP 400 microprocessor has not been calibrated. Operation will be restricted until calibration is completed. Refer to “Set up procedures” in this section for calibration information and instructions.

HEIGHT NOT CALIBRATED_____ Flash Code: 1/1

- The Height portion of the calibration has not been completed. Operation will be restricted until calibration is completed. Refer to “Set up procedures” in this section for calibration information and instructions.

FUNCTIONS LOCKED - NOT CALIBRATED_____ Flash Code: 1/1

- The GP 400 microprocessor has not been calibrated. Operation will be restricted until calibration is completed. Refer to “Set up procedures” in this section for calibration instructions.

FAULT: CUSTOMER_____ Flash Code: 1/1

- Customer vs. Model settings not correct. Using the EZ-Cal, go to SETUPS/CHANGE DEFAULTS/CUSTOMER to correct. Changing customer or model will require access level 1 code.
- **NOTE:** All adjustments and settings return to default value when Customer or Model is changed, ensure proper settings and adjustments after changing Customer or Model.

EZ-Cal Interlock Messages

The following messages appear as result of perceived improper operation, machine positioning, or other incorrect operation. Interlock messages may be the result of a part failure if the part in question provides incorrect information to the GP400.

FUNCTIONS LOCKED - LIMIT REACHED_____ Flash Code: 2/2

- Rotating platform not centered; certain operations require centered platform. Rotating platform at extreme CW or CCW; no further rotation possible in that direction

FUNCTIONS LOCKED - TEST MODE SELECTED_____ Flash Code: 2/2

- Calibration in progress or internal test mode active. Cycle EMS to clear.

FUNCTIONS LOCKED - OUTRIGGERS_____ Flash Code: 2/2

- Stabilizers must be set before operation is allowed.

FUNCTIONS LOCKED - OVERLOADED_____ Flash Code: 2/2

- Platform overloaded - reduce weight in platform until alarms stop (Overload option only)

FUNCTIONS LOCKED - UNDERLOADED_____ Flash Code: 2/2

- Overload system detects less then normal lift cylinder pressure. Platform resting atop a fixed object, possible pressure switch failure or not calibrated correctly.

FUNCTIONS LOCKED - TILTED_____ Flash Code: 2/2

- Platform sensors indicate platform out of level; level platform or chassis until alarm stops or re-position machine

FUNCTIONS LOCKED - AUTO PLATFORM LEVEL_____ Flash Code: 2/2

- Auto Platform Level operation running, wait until completed to operate other functions.

FUNCTIONS LOCKED - TOO HIGH_____ Flash Code: 2/2

- Elevation sensor indicating elevation beyond 98%. Height Calibration performed incorrectly; Angle Transducer loose or remounted incorrectly or extend proximity switch/s failure. Use EZ-Cal in conjunction with EZ-Cal Flow Charts to identify GP400 or GP440 for sensor's inputs to check sensor readings.

FUNCTIONS LOCKED - EXTERNAL SHUTDOWN_____ Flash Code: 2/2

- Boom not retracted or axle/s off level. Boom must be retracted to allow frame level, drive or outrigger operation. Axles must be centered before drive is allowed when the platform is elevated. Also, drive will be interrupted if Stabilizer pressure sensor output is below 0.2 Volts (possible sensor failure or sensor wiring issue).

CHECK DRIVE/STEER SWITCHES_____ Flash Code: 2/2

- Drive joystick output without enable or during power up. Check drive joystick analog output and steer switch digital output using the EZ-Cal.

CHECK LIFT SWITCHES_____ Flash Code: 2/2

- Lift joystick or toggle switch movement without enable or during power up. Check joystick analog output using the EZ-Cal.

CHECK PLATFORM SWITCHES_____ Flash Code 2/2

- Platform Rotate/slide joystick or toggle switch movement without enable or during power up. Check joystick analog output and switch digital outputs using the EZ-Cal.

CHECK TELE SWITCHES_____ Flash Code 2/2

- Telescope joystick or toggle switch movement without enable or during power up. Check joystick analog output and switch digital output using the EZ-Cal.

RELEASE ENABLE SWITCH_____ Flash Code 2/2

- One or more enable switches activated for extended period of time without corresponding function or during start up. Check enable switches digital outputs using the EZ-Cal.

EZ-Cal Other Messages

The following messages are the result of various possible failures or occurrences which may result in machine interruption.

FUNCTIONS LOCKED - NO VALVE SUPPLY!_____ Flash Code 2/3

- GP400 detects no power on P7-1 of the GP400. Check wiring to plug connection; possible GP400 internal failure.

FAULT: ENERGIZED VALVE_____ Flash Code: 3/2

- Power on valve output wire at GP400 plugs P4, P5 or P6. Unplug these connectors and cycle e-stop switch to clear code. Plug in one-at-a-time until code reappears then isolate the circuit (with voltage) within that plug. If code does not clear, possible GP400 failure. EZ-Cal not useful for this procedure.

FAULT: VALVE FEEDBACK HIGH!_____ Flash Code: 3/2

- On start-up GP400 p-5 pin voltage incorrect, check P5-X wiring for voltage feed back. Possible GP400 internal fault

FAULT: BAD INTERNAL SAFETY SWITCH!_____ Flash Code: 3/4

- At startup, internal feedback of output incorrect, possibly failed output driver; check wiring to P6-12/13/14/15; possible GP400 internal failure

FAULT: LOW OIL PRESSURE!_____ Flash Code: 4/1

- Oil pressure switch opened during operation or time out. Check oil pressure, pressure switch, wiring. Message will appear if engine stops running for reasons other then normal shut down.

FAULT: BAD INTERNAL SLAVE!_____ Flash Code: 4/2

- Malfunction within the GP400 possibly caused by a short circuit in the wiring or high voltage surge. Replace GP400.

FAULT: BAD INTERNAL 5 VOLTS!_____ Flash Code: 4/2

- 5 Volts circuit that provides voltage to sensors had failed. Possible short in the wiring or high voltage surge on supply.

FAULT: BATTERY VOLTAGE TOO LOW!_____ Flash Code: 4/4

- Charge battery and battery connections, check charging system and voltage source connections.

FAULT: BATTERY VOLTAGE TOO HIGH!_____ Flash Code: 4/4

- GP400 input voltage should be 12 Volts. Check battery and battery connections, alternator output.

FAULT: CHECK HEIGHT 2 SENSOR!_____ Flash Code 6/1

- Height 2 sensor output over 4.5 Volts or under .5 Volts. Check height 2 sensor output using the EZ-Cal (height 2 sensor on CE option only). Possible sensor failure or wire connection failure.

FAULT: CHECK HEIGHT 1 SENSOR!_____ Flash Code 6/1

- Height 1 sensor output over 4.5 Volts or under .5 Volts. Check height 1 sensor output using the EZ-Cal. Possible sensor failure or wire connection failure.

FAULT: CHECK HEIGHT SENSORS!_____ Flash Code 6/1
- Voltage from Height sensors out of range, should be .5 Volts to 4.5 Volts.

FAULT: CHECK PRESSURE SENSOR!_____ Flash Code 6/2
- Voltage from Pressure sensor out of range, should be .5 to 4.5 Volts (Overload option only).

FAULT: CHECK ELEVATION SWITCH!_____ Flash Code 6/3
- Check for incorrect GP 400 part.

FAULT: LOW OIL PRESSURE!_____ Flash Code 7/7
- Engine Start was pushed but engine did not start or oil pressure switch did not close.
- Engine Oil Pressure is low. Check oil level.

FAULT: SOME BIG BAD PROBLEM!_____ Flash Code 9/9
- A failure happened that has no message associated with it. This should never occur.

Troubleshooting Chart

The following chart describes the possible causes for in-operation of the different functions of this machine. The Causes and Solutions columns list various points of references that can be found in the Hydraulic, Electrical, Schematics and Troubleshooting sections of this manual.

The majority of electrical troubleshooting on this model will require the use of the onboard EZ-Cal scan tool, located inside the lower control box door. Please refer to “EZ-Cal Scan Tools” on page 49 for further instructions on the use of the EZ-Cal scan tool.

Perform a full assessment of machine operations prior to troubleshooting this model and using this chart. This model is operated by a Microprocessor Control System equipped with a variety of built-in safety interlocks to prevent continued operation in the event of a failure or mis-operation. Some interlocks may only be detected through the use of the EZ-Cal.

General Power Issue

Problem	Possible Cause	Remedy/Solution
No operation from upper or lower control station. No LEDs on modules	Emergency stop switch pushed in or ignition switch turned off or faulty switches	Lower e-stop switch and ignition switch will cut all power. Upper e-stop will cut only upper power as will the ignition switch in platform control box.
	Battery discharged or faulty cables	Will receive 4-4 or 7-7 flash on GP400. Clean, service and charge battery - repair cables.
	Circuit breaker tripped	Located in lower control box. Look for short circuit and/or damage in wiring or high amperage draw at valve coils or engine actuators.
	Faulty Terminal Block Module (TBM)	Located inside the lower control box, initiates all power when signaled by the key switch. Also check for loose terminals. Terminal 4 is Common power from Circuit breaker, Terminals 1 and 2 are signals to close the relay.
No operation from upper or lower control station Module LEDs on or flashing	Flash codes are the GP400s indication of a fault in the system.	Refer to flash code designation in this section of the manual or plug in an EZ-Cal scan for considerably more relevant information relating to the failure. See EZ-Cal Instructions for more information.
	Starter Relay or Starter failure	Test for signal and Common power to Starter Relay. Check fuse for Common power to relay. Test Starter.
Operates from lower controls but not from upper controls	Base/Platform select switch not in Platform position or switch malfunction	Ensure that the switch is in the platform position, check switch function.
No LEDs when in Upper control position	Damaged or loose Harness connections to upper control box	Check for power inside the upper control box on e-stop switch and at Buss Module. Check for presence of ground on the Ground Buss Module. Repair connections.
	Malfunctioning GP440 Module (Module inside the upper control box)	Check help messages using the EZ-Cal tool, also check for joystick inputs (see 2C2 and 2D2 Diagnostic Chart for inputs from GP440).

Engine Related Issues

Problem	Possible Cause	Remedy/Solution
Starter will not crank from upper or lower stations	Battery discharged or faulty cables	Will receive 4-4 flash on GP400. Clean, service and charge battery - repair cables.
	Malfunctioning start relay or fuse	Test/replace relay located on left hand side of engine and fuse located near starter.
	Malfunctioning starter	Test/replace starter.
	Upper or Lower control start switch faulty	Test, replace as necessary.
	Starter interrupt system initiated	Check for red “Start Disable” light on lower panel. Starter may be operated for 10 seconds before a 30 second “cool down” is initiated.
7-7 Flash code on GP400	Indicates and attempt to start was sent by the GP400 but the oil pressure switch did not close.	Check all the above
Starter cranks but engine will not start	Low fuel reservoir	Check/fill fuel reservoir. Fuel system will require air purge after loss of fuel.
	Air trapped in the fuel system	Purge air from the fuel system (see section 3 for instructions). Check fuel reservoir level or for leaks in the fuel hoses.
	Restriction in the fuel system	Replace Fuel Filter. Check fuel supply hoses.
	Malfunctioning fuel solenoid	Check/replace fuel solenoid located on the top of the injection pump.
	Malfunctioning Glow plugs (cold climates)	Test/ replace grid heater relay, fuse and grid heater.
	Obstructed air filter	Clean/replace air filter.
	Contaminated Fuel	Test/replace fuel.
	Other engine issues	See engine manufacturers troubleshooting guide.
No high throttle	Malfunctioning Throttle controller, solenoid or blown fuse	Test/replace throttle controller and/or throttle solenoid and fuse.
	Restriction in the fuel system	Replace Fuel Filter. Check fuel supply hoses.
	Obstructed air filter	Clean/replace air filter.
	Other engine issues	See engine manufacturers troubleshooting guide.

Boom & Riser Lift/Lower

Problem	Possible Cause	Remedy/Solution
Upper boom will not lift	Excessive weight on Platform	Reduce weight to within platform capacity.
	Machine out of level (platform elevated above 10')	Indicator light will be illuminated and alarm will sound off. Reposition machine to level ground.
	Main relief valve (RV3) out of adjustment	Adjust Main relief valve (6) to rated platform capacity located on function manifold - see hydraulic section.
	Lift Valve (SV2) not energized	Check wiring to lift valve. Check for EZ-Cal message or flash code.
	Lift valve (SV2) not shifting	Clean debris. Check for damage, replace.
	Proportional Valve (PV2) not energizing	Check wiring to proportional valve. Check for EZ-Cal message or flash code.
	Proportional Valve (PV2) not shifting	Clean debris. Check for damage, replace.
	Main system pressure inadequate	Check pump output flow and pressure if it will lift using emergency the pump.
	Lift/Lower joystick inoperative	Check Joystick output using EZ-Cal ref. 2D-2, P7-1 for analog joystick output signal.
	Battery discharged - no charge output	Check battery voltage, alternator output (14.5 volts). Check GP400 for 4-4 flash code.
	System interlock	Check EZ-Cal HELP messages for interlock
Upper Boom lifts slowly	Adjustment may be set too low	Using the EZ-Cal and Adjustment Flow Chart, compare the machine setting with the flow chart 2B-2 (UP MAX). Do not change if setting is correct.
	Similar problem as no Upper Boom lift	Check all the same areas as listed in **Upper Boom Will Not Lift**.
Upper Boom will not lower or lowers slowly	Lowering valve SV2 not energized	Check wiring to lowering valve located inside control module - see Hydraulic section for location.
	Lowering valve (SV2) not shifting	Clean debris, Check for damage, replace.
	Proportional Valve (PV2) not energizing	Check wiring to proportional valve, Check for EZ-Cal message or flash code
	Proportional Valve (PV2) not shifting	Clean debris, Check for damage, replace
	System interlock	Check EZ-Cal HELP messages for interlock.
	Main system pressure inadequate	Check pump output flow and pressure if it will lift using emergency the pump.
	Adjustment may be set too low	Using the EZ-Cal and Adjustment Flow Chart, compare the machine setting with the flow chart 2B-4 (DOWN MAX). Do not change is setting is correct.
Riser Boom will not lower or lowers slowly	Lowering valve SV4 not energized	Check wiring to lowering valve located inside control module - see Hydraulic section for location.
	Lowering valve (SV4) not shifting	Clean debris. Check for damage, replace.
	Proportional Valve (PV3) not energizing	Check wiring to proportional valve. Check for EZ-Cal message or flash code.
	Proportional Valve (PV3) not shifting	Clean debris. Check for damage, replace.
	System interlock	Check EZ-Cal HELP messages for interlock.
	Main system pressure inadequate	Check pump output flow and pressure if it will lift using emergency the pump.
	Adjustment may be set too low	Using the EZ-Cal and Adjustment Flow Chart, compare the machine setting with the flow chart 4C-4 (DOWN MAX). Do not change is setting is correct.

Emergency lowering not working	Battery discharged, not charging	Check/charge battery, check charge isolator relay and fuse, check alternator output (14.5 volts).
	Auxiliary power unit malfunction	Check APU located in hydraulic tank.
	Emergency Down switch failure	Check/replace switch.
	Lowering valve (SV2 AND SV4) not shifting	See "**Platform will not lower or lowers slowly**"
	Counterbalance Valve (on lift cylinder) not adjusted correctly	Contact Factory Technical Support for instructions for counterbalance valve adjustment.
	System interlock	Check EZ-Cal HELP messages for interlock.
Riser boom will not lift	Excessive weight on Platform	Reduce weight to within platform capacity.
	Machine out of level (platform elevated above 10')	Indicator light will be illuminated and alarm will sound off. Reposition machine to level ground.
	Main relief valve (RV3) out of adjustment	Adjust Main relief valve (6) to rated platform capacity located on function manifold - see hydraulic section.
	Lift valve (SV4) not shifting	Clean debris, Check for damage, replace.
	Proportional Valve (PV3) not energizing	Check wiring to proportional valve. Check for EZ-Cal message or flash code.
	Proportional Valve (PV3) not shifting	Clean debris. Check for damage, replace.
	Main system pressure inadequate	Check pump output flow and pressure if it will lift using emergency the pump.
	Lift/Lower joystick inoperative	Check switch output using EZ-Cal ref. 2D-2, P7-7 for digital switch output signal.
	Battery discharged - no charge output	Check battery voltage, alternator output (14.5 volts). Check GP400 for 4-4 flash code.
	System interlock	Check EZ-Cal HELP messages for interlock.
	Adjustment may be set too low	Using the EZ-Cal and Adjustment Flow Chart, compare the machine setting with the flow chart 4C-2 (UP MAX). Do not change is setting is correct.
	Similar problem as no Riser Boom lift	Check all the same areas as listed in **Riser Boom Will Not Lift**.

Platform Auto-level

Problem	Possible Cause	Remedy/Solution
Platform level not operating with boom operation	Platform Level solenoid (SV9) valve not energized	Check wiring to valve, check output from GP400 2E-1, P6-8.
	Counterbalance valve faulty	Valve must not be tampered with - replace valve.
	Excessive weight on Platform	Reduce weight to within platform capacity.

Platform Manual Level

Problem	Possible Cause	Remedy/Solution
Platform level operates automatically but not manually	Platform Level toggle switch inoperative	Check output from toggle using EZ-Cal (see I.D.# 2C-1, P15-7 (up) P15-6 (down) for lower control operation or 2c-2, P14-11 (up) or P14-12 (down) from upper controls.
	System Interlock	Check EZ-Cal HELP message for interlock.

Turret Rotate

Problem	Possible Cause	Remedy/Solution
Turret will not rotate either direction	Turret Rotate joystick inoperative	Check joystick output using EZ-Cal, see 2D2 P7-2 for signal.
	Rotate Valve (SV1) not energizing	Check wiring to valve. Check GP400 output using EZ-Cal, see 2E1 P4-7 (left) and P4-8 (right).
	Rotate valve (SV1) not shifting	Clean debris, check for damage, replace.
	Proportional Valve (PV1) not energizing	Check wiring to proportional valve, check for EZ-Cal message or flash code.
	Proportional Valve (PV1) not shifting	Clean debris, check for damage, replace.
	Internal damage or failure of rotator	Inspect, clean or repair.
Turret will rotate in one direction only	Rotate Valve (SV1) not energizing	Check wiring to valve.
	Rotate valve (SV1) not shifting	Clean debris, check for damage, replace.
	Mechanical interference in rotator	Inspect, clean or repair.
	System interlock	Check EZ-Cal HELP messages for interlock.

Boom Extend, Retract

Problem	Possible Cause	Remedy/Solution
No boom Extension	Excessive weight on Platform	Reduce weight to within platform capacity.
	Level sensor out of level (platform elevated above 10')	Indicator light will be illuminated and alarm will sound off. Reposition machine to level ground.
	Main relief valve (RV3) out of adjustment	Adjust Main relief valve (RV3) to rated platform capacity located on function manifold - see hydraulic section.
	Extend/Retract Valve (SV5) not energizing	Check wiring to valve. Check EZ-Cal ref.2E-1, P5-7 for output & check flash code.
	Extend/Retract valve (SV5) not shifting	Clean debris. Check for damage, replace.
	Proportional Valve (PV3) not energizing	Check wiring to proportional valve. Check for EZ-Cal message or flash code.
	Proportional Valve (PV3) not shifting	Clean debris. Check for damage, replace.
	Ext/Retract Switch inoperative	Check Switch output using EZ-Cal ref. 2C-2, P14-2 for upper control analog output signal.
	Battery discharged - no charge output	Check battery voltage, alternator output (14.5 volts) Check GP400 for 4-4 flash code.
	System interlock	Check EZ-Cal HELP messages for interlock.
Boom Extends/Retracts slow	Excessive weight on Platform	Reduce weight to within platform capacity.
	Main relief valve (RV3) out of adjustment	Adjust Extend relief valve (see hydraulics section) located on function manifold.
	Extend/Retract valve (SV5) not shifting completely	Clean debris, check for damage, replace.
	Extend Speed adjustment reduced in GP400 Processor	Use the EZ-Cal and check/adjust setting. See ADJUSTMENTS/TELESCOPE OUT MAX.

No Boom Retract	Main relief valve (RV3) out of adjustment	Adjust Main relief valve (RV3) to rated platform capacity located on function manifold - see hydraulic section.
	Foreign debris stuck in boom slide pads	Inspect slide pads, clean.
	Ext/Retract valve (SV5) not energized	Check wiring to lift valve, check for EZ-Cal message or flash code.
	Extend/Retract valve (SV5) not shifting	Clean debris, check for damage, replace.
	Ext/Retract Switch inoperative	Check Switch output using EZ-Cal ref. 2C-2, P14-2 for upper control analog output signal.
	Battery discharged - no charge output	Check battery voltage, alternator output (14.5 volts). Check GP400 for 4-4 flash code.
	System interlock	Check EZ-Cal HELP messages for interlock.

Platform Rotate

Problem	Possible Cause	Remedy/Solution
Platform will not rotate either direction	Platform Rotate joystick inoperative	Check joystick output using EZ-Cal, see 2D2 P6-2 for signal.
	Rotate Valve (SV6) not energizing	Check wiring to valve. Check GP400 output using EZ-Cal, see 2E1 P4-5 (left) and P4-4 (right).
	Rotate valve (SV6) not shifting	Clean debris, Check for damage, replace.
	Proportional Valve (PV3) not energizing	Check wiring to proportional valve, check for EZ-Cal message or flash code.
	Proportional Valve (PV3) not shifting	Clean debris, Check for damage, replace.
	Internal damage or failure of rotator	Inspect, clean or repair.
	Incorrect Adjustment	Using the EZ-Cal, increase the setting for platform rotate 4G-9 and 4G-11 until correct speed.
	System interlock	Check EZ-Cal HELP messages for interlock.
Platform will rotate in one direction only	Rotate Valve (20-1) not energizing	Check wiring to valve.
	Rotate valve (20-1) not shifting	Clean debris, Check for damage, replace.
	Mechanical interference in rotator	Inspect, clean or repair.
	System interlock	Check EZ-Cal HELP messages for interlock.
Jib operates instead of platform rotate	Platform Select Valve not energizing (platform select valve is located on the platform just above the rotator)	Check wiring to proportional valve, Check for EZ-Cal message or flash code.
	Platform Select Valve not shifting	Clean debris, Check for damage, replace.

Jib Up/Down

Problem	Possible Cause	Remedy/Solution
Jib will not operate	Excessive weight on Platform	Reduce weight to within platform capacity.
	Machine out of level (platform elevated above 10')	Indicator light will be illuminated and alarm will sound off. Reposition machine to level ground.
	Main relief valve (RV3) out of adjustment	Adjust Main relief valve (6) to rated platform capacity located on function manifold - see hydraulic section.
	Jib/rotate Valve (SV6) not energized	Check wiring to Jib/rotate valve, check for EZ-Cal message or flash code.
	Jib/Rotate valve (SV6) not shifting	Clean debris, Check for damage, replace.
	Proportional Valve (PV3) not energizing	Check wiring to proportional valve, check for EZ-Cal message or flash code.
	Proportional Valve (PV3) not shifting	Clean debris, check for damage, replace.
	Main system pressure inadequate	Check pump output flow and pressure if it will lift using emergency the pump.
	Jib joystick inoperative	Check Joystick output using EZ-Cal ref. 2D-2, P6-1 for analog joystick output signal.
	Battery discharged - no charge output	Check battery voltage, alternator output (14.5 volts). Check GP400 for 4-4 flash code.
	System interlock	Check EZ-Cal HELP messages for interlock.
Platform Rotate operates instead of jib	Platform Select Valve remaining energized (platform select valve is located on the platform just above the rotator)	Check wiring to proportional valve, check for shorts in the wiring to the valve.
	Platform Select Valve stuck	Clean debris, check for damage, replace.

Drive

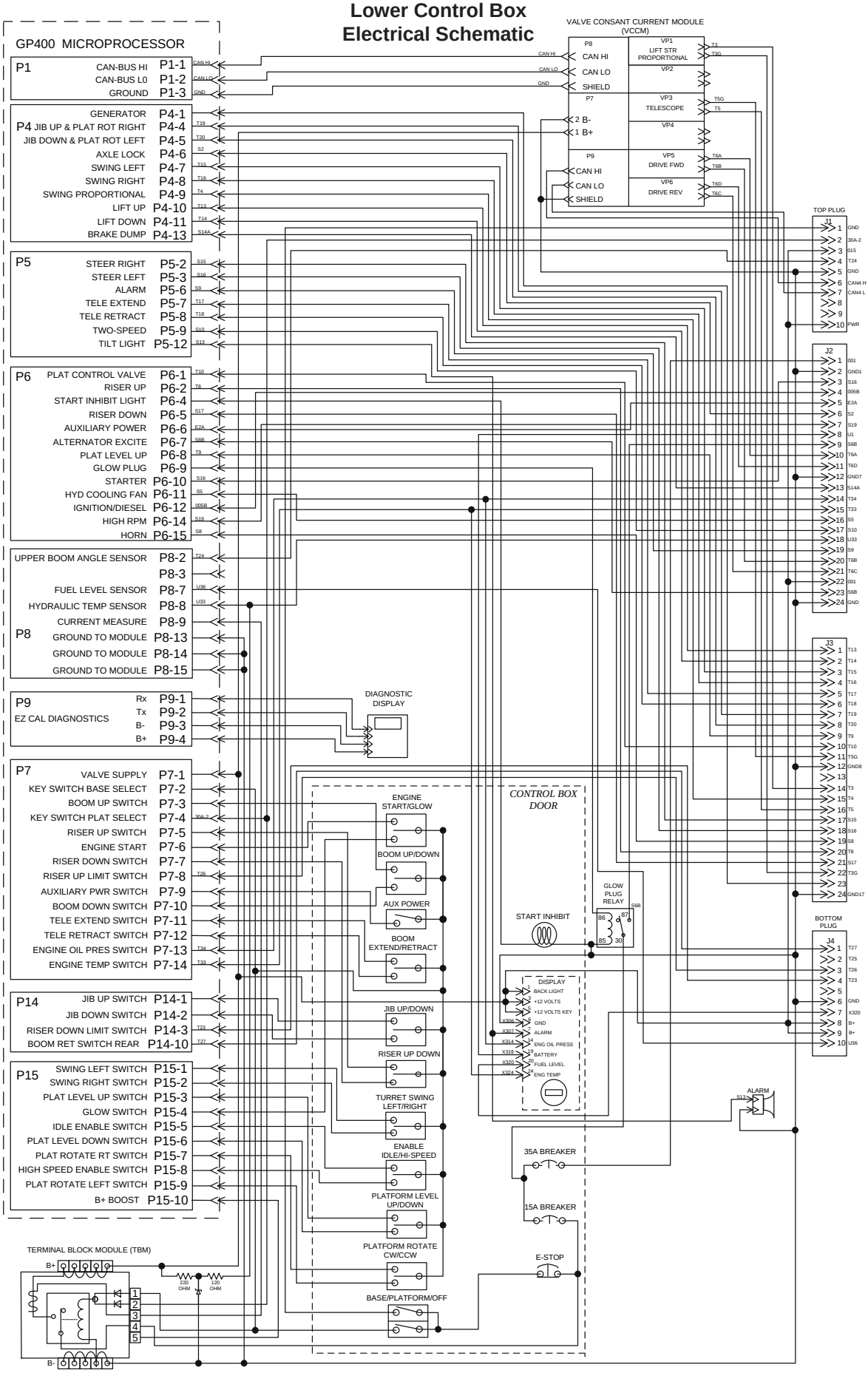
Problem	Possible Cause	Remedy/Solution
No drive operation	Planetary hub bi-pass engaged	Check bi-pass plates located in the center of each planetary hub, should be convex - turn over.
	System interlock	Check EZ-Cal HELP messages for interlock.
	Hydraulic oil incorrect for severe low temperatures	Use hydraulic tank warmer if equipped, operate drive continuously until drive begins to operate.
	Drive Valve (on drive pump) not energized	Check Drive output from VCCM Module VP5 and VP6. Check for power at valve coils located on top of the drive pump.
	Drive Valve (on drive pump) not shifting	Check drive valve for contamination.
	Brakes not releasing (system under pressure when drive attempted)	Check brake valve and brake pressure (see hydraulic diagram for location).
	Drive joystick output failure	Check drive joystick output from GP400 (see 2d2, P10-1) check joystick enable trigger operation, check wire connections.
	Low Pump Stand-by pressure	Check at main manifold port GCP, (see hydraulic Diagram) 300 PSI (21 bar) - Adjust stand-by pressure.
	Incorrectly adjusted or Worn hydraulic drive pump	See Hydraulics section for pump adjustment, inspect or replace pump.
No drive with platform elevated	Unit out of level	Lower boom and operate on more level surfaces.
	Elevated Drive settings incorrect	Reset Elevated Drive Fwd & Rev speeds using EZ-Cal.
	Hydraulic oil incorrect for severe low temperatures	Use hydraulic tank warmer if equipped, operate drive continuously until drive begins to operate.
	Low Pump Stand-by pressure	Check at main manifold port GCP, (see hydraulic Diagram) 300 PSI (21 bar) - Adjust stand-by pressure.
	System interlock	Check EZ-Cal HELP messages for interlock.
Slow drive with Platform in stowed position and boom retracted	Slow speed enabled	Check speed switch in platform box, check 2-speed valve located on the main manifold (see hydraulic diagram).
	Hydraulic oil incorrect for severe low temperatures	Use hydraulic tank warmer if equipped, operate drive continuously until drive begins to operate.
	Boom Retract Limit Switch failure	Check for power & signal output at Limit Switch located on left side of upper boom tip Also check EZ-Cal 2C1, P14-10 for input.
	Riser Up Limit Switch failure	Check for power & signal output at Limit Switch located inside boom end weldment. Also check EZ-Cal 2C1, P7-8 for input.
	Low Pump Stand-by pressure	Check at main manifold port GCP, (see hydraulic Diagram) 300 PSI (21 bar) - Adjust stand-by pressure.
	Drive Settings incorrect	Reset drive Fwd and Rev Max speeds using EZ-Cal.
	Wheel motor not functioning correctly	Inspect wheel motors for damage or wear.

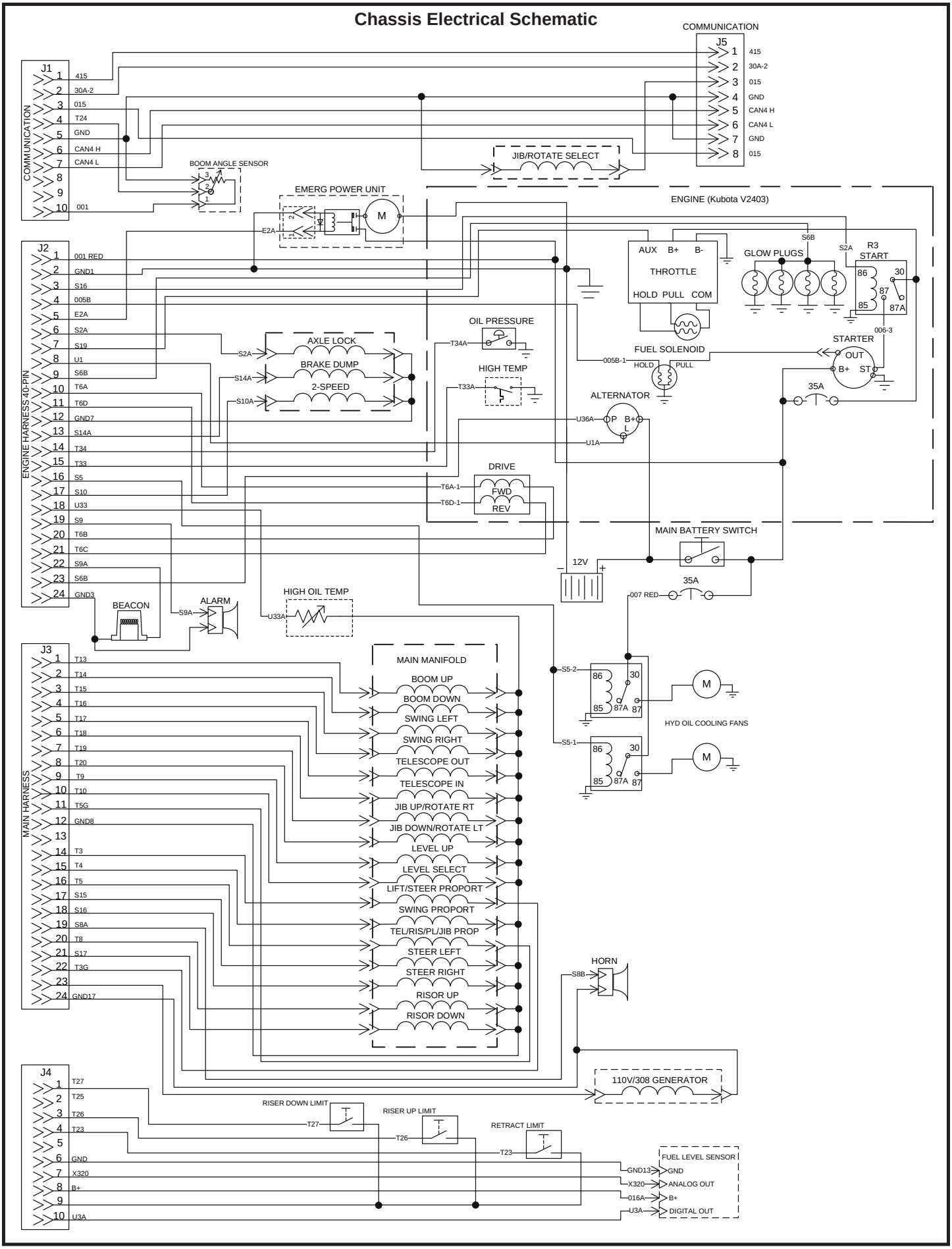
Poor Grade-ability or Drive performance	High Speed enabled	Check Speed Switch on upper control box.
	Wheel motor not functioning correctly	Inspect wheel motors for excessive bypass or shift not working properly.
	Hydraulic oil incorrect for severe low temperatures	Use hydraulic tank warmer if equipped, operate drive continuously until drive begins to operate.
	Planetary hub bi-pass engaged	Check bi-pass plates located in the center of each planetary hub, should be convex - turn over bi-pass plate.
	Low Pump stand-by pressure	Check at Brake/Axle manifold, should be 300psi (21 bar) see hydraulic diagram - Adjust Stand-by pressure.
	Incorrectly adjusted or Worn hydraulic drive pump	See Hydraulics section for pump adjustment, inspect or replace pump.
Drive in one direction only	Drive valve not energizing in one direction	Check 12 volts to coil, check coil, check valve function (located on top of drive pump).
	No output from VCCM Module	Check output from VCCM VP5 and VP6.
	Drive joystick output failure	Check drive joystick output from GP400 (see 2d2, P10-1).
No High Speed	Speed selector switch inoperative	Check continuity through Speed Select switch with wires disconnected.
	2-speed valve SV12 not functioning	Check for 12 volts and ground to valve, check for faulty valve spool, check switch position output from GP400 (See EZ-Cal ID# 2E1, P5-9).
	Boom Retract Limit Switch failure	Check for power & signal output at Limit Switch located on left side of upper boom tip. Also check EZ-Cal 2C1, P14-10 for input.
	Riser Up Limit Switch failure	Check for power & signal output at Limit Switch located inside boom end weldment. Also check EZ-Cal 2C1, P7-8 for input.

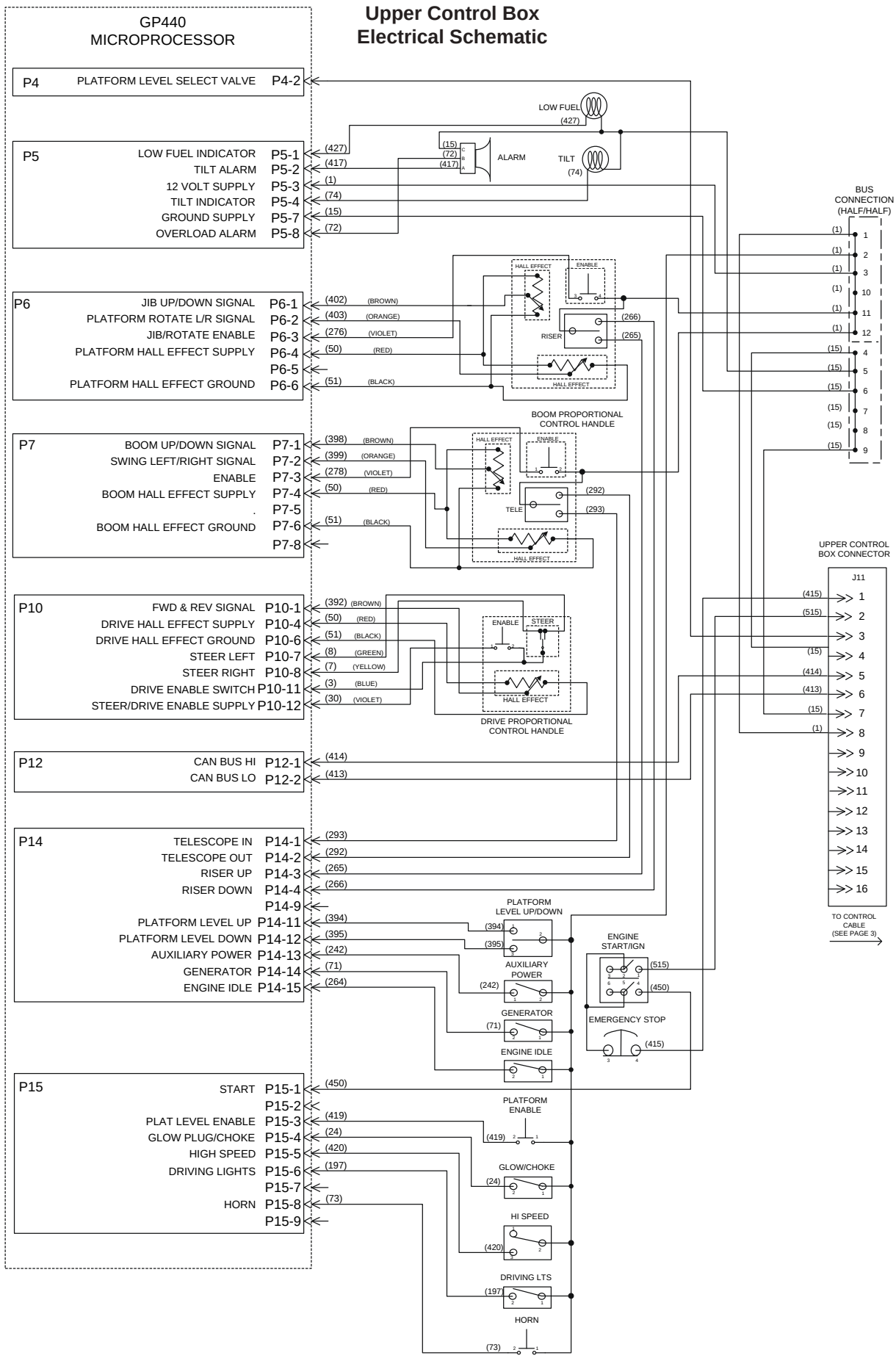
Steer

Problem	Possible Cause	Remedy/Solution
No steer in either direction	Joystick rocker switch inoperative	Check continuity through micro-switch inside joystick handle using wires outside the handle. Check output (see EZ-Cal 2C2, P10-7 and P7-8).
	Steering valve (SV10) inoperative	Check steering valve for power. Check for damage and contamination. Check output from GP400 (see EZ-Cal ID # 2E1 P5-2 and P5-3).
	Proportional Valve (PV2) not energizing	Check wiring to proportional valve, check for EZ-Cal message or flash code.
	Proportional Valve (PV2) not shifting	Clean debris, check for damage, replace.
	Steer Cross-port Relief valve (CR1) set too low	Set steer relief valve to 1800 PSI (124 bar) (see hydraulic diagram for relief valves location).
	System interlock	Check EZ-Cal HELP messages for interlock.
Steer in one direction only	Joystick rocker switch inoperative	Check continuity through micro-switch inside joystick handle using wires outside the handle. Check output (see EZ-Cal 2C2, P10-7 and P7-8).
	Steering valve (SV10) inoperative	Check steering valve for power. Check for damage and contamination. Check output from GP400 (see EZ-Cal ID # 2E1 P5-2 and P5-3) Inspect - replace steering valve.
	No power to steering coil	Check steering valve for power. Check for damage and contamination. Check output from GP400 (see EZ-Cal ID # 2E1 P5-2 and P5-3).
	System interlock	Check EZ-Cal HELP messages for interlock.
Will steer but not fully or slow steering	Steering Cylinder internal Seal failure	Check steering cylinder seals, replace.
	King pin/s seizing in the bore	Disassemble and inspect, replace bushings.

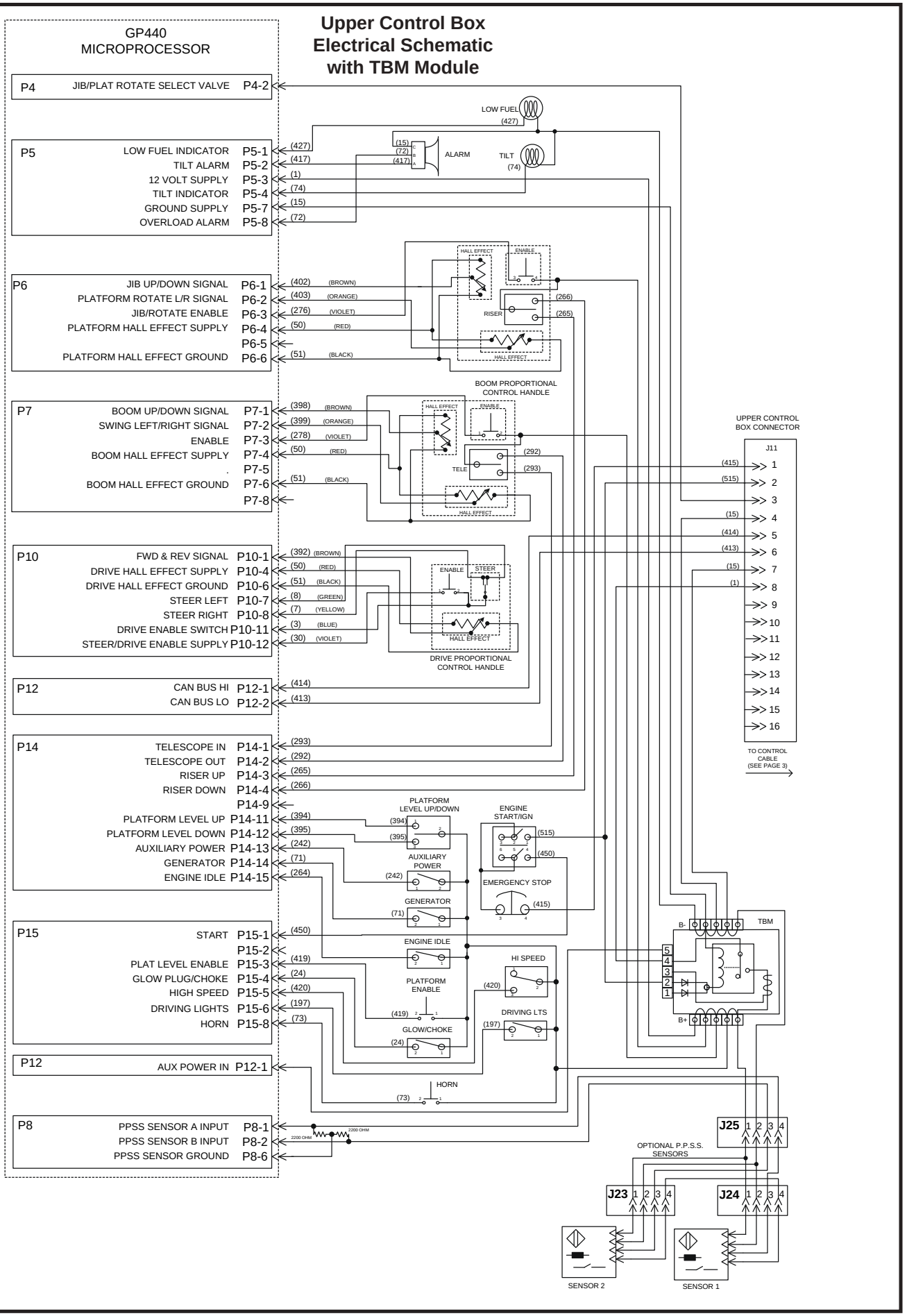
Lower Control Box Electrical Schematic



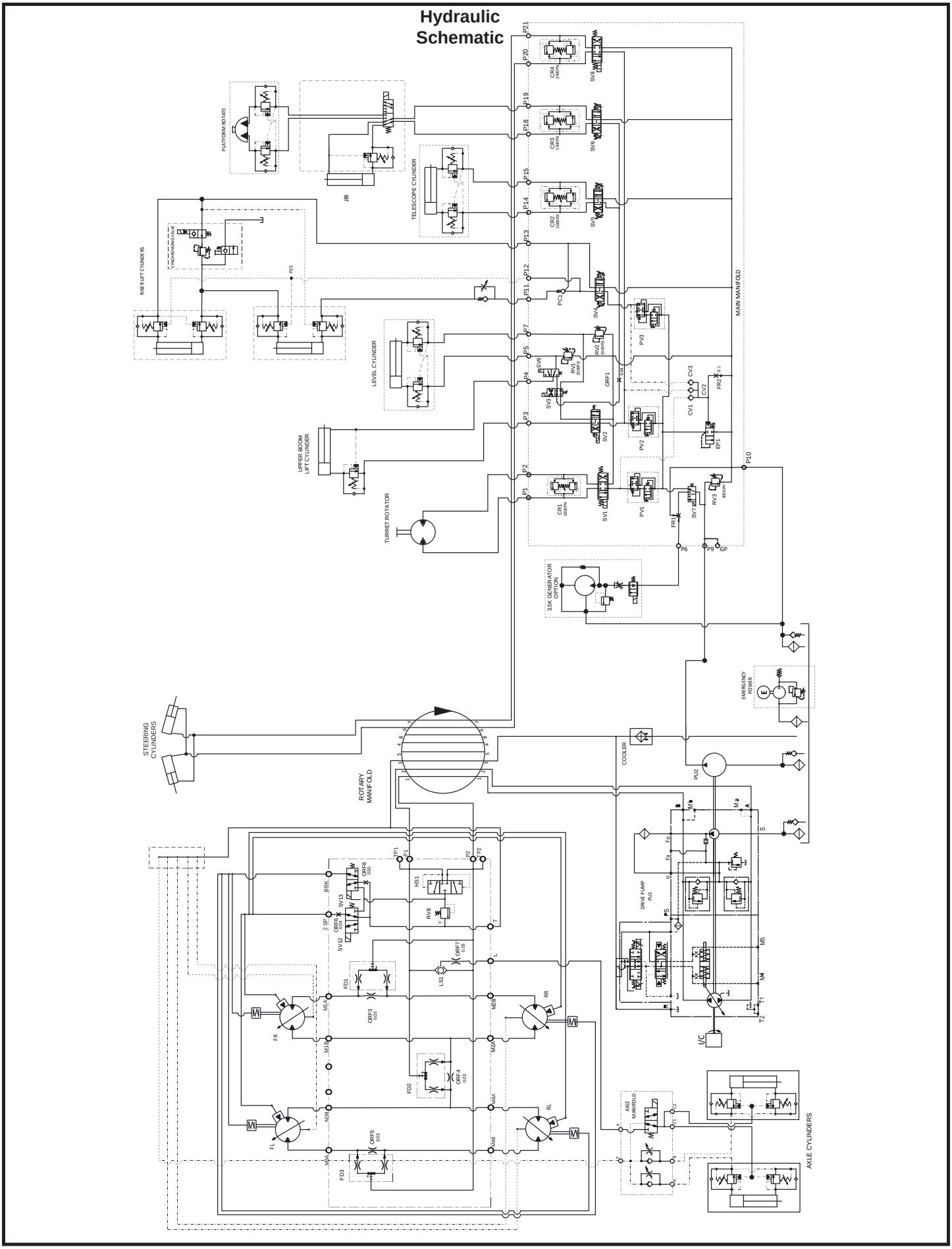

Chassis Electrical Schematic
COMMUNICATION
J5
1 415
2 30A-2
3 015
4 GND
5 CAN4 H
6 CAN4 L
7 GND
8 015
J1
1 415
2 30A-2
3 015
4 T24
5 GND
6 CAN4 H
7 CAN4 L
8
9
10 001
COMMUNICATION
BOOM ANGLE SENSOR
JIB/ROTATE SELECT
EMERG POWER UNIT
M
E2A
ENGINE (Kubota V2403)
AUX B+ B-
THROTTLE
HOLD PULL COM
GLOW PLUGS
S6B
S2A
R3
START
86
30
87
85
87A
006-3
STARTER
OUT
B+
ST
35A
J2
1 001 RED
2 GND1
3 S16
4 005B
5 E2A
6 S2A
7 S19
8 U1
9 S6B
10 T6A
11 T6D
12 GND7
13 S14A
14 T34
15 T33
16 S5
17 S10
18 U33
19 S9
20 T6B
21 T6C
22 S9A
23 S6B
24 GND3
ENGINE HARNESS 40-PIN
AXLE LOCK
BRAKE DUMP
2-SPEED
S2A
S14A
S10A
OIL PRESSURE
T34A
HIGH TEMP
T33A
FUEL SOLENOID
005B-1
HOLD
PULL
ALTERNATOR
U36A
P
B+
L
U1A
DRIVE
T6A-1
T6D-1
FWD
REV
MAIN BATTERY SWITCH
12V
35A
007 RED
BEACON
ALARM
S9A
HIGH OIL TEMP
U33A
J3
1 T13
2 T14
3 T15
4 T16
5 T17
6 T18
7 T19
8 T20
9 T9
10 T10
11 T5G
12 GND8
13
14 T3
15 T4
16 T5
17 S15
18 S16
19 S8A
20 T8
21 S17
22 T3G
23
24 GND17
MAIN HARNESS
MAIN MANIFOLD
BOOM UP
BOOM DOWN
SWING LEFT
SWING RIGHT
TELESCOPE OUT
TELESCOPE IN
JIB UP/ROTATE RT
JIB DOWN/ROTATE LT
LEVEL UP
LEVEL SELECT
LIFT/STEER PROPORT
SWING PROPORT
TEL/RIS/PL/JIB PROP
STEER LEFT
STEER RIGHT
RISOR UP
RISOR DOWN
S5-2
S5-1
HYD OIL COOLING FANS
HORN
S8B
J4
1 T27
2 T25
3 T26
4 T23
5
6 GND
7 X320
8 B+
9
10 U3A
110V/308 GENERATOR
RISER DOWN LIMIT
T27
RISER UP LIMIT
T26
RETRACT LIMIT
T23
FUEL LEVEL SENSOR
GND13 GND
X320 ANALOG OUT
016A B+
U3A DIGITAL OUT


Upper Control Box
Electrical Schematic
GP440
MICROPROCESSOR
P4 PLATFORM LEVEL SELECT VALVE P4-2
P5 LOW FUEL INDICATOR P5-1
TILT ALARM P5-2
12 VOLT SUPPLY P5-3
TILT INDICATOR P5-4
GROUND SUPPLY P5-7
OVERLOAD ALARM P5-8
LOW FUEL
ALARM
TILT
P6 JIB UP/DOWN SIGNAL P6-1
PLATFORM ROTATE L/R SIGNAL P6-2
JIB/ROTATE ENABLE P6-3
PLATFORM HALL EFFECT SUPPLY P6-4
P6-5
PLATFORM HALL EFFECT GROUND P6-6
HALL EFFECT
ENABLE
RISER
BOOM PROPORTIONAL
CONTROL HANDLE
P7 BOOM UP/DOWN SIGNAL P7-1
SWING LEFT/RIGHT SIGNAL P7-2
ENABLE P7-3
BOOM HALL EFFECT SUPPLY P7-4
P7-5
BOOM HALL EFFECT GROUND P7-6
P7-8
TELE
P10 FWD & REV SIGNAL P10-1
DRIVE HALL EFFECT SUPPLY P10-4
DRIVE HALL EFFECT GROUND P10-6
STEER LEFT P10-7
STEER RIGHT P10-8
DRIVE ENABLE SWITCH P10-11
STEER/DRIVE ENABLE SUPPLY P10-12
STEER
DRIVE PROPORTIONAL
CONTROL HANDLE
P12 CAN BUS HI P12-1
CAN BUS LO P12-2
P14 TELESCOPE IN P14-1
TELESCOPE OUT P14-2
RISER UP P14-3
RISER DOWN P14-4
P14-9
PLATFORM LEVEL UP P14-11
PLATFORM LEVEL DOWN P14-12
AUXILIARY POWER P14-13
GENERATOR P14-14
ENGINE IDLE P14-15
PLATFORM
LEVEL UP/DOWN
AUXILIARY
POWER
GENERATOR
ENGINE IDLE
ENGINE
START/IGN
EMERGENCY STOP
P15 START P15-1
P15-2
PLAT LEVEL ENABLE P15-3
GLOW PLUG/CHOKE P15-4
HIGH SPEED P15-5
DRIVING LIGHTS P15-6
P15-7
HORN P15-8
P15-9
PLATFORM
ENABLE
GLOW/CHOKE
HI SPEED
DRIVING LTS
HORN
BUS
CONNECTION
(HALF/HALF)
UPPER CONTROL
BOX CONNECTOR
J11
TO CONTROL
CABLE
(SEE PAGE 3)

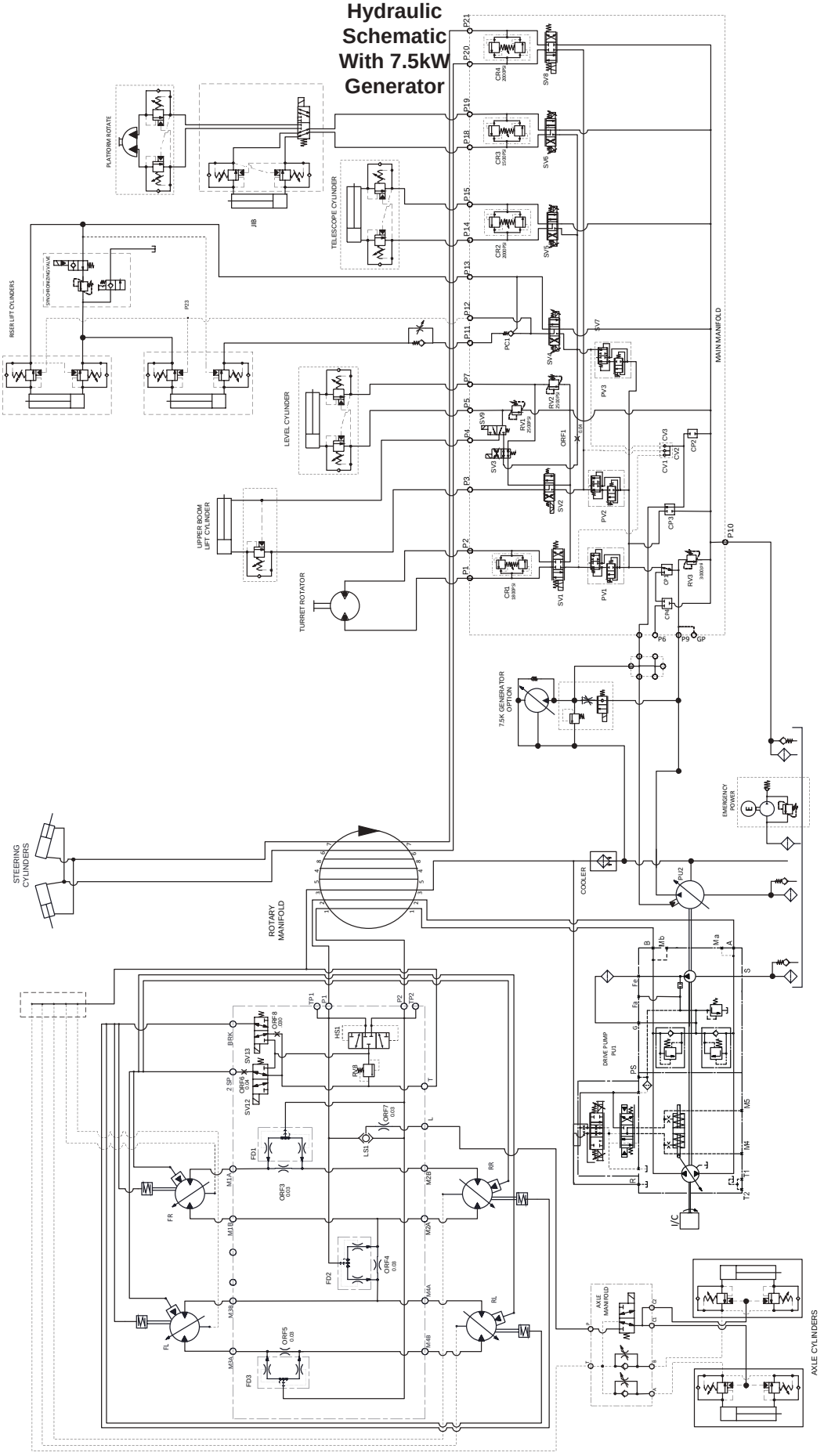
Upper Control Box Electrical Schematic with TBM Module



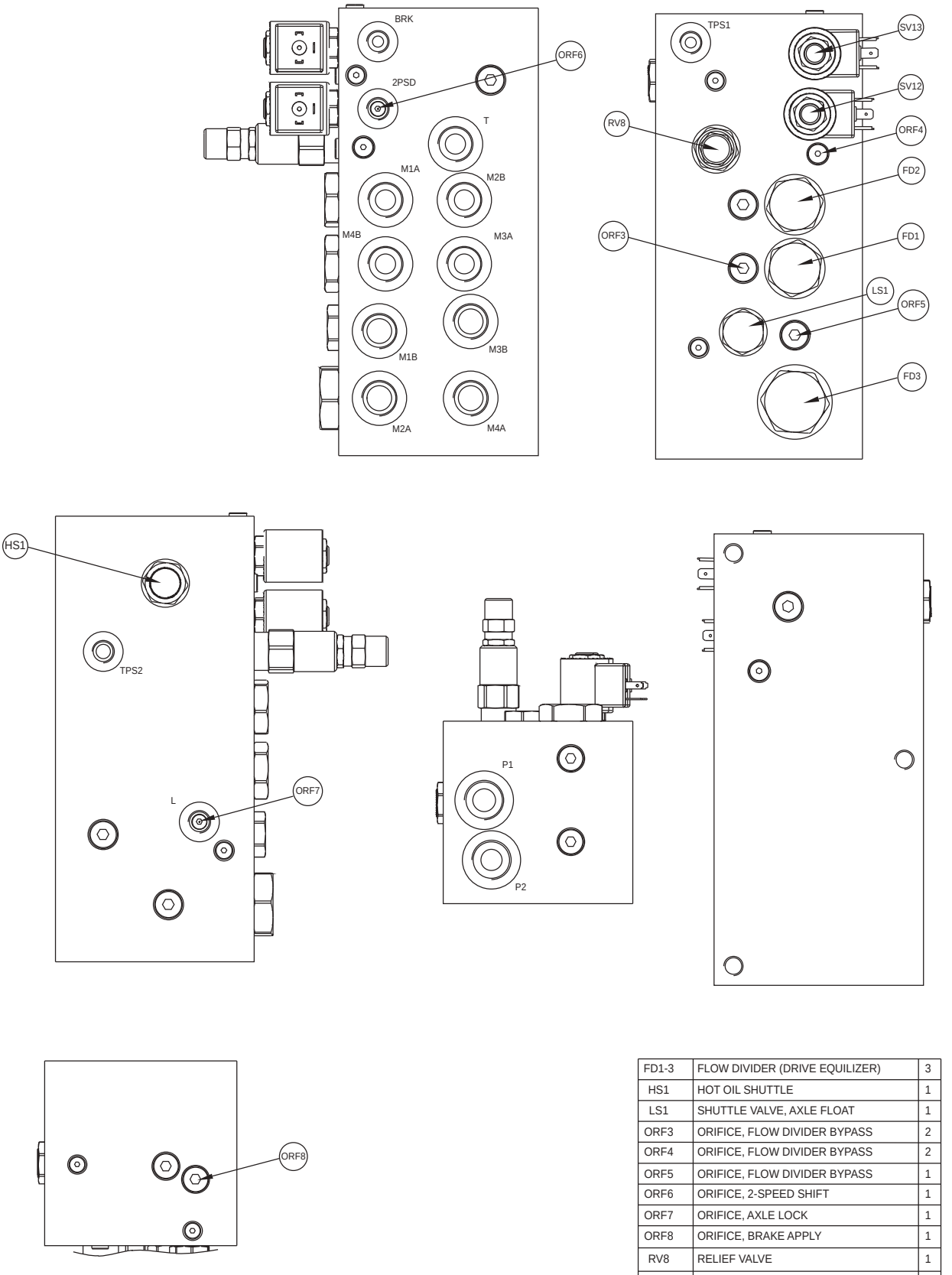
Hydraulic Schematic



Hydraulic Schematic With 7.5kW Generator



Drive Manifold Valves



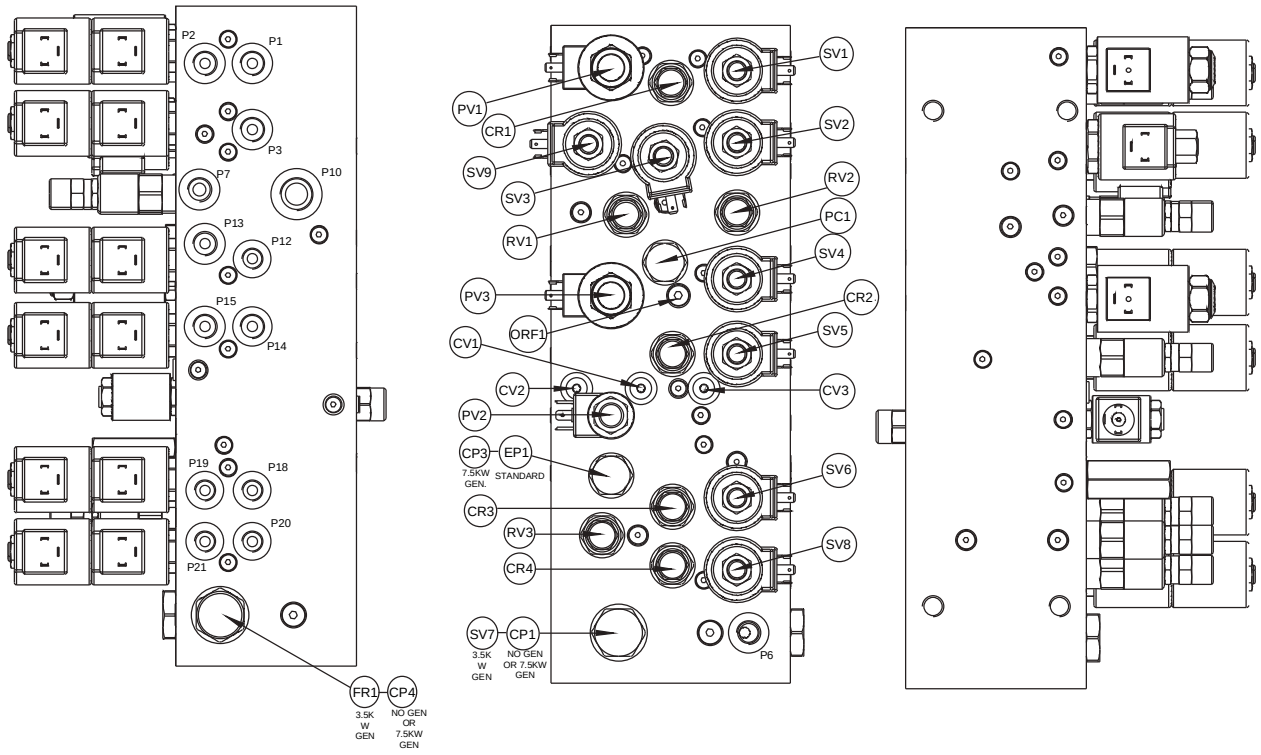
FD1-3	FLOW DIVIDER (DRIVE EQUILIZER)	3
HS1	HOT OIL SHUTTLE	1
LS1	SHUTTLE VALVE, AXLE FLOAT	1
ORF3	ORIFICE, FLOW DIVIDER BYPASS	2
ORF4	ORIFICE, FLOW DIVIDER BYPASS	2
ORF5	ORIFICE, FLOW DIVIDER BYPASS	1
ORF6	ORIFICE, 2-SPEED SHIFT	1
ORF7	ORIFICE, AXLE LOCK	1
ORF8	ORIFICE, BRAKE APPLY	1
RV8	RELIEF VALVE	1
SV12	SOLENOID VALVE, 2-SPEED SHIFT	1
SV13	SOLENOID VALVE, BRAKE RELEASE	1

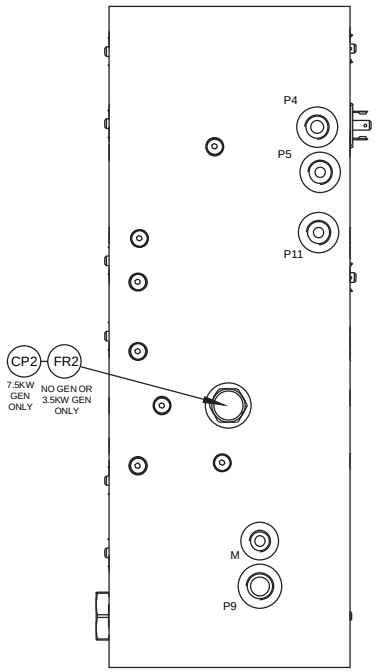
ILLUSTRATION No.
Art_5382

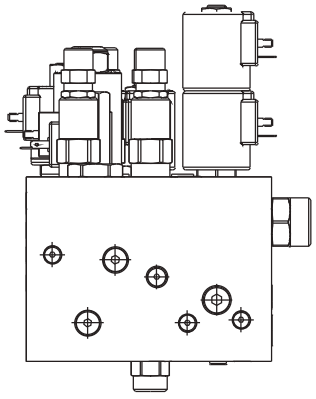
45 - AJ

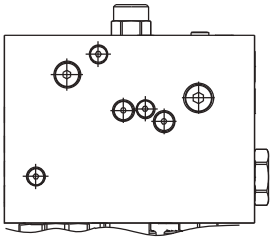
Drive Manifold Valves

Manifold Valves









CR1	CROSS PORT RELIEF, TURRET ROT.	1
CR2	CROSS PORT RELIEF EXT/RET	1
CR3	CROSS PORT RELIEF JIB/PLAT.	1
CR4	CROSS PORT RELIEF STEER.	1
CV1-3	CHECK VALVE, FLOW REG	3
EP1	FLOW COMPENSATOR	1
FR1	FLOW REGULATOR, 3.5KW GEN	1
FR2	FLOW REGULATOR, COMP.	1
ORF1	ORIFICE, PLAT LEVEL SPEED	1
PC1	PILOT OP. CHECK, RISER	1
PV1	PROP. VALVE, TUR ROTATE.	1
PV2	PROP. VALVE, UPPER BOOM.	1
PV3	PROP. VALVE, MULTI FUNCTION.	1
RV1	RELEIF, PLAT LEVEL	1
RV2	RELEIF, PLAT LEVEL	1
RV3	RELEIF, MAIN	1

SV1	DIRECTIONAL , TURRET ROTATE	1
SV2	DIRECTIONAL , BOOM UP/DOWN	1
SV3	SOL VALVE, PLAT LEVEL DIR.	1
SV4	DIRECTIONAL , RISER	1
SV5	DIRECTIONAL , BOOM EXT/RET	1
SV6	DIRECTIONAL , JIB/PLAT ROTATE	1
SV7	DIRECTIONAL , 3.5KW GENERATOR	1
SV8	DIRECTIONAL , STEER	1
SV9	SOL. VALVE, PLATFORM LEVEL	1
CP1	CAVITY PLUG, FOR 7.5KW GEN.	1
CP2	CAVITY PLUG, FOR 7.5KW GEN.	1
CP3	CAVITY PLUG, FOR 7.5KW GEN.	1
CP4	CAVITY PLUG, FOR 7.5KW GEN.	1

NOTE: **CP1** AND **CP4** ARE USED ON UNITS WITHOUT GENERATOR AND UNITS EQUIPPED WITH 7.5KW GENERATOR ONLY

NOTE: **CP2** AND **CP3** ARE USED ON UNITS EQUIPPED WITH 7.5KW GENERATOR ONLY

ILLUSTRATION No.
Art_5383

45 - AJ

Manifold Valve

Notes

Parts Introduction

This Parts sections consists of illustrated parts sections and is designed to provide you, the customer, with illustrations and the list of associated parts needed to properly maintain the MEC self-propelled aerial work platform. When used in conjunction with the Service section in this manual and the Operator's Manual (provided separately), this manual will assist you in making necessary adjustments and repairs, and identifying and ordering the correct replacement parts.

All parts represented here are manufactured and supplied in accordance with MEC quality standards.

We recommend that you use genuine MEC parts to ensure proper operation and reliable performance.

To obtain maximum benefits from your MEC Aerial Work Platforms, always follow the proper operating and maintenance procedures. Only trained authorized personnel should be allowed to operate or service this machine. Service personnel should read and study the Operator's, and the Service and Parts Manuals in order to gain a thorough understanding of the unit prior to making any repairs.

Chassis

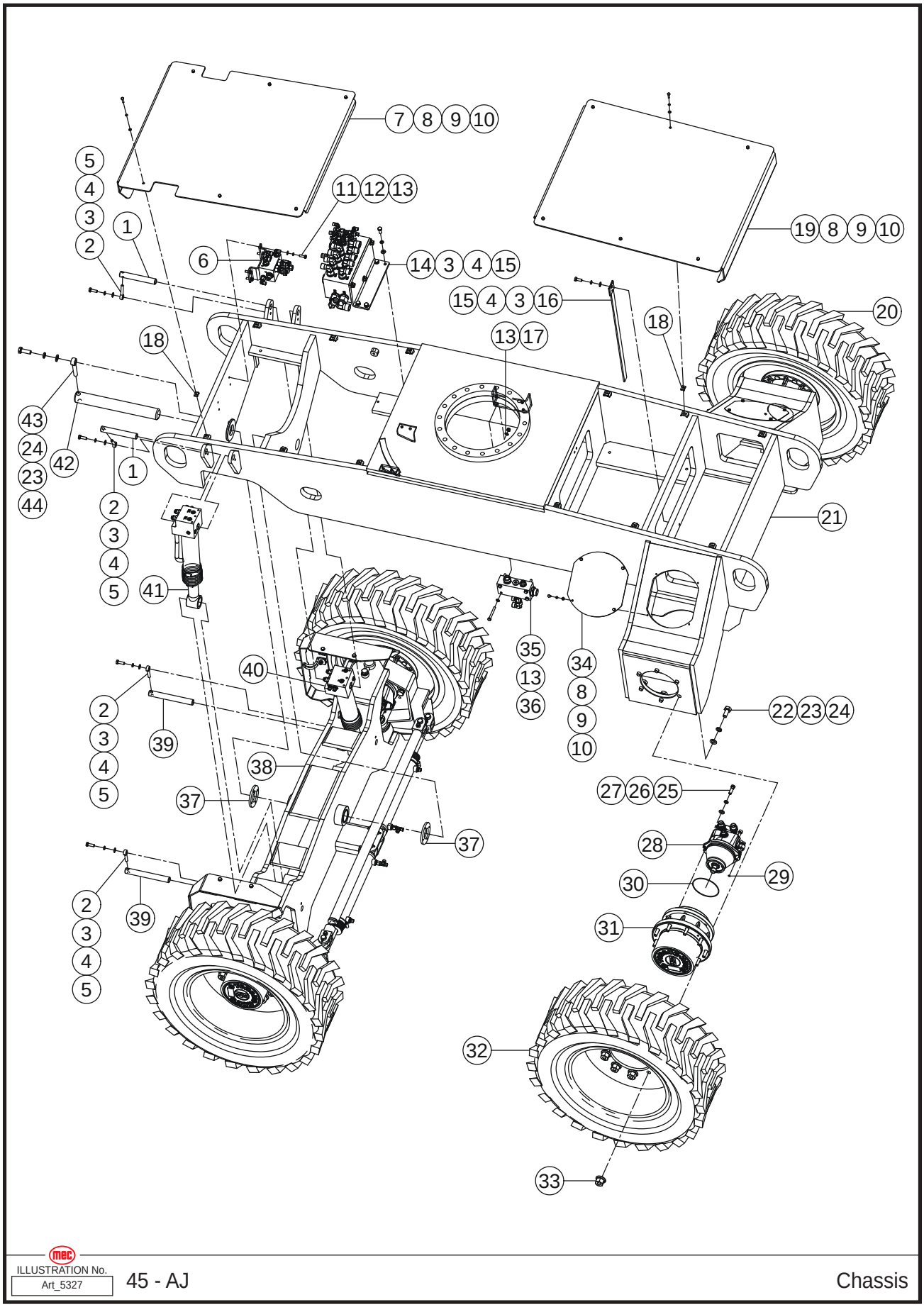


ILLUSTRATION No. Art_5327 45 - AJ Chassis

Item	Part Number	Description	Qty.
1	42100	Pin, Pivot	2
2	42096	Pin, Lock	4
3	50002	Flat Washer M10	9
4	53054	Spring Washer M10	9
5	50034	HHCS M10 × 30	4
6	REF	Oscillate Manifold with Fittings (See page 87 for Breakdown)	1
7	42210	Plate, Rear Cover	1
8	50000	Flat Washer M6	20
9	53046	Spring Washer M6	20
10	50117	HHCS M6 × 25	20
11	50031	HHCS M8 × 25	4
12	53055	Spring Washer M8	4
13	50001	Flat Washer M8	12
14	REF	Drive Manifold Assembly with Fittings (See page 89 for Breakdown)	1
15	50033	HHCS M10 × 25	5
16	44561	Ground Strap	1
17	53014	NHEX Nut M8	4
18	42012	Nut, Reed	12
19	42207	Plate, Rear Cover	1
20	42014	Tire and Wheel Assembly (Right Side)	1
21	42208	Frame	1
22	50187	HHCS 5/8-11 × 1.50	12
23	53149	Spring Washer M16	13
24	50004	Flat Washer M16	13
25	53178	HHCS 7/16-14 × 1.50	4
26	50252	Washer	4
27	50247	Flat Washer	4
28	REF	Drive Motor Assembly with Fittings (See page 85 for Breakdown)	2
29	42639	O-Ring 6.07×1.78	2
30	42641	O-Ring 120.32×2.62	2
31	42015	Drive HUB Assembly (7HP)	2
--	94697	Seal Kit	2
32	42013	Tire and Wheel Assembly (Left Side)	1
33	50266	LUG Nut 5/8-18	18
34	42206	Plate, Cover	2
35	REF	Return Oil Manifold with Fittings (See page 86 for Breakdown)	1
36	50550	HHCS M8 × 70	4
37	42094	Washer, Thrust	2
38	42211	Front Axle Assembly (See page 83 for Breakdown)	1
39	42101	Pin, Pivot	2
40	REF	Right Axle Lockout Cylinder Assembly (See page 171 for Breakdown)	1
41	REF	Left Axle Lockout Cylinder Assembly (See page 170 for Breakdown)	1
42	42112	Pin, Pivot	1
43	42097	Pin, Lock	1
44	50393	HHCS M16 × 45	1

REF - Reference

Front Axle Assembly

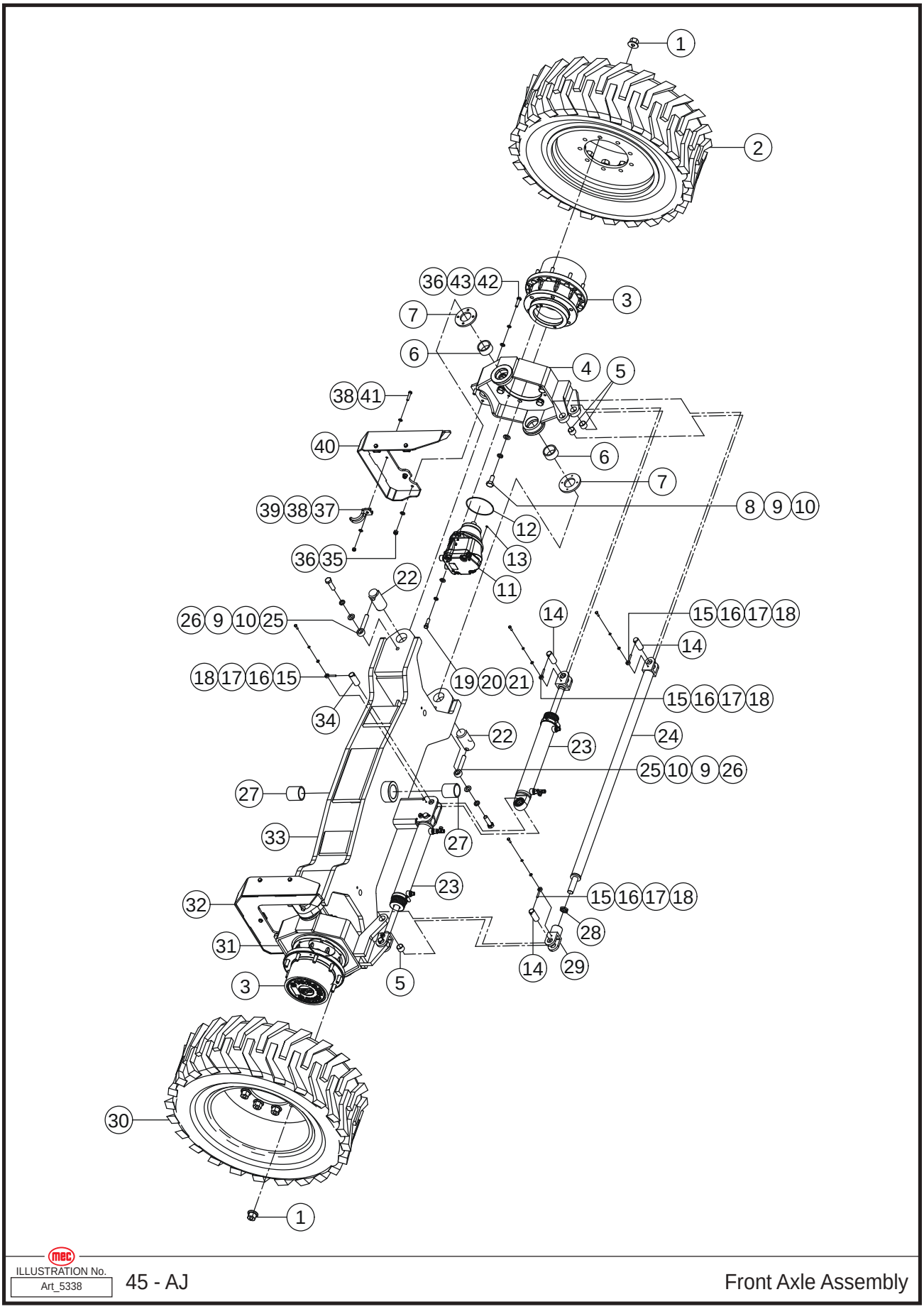


ILLUSTRATION No. Art_5338 45 - AJ Front Axle Assembly

Item	Part Number	Description	Qty.
1	50266	LUG Nut 5/8-18	18
2	42014	Tire and Wheel Assembly (Right Side)	1
3	42015	Drive HUB Assembly (7HP)	2
--	94697	Seal Kit	2
4	42214	Spindle Weldment (Right Side)	1
5	42087	Bearing, Composite	4
6	42084	Self-lubricating	4
7	42094	Washer, Thrust	4
8	50187	HHCS 5/8-11 × 1.50	12
9	53149	Spring Washer M16	16
10	50004	Flat Washer M16	16
11	REF	Drive Motor Assembly with Fittings (See page 85 for Breakdown)	2
12	42641	O-Ring 120.32×2.62	2
13	42639	O-Ring 6.07×1.78	2
14	42098	Pin, Pivot	4
15	42449	Pin 6 × 45	6
16	50000	Flat Washer M6	6
17	53046	Spring Washer M6	6
18	50028	HHCS M6 × 20	6
19	53178	HHCS 7/16-14 × 1.50	4
20	53148	Spring Washer M12	4
21	50247	Washer	4
22	42106	Pin, Pivot	4
23	REF	Steer Cylinder Assembly (See page 172 for Breakdown)	2
24	42212	Tie Rod	1
25	42097	Pin, Lock	4
26	53161	HHCS M16 × 55	4
27	42092	Bearing, Composite	2
28	53169	HEX Nut M24×1.5	1
29	42669	Link, Steer	1
30	42013	Tire and Wheel Assembly (Left Side)	1
31	42213	Spindle Weldment (Left Side)	1
32	42215	Hose Guard L.H.	1
33	42739	Front Axle Weldment 4×4	1
34	42099	Pin, Pivot	2
35	50049	NNYL Nut M10	4
36	50002	Flat Washer M10	8
37	42740	Hoop	6
38	50001	Flat Washer M8	12
39	53014	HEX Nut M8	6
40	42216	Hose Guard R.H.	1
41	50014	HHCS M8 × 40	6
42	50035	HHCS M10 × 40	4
43	53054	Spring Washer M10	4

REF - Reference

Drive Motor Assembly with Fittings

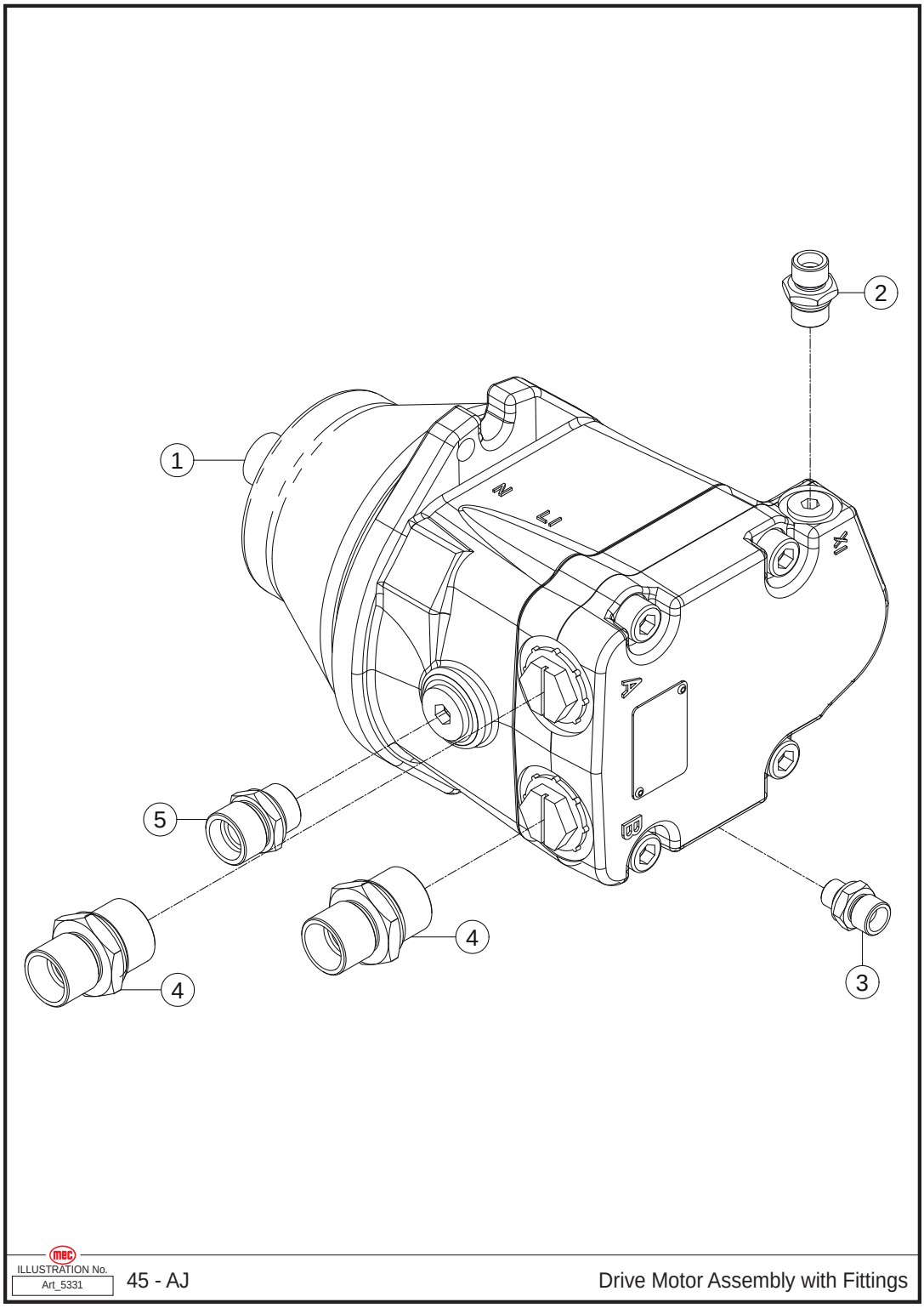
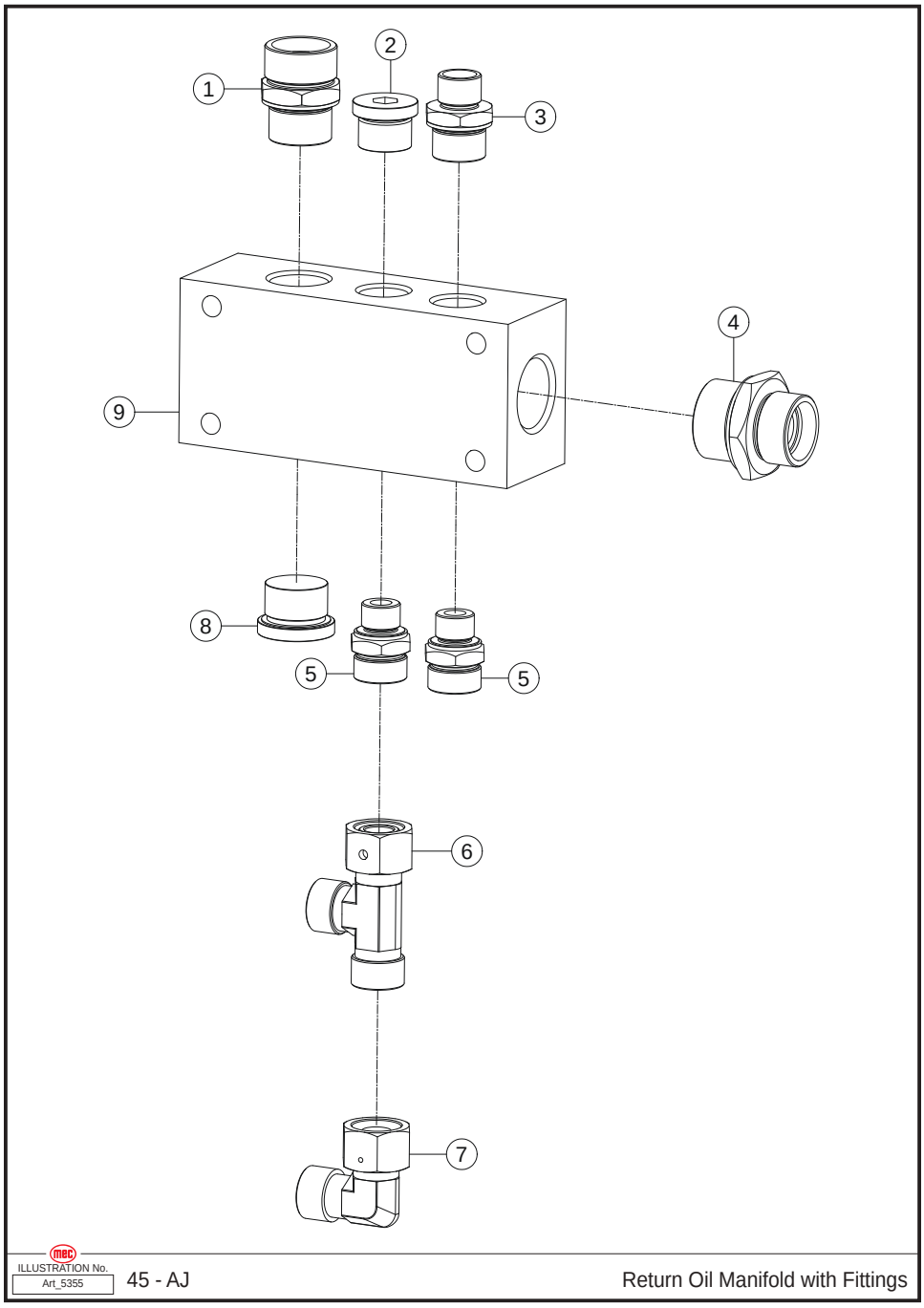


ILLUSTRATION No. Art_5331 45 - AJ Drive Motor Assembly with Fittings

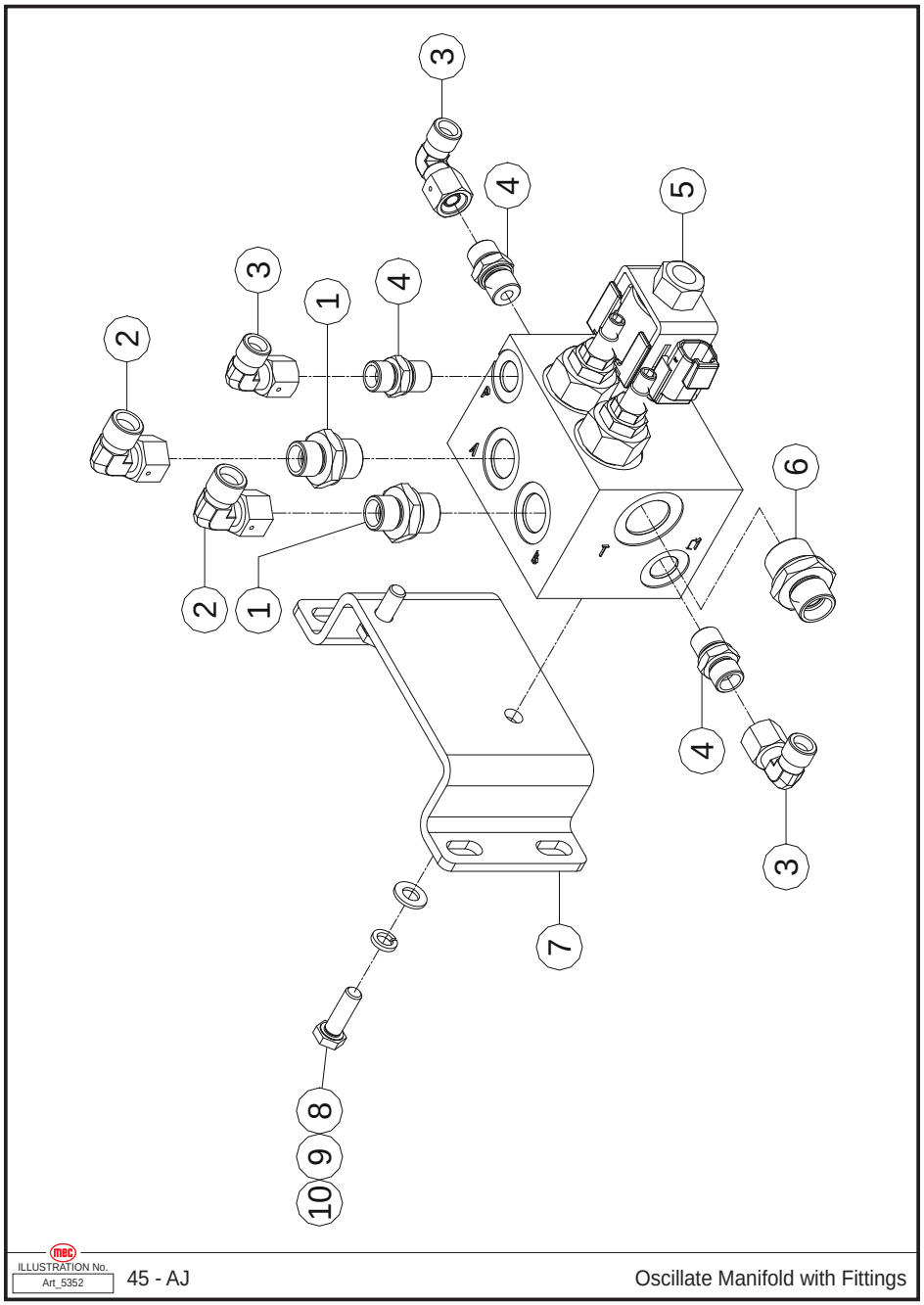
Item	Part Number	Description	Qty.
1	42289	Drive Motor	1
2	42622	Fitting, Straight	1
3	42602	Fitting, Straight	1
4	42623	Fitting, Straight	2
5	42604	Fitting, Straight	1

Return Oil Manifold with Fittings



Item	Part Number	Description	Qty.
1	42593	Fitting, Straight	1
2	42584	Plug	1
3	42590	Fitting, Straight	1
4	42595	Fitting, Straight	1
5	42592	Fitting, Straight	2
6	42138	Fitting, Tee	1
7	41188	Fitting, 90°	1
8	42585	Plug	1
9	42628	Return Oil Block	1

Oscillate Manifold with Fittings



Item	Part Number	Description	Qty.
1	42546	Fitting, Straight	2
2	42143	Fitting, 90°	2
3	42142	Fitting, 90°	3
4	41181	Fitting, Straight	3
5	42642	Oscillate Manifold	1
6	42590	Fitting, Straight	1
7	42742	Bracket	1
8	50031	HHCS M8 × 25	2
9	53055	Spring Washer M8	2
10	50001	Flat Washer M8	2

Oscillate Manifold

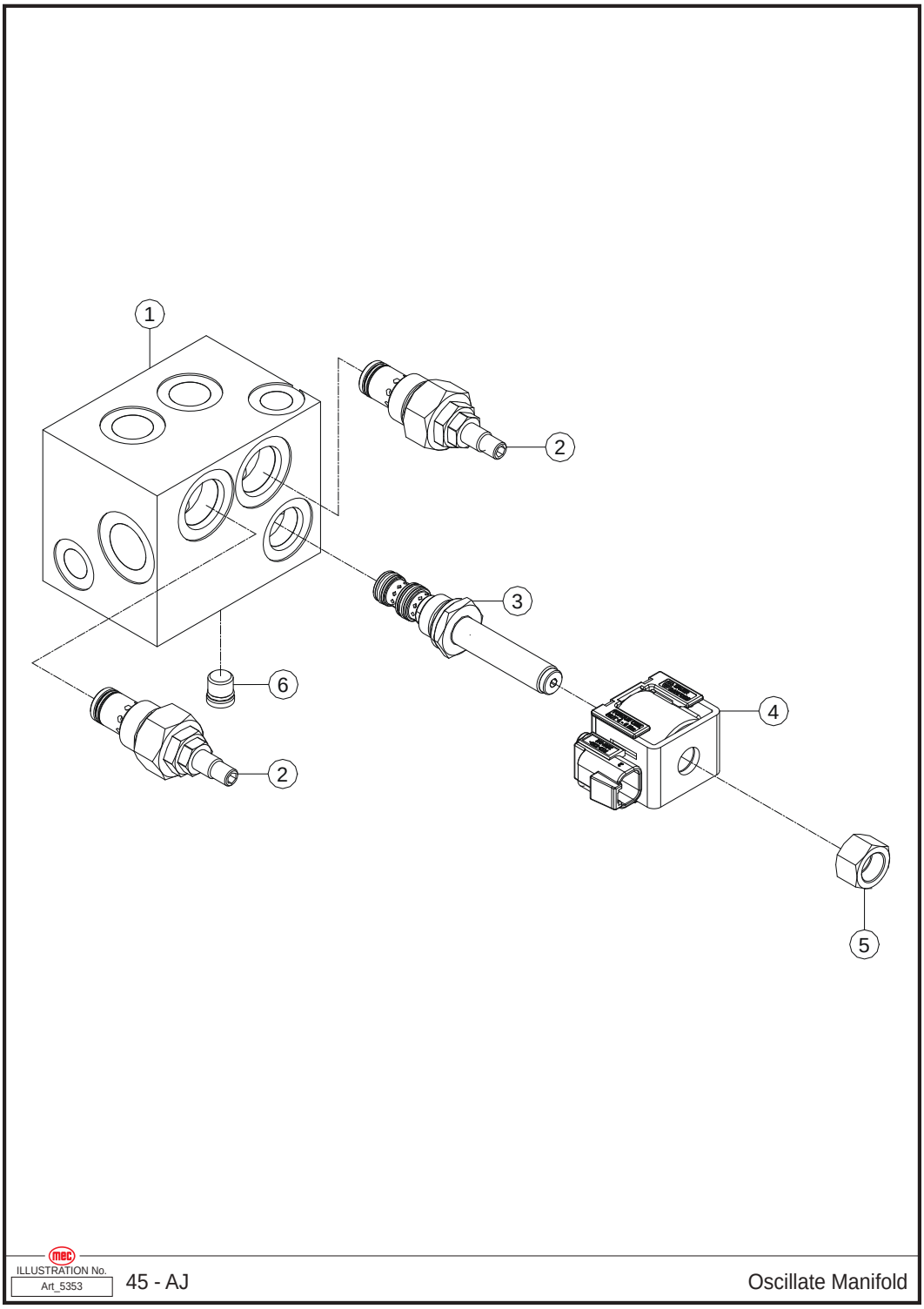


ILLUSTRATION No. Art_5353 45 - AJ Oscillate Manifold

Item	Part Number	Description	Qty.
1	42743	Body	1
2	42744	Cartridge, Counterbalance Valve	2
3	42745	Cartridge without Coil	1
4	42783	Coil	1
5	42784	Nut	1
6	42785	Plug	1

Drive Manifold Assembly with Fittings

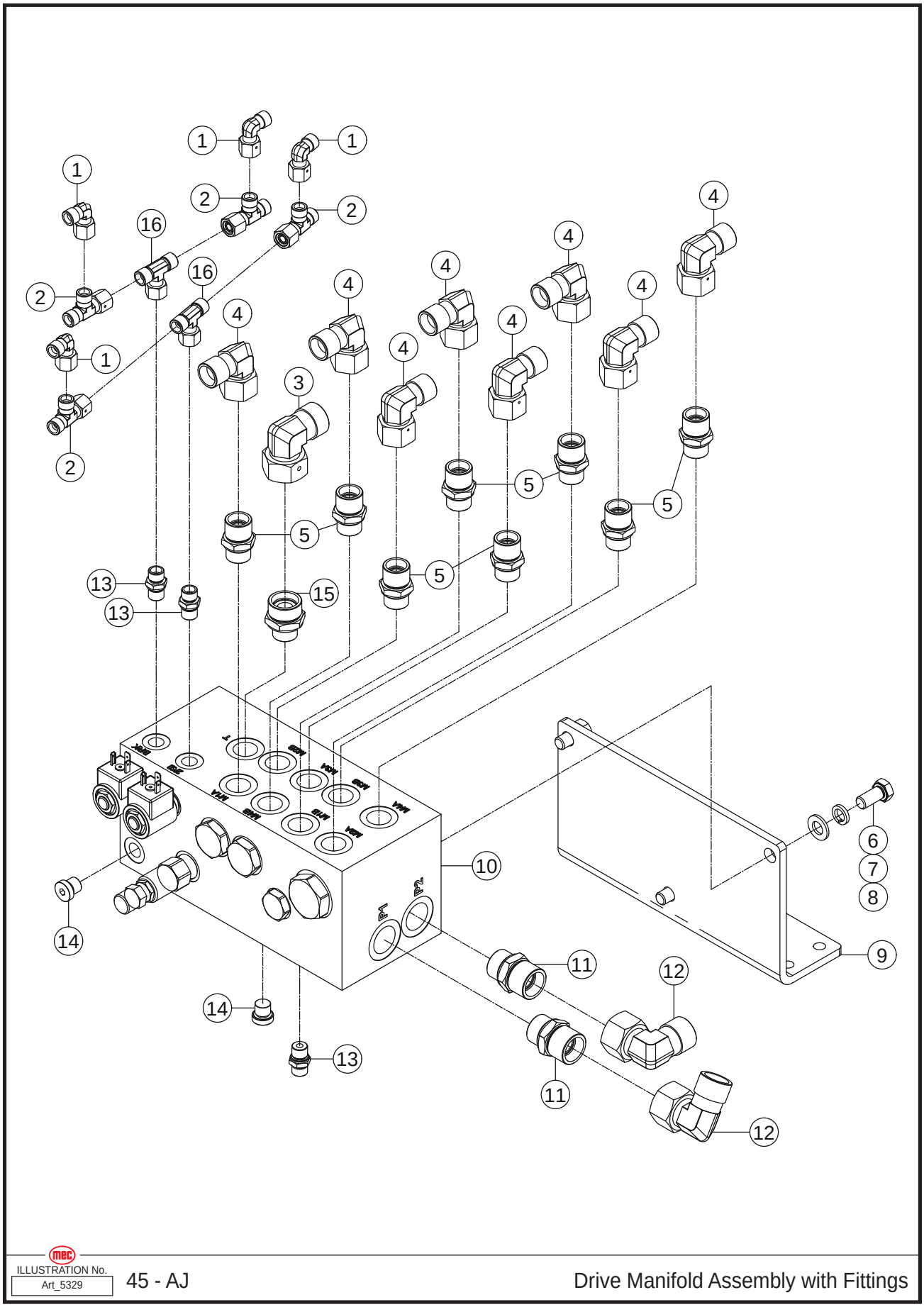
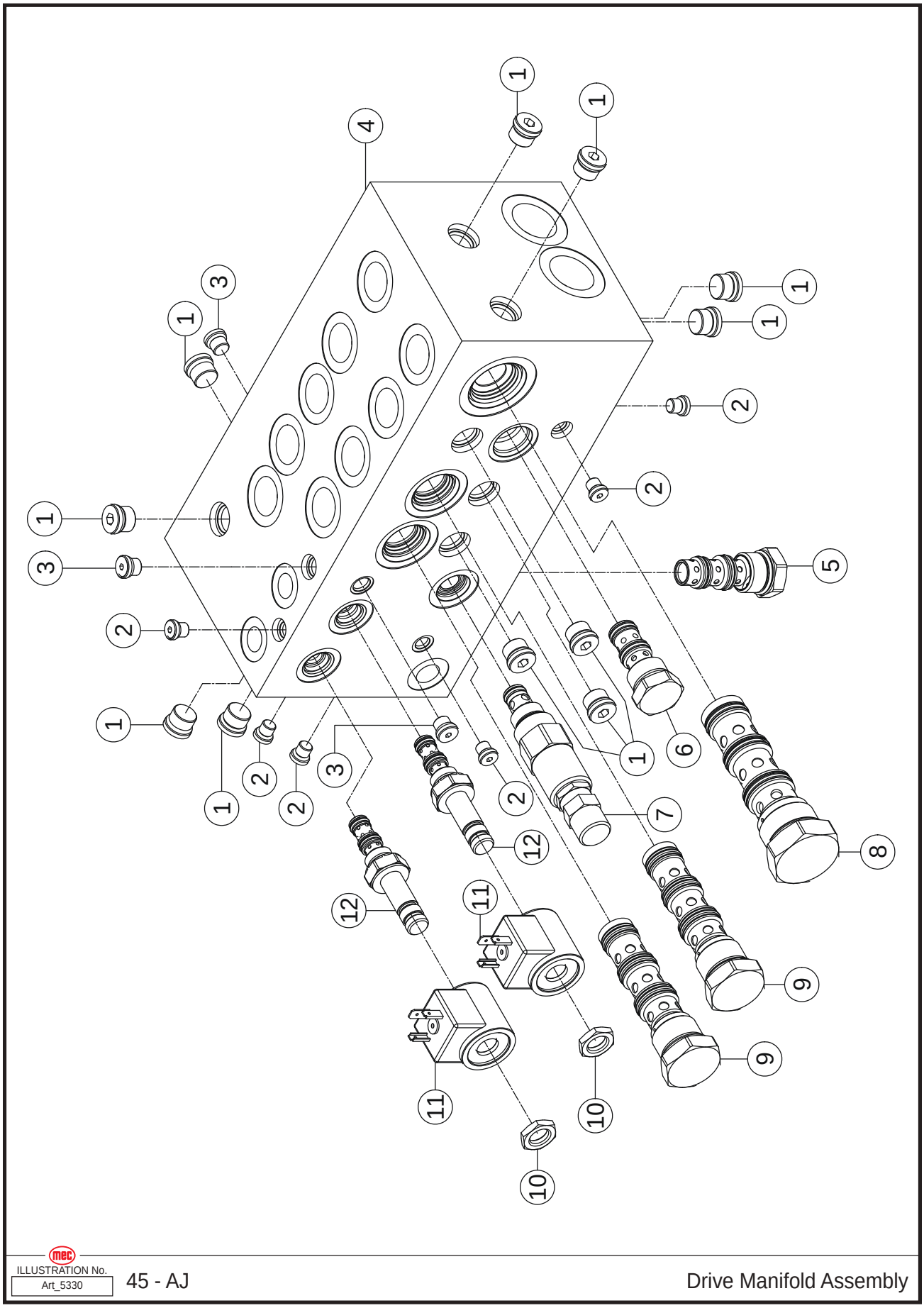


ILLUSTRATION No. Art_5329 45 - AJ Drive Manifold Assembly with Fittings

Item	Part Number	Description	Qty.
1	42142	Fitting, 90°	4
2	42136	Fitting, Tee	4
3	42146	Fitting, 90°	1
4	42144	Fitting, 90°	8
5	42162	Fitting, Straight	8
6	50038	HHCS M12 × 25	3
7	53148	Spring Washer M12	3
8	50003	Flat Washer M12	3
9	42318	Bracket	1
10	42034	Drive Manifold Assembly (See page 91 for Breakdown)	1
11	42164	Fitting, Straight	2
12	42145	Fitting, 90°	2
13	41181	Fitting, Straight	3
14	42480	Plug	2
15	42166	Fitting, Straight	1
16	42140	Fitting, Tee	2

Drive Manifold Assembly



Item	Part Number	Description	Qty.
1	42786	Plug	11
2	42787	Plug	6
3	42788	Plug	3
4	42133	Body	1
5	42348	Shuttle Valve	1
6	42349	Shuttle Valve	1
7	42359	Cartridge, Relief Valve	1
8	42149	Flow Control Valve	1
9	42148	Flow Control Valve	2
10	42795	Nut	2
11	42796	Coil	2
12	42797	Cartridge without Coil	2

Turntable and Chassis Installations

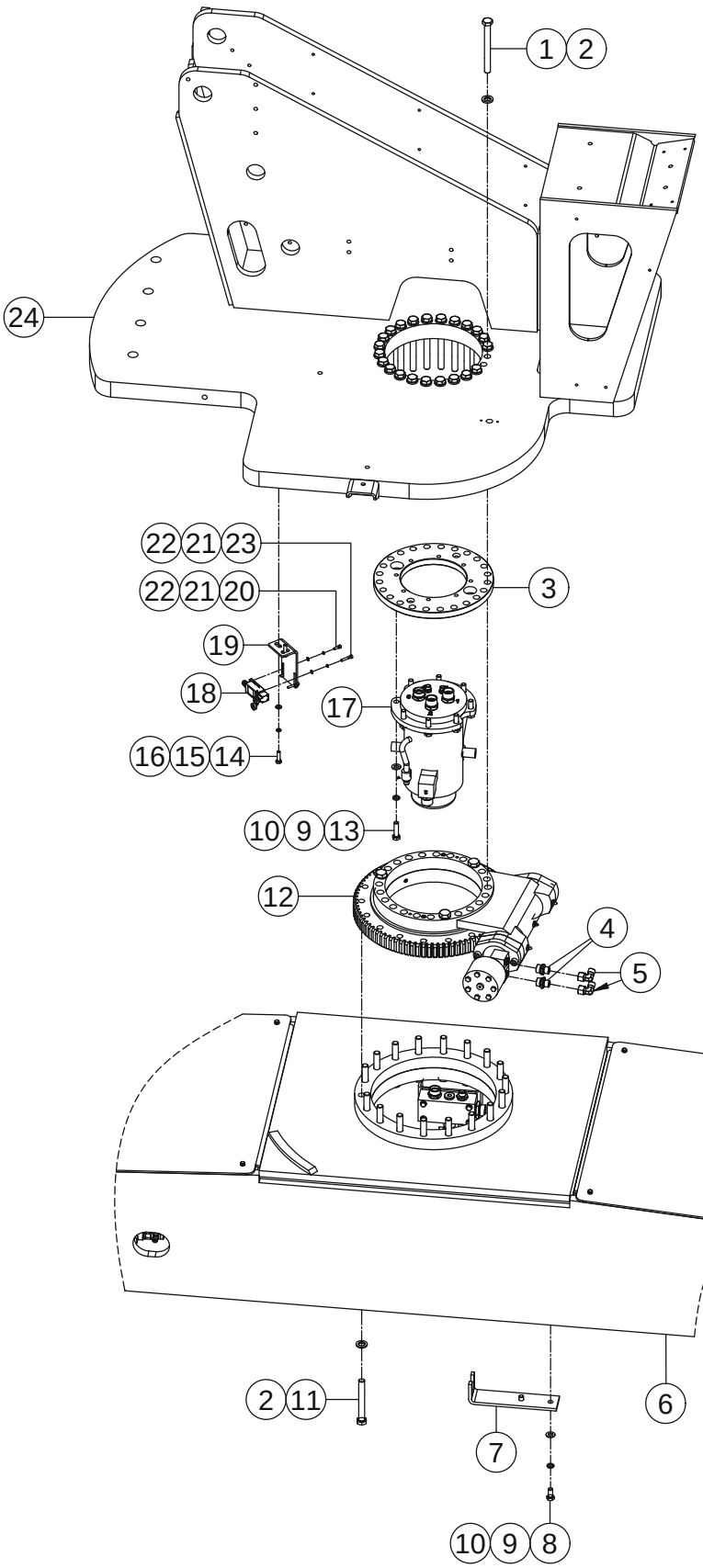


ILLUSTRATION No. Art_5368 45 - AJ Turntable and Chassis Installation

Item	Part Number	Description	Qty.
1	50485	HHCS M16 × 160	23
2	50004	Flat Washer 16	41
3	42172	Plate, Connecting	1
4	42603	Fitting, Straight	2
5	42610	Fitting, 90°	2
6	42209	Chassis	1
7	42173	Plate, Stop	1
8	50038	HHCS M12 × 25	2
9	53148	Spring Washer M12	10
10	50003	Flat Washer M12	10
11	50310	HHCS M16 × 130	18
12	47190	Slew Drive Assembly (See page 95 for Breakdown)	1
13	53052	HHCS M12 × 45	8
14	50032	HHCS M8 × 30	2
15	53055	Spring Washer M8	2
16	50001	Flat Washer M8	2
17	REF	Rotary Coupling Assembly with Fittings (See page 96 for Breakdown)	1
18	42074	Limit Switch	1
19	42333	Bracket	1
20	50359	SHCS M5 × 16	2
21	53043	Spring Washer M5	4
22	53038	Flat Washer M5	4
23	53171	SHCS M5 × 30	2
24	42217	Turntable	1

REF - Reference

Slew Drive Assembly

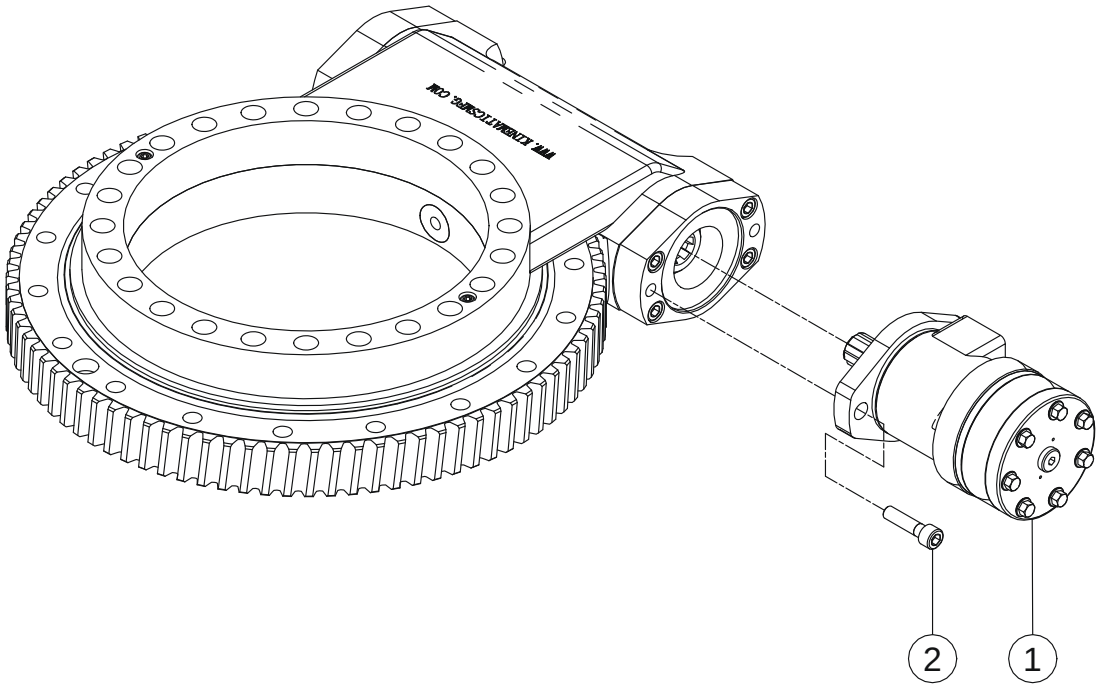


ILLUSTRATION No. Art_5359 45 - AJ Slew Drive Assembly

Item	Part Number	Description	Qty.
1	42798	Hydraulic Motor	1
2	50440	SHCS M10 × 40	2

Rotary Coupling Assembly with Fittings

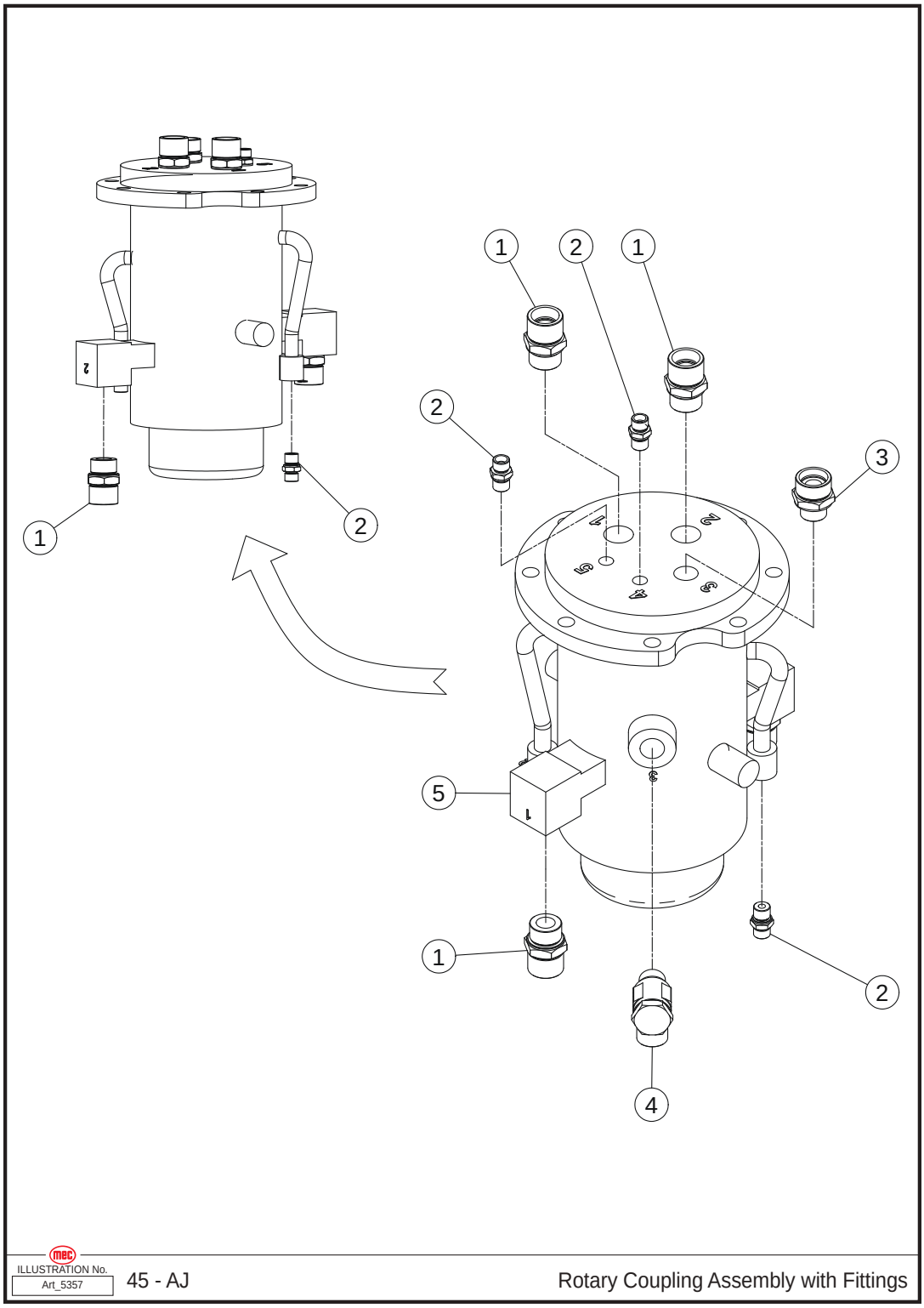


ILLUSTRATION No. Art_5357 45 - AJ Rotary Coupling Assembly with Fittings

Item	Part Number	Description	Qty.
1	42164	Fitting, Straight	4
2	41181	Fitting, Straight	4
3	42166	Fitting, Straight	1
4	42761	Fitting, 90°	1
5	42050	Rotary Coupling and Collector Ring Assembly	1

Engine Assembly Installation

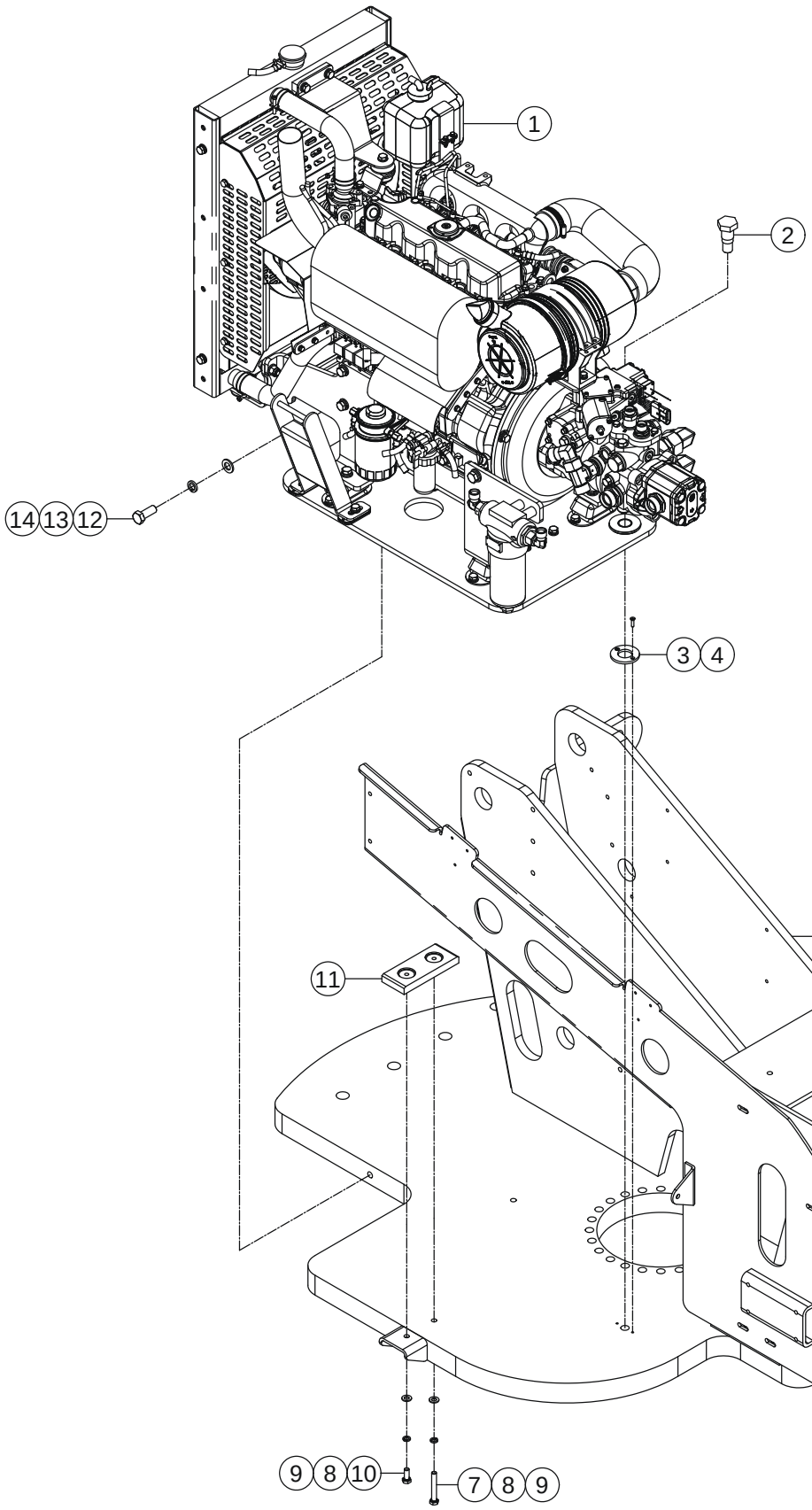
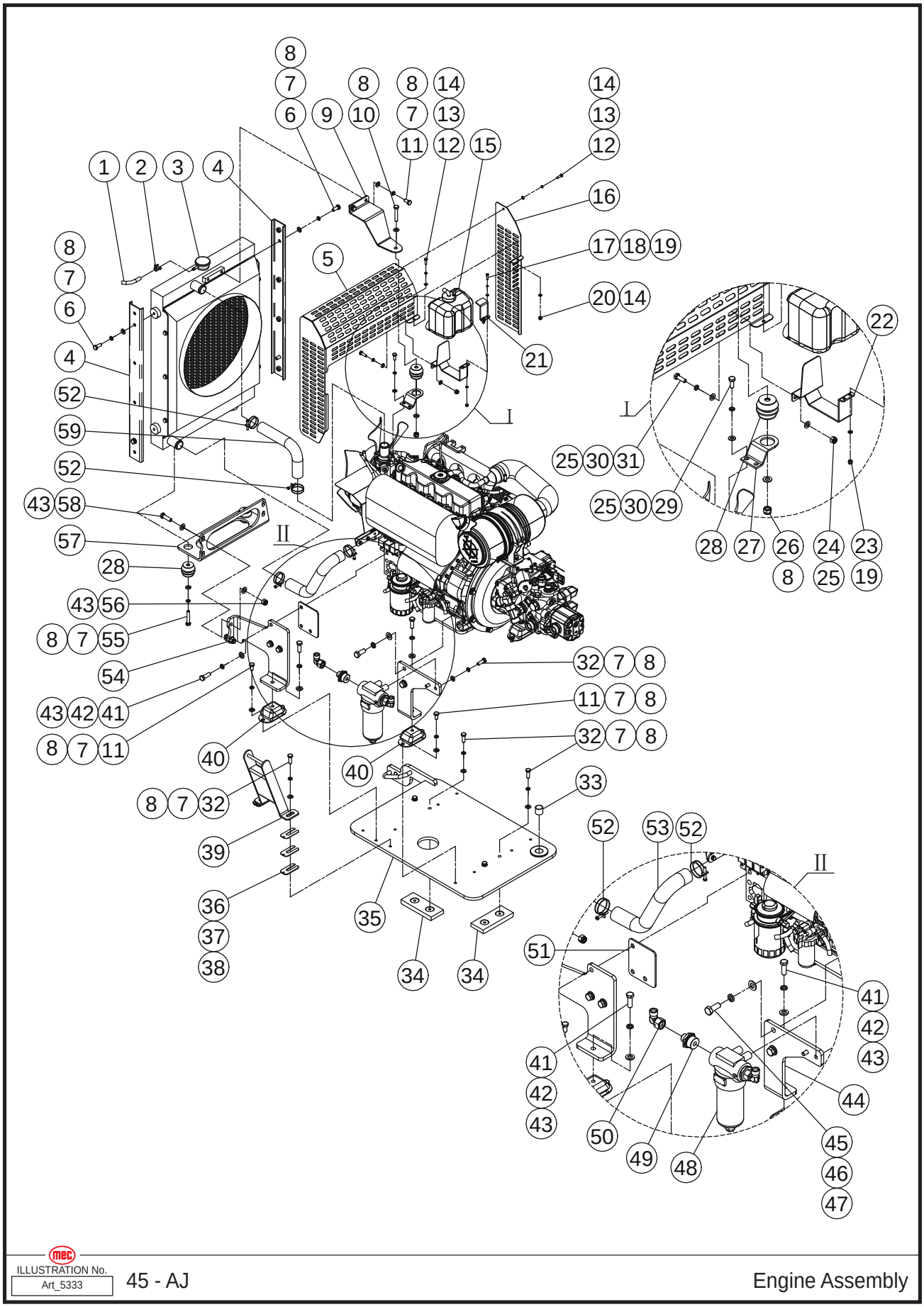


ILLUSTRATION No. Art_5332 45 - AJ Engine Assembly Installation

Item	Part Number	Description	Qty.
1	REF	Engine Assembly (See pages 99-101 for Breakdown)	1
2	42177	Pin, Pivot	1
3	42093	Washer, Thrust	1
4	53118	CSCS M5×20	2
5	42217	Turntable	1
6	42187	Plate, Bracket	1
7	50022	HHCS M10 × 70	1
8	53054	Spring Washer M10	2
9	50002	Flat Washer M10	2
10	50033	HHCS M10 × 25	1
11	42277	Block, Sliding	1
12	50043	HHCS Bolt M16 × 40	1
13	53149	Spring Washer M16	1
14	50004	Flat Washer M16	1

REF - Reference

Engine Assembly



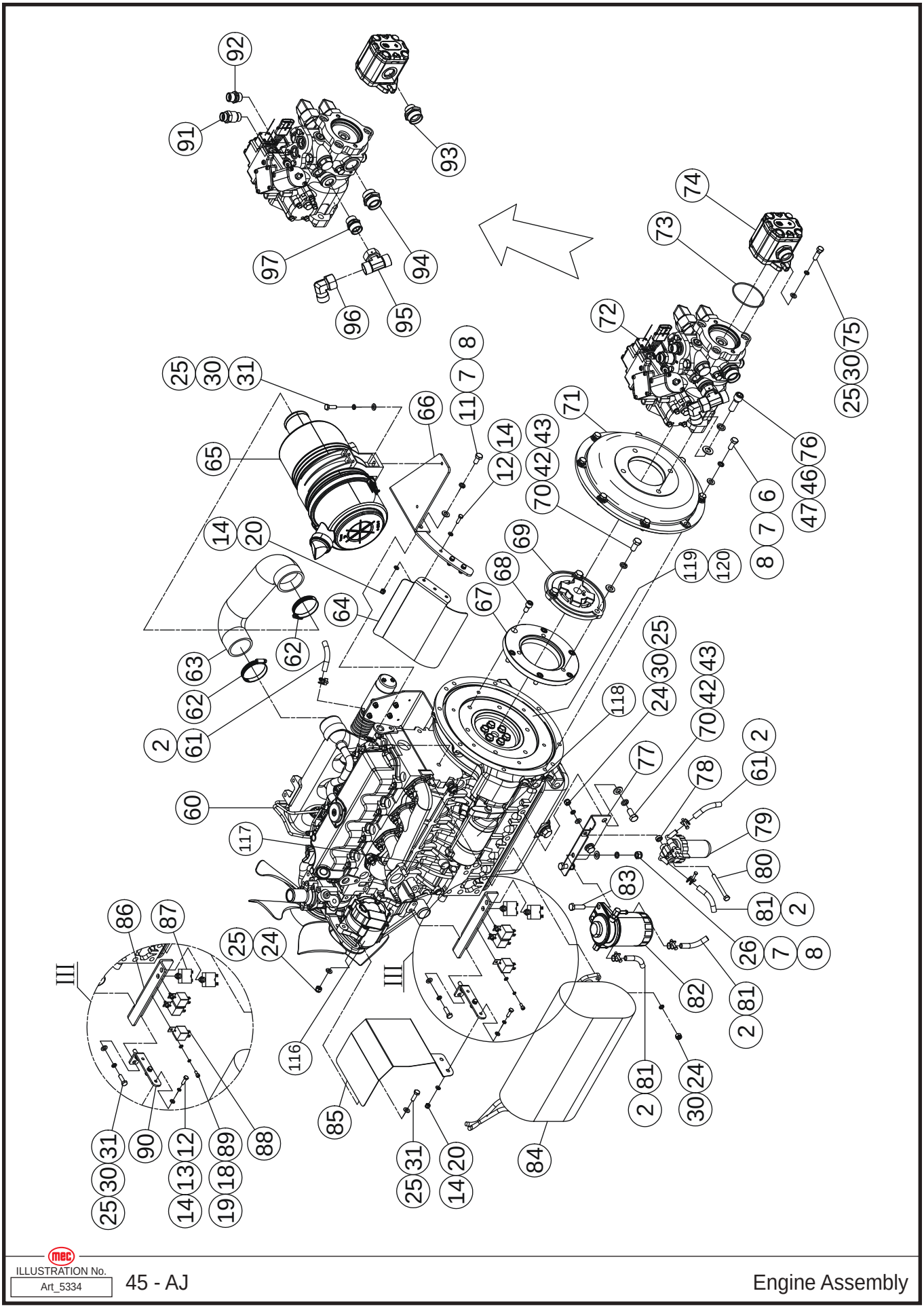


ILLUSTRATION No. Art_5334

45 - AJ

Engine Assembly

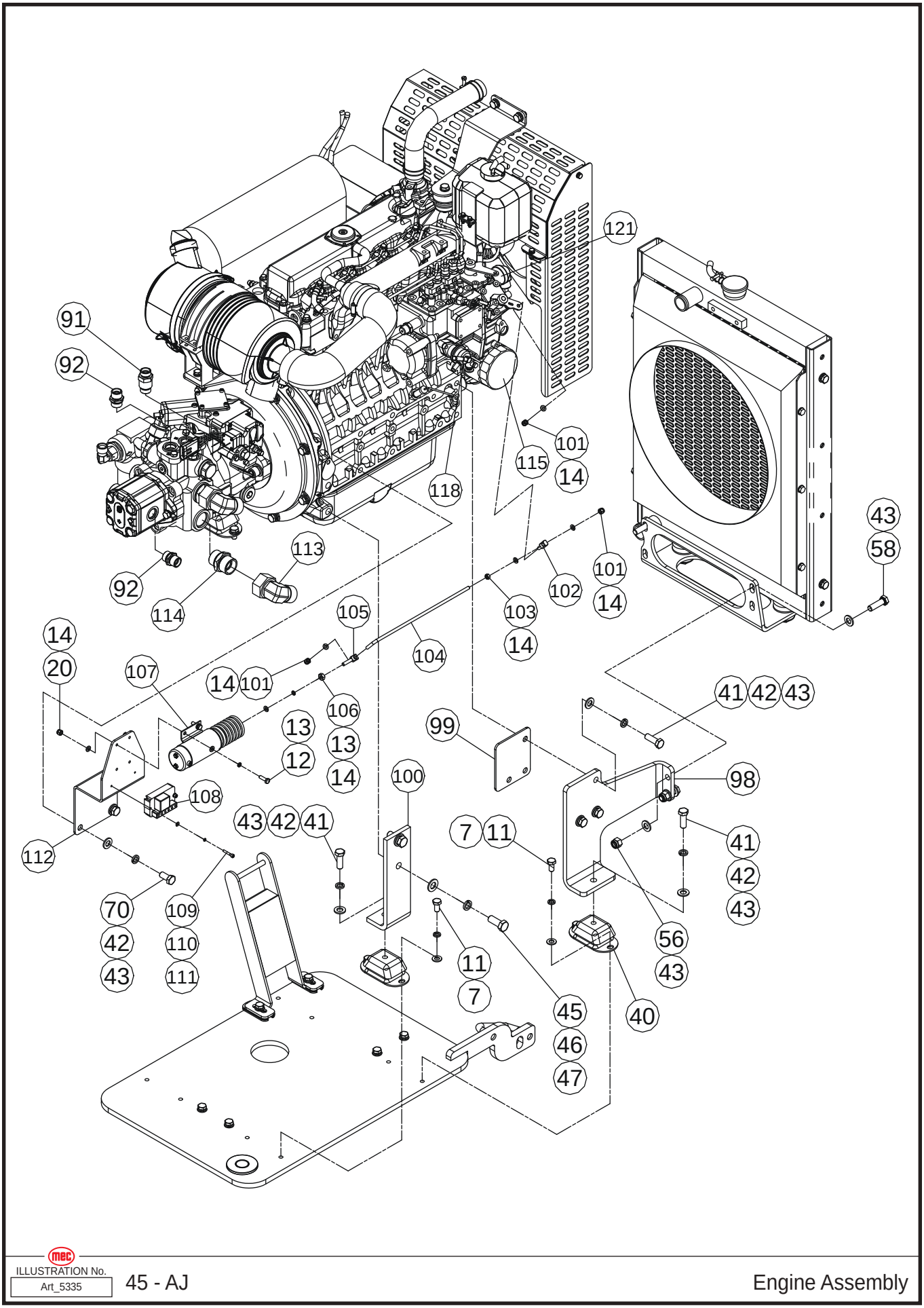


ILLUSTRATION No. Art_5335

45 - AJ

Engine Assembly

Item	Part Number	Description	Qty.
1	42245	Hose, Fuel	1
2	42241	Clamp 11-14	6
3	42021	Cooler, Water	1
4	42220	Bracket	2
5	42219	Shield, Engine	1
6	50033	HHCS M10 × 25	12
7	53054	Spring Washer M10	36
8	50002	Flat Washer M10	38
9	42235	Bracket, Connection	1
10	50421	HHCS M10 × 60	1
11	50215	HHCS M10 × 20	12
12	50028	HHCS M6 × 20	11
13	53046	Spring Washer M6	9
14	50000	Flat Washer M6	26
15	42022	Coolant Bottle	1
16	42236	Shield, Engine	1
17	53179	HHCS M5 × 20	2
18	53043	Spring Washer M5	5
19	53038	Flat Washer M5	7
20	50396	NHEX Nut M6	10
21	42644	Plate	1
22	42223	Plate, Bracket	1
23	50524	NNYL Nut M5	2
24	53014	NHEX Nut M8	12
25	50001	Flat Washer M8	22
26	50049	NNYL Nut M10	3
27	42234	Mount Bracket (radiator)	1
28	42028	Absorber, Rubber	3
29	50030	HHCS M8 × 20	1
30	53055	Spring Washer M8	18
31	50031	HHCS M8 × 25	7
32	50034	HHCS M10 × 30	8
33	41287	Bearing, Lift Cylinder	1
34	42277	Block, Sliding	2
35	42218	Plate, Engine	1
36	42675	Shim	2
37	42673	Shim	2
38	42674	Shim	2
39	42224	Seat, Lock	1
40	42027	Absorber, Engine	4
41	50040	HHCS M12 × 35	10
42	53148	Spring Washer M12	17
43	50003	Flat Washer M12	25
44	42228	Plate, Bracket (Engine)	1
45	53047	HHCS M14 × 35	4

46	53048	Spring Washer M14	6
47	53049	Flat Washer M14	6
48	92072	High Pressure Filter Assembly	1
--	92169	Filter, Hyd Charge Pump Element	1
49	42620	Fitting, Straight	2
50	41188	Fitting, 90°	2
51	42230	Plate, Washer	1
52	42237	Clamp 37-42	4
53	42030	Pipe, Outlet	1
54	42226	Plate, Bracket (Engine)	1
55	50021	HHCS M10 × 55	2
56	50590	NHEX Nut M12	4
57	42233	Plate, Bracket (Radiator)	1
58	50236	HHCS M12 × 40	4
59	42029	Pipe, Inlet	1
60	42018	Engine	1
--	92180	Element, Filter (Not Shown)	1
61	42245	Hose, Fuel	2
62	42238	Clamp 52-76	2
63	42024	Pipe, Inlet (Air Filter)	1
64	42239	Shield	1
65	42023	Air Filter	1
--	42392	Element, Filter (Not Shown)	1
66	42221	Bracket, Air Filter	1
67	42231	Plate	1
68	53106	SHCS M10 × 20	6
69	42026	Coupling, Flexible	1
70	50038	HHCS M12 × 25	7
71	42232	Flange, Pump Connection	1
72	42033	Piston Pump	1
73	42756	O-Ring 82.22×2.62	1
74	42520	Function Pump Assembly without Fittings	1
75	50556	HHCS 3/8-16 × 1 1/4”	2
76	53172	SHCS M14 × 40	2
77	42247	Fuel Filter Assembly	1
78	42661	Spacer	1
79	42247	Fuel / Water Separator	1
--	42388	Element, Filter (Not Shown)	1
80	50018	HHCS M8 × 80	1
81	42244	Hose, Fuel	3
82	42634	Fuel Filter	1
--	92182	Element, Filter (Not Shown)	1
83	50332	HHCS M10 × 35	2
84	42025	Silencer	1
85	42222	Shield, Alternator	1
86	42325	Bracket, Relay	1

87	42632	Circuit Breaker	2
88	42631	Relay	3
89	53116	SHCS M5 × 12	3
90	42240	Plate, Bracket	1
91	42799	Fitting, Straight	1
92	42605	Fitting, Straight	2
93	42607	Fitting, Straight	1
94	42608	Fitting, Straight	1
95	42625	Fitting, Tee	1
96	42146	Fitting, 90°	1
97	42606	Fitting, Straight	1
98	42225	Plate, Bracket (Engine)	1
99	42229	Plate, Washer	1
100	42227	Plate, Bracket	1
101	50396	NHEX Nut M6	3
102	42767	Bolt-Shoulder	1
103	50396	NHEX Nut M6	1
104	42248	Throttle-Linkage	1
105	42766	Throttle Screw	1
106	50476	NNYL Nut 1/4-28	1
107	92939	Actuator, Throttle	1
108	92940	Module, Throttle	1
109	53115	SHCS M4 × 25	2
110	53062	Spring Washer M4	2
111	50284	Flat Washer M4	2
112	42227	Plate, Bracket	1
113	42616	Fitting, 90°	2
114	42609	Fitting, Straight	2
115	92180	Oil Filter Element	1
116	92178	Alternator, Kubota# 16404-6401-2	1
117	42862	Dipstick	1
118	42737	Starter	1
119	92175	Ring Gear, Flywheel Kubota	1
120	92183	Flywheel Kubota	1
121	92179	Solenoid, Fuel Shut-off	1

Fuel Oil Tank and Function Manifold Installations

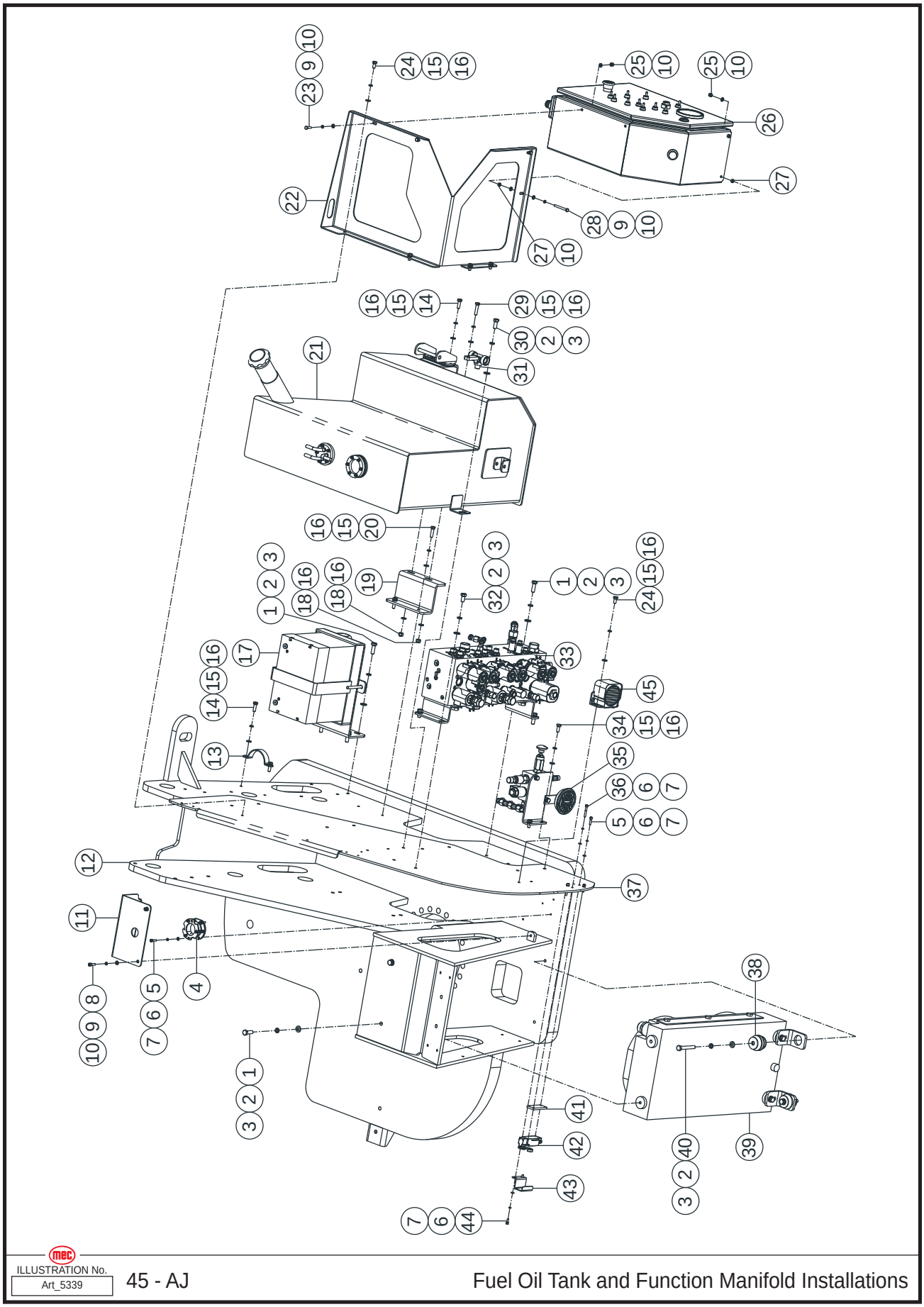


ILLUSTRATION No. Art_5339

45 - AJ

Fuel Oil Tank and Function Manifold Installations

Item	Part Number	Description	Qty.
1	50034	HHCS M10 × 30	7
2	53054	Spring Washer M10	13
3	50002	Flat Washer M10	13
4	42916	Sensor, Tilt	1
5	53150	SHCS M5 × 20	5
6	53043	Spring Washer M5	9
7	53038	Flat Washer M5	9
8	53124	SHCS M6 × 20	4
9	53046	Spring Washer M6	8
10	50000	Flat Washer M6	14
11	42917	Shield, Sensor	1
12	42217	Turntable	1
13	42179	Clamp	1
14	50031	HHCS M8 × 25	3
15	53055	Spring Washer M8	14
16	50001	Flat Washer M8	16
17	REF	Battery System Assembly (To serial # 14600119 - See page 107 for Breakdown) (From serial # 14600120 - See page 109 for Breakdown)	1
18	53014	NHEX Nut M8	2
19	42178	Plate, Bracket (Fuel Tank)	1
20	50032	HHCS M8 × 30	2
21	REF	Fuel Tank Assembly (See page 111 for Breakdown)	1
22	42332	Plate, Bracket (Ground Control Box)	1
23	50028	HHCS M6 × 20	2
24	53154	HHCS M8 × 16	6
25	50396	NHEX Nut M6	4
26	REF	Lower Control Box Assembly (See page 121 for Breakdown)	1
27	50396	NHEX Nut M6	4
28	50125	HHCS M6 × 55	2
29	50282	HHCS M8 × 35	1
30	50033	HHCS M10 × 25	2
31	42800	Fitting, Tee	1
32	50215	HHCS M10 × 20	2
33	REF	Function Manifold Assembly with Fittings (See page 113 for Breakdown)	1
34	50030	HHCS M8 × 20	2
35	REF	Synchronizing Manifold with Fittings (See page 117 for Breakdown)	1
36	53082	SHCS M5 × 35	2
37	42176	Plate, Bracket	1
38	42028	Absorber, Rubber	2
39	REF	Radiator Assembly with Fittings (See page 119 for Breakdown)	1
40	50022	HHCS M10 × 70	2
41	42329	Bracket	1
42	42074	Limit Switch	1
43	42181	Shield, Switch	1
44	53116	SHCS M5 × 12	2
45	42882	Buzzer	1

REF - Reference

Battery System Assembly - To Serial # 14600119

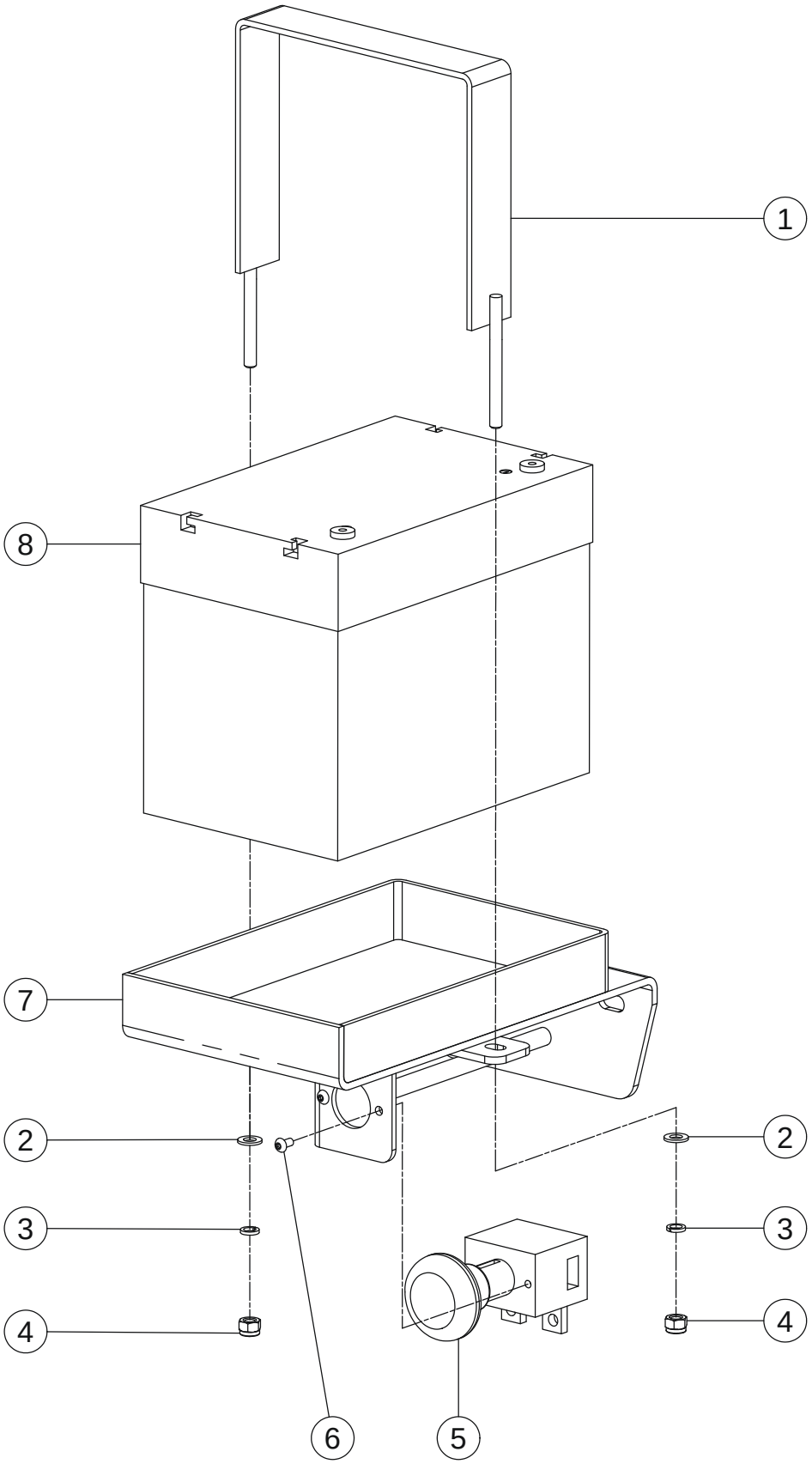


ILLUSTRATION No. Art_5324 45 - AJ Battery System Assembly

Item	Part Number	Description	Qty.
1	42331	Clamp, Battery	1
2	50001	Flat Washer M8	2
3	53055	Spring Washer M8	2
4	53014	NHEX Nut M8	2
5	42071	Power Switch	1
6	53175	BHCS M5×10	2
7	42330	Battery Tray	1
8	94652	Battery, MT-24 Interstate	1

Battery System Assembly - From Serial # 14600120

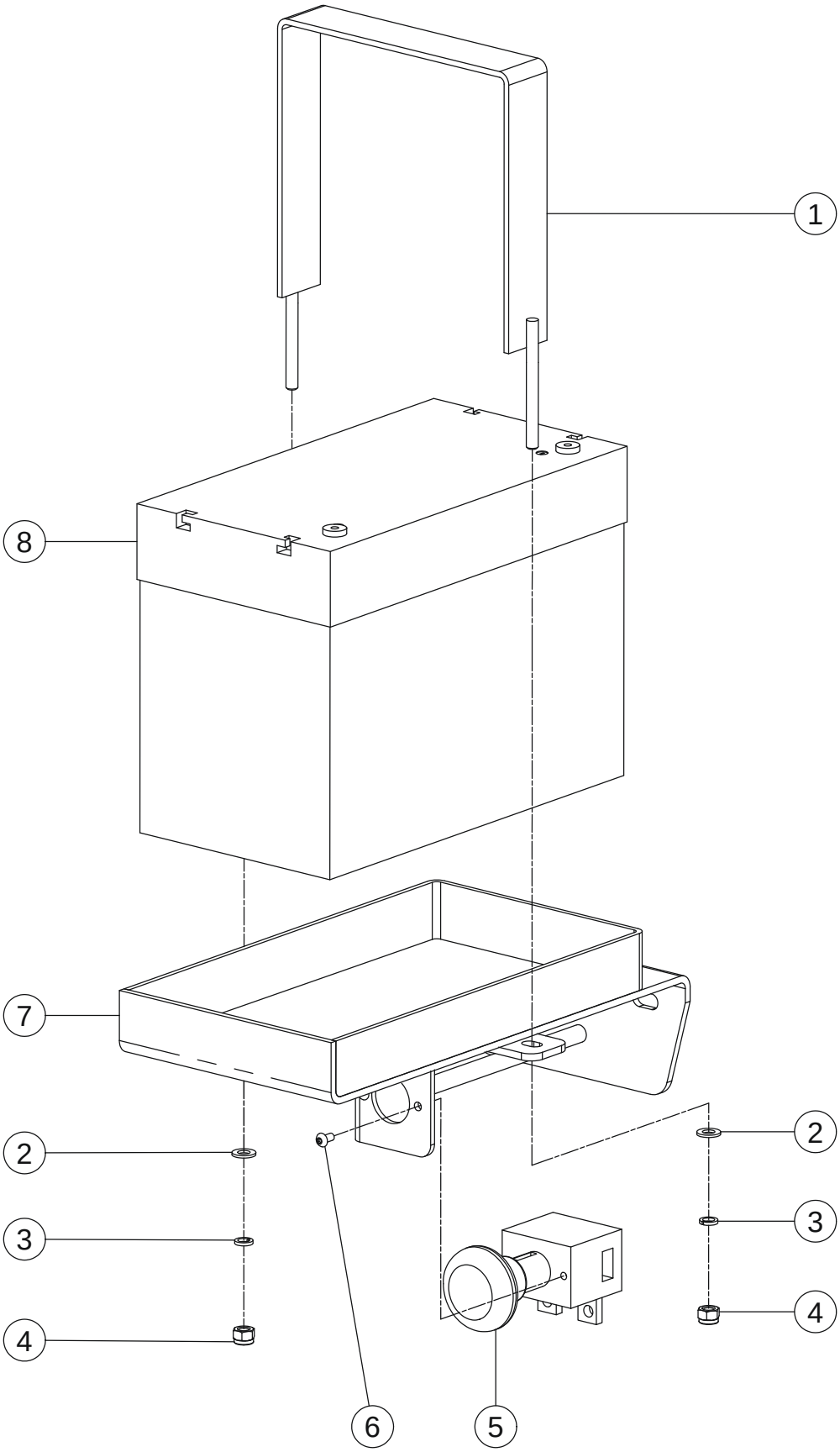


ILLUSTRATION No. Art_5372 45 - AJ Battery System Assembly

Item	Part Number	Description	Qty.
1	42518	Clamp, Battery	1
2	50001	Flat Washer M8	2
3	53055	Spring Washer M8	2
4	53014	NHEX Nut M8	2
5	42071	Power Switch	1
6	53175	BHCS M5 × 10	2
7	42519	Battery Tray	1
8	17966	Battery 950cca Group 31- Stud	1

Fuel Tank Assembly

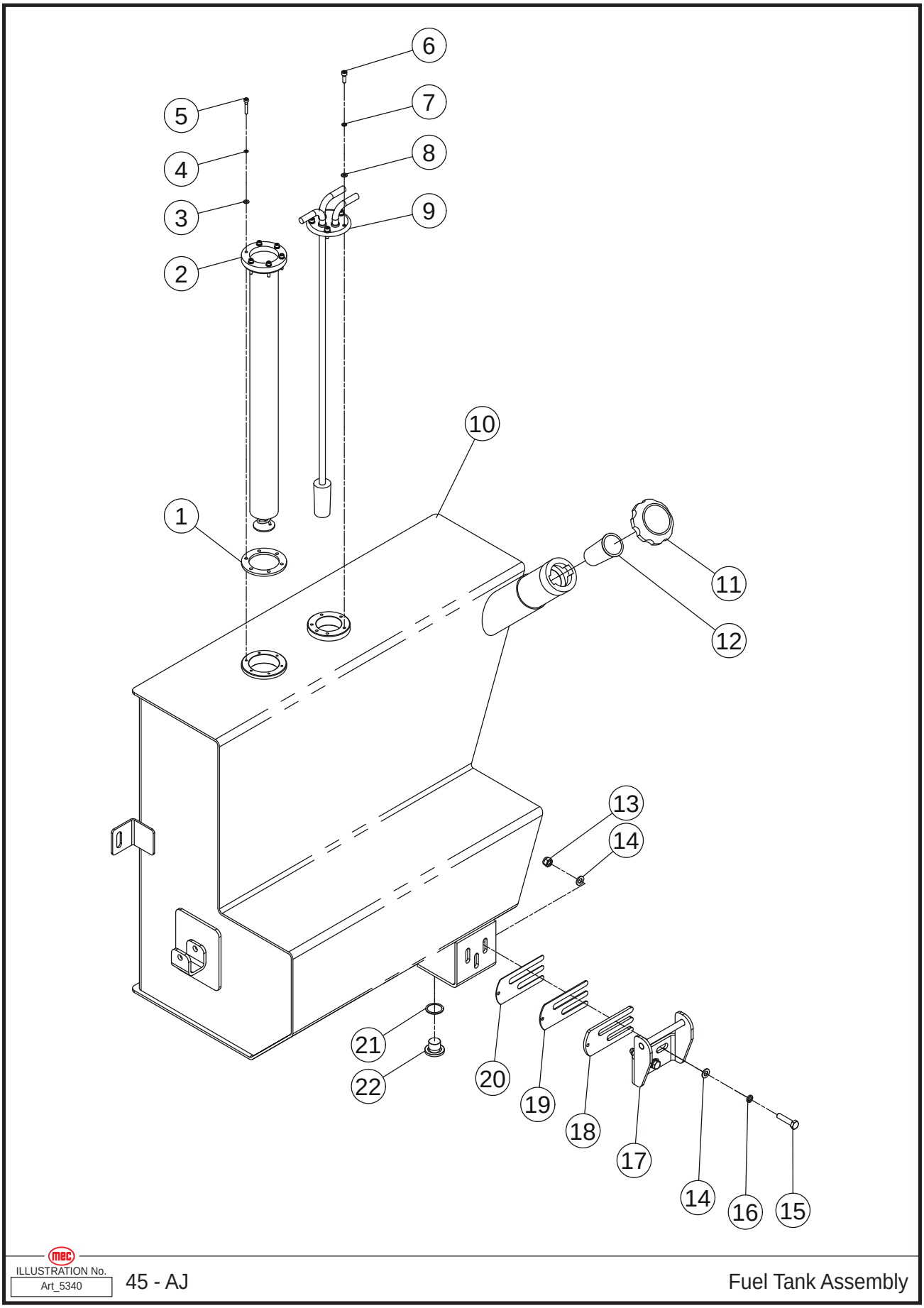


ILLUSTRATION No. Art_5340 45 - AJ Fuel Tank Assembly

Item	Part Number	Description	Qty.
1	42251	Pad, Rubber	1
2	42065	Sensor	1
3	50284	Flat Washer M4	6
4	53062	Spring Washer M4	6
5	53115	SHCS M4 × 25	6
6	50359	SHCS M5 × 16	5
7	53043	Spring Washer M5	5
8	53038	Flat Washer M5	5
9	42252	Fuel Sender unit	1
10	42250	Housing	1
11	42019	Fuel Cap	1
12	42020	Strainer	1
13	53014	NHEX Nut M8	3
14	50001	Flat Washer M8	6
15	50282	HHCS M8 × 35	3
16	53055	Spring Washer M8	3
17	42253	Bracket	1
18	42664	Shim	1
19	42663	Shim	1
20	42662	Shim	1
21	42840	Washer	1
22	42647	Plug, Magnetic	1

Function Manifold Assembly with Fittings

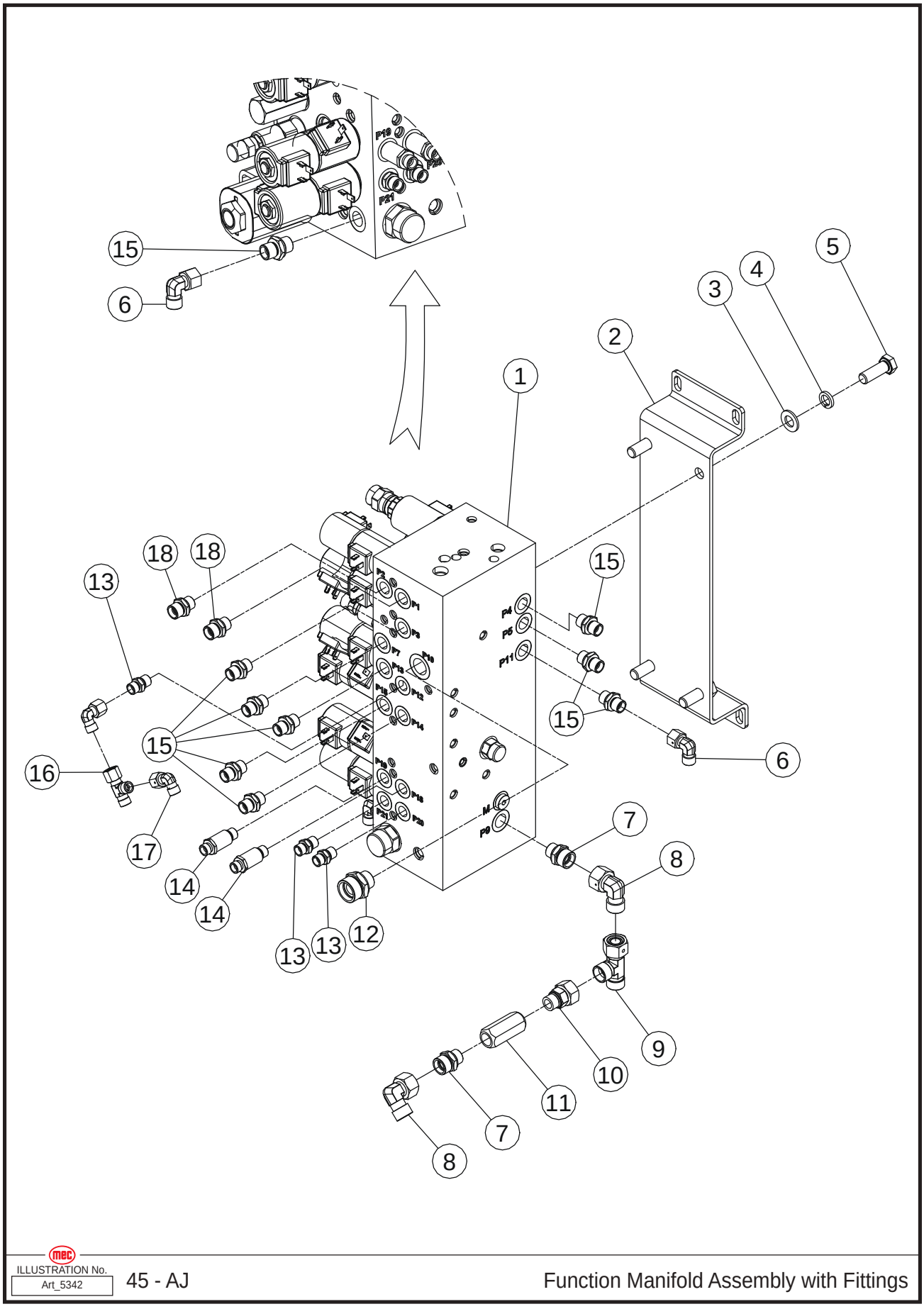


ILLUSTRATION No. Art_5342 45 - AJ Function Manifold Assembly with Fittings

Item	Part Number	Description	Qty.
1	42036	Function Manifold Assembly	1
2	42320	Plate, Bracket	1
3	53049	Flat Washer M14	4
4	53048	Spring Washer M14	4
5	50333	HHCS M14 × 40	4
6	42143	Fitting, 90°	2
7	41182	Fitting, Straight	2
8	41188	Fitting, 90°	2
9	42138	Fitting, Tee	1
10	42762	Fitting, Straight	1
11	42643	Check Valve	1
12	42166	Fitting, Straight	1
13	41181	Fitting, Straight	3
14	42548	Fitting, Straight	2
15	42537	Fitting, Straight	9
16	42136	Fitting, Tee	1
17	42142	Fitting, 90°	2
18	42599	Fitting, Straight	2

Function Manifold Assembly

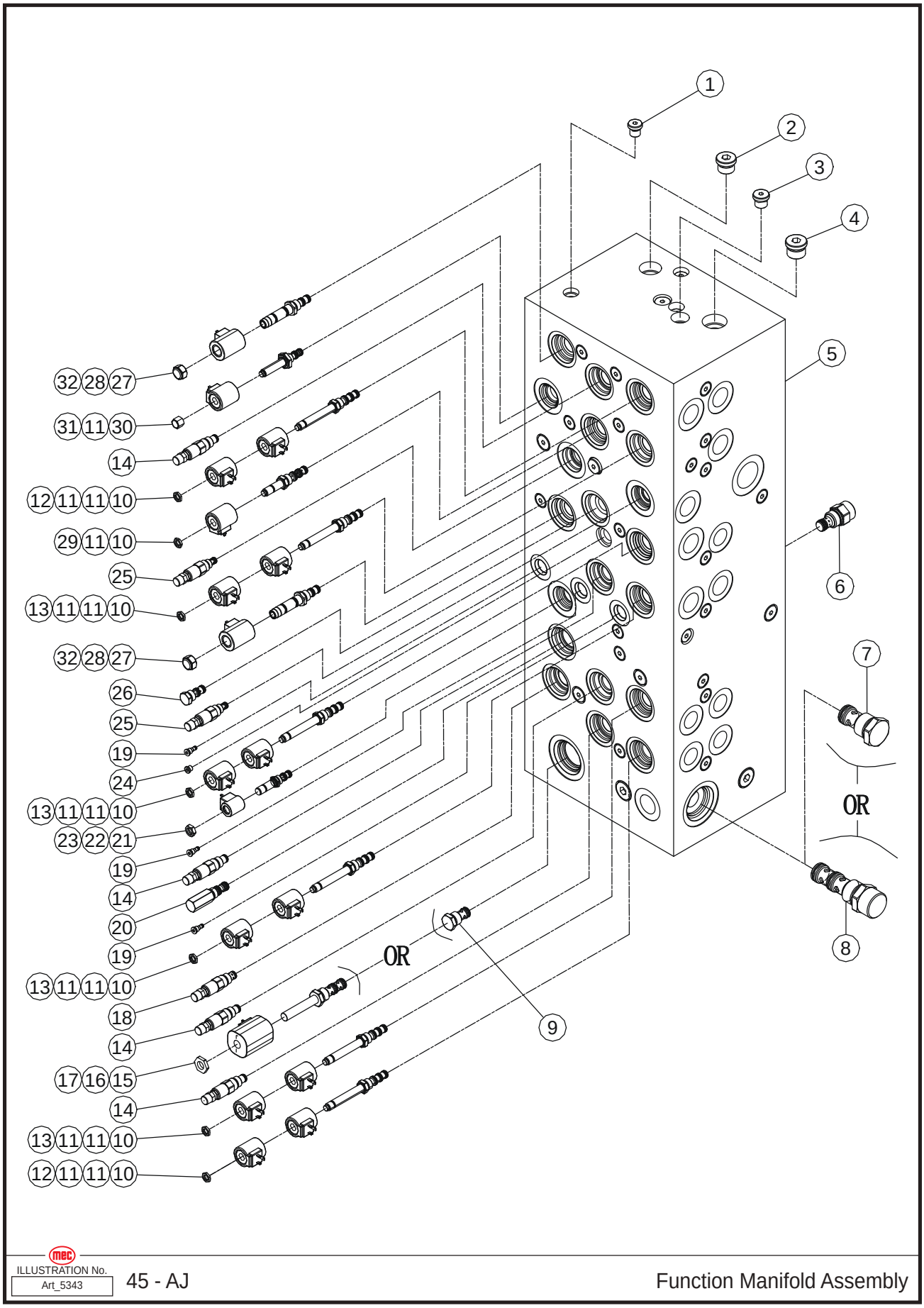
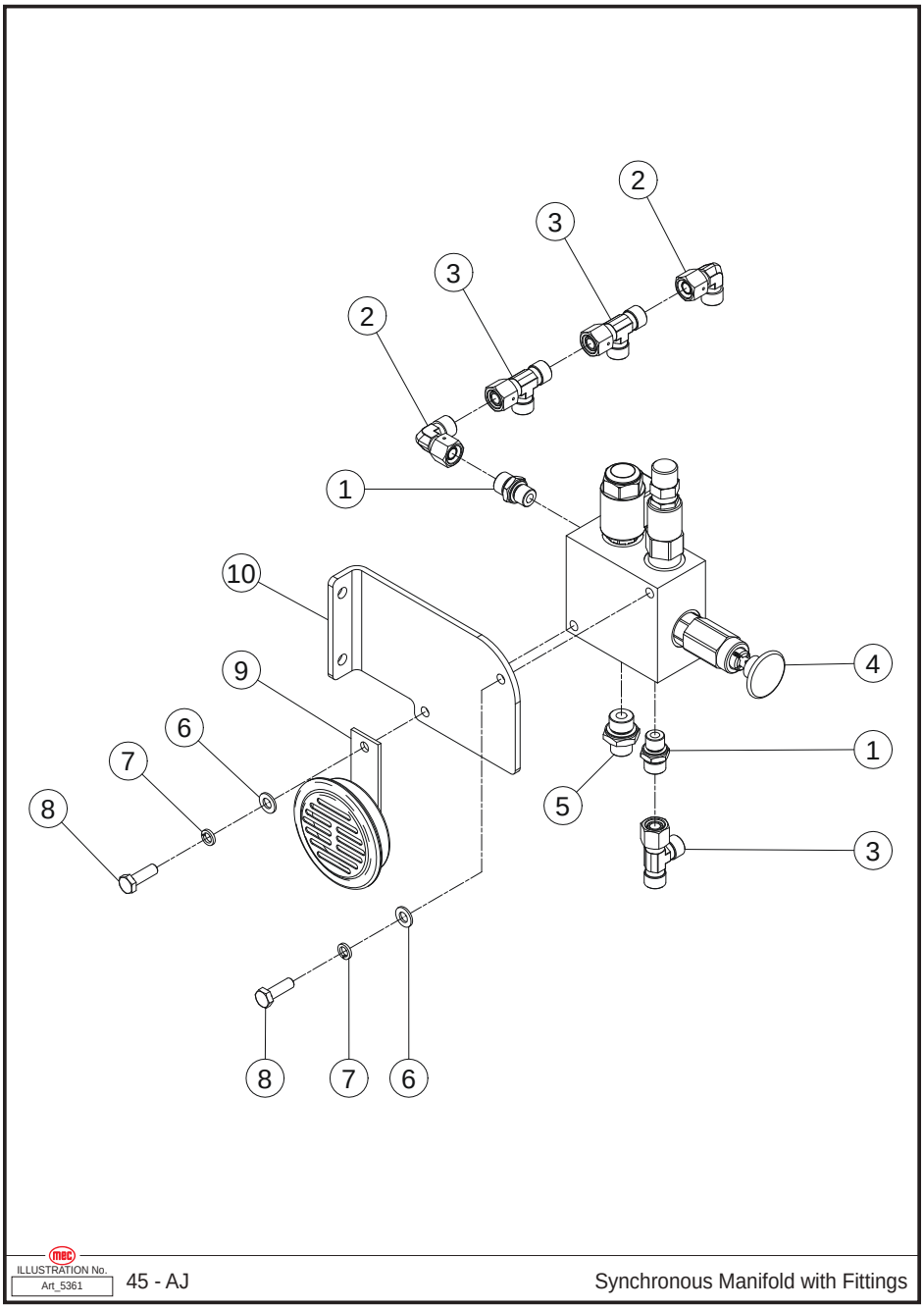


ILLUSTRATION No. Art_5343 45 - AJ Function Manifold Assembly

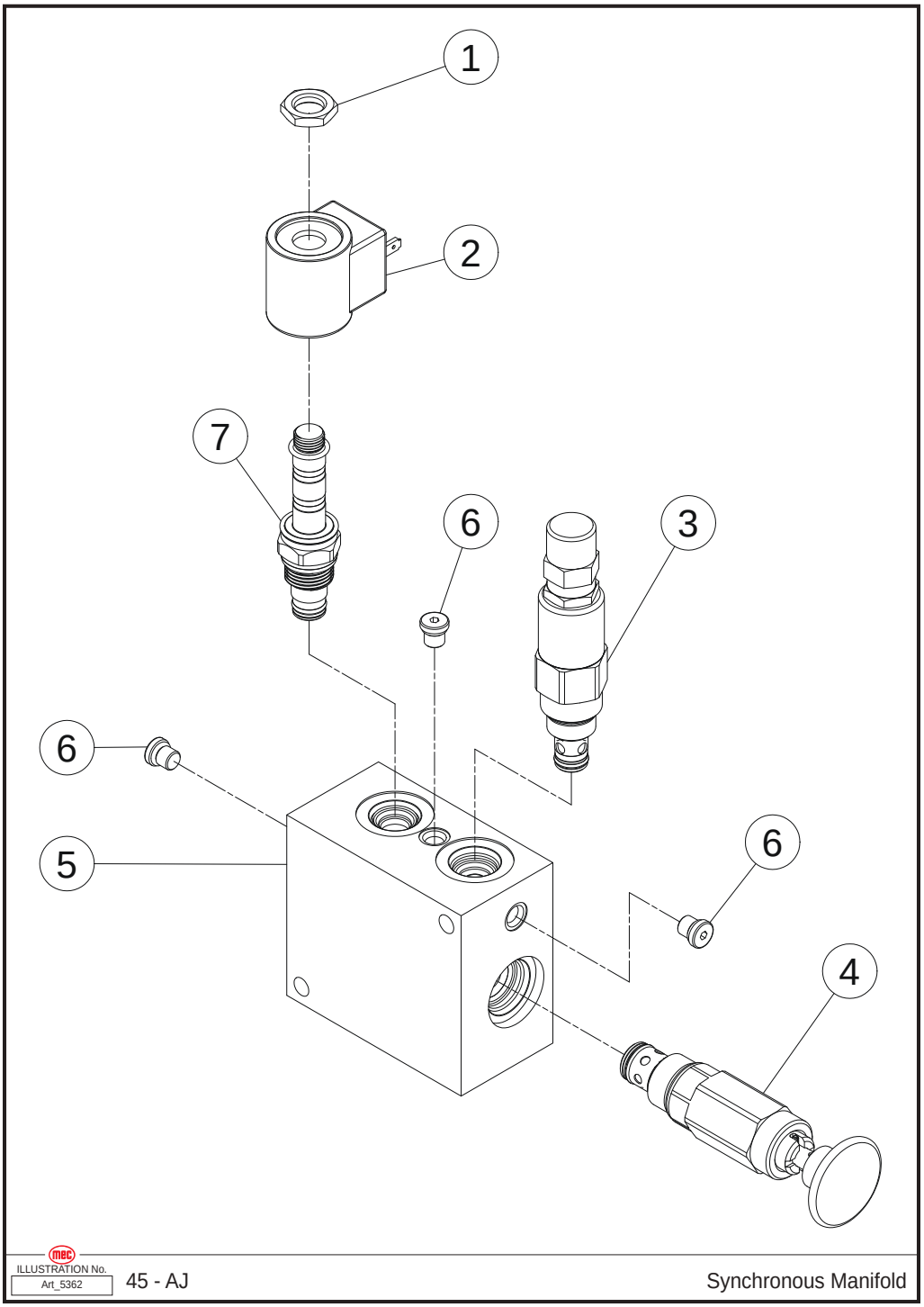
Item	Part Number	Description	Qty.
1	42787	Plug	42
2	42802	Plug	5
3	42788	Plug	12
4	42786	Plug	2
5	42134	Body	1
6	42150	Flow Control Valve	1
7	42805 - Without Hydraulic Generator	Plug	1
8	42151 - With Hydraulic Generator	Flow Control Valve	1
9	42807 - Without Hydraulic Generator	Plug	1
10	42795	Nut	7
11	42808	Coil	14
12	42364	Cartridge without Coil	2
13	42543	Cartridge without Coil	4
14	42124	Cartridge, Relief Valve	4
15	42812 - With Hydraulic Generator	Nut	1
16	42813 - With Hydraulic Generator	Coil	1
17	42365 - With Hydraulic Generator	Cartridge without Coil	1
18	42360	Cartridge, Relief Valve	1
19	42816	Check Valve	3
20	42139	Logic Element	1
21	42818	Nut	1
22	42819	Coil	1
23	42355	Proportional Valve	1
24	42821	Plug	1
25	42358	Cartridge, Relief Valve	2
26	42354	Check Valve	1
27	42824	Nut	2
28	42825	Coil	2
29	42363	Cartridge without Coil	1
30	42827	Nut	1
31	42366	Cartridge without Coil	1
32	42356	Proportional Valve	2

Synchronizing Manifold with Fittings



Item	Part Number	Description	Qty.
1	42545	Fitting, Straight	2
2	42143	Fitting, 90°	2
3	42137	Fitting, Tee	3
4	42039	Synchronous Manifold (See page 118 for Breakdown)	1
5	42546	Fitting, Straight	1
6	50001	Flat Washer M8	2
7	53055	Spring Washer M8	2
8	50031	HHCS M8 × 25	2
9	42082	Horn	1
10	42321	Plate, Bracket	1

Synchronous Manifold



Item	Part Number	Description	Qty.
1	42795	Nut	1
2	42796	Coil	1
3	42357	Cartridge, Relief Valve	1
4	42351	Manual Valve	1
5	42135	Body	1
6	42787	Plug	3
7	42362	Cartridge without Coil	1

Radiator Assembly with Fittings

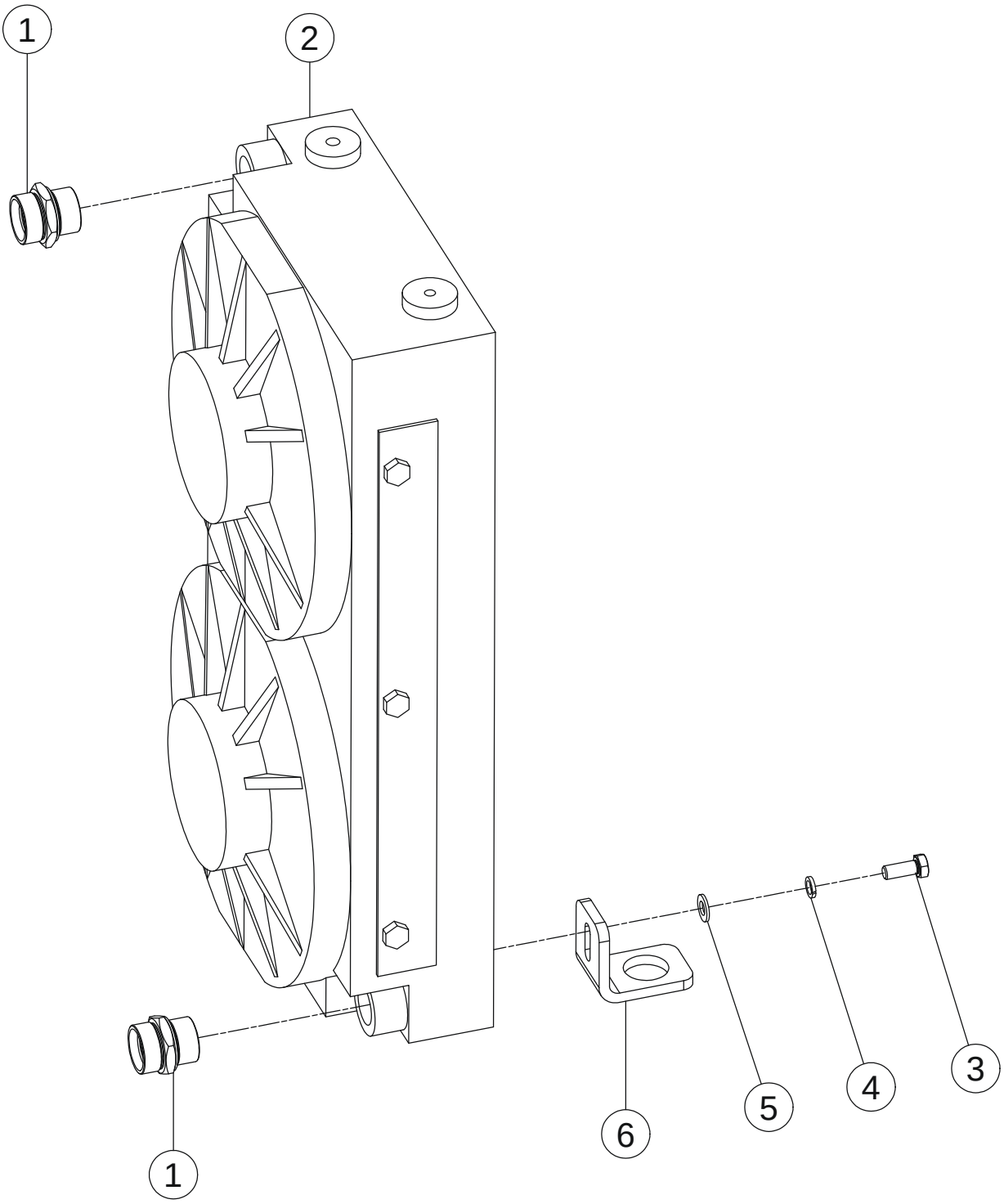


ILLUSTRATION No. Art_5354 45 - AJ Radiator Assembly with Fittings

Item	Part Number	Description	Qty.
1	42170	Fitting, Straight	2
2	42057	Radiator	1
3	50033	HHCS M10 × 25	2
4	53054	Spring Washer M10	2
5	50002	Flat Washer M10	2
6	42665	Plate, Bracket	2

Lower Control Box Assembly

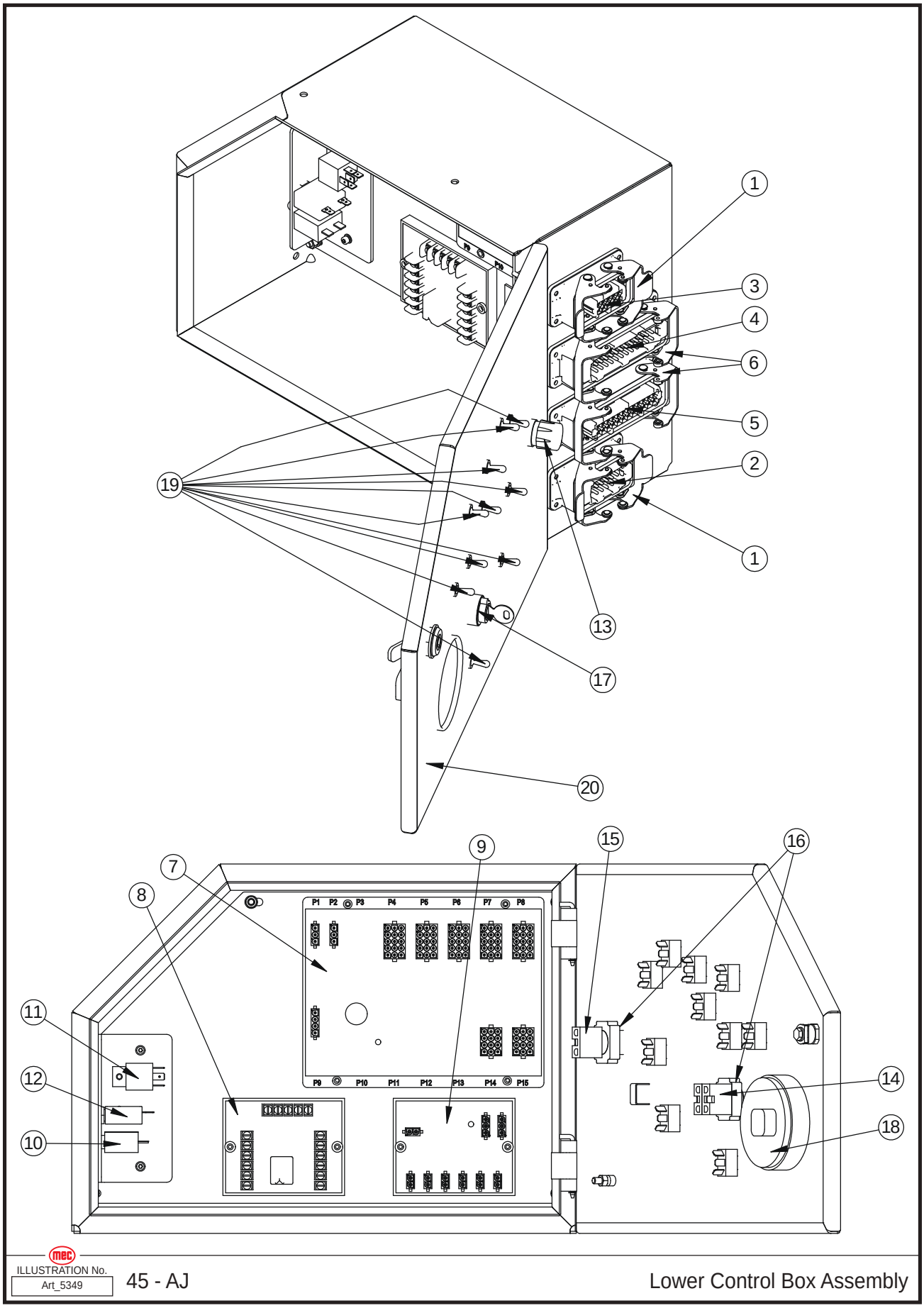


ILLUSTRATION No. Art_5349 45 - AJ Lower Control Box Assembly

Item	Part Number	Description	Qty.
1	42577	10P Hood TE H10B-AGS	2
2	42575	10 Male Pin Connector TE HE-010-MS	1
3	42551	10 Female Socket Connector TE HE-010-FS	1
4	42754	24 Male Pin Connector TE HE-024-FS	1
5	42574	24 Female Socket Connector TE HE-024-FS	1
6	42578	24P Hood TE H24B-AGS	2
7	93900	GP400B Main Controller PG Trionic 21510487	1
8	94244	TBM PG Trionic 21500340	1
9	91950	VCCM PG Trionic 21500315	1
10	42632	35A Circuit Breaker Cixi City Chaoxin Electrical Appliance Co ST-109 35A	1
11	42631	12 VDC SPDT Relay Song Chuan 896H-1AH-C1	1
12	7235	15 AMP Circuit Breaker	1
13	7800	Stop Button	1
14	8082	Block Contact N.O.	2
15	8083	Block Contact N.C.	1
16	90714	Switch/Button Base Mount	2
17	9549	Switch Tumbler Lever 3 Pos	1
18	42067	Instrument Cluster D.85 Cobo 07910002	1
19	91954	Toggle Switch MOM-OFF-MOM	10
20	94560	45-AJ Lower Controls Decal	1

Counterweight and Engine Hoods Installation

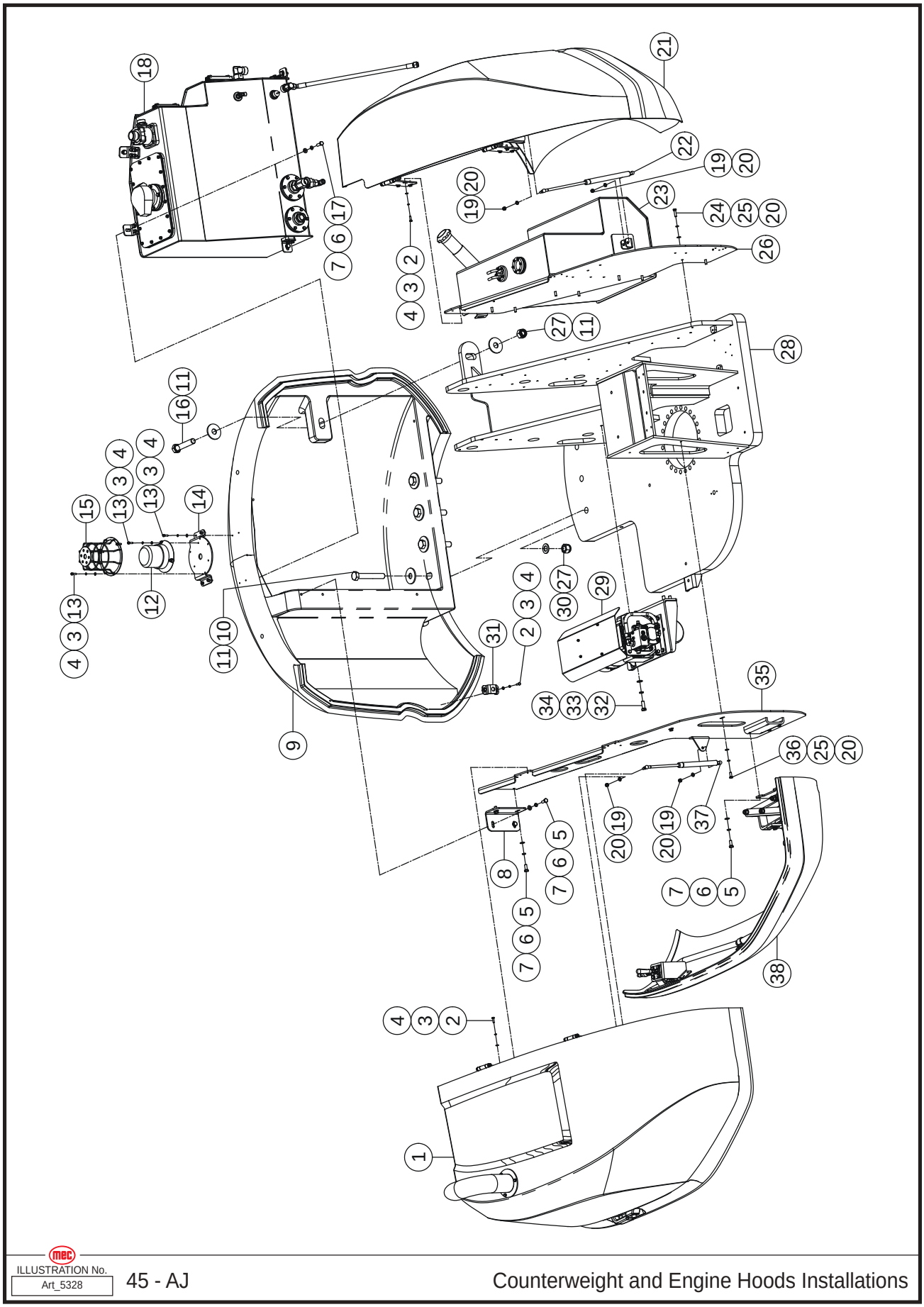


ILLUSTRATION No. Art_5328

45 - AJ

Counterweight and Engine Hoods Installations

Item	Part Number	Description	Qty.
1	REF	Engine Upper Hood Assembly (See page 129 for Breakdown)	1
2	50028	HHCS M6 × 20	14
3	53046	Spring Washer M6	15
4	50000	Flat Washer M6	12
5	50033	HHCS M10 × 25	8
6	53054	Spring Washer M10	12
7	50002	Flat Washer M10	12
8	42187	Plate, Bracket	1
9	42184	Counterweight	1
10	53155	HHCS M24 × 150	4
11	53158	Flat Washer M24	6
12	42080	Flashing Beacon - To Serial # 14600165	1
	42523	Flashing Beacon - From Serial # 14600166	1
13	53124	SHCS M6 × 20	7
14	42183	Bracket, Flashing Beacon	1
15	42188	Guard, Beacon	1
16	53110	HHCS M24 × 130	1
17	REF	Hydraulic Tank Assembly (See page 125 for Breakdown)	1
18	50034	HHCS M10 × 30	4
19	53014	NHEX Nut M8	4
20	50001	Flat Washer M8	16
21	REF	Fuel Tank Hood Assembly (See page 131 for Breakdown)	1
22	42011	Spring, Gas	1
23	REF	Fuel Tank Assembly (See page 111 for Breakdown)	1
24	50032	HHCS M8 × 30	8
25	53055	Spring Washer M8	12
26	42176	Plate, Bracket	1
27	50463	NHEX Nut M24	5
28	42217	Turntable	1
29	REF	3.5kW Hydraulic Generator Assembly (See page 133 for Breakdown)	1
30	53158	Flat Washer M24	4
31	42191	Plate, Stop	1
32	50040	HHCS M12 × 35	4
33	53148	Spring Washer M12	4
34	50003	Flat Washer M12	4
35	42187	Plate, Bracket	1
36	50030	HHCS M8 × 20	4
37	42010	Spring, Gas	1
38	REF	Engine Lower Hood Assembly (See page 127 for Breakdown)	1

REF - Reference

Hydraulic Tank Assembly

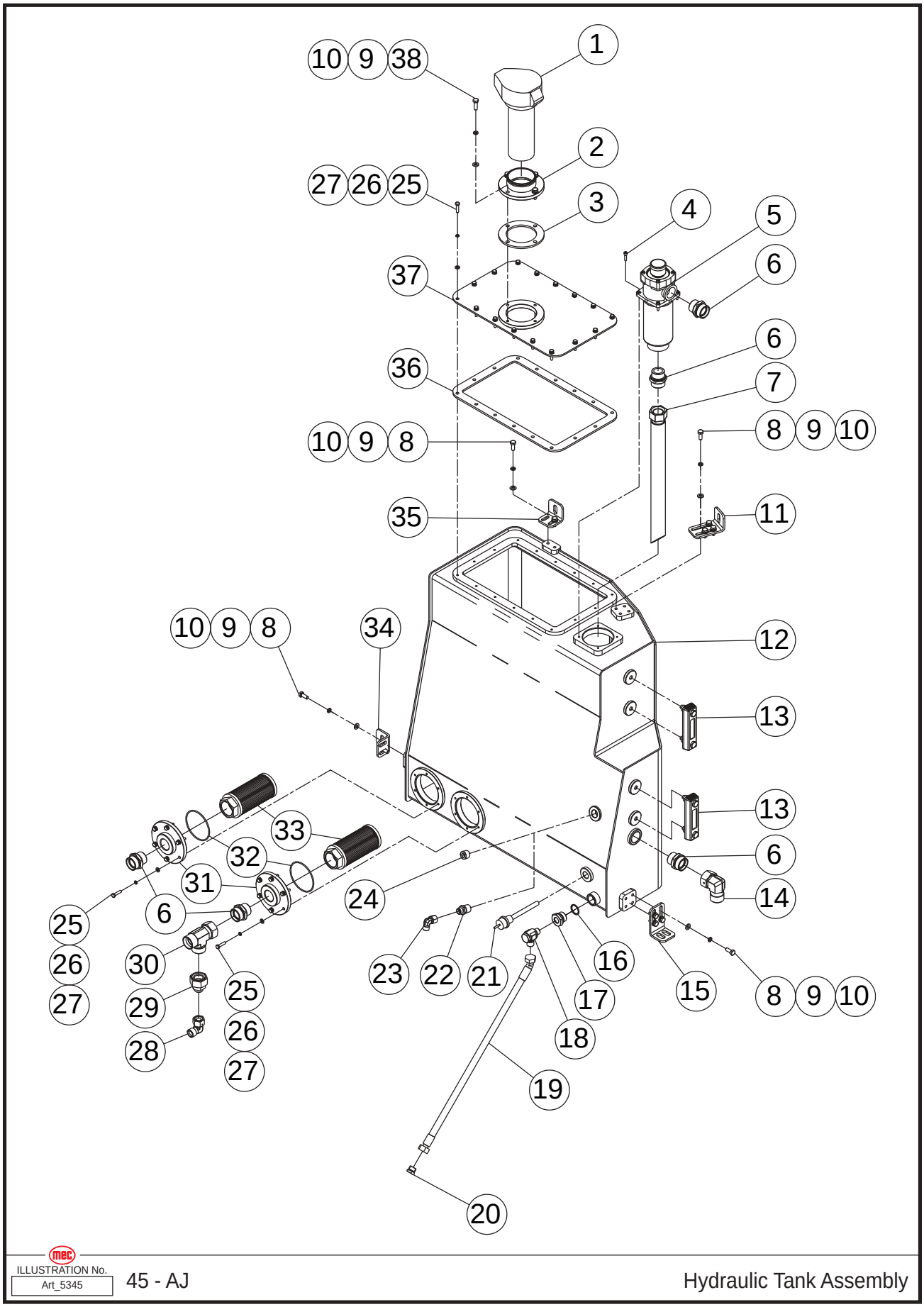


ILLUSTRATION No. Art_5345 45 - AJ Hydraulic Tank Assembly

Item	Part Number	Description	Qty.
1	42549	Air Cleaner	1
--	42834	Cap	1
--	42835	Strainer	1
--	42836	Seal Kit for Filter	1
--	42522	Key	1
2	42547	Flange	1
3	42312	Rubber Pad	1
4	53150	SHCS M5 × 20	4
5	42052	Return Filter	1
--	42053	Element	1
--	42838	Seal Kit for Filter	1
6	42170	Fitting, Straight	5
7	42839	Hose, Return Oil	1
8	50030	HHCS M8 × 20	12
9	53055	Spring Washer M8	16
10	50001	Flat Washer M8	16
11	42314	Plate, Bracket	2
12	42315	Tank	1
13	42056	Indicator, Liquid	2
14	42147	Fitting, 90°	1
15	42395	Plate, Bracket	1
16	42840	Washer	1
17	42841	Fitting, Straight	1
18	42760	Fitting, 90°	1
19	42842	Hose Assembly	1
20	42843	Plug	1
21	42064	Hydraulic Oil Temperature Sensor	1
22	42845	Fitting, Straight	1
23	42143	Fitting, 90°	1
24	42844 – Without Hydraulic Generator	Plug	1
25	50117	HHCS M6 × 25	28
26	53046	Spring Washer M6	28
27	50000	Flat Washer M6	28
28	41188	Fitting, 90°	1
29	42170	Fitting, Straight	1
30	42588	Fitting, Tee	1
31	42310	Flange	2
32	42756	O-Ring 82.22 × 2.62	2
33	42054	Filter	2
34	42396	Plate, Bracket	1
35	42054	Plate, Bracket	2
36	42311	Pad, Rubber	1
37	42316	Cover, Rinse	1
38	50031	HHCS M8 × 25	4

Engine Lower Hood Assembly

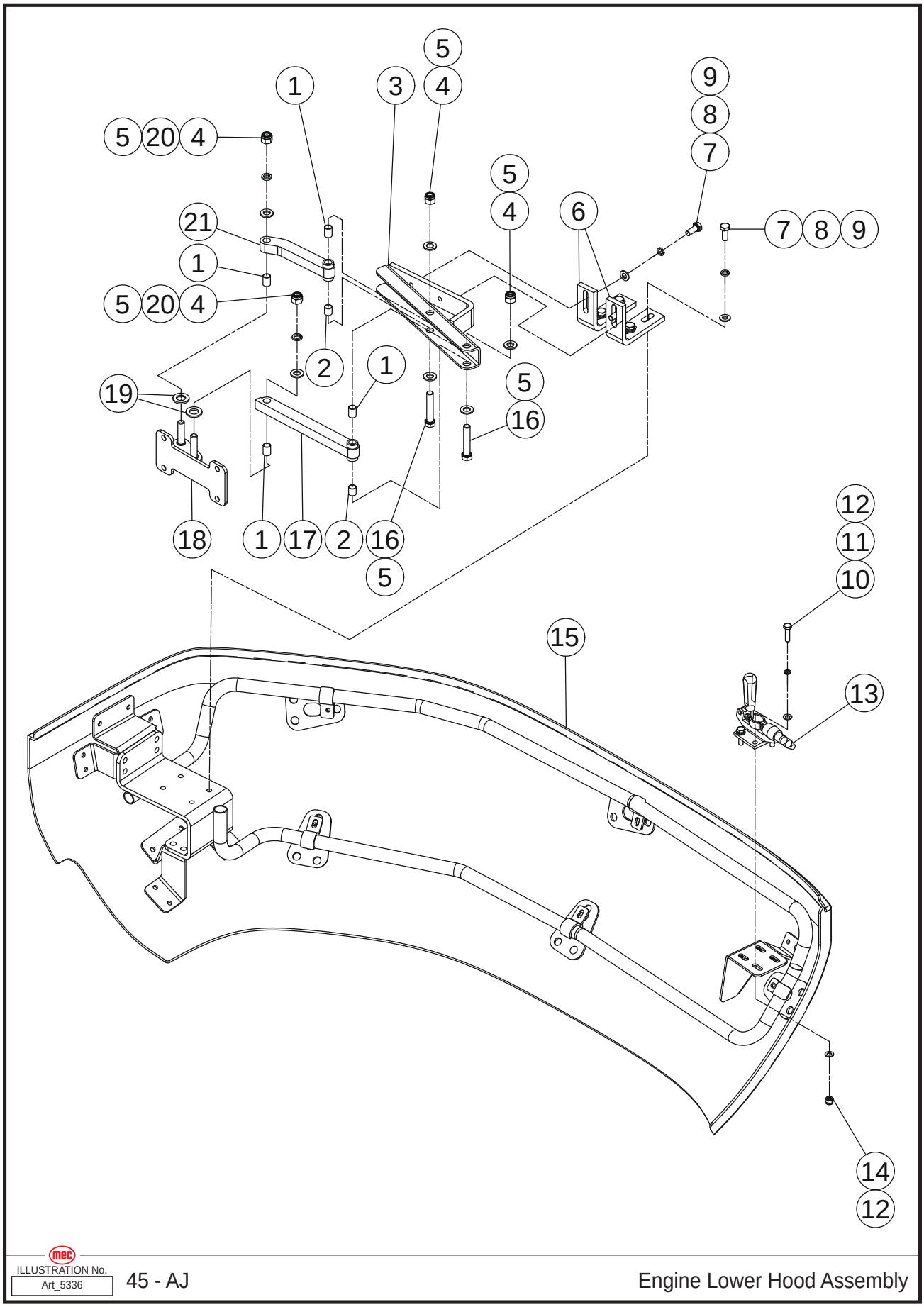


ILLUSTRATION No. Art_5336 45 - AJ Engine Lower Hood Assembly

Item	Part Number	Description	Qty.
1	42086	Bearing	4
2	42753	Bearing	2
3	42196	Seat	1
4	50590	NHEX Nut M12	4
5	50003	Flat Washer M12	6
6	42190	Seat, Guard	2
7	50033	HHCS M10 × 25	6
8	53054	Spring Washer M10	6
9	50002	Flat Washer M10	6
10	50032	HHCS M8 × 30	4
11	53055	Spring Washer M8	4
12	50001	Flat Washer M8	8
13	42031	Clamp, Toggle	1
14	53014	NHEX Nut M8	4
15	42204	Hood, Engine	1
16	53108	HHCS M12 × 65	2
17	42195	Link	1
18	42193	Hood Seat	1
19	50004	Flat Washer M16	2
20	53148	Spring Washer M12	2
21	42194	Link	1

REF - Reference

Engine Upper Hood Assembly

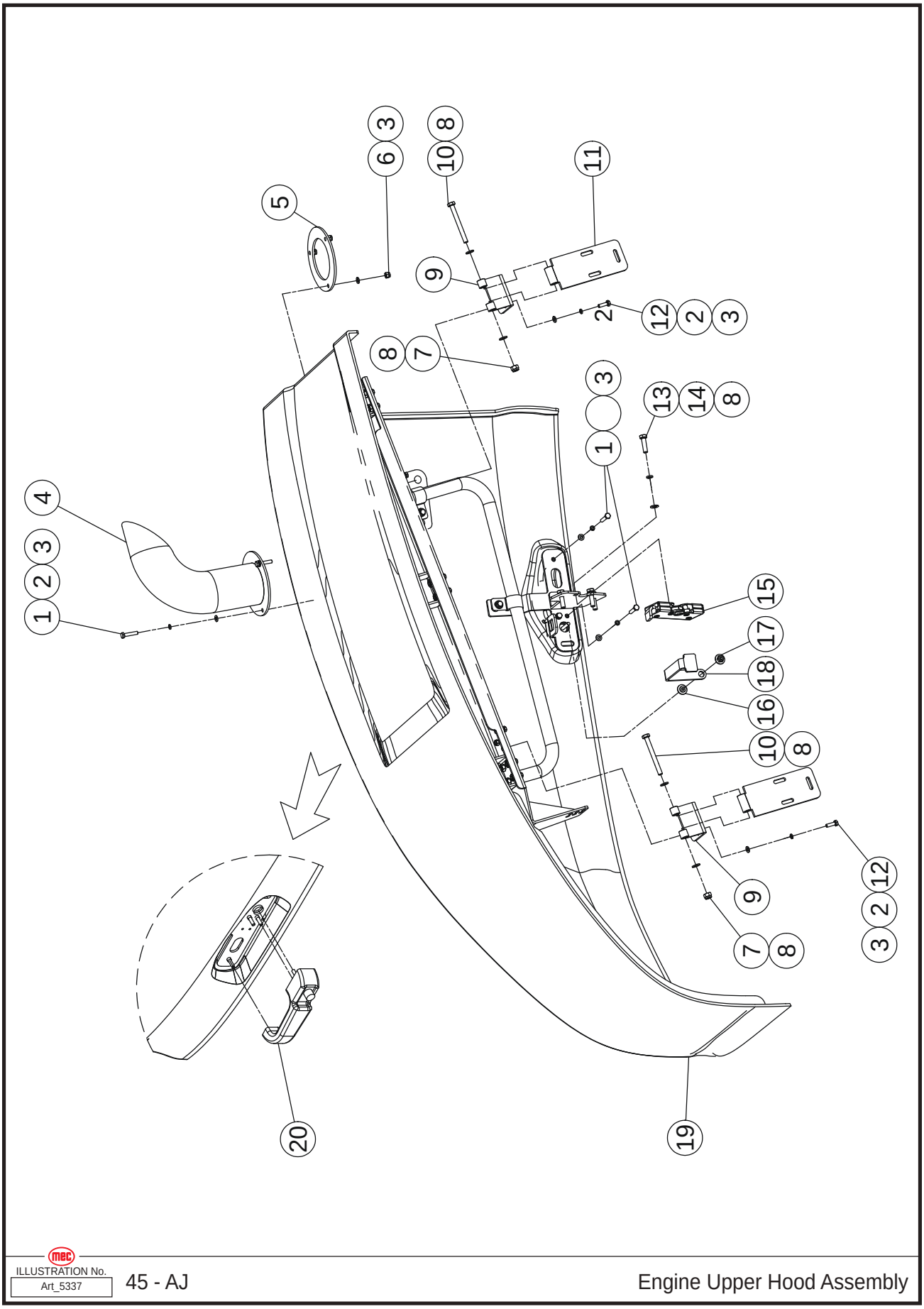


ILLUSTRATION No. Art_5337 45 - AJ Engine Upper Hood Assembly

Item	Part Number	Description	Qty.
1	50214	HHCS M6 × 30	6
2	53046	Spring Washer M6	12
3	50000	Flat Washer M6	15
4	42201	Exhaust Tube Weldment	1
5	42199	Bracket	1
6	50396	NHEX Nut M6	3
7	53014	NHEX Nut M8	2
8	50001	Flat Washer M8	8
9	42202	Hinge	2
10	50018	HHCS M8 × 80	2
11	42205	Hinge	2
12	50028	HHCS M6 × 20	6
13	50032	HHCS M8 × 30	4
14	53055	Spring Washer M8	4
15	42119	Lock	1
16	42650	Pin	1
17	42651	Nut	1
18	42671	Bracket	1
19	42197	Hood, Engine	1
20	42353	Handle	1
--	42514	Key	1

Fuel Tank Hood Assembly

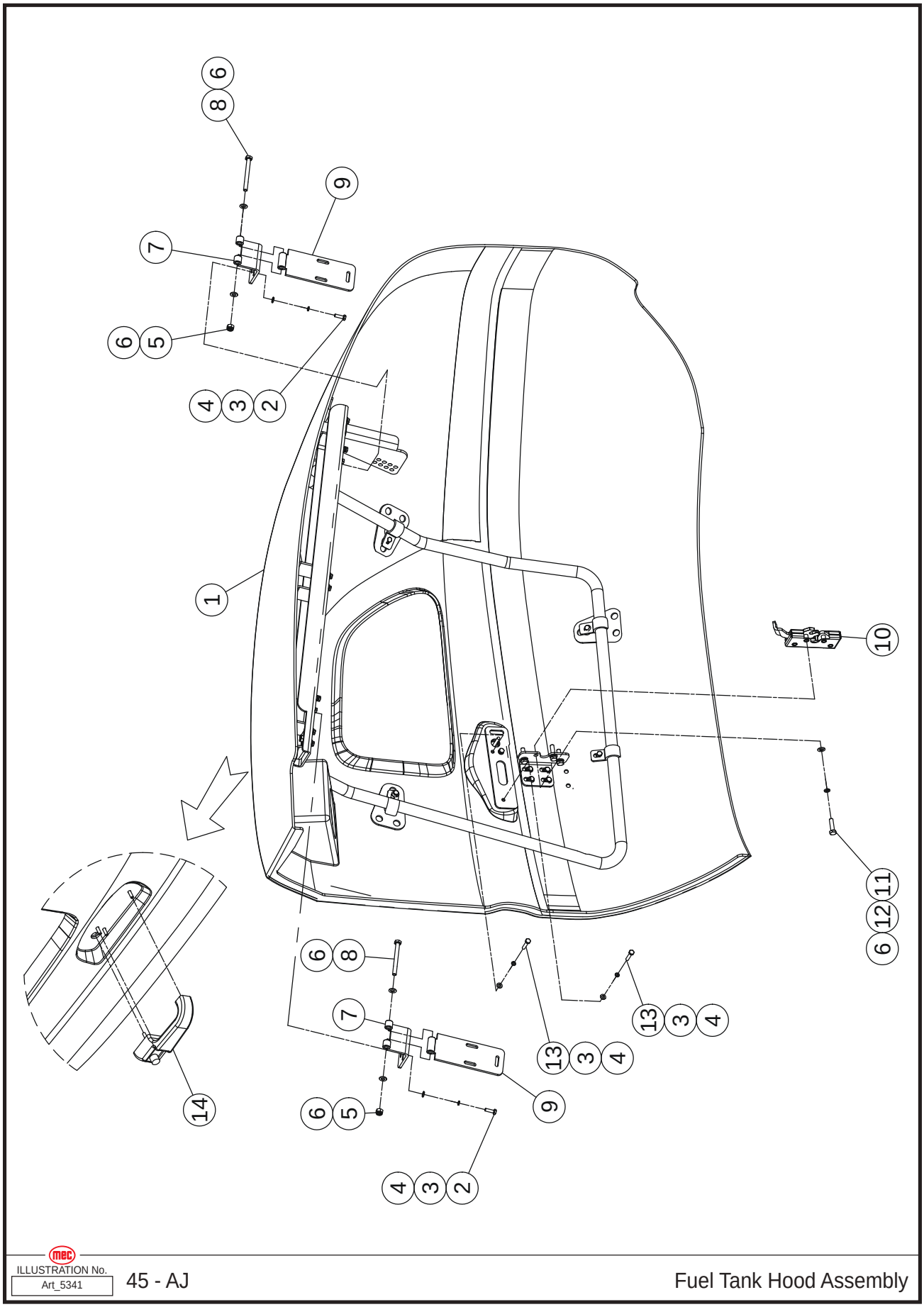


ILLUSTRATION No. Art_5341 45 - AJ Fuel Tank Hood Assembly

Item	Part Number	Description	Qty.
1	42192	Fuel Oil Tank Hood	1
2	50028	HHCS M6 × 20	6
3	53046	Spring Washer M6	9
4	50000	Flat Washer M6	9
5	53014	NHEX Nut M8	2
6	50001	Flat Washer M8	8
7	42777	Hinge	2
8	50018	HHCS M8 × 80	2
9	42778	Hinge	2
10	42120	Lock	1
11	50032	HHCS M8 × 30	4
12	53055	Spring Washer M8	4
13	50214	HHCS M6 × 30	3
14	42353	Handle	1
--	42514	Key	1

REF - Reference

3.5 kW Hydraulic Generator Assembly

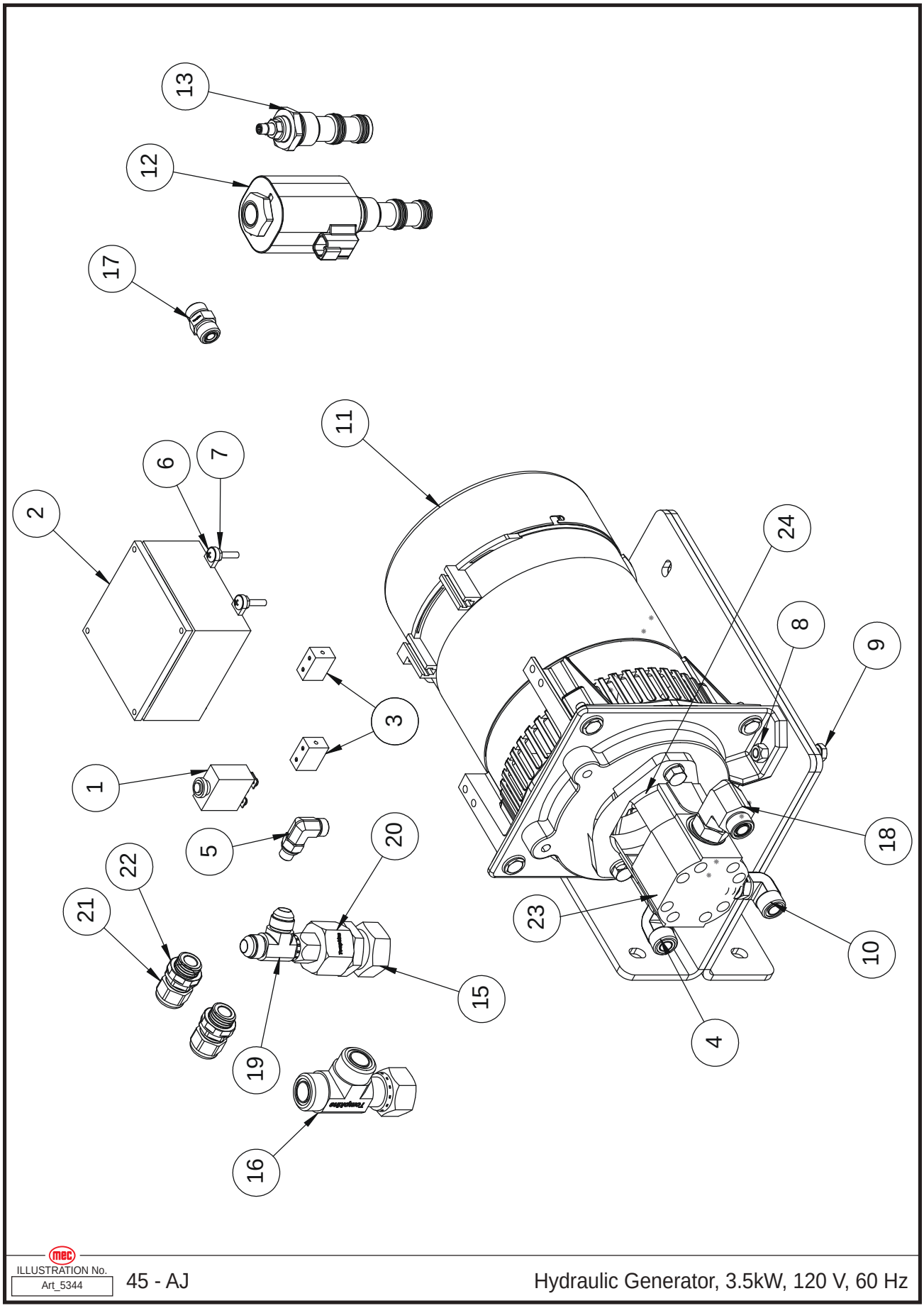
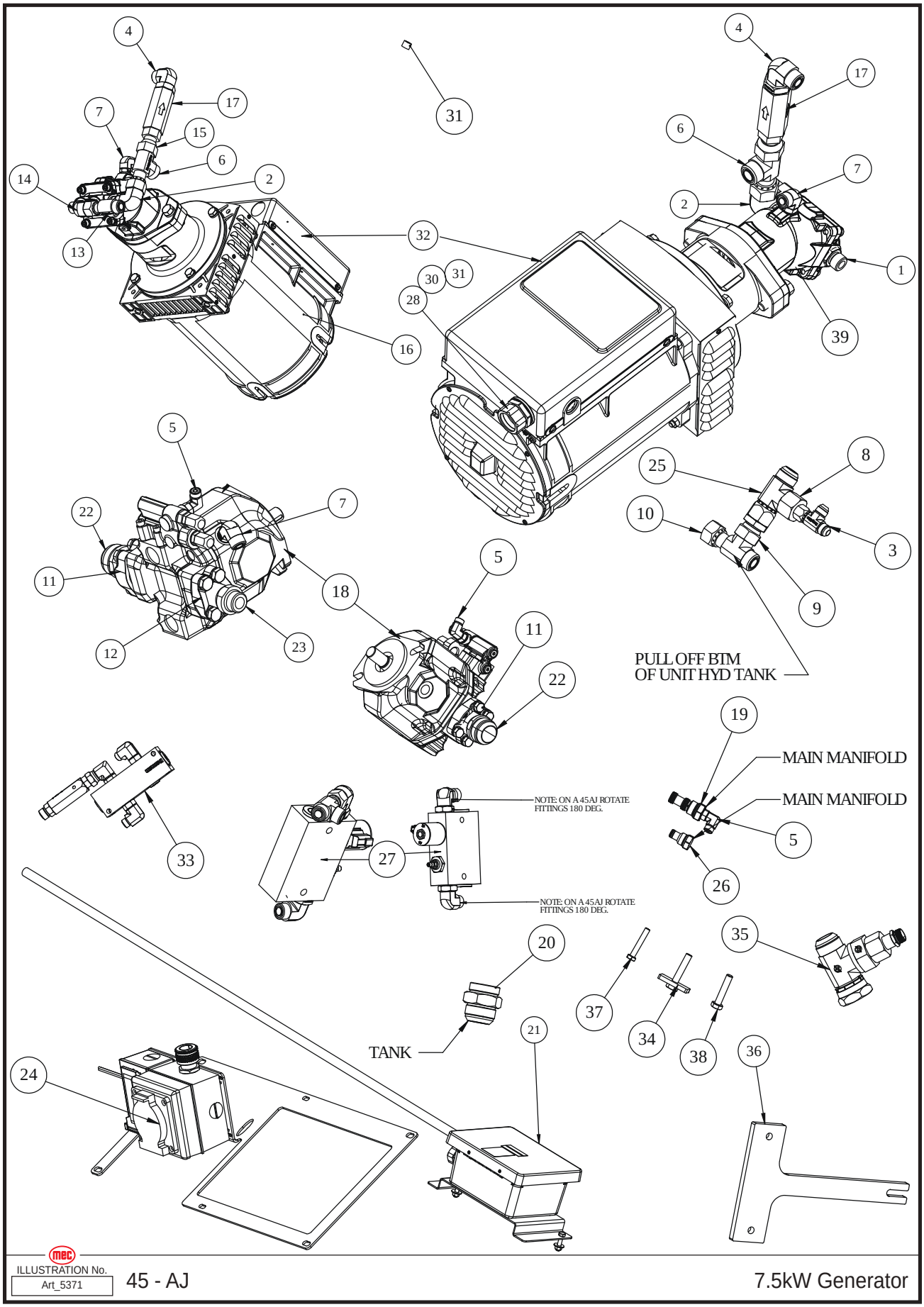


ILLUSTRATION No. Art_5344 45 - AJ Hydraulic Generator, 3.5kW, 120 V, 60 Hz

Item	Part Number	Description	Qty.
1	92493	Circuit Breaker, Generator Option, 30 AMP	1
2	92495	Junction Box, 4 × 4 × 2, Marine, Weatherproof, Plastic	1
3	92494	Ceramic Wire Connector	2
4	50850	HYFT MFFOR-MB90-8-8 ; FS6801-08-08-FG	1
5	50673	HYFT MFFOR-MB90 4-4	1
6	50330	THMS #10-32 × 01.00 ZP	4
7	50238	NNYL #10-32 05 Z	4
8	50048	NNYL M08 × 1.25 08 ZP Nylon INSE	3
9	50017	HHCS M08-1.25 × 060 08 ZP P	3
10	51084	HYFT MFFOR-MB90-08-06; 6801-08-06	1
11	94620	3.5KW 60HZ 120V AC Gen (No Manifold) Harrison HU03.5PMG-16G5/B-00000/12/0	1
12	91551	Solenoid Valve 12V Deutsch Hydraforce	1
13	94622	Flow Control Bypass Type Hydraforce FR12-33A-0-N	1
14	--	--	--
15	51232	HYFT Male JIC × Female Metric Din	1
16	51233	HYFT Male ORFS × Male Metric W/washer & O-Ring	1
17	51239	HYFT Male ORFS × Male Metric	1
18	50848	HYFT MFFOR-MB90-8-10	1
19	50894	HYFT MJ-FJX-MJT-8 ; 6602-08-08-08	1
20	51030	HYFT MJ-FJ-08-16 Reducer	1
21	92008	Strain Relief, Cord Grip, .17” - .45” Cord, 1/2 NPT, Straight, Black, Water Tight	2
22	92949	1/2” NPT Black Nylon Locknut For Strain Relief	2
23	94772	Gear Motor	1
24	94453	Seal, Shaft Oil (Not Shown)	1

7.5 kW Generator with Option Hose Kit



Item	Part Number	Description	Qty.
1	50812	HYFT MFFOR-MB-10-10 ; FS6400-10-10-O	1
2	50842	HYFT MFFOR-MB90-12-10 ; FS6801-12-10-F	1
3	50894	HYFT MJ-FJX-MJT-8 ; 6602-08-08-08	1
4	51066	HYFT MFFOR-MB90-10-12	1
5	50673	HYFT MFFOR-MB90 4-4	2
6	50979	HYFT MFFOR-FFORX-MFFOR-12 FS6602-12-12-12	1
7	51084	HYFT MFFOR-MB90-08-06; 6801-08-06	2
8	51030	HYFT MJ-FJ-08-16 Reducer	1
9	51232	HYFT Male Jic × Female Metric Din (Swivel) 9197-16-L28-36	1
10	51233	HYFT Female Din (Swivel) Run Tee 5390L-28	REF
11	91161	Flange Kit, Pump Suction	1
12	91162	Flange Kit, Pump Pressure	1
13	51199	HYFT MFFOR-FFORX-MFFOR-10 FF6602-10-10-10	1
14	51200	HYFT MFFOR-MB90-10-10 FF6801-10-10	1
15	51216	HYFT FFORX-MB-12-12	1
16	93829	Hyd Generator 7.5KW 208/120 60HZ 12CC Harrison HU07.5DAG36J-US	1
17	94277	Check Valve Hydac RV-16-01.X/12	1
18	94612	Pump Hyd Rexroth #AA10VSO18DFR	1
19	94637	Cavity Plug 10-S3 With External O-Ring Boss Port Connected To Port 3	1
20	51237	Male Jic 1.25” × Male Metric mm	1

Item	Part Number	Description	Qty.
21	84429	Subassembly, Option, 7.5kW Breaker Box	1
22	51235	HYFT FL-MJ Code 61 6840-20-16	1
23	51236	HYFT FL- FFOR Code 61 FF6840-12-12	1
24	41985	Subassembly, Option, 7.5kW Outlet Boxes MkII	1
25	51031	HYFT MJ-FJX-MJT-16	1
26	92749	Cavity Plug Hydraforce CP08-20-N	1
27	28993	7.5kW Generator Manifold	1
28	93095	1” Liquidtight Strain Relief Cord Connector T&B 2546	1
29	93096	1” Liquidtight Sealing Gasket T&B 5264	1
30	93097	1” Steel Locknut T&B 143	1
31	42384	Spacer	1
32	28295	7.5kW Gen Cover Forming Hole Cutouts	1
33	84430	Load Sense Manifold	1
34	42871	Foot Plate Weldment	1
35	42872	Suction Fitting Assembly 7.5kW Gen	1
36	42873	Spacer Plate 7.5kW Gen	1
37	50015	HHCS M08-1.25X050 08 ZP P	1
38	50036	HHCS M10-1.50X050 08 ZP F	1
39	94774	Hyd Motor, Harrison 7.5kW	1

REF - Reference

7.5kW Generator Option Hose Kit

P/N	ID	End A Fitting P/N	End A Fitting Info	End B Fitting P/N	End B Fitting Info	Hose Spec P/N	Hose Spec Info	Hose Length (in)
52839	Tank-Pumpinlet	50605	20G-20FJX	50606	20G-20FJX90M	50636	20GMV	56”
52840	18cc Pump-Gen Block-T	50700	10G-10FFORX	51241	HYCR 10G-12MFFOR90S	51080	10M3K	64”
52841	Gen Block-T-Main Manifold-T	51202	08G-10FFORX90S	51240	M22 × 1.5 Female × 1/2 in	50630	8M3K	52”
52842	Gen Out-T Oil Cooler T	50704	12G-12FFORX45	51146	12G-16FJX Gates	50632	12M3K	41”
52844	Gen Manifold-Front T Gen	50700	10G-10FFORX	50702	10G-10FFORX90S	51080	10M3K	13.5”
52845	Check Valve-Gen Inlet	50700	10G-10FFORX	50702	10G-10FFORX90S	51080	10M3K	12”
52846	Gen CD/Pump CD-Oil Cooler T	50620	08G-08FFORX	50626	08G-8FJX90S	50630	8M3K	33”
52847	Gen Inlet T-LS Manifold	50693	08G-10FFORX	50657	08G-06FFORX	50630	8M3K	34”
52848	LS Pump - LS Manifold	50667	04G-04FFORX	50677	4G-4FFORX 45	50627	4M3K	24”
52849	Main Manifold LS-LS Manifold	50667	04G-04FFORX	50679	4G=4FFORX 90S	50627	4M3K	64”

Boom and Turntable Installations

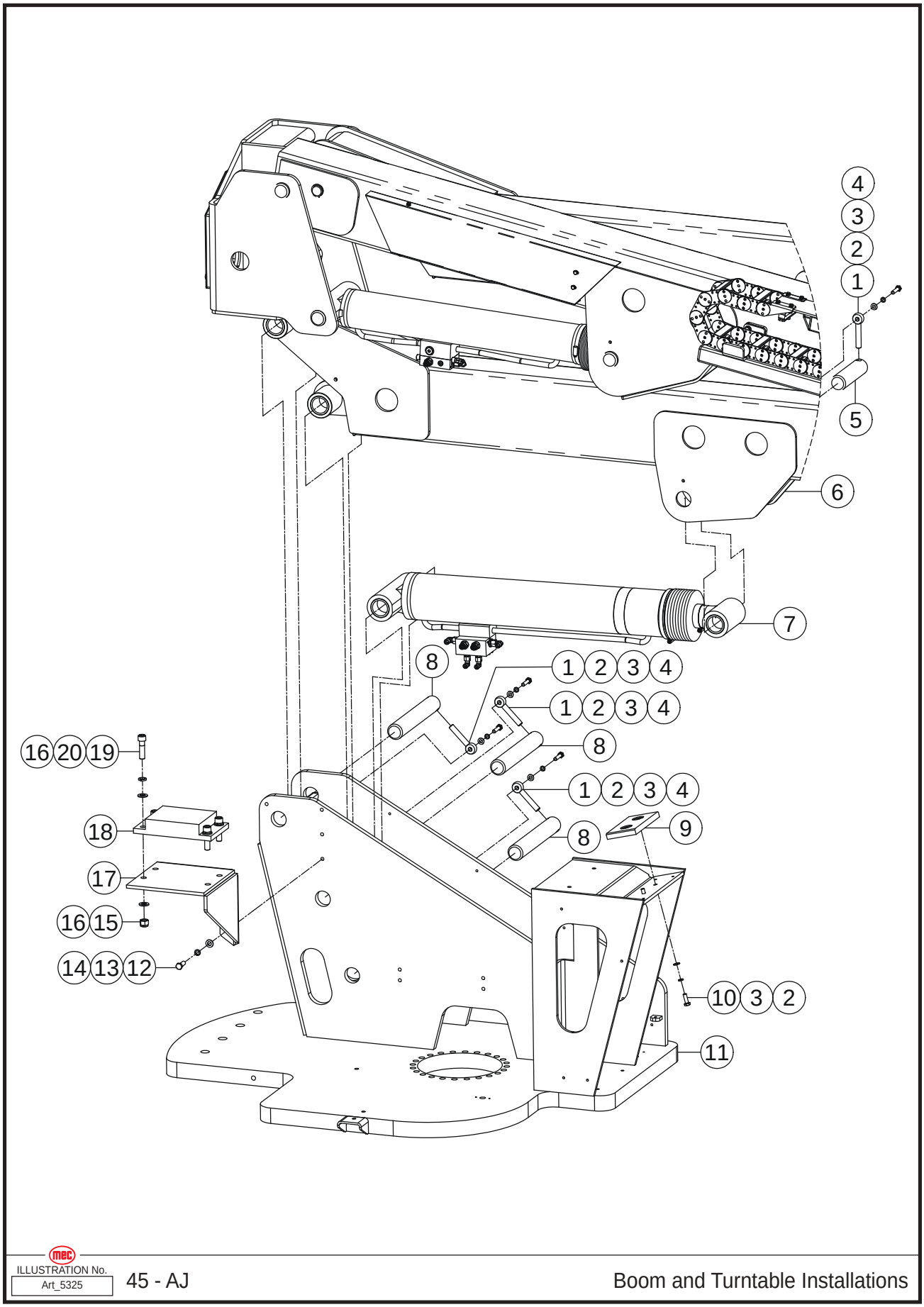


ILLUSTRATION No. Art_5325 45 - AJ Boom and Turntable Installations

Item	Part Number	Description	Qty.
1	42097	Pin, Lock	4
2	50002	Flat Washer M10	6
3	53054	Spring Washer M10	6
4	50430	HHCS M10 × 45	4
5	42107	Pin Pivot, Cylinder Upper	1
6	42254	Boom Assembly (See page 139 for Breakdown)	1
7	42300	Lower Lifting Cylinder Assembly (See page 159 for Breakdown)	1
8	42111	Pin, Pivot	3
9	42175	Sliding, Block	1
10	50034	HHCS M10 × 30	2
11	42217	Turntable	1
12	50040	HHCS M12 × 35	4
13	53148	Spring Washer M12	4
14	50003	Flat Washer M12	4
15	50597	NHEX Nut M16	4
16	50004	Flat Washer M16	8
17	42185	Plate, Bracket	1
18	42186	Cushion, Rubber	1
19	50011	SHCS M16 × 60	4
20	53149	Spring Washer M16	4

Boom Assembly

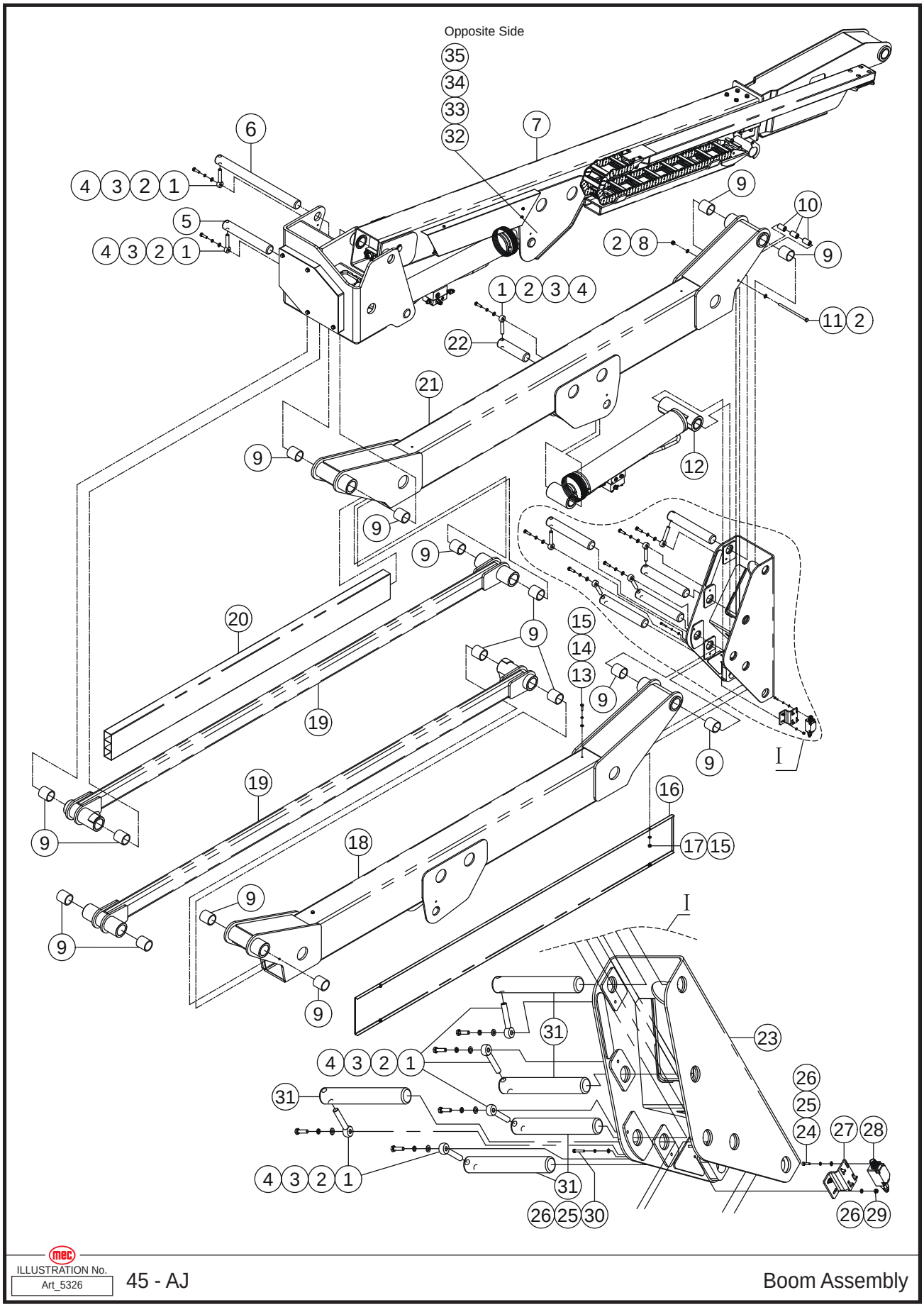


ILLUSTRATION No. Art_5326 45 - AJ Boom Assembly

Item	Part Number	Description	Qty.
1	42097	Pin, Lock	8
2	50002	Flat Washer M10	10
3	53054	Spring Washer M10	8
4	50332	HHCS M10 × 35	8
5	42111	Pin, Pivot	1
6	42113	Pin, Pivot	1
7	42262	Telescopic Boom Assembly (See page 143 for Breakdown)	1
8	50049	NNYL Nut M10	1
9	42092	Bearing, Composite	16
10	42256	Wheel, Nylon	3
11	53168	HHCS M10 × 200	1
12	42301	Mid Lifting Cylinder Assembly (See page 161 for Breakdown)	1
13	50032	HHCS M8 × 30	4
14	53055	Spring Washer M8	4
15	50001	Flat Washer M8	8
16	42255	Board	1
17	53014	NHEX Nut M8	4
18	42259	Crank Arm	1
19	42260	Rod, Connection	2
20	42261	Sleeve	1
21	42782	Crank Arm	1
22	42107	Pin, Pivot	1
23	42257	Platform, Connection	1
24	53124	SHCS M6 × 20	4
25	53046	Spring Washer M6	6
26	50000	Flat Washer M6	8
27	42326	Plate, Bracket	1
28	42073	Switch, Limit	1
29	50396	NHEX Nut M6	2
30	50327	HHCS M6 × 35	2
31	42110	Pin, Pivot	5
32	50047	NNYL M6	2
33	50125	HHCS M6 × 55	2
34	50000	Flat Washer M6	4
35	90844	EZFit Angle Transducer	1

Telescopic Boom Installation

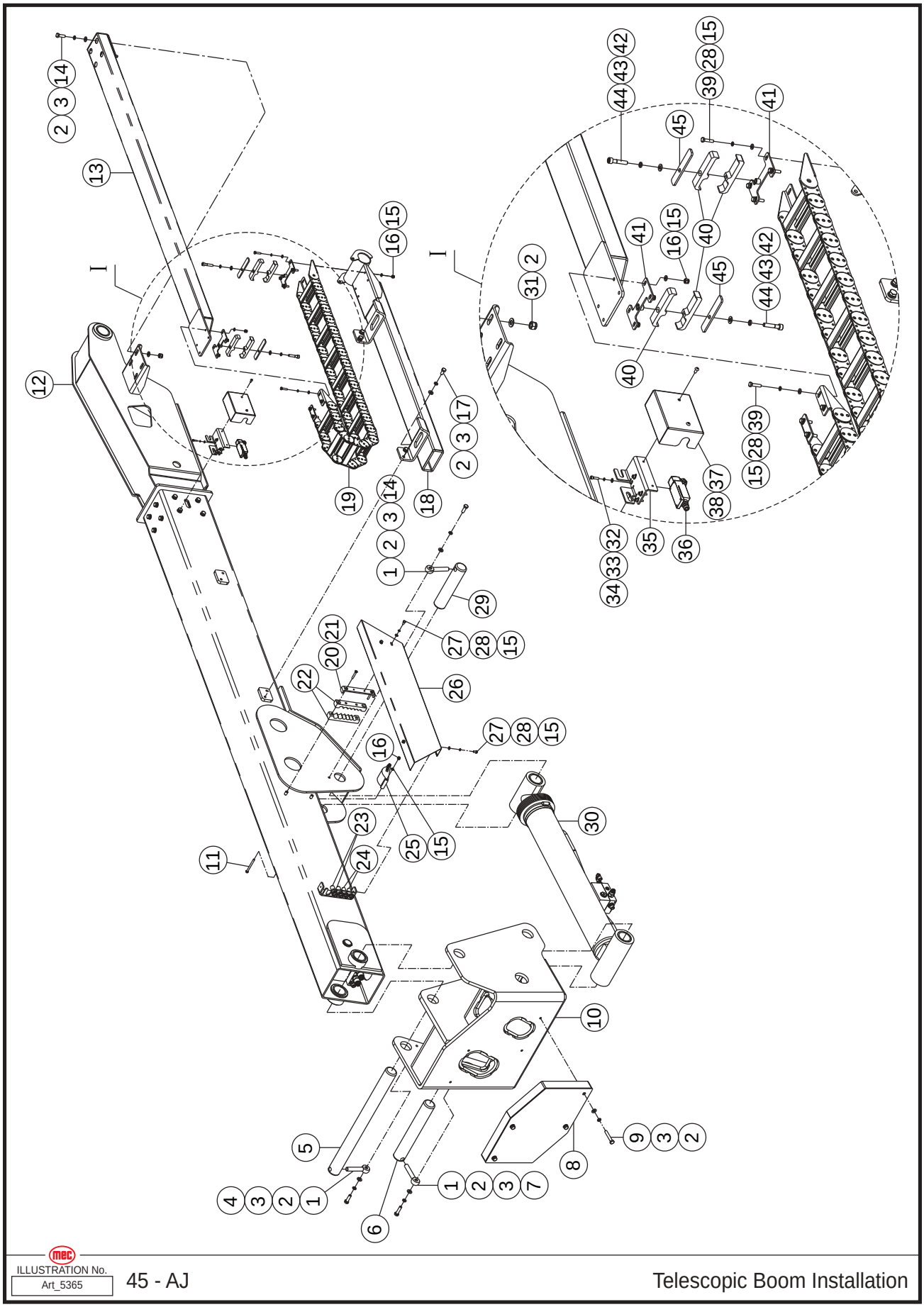


ILLUSTRATION No. Art_5365

45 - AJ

Telescopic Boom Installation

Item	Part Number	Description	Qty.
1	42097	Pin, Lock	3
2	50002	Flat Washer M10	19
3	53054	Spring Washer M10	15
4	50332	HHCS M10 × 35	1
5	42113	Pin, Pivot	1
6	42110	Pin, Pivot	1
7	50035	HHCS M10 × 40	1
8	42281	Cover	1
9	50421	HHCS M10 × 60	4
10	42271	Cage, Connection	1
11	53003	HHCS M6 × 70	2
12	42262	Telescopic Boom Assembly (See page 143 for Breakdown)	1
13	42279	Hose Tube	1
14	50034	HHCS M10 × 30	5
15	50000	Flat Washer M6	20
16	50396	NHEX Nut M6	8
17	50215	HHCS M10 × 20	4
18	42280	Hose Tube	1
19	42367	Cable Track	1
20	42264	Pad, Rubber	1
21	53126	CSCS M6 × 40	2
22	42263	Plate, Clamp	2
23	42627	Fitting, Straight	2
24	42626	Fitting, Straight	2
25	90844	Sensor Angle	1
26	42268	Cover	1
27	42302	Upper Lifting Cylinder Assembly (See page 163 for Breakdown)	1
28	53046	Spring Washer M6	12
29	42747	Pin, Pivot	1
30	42302	Upper Lifting Cylinder Assembly (See page 163 for Breakdown)	1
31	50049	NNYL Nut M10	4
32	53113	SHCS M4 × 16	4
33	53062	Spring Washer M4	4
34	50284	Flat Washer M4	4
35	42327	Plate, Bracket	1
36	42074	Limit Switch	1
37	42269	Cover, Switch	1
38	53175	BHCS M5 X 10	2
39	50117	HHCS M6 × 25	8
40	42266	Plate, Clamp	4
41	42265	Plate, Weldment	2
42	50001	Flat Washer M8	2
43	53055	Spring Washer M8	2
44	53127	SHCS M8 × 40	2
45	42267	Pad, Rubber	2

Telescopic Boom Assembly

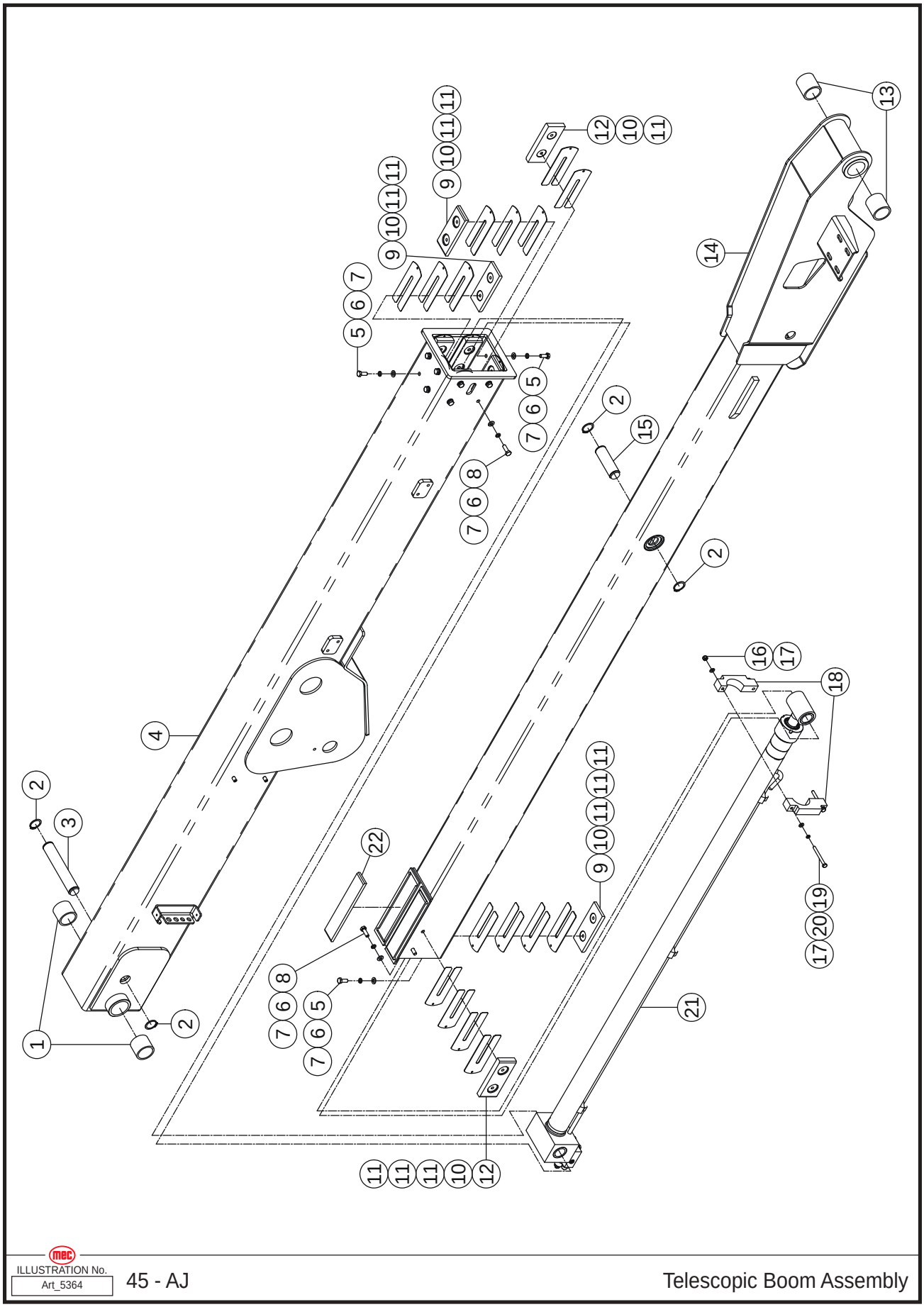


ILLUSTRATION No. Art_5364 45 - AJ Telescopic Boom Assembly

Item	Part Number	Description	Qty.
1	42091	Sleeve Bearing	2
2	42848	Circlips	4
3	42118	Pin, Pivot	1
4	42275	Base Boom	1
5	50033	HHCS M10 × 25	10
6	53054	Spring Washer M10	22
7	50002	Flat Washer M10	22
8	50034	HHCS M10 × 30	12
9	42278	Block, Sliding	5
10	42273	Washer, Adjusting	11
11	42273	Washer, Adjusting	21
12	42277	Block, Sliding	6
13	42092	Bearing, Composite	2
14	42276	Second Boom	1
15	42116	Pin, Pivot	1
16	53014	NHEX Nut M8	2
17	50001	Flat Washer M8	4
18	42322	Bracket	2
19	50018	HHCS M8 × 80	2
20	53055	Spring Washer M8	2
21	42299	Telescope Cylinder Assembly (See page 165 for Breakdown)	1
22	42274	Block, Sliding	2

Jib Assembly Installation

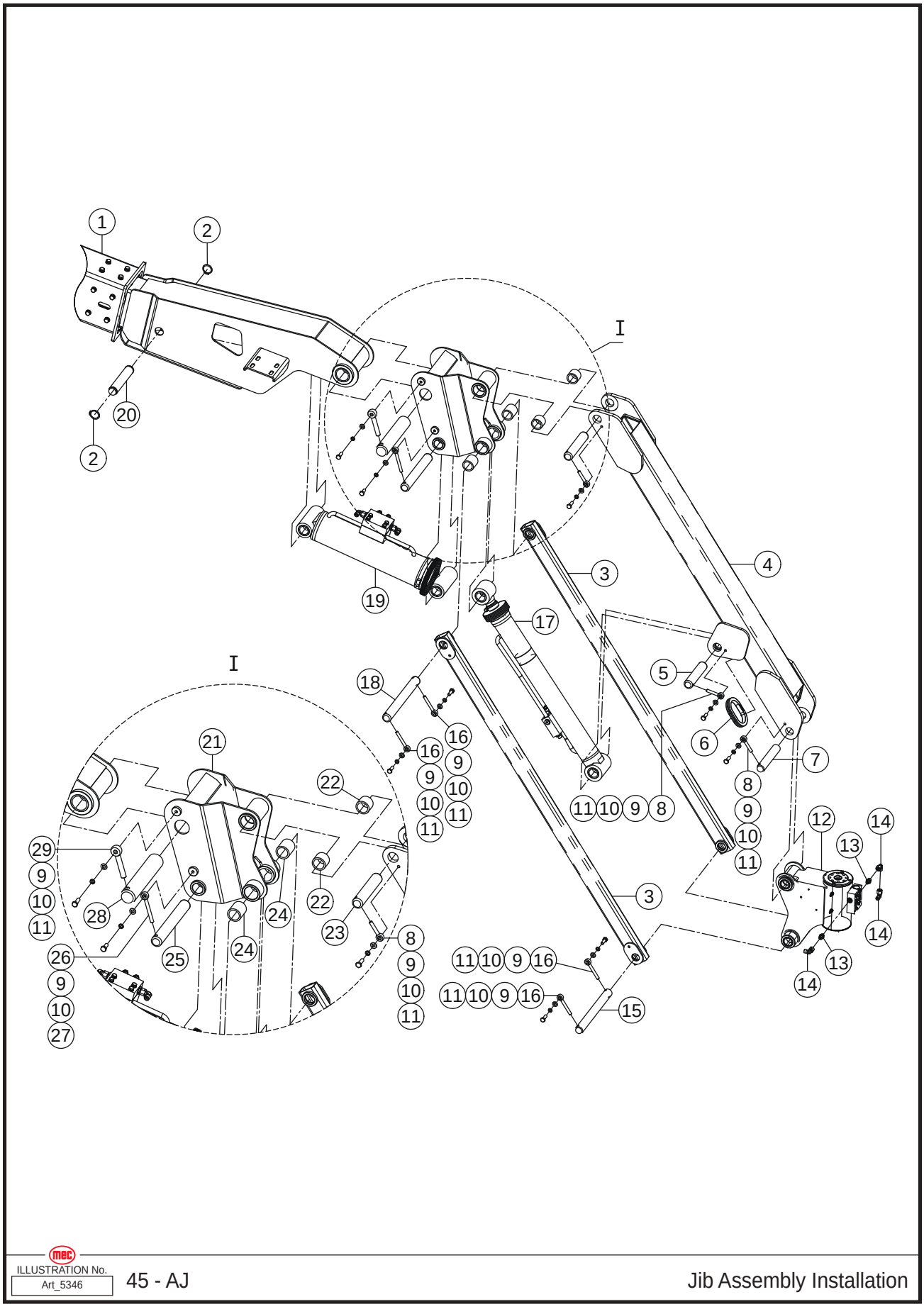


ILLUSTRATION No. Art_5346 45 - AJ Jib Assembly Installation

Item	Part Number	Description	Qty.
1	42254	Boom Assembly (See page 139 for Breakdown)	1
2	42848	Circlips	2
3	42285	Linker, Lower	2
4	42283	Jib Boom	1
5	42103	Pin, Pivot	1
6	41370	Sheath (Trim Lock)	2
7	42102	Pin, Pivot	1
8	42619	Pin, Lock	3
9	50002	Flat Washer M10	9
10	53054	Spring Washer M10	9
11	50034	HHCS M10 × 30	8
12	42051	Rotary Actuator	1
--	42850	Housing/Ring Gear Assembly	1
--	42851	Counterbalance Valve	1
--	42852	Seal Kit for Air Cleaner	1
13	42602	Fitting, Straight	2
14	42142	Fitting, 90°	3
15	42114	Pin, Pivot	1
16	41431	Pin, Lock	4
17	42305	Jib Cylinder Assembly (See page 169 for Breakdown)	1
18	42115	Pin, Pivot	1
19	42304	Slave Cylinder Assembly (See page 167 for Breakdown)	1
20	42117	Pin, Pivot	1
21	42284	Jib Base	1
22	42089	Bearing, Composite	2
23	42104	Pin, Pivot	1
24	41595	Bearing	2
25	42105	Pin, Pivot	1
26	42752	Pin, Lock	1
27	50033	HHCS M10 × 25	1
28	42748	Pin, Pivot	1
29	42097	Pin, Lock	1

Platform Assembly Installation

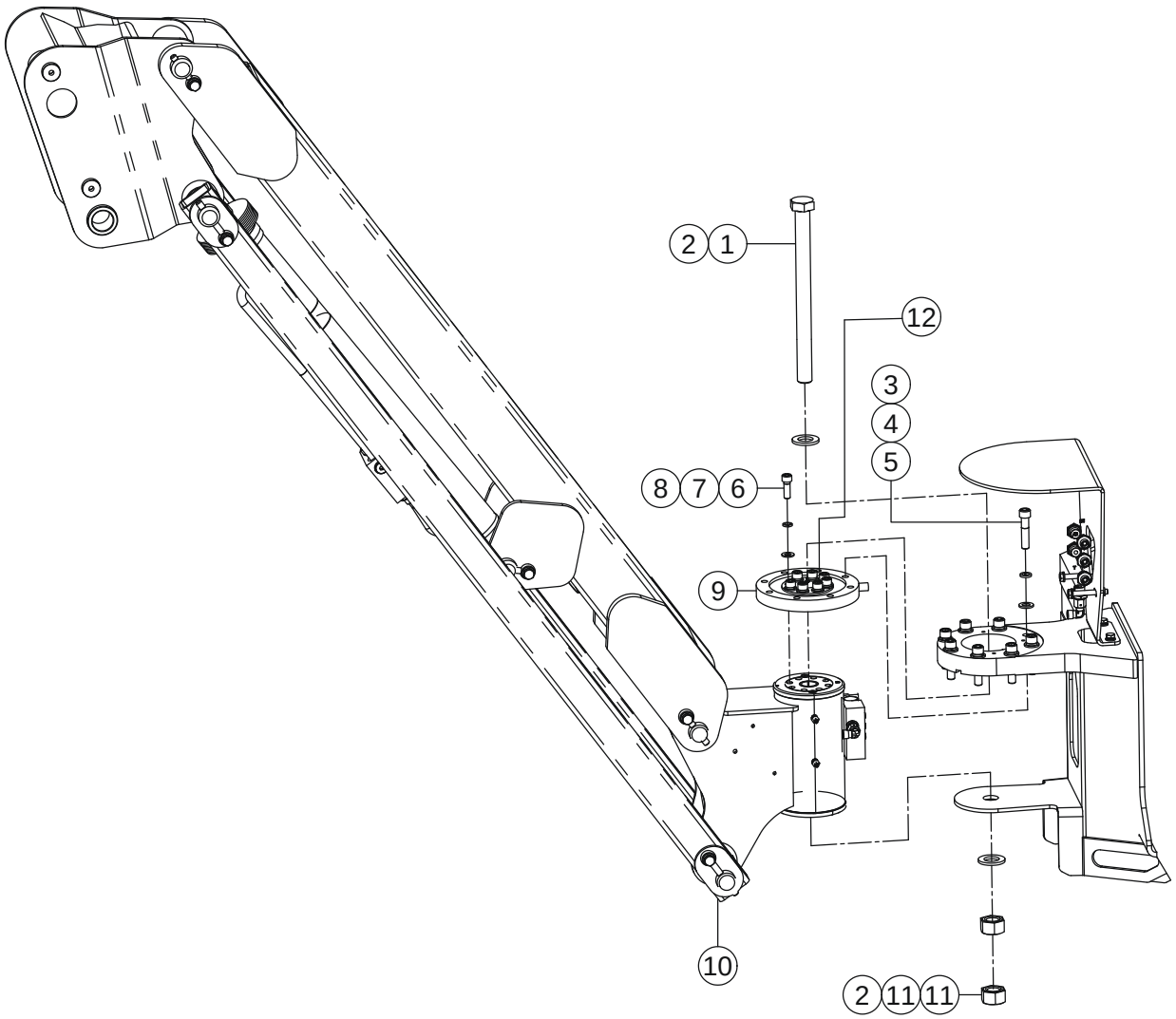


ILLUSTRATION No. Art_5376 45 - AJ Platform Assembly Installation

Item	Part Number	Description	Qty.
1	53182	Bolt M24 × 300	1
2	53158	Flat Washer 24	2
3	50003	Flat Washer 12	8
4	53148	Spring Washer 12	8
5	53176	Screw M12 × 55	8
6	50127	Screw M10 × 30	8
7	53054	Spring Washer 10	8
8	50002	Flat Washer 10	8
9	42523	Bracket, Link	1
10	REF	Jib Assembly Installation (See page 145 for Breakdown)	1
11	50463	NHEX Nut M24	2
12	42381	Hose Retainer (Not Shown)	1

REF - Reference

Platform Assembly

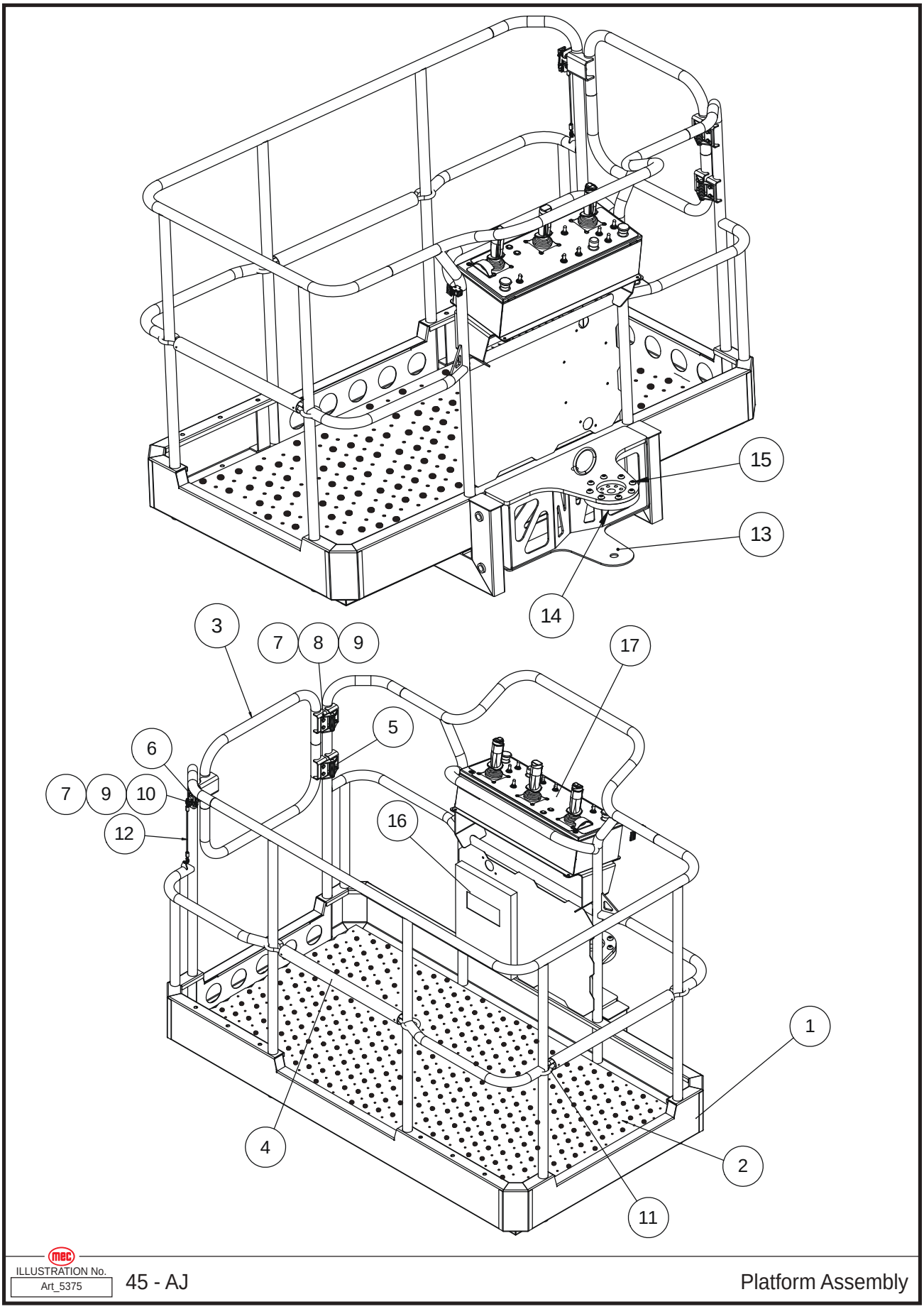


ILLUSTRATION No. Art_5375 45 - AJ Platform Assembly

Item	Part Number	Description	Qty.
1	28550	Platform, Weldment, 6 Foot	1
2	42568	Deck Plate	3
3	28520	Platform, Swing Gate Weldment	1
4	42563	Sliding Lift Gate	2
5	91888	Gate Hinge	2
6	42337	Latch	1
7	50000	WSHR M06 ZP Standard Flat	10
8	50028	HHCS M06-1.00 × 020 08 ZP F	8
9	50047	NNYL M06 × 1.00 08 ZP NYLOCK	10
10	50327	HHCS M06-1.00 × 035 08 ZP P	2
11	42563	Sliding Lift Gate	2
12	28528	Platform, Swing Gate Latch Cable Assembly	1
13	18189	Platform Mount, Weldment	REF
14	28698	Sensor, Load Ring Plate	REF
15	53018	BHCS M12 - 1.75 × 35, 12.9, ZP	REF
16	8909	Enclosure Service Manual	REF
17	28916	Subassembly, Upper Control Box, Diesel	REF

REF - Reference

Upper Control Box

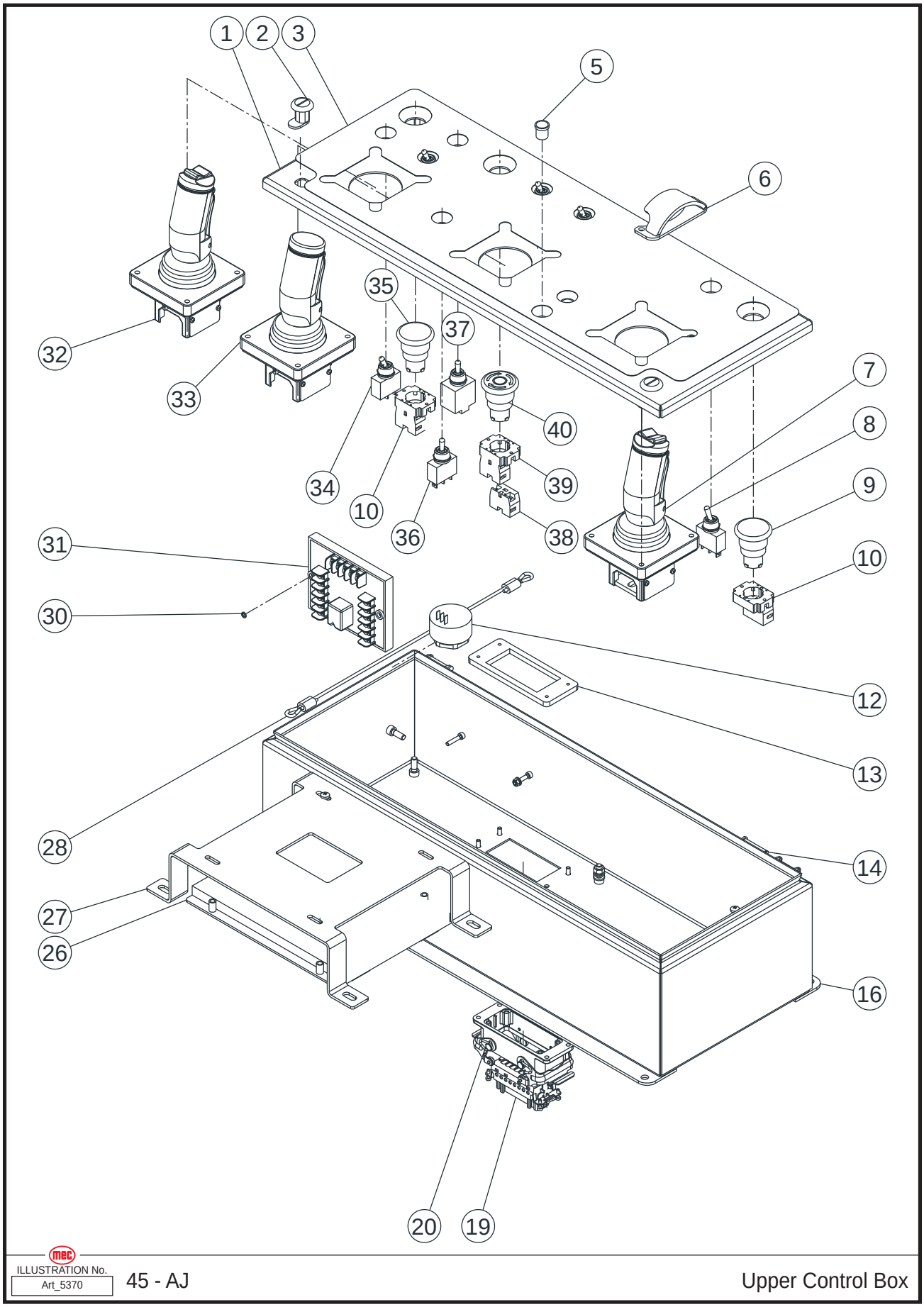


ILLUSTRATION No. Art_5370 45 - AJ Upper Control Box

Item	Part Number	Description	Qty.
1	42749	Lid, Platform Control Box	1
2	42746	Lock, Column	2
3	94460	Decal, Platform Control Panel	1
4	--	--	--
5	92253	Indicator	2
6	18494	Weldment, Palm Rest	1
7	94118	Joystick, Single Axis	1
8	6234	Switch, Toggle	3
9	92421	Horn Button	1
10	90714	Base	3
11	--	--	--
12	41961	Alarm	1
13	42755	Support, Connector	1
14	42757	Pin	2
15	--	--	--
16	42758	Body, Platform Control Box	1
17	--	--	--
18	--	--	--
19	94750	Female Insert	1
20	94751	Housing	1
21	--	--	--
22	--	--	--
23	--	--	--
24	--	--	--
25	--	--	--
26	92027	Controller GP440	1
27	42759	Bracket, Controller	1
28	42763	Cable Assembly	1
29	--	--	--
30	--	--	--
31	91838	TBM Module	1
32	93772	Joystick Boom	1
33	93773	Joystick Platform	1
34	7423	Toggle Switch EM Power	1
35	92422	Enable Button	1
36	91954	Toggle Switch Lever	1
37	92427	Toggle Switch Start	1
38	8082	Contact Block N/C	1
39	8083	Contact Block N/O	2
40	92408	E-Stop Head	1

Upper Control Box Assembly

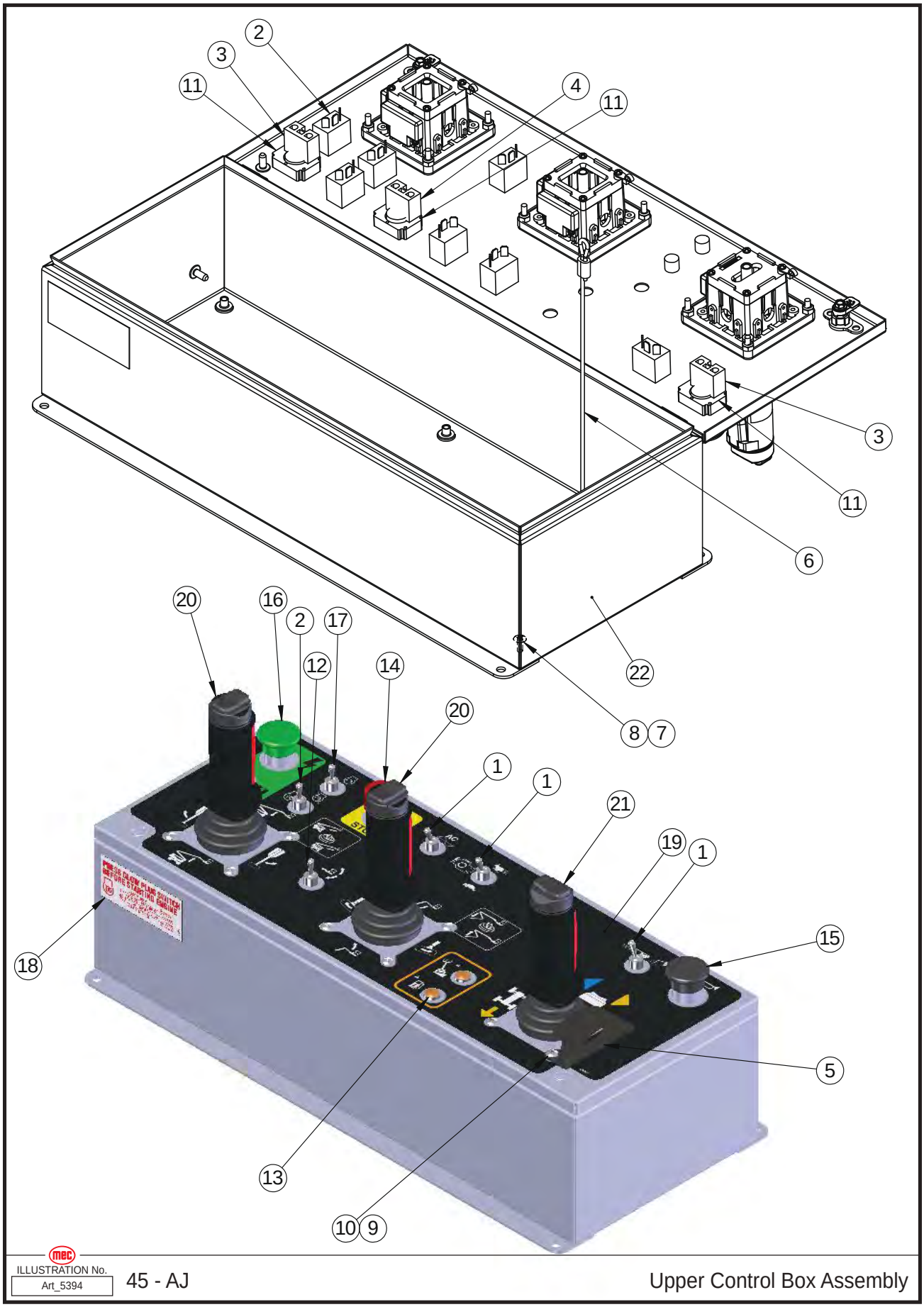


ILLUSTRATION No. Art_5394 45 - AJ Upper Control Box Assembly

Item	Part Number	Description	Qty.
1	6234	Switch Toggle 1 Pole 2 Pos	3
2	7423	On-Mom Toggle Switch	2
3	8082	Block Contact N.O.	2
4	8083	Block Contact N.C.	1
5	28542	Palm Rest Weldment	1
6	28785	Cable Assembly, Upper Control Box Lid Leash	1
7	50000	WSHR M06 ZP Standard Flat	1
8	50191	THMS #10-32X00.50 ZP	1
9	50238	NNYL #10-32 05 Z	12
10	50330	THMS #10-32X01.00 ZP	12
11	90714	Switch/Button Base Mount	3
12	91954	Toggle Switch Mom-Off-Mom	1
13	92253	Orange Light	2
14	92408	Push Button, E-Stop, Red	1
15	92421	Black Button	1
16	92422	Green Button	1
17	92427	Off-On-Mom Toggle Switch	1
18	93572	Decal - Glow Plug, ANSI/CSA	1
19	94460	Upper Controls Decal	1
20	94685	Dual Axis Joystick W/Trig & F/A Rocker PQ Controls 212N38-246	2
21	94687	Single Axis Joystick W/Trig & R/L Rocker PQ Controls 112N38-245	1
22	A00301	Control Box, Upper, Machined, Diesel	1

Transition Manifold Assembly with Fittings

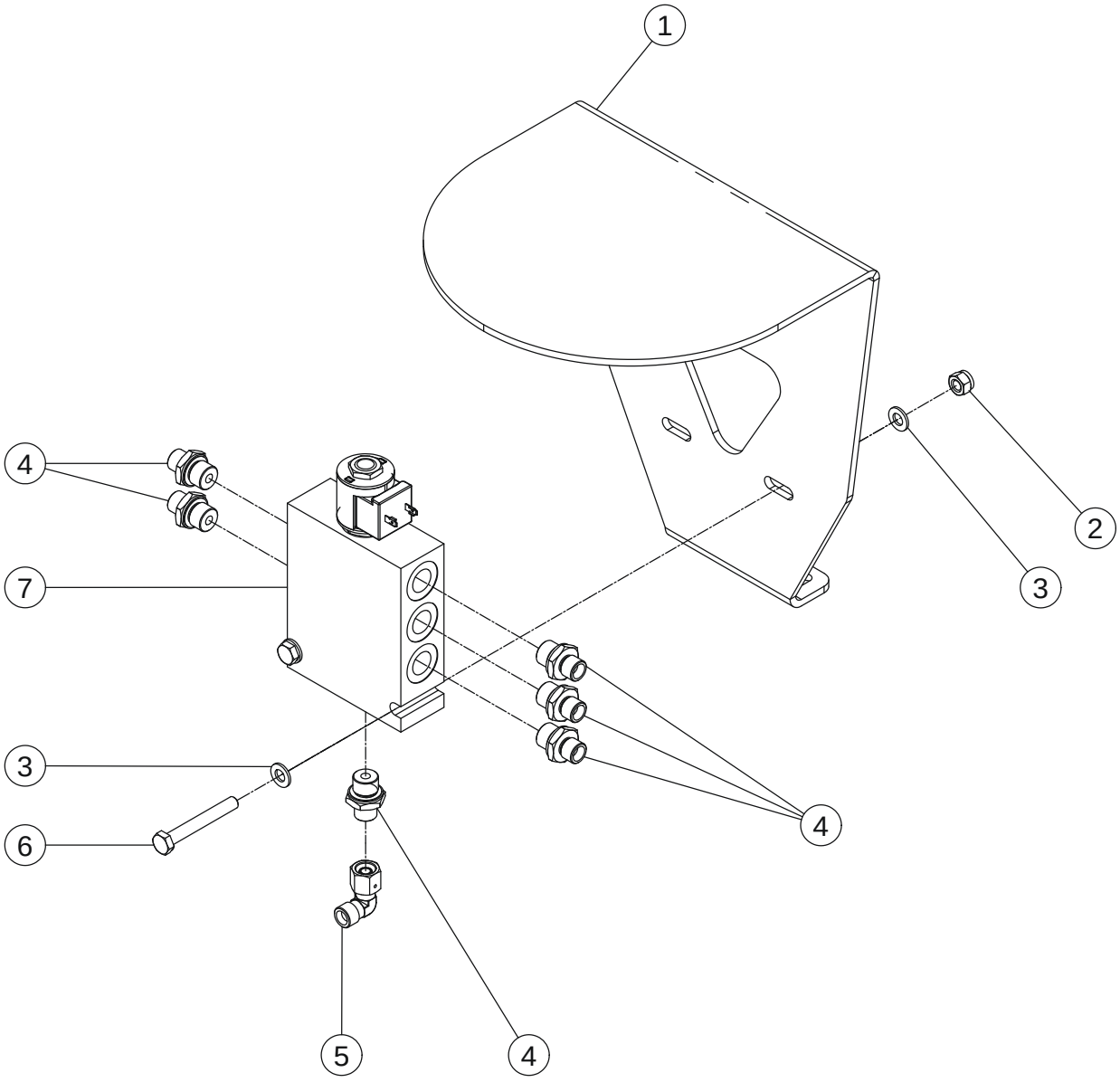


ILLUSTRATION No. Art_5366 45 - AJ Transition Manifold Assembly with Fittings

Item	Part Number	Description	Qty.
1	42657	Bracket	1
2	53014	NHEX Nut M8	2
3	50001	Flat Washer M8	4
4	42567	Fitting, Straight	6
5	42142	Fitting, 90°	1
6	50017	HHCS M8 × 60	2
7	42037	Transition Manifold Assembly (See page 157 for Breakdown)	1

Transition Manifold Assembly

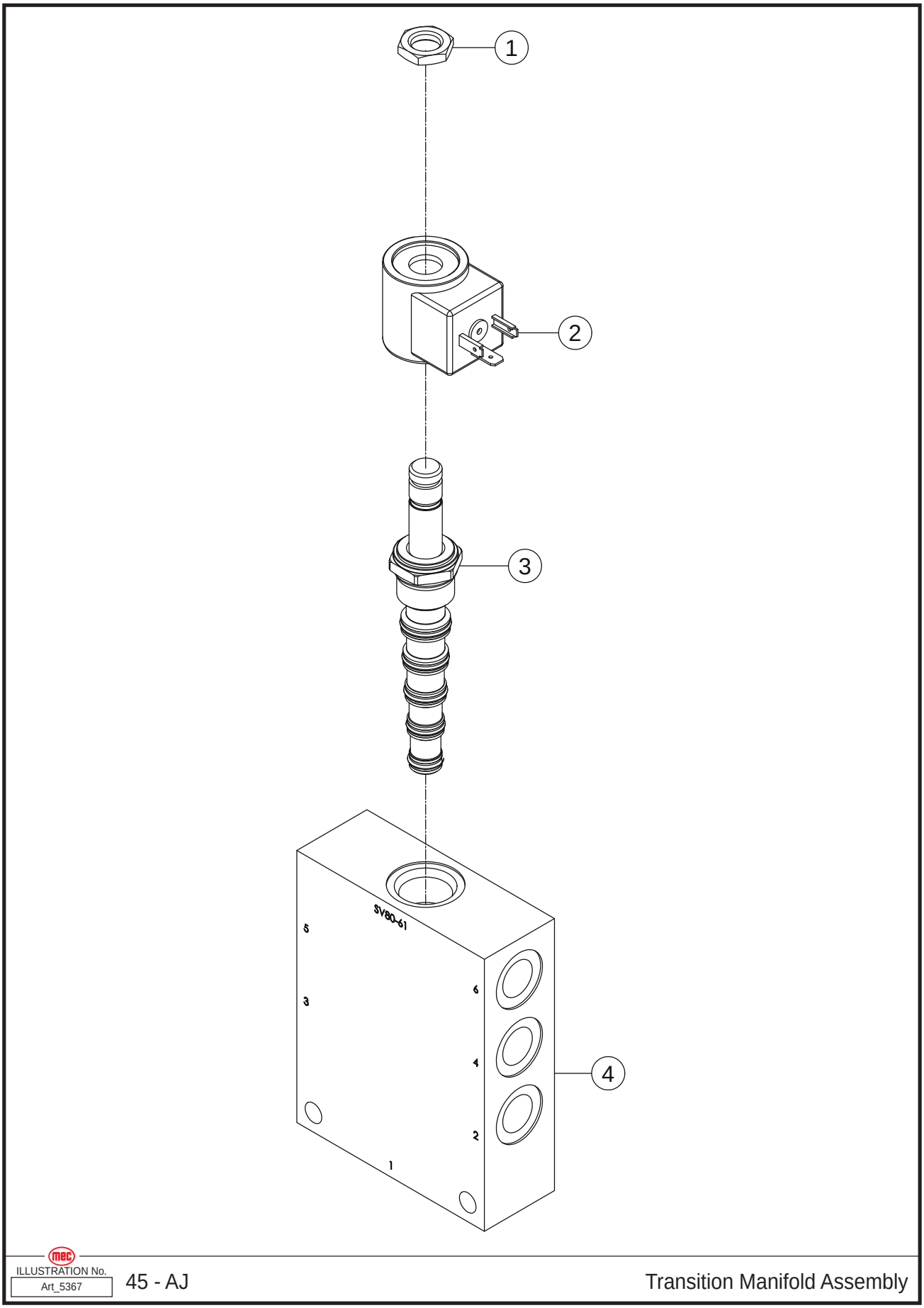


ILLUSTRATION No. Art_5367

45 - AJ

Transition Manifold Assembly

Item	Part Number	Description	Qty.
1	42795	Nut	1
2	42796	Coil	1
3	42858	Cartridge Without Coil	1
4	42859	Body	1

Lower Lifting Cylinder Assembly

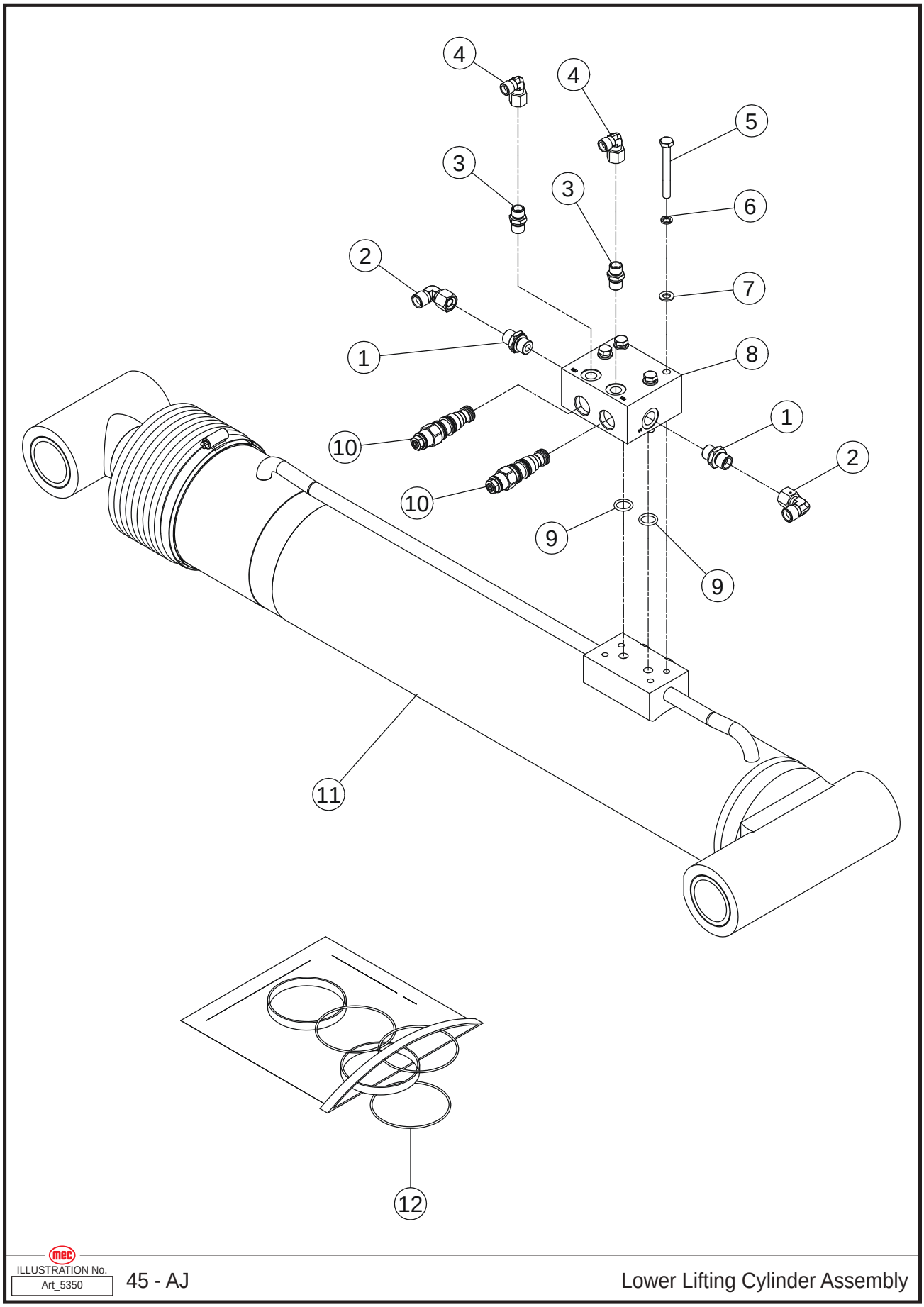


ILLUSTRATION No. Art_5350 45 - AJ Lower Lifting Cylinder Assembly

Item	Part Number	Description	Qty.
1	42537	Fitting, Straight	2
2	42143	Fitting, 90°	2
3	41181	Fitting, Straight	2
4	42142	Fitting, 90°	2
5	50550	HHCS M8 × 70	4
6	53055	Spring Washer M8	4
7	50001	Flat Washer M8	4
8	42555	Body	1
9	42556	O-Ring 15.54 × 2.62	2
10	42122	Cartridge, Valve (Counterbalance)	2
11	42300	Lower Lift Cylinder	1
12	42557	Seal Kit	1

Mid Lifting Cylinder Assembly

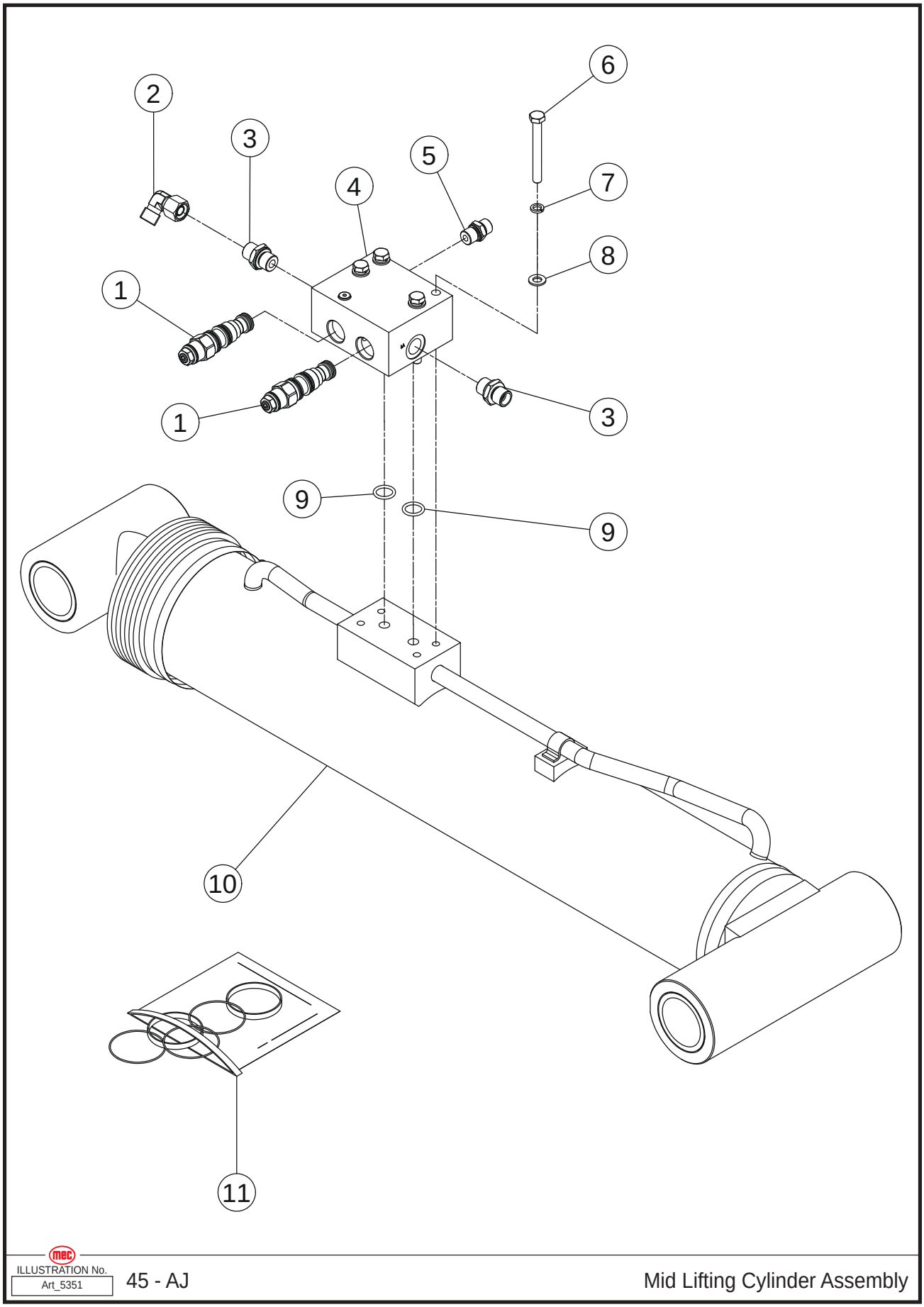


ILLUSTRATION No. Art_5351 45 - AJ Mid Lifting Cylinder Assembly

Item	Part Number	Description	Qty.
1	42122	Cartridge, Valve (Counterbalance)	2
2	42143	Fitting, 90°	1
3	42537	Fitting, Straight	2
4	42558	Body	1
5	41181	Fitting, Straight	1
6	50550	HHCS M8 × 70	4
7	53055	Spring Washer M8	4
8	50001	Flat Washer M8	4
9	42556	O-Ring 15.54 × 2.62	2
10	42301	Boom Lift Cylinder	1
11	42559	Seal Kit	1

Upper Lifting Cylinder Assembly

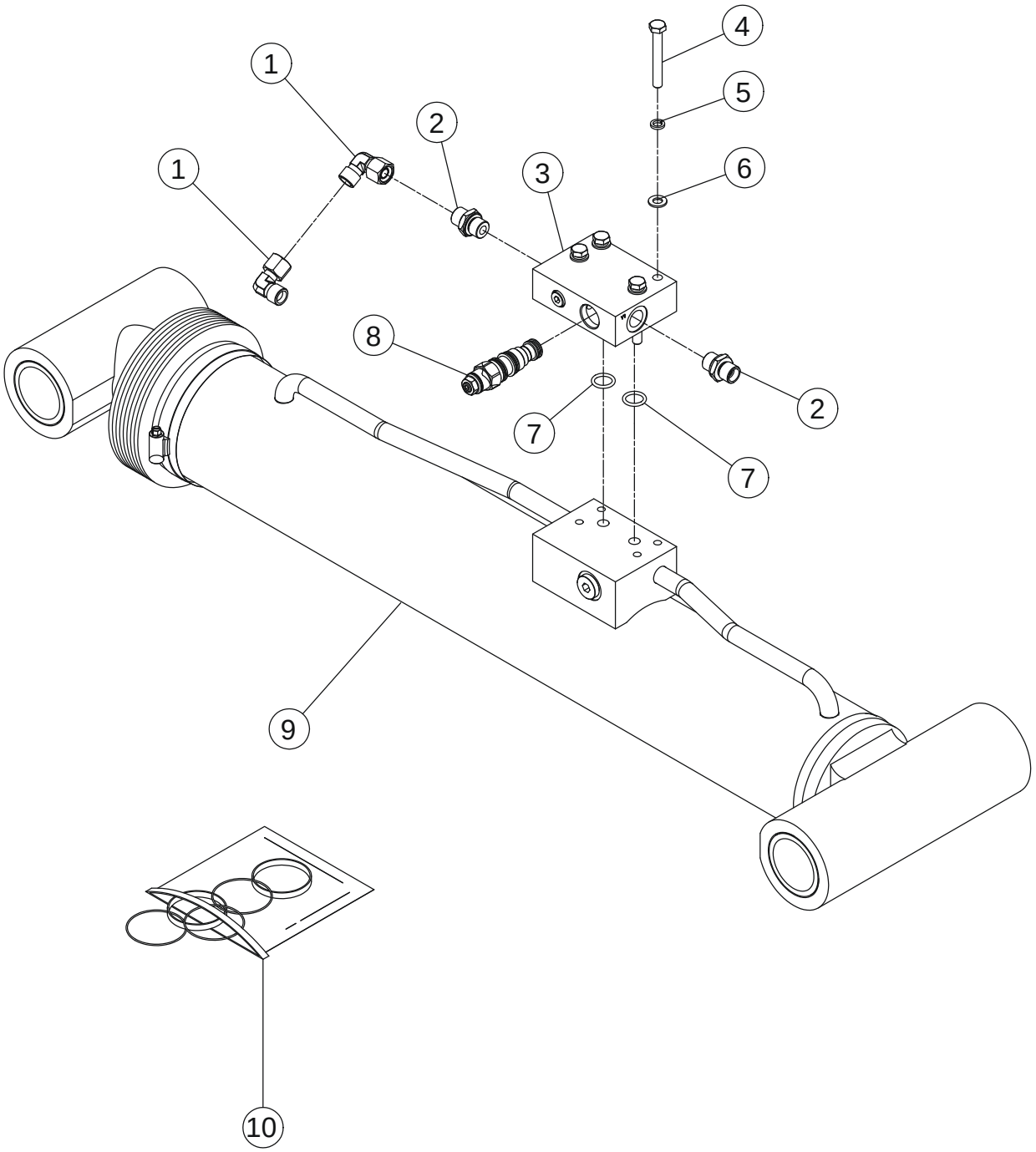


ILLUSTRATION No. Art_5369 45 - AJ Upper Lifting Cylinder Assembly

Item	Part Number	Description	Qty.
1	42143	Fitting, 90°	2
2	42537	Fitting, Straight	2
3	42560	Body	1
4	50017	HHCS M8 × 60	4
5	53055	Spring Washer M8	4
6	50001	Flat Washer M8	4
7	42556	O-Ring 15.54 × 2.62	2
8	42122	Cartridge, Valve (Counterbalance)	1
9	42302	Lift Cylinder	1
10	42561	Seal Kit	1

Telescope Cylinder Assembly

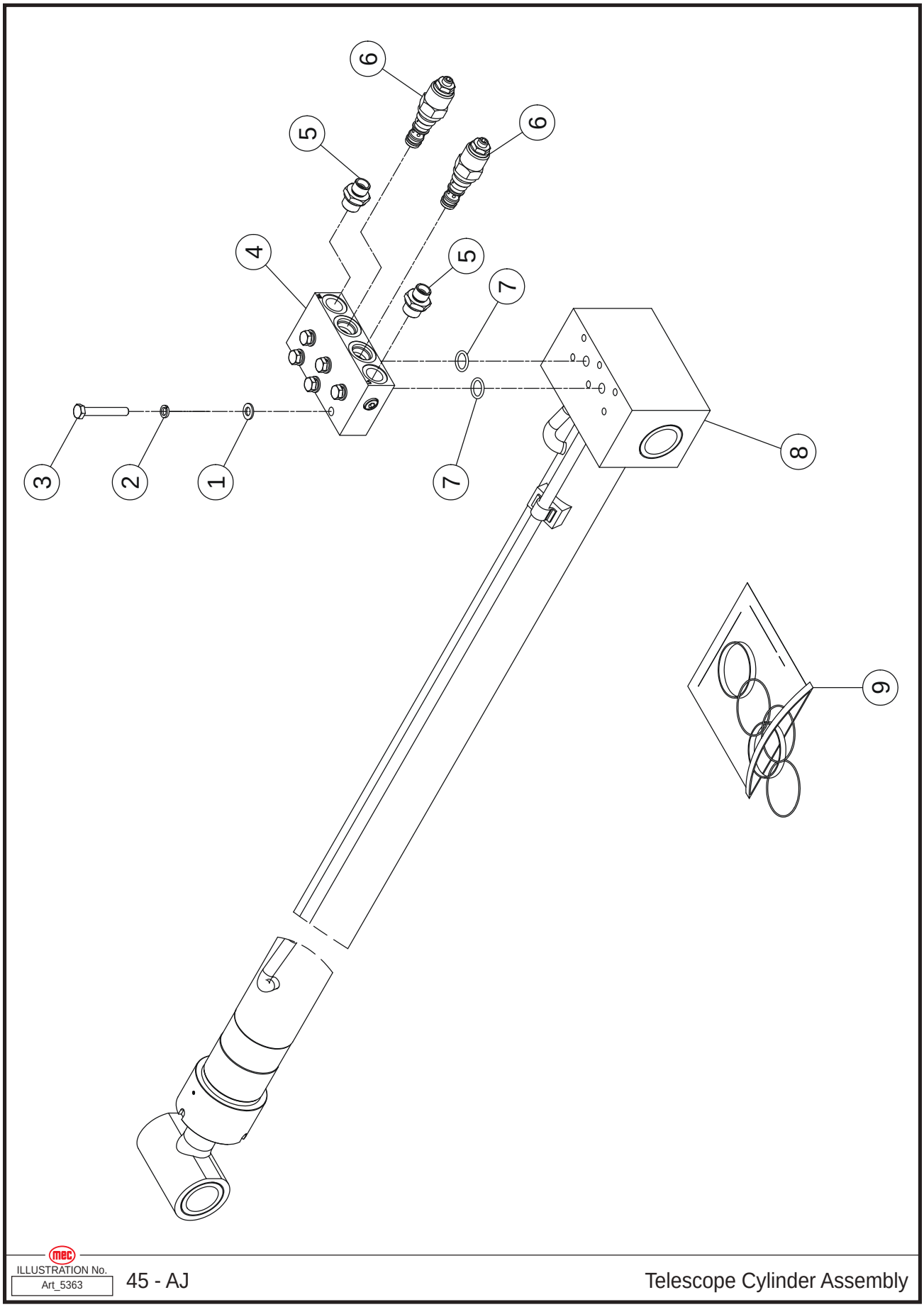


ILLUSTRATION No. Art_5363 45 - AJ Telescope Cylinder Assembly

Item	Part Number	Description	Qty.
1	50001	Flat Washer M8	6
2	53055	Spring Washer M8	6
3	50016	HHCS M8 × 55	6
4	42562	Body	1
5	42546	Fitting, Straight	2
6	42017	Control Balance Valve	2
7	42556	O-Ring 15.54 × 2.62	2
8	42303	Telescope Cylinder	1
9	42564	Seal Kit	1

Slave Cylinder Assembly

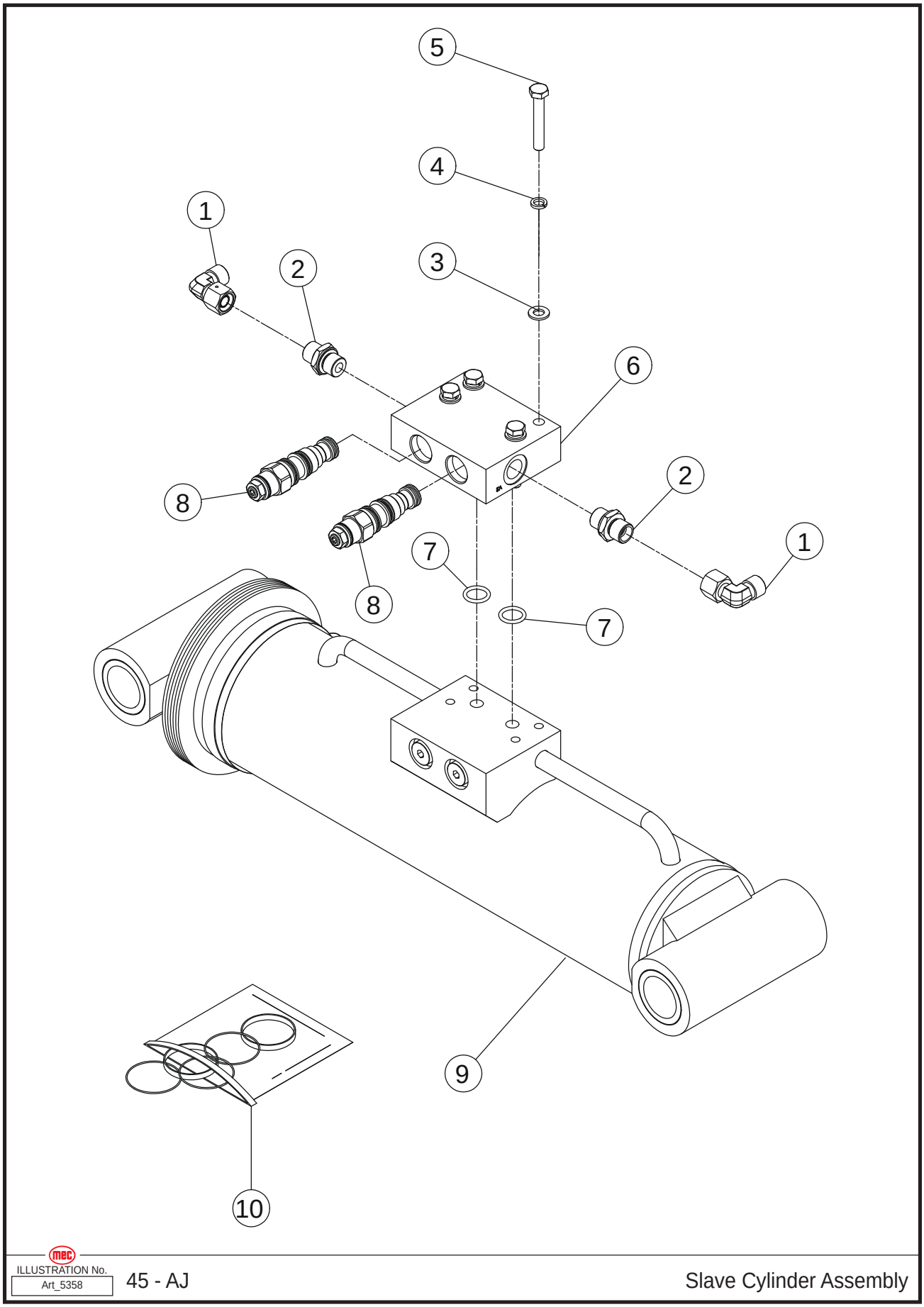
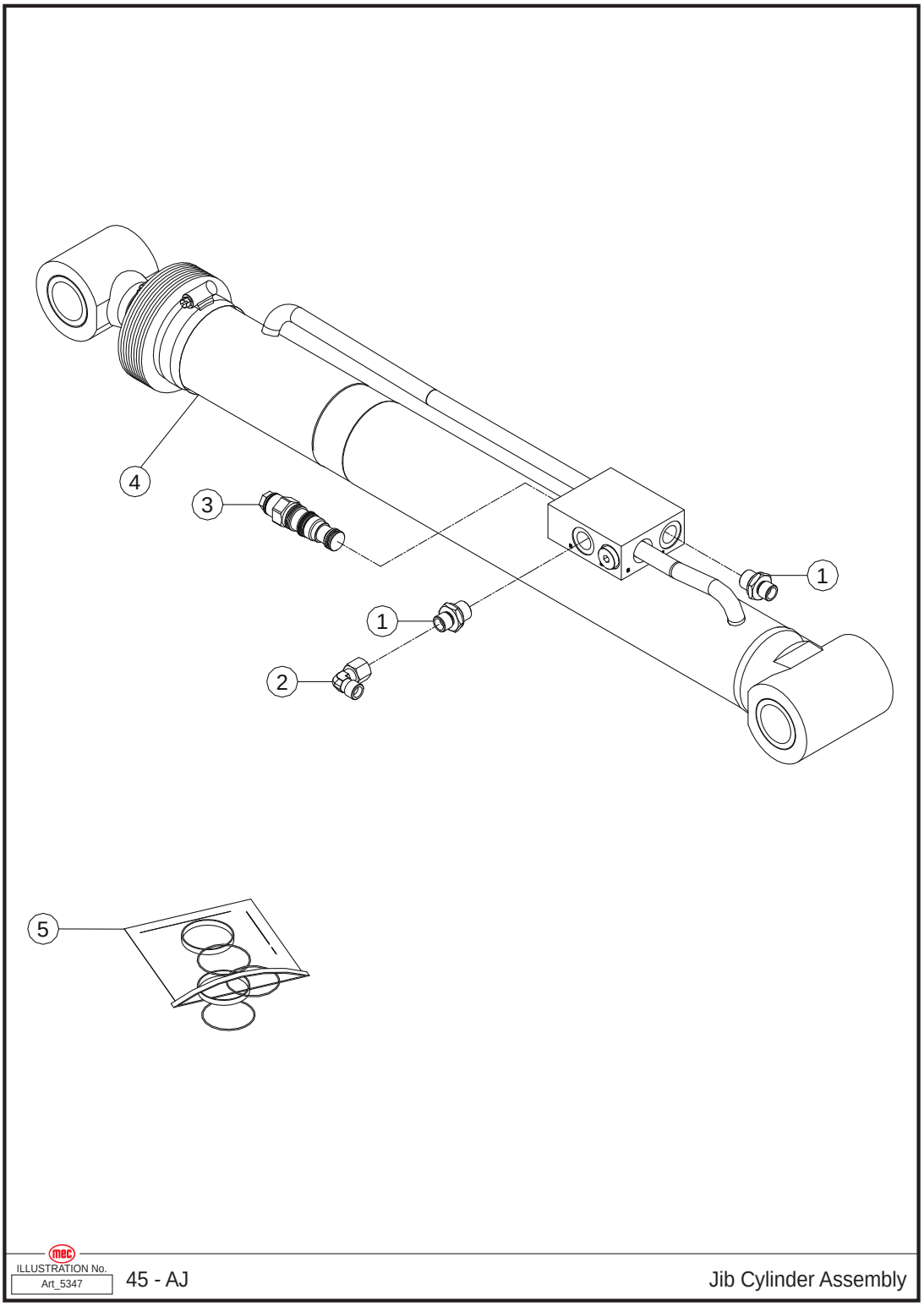


ILLUSTRATION No. Art_5358 45 - AJ Slave Cylinder Assembly

Item	Part Number	Description	Qty.
1	42143	Fitting, 90°	2
2	42537	Fitting, Straight	2
3	50001	Flat Washer M8	4
4	53055	Spring Washer M8	4
5	50015	HHCS M8 × 50	4
6	42565	Body	1
7	42556	O-Ring 15.54 × 2.62	2
8	42122	Cartridge, Valve (Counterbalance)	2
9	42304	Level Cylinder	1
10	42566	Seal Kit	1

Jib Cylinder Assembly



Item	Part Number	Description	Qty.
1	42567	Fitting, Straight	2
2	42142	Fitting, 90°	1
3	42121	Counterbalance Valve	1
4	42305	Jib Cylinder	1
5	42557	Seal Kit	1

Left Axle Lockout Cylinder Assembly

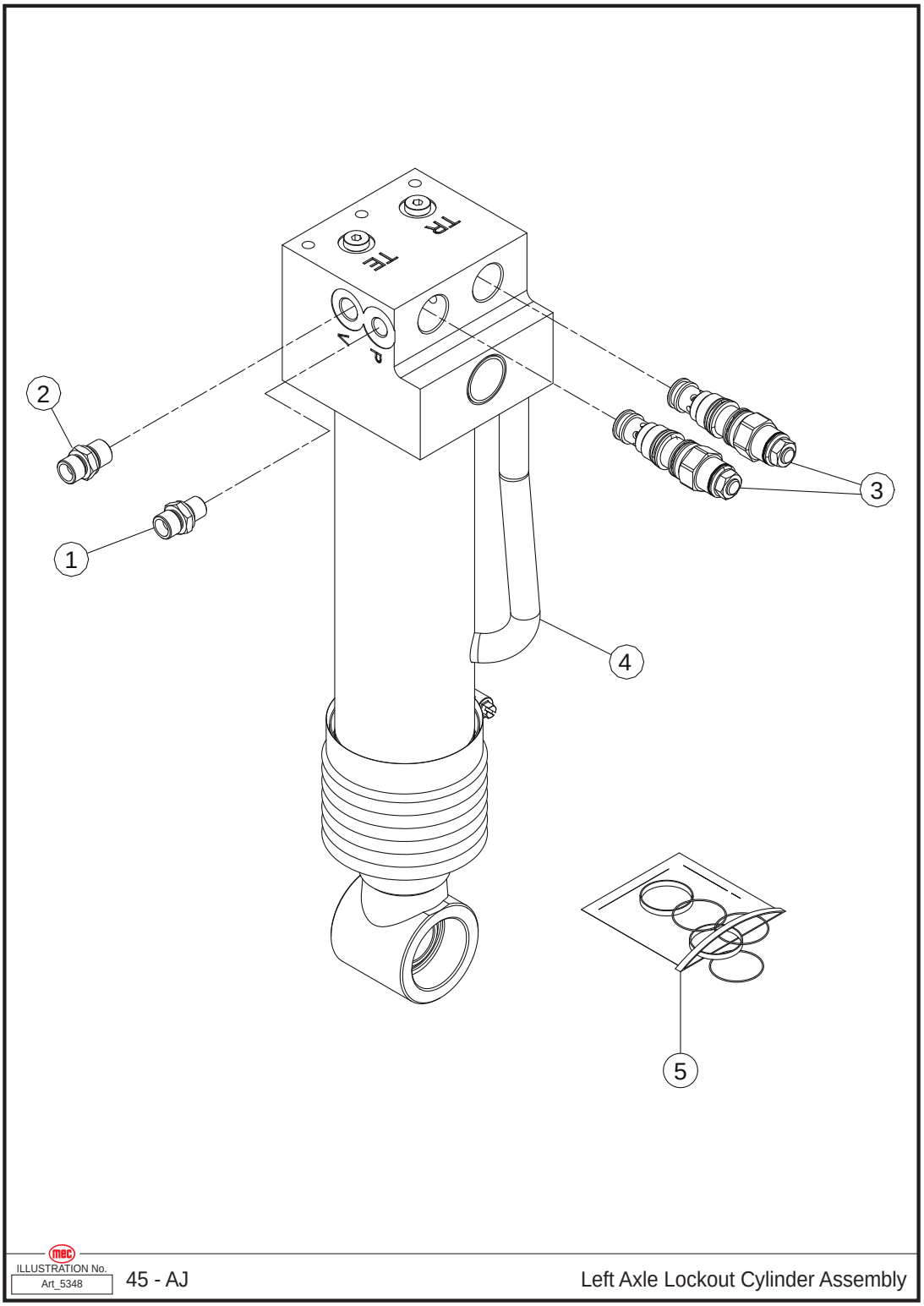
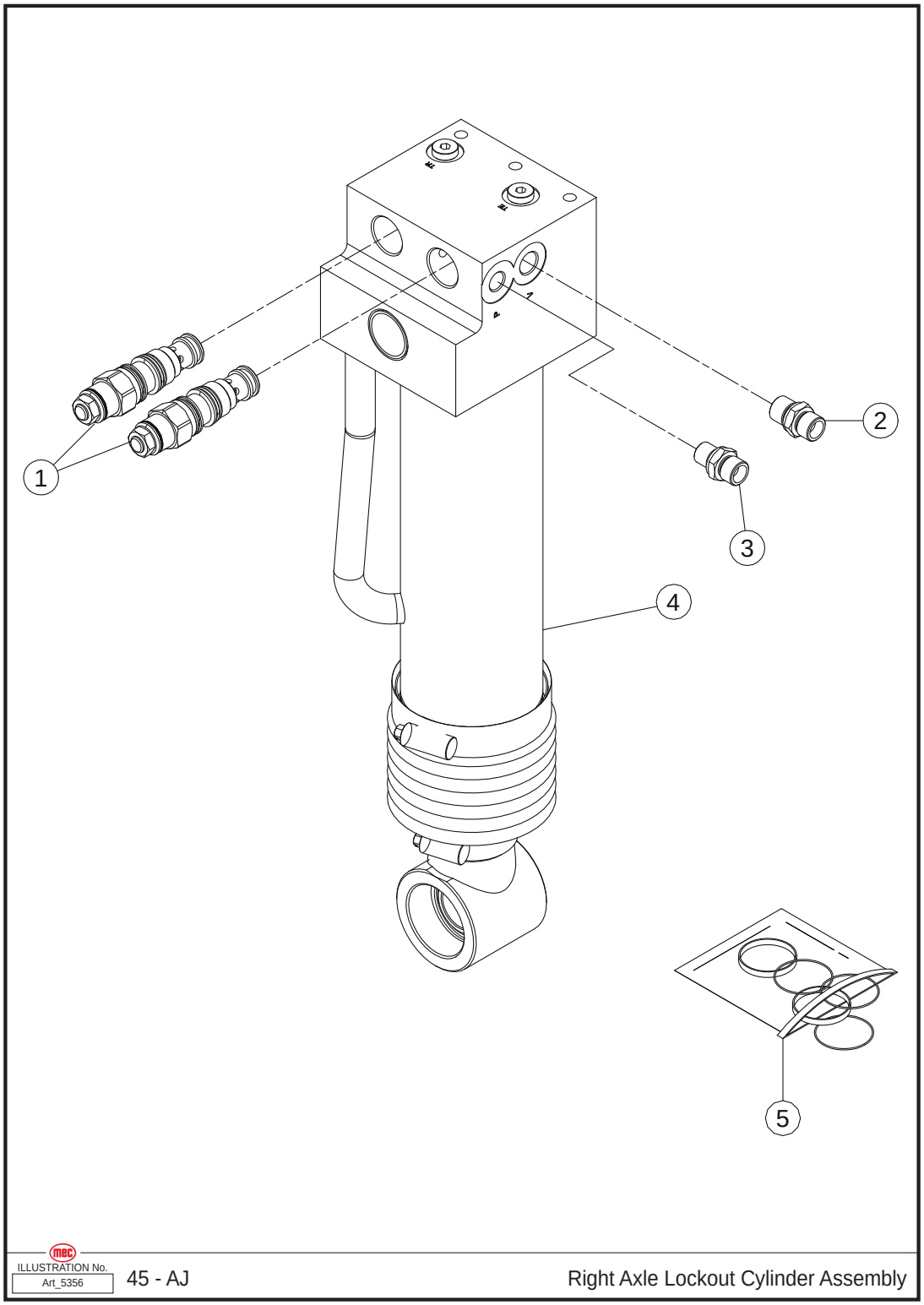


ILLUSTRATION No. Art_5348 45 - AJ Left Axle Lockout Cylinder Assembly

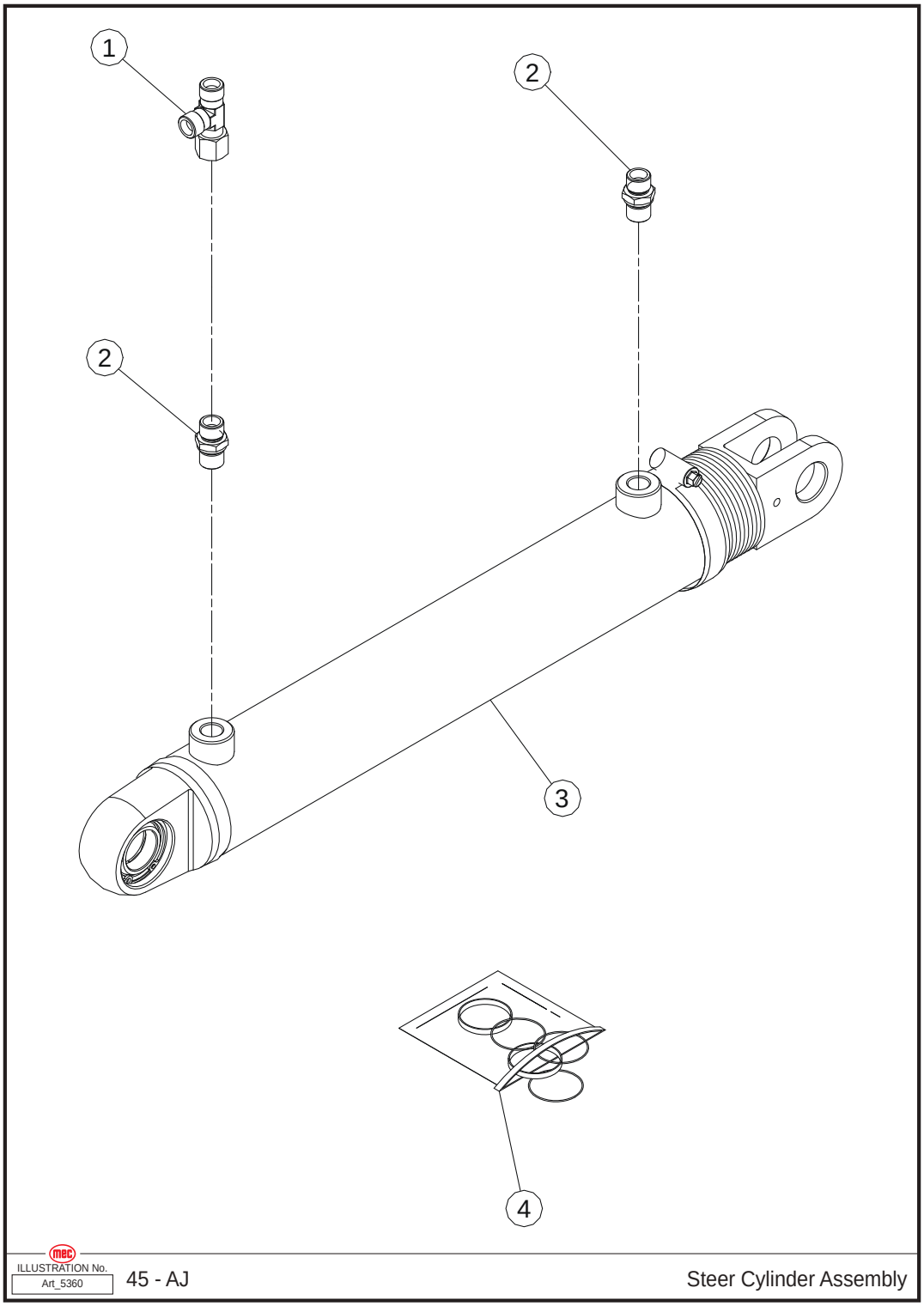
Item	Part Number	Description	Qty.
1	42569	Fitting, Straight	1
2	41181	Fitting, Straight	1
3	42123	Counterbalance Valve	2
4	42306	Left Oscillate Cylinder	1
5	42571	Seal Kit	1

Right Axle Lockout Cylinder Assembly



Item	Part Number	Description	Qty.
1	42123	Counterbalance Valve	2
2	41181	Fitting, Straight	1
3	42569	Fitting, Straight	1
4	42307	Right Oscillate Cylinder	1
5	42571	Seal Kit	1

Steer Cylinder Assembly



Item	Part Number	Description	Qty.
1	42136	Fitting, Tee	1
2	41181	Fitting, Straight	2
3	42308	Steering Cylinder	1
4	42573	Seal Kit	1

REF - Reference

Electrical Harness, Part 1

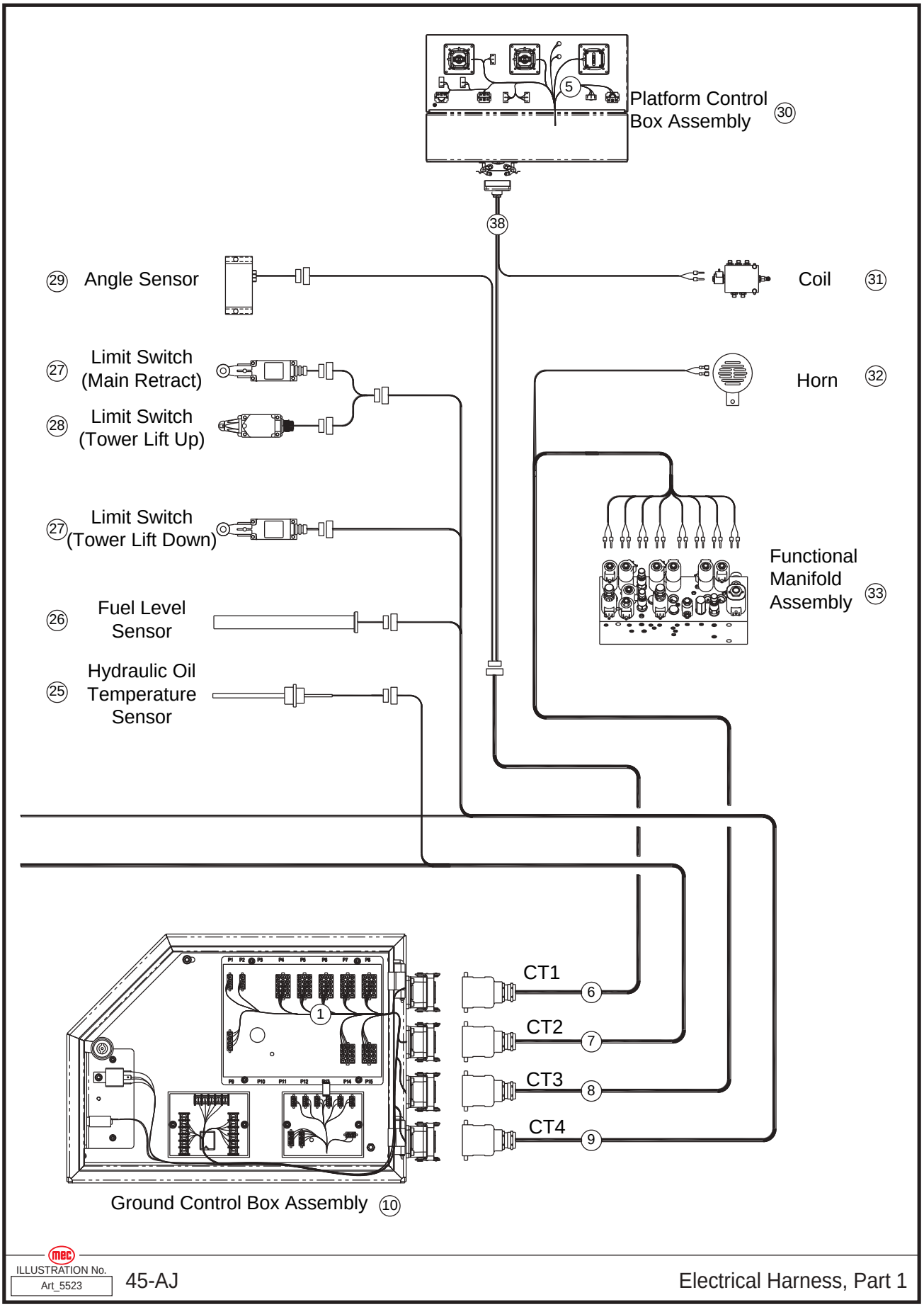
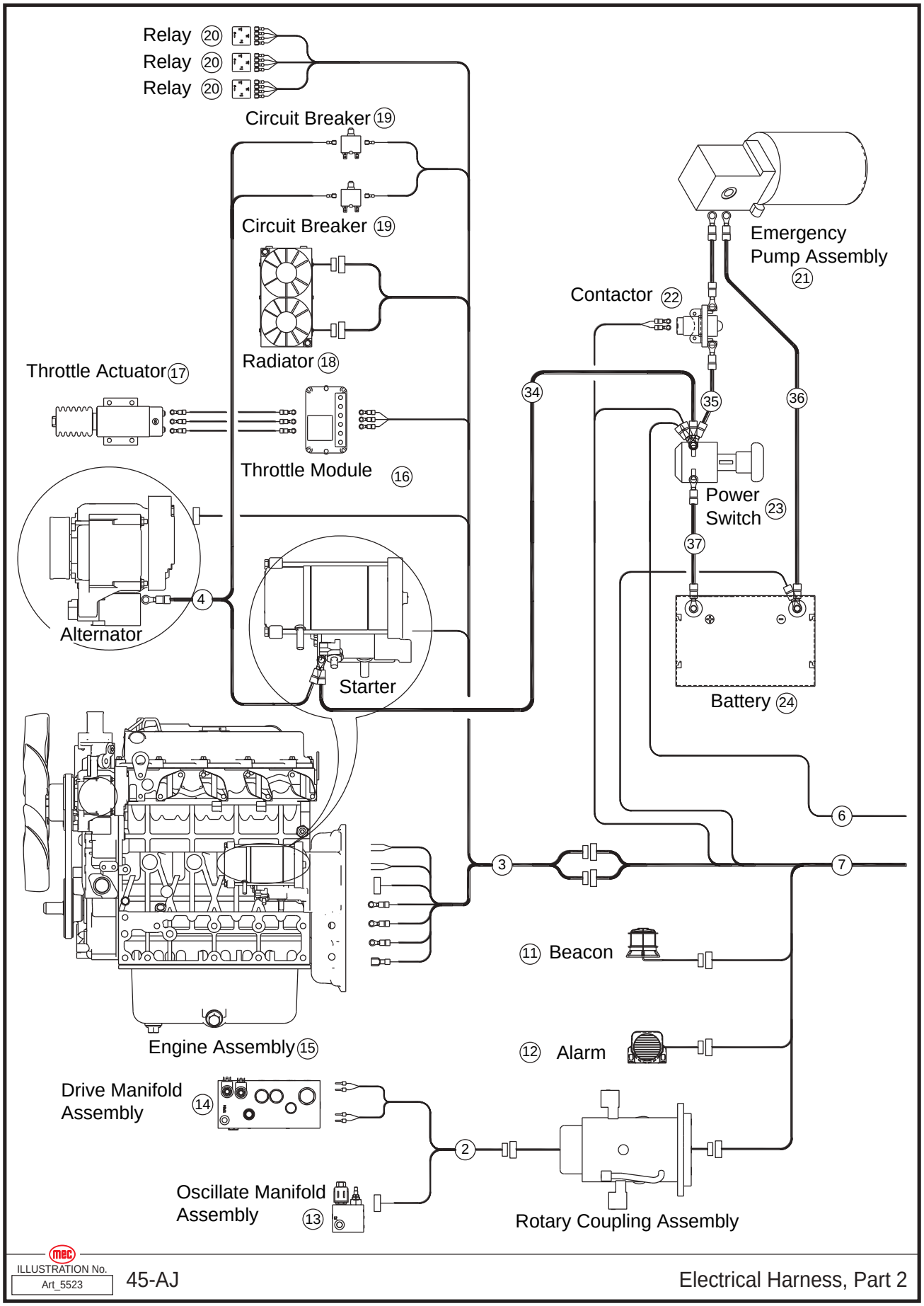


ILLUSTRATION No. Art_5523 45-AJ Electrical Harness, Part 1

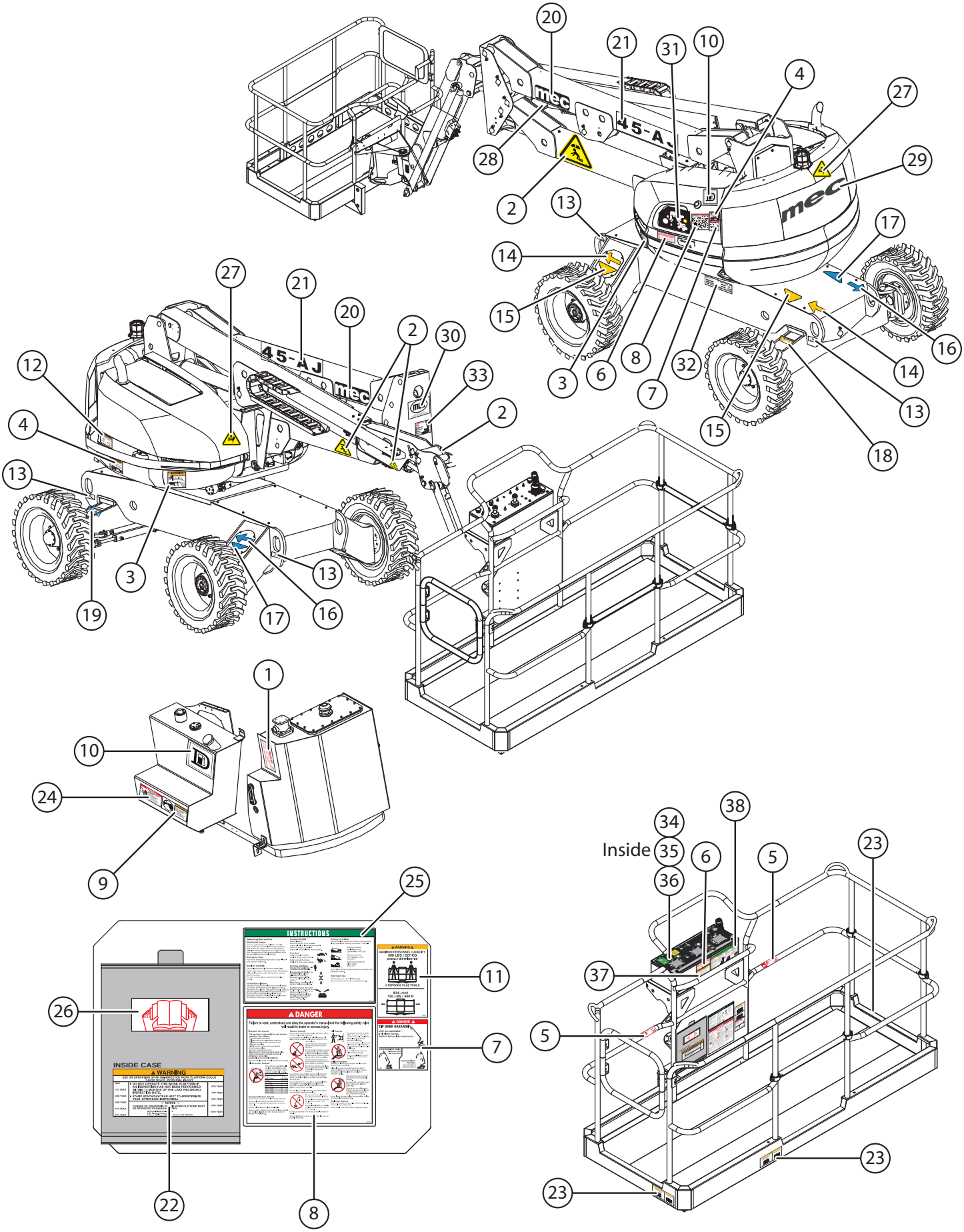
Electrical Harness, Part 2



Item	Part Number	Description	Qty.
1	42768	Ground Control Box Harness	1
2	42769	Valve Assembly Harness	1
3	42770	Engine Harness	1
4	42771	Power Harness	1
5	42772	Platform Control Box Assembly Harness	1
6	42773	CT1 Harness	1
7	42774	CT2 Harness	1
8	42775	CT3 Harness	1
9	42776	CT4 Harness	1
10	REF	Ground Control Box Assembly (See page 121 for Breakdown)	1
11	43442	Beacon	1
12	42882	Alarm	1
13	REF	Oscillate Manifold (See page 88 for Breakdown)	1
14	REF	Drive Manifold (See page 91 for Breakdown)	1
15	43799	Engine	1
16	92940	Module, Throttle	1
17	92939	Actuator, Throttle	1
18	43074	Radiator	1
19	43090	Circuit Breaker	2
20	42342	Relay	3
21	42612	Emergency Pump Assembly	1
22	43800	Contactor	1
23	42071	Power Switch	1
24	43144	Battery	1
25	43801	Hydraulic Oil Temperature Sensor	1
26	43836	Fuel Level Sensor	1
27	42074	Limit Switch	2
28	43228	Limit Switch	1
29	43837	Angle Sensor	1
30	REF	Platform Control Box Assembly (See page 153 for Breakdown)	1
31	42796	Coil	1
32	43243	Horn	1
33	REF	Functional Manifold (See page 115 for Breakdown)	1
34	44289	Cable, Positive To Starter	1
35	44290	Cable, Positive To Starter	1
36	44287	Cable, Battery Negative	1
37	44288	Cable Battery Positive	1
38	44482	Harness Comm To Upper Control	1

REF - Reference

Decal Locations



1 92117
Qty - 1

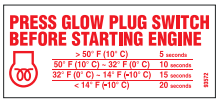
2 91850
Qty - 4

3 93804
Qty - 2

4 93801
Qty - 2

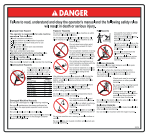
5 91970
Qty - 2

6 93572
Qty - 2



7 93807
Qty - 2

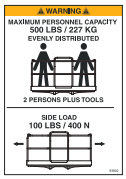
8 93755
Qty - 2



9 90732
Qty - 1

10 91975
Qty - 2

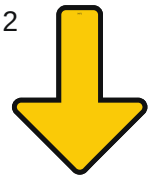
11 93802
Qty - 1



12 93806
Qty - 1

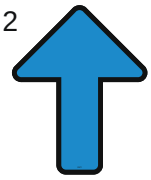
13 91973
Qty - 4

14 91972
Qty - 2



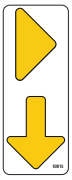
15 91982
Qty - 2

16 91971
Qty - 2



17 91981
Qty - 2

18 93815
Qty - 1



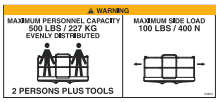
19 93814
Qty - 1

20 94513
Qty - 2

21 94514
Qty - 2

22 90718
Qty - 1

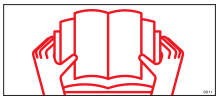
23 93803
Qty - 3



24 93805
Qty - 1

25 93754
Qty - 1

26 8911
Qty - 1



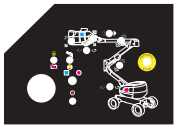
27 9910
Qty - 2

28 92416
Qty - 1

29 94520
Qty - 1

30 90719
Qty - 1

31 94560
Qty - 1



32 93851
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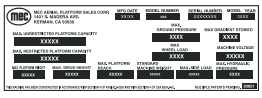

33 94254
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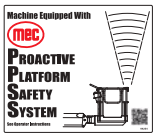

34 94253
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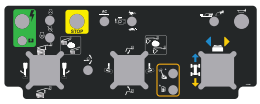
35 92236
QTY - 1

36 94460
QTY - 1



37 8606
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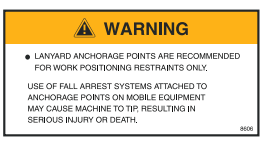
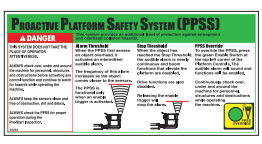


38 94262
QTY - 1



Item	Part Number	Description	Qty.
1	92117	Decal, Hydraulic Fluid Range	1
2	91850	Decal, Caution Triangle Overhead Clearance	4
3	93804	Decal, Crush Hazards	2
4	93801	Decal, Compartment Access	2
5	91970	Decal, Boom Harness Attach Point	2
6	93572	Decal, Glow Plug, Ansi/csa	2
7	93807	Decal, Danger Tipover	2
8	93755	Decal, Danger Panel	2
9	90732	Decal, Warning No Powerwash	1
10	91975	Decal, Diesel Fuel	2
11	93802	Decal, Platform Capacity Tall	1
12	93806	Decal, Explosion Hazard Ether	1
13	91973	Decal, Tie Down	4
14	91972	Decal, Boom Yellow Arrow, Reverse	2
15	91982	Decal, Boom Yellow Arrow, Right	2
16	91971	Decal, Boom Blue Arrow, Forward	2
17	91981	Decal, Boom Blue Arrow, Left	2
18	93815	Decal, Yellow Arrows, Small	1
19	93814	Decal, Blue Arrows, Small	1
20	94513	Decal, 45-AJ - Logo Cosmetic	2
21	94514	Decal, 45-AJ - Model# Cosmetic	2
22	90718	Decal, Warning Annual Inspection	1
23	93803	Decal, Platform Capacity Wide	3
24	93805	Decal, Electrocution Hazard	1
25	93754	Decal, Instructions Panel	1
26	8911	Decal, Manuals Inside Icon	1
27	9910	Decal, Hand Crush Hazard	2
28	92416	Decal, Website	1
29	94520	Decal, Charcoal Gray version	1
30	90719	Decal, MEC Oval	1
31	94560	Decal, 45-AJ / 60J - Lower Control Panel	1
32	93851	Decal, Serial Plate, 60-J Boom ANSI	1
33	94254	Decal, PPSS Equipped	1
34	94253	Decal, PPSS Override	1
35	92236	Decal, EZ-CAL port	1
36	93688	Decal, Upper Controls, 60J-D	1
37	8606	Decal, Warning Lanyard Anchorage	1
38	94262	Decal, PPSS Instructions	1

Notes

Notes

MEC Parts Order Form

Phone: 559-842-1523
Fax: 559-400-6723
Email: Parts@mecawp.com

Please fill out completely

Date: _____

Account: _____

Bill to: _____

_____

_____

_____

Ordered By: _____

Your Fax No.: _____

Ship to: _____

_____

_____

_____

Purchase Order Number _____
** All orders MUST have a Purchase Order Number

Ship VIA _____
**Fed Ex shipments require Fed Ex account number

Part Number	Description	Quantity	Price

All back-ordered parts will be shipped when available via the same ship method as original order unless noted below:

___ Ship complete order only - No Backorders
___ Ship all available parts and contact customer on disposition of back-ordered parts
___ Other (Please specify)

_____

Limited Owner Warranty

MEC Aerial Platform Sales Corp. warrants its equipment to the original purchaser against defects in material and/or workmanship under normal use and service for one (1) year from date of registered sale or date the unit left the factory if not registered. MEC Aerial Platform Sales Corp. further warrants the structural weldments of the main frame and scissor arms to be free from defects in material or workmanship for five (5) years from date of registered sale or date unit left the factory if not registered. Excluded from such warranty is the battery(s) which carries a ninety (90) day warranty from described purchase date. Warranty claims within such warranty period shall be limited to repair or replacement, MEC Aerial Platform Sales Corp's option, of the defective part in question and labor to perform the necessary repair or replacement based on MEC Aerial Platform Sales Corp's then current flat rate, provided the defective part in question is shipped prepaid to MEC Aerial Platform Sales Corp. and is found upon inspection by MEC Aerial Platform Sales Corp. to be defective in material and/or workmanship. MEC Aerial Platform Sales Corp. shall not be liable for any consequential, incidental or contingent damages whatsoever. Use of other than factory authorized parts; misuse, improper maintenance, or modification of the equipment voids this warranty. The foregoing warranty is exclusive and in lieu of all other warranties, express or implied. All such other warranties, including implied warranties of merchantability and of fitness for a particular purpose, are hereby excluded. No Dealer, Sales Representative, or other person purporting to act on behalf of MEC Aerial Platform Sales Corp. is authorized to alter the terms of this warranty, or in any manner assume on behalf of MEC Aerial Platform Sales Corp. any liability or obligation which exceeds MEC Aerial Platform Sales Corp's obligations under this warranty.

MEC Aerial Work Platforms

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