

APPLICATION CASE STUDY #146

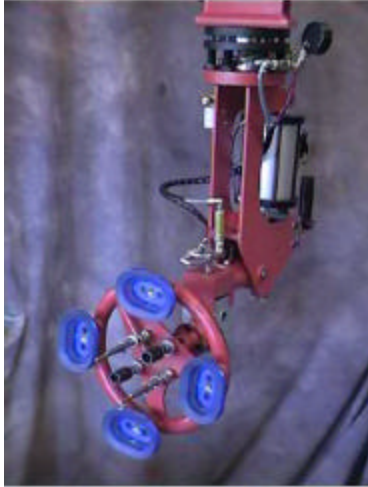
SIC Code:
3700

Product Handled:
Heavy Duty Truck Engine Flywheel

Machine Type:
RA-3P

HANDLING PROCEDURE

Pick up the flywheel from a dunnage tray, pitch it up ninety degrees and transfer it inside of the engine bell housing onto a guide pin. Two prestaged bolts on the flywheel are then fastened to the engine so that the manipulator can release the part.



PROBLEM

There are multiple parts to be handled. The dunnage and bellhousing create clearance restrictions above, below and around the part. This leaves the face of the flywheel as the only exposed surface for gripping. The orientation of the flywheel must be matched to align with the infinitely variable position of the crankshaft. The gripper can not interfere with power tool access for driving in the attachment bolts. The entire process must be completed within a 54 second cycle time.

MATERIAL HANDLING REQUIREMENT AND WORK AREA RESTRICTIONS

- The gripper must be a compact design incorporating two powered functions (grip and pitch) and one manual function (rotate.)
- The part is horizontal in the dunnage (pick point) and vertical when placed on the engine.
- The highest point of the part centerline is 22" (horizontal) and 30" (vertical)
- Prevent lift unless the flywheel is securely gripped.
- Prevent release unless the part is supported.
- Continuous rotation through the horizontal axis.
- Limit the operator's controls to the two powered functions.
- The flywheels are in custom dunnage.
- A customer supplied air wrench is used to secure the prestaged flywheel bolts on the engine.

MATERIAL HANDLING SOLUTION

- Model RA-3P Pneumatic Manipulator with 26½" of vertical travel and 112" of radial reach.
- Two operator controls – vacuum on/off – pitch up/down
- Vacuum sensed automatic activation of balance controls
- 360 degree continuous rotating manifold vacuum system
- Gripper safety circuitry to prevent release of the part unless it is fully supported.
- Springloaded alignment pins and bolt driver assemblies
- Compact pitching end joint

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