COMPONENT
BULLETIN SB-1110-1900

MARINE PROPULSION CONTROL

PNEUMATIC LOGIC AND CONTROL PANEL

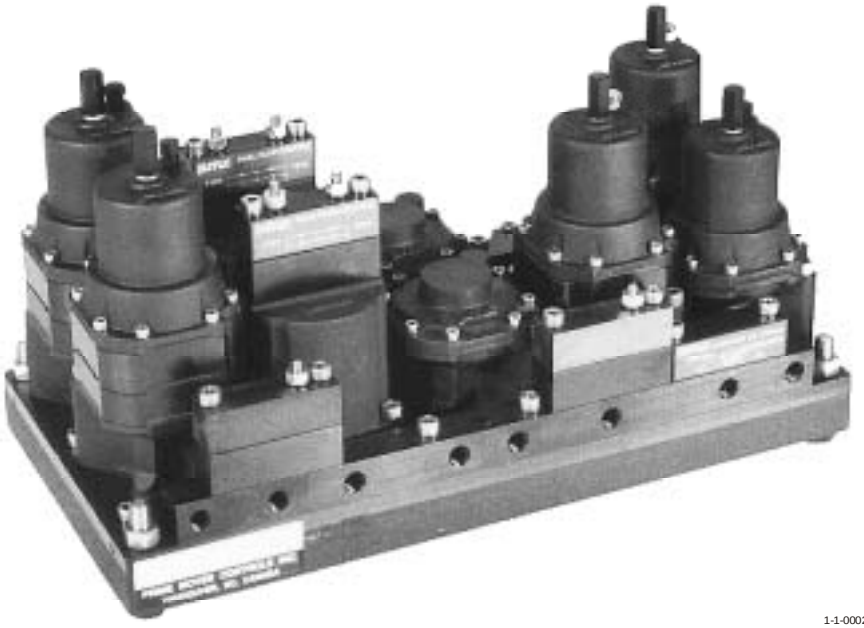
Type MPC-9H Control Panel

APPLICATION

Propulsion controls for small and large vessels with fixed pitch propellers, reversing gears and hydraulic clutches.

FEATURES

- Fixed and proportional timed reversing Interlock
- Separate Clutch Pressure interlock
- Power Boost
- Controlled Engine Acceleration
- Signal for Brake Control
- High Flow Manifold Mounted Components
- Compact Size
- Easy Installation



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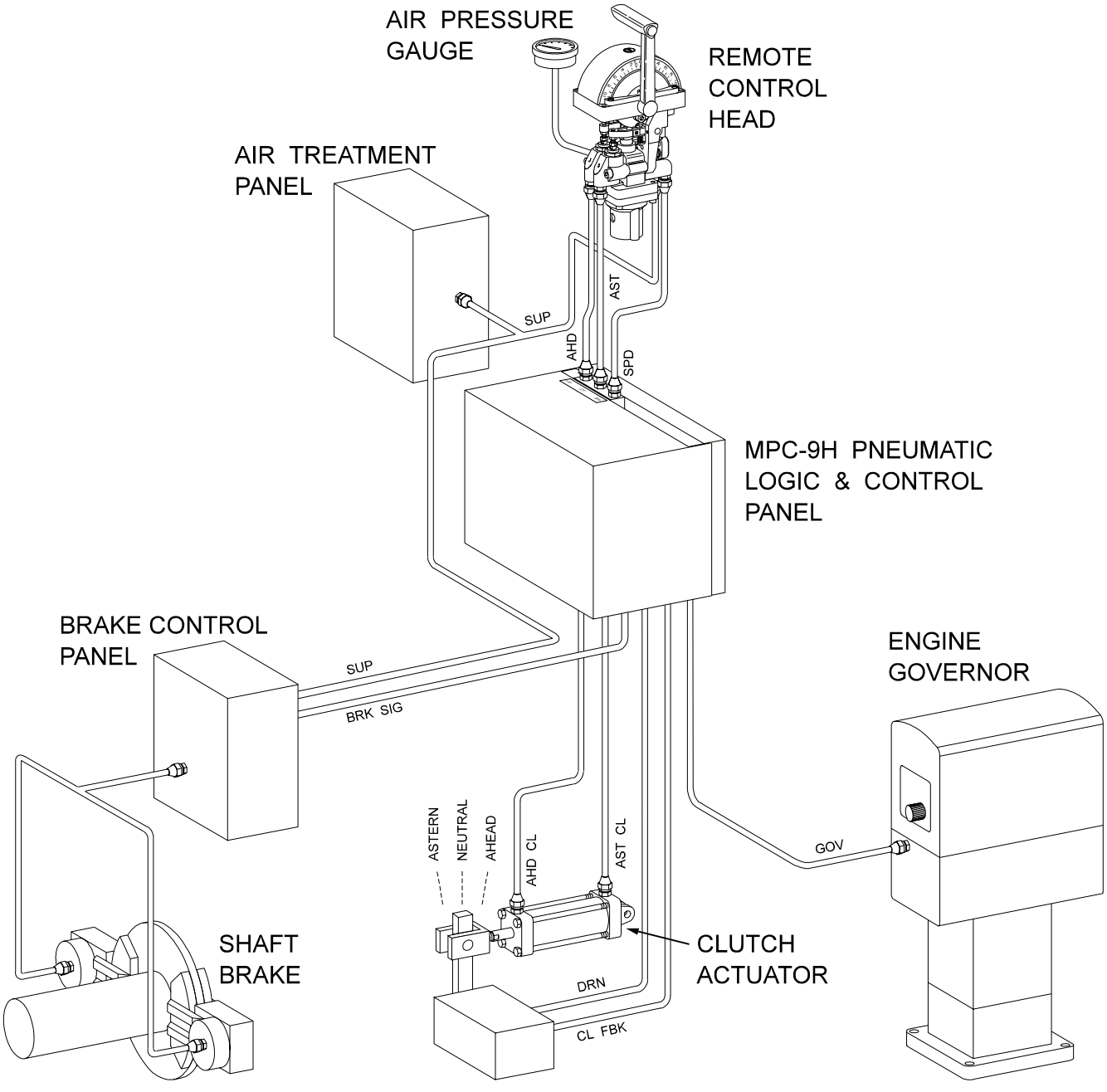
PRIME MOVER CONTROLS INC.
VANCOUVER, BC, CANADA

DESIGN MANUFACTURE AND SERVICE OF MARINE AND INDUSTRIAL CONTROL COMPONENTS AND SYSTEMS

Electronic - Pneumatic - Hydraulic - Mechanical

TYPICAL PROPULSION CONTROL SYSTEM

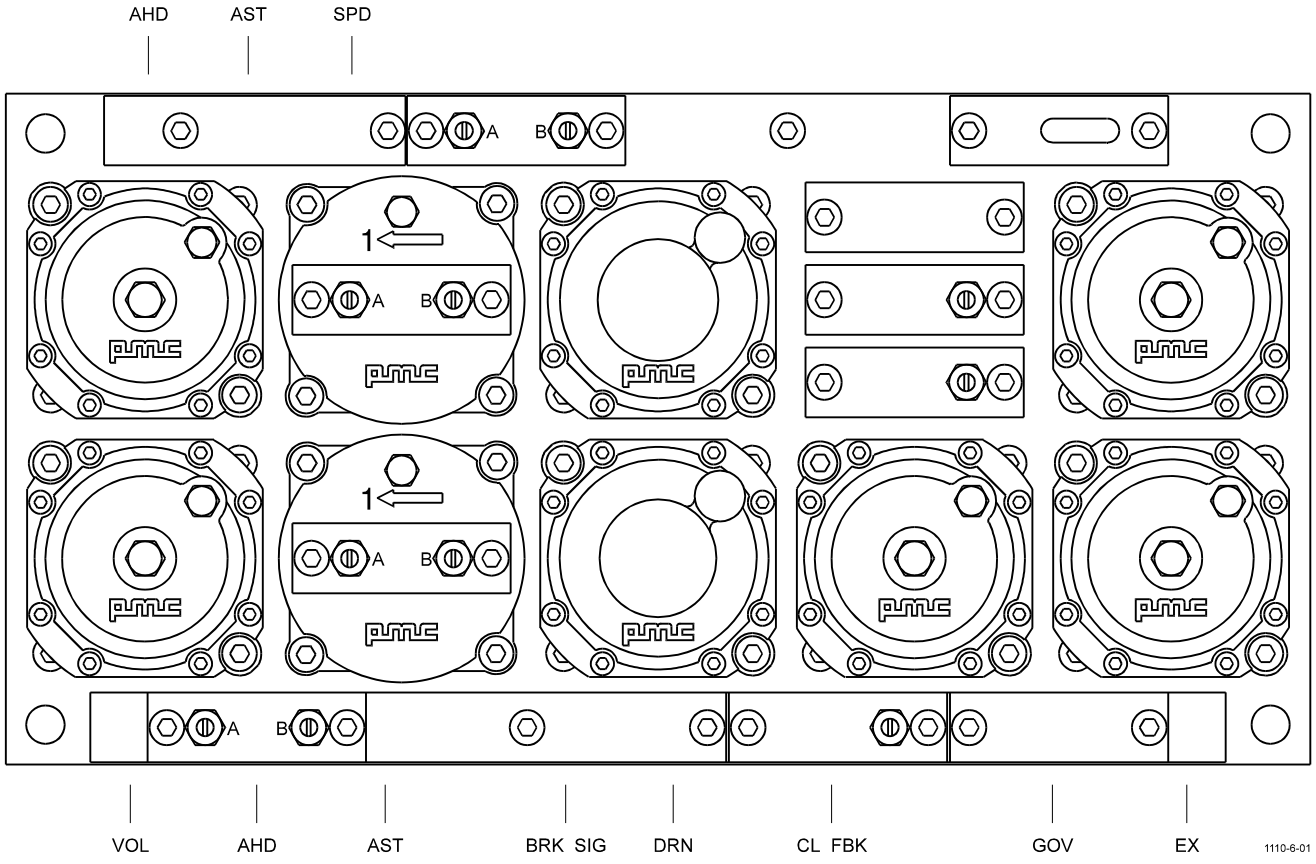


GENERAL DESCRIPTION

The MPC-9H pneumatic panel is a compact and modular design that provides propulsion control for vessels with fixed pitch propellers, reversing gears and hydraulic clutches. The MPC panel contains all necessary logic, interlocks and timing to ensure that the engine and reverse gear operate properly, smoothly and safely. A pneumatic signal for operating a shaft brake is also provided.

A laminated manifold with air channels eliminates the need for piping between the individual valves. Installation is fast and simple. All valves are specifically designed for marine use. They are very high quality, rugged, proven, base mounted valves and can be removed for servicing without disconnecting any pipes.

All valves are first tested individually and then, as part of the MPC-9H control for operational performance before shipping. All timing and pressure settings are documented and extensive service information is available on all components.



FEATURES

Fixed and Proportional Timed Reversing Interlock:

Provides a reversing time delay by maintaining neutral position for a predetermined time, depending on the previous maneuver. Although the remote control lever is shifted directly through neutral, the time delay before reversing ensures that the propeller RPM has decreased to an acceptable level, or to a complete stop if a shaft brake is used.

The **Fixed Timed Reversing Interlock** determines the minimum reversing time delay. Timing is independently adjustable from ahead to astern and from astern to ahead. The build-up of the fixed time delay can also be provided with independent adjustments. The fixed timed reversing flow control adjustments do not interfere with the proportional timed reversing interlock.

The **Proportional Timed Reversing Interlock** provides a reversing time delay proportional to the magnitude and duration of the previous engine RPM setting. The base, ratio and delayed build-up of the proportional reversing interlock timing is independently adjustable from ahead to astern and from astern to ahead. Whichever of the fixed or proportional timed reversing interlock has longer timing will be in effect.

This arrangement gives fast maneuvering when reversing in the low power range, where stalling of the engine is unlikely. The time delay in neutral automatically becomes proportionately higher in the high power range maneuvers. The duration of the reversing time delay is not effected by the control lever being held in neutral during a reversal. There is no time delay when moving the remote control lever into neutral and then back into the direction of the previous maneuver.

Clutch Pressure Interlock:

Assures clutch lock-up before the engine RPM can be increased from any remote control station, preventing excessive wear of clutches. This is accomplished by blocking the governor speed-setting signal, except for the power boost, until the monitored hydraulic clutch pressure reaches a predetermined level during engagement. If the clutch pressure drops below the pre-set value, the interlock again blocks the governor speed setting signal and prevents potential clutch damage due to clutch pressure failure.

Power Boost:

Increases engine governor speed setting during clutch engagement. This provides increased engine torque and prevents stalling as the propeller load is applied. The power boost can be adjusted for desired magnitude and duration.

Controlled Engine Acceleration:

Limits rate of speed setting signal increase for efficient engine acceleration.

Shaft Brake Control:

Provides a signal for shaft brake activation while both clutches are disengaged. Optional adjustments are available as an integral part of the MPC-9H panel for a delay of brake application and/or release.

Operating Sequence:

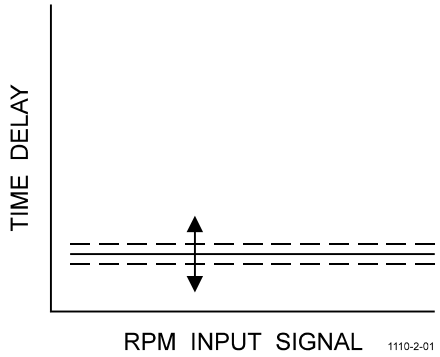
Sequence of events when the operator moves the remote control lever from ahead to astern and from astern to ahead:

- Governor speed setting is set to minimum RPM
- Clutch is disengaged
- Governor speed setting signal is blocked
- Shaft brake is applied
- Reverse gear remains in neutral and propeller shaft remains stopped relative to the length of time and amplitude of the previous maneuver
- Shaft brake is released
- Power boost is applied to a predetermined magnitude for a predetermined duration
- Clutch is engaged
- Governor speed setting signal is enabled after clutch lock-up

ADJUSTMENTS

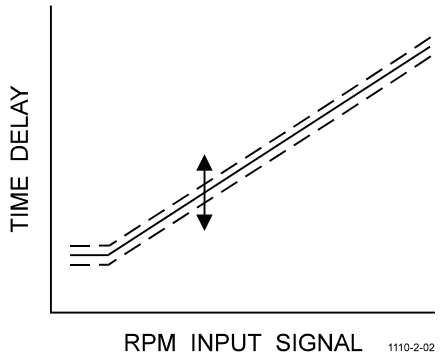
All of the above features are adjustable and are individually set and tested at the factory before shipping. They are also available in factory pre-set tamper proof configurations. The following adjustments make up the timed reversing interlock operation. Independent adjustments are provided for ahead to astern and from astern to ahead.

Minimum Delay Adjustment



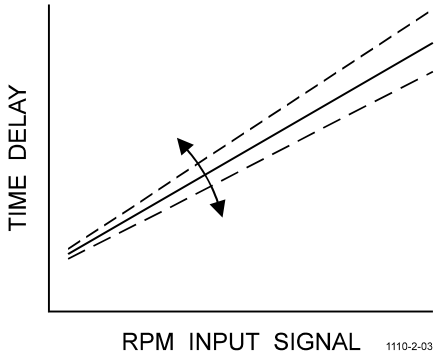
Adjusts, independently Ahead and Astern, the minimum time delay for low speed maneuvering. This adjustment has no effect on the proportional time delay.

Base Adjustment



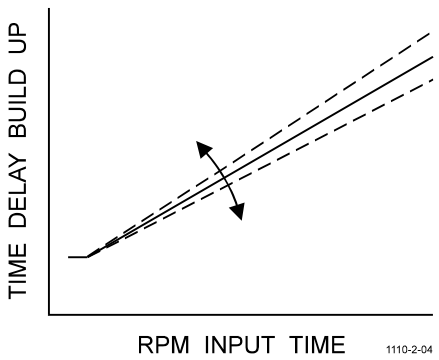
Adjusts independently the time delay over the entire range of governor speed setting signal. The base adjustment affects both the fixed and proportional time delay.

Ratio Adjustment

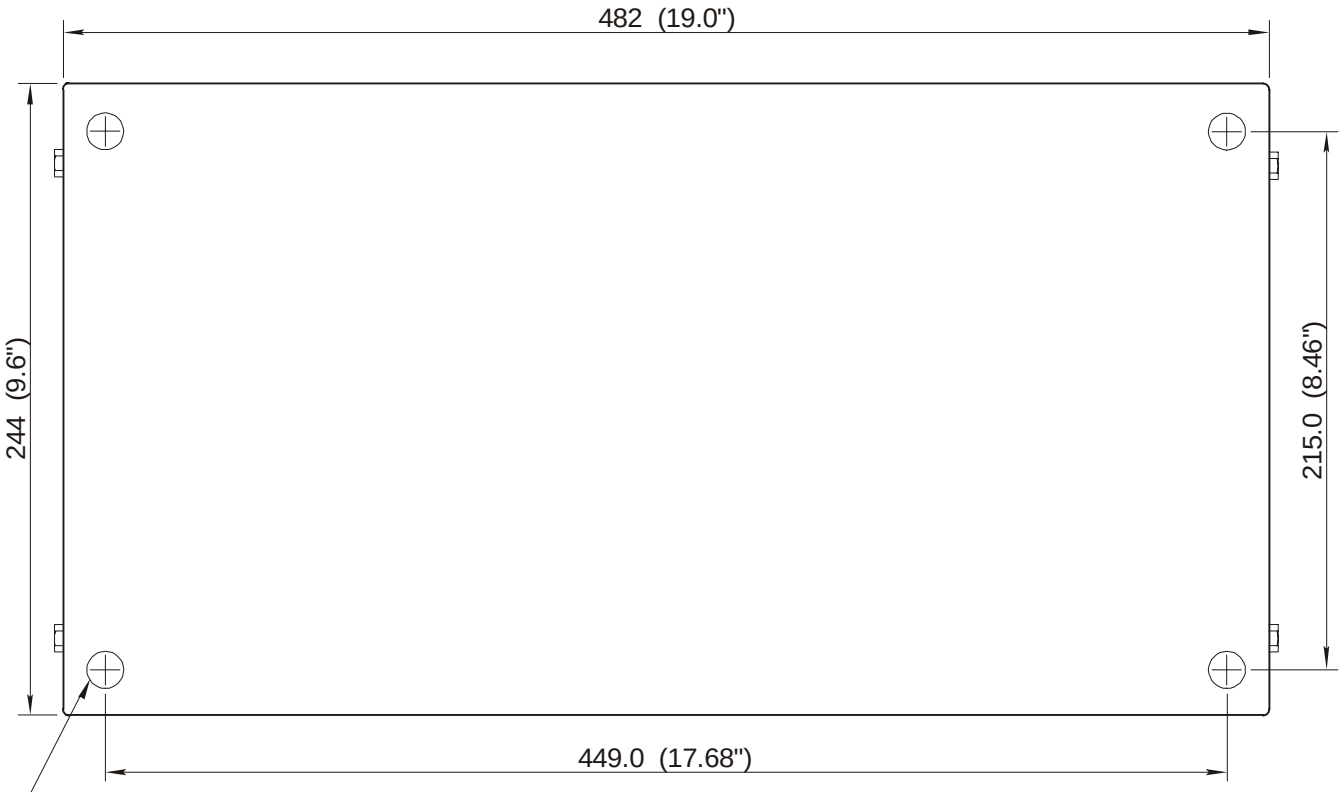


Adjusts the ratio of the governor speed setting signal to the time delay. This adjustment is only effective on the proportional time delay.

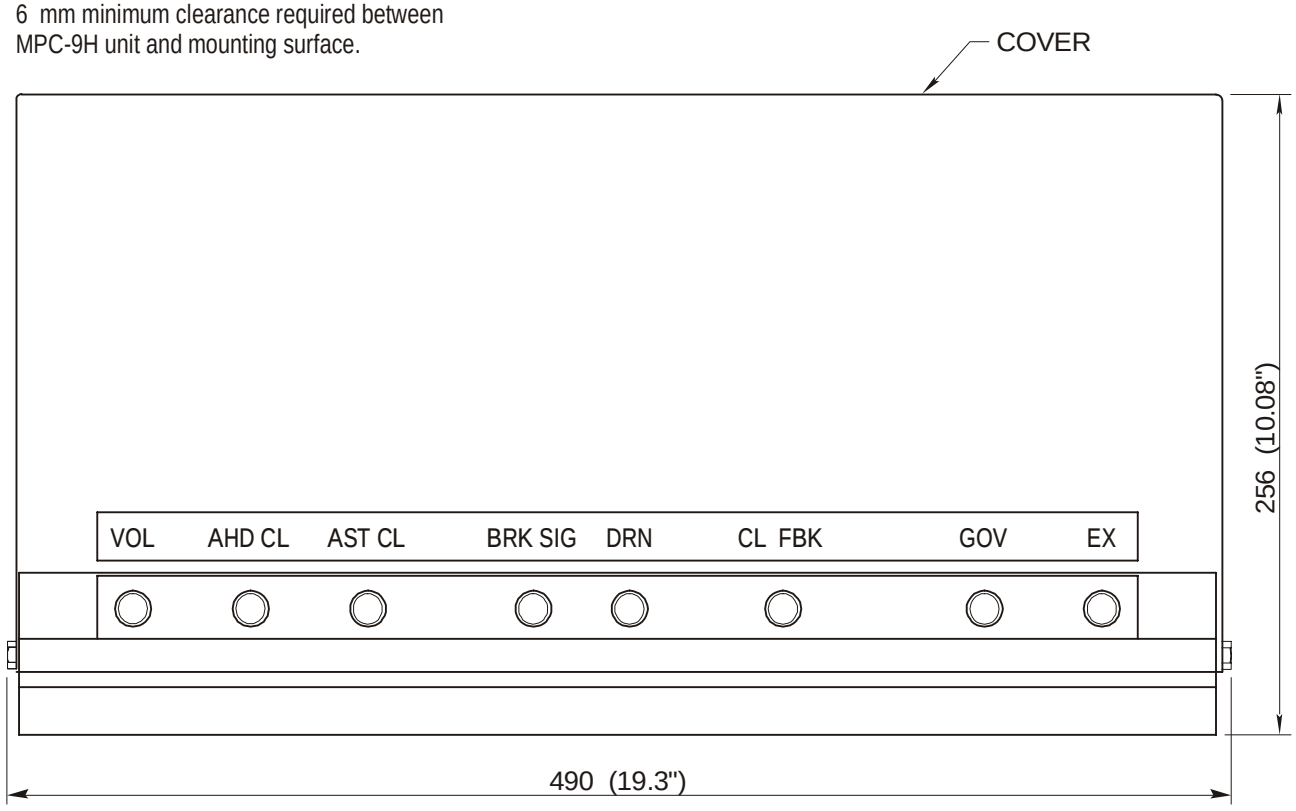
Time Delay Build Up Adjustment



Adjusts the rate of build up of the proportional time delay. An optional fixed time delay build up adjustment can also be provided.



4 MOUNTING HOLES IN BASE 14 (.55")
6 mm minimum clearance required between
MPC-9H unit and mounting surface.



DIMENSIONS ARE IN mm (INCHES)

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