CHEMICAL SOLUTIONS FOR INDUSTRY

NCOC

FORD Q1 • ISO / TS 16949 & ISO 14001 *CERTIFIED*

Conversion Coating / Surface Preparation

Trouble Shooting Guide

IN GENERAL, TO ENSURE GOOD PAINT/COATINGS ADHESION TO A METAL SURFACE, CHEMICAL PRE-TREATMENT MUST ACCOMPLISH THREE TASKS, (1) CLEAN/DE-RUST, (2) PASSIVATE THE METAL SURFACE TO PREVENT FLASH RUST AND (3) PROVIDE AN EVEN AND SUFFICIENT PHOSPHATE COATING. ASSUMING THAT THE CORRECT PRODUCT IS BEING USED, LISTED BELOW ARE THE LIKELY CAUSES AND SOLUTIONS IF ONE OR MORE OF THREE CONDITIONS ARE NOT APPARENT:

TROUBLE SHOOTING CHECKLIST:

CONDITION	LIKELY CAUSE	CORRECTIVE ACTION
Parts Not Clean After Phosphating • Water breaks • Water droplets	Nozzles plugged or misaligned.	Clean and adjust nozzles.
	Low temperature in first stage.	Increase temperature.
	Low concentration.	Titrate and adjust.
	Insufficient time.	Reduce line speed.
	Contaminated bath.	Dump, clean and recharge washer.
	Excessive soils on part.	Hand clean, prewipe or add detergent additive (e.g. NCOC Surf-Aid product)
Uneven Phosphate Coating • Streaks, powder, spots • Low coating weights	Nozzles plugged or misaligned.	Clean and adjust nozzles.
	Improper bath temperature	Increase temperature.
	Low concentration.	Titrate and adjust.
	Borderline cleaning.	Increase concentration, time or process temperature.
	Excessive temperature in rinse stage.	Increase water overflow rate.
	Contaminated process or rinse stage.	Dump, clean and recharge washer.
Rusty parts (“flash rusting”) • Superficial, loose rust	Borderline cleaning.	See section under Parts Not Clean
	Insufficient phosphate coating.	Increase concentration/temperature in phosphate stage.
	Exhausts not functioning properly	Check to insure exhausts are operational.
	Parts rusted prior to washer.	Derust

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INSPECTION OF PROCESSED WORK

- Periodic inspection of parts emerging from the washer after phosphating should find them to be completely water-break free. Special note should be made of welded or crimped edges where oil may have been trapped and difficult to reach.
- After drying, the phosphate coating appearance should be generally even overall with no streaks or spots. Although the coating color will vary with different steels, it will most often exhibit a blue or iridescent color when it is proper.

  Note: Variations in color can still be satisfactory as long as one color shades into the other with no sharply defined edges between.

CORRECTION PROCEDURES

- **WATER BREAKING**

  If water-breaking is observed, it usually indicates unremoved soil or residual oil film and the washer should be inspected to determine if discrepancies in operating concentration, temperature, nozzle pressure, or spray pattern exists.

  The next step is to increase cleaning by adding **SURF AID** (detergent additive) either to the point of foam, or in 1/4% increments until an additional one-half percent has been added. If this doesn't correct the problem, then the temperature should be raised in ten degree increments (not to exceed 160 degrees maximum). In more extreme cases, it may be necessary to add still more detergent.

- **STEAKING, SPOTTING, OR LOOSE WHITE POWDER**

  Streaking, spotting, or loose white powder could represent any one of a number of inefficiencies. For instance, mill oil that has sufficiently oxidized may etch and stain the metal in a worm-track pattern that will produce sharply defined edges.
  Under certain conditions, condensation of chemical vapors can occur on the conveyor or ceiling of the washer and then run down the work to form streaks. Depending on the efficiency of the exhaust system, this can happen in any area where no sprays are operating. Streaks caused by conveyor drippings are especially prevalent during stoppages when parts stand motionless between stages.

  Powdery streaks are also frequently caused by the ricocheting of sprays hitting each other, parts, or the spray chamber walls and then splattering on the work just outside the entrances or exits of the spray stages.

  Note: Even though final results show that all oil has been removed, it is sometimes possible to eliminate streaking and powdering by adding more detergent into the phosphate bath.

- **FLASH RUSTING**

  Occasionally, parts may emerge from the washer with superficial, loose rust. Its color can vary from light tan to deep orange and the pattern it takes may be in wavy lines following the design of water draining from the metal surface, or streaks and spots. Frequently, this 'flash rusting' is mistaken for a light coating when it is light tan with a blotchy appearance, but its presence can be confirmed by wiping with a white cloth and looking for tell-tale reddish residues.

  Most of the time, the cause of flash rusting is the lack of sufficient phosphate coating to protect the metal surface until it dries. However, if the exhausts are not functioning properly, the acidic humidity from the acid phosphate spray may become trapped and cause even a well phosphated area to rust.