AJAX

MAKES CONCRETE SENSE

SELF LOADING CONCRETE MIXER

ARGO 4300/4800

OPERATION AND MAINTENANCE MANUAL

Self-Loaders | Batching Plants | Transit Mixers | Pumps | Slip - Form Pavers

OPERATION AND MAINTENANCE MANUAL

ARGO 4300/4800

SELF LOADING CONCRETE MIXER

MACHINE PIN No. : ……..

CHASSIS No. : ……..

ENGINE No. : ……..

AJAX ENGINEERING PRIVATE LIMITED

BENGALURU-561203

ALL INDIA TOLL FREE NO: 1-800-4190-628

PART NO. OF THIS MANUAL:200100001983 (REVISION:B)

YEAR: MARCH 2023

FOREWORD

This manual has been designed to provide a practical guide for proper and safe use of the machine, as well as for its correct routine maintenance. Thorough and ongoing observance of the instructions contained herein will help ensure the machine optimal performance, its operation economy as well as its longest life. In addition, this will allow you to use the machine properly, thus helps to avoid the most common accidents which may occur during operation or maintenance.

GENERAL RECOMMENDATIONS:

This operation and maintenance manual is an integral and essential part of the machine and must be delivered to the user.
Read this manual carefully and thoroughly before starting, using and performing maintenance, refueling or any other operation on the machine.
The machine shall be entrusted to and operated by skilled staff only, who must have been duly trained on the use of self-propelled vehicles of this type and on the relative safety rules and regulations.

The operator must observe all safety and accident prevention regulations as well as the Road Traffic Regulations if the vehicle is road driven.
Furthermore, it is essential to carefully read the safety CAUTIONS found on the machine plates and labels, and to strictly observe the instructions contained therein before starting, operating or repairing the machine or performing maintenance operations on the same.
Each machine comes equipped with a copy of this manual.
The manual must be properly and safely stored in its compartment in the driver's cab. It must be kept within reach and in good conditions at all times. Do not use the machine if this manual is not in the cab and if you have not read all the instructions carefully.
If the manual is lost or becomes illegible (pages torn, dirty, etc.) ask either your Dealer or the Manufacturer immediately for a new copy.
The machine must be used for its intended purpose only. Any other use is to be considered improper and consequently dangerous.
Thorough and ongoing observance of the instructions contained herein will help ensure a longer service life and reduction of maintenance and stop time. In addition, this will help you to avoid the most common accidents which may occur during operation or maintenance.
It is of mutual interest to observe the aforementioned instructions, and that the buyer undertakes to ensure that this manual is an integral part of the machine, that it is actually consulted by the operator and by maintenance staff and that the instructions provided are strictly observed, assuming full responsibility in relation thereto.
The buyer and the operator of the vehicle must read the use and maintenance manual carefully the first time they are using the machine. If this vehicle is subject to a use or lease agreement, it is the owner's duty to make sure that the new user reads and understands this use and maintenance manual. In addition, make sure that the new operator has fully inspected the vehicle and is knowledgeable with all of its labels, decals and equipment, and that he has tested all the controls to understand and verify their proper functioning.
The Manufacturer reserves the right to make any and all modifications for product improvement purposes, without updating this documentation. For additional information, please feel free to contact your Dealer or the Manufacturer at your convenience.

INTENDED USE

This machine has been designed and manufactured to load aggregates, cement and water in the appropriate quantities, and mix them homogeneously directly on the worksite, to produce quality concrete for on-site casting. Use of the machine on public roads is subject to road traffic regulations in force in the country of use.

This machine must be used by the driver only and cannot be used to transport other people. This machine has been designed and manufactured for its intended use and purpose. Therefore, its technical features shall be considered binding in order to use the machine for its intended purpose. No modifications can be made to the machine without prior authorization from Ajax, as they may lead to dangerous situations. It is always necessary to strictly observe the safety rules and regulations illustrated in this use and maintenance manual.

UNAUTHORISED OR IMPROPER USE

It is strictly forbidden to use the machine for any operation other than those described herein. Under no circumstance may AJAX be held responsible for any other use of the machine or for non-observance of the instructions provided by the Manufacturer. The machine shall not be used for underground works or in potentially explosive workplaces. In the event of underground works, contact AJAX to request information on the requirements to be observed for adjusting the machine so that it is suitable for such purposes. Any unauthorized modification to the machine relieves the Manufacturer from any responsibility for property damage or personal injuries which may directly and/or indirectly arise in connection therewith. The Manufacturer and its Distribution and After Sales Service Network accept no responsibility for any damage which may arise in connection with not approved and malfunctioning components fitted on the machine during maintenance or repair operations. No objects of any kind may be transported on the machine or inside the driver's cab. Therefore no warranty, of any kind whatsoever, is provided in relation to the product manufactured or traded by the Manufacturer for damages due to non-approved malfunctioning parts and/or components.

DANGER: If the machine is used for any purpose other than its intended and allowed use, the operator shall be responsible for his own safety as well as for the safety of any other person involved.

CAUTION: Ajax accepts no responsibility for personal injury or property damage which may derive from non-observance of the provisions and instructions contained in this manual and from non-observance of safety and accident prevention regulations.

The Company has protected and applied for protection of the intellectual property through various forms such as patent, copyright, trademark, trade secrets, domain names, and industrial design rights under common law and statutory laws in India and outside India.

PROHIBITION: The vehicles and equipment cannot be modified without the manufacturer's authorization

DRIVER OF THE VEHICLE

Road driving of the vehicle is naturally governed by Road Traffic Regulations, and therefore the driver shall be equipped with a driving license as required. **DRIVER OF THE VEHICLE**

In order to use the machine on the worksite, the operator must be of the minimum age established by applicable legislation in the country of use. The operator may use the machine only after receiving adequate and specific training. This training must ensure that the machine is used correctly in relation to the risks which may arise for the driver or other people.

Driving an earth moving machine always requires technical skills and training, in addition to a strong sense of responsibility. The operator must therefore have specific psychophysical requisites to qualify for this job. Therefore, only authorized personnel may use these vehicles.

The operators must be duly trained on the use of the machine and instructed about any possible risks at the workplace.

The machine must only be driven and serviced by persons who:

- have an excellent eyesight and color perception, good hearing, co-ordination and sharp reflexes;
- are physically and mentally eligible for this type of job, and are able to meet the requirements connected with the machine operation at peak performance levels;
- refrain from operating the machine when they are tired, unwell or under the influence of drugs, alcohol or medicines which may affect their physical abilities or sharpness of their reflexes;
- are able to read and properly understand the instructions contained in this manual, according to the Manufacturer's purposes;
- have an excellent ability to assess weight, distance and size;
- are able to drive and control the machine at the worksite;
- have been trained on the operation of the machine and its maintenance; know its technical specifications, its overall dimensions as well as its performance and limitations;
- are conscientious, careful and aware of the problems of their own safety and that of other people, animals, property, the machine itself and the environment;
- Are knowledgeable with the safety rules and regulations applicable to the workplace.

The Legal Representative of the company who owns the vehicle shall appoint staffs who possess the above said requisites to perform the tasks required.

The operator is also responsible for and shall assure that:

- Nobody approaches the machine when it is working;
- No unauthorized and untrained personnel may use the machine;
- The safety procedures learnt during the training course are observed every day;
- Potential hazards in the workplace are recognized and avoided;
- The caution and warning labels and plates have been read and understood, and their instructions observed
- The machine has been inspected and its proper working condition checked before starting the shift
- Report any operational problems encountered before, or while operating the machine
- Reckless or careless actions, which may endanger one's safety as well as other people's safety, are avoided
- Common sense is used at all times and safety has absolute priority

Prior to commencing work, the operator must check that all the safety devices are active and functioning properly: he/she is obliged to refuse to start work in the event that the requirements for safe working are not met.

MANUFACTURER

The mixing machine **ARGO 4300/4800** and the relevant following models are manufactured exclusively by:

AJAX ENGINEERING PRIVATE LIMITED
Plot Nos. 149,150 & 151,
KIADB Industrial Area, Phase III,
Obedenahalli Village, Kasaba Hobali,
Doddaballapur, Bengaluru-561203
Karnataka, India

REQUEST OF TECHNICAL ASSISTANCE

In case of machine failure, it is necessary to keep to the following instruction:

- See service manual concerning TROUBLESHOOTING.
- See the relevant spare parts catalogue attached to this manual.
- Should the trouble persist, do not try any further manoeuvre or repair procedure contact to the nearest **AJAX CUSTOMER SERVICE CENTER (Toll free No. 1800-4190-628).**
- When contacting to the Customer Service, write down in detail all pertinent data related to the issue and source of the problem / failure.
- Mention all data contained in the name plate positioned on the machine particularly machine Sr. No.
- Refer all diagrams contained in this manual / spare parts catalogue.
- Describe systematically and clearly the existing failure or trouble.

Table of Contents

1. Introduction

Symbols used in the manual.

To provide a clearer understanding of the information contained in this manual, major information or information regarding danger is shown with the following symbols:

DANGER: Indicates a situation of imminent risk that, if not avoided, may result in serious injury or even death.

CAUTION: Indicates a potential risk which, if not avoided, may result in injury of low or medium severity. It may also be used to prohibit operations involving risks and which may cause damages.

Direction References

FIG A

FIG B

The position of the pivoting driving post determines the driving direction.
The right-hand side (RH) or left-hand side (LH) will be identified based on the current driving position of the operator, as shown in above figure.

Vehicle Control and Driving Phases

Working Phase (Slow Speed Driving) – FIG A

The driving post is turned toward the rear of the machine.

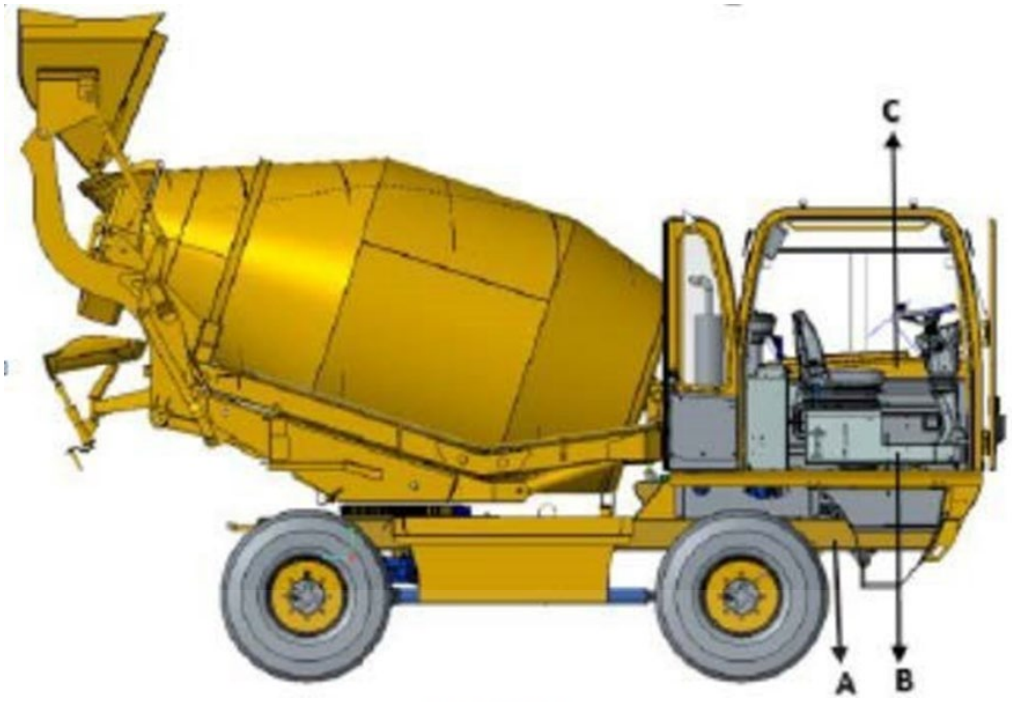
Driving the machine for material loading & unloading.

Driving the machine at work sites.

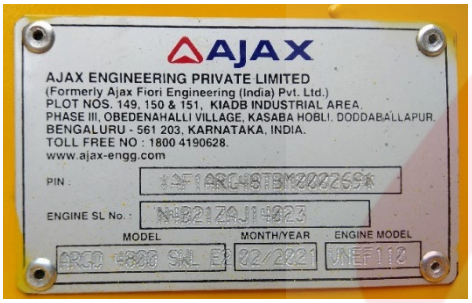
Transfer Phase (Preferential Speed) – FIG B

The driving post is turned toward the front of the machine.
Driving the machine on short or long stretches, with or without carrying material.

1.1. Identification Of Machine



A - Chassis number
- AF1ARG43 *****
- AF1ARG48 *****



B – MACHINE DATA PLATE

C: 1) -KIRLOSKAR

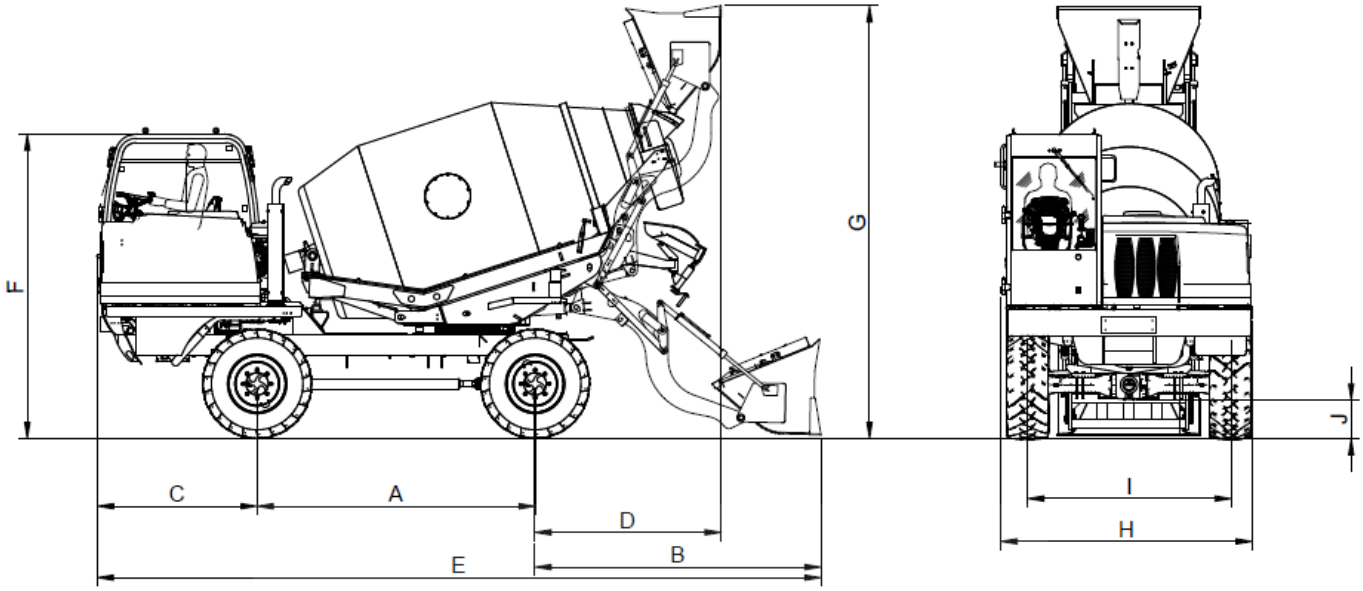
C: II) MAHINDRA

In the machine identification plate "**B**", the following data are listed:

Sl. No	Name	Description
1	Pin	Product Identification
2	Model	Product Model
3	Month/Year	Month / Year of Manufacture

These data shall always be mentioned when addressing to the manufacturer for information, spare parts etc.

2. Technical Features



2.1. Dimensions

Parameters	ARGO 4300	ARGO 4800
Wheelbase (A)……	2630	2730
Rear Overhang with bucket down (B)……	2469	2788
Front Overhang (C)……	1554	1575
Rear Overhang with bucket up (D)……	1604	1822
Minimum road transfer length (A+D+C)……	5788	6127
Maximum length with shovel on ground E (A+B+C)……	6833	7112
Height from ground to cabin top (F)……	2480	2530
Maximum height during transfer (G)……	4288	4239
Maximum width (H)……	2480	2530
Front track width (I)……	1993	1993
Rear track width (I)……	1993	1993
Ground clearance under the differentials (J)……	375	353

Note: All dimensions are in mm.

2.2. Engine

I) DIESEL ENGINE: KIRLOSKAR, CEV STAGE IV

- Model ……. Kirloskar 4R1190TA
- Cylinders……4
- Total displacement ……...4760 cc
- Maximum power……110 hp (81.6 kW) @2200rpm
- Type of injection……Common rail direct injection (CRDI)
- Air cleaner…….……Dry cartridge
- Emission System…… Exhaust Gas Recirculation (EGR)+Diesel Oxidation Catalyst (DOC) & selective catalyst reduction (SCR) system.

II) DIESEL ENGINE: MAHINDRA CEV STAGE IV

- Model …….…….....48051A
- Cylinders……....4
- Total displacement…….....3530cc
- Maximum power ……..……110 hp (80.9 kW) @2200 rpm
- Type of injection……..…. Common rail direct injection (CRDI)
- Air cleaner…….... Dry cartridge
- Emission System……..…… Exhaust Gas Recirculation (EGR)+Diesel Oxidation Catalyst (DOC) & selective catalyst reduction (SCR) system.

Note 1: Refer respective engine manuals for further details.
Note 2: Following abbreviations are used for engines:
Kirloskar – KOEL, Mahindra -M&M.

2.3. Electrical System:

- Battery …….....…..... 12 V, 150 Ah
- Alternator (KOEL)…… ……..... 90 Amp
- Alternator (MAHINDRA) …… ……..... 140 Amp

2.3.1. 4x4 – Wheel Drive:

Hydrostatic transmission with variable displacement pump and dual displacement hydraulic motor with electro-hydraulic control for high and low speeds and reverse.
Two-speed mechanical gear box with electro hydraulic switch for gear selection.

2.4. Speed:

	4 forward speeds	4 reverse speeds
• 1st Low	0 – 4.2 Km/h	0 – 4.2 Km/h
• 1st High	0 – 9.5 Km/h	0 – 9.5 Km/h
• 2nd Low	0 – 13 Km/h	0 – 13 Km/h
• 2nd High	0 - 28 Km/h	0 - 28 Km/h

2.4.1.Axles:

- Front Axle: Oscillating and steerable type with planetary hub reduction gears
- Rear Axle: Steerable planetary hub reduction type. Transmission motor & gearbox integrated on axle.

2.4.2.Brakes:

- Independent & dual circuit wet type disc for service brakes acts on all four wheels.
- Inching pedal provided as secondary brake.
- Parking Brake: Negative parking brake acting on rear axle, operation through transmission hydraulics. Brakes will be applied automatically once the engine goes off.

2.4.3.Tyres:

- Front and rear tyres (Argo 4800) ……405/70-20, IND -16PR
- Front and rear tyres (Argo 4300) ……405/70-20, IND -14PR
- Rim size ……..…. 13''x 20''

2.4.4.Cabin:

- Closed cabin with sliding windows & electric fan for operator comfort.
- 180^0 rotating operator post, seat with mechanical suspension adjustable according to operator weight, provided with lap belt & enabled back & forth adjustments.

2.4.5.Steering:

- Hydrostatic power steering system assisted by independent pump for vehicle direction control. Provided with steering selection device for 2-wheel, 4-wheel & crab modes.

2.4.6.Hydraulic System: M&M & KOEL

- Maximum displacement of Drive pump ……..……. 71cc/rev
- Maximum displacement of Drum Rotation pump.……..…… 45cc/rev
- Maximum displacement Steering pump(M&M) ……..…….12cc/rev
- Maximum displacement Steering pump (KOEL)) ……11cc/rev
- Maximum displacement implement pump ……19 cc/rev

2.4.7.Bucket

- Bucket capacity - 650 L (Geometric)
- Fill factor - 85% - 90%
- Single Joystick control for bucket operation. Joystick incorporated with push button for bucket gate control.

2.4.8.Mixing And Unloading

- Drum with double – spiral-mixing propellers. Two Inspection manhole for emergency discharge.
- Drum rotation by variable displacement hydraulic pump with electro-hydraulic control switch located inside the cabin.
- Optional- ECU controlled drum rotation by variable displacement hydraulic pump with electro-hydraulic control switch located inside the cabin. (Refer 4.41 for details).
    - Concrete output, ARGO 4300 ……..……..……. 4.3CUM*
    - Concrete output, ARGO 4800 ……..……..……. 4.8CUM*
    - Max. Drum rotation speed in both directions...…….... 0 - 20 rpm

    *-Derived with ≤ 50mm slump concrete.

2.4.9. Water System:

Self-priming volumetric water pump with quick suction.

- Maximum delivery ……..…. 400 L /min @ 0 meter head height.

- Two connected tanks positioned opposite to each other with a total capacity of 800 liters for Argo 4300 & 850 liters for Argo 4800.
- Water pump actuation can be enabled from the driver cabin. Supplied volume to the drum will be shown in cabin display.
- Suction selection from the ground with quick coupling pipes.

2.4.10. Fluid Tanks Capacities:

- ARGO 4300 Fuel tank ……..... 115 Lts
- ARGO 4800 Fuel tank ……..... 135 Lts
- Hydraulic Tank ……..…..……...…..... 110 Lts
- Engine oil sump, KOEL……..…...11.5 Lts
- Engine oil sump, MAHINDRA ……..……...13.5 Lts
- Engine cooling system, KOEL…….…….....19.6 Lts
- Engine cooling system, MAHINDRA…….……..…….…….....18 Lts
- AD BLUE / DEF Tank, KOEL……..…….…. 16 Ltrs
- AD BLUE / DEF Tank, MAHINDRA…….……. 23 Ltrs

2.4.11. Weights: Unladen

- ARGO 4300 Unladen vehicle, KOEL …….....…….…8290 Kg (swivel)
- ARGO 4300 Unladen vehicle, MAHINDRA …….....…….…8290 Kg (swivel)
- ARGO 4800 Unladen vehicle, KOEL …….....…….…8930 Kg (swivel)
- ARGO 4800 Unladen vehicle, MAHINDRA …….....…….…8930 Kg (swivel)

2.5. Performance Data

The maximum level of comprehensive performance of the machine is reached during function test before delivery. It is strictly forbidden to perform any modification. In case of any such alteration the overall manufacturer guarantee covering the machine, kits equipment and fittings will be null and void.

- ARGO 4300 Max. Grade ability …….... 42 %
- ARGO 4800 Max. Grade ability …….... 38 %
- ARGO 4300 Max. Speed …….. 28Km/h
- ARGO 4800 Max. Speed ……..…… 28Km/h
- Minimum Turning Radius ……..... 4.35m

Note: Concrete batch cycle operation & long distance run are completely different. The vehicle hydrostatic transmission & axle combination are not intended for long distance on-road operation, if used, it causes axle & hydrostatic transmission overheating & impart severe damages to the components & reduces its service life, hence it is strictly abstained, if under inevitable circumstances same need to be operated for long distance, then the continuous travel should not exceed more than 30 minutes or 5km, whichever occur earliest, after each 5Km or 30 minutes run, break shall be given for 20-30 minutes to cool down the system. Vehicle shall be empty while on-road travel.

2.5.1. Electronic Weigh Batching:

The machine is equipped with "On the fly" microprocessor based, high accuracy electronic weigh batching system. Up to 8 different aggregates can be weighed & batched in addition or subtraction mode. Refer the provided CBC manual for further information.

2.5.2. Optional Equipment's

A. Telematics

a Telematics is a term that combines the words "telecommunication and informatics" to broadly describe the integrated use of communications and information technology to transmit, store and receive information's from telecommunication devices to remote assets (automobile, heavy equipment's, machines etc.) over a network.

b All major engine monitoring parameters like fuel level, engine RPM, engine runtime hours, machine health & CBC readings (Individual batch consumption report, total batch consumption report) etc. can be viewed & monitored online in web & mobile application like android & iPhone Operating System (IOS) via Telematics

c Subscription renewal of IoT services to be done by reputed service provider after purchase the machine 12 months subscriptions available by default. There after customer need renewal for various options 1year, 2 years, 3 years through nearest Ajax dealers / sales & service office.

NOTE: Renewal not done on time the telematics, stop to function and all related information will not be available, same will come to work post renewal, SMS communication will receive to customer registered mobile one month advance.

***Applicable for "INDIA" only.**

B. Water Pump with Auto Cut-Off

This system is enabled with an electromagnetic flow meter which automatically cuts-off water feeding to the drum once the set CBC value is achieved.

C. Admixture

Admixtures are chemicals which are added to concrete at the mixing stage to modify some of properties of the mix. Admixtures should never be regarded as substitute for good mix design, good workmanship, or used good materials. Chemical admixtures reduce the cost of construction, modify properties of hardened concrete, ensure quality of concrete during mixing/transporting/placing/curing, and overcome certain emergencies during concrete operations. Chemical admixtures are used to improve the quality of concrete during mixing, transporting, placement and curing.

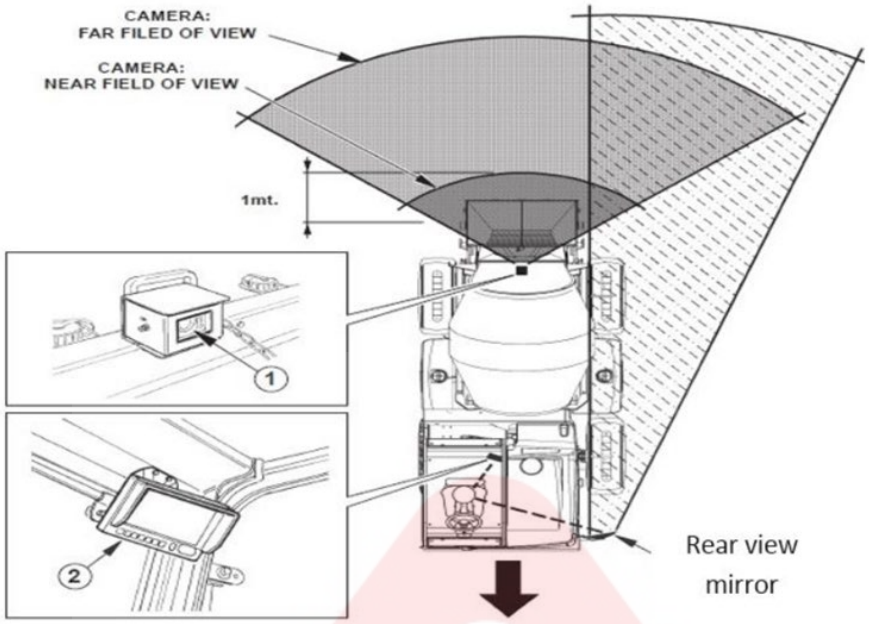
Ajax offers complete kit for additive system which consists of a self-priming pump, flow meter (electromagnetic type) & two additive tanks. It can be fitted at factory as well as in the field.

D. High Pressure Water Jet System

a. This will help to remove the accumulated concrete with ease and improve the efficiency of the machine. High pressure water jet is created by a hydraulic piston pump which can be actuated by a switch provided in the cabin.
b. As a standard feature Argo 4300/4800 comes with low pressure water pump. At any point of time one of these pumps will work.
c. High pressure water Jet System include following components:
d. Water bypass to tank feature
e. Aluminum Suction cover
f. Water filter with flow limiting valve.
g. High pressure nozzle and nozzle protection
h. Water Pistol
i. Outlet Water Pressure – 95bar
j. Outlet water flow – 18 lpm

E. Rear View Camera

Rear-view camera (1) system is a special type of camera that is produced for the purpose of being attached to the rear of the vehicle to help in backing up and avoid collision with any obstacle or human being. The monitor (2) will on when only the vehicle in reverse driving mode.
However, in SLCMs, the main objective is to see/ visualize the material from the operator cabin comfortably without leaning forward/sideways, also during bad weather/ dim light where the vision quality becomes poor for human eyes.



F. Load Cell

Shear Beam Load Cell is mounted on the Loading arm pin. As the bucket gets loaded, the force will get applied on the Pin and in turn on the load cell. The millivolts are then generated by the Load cell. Produced millivolt inputs to the Digital read out which in turn shows the output in terms of weights of different aggregates.

3. Safety Precautions

3.1. General Provisions

 This symbol means: **CAUTION**

IT INVOLVES YOUR SAFETY!

As already mentioned in the foreword this manual is a practical and rational guide for a correct use to prevent the commonest accident causes that might occur when working or during maintenance operations.
This manual is intended as a practical and rational guide to proper use and prevention of the most common causes of accidents during work and maintenance.

Below are the main rules that must strictly be followed:

- Carefully read this manual before any starting, use, maintenance, refueling or other operations.
- Read and comply with all the SAFETY REGULATIONS given in this manual before carrying out any operation.
- Prudence and judgement during appropriate use of the vehicle are essential and basic factors for the safety of the operator and of other people working near the vehicle.
- Therefore, before starting any work, you must know exactly what the functions of all the controls and the stability characteristics of the vehicle.

3.1.1. Precautions of Use:

Wear clothing suited to the work to be carried out on the site and do not wear loose or hanging clothes such as ties, scarves, unbuttoned jackets, unzipped garments or sleeves with wide cuffs, which may get caught up in the moving parts.

The following protective clothing is to be worn as prescribed by the site regulations:

- Hardhat
- Non-slip shoes
- Protective goggles
- Protective gloves
- Anti-noise headsets (where applicable)
- Reflecting garments or vests
- Raincoats in bad weather
- Protective mask for cement loading

3.1.2. Vehicle Limits:

- The maximum overall performance level of the vehicle is optimized during functional testing before delivery.
- Do not use the vehicle outside the limits defined during design; exceeding these limits may be dangerous and cause damage to the vehicle.
- Do not attempt to improve vehicle performance with unapproved modifications.
- Any alteration will lead to forfeiture of the warranty on the vehicle as well as on functional and accessory equipment.

3.1.3. Precautions When Using Accessories:

- During installation of optional components or equipment, problems may occur that put your safety at risk. Therefore, always ask AJAX for advice before installation.
- AJAX is not responsible for injury, accidents or faults deriving from use of unauthorized equipment or accessories.
- Before installation and use of accessories, read the instruction manual of the specific accessory and the general information on accessories given in this manual.

3.1.4. Prohibition To Transport Persons or Objects:

- The vehicle is not homologated for transport of persons other than the operator, who must be seated on the driver's seat.
- During all working phases, do not allow anyone to come close to the vehicle.
- Do not allow anyone to climb onto the working equipment.
- Do not carry people onboard the vehicle.
- Do not use the vehicle to transport objects, except those needed for the job and equipped with special couplings.
- Do not use the vehicle as platform or scaffolding and under no circumstances use it for any function not specified by the manufacturer.

3.1.5. Getting On and Off the Vehicle:

- To get on the vehicle, use the steps and the handrails in proximity of the driver's seat; it is prohibited to use the control levers and devices as handholds.
- If the vehicle starts moving when you are not on it, do not jump on to try and stop it.
- It is prohibited to get on and off the vehicle when it is moving.
- Get off the vehicle only when it has come to a complete halt and is stable.
- Do not get on and off the vehicle by jumping or holding tools in your hands.
- Always face the vehicle when getting on and off the driver's seat or other raised parts and support yourself by keeping both hands and one foot or both feet and one hand on the steps and the handrail.
- Do not climb onto the engine compartment lid or other parts of the vehicle.

3.1.6. Driver's Seat:

- Before getting into the operator's cabin, always remove mud and oil from the soles of your shoes. If you push a pedal with mud or oil on the soles of your shoes, your foot might slip causing accidents.
- Keep the area around the driver's seat clean.
- Do not place any object at the foot of the driver's seat or around the pedals and do not hang anything on the control levers. The levers might accidentally be activated causing uncontrolled vehicle movement or activation of the working equipment and hence dangerous conditions.
- Place all objects not needed for driving in the storage compartments provided.
- Do not carry objects in your pockets that may fall into the open compartments of the vehicle.
- Always keep the driver's seat clear of foreign objects, especially if not secured.
- Do not leave components or tools scattered around the cabin.
- Do not use mobile phones in the cabin while driving or operating the vehicle.
- Never take dangerous objects into the cabin, for example, flammable or explosive objects.

3.1.7. Driver's Cab / Operator's Protective Structure:

- DO NOT modify, repair or remove the operator protective structure. Should it be structurally damaged or modified (e.g. by welding or drilling) the protection provided by the cabin/roof would be compromised, creating a risk which may cause death or serious injury.
- After an accident, carefully inspect the protective structure, the driver's seat, the seatbelt and all the pillars.
- Replace all the parts that show any sign of damage. Original spare parts must be used as indicated in the Spare Parts Catalogue and can be ordered from AJAX.

3.1.8. Seatbelts:

- Check that the seatbelts do not show any sign of fraying or cuts and that they have not been subjected to heavy strain (overturning) in which case they need to be replaced.
- Keep the seatbelts correctly positioned on the seat, do not let them get twisted and do not alter or modify them in any way. Always keep them clean.
- Choose the most comfortable driving position in relation to your physique.
- Adjust the seat position. Check functioning of the adjuster, the buckle and the winders (where fitted) and the method that allows checking that the seatbelts are locked. Adjust the seatbelt tension so that it holds you in place at the level of the hips leaving your abdomen completely free.

- Do not start work before having checked these safety conditions.

3.1.9. Checks Before Starting The Vehicle:

- It is prohibited to start or operate the vehicle IF IT IS NOT IN PERFECT WORKING CONDITIONS (e.g. faulty or malfunctioning).
- Before using the vehicle, make sure that there is no dangerous condition.
- Also check that you have enough fuel so as not to run the risk of being forced to stop, perhaps during a critical maneuver.
- Check that the steering controls and the brakes function perfectly. In case of malfunctions, notify the
- Maintenance manager and stop the vehicle.
- Check that all the guards and safety devices are in the right position and in such a condition that they can be operated.
- Check proper functioning of all the safety devices on the vehicle and in the working area.
- Should there be any problems, immediately inform your manager and do not start work if the necessary safety conditions are not present.
- Do not make any botched repairs just for the sake of starting work.

3.2. Starting The Vehicle:

- Before starting the vehicle, check and adjust the seat position for optimal driving comfort and so that you can easily reach the controls, and always fasten the seatbelts.
- Adjust the mirrors so that you can clearly see the area behind the vehicle from the driver's seat.
- Check that the warning lights work properly and check the angle of the headlights and the working lights.
- Do not drive the vehicle unless you are properly seated on the driver's seat.
- Never attempt to start the engine by short-circuiting the starter motor. This may cause fire or serious injury.
- Keep your head, body and limbs inside the driver's cabin, to prevent injury from hitting objects outside the cabin.
- Do not allow anyone other than yourself to get on the vehicle.
- Do not try to start the engine by rolling the vehicle down a slope.
- Check that no one is standing within the range of action of the vehicle before starting it and using the equipment.

3.2.1. Precautions While Driving:

- Before moving the vehicle, check that there is no one in the vicinity.
- Use the horn and observe the signs, banners and signals.
- Always make sure that you can clearly see the entire working or maneuvering area. If the cabin has windows, they must always be kept clean and intact.
- Always lock the cabin door in closed position. Lock the cabin windows in open or closed position.
- Always check that the brakes function properly and do not use the vehicle if there are any malfunctions or irregularities.
- Never turn the ignition switch key to neutral while the vehicle is moving.
- Hold the vehicle at such a speed that you have full control of it in any circumstances.
- Do not use the vehicle with the front lid open or without its guards and covers.
- While driving, do not activate any of the working equipment control levers.
- When driving on uneven ground, drive slowly and do not steer sharply. The vehicle might overturn.
- Always keep at a safe distance from other vehicles or obstacles, so that you always have the necessary visibility.
- Avoid driving over obstacles, where possible. If you need to drive over an obstacle, drive at low speed. Never drive over obstacles that will cause the vehicle to lean too far to one side.
- Pay attention to ground unevenness, poor visibility, and other vehicles in the vicinity.
- If the engine slows down and stops under load or runs at idle speed, inform the maintenance manager and do not use the vehicle until it has been checked.
- When driving on public roads observe the road regulations and before setting off consult with the competent authorities and follow their instructions. This vehicle travels at a speed lower than that of

normal motor vehicles, therefore, keep to the edge of the road leaving the center free for other vehicles to pass.
- If working in the dark, carefully check the working area, turn on all the lights available and do not work in areas where visibility is poor.
- Do not make quick movements (e.g. continuously steering right and left) which may cause the vehicle to overturn.
- Overtake only when absolutely necessary.
- When crossing bridges or similar structures, first check that the structure is strong enough to support the weight of the vehicle and its load.

3.2.2. Precautions While Driving In Reverse:
- Reversing at high speed can cause accidents; do not reverse at top speed and always drive at a safe speed suited to the working conditions.
- When reversing always look in the direction the vehicle is moving. Watch out for people in the area and immediately stop if anyone comes into the range of action of the vehicle and into the working area.
- If you cannot clearly see the entire working area, ask someone to guide you with hand signals. This person must stand outside the working area and you must be able to see him or her clearly.

3.3. Dangerous Working Conditions

- Before starting any operation, check that there are no dangerous working conditions in the surrounding area.
- Areas where there are slopes, humps, trees, demolished constructions, escarpments, gorges, tilled soil, ditches, excavations, heavy traffic, crowded parking and service areas and closed places are classified as risk areas.
- Check that there are no obstacles such as piping, cables, bottlenecks or loading limitations on the grounds, bridges, pavements or access ramps.
- Establish the due safety measures to prevent danger on public roads in collaboration with the owners, users and competent authorities.
- In places where there are underground water or gas pipes or high-voltage cable ducts, contact the public utilities to find out their exact position. Ensure that these structures are not damaged.
- Take particular precautions when working near ditches, escarpments or close to open excavations.
- To carry out operations in water or when crossing sand banks, check the conditions of the bed and the depth and speed of water flow.
- Always move slowly on very uneven ground and ridges, in the vicinity of slopes or gorges, and on icy or slippery ground. Remember that the ground is wet and soft after heavy rains.
- If the ground starts to cave in, the vehicle could tip over, sink in or overturn, causing serious injuries.
- If you work with the vehicle in tight spaces or have to pass through narrow doors or structures, maneuver very carefully.
- Avoid crossing or going over obstacles such as rocks, felled trunks, steps, ditches and tracks.
- Always ensure good visibility. Check that there are no people or obstacles in the area around the vehicle.
- Check the conditions of the working area to ensure that you can operate and move safely.

3.3.1. Working Area

The WORKING AREA is defined as the area in proximity of the vehicle where only persons that know its operating capabilities may work. The driver may operate only and exclusively when there is no one within the range of action. The driver must warn anyone in the vicinity of the vehicle of the danger they are in by voice or sounding the horn. If there is scaffolding or unstable structures near where you are working, keep at a safe distance so that you do not risk touching these structures should you accidentally make an incorrect maneuver.

3.3.2. Visibility Of the Working Area

- Always check that there is no one in the vicinity of the vehicle before starting work.
- Before getting on the vehicle, walk around it once and check that everything is in order.
- Dust, smoke, fog, etc. may reduce your vision and cause accidents. Always stop or slow down until the impediment has been removed and you have perfect visibility of the working area.
- If you cannot clearly see the entire working area, ask someone to guide you with hand signals and delimit an area of over 12 meters for forward movement. This person must stand outside the working area and you must be able to see him or her clearly.
- If working in the dark, carefully check the working area, turn on all the lights available and do not work in areas where visibility is poor.
- Always make sure that you can clearly see the entire working or maneuvering area.
- If the cabin has windows, they must always be kept clean and intact.

3.3.3. Site Conditions:

- Before starting work, analyses and ask for the topography and geological characteristics of the area, so that the appropriate measures can be taken to prevent landslides and the vehicle from overturning. Holes, obstructions, rubble and other risks connected with the working areas may cause physical injury or death.
- Always carefully inspect the site to identify any of these risk elements before using the vehicle.
- Be aware of all the conditions on the site and always look in the direction you are driving before starting any maneuver.
- Find out about the movements of persons and vehicles on the site. Follow the indications given by signals and signs.
- Do not start work until you have ascertained all the safety conditions.

3.4. Precautions During Operations:

- Before and during operations do not drink alcohol, take medicines or other substances that may alter your capability of working with machine tools.
- If you are very tired or not feeling well, do not use the vehicle, and in any case pay the utmost attention at the beginning and end of your shift.
- Contact the site manager for the safety regulations to be applied according to the laws in force.
- Watch out for people in the area and immediately stop if anyone comes into the range of action of the vehicle and into the working area.
- During work keep an eye on the instruments and immediately stop the vehicle if any malfunctions are indicated.
- Pay attention to any unusual noise from the engine, the hydraulic device, the transmission components, the working equipment, etc. If you hear any suspicious noise, immediately stop the vehicle and check what causes it.
- If you need to continuously work in very noisy conditions, wear a protective headset in accordance with the regulations in force.
- While carrying out maneuvers do not receive or take signals or instructions at the same time from many persons. Signals must be given by one person only. Always pay attention to the instructions given by the persons in charge.
- Always operate the hydraulic equipment seated in the driver's seat, check that no one is within the range of action of the vehicle and signal with the horn when you are about to make a maneuver.
- To prevent accidents due to collision with other objects, always operate at a safe speed when carrying out maneuvers, especially if you are in tight spaces and in places where there are other vehicles.
- Do not call out or give someone who is working with a fright without good reason, and do not throw objects, not even as a joke.
- Whenever you take a break, carefully check that all the controls are in NEUTRAL position and that the safety devices are locked.

3.4.1. Working On Slopes:

- Moving or working on steep slopes, hills, river or lake embankments can be dangerous. Always drive up and down slopes at low speed and pay attention. Obstacles or changes in the gradient may cause you to lose control of the vehicle and consequently it might overturn.
- Before starting work, check the working area for any signs of holes, landslips, gravel or tilled soil that could affect the working conditions and the stability of the vehicle.
- Always move in a straight line when going up or down a slope.
- Do not turn around on slopes or move across them.
- Never move sharply sideways, or even worse, with the vehicle axis turned 90º with respect to the direction of the slope.

☞ **WARNING: Do not work on slopes with a gradient over the limit as this may cause the vehicle to overturn.**

- Do not drive downhill with the gear in neutral or excessively using the brakes. Select and engage the most suitable gear that will allow maintaining the speed necessary to prevent losing control of the vehicle.
- If you need to drive down very steep slopes do not overrun the engine; select the most suitable gear before setting off downhill.
- NEVER park or leave the vehicle unattended on a slope.
- Drive slowly over grass, fallen leaves or wet steel sheet.
- If the fuel reserve warning light comes on while you are working on a slope, immediately refuel; given that the vehicle is inclined, the engine may take in air and stall unexpectedly, posing a grave danger to yourself and to anyone standing downstream of the vehicle.
- The limit gradient must be assessed based on the type of ground, the load, the vehicle conditions and speed and visibility.
- When driving on public roads where gradient is more than 5%, use the lowest gear.

3.4.2. Driving On Icy or Snow-Covered Surfaces

- If you need to work on icy or snow-covered surfaces, reduce the speed and avoid making sudden movement as the vehicle is much more sensitive and can easily slip sideways.
- When a lot of snow has fallen, pay the utmost attention as it is difficult to see the edges of the road.

3.4.3. Electrical Lines

- Working in proximity of electrical lines can be extremely dangerous and it is therefore essential that you take the necessary precautions to eliminate the potential risks.
- Do not work at a distance of less than 5 meters from overhead electrical lines, unless having notified the electricity board and having provided for adequate protection to prevent accidental contact or coming dangerously close to the line conductors.
- In order to work without any risk, keep as far away as possible from the electrical line and never violate the minimum safety distance. Mere passing near high-voltage cables may cause electric shock and hence burns or even death.
- Be prepared for any possible emergency situation and wear rubber shoes and gloves. Place a rubber mat on the driver's seat and be careful not to touch any part of the chassis with uncovered parts of your body. Ask someone to warn you if the vehicle comes too close to electrical cables.
- During operations near high-voltage cables, do not allow anyone to approach the vehicle.
- Should you make contact with an electrical line, absolutely do not leave the vehicle touching the live metal structures but wait until you have received confirmation that the power has been cut. In addition, do not allow anyone to approach the vehicle.

3.4.4. Closed Environments

When you need to work in a tunnel or closed places (factory buildings, car parks etc.) it is advisable to check

before starting that there is sufficient air exchange and good ventilation to prevent build-up of toxic exhaust gas or dust. In any event, it is always advisable to convey the engine exhaust gas to the outside using a flexible hose. Open doors and windows to facilitate ventilation and also wear an appropriate protective mask.

3.5. Stopping The Vehicle

Do not leave the vehicle unattended with the engine running for any reason whatsoever.
If you want to stop the vehicle for any reason, follow the instructions given in the chapter STOPPING THE VEHICLE and TURNING OFF THE ENGINE.
Always turn off the engine whenever you leave the vehicle.
Before leaving the vehicle, do the following:

- Make sure that there is no one near the vehicle.
- Slowly lower the equipment.
- Set all the controls to neutral position.
- Shift the gear lever to NEUTRAL and engage the control locking lever. Engage the parking brake.
- Remove the key from the ignition block.

3.5.1. Parking The Vehicle

- Choose an area where no other vehicles are operating.
- Park the vehicle on solid and possibly level ground and apply the parking brake
- Do not park the vehicle on embankments or beds of watercourses at the end of your shift or working day.
- Never park on a slope without first having blocked the vehicle with wedges or similar to prevent accidental movement. To park on steep slopes, position the vehicle crosswise to the slope, check that there is no risk of slipping, engage the parking brake and wedge the wheels. Do not park with the wheels facing downhill.
- Lock the equipment controls.
- Always remove the key from the ignition block when you need to leave the vehicle parked to prevent accidental or unauthorized starting.
- Secure and lock the vehicle when you have finished work and whenever you temporarily leave the vehicle.
- Hand the keys to the person in charge. Check that all the maneuvers provided in this manual have been observed.
- If you expect to work in low temperatures, check that the cooling system is filled with the right percentage of antifreeze.

3.5.2. Towing And Recovery

CAUTION: Before proceeding, always read the safety regulations. Remember that towing may cause further damage to the vehicle. Tow the vehicle only as far as the breakdown truck. Drive very slowly and for short stretches (5 km/h) to prevent the hydraulic oil in the closed circuit from overheating.

- Lower the drum and raise the arm locking it with safety pin.
- Connect a suitable tow bar.
- Release the negative brake (refer 5.12.13 & 5.12.15) negative brake release method given in this manual).
- Remove the propeller shaft.
- Turn on the hazard lights.

- An operator must be on board to drive and stop the vehicle, correctly seated in the driver's seat with the seatbelt fastened, the driving post facing the preferential driving direction and the steering lever positioned on **2-wheel steering mode**. If you need to steer, make sure that you understand the actions of the driver of the towing vehicle.

- Follow his instructions and comply with all the relative regulations. Bear in mind that steering is harder when the engine is off.
- Use a towing vehicle with a towing capacity of more than 20105 kg with full load and 9305 kg when unladen.
- When you have finished the towing operations, restore the negative brake.

CAUTION: The vehicle is not designed to tow other vehicles.

- If towing the vehicle (permitted for short distances only), use the warning signs according to the regulations in force and follow the instructions given in this manual.
- Always wear protective gloves when handling the towing devices.
- DO NOT use cables or chains for towing.
- To tow the vehicle, exclusively use the couplings specified and adequate towing devices.
- Hook the vehicle with extreme care and make sure that the devices used are securely fastened before towing.
- Never tow a vehicle on a slope.
- Do not allow anyone to stand in the vicinity of the vehicle being towed.
- Keep eye contact with the operators.
- Follow all the instructions given in the relative chapter.

3.6. Transport

- To load or unload the vehicle from the means of transport find a level area that offers a solid support for the wheels of the transport vehicle.
- Ensure that the means of transport is of adequate capacity to carry the vehicle.
- The weight, transport height and overall length of the vehicle vary depending on the working equipment, therefore, check the dimensions.
- Check that the overall dimensions are permitted by the Road Regulations.
- Use robust access ramps of adequate height and angle.
- Ensure that the ramp surface is clean and free of any traces of grease, oil, ice or other material residues.
- Remove any dirt from the vehicle's wheels. In the event of rain, the surface of the ramps may become slippery, hence be extremely careful.
- Check that the platform of the means of transport is well cleaned.
- Let the engine run at low speed and proceed slowly. The weight must be transferred gradually from the loading ramp to the transport vehicle.
- Never steer on the ramps to correct the vehicle's position. If necessary, drive off the ramps, correct the direction and then drive back up.
- The vehicle must be positioned in such a way that the loads on the axles are as specified for the transport vehicle and that it is not unbalanced.
- Securely tie the vehicle to the platform with chains or cables and block the wheels with wedges.
- Ensure that the engine is off and that the windows and door (if any) are closed.

3.7. Precautions Against Residual Risks

3.7.1. Slipping

- The driver's seat, the steps and the handholds must always be kept clean and free of any foreign object or traces of grease, oil, mud or water in order to reduce the risk of slipping.
- Pay attention to possible slippery steps and slippery ground around the vehicle.
- Always clean your shoes before getting on to prevent slipping or stumbling.

3.7.2. Moving Parts

- DO NOT come close to the moving parts of the vehicle with your limbs or other parts of your body. This may cause serious injury or death by crushing or amputation.

- Keep objects away from the moving fan blades. The fan blades may project or cut objects.
- Turn off the engine and wait until all the moving parts have stopped before carrying out maintenance or any other operation on the vehicle.

3.7.3. Shearing Or Trapping

- It is advisable to keep at a safe distance from moving parts.
- Do not hang your legs or arms out of the vehicle as you might get seriously injured if you knock them against obstacles.
- In some parts of the vehicle there are devices that may cause serious injury to your limbs. It is strictly prohibited to insert any parts of your body in these devices when the engine is running.
- Wear suitable clothing that cannot get caught up in the moving parts of the vehicle.
- Never climb into or insert your hands, arms or other parts of your body in the moving parts between the working equipment and the vehicle or between the cylinder and the working equipment. If someone inadvertently activates the control levers, the play of the working equipment is altered with the risk of serious injury to the body, hands or arms should they become entangled.
- Always keep your hands and fingers away from gaps and/or kinematic mechanisms.
- Do not use your fingers or hands to line up holes, but use appropriate tools.
- Remove any burrs or sharp edges from replaced and/or repaired parts.
- If you need to access a moving part, always lock the working equipment and check if it is well secured.

3.7.4. Crushing

The machine is a vehicle to all intents and purposes, therefore be extremely careful when handling it and watch out for persons, animals or objects around the working area.

- Check the efficiency of the controls and in particular the braking devices. Make sure that you can clearly see the entire working area from the driver's seat, also with the aid of the mirrors, video devices, lighting equipment for night-time work, and keep them efficient and in working order.
- Before carrying out any operation with the vehicle, always check that you have sufficient room to work safely.
- Ask someone on the ground to help you when carrying out operations in tight spaces or with poor visibility.
- Adjust the speed to the limits established for the various areas on the site, never exceed 15 km/h and drive at walking speed in the vicinity of workstations.
- If the driver needs to be contacted while he is working, approach the cabin from a point visible to the driver and only after he has given his consent. The conditions of the ground must be such as to allow quickly stopping the vehicle.
- It is prohibited to stand underneath the working equipment.

3.8. Overturning

The operator must be fully knowledgeable with the performance, weight and the maximum load the vehicle can transport in relation to the ground conditions (flat, compact, uneven, sloping).

- Before starting to work, always check that the area on which the vehicle wheels stand is sufficiently solid and capable of supporting its weight and, consequently, keep at a safe distance from the edge of the excavation.
- Check that the site paths are adequate and that the working areas are clear and suitable for transit of the vehicle and its stability.
- Analyses and record the topography and geological characteristics of the site in order to take the appropriate preventive measures against the vehicle overturning, landslides or landslips.
- Consider the characteristics of the ground complementary to those of the vehicle; variables controlled by the operator such as speed, angle of attack on slopes, gradient of the ground, load distribution etc., are essential to minimize the risk of overturning.

CAUTION: Observing the recommended gradient limits does not mean that you can maneuver

the vehicle in total freedom in all loads, ground or maneuvering conditions on a slope. In any event, it is advisable to halve the gradient values on wet or uneven ground.

- Avoid reaching the limit conditions and generally act with great caution and carefully: adapting to the ground and visibility conditions by adjusting the speed and changing paths and avoid sudden braking, acceleration and changes in direction. The vehicle may be used on sloping ground only within the limits indicated by the manufacturer. Where the ground is particularly steep and inaccessible, it is advisable to have only experienced operators use the vehicle.
- The vehicle may also overturn because of uneven ground, the ground caving in (especially when working near the edge of the road or the maneuvering surface), slipping on wet or muddy surfaces or making incorrect or careless maneuvers (sudden acceleration or steering, unbalanced load, excessive speed, etc.).
- Do not steer sharply at high speed.
- The vehicle center of gravity may shift in relation to the size and position of the load, the gradient of the ground and the movement of the vehicle.

3.8.1. In The Event of Overturning

The protective structure makes the driver's seat the only safe place to be should the vehicle overturn.

3.8.2. During Overturning

Never leave the vehicle and remain seated firmly, gripping the seat or the steering wheel.
After Overturning
Never leave the vehicle and remain seated firmly, gripping the seat or the steering wheel.

3.8.3. After Overturning

Make sure that the vehicle is stable and that it will not continue turning over, unfasten the seatbelt and quickly leave the vehicle trying to get off at the top to avoid being crushed by the vehicle.

3.9. Tyre Bursting:

- If the tyres or rims are incorrectly used, there is a risk of the tyres bursting or getting damaged.
- Tyre maintenance, removal, repair and refitting require special tools and techniques, therefore, always have these operations carried out by an AUTHORISED SERVICE CENTRE OR AUTHORISED PERSONS.
- Check that the wheel nuts are properly fastened before starting work. If necessary, tighten the nuts.
- Always check that the tyre inflation pressure is as specified by the manufacturer and check that the tyres are in good condition. If the tyre pressure is too low, the tyre could overheat and burst. Also if the tyre pressure is too high, there is a risk of the tyre bursting.
- Check the tyre pressure when the tyres are still cold. Do not release the pressure when it increases in a hot tyre.
- Keep at a safe distance or stand next to the tyre when inflating it.
- Keep the working area clear of sharp objects that could damage the tyres.

Deflate the tyres before removing any foreign bodies that may have lodged in the tread.

- Never use overhauled rims, since improperly carried out welding or heat treatments might weaken them.
- Do not cut or weld the rims when the tyres are fitted and inflated.
- Never inflate the tyres with a gas different from compressed air.
- The tyre pressure values and permitted speed specified in this manual correspond to the values specified by the manufacturer (see the pressures and loads table).
- For more information, contact AJAX or the tyre manufacturer.

3.10. Electrical Risks

Any operation on the electric system or the battery must be carried out by a qualified person.
Before any operation on the electric system, disconnect the battery by removing the key from the battery master switch. Check that the cables and terminals of the electrical connections show no sign of corrosion,

cracks or burns; if so, immediately contact your local AJAX dealer. In the event of an electrical fault, do not attempt to start the vehicle by running it downhill.

Risk Of Short-Circuit

Do not under any circumstances start the engine by short-circuiting the starter motor terminal or the battery.

3.10.1. Battery

The battery electrolyte contains sulphuric acid and batteries generate flammable hydrogen gas which could explode. Improper use may cause serious injury or fire.

- Do not use or charge the battery when the electrolyte level is below the minimum level mark. Check the electrolyte level at regular intervals and add distilled water to bring it up to maximum level.
- ALWAYS wear protective goggles and rubber gloves when working with batteries.
- Do not smoke or use open flames near the battery.
- If the acid encounters your clothes or skin, immediately rinse with abundant water. If the acid comes into contact with your eyes, immediately rinse with abundant water and seek medical advice.
- The battery must never be tilted more than 45° in any direction, as this may cause the acid to leak out of the battery.
- Do not connect a flat battery in series to a charged battery. Risk of explosion!
- Lead is a major component in all batteries, if not handled with care after use, can become hazardous and seriously harm the environment and the people around.
- Handle used batteries with care. All you need to do is return your used battery to any authorized Battery dealers/Manufacturer/Registered agencies who is authorized for collecting Used Batteries.

3.11. Hot And Pressurised Fluids

3.11.1. Hot Hydraulic Oil Causes Serious Burns:

- Wait for the oil to cool down before disconnecting the pipes. Pressurised fluid leaks may be invisible.
- **DO NOT** use your hands to check for leaks. Fluid leakage even from a very small hole may have sufficient force to penetrate the skin.
- If you need to check for leaks, use a piece of cardboard or wood.
- Wear gloves to protect your hands from any oil splashes. **DO NOT** attempt to repair or tighten flexible hoses or hydraulic unions when the hydraulic system of the vehicle is under pressure.
- **TURN OFF** the engine, discharge all the cylinders and release the pressure.
- Keep your face and hands away from loosened unions while you are checking the efficiency of the hydraulic system. Wear protective goggles as the jet of pressurized hydraulic oil may penetrate your skin and cause permanent injury to your eyes.
- If any fluid or oil leaks are found, immediately stop the vehicle and make the necessary repairs.

- Turn off the engine and check that all the hydraulic controls are in neutral position before removing covers.

3.11.2. Risk Of Burns

- In order to prevent burns caused by boiling water or steam escaping while checking or draining the coolant, wait for the water to cool down to a temperature such that you can touch the radiator cap without burning your hand. Even when the coolant has cooled down, loosen the cap gradually to allow the pressure in the radiator to drop before removing the cap completely.
- In order to prevent burns while checking or draining the oil, wait for the oil to cool down to a temperature such that you can touch the drain cap without burning your hand. Even when the oil has cooled down, loosen the drain cap gradually to allow the internal pressure to drop before removing the plug completely.
- Do not touch the silencer immediately after turning off the engine, as it is extremely hot and may cause serious injury.

3.11.3. Ventilation

Do not work with the vehicle in closed places unless equipped with a suitable combustion gas suction and exhaust system. Good ventilation is very important for vehicle operation. Carbon monoxide emission from the engine's exhaust may moreover cause suffocation in closed areas.

3.11.4. Intoxication

- Engine combustion smoke can be very dangerous and/or lethal for the human body if directly and continuously inhaled.
- If you need to work in closed environments, take all possible precautions to ensure circulation of fresh air and protect the airways by wearing a suitable mask.
- Avoid inhaling or contact with the battery acids which are highly toxic and cause serious burns.
- Be careful not to come into contact with cement as perspiration and other body fluids cause an irritating alkaline reaction and, in some people, allergic reactions. Use protective gloves and goggles.

3.12. Fire Prevention

3.12.1. Fire Caused by Fuel or Oil

Fuel and oil are highly flammable and dangerous. Always take the following precautions to prevent fires:

- Do not refuel with the engine on and in the presence of smoking materials and open flames. Do not use matches, lighters or torches to illuminate the refueling area.
- Do not smoke, use open flames or create sparks in the vicinity of the vehicle while refueling or changing the oil.
- The fuel nozzle must always remain in contact with the filler neck. Hold the fuel nozzle in contact throughout refueling to prevent sparks from being created due to build-up of static electricity.
- Do not leave the vehicle unattended while refueling or topping up the oil.
- Clean off any spillage after refueling or topping up with oil. Do not spill fuel on hot surfaces or on parts of the electric system.
- Store oil and fuel in a special room and do not allow access to unauthorized persons.
- Before carrying out any grinding or welding on the chassis, move any flammable material to a safe place.
- Do not weld or use a cutting torch to cut ducts or pipes that contain flammable liquids.
- Use a non-flammable oil to clean the components. Do not use Diesel and petrol as they are highly flammable.

- To ensure safety in the workplace, put all the cloths soaked with grease, oil or flammable liquids in a safe metal container as they pose a risk of fire.
- Store containers or cans only in their specifically allocated areas.
- Do not pour flammable liquids into open, large and low containers.

3.12.2. Fire Caused by Build-Up of Flammable Material

- Remove dry leaves, stone splinters and pieces of paper, dust or other flammable materials that have accumulated or attached to the engine, the exhaust manifold, the silencer, the battery or in the internal guards.

3.12.3. Fire In the Electric System

- Short-circuits in the electric system may cause a fire.
- Check that there are no loose or damaged parts in the system. Tighten any loose connectors or wiring terminals. If any cables or connections are corroded and/or damaged, immediately contact your local AJAX dealer.
- Any operation on the electric system or the battery must be carried out by a qualified person. Before any operation on the electric system, disconnect the battery by removing the key from the battery master switch.
- Do not smoke and avoid sparks or flames in the recharging area to prevent the outbreak of fire.
- Recharge the battery only in adequately ventilated places to prevent accidental explosions due to gas buildup.

3.13. Precautions During Maintenance Operations

3.13.1. Correct Maintenance

- Before using or carrying out any operation on the vehicle always do the following:
- Carefully read all the instructions contained in this manual.
- Always read the labels and the instructions on the vehicle and in the manual before starting any operation on the vehicle.
- Repairs and maintenance on the vehicle may only be carried out by authorized persons. Do not allow unauthorised persons to access the area. If necessary, have someone stand guard in the area.
- Before carrying out any operation, apply all the special safety devices.
- First of all, check that the maintenance operations have meticulously been carried out at the intervals established.
- Always wear suitable protective clothing and any other protection required for the operation to be carried out.
- Do not leave hammers or other tools lying around in the working area. Remove any traces of grease, oil or other substances that might cause someone to slip. Always keep the workplace clean and tidy so that you can carry out all the operations in complete safety. If the workplace is dirty and untidy, there is a risk of tripping, slipping, falling and being injured.
- Check that all the tools provided are in good condition. Do not under any circumstances use tools with upset heads and always wear protective goggles.
- Always keep the vehicle clean to prevent the formation of dirt and oil encrustations. This also reduces the risk of fire and makes it easier to identify damaged components and detached parts.
- Do not lubricate or repair the vehicle when the engine is running, except where expressly indicated in this manual.
- Do not allow anyone to tamper with the danger signs or make them illegible.
- Do not use parts of the vehicle, such as handholds or supports, to carry out the operations.
- Absolutely do not use matches, lighters, torches or open flames to illuminate dark areas.
- Use lights or lamps (vehicle and auxiliary lights) positioning them in such a way that other persons working in the area are not blinded.

3.13.2. Routine Maintenance

- Always lower the equipment to the ground and release the hydraulic pressure from all the circuits before starting to carry out maintenance on the vehicle.
- Connect all the safety devices on the vehicle and remove the ignition key.
- Depending on the type of maintenance to be carried out, disconnect the battery master switch and hang a sign on the driver's seat saying that maintenance is in progress.

3.13.3. Extraordinary Maintenance

- Do not keep the engine running in closed spaces without adequate ventilation.
- Keep your head, body, limbs and hands away from moving and/or raised equipment.
- Do not remove any safety devices, lids, covers or guards if not for maintenance reasons.
- If they need to be removed, be extremely careful and refit them before using the vehicle.

If during maintenance you need to move the equipment using the hydraulic control, operate as follows:

- Before starting the engine, warn everyone in the vicinity to move away from the vehicle.
- Operate seated on the driver's seat and never use the controls if not seated on the driver's seat.
- Engage the parking brake.
- Signal when you are about to make a maneuver by voice and sounding the horn
- Maneuver slowly
- Always lock the arms or the parts that need to remain raised during the operation using external devices.
- To lift and transport heavy parts use cranes or hoists of adequate capacity. Sling the material as best you can.
- Use eyebolts where required. Always check that no one is in the vicinity.
- If you need to remove or fit units on the vehicle that need to be supported by hydraulic or pneumatic lifting devices, check that they are of adequate capacity to support and handle the load.
- Do not allow anyone to pass in the vicinity of the vehicle and absolutely do not allow anyone to stand underneath the raised equipment even when you are certain that it is locked.
- Do not work on or under the vehicle if it is only supported by hydraulic or pneumatic lifting devices without locking valves.
- Do not work under or near a tool, a vehicle or parts of it that have been removed if they are not adequately supported.
- If you need to make repairs at the top of the vehicle, use ladders or platforms compliant to the safety regulations in force and always pay the utmost attention.
- Loads lifted with jacks are always dangerous.
- Before operating on parts lifted with jacks, it is obligatory to position adequate supports to ensure that they are securely supported.
- If there is a risk of being hit by metal splinters (grinding) always wear safety goggles.

After maintenance or repairs never leave tools, cloths or any other material in compartments containing moving parts.

3.13.4. Battery

- Before carrying out any operation on the electric system, always disconnect the battery by removing the key from the battery master switch.
- If you need to replace the battery, first disconnect the negative and then the positive cable. To reconnect the battery, first connect the positive and then the negative cable and then reinsert the key in the battery master switch.
- To recharge the battery, correctly connect the auxiliary cables to the terminals. Never short-circuit them.
- During battery recharging, flammable hydrogen gas is produced; therefore, leave the battery compartment open to ensure more effective ventilation.
- Never check the battery charge by placing metal objects on the terminals.

3.13.5. Engine

- Do not operate on the vehicle with the engine on.
- Do not turn on the engine while the lid is raised.
- Do not check or even less adjust the alternator belt tension with the engine on.
- Do not adjust the fuel pump with the engine on.
- When handling flammable materials, keep at a certain distance from the exhaust manifold, the silencer or hot points of the engine.

3.13.6. Greasing And Lubrication

- Use only the products recommended by the manufacturer.
- Lubricate and grease the vehicle at the intervals given in the scheduled maintenance table in this manual in order to keep the vehicle in efficient and safe operating conditions.
- Wear clothing suited to the operations to be carried out.
- Position the vehicle on level ground, engage the parking brake and turn off the engine.
- If the lubrication and greasing points require the equipment to be raised, use the special safety devices provided. IT IS DANGEROUS TO WORK UNDERNEATH THE EQUIPMENT WITHOUT THE SAFETY DEVICES.

3.13.7. Tyres

- The tyres are very heavy. Handle them carefully and when stored make sure that they cannot fall out of their storage space and cause injury.
- Never attempt to repair a tyre on public roads.
- When a tyre needs to be changed, the first thing to do is engage the parking brake, shift the gear lever to neutral, turn off the engine and remove the ignition key.
- This operation must be carried out on level and solid ground.
- Position a wedge under the wheel diametrically opposite the one to be replaced.
- Always stand the jack on a solid and flat surface.
- Check that the jack has sufficient lifting capacity for the vehicle.
- Use stands or other suitable supports to support the weight of the vehicle while you repair the tyres.
- Never lie under the vehicle, not even partially, or start the engine when the vehicle is lifted with a jack.
- Never hit the tyre or rim with a hammer.
- Check that the rim is clean and without rust or other damage. Do not weld, braze or repair a rim in any way nor use a damaged rim.
- Do not inflate a tyre if the rim is not fitted on the vehicle and well fastened so that it cannot move in the event that the tyre or the rim suddenly breaks.
- When fitting a new or repaired tyre, use a pressure gauge with a flexible hose connected to the valve so that you can stand far away from the tyre during inflation. If possible, also use a safety cage.
- When checking the tyre pressure, also inspect the treads and the sides for any damage. Neglected damage may lead to premature tyre breakage.
- The inflation pressure also determines the weight a tyre can support. Identify the tyre sizes in the pressure and loads table. Do not exceed the load for any given pressure. Do not over- or under-inflate the tyres.
- Never inflate a steering tyre to over the maximum pressure recommended by the manufacturer as indicated on the tyre, or over the maximum pressure indicated in the pressures and loads table and when the tyre is not marked with the maximum pressure values.
- Inflating a tyre to over the permitted value with the bead not perfectly adjusted; there is a risk of the bead or the rim breaking with an explosive force that could cause serious injury.

- Do not inflate a tyre that has been used deflated or at very low pressure, but first have it examined by a qualified person.
- During inflation stand in a protected area with respect to the side of the tyre.
- Never inflate using flammable gases or compressed air from systems with alcohol injectors.
- After refitting the wheel, tighten the wheel fastening nuts on the axle to the specified torque. Check the torque of the nuts every day until it has stabilized.

3.13.8. Refuelling

- Use only the products recommended by the manufacturer.
- Refuel and top up at the intervals indicated in the scheduled maintenance table in this manual in order to keep the vehicle in efficient and safe operating conditions.
- Wear clothing suited to the operations to be carried out.
- Any fluid top-ups must be carried out with the engine off and cold.
- Before checking or refueling, make sure that there are no open flames or smoking materials in the area and do not use matches, lighters or torches as light source.
- Unscrew the caps very slowly to release the pressure from the system before removing them completely.
- Be careful during refueling and topping up as splashes of fuel and oil may cause slipping and injury.
- Immediately and thoroughly clean off any soiled areas.

3.13.9. Precautions During Welding Operations

- Welding operations must always be carried out by a qualified welder and in a place equipped with adequate tools.
- If you are involved in welding operations, wear dark-glassed goggles or a mask, a hardhat, overalls, and safety gloves and shoes.
- Never look at the welding arc without wearing all the specific personal protection devices.
- Eye protection must also be worn by anyone standing in the vicinity even if not directly involved in the welding operations.
- Have a fire extinguisher at hand in the area where the welding operations are carried out.
- Remove the key from the battery master switch before carrying out any welding operations on the vehicle.
- When carrying out repairs by means of welding, the paint may get burned by the welding heat or dangerous gases may be released.
- Before starting to weld, remove the paint from the part to be welded.
- Do not use a torch to weld or cut a tube containing a combustible solution: this may cause fire or explosion.

3.13.10. Faults And Unauthorised Modifications

- If faults are found during vehicle operation or maintenance (noise, vibration, unusual smells, fault signaling, oil leaks, etc.) report to the person in charge so that the appropriate action can be taken. Do not start the vehicle until the fault has been repaired.
- No modifications may be made to the vehicle without prior authorization from AJAX, as modifications may create risks.
- Before making any modification, consult with AJAX .AJAX is not responsible for any injury or damage caused by unauthorized modifications.

3.13.11. Cleaning The Vehicle

- Parts soiled with oil or grease, broken tools or parts left lying around are dangerous as they may cause slipping and falling. Always keep the vehicle and the workplace clean and tidy.
- Thoroughly clean the floor, handrails, instruments, plates, lights and windows of the cabin.

- When using compressed air to clean parts, wear protective goggles, limit the pressure to maximum 2 bars and adhere to the safety regulations in force.
- Accidental infiltration of water into the electric system may cause functional and operational problems. Do not use pressurized water or steam to clean the electric system (sensors, connectors).
- Do not use petrol, solvents or other flammable liquids to clean parts; use approved non-flammable and nontoxic commercial solvents.
- If inspection and maintenance are carried out when the vehicle is still soiled with oil or mud, you run the risk of slipping and falling, or that the mud and dirt comes into contact with your eyes. Always keep the vehicle clean.

3.13.12. Waste Fluid/Material Disposal

- Incorrect disposal of waste fluids can seriously harm the environment. Before disposing of waste fluids, contact the competent local authorities for the correct disposal procedures.
- Always collect the oil drained from the vehicle into suitable containers. Never drain the oil directly onto the ground or into drains, rivers, oceans or lakes.
- For disposal of hazardous waste, such as oil, fuel, coolant, filters, batteries, and other waste materials, observe the relative laws and regulations in force.

3.14. Safety Plates

CAUTION

SAFETY RULES

- Always fasten seat belt. before starting the machine, learn location and purpose of all controls, instruments, indicators etc. See operational manual.
- Be sure control levers are in neutral position before attempting to start engine.
- Never attempt to get on or off the machine while it is operating. When getting on or off use the handrail and steps.
- when in operation do let another person on the machine. All the persons must be away from range of operation.
- In operation avoid jerky turns and starts, as well as, too violent stops or reverse movements. if you become confused stop engine with stop cable/switch.
- Shut off engine before making any adjustment or check. Place the machine on level ground, lower loading arm and bucket to the ground.
- If loading arm is raised for inspection always use safety blocks, safety supports, wear safety glasses, hard hat and gloves.
- Park safely your machine. If on a slope put blocks against tyres.
- Move safely. Do not travel near the edge of ditch, gully or excavation, travel carefully where room is limited, over rough ground and on slopes.

A CAREFUL OPERATION IS THE BEST INSURANCE AGAINST ANY ACCIDENT

WARNING — AVOID HIGH PRESSURE FLUIDS RELEASE PRESSURE BEFORE DISCONNECTING OIL LINES

WARNING — AVOID SERIOUS INJURY KEEP OF ROTATING PART

WARNING — FRESH CONCRETE DO NOT TOUCH WITH BARE HANDS. PROTECT EYES WITH SAFETY - GLASSES

WARNING — KEEP OF YOUR HEAD FROM HARD CORNERS ALWAYS USE YOUR HARD - HAT

WARNING — BE CAREFUL NOT TO TOUCH HOT SURFACES

WARNING — OPEN ENGINE HOOD FOR INSPECTION ONLY WITH STOPPED ENGINE

WARNING — FOR TRAVELING AND INSPECTION FIX SAFETY BLOCKS

WARNING — NOXIUS FLUIDS DO NOT TOUCH WITH BARE HANDS AND DO NOT INGEST

WARNING — BEFORE STARTING BE SURE ALL PERSONS ARE AWAY FROM THE RANGE OF OPERATION

WARNING — NOT DRINKABLE WATER

CAUTION — THIS MACHINE IS WITH IMPROVED HYDRAULIC OIL. USE ONLY AJAX GENUINE OIL.

CAUTION

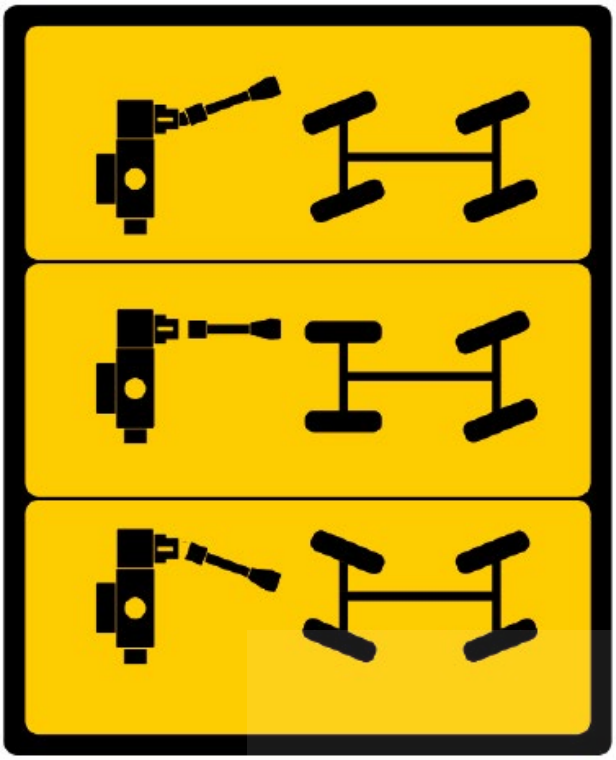
PNEUMATIC 16.0/70-20 — TYRE SIZE 14PR

INFLATION PRESSURE

4.8 BAR — 70 PSI

WARNING — DO NOT EXPOSE CHROMIUM PLATED CYLINDER ROD TO ACID

WARNING — TURN THE KEY TO IGNITION ON POSITION AND WAIT FOR FEW SECONDS FOR CLUSTER TO TURN ON BEFORE CRANKING

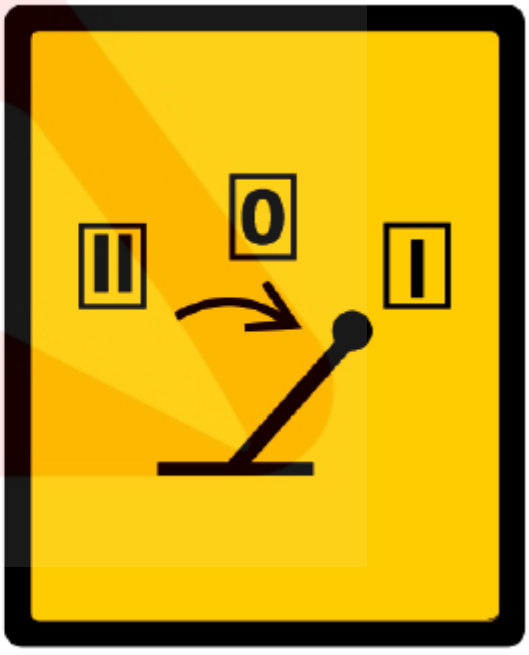


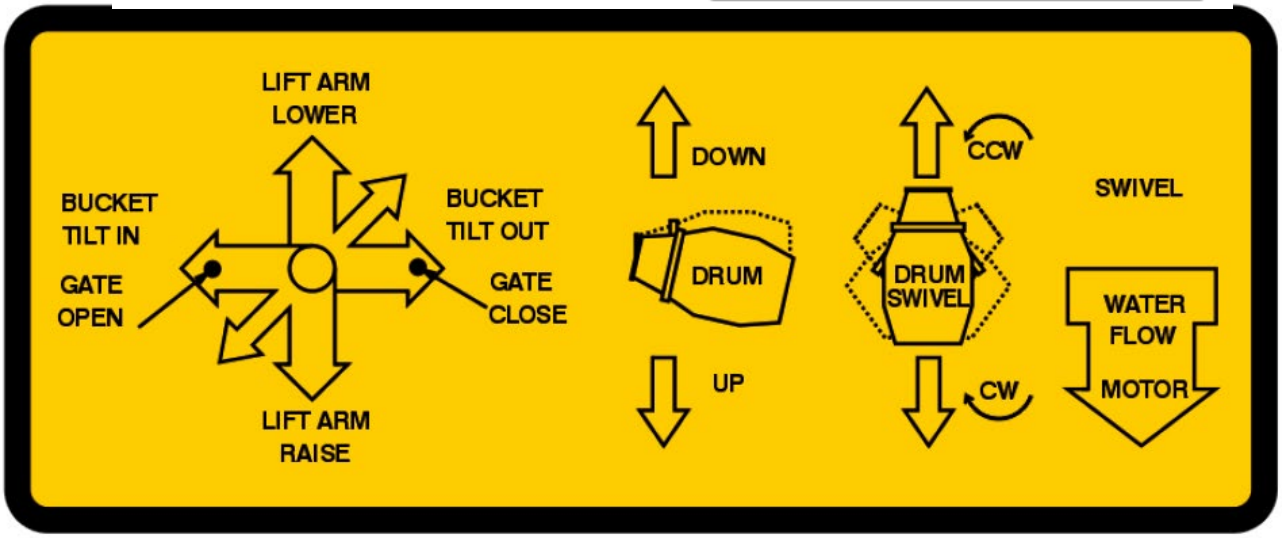
GEAR SELECTION

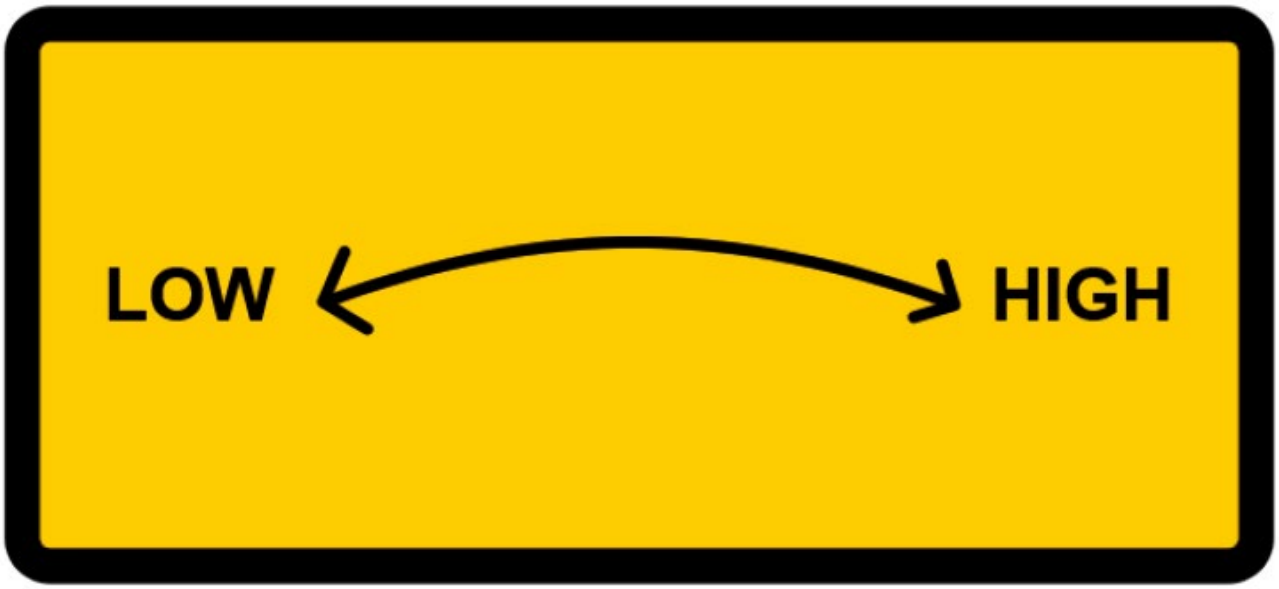
1. MAKE SURE THE BRAKE PEDAL IS PRESSED COMPLETELY
2. DO NOT ALLOW THE MACHINE TO MOVE
3. SHIFT THE GEAR 1 OR 2 AS PER SITUATION
4. OPERATE THE STEERING WHEEL IN BOTH THE DIRECTION IN CASE GEAR IS NOT PROPERLY ENGAGED
5. DO NOT CHANGE THE GEAR WHILE MACHINE IS MOVING FORWARD/REVERSE DIRECTION IT WILL DAMAGE THE GEAR SYSTEM OF THE EQUIPMENT

PARKING BRAKE APPLIED/RELESED

1. PARKING BRAKE SWITCH IS ON RED LIGHT INDICATION ON DASH BOARD
2. FORWARD & REVERSE SWITCH SHOULD NOT BE ENGAGING
3. PARKING BRAKE RELEASED IS NOT RECOMMENDED
4. INCASE FORWARD/REVERSE SWITCH IS IN ENGAGED POSITION, DON'T TRY TO CHANGE THE GEAR 1 & 2







It is extremely important to observe the adhesive stickers positioned on the vehicle every time you start up the machine, repair it or are simply moving close to it. Therefore, the user is obligated to keep all stickers legible.
If stickers must be replaced because of wear, it is necessary to contact AJAX SPARE PARTS ASSITANCE to obtain spare stickers, specifying the code number of the plate itself as laid down in the attached director (fig.1).
The attached list contains all standard plates commonly used that AJAX has in its production.
Special plates not included in the above-mentioned list are supplied by indicating serial number of your vehicle.
We underline once again the necessity to keep said plates always visible and to draw the attention of those who for work reasons or else are standing close to the vehicle on the strict observance of all reported regulations.

CAUTION: **The Manufacturer disclaims all responsibility for injury to persons or damage to things due to non-observance of the above-mentioned safety rules.**

Attention Make sure you have fully understood their position and content. To ensure correct interpretation, verify that they are in the correct position and that they are always kept clean.

3.15. Safety Devices

The machine is equipped with safety devices that are activated when starting up and/or running procedures are not performed correctly; the following legend describes their specific function.

3.16. Loading Arm Locking Pin

When the loading arm is locked in lifted position it prevents accidental lowering of the arm during transfer and transport operations.

3.17. Operator Post Rotation Locking Pin

It is an anti-rotation device of the rotating frame. It automatically connects by rotating the frame.

4. Operation And Use

4.1. Introduction

This chapter is intended to help you learn how to maneuver with the vehicle. Read it carefully from start to finish. When you have finished reading this chapter, you should have good knowledge of the vehicle and its functioning.

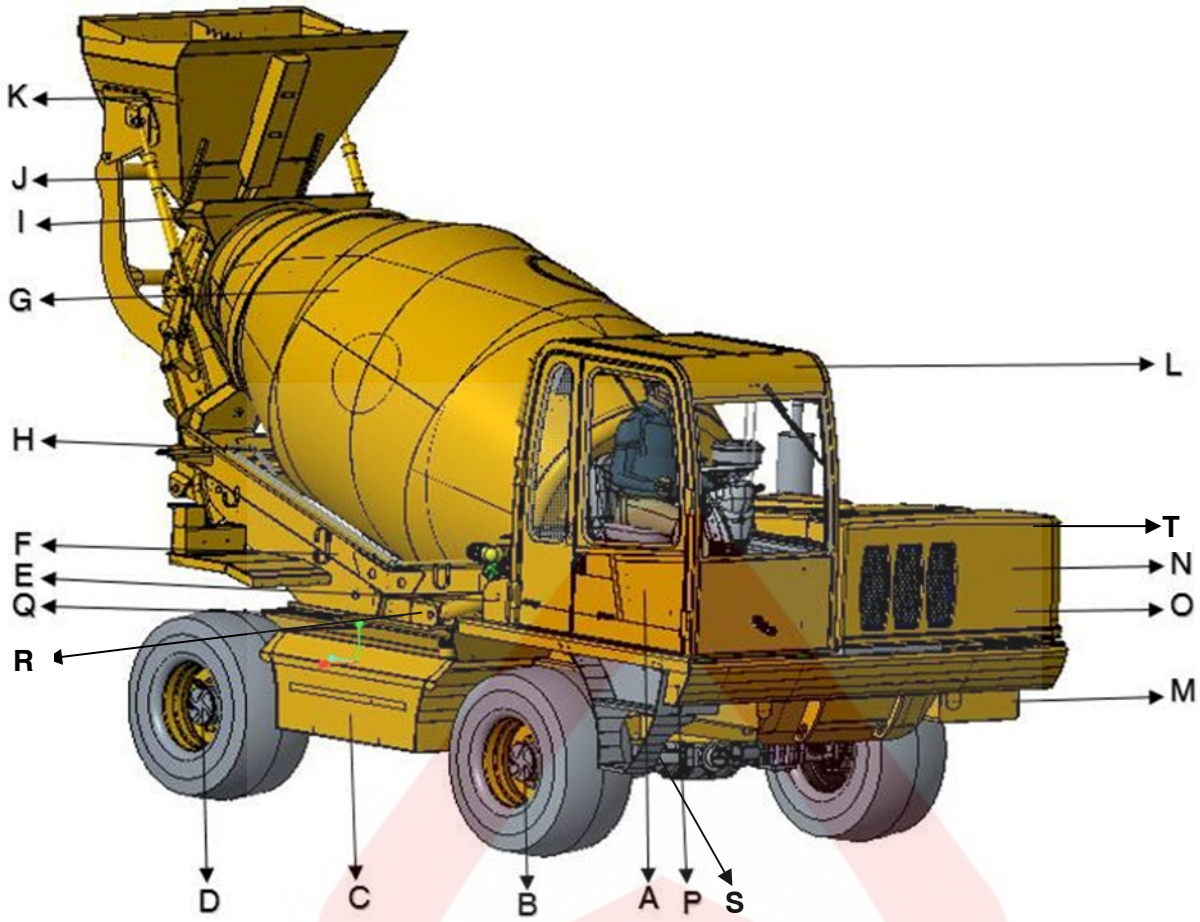
Once you have learned where the controls are and what they do, practice using them. Practice by using the vehicle in the open on level ground and where there are no obstacles or persons around.
Learn to anticipate the reactions of the vehicle and its controls. Only start using the equipment when you are sure that you have good command of the vehicle and can drive it safely.

Be careful when you use the equipment controls.
Practice in the open. Do not allow anyone to come near the vehicle. Do not act roughly on the controls but use them carefully until you fully understand the effect they have on the vehicle.
Finally, do not rush to learn to maneuver the vehicle. Take your time and do things calmly and safely.

CAUTION: Before starting to use or carry out maintenance on the vehicle, always read the safety Regulations for the operations to be carried out.

4.2. Description Of Main Parts

The references and descriptions of the main parts of the vehicle are given here so that you can quickly get to know and understand them when mentioned further on in this manual. Therefore, it is important that you very carefully read the legend below.

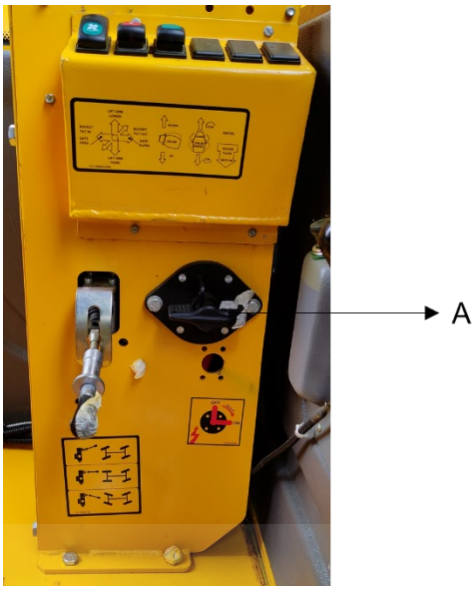


A. DRIVING TURRET	J. SLIDING GATE
B. FRONT AXLE	K. LOADING BUCKET
C. WATER TANK	L. OPERATOR CABIN
D.REAR AXLE + GEAR BOX	M. FUEL TANK
E. WATER SYSTEM	N. BONNET
F. DRUM SUPPORT FRAME	O. HYDRAULIC OIL TANK
G. MIXING DRUM	P. BATTERY CUT-OFF SWITCH
H. DISCHARGE CHUTE	Q. DRUM BASE FRAME
I. LOADING HOPPER	R. AD BLUE / DEF Tank

S. ECU – Electronic control unit (M & M engine).

T. ECU – Electronic control unit (KOEL engine).

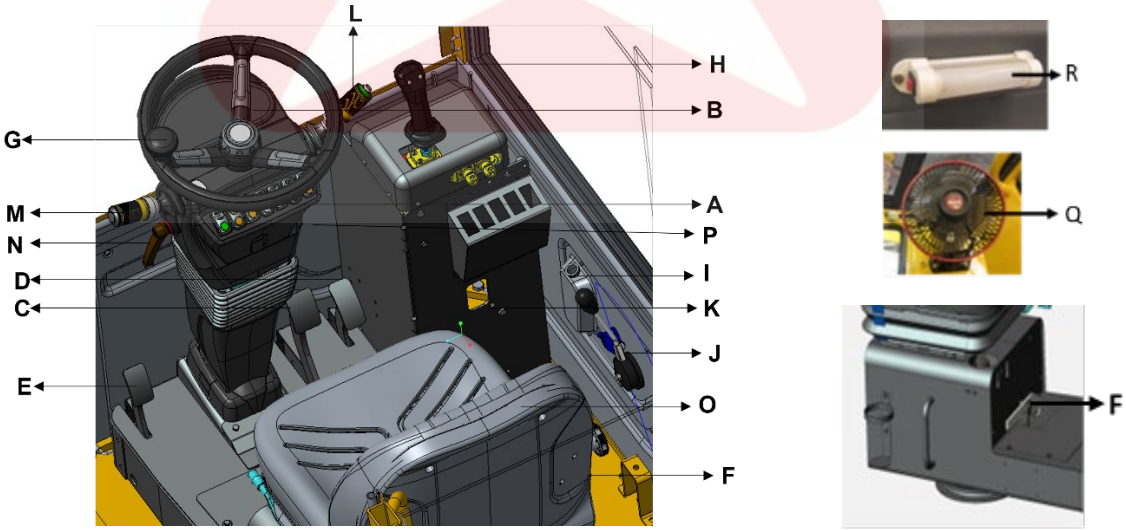
4.3. Battery Cutoff Switch



The battery cut of switch '**A**' helps to avoid battery by self-discharging and isolate the negative power during machine standby mode.

4.4. Controls And Gauges:

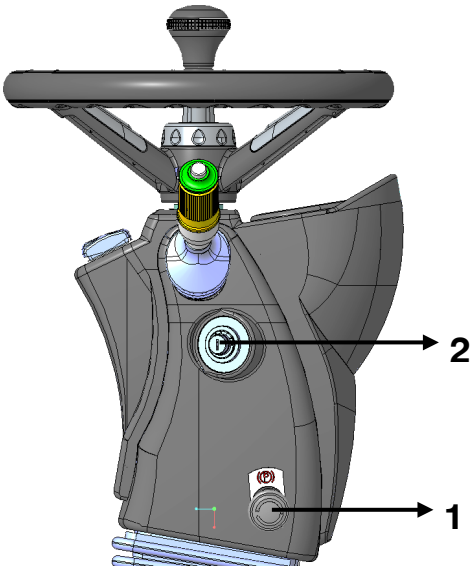
Your safety and that of others in the vicinity depends on your good judgement and care in using the vehicle. Therefore, you should know exactly where all the controls are positioned and what their function is. Every vehicle has its limits: before using it, familiarise yourself with its speed, braking, steering, stability and load capabilities. This chapter provides all the useful information you need to quickly get to know and safely use the vehicle control.

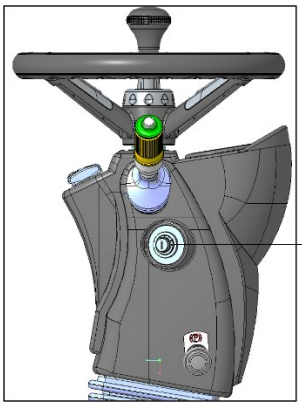


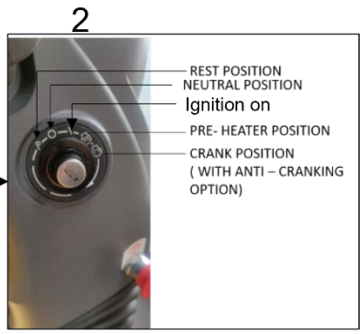
A. Dashboard Control
B. Instrument Cluster
C. Service Brake
D. Accelerator Pedal
E. Inching Pedal
F. Pivoting Driver Post Locking Lever
G. Steering Wheel
H. Joystick Control
I. Power Socket & Cigarette Lighter
J. Hand Accelerator Lever

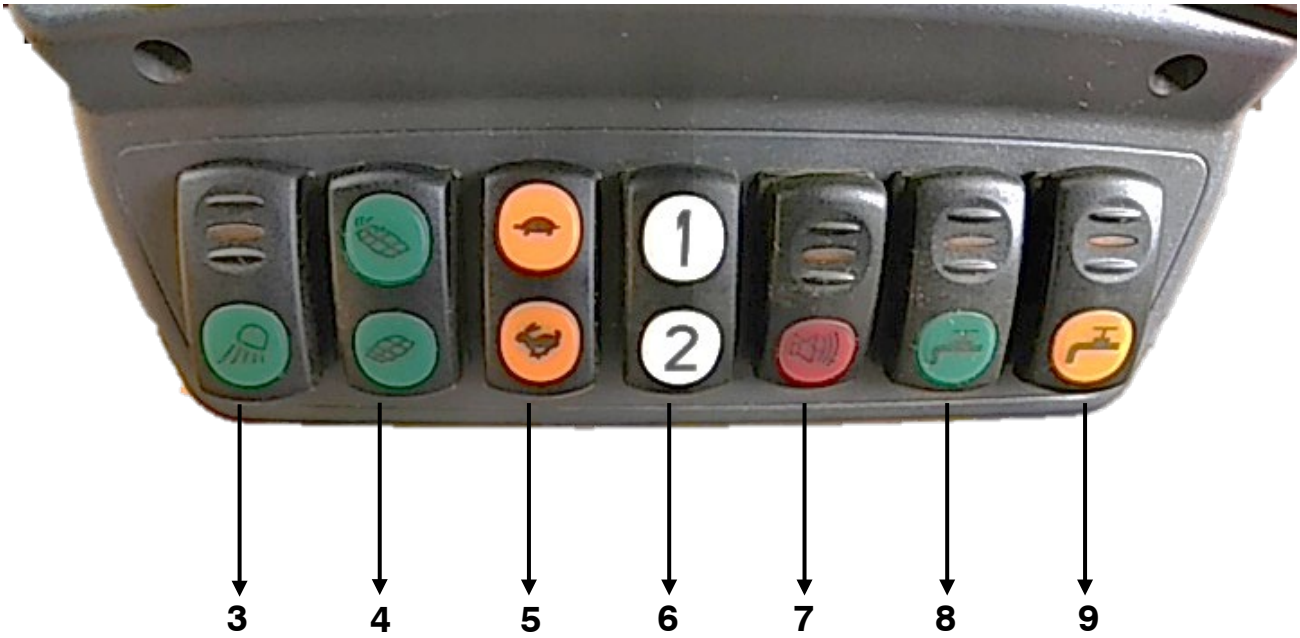
K. Steering Mode Selector
L. Right Side Combination Switch
M. Left Side Combination Switch
N. Steering Column Adjustment Lever
O. Driver Seat
P. Parking Brake
Q. Roof Fan
R. Roof Lamp

4.4.1.A. Dashboard Controls:

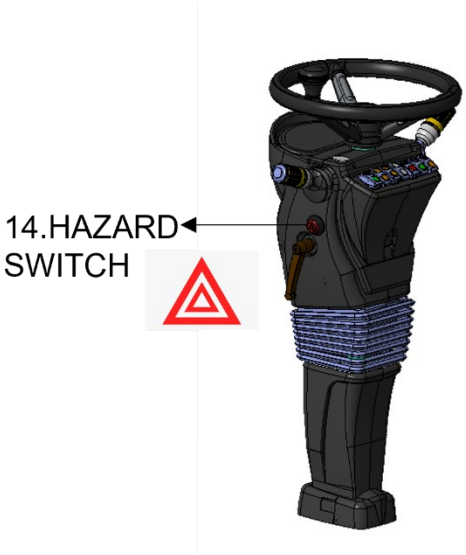








4.4.2. Rear Dc valve mounting bracket (Argo 4800 EH drum control)



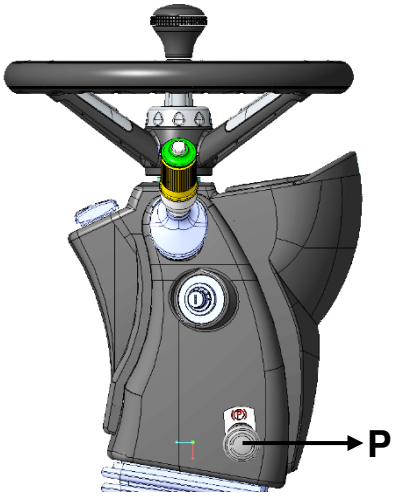
4.4.3. Rear Dc valve mounting bracket (Argo 4800/4300Non EH drum control)

1. Parking Brake Push Button
2. Ignition Switch
3. Work Lamp Switch
4. Drum Rotation Switch
5. High/Low Speed Switch

6. Gear1 / Gear 2 Shifting Switch.
7. Reverse Horn Switch
8. High pressure jet (optional)
9. Additive Switch
10. Error Lamp for Electronic Drum Control System)
11. Auto/manual drum control switch (optional - only for electronic drum control system)
12. Drum Auto wash (optional - only for electronic drum control system)
13. Cabin Fan Switch
14. Mobile Charger Switch
15. Rear Wiper Motor Switch
16. Hazard Switch

1 - Parking Brake Push Button

It permits to block the machine during any work break with engine turned on. To lock, firmly push the button. To unlock, turn the button clockwise front to release. With engine turned off the machine brakes automatically.

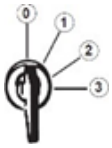


CAUTION: When the engine is turned on, the parking brake automatically disengages if the button (P) is in released condition. The next time the vehicle is turned off the parking brake automatically engages because the residual pressure is cancelled out.

To disengage it, turn the button P to clockwise direction and release it.
For temporary stops on slopes or where necessary engage the parking brake by pressing the button P

DANGER Do not use the parking brake to slow down the vehicle, except in emergencies, as the vehicle would stop abruptly and thereby reducing the efficiency of the brake.

2- Ignition Switch



Start the engine by turning the ignition key, rotate the key clockwise to neutral position by one click, Turn the key further to I position this is ignition ON & will turn ON the cluster. Turning the key further forward will enable pre-heating mode (pre-heating is optional), followed by pre-heating mode next is cranking position.

3 - Working Lamp Switch

Snap switch ON to turn on the rear working lights.

4 - Drum Rotation Switch

This selector is used to control drum rotation.

- Push the selector forward/downward for clockwise drum rotation during concrete in loading and mixing.
- center/neutral position the set speed remains fixed.
- Push the selector backward/upward for anticlockwise drum rotation during concrete unloading.
- Repeatedly act on the selector to increase the drum rotation speed. Act on the selector in opposite direction to reduce the speed or until the drum stops.

CAUTION: Because of minimal hydraulic leakage, the drum tends not to remain stationary. Periodically check drum rotation by acting on the selector.

5 - High/Low Speed Switch

Push the selector backward/up for constant slow speed.

Push the selector forward/down to maintain a constant high speed.

6 - Gear 1 / Gear 2 Shifting Switch

The gear shift switch allows you to select two basic speeds:

Position I – Low speed or working speed.
Position II – High speed or road transfer speed.

7- Reverse Horn Switch

Press the switch to turn off the beep sound when operating in reverse direction / working phase.

8 – High pressure jet (optional)

Snap the switch ON to active the high-pressure jet for cleaning the vehicle.

9- Additive Switch (Optional, In Yellow)

The switch controls use of additive when required.
1st click – forward/downward, Admixture Pump ON
2nd click – backward/upward, Admixture Pump OFF

10 - Error Lamp for Electronic Drum Control System

The lamp glows only when the vehicle is started in auto mixing mode.

Error Lamp details

Error lamp to given Indication of errors and warning related Drum control system, Controller function and IO healthy

11 – Cabin fan switch

Snap the switch ON to turn on the roof fan.

12 - Mobile Charger Switch

Snap the switch ON to charge the mobile phone.

13 - Rear Wiper Motor Switch

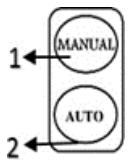
Snap the switch ON to turn on the wiper on the rear side.

14- Hazard Switch

Snap switch to turn on the four-hazard warning lights.

Electronic drum control system,(available as on optional only for Argo 4800)

15- Auto/Manual Drum Control Switch



- Engine shall be cranked always with drum control switch in manual mode else error lamp will be glowing and inhibits drum rotation function. To enable drum rotation, switch position shall be changed to manual mode (position1), and this turns off the error lamp.
- Auto and Manual Selection Switch Operation Auto Mixing Mode – 2
- Press the switch 11 to auto mode (position 2) to perform automatic.

Mixing of concrete, the process will be as follows.

- Press Auto Mixing button. Mixing starts with constant speed of 15 rpm for 4 minutes (based on engine RPM).
- After 4 minute it will slows down to 25% of speed.
- It will continue till discharge happens.
- Discharge operation will be manual thru another button.
- Auto mixing cycle will re-set once discharge operates.

Manual mixing mode - 1

Press the switch 11 to manual mode to perform manual mixing of

Press the concrete the process will be as follows:

1. Drum rotation switch 4 provided on the dashboard controls.

2. Push the selector forward/downward for clockwise drum rotation during concrete loading and mixing

3. In centre/neutral position the set speed remains fixed

4. Push the selector backward/upward for anticlockwise drum rotation during concrete unloading

Drum control operation

Manual Mixing and Discharge:

- Turn the Auto / Manual selector Switch to Manual mode
- Use Drum FWD/REV Switch to change the direction of Drum for Mixing / Discharge and control the drum speed by inching UP/Down direction

Auto Mixing :

- After completion of loading operation (required material in the drum), Turn the Auto / Manual selector Switch to Auto mode.
- Drum will rotate at max speed (to yield good homogeneous concrete).
- Drum rotation will go to lower drum speed automatically. This will reduce load on engine and in turn save fuel*.
- Drum rotation will be retained constant at this speed till Discharge is chosen.
- For discharge, change Auto / Manual selector switch to manual mode and press the REV Switch.

Parameters of each mode :

i) Manual Mixing

Drum direction **:** Mixing and Discharge

Input: Auto/Manual Mixing Mode switch (On SCK) to increase speed and direction of drum.

ii) Auto mixing
Drum direction : Mixing
Input: Auto mixing mode selection from Auto/Manual Selector switch

Note : Engine RPM changes may vary mixing cycle time.

iii) Auto mixing
Drum direction : Clockwise and Anti-clockwise
Input: Auto Drum washing Switch.

Note: "Always Discharge will be in manual mode only".

16 AUTO CLEANING (optional - only for electronic drum control system the process will be as follows

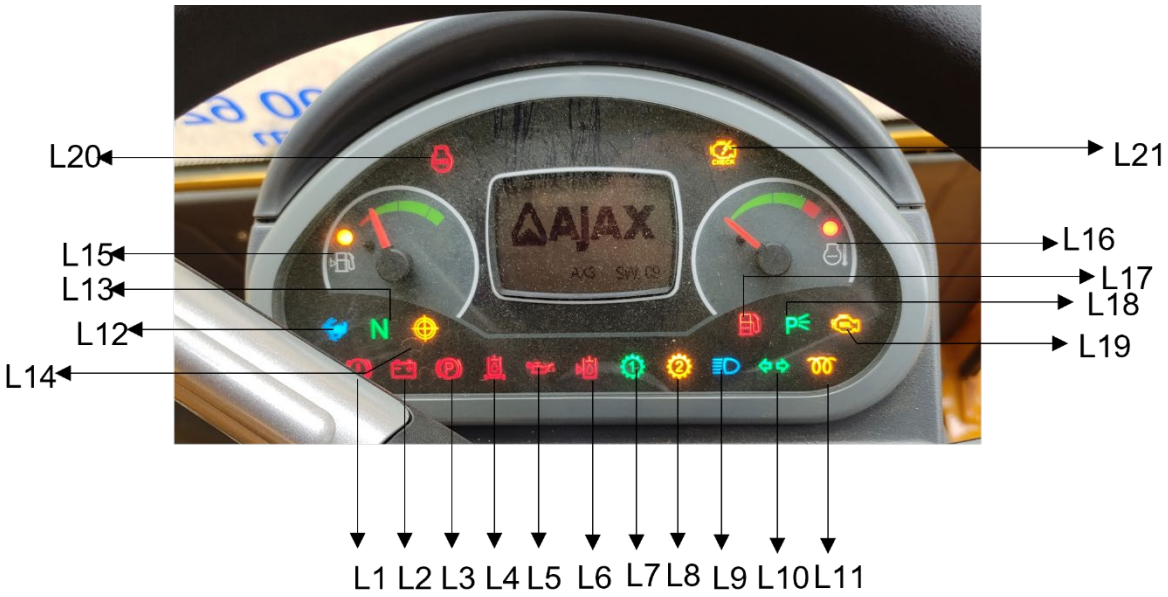
- Press Auto Clean button to start the cycle.
- Drum start in mixing direction rotating at maximum speed (Based on engine RPM).
  - Water pump start pumping water in to drum for 20 sec. (~ 60 ltrs of water)
  - Drum will run for 30 sec.
  - After 30 sec Drum start discharge cycle at 50 % speed for 30 sec
  - This ends the Auto Clean process.

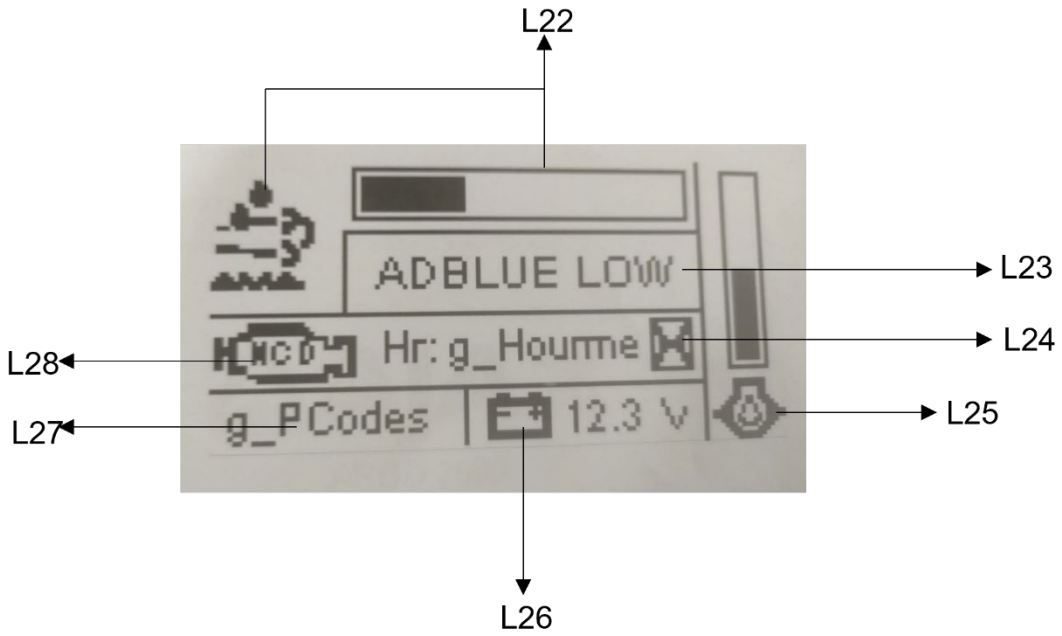
Auto Washing :

- Drum cleaning cycle with Auto cut-off of Water pump whenever drum cleaning is required.
- Make sure Auto/Manual selector switch will be in Manual Mode. Auto washing function will work only in manual mode.
- Press and hold Auto Clean button (WASH) for 2sec to start the cycle.
- Auto Cleaning cycle starts and ends by completing the cleaning process automatically.
- In case, want to stop Auto clean cycle, press again the same button.

Note "This Cleaning cycle will reduce operator fatigue and optimize water usage"

4.4.4.B Instrument Cluster





W/L	Function	Color	Symbol		W/L	Function	Color	Symbol
L1	Park Brake failure	**RED**			**L12**	High speed	Blue	
L2	Battery Indicator	**RED**			**L13**	Neutral	Green	
L3	Park Brake applied	**RED**			**L14**	Wheel Centering	Amber	
L4	Hydraulic Filter Clog	**RED**			**L15**	Fuel tank alarm	Amber	
L5	Lubrication Oil pressure low	**RED**			**L16**	Engine water over heated	**RED**	
L6	Hydraulic Oil level low	**RED**			**L17**	Water in fuel	**RED**	
L7	Gear 1	Green			**L18**	Parking light indication	Green	
L8	Gear 2	Amber			**L19**	MIL Lamp	Amber	
L9	High Beam	Blue			**L20**	Engine stop lamp	**RED**	
L10	Turn Left / Right	Green			**L21**	System lamp	Amber	
L11	Engine pre Heat	Amber						

Switch Details

L1. Park brake failure
L2 Battery indicator
L3 Parking brake applied
L4 Hydraulic filter clog
L5 Lubrication oil pressure low
L6 Hydraulic oil level low
L7 Gear 1
L8 Gear 2
L9 High Beam
L10 Turn Left/Right
L11 Engine Pre Heat (Optional, applicable for cold regions)
L12 High Speed

L13 Neutral
L14 Wheel Centering
L15 Fuel Level Alarm
L16 Engine Water Over Heated
L17 Water In Fuel
L18 Parking Light Indication
L19 MIL (Malfunction Indication Lamp)
L20 Engine Stop Lamp
L21 System Lamp
L22 Adblue / DEF level indicator
L23 Adblue low level warning
L24 Hour meter
L25 Lube oil level indication
L26 Battery voltage indication
L27 Error code
L28 NCD (Nox control diagnostic system)

4.5. C - Service Brakes:

Push the service brake pedal to slow down or stop the vehicle; use the brakes to avoid picking up speed when you are going downhill. It permits to control the machine speed. It is equipped with a Brake Master cylinder transmitting brake fluid directly to brake pistons within the axles. Even with the diesel engine stopped. Any wrong operation of the brake feeding hydraulic system is signaled by a pilot light located on the dashboard.

CAUTION: If driving down steep slopes never use only the brake pedal, but also engage the lowest gear and hydraulic motor in low mode (tortoise) and depress the brake pedal intermittently so as not to overheat the brakes & for better control.

The stop lamps must come on when the brakes are engaged. As the malfunctioning of brake lamps can lead to serious accidents, we recommend using the vehicle if both stop lights are functioning properly.

4.6. D - Accelerator Pedal:

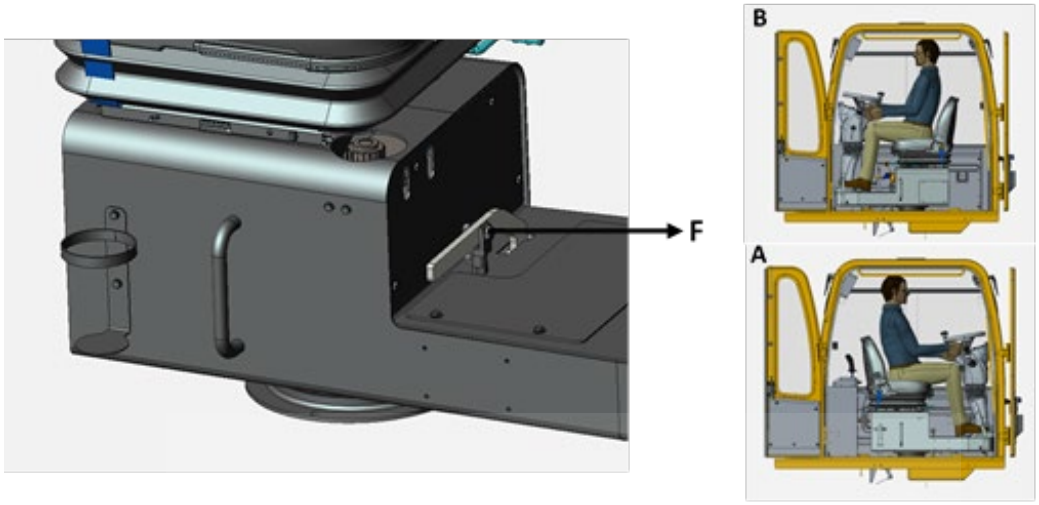
This pedal controls the engine speed, and the automotive system controls the vehicle speed when a gear is engaged.

4.7. E - Inching Pedal:

This pedal acts similar like the brake pedal but it controls swash plate angle of the drive pump there by reducing the vehicle speed. Function is to reduce the travel speed by maintaining higher engine speed.

Note: Inching pedal is not an alternative/substitute for service brakes. Complete stop of the vehicle can only be achieved with service brakes.

4.8. F - Pivoting Driver Post Locking Lever:



The lever allows the operator to lock the driving post in the transfer A and loading B positions.

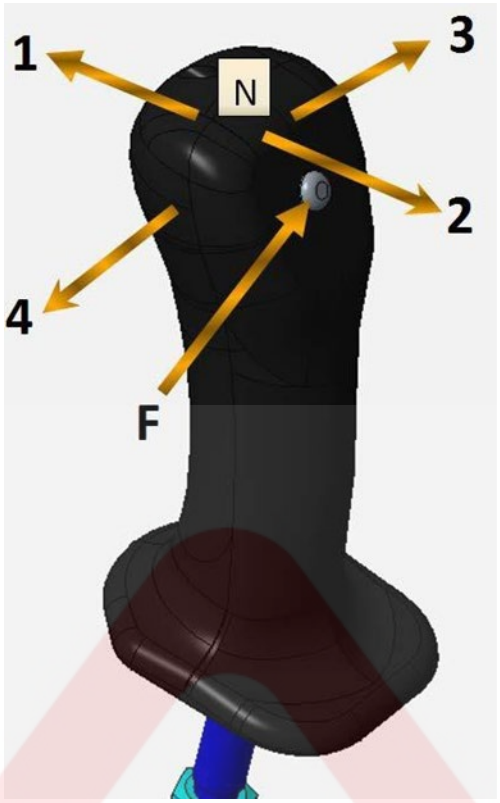
CAUTION: The driving post must be turned in the direction as shown in Fig. A for road transfers and in Fig. B for the drum loading phases. Turn the driving post with the vehicle stationary and stable and the parking brake engaged. This operation should be carried out while you are seated on the driver's seat. Check that it is locked into place at the end of the operation. Improper locking of driving post can result in fatal accidents.

4.9. G - Gear Shift by Switch

The gear shift switch allows you to select two basic speeds:
Position I – Low speed or working speed
Position II – High speed or road transfer speed
To change gear, vehicle has to be brought to complete stop/stand still, press and hold the brake pedal fully, shift the FNR control switch to the neutral position, release brakes & continue driving. Shifting gears in motion will damage the gear box

CAUTION: Before driving uphill or downhill on steep slopes, always select the lowest gear i.e. gear I with the vehicle stationary and stable.

4.10. H- Joystick Controls



Position N- Neutral

Position 1 - Loading arm Lowering

Position 2 – Loading arm raising

Position 3 – Bucket rotates downward (bucket open), press button F to open the sliding hatch/ sliding gate

Position 4 – Bucket rotates Upward (bucket close), press button F to open the sliding hatch/ sliding gate

CAUTION: All lowering movements such as loading arm lowering, drum lowering are functional even when the engine is stopped. (Loading arm lowering and drum lowering are functional, when the ignition key is on) Hence it is strongly recommended to engage the lock pin for the loading arm when the vehicle is not used and support the drum lifting cylinder with safety rod while carrying out any work under the drum

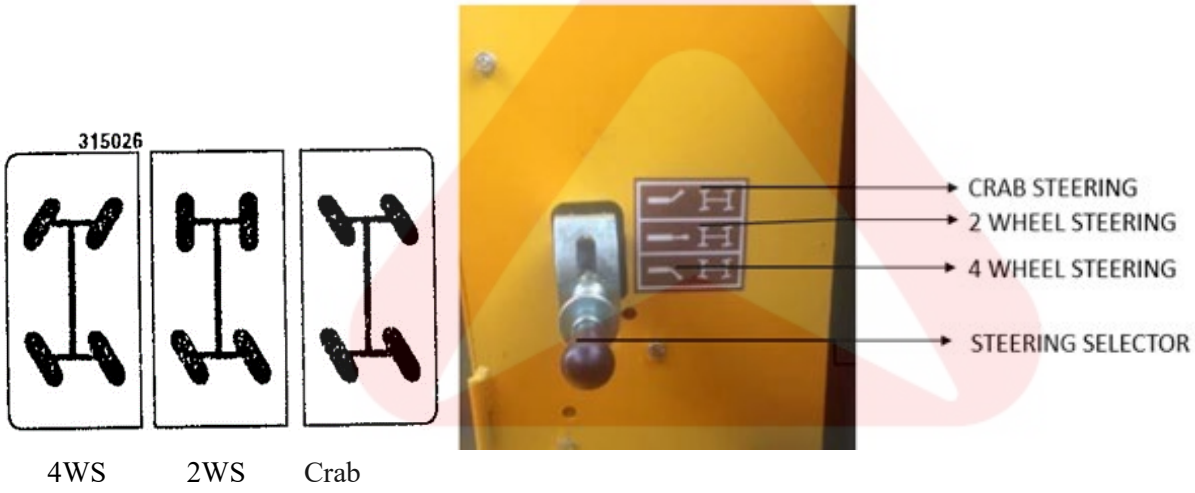
4.11. I - Power Socket & Cigarette Lighter

Draws current from the 12V battery, can be used for mobile charging as well as for cigarette lighting. Snap switch for mobile charging shall be on to enable this function.

4.12. J - Hand Accelerator Lever

Allows the operator to adjust the engine RPM when the vehicle is stationary; use only during concrete mixing and unloading and to operate the water pump. Before activating it, check that the forward/ reverse FNR control is in neutral position & parking brake is engaged.

4.13. K - Steering Mode Selector



Crab Steering:

This means the same steering angle is present on both front and rear wheels.

2 Wheel Steering:

Two front wheels are steering

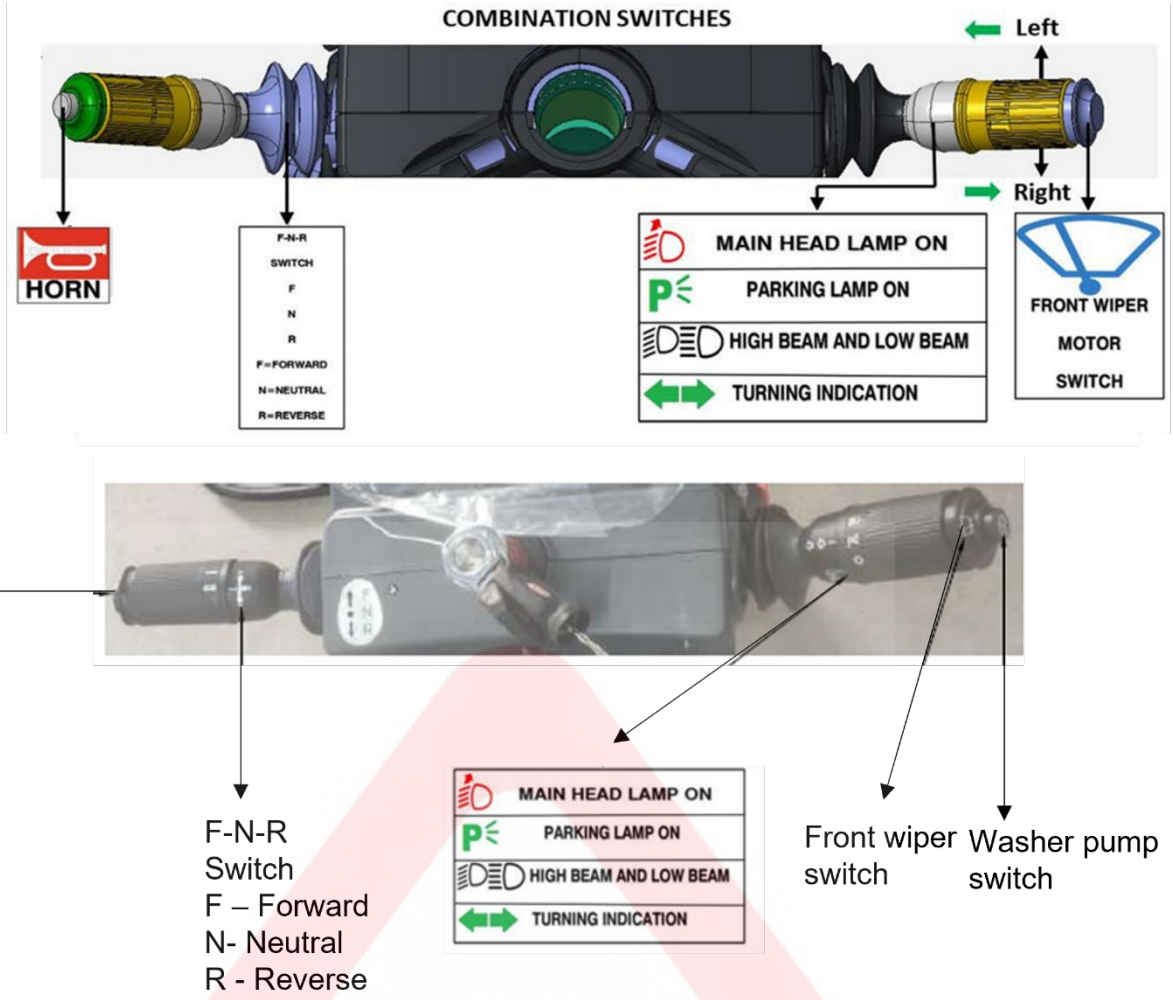
4 Wheel Steering:

The four wheels are steering. The rear wheels steer toward the opposite direction to the front wheels.

Caution: Before performing any transfer maneuver with the machine, check the correct alignment of all four wheels. Speed selection shall occur necessarily when the vehicle is standing still and stable.

CAUTION: It is prohibited to use CRAB STEERING if the driving post is facing the drum. In this position steering is inverted with respect to steering wheel rotation.

4.14. Combination Switch



4.15. L - Right Side Combination Switch

Turn the rotary switch backward (2steps) to turn on main head lamp

Turn the rotary switch one step backward to turn on the park lamp

Move the lever up and down for selecting low and high beams

Push the lever forward for left turn indicator and backward for right turn indicator. Center position is neutral

Front Wiper Motor Switch - Press the switch to activate the wiper on the front side.

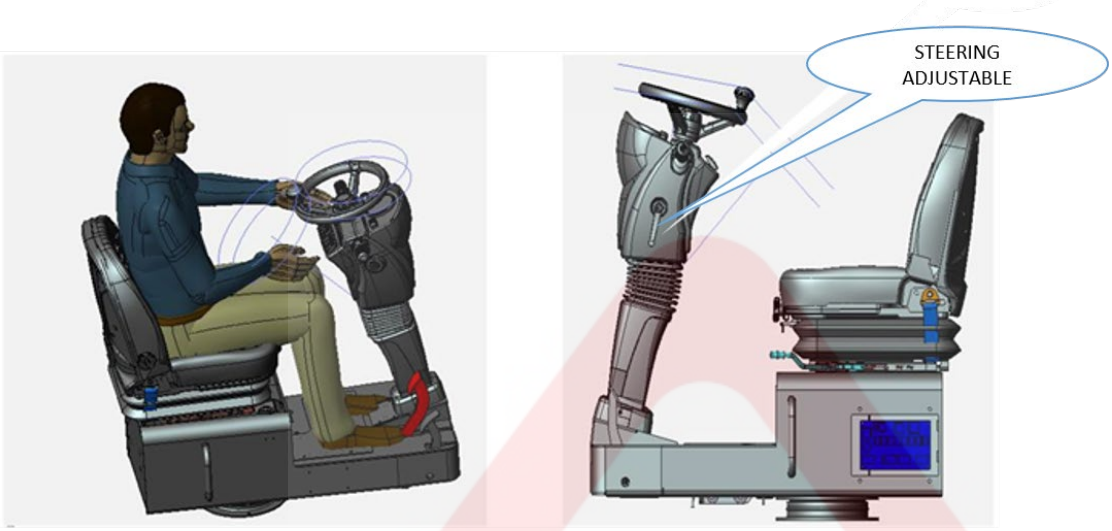
4.16. M - Left Side Combination Switch

HORN - Press the button to activate the horn

FNR SWITCH
Forward – Lift and push forward
Neutral – Middle position
Reverse – Lift and pull backward

4.17. N - Steering Column Adjustment Lever

Tilt and telescopic steering column, can be adjusted to drivers of various statures. The driver can tilt as well as move the steering column telescopically according to his convenience, using this lever.



Tilt and telescopic steering system provide driver of various statues to adjust the steering wheel up and down, back and forward to suit their comfort.

Procedure

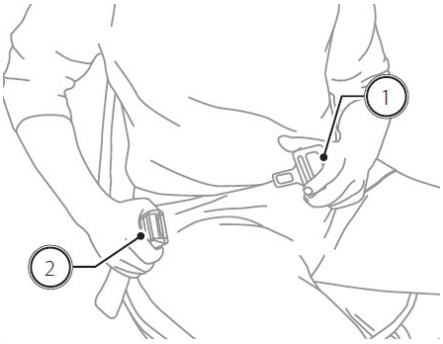
1. Adjust the seat so you are a comfortable distance from the pedals and can operate them safely.
2. The lever to tilt the steering wheel is left to the steering column. Push this lever all the way up.
3. Move the steering wheel up or down to the desired position. Position the wheel so you can see all the instrument panel gauges and warning lights. Push the lever down to lock the steering wheel in that position.
4. Make sure you have securely locked the steering wheel in place by trying to move it up and down

Fastening the seat belts

Before starting up the vehicle, carefully check the belts, the buckle and the fasteners of the structure. If any part is damaged or worn, replace the seat belt or the relative part before starting up the vehicle.
Remain seated with the seat belts fastened correctly for the entire time the vehicle is used in order to reduce the risk of injury in case of an accident. Following a significant accident replace the seat belts even if there is no apparent damage

Procedure as follows to fasten the seat belts

1. Insert latch “1” into buckle “2”
2. Make sure it is fitted in securely and then adjust the belt around your body

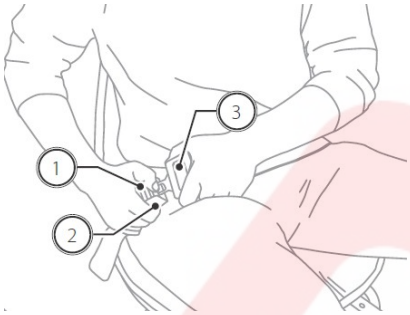


Attention

The seat belt is fastened properly when it fits snugly around the body.

Proceed as follows to unfasten the seat-belt

1. Press the red button “1” on buckle “2”.
2. Then slide the latch “3” out.



Attention

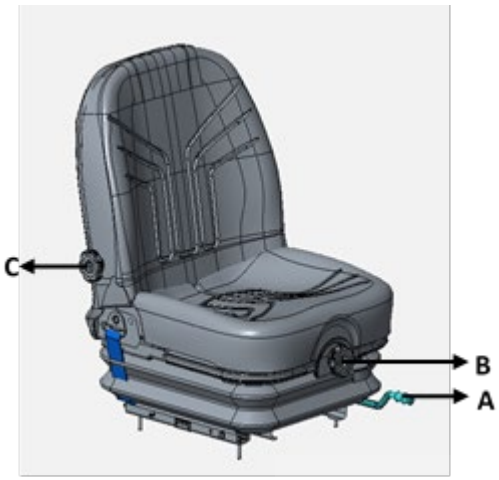
Only drive the vehicle when wearing the seat belt fastened and adjusted. driving without a fastened seat belt increases the risk of accidents.

Prohibited

Do not use damaged or worn seat belts. Worn or damaged seat belts can break or give way during a collision, causing serious injury to the operator.

4.18. O - Driver seat

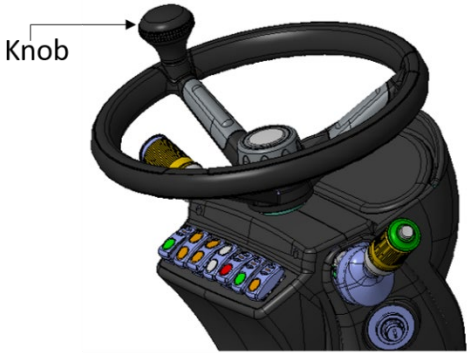
Seat Adjustment



The seat can be adjusted by means of the lever A to determine the distance from pedals and by the knob B to select cushion hardness (depending on the operator's weight). Knob C is used to control back rest reclining, counter clockwise for going backward and vice-versa for going forward (looking towards the knob).

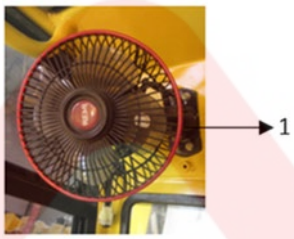
4.20. Q- Steering wheel

Turn the steering wheel in the desired driving direction. Using the knob you can steer with just one hand during loading operations



4.21. R - Roof fan

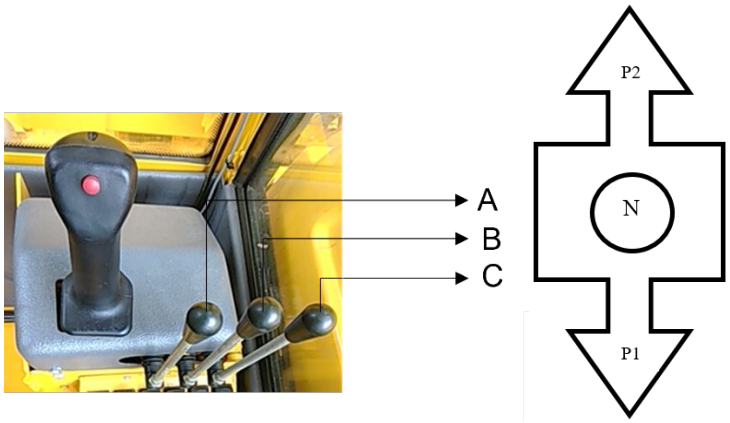
Use the switch provided on the operator controls (Dashboard Controls – 13) to turn on and off the fan on the roof while working phase. Also during transfer mode/driving mode, the fan can be
operated by using the switch provided on the bottom of the fan (1).



4.22. S – Roof Lamp

Use the switch ‘1’ provided on the Lamp which is mounted on the roof of the cabin to turn it ON and off.

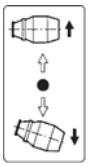
4.23. Drum Lifting, And Water Pump Actuation



4.23.1. Drum Operation.

A – Drum raising / lowering lever

The lever controls drum rising. Follow the instructions below:

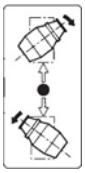


Position 1 - Drum rising. To enable, pull the lever towards you
Position N - Neutral. Center position, self-return type lever, comes back to center when released
Position 2 - Drum lowering. To enable, push the lever from center position.

4.23.2. Drum Swivel control

B – Drum Swiveling

This lever controls rotation of the slewing bearing of the drum. Before turning the drum, Follow the instructions below:



Posit ion 1 - Clockwise drum traverse swinging. Position N - Neutral.
Posit ion 2 - Anticlockwise drum traverse.
For detailed operation, (refer clause 4.61).

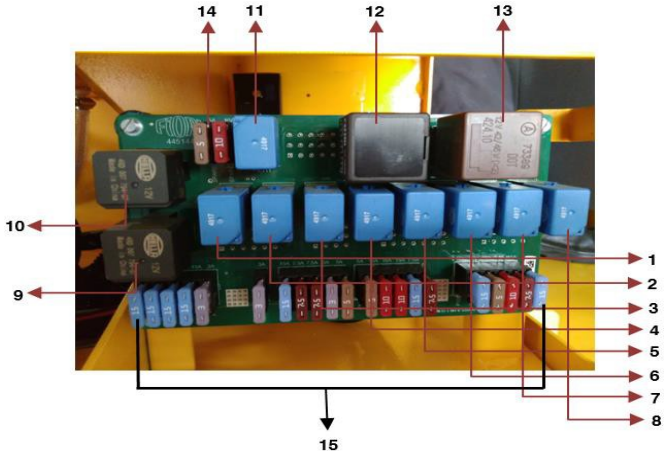
4.23.3. Water Pump

C–Water pump

The lever permits water pump operation. It's a non-return type lever.
Follow below instructions for actuation:
Position "1" - Water pump in **OFF** condition.

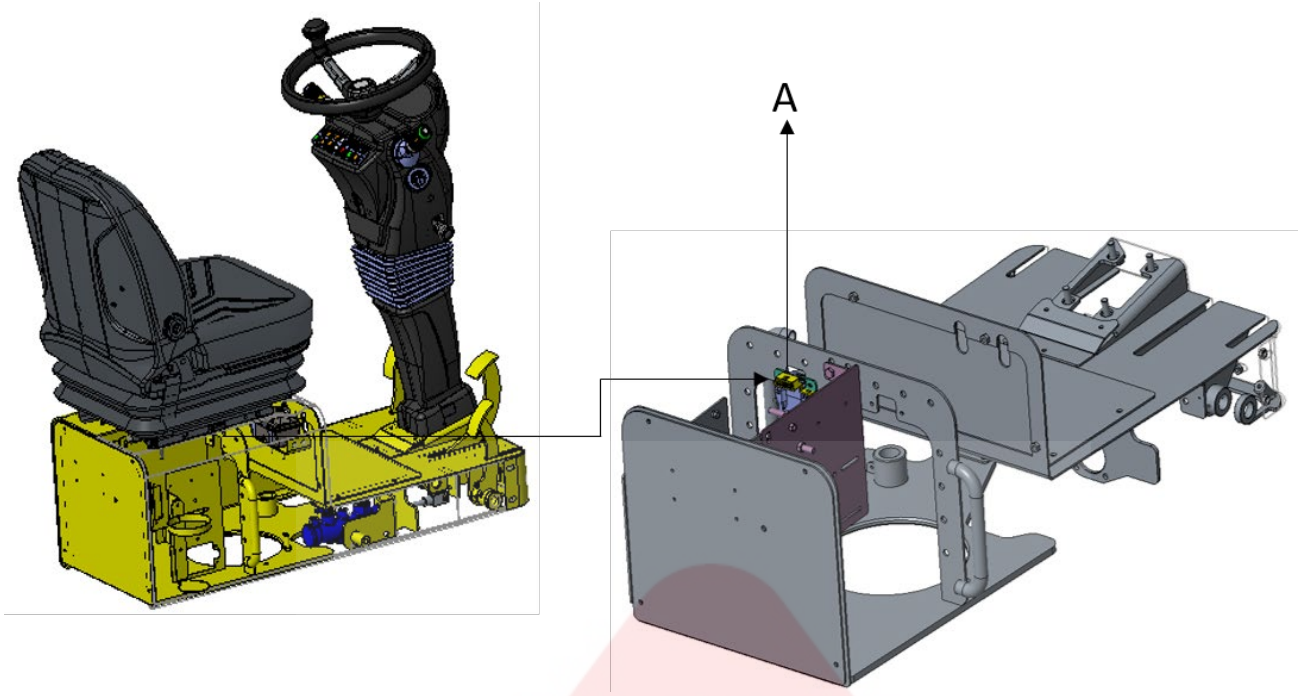
Position "2" Pull the lever down to turn **ON** water pump.

4.24. Electrical Components

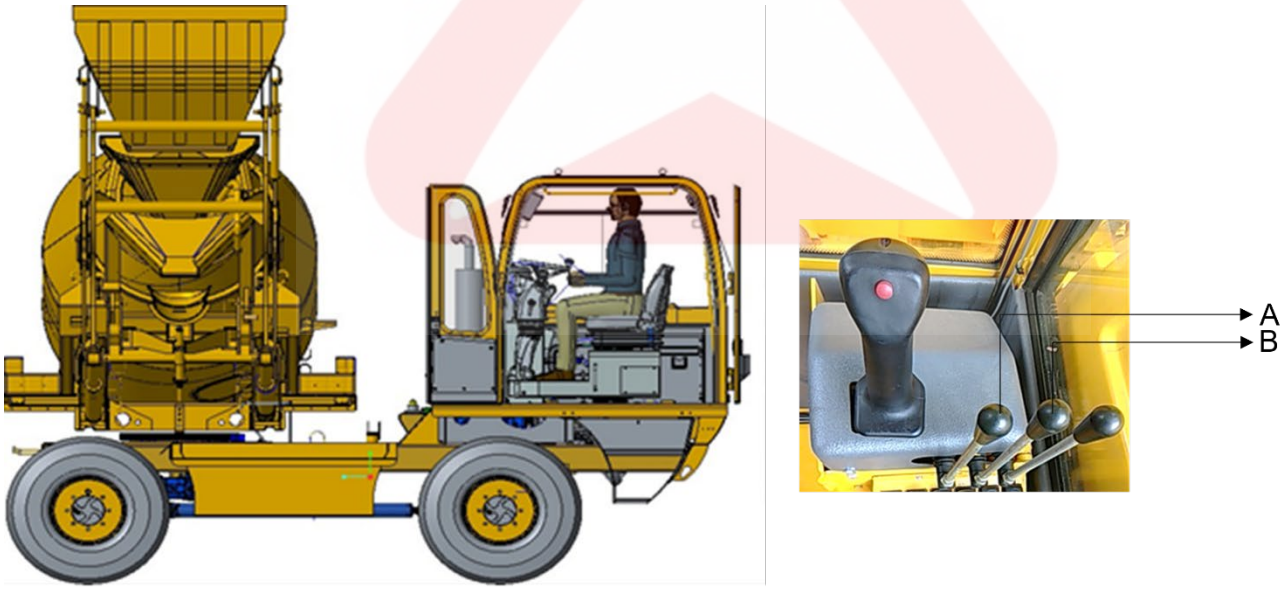


1) Loading Arm
2) Forward
3) Crank enable through micro switch
4) Optional
5) Drive enable when parking brake release
6) Optional
7) Engine off solenoid
8) Optional
9) Swivel relay
10) Working relay
11) Reverse
12) Diode module
13) Flasher module
14) Spare blade fuses
15) Blade fuses

4.25. OBD Switch (On – board diagnostic) KOEL and M&M engine



4.26. Drum swivel Operation



CAUTION: The unbalance due to the weight variations of the vehicle may alter the stability conditions. Therefore, be extremely careful when rotating the drum

Attention: Drive carefully during the drum swiveling maneuver so as to avoid possible wheels unbalances

Procedure

- Park the vehicle on stable ground and set the FNR control/lever in neutral position.

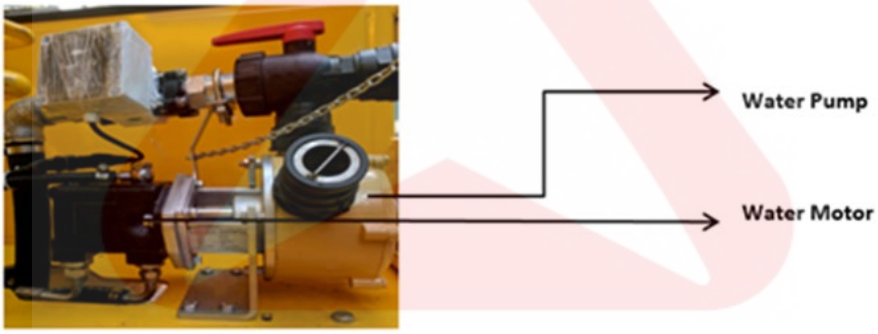
- Raise the drum by operating lever **B** downward and make sure that it is raised only to certain height after the disengagement from the locking pin.
- Swivel the drum using lever A either in left or right as per requirement (drum can be swivel to 230 degree)
- lower the drum to minimum position to discharge
- Once the discharge is completed, swivel it back to initial position and ensure that the pin has been locked.

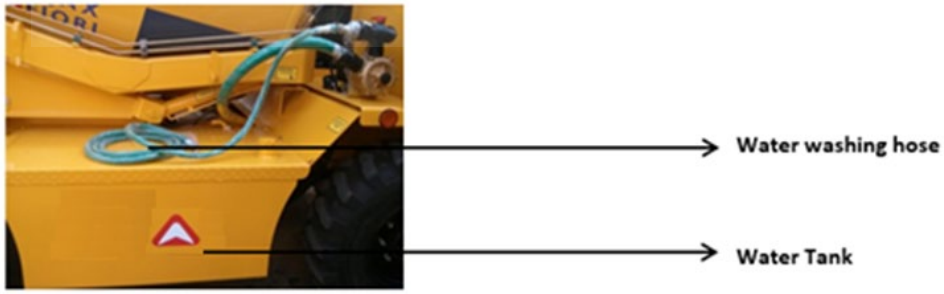
Precautions To Be Taken While Swiveling:

- Start the drum rotation in the mixing direction (clockwise).
- Approach the discharge area with the forward movement line parallel to the discharge line.
- Park the machine and set the FNR control/lever in neutral position.
- Always Park the vehicle on stable ground and recommended not to park on slopes.
- Make sure that there is no obstruction for the swivel movement.
- Raise the drum and make sure that it is raised only to certain height after the disengagement from the locking pin.
- Swivel the drum with caution and with complete awareness of the surroundings
- Once the discharge is completed, lower the drum to minimum position and then swivel it back to its position.
- Always make sure that the drum is swiveled back to right position and that the pin has been locked (wait for the locking sound).

4.27. Water Supply And Distribution Control Systems.

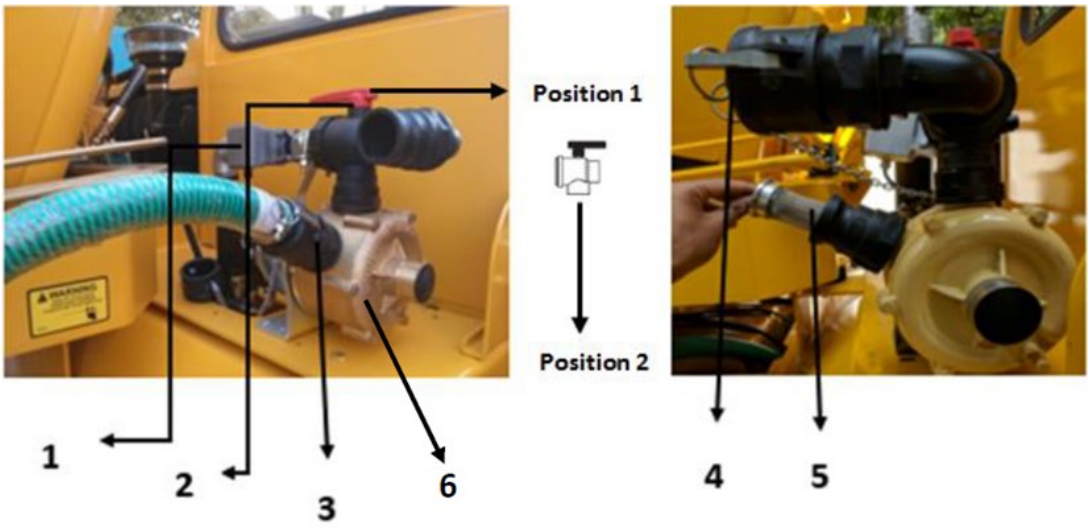
I)Water Suction Pump and Motor





1. Water Pump: This pump provides the required amount of energy to transfer water from external source or water tank into the mixer drum.
2. Water Motor: This motor helps the functioning of the pump.
3. Water Washing Hose: This pipe line is used to suck water from external sources.
4. Water Tank: This tank is fitted on either side of the machine and acts as the water source in areas where water is scarce.

III) Water Distribution Control Parts.



The following parts control the feed and distribution of the mixing and washing water:

1 – Liter counter

Indicates the amount of water pumped into the drum and shows it on the CBC display in the driver cabin

2 – Delivery switching valve

Position 1 - Water delivery to the drum from an external source or from the vehicle tank.

Position 2 - Water delivery to the tank from an external source.

3 - Suction coupling

Water suction from external water sources by means of a flexible suction hose. Also can be used to suck water from the vehicle tank.

4 – Outlet for washing

Can be used to wash the drum, chute and complete vehicle by keeping at position 2.

5 - Suction filter

To be positioned inside the suction coupling when the water is drawn from sources like reservoir, external tanks etc.

6 – Water suction pump

Self-priming volumetric pump

III)Water Delivery Operations

Water delivery occurs through the three way valve in three different modes:

1. Transfer of water from the water tank into the drum mixer.
2. Transfer of water from the external water source to the mixer drum(Direct discharge)
3. Transfer from the external water source to water tank.

Note: Make sure that the external water source is clean and free from any large or small sized particles.

FILLING THE WATER TRANSFER PUMP BODY (Refer above picture to perform this operation)

1. For proper operation of the self-priming pump, this must contain water.
2. Remove the closing cap from suction line and take out the pre-filter **5**.
3. Check that it contains water through the suction pipe union **3**.
4. If there is no water, refit the pre-filter **5**, fill the pump body with water through the suction union **3** holding the delivery switching valve/three way valve **2** in the position shown in above picture, but not in the central position.
5. Finally, refit the closing cap of suction line.

4.28. Instructions For Use

It is essential that the first time you use this vehicle you familiarize yourself with the use of all the controls. Therefore, practice all the vehicle handling procedures both during the working phase and during road transfer so that you develop a good feeling for the controls and the equipment movement times. This chapter is intended as a valid guide for those that already know the vehicle well and can hence easily and quickly understand the instructions given.

4.28.1. Preliminary Instructions And Running-In

Upon machine delivery AJAX CUSTOMER SERVICE will provide the user with all main instructions concerning use and maintenance.

4.28.2. Running- In

The running in period for this machine is of **50 hrs. for KOEL & 100 HOURS for M&M**

4.29. Starting & Using CEV Stage IV Engines

It is recommended to observe below instructions before using a cold engine

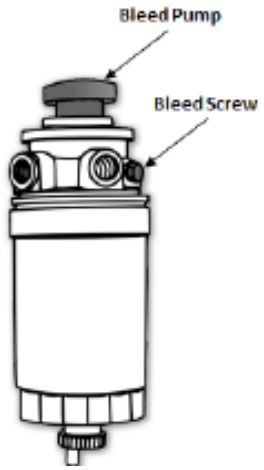
- Turn the key to Ignition ON position & wait for few seconds for the cluster to turn ON before cranking
- Let the engine run for few minutes at low idle speed after each cold start.
- Lamps such as MIL, Check, Nox control diagnostic system (NCD) & Water in fuel must not appear in the cluster when the engine is ON, if the lamps appear while the engine is in operation, please contact Ajax authorised dealer. If water in fuel indication lamp pop up, please drain water from the fuel filter using the drain coke provided at the bottom of the filter (refer respective engine manual for draining procedure). After draining water, fuel system shall be primed. The lamp shall disappear after resuming to work in few minutes, if not please contact Ajax authorised dealer.
- No error code shall display in the cluster. If any error code pop up & stays ON for some time, please contact Ajax authorised dealer.
- Ad blue solution shall be maintained minimum 30% in the Ad blue tank, if not, engine goes to torque limitation mode. Refer respective engine manual for more details.
- It is recommended to perform the scheduled maintenance, mentioned in the engine manual/CD provided along with the vehicle.

Warning: Errors related to MIL, check & NCD functions can lead to torque limitation after certain hours of operation hence all errors must be diagnosed by authorised dealer of Ajax. If ignored engine will drop torque &eventually machine becomes immovable

CAUTION: AUS 32 grade Ad blue solution shall be used. Any non-standard solution usage can lead to selective catalyst reduction (SCR) system failure and will lead the engine to torque limitation mode.

NOTE: Battery cut off switch shall be enabled after >3 minutes of engine stop. Reason – After every ignition turn off, ad blue solution present in the dosing line will be reverted back to ad blue tank to avoid urea crystallization, if turned off immediately, power supply to supply module will be interrupted & ad blue back flow will be abstained and leads to crystallization in the dosing line & results in the malfunction of supply module, dosing module & dosing injector.

Priming the fuel system



- Loosen the fuel filter Bleed Screw. Operate the hand primer provided on main filter head until the fuel flows out from the bleed screw. Ensure that the fuel system is free from air and air bubble. Steady stream of fuel must flow out.
- Push / pump the Bleed Pump until the fuel lines filled with fuel.
- Retighten the bleed screw.
- Check for any leakage in fuel system and correct, if required.

CAUTION: Do not try to activate the starter motor with the key inserted for more than 10 seconds. If the engine does not start, wait for 2 minutes before retrying, allowing the starter motor to cool down.

CAUTION: If the engine does not start in the first attempt, switch off the ignition key wait for 5 seconds before retrying. Enabled anti- cranking feature i.e. if the vehicle doesn't start in the first attempt re-cranking from position 2 is not possible, therefore turn back to position '0' for next attempt.

CAUTION: Read thoroughly the manual before undertaking any operation on the machine and particularly concerning safety rules.

CAUTION: Always turn off the engine before starting maintenance.

4.30. Checks Before Starting Work

- Check that the vehicle has been equipped with all the required equipment.
- Check that all the maintenance operations set out in Chapter 5 of this manual have been carried out.

- If repairs were made, check tightness of all the screws and nuts and the adjustments.

CAUTION: Before starting to use or carry out maintenance on the vehicle, always read the safety regulations for the operations listed in the beginning of this manual.

4.30.1. Level Check

Before starting the vehicle check the following

- Engine oil level
- Engine coolant level
- Hydraulic oil level
- Brake fluid level

1) Engine Oil Level

Oil change Intervals

Oil change interval is very important factor in preserving integrity of an engine. Lubricating oil contamination is the direct result of engine operation & load factor involved. The amount of contamination generated depends on the amount of the fuel, the engine consumes. At each oil change the filters must be replaced.

Daily Checking

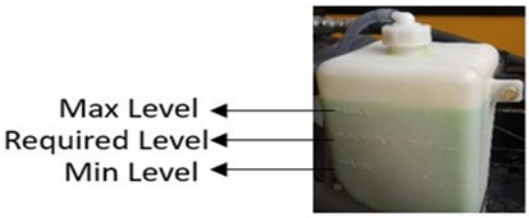
- Check engine oil level before starting the engine by means of dipstick gauge.
- Top up if found below low level.

NOTE 1) Do not check oil level when engine is running. Shut down the engine and wait for 45 minutes, then check the oil level.

NOTE 2) Required level shall be maintained between minimum and maximum level.

2) Engine Coolant Level

- The Coolant level shall be maintain between minimum and maximum level.

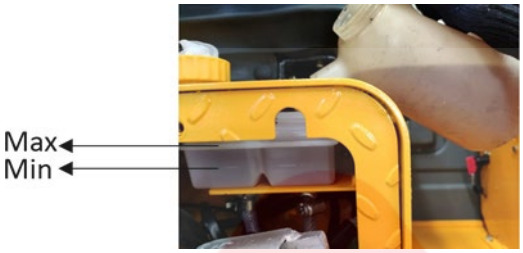


3) Hydraulic Oil Level

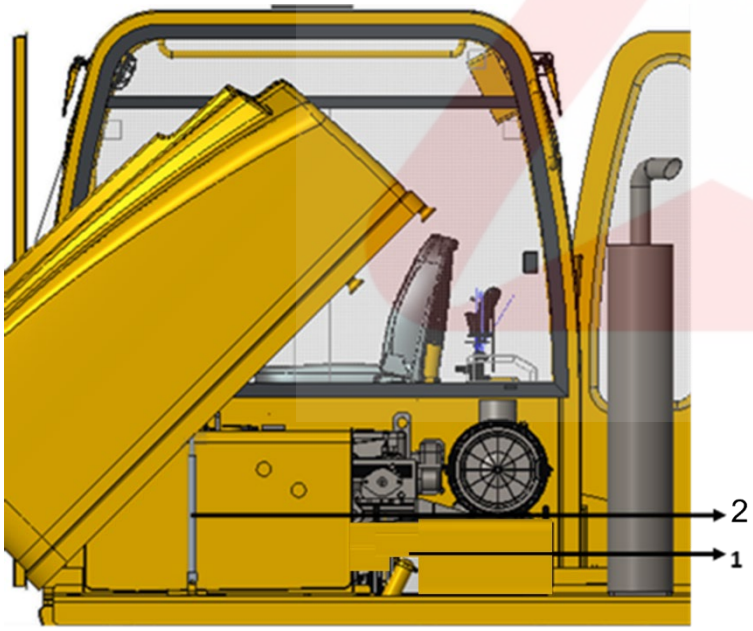
- Refer 5.14 hydraulic system in this manual.

4) Brake Fluid Level

- The Oil level shall be maintain between minimum and maximum level.



4.31. Refueling (Diesel)



Refuel the vehicle with good quality diesel fuel. Use a pump equipped with filter with a delivery nozzle that goes down into the filler neck after removing the cap **'1'**
It is advisable to refuel at the end of a working day thus avoiding condensation during the night.

NOTE: Before filling diesel, lift the bonnet and secure it safely with stay rod '2' and then reach the fuel tank .

CAUTION: Do not run out of fuel thus emptying the tank (keep an eye on the fuel gauge). If this occurs, you have to bleed the air from the engine fuel supply system. The Diesel gauge level indication

is in horizontal condition. It is recommended to have sufficient fuel in the tank to avoid air lock in the fuel system while climbing up/down gradient.

DANGER: Before checking or filling the fuel tank, make sur e that there are no open flames or smoking materials in the area. Do not refuel with the engine on. Do not use matches, lighters or torches as light source

4.32. AD BLUE / DEF Tank (Diesel Exhaust Fluid)

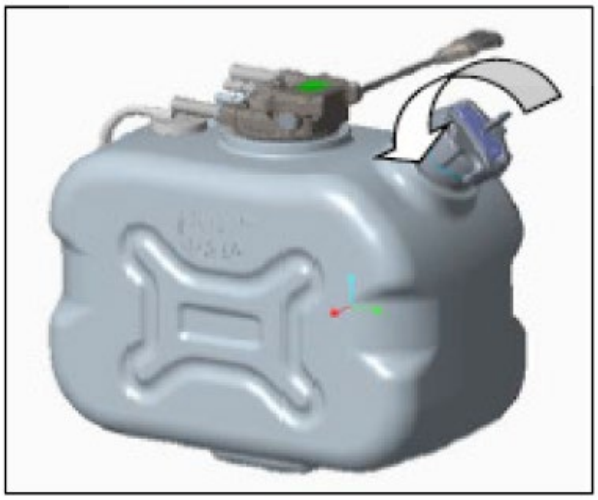
Never put DEF/Adblue in diesel fuel tank, or diesel fuel in DEF tank. Fill DEF/ Adblue tank every time when engine is refueled. If this cannot be done, monitor DEF/ Adblue level indicator on instrument cluster and refill as necessary. To avoid drastic changes in engine performance, always keep sufficient level of DEF/ Adblue in the DEF/ Adblue tank

Disposal of Diesel Exhaust Fluid (DEF)/ Ad blue

Although there is no much issue with minor spillage of DEF/ Ad blue on the ground, large amounts of DEF/ Ad blue should be contained. If large spills occur, contact local environmental authorities for assistance with clean-up.
If a substantial quantity of DEF/ Ad blue is not within specification, contact the DEF/ Ad blue supplier for assistance with disposal.
Do not dump substantial quantities of DEF/ Ad blue onto the ground or send DEF/ Ad blue to waste water treatment facilities.

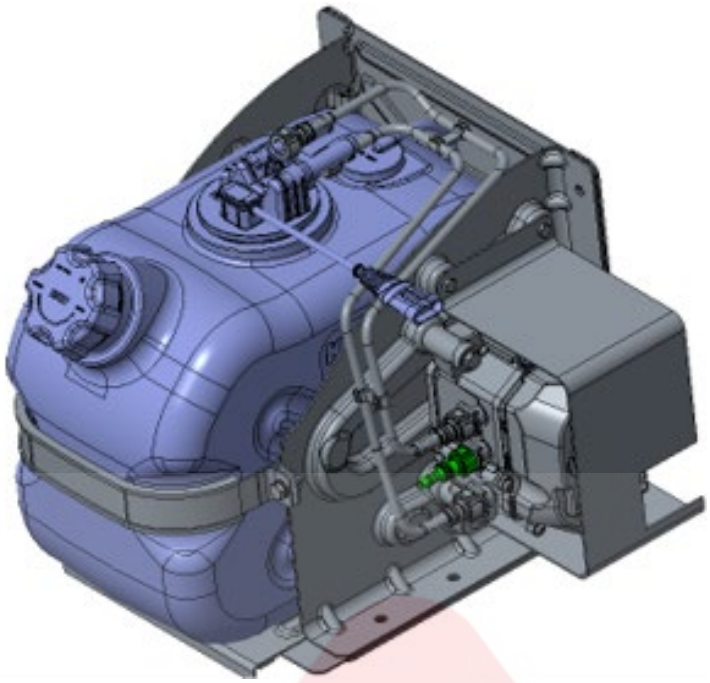
DEF/AD blue tank cap opening procedure

- Insert the key and Open the Lock, twist the cap to 290 Deg
- Turn anti-clockwise until you hear a “Snap” and the plastic cap can be removed (Refer Fig below)
- Removed Plastic Cap should be placed in a clean, dust free, moisture free place to ensure that the cap is free from Dirt.
- Do not throw the removed plastic cap on the ground, avoid losing or dirtying the cap.



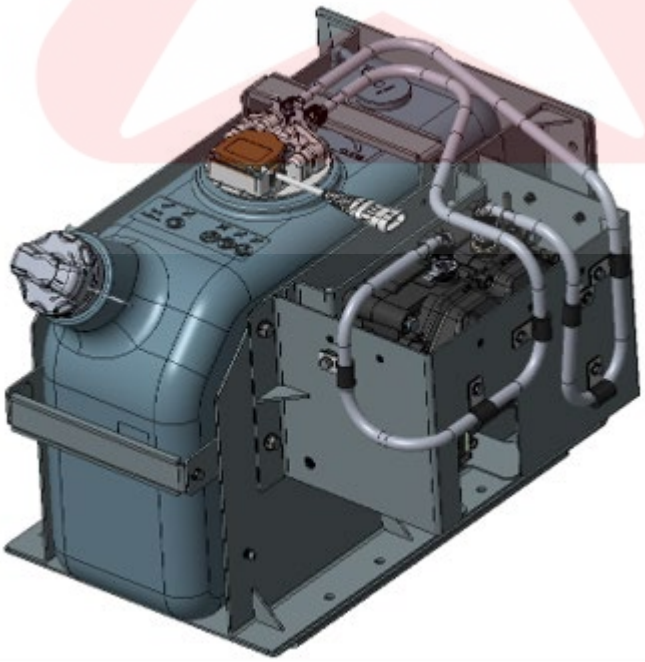
Note: Refer respective engine manuals for ad blue tank maintenance

I) KOEL ENGINE



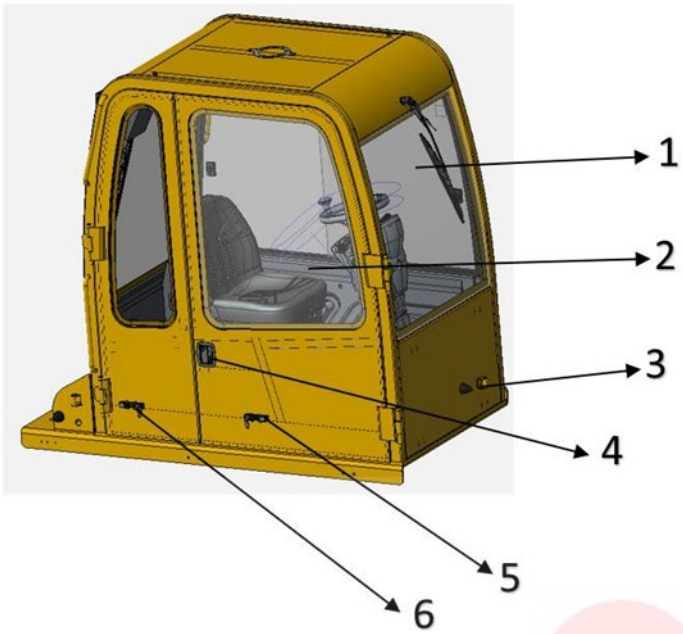
Capacity – 16 L

II) MAHINDRA ENGINE



Capacity – 23 L

4.33. Door



1. Front glass
2. Side door glass
3. Front locking slot
4. External handle
5. Main door lock knob
6. Secondary door lock knob

Opening/ closing the main door

Proceed as follows to open the door from outside:

- open the door using the key
- Pull the handle outwards to open the door.

Proceed as follows to open the door from inside the cab:

- Press the internal handle
- Push the door outwards.

Proceed as follows to release the main door leaf:

- Press the release button
- Turn the window release knob
- Close the door again.

4.34. Driving Post Position

CAUTION: Turn the driving post with the vehicle stationary and stable. This operation may be carried out while you are seated on the driver's seat. Check that it is locked into place after the operation.

The driving post must always face forward A during road transfer and backward B, turned 180° for the drum loading phases. Press the lever C to release the driving post, by holding handle provided on the roof, turn it in the desired direction and relock the lever C. Recheck the locked position & ensure that the lock is engaged correctly.

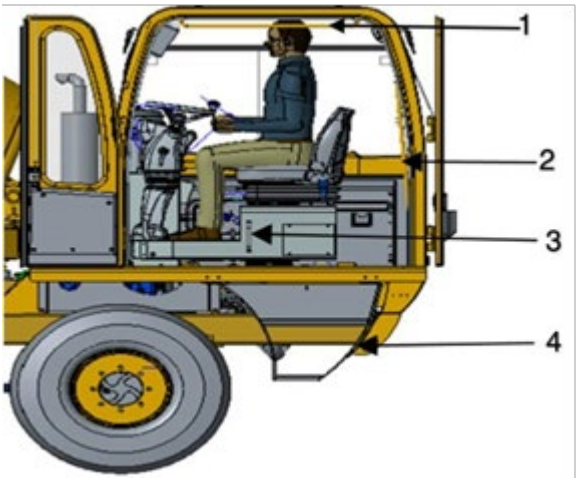
Attention
Make sure nothing on the ground of the cab obstructs the seat from rotating (rags, gloves, Dirt, etc.) As the seat could jam or the sensors may not work correctly

Resetting the Driver's Seat

1. Procedure as follows to reset the driver's seat back to the transport position: Procedure as follows to invert the driver's seat correctly:
2. Stop the vehicle (possibly on level ground).
3. Press the parking brake switch.
4. Move the FNR lever/control to the neutral position (position "N").
5. Open the door completely.
6. Press the driver's seat inversion pedal located under the operator's seat.
7. While keeping the pedal pressed, turn the driver's seat manually with the help of the handles in the cabin.
8. Turn the driver's seat up to the end run and release the pedal.
9. Make sure the driver's seat is fixed correctly.

Prohibited
It is strictly for bidden to operate with the driver's seat partially rotated.

4.35. Climbing Into and Out of the Cab.



In above fig (1 , 2, and 3) indicate handle for climbing and (4) for foo t steps Falls are one of the major causes of personal injury .

Always face the vehicle when climbing in or out of it and maintain contact with it in three points at all times, using the steps and the handles. Always keep the footboards, steps and handles clean so as to prevent the risk of falling. Before climbing into the cab make sure that your hands and shoes are clean and dry to prevent slipping and falling.

Prohibited

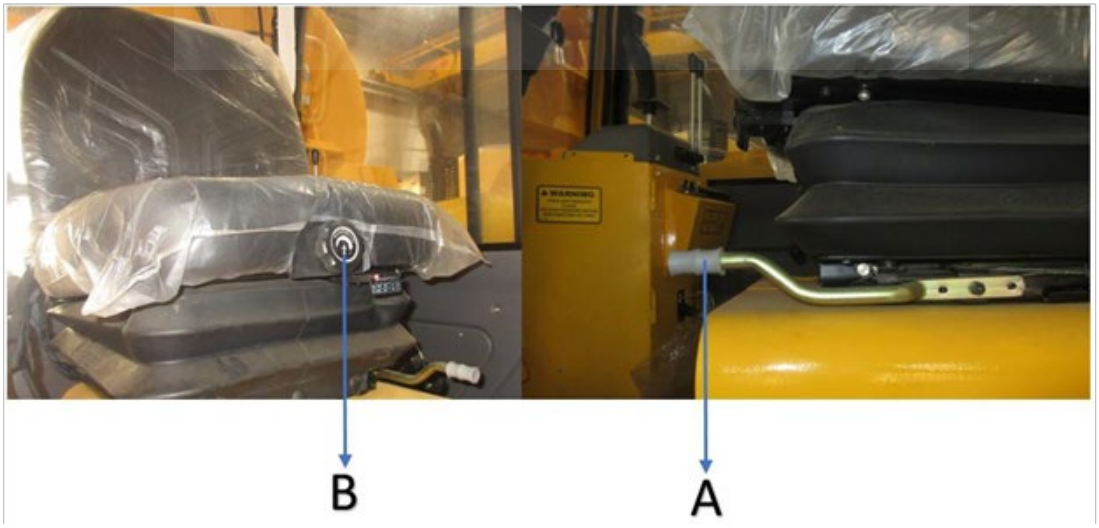
Do not use the controls as a handle. Never jump off the vehicle. Never climb on or off a moving vehicle. Never climb on or off the vehicle while holding tools.

DANGER

If the vehicle begins to move without an operator inside the cab, do not jump on the vehicle to try to stop it.

Seat Adjustment

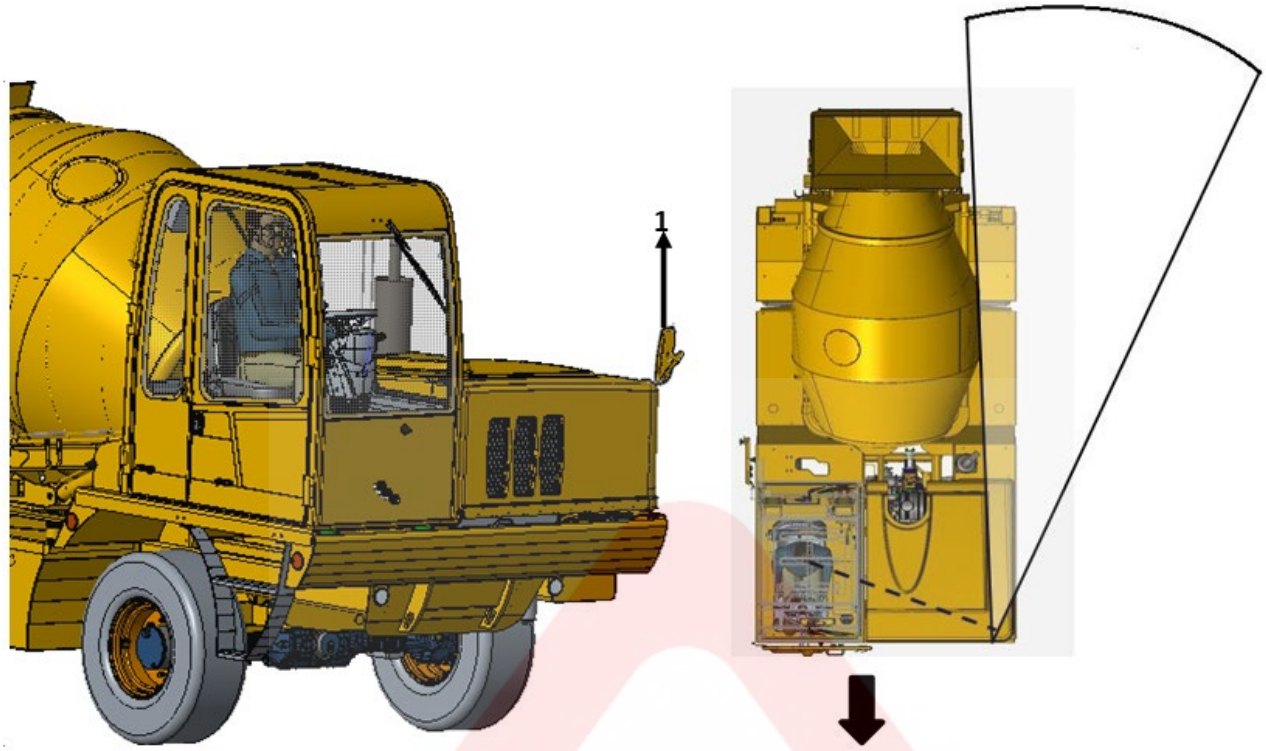
The seat can be adjusted by means of the lever A to determine the distance from pedals and by the knob B to select cushion hardness (depending on the operator's weight)



Caution: Before starting the machine adjust and block the seat in the most adequate and comfort able posit ion to get an easy access to all operating controls.

The seat can be adjusted by means of the lever A to determine the distance from pedals and by the knob B to select cushion hardness (depending on the operator's weight).

4.36. Adjusting the Rear-View Mirror



CAUTION
Operation to be carried out before starting the vehicle.

- To adjust the field of vision of the side view mirror (1), turn it so that you can see the rear left-hand side of the vehicle as shown in the figure.
  - While the engine is running at 1000 rpm, check that warning lights signaling engine oil pressure, insufficient battery recharge etc. are off.

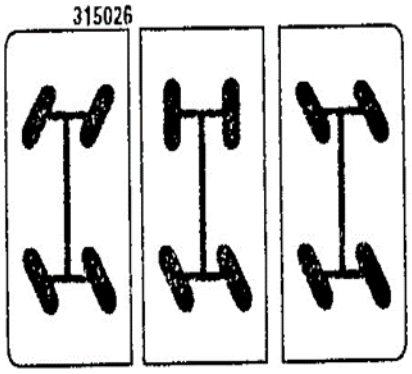
4.37. Starting At Low Temperatures

Preheating Process (Optional)

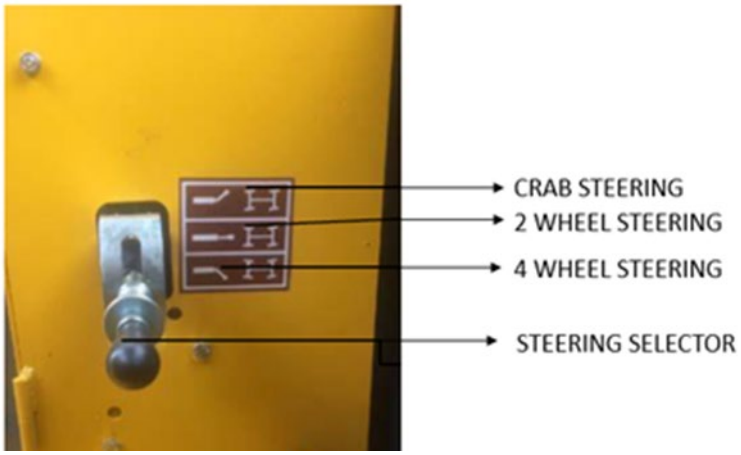
- Turn & hold the ignition key clockwise between position 2 to 3 (refer above picture) until Pre heating symbol glows
- Wait for 10-20 secs for preheating, then turn to position 3 to start the engine.
- In case this process fails repeat the previous step 2 to 3 times to obtain a successful ignition of engine.
- Don't hold the accelerator pedal depressed during the preheating process.

NOTE: When the engine has started, let it run at low idle rpm for a few minutes to allow the oil to warm up and lubricate all the parts; this is essential in cold climates & longer life for the engine components.
This Pre-heat function is incorporated to machines in cold regions.

4.38. Reset Of Wheel Alignment:



4WS 2WS Crab



Whenever you drive on the road or for long stretches, it is essential to check proper alignment of the four wheels to prevent running into translation problems.
To align the four wheels, operate as follows:
Turn the driving post to the PREFERENTIAL driving direction and turn the steering wheel to move the rear wheels into a straight line with the vehicle.

Shift the selection lever to the "**2 WS**" position and use the steering wheel to align the front wheels with the rear ones (visually check).
Select the type of steering based on the type of translation to be performed with the vehicle.
After this procedure the steering will be synchronized.
During translation with "**2WS**" the rear wheels remain in fixed position.

NOTE: While driving on public roads, steering wheel selector should be positioned on 2 steering wheels. Driving on higher speeds with 4 wheel steering will affect the stability of the vehicle.

4.39. Starting And Driving the Vehicle:

CAUTION: Before proceeding, always read the safety regulations mentioned in the beginning of the manual.

- Lock the driving post in the road transfer position using the dedicated lever and check that it is firmly secured & ensure all controls are in neutral position.
- Start the engine by following the procedure described above.
- Keep the engine running for the period of time necessary to warm up the hydraulic system oil.
- Disengage the parking brake by applying the service brake.
- Check that the hand accelerator is at rest and the direction selector (forward/reverse lever) is in neutral position. If the hand accelerator is in engaged condition, machine won't move even if the direction selector (forward/ reverse switch) is employed.
- Depress the service brake pedal and shift the gear selection to **gear 1** and motor flow control switch (**i.e. high/low switch**) to **low position** for driving on steep slopes and **gear 2** and **high position** for flat stretches.
- Set the direction selector (forward/reverse switch) to the desired driving direction. This selection can also be performed while the vehicle is moving.
- Check that you can safely move forward, and then start depressing the accelerator pedal to move the vehicle.

CAUTION: Mechanical gears must only be selected when the vehicle is stationary and stable. Steer the vehicle maintaining an adequate speed and act gradually on the steering wheel, especially when you are on a slope.

4.40. Stopping The Vehicle:

CAUTION: Whenever you interrupt work for any reason always set the joystick & all controls to neutral position before leaving the vehicle.

- Release the accelerator pedal.
- Gradually depress the brake pedal till the machine stops.
- Shift the direction selector (forward/reverse switch) to neutral position.
- Engage the parking brake.
- Lower the drum and bucket

NOTE: Never use direction selector switch (forward/reverse switch) to stop the machine.

Stopping the Engine:

CAUTION: Never leave the vehicle with the engine on.

Turn the ignition key anticlockwise to **position P** and remove it even if only temporarily leaving the vehicle.

4.41. Parking The Vehicle

CAUTION: Before proceeding, always read the safety regulations for the operations to be carried outset out in Chapter 3.

CAUTION: Never stop or park on a slope without first blocking the vehicle to prevent it from rolling.

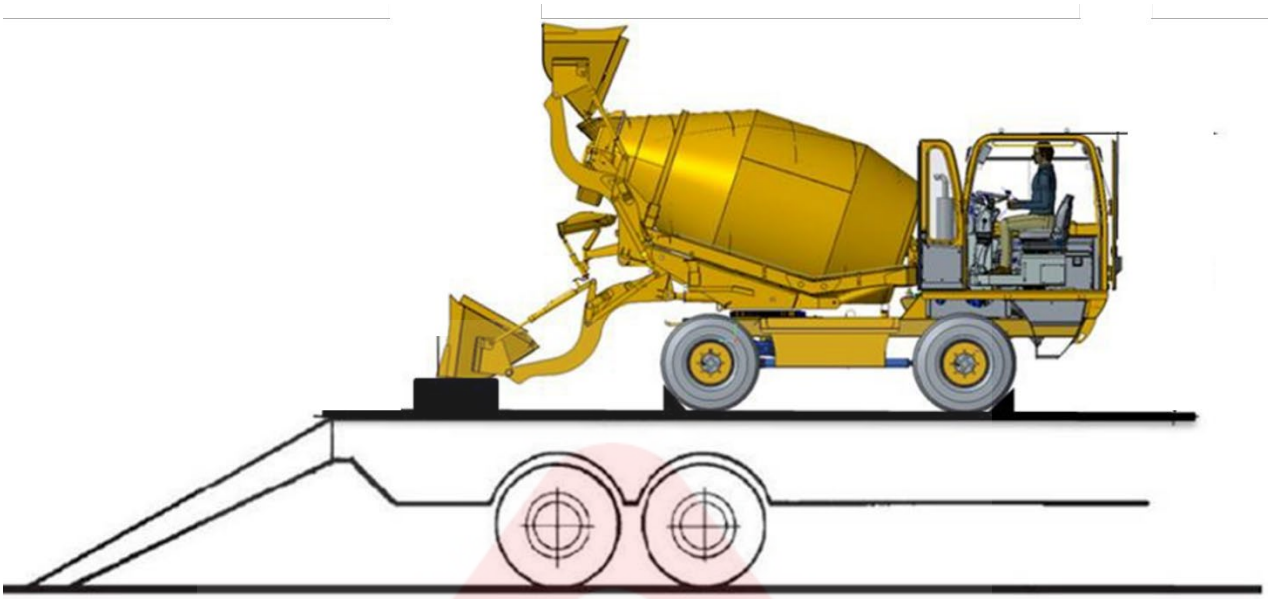
CAUTION: Always face the vehicle when getting on or off and check that your shoes and hands are clean and dry to prevent slipping and falling.

- Where possible, stop the vehicle on level and dry ground.
- Remove the ignition key before leaving the vehicle.
- Deactivate all the unnecessary switches.
- Check that all the switches are deactivated before leaving the vehicle. If necessary, leave the hazard switch on.
- Use the handles and steps to get off the vehicle. If you leave the vehicle, close and lock all the windows and the doors.
- Check that the fuel tank cap and the engine compartment lids are locked.

4.42. Machine Transport on Truck

CAUTION: Before proceeding, always read the safety regulations for the operations to be carried out

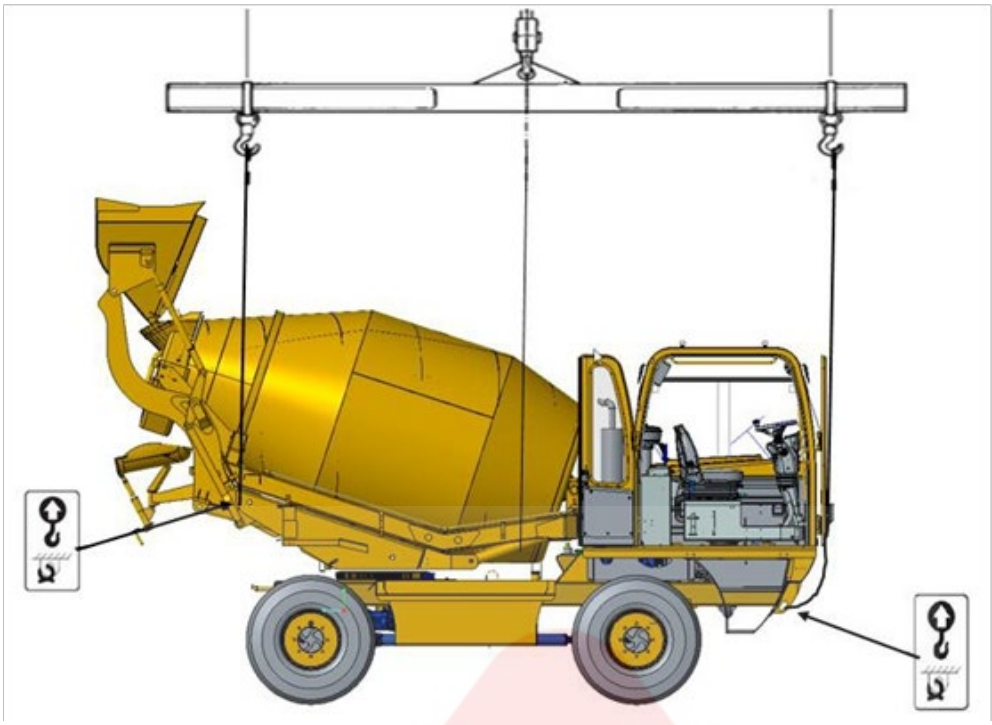
CAUTION: Before loading the vehicle onto the means of transport, check that it carries no other load. Use vehicles complying with legal carrying capacity and driven by qualified staff.



- Load and unload the machine on even and stable grounds so that wheels are stable.
- Use ramps adequate to carrying capacity.
- Make sure that platform is free and clean from any mud, oil and/or other slippery material.
- Ask for assistance of a signalman who keeps an overall sight of the machine, platform and operator.
- Lift the bucket.
- Keep very slow speed both on ramps and on the platform. Limit the use of accelerator and steering wheel as much as possible.
- When the machine has been positioned, lower the bucket and engage the parking brake.
- Perform machine stop operations as described above. Transport is forbidden whenever the arms are lifted.
- Firmly anchor the machine to the platform and block wheels with adequate wedges (refer above picture.
- Check that all doors, hood or other movable parts are perfectly locked.

CAUTION: **Do not use roof masts to anchor the machine during transport**

4.43. Lifting The Vehicle with A Crane



CAUTION:: Before proceeding, always read the safety regulations for the operations to be carried out

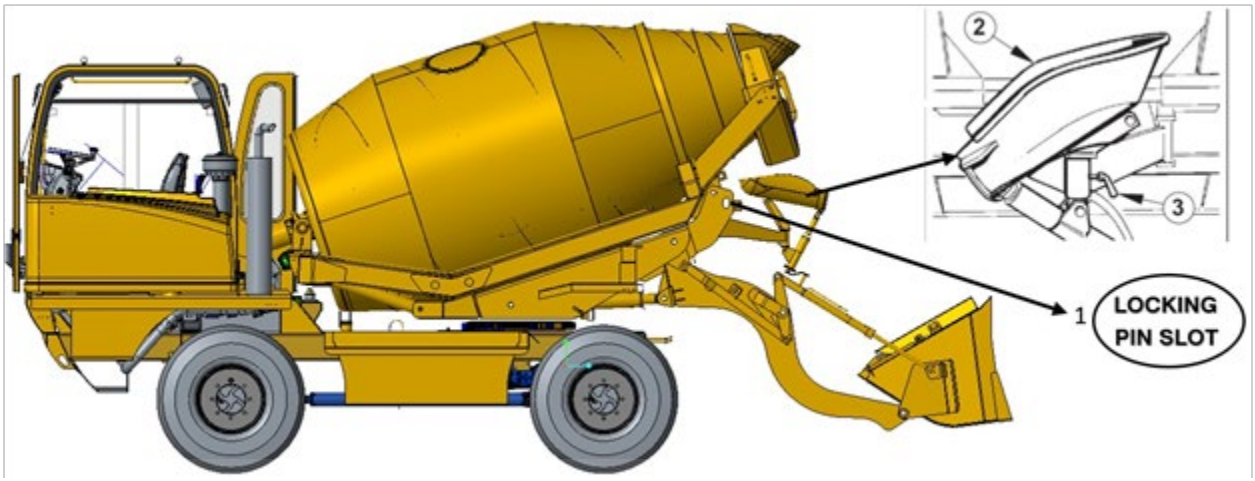
CAUTION: Before lifting the vehicle, check that it carries no other load and crane used is of adequate carrying capacity. See the section "Specifications" for the weights and dimensions.

CAUTION: For lifting with a crane it is advisable to use adequate rocker arms/ D shackle in order not to damage parts of the vehicle when the chains tighten. Use only the lifting points marked on the vehicle.

- Lower the drum as you would for road transfer.
- Raise the loader arm and lock it with a tie-rod provided.
- Hook the chains onto the special hooks.

DANGER: During lifting, stand well away from the vehicle and do not stand under the load. Sudden movements or the chains snapping may cause injury and even death.

4.44. Driving On Public Roads



Note Make sure that the joystick for bucket control is in NEUTRAL position and locked by the safety lever in order to avoid any accidental maneuver.

Direct the driving post in the preferential driving direction.

- Activate all the safety devices as indicated in the previous chapters
- Lower the drum fully.
- Raise the bucket as far as it will go and engage the safety pin. Also for additional safety tie it with the safety cable (1), so that the arm is perfectly locked.
- Direct the chute (2) into retracted position and lock it with the lever (3)
- Check that all the warning lights function properly.
- With the vehicle stationary, shift the gear lever to **2nd** gear and motor flow control (high/low switch) to high position for transfers on flat surfaces or moderate slopes or to **1st** gear for medium slopes & **1st** gear along with motor flow control switch on **low position** for steep slopes.
- Keep an eye on the instruments and check that they function properly. Strictly observe the road regulations. If traffic slows down, move aside & allow faster vehicles to pass.

CAUTION: In no case perform reverse movement to stop the machine as this is hazardous and also can severely damage the transmission elements.

CAUTION: AS PER CMVR INDIA REGULATION, THIS VEHICLE SHALL TRAVEL ON ROAD EMPTY.

4.45. Type Approval for On-Road Traffic

As per CMVR rules India, this vehicle is classified as a construction equipment. To run on road, it must have valid registration. Anyone driving on road should have valid license.

If the vehicle is operated outside India, it must comply with the rules prevailing in that country

4.46. Cold Weather Precautions:

4.46.1. Steps to be followed during the start of an engine in cold condition:

- If the engine will start, operate the engine until a minimum operating temperature is achieved. Achieving operating temperature will help prevent the intake valves and exhaust valves from sticking.
- The cooling system and the lubrication system for the engine do not lose heat immediately upon shutdown. This means that an engine can be shut down for a period of time and the engine can still have the ability to start readily.
- Install the correct specification of engine lubricant before the beginning of cold weather.
- Check all rubber parts (hoses, fan drive belts, etc.) weekly.
- Check all electrical wiring and connections for any fraying or damaged insulation.
- Keep all batteries fully charged and warm.
- Fill the fuel tank at the end of each shift.
- Check the air cleaners and the air intake daily.

4.47. Usage Of Anti-Freeze Mixture:

If you are obliged to work at room temperatures close to 0°C or less than that, make sure that radiator contains an anti-freezing mixture to prevent troubles due to cooling water freezing.

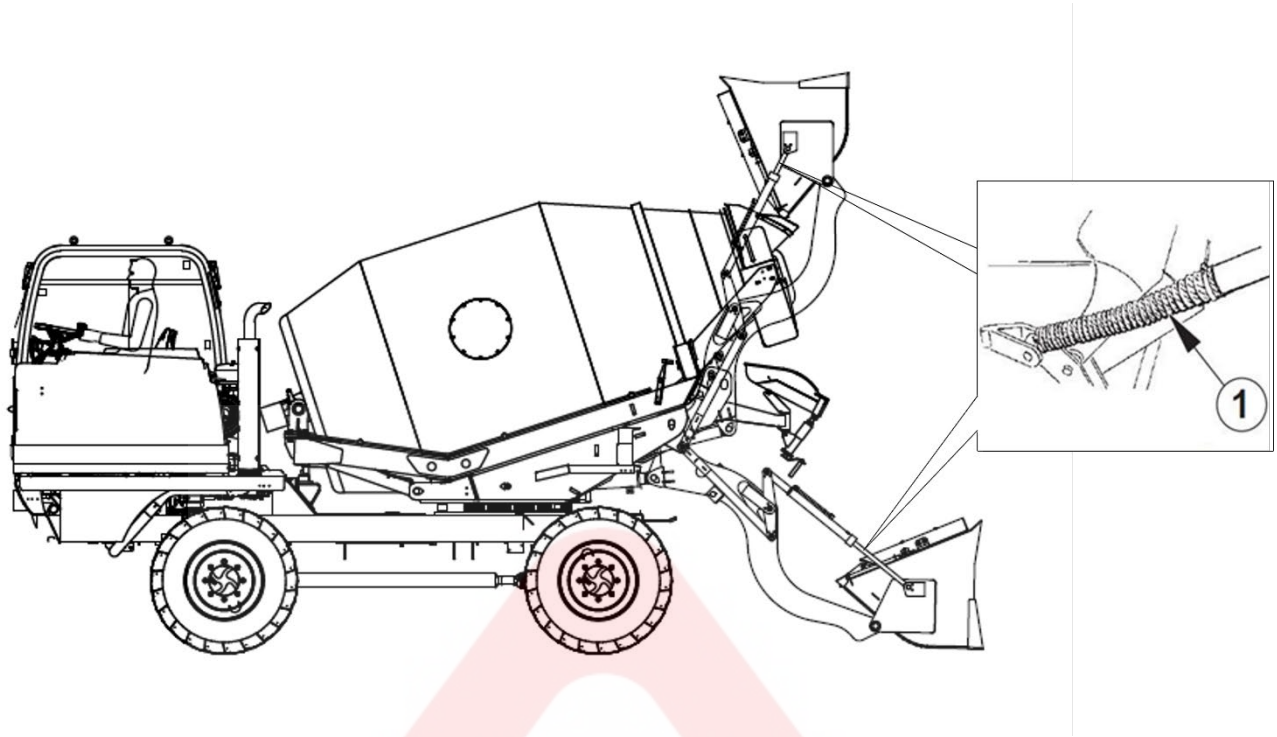
DANGER: Remove radiator cap only when engine has cooled up. With engine off rotate the cap slowly to release pressure before removing it completely to avoid the sudden flow of high temperature vapor.

Use always engine manufacturer recommended coolant only. Warranty will be void if wrong grade coolant is used

- **CAUTION: When using the machine at low temperatures it is necessary to replace also the machine lubricants with lubricants having an adequate viscosity. Refer respective engine manuals for winter grade fluids.**

4.48. Machine Long Inactivity Precautions:

If the machine has to remain still for a long time it is necessary to observe the following rules to avoid significant troubles.



- Vehicles that remain outdoors, e.g. on a yard/open area, for long periods of time must be parked with the loader lowered; the cylinder rods can also be protected with external guards **1**.
- Clean thoroughly the machine and lubricate all grease nipples.
- Fill up the fuel tank to avoid rust.
- Disassemble injectors and introduce modest engine oil quantity into the cylinders using a syringe after shifting every piston to bottom dead center. Assembly the injectors again.
- To keep the engine lubricated, let it run for at least 20 minutes no less than once a week.
- Remove battery and put it where temperature will never be too low and perform battery recharge at least once a month.
- Empty the water tanks and the transfer pump
- Protect hydraulic cylinder rods with grease to avoid scaling and corrosions.
- Move the machine in a sheltered place and/or cover it with a water proof sheet.

CAUTION: Recharge battery slowly before connecting cables check correct polarity. Never short circuit terminals.

4.49. Operative Phases:

It is necessary for the operator to gain a good knowledge of all controls when approaching the machine for the first time and to work the first training period in a relatively isolated area where he can perform all maneuvers and operations which will later on become his routine operations.

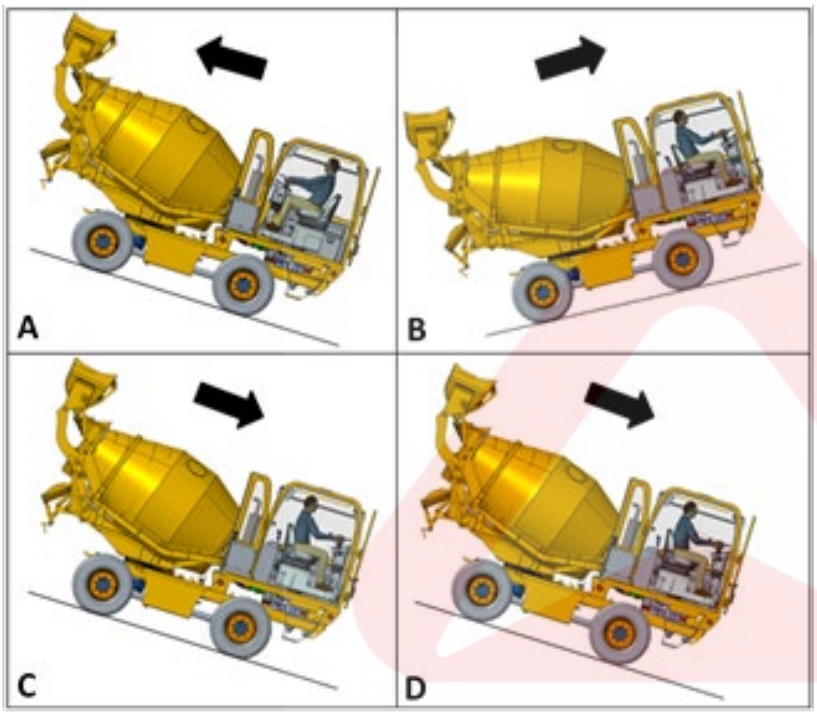
This specific paragraph reviews all work phases of the machine that is to be followed to obtain maximum performances as well as observance of all safety rules.

1. First filling with mixing water.
2. Cement Loading.
3. Aggregate loading.
4. Mixing and second filling with mixing water.
5. Concrete discharge.
6. Bucket Drum concrete chute washing.

CAUTION: **Before starting the work, driver's turret shall be necessarily turned towards the bucket and drum.**

CAUTION: It is strictly forbidden to climb on the machine both during the mixing phase and when it is stopped.

4.50. Correct Use on Slopes



A – DRIVING UP HILL WITH A FULL LOAD

When having to drive uphill while transporting a load, operate with the vehicle facing bottom of the hill and operator facing the direction of motion

B – DRIVING UP HILL WITHOUT A LOAD

When having to drive uphill without a load, operate with the vehicle facing top of the hill

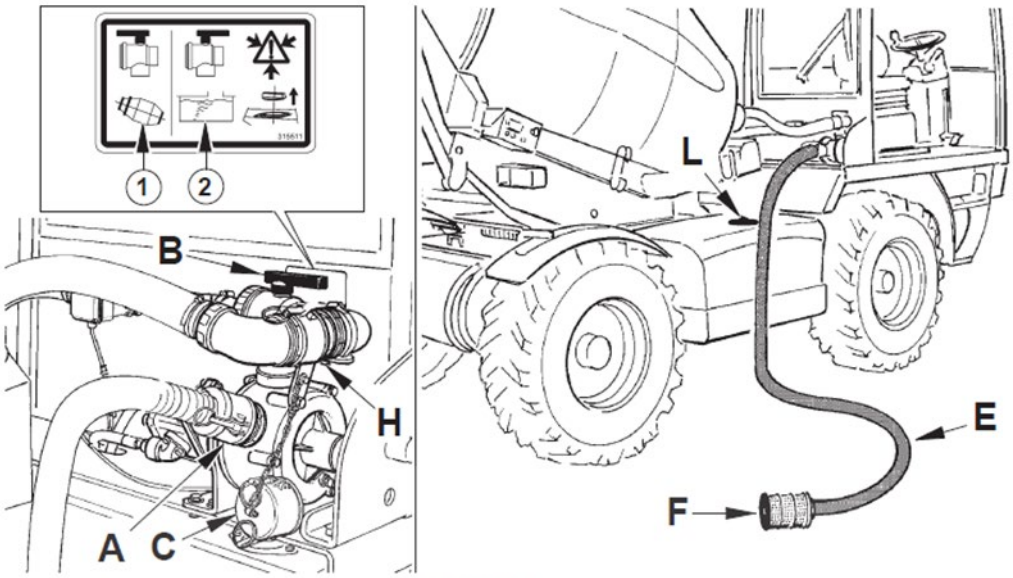
C – DRIVING DOWN HILL WITH A FULL LOAD

When having to drive downhill while transporting a load, operate with the vehicle facing bottom of the hill

D – DRIVING DOWN HILL WITHOUT A LOAD

When having to drive downhill without a load, operate with the vehicle facing bottom of the hill

4.51. First Filling With Mixing Water



1.) Filling the tanks with mixing water

CAUTION: In the event of pump failure, check that there is water in the pump body

Fill with water through the water inlet pipe

- To fill the tank, use an external water source, fill via port L.
- You can fill from both water tanks positioned opposite each other as they are connected.

Filling with water using the transfer pump

CAUTION: Check that the pre-filter is fitted inside the filler neck A of the pump, and always use the filter F during suction from water sources, since the pump may take in small parts that could damage the pump propeller.

- Remove the closing cap C, check that the pre-filter is fitted; insert the flexible suction hose E into the suction pipe filler neck A of the pump.
- Connect the tube leading to the tank into the delivery filler neck H.
- Move the valve B to the correct position (with delivery to tank 2).
- Position the flexible suction hose E in the relative water source (reservoir, external tank etc.).
- Open & keep both caps L to prevent the water tank from swelling.
- Check that the suction filter F is completely immersed
- Start the engine.
- Activate the transfer pump (engine rpm ideally about 2000).

- Wait until the tank is full (when water starts flowing from the water inlet pipe and from the tank).
- Stop the transfer pump and tighten the cap L.

2.) First filling with mixing water

The Mixing water is managed by two different systems (refer above picture)

I. External water sources (tanks, external waterbodies like lakes, ponds etc.)
II. Machine tank.

The first system permits to fill water on both machine tank and drum.
The second system permits only to feed in the drum.

4.52. Water Feeding From External Source

- Position the flexible suction hose E in the relative water source. Check that the hose coupling is connected to the suction pump union A and that the suction filter F is intact.
- Set the switching valve B to position “1” and then start filling the drum with mixing water.

4.53. Filling Water From Machine Tank

- When the tank is full, set the switching valve B to position “1” checking that the coupling of the hose leading from the vehicle tank is connected to the suction pipe union A of the pump.

4.54. Water Transfer Pump Operation

- Check that all the control levers are in neutral position.
- Start the engine.
- Rotate the drum.
- Increase the rotation speed until reaching maximum speed.
- Accelerate the engine by acting on the hand accelerator for 2/3 of its total travel (1800-2000 rpm). Actuate the water pump switch provided on the dashboard controls.

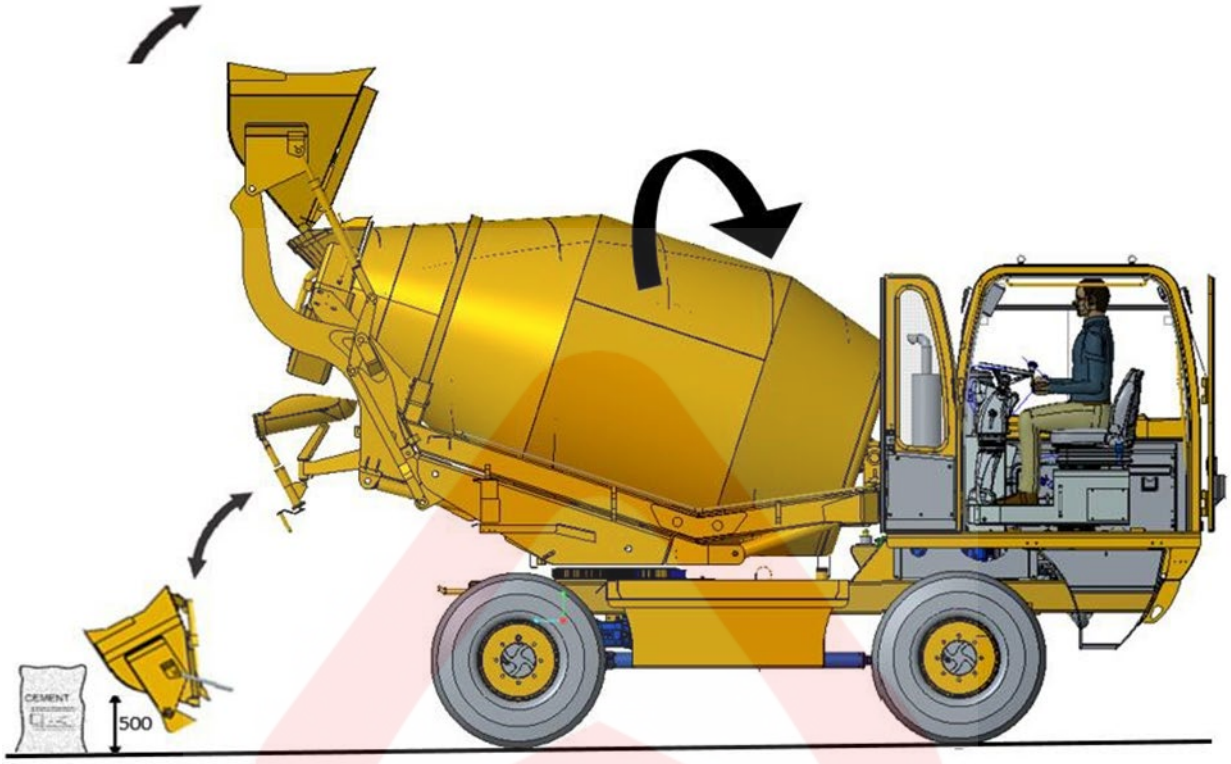
CAUTION: Ensure that there is enough water in the outer water source or in the machine tank to keep the transfer pump submerged and do not let it work dry, risking damage to the propeller.

4.55. Cement Loading

DANGER: It is strictly prohibited to climb onto the vehicle, whether it is in the mixing phase or stationary.

CAUTION: Wear a protective mask.

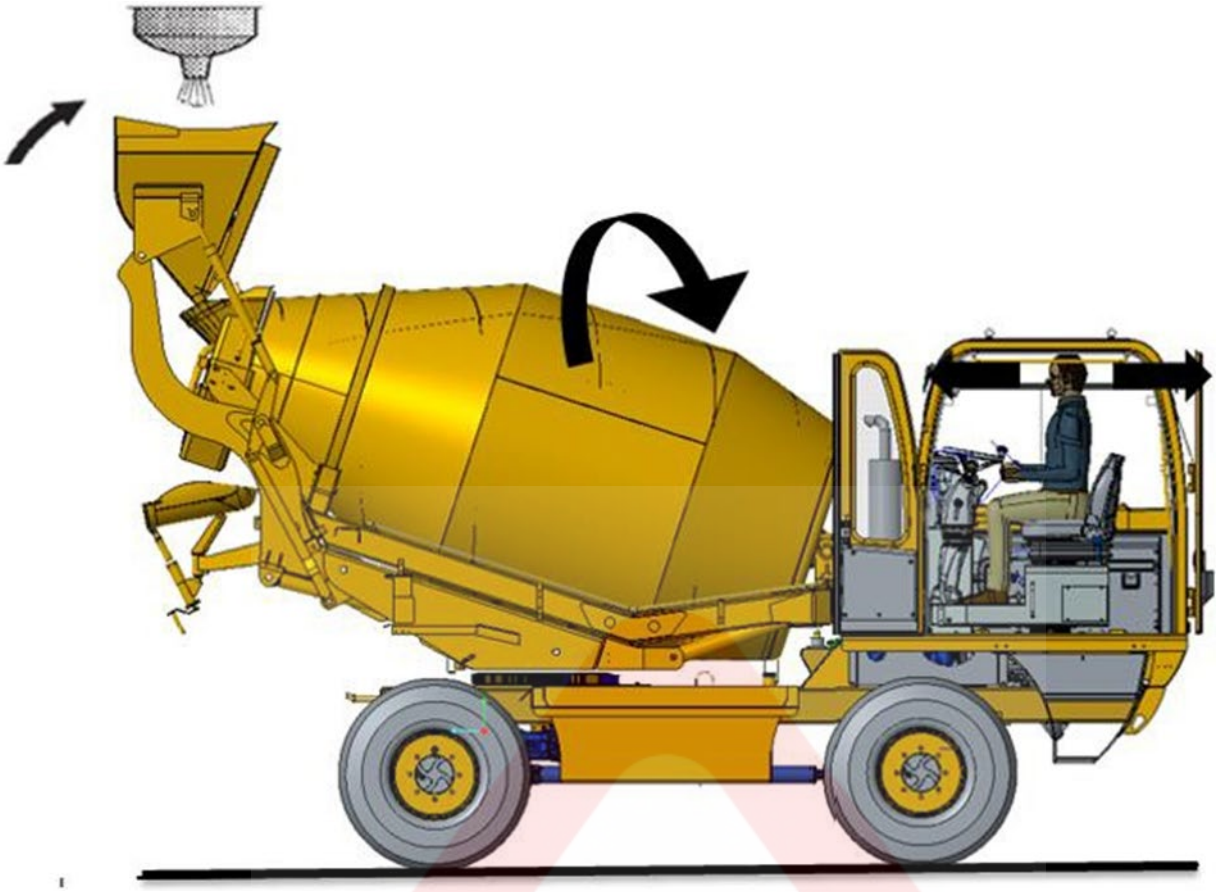
CAUTION: This drum is not designed to mix / handle dry lean concrete (DLC)



- Keep the drum rotating.
- Raise the bucket about 0.5 meters and hold it in fully tilted position with the gate/hatch closed.
- Calculate the quantity of cement to be loaded
- Manually fill the bucket with cement, tear open the bags on the serrated blade of the bucket.
- Remove the empty bags.
- Raise the arm to its maximum height.

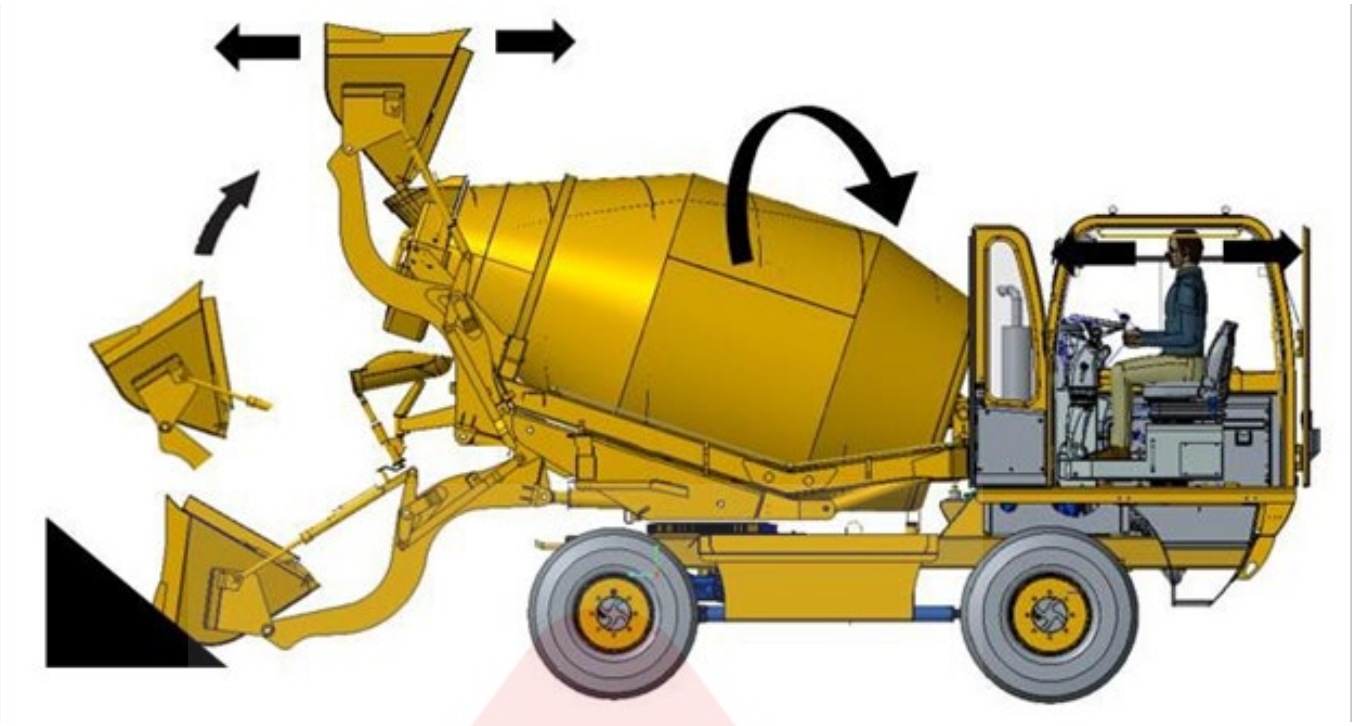
Open the unloading gate/hatch and wait until the cement has poured into the drum through the hopper, helping it along by vigorously shaking the bucket with the arm.

4.56. Cement In Silos



- Keep the drum rotating at top speed.
- Raise the bucket arm to its maximum height
- Move to underneath the unloading point of the silo.
- Calculate the quantity of cement to be loaded
- Open the unloading gate/hatch and fill the drum using the silo dosage system.

4.57. Aggregate Loading

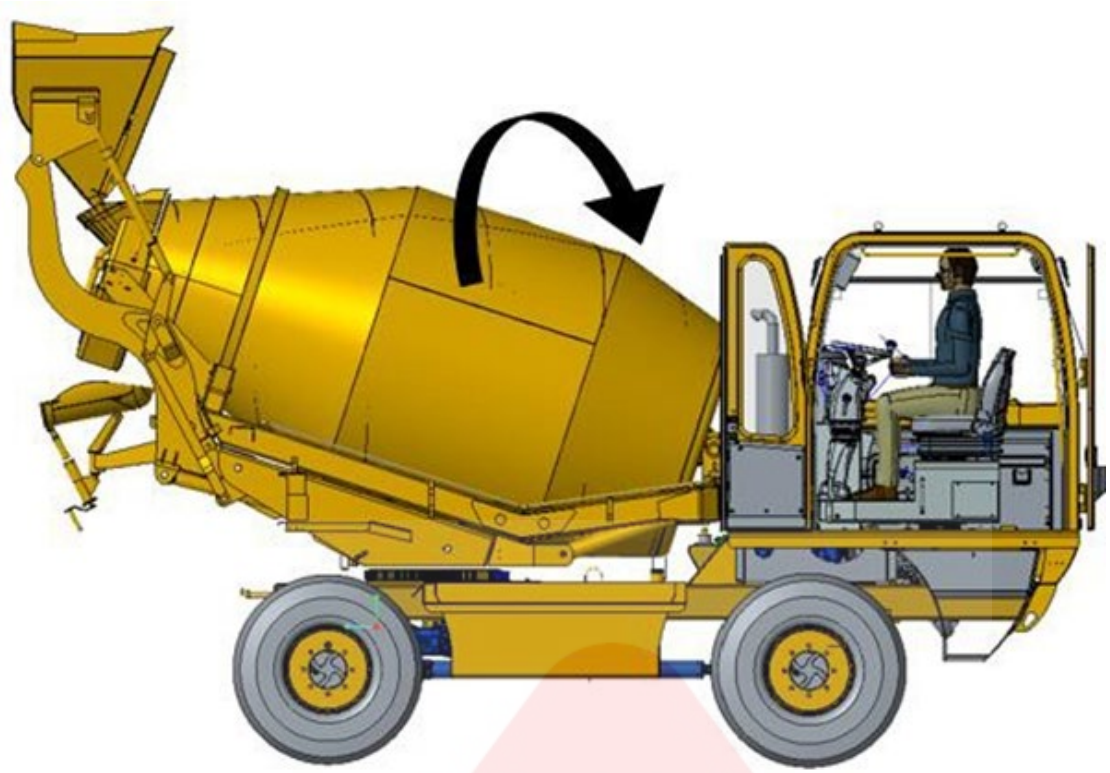


- Keep the drum rotating at top speed.
- Lower the arm after checking that the gate/hatch is closed.
- Select the lowest gear i.e.1st gear & motor speed (low).
- Dig into the heap with the bucket and at the same time tilt & raise the arm, that way filling the bucket with a larger amount of material & thus by reducing the cycle time
- Raise the arm to its maximum height while moving backward.
- Stop the vehicle.
- Open the unloading hatch and wait until the aggregate has poured into the drum through the hopper helping it
- Along by vigorously shaking the bucket with the arm.
- Approach the heap again while lowering the arm.
- Repeat the operations described above to obtain optimal drum loading.
-

NOTE: You can shift to reverse gear even if the vehicle has not completely stopped, only while loading at lower speed.

CAUTION: Sliding gate guides shall be cleaned with wire brush at the end of the day. Accumulation of cement and other aggregates will restrict the free movement of the gate which leads to gate failure/hydraulic cylinder seal failure.

4.58. Mixing And Second Filling With Water



- Keep the drum rotating for about 2 minutes after the last aggregate loading phase.
- Add the required amount of water. Follow the procedure described in 4.27.

4.59. Concrete Unloading

CAUTION: Always set the forward/reverse selector lever to neutral position. Move the arms up to the maximum height with the hydraulic gate/hatch closed.

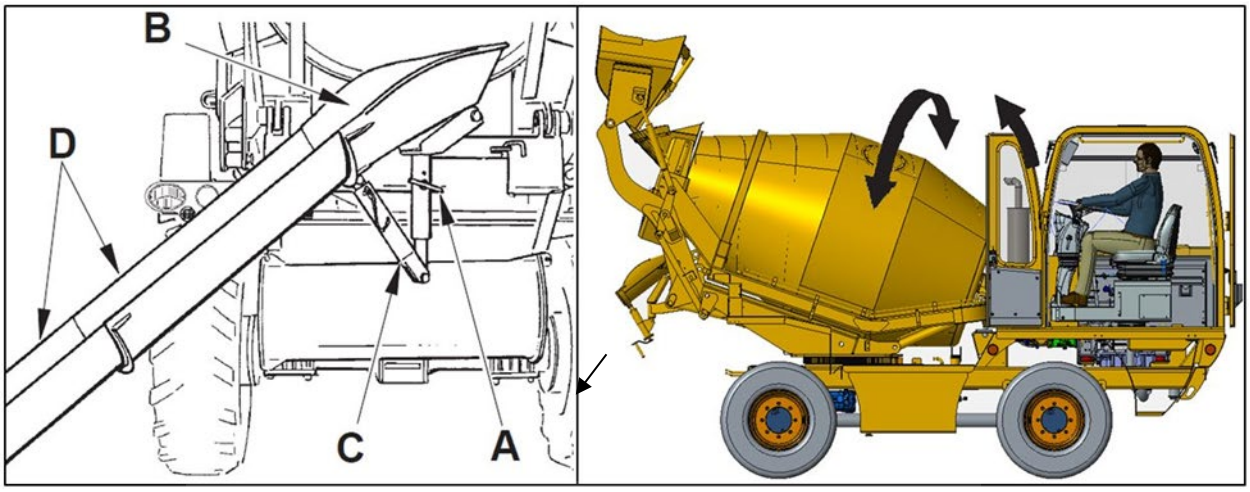
CAUTION: If someone on the ground assists you during unloading, be extremely careful in carrying out the maneuvers and keep eye contact at all times.

CAUTION: Avoid sudden inversion of drum rotation when the drum is fully or partially full and raised on uneven, bumpy or soft ground.

CAUTION: When working on side slopes do not rotate the rotary frame with the unloading chute facing downhill. Avoid steep slopes when you need to traverse with the rotary frame. Keep the arms at the maximum height.

CAUTION: Carefully rotate the drum to prevent unbalancing the wheels.

4.60. Concrete Unloading from Chute:

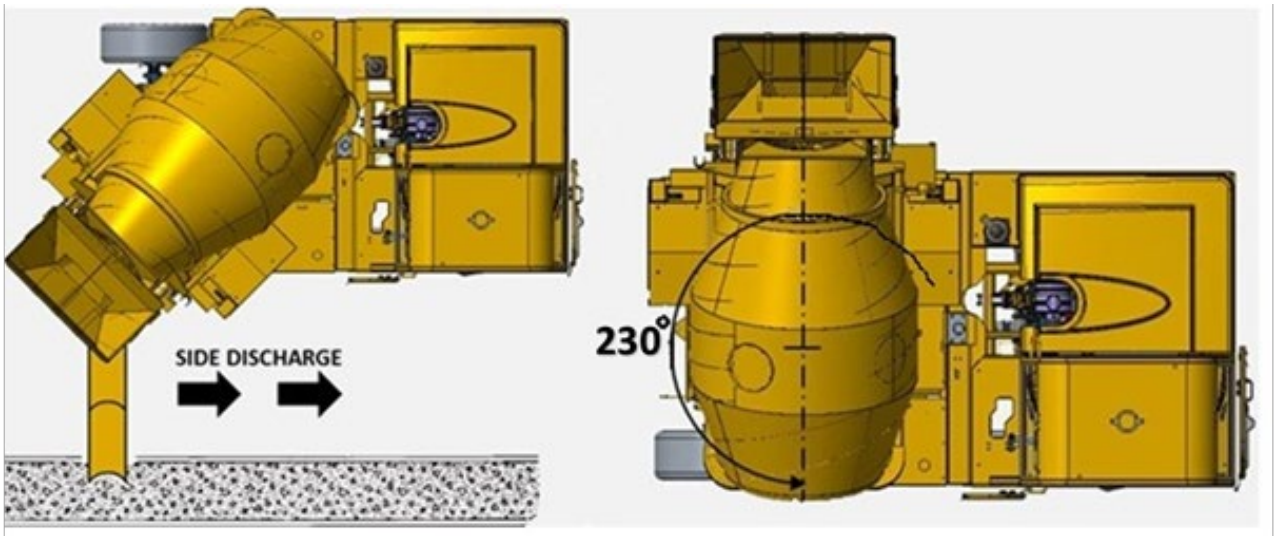


- Keep the drum rotating in the mixing direction (clockwise).
- Approach the unloading area.
- Stop the vehicle.
- Loosen the lever A that locks the chute B.
- Move the chute B directing it to the correct unloading position.
- Operate the lever E to adjust the chute height. This control acts on the chute tilting cylinder C
- Arrange extensions D and lock the chute B using the lever provided A.
- Bring the engine rpm up to a medium speed.
- Invert the drum rotation direction for unloading by acting on the selector switch provided in the cabin
- Adjust the drum rotation speed. The concrete unloading speed depends on the engine speed, the drum rotation speed, the height to which the drum is raised and the fluidity of the concrete.
- Raise the drum but not necessarily to its maximum height.
- Visually inspect regular concrete unloading.

To move on to the next area after completing unloading in the first area, follow the instructions below:

- Lower the drum if it is still relatively full, reposition it on the longitudinal axis.
- Reverse the drum rotation direction to mixing (clockwise).
- Approach and position in the new unloading area and follow all the instructions given above.

4.61. Unloading In Transverse Swinging Mode



To discharge the concrete into formworks or ground works with side discharge outlet.
Keep to the following instructions:

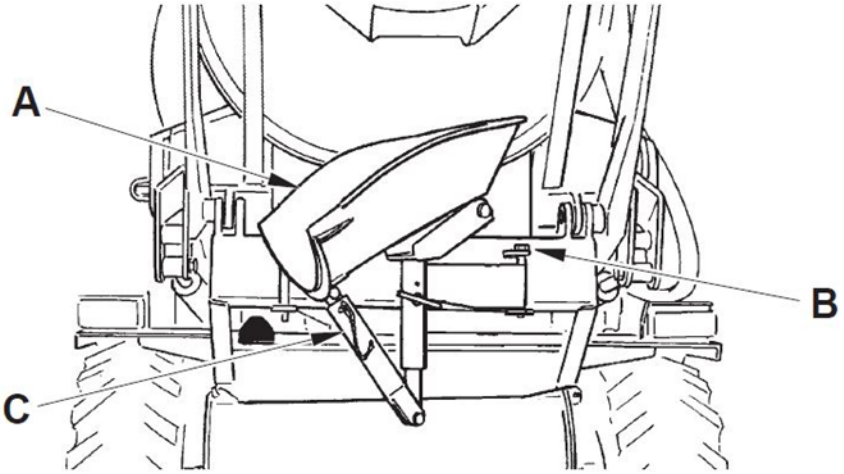
- Keep the drum rotating towards the mixing direction (clockwise rotation).
- Approach the discharge area with the forward movement line parallel to the discharge line. Stop the machine and set the gear box lever in neutral position.
- Fit required extension chute.
- Set the engine rpm at a medium value.
- Reverse the direction of rotation of the drum for the discharge by adjusting the selector switch inside the cab. Adjust the rotating/swivel frame by adjusting DC valve lever controlling the rotation of fifth wheel rotation.

CAUTION: Any possible unbalance due to the machine weight variations can alter the stability conditions. Be careful during the drum rotation maneuver.

- Invert the drum rotation direction for unloading by acting on the selector switch provided in the cabin
- Accelerate the engine r.p.m and regulate the drum rotation speed. The concrete discharge speed depends on the engine r.p.m, on the drum rotation speed, its lifting position and the concrete fluidity.
- Lift drum, however not necessarily to maximum lifting position.
- Check visually that concrete discharge occurs regularly.
- Slowly move according to the working direction and avoid any sudden braking.

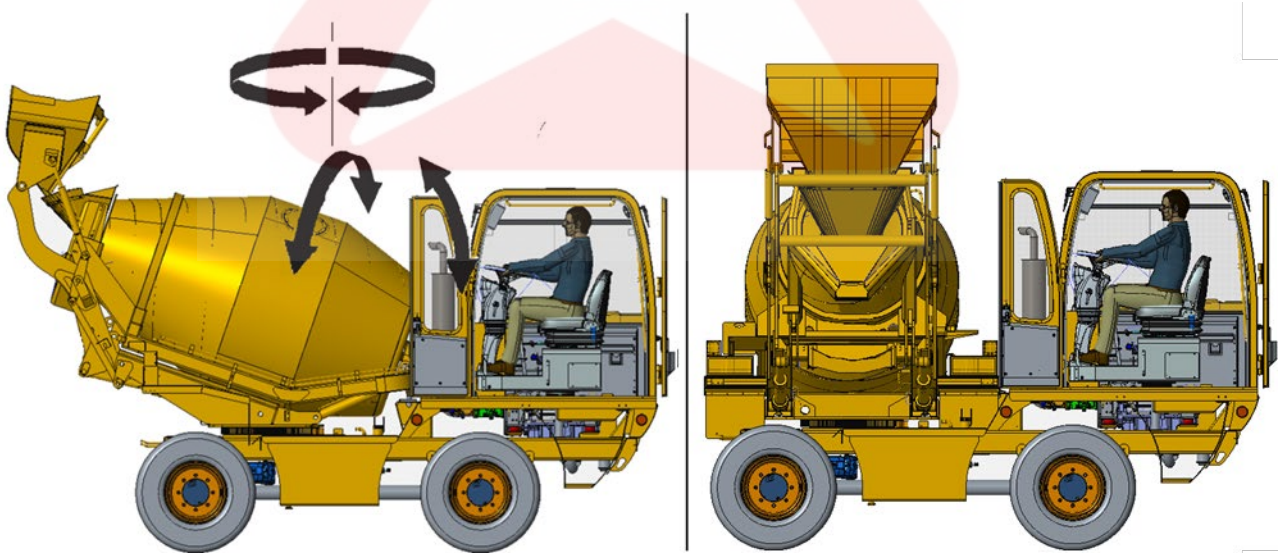
NOTE: Never turn the rotating frame while the drum is turned towards the lower side during the work on side slopes. Avoid steep slopes during the rotation of the rotating frame. Keep the shovel lowered during transfers to the working site or in areas out of the road .Avoid the work on steep side slopes.

4.62. Direct Discharge from Hopper



The concrete can be discharged directly from hopper by removing the discharge concrete-skid A. In this way it is possible to obtain a maximum height:

- Remove both pins B from relevant supports.
- Remove concrete discharge Chute A.
- Disassemble cylinder C for the concrete-skid inclination control. Keep the drum rotation towards the mixing direction.
- Approach the discharge area.
- Stop the machine by shifting the gearbox lever to neutral position.
- For side discharge, set the rotating frame in the most convenient position (as fig below).



CAUTION: Drive carefully during the drum swivel maneuver so as to avoid possible wheels unbalances.

- Set the engine r.p.m at a medium value.
- Reverse the drum rotation direction for discharge by adjusting the selector switch inside the cab.
- Accelerate engine and adjust drum rotation speed. The concrete discharge speed depends on the engine r.p.m, on the drum rotation speed, on its lifting position and on the concrete fluidity.
- Lift drum, however not necessarily to maximum lifting position
- Check visually that concrete discharge occurs regularly.
- When discharge operation in the first area is over move to the next one by observing the instructions:
- Lower drum if it is still relatively full.
- Stop drum rotation.
- Bring drum rotation back to mixing phase (clockwise rotation).
- Approach and take position in the new discharge area and observe all instructions described above.

CAUTION: If during discharge phase you are assisted by an operator on the ground, take care when performing maneuvers Avoid sudden drum rotation reverse when it is full or lifted on uneven, rough or soft grounds.

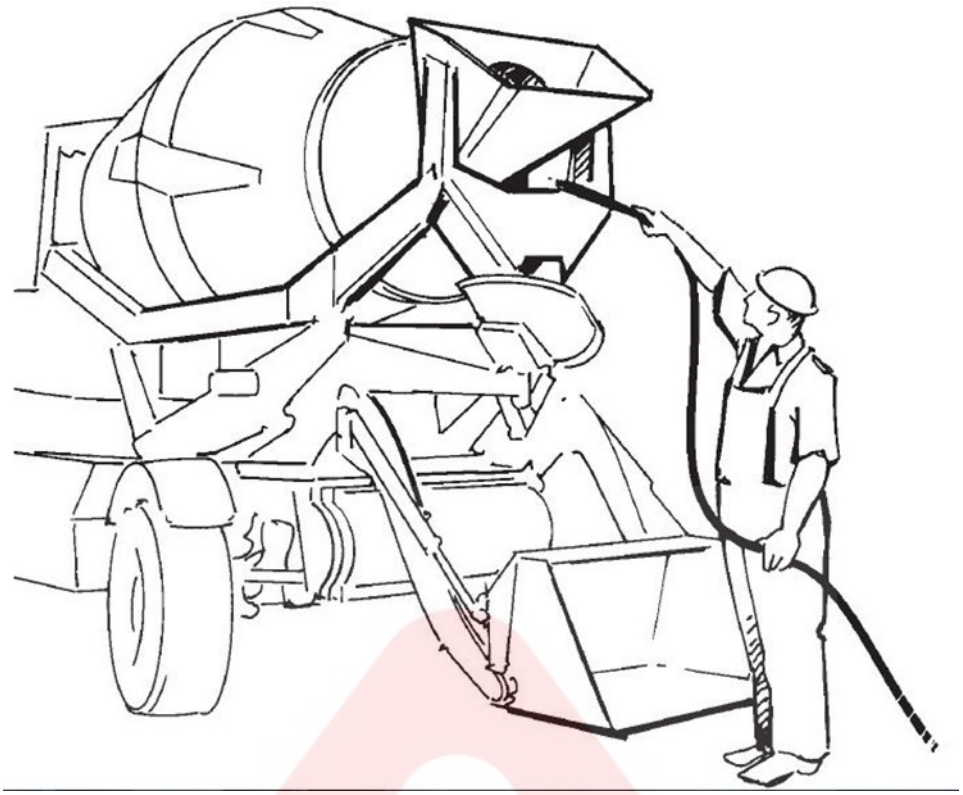
Concrete Discharge from Drum Emergency Door:

DANGER: This operation must be performed by Authorised AJAX Workshops qualified personnel.

In case of breakdown or failure of the drum rotation system, then it is necessary to empty the drum to avoid concrete hardening/setting.

- Lift the drum if possible.
- Rotate the drum manually by using belts.
- Rotate & position the inspection door to side to loosen the screws to remove door
- Rotate the drum further till discharge opening is in the lower part of the machine, to help concrete flow outside.
- To increase concrete fluidity it is necessary to add water by using the transfer pump as described before.
- When discharge operation is over wash internal drum propellers.

4.63. Bucket, Drum and chute Washing & internal cleaning of the mixing Drum



- Set the drum to rotate clockwise like for mixing.
- Fill the drum with water and gravel following the procedures as described above in a quantity that is sufficient to dilute and detach the concrete residues.
- Connect the washing nozzle to the pump delivery side (refer water pump operation section above).
- Connect washing hose to pump delivery side H & switching valve to position 2 (refer 4.51).
- Externally wash the bucket, drum and chute as well as all the parts normally soiled with concrete.
- Raise the drum.
- Change drum rotation from clockwise to anticlockwise.
- Drain out all the water in the drum and wash the chute and the extensions.
- Remove the extensions.

- Lower the bucket and wash it inside and out.

NOTE: Washing operation can be carried out both with the supplied nozzle and other optional nozzles working with 2 bar supply pressure.

DANGER: Do not climb onto wet and slippery parts of the vehicle and be extremely careful in all the movements you make.

CAUTION: Do not insert the washing nozzle in the drum mouth when it is rotating.

The main device of the vehicle is the drum. Therefore it is essential to thoroughly clean the inside of the drum to prevent concrete encrustations from solidifying on the mixing blades for as long as possible. Therefore, in addition to washing the vehicle when you have finished work as described in previous chapter, it is advisable to wash the inside of the drum. Proceed as follows:

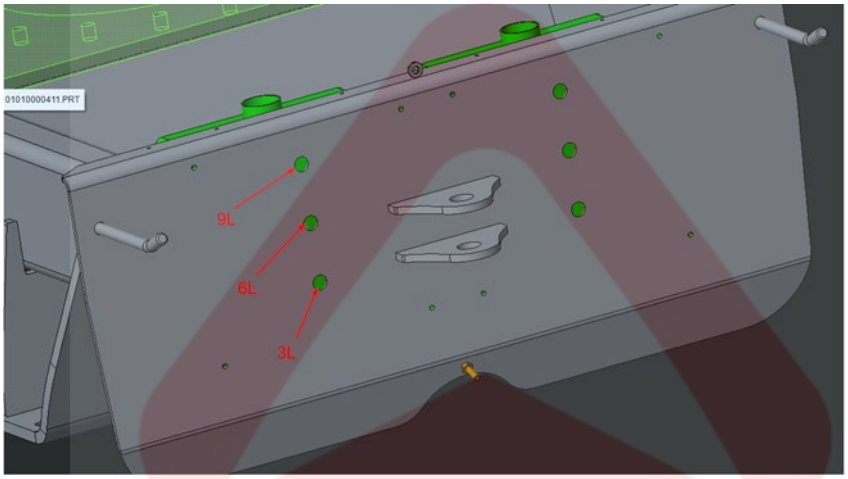
- Lower the loader to the ground.
- Fully raise the drum counter frame in order to bring the unloading hatch close to the ground.
- Wash the inside of the drum as thoroughly as possible using the washing nozzle.
- When done, turn the drum anticlockwise and drain out the water.

4.64. Extraordinary Drum Cleaning or Blade Replacement

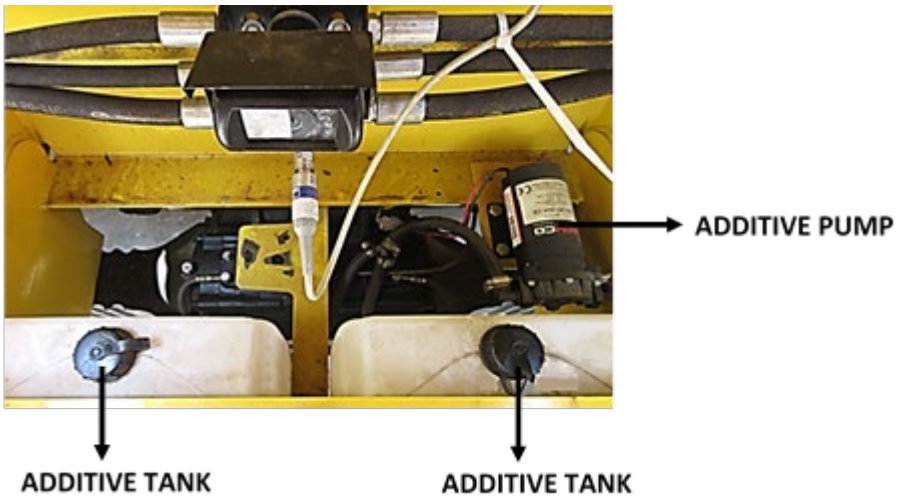
DANGER: Do not climb into the drum while it is still mounted on the vehicle.

Extensive use of the vehicle and not thoroughly washing the drum after mixing will wear out the blades or cause them to clog up with solidified concrete. To solve these problems one has to work inside the drum. Therefore it is obligatory to go to an authorised AJAX workshop and dismantle the drum from the vehicle so that these operations can be carried out on the ground in safe conditions.

4.65. Additive System (Optional)



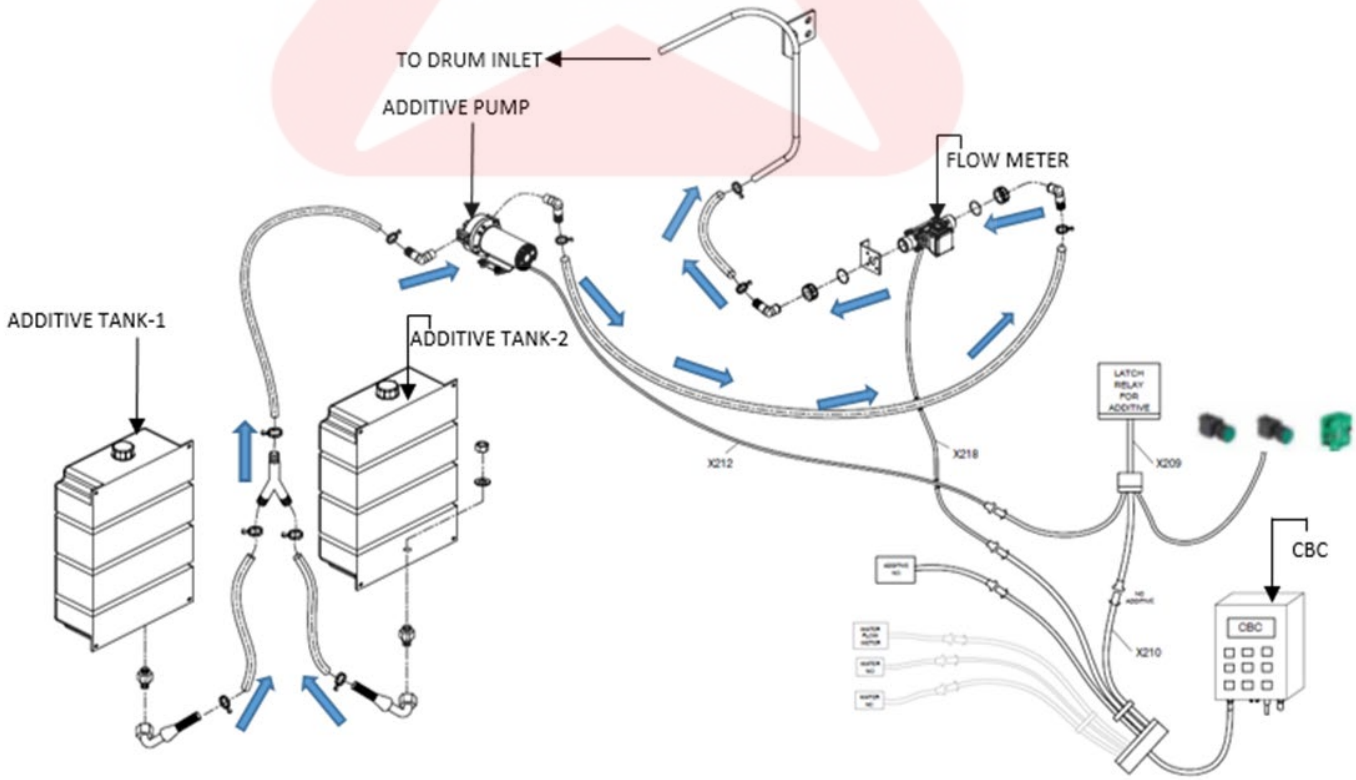
4.66. Additive Dozing System Setup




ADDITIVE PUMP


FLOW METER

4.67. Additive system connection



4.67.1. Additive System Specifications

Additive Pump

- Make: DELAVAN AG PUMPS. INC
- Model: 7802 111
- Pump Type: Self-priming, capable of being run dry, 3 chamber diaphragm pump
- Operating pressure: 4.1 bar or 60 psi
- Flow: 4.0 Lpm
- Type: 12 V DC
- Liquid Temperature: 60°C Max.

Flow Meter

- Make: ARAG
- Model: ORION H187148
- Flow meter Type: Electro - magnetic
- Operating pressure: 20 bar
- Pulse output: 0-12V DC
- Additive Tank Capacity :15 Lts

4.67.2. Procedure

1. To turn the power up; Switch on the isolator switch. 2. Fill the additive storage tank shown below from the filling port:	
3. Open the Electromagnetic flow meter top cover to operate the additive pump.	

4. Switch ON the unit and wait for 5seconds then press MENU key. 5. Then ENTER PASSWORD screen will be appear. 6. Type the 2012 and press the ENT key. 7. Then you will get MAIN MENU screen.	 

8. From the MAIN MENU select the Display of AGG/CEMT/SAND SET. 9. In this display" AGG/CEMT/SAND SET" additive request will be appeared on the display as shown side photos. 10. Press down key, until the Enter arrow come to "Y" position. 11. Press ENT to Select 'Y' for additive dosing enable.	

DIAGNOSTIC MODE:- 1. Switch ON the unit, & press ENT button within 5sec. 2. CBC unit will go to "DIAG NOSTIC MODE". 3. Display shows "FUNCTION 1" DISPLAY TEST. 4. As shown in the picture.	
5. Press UP key 4 times display shows FUNCTION 5 , "PULSE INPUT TEST". 6. Press ENT key display shows "CH NO.2: 000000" and "CH NO.3: 0000". 7. As shown in beside pictures. 8. Pull the water/additive lever, the pulse starts to count from 000000 for water; 0000 for additive. 9. Which indicates pulse input is coming to the CBC.	 

FOR PULSE SETTING : 1. Press down key until the arrow comes to pulse setting position. 2. Press ENT key to select the PULSE SETTINGS. 3. The SCREEN-3 appears. 4. Press ENT key until the arrow comes to ADDITI VE PULSE RA TE position. 5. Give the pulse rate 0.166cc/p or else as per your requirement in additive. 6. Press the ENT key. 7. Pulse setting is done.	
ADDITIVE BATCHING:- "AUTOCUT-OFF IN SUBTRACTIONMODEONLY". 1. In main screen select MODE SELECTION. 2. Press ENT. 3. In mode selection select SUBTRACTION MODE as shown. 4. Press ENT button. 5. SUBTRACTION MODE will appears.	 

6. After selecting subtraction mode the RECIPES screen will be appear. 7. Press ENT key. 8. You will see overall recipes. 9. By pressing 7 times of ENT key you will be getting ADDITI VE PRE-STOP setting option. 10. Set the PRE-STOP value as per your requirement. 11. Press ENT.	 
WORKING FUNCTION: - - The working condition of additive. - When the additive reaches its pre-stop value the cut-off relay will gets NO (normally open) position.	
CUT-OFF FUNCTION:- - In this screen you can notice the auto cut off for additive.	

NOTE: With this command, it is not possible to restart the filling operation from the point where it was interrupted. Once filling is complete, the display (as shown in Fig) starts to flash. Return to display of the total amount of liquid delivered to the mixer

4.67.3. Admixture

Admixtures are chemicals which are added to concrete at the mixing stage to modify some of properties of the mix. Admixtures should never be regarded as substitute for good mix design, good workmanship, or used good materials. Chemical admixtures reduce the cost of construction, modify properties of hardened concrete, ensure quality of concrete during mixing/transporting/placing/curing, and overcome certain emergencies during concrete operations. Chemical admixtures are used to improve the quality of concrete during mixing, transporting, placement and curing.

Use of admixture

a) To increase workability without changing water content
b) To reduce water content without changing workability
c) To effect a combination of the above
d) To adjust setting time.
e) To reduce segregation
f) To improve pump ability.
g) To accelerate the rate of strength development at early ages.
h) To increase strength.
i) To improve potential durability and reduce permeability.
j) To reduce the total cost of the materials used in the concrete.
k) To compensate for poor aggregate properties.

NOTE: Most of admixtures are not hazardous to health, certain admixtures are caustic in nature and some may be flammable. Avoid eye, mouth and skin contact as like other chemicals.

5. Maintenance

5.1. Foreword

This manual provides all the information necessary for routine maintenance on the AJAX vehicles.
This chapter addresses the persons who will physically be carrying out routine maintenance and provides the rules to follow to achieve the end result, namely, repair when necessary and help ensure functionality of the AJAX vehicle over time. The service intervals given in this chapter refer to normal operating conditions. The service intervals may vary in the running-in period or in specific conditions. The main purpose of this chapter is to indicate all the operations to be carried out at the same service interval thus facilitating the procedures and reducing the vehicle stop time.

CAUTION: All the operations described in detail in this chapter are considered routine maintenance. Given the care that needs to be taken to remove and refit parts of the vehicle, the persons that physically carry out the operations are responsible for their success and assuring that functionality is restored.

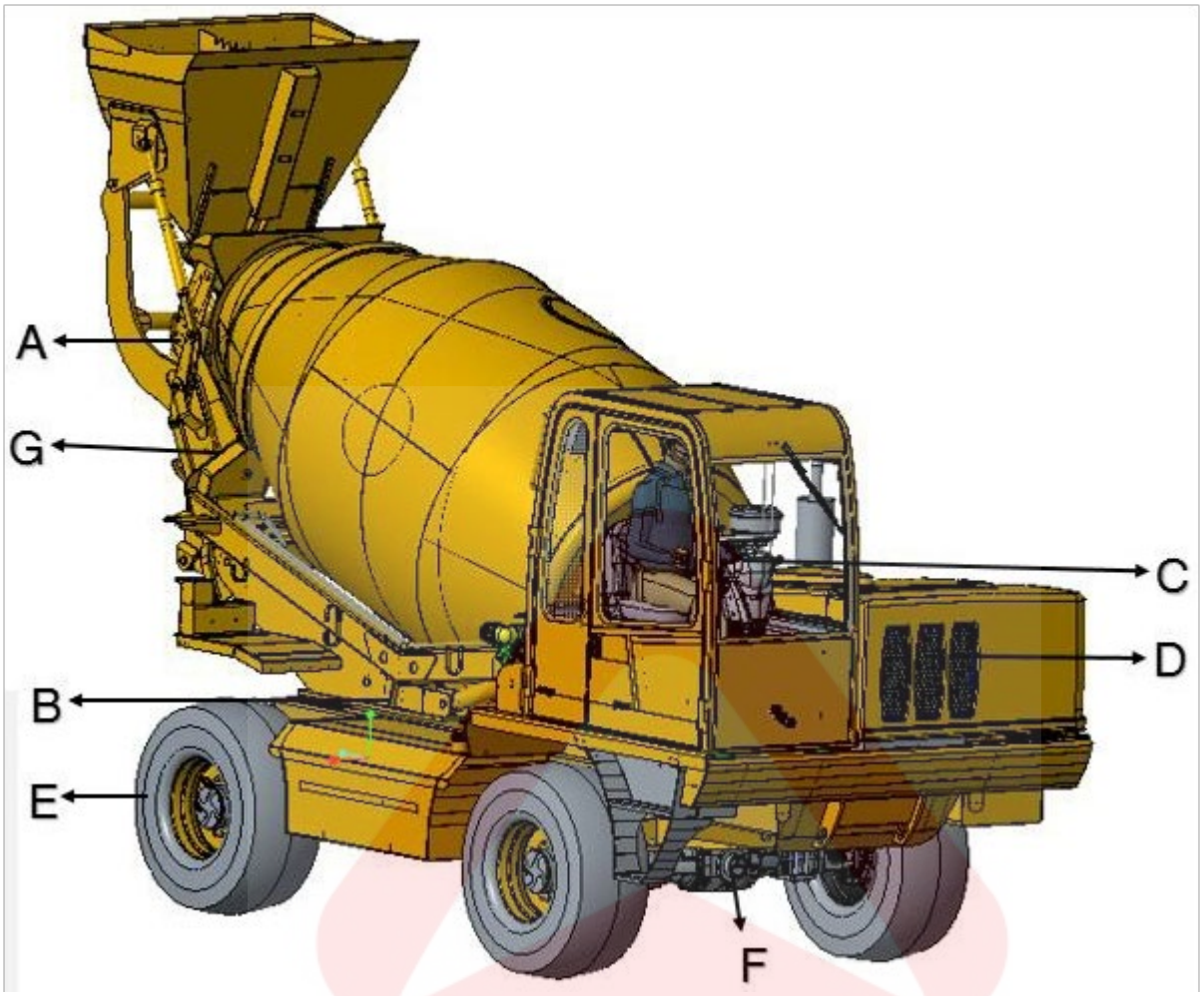
CAUTION: For extraordinary maintenance, contact your nearest AUTHORISED AJAX WORKSHOP.

Before and after the lubrication operations, clean the covers, grease nipples and caps to prevent dirt infiltrations. Lubrication is of primary importance in preventive maintenance, and the useful life of the vehicle depends on it. Therefore, it is absolutely essential that you follow the instructions given in this manual for the lubricants to use and the service intervals.

CAUTION: Do not pollute the environment. In accordance with national and international laws, lubricants, fluids, coolants and impregnated filtering elements are classified as polluting and toxic waste. They must be stored and disposed of at special facilities.

5.2. External Visual Inspection

Every day, before starting work or at the end of the day, it is advisable to quickly check the vehicle and take any necessary action, thus considerably reducing maintenance costs and the vehicle stop times.



Every day, before starting work or at the end of the day, it is advisable to quickly check the vehicle and take any necessary action, thus considerably reducing maintenance costs and the vehicle stop times.

Check the following:

- A - Arm - Bucket articulations
- B - Hydraulic system and pipes
- C - Instruments and gauges
- D – Engine, radiator & SCR system
- E - Tyres
- F – Axles & Transmission
- G - Jacks and pins

5.3. Cleaning The Vehicle

Clean the vehicle with water. Pay particular attention to the bottom of the vehicle. Do not let mud to deposit under the engine and the transmission. Check that the radiator grille is not clogged.

Warning: Avoid sparring of water on electrical wiring harness, ECU & sensors as it may lead to short circuit & malfunction

Checking For Damages

- Check that all the pins are properly in place and well secured with the respective stops.
- Check the light and signaling devices.
- Check the tyre condition.
- Check that all the adhesive safety labels are in place and undamaged. Replace them if necessary.

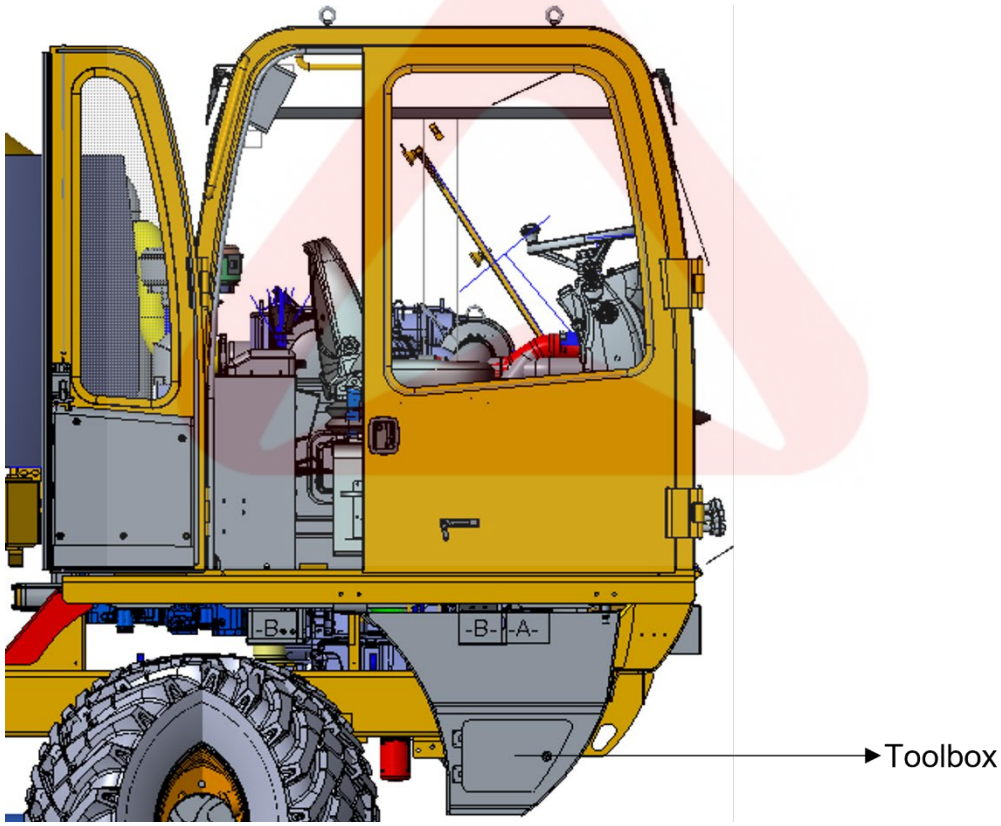
5.4. Seatbelts

CAUTION: Replace the seatbelt if worn or damaged following an accident.

- Check that the seatbelt is not frayed or stretched.
- Check that the buckles are intact and working.
- Check that the fastening screws are properly fitted and tightened.

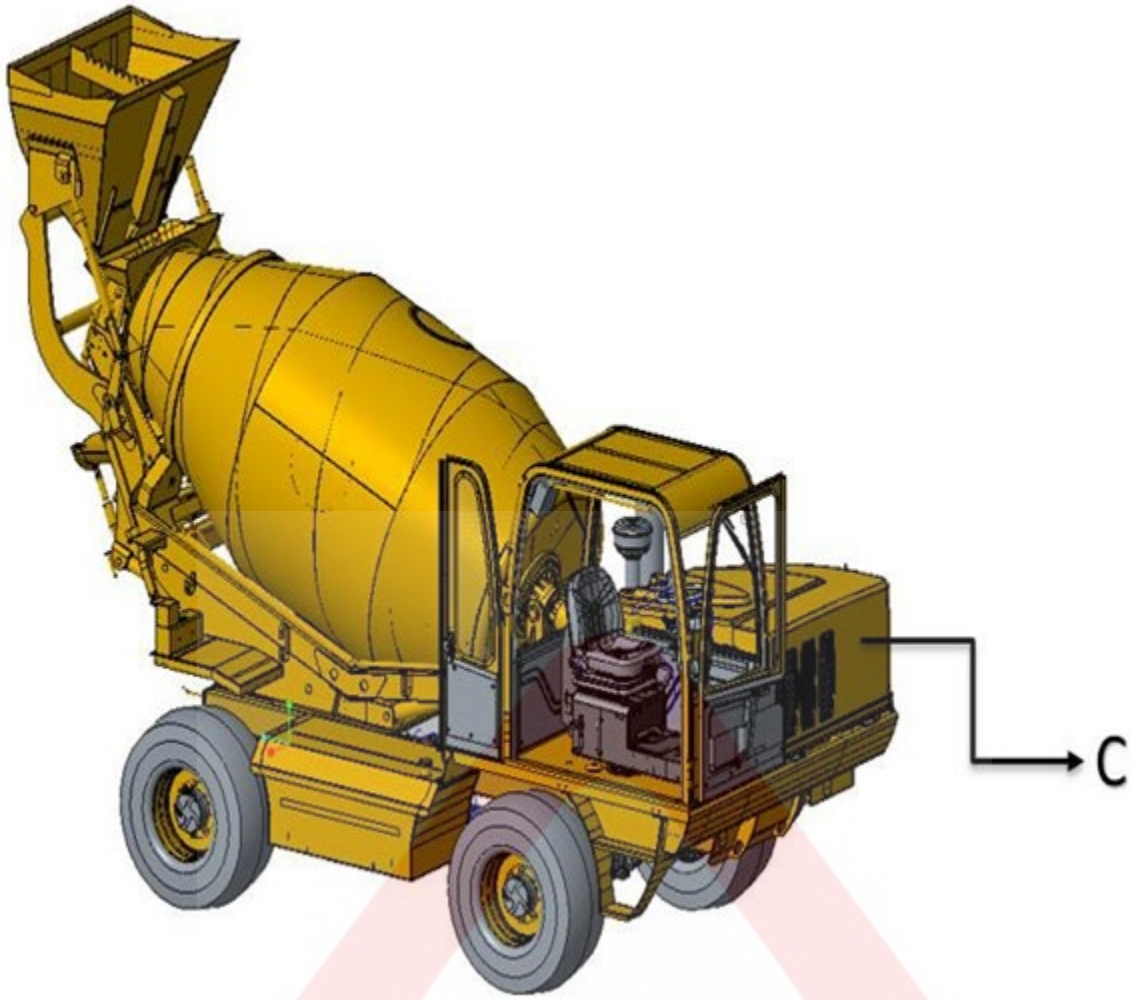
5.5. Access To Main Devices

Toolbox



- Tool kit is a part of foot rest.

5.6. Routine Maintenance and checks



CAUTION: Never open the various access doors if the machine is not parked on a flat surface with the engine off and the parking brake engaged.

Engine Compartment Lid/Bonnet
Unlock the bonnet lid **'C'** and raise it to access the following parts:

- Engine oil cap, level gauge and filter
- Engine accelerator cables
- Starter motor and alternator
- Hydraulic oil tank cap
- Radiator
- Engine air filter
- Hydraulic oil filter

5.7. Hydraulic Tank

Caution: The ventilation openings are designed that dust on the surface of the tank is not drawn in, and that the ingress of spray and rainwater is largely prevented.

5.8. Maintenance Schedule

For engine maintenance, a copy of the maintenance schedule as indicated in the engine manufacturer's instruction manual/ CD provided with vehicle.

NOTE: For all the operations on the engine, refer to the engine manufacturer's instruction manual/CD provided separately from this manual.

5.9. Maintenance Planning Table

I) Kirloskar Engine

ROUTINE MAINTENANCE CHART ARGO 4800/4300 - Kirloskar										
TYPE OF OPERATION	SL. NO.	Description	Daily or 10 HRS	Weekly or 50 HRS	EVERY Month or 150 HRS	EVERY 3 Month or 250 HRS	EVERY 6 Months or 500 HRS	EVERY 1000 HRS or 1 year	EVERY 12 Months or 1500 HRS	EVERY 5000 HRS
CLEANING	1	Machine Washing	●							
	2	Concrete in Drum	●							
	3	Drain water from water separator		●						
	4	Air Pre cleaner Bowl		●						
	5	Air Cleaner Element		●						
	6	Radiator Fins				●				
	7	Battery & lead connections		●						
	8	Fuel Tank					●			
	9	Fuel tank strainer				●				
	10	Radiator cleaning								●
	11	Ad blue tank neck filter						●		
	12	Urea tank cleaning						●		
	13	Water pump Filter	●							
	14	SCR system soot cleaning					●			
CHECK & ADJUST	1	Fan belt tension				●				
	2	Check & correct tyre inflation	●							
CHECK & TIGHTEN	1	Propeller shaft coupling bolts		●						
	2	Wheels & wheel nuts		●						
	3	Chassis mtg. bolts			●					
	4	Engine mtg. bolts			●					
	5	Battery connections								
	6	Pump mtg. bolts			●					
CHECK & TOP UP	1	Engine Oil	●							
	2	Radiator Coolant	●							
	3	Hydraulic Oil Level	●							
	4	Brake Fluid level	●							
	5	Fuel level	●							
	6	Gear Oil axle, Gear box, wheel hubs,			●					
	7	Drum Gear box oil			●					
	8	Battery electrolyte			●					
	9	Ad blue level	●							
REPLACEMENT	1	Engine oil		◘			Ⓟ			
	2	Engine oil filter		◘			Ⓟ			
	3	Fuel filters		◘			Ⓟ			
	4	Hydraulic Oil filter element					◘		Ⓟ	
	5	Hydraulic Oil							Ⓟ	
	6	Brake Fluid							Ⓟ	
	7	Gear Oil axle, Gear box, wheel hubs,					◘		Ⓟ	
	8	Drum Gear box					◘		Ⓟ	
	9	Air filter (primary & secondary)						Ⓟ		
	10	Radiator coolant								Ⓟ
	11	Ad blue supply line filter					Ⓟ			
	12	Supply module main filter element					Ⓟ			
	13	Hydraulic oil tank Breather							Ⓟ	
LUBRICATION		Grease all grease nipples	●							
	●	**Periodic checks**								
	◘	**First change**								
	Ⓟ	**Periodic change**								

Note :-1) Replace air cleaner element if torn, punctured,wet,damaged in sealing area or chocked / restriction indicator shows Red band for 3 rd time,replace the filter element along with safety element.Replace Air cleaner filter element at least once in year.

2) Replace hydraulic oil filter (cartridge) if found clogg indicator glows / comes on dash board else change same as per above table.

3) Hydraulic oil filter must be changed with every hydraulic oil change.

4) Clean the filter housing (Hydraulic filter & Air filter) before putting the new element.

5) All Perodic checks, changes & first change shall be done in whichever is earlier basis.

6) For more details on Engine related maintenace activities refer Kirloskar engine manual.

7) Change fan belt for every 1000 hrs.

8) Refer Kirloskar engine manual for radiator cleaning procedure

9) Refer Kirloskar engine manual for ad blue tank cleaning procedure

10) SCR system soot cleaning will be performed by Kirloskar service engineer

11) Engine service shall be carried out only based on hours

12) Check : indication on the battery - Weekly.1) Green - Ready to use. 2) White - Need to charge. 3) Red - Send to service to top up & charging.

ii) Mahindra Engine

ROUTINE MAINTENANCE CHART ARGO 4800/4300 - Mahindra										
TYPE OF OPERATION	SL. NO.	Description	Daily or 10 HRS	Weekly or 50 HRS	EVERY Month or 100 HRS	EVERY 3 Month or 250 HRS	EVERY 6 Months or 500 HRS	EVERY 1000 HRS or 1 year	EVERY 12 Months or 1500 HRS	EVERY 3000 HRS or 2years
CLEANING	1	Machine Washing	●							
	2	Concrete in Drum	●							
	3	Drain water from water separator		●						
	4	Air Pre cleaner Bowl		●						
	5	Air Cleaner Element		●						
	6	Radiator Fins				●				
	7	Battery & lead connections		●						
	8	Fuel Tank					●			
	9	Fuel tank strainer				●				
	10	Urea tank cleaning								●
	11	Water pump Filter	●							
CHECK & ADJUST	1	Fan belt tension			●	●				
	2	Check & correct tyre inflation	●							
CHECK & TIGHTEN	1	Propeller shaft coupling bolts		●						
	2	Wheels & wheel nuts		●						
	3	Chassis mtg. bolts			●					
	4	Engine mtg. bolts			●					
	5	Battery connections								
	6	Pump mtg. bolts			●					
CHECK & TOP UP	1	Engine Oil	●							
	2	Radiator Coolant	●							
	3	Hydraulic Oil Level	●							
	4	Brake Fluid level	●							
	5	Fuel level	●							
	6	Gear Oil axle, Gear box, wheel hubs,			●					
	7	Drum Gear box oil			●					
	8	Battery electrolyte			●					
	9	Ad blue level	●							
REPLACEMENT	1	Engine oil			◘		Ⓟ			
	2	Engine oil filter			◘		Ⓟ			
	3	Fuel filters					Ⓟ			
	4	PCV Filter					Ⓟ			
	5	Hydraulic Oil filter element					◘		Ⓟ	
	6	Hydraulic Oil							Ⓟ	
	7	Brake Fluid							Ⓟ	
	8	Gear Oil axle, Gear box, wheel hubs,					◘		Ⓟ	
	9	Drum Gear box					◘		Ⓟ	
	10	Air filter (primary & secondary)						Ⓟ		
	11	Radiator coolant								Ⓟ
	12	Supply module main filter element					Ⓟ			
	13	Hydraulic oil tank Breather							Ⓟ	
LUBRICATION	14	Grease all grease nipples	●							
	15	Front end cover greasing				●				
	●	**Periodic checks**								
	◘	**First change**								
	Ⓟ	**Periodic change**								

Note :-1) Replace air cleaner element if torn, punctured,wet,damaged in sealing area or chocked / restriction indicator shows Red band for 3 rd time,replace the filter element along with safety element.Replace Air cleaner filter element at least once in year.

2) Replace hydraulic oil filter (cartridge) if found clogg indicator glows / comes on dash board else change same as per above table.

3) Hydraulic oil filter must be changed with every hydraulic oil change.

4) Clean the filter housing (Hydraulic filter & Air filter) before putting the new element.

5) All Perodic checks, changes & first change shall be done in whichever is earlier basis.

6) For more details on Engine related maintenace activities refer Kirloskar engine manual.

7) Change fan belt for every 1000 hrs.

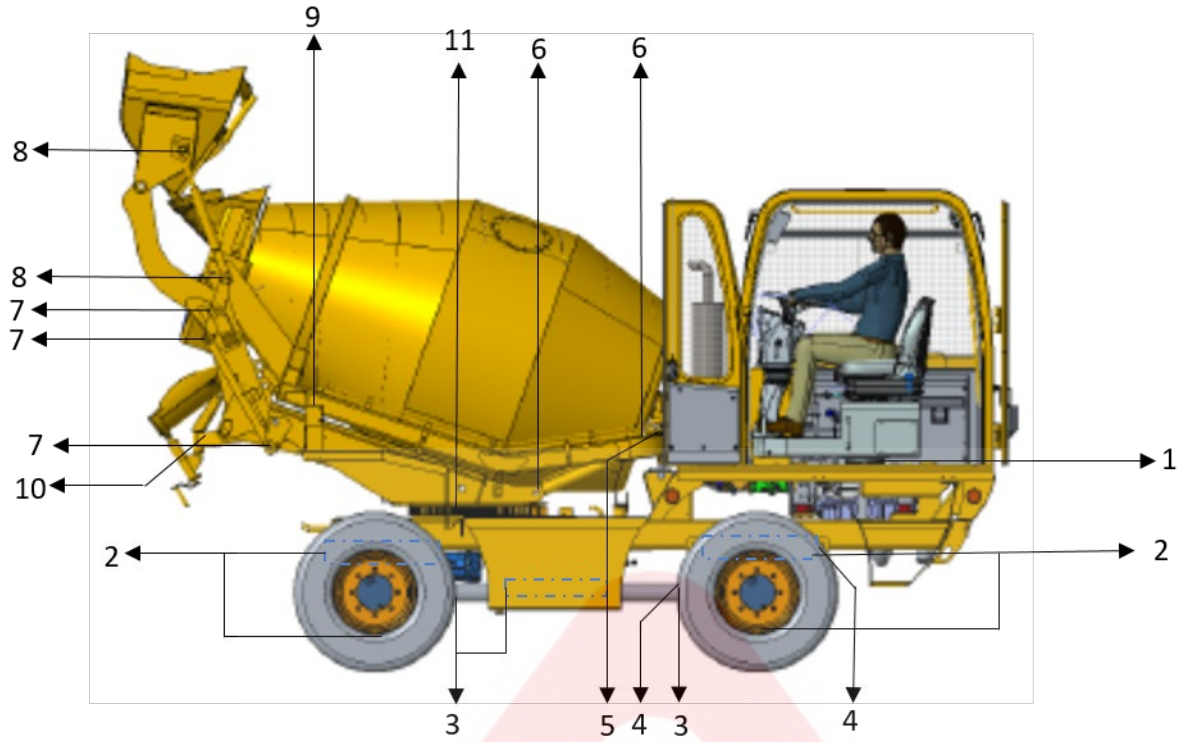
9) Refer Mahindra engine manual for ad blue tank cleaning procedure

10) SCR system soot cleaning will be performed by Mahindra service engineer

12) Check : indication on the battery - Weekly.1) Green - Ready to use. 2) White - Need to charge. 3) Red - Send to service to top up & charging.

5.10. General Inspections

Grease



CAUTION: For the greasing operations, park the vehicle on flat ground and lower the arm. Remove the ignition key and apply the parking brake.

CAUTION: Daily grease the drum rollers to keep them free of concrete residues. Do not use graphite grease on the bearings.

The vehicle must be greased regularly in order to keep it in efficient operating conditions. Stop greasing as soon as fresh grease starts flowing out from the openings.

S.NO	WORKING AREA	QTY	EVERY 8HOURS/DAILY	EVERY 40HOURS/WEEKLY	EVERY 1000HOURS/ 8 MONTHS
1	PIVOTING DRIVING POST	1		X	
2	KING PIN	4		X	
3	TRANSMISSION SHAFT	3		X	
4	OSCILLATING CHASSIS	2		X	
5	DRUM LOCKING PIN	1		X	
6	DRUM LIFTING CYLINDERS	2+2		X	
7	LOADING ARM &CONNECTING ROD & TIE ROD	2+2	X		

8	BUCKET TILTING CYLINDERS	3+3	X		
9	DRUM ROLLERS	2+2	X		
10	UNLOADING CHUTE	1+1	X		
11	DRUM SWIVEL BEARING	2			X

Cleaning And Draining the Fuel Tank

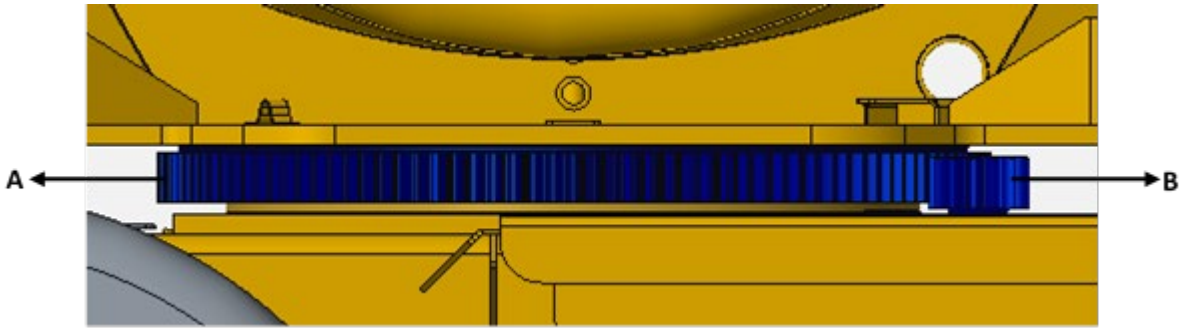
CAUTION: Before proceeding, always read the safety regulations

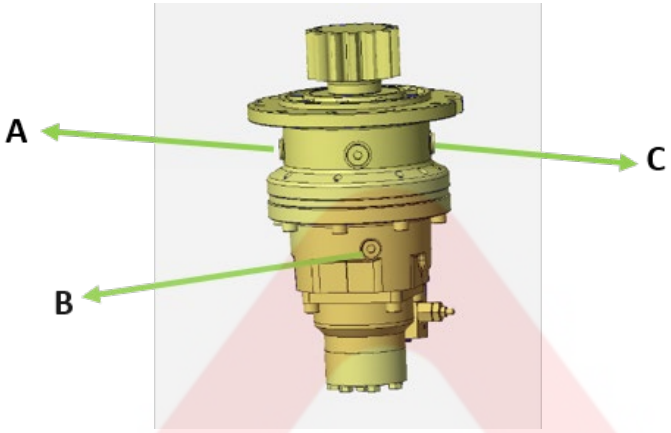
DANGER: Extinguish all smoking materials and open flames as there may be flammable vapours.

Vapours.
With the engine off, position an adequately sized container under the fuel tank. Unscrew the drain plug ‘A’ and let the fuel flow out until it is clean and free of impurities that have remained at the bottom of the tank.

5.11. Fifth Wheel Lubrication

- Park the vehicle on flat ground and make sure the drum is empty.
- After the drum has been raised, engage the drum cylinder supporting stay rod (safety rod).
- Turn the engine off, take the ignition key out and make certain the parking brake is on.
- Lubricate with grease or equivalent lubrication toothed fifth wheel ‘A’ and pinion ‘B’.
- Use a hard-bristle brush.
- Grease the internal rack through the nipples.

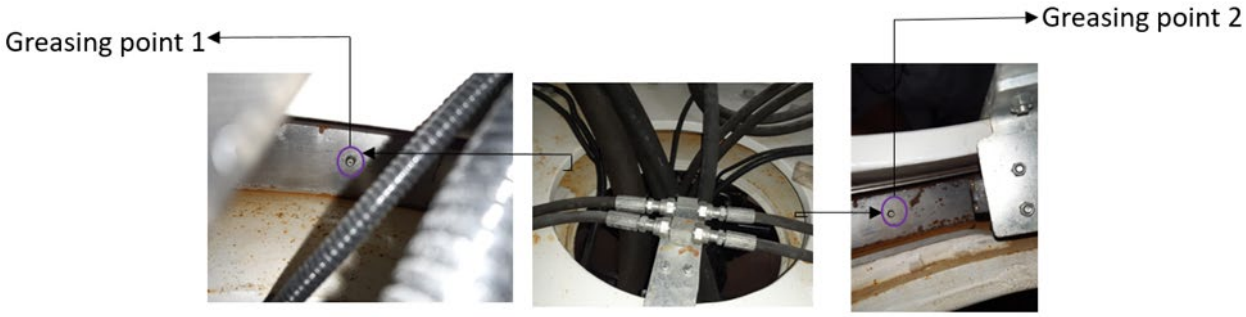




Oil change of fifth wheel rotation reduction gear

- Move the vehicle onto flat a ground, engage the parking brake, turn off the engine and remove the ignition key.
- Work from underneath the vehicle to access the reduction gear.
- Unscrew the drain cap B and drain out all the oil into a prearranged container and screw the cap B back on.
- Add the specified oil through the filler cap A using a syringe till the oil level reach the center of sight glass C.
- Screw the cap A back on.
- Oil can even be filled by via breather.

Greasing point for swivel bearing



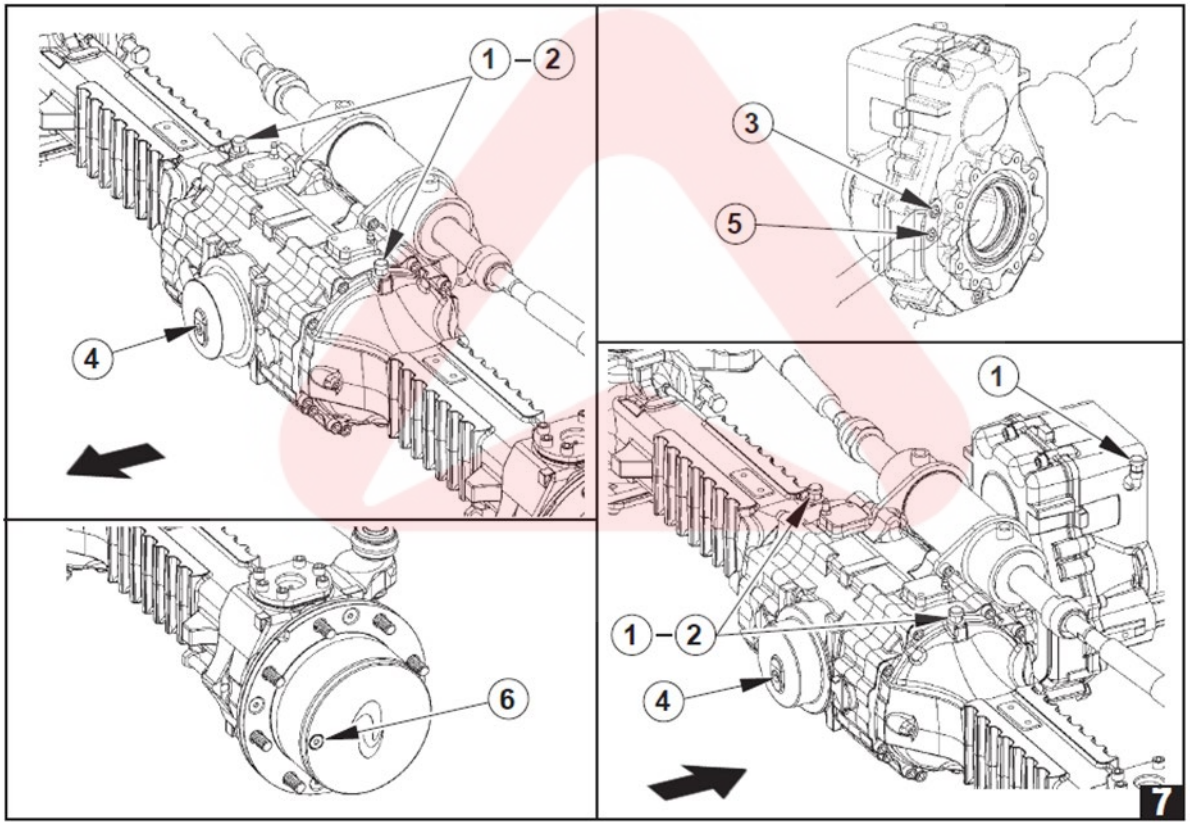
5.12. Axle And Wheels

5.12.1. Cleaning The Axle And Differential Bleeders(COMER AXLE)

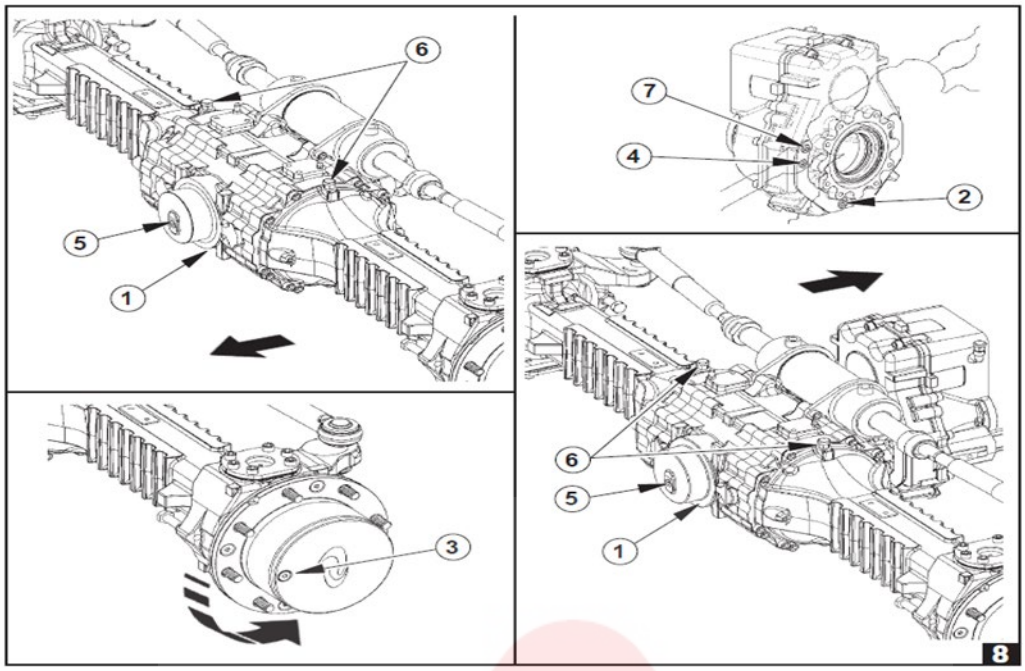
CAUTION: Before proceeding, always read the safety regulations. Never use petrol, solvents or flammable liquids in general for cleaning. Use only approved non-flammable and non-toxic commercial solvents.

5.12.2. Checking And Topping Up the Oil Level In The Front And Rear Axles (COMER AXLE)

- Remove any dirt from the bleeders (**1**) located on both the axles and the differentials.
- Park the vehicle on level ground, turn off the engine, apply the parking brake, lower the arm and remove the ignition key.
- Unscrew the filler cap - **(3)** and the level gauge caps **(4)** - **(5)** (in horizontal position).
- If oil trickles from the level gauge caps **(4) - (5) - (6)**, it is not necessary to top up; if not, top up using a funnel adding oil through the filler cap **(2) - (3)** and the level gauge cap **(6)** until reaching the optimal level.
- Screw all the caps back on after topping up.



5.12.3. Replacing The Oil In The Front And Rear Axles (COMER AXLE)

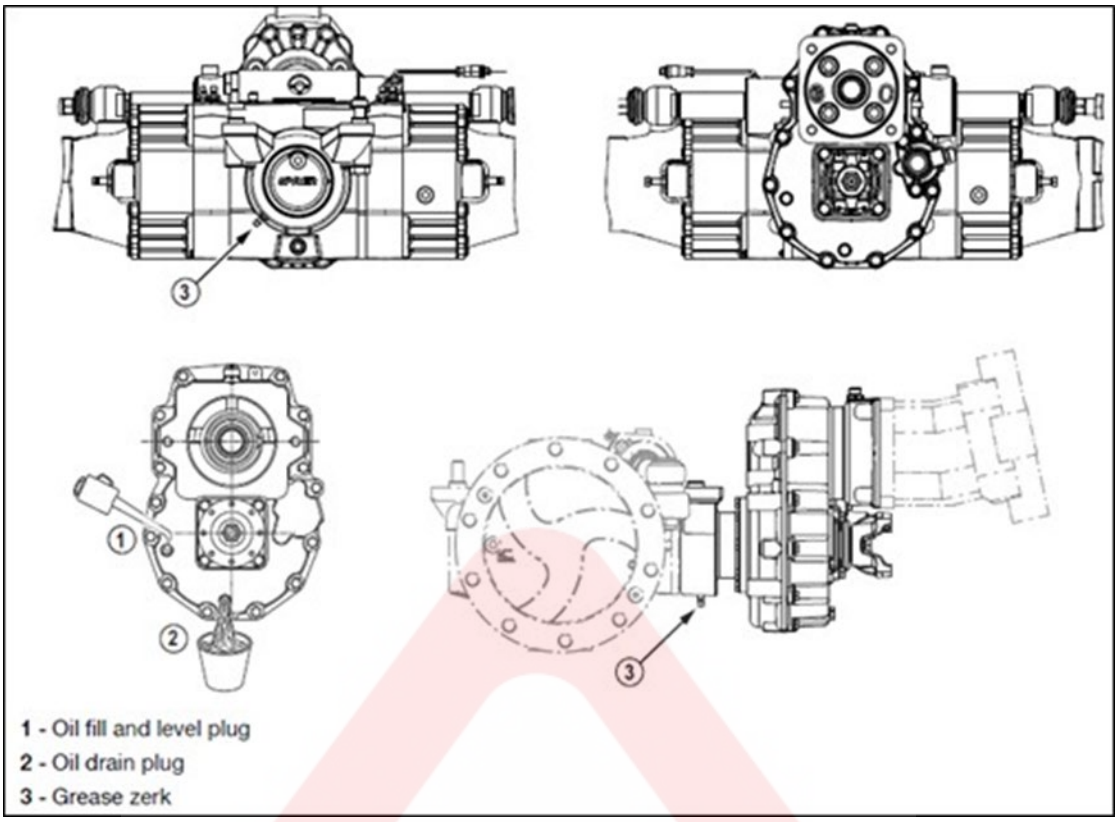


Park the vehicle on level ground, turn off the engine, apply the parking brake, lower the arm and remove the ignition key.

- Position two pans under the front and rear axles by the draining caps.
- Unscrew the draining caps (**1**), (**2**) and (**3**). Position the cap (**3**) at the bottom by turning the planetary reduction gear.
- Unscrew the level gauge cap (**4**) and (**5**).
- Drain out all the oil and screw the draining caps (**1**) and (**2**) back on.
- Turn back the planetary reduction gear so that the plug (**3**) is in the position as shown in the figure. Using a funnel, add the required type of oil until reaching the optimal level.
- Unscrew the filler cap (**6**) and (**7**).
- Using a funnel, add the required type of oil through the filler cap (**6**) and (**7**) until oil trickles from the hole in the level gauges (**4**) and (**5**).

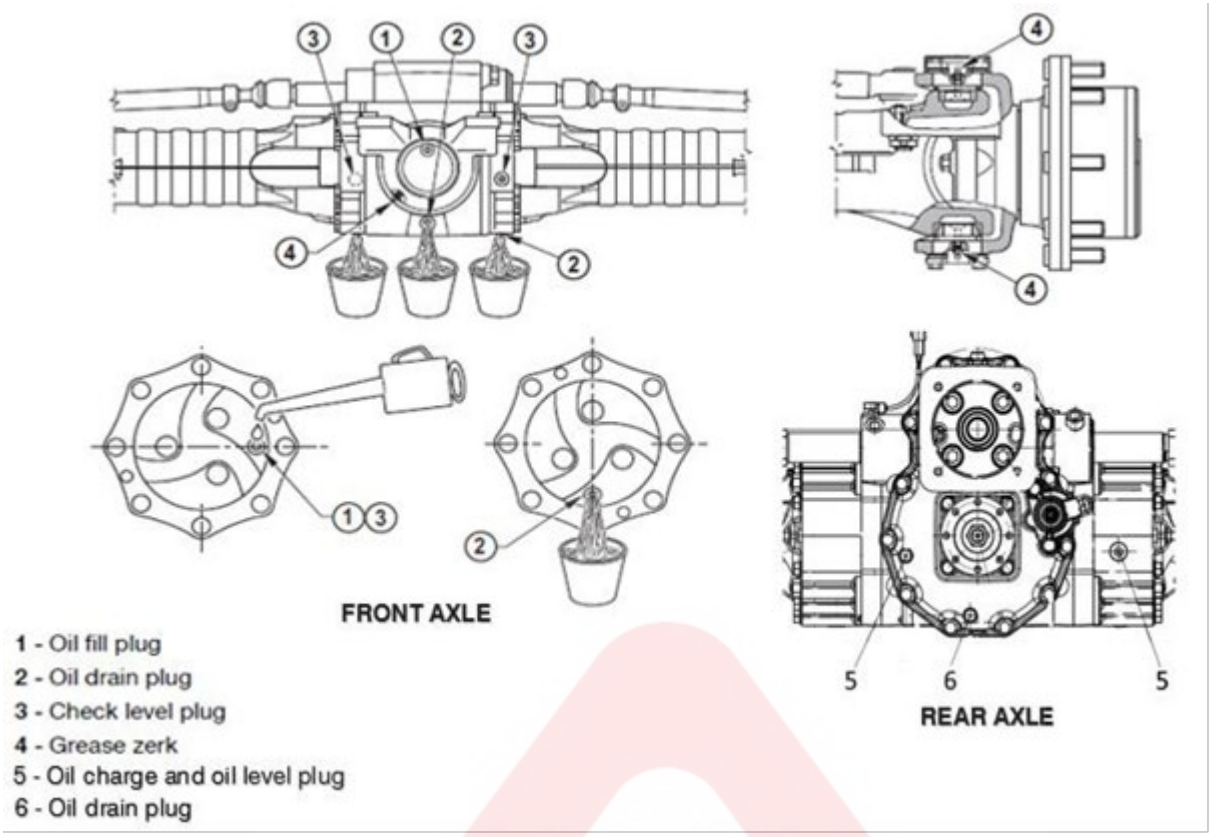
5.12.4. Cleaning The Axle And Differential Bleeders (DANA AXLE)

5.12.5. Checking and Topping Up the Oil Level in the Front and Rear Axles (DANA AXLE)



- Park the vehicle on level ground, turn off the engine, apply the parking brake, lower the arm and remove the ignition key.
- Remove any dirt from the bleeders (1) located on both the axles and the differentials.
- Unscrew the filler cap and the level gauge (1) caps (in horizontal position).
- If oil trickles from the level gauge caps (1) ,it is not necessary to top up; if not, top up using a funnel adding oil through the filler cap and the level gauge cap until reaching the optimal level.
- Screw all the caps back on after topping up

5.12.6. Replacing The Oil in The Front and Rear Axles (DANA)



Oil Draining Mandatory Procedure

Central Housing

Before draining oil it is mandatory to loosen the oil filling plug or the breather (if present), and wait until the internal pressure is completely released. Remove the oil draining plug and drain oil only when the pressure is completely released.

Planetary Gear Reduction

Before draining oil it is mandatory to rotate the planetary gear reduction in order to move the oil plug in filling position, then loosen the oil plug and wait until the internal pressure is completely released. Remove the oil plug and drain oil only when the pressure is completely released.

Warning

•Do not attempt any maintenance if the axle is hot (40-50°C / 104-122°F). Hot oil and components can cause personal injury. Avoid skin contact. Wear protective gloves and glasses.

•Make sure all fluids are contained during inspection, maintenance, tests, adjustment and repair of the product. Prepare a suitable container to collect the fluid before removing any component containing flu ids. Dispose of all fluids following legal and local regulations.

Park the vehicle on level ground, turn off the engine, apply the parking brake, lower the arm and remove the ignition key.

- Position two pans under the front and rear axles by the draining caps.
- Unscrew the draining caps (1), (2) and (6). Position the cap (3) at the bottom by turning the planetary reduction gear.

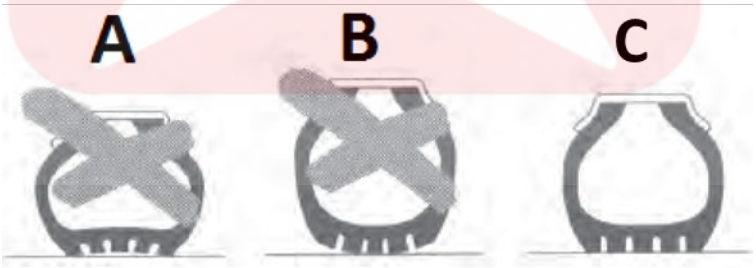
- Unscrew the level gauge cap (3) and (5).
- Drain out all the oil and screw the draining caps (1),(2) and (6) back on.
- Turn back the planetary reduction gear so that the plug (3) is in the position as shown in the figure.
- Unscrew the filler cap (6) and (7).
- Using a funnel, add the required type of oil through the filler cap (1) and (5) until oil trickles from the hole in the level gauges (3) and (5).

5.12.7. Checking And Adjusting The Tyre Pressure

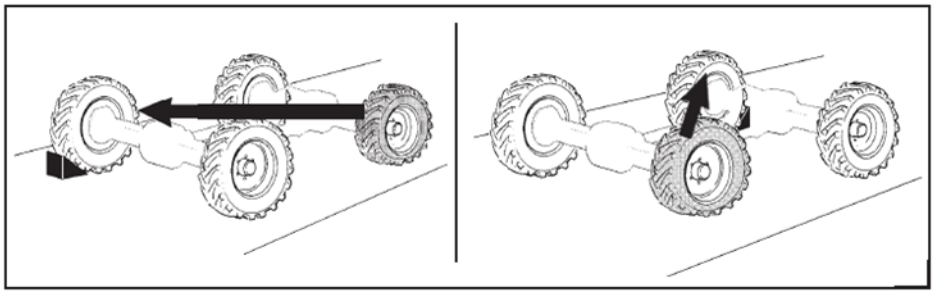
CAUTION: Tyre maintenance and inflation are potentially dangerous operations. If possible, it is advisable to have tyre maintenance and fitting carried out by a SPECIALISED CENTRE or SKILLED PERSONNEL. Before proceeding, always read the safety regulations. Check and tighten the rim bolts before each work shift, alternately going from one bolt to the one diametrically opposite

TYRES	PRESSURE	WHEEL NUT TIGHTENING TORQUE
ARGO 4800-405/70-20, IND-16 PR	5.2 bar	710-720Nm
ARGO 4300-405/70-20, IND-14 PR	5.2 bar	710-720Nm

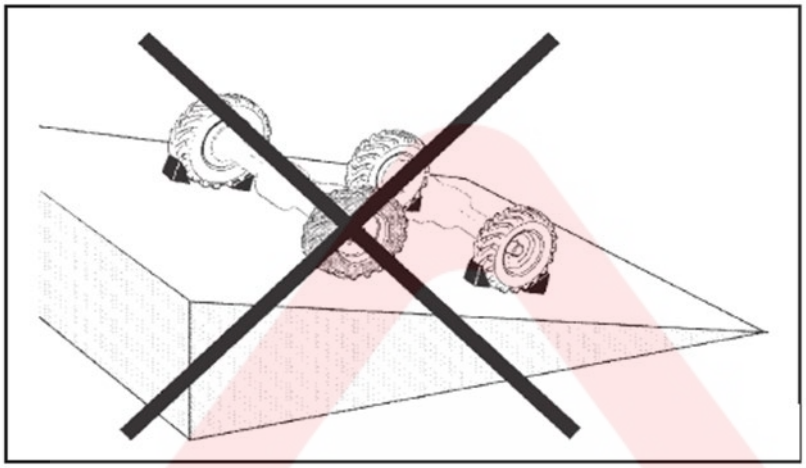
Upon delivery of the vehicle, check the tyre inflation pressure and subsequently check it weekly. Make sure that the tyres are inflated to the pressure specified by the manufacturer. Check the tyre pressure when they are cold. The inflation pressure also determines the weight a tyre can support. Do not over- or under-inflate the tyres. Incorrect tyre inflation causes tyre problems, therefore do not under-inflate **A** or over-inflate **B**. I f a tyre has completely deflated, call in a mechanic who will use an inflation cradle and suitable tools. Before inflating a tyre, check that the wheel is properly fitted. Only use air pumps fitted with a pressure regulator. Make sure that the flexible air hose is properly connected to the tyre valve. **C** is correctly inflated.



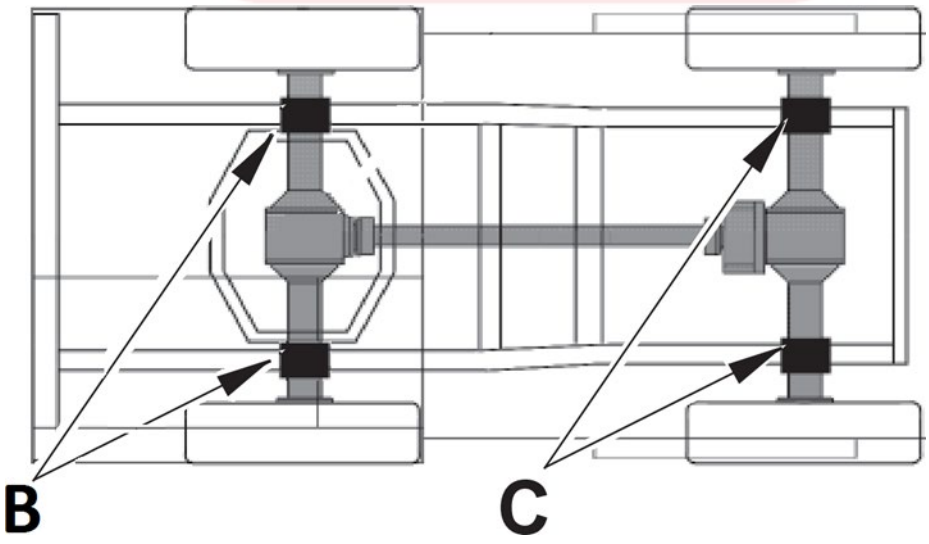
5.12.8. Replacing The Wheels



When you need to change a tyre, first of all engage the parking brake, shift the gear selector lever to neutral, turn off the engine and remove the ignition key. Position a wedge under the wheel diametrically opposite the one to be changed as shown in above figure



DANGER: It is prohibited to change a tyre on a slope or near canals or ditches to prevent the vehicle from overturning and causing serious injury. This operation must be performed on a solid, flat surface.



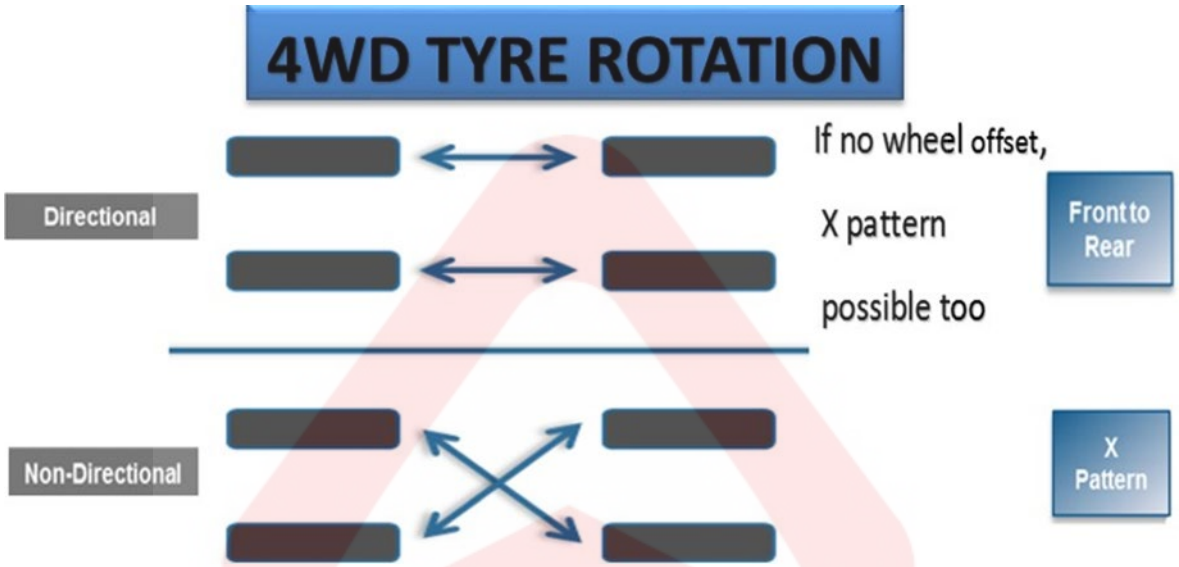
CAUTION: Jack up the vehicle ONLY when the drum is empty and in rest position. Ensure that

there are always 3 wheels resting on level and solid ground.

DANGER: The front axle is oscillating and, during lifting, there is a risk of crushing your limbs between the axle and the chassis. Moreover incorrectly jacking up may cause the vehicle to overturn posing a grave risk to anyone working in the vicinity.

CAUTION: Pay attention to the support area underneath the jack; this area must be capable of supporting the entire weight of the vehicle.
Fit the jack under the screwed on plate B of the front axle. To replace the rear tyres, fit the jack under the screwed-on plate C of the axle shaft or, in the case of a round section axle shaft, fit an adapter (fork) in the jack. Slowly jack up the vehicle until the arch rests on the chassis, then continue jacking up slowly until the deflated tyre lifts off the ground and then proceed with repairing it.

During tyre change or repair, always fit adequate stands or supports capable of supporting the weight of the vehicle under the axles. After fitting the wheel, tighten the nuts diametrically/crosswise.



If you want to invert a wheel, operate as shown in the figure We recommend tyre rotation with minim um 1/3 tread wear (RTD<66%)

5.12.9. Brakes

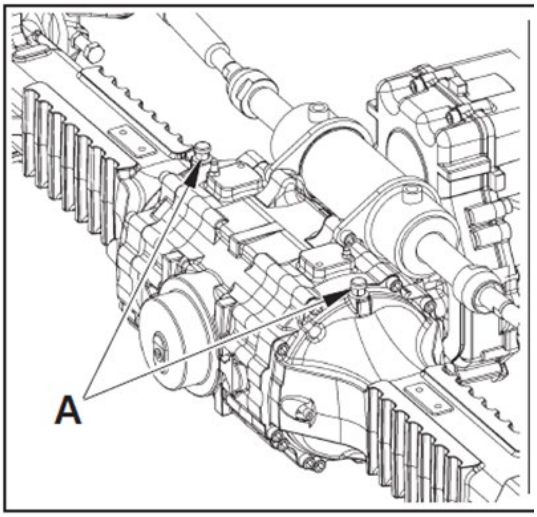
5.12.10. Checking And Topping Up The Brake Fluid Level (COMER AXLE)

CAUTION: It is essential to use only the fluid indicated in the RECOMMENDED LUBRICANTS AND FLUIDS TABLE; using unsuitable fluids will damage the braking system. Regularly check good functioning of all the braking components.

CAUTION: In the event of malfunctioning, immediately contact the nearest AUTHORISED AJAX WORKSHOP.

The brake fluid tank is installed under the revolving driving post. Always check the brake fluid level before you start using the vehicle.

5.12.11. Replacing The Braking System Fluid (COMER AXLE)



CAUTION: Block all the wheels with wedges at the front and rear and always engage the parking brake before operating on the system lines.

CAUTION: Air in the braking system will lead to poor braking performance. Always bleed the air after working on the braking system. If you are not sure that all the air has been bled from the system, have it checked by skilled technicians.

CAUTION: Do not pollute the environment. Keep used oils in special containers and send them to companies specialized in storage and disposal of polluting and hazardous waste.

Testing The Hand Brake

CAUTION: Before proceeding, always read the safety regulations

DANGER: Before testing the efficiency of the parking brake, check that there is no one near the vehicle.

The efficiency of the hand brake helps ensure that the machine will remain still under full load on a gradient of 25%.

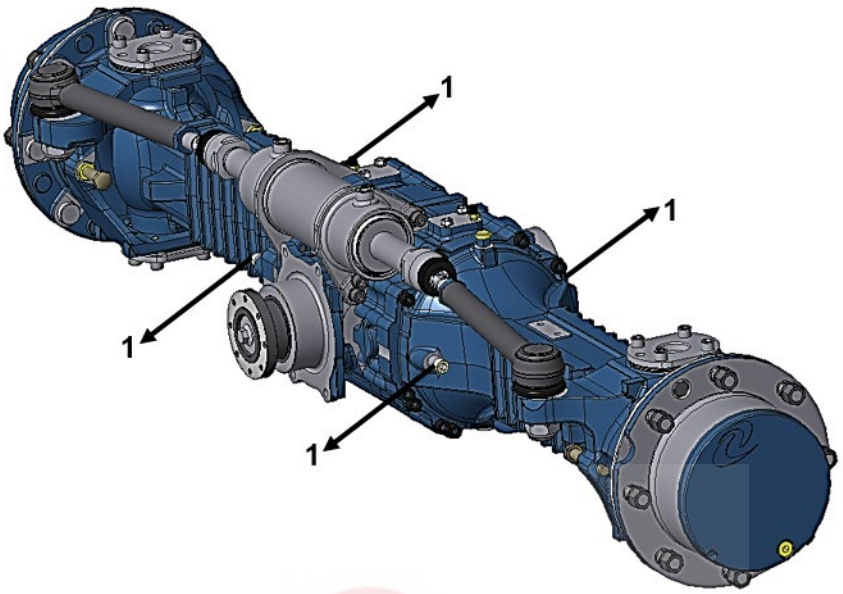
- Ensure that the parking brake button is fully pressed down.
- If you notice that the vehicle moves, contact an AUTHORISED AJAX SERVICE CENTRE.

CAUTION: Do not use the vehicle if the parking brake is not fully efficient.

5.12.12. Checking The Wear Condition Of The Braking System

This type of operation must be carried out by an AUTHORIZED SERVICE CENTRE.

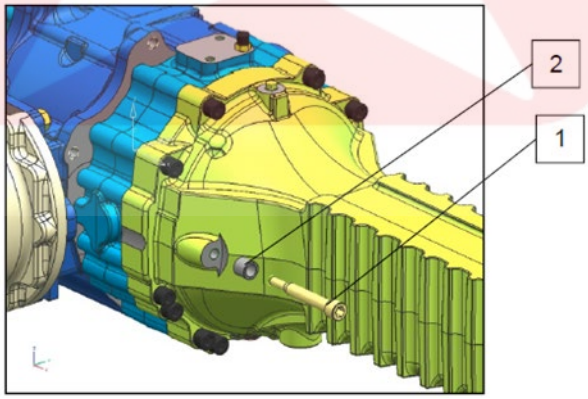
5.12.13. Releasing The Parking Brake (COMER AXLE)



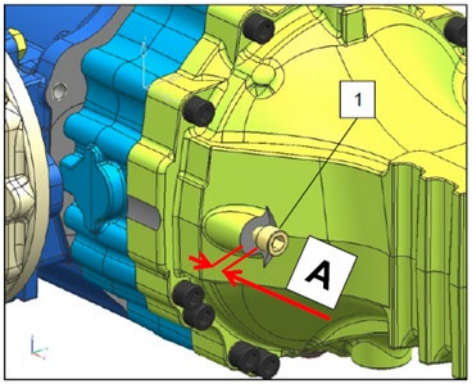
CAUTION: Make sure the vehicle is not moving after releasing brakes (for example, place some wedges under all wheels).

Release process

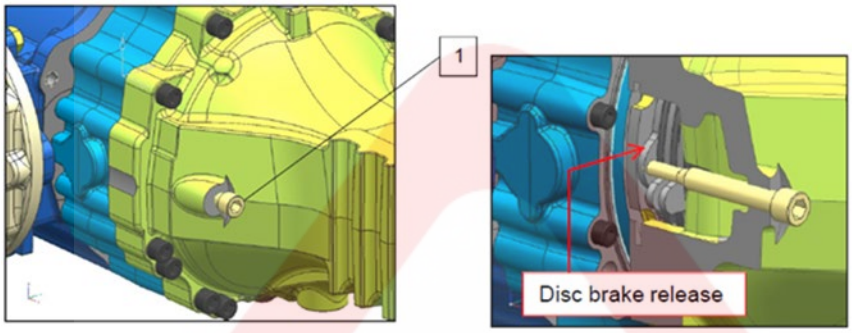
1. Loosen the special screws (1) and remove the spacers (2).



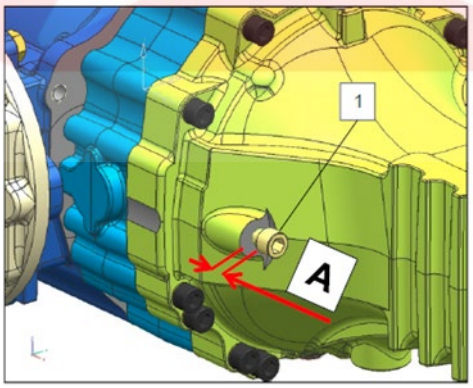
2. Tighten the screws (1) only by hand (without using tools).



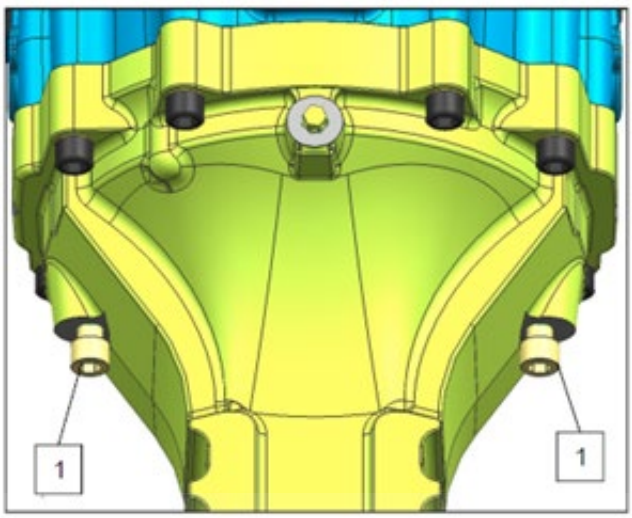
3.) Tighten the screws (1) until it locks only by hand. The tip of the screw abuts on the site of disc brake release



4.) Check the CORRECT POSITION of the screws (1) A = 8 mm (approximate value)



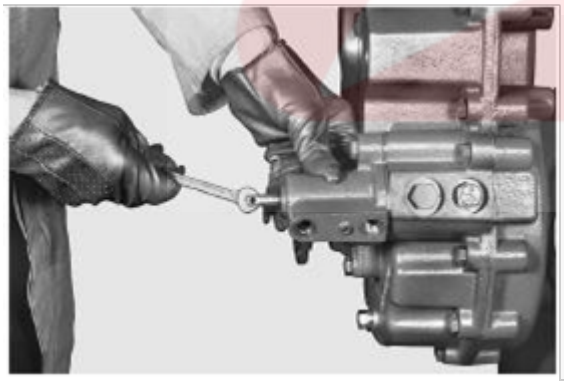
5. Once all special screws (1) are in CORRECT POSITION, perform the following steps (by using a wrench)

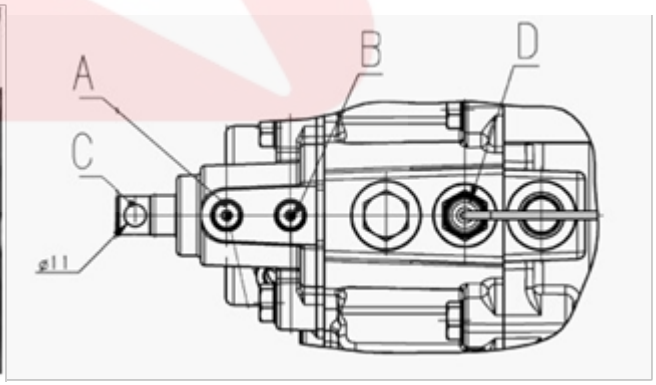


The screws must be tightened alternately rotating at 30° at a time. - You should not completely tighten one of the screw and then the other. - It is not necessary to completely tighten the screws, you must stop when the brake is released (physically check whether the wheels are rolling freely or not. This shall be done by pulling the machine slowly using a tow vehicle). Repeat the operation on both brakes. To resume the brake back to original condition, follow the above procedures in reverse order.

5.12.14. Procedure for releasing & activate parking brake (DANA AXLE)

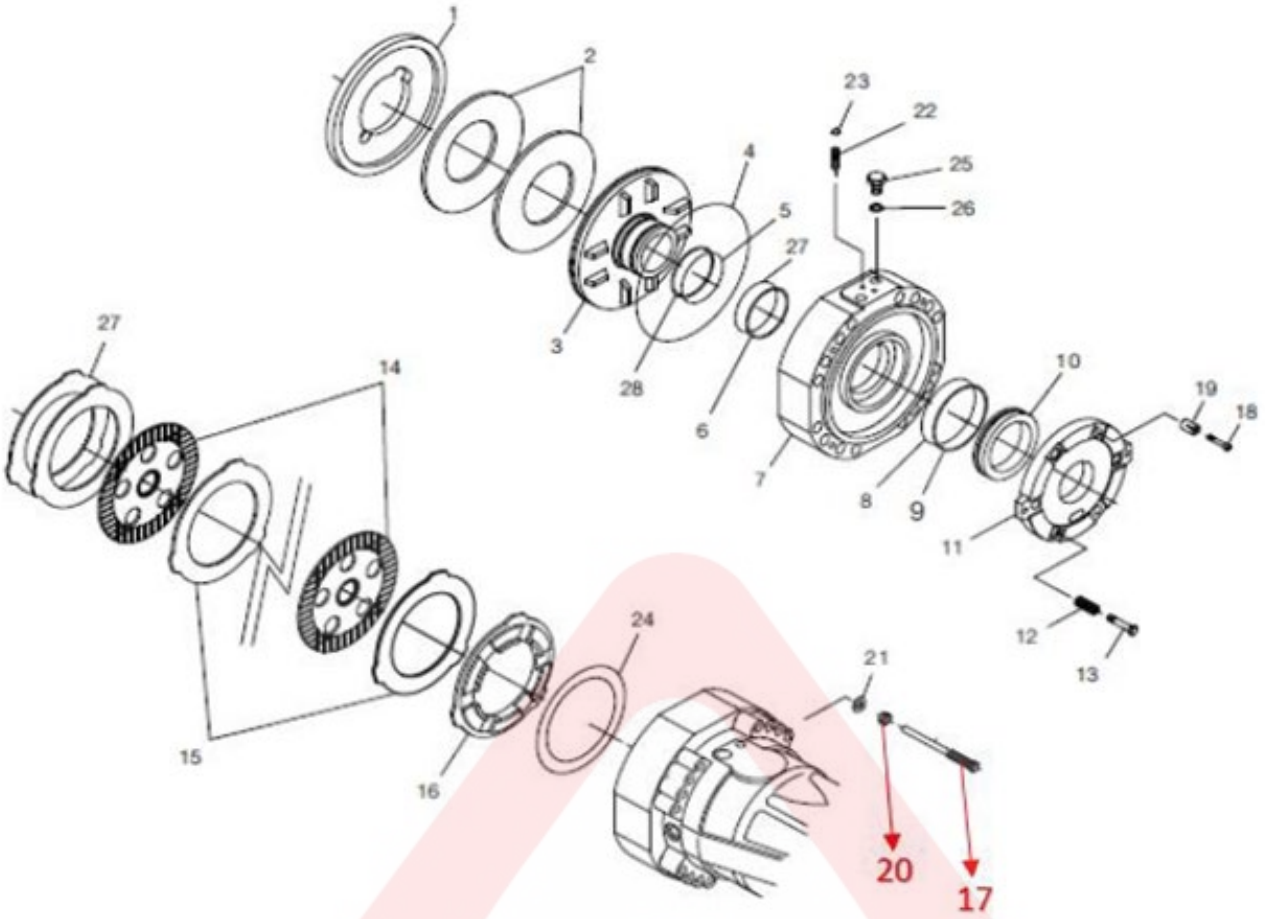
ATTENTION: Parking brake are acting on the rear axle of vehicle. Before performing towing procedure block and secure front wheel with choke blocker on both side, rise the rear axle with suitable capacity jack





HYDRAULIC NEGATIVE BRAKE

EXPLODED VIEW

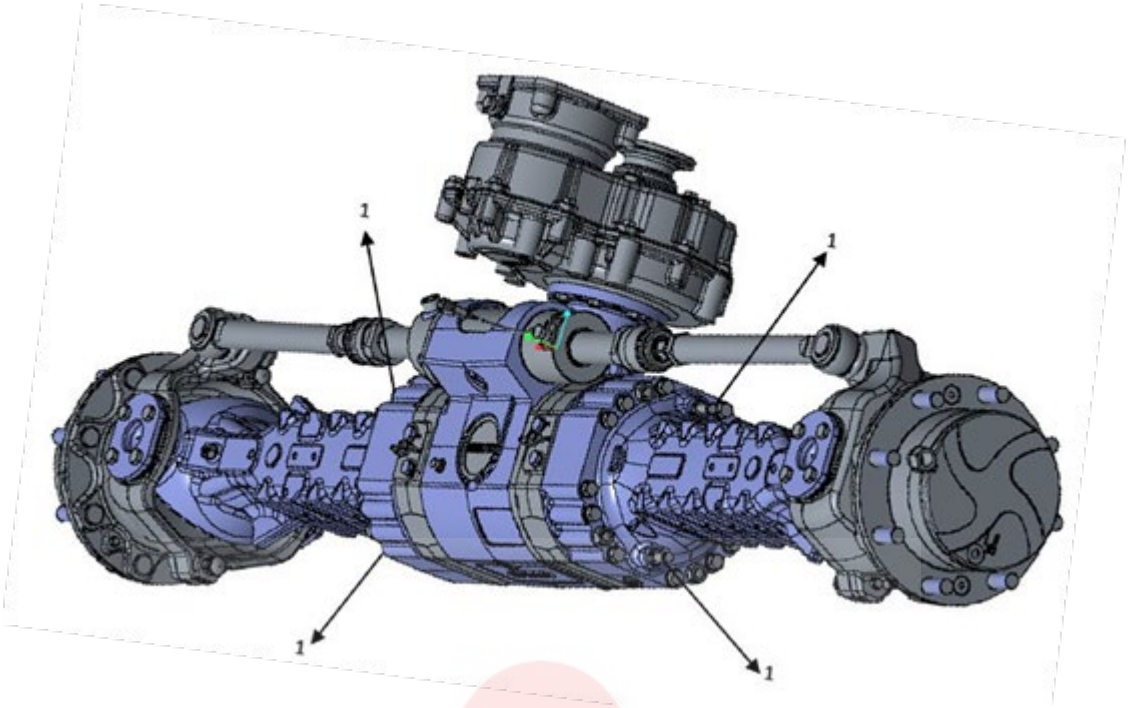


Procedure

- To release the parking brake or Negative brake, please refer above exploded view
- Loose the nut (20) of all side & release from the thread towards bolt head
- Start tight the bolt (17) equally of all side (2 bolts on each side) till bolt stops traveling forward.
- Tight the nut (20) of all side with torque value of 15 to 20Nm
- Machine is ready to tow for further detail 5.13

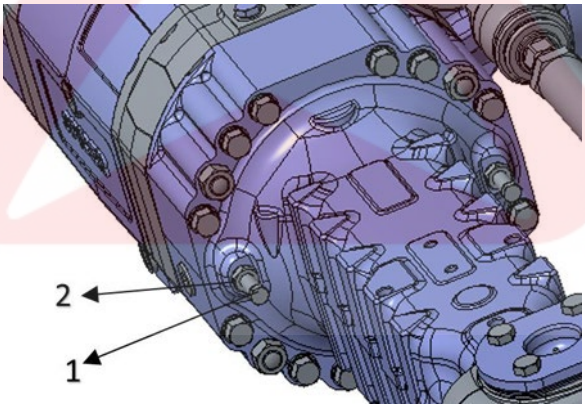
Caution: Before proceeding, always read the safety regulations for the operations to be carried out

5.12.15. Releasing The Parking Brake (DANA AXLE)

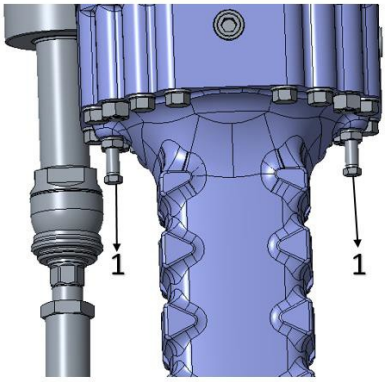


Attention Make sur e the vehicle is not moving after releasing brakes (for example, place some wedges under all wheels).

Release process (DANA AXLE)



1. Loosen the special screws (1) and remove the spacers (2).
2. Tighten the screws (1) only by hand (without using tools).
3. Tighten the screws (1) until it locks only by hand. The tip of the screw abuts on the site of disc brake release
4. Check the CORRECT POSITION of the screws (1)
5. . Once all special screws (1) are in CORRECT POSITION, perform the following steps (by using a wrench)



The screws must be tightened alternately rotating at 30° at a time. - You should not completely tighten one of the screw and then the other. - It is not necessary to completely tighten the screws, you must stop when the brake is released (physically check whether the wheels are rolling freely or not. This shall be done by pulling the machine slowly using a tow vehicle). Repeat the operation on both brakes. To resume the brake back to original condition, follow the above procedures in reverse order.

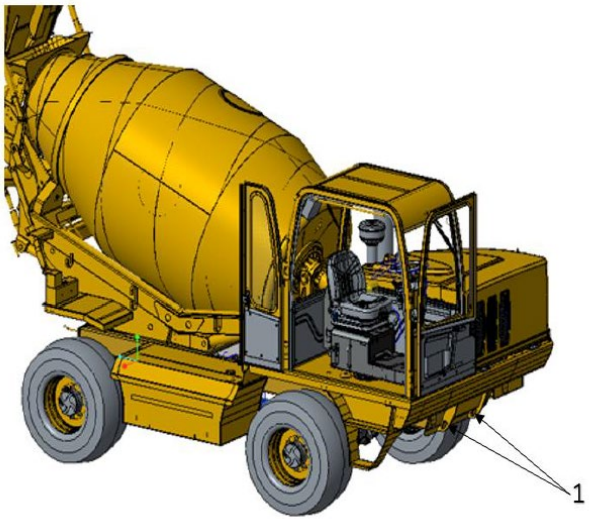
5.13. Towing

Attention: Remember that towing can further damage the vehicle. Tow the vehicle only until reaching a trailer and recovery vehicle. Drive very slowly and for short stretches (<2 km/h) to prevent the hydraulic oil in the closed circuit from overheating.

- Lower the drum and lift the loading arm, lock it with the safety lever.
- Shift the FNR control/lever to neutral Disengage the parking brake (see procedure 5.12.13 &14).
- Connect a suitable tow bar to the front lifting couplings (1).
- Turn on the hazard warning lamp.

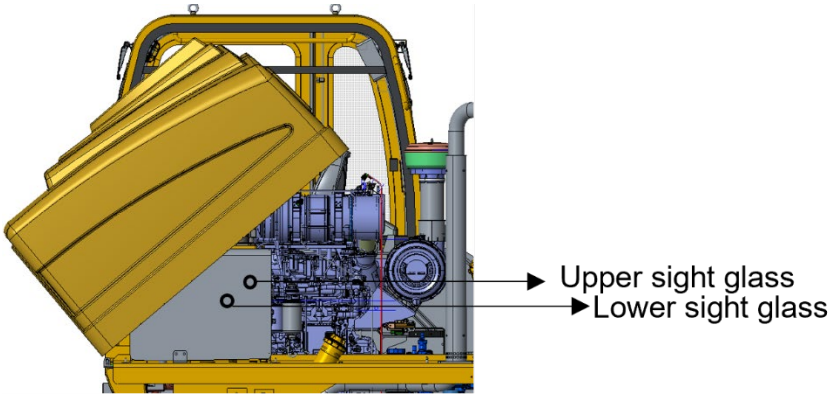
An operator must be on board the vehicle, properly seated in the driver's seat with the seat

- belt fastened and the driving turret facing the preferential direction of travel, with the steering lever on 2 wheel steering mode, in order to control and stop it. If the vehicle has to be steered, make sure you understand the actions of the person driving the towing vehicle. Follow his instructions and comply with all the relative regulations. Bear in mind that the steering wheel is harder to turn if the engine is off.
- Use a vehicle that is capable of towing a weight of more than 20105 kg with full load and 9305 kg when empty.
- When you have finished the towing operations, restore the parking brake



5.14. Hydraulic System

5.14.1. Checking The Hydraulic Oil



CAUTION: Carry out this operation only with the engine off.

- Move the vehicle onto flat ground, engage the parking brake, turn off the engine and remove the ignition key.
- Wait until the oil reaches the ambient temperature.
- Open the engine compartment lid.
- Check the hydraulic oil level with the sight glass provided on the tank. Oil level shall be at the middle of upper sight glass. Top up only when the level goes below the middle of lower sight glass.
- Whenever the oil level goes below critical limit, warning buzzer comes on. Park the vehicle immediately on a stable ground. Functions such as loading arm movement, drum lifting etc. shall not be performed. Check for any leaks in the system & get it attended with a skilled technician
- Never fill the hydraulic tank fully, since the oil expands once the temperature increases
  Change The Hydraulic Oil Filter Cartridge.

CAUTION: Do not pollute the environment. Keep the filters in special containers and send them to companies specialized in storage and disposal of polluting and hazardous waste.

CAUTION: If the filter clogged warning light is illuminated & warning buzzer comes on. The suction filter needs to be replaced.

- Raise the engine compartment lid.
- Remove filter cover.
- Remove the cartridge.
- Manually refit the new cartridge taking care to correctly position the seals.
- Clean and refit the filter cover, taking care to correctly position the seal.
- Check the level in the tank, top up if required. Fill with the specified oil until reaching the indicated level
- It is essential to keep a stock of spare cartridges, which can be ordered from the AUTHORISED AJAX SERVICE CENTRES.

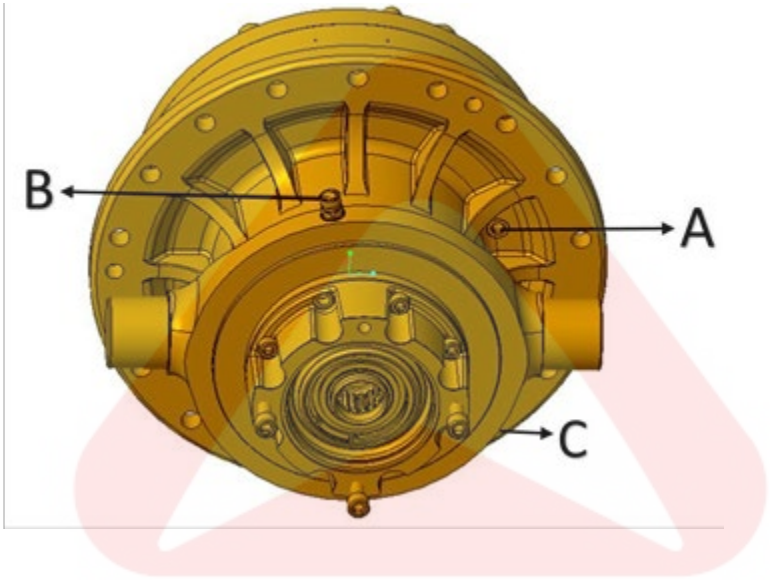
5.14.2. Replacing The Hydraulic Oil

CAUTION: Do not pollute the environment. Keep used oils in special containers and send them to companies specialized in storage and disposal of polluting and hazardous waste.

- Move the vehicle onto flat ground, engage the parking brake, turn off the engine and remove the ignition key.
- Raise the engine compartment lid.
- Unscrew the drain cap and drain all the oil from the tank into a container.

- When the tank is empty, screw the drain cap back in and fill the tank with the recommended oil until reaching the required level, checking with the eye sight provided.
- The engine must be started at idle speed for a few minutes before checking proper operation of the hydraulic functions.

5.14.3. Checking And Topping Up the Drum Reduction Gear Oil Level (Bonfiglioil)



- Move the vehicle onto flat ground
- Raise the drum to horizontal position.
- Turn the drum so that the level gauge/sight glass A of the reduction gear is positioned in the horizontal lateral part.
- Engage the parking brake, turn off the engine and remove the ignition key.
- The optimal level is up to the middle of level gauge/sight glass A.
- If you need to top up, unscrew the cap B and add oil until reaching the optimal level.

Oil Change Of Drum Gear Box

- Follow the above procedure
- Before draining oil it is mandatory to loosen the oil filling plug A or the breather valve B.
- Unscrew the drain plug C and drain out all the oil into a prearranged container and screw the drain plug C back on.
- Add the specified oil through the filler plug A, till the oil level reaches the filler plug A.

5.14.4. Oil Quantity For KOEL ENGINE

Device to be filled	**Qty to be filled**
Engine oil	11.5ℓ
Cooling system	19.6ℓ
Front axle differential housing (DANA AXLE)	6.4 ℓ
Rear axle differential housing (DANA AXLE)	6.4 ℓ
Front axle differential housing (COMER AXLE)	8.5 ℓ
Rear axle differential housing (COMER AXLE)	8.5 ℓ
4 Hubs (DANA AXLE)	0.8 ℓ each
4 Hubs (COMER AXLE)	1 ℓ each
Drum reduction gear box (Bonfiglioli)	3 ± 10% ℓ
Drum reduction gear box (Comer)	3ℓ
Drum Swivel gear box	0.6ℓ
Brake system	1ℓ
Hydraulic tank	110ℓ
Ad blue/DEF tank	16 ℓ

5.14.5. Oil Quantity for MAHINDRA ENGINE

Device to be filled	**Qty to be filled**
Engine oil	13.5 ℓ
Cooling system	18ℓ
Front axle differential housing (DANA AXLE)	6.4ℓ
Rear axle differential housing (DANA AXLE)	6.4ℓ
Front axle differential housing (COMER AXLE)	8.5 ℓ
Rear axle differential housing (COMER AXLE)	8.5 ℓ
Drum reduction gear box (Bonfiglioli)	3 ± 10% ℓ
Drum reduction gear box (Comer)	3ℓ
Drum Swivel gear box	0.6ℓ
4 Hubs (DANA AXLE)	0.8 ℓ each
4 Hubs (COMER AXLE)	1 ℓ each
Brake system	1ℓ
Hydraulic tank	110ℓ
Ad blue/DEF tank	23ℓ

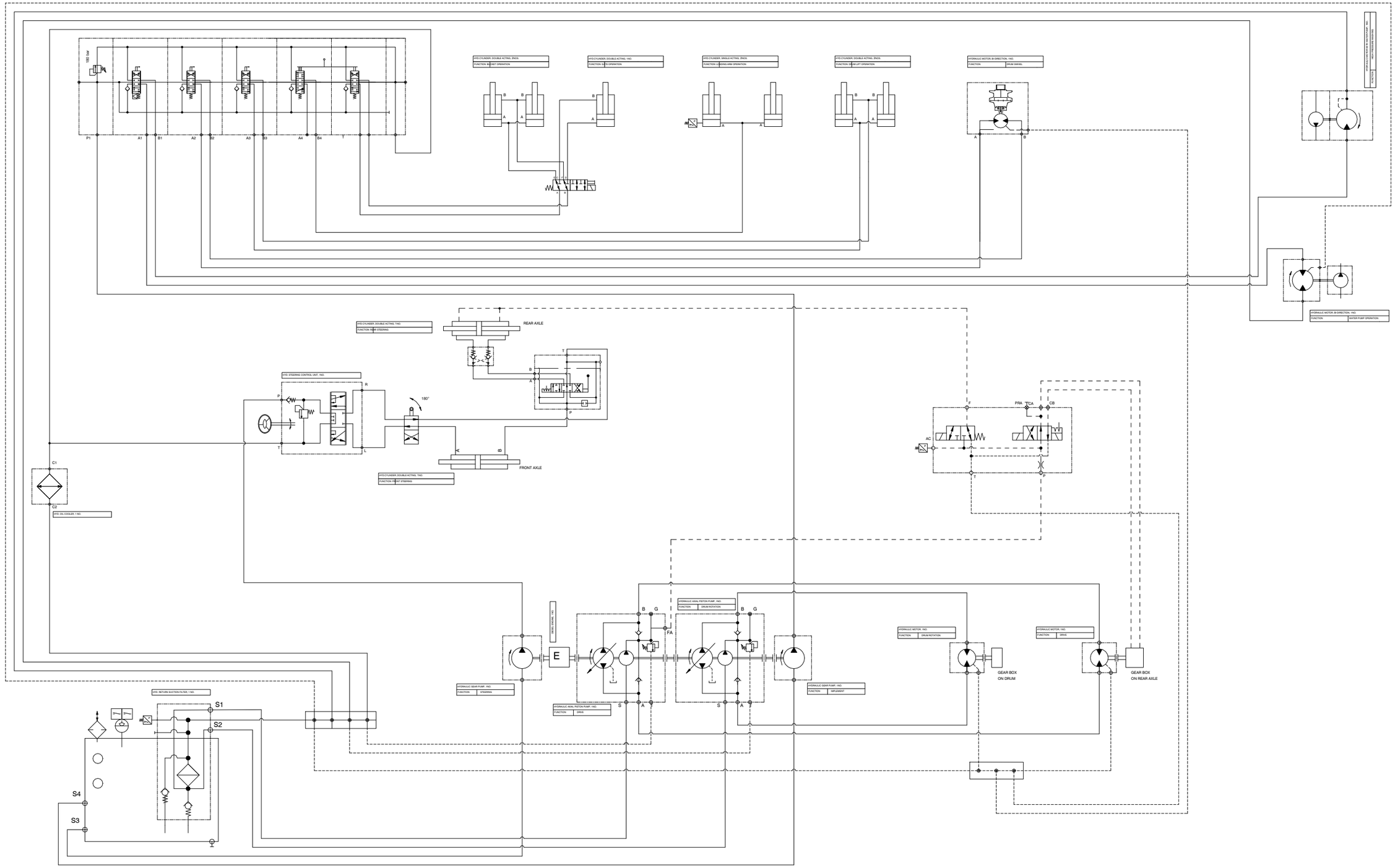
5.14.6. Oil & Lubricant Chart

ARGO 4300/4800 TABLE OF OIL & LUBRICANTS		
Ajax Genuine lubricants are specially designed to provide optimum performance of components, better lubricity and trouble free operation. To get best performance and desired results, maintain oil cleanliness as suggested in the manual by checking, replacing oil, replacing filter elements etc. periodically. Always ask for AJAX Geunine Lubricants and "DO NOT" mix with any other lubricants.		
COMPONENTS	**PART NUMBER**	**DESCRIPTION / SPECS**
ENGINE CRANK CASE SUMP	REFER RESPECTIVE ENGINE MANUAL	
ENGINE COOLANT		
AXLE, GEAR BOX, WHEEL HUB,	200100000296	20 ltrs CAN, Axle Gear Oil - GP
AXLE, GEAR BOX, WHEEL HUB DANA	200100000295 100060044000	5 ltr CAN, Axle Gear Oil – GP 5 ltr CAN.Axle Gear Oil - GPO
SERVICE BRAKE FLUID	200100000300	1 ltr CAN, Ajax Brake Oil - HP
DRUM GEAR BOX OIL	200100000308	20 ltrs CAN, Ajax Gear Oil - XTR
SWIVEL GEAR BOX OIL	200100000307	5 ltr CAN, Ajax Gear Oil - XTR
HYDRAULIC OIL	200100000272	210 ltrs Barrel, Ajax Hydraulic Oil - ULTRA
	200100000270	55 ltrs CAN, Ajax Hydraulic Oil - ULTRA
	200100000269	20 ltrs CAN, Ajax Hydraulic Oil - ULTRA
GREASE	200100000302	20 kg CAN, Ajax Grease - HD
	200100000301	5 kg CAN, Ajax Grease - HD

5.14.7. Standard Bolt Tightening Torque

Bolt Size mm	Pitch mm	Bolt Hex mm	Strength Grade (N·m)				
			4.6	6.8	8.8	10.9	12.9
3	0.5	5.5	0.51	1.01	1.35	1.90	2.27
4	0.7	7	0.95	1.91	2.54	3.57	4.29
5	0.8	8	2.28	4.56	6.09	8.56	10.3
6	1.0	10	3.92	7.85	10.5	14.7	17.7
8	1.25	13	9.48	18.9	25.3	35.5	42.7
10	1.5	17	19.1	38.1	50.9	71.5	86.8
12	1.75	19	32.6	65.1	86.9	122	146
14	2.0	22	51.9	104	139	195	234
16	2.0	24	79.9	160	213	299	359
18	2.5	27	110	220	293	413	495
20	2.5	30	156	312	416	585	702
22	2.5	32	211	422	563	792	950
24	3.0	36	270	539	719	1010	1213
27	3.0	41	398	795	1060	1490	1789
30	3.5	46	540	1080	1440	2025	2430

6 ARGO 4800 Hydraulic Circuit E1 Engine



HYDRAULIC OIL ISO VG 68 HVLP
OIL CLEANLINESS NAS 8 OR BETTER
CONTROL VOLTAGE 12VDC

CONFIGURATION : NORMAL DRUM CONTROL

AJAX ENGINEERING PRIVATE LIMITED

DRAWN	VMBM	DATE	22-06-2021
CHECKED	SBP	DATE	22-06-2021
APPROVED	SBP	DATE	22-06-2021

REV. BELOW TABLE IS VALID ES TO HYDRAULIC SERVICE KEY

ABOVE UPTO & INCL	3.15	6	10	30	120	400	1000	2500
	6	10	30	120	400	1000	2500	4000
FABRICATION	±0.2	±0.3	±0.5	±1.0	±2.5	±4.0	±6.0	±10.0
MACHINING	±0.1	±0.2	±0.3	±0.5	±1.0	±2.5	±4.0	±6.0

NOTE:- Ra VALUE µm — SURFACE FINISH SYMBOL — ANGULAR TOLERANCE

ANGLE	UPTO 100	100 TO 250	250 TO 400	400 TO 630	630 TO 1000	1000 TO 1600	1600 TO 2500	2500 TO 4000
ANGULAR TOLERANCE	±1	±0.5	±0.33	±0.25	±0.2	±0.16	±0.13	±0.1

MATERIAL

SCALE NTS — WT.(Kg) — MODEL ARGO 4800 — QTY 1 — SIZE A1

THICKNESS OF GALVANIZATION PLATE

TITLE: HYDRAULIC SCHEMATIC FOR ARGO 4800 (BSIV - E1)

PART NO. 101040500200

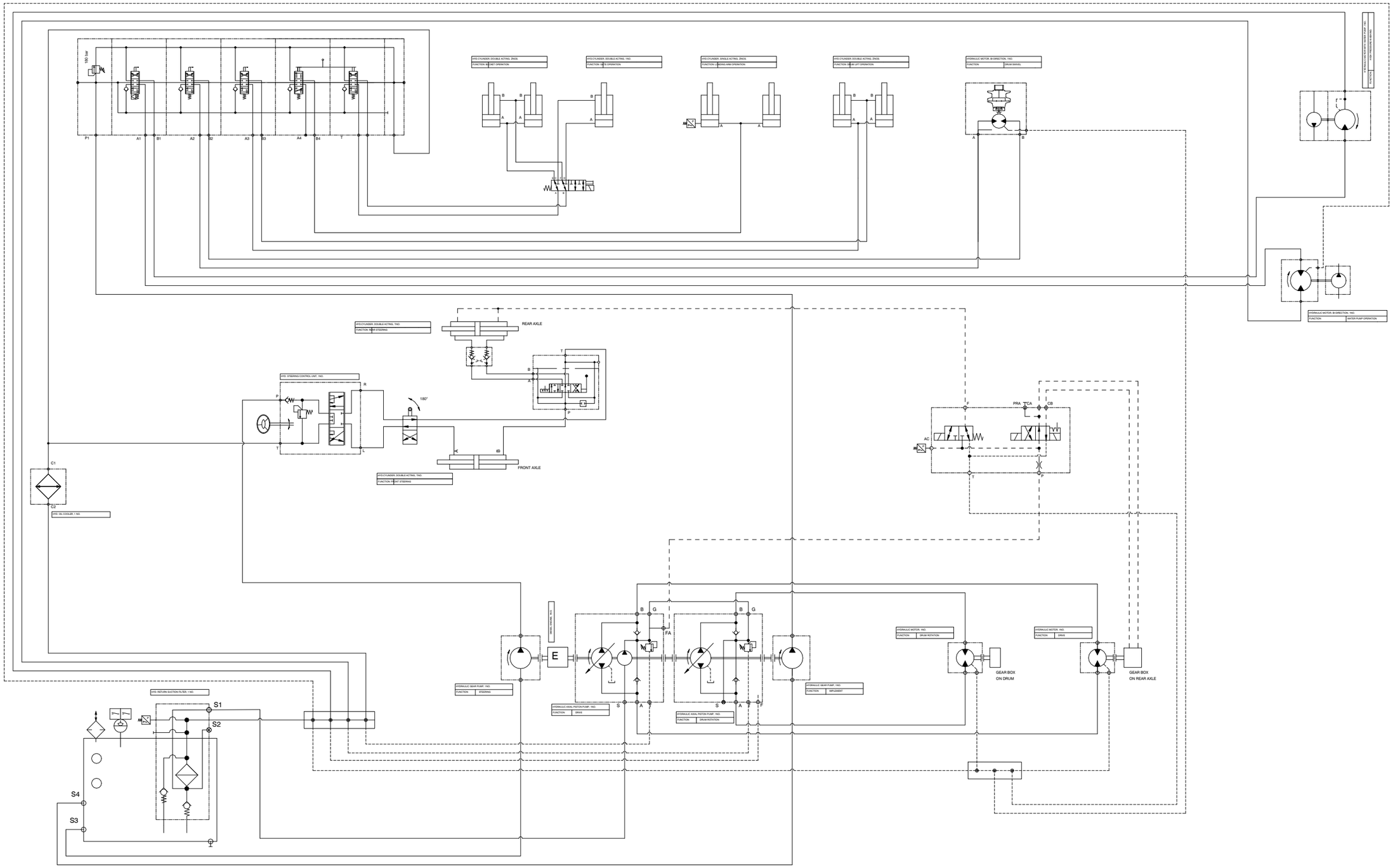
SHEET 1 OF 2 REV A

DATE	REV	ECN no.	DESCRIPTION	NAME

FILE LOCATION:

GENERAL NOTE:
REMOVE SHARP EDGES & BURRS.
DO NOT SCALE THE DRAWING.
ALL DIMENSIONS ARE IN mm.

6 ARGO 4800 Hydraulic Circuit E1Engine



HYDRAULIC OIL ISO VG 68 HVLP
OIL CLEANLINESS NAS 8 OR BETTER
CONTROL VOLTAGE 12VDC

CONFIGURATION : ELECTRO HYDRAULIC DRUM CONTROL

B

AJAX ENGINEERING PRIVATE LIMITED

DRAWN	VMBM	23-06-2021	REMOVE LIFTING & PIN		
CHECKED	SBP	23-06-2021	FABRICATION		
APPROVED	SBP	23-06-2021	WELDING		
			SYMBOL		
NOTE:-			No. OF WELD		
MATERIAL			WORK ARGO 4800		
			A1		
			QTY	1	

UNLESS OTHERWISE SPECIFIED

DIMENSIONS	0.5	6	30	120	400	1000	4000
	5	30	120	400	1000	4000	
	±0.1	±0.5	±0.8	±1.5	±2.5	±4.0	±6.0
	±0.1	±0.1	±0.3	±0.5	±0.8	±1.5	±2.5
	NIL		W				

TOLERANCES OF ANGULAR PLACE	ANGULAR	0.5	2	10	50	120	400	1000	4000
		2	10	50	120	400	1000	4000	
		±0° 30'	±0° 20'	±0° 10'	±0° 05'	±0° 03'	±0° 02'	±0° 01'	±0° 00' 30"
	LINEAR	0.5	3	6	30	120	400	1000	4000
		3	6	30	120	400	1000	4000	
		±0.2	±0.5	±1.0	±1.5	±2.5	±4.0	±6.0	±8.0

A

DATE REVECN no. DESCRIPTION NAME

FILE LOCATION:-

TITLE

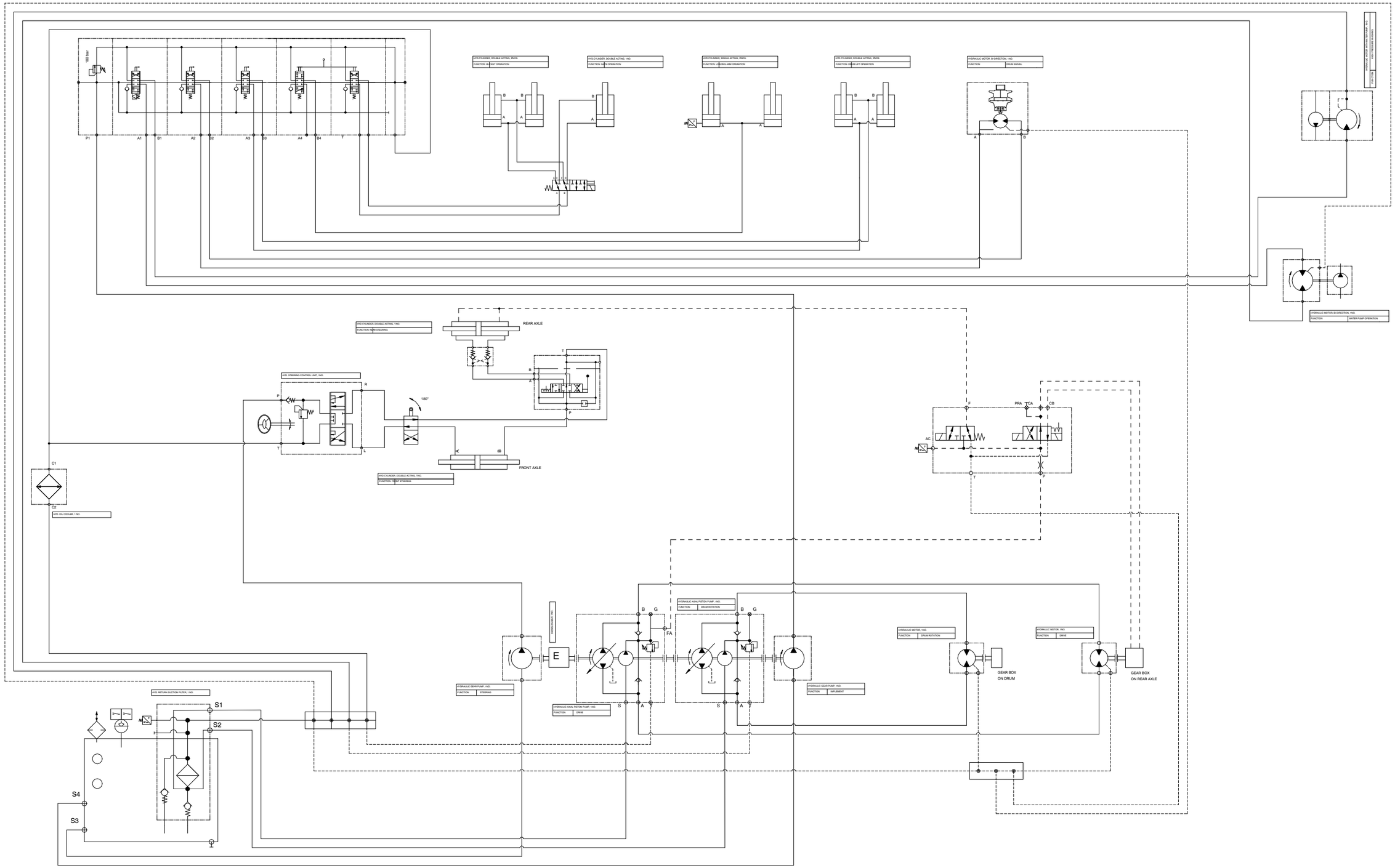
PART NO. 1010405002OO

HYDRAULIC SCHEMATIC FOR ARGO 4800 (BSIV - E1)

SHEET 2OF 2 A REV

GENERAL NOTE:
REMOVE SHARP EDGES & BURRS.
ALL DIMENSIONS ARE IN mm.
ALL DIMENSIONS ARE IN mm.

6 ARGO 4800 Hydraulic Circuit E2 Engine



HYDRAULIC OIL ISO VG 68 HVLP
OIL CLEANLINESS NAS 8 OR BETTER
CONTROL VOLTAGE 12VDC

CONFIGURATION : NORMAL DRUM CONTROL

B

AJAX ENGINEERING PRIVATE LIMITED

DRAWN	VMBM	DATE 21-OCT-2021	
CHECKED	SSP	21-OCT-2021	
APPROVED	SSP	DATE 23-OCT-2021	

REV. BELOW TABLES UNLESS OTHERWISE SPECIFIED

ABOVE UPTO & INC	0.5	3	6	30	120	400	1000	2000
	3	6	30	120	400	1000	2000	4000
FABRICATION	±0.2	±0.3	±0.5	±1.0	±2.5	±5.0	±10	±15
MACHINING	±0.1	±0.1	±0.2	±0.3	±0.5	±1.0	±2.5	±5.0
CASTING		MM						

NOTE:-

Rm VALUE µm: 3.2 | 6.3 | 12.5 | 25 | 50 | 100

Rm	3.2	6.3	12.5	25	50	100
Ra	0.8	1.6	3.2	6.3	12.5	25

SCALE	NTS	SHEET SIZE	A1
WT/Kg		QTY	

MATERIAL

DATE	REVISION no.	DESCRIPTION	NAME

FILE LOCATION:-

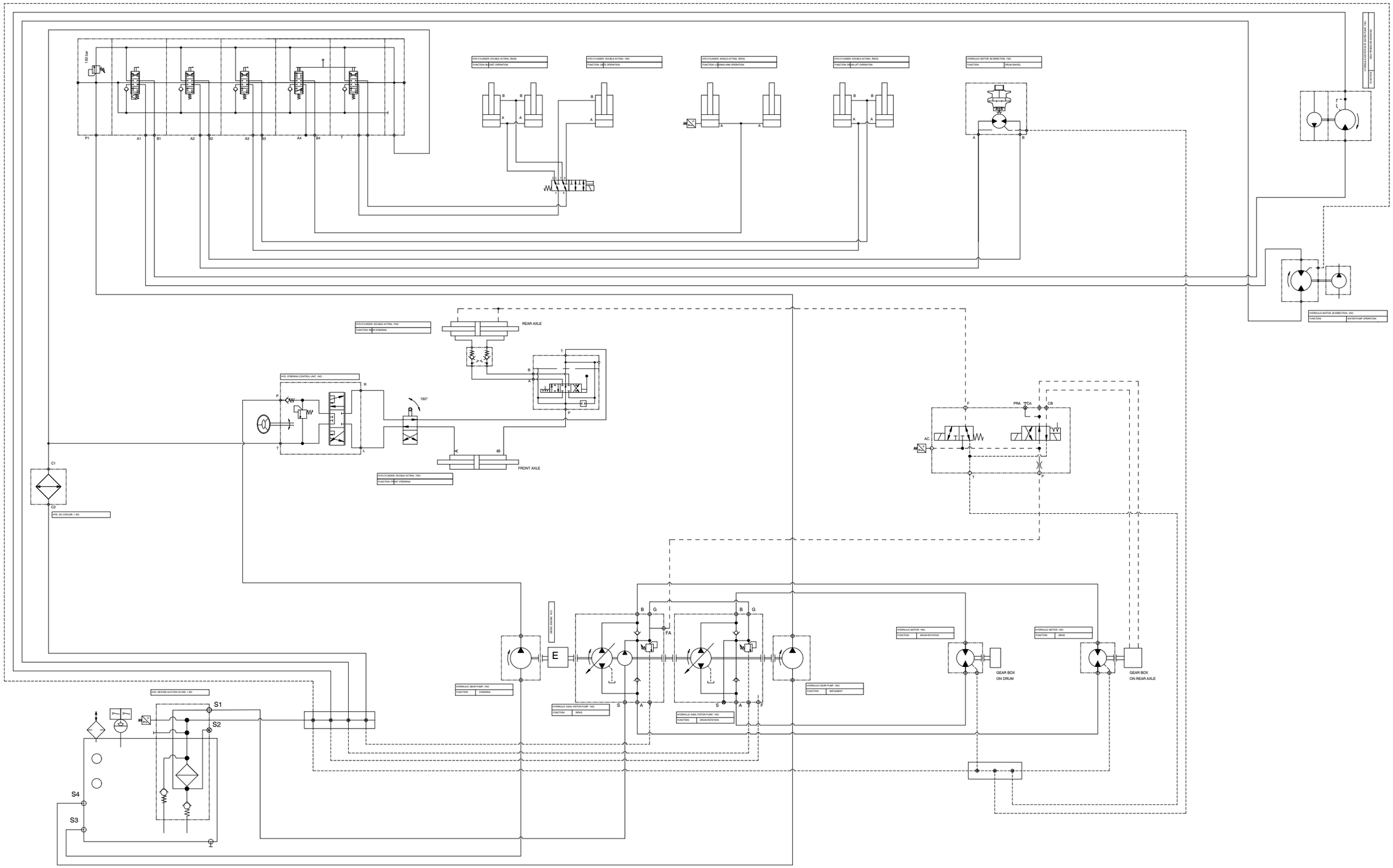
GENERAL NOTE:-
REMOVE SHARP EDGES & BURRS
ALL WELDING AS PER AWS D1.1
ALL DIMENSIONS ARE IN mm

TITLE: HYDRAULIC SCHEMATIC FOR ARGO 4800 (BSIV - E2)

PART NO. 101040520200

SHEET 1 OF 2 REV A

6 ARGO 4800 Hydraulic Circuit E2 Engine



HYDRAULIC OIL ISO VG 68 HVLP
OIL CLEANLINESS NAS 8 OR BETTER
CONTROL VOLTAGE 12VDC

CONFIGURATION : ELECTRO HYDRAULIC DRUM CONTROL

AJAX ENGINEERING PRIVATE LIMITED

DRAWN	VMBM	DATE 23-06-2021		
CHECKED	SBP	DATE 23-06-2021		
APPROVED	SBP	DATE 23-06-2021		
NOTE:-				
MATERIAL		MODEL ARGO 4800	SCALE NTS	
		A1	WT.(Kg) -	QTY -

REF. BELOW TABLES UNLESS OTHERWISE SPECIFIED								
ABOVE UPTO & INC.	0.5 3	3 6	6 30	30 120	120 400	400 1000	1000 2000	2000 4000
FABRICATION		±0.2	±0.5	±0.8	±1.2	±2.0	±3.0	±4.0
MACHINING	±0.1	±0.1	±0.2	±0.3	±0.5	±0.8	±1.2	±2.0
Ra VALUE µm	0.025 0.05 0.1		0.2 0.4 0.8		1.6 3.2 6.3		12.5 25	50

UNLESS OTHERWISE SHOWN COTINOUS WELD
a = 0.7 x t
t = THICKNESS OF SMALLEST PLATE

ABOVE UPTO	0 10	10 50	50 120	120 400	Over 400	
ANGLE	±0.1°	±0.30'	±0.20'	±0.10'	±0.50'	
ABOVE UPTO	0 10	10 30	30 100	100 300	300 1000	1000 3000
STRAIGHTNESS & FLATNESS	0.05	0.1	0.2	0.4	0.6	0.8
ABOVE UPTO	0 100	100 300	300 1000	1000 3000		
PERPENDICULARITY	0.4	0.6	0.8	1.0		

DATE	REV	ECN no.	DESCRIPTION	NAME

FILE LOCATION:-

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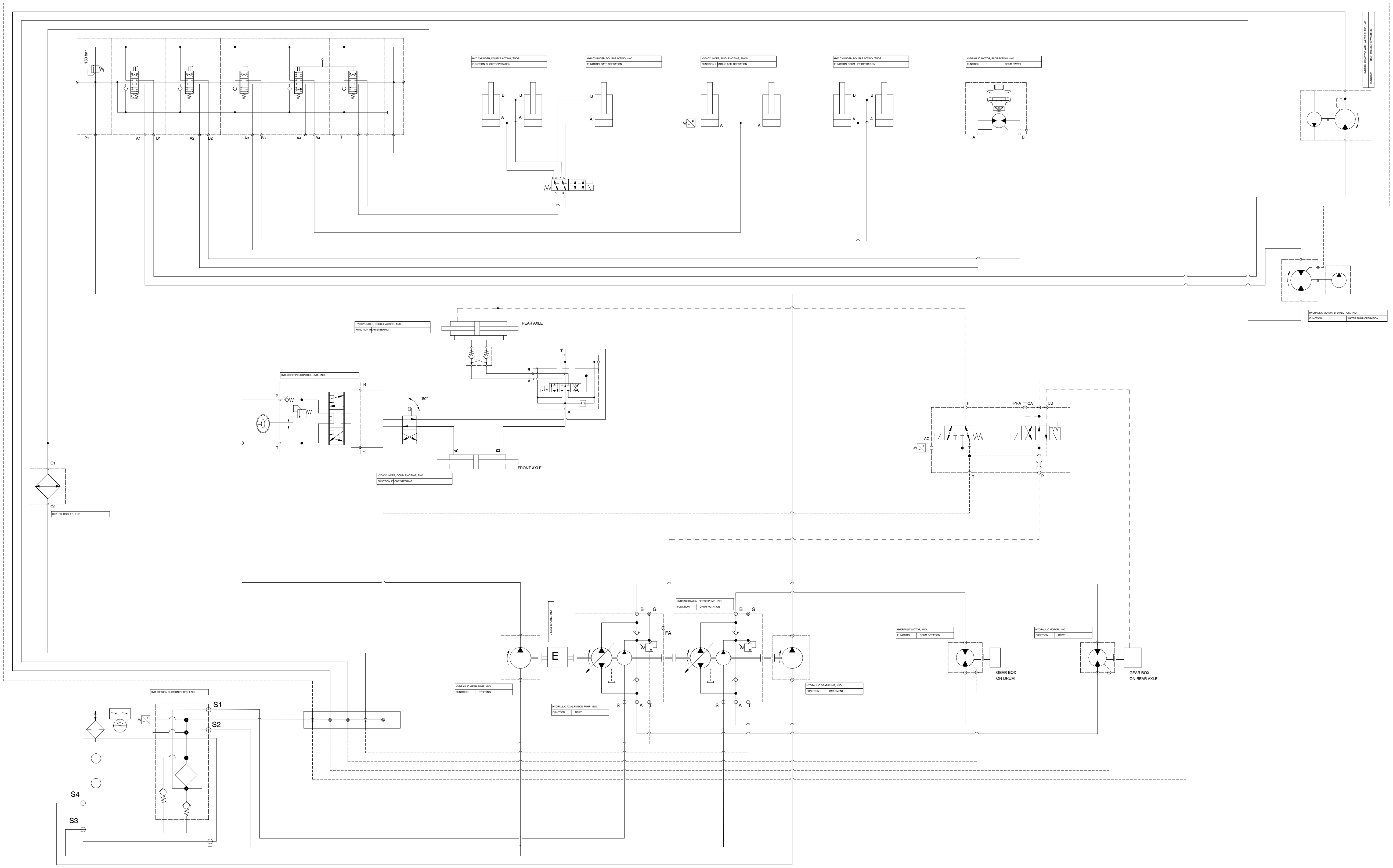
TITLE
HYDRAULIC SCHEMATIC FOR
ARGO 4800 (BSIV - E2)

PART NO.
101040520200
SHEET 2 OF 2 REV A

6 ARGO 4300 Hydraulic Circuit E1Engine



HYDRAULIC OIL ISO VG 68 HVLP
OIL CLEANLINESS NAS 8 OR BETTER
CONTROL VOLTAGE 12VDC

AJAX ENGINEERING PRIVATE LIMITED

DRAWN VMBM DATE 23-06-2021
CHECKED SBP DATE 23-06-2021
APPROVED SBP DATE 23-06-2021

SCALE NTS | MODEL ARGO 4300 | A1

TITLE: HYDRAULIC SCHEMATIC FOR ARGO 4300 (BSIV - E1-CH)

PART NO. 101040500450 | SHEET 1 OF 1 | REV A

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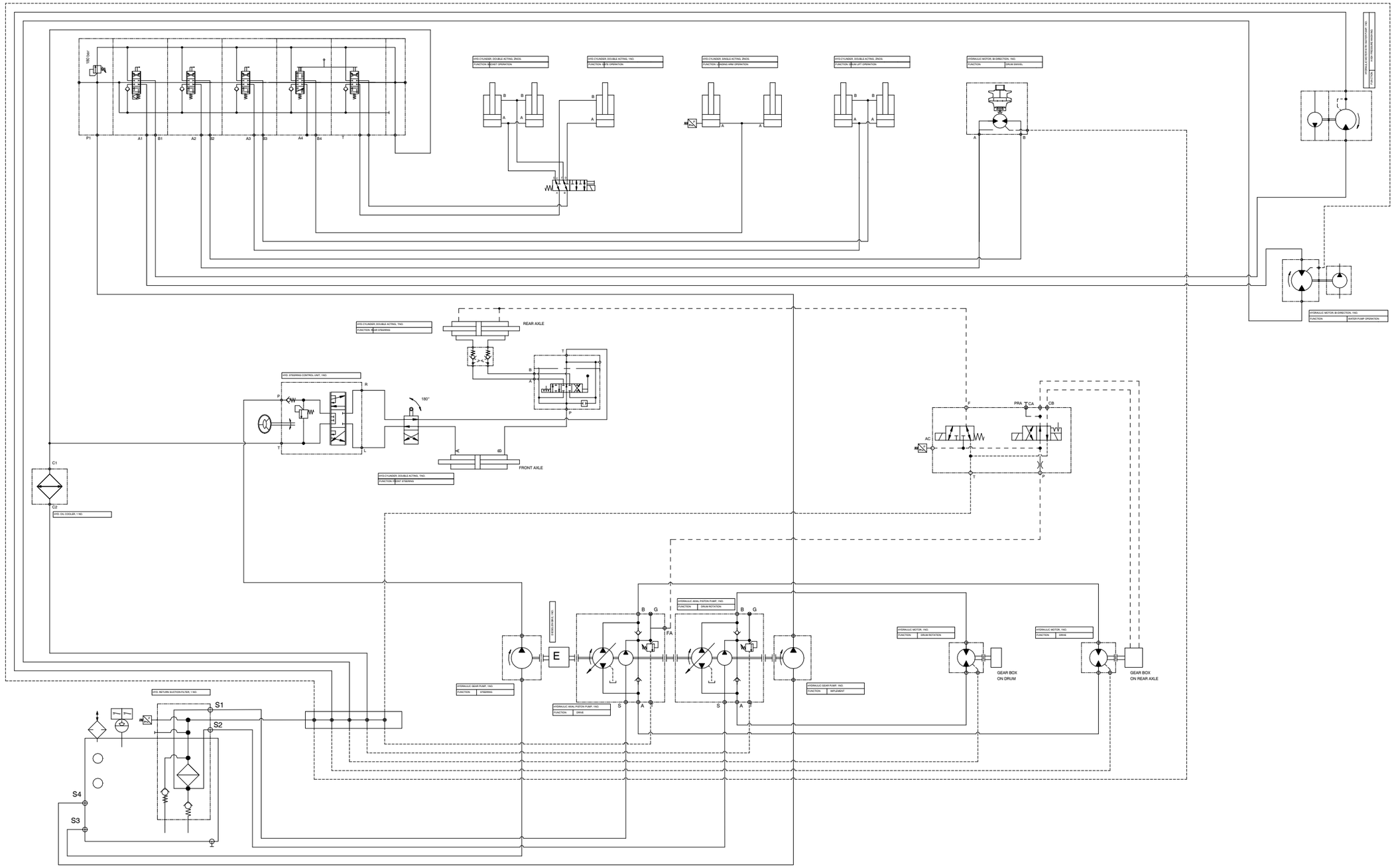
6 ARGO 4300 Hydraulic Circuit E2 Engine



HYDRAULIC OIL ISO VG 68 HVLP
OIL CLEANLINESS NAS 8 OR BETTER
CONTROL VOLTAGE 12VDC

DATE	REVISION no.	DESCRIPTION	NAME

FILE LOCATION:-

GENERAL NOTE:
REMOVE SHARP EDGES & BURRS.
ALL DIMENSIONS ARE IN mm.
ALL TOLERANCES ARE IN mm.

AJAX ENGINEERING PRIVATE LIMITED

DRAWN	DATE: 23-06-2021	REF. BELOW TABLES UNLESS OTHERWISE SPECIFIED
CHECKED	SBP 23-06-2021	ABOVE UPTO & INC.
APPROVED	SBP 23-06-2021	

NOTE:-

		0.5	3	6	30	120	400	1000	2000	
		3	6	30	120	400	1000	2000	4000	
MACHINING SYMBOL		±0.1	±0.1	±0.2	±0.3	±0.5	±0.8	±1.2	±2.0	
		MM				M		L		

Angular tolerance		±1°	±30'	±20'	±10'	±5'	±3'	±2'	±1'	
Form tolerance		0.2	0.5	1	2	3	5	8	12	
Position tolerance		0.1	0.2	0.4	0.8	1.2	2	3	5	
Runout tolerance		0.1	0.2	0.4	0.8	1.2	2	3	5	
Concentricity		0.1	0.2	0.4	0.8	1.2	2	3	5	

MATERIAL	SCALE	NTS
	WEIGHT	167.0kg
	SHEET SIZE	ARGO 4300 A1
	QTY	1

TITLE: HYDRAULIC SCHEMATIC FOR ARGO 4300 (BSIV - E2-CH)

PART NO. 1010400500480

SHEET 1 OF 1 REV. A

6 Electrical circuits

ELECTRICAL SCHEMATIC ARGO BSIV SERIES

SECTION	DESCRIPTION	FUNCTION	PAGE NUMBERS
A	INDEX	INDEX	1
B	ENGINE	BATTERY, Starter Motor, Alternator, Ignition Key FOR E1	2
		BATTERY, Starter Motor, Alternator, Ignition Key FOR E2	2A
		ECU Pin details (Interfacing Harness main 47 pin for 110HP, 94 pin for 74HP	3
C	INDICATIONS & GAUGES	Instrument Cluster Indications & CAN Parameters	4
		Lube oil, water Temp Ind, Fuel float , Hyd.filter chocked & filter	5
D	CABIN COMPONENETS	Mobile charger, cabin light,fan, Front & Rear wiper	6
E	LIGHTING SYSTEM	Work light, turn light & indication, hazard	7
		Head light, Front & Rear Parking light, Name plate lamp, High/low Beam, Break Pressure switch, LH/RH Stop light	8
F	CONTROL & DRUM SYSTEM	Vehicle forward/reverse, horn, RH&LH reverse lamp, reverse horn, Gear1 Ind , Gear2 Ind, Parking brake Sol, Parking brake applied Indication	9A
		Vehicle high/low, Bucket Open/Close	9B
		Drum Fwd/Rev, parking brake fail Ind, Cabin work light (Bulb 55watt), Gear1 Sol, Gear2 Sol, Pre heating option	9C
G	ECU & OPTIONAL INTERFACINGS	XC25(K-type interfacing), IGN Switch & ECU Power Connector details	10A
		Water operation, WTR Latch relay, HPJ, WTR flow sensor, HPJ SOL	10B
		EH Water Pump	10C
		ADTV operation, ADTV latch relay, ADTV motor, ADTV & Water Weight batch system	10D
		AC, camera, Telematics	10E
H	WEIGHING SYSTEM	Pressure Transducer (PT)	11A
		Load cell (LC)	11B & 11C

SECTION	TITLE	DESCRIPTION	PAGE NUMBERS
I	ANNEXURE-1	Relay & Fuse board details	12A
		Note, component details	12B
		Telematics, Accelerator Pedal Sensor, CAN Diagnostics, Fuse box Details	12C
		Relay Board Connector Details	12D
		Relay Board Connector Image	12E
J	ANNEXURE-2	BSIV Emission Connector Details	13A
		ECU pin Details with reference and functionality	13B
K	ANNEXURE-3	Electrical Safety Precaution	14

DATE	REV	ECN	DESCRIPTION	BY	APVD.

GENERAL NOTE:-
DO NOT SCALE THE DRAWING.
ALL DIMESIONS ARE IN mm.

SIZE: A3

MODEL : -

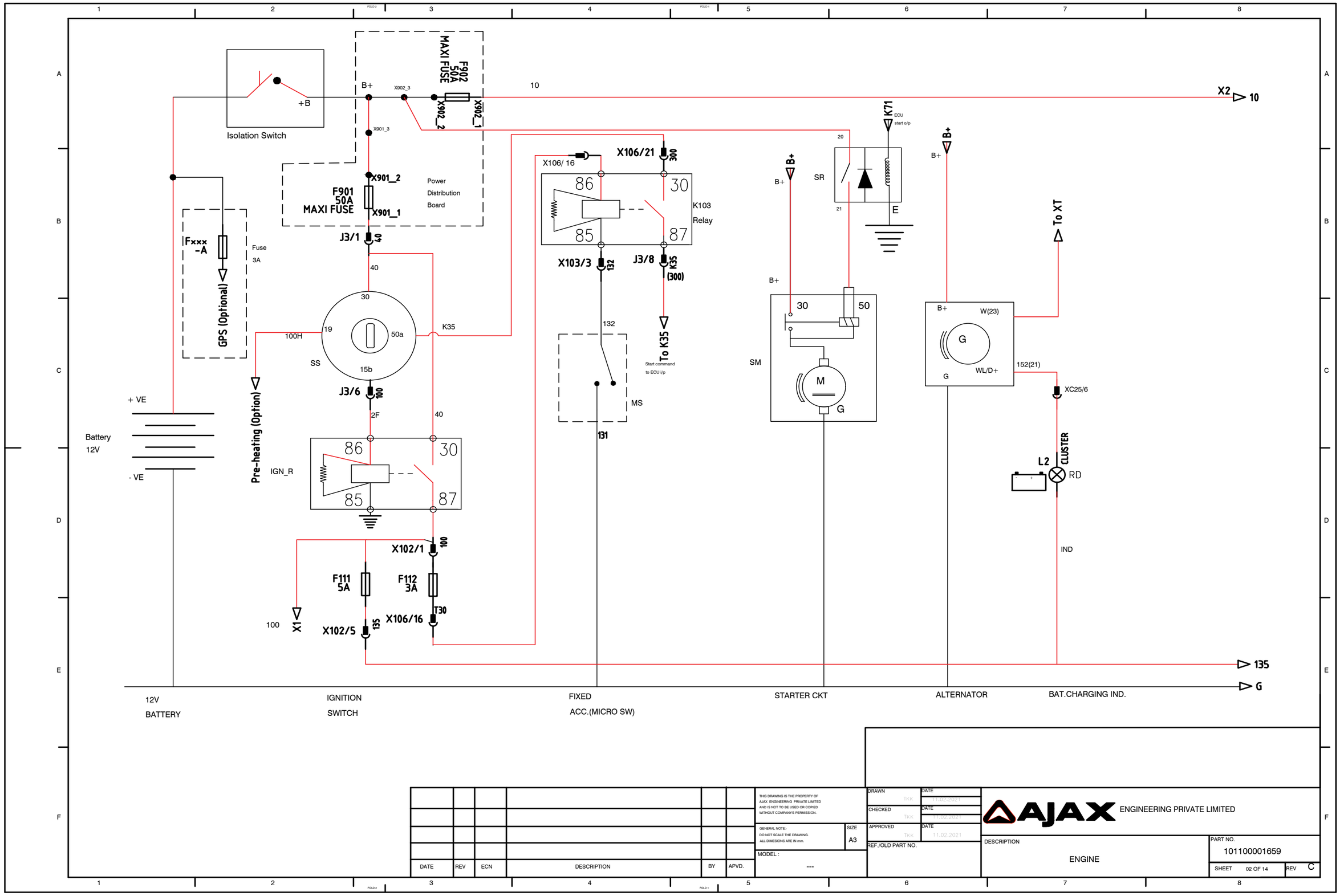
DRAWN: TKK DATE: 11.02.2021
CHECKED: TKK DATE: 11.02.2021
APPROVED: TKK DATE: 11.02.2021
REF./OLD PART NO.

AJAX ENGINEERING PRIVATE LIMITED

DESCRIPTION: INDEX

PART NO. 101100001659

SHEET 01 OF 14 REV C



DATE	REV	ECN	DESCRIPTION	BY	APVD.

GENERAL NOTE:-
DO NOT SCALE THE DRAWING.
ALL DIMESIONS ARE IN mm.

SIZE: A3

MODEL : ---

DRAWN	TKK	DATE 11.02.2021
CHECKED	TKK	DATE 11.02.2021
APPROVED	TKK	DATE 11.02.2021

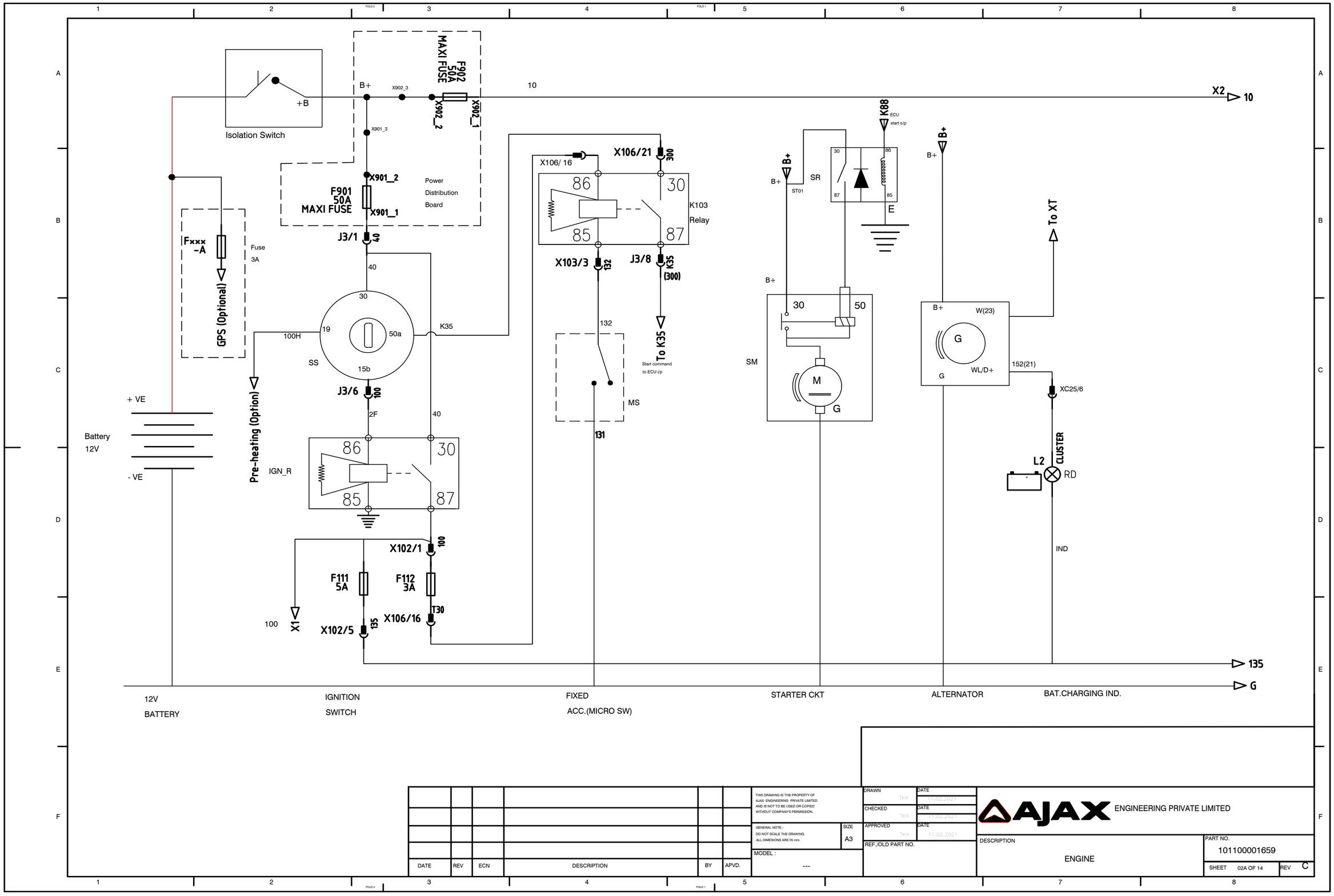
REF./OLD PART NO.

AJAX ENGINEERING PRIVATE LIMITED

DESCRIPTION: ENGINE

PART NO. 101100001659

SHEET 02 OF 14 REV C



DATE	REV	ECN	DESCRIPTION	BY	APVD.

GENERAL NOTE:-
DO NOT SCALE THE DRAWING.
ALL DIMESIONS ARE IN mm.

SIZE A3

MODEL : ---

DRAWN	TKK	DATE 11.02.2021
CHECKED	TKK	DATE 11.02.2021
APPROVED	TKK	DATE 11.02.2021

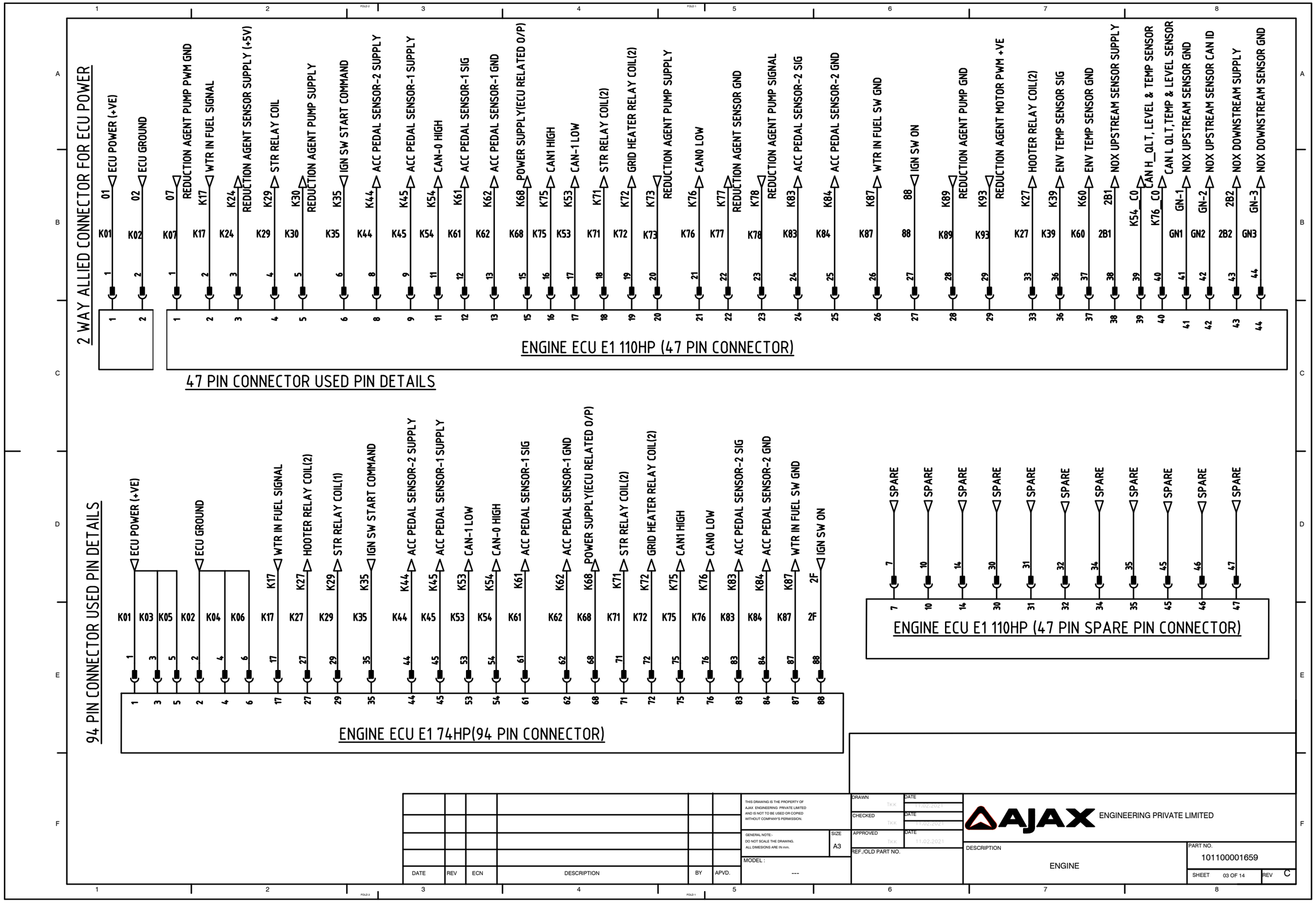
REF./OLD PART NO.

AJAX ENGINEERING PRIVATE LIMITED

DESCRIPTION: ENGINE

PART NO. 101100001659

SHEET 02A OF 14 REV C


2 WAY ALLIED CONNECTOR FOR ECU POWER
01 ECU POWER (+VE)
02 ECU GROUND
ENGINE ECU E1 110HP (47 PIN CONNECTOR)
07 REDUCTION AGENT PUMP PWM GND
K17 WTR IN FUEL SIGNAL
K24 REDUCTION AGENT SENSOR SUPPLY (+5V)
K29 STR RELAY COIL
K30 REDUCTION AGENT PUMP SUPPLY
K35 IGN SW START COMMAND
K44 ACC PEDAL SENSOR-2 SUPPLY
K45 ACC PEDAL SENSOR-1 SUPPLY
K54 CAN-0 HIGH
K61 ACC PEDAL SENSOR-1 SIG
K62 ACC PEDAL SENSOR-1 GND
K68 POWER SUPPLY(ECU RELATED O/P)
K75 CAN1 HIGH
K53 CAN-1 LOW
K71 STR RELAY COIL(2)
K72 GRID HEATER RELAY COIL(2)
K73 REDUCTION AGENT PUMP SUPPLY
K76 CAN0 LOW
K77 REDUCTION AGENT SENSOR GND
K78 REDUCTION AGENT PUMP SIGNAL
K83 ACC PEDAL SENSOR-2 SIG
K84 ACC PEDAL SENSOR-2 GND
K87 WTR IN FUEL SW GND
88 IGN SW ON
K89 REDUCTION AGENT PUMP GND
K93 REDUCTION AGENT MOTOR PWM +VE
K27 HOOTER RELAY COIL(2)
K39 ENV TEMP SENSOR SIG
K60 ENV TEMP SENSOR GND
2B1 NOX UPSTREAM SENSOR SUPPLY
K54_C0 CAN H_QLT, LEVEL & TEMP SENSOR
K76_C0 CAN L QLT,TEMP & LEVEL SENSOR
GN-1 NOX UPSTREAM SENSOR GND
GN-2 NOX UPSTREAM SENSOR CAN ID
2B2 NOX DOWNSTREAM SUPPLY
GN-3 NOX DOWNSTREAM SENSOR GND
47 PIN CONNECTOR USED PIN DETAILS
94 PIN CONNECTOR USED PIN DETAILS
ENGINE ECU E1 74HP(94 PIN CONNECTOR)
ENGINE ECU E1 110HP (47 PIN SPARE PIN CONNECTOR)
SPARE
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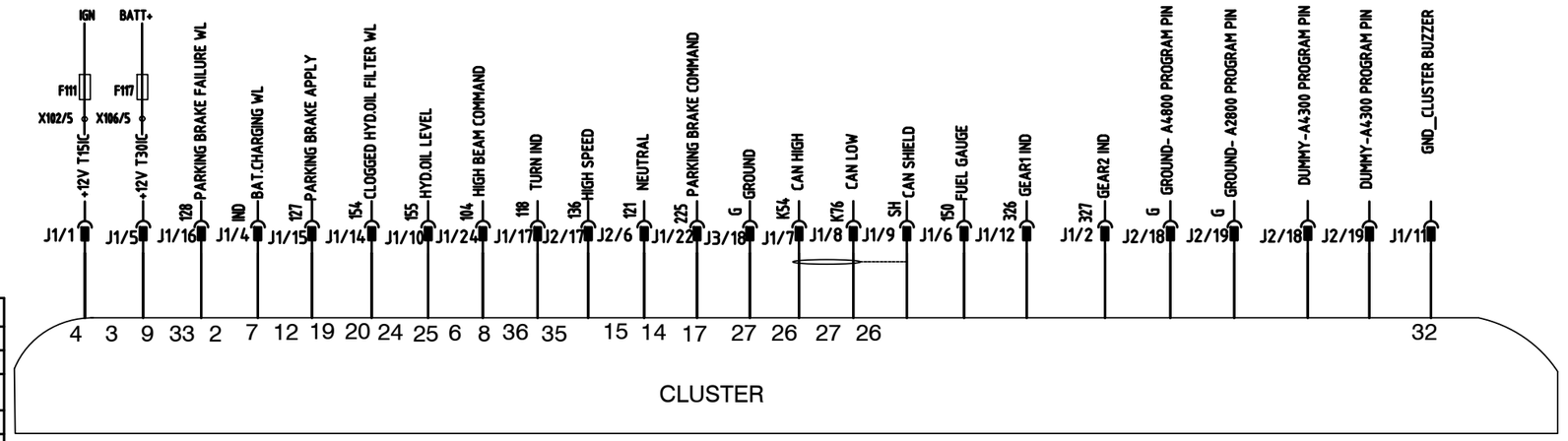
GENERAL NOTE:- DO NOT SCALE THE DRAWING. ALL DIMESIONS ARE IN mm.
SIZE A3
MODEL : ---
DRAWN TKK 11.02.2021
CHECKED TKK 11.02.2021
APPROVED TKK 11.02.2021
REF./OLD PART NO.
DATE REV ECN DESCRIPTION BY APVD.
AJAX ENGINEERING PRIVATE LIMITED
DESCRIPTION ENGINE
PART NO. 101100001659
SHEET 03 OF 14 REV C

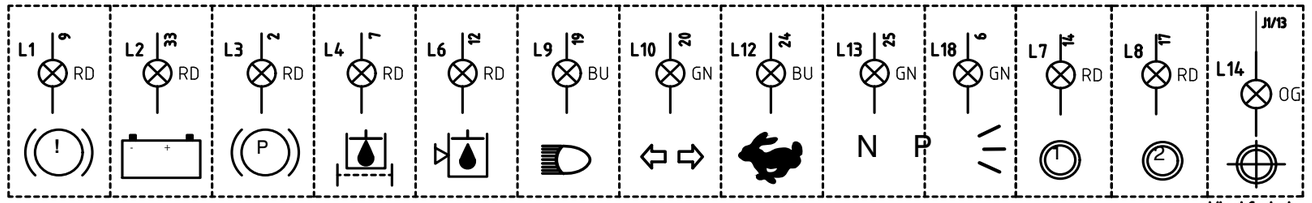
Lamp Details			
	Color Code		Function
L1	RD	Red	Parking Break Fail
L2	RD	Red	Battery Charging (Alternator Excitation)
L3	RD	Red	Parking Break Apply
L4	RD	Red	Hydraulic Filter Clog
L6	RD	Red	Hydraulic Low Level
L9	BU	Blue	High Beam
L10	GN	Green	Turning Signal
L12	BU	Blue	High-Speed(Rabbit)
L13	GN	Green	Neutral
L18	GN	Green	Parking Lamps
L15	OG	Orange/Amber	Diesel Low Alarm
L16	RD	Red	Coolant Over Heat Alarm
L7	RD	Red	Gear1 Indication
L8	RD	Red	Gear2 Indication
L11	OG	Orange/Amber	Pre heating Indication
L14	OG	Orange/Amber	Wheel Centering Indication

1) Other then these components which are present in the relay panel are future use.
2) For ECU related connection refer Respective Engines O&M manuals.

1) FUEL LEVEL LOW
2) PARKING BREAK FAIL
3) WATER TEMPERATURE HIGH
4) LUBE OIL PRESSURE LOW
5) HYDRAULIC OIL LEVEL LOW (NA)

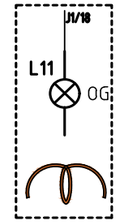
Lamp Details (CAN)			
	Color Code		Function
L5	RD	Red	Lube Oil Pressure Low
L19	OG	Orange/Amber	MIL (Malfunction Indication Lamp)
L21	OG	Orange/Amber	Check Lamp(SVS)
L17	RD	Red	WIF(Water In Fuel)



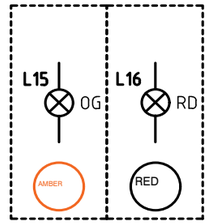


E1, E2, E3 CAN INTERFACING

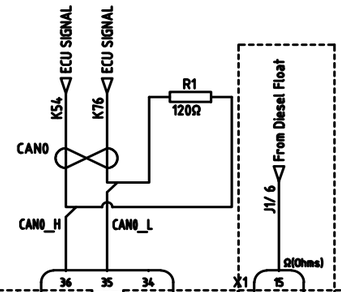
Wheel Centering

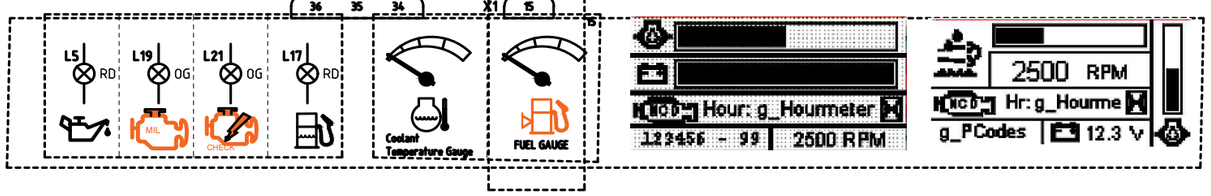


Pre heating(optional)



Alarm Signals "ON" When Input Reach Warning Level along with guage





CAN Analog Bar Graph Signals A2800

CAN Analog Bar Graph Signals A4300/A4800

NOTE-1:- CAN Digital Error Lamps

NOTE-2:-OPTIONAL
~~IN CLUSTER~~ WHEN BELOW WARNING INDICATION APPEARED:-

3) BUZZER WILL BE GETTING 'ON'

For complete understanding of lamps/indications, cluster bars refer respective vehicle variant O&M manual.

DATE	REV	ECN	DESCRIPTION	BY	APVD.

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SIZE A3

MODEL : ---

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CHECKED	TKK	DATE 11.02.2021
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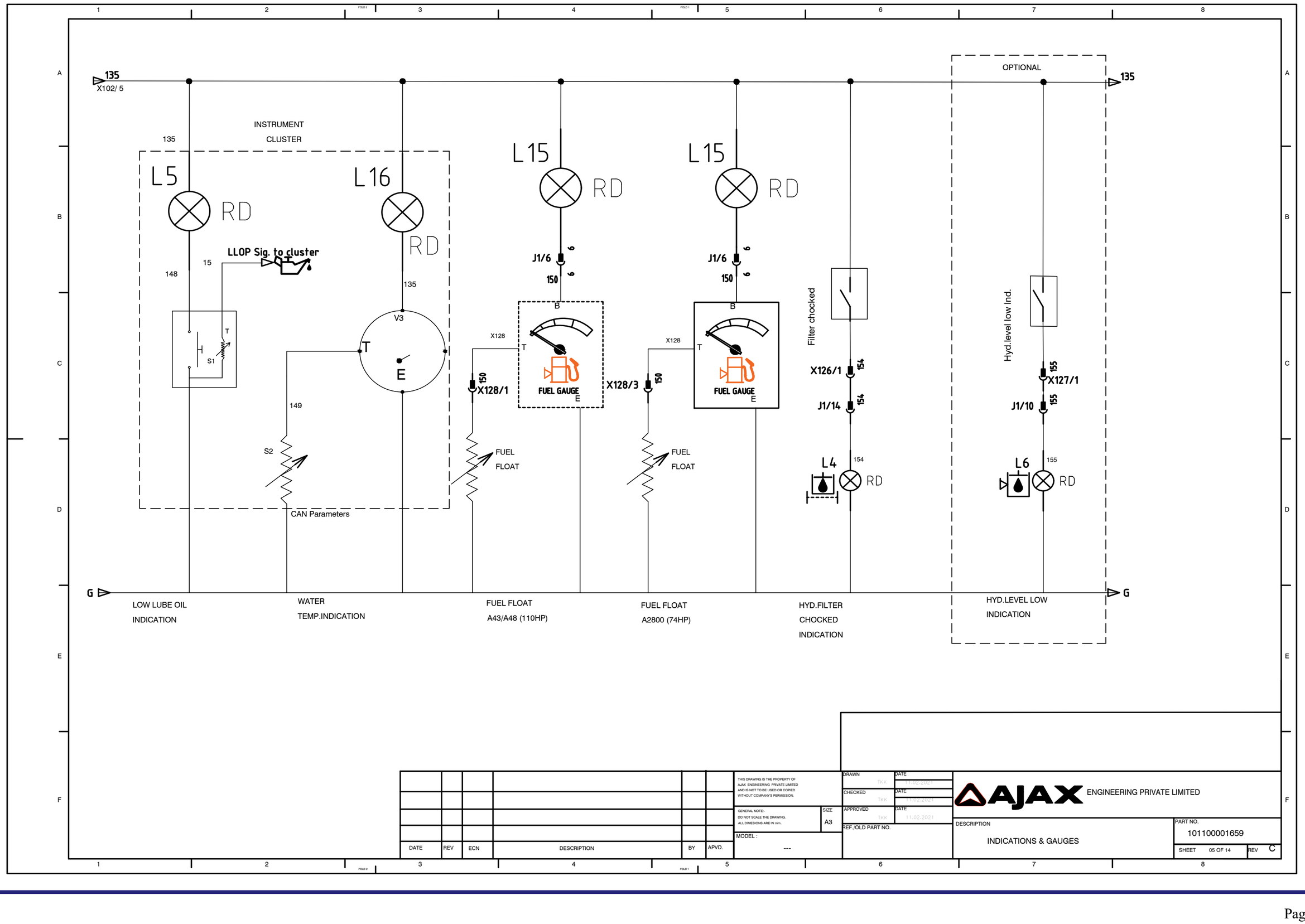
REF./OLD PART NO.

AJAX ENGINEERING PRIVATE LIMITED

DESCRIPTION: INDICATIONS & GAUGES

PART NO. 101100001659

SHEET 04 OF 14 REV C


135
X102/ 5
INSTRUMENT
CLUSTER
135
L5
RD
L16
RD
LLOP Sig. to cluster
15
148
135
V3
T
E
H
S1
T
149
S2
CAN Parameters
L15
RD
J1/6
6
150
6
B
X128
T
150
X128/1
FUEL GAUGE
E
FUEL
FLOAT
L15
RD
J1/6
6
150
6
B
X128
T
X128/3
150
FUEL GAUGE
E
FUEL
FLOAT
Filter chocked
X126/1
154
J1/14
154
L4
154
RD
OPTIONAL
135
Hyd.level low Ind.
155
X127/1
J1/10
155
L6
155
RD
G
G
LOW LUBE OIL
INDICATION
WATER
TEMP.INDICATION
FUEL FLOAT
A43/A48 (110HP)
FUEL FLOAT
A2800 (74HP)
HYD.FILTER
CHOCKED
INDICATION
HYD.LEVEL LOW
INDICATION
DATE
REV
ECN
DESCRIPTION
BY
APVD.
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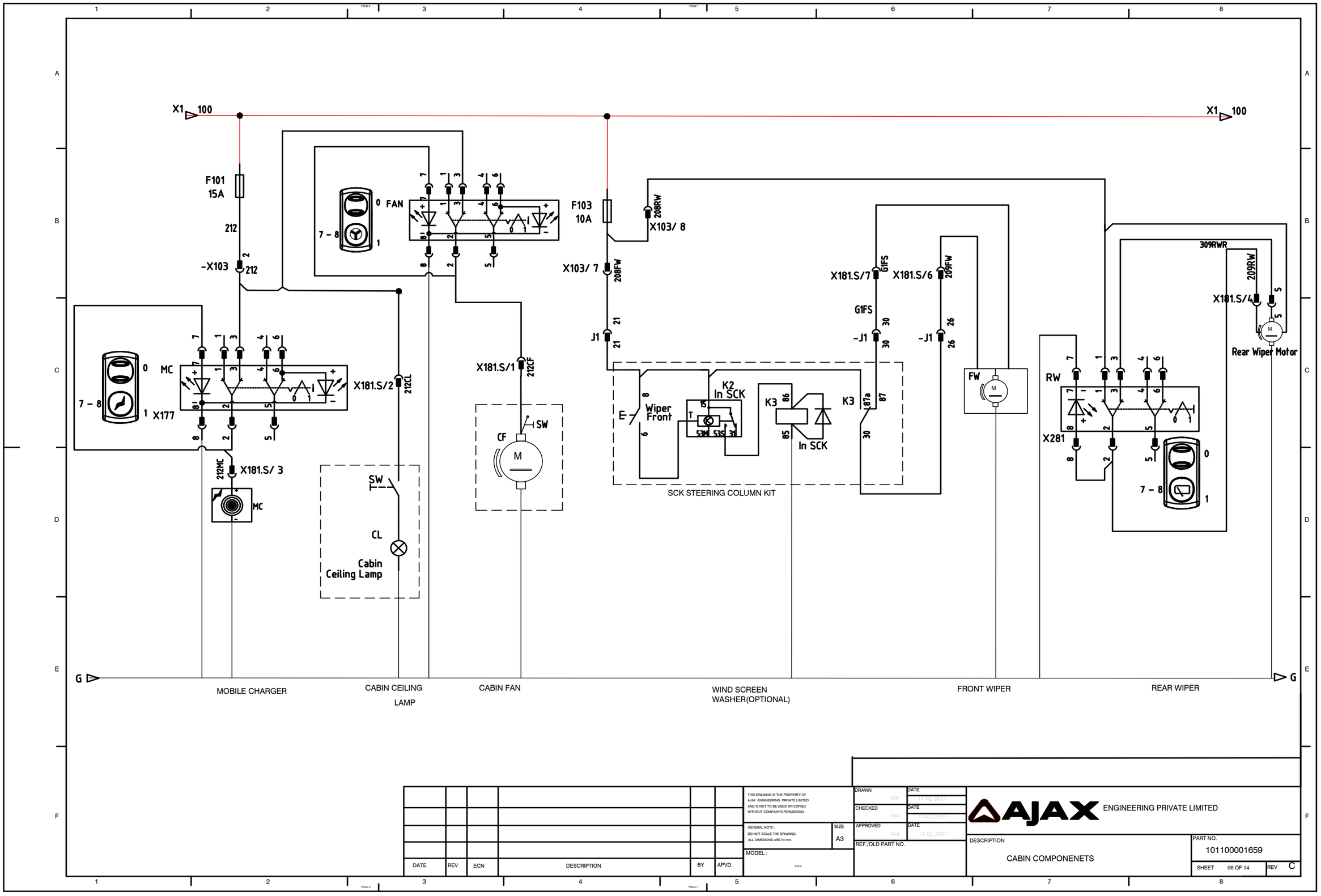
SIZE
A3
MODEL :

DRAWN
TKK
DATE
11.02.2021
CHECKED
TKK
DATE
11.02.2021
APPROVED
TKK
DATE
11.02.2021
REF./OLD PART NO.
AJAX ENGINEERING PRIVATE LIMITED
DESCRIPTION
INDICATIONS & GAUGES
PART NO.
101100001659
SHEET
05 OF 14
REV
C



DATE	REV	ECN	DESCRIPTION	BY	APVD.

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MODEL : ---

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APPROVED	TKK	DATE 11.02.2021

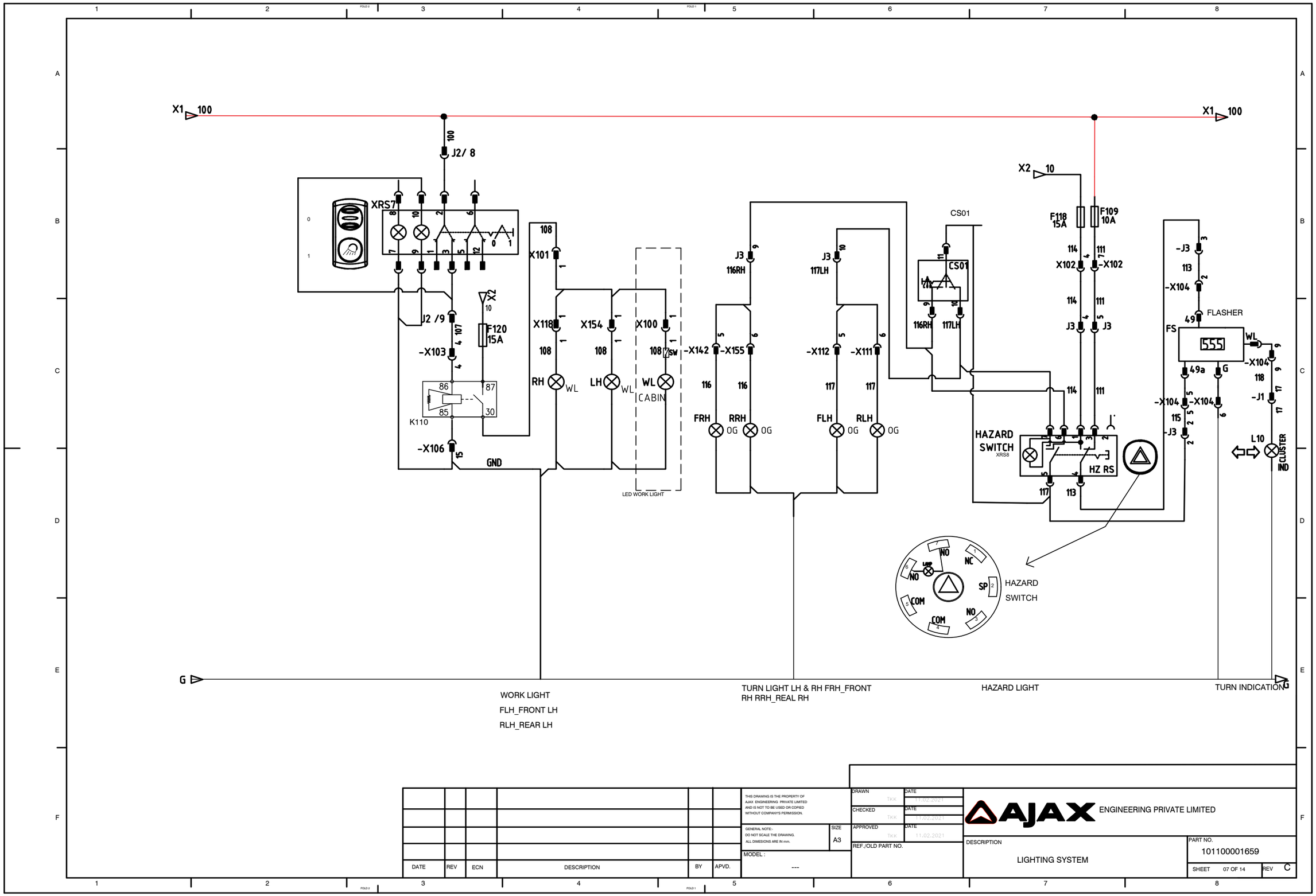
REF./OLD PART NO.

AJAX ENGINEERING PRIVATE LIMITED

DESCRIPTION: CABIN COMPONENETS

PART NO. 101100001659

SHEET 06 OF 14 REV C



DATE	REV	ECN	DESCRIPTION	BY	APVD.

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SIZE A3

MODEL : ---

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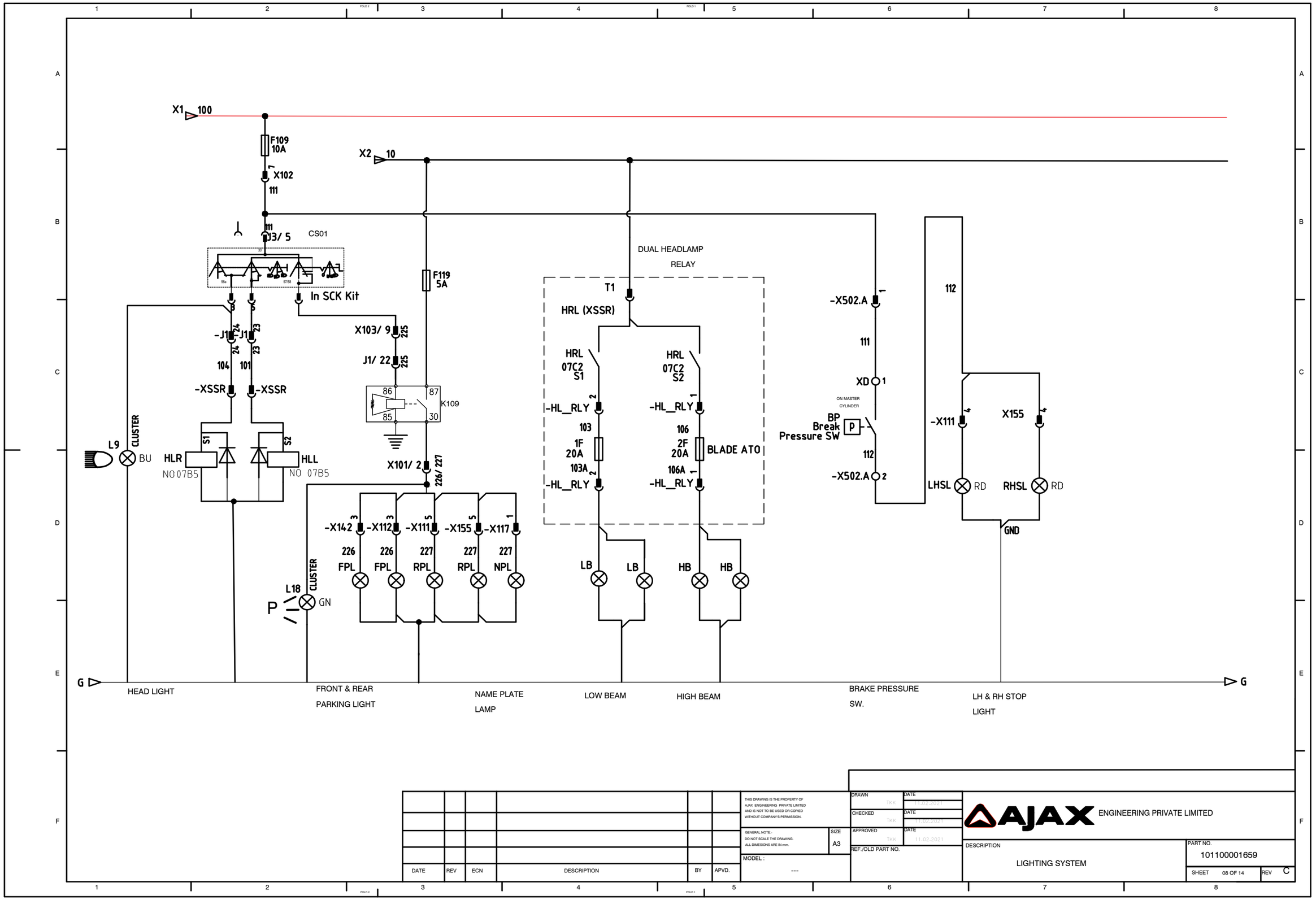
REF./OLD PART NO.

AJAX ENGINEERING PRIVATE LIMITED

DESCRIPTION: LIGHTING SYSTEM

PART NO. 101100001659

SHEET 07 OF 14 REV C



DATE	REV	ECN	DESCRIPTION	BY	APVD.

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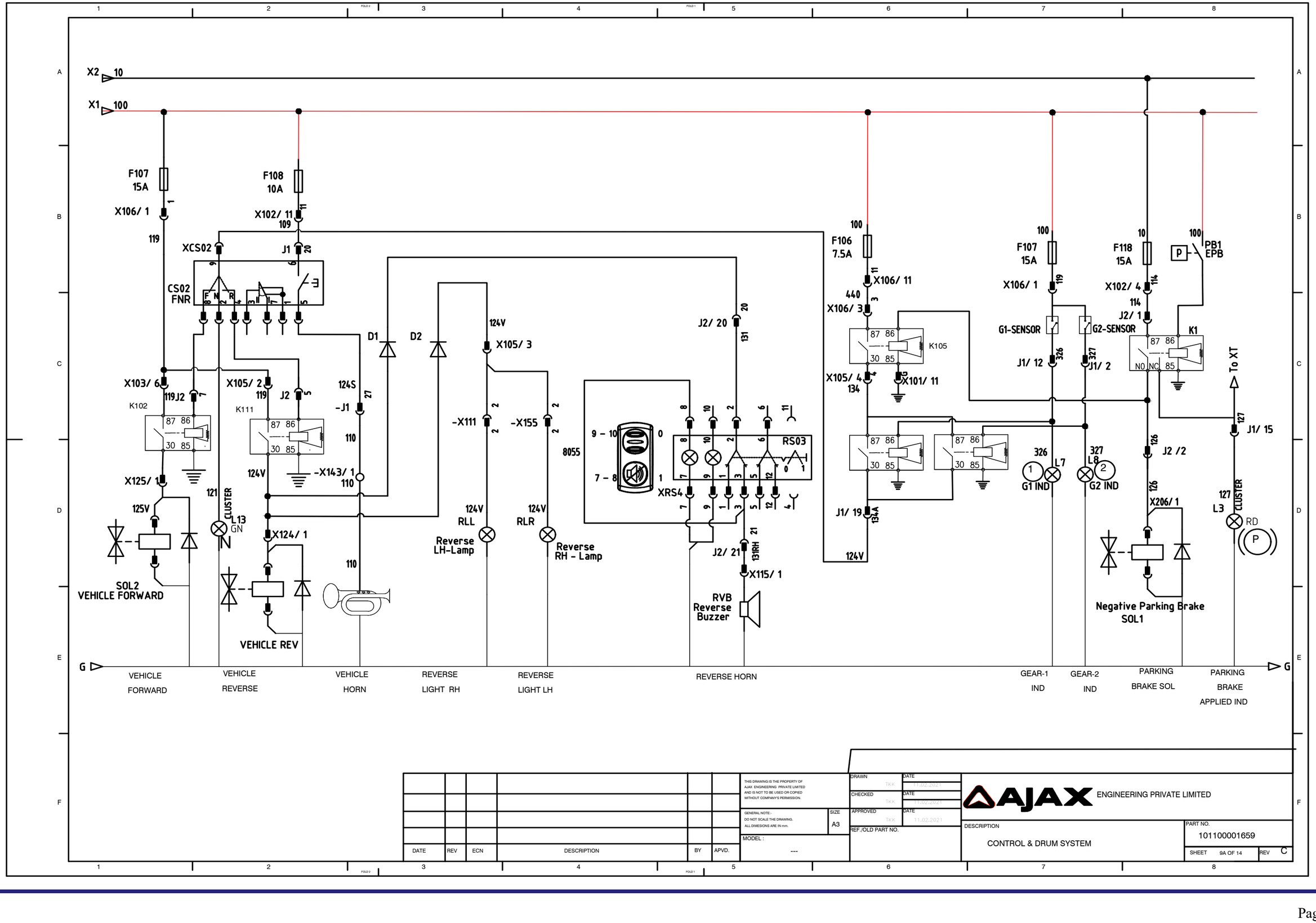
REF./OLD PART NO.

AJAX ENGINEERING PRIVATE LIMITED

DESCRIPTION: LIGHTING SYSTEM

PART NO. 101100001659

SHEET 08 OF 14 REV C


X2 10
X1 100
F107 15A
X106/ 1
119
F108 10A
X102/ 11
109
XCS02
J1 20
CS02 FNR
F N R
D1
D2
124V
X105/ 3
J2/ 20
131
X103/ 6
119J2 7
K102
87 86
30 85
X125/ 1
125V
SOL2 VEHICLE FORWARD
X105/ 2
119
J2 5
K111
124S
-J1 27
110
124V
-X143/ 1
110
121
CLUSTER
L13
GN
N
X124/ 1
VEHICLE REV
110
-X111 2
-X155 2
124V
RLL
Reverse LH-Lamp
124V
RLR
Reverse RH - Lamp
8055
9 - 10
7 - 8
0
1
RS03
XRS4
J2/ 21
131RH 21
X115/ 1
RVB Reverse Buzzer
100
F106 7.5A
X106/ 11
440
X106/ 3
3
K105
30 85
X105/ 4
134
X101/ 11
J1/ 19
134A
124V
100
F107 15A
X106/ 1
119
G1-SENSOR
G2-SENSOR
J1/ 12
326
J1/ 2
327
10
F118 15A
100
PB1 EPB
X102/ 4
114
114
J2/ 1
K1
87 86
NO NC 85
To XT
127
J1/ 15
126
J2 /2
126
X206/ 1
Negative Parking Brake SOL1
326
L7
G1 IND
327
L8
G2 IND
127
L3
CLUSTER
RD
P
G
VEHICLE FORWARD
VEHICLE REVERSE
VEHICLE HORN
REVERSE LIGHT RH
REVERSE LIGHT LH
REVERSE HORN
GEAR-1 IND
GEAR-2 IND
PARKING BRAKE SOL
PARKING BRAKE APPLIED IND
DATE REV ECN DESCRIPTION BY APVD.
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SIZE A3
MODEL : ---
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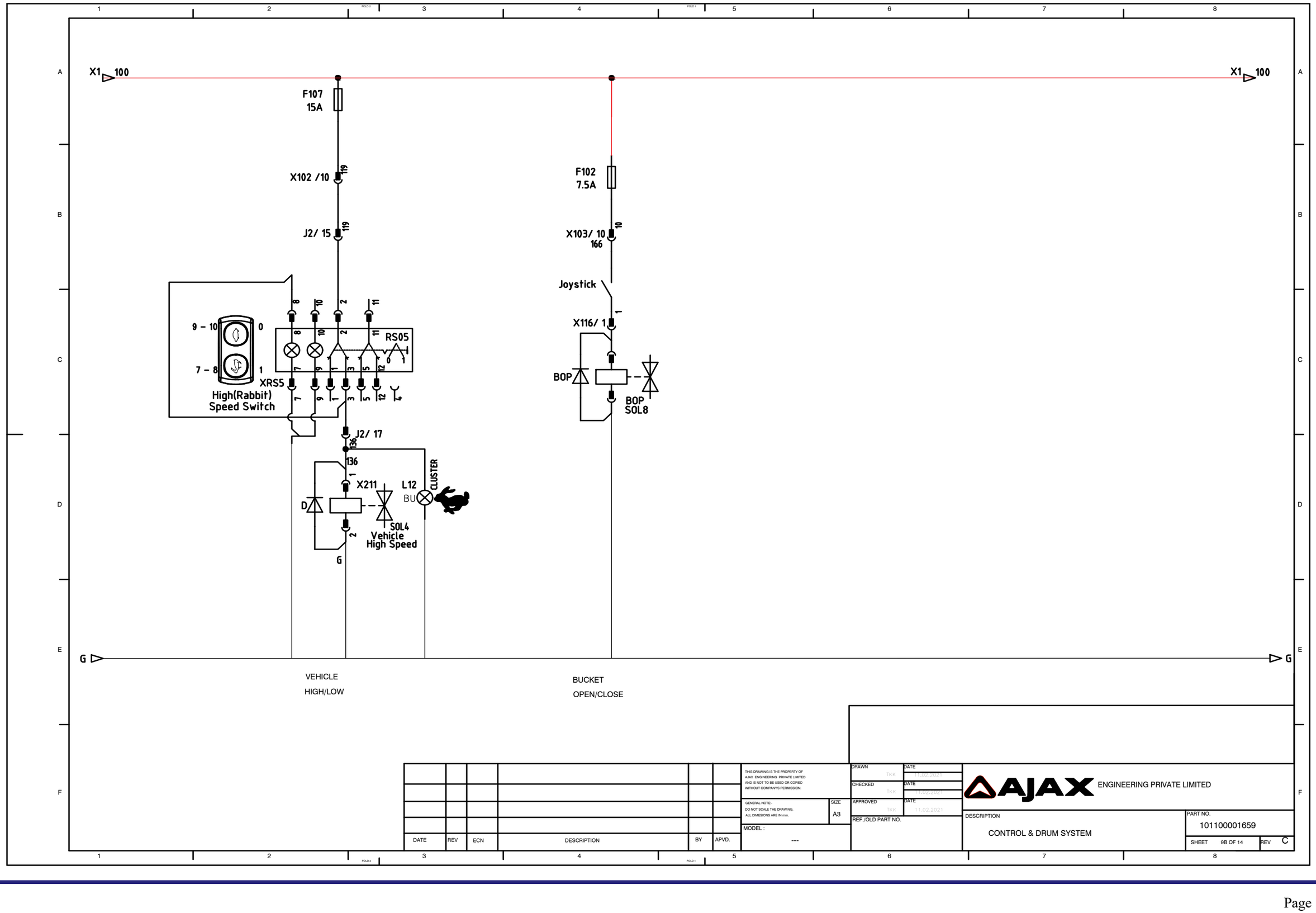
AJAX ENGINEERING PRIVATE LIMITED
DESCRIPTION CONTROL & DRUM SYSTEM
PART NO. 101100001659
SHEET 9A OF 14 REV C


X1 100
X1 100
F107
15A
X102 /10
119
J2/ 15
119
F102
7.5A
X103/ 10
166
10
Joystick
X116/ 1
1
9 – 10
0
7 – 8
1
XRS5
High(Rabbit)
Speed Switch
RS05
BOP
BOP
SOL8
J2/ 17
136
136
X211
L12
BU
CLUSTER
D
SOL4
Vehicle
High Speed
G
G
VEHICLE
HIGH/LOW
BUCKET
OPEN/CLOSE
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SIZE A3
MODEL : ---
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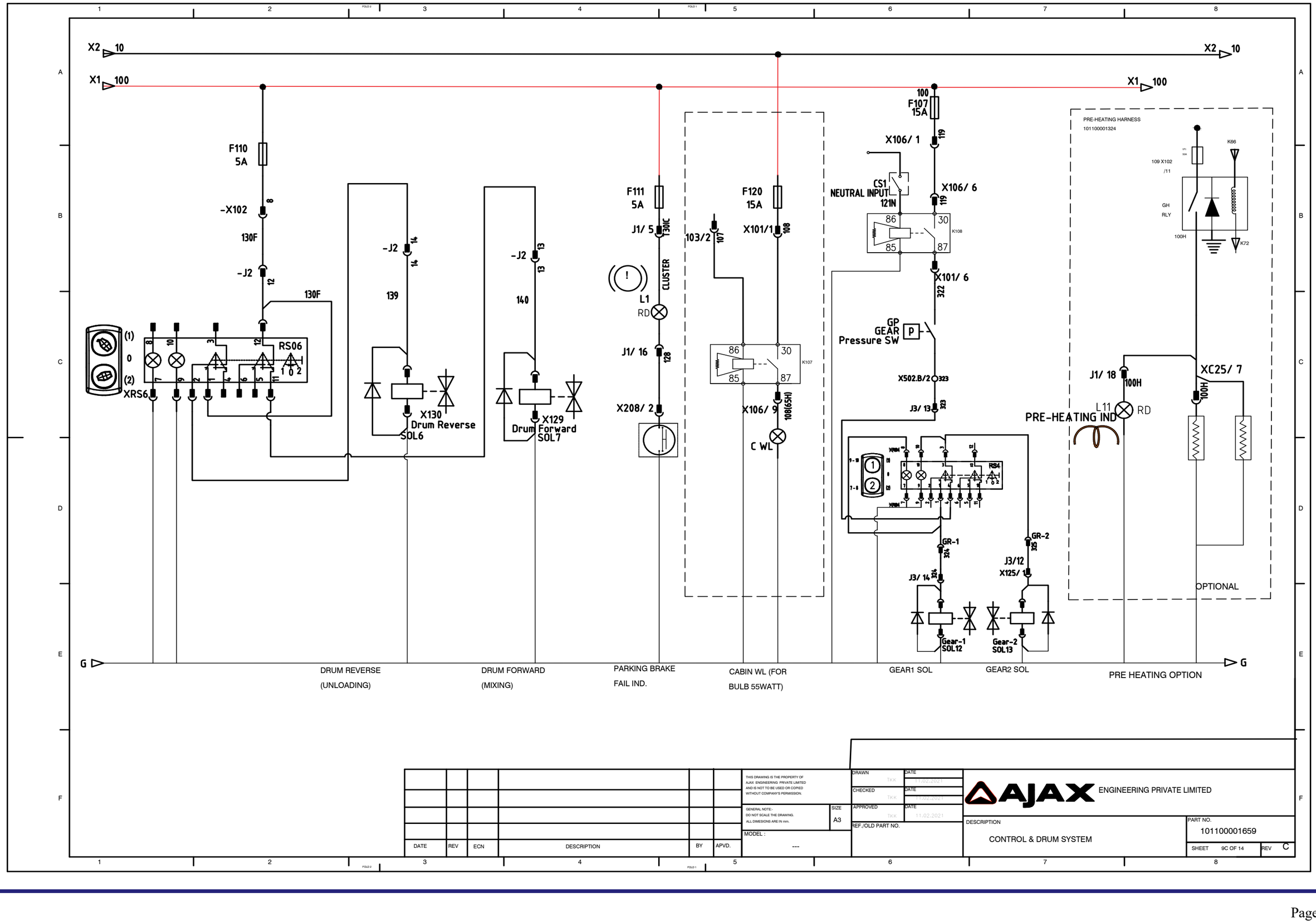
APPROVED Tkk DATE 11.02.2021
REF./OLD PART NO.
DATE REV ECN DESCRIPTION BY APVD.
AJAX ENGINEERING PRIVATE LIMITED
DESCRIPTION CONTROL & DRUM SYSTEM
PART NO. 101100001659
SHEET 9B OF 14
REV C



DATE	REV	ECN	DESCRIPTION	BY	APVD.

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MODEL : ---

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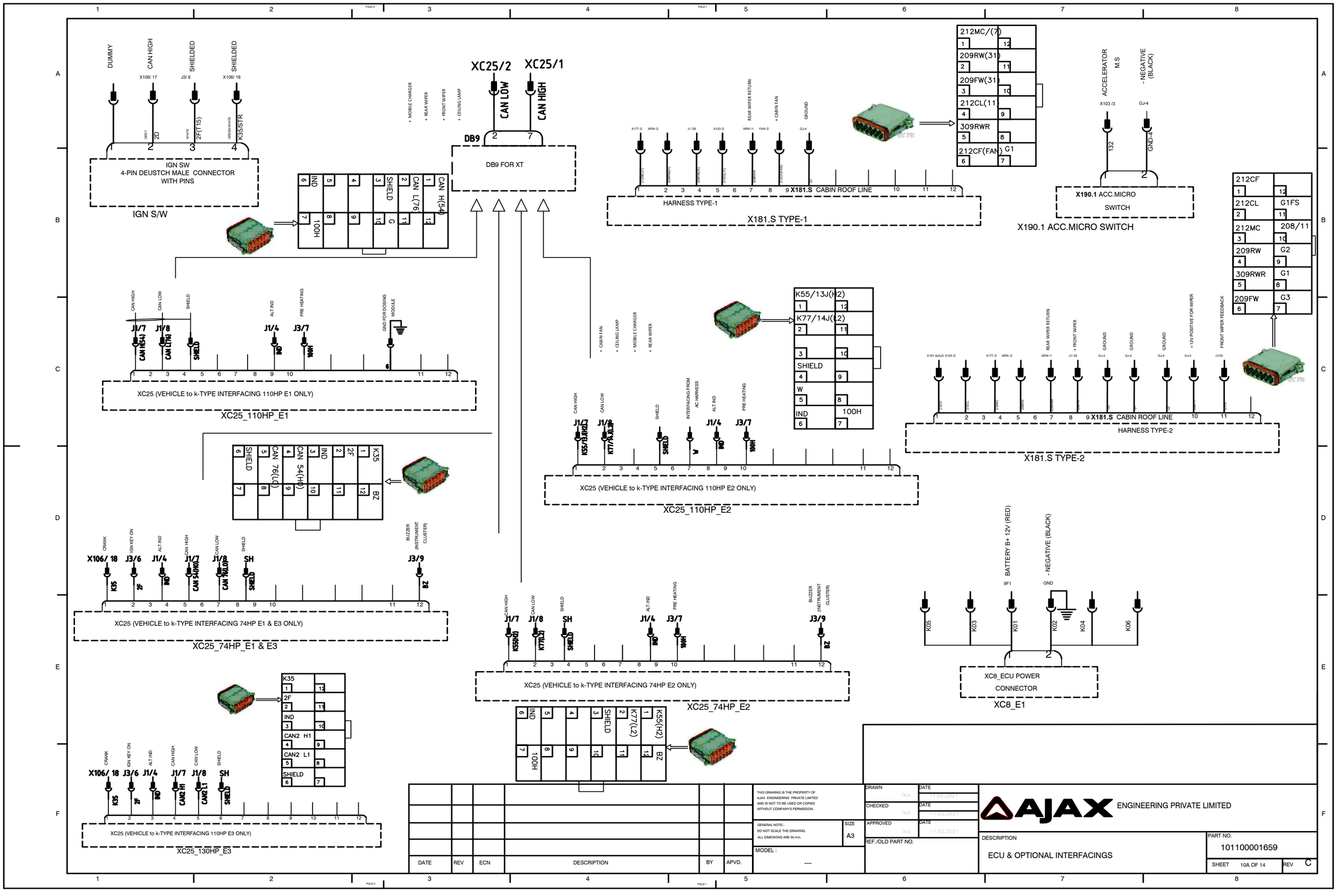
REF./OLD PART NO.

AJAX ENGINEERING PRIVATE LIMITED

DESCRIPTION: CONTROL & DRUM SYSTEM

PART NO. 101100001659

SHEET 9C OF 14 REV C


DUMMY
CAN HIGH
SHIELDED
SHIELDED
X106/ 17
J3/ 6
X106/ 18
GREY
2D
WHITE
2F(T15)
GREEN-WHITE
K35/STR
IGN SW
4-PIN DEUSTCH MALE CONNECTOR
WITH PINS
IGN S/W
XC25/2
XC25/1
CAN LOW
CAN HIGH
DB9
DB9 FOR XT
+ MOBILE CHARGER
+ REAR WIPER
+ FRONT WIPER
+ CEILING LAMP
IND
SHIELD
CAN L(7G)
CAN H(5H)
100H
REAR WIPER RETURN
+ CABIN FAN
GROUND
212MC/(7)
209RW(31)
209FW(31)
212CL(11)
309RWR
212CF(FAN)
G1
X181.S CABIN ROOF LINE
HARNESS TYPE-1
X181.S TYPE-1
ACCELERATOR M.S
- NEGATIVE (BLACK)
X103 /3
GJ-4
132
GND-4
X190.1 ACC.MICRO SWITCH
212CF
212CL
G1FS
212MC
208/11
209RW
G2
309RWR
G1
209FW
G3
FRONT WIPER FEEDBACK
+ 12V POSITIVE FOR WIPER
CAN HIGH
CAN LOW
SHIELD
ALT IND
PRE HEATING
GND FOR DOSING MODULE
J1/7
J1/8
J1/4
J3/7
XC25 (VEHICLE to k-TYPE INTERFACING 110HP E1 ONLY)
XC25_110HP_E1
K55/13J(H2)
K77/14J(L2)
SHIELD
W
IND
INTERFACING FROM AC HARNESS
XC25 (VEHICLE to k-TYPE INTERFACING 110HP E2 ONLY)
XC25_110HP_E2
HARNESS TYPE-2
X181.S TYPE-2
CAN 76(LO)
CAN 54(HO)
2F
K35
BZ
CRANK
IGN KEY ON
CAN2 H1
CAN2 L1
J3/9
XC25 (VEHICLE to k-TYPE INTERFACING 74HP E1 & E3 ONLY)
XC25_74HP_E1 & E3
XC25 (VEHICLE to k-TYPE INTERFACING 74HP E2 ONLY)
XC25_74HP_E2
XC25 (VEHICLE to k-TYPE INTERFACING 110HP E3 ONLY)
XC25_130HP_E3
BATTERY B+ 12V (RED)
- NEGATIVE (BLACK)
9F1
GND
K05
K03
K01
K02
K04
K06
XC8_ECU POWER CONNECTOR
XC8_E1
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SIZE A3
MODEL : ---
DRAWN TKK DATE 11.02.2021
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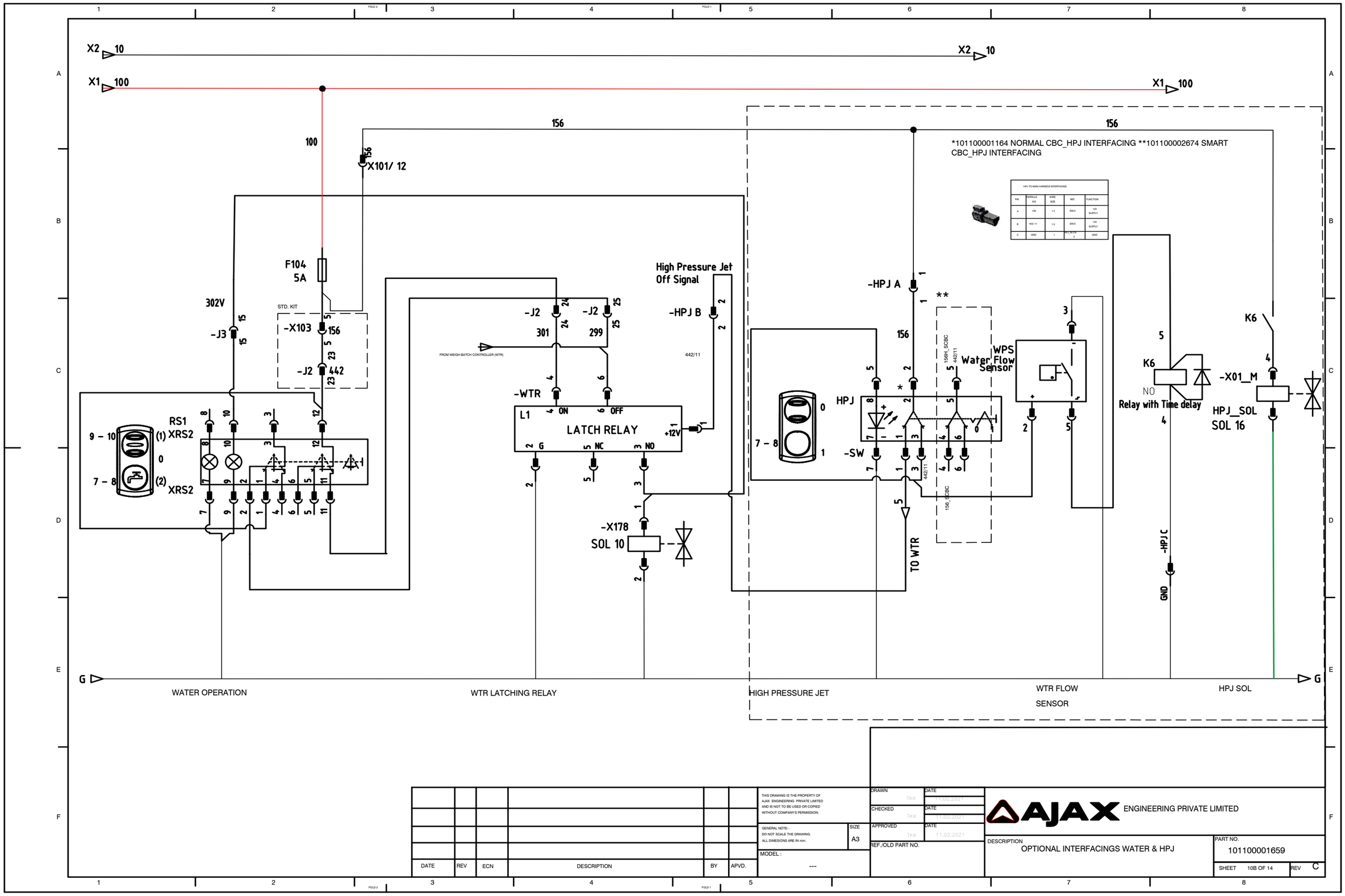
APPROVED TKK DATE 11.02.2021
REF./OLD PART NO.
AJAX ENGINEERING PRIVATE LIMITED
DESCRIPTION ECU & OPTIONAL INTERFACINGS
PART NO. 101100001659
SHEET 10A OF 14
REV C
DATE REV ECN DESCRIPTION BY APVD.



DATE	REV	ECN	DESCRIPTION	BY	APVD.

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REF./OLD PART NO.

AJAX ENGINEERING PRIVATE LIMITED

DESCRIPTION: OPTIONAL INTERFACINGS WATER & HPJ

PART NO. 101100001659

SHEET 10B OF 14 REV C

X1 100

X1 100

SMART CBC,HPJ & EH INTERFACING

EH-ECU CONTROL HARNESS (BSIV)

100

56

RELAY
73 SERIES

30 86 87A 87 85

FROM SCBC
WATER ON

156_H

J2/23

56

156

WATER ROCKER SWITCH

RS1
XRS2

9 – 10 (1)
0
7 – 8 (2)

8 10 3 12 7 9 2 1 4 6 5 11

56

302V

DIODE KIT

3 2 4 G

HPJ

X01

START COMMAND
MANUAL S/W

302A

301

-WTR

4 ON 6 OFF

L1

LATCH RELAY

+12V

2 G 5 NC 3 NO

CBC, HPJ & EH INTERFACING

FROM ECU-EH DRUM
CONTROL HARNESS

302V

56

302A

START COMMAND
MANUAL S/W

DIODE KIT

302V

3 2 4 G

HPJ

X01

-WTR

4 ON 6 OFF

L1

LATCH RELAY

+12V

2 G 5 NC 3 NO

G

EH WATER PUMP

EH WATER PUMP

G

DATE	REV	ECN	DESCRIPTION	BY	APVD.

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SIZE A3

MODEL : ---

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DRAWN	TKK	11.02.2021
CHECKED	TKK	11.02.2021
APPROVED	TKK	11.02.2021

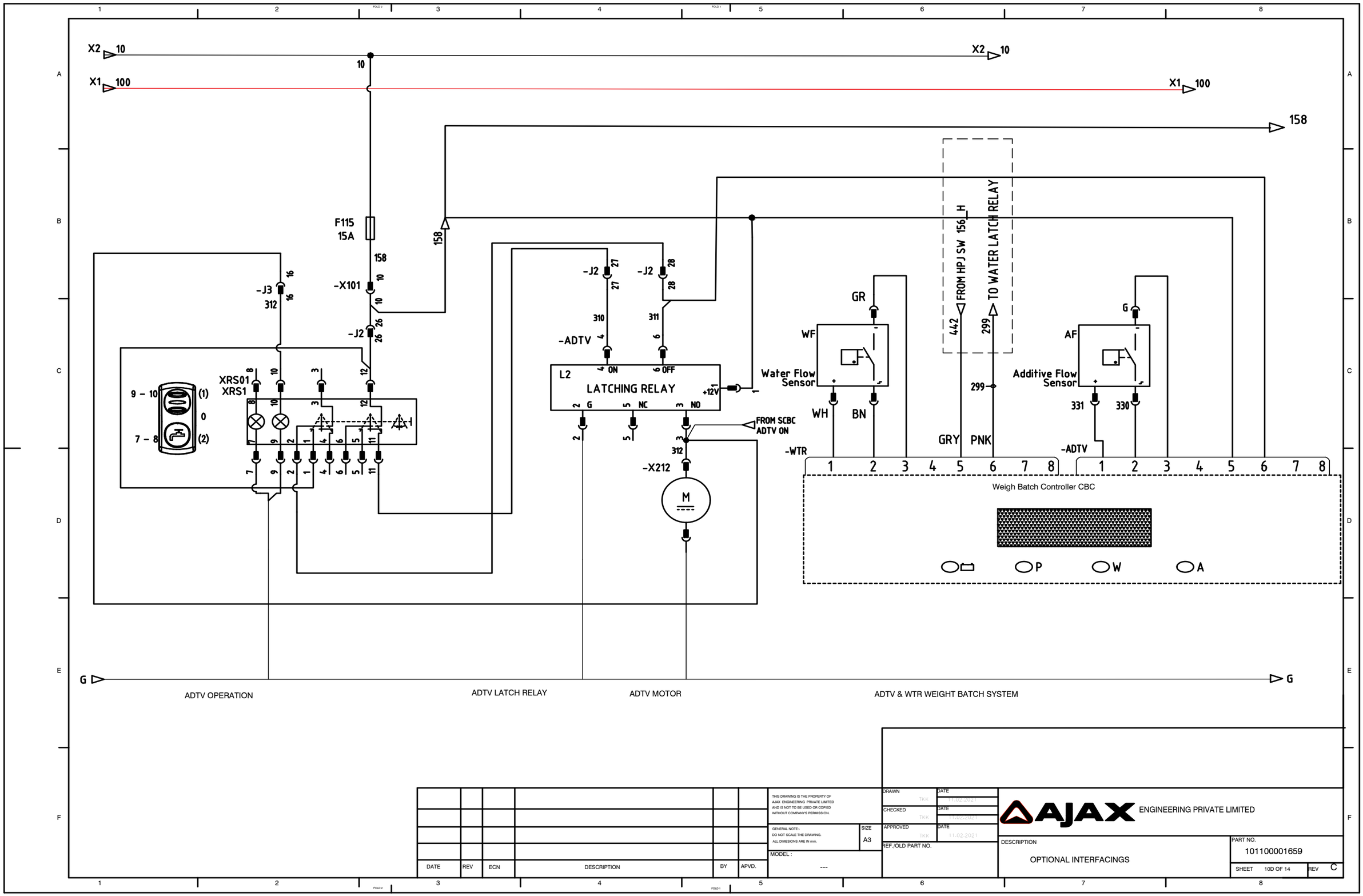
REF./OLD PART NO.

AJAX ENGINEERING PRIVATE LIMITED

DESCRIPTION: OPTIONAL INTERFACING EH WATER PUMP

PART NO. 101100001659

SHEET 10C OF 14 REV C



DATE	REV	ECN	DESCRIPTION	BY	APVD.

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SIZE A3

MODEL : ---

		DATE
DRAWN	TKK	11.02.2021
CHECKED	TKK	11.02.2021
APPROVED	TKK	11.02.2021

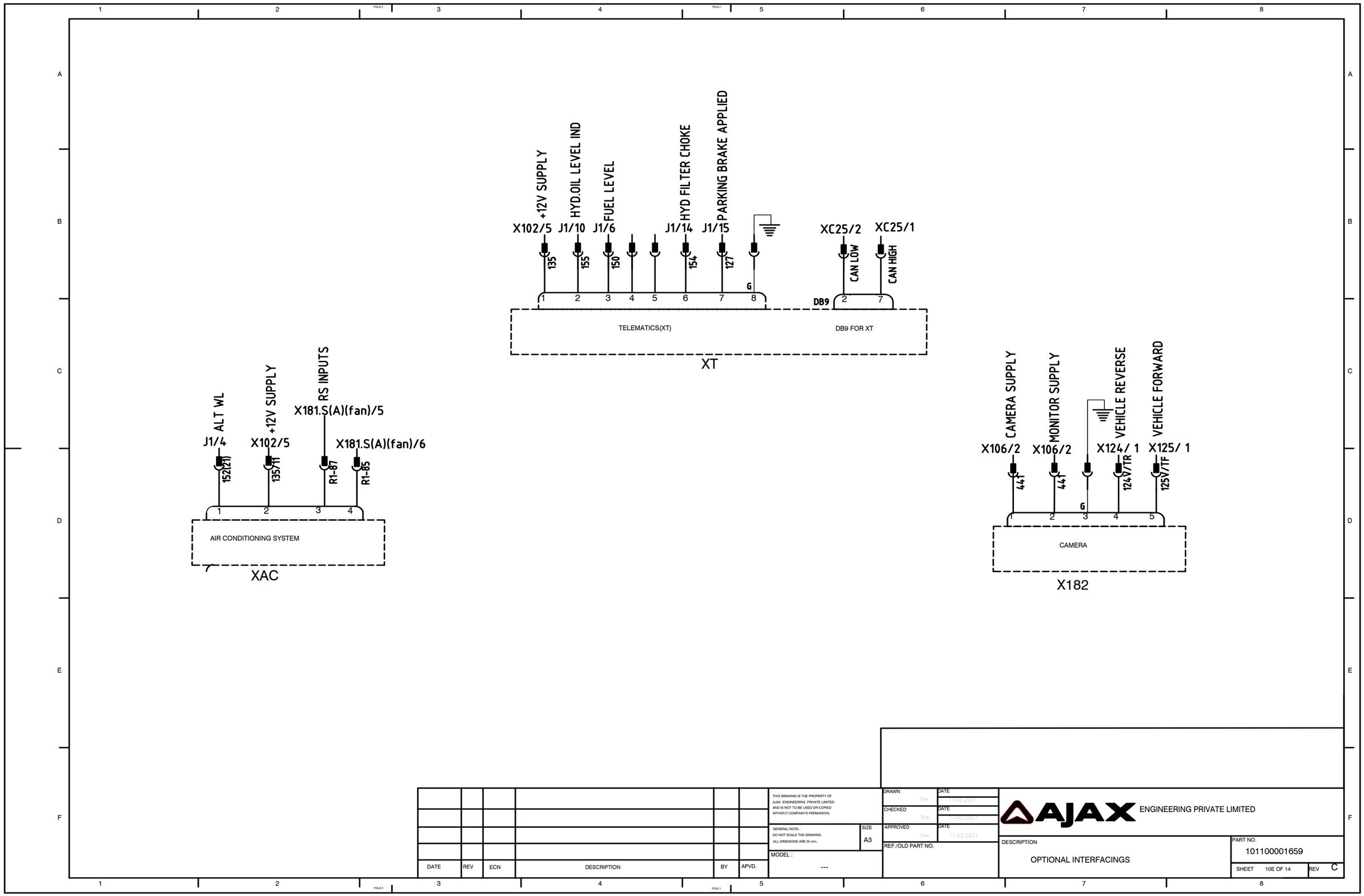
REF./OLD PART NO.

AJAX ENGINEERING PRIVATE LIMITED

DESCRIPTION: OPTIONAL INTERFACINGS

PART NO. 101100001659

SHEET 10D OF 14 REV C


X102/5 +12V SUPPLY
J1/10 HYD.OIL LEVEL IND
J1/6 FUEL LEVEL
J1/14 HYD FILTER CHOKE
J1/15 PARKING BRAKE APPLIED
135
155
150
154
127
G
1 2 3 4 5 6 7 8
TELEMATICS(XT)
XC25/2 CAN LOW
XC25/1 CAN HIGH
DB9 2 7
DB9 FOR XT
XT
J1/4 ALT WL
152(21)
X102/5 +12V SUPPLY
135/11
X181.S(A)(fan)/5 RS INPUTS
R1-87
X181.S(A)(fan)/6
R1-85
1 2 3 4
AIR CONDITIONING SYSTEM
XAC
X106/2 CAMERA SUPPLY
441
X106/2 MONITOR SUPPLY
441
G
X124/ 1 VEHICLE REVERSE
124/TR
X125/ 1 VEHICLE FORWARD
125/TF
1 2 3 4 5
CAMERA
X182
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SIZE A3
MODEL : ---
DRAWN TKK DATE 11.02.2021
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APPROVED TKK DATE 11.02.2021
REF./OLD PART NO.
AJAX ENGINEERING PRIVATE LIMITED
DESCRIPTION OPTIONAL INTERFACINGS
PART NO. 101100001659
SHEET 10E OF 14
REV C
DATE REV ECN DESCRIPTION BY APVD.

158

158

×
5 PIN ALLIED MALE
CONNECTOR

××
3 PIN ALLIED MALE
CONNECTOR

-CBC (X100)

-X200 (BP)

ORANGE — BATT+ 12V IN
BLACK — GND
BROWN — +10V
WHITE — PR_IN+
GREEN — PR_IN-

× 5 PIN ALLIED MALE CONNECTOR

PRESSURE CELLS

BN
BU
GND
+12V
Fe
PROXIMITY
BK
PROX O/P

××
3 PIN ALLIED MALE
CONNECTOR

Twisted Pair Cable

CN1 2 1 -PROXY 1 2 3

A B C D E

-AL C D A B

Weigh Batch Controller

-CBC

DB9 5 2

P W A

PF TEST

-X200

PRINTER

022C6 GND

GND 027C1

PRESSURE TRANSDUCER BASE CBC SYSTEM

DATE	REV	ECN	DESCRIPTION	BY	APVD.

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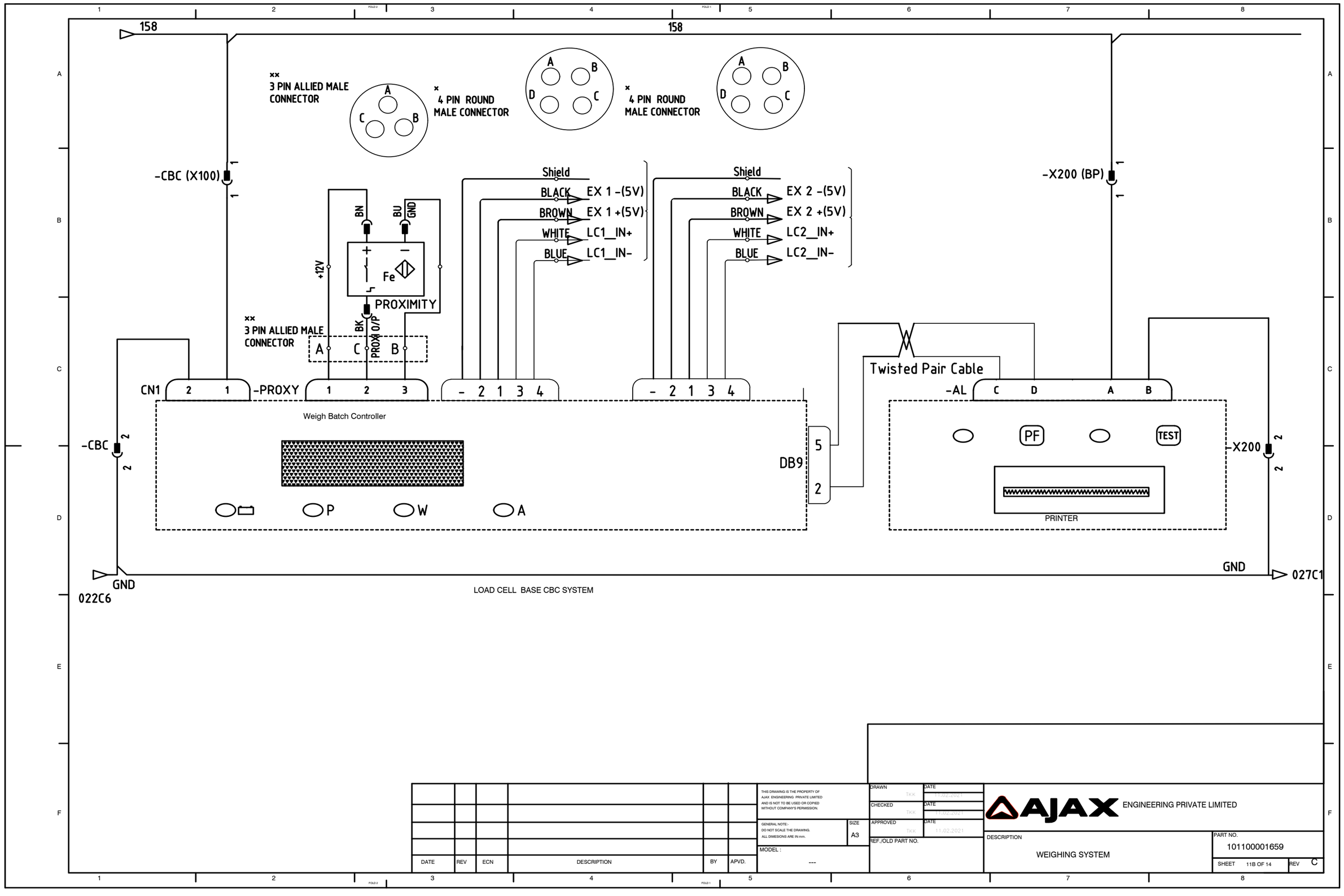
DRAWN TKK DATE 11.02.2021
CHECKED TKK DATE 11.02.2021
APPROVED TKK DATE 11.02.2021
REF./OLD PART NO.

AJAX ENGINEERING PRIVATE LIMITED

DESCRIPTION: WEIGHING SYSTEM

PART NO. 101100001659

SHEET 11A OF 14 REV C


158
158
××
3 PIN ALLIED MALE
CONNECTOR
A
C
B
×
4 PIN ROUND
MALE CONNECTOR
A
B
D
C
×
4 PIN ROUND
MALE CONNECTOR
A
B
D
C
-CBC (X100)
1
1
BN
BU
GND
+12V
+
−
Fe
PROXIMITY
BK
PROX O/P
××
3 PIN ALLIED MALE
CONNECTOR
A
C
B
Shield
BLACK
EX 1 -(5V)
BROWN
EX 1 +(5V)
WHITE
LC1_IN+
BLUE
LC1_IN-
Shield
BLACK
EX 2 -(5V)
BROWN
EX 2 +(5V)
WHITE
LC2_IN+
BLUE
LC2_IN-
-X200 (BP)
1
1
CN1
2
1
-PROXY
1
2
3
- 2 1 3 4
- 2 1 3 4
Twisted Pair Cable
-AL
C
D
A
B
Weigh Batch Controller
-CBC
2
2
P
W
A
DB9
5
2
PF
TEST
-X200
2
2
PRINTER
GND
022C6
GND
027C1
LOAD CELL BASE CBC SYSTEM
DATE
REV
ECN
DESCRIPTION
BY
APVD.
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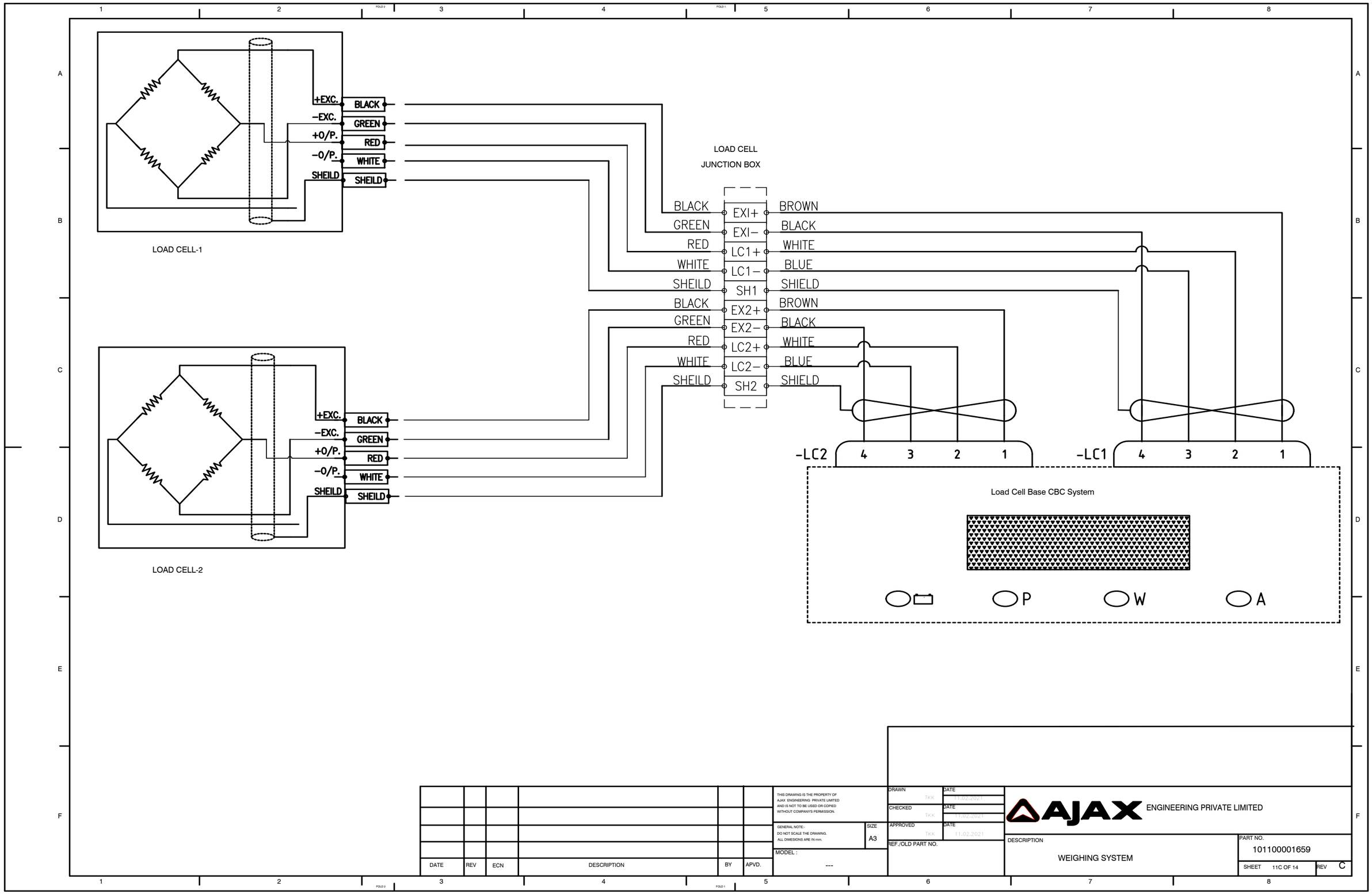
SIZE
A3
MODEL :

DRAWN
TKK
DATE
11.02.2021
CHECKED
TKK
DATE
11.02.2021
APPROVED
TKK
DATE
11.02.2021
REF./OLD PART NO.
AJAX ENGINEERING PRIVATE LIMITED
DESCRIPTION
WEIGHING SYSTEM
PART NO.
101100001659
SHEET
11B OF 14
REV
C


+EXC.
BLACK
−EXC.
GREEN
+O/P.
RED
−O/P.
WHITE
SHEILD
SHEILD
LOAD CELL-1
LOAD CELL
JUNCTION BOX
BLACK
GREEN
RED
WHITE
SHEILD
BLACK
GREEN
RED
WHITE
SHEILD
EXI+
EXI−
LC1+
LC1−
SH1
EX2+
EX2−
LC2+
LC2−
SH2
BROWN
BLACK
WHITE
BLUE
SHIELD
BROWN
BLACK
WHITE
BLUE
SHIELD
-LC2
4 3 2 1
-LC1
4 3 2 1
Load Cell Base CBC System
P
W
A
LOAD CELL-2
DATE
REV
ECN
DESCRIPTION
BY
APVD.
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SIZE
A3
MODEL :

DRAWN
TKK
DATE
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TKK
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APPROVED
TKK
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11.02.2021
REF./OLD PART NO.
AJAX ENGINEERING PRIVATE LIMITED
DESCRIPTION
WEIGHING SYSTEM
PART NO.
101100001659
SHEET 11C OF 14
REV C

ANNEXURE-1

X1 100

F111 5A — X101/14 — 135
X102/5 — 135 J1/1 POWER SUPPLY

F104 5A — X101/12 — 156 TO WTR.
X103/5 — 135 TO WTR PUMP SW

F109 10A — X102/7 — 111 POWER SUPPLY
F106 15A — X106/9 — 143(108W) SUPPLY TO SW
X103/2 — 212 12V TO HPJ

F115 15A — X101/10 — 158 SUPPLY TO CRC/PRINTER &UTY
F108 10A — X102/11 — 109 TO HORN
X106/2 — 441 TO CAMERA

F103 10A — X103/7 — 208FW FRONT WIPER M
X103/8 — 208RW REAR WIPER M
X103/11 — SPARE

F110 5A — X102/8 — 130F +12V DRUM ROTATION
X101/17 — SPARE

F102 7.5A — X103/10 — 166 TO BUCKET O/C

F107 15A — X102/10 — 119 SUPPLY TO HIGH/LOW SW
X106/1 — 119 +12V SPEED F/R RELAY, GEAR RELAY

F106 15A — X106/10 — 143 +12 ENGINE STOP
X106/11 — 440 GEAR INTERLOCK

F101 15A — X103/13 — +12V WC SW

F116 3A — X101/7

X102/3

F112 3A — X101/4 — T15IC
X106/13 — T30

IGN COMMAND I/P
(X102/1) 10
F113 7.5A — 10 X102/2 POWER SUPPLY
F114 7.5A — 10 X101/13 POWER SUPPLY
SPARE

To Cabin W.light
X101/ 15 — 107
X101/ 18 — 100A
K107 86 87 85 30
143 X106/ 9
GND

GEAR CHANGING RELAY
X101/ 9 — 121
X101/ 3 — 322
X101/ 6
K108 86 87a 87 85 30
107 X101/ 5
119 X106/ 6

To Forward Relay
X101/ 8 — 125S
X103/ 6 — 119
K102 86 87 85 30
GND
125V X106/ 20
Vehicles Forward Relay

To Reverse Relay
X105/ 5 — 124S
X105/ 1 — 119
K111 86 87a 87 85 30
G X105/ 8
124V X105/ 3
Vehicles Reverse Relay

To K108 Coil
X106/ 4 — K106 86 87a 87 85 30 — GND
X106/ 12 — X102/ 9
X102/ 6
Neutral interlock to Gear Relay

Start (+50a)
X106/ 16 — T30
X106/ 21 — 300
K103 86 87 85 30
X103/ 3 — 132
X106/ 18 — K35
Idle speed Engine crank Relay

To Drive Sw
X106/ 7 — 126
X105/ 4 — 134
K105 86 87 85 30
G X101/ 11
440 X106/
Parking Brake interlock to Forwar & Reverse

To Feed Pump
X106/ 14 — K104 86 87 85 30 — GND
X106/ 8
X102/ 12
To Fuel lift pump Relay

To Mobile Charger Sw
To Ignition Switch
X103/ 15 — 2F
X103/ 14 — X106/ 17 — 2D
K101 86 87 87a 85 30
10 X103/ 12
GND

To parking light
X103/ 9 — 225
X101/ 2 — 226
K109 86 87 85 30
GND
Parking light Relay

To Work Light
X103/ 2 — 107
X101/ 1 — 108
K110 86 87 85 30
GND
Vehicle Work lamp Relay

TURNING LAMP
X103/ 1 — 114
Emergency PB
X102/ 4 — 114
F118 15A

Battery to cluster
J1/ 5
X106/ 5 — T30IC
F117 3A

F119 5A
F120 15A
10 X2(Battery)

X104: 1 2 3 4 5 6 7 8 9
X113: 1 66 7 3 85 87a 30 9 87

X106
15 9 6 7 12 14 11 15 13 10
X105 X105 X105 X105 X105 X105 X105 X105 X105 X105
9 87 7 85 87 86 3 30 1
K112 K112 K112 K112 K112 K112 K112 K112 K112
GND

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SIZE A3

MODEL : ---

DATE	REV	ECN	DESCRIPTION	BY	APVD.

		DATE
DRAWN	TKK	11.02.2021
CHECKED	TKK	11.02.2021
APPROVED	TKK	11.02.2021
REF./OLD PART NO.		

AJAX ENGINEERING PRIVATE LIMITED

DESCRIPTION: RELAY & FUSE BOARD DETAILS

PART NO. 101100001659

SHEET 12A OF 14 REV C

ANNEXURE-1

RELAY DETAILS

SL.NO	RELAY.NO	USED FOR
1	K101	MOBILE CHARGING
2	K102	FORWARD
3	K103	IDLE SPEED ENGINE RELAY
4	K104	Fuel lift pump Relay
5	K105	PARKING BRAKE INTERLOCK WITH FORWARD REVERSE
6	K106	NEUTRAL INTERLOCK TO GEAR RELAY
7	K107	CABIN WORK LIGHT
8	K108	GEAR CHANGING
9	K109	PARKING LIGHT
10	K110	VEHICLE WORK LAMP RELAY
11	K111	VEHICLE REVERSE
12	SR	STARTER RELAY
13	K1	PARKING BREAK RELAY
14	SSR	HEAD LIGHT RELAY
15	WTR	WATER LATCHING RELAY
16	ADTV	ADDITIVE LATCHING RELAY
17	IS_R	ISOLATION RELAY
18	K6	RELAY WITH TIME DELAY

ACRONOMY

SL.NO	COMPONENT	DESCRIPTION
1	SM	STARTER MOTOR
2	AL	ALTERNATOR
3	PC	PRESSURE CELL
4	AM	ADDITIVE MOTOR
5	IC	INSTRUMENT CLUSTER
6	ECU	ELECTRONIC CONTROL UNIT
7	GH	GRID HEATER
8	X1	CONTROL POWER DISTRIBUTION POINT
9	X2	BATTERY POWER DISTRIBUTION POINT
10	RS	ROCKER SWITCH
11	SS	START(IGNITION) SWITCH
12	MS	MICRO SWITCH

SWITCHES DETAILS

SL.NO	SWITCH	DESCRIPTION
1	RS1	ADDITIVE PULSE SWITCH
2	RS2	WATER PULSE SWITCH
3	RS3	REVERSE HORN BYPASS SWITCH
4	RS4	GEAR 1&2 SPRING RETURN SWITCH
5	RS5	HIGH / LOW SPEED SWITCH
6	RS6	DRUM MIXING / UNLOADING
7	RS7	HAZARD SWITCH
8	RS8	REAR WIPER SWITCH
9	RS9	WORK LIGHTS SWITCH
10	CS1	COMBINATIONAL SWITCH
11	CS2	F-N-R COMBINATIONAL SWITCH
12	K2	PULSE MODULE FOR FRONT WIPER(INTERLOCKING)
13	SK1	IGNITION KEY WITH PREHEATING
14	P2	IB5124 IFM PROXIMITY
15	SW1	CABIN FAN SWITCH
16	SW2	MOBILE CHARGER SWITCH
17	SW4	HIGH PRESSURE PUMP SWITCH
18	LPS	LUBE OIL PR. SWITCH
19	K3	PULSE MODULE FOR FRONT WIPER

SOLENOID COIL DETAILS

SL.NO	COMPONENT	DESCRIPTION
1	SOL 1	NEGATIVE PARKING BREAK
2	SOL 2	ENGINE FORWARD
3	SOL 3	ENGINE REVERSE
4	SOL 4	VEHICLE HIGH/LOW (VHL)
5	SOL 5	-
6	SOL 6	DRUM UNLOADING
7	SOL 7	DRUM MIXING
8	SOL 8	BUCKET OPEN/CLOSE
9	SOL 9	-
10	SOL10	WATER SOL
11	SOL11	-
12	SOL12	GEAR 1
13	SOL13	GEAR 2
14	SOL14	-
15	FIP SOL	ENGINE STOP SOL
16	HPJ SOL	HPJ SOL

FUSE DETAILS

FUSE IDENTITY	RATING(AMPS)
X901	50A
X902	50A
F101	15A
F102	7.5
F103	10A
F104	5A
F106	7.5A
F107	15A
F108	10A
F109	10A
F110	5A
F111	5A
F115	15A
F118	15A
F119	5A
F120	15A
1F	20A
2F	20A
F112	3A
F116	3A
F117	3A
F113	7.5A
F114	7.5A

INDICATION LIGHT DETAILS

SL.NO	LAMP	DESCRIPTION
1	L1	PARKING BRAKE FAIL
2	L2	BATTERY INDICATION
3	L3	PARKING BRAKE APPLIED
4	L4	HYD.FILTER CHOCKED
5	L5	LUBE OIL LOW INDICATION
6	L6	HYDRAULIC LEVEL LOW INDICATION
7	L7	GEAR-1 INDICATION
8	L8	GEAR-2 INDICATION
9	L9	HEAD LAMP HIGH/LOW BEAM
10	L10	TURNING INDICATION
11	L11	PRE-HEATING INDICATION
12	L12	HIGH SPEED INDICATION
13	L13	NEUTRAL INDICATION
14	L14	WHEEL CENTERING POSITION
15	L15	FUEL RESERVE INDICATION
16	L16	TEMP. HIGH INDICATION
17	REVERSE	REVERSE INDICATION
18	L18	PARKING LIGHT IND IN CLUSTER
20	WIF	WATER IN FUEL INDICATION(Indication Lamp Included in Harness)

ENGINE INTERFACING (K-TYPE) HARNESS LIST(for reference only,ask for latest revision & part number)

ENGINE	CAPACITY (HP)	PART NUMBERS
E1	74	101010508007
	110	101040528109
E2	74	101100001278
	110	101100001277
E3	74	200100001124*
	110	200100002074*

SYMBOLS

NAME	SYMBOL	NAME	SYMBOL
Connector	1 2	Surge Suppressor	
Male Female Terminal		Lamps Bulb, LED	
NO,NC Contacts		Variable Resistor	
Push Button		Buzzer	
Fuse		Source, Destination	
Pressure Switch	P	Battery	+ VE - VE
Proximity Sensor	Fe		
Flow Sensor			
Relay Coil	A1 A2		
Selector Switch			
DC Motor	M		

DATE	REV	ECN	DESCRIPTION	BY	APVD.

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SIZE A3

MODEL : ---

DRAWN	TKK	DATE 11.02.2021
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REF./OLD PART NO.

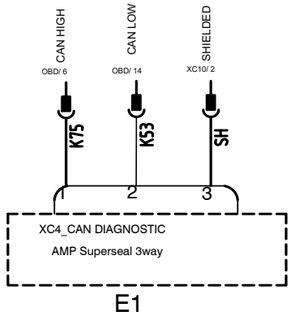
AJAX ENGINEERING PRIVATE LIMITED

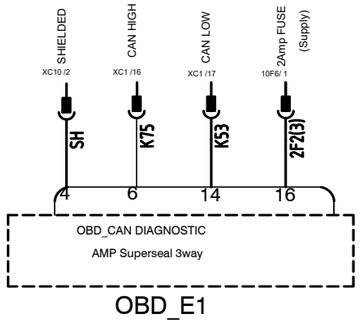
DESCRIPTION: NOTE, COMPONENTS DETAILS

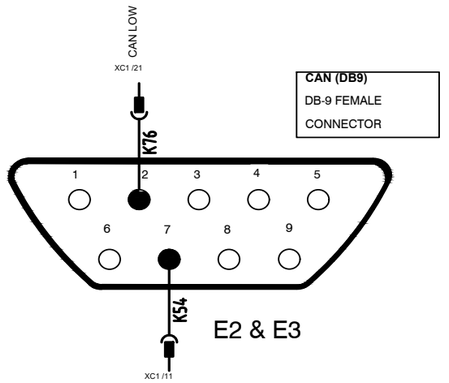
PART NO. 101100001659

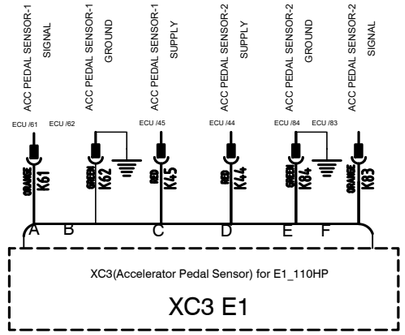
SHEET 12B OF 14 REV C

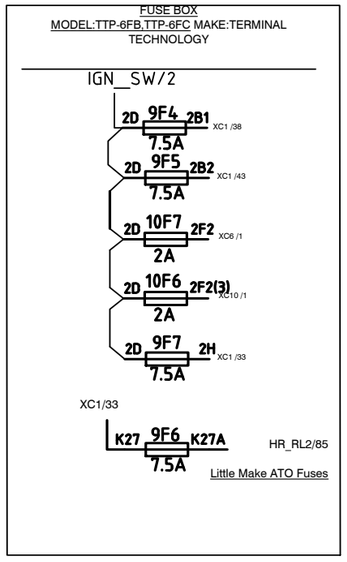
ANNEXURE-1

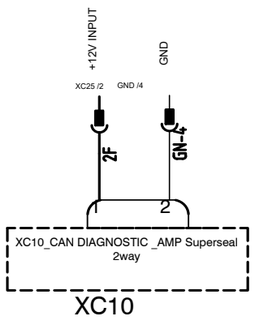


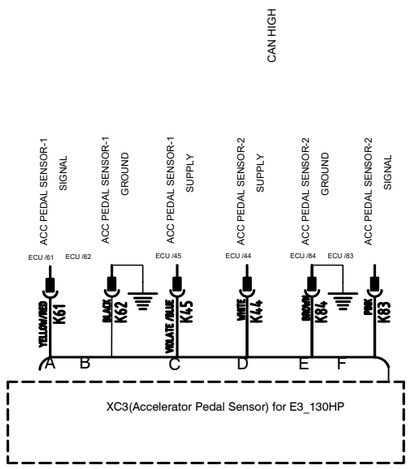


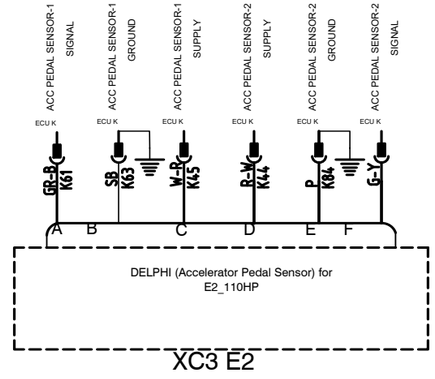












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SIZE: A3

MODEL : ---

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REF./OLD PART NO.		

AJAX ENGINEERING PRIVATE LIMITED

DESCRIPTION: Telematics, Accelerator Pedal Sensor, CAN Diagnostics, Fuse box Details

PART NO. 101100001659

SHEET 12C OF 14 REV C

ANNEXURE-1

X101
TO RELAY / FUSE PCB BOARD CONNECTOR: TYCO 18-PIN MODEL
NO: 1-0967624-1

SL.NO	PIN NO.	PIN DETAILS
1	1	K110(NO)
2	2	K109(NO)
3	3	K108 (NC)
4	4	F112
5	5	K108 (A2 COIL)
6	6	K108(NO)
7	7	F116
8	8	K102 (A1 COIL)
9	9	K108 (A1 COIL)
10	10	F115
11	11	K105 (A2 COIL)
12	12	F104
13	13	F114
14	14	F111
15	15	K107 (A1 COIL)
16	16	F113
17	17	F110
18	18	K105(NO)

X102
TO RELAY / FUSE PCB BOARD CONNECTOR: TYCO 12-PIN MODEL
NO: 1-0967622-3

SL.NO	PIN NO.	PIN DETAILS
1	1	F112
2	2	F113
3	3	F116
4	4	F118
5	5	F111
6	6	K106 (COM)
7	7	F109
8	8	F110
9	9	K106 (NO)
10	10	F107
11	11	F108
12	12	K104 (COM)

X103
TO RELAY / FUSE PCB BOARD CONNECTOR: TYCO 15-PIN MODEL
NO: 1-0967623-2

SL.NO	PIN NO.	PIN DETAILS
1	1	F118
2	2	F105
3	3	K103 (A2 COIL)
4	4	K110 (A1 COIL)
5	5	F104
6	6	K102 (NO)
7	7	F103
8	8	F103
9	9	K109 (A1 COIL)
10	10	F102
11	11	F103
12	12	K101 (COM)
13	13	F101
14	14	K101 (NC)
15	15	K101 (A1 COIL)

X104
TO RELAY / FUSE PCB BOARD CONNECTOR: TYCO 9-PIN MODEL
NO: 1-0967621-1

SL.NO	PIN NO.	PIN DETAILS
1	1	K113
2	2	K113 (+)
3	3	K113
4	4	K113
5	5	K113(C)
6	6	K113 (31)
7	7	K113
8	8	K113
9	9	K113 (R)

X105
TO RELAY / FUSE PCB BOARD CONNECTOR: TYCO 15-PIN MODEL
NO: 1-0967623-4

SL.NO	PIN NO.	PIN DETAILS
1	1	K111 (NC)
2	2	K111 (NO)
3	3	K111 (COM)
4	4	K105 (NO)
5	5	K111 (A1 COIL)
6	6	K112 /8
7	7	K112 /7
8	8	K111 (A2 COIL)
9	9	K112 /9
10	10	K112 /1
11	11	K112 /4
12	12	K112 /6
13	13	K112 /2
14	14	K112 /5
15	15	K112 /3

X106
TO RELAY / FUSE PCB BOARD CONNECTOR: TYCO 21-PIN MODEL
NO: 1-0967625-1

SL.NO	PIN NO.	PIN DETAILS
1	1	F107
2	2	F108
3	3	K105 (COM)
4	4	K106 (A1 COIL)
5	5	F117
6	6	K108 (COM)
7	7	K105 (A1 COIL)
8	8	K104 (NO)
9	9	K107 (COM)
10	10	F106
11	11	F106
12	12	K106 (NC)
13	13	F112
14	14	K104 (A1 COIL)
15	15	K110 (A2 COIL)
16	16	K103 (A1 COIL)
17	17	K101 (NO)
18	18	K103 (COM)
19	19	F105
20	20	K102 (COM)
21	21	K103 (NO)

FOR INDIVIDUAL CONNECTOR IDENTIFICATION PLEASE REFER NEXT PAGE WITH RELAY BOARD IMAGE

DATE	REV	ECN	DESCRIPTION	BY	APVD.

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SIZE A3

MODEL : ---

DRAWN TKK DATE 11.02.2021
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REF./OLD PART NO.

AJAX ENGINEERING PRIVATE LIMITED

DESCRIPTION: Relay Board Connector Details

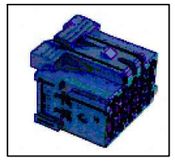
PART NO. 101100001659

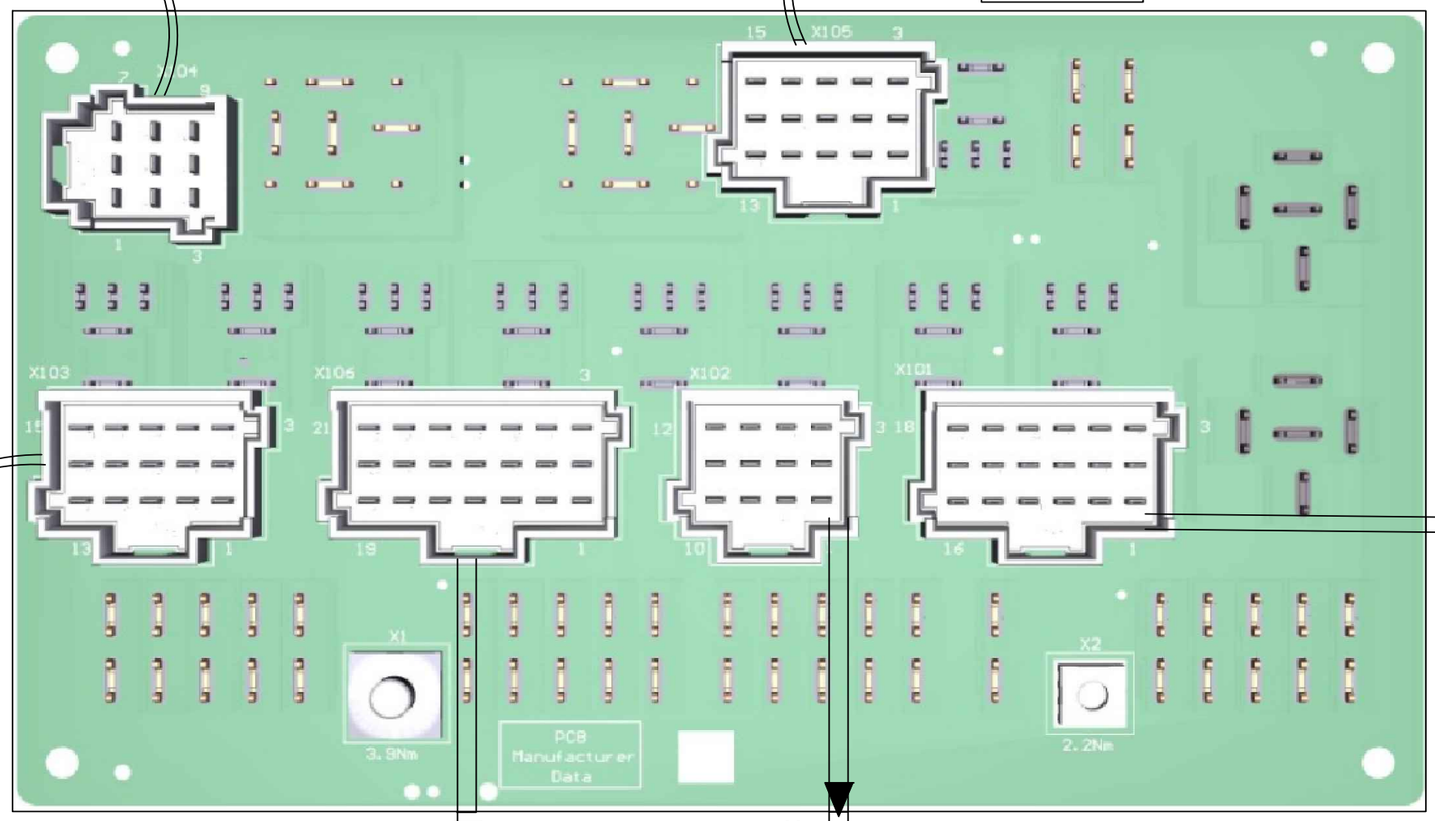
SHEET 12D OF 14 REV C

ANNEXURE-1

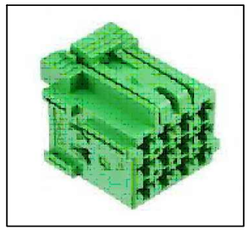
X104

X105



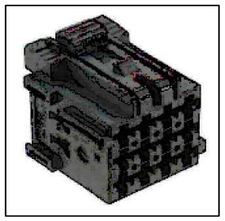


X103



X106

X102



X101

DATE	REV	ECN	DESCRIPTION	BY	APVD.

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SIZE: A3

MODEL : ---

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REF./OLD PART NO.

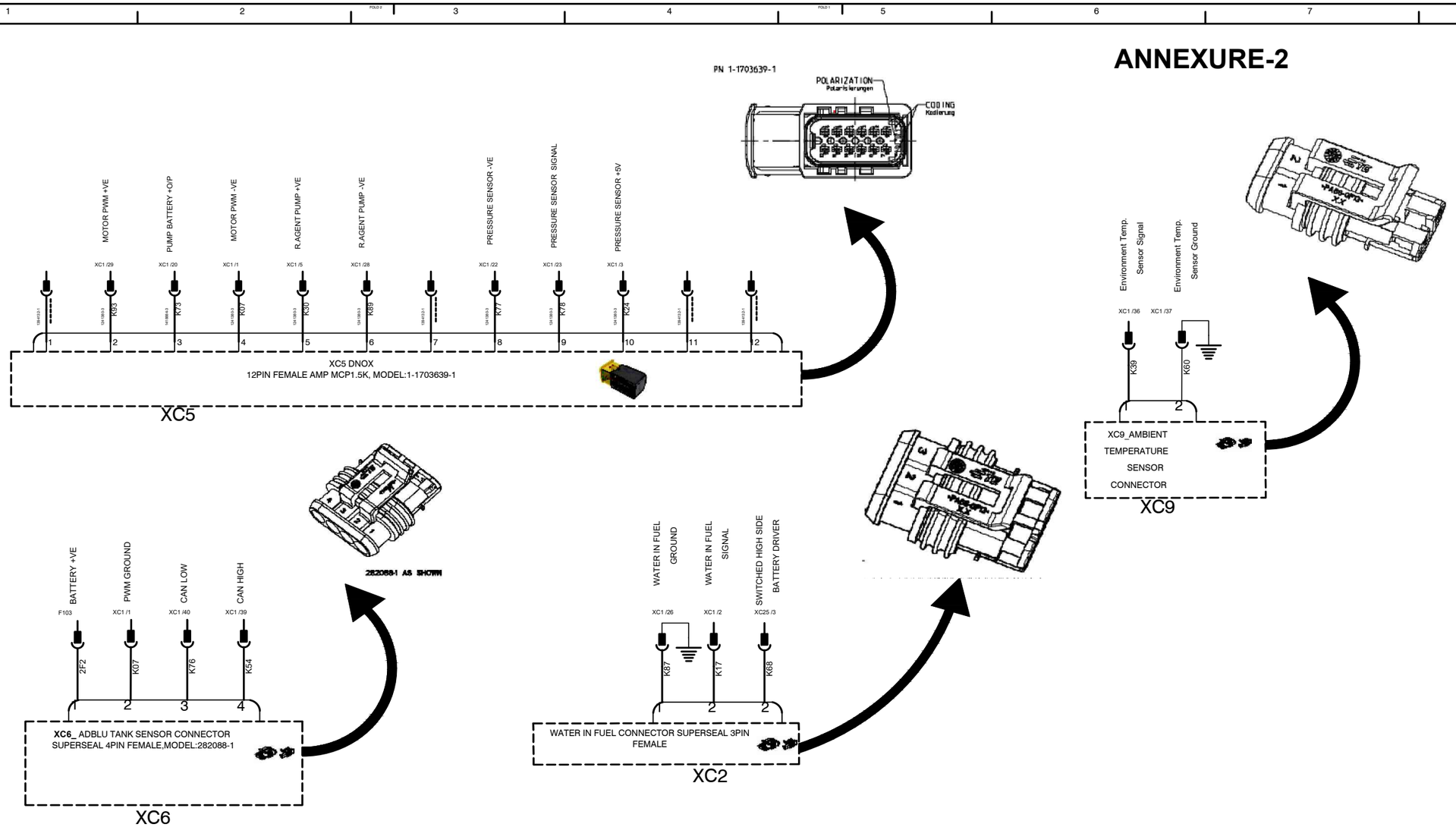
AJAX ENGINEERING PRIVATE LIMITED

DESCRIPTION: Relay Board Connector Image

PART NO. 101100001659

SHEET 12E OF 14 | REV C

ANNEXURE-2



DATE	REV	ECN	DESCRIPTION	BY	APVD.

GENERAL NOTE:-
DO NOT SCALE THE DRAWING.
ALL DIMESIONS ARE IN mm.

SIZE A3

MODEL : ---

DRAWN	TKK	DATE 11.02.2021
CHECKED	TKK	DATE 11.02.2021
APPROVED	TKK	DATE 11.02.2021
REF./OLD PART NO.		

AJAX ENGINEERING PRIVATE LIMITED

DESCRIPTION: ECU pin Details with reference and functionality

PART NO. 101100001659

SHEET 13A OF 14 REV C

ANNEXURE-2

ENGINE ECU E1_110HP (47 PIN CONNECTOR) WITH REF. & FUNCTIONALITY

PIN NO A	FROM (A)	TO (B)	PIN NO B	FUNCTION	REF.	REF. FUNCTION
1	K01	XC8	A	BATTERY B+ 12V (RED)	9F1	BATTERY B+ 12V (RED)
2	K02	XC8	B	- NEGATIVE (BLACK)	GND	- NEGATIVE (BLACK)
7	K07	XC5	4	FROM REDUCTION AGENT PUMP MOTOR PWM GROUND	XC1 /1	MOTOR PWM -VE
17	K17	XC2	2	TO WATER IN FUEL SIGNAL	XC1/ 2	WATER IN FUEL SIGNAL
24	K24	XC5	10	TO REDUCTION AGENT PUMP PRESSURE SENSOR SUPPLY (+5V)	XC1 /3	PRESSURE SENSOR +5V
29	K29	XC25	9	TO SWITCHED BATTERY HIGH SIDE DRIVER FOR STARTER RELAY	XC1 /4	+VE I/P TO CRANK FROM ECU
30	K30	XC5	5	TO REDUCTION AGENT PURGING PUMP SUPPLY +	XC1 /5	R.AGENT PUMP +VE
35	K35	XC25	1	FROM T50 SWITCH FOR START COMMAND	XC1 /6	CRANK SIGNAL
44	K44	XC3	4	TO ACCELERATOR PEDAL SENSOR2 SUPPLY	XC1 /8	POSITION2-INPUT
45	K45	XC3	3	TO ACCELERATOR PEDAL SENSOR1 SUPPLY	XC1 /9	POSITION1-INPUT
54	K54	XC25	4	TO CONTROLLER AREA NETWORK(0) HIGH	XC1 /11	CAN HIGH
61	K61	XC3	1	FROM ACCELERATOR PEDAL POSITION SENSOR1 SIGNAL	XC1 /12	POSITION-1 SIGNAL
62	K62	XC3	2	TO ACCELERATOR PEDAL POSITION SENSOR1 GROUND	XC1 /13	POSITION-1 -VE(GND)
68	K68	XC25	3	TO SWITCHED BATTERY HIGH SIDE DRIVER	XC1 /15	HOOTER RELAY 12V
75	K75			CAN1 HIGH		
53	K53			CAN1 LOW		
71	K71	XC25	10	TO STARTER RELAY OUTPUT	XC1 /18	-VE I/P TO CRANK FROM ECU
72	K72			TO GRIDER HEATER RELAY OUTPUT		
73	K73	XC5	3	TO REDUCTION AGENT PUMP BATTERY PLUS O/P	XC1 /5	R.AGENT PUMP +VE
76	K76	XC25	5	TO CONTROLLER AREA NETWORK 0 (LOW)	XC1 /21	CAN LOW
77	K77	XC5	8	TO REDUCTION AGENT PUMP PRESSURE SENSOR GROUND	XC1 /22	PRESSURE SENSOR -VE
78	K78	XC5	9	FROM REDUCTION AGENT PUMP PRESSURE SENSOR SIGNAL	XC1 /23	PRESSURE SENSOR SIGNAL
83	K83	XC3	6	FROM ACCELERATOR PEDAL POSITION SENSOR2 SIGNAL	XC1 /24	POSITION-2 SIGNAL
84	K84	XC3	5	TO ACCELERATOR PEDAL POSITION SENSOR 2 GROUND	XC1 /25	POSITION-2 (-)VE (GND)
87	K87	XC2	1	TO WATER IN FUEL SWITCH GROUND	XC1/ 26	WATER IN FUEL GROUND
88	K88	XC25	2	FROM IGNITION SWITCH FOR KEY ON	FUSE	IGN ON
89	K89	XC5	6	TO REDUCTION AGENT PURGING PUMP GROUND	XC1 /28	R. AGENT PUMP -VE
93	K93	XC5	2	TO REDUCTION AGENT PUMP MOTOR PWM +VE	XC1 /5	R.AGENT PUMP +VE
27	K27	XC25	7	TO HOOTER RELAY OUTPUT	XC1 /33	TO HOOTER RELAY -VE
36	K39	XC9	1	FROM ENVIRONMENTAL TEMPERATURE SENSOR SIGNAL	XC1 /36	Environment Temp. Sensor Signal
37	K60	XC9	2	FROM ENVIRONMENTAL TEMPERATURE SENSOR GROUND	XC1 /37	Environment Temp. Sensor Ground
38	2B1	F101	F101	FROM NOX UPSTREAM SENSOR SUPPLY		
39	K54_C0	XC6	4	TO CAN HIGH FOR LEVEL,QUALITY & TEMPERATURE SENSOR		
40	K76_C0	XC6	3	TO CAN LOW FOR LEVEL,QUALITY & TEMPERATURE SENSOR		
41	GN1	GND		FROM NOX UPSTREAM SENSOR GROUND		
42	GN2	GND		FROM CAN ID		
43	2B2	F102		FROM NOX DOWNSTREAM SENSOR SUPPLY		
44	GN3	GND		FROM NOX DOWNSTREAM SENSOR GROUND		

ENGINE ECU E1_74HP (94 PIN CONNECTOR) WITH REF. & FUNCTIONALITY

PIN NO B	FROM (A)	TO (B)	PIN NO B	FUNCTION	REF.	REF. FUNCTION
1	K01	S-5	2	+12 VOLT SUPPLY FOR ECU	ECU/1	ECU POWER 1
3	K03	S-6	2	GROUND FOR ECU	ECU/1	ECU GROUND 1
5	K05	S-5	3	+12 VOLT SUPPLY FOR ECU	ECU/2	ECU POWER 2
2	K02	S-6	3	GROUND FOR ECU	ECU/2	ECU GROUND 2
4	K04	S-5	4	+12 VOLT SUPPLY FOR ECU	ECU/3	ECU POWER 3
6	K06	S-6	4	GROUND FOR ECU	ECU/3	ECU GROUND 3
17	K17	WFP/2	2	WATER IN FUEL SIGNAL	ECU/17	WATER IN FUEL SIGNAL
27	K27	HR/2	2	HOOTER RELAY COIL(2)	ECU/27	HOOTER RELAY COIL(2)
29	K29	SR/1	1	STARTER RELAY COIL(1)	ECU/29	STARTER RELAY COIL(1)
35	K35	XC25 /1	1	IGN SWITCH START COMMAND	ECU/35	IGN SWITCH START COMMAND
44	K44	XC3 /4	4	ACC PEDAL SENSOR-2 SUPPLY	ECU/44	ACC PEDAL SENSOR-2 SUPPLY
45	K45	XC3 /3	3	ACC PEDAL SENSOR-1 SUPPLY	ECU/43	ACC PEDAL SENSOR-1 SUPPLY
53	K53	OBD/14	14	CAN-1 LOW	TR /2	CAN-1 LOW
54	K54	XC25 /4	4	CAN-0 HIGH	ECU/54	CAN-0 HIGH
61	K61	XC3 /1	1	ACC PEDAL SENSOR-1 SIGNAL	ECU/61	ACC PEDAL SENSOR-1 SIGNAL
62	K62	XC3 /2	2	ACC PEDAL SENSOR-1 GROUND	ECU/62	ACC PEDAL SENSOR-1 GROUND
68	K68	GHR /1	1	POWER SUPPLIES (ECU RELATED O/P)	XC1 /68	GRID HEATER RELAY COIL(1) SUPPLY
71	K71	SR/2	2	STARTER RELAY COIL (2)	ECU /71	STARTER RELAY COIL(2)
72	K72	GHR/2	2	GRID HEATER RELAY COIL (2)	ECU /72	GRID HEATER RELAY COIL (2)
75	K75	OBD/6	6	CAN-1 HIGH	TR /1	CAN-1 HIGH
76	K76	XC25 /5	5	CAN-0 LOW	ECU/76	CAN-0 LOW
83	K83	XC3 /6	6	ACC PEDAL SENSOR-2 SIGNAL	ECU/83	ACC PEDAL SENSOR-2 SIGNAL
84	K84	XC3 /5	5	ACC PEDAL SENSOR-2 GROUND	ECU/84	ACC PEDAL SENSOR-2 GROUND
87	K87	WFP /1	1	WATER IN FUEL SWITCH GROUND	ECU/27	WATER IN FUEL SWITCH GROUND
88	2F	S-4 /2	2	IGNITION SWITCH 0N	ECU/88	IGNITION SWITCH ON TO ECU

× THIS IS ONLY APPICABLE FOR E1 ENGINE ONLY
× FOR E2 ENGINE COLOUR CODE WILL APPEAR

DATE	REV	ECN	DESCRIPTION	BY	APVD.

GENERAL NOTE:-
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SIZE A3

MODEL : ---

DRAWN	TKK	DATE 11.02.2021
CHECKED	TKK	DATE 11.02.2021
APPROVED	TKK	DATE 11.02.2021

REF./OLD PART NO.

AJAX ENGINEERING PRIVATE LIMITED

DESCRIPTION: Connector Details

PART NO. 101100001659

SHEET 13B OF 14 REV C

ANNEXURE-3

ELECTRICAL SAFETY PRECAUTION		
SL.NO	CONSTRAINTS	PRECAUSTION
1	ELECTRICAL RISKS	1.1 ANY OPERATION ON THE ELECTRIC SYSTEM OR THE BATTERY MUST BE CARRIED OUT BY A QUALIFIED PERSON. BEFORE ANY OPERATION ON THE ELECTRIC SYSTEM, DISCONNECT THE BATTERY BY REMOVING THE KEY FROM THE BATTERY MASTER SWITCH. CHECK THAT THE CABLES AND TERMINALS OF THE ELECTRICAL CONNECTIONS SHOW NO SIGN OF CORROSION, CRACKS OR BURNS 1.2 THE CABLES AND TERMINALS OF THE ELECTRICAL CONNECTIONS SHOW NO SIGN OF CORROSION, CRACKS OR BURNS; IF SO IMMEDIATELY CONTACT YOUR LOCAL AJAX DEALER. IN THE EVENT OF AN ELECTRICAL FAULT, DO NOT ATTEMPT TO START THE VEHICLE BY RUNNING IT DOWNHILL
2	RISK OF SHORT-CIRCUIT	2.1 DO NOT UNDER ANY CIRCUMSTANCES START THE ENGINE BY SHORT-CIRCUITING THE STARTER MOTOR TERMINAL OR THE BATTERY.
3	PRECAUTIIONS	3.1 BSIV ENGINE SHOULD CRANK AFTER BATTERY CUT OFF SWITCH & IGNITION KEY ON. NEED TO CONSIDER 30SEC DELAY BEFORE PERFORMING THE CRANKING OPERATION
		3.2 ERROR CODES (SPN/FMA) SHOULD BE FOLLOWED WITH THE INSTRUCTION PROVIDED BY BSIV CAN J1939 STANDARDS WITH RESPECT TO ENGINE SUPPLIER
		3.3 BEFORE CARRYING OUT ANY OPERATION ON THE ELECTRIC SYSTEM, ALWAYS DISCONNECT THE BATTERY BY REMOVING THE KEY FROM THE BATTERY MASTER SWITCH. 3.4 IF YOU NEED TO REPLACE THE BATTERY, FIRST DISCONNECT THE NEGATIVE AND THEN THE POSITIVE CABLE. TO RECONNECT THE BATTERY, FIRST CONNECT THE POSITIVE AND THEN THE NEGATIVE CABLE AND THEN REINSERT THE KEY IN THE BATTERY MASTER SWITCH
		3.5 TO RECHARGE THE BATTERY, CORRECTLY CONNECT THE AUXILIARY CABLES TO THE TERMINALS. NEVER SHORT-CIRCUIT THEM
		3.6 DURING BATTERY RECHARGING, FLAMMABLE HYDROGEN GAS IS PRODUCED THEREFORE; LEAVE THE BATTERY COMPARTMENT OPEN TO ENSURE MORE EFFECTIVE VENTILATION
		3.7 NEVER CHECK THE BATTERY CHARGE BY PLACING METAL OBJECTS ON THE TERMINALS.
4	FIRE IN ELECTRIC SYSTEM	4.1 SHORT-CIRCUITS IN THE ELECTRIC SYSTEM MAY CAUSE A FIRE.
		4.2 CHECK THAT THERE ARE NO LOOSE OR DAMAGED PARTS IN THE SYSTEM. TIGHTEN ANY LOOSE CONNECTORS OR WIRING TERMINALS. IF ANY CABLES OR CONNECTIONS ARE CORRODED AND/OR DAMAGED, IMMEDIATELY CONTACT YOUR LOCAL AJAX DEALER. 4.3 ANY OPERATION ON THE ELECTRIC SYSTEM OR THE BATTERY MUST BE CARRIED OUT BY A QUALIFIED PERSON. BEFORE ANY OPERATION ON THE ELECTRIC SYSTEM, DISCONNECT THE BATTERY BY REMOVING THE KEY FROM THE BATTERY MASTER SWITCH.
		4.4 DO NOT SMOKE AND AVOID SPARKS OR FLAMES IN THE RECHARGING AREA TO PREVENT THE OUTBREAK OF FIRE.
		4.5 RECHARGE THE BATTERY ONLY IN ADEQUATELY VENTILATED PLACES TO PREVENT ACCIDENTAL EXPLOSIONS DUE TO GAS BUILDUP.

DATE	REV	ECN	DESCRIPTION	BY	APVD.

GENERAL NOTE:-
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SIZE A3

MODEL : ---

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REF./OLD PART NO.

AJAX ENGINEERING PRIVATE LIMITED

DESCRIPTION: ELECTRICAL SAFETY PRECAUTION

PART NO. 101100001659

SHEET 14 OF 14 REV C

AJAX
MAKES CONCRETE SENSE

AJAX ENGINEERING PRIVATE LIMITED

DAILY LOG FOR PRODUCTION AND MAINTENANCE / **ARGO**.....

CUSTOMER: SL NO.....

EQP MODEL: EQP SL. No: Total Hours Run: DATE:.....

Sl No	Date	TIME Started (HMR)	TIME Stopped (HMR)	No. Of Hours Worked	No Of Trips Done	Engine Oil Pressure	Water Temp	REMARKS Any Parts Replaced / Service carried out
1								
2								
3								
4								
5								
6								

MAINTENANCE CHECKS

1. Check **no leakage** on the machine.
2. Machine **cleaning** after work and **No concrete in the drum**.
3. Check **Battery Terminals and Battery** condition.
4. Check for **loose connection** in Hydraulic / Electrical.
5. Greasing all points. **# King pin Bush**
6. Check and top up **oil & Coolant - Engine / Hydraulic Tank / Drum gear box/ Hub/ Brake**
7. Check and correct the **Tyre Pressure** and inspect tyre condition.
8. **Air Cleaner / Water pump filter / Diesel filter** condition and cleaning.
9. D.R.O –Tarring
10. Propeller shaft **coupling Bolts**.

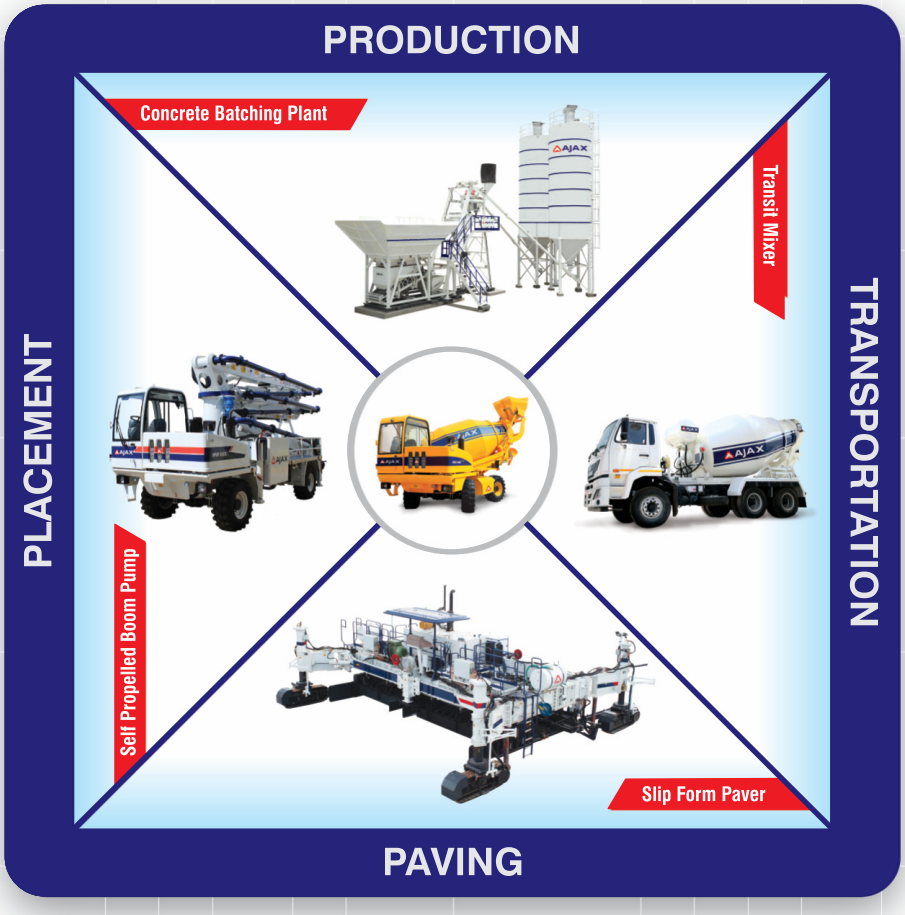
Operator Signature,

Name:

Site Incharge Signature,

Name :

360° CONCRETING SOLUTIONS



AJAX

MAKES CONCRETE SENSE

AJAX ENGINEERING PRIVATE LIMITED

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149, 150& 151, KIADB Ind Area, Obedenahalli, Doddaballapur - 561 203. Karnataka
IP 9-11, 17 & 18, KIADB Ind Area, Kudumalakunte, Gowribidanur - 561 208. Karnataka

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