Health and Safety in Washington State's Collision Repair Industry:

A Needs Assessment

Technical Report 69-4-2005
December 2005

SHARP
Safety & Health Assessment & Research for Prevention
1-888-66-SHARP

Department of LABOR AND INDUSTRIES

Health and Safety in Washington State's Collision Repair Industry: A Needs Assessment

Technical Report Number 69-4-2005

This report was prepared by:

Stephen G. Whittaker, Ph.D., Toxicologist

Robert Anderson, CIH, Industrial Hygienist

Carolyn Whitaker, Industrial Hygienist

Suggested citation for this report:

Whittaker SG, Anderson R, Whitaker C: Health and Safety in Washington State's Collision Repair Industry: A Needs Assessment. Technical report 69-4-2005. Safety & Health Assessment & Research for Prevention, Washington State Department of Labor and Industries, Olympia, Washington.

December 2005

Table of Contents

TABLES

FIGURES

APPENDICES

Acknowledgments

This study could not have been conducted without the cooperation of the owners, managers, painters, and technicians who allowed us to visit their collision repair shops and spent their valuable work time educating SHARP's researchers. Fred Arnold (Arnold & Associates) also provided valuable insights into the industry.

The support of Yumi Vaught (Autobody Craftsman Association) and Jeff Lovell (Automotive Service Association of Washington) is also gratefully acknowledged.

The insights into the collision repair industry provided by Lou Russo (Coalition for Collision Repair Excellence) and Jack Lundberg (former Executive Director, Ohio Board of Motor Vehicle Collision Repair Registration) are very much appreciated.

We wish to thank Mary Cushmac of EPA's Design for the Environment (DfE) Program for engaging in early discussions about the project and providing multiple copies of DfE's Best Practices Kit.

We appreciate the technical insights provided by Youcheng Liu (Yale University), Claire Lutgendorf (Yale University), Bob Streicher (NIOSH), Mark Boeniger (NIOSH), and representatives of the Alliance for the Polyurethanes Industry (facilitated by Christopher Cleet and Stephanie Bernard).

Laurel Tomchick and Bill Lawrence with the Local Hazardous Waste Management Program in King County assisted with identifying collision repair shops and establishing our contacts with the industry.

We wish to thank the Washington State OSHA plan (WISHA) staff who shared the benefit of their insights and experience—most notably Donald Lofgren and Nadine Grady.

Mary Ellen Flanagan with the University of Washington's Field Consultation and Research Group provided valuable industrial hygiene expertise during our initial field visits.

Joyce Fan (SHARP Epidemiologist) and Edmund Rauser (SHARP Data Manager) assisted with data analysis. Christy Curwick (SHARP Research Investigator) provided work-related asthma surveillance data. Darrin Adams (SHARP Information Technology Specialist) provided workers' compensation data.

The contributions, review, and comments of other SHARP staff are greatly appreciated.

This report was supported in part by Cooperative Agreement 5 U01 OH007292 from the National Institute for Occupational Safety and Health (NIOSH). The contents are solely the responsibility of the authors and do not necessarily represent the official views of NIOSH or the Centers for Disease Control and Prevention.

List of Definitions and Acronyms

ACA..... Autobody Craftsman Association

ASA-WA.....Automotive Service Association of Washington

EPA..... U.S. Environmental Protection Agency

FTE…….. Full Time Equivalents

L&I……..……. Washington State Department of Labor and Industries

MSDS.....Material Safety Data Sheet

NAICS.....North American Industry Classification System (2002 revision)

NIOSH……..... National Institute for Occupational Safety and Health

OSHA……..…. Occupational Safety and Health Administration

PPE…….. Personal Protective Equipment

SHARP…..……Safety & Health Assessment & Research for Prevention

SIC…… Standard Industrial Classification (1987 revision)

SPRAY.....Survey of Painters and Repairers of Autobodies by Yale

SWORD…… Surveillance of Work-related and Occupational Respiratory Disease

WIC……...Washington Industrial Classification

WISHA……. Washington Industrial Safety and Health Act – Washington State's OSHA program

WRA..... Work-related asthma

Executive Summary

Workers in the collision repair industry may be exposed to isocyanates and other harmful chemicals. Of particular concern is the burden of work-related asthma in this industry, which likely reflects exposures to the isocyanates in two-part paints. Consequently, Safety & Health Assessment & Research for Prevention (SHARP) staff conducted key informant interviews, performed field investigations, and distributed a statewide needs assessment survey to gather information about:

- The collision repair industry business model,
- The number of collision repair production workers potentially exposed to isocyanates,
- Additional chemical and physical exposures of concern,
- Current health & safety practices in the industry, and
- Strategies to reduce exposure and increase employer and worker awareness.

The response rate to the survey was 69 percent, suggesting that our survey results are likely representative of Washington State's collision repair industry.

Our study found that collision repair in Washington State is a male-dominated industry comprised chiefly of small, non-unionized, family-run businesses. Many shops face numerous safety and health challenges, resulting from a combination of misinformation within the industry, insufficient funds to address workplace health & safety concerns, and social barriers to enforcing best practices within the shops. Most notably, inappropriate selection and use of respirators and gloves likely contribute significantly to isocyanate exposures. Collision repair workers are potentially exposed to a variety of additional chemical and physical hazards that deserve attention. We determined that this industry is a good candidate for a "research to practice" intervention comprised of both an educational campaign and technical assistance. However, any such intervention must account for the financial, demographic, and social characteristics of this industry.

Introduction

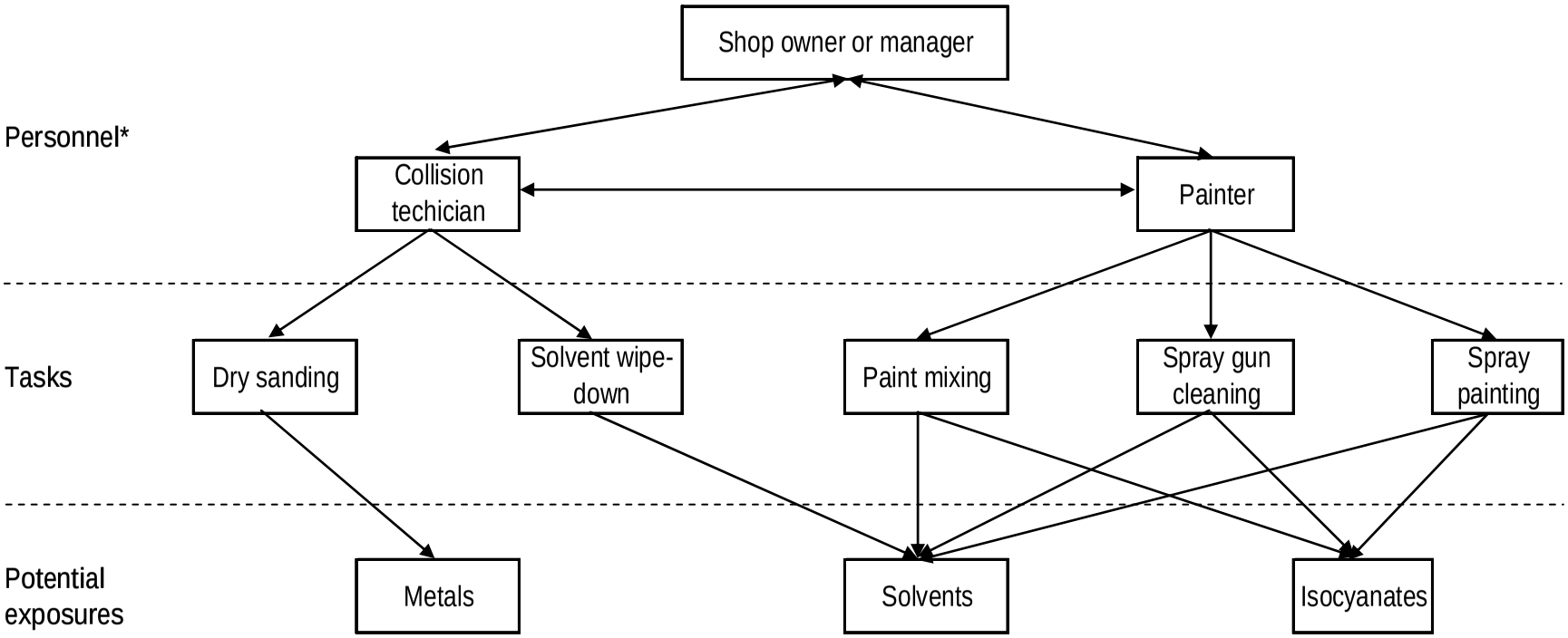
Production workers in the collision repair industry are potentially exposed to a wide range of chemical hazards, including metals, organic solvents, and, most notably, isocyanates. Collision repair shops generally repair vehicles that have been damaged in accidents by restoring their exteriors (and in some cases, interiors) to pre-accident condition (Best 2005). Some shops may also perform custom paint jobs, for example, on buses, police cars, fleet trucks, or vehicles with company logos. Other collision repair shops may specialize in repairing certain types of vehicles, such as sports cars, luxury vehicles (e.g., limousines), antique or "classic" cars, or other high-value vehicles, such as racecars or construction vehicles" (Best 2005).

A 2004 industry survey (I-CAR 2004) estimated that there were approximately 50,000 collision repair businesses in the United States, with an average of eight employees per shop. This estimate is similar to that presented in another 2004 survey (BSB 2004), which reported an average of seven employees per shop, with a median of five employees. On the average, shops employed five production employees (I-CAR 2004).

The industry classifications for collision repair are predominantly North American Industry Classification System (NAICS) code 811121 (Automotive Body, Paint, and Interior Repair and Maintenance) or Standard Industrial Classification (SIC) code 7532 (Top, Body, and Upholstery Repair Shops and Paint Shops). However, these industrial classifications are not specific for collision repair because they include businesses that repair only automotive interiors, such as upholstery and trim. The Washington Industrial Classification (WIC) 3412-00 (Automobile and truck: Body and fender repair shops) also includes collision repair workers.

The principal tasks performed by production employees in this industry are structural repair, surface preparation, and painting. A summary of the personnel, tasks, and potential exposures in the collision repair industry is presented in Figure 1. Structural repair and surface preparation are generally conducted by collision technicians. Sanding, grinding, and welding during structural repair may expose collision technicians to a variety of airborne particles. Surface preparation (which includes grinding the paint off sheet metal, and applying, smoothing, shaping and sanding polyester resin body fillers) may expose technicians to toxic metals if the surface of the vehicle being repaired contains lead, cadmium, or chromium (Enander et al; EPA 2005). Painting is generally performed by designated painters, and involves matching paint colors, mixing paint formulations, and coating the repaired area using spray-painting techniques. Painters may be

Figure 1. Personnel, tasks, and potential chemical exposures in the collision repair industry



*In a typical colllision repair shop, the collision technician and painter are employees of the shop owner or manager. However, several other arrangements are possible. An owner/operator may perform the tasks of the collision technician and the painter. Alternatively, the shop owner or manager may employ a single individual to perform both preparation and painting - or a technican and painter may share tasks.

exposed to a wide range of hazardous chemicals, including organic solvents, isocyanates and toxic pigments. Isocyanates are of particular concern because their use is so widespread in this industry (NIOSH 1996a) and these reactive chemicals are a leading cause of work-related asthma (Liu & Wisnewski 2003). Isocyanates are used as catalyst hardeners in two-part polyurethane paint systems, including certain primers, sealers, and basecoats. However, the application of the final "clear coat" is generally recognized as being of principal concern. When these products are sprayed, the aerosolized liquids can create a significant inhalation hazard for airborne isocyanates (EPA 2005; Sparer et al. 2004). Dermal exposures may also occur through handling the pre-mixed or mixed paint products and during spray application and clean up procedures. Isocyanates are strong irritants and sensitizers (Liu & Wisnewski 2003). Animal studies suggest that skin exposures to isocyanates may be a significant source of exposure. These skin exposures may lead to systemic respiratory sensitization, resulting in work-related asthma (Erjefalt & Persson 1992; Rattray et al. 1994).

Nearly 30 percent of adult asthma may be attributable to occupational exposure (NIOSH 1996b). In the United Kingdom, occupational disease surveillance for work-related asthma (WRA) revealed that isocyanates were the most commonly cited causative agents for the period 2002-2004 (HSE 2005a). Data gathered from the United Kingdom's Surveillance of Work-related and Occupational Respiratory Disease (SWORD) suggests that "vehicle spray painters" had the second-highest rate of WRA (HSE 2005b) for the period 2002-2004. The WRA rate for this occupation (86 WRA cases per 100,000 workers per year) was 86-fold greater than the rate determined for "all occupations" (1 case per 100,000 workers per year).

A review of Washington State's workers' compensation data from 1995 through 2002 (SHARP 2003) determined that the automotive repair industry (defined as WIC 3412-00) exhibited the second-highest rate of compensable State Fund asthma claims: 20.3 compensable claims per 100,000 full-time equivalents (FTE) per year. This rate is almost ten times the overall incidence rate for compensable claims of 2.2 per 100,000 FTE per year. Additionally, the rate for all asthma claims filed in this industry (32.5 claims per 100,000 FTE per year) was three-fold higher than the overall rate of 9.8 claims per 100,000 FTE per year. Although the causative agent(s) were not described, it is likely that exposure to isocyanates in two-part paint systems was largely responsible for this respiratory disease.

SHARP administers Washington State's WRA surveillance system (SHARP 2000, 2003), which is partially funded by NIOSH. WRA cases are received from two sources: Washington State's workers' compensation database and reporting physicians.

A review of the cases identified by the WRA surveillance system revealed the following:

- From September 2000 (initiation of the WRA surveillance system) to July 11, 2005, a total of 937 workers' compensation claims filed for WRA were identified.
- 12 cases were filed by workers conducting collision repair (identified by reviewing text associated with the claims file).
- Of these 12 cases, eight had confirmed exposures to isocyanates that were identified as contributing factors in the workers' asthma. An additional two cases had possible isocyanate exposures and the remaining two workers were unlikely exposed to isocyanates.

Recognizing the potential for harmful exposures and occupational illness in collision repair workers, we conducted key informant interviews, performed field investigations, and distributed a statewide health and safety "needs assessment" survey to gain information about:

1) The collision repair industry business model,
2) The number of collision repair production workers potentially exposed to isocyanates,
3) Additional chemical and physical exposures of concern,
4) Current health & safety practices in the industry,
5) Health & safety perceptions and needs of business owners and managers, and
6) Strategies to reduce exposure and increase employer and worker awareness.

Methods

Survey Development, Key Informant Interviews, and Field Investigations

A preliminary version of the collision repair survey instrument was designed to gain information specifically about isocyanate exposures (see the "Isocyanate Users Survey" in Appendix A). This survey was developed with input from isocyanate subject experts associated with NIOSH, the U.S. Environmental Protection Agency's (EPA's) Design for the Environment (DfE) program, and Yale University's Survey of Painters and Repairers of Autobodies by Yale (SPRAY). We also obtained local perspectives on the collision repair industry from Washington Industrial Safety and Health Act (WISHA) Industrial Hygiene inspectors and staff from the Local Hazardous Waste Management Program (LHWMP) in King County. Members of the Alliance for the Polyurethanes Industry (API) also reviewed the survey.

King County LHWMP had established working relationships with several collision repair shop owners during a recent emphasis program on hazardous waste management in this industry. The identities of business owners with shops that qualified for environmental certification ("Envirostars") were provided to SHARP as candidates for "key informant" interviews and field visits. We then solicited reviews of the Isocyanate Users Survey from several of these shop owners and representatives of the two principal autobody repair business associations in Washington State (the Autobody Craftsman Association and the Automotive Service Association of Washington). SHARP staff also described the study and solicited feedback on the survey instrument at two local chapter meetings.

We mailed the final Isocyanate Users Survey to seven of the collision repair shop owners identified by King County LHWMP and followed up with site visits to their shops. We developed an Industrial Hygiene Checklist to systematically record observations during these field visits for comparison to the survey responses (see Appendix B). The Isocyanate Users Survey was also administered to instructors at a local vocational training school and a paint manufacturer-owned training facility. The shop owners and instructors were given a copy of the EPA DfE Program's Auto Refinish Project Best Practices Kit (EPA 2000a) in return for their participation. SHARP then provided the shop owners with brief confidential reports that described our field observations and provided recommendations, where necessary.

While conducting the field visits, we interviewed the local shop owners and trainers described above. We also interviewed an independent health & safety consultant, a retired shop owner who had written extensively in trade journals, a representative of a national autobody association, an automobile insurance

representative, and the former Executive Director of the Ohio Board of Motor Vehicle Collision Repair Registration.

The information gathered from the Isocyanate Users Survey, the interviews, and field visits led us to conclude that workers in the collision repair industry are potentially exposed to several additional chemical and physical hazards. Consequently, we determined that any intervention in this industry should focus on exposures to isocyanates, organic solvents, metals, particulates, and potentially other chemical and physical hazards.

We also concluded that it is essential to gain a thorough understanding of the collision repair industry in order to develop an effective intervention strategy. Consequently, we drafted a Needs Assessment Survey (derived from the original Isocyanate Users Survey) in order to gain additional information about business practices and perceptions about health & safety. This draft survey was distributed to our stakeholders and their feedback was included in the final survey instrument, which is included in Appendix C.

Selection of Employers for the Needs Assessment Survey

Four sources of information were used to generate a "master list" of collision repair shops in Washington State. These data sources were accessed in June of 2005.

1. The membership list of the Automotive Service Association of Washington (ASA-WA). Business names and addresses were provided in a Microsoft Excel™ spreadsheet.
2. Dex™ on-line Yellow Pages™ (*www.dexonline.com*). Business addresses and telephone numbers were retrieved for all companies listed under "Auto Body Repair & Paint" in Washington State. Businesses that contained the term "collision repair" in their title or Yellow Page™ advertisement were also retrieved.
3. A collision repair business database compiled by the Local Hazardous Waste Management Program in King County. Business information was provided in a Microsoft Excel™ spreadsheet.
4. A Google™ search of Washington State "collision repair" or "auto painting" businesses on the Internet.

Data from these four sources were combined and duplicate records were eliminated to generate the master list of collision repair shops.

Survey Strategy

The needs assessment survey was designed to gather information from the owners and managers of collision repair shops, rather than their employees. The survey instrument was mailed to the shops in June of 2005. Included in the package was a cover letter describing the purpose of the survey, letters of support from the Autobody Craftsman Association (ACA) and the Automotive Service Association of

Washington (ASA-WA). Also included was a postage-paid return envelope addressed to Gilmore Research Group (Gilmore Research), the Seattle-based firm that conducted the survey. Recipients were given the option to provide anonymous responses.

Recipients were given a deadline of two weeks to complete and return the survey. Gilmore Research mailed a reminder postcard three weeks after the initial mailing (i.e., one week after the specified deadline expired). Gilmore Research then telephoned recipients who failed to respond to the reminder postcard in order to attempt completion over the telephone or to gain commitment to return the survey by mail or fax.

Survey Instrument

The goal of this study was to focus on collision repair shops that actually paint vehicles, rather than those that perform only mechanical repairs and then subcontract vehicle painting. In order to identify "qualified" shops, the first question attempted to determine whether any worker (including the business owner) conducted collision repair activities that could potentially result in exposure to paints: "*Does your business actually do collision repair (i.e., do you repair **and** paint cars or other vehicles?*" If the answer to this question was "no", the respondent was instructed to return the survey without answering the remaining questions. However, if the answer to this first question was "yes", the respondent was instructed to answer the remaining questions. Other questions covered the following subject areas:

- Business and employment information,
- General health & safety,
- Shop procedures and equipment, and
- Other health & safety procedures and perceptions.

The qualitative responses to open-ended questions were reviewed and assigned to an appropriate category.

Data Management and Analysis

Survey data were key-entered into a proprietary database by Gilmore Research and provided to SHARP in both a Microsoft Excel™ spreadsheet and an SPSS™ file. Gilmore Research did not reveal to SHARP the identities of survey respondents who requested anonymity or recipients who chose not to respond to the survey. All data derived from the interviews, field visits, and survey responses were kept confidential. Paper records were kept under lock and key and electronic data were stored on a secure server accessible only by SHARP staff.

Descriptive statistical analyses were performed in Microsoft Excel™ and SAS™.

Results

Employer Data Sources

A master list of 1258 collision repair shops was generated using the four data sources. The ASA-WA database contained 808 entries, which was supplemented by 371 shops retrieved from on-line Yellow Pages™, 71 shops identified in the King County database, and eight listings retrieved from a collision repair franchise's web site.

Survey Response Rate

The sample disposition summary is presented in Table 1. Of the 1258 businesses to which the survey was mailed, survey responses were received (via mail and telephone follow-up) from 707 shops. The response rate was 69 percent and was calculated as follows:

$$\text{Response Rate (\%)} = \left[\frac{\text{Survey Responses}}{\text{Survey Responses} + \text{Unreachable} + \text{Refused} + \text{No Response}} \right] \times 100$$

$$= \left[\frac{707}{707 + 125 + 61 + 139} \right] \times 100 = 69\%$$

Table 1. Collision repair survey sample disposition

Disposition	No. shops
Survey responses received (by mail and telephone)	707
Unable to determine if qualified (duplicates, no longer in business, no phone/no listing, wrong phone no., disconnected, fax/modem, barriers: language/hearing/other problem)	226
Unreachable (no answer, blocked phone no.)	125
Refused survey	61
Made contact, determined qualified, but no response (respondent said would send, resent to respondent, respondent gone)	139
Total	**1258**

Survey Responses

Survey Data Summary

The data summary provided by Gilmore Research is included in Appendix D.

Collision Repair Status

Of the 707 businesses from which we received survey responses, 494 (70 percent) stated that they repair **and** paint cars or other vehicles. The remaining discussion will focus on the responses from these "qualified" collision repair shops. Note that the denominator used to calculate percentage responses varies from question-to question because respondents occasionally skipped questions.

Business and Employment Information

Question 1. The majority of respondents described themselves as either the shop owner (62 percent) or the manager (29 percent)–see Table 2.

Table 2. Job titles of survey respondents

Job Title	Number	Percent
Shop owner	307	62%
Shop manager	141	29%
Office manager	10	2%
Other	35	7%
Total	**493**	**100%**

Question 2. The counties in which ten or more shops were located are presented in Table 3. Shops were concentrated in Washington State's most populous counties–King, Pierce, Spokane, and Snohomish.

Table 3. Location of shops

County	No. shops	Percent of shops
King	138	28%
Pierce	49	10%
Spokane	41	8%
Snohomish	36	7%
Yakima	21	4%
Whatcom	20	4%
Clark	18	4%
Benton	13	3%
Kitsap	13	3%
Chelan	12	3%
Skagit	10	2%
Thurston	10	2%
Other	106	22%
Total	**487**	**100%**

Question 3. The distribution of the number of years collision repair shops reported being in business is presented in Figure 2. Shops were in business for an average of 23 years (median value of 20 years), ranging from less than one year (three shops) to 90 years (one shop).

Question 4. Eighty-three percent of respondents (408 shops) reported that the shop was family-owned and operated.

Question 5. The average number of cars painted per month is presented in Table 4. The median number of cars painted per month was 25; the average was 42. Sixteen shops reported that they painted one car per month; one shop painted 400 per month.

Table 4. Number of cars painted per month

No. cars painted	No. shops	Percent of shops
1 to 9	101	20%
10 to 19	80	16%
20 to 29	69	14%
30 to 39	43	9%
40 to 49	31	6%
50 to 59	28	6%
60 to 69	29	6%
70 to 79	14	3%
80 to 89	18	4%
90 to 99	8	2%
100 to 199	57	11%
200 to 399	6	1%
≥ 400	1	<1%
Don't know	2	<1%
Other	6	1%
Total	**493**	**100%**

Question 6. The number of **complete** cars painted in a month (i.e., restore, refinish and/or paint the entire vehicle, rather than just damaged sections) is presented in Table 5. The majority of shops (56 percent) did not paint complete vehicles. The median number of complete cars painted per month was 0; the average was 2.8 per month. One shop painted 115 complete cars per month.

Table 5. Number of complete cars painted per month		
No. cars painted	**No. shops**	**Percent of shops**
0	272	56%
<1 to 4	189	39%
5 to 49	11	2%
50 to 115	12	3%
Don't know	2	<1%
Total	**486**	**100%**

Question 7. The approximate size of the shop's production area is presented in Table 6. The majority of shops (81 percent) had production areas between 1,000 and 10,000 sq. ft.

Table 6. Size of the shop's production area		
Shop area	**No. shops**	**Percent of shops**
Less than 1,000 sq. ft.	31	6%
1,000 to 5,000 sq. ft.	243	50%
5,000 to 10,000 sq. ft.	153	31%
Greater than 10,000 sq. ft.	55	11%
Don't know	7	1%
Total	**489**	**100%**

Question 8. Twelve percent of shops (59 shops) reported that they were part of a multi-store business, consolidator, franchise, cooperative group, chain, or similar collection of businesses.

Question 9. Twenty-seven percent of shops reported that the profitability of their business will likely decrease over the next two years (132 shops); 32 percent thought that their profitability will remain unchanged (158 shops); 37 percent thought that their profitability would increase (182 shops); and sixteen respondents (3 percent) did not know.

Question 10. When asked the open-ended question "*What factors influence your company's profitability the most?*," 135 shops (28 percent) responded that automobile insurance company concerns were the most important (see Table 7). Typical responses reflected concerns about the reimbursement rates provided by the insurance companies.

Table 7. Factors influencing a shop's profitability

Factors	Number of shops			
	Most impt. Factor	2nd most impt. Factor	3rd most impt. Factor	Total
Insurance company concerns	135	46	18	**199**
Business volume	49	9	8	**66**
"The Economy"	28	18	11	**57**
Material cost	27	63	31	**121**
Customer service/satisfaction	27	14	13	**54**
Labor cost	26	25	11	**62**
Weather	26	20	9	**55**
Productivity	21	8	9	**38**
Quality	13	18	10	**41**
Taxes	13	7	14	**34**
Advertising	7	4	4	**15**
Location	3	8	2	**13**
Competition	2	5	3	**10**
Other	82	119	73	**274**
Don't know	17	17	4	**38**
Refused	1	0	0	**1**
No other factors	0	43	101	**144**
Total	**477**	**424**	**321**	**--**

Question 11. Sixty-two percent of shops reported that their major source of income was insurance companies (304 shops), followed by direct customer payment (23 percent, 111 shops), and referrals from dealers (6 percent, 28 shops).

Question 12. Seventeen percent of shops reported that they belong to a retrospective rating program for workers' compensation insurance. The "retro" programs to which the shops belonged are presented in Table 8.

Table 8. Retrospective rating programs

"Retro" program	No. shops	Percent of shops
Automotive Service Association (ASA)	24	30%
Autobody Craftsman Association (ACA)	20	25%
Integrated Claims Management (ICM)	17	21%
Washington State Auto Dealers Association (WSADA)	4	5%
Associated Industries	3	4%
Other	5	6%
Don't know	7	9%
Refused	1	1%
Total	**81**	**100%**

Question 13. Thirty-seven percent of shops (181) reported that they belonged to at least one local or national automotive industry association. The associations to which the shops belonged are presented in Table 9.

Table 9. Membership of automotive industry associations

Association	No. shops*	Percent of shops
Automotive Service Association (ASA)	74	41%
Autobody Craftsman Association (ACA)	67	37%
I-CAR	35	19%
Automotive Service Excellence (ASE)	16	9%
Certified First	7	4%
Washington State Auto Dealers Association (WSADA)	6	3%
American Automobile Association (AAA)	5	3%
Better Business Bureau (BBB)	3	2%
Other	20	11%
Don't know	3	2%

*The total (236) exceeds the number of shops (181) because several respondents belonged to more than one industry association.

Question 14. When asked "*How many employees in total (i.e., office workers, repair technicians, painters, etc.) do you have in the shop at your busiest time?,*" the majority of shops (63 percent) responded that they had between one and nine employees (see Table 10). The median number of employees was five; the average was 7.2. The number of employees ranged from none (46 shops) to 63 (one shop).

Table 10. Number of total employees

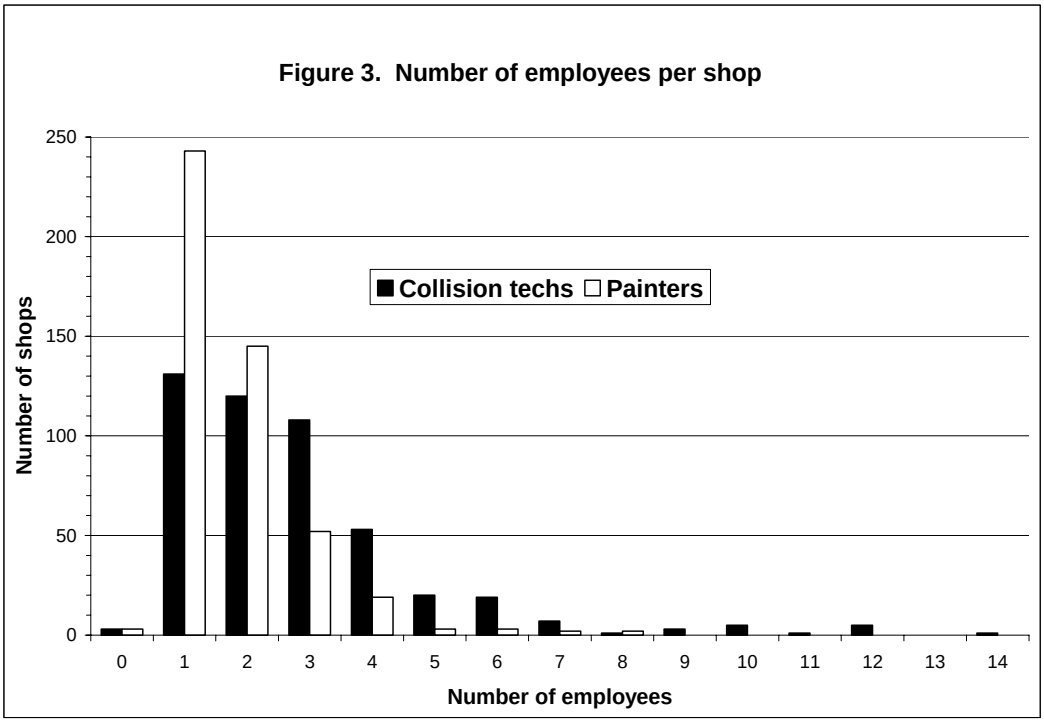
No. employees	No. shops	Percent of shops
0	46	9%
1 to 4	168	34%
5 to 9	142	29%
10 to 14	76	15%
15 to 19	33	7%
20 to 24	10	2%
25 to 30	6	1%
>30	10	2%
Total	**491**	**100%**

Question 15. Two percent of shops responded that they were unionized (11 shops).

Question 16a. The number of collision technicians ("body men") and painters working in shops is presented in Figure 3.

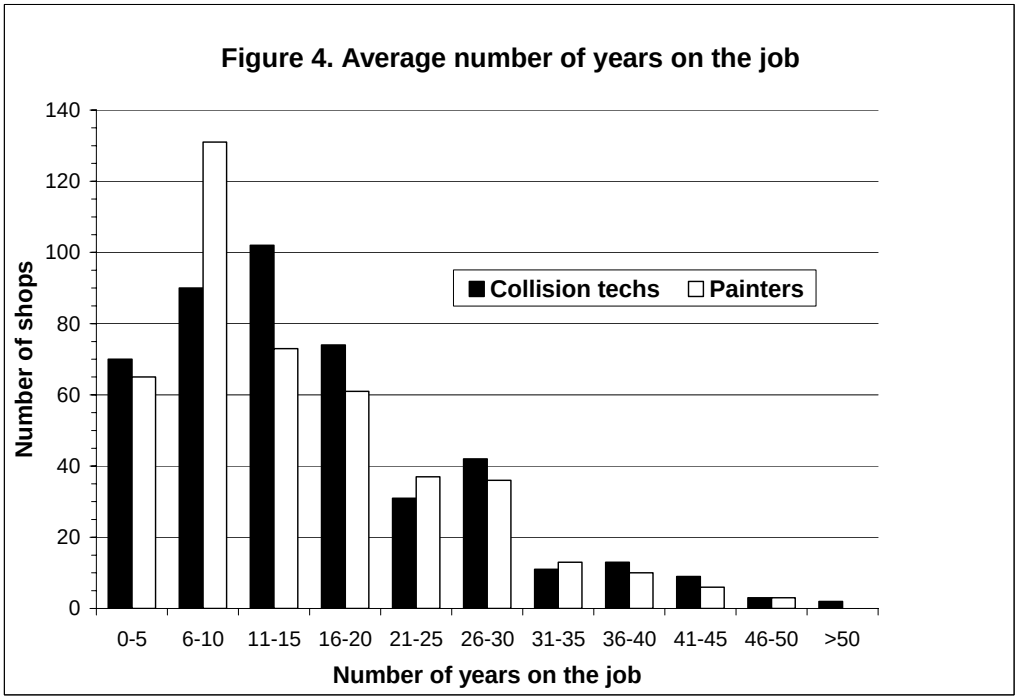
The median number of collision technicians was two per shop and the average was 2.8, ranging from none (three shops) to 14 (one shop).

The median number of painters was one per shop and the average was 1.8, ranging from none (three shops) to eight (two shops).



Question 16b. Fifteen shops (3 percent) reported that they employed one female collision technician; one shop reported that they employed two female technicians. Similarly, 15 shops reported that they employed one female painter.

Question 16c. On the average, collision technicians had been on the job for 17 years (median of 15 years), ranging from less than one year (two employees) to 80 years (one employee). On the average, painters had been on the job for 16 years (median of 13 years), ranging from less than one year (four employees) to 50 years (one employee). See Figure 4.



Question 16d-f. The ages of collision technicians and painters are summarized in Tables 11a and 11b, respectively. Fifty-seven percent of shops employed at least one collision technician who was less than 35 years old; 83 percent employed at least one collision technician who was 35-55 years old; and 23 percent of shops employed at least one collision technician who was older than 55 years. Fifty-three percent of shops employed at least one painter who was less than 35 years old; 69 percent employed at least one painter who was 35-55 years old; and 10 percent of shops employed at least one painter who was older than 55 years.

Table 11a. Ages of collision technicians

Number of collision techs per shop	Number and percent of specified age		
	<35 years	**35-55 years**	**>55 years**
0	201 (43%)	71 (15%)	338 (75%)
1	143 (31%)	176 (38%)	91 (20%)
2	72 (15%)	108 (23%)	15 (3%)
3	28 (6%)	59 (13%)	0 (0%)
4	12 (3%)	20 (4%)	0 (0%)
≥ 5	7 (2%)	22 (5%)	0 (0%)
Other	0 (0%)	1 (<1%)	0 (0%)
Don't know	3 (<1%)	3 (<1%)	5 (1%)
Total	**466 (100%)**	**460 (100%)**	**449 (100%)**

Table 11b. Ages of painters

Number of painters per shop	Number and percent of specified age		
	<35 years	**35-55 years**	**>55 years**
0	212 (47%)	139 (31%)	382 (89%)
1	151 (34%)	225 (50%)	48 (11%)
2	56 (13%)	68 (15%)	1 (<1%)
3	18 (4%)	12 (3%)	0 (0%)
4	7 (2%)	2 (<1%)	0 (0%)
≥ 5	1 (<1%)	1 (<1%)	0 (0%)
Other	0 (0%)	0 (0%)	0 (0%)
Don't know	2 (<1%)	2 (<1%)	4 (<1%)
Total	**447 (100%)**	**449 (100%)**	**435 (100%)**

Question 16g. The payment arrangements employed by shops are summarized in Table 12. This summary excludes 35 collision technicians and 40 painters who identified themselves as shop owners who paid themselves from the shops' profits.

Table 12. Payment arrangements for employees		
Payment arrangement	**No. and percent of shops**	
	Collision techs	**Painters**
Commission	95 (22%)	79 (19%)
Flat rate	104 (24%)	90 (21%)
Hourly	195 (45%)	206 (49%)
Salaried	32 (7%)	41 (10%)
Other	11 (3%)	6 (1%)
Don't know	0 (0%)	1 (<1%)
Total	**437 (100%)**	**423 (100%)**

Question 17. The benefits provided to employees are summarized in Table 13. This summary excludes responses from shop owners who identified themselves as owner-operators with no employees.

Table 13. Benefits provided to employees			
Benefit	**No. shops providing benefits (percent)**		
	Office staff	**Collision techs**	**Painters**
Medical	250 (28%)	263 (30%)	261 (30%)
Dental	166 (25%)	171 (25%)	172 (26%)
Vision	129 (22%)	132 (23%)	131 (23%)
Retirement Plan	144 (23%)	149 (24%)	150 (24%)
Childcare Assistance	5 (2%)	5 (2%)	5 (2%)
On the Job Training	194 (25%)	245 (32%)	240 (31%)
Tuition Reimbursement	71 (16%)	91 (20%)	92 (20%)
Outside Training	194 (25%)	252 (32%)	253 (32%)
Paid Vacation Leave	285 (29%)	320 (33%)	317 (32%)
Paid Sick Leave	90 (19%)	97 (20%)	96 (20%)
Paid Family Leave	57 (14%)	63 (16%)	63 (16%)
Family Emergency Assist.	53 (14%)	60 (16%)	60 (16%)

General Health & Safety

Question 18. Ninety-five percent of respondents (456) reported that they read at least one trade journal. Among these 456 respondents, 93 percent read BodyShop Business. See Table 14.

Table 14. Trade journals read by body shops

Trade journal	No. shops*	Percent of shops
BodyShop Business	425	93%
ACA Newsletter	172	38%
Auto Inc (ASA)	115	25%
Parts and People	108	24%
Automotive Body Repair News	98	22%
Other	44	10%
Don't know	5	1%

*The total (967) exceeds the number of shops (456) because some respondents read more than one trade journal

Question 19. Sixty-one percent of shops (273) with employees reported having a safety committee that meets regularly.

Question 20. Sixty-four percent of shops (286) with employees reported having a person designated with allotted time to address safety and health issues.

Question 21. Forty-two percent of shops (205) reported that they have funds dedicated to address unsafe conditions or equipment.

Question 22. Fourteen percent of shops (62) with employees reported having a safety incentive program for employees.

Question 23. Thirty-two percent of shops (141) with employees reported that they generally keep injured employees on salary.

Question 24. Sixty-one percent of shops (268) with employees reported that they design and provide modified or light-duty jobs for injured employees.

Question 25. The respondents' sources of health & safety information for two-part paint systems are presented in Table 15.

Table 15. Sources of health & safety information for two-part paint systems		
Source	**No. shops***	**Percent of shops**
Material Safety Data Sheets (MSDS)	470	95%
Other manufacturer or supplier information	377	77%
Trade journals	225	46%
Health and safety information on the Internet	130	26%
Other source	34	7%
Department of Labor & Industries	6	1%
Don't have access to any health information	1	<1%
Don't know	4	<1%
*The total (1247) exceeds the number of shops (491) because some respondents had more than one source of information.		

Shop Procedures and Equipment

Question 26. The procedures used by painters to clean their paint guns with solvents are summarized in Table 16.

Table 16. Procedures used to clean paint guns with solvent		
Cleaning procedure	**No. shops**	**Percent of shops**
Automatic gun washer	276	56%
Combination of manual and automatic washing	119	24%
Manual cleaning	91	18%
Don't use solvent	1	<1%
Other	4	<1%
Don't know	2	<1%
Total	**493**	**100%**

Question 27. The types of gloves used by workers while handling lacquer thinner are summarized in Table 17.

Table 17. Types of gloves used while handling lacquer thinner		
Glove type	**No. shops***	**Percent of shops**
Latex	215	44%
Nitrile	186	38%
Neoprene	54	11%
Natural rubber	49	10%
Don't use lacquer thinner	17	4%
Laminated polyethylene	11	2%
PVC	7	1%
Cloth/Leather	4	<1%
None	4	<1%
Don't know	46	10%
*The total (593) exceeds the number of shops (487) because some shops use more than one type of glove.		

Question 28. Twenty percent of respondents (99 shops) had a central vacuum system to collect dust from power tools. The principal reasons why shops do not have a central vacuum system are summarized in Table 18.

Table 18. Reasons why shops do not have central vacuum systems		
Reason	**No. shops***	**Percent of shops**
Too expensive	150	39%
Not enough dust generated to justify cost	149	39%
Incompatible with technicians' tools	60	16%
Inconvenient to use	43	11%
Too difficult to install	27	7%
Not proven to work	23	6%
Too difficult to maintain	21	5%
Other	60	16%
Don't know	30	8%
*The total (563) exceeds the number of shops (387) because some respondents provided more than one reason.		

Question 29. The personal protective equipment (PPE) workers used while spraying two-part clear coats are summarized in Table 19.

Table 19. PPE used while spraying two-part clear coats

PPE	No. shops*	Percent of shops
Respirator	482	98%
Gloves	422	85%
Shoot suit	411	83%
Safety glasses	292	59%
Head socks	267	54%
Cloth or leather work boots	228	46%
Earplugs or muffs	197	40%
Goggles	184	37%
Disposable coveralls	151	31%
Fabric coveralls	141	29%
Disposable boot covers	67	14%
Rubber boots	43	9%

*The total (2885) exceeds the number of shops (494) because some shops use more than one type of PPE.

Question 30. The types of gloves workers use when mixing or applying two-part clear coats are summarized in Table 20.

Question 31. The types of respirators workers use while spraying two-part clear coats are summarized in Table 21.

Table 20. Gloves used while spraying two-part clear coats		
Glove type	**No. shops***	**Percent of shops**
Latex	253	51%
Nitrile	195	40%
Neoprene	39	8%
Natural rubber	24	5%
PVC	5	1%
Laminated polyethylene	4	<1%
Cloth/Leather	3	<1%
Other	5	1%
None	11	2%
Don't know	42	9%
*The total (581) exceeds the number of shops (493) because some shops use more than one glove type.		

Table 21. Respirators used while spraying two-part clear coats		
Respirator type	**No. shops***	**Percent of shops**
Half-face type with replaceable cartridges	227	46%
Full-face type with an air supply hose	128	26%
Disposable half-face type with cartridges	114	23%
Hood or head covering with air supply hose	87	18%
Full-face type with cartridges	79	16%
Half-face type with an air supply hose	70	14%
Hood-type powered air-purifying respirator (PAPR)	40	8%
Dust masks (filtering face pieces)	16	3%
None	0	0%
Don't know	2	<1%
Other	1	<1%
*The total (764) exceeds the number of shops (494) because some shops use more than one type of respirator.		

Question 32. The reasons why workers do not use supplied air respirators are summarized in Table 22.

Table 22. Reasons why workers do not use supplied air respirators		
Reason	**No. shops***	**Percent of shops**
The painters don't like them	70	29%
Too expensive	60	25%
We have them but the painters don't use them	55	23%
Too difficult to maintain	7	3%
Too difficult to install	6	3%
Other	52	21%
Don't know	22	9%
*The total (272) exceeds the number of shops (243) because some shops provided more than one reason.		

Question 33. The locations at which painters spray two-part clear coats are summarized in Table 23.

Table 23. Where painters spray two-part clear coats		
Location	**No. shops***	**Percent of shops**
Downdraft booth (Air supplied from the top of the booth and exhausted below)	226	46%
Prefabricated crossdraft booth (Air supplied from one side of the booth and exhausted on the opposite side)	127	26%
Custom crossdraft booth (Air supplied from one side of the booth and exhausted on the opposite side)	99	20%
Semi-downdraft booth (Air supplied from the top of the booth and exhausted from the side)	50	10%
Ventilated prep station	44	9%
On the shop floor	13	3%
Somewhere else	8	2%
*The total (567) exceeds the number of shops (492) because some shops spray in more than one location.		

Question 34. The health effects respondents associated with exposure to two-part paint systems are summarized in Table 24.

Table 24. Health effects caused by exposure to two-part paint systems		
Health effect	**No. shops***	**Percent of shops**
Other respiratory disease	203	44%
Neurological effects	119	26%
Cancer	76	17%
"Isocyanate poisoning"	54	12%
Skin disorders	37	8%
Liver disease	28	6%
"Chemical poisoning"	19	4%
Kidney disease	17	4%
Death	13	3%
Allergy/sensitization	13	3%
Asthma (mentioned specifically)	10	2%
Other health effect	51	11%
None	3	<1%
Don't know	69	15%
*The total (712) exceeds the number of shops (460) because some shops reported more than one health effect.		

Question 35. The harmful chemicals respondents identified in two-part paint systems are summarized in Table 25.

Table 25. Harmful chemicals in two-part paint systems		
Harmful chemical	**No. shops***	**Percent of shops**
Isocyanates	279	63%
Solvents	77	17%
Metals	15	4%
"Everything"	15	4%
Don't know	98	22%
Other	33	7%
*The total (517) exceeds the number of shops (443) because some shops reported more than one harmful chemical.		

Other Health & Safety Procedures and Perceptions

Question 36. The mechanisms by which employees report health & safety concerns are summarized in Table 26 (excludes 48 owner-operated shops).

Table 26. How employees report health & safety concerns		
Reporting mechanism	**No. shops**	**Percent of shops**
Report to owner/manager/supervisor/verbally	327	77%
Report to other person	43	10%
Report to safety committee/meeting	20	5%
Report to safety person	19	5%
Don't know	15	4%
Total	**424**	**100%**

Question 37. The methods by which respondents know how health & safety concerns have been resolved is presented in Table 27 (excludes 40 owner-operated shops).

Table 27. Resolution of health & safety concerns		
Method	**No. shops**	**Percent of shops**
Management follow-up (specified)	195	49%
Communication/follow-up (participants not specified)	100	25%
Safety committee/meeting	23	6%
Medical clearance	14	4%
No issues	12	3%
Consultant review	6	2%
Other	25	6%
Don't know	26	7%
Total	**401**	**100%**

Question 38. The responses to the question: "*If you were given $500 to improve some aspect of health & safety in your shop, what would you do with it?*" are summarized in Table 28.

Table 28. How respondents would spend $500

Item	No. shops	Percent of shops
Air system/ventilation/filters	63	14%
Air-supplied (fresh air) respirator systems	61	13%
Dust collection/central vacuum systems	59	13%
Training materials or sessions	30	6%
Other safety equipment or supplies	26	6%
Respirators	24	5%
Other PPE	22	5%
Don't need funds	11	2%
Eye wash systems	9	2%
$500 is insufficient	8	2%
Gun cleaning system	8	2%
Other engineering controls	7	2%
Can't decide	7	2%
Lighting	6	1%
Other	43	9%
Don't know	84	18%
Total	**468**	100%

Question 39. Twenty-five percent of respondents (123) reported that their shops contract with a private health & safety consultant or "compliance company."

Ninety-six percent of those respondents (118) reported that they were satisfied with the services provided by their consultant/company.

Consultants visited the shops an average of four times per year (median value), ranging from once per year (18 shops, 15 percent of respondents) to 36 times per year (one shop, one percent of respondents).

Ninety-two percent of those respondents (107) would recommend their consultant to another shop.
The most frequently used consultants are summarized in Table 29.

Table 29. Consultants used by shops

Consultant	No. shops	Percent of shops
Environmental Compliance & Remediation, Inc. (ECR)	35	31%
Integrated Claims Management, Inc. (ICM)	15	13%
Arnold & Associates	9	8%
Compliance Northwest, Inc.	7	6%
Safety-Kleen Systems, Inc.	4	4%
Other	30	27%
Don't know	11	10%
Refused	1	<1%
Total	**112**	**100%**

Question 40. When asked "What are the most serious injuries, illnesses, or exposures in the collision repair industry?," 74 shops (16 percent) responded that eye injuries were the most important (see Table 30). The second most important serious injury, illness, or exposure was cuts, followed by respiratory disease. Other injuries", which were also considered relatively important by respondents, primarily included strains, sprains, burns, crushing injuries, abrasions, and falls.

Table 30. Most serious injuries, illnesses, or exposures

Response	Number of responses			
	Most impt. response	2nd most impt. response	3rd most impt. response	Total
Eye injuries	74	47	21	**142**
Cuts	62	55	27	**144**
Respiratory disease	61	33	23	**117**
Other injuries	43	56	48	**147**
Chemical exposure	40	31	15	**86**
Back injuries	35	25	16	**76**
Paints	35	13	9	**57**
Isocyanates	23	7	4	**34**
Dust/particles/fumes	16	17	8	**41**
Frame racks	13	8	1	**22**
Cancer	8	4	3	**15**
Knee injuries	5	5	4	**14**
Carpal Tunnel Syndrome	4	5	4	**13**
Noise/hearing loss	2	23	12	**37**
Don't know	35	15	13	**63**
Other	38	45	22	**105**
None/no others	0	51	109	**160**
Total responses*	**494**	**440**	**339**	**--**
Total shops*	**472**	**419**	**318**	**--**

*The total responses exceed the number of responding shops because some respondents provided more than one response.

Question 41. When asked "What are the three most effective ways to protect the health & safety of collision repair workers (i.e., "best practices")?," 116 shops (25 percent) responded that wearing PPE and other safety equipment is the most effective best practice (see Table 31).

Education and training was ranked second, with 106 shops (23 percent) responding that this was the most effective best practice.

Table 31. Best practices in health & safety

Best practice	Number of shops			
	Most impt. practice	2nd most impt. practice	3rd most impt. practice	Total responses
Wearing PPE/safety equipment	116	87	36	**239**
Education/training	106	57	23	**186**
Enforcement/supervision/ensuring compliance	45	27	11	**83**
Communication	36	21	14	**71**
Worker common sense/ awareness/ knowledge/care	35	24	16	**75**
Safety programs	30	20	6	**56**
Shop cleanliness	18	17	11	**46**
Engineering control/shop improvements	14	12	15	**41**
Providing equipment/tools	13	15	11	**39**
Don't know	16	10	9	**35**
Refused	2	0	0	**2**
Other	40	58	42	**140**
None/no others	0	91	118	**209**
Total	**471**	**439**	**312**	**--**

Question 42. When asked "What are the three most significant challenges to implementing those "best practices" in health & safety?," 175 shops (39 percent) responded that employee-related issues were the greatest challenge (see Table 32).

Examples of employee-related issues provided by respondents included:

- "Employee participation"
- "Employee cooperation"
- "Employee compliance"
- "Employee awareness"
- "Employee commitment"
- "Employee resistance"
- "Worker apathy"
- "Consistency"
- "Common sense"

Table 32. Challenges to implementing best practices in health & safety

Challenge	Number of shops			
	Most impt. challenge	2nd most impt. challenge	3rd most impt. challenge	Total responses
Employee-related issues	175	55	10	**240**
Supervision/enforcement of safety procedures	45	22	5	**72**
Financial considerations	34	24	9	**67**
Time constraints	34	13	7	**54**
Education & training	10	9	4	**23**
Don't know	36	17	10	**63**
Refused	2	0	0	**2**
Other	61	42	34	**137**
None/no challenges	49	133	55	**237**
Total	**446**	**315**	**134**	**--**

Question 43. When asked "What strategies could be used to overcome these challenges?," 65 shops (18 percent) responded that training/education/information was the most effective. Respondents also reported that having safety programs/meetings and enforcement/discipline/supervision were effective strategies (see Table 33).

Table 33. Strategies used to overcome challenges

Strategy	Number of shops			
	Most impt. strategy	2nd most impt. strategy	3rd most impt. strategy	Total
Training/education/information	65	18	12	**95**
Safety programs/meetings	46	17	4	**67**
Enforcement/discipline/supervision	40	26	10	**76**
Communication/reminding	36	18	1	**55**
Incentive programs	13	3	7	**23**
Don't know	70	9	4	**83**
Refused	2	0	0	**2**
Other	85	56	26	**167**
None/no others	0	108	57	**165**
Total	**357**	**255**	**121**	**--**

Question 44. Sixty-five percent of respondents (300 shops) reported that they would be willing to work with SHARP on a future confidential project.

Question 45. Eighty-eight percent of respondents (427 shops) reported that they have access to the Internet. Of these, 71 percent (300) reported that they would consider completing a future confidential survey on-line, rather than on paper.

Question 46. Sixty-three respondents (17 percent of shops) provided additional concerns or comments about health & safety in the collision repair industry. The themes associated with those comments were:

- Need for better training and information (11 respondents)
- Regulatory concerns (9 respondents)
- Concerns about inconsistent compliance with regulations (5 respondents)
- Concerns about toxic substances (5 respondents)
- The industry is improving (4 respondents)
- Financial concerns (4 respondents).

Discussion

Study Strengths and Limitations

This study was the first attempt to characterize the collision repair industry in Washington State. Although the needs assessment provided considerable insight into the industry, certain limitations in the study design may compromise the representativeness of the data gathered in this study.

The principal limitation associated with the field visits and key informant interviews is that the subjects and their shops may not be representative of Washington State's collision repair industry. The shop owners that participated in interviews and shop visits were the preeminent business owners in the Puget Sound region. Consequently, the health & safety conditions observed at their shops are likely better than the majority of shops in the state. Nonetheless, we noted several health & safety deficiencies, which were consistent with the field observations described by Yale's SPRAY study (Sparer et al. 2004) and EPA's DfE Program (EPA 2000a).

The principal limitation of the needs assessment survey is that the responses were self-reported by employers. Consequently, the responses may not reflect actual conditions and practices at the surveyed workplaces—for fear of retribution by regulatory agencies, concerns about privacy, etc. However, the survey responses were consistent with our field observations at seven collision repair shops, information provided by our stakeholders, and data published by Yale's SPRAY study (Sparer et al. 2004) and EPA's DfE Program (EPA 2000a).

Our findings were also compared to data collected in industry-sponsored surveys conducted by the I-CAR Education Foundation (I-CAR 2004) and BodyShop Business (BSB 2004). However, both surveys had relatively low response rates (10 to 13 percent), limiting the generalizability of their findings. Therefore, it is unclear whether disparities between our findings and those of I-CAR (2004) and BSB (2004) reflect genuine differences between the collision repair industry in Washington State and the rest of the United States, or rather reflects differences in sampling strategies, survey response rates, and/or data analyses.

Strengths of our study include the following:

1. The use of several data sources to identify employers eligible for inclusion in the sampling frame. Combining employer listings derived from ASA-WA's membership roster, Yellow Page™ headings, King County's database, and Internet searches likely included most collision repair shops in Washington State.

2. The use of site visits to collision repair shops to validate the survey instrument prior to distribution.

3. The support and participation of local shop owners, trainers, and business associations.

4. The high (69 percent) response rate to the survey. Note that unreachable businesses were conservatively assumed to perform collision repair and were included in the denominator of the response rate calculation. Excluding these unreachable shops would have yielded a response rate of 78 percent. This relatively high response rate results in a comprehensive profile of Washington State's collision repair industry.

Needs Assessment Findings

The first goal of this study was to gain an understanding of the collision repair business. The results of the survey indicate that this is a male-dominated industry comprised chiefly of small, non-unionized, family-run businesses. The principal factor influencing a shop's profitability is the reimbursement rates paid by insurance companies, which are the major source of income for 62 percent of shops. Several of our key informants suggested that the reimbursement rates set by insurance companies are not sufficient to allow investment in the training, education, PPE, and engineering controls that would provide optimal worker protection. However, others suggested that the relatively slim profit margins typically associated with this industry may also reflect the lack of formal business management training amongst the owners and managers of smaller shops. Regardless of the cause, this lack of profitability is an important factor to consider when formulating health & safety interventions. Our key informants suggested that providing grants, workers' compensation premium discounts, or tax incentives would increase the likelihood that shop owners would invest more resources in worker health & safety.

The second goal of this study was to describe the number of workers potentially exposed to isocyanates. Although painters are most likely to have frequent contact with isocyanates, collision technicians may also contact these reactive chemicals by occasionally mixing paints, cleaning paint guns, cleaning up spills, "bystander" exposures to fugitive paint mists, and incidental contact with hardeners that contaminate shop tools and work surfaces. The survey identified 2168 production employees in Washington State's collision repair industry (i.e., 828 painters plus 1340 collision technicians). Production worker employment was also estimated from Washington State's workers compensation database. The number of hours reported per quarter was retrieved for employers in the State Fund within NAICS code 811121 (Automotive Body, Paint, and Interior Repair and Maintenance) and employees classified in WIC 3412-00 (Automobile and truck: Body and fender repair shops). Assuming that one FTE works 500 hours per quarter, the 2005 estimate for production worker employment was 2,811 FTE. This estimate compares favorably to the survey results (2168 production employees), which likely represents an underestimate because less than 100 percent of collision repair shops responded to the survey. Therefore, we conclude that between 2200 and 2800 production employees are potentially exposed to isocyanates in Washington State's collision repair industry.

The third goal was to identify additional chemical and physical exposures of concern. Although the initial focus of our collision repair project was isocyanate exposures, it is clear that workers in this industry are potentially exposed to a multitude of hazards. Survey respondents expressed concern about eye injuries, lacerations, musculoskeletal injuries, burns, crushing injuries, abrasions, and falls. These responses are largely consistent with our field observations and the following workers' compensation "exposures" reported in Best's Loss Control Manual for Automobile Body Repair Shops (Best 2005): *"slips, trips, and falls; burns; cuts, lacerations, and dismemberment; electrical shocks; benzene fume inhalation; lead poisoning (especially for workers that specialize in the restoration of "classic" cars); back injuries; repetitive motion injuries; skin irritations; respiratory problems; hearing loss; and musculoskeletal problems."*

The fourth goal of this study was to describe current health & safety practices in the industry. The emphasis was placed on application of clear coats because Woskie et al. (2004) reported that the amount of clear coat used by a shop is a significant determinant of isocyanate exposures in spray booths. However, workers may also be exposed to the isocyanates present in certain primers, sealers, and topcoats. Eighty-five percent of shops reported that painters wore gloves while spraying two-part clear coats. More than half (51 percent) reported using latex gloves. However, recent findings suggest that isocyanates break through latex gloves, even after a single painting session (Liu et al. 2000). A more appropriate choice of glove material is nitrile, which was reportedly used by 40 percent of shops. Although there are no regulatory requirements to use nitrile gloves in collision repair shops, their use for handling isocyanates is recommended in the peer-reviewed literature (Liu et al. 2000), by a product manufacturer (Bayer 1999) and federal agencies (EPA 2000b; OSHA 1997). However, we observed that many production employees prefer latex gloves because they are perceived to be more comfortable and more flexible than nitrile.

The vast majority of shops (98 percent) reported that painters wore respirators while spraying two-part clear coats. Most shops used half-face air purifying respirators, which are allowed under current workplace regulations as long as an appropriate cartridge change-out schedule is established. However, half-face respirators do not provide eye protection, and SHARP rarely observed workers wearing goggles in combination with half-face respirators. Appropriate eye and face protection is required under state and federal workplace regulations when handling isocyanates because contact with vapors may cause permanent eye damage.

Supplied air respirators are recommended by state and federal agencies (EPA 2000c; HESIS 1989; NIOSH 1996a) and a product manufacturer (Bayer 1996). When asked why workers do not use supplied air respirators, 29 percent of respondents stated that the shop does not supply these respirators because the painters do not like them; 23 percent stated that the shop has supplied air respirators but the painters do

not use them. This finding is consistent with the observation by Sparer et al. (2004) that painters did not always wear supplied air respirators in shops that made them available. Our key informant interviews and field visits revealed that some shop owners are aware that supplied air respirators offer the best protection against isocyanate exposures, but painters refuse to wear them because of perceptions about interference with visual acuity and mobility while painting.

The survey revealed that application of two-part clear coats was primarily conducted in enclosed spray booths. However, nine percent of shops reported that painting was performed in ventilated prep stations and three percent said that painting occurred on the shop floor. During our field visits, we observed prep stations that were comprised of a separate area with an exhaust filter bank mounted in the wall. Occasionally, these stations were separated from the rest of the production area by movable plastic curtains. Some configurations did not have a local source of supply air. We determined that some ventilated prep stations may provide sufficient air flow velocities to protect painters from isocyanate overexposures. However, Washington State's workplace health and safety regulations dictate that spray finishing with flammable materials may only be conducted in approved spray booths. Paint spraying outside of approved spray booths may also violate fire protection codes.

Slightly less than half of the survey respondents reported that two-part clear coats were applied in downdraft booths (46 percent); 26 percent reported prefabricated crossdraft booths, 20 percent reported custom crossdraft booths, and 10 percent reported semi-downdraft booths. Under experimental conditions, Heitbrink et al. (1995) determined that downdraft booths (where air is supplied from the top of the booth and exhausted below) produced lower particulate exposures for workers than crossdraft (air supplied from one side of the booth and exhausted on the opposite side) or semi-downdraft booths (air supplied from the top of the booth and exhausted from the side). Woskie et al. (2004) determined that custom built crossdraft booths yielded the highest exposures, prefabricated crossdraft booths yielded intermediate exposures, and the lowest exposures were noted in downdraft or semi-downdraft booths. Our study revealed that 64 percent of larger shops (production areas >5,000 sq.ft). had a downdraft booth, whereas only 36 percent of smaller shops (<5,000 sq.ft.) had this type ($p < 0.0001$). This observation is consistent with the findings of Woskie et al. (2004), who reported that larger shops had more downdraft booths than smaller shops. We also determined that 70 percent of smaller shops had custom crossdraft booths, compared to 30 percent of larger shops. This discrepancy likely reflects the fact that smaller shops are more likely to design and build their own custom crossdraft booths than purchase downdraft booths. The finding that smaller shops are less likely to have downdraft booths (most protective) and more likely to have custom crossdraft booths (least protective) has significant implications for worker exposure.

The fifth goal of this study was to learn about the health & safety perceptions and needs of business owners and managers. The majority of shop owners received their health & safety information from Material Safety Data Sheets, manufacturers and suppliers, and trade journals. We learned from our key informant interviews that certain poor work practices (such as the use of latex gloves) are perpetuated by misinformation provided by some of these sources.

Only 25 percent of shops contracted with a private health & safety consultant and only one percent reported receiving information from L&I (the state agency tasked with administering workplace health & safety regulations and providing consultation services in Washington State). This finding is particularly disconcerting because specialized expertise is required to develop effective safety & health programs, especially concerning respiratory protection. It is clear that many shop owners are lacking good quality health & safety information and require technical assistance.

Intervention Strategies

The final goal of the study was to identify strategies to reduce exposures and increase employer and worker awareness. A successful intervention strategy must recognize the challenges faced by small businesses in general, and the collision repair industry in particular. Although state and federal workplace regulations require that employers identify and address hazardous exposures in the workplace, preventing occupational illness and injury is often difficult in small businesses because they generally have few safety and health resources, cannot usually hire staff devoted to safety and health activities, and often lack the ability to identify occupational hazards and conduct surveillance (NIOSH 1999).

Our field observations revealed that many collision repair shops had significant deficiencies in their respiratory protection programs, especially with regard to fit-testing, selection, and maintenance of air purifying respirators. Maintenance of supplied air respirators and the associated compressor systems was also lacking. Another major deficiency was the use of inappropriate gloves for handling isocyanates, lacquer thinners, and other solvents. We also observed that spray booths often failed to provide sufficient air flow to protect workers due to inadequate filter change-out schedules, accumulation of debris in exhaust filters, or other mechanical problems. Failure to maintain spray booths increases exposures to airborne contaminants and may increase costs because of inefficient heating, cooling, and movement of air. Insufficient air flow can also compromise the quality of the painted surface because of dust contamination. We also observed that workers in this industry may be exposed to excessive noise and other physical and musculoskeletal hazards while prepping and painting vehicles. Our field observations revealed inconsistent use of hearing protection and eye protection. Several tasks performed by collision technicians and painters had numerous risk factors for musculoskeletal injuries, including awkward postures, forceful exertion, and repetitive motion.

Paradoxically, many of the "best practices" necessary to protect collision repair workers from these hazards have been recognized for decades. (One exception is the relatively recent finding that isocyanates penetrate latex gloves.) Consequently, this industry is amenable to the "Research to Practice" approach proposed by NIOSH, which is defined as "... the transfer and translation of research findings, technologies, and information into highly effective prevention practices and products which are adopted in the workplace" (NIOSH 2005). However, the mechanisms by which this information is transferred to these workplaces must account for the financial and social characteristics of this industry. Any outreach effort must recognize that the social organization of work within small businesses is extremely complex and poses unique challenges to developing effective intervention strategies. Eakin (1992) suggests that most owners of small workplaces have very little involvement in activities related to workplace health and safety and strive to sustain good working relationships with valued employees. Our field observations revealed that some shop owners express considerable concern for the health and well-being of their employees, likely because many of these businesses are family-owned and operated. Even when this is not the case, we noted a strong sense of community within some shops. However, we observed that some shop owners allow valued production employees to dictate work practices, even if they are not the most protective. This behavior was observed with the painters' selection and use of gloves and respirators. One possible explanation for this dynamic is our observation that painters may be regarded as the "quarterbacks" of the collision repair shop; some business owners will not discipline or place excessive pressure on these employees for fear that they will seek employment elsewhere. Another explanation is that some shop owners may perceive intervention with their employees to be inappropriately paternalistic—they do not believe that they have the right or obligation to intervene in the health-related aspects of employee behavior (Eakin 1992). These findings are consistent with the obstacles to implementing safe work practices observed by EPA (1999).

This industry would benefit from an intervention strategy based on "social marketing", where "social marketing" is defined as the application and adaptation of commercial marketing concepts to the planning, development, and implementation of programs that are designed to bring about behavior change to improve the welfare of individuals or their society (NCI 2002). This approach would use the barriers and benefits to adopting sustainable safe work practices identified in this study as the foundation of an educational and technical assistance campaign that utilizes the behavior change tools from social science research to promote information, attitudes, values and behaviors. It is critically important to include prominent owners and managers, business associations, trade groups, and other industry leaders in any intervention, to ensure that these efforts are meaningful and relevant to the target population. Collaborating with trade organizations to disseminate information is also critical, especially since we determined that 95 percent of respondents subscribe to at least one trade journal. Providing on-site technical assistance is an essential component of any outreach strategy, and efforts should be made to promote the services currently available from the Washington State OSHA plan (WISHA) consultation

program and other health & safety professionals. Collective efforts should be developed that provide low cost health & safety services as collaborative partnerships between local, state, and federal agencies, trade associations, retrospective rating programs, and other stakeholders.

We conclude that there is a critical need to develop a multi-faceted education and training campaign for this industry. Although the solutions to protecting workers have been documented for several decades, this information has not been delivered effectively to Washington State's collision repair industry. Using social marketing strategies and financial incentives would likely be an effective means to improve workplace health and safety in this underserved business sector.

References

Bayer (1996). Working Safely with Polyurethane Paints. Bayer Industrial Chemical Division, Publication 7354 396.

Bayer (1999). Desmodur® N. Hexamethylene Diisocyanate Based Polyisocyanates. Bayer Industrial Chemical Division, Publication 7082 2.0. December 1999.

Best (2005). Automobile Body Repair Shops. Revision: September, 2000. Best's Loss Control Manual on CD-ROM, Version 2005.2.

BSB (2004). 2004 Industry Profile. BodyShop Business.

Eakin JM (1992). Leaving it up to the workers: Sociological perspective on the management of health and safety in small workplaces. International Journal of Health Services 22(4):689-704.

Enander RT, Gute DM, Cohen HJ, Brown LC, Desmaris AM, Missaghian R. (2002). Chemical characterization of sanding dust and methylene chloride usage in automotive refinishing: implications for occupational and environmental health. AIHA J ;63(6):741-9.

EPA (1999). Factors that Motivate Owners of Auto Refinish Shops to Implement Changes. U.S. Environmental Protection Agency. Downloaded from *www.epa.gov/dfe/pubs/auto/factors/factors.pdf,* October 2005.

EPA (2000a). U.S. Environmental Protection Agency Design for the Environment Program, Auto Refinish Project, Best Practices Kit. Available at *www.epa.gov/opptintr/dfe/pubs/auto/trainers/index.htm*

EPA (2000b). Choosing the Right Gloves for Painting Cars. U.S. Environmental Protection Agency. Publication EPA/744-F-00-005. June 2000. Downloaded from *www.epa.gov/dfe/pubs/auto/gloves/gloves.pdf,* October 2005.

EPA (2000c). Supplied-Air Respirators in Auto Refinishing Shops: Get the Best Protection. U.S. Environmental Protection Agency. Publication EPA/744-F-00-007. June 2000. Downloaded from *www.epa.gov/dfe/pubs/auto/respirator/respirator.pdf,* October 2005.

EPA (2005). Revised Automotive Refinishing Industry Isocyanate Profile. U.S. Environmental Protection Agency. January 2005. Downloaded from *www.epa.gov/opptintr/dfe/pubs/auto/profile/index.htm,* October 2005.

Erjefalt I, Persson CG. (1992). Increased sensitivity to toluene diisocyanate (TDI) in airways previously exposed to low doses of TDI. Clin Exp Allergy 22(9):854-62.

Heitbrink,W, Wallace M, Bryant C, Ruch W. (1995). Control of Paint Overspray in Autobody Repair Shops. Am Ind Hyg Assoc J. 56(10):1023-1032.

HESIS (1989). Isocyanates. Hazard Evaluation System and Information Service, California Department of Health Services. October 1989. Downloaded from *www.dhs.ca.gov/ohb/HESIS/iso.htm*, October 2005.

HSE (2005a). Work-related Asthma. Health and Safety Executive. Statistics. Viewed at *www.hse.gov.uk/statistics/causdis/asthma.htm*, November 2005.

HSE (2005b). Table THORR05: Occupational asthma: estimated number of cases reported by chest and occupational physicians to SWORD/OPRA and estimated rates per 100,000 workers per year, by occupation. Health and Safety Executive. Viewed at *www.hse.gov.uk/statistics/tables/thorr05.htm*, November 2005.

I-CAR Education Foundation. (2004). Snapshot of the Collision Industry - Full Survey. Downloaded from *www.i-car.com/pdf/status_files/annual_report.pdf*, October 2005.

Liu Q, Wisnewski AV (2003). Recent developments in diisocyanate asthma. Annals of Allergy, Asthma, & Immunology 90:35-41.

Liu Y, Sparer J, Woskie SR, Cullen MR, Chung JS, Holm CT, Redlich CA (2000). Qualitative assessment of isocyanate skin exposure in auto body shops: a pilot study. Am J Ind Med 37(3):265-74.

NCI (2002). Making Health Communication Programs Work. U.S. Department of Health & Human Sciences. Public Health Service. National Institutes of Health. National Cancer Institute. NIH Publication No. 02-5145.

NIOSH (1996a). NIOSH Alert: Preventing Asthma and Death from Diisocyanate Exposures. National Institute of Occupational Safety and Health. Cincinnati, OH. DHHS (NIOSH) Publication No. 96-111. 1996.

NIOSH (1996b). National Occupational Research Agenda. National Institute of Occupational Safety and Health. Cincinnati, OH. 1996.

NIOSH (1999). Identifying High-Risk Small Business Industries. National Institute of Occupational Safety and Health. DHHS (NIOSH) Publication Number 99-107. May 1999. Viewed at *www.cdc.gov/niosh/sbintro.html*, November 2005.

NIOSH (2005). r2p: Research To Practice at NIOSH. National Institute of Occupational Safety and Health web site: *www.cdc.gov/niosh/r2p/*. Viewed October 2005.

OSHA (1997). Aromatic Isocyanate Surface Contamination Sampling and Evaluation Techniques. U.S. Department of Labor, Occupational Safety & Health Administration. August 1997. Downloaded from *www.osha.gov/SLTC/isocyanates/mrl_inte.html*, October 2005.

Rattray NJ, Botham PA, Hext PM, Woodcock DR, Fielding I, Dearman RJ, Kimber I. (1994). Induction of respiratory hypersensitivity to diphenylmethane-4 4'-diisocyanante (MDI) in guinea pigs. Influence of route of exposure. Toxicology 88:15-30

SHARP (2000). Workers' Compensation Based Surveillance of Asthma, Hospitalized Burns, and Adult Blood Lead Levels in Washington State, 1994-1998. Safety & Health Assessment & Research for Prevention (SHARP) report 64-1-2000. Olympia, Washington. July 2000.

SHARP (2003). Work-Related Asthma in Washington State: A Review of Worker's Compensation Claims from 1995-2002. Safety & Health Assessment & Research for Prevention (SHARP) report 64-6-2003. Olympia, Washington. December 2003.

Sparer J, Stowe MH, Bello D, Liu Y, Gore RJ, Youngs F, Cullen MR, Redlich CA, Woskie SR (2004). Isocyanate Exposures in Autobody Shop Work: The SPRAY Study. Journal of Occupational and Environmental Hygiene, 1:570-581.

Woskie SR, Sparer J, Gore R, Stowe M, Bello D, Liu Y, Youngs F, Redlich C, Cullen M. (2004). Determinants of isocyanate exposures in auto body repair and refinishing shops. Annals of Occupational Hygiene 48:393-403.

Appendix A:

Preliminary Collision Repair Survey

Isocyanate Users Survey

All information you provide on this survey will be treated in the strictest confidence. We will not share this information with WISHA, OSHA, or anyone else. We will only publish data that summarizes information for all shops combined (with no identifying information). Thank you for helping us reduce exposures to isocyanates and other hazardous chemicals in auto body shops.

To be completed by shop owner or manager

Please print name below

_____
Last First

(_____) _____
Telephone no. Fax no.

Shop name and address

_____
Shop name

_____
Street address City State

1. Before receiving this package, did you know that two-part polyurethane paints and coatings contain isocyanates? □ Yes □ No

2. What products do you apply that contain isocyanates? (Choose all that apply)

□ Primers
□ Sealers
□ Basecoats
□ Clearcoats
□ Other? (please describe) _____

If you do not use isocyanate-containing products, please stop here and return the survey. If you checked any of the boxes in this question, please complete the remainder of the survey.

3. On the average, how many cars do you paint in a month? ☐ cars per month

4. Are you an owner/operator without employees? □ Yes □ No
   If you answered No, how many employees do you have during your busiest period? ☐

5. Does the owner/manager do all the painting? □ Yes □ No
   If you answered No, how many employees apply isocyanate-containing products during your busiest period? ☐

6. Approximately how many square feet is the production area of your shop?

□ Less than 1,000 square feet
□ Between 1,000 and 5,000 square feet
□ Greater than 5,000 square feet

7. What personal protective equipment (PPE) do workers wear while mixing paints? (Choose all that apply):

□ None
□ Gloves
□ Coveralls
□ Respirators
□ Other? (please describe) _____

8. Is your mixing area located in an enclosed room? □ Yes □ No
   If Yes, is ventilation provided in the mixing room? □ Yes □ No

9. How do you and your employees apply the following types of coatings? (Fill in all the boxes with "Yes" or "No")

	Brush	Roller	Conventional Spray	Airless Spray	HVLP Spray Gun	Other (Please describe)
Primers						
Sealers						
Basecoats						
Clearcoats						
Other _____						

10. Do you or your employees eat, drink, or smoke on the shop floor? □ Yes □ No

11. What type(s) of respirator do you and your employees use when you apply isocyanate products? (Choose all that apply)

□ None
□ Dust masks (filtering face pieces)
□ Half-face type with cartridges
□ Full-face type with cartridges
□ Hood or head covering with air supply hose
□ Half-face type with an air supply hose
□ Full-face type with an air supply hose
□ Full-face type with air bottles on the back (SCBA)
□ Hood-type powered air-purifying respirator (PAPR)
□ Other? (please describe) _____

12. Do you have a written respiratory protection program? □ Yes □ No

13. Do you perform medical evaluations to determine fitness to wear a respirator? □ Yes □ No

14. Do workers receive an initial respirator fit test? □ Yes □ No
    If Yes, how frequently do workers receive fit tests following the initial fit test? _____ times per year

15. If you use cartridge-type respirators, how do you know when it's time to change the cartridge?:

□ We never replace the cartridges
□ When it becomes difficult to breathe through the respirator
□ We follow the manufacturers' recommended change-out schedules
□ We change them on a routine basis (daily/weekly/monthly)
□ We don't use this type of respirator
□ Other (please describe) _____

16. If you use respirator(s) with an air supply hose, are they on the same air hose that goes to the paint sprayer?
□ Yes □ No □ We don't use this type of respirator

PLEASE TURN THE PAGE

17. What type(s) of gloves do you and your employees use when **applying** isocyanate products? (Choose all that apply)

□ None
□ Latex
□ Natural rubber
□ Nitrile
□ Neoprene
□ PVC
□ Laminated polyethylene
□ Cloth/leather
□ Other? (please describe) _____

18. What type(s) of other PPE do you and your employees use when **applying** isocyanate products? (Choose all that apply)

□ Safety glasses
□ Goggles
□ Face shield
□ Head socks
□ Earplugs or earmuffs
□ Fabric coveralls
□ Disposable coveralls
□ Cloth or leather work boots
□ Rubber boots
□ Disposable boot covers
□ Other? (please describe) _____

19. List the type of ventilated enclosures used for each type of spray application (Fill in all the boxes with "Yes" or "No")

	Downdraft booth	Semi-downdraft booth	Prefabricated crossdraft booth	Custom crossdraft booth	None	Other (Describe)
Primers						
Sealers						
Basecoats						
Clearcoats						
Other _____						

20. How do you tell whether your ventilation is working well enough? (Please describe)

21. **If you use a spray booth**, does it have any kind of gauge to indicate how well it's working?
□ Yes □ No □ We don't use a spray booth

22. **If you use exhaust ventilation**, have you ever had it tested to see what the flow rate is?
□ Yes □ No □ We don't use exhaust ventilation

23. Approximately how many gallons of clearcoat are used by the shop each month? ☐ gallons per month

24. What health effects do you know of that can be caused by isocyanates? (Please describe):

25. Where do you get your information on the health effects of isocyanates? (Choose all that apply):

□ I don't have access to any health information
□ Material Safety Data Sheets (MSDS)
□ Other manufacturer or supplier information
□ Health & safety information on the Internet
□ Other (please describe): _____

26. How do you inform your employees about the hazards associated with using isocyanates? (Choose all that apply):

□ Making MSDSs available
□ Health & safety trainings
□ Regular safety meetings
□ Other (please describe): _____

27. Have any of your employees ever told you that they have symptoms when they use isocyanate products, or within a few hours after they use them? □ Yes □ No
If **Yes**, what were the symptoms? (please describe)

28. Do you have a medical monitoring program to specifically identify health effects from isocyanate exposures? □ Yes □ No

29. Have you ever had any air monitoring done to see whether employees were exposed to isocyanates in the air? □ Yes □ No

30. What other hazardous chemical exposures are of concern in your shop? (Please describe)

31. **In the last year**, has anyone in your shop attended a health & safety training program (on-line or face-to-face) **as a requirement of your shop's insurance carrier for commercial property & liability coverage?** □ Yes □ No

32. Would you be interested in participating in a study to evaluate isocyanate exposures in auto body shops? This could include a free-of-charge isocyanate exposure evaluation? □ Yes □ No

33. Do you belong to any local or national automotive industry associations? □ Yes □ No
If **Yes**, which association(s) do you belong to? _____

34. We value your opinion! Is there anything you'd like to add? (Please continue on an additional sheet if you need more space)

Thank you for completing the survey. **Please mail** in the envelope provided **or fax** (360) 902-5672 **by** February 28, 2005.

Additional Questions

Shop _____

Date _____

Interviewer _____

Interviewee _____

1. Do you have any "ventilated prep stations" (i.e., painting stations that are not fully enclosed booths)?

Yes No

2. Do you use single stage topcoats? Yes No.

If yes, where do you apply them?

Downdraft booth	Semi-downdraft booth	Prefabricated crossdraft booth	Custom crossdraft booth	Ventilated workstation	Other (Describe)

3. What types of gloves do you use when applying solvents?

- □ None
- □ Latex
- □ Natural rubber
- □ Nitrile
- □ Neoprene
- □ PVC
- □ Laminated polyethylene
- □ Cloth/leather
- □ Other? (please describe)

_____

4. What sort of payment arrangement do you have with your painters?

Paid on commission Hourly Salaried

5. Do you have a vacuum system to collect dusts from sanders or other power tools?

Yes No

Appendix B:

Industrial Hygiene Checklist

Observational Checklist Site Number:_____

Observer(s):_____ Date:_____

RESPIRATORS

35. Check type(s) of respirator used to apply isocyanate products?

- □ None
- □ Dust masks (filtering face pieces)
- □ Half-face type with cartridges
- □ Full-face type with cartridges
- □ Hood or head covering with air supply hose
- □ Half-face type with an air supply hose
- □ Full-face type with an air supply hose
- □ Full-face type with air bottles on the back (SCBA)
- □ Hood-type powered air-purifying respirator (PAPR)
- □ Other? (please describe) _____

POWERED AIR Respirator type #1_____ Used at what booth:_____

If powered air is used, is supply line separate from paint gun air supply:

If No, Comments:

Describe condition of airline hose:

Other:

POWERED AIR Respirator type #2_____ Used at what booth:_____

If powered air is used, is supply line separate from paint gun air supply:

If No, Comments:

Describe condition of airline hose:

Other:

POWERED AIR Respirator type #3_____ Used at what booth:_____

If powered air is used, is supply line separate from paint gun air supply:

If No, Comments:

Describe condition of airline hose:

Other:

For CARTRIDGE TYPE respirators, describe method of cartridge change-out:

- □ They rarely replace the cartridges
- □ When it becomes difficult to breathe through the respirator
- □ They follow the manufacturers' recommended change-out schedules
- □ Changed on a routine basis (daily/weekly/monthly)
- □ Other (please describe)

What type(s) of cartridge is being used:

Is this cartridge choice appropriate?

Concerns:

OTHER:

VENTILATION

Check the type of ventilated enclosures found in the shop:

□ Downdraft booth □ Prefabricated crossdraft □ Spray Station (3 sides or less)

□ Semi-downdraft booth □ Custom crossdraft □ None

Ventilation #1_____

Is there a magnahelic: Is pressure Pos or Neg to room?
Method used for changing filters:

Circle type of gun used: Conventional Spray Airless Spray HVLP Gun Other:

Briefly describe:

Concerns:

Ventilation #2_____

Is there a magnahelic: Is pressure Pos or Neg to room?
Method used for changing filters:

Circle type of gun used: Conventional Spray Airless Spray HVLP Gun Other:

Briefly describe:

Concerns:

PPE

What type(s) of gloves are used when applying isocyanate products:

□ None
□ Latex
□ Natural rubber
□ Nitrile
□ Neoprene
□ PVC
□ Laminated polyethylene
□ Cloth/leather
□ Other? (please describe) _____

What type(s) of other PPE is used when applying isocyanate products? (Choose all that apply)

□ Safety glasses
□ Goggles
□ Face shield
□ Head socks
□ Earplugs or earmuffs
□ Fabric coveralls
□ Disposable coveralls
□ Cloth or leather work boots
□ Rubber boots
□ Disposable boot covers
□ Other? (please describe) _____

PAINT MIXING

Check PPE used when mixing paints

□ None
□ Gloves
□ Coveralls
□ Respirators
□ Other? (please describe) _____

36. Is **mixing area** located in an enclosed room? □ Yes □ No
If Yes, is ventilation provided in the mixing room? □ Yes □ No

Briefly describe mixing area:

Concerns:

Appendix C:

Collision Repair Needs Assessment Survey

Please note that the survey instrument was modified from a 8.5” X 6.5” booklet for printing in this report.

How to complete the survey

Step 1: Ask the person most familiar with the day-to-day operations in your shop (preferably the shop owner or manager) to complete the survey.

Step 2: Return the survey in the enclosed postage-paid envelope to Gilmore Research by **Friday July 8th, 2005**.

Who is conducting this survey?

This survey is from the Safety & Health Assessment & Research for Prevention (SHARP) program – an independent research group within the Washington State Department of Labor & Industries (L&I).

If you have questions about SHARP or this survey, please contact:

Steve Whittaker, Collision Repair Project Lead
SHARP Program
PO Box 44330
Olympia WA 98504-4330
Tel. (888)-66-SHARP (toll-free)
Fax (360)-902-5672
E-mail SHARP@LNI.wa.gov
Web site: http://www.lni.wa.gov/Safety/Research/

SHARP – Promoting Safer, Healthier Workplaces

Thank you for participating in this survey!

Are you a collision repair shop?

We are interested in learning about health & safety in the collision repair industry. Your shop received this survey because it may have been listed under "Auto Repair & Painting" or "Collision Repair" in the Yellow Pages™.

Does your business actually do collision repair (i.e., do you repair **and** paint cars or other vehicles)? □ Yes □ No

If you **are not** a collision repair business, **please stop here**, complete the Survey Respondent Information* on the last page, and return the survey to Gilmore Research.

If you are a collision repair shop, please complete the rest of the survey.

*Identifying yourself to SHARP by completing the Survey Respondent form is optional. However, if you give us this information, we will know not to contact you in the future.

QUESTIONS ABOUT YOUR BUSINESS

We are asking the following confidential questions to learn about the day-to-day operation of your shop. Your responses will help us understand the challenges you face in running a profitable and safe collision repair shop. We will use this information to help shops overcome challenges to providing a safe and healthy workplace.

1. Which job title best describes your current position? (Please check one box)

- □ Shop owner
- □ Shop manager
- □ Lead collision technician (body man)
- □ Lead painter
- □ Other (describe) _____

2. In which county is your shop located?

_____ county

3. How long has your shop been in business?

_____ years

4. Is your shop family-owned and operated?

□ Yes □ No

5. On the average, how many cars do you paint in a month?

_____ cars per month

6. On the average how many <u>complete</u> cars do you paint in a month (i.e., restore, refinish and/or paint the <u>entire</u> vehicle, rather than just damaged sections)

_____ complete cars per month

7. Approximately how large is the production area of your shop (i.e., preparation and painting)?

- □ Less than 1,000 square feet
- □ Between 1,000 and 5,000 square feet
- □ Between 5,000 and 10,000 square feet
- □ Greater than 10,000 square feet

8. Is your shop part of a multi-store business, consolidator, franchise, cooperative group, chain, or similar collection of businesses? □ Yes □ No

9. How do you see the profitability of your business changing over the next 2 years? (Check one only)

□ Decrease □ Unchanged □ Increase

10. What factors influence your company's profitability the most?

#1:_____

_____

#2:_____

_____

#3:_____

_____

11. What is your <u>major</u> source of income? (check one only)

- □ Dealer referral
- □ Customer pay
- □ Insurance companies
- □ Other (describe) _____

12. Do you belong to a retrospective rating program for workers' compensation insurance (i.e., a "retro" program)? □ Yes □ No

If "Yes", which program do you belong to?

_____

13. Do you belong to any local or national automotive industry associations? □ Yes □ No

If "Yes", which association(s) do you belong to?

_____

14. How many employees in total (i.e., office workers, repair technicians, painters, etc.) do you have in the shop at your busiest time?

☐ **total workers**

15. Is your shop unionized? □ Yes □ No

16. Please complete the following table for the body men (collision technicians) and painters working in your shop at your busiest time:

	Body men (collision technicians)	**Painters**
a) How many workers are there?	_____ techs	_____ painters
b) How many workers are female?	_____ techs	_____ painters
c) Average number of years on the job	_____ years	_____ years
d) How many workers are less than 35 years old?	_____ techs	_____ painters
e) How many workers are 35-55 years old	_____ techs	_____ painters
f) How many workers are greater than 55 years old	_____ techs	_____ painters
g) Payment arrangement (please check the box that describes the arrangement you use most frequently for your painters and technicians)	□ Commission □ Flat rate □ Hourly □ Salaried □ Other (describe) _____	□ Commission □ Flat rate □ Hourly □ Salaried □ Other (describe) _____

17. What benefits do you provide your workers? (Check all that apply)

Benefit	Office staff	Collision techs	Painters
Medical	□	□	□
Dental	□	□	□
Vision	□	□	□
Retirement Plan	□	□	□
Childcare Assistance	□	□	□
On the Job Training	□	□	□
Tuition Reimbursement	□	□	□
Outside Training	□	□	□
Paid Vacation Leave	□	□	□
Paid Sick Leave	□	□	□
Paid Family Leave	□	□	□
Family Emergency Assist.	□	□	□
Other_____	□	□	□

QUESTIONS ABOUT HEALTH & SAFETY

18. Which trade journals do you read?

- □ BodyShop Business
- □ Parts & People
- □ ACA Newsletter
- □ Auto Inc. (ASA)
- □ Other (please describe) _____

19. Does your shop have a safety committee that meets regularly? □ Yes □ No

20. Is there a person designated with allotted time to address safety and health issues?

□ Yes □ No

21. Does the shop have funds dedicated to address unsafe conditions or equipment?

□ Yes □ No

22. Does your shop have a safety incentive program for employees? □ Yes □ No

23. Do you generally keep injured employees on salary ? □ Yes □ No

24. Does your shop design and provide modified or light-duty jobs for injured employees?

□ Yes □ No

25. Where do you get your health & safety information for two-part paint systems? (Choose all that apply)

- □ Material Safety Data Sheets (MSDS)
- □ Other manufacturer or supplier information
- □ Health & safety information on the Internet
- □ Trade journals
- □ Other (please describe): _____
- □ I don't have access to any health information

26. How do your painters clean their paint guns with solvent? (Check one)

- □ We don't use solvent
- □ Manual cleaning
- □ Automatic gun washer
- □ Combination manual & automatic washing
- □ Other? (describe) _____

27. What type(s) of gloves do your workers use when handling lacquer thinner? (Choose all that apply)

- □ We don't use lacquer thinner
- □ None
- □ Latex
- □ Natural rubber
- □ Neoprene
- □ PVC
- □ Laminated polyethylene
- □ Cloth/leather
- □ Other? (describe)

□ Nitrile _____

28. Do you have a central vacuum system to collect dust from power tools?
□ Yes □ No

If "No", please tell us why you do not have a system (Choose all that apply)

- □ Too expensive
- □ Too difficult to maintain
- □ Too difficult to install
- □ Not proven to work
- □ Inconvenient to use
- □ Not enough dust generated to justify cost
- □ Incompatible with technicians' tools
- □ Other (please describe) _____

29. What personal protective equipment (PPE) do your workers wear while spraying two-part <u>clear coats</u>? (Choose all that apply)

- □ Respirator
- □ Safety glasses
- □ Goggles
- □ Head socks
- □ Earplugs or muffs
- □ Gloves
- □ Shoot suit
- □
- □ Fabric coveralls
- □ Disposable coveralls
- □ Cloth or leather work boots
- □ Rubber boots
- □ Disposable boot covers
- □ Other? (describe) _____

30. What type(s) of gloves do your workers use when mixing or applying two-part <u>clear coats</u>? (Choose all that apply)

- □ Latex
- □ Natural rubber
- □ Nitrile
- □ Neoprene
- □ PVC
- □ Laminated polyethylene
- □ Cloth/leather
- □ Other? (describe) _____
- □ None

31. What type(s) of respirator do your workers use while spraying two-part clear coats? (Choose all that apply)

- □ Dust masks (filtering face pieces)
- □ Disposable half-face type with cartridges (entire unit disposable – both the face-piece and cartridges)
- □ Half-face type with replaceable cartridges
- □ Full-face type with cartridges
- □ Half-face type with an air supply hose
- □ Full-face type with an air supply hose
- □ Hood or head covering with air supply hose
- □ Hood-type powered air-purifying respirator (PAPR)
- □ Other? (please describe)

  _____
- □ None

32. If your workers do not use supplied air respirators, please tell us why not. (Choose all that apply)

- □ We **don't have** supplied air respirators because they are **too expensive**
- □ We **don't have** supplied air respirators because they are **too difficult to install**
- □ We **don't have** supplied air respirators because they are **too difficult to maintain**
- □ We **don't have** supplied air respirators because the **painters don't like them**
- □ We **have** supplied air respirators but the **painters don't use them**
- □ Other? (please describe) _____

33. Where do painters spray two-part clear coats?

- □ Downdraft booth (air supplied from the top of the booth and exhausted below)
- □ Semi-downdraft booth (air supplied from the top of the booth and exhausted from the side)
- □ *Prefabricated* crossdraft booth (air supplied from one side of the booth and exhausted on the opposite side)
- □ *Custom* crossdraft booth (air supplied from one side of the booth and exhausted on the opposite side)
- □ Ventilated prep station
- □ On the shop floor (no mechanical ventilation)
- □ Other (please describe)

  _____

34. What health effects do you know of that can be caused by exposure to two-part paint systems?

_____

_____

35. What harmful chemicals do you know of that are present in two-part paint systems?

_____

_____

36. How do employees report health & safety concerns? (Please describe)

_____

_____

37. How do you know when those health & safety concerns have been resolved? (Please describe)

_____

_____

38. If you were given $500 to improve some aspect of health & safety in your shop, what would you do with it? (Please describe)

_____

_____

39. Do you contract with a private health & safety consultant or "compliance company"?

□ Yes □ No → Skip to Q.40

a) If "Yes", how often do they visit your shop?

[ ] times per year

b) Are you satisfied with the services provided by the consultant/company? □ Yes □ No

c) Would you recommend your consultant/company to another shop? □ Yes □ No

d) Which consultant/company do you use? (optional)

_____

_____

40. In your opinion, what are the three most serious injuries, illnesses, or exposures in the collision repair industry?

#1:_____

_____

#2:_____

_____

#3:_____

_____

41. **What are the three most effective ways to protect the health & safety of collision repair workers (i.e., “best practices”)?**

#1:_____

_____

#2:_____

_____

#3:_____

_____

42. **What are the three most significant challenges to implementing those “best practices” in health & safety?**

#1:_____

_____

#2:_____

_____

#3:_____

_____

43. **What strategies could be used to overcome these challenges?**

#1:_____

_____

#2:_____

_____

#3:_____

_____

44. If SHARP gets additional funding, we will be doing further work in the collision repair industry. Would you be willing to work with us on this confidential project? SHARP would visit your shop and provide hands-on training and education. □ Yes □ No

45. Do you have access to the Internet?

□ Yes □ No

If "Yes" would you consider completing a future confidential survey on-line, rather than on paper? □ Yes □ No

46. Do you have additional concerns or comments about health & safety in the collision repair industry?

_____

_____

Survey Respondent Information

If you prefer to remain anonymous, do not provide the information below. However, we encourage you to complete this form so that we might send you educational materials and work with you in the future on this confidential project.

Please print your name below:

_____
First Last

Shop name:

_____

Job title:

_____

Shop address:

_____
Street address City State Zip

E-mail address: _____

Shop telephone no.: ( )_____

Shop fax no.: ( )_____

Thank you for helping to keep Washington State's collision repair businesses healthy!

Appendix D:

Needs Assessment Survey Data

1: **GRGID**

14: **MAIL**

N =		307	100%
Mail survey returned	1	0	0%
Phone survey	2	307	100%

15: **RESPN**

N =		187	100%

51: **Q1**

READ 1-97

The following questions are about the day-to-day operation of your shop. First, which job title best describes your current position...

N =			493	100%
Shop owner	01		307	62%
Shop manager	02		141	29%
Lead (PRONOUNCED: "leed") collision technician (body man)	03		5	1%
Lead (PRONOUNCED: "leed") painter	04		1	0%
Or some other title (SPECIFY:)	97	O	39	8%
Don't know - DO NOT READ	98	X	0	0%
Refused - DO NOT READ	99	X	0	0%

52: **Q2**

In which county is your shop located?

N =		487	100%
Adams	001	3	1%
Asotin	003	4	1%
Benton	005	13	3%
Chelan	007	12	2%
Clallam	009	7	1%
Clark	011	18	4%
Columbia	013	0	0%
Cowlitz	015	9	2%
Douglas	017	3	1%
Ferry	019	2	0%
Franklin	021	6	1%
Garfield	023	0	0%
Grant	025	8	2%
Grays Harbor	027	6	1%
Island	029	7	1%
Jefferson	031	5	1%
King	033	138	28%
Kitsap	035	13	3%
Kittitas	037	4	1%
Klickitat	039	2	0%
Lewis	041	8	2%
Lincoln	043	2	0%
Mason	045	4	1%
Okanogan	047	4	1%
Pacific	049	2	0%
Pend Oreille	051	1	0%
Pierce	053	49	10%
San Juan	055	2	0%
Skagit	057	10	2%
Skamania	059	1	0%
Snohomish	061	36	7%
Spokane	063	41	8%
Stevens	065	4	1%
Thurston	067	10	2%
Wahkiakum	069	1	0%
Walla Walla	071	6	1%
Whatcom	073	20	4%
Whitman	075	5	1%
Yakima	077	21	4%
Don't know/Not sure	777	0	0%
Refused	999	0	0%

53: **Q3**

RECORD IN YEARS

How long has your shop been in business?

$E 1 999

N =	494	100%
Less than one year 000	3	1%
Don't know 998	6	1%
Refused 999	0	0%
..... 1	9	2%
..... 2	13	3%
..... 3	14	3%
..... 4	7	1%
..... 5	18	4%
..... 6	19	4%
..... 7	13	3%
..... 8	9	2%
..... 9	6	1%
..... 10	15	3%
..... 11	6	1%
..... 12	9	2%
..... 13	6	1%
..... 14	14	3%
..... 15	31	6%
..... 16	5	1%
..... 17	13	3%
..... 18	13	3%
..... 19	4	1%
..... 20	24	5%
..... 21	7	1%
..... 22	8	2%
..... 23	12	2%
..... 24	7	1%
..... 25	34	7%
..... 26	7	1%
..... 27	10	2%
..... 28	11	2%
..... 29	2	0%
..... 30	19	4%
..... 31	6	1%
..... 32	4	1%
..... 33	11	2%
..... 34	7	1%
..... 35	13	3%
..... 36	6	1%
..... 37	2	0%
..... 38	3	1%
..... 39	3	1%
..... 40	8	2%
..... 42	3	1%
..... 43	3	1%
..... 44	1	0%
..... 45	4	1%
..... 46	3	1%
..... 47	5	1%
..... 48	3	1%
..... 50	7	1%
..... 53	3	1%
..... 55	3	1%
..... 57	1	0%
..... 58	3	1%

59	1	0%
60	3	1%
63	2	0%
64	1	0%
65	1	0%
66	1	0%
67	1	0%
70	1	0%
72	1	0%
75	1	0%
77	1	0%
80	1	0%
83	2	0%
90	1	0%

54: **Q4**

Is your shop family-owned and operated?

N =	492	100%
Yes 1	408	83%
No 2	82	17%
Don't know 3	1	0%
Refused 4	1	0%

55: **Q5**

On the average, how many cars do you paint in a month? IF NEEDED: Just give me your best estimate TYPE NUMBER, USE OTHER ONLY IF NUMBER NOT GIVEN

$R 1 9999999

N =			493	100%
Other (SPECIFY:)	9999997	O	6	1%
Don't know	9999998		2	0%
Refused	9999999		0	0%
1			16	3%
2			8	2%
3			12	2%
4			17	3%
5			17	3%
6			14	3%
7			3	1%
8			13	3%
9			1	0%
10			25	5%
11			3	1%
12			13	3%
13			1	0%
14			2	0%
15			25	5%
16			2	0%
17			2	0%
18			7	1%
20			33	7%
23			3	1%
24			1	0%
25			23	5%
26			1	0%
27			3	1%
28			5	1%
30			31	6%
32			1	0%
33			1	0%
35			8	2%
37			1	0%
38			1	0%
40			27	5%
45			4	1%
50			24	5%
53			1	0%
55			3	1%
60			23	5%
65			6	1%
70			3	1%
75			10	2%
76			1	0%
80			17	3%
85			1	0%
90			8	2%
100			31	6%
110			1	0%
113			1	0%
115			1	0%
120			5	1%
125			1	0%
130			2	0%
140			4	1%

..... 145		1	0%
..... 150		6	1%
..... 151		1	0%
..... 160		1	0%
..... 170		1	0%
..... 180		1	0%
..... 200		2	0%
..... 250		3	1%
..... 300		1	0%
..... 400		1	0%

56: Q6

IF NEEDED: Just give me your best estimate

On the average how many complete cars do you paint in a month? For example, restore, refinish and paint the entire vehicle, rather than just damaged sections. TYPE NUMBER, USE OTHER ONLY IF NUMBER NOT GIVEN

$R 0 9999999

N = ...			486	100%
Other (SPECIFY:)	9999997	O	42	9%
Don't know	9999998		2	0%
Refused	9999999		0	0%
..... 0			271	56%
..... 1			95	20%
..... 2			27	6%
..... 3			21	4%
..... 4			5	1%
..... 5			2	0%
..... 6			1	0%
..... 10			2	0%
..... 12			1	0%
..... 20			1	0%
..... 30			1	0%
..... 35			1	0%
..... 40			2	0%
..... 50			3	1%
..... 60			2	0%
..... 75			1	0%
..... 80			3	1%
..... 85			1	0%
..... 100			1	0%
..... 115			1	0%

57: Q7

READ 1-4 ONLY IF NEEDED

Approximately how large is the production area of your shop? IF NEEDED: For example, preparation and painting.

N = ...		489	100%
Less than 1,000 square feet.....	1	31	6%
Between 1,000 and 5,000 square feet	2	243	50%
Between 5,000 and 10,000 square feet	3	153	31%
Or greater than 10,000 square feet.....	4	55	11%
Don't know - DO NOT READ.....	5	7	1%
Refused - DO NOT READ	6	0	0%

58: **Q8**

Is your shop part of a multi-store business, consolidator, franchise, cooperative group, chain, or similar collection of businesses?

N =			492	100%
Yes	1		59	12%
No	2		431	88%
Don't know	3		2	0%
Refused	4		0	0%

59: **Q9**

READ 1-3

How do you see the profitability of your business changing over the next 2 years, would you say it will...

N =			488	100%
Decrease	1		132	27%
Remain unchanged	2		158	32%
Or increase	3		182	37%
Don't know - DO NOT READ	4		16	3%
Refused - DO NOT READ	5		0	0%

60: **Q10A**

CLARIFY

What one factor influences your company's profitability the most?

N =			477	100%
RECORD COMMENTS	97	O	459	96%
Don't know	98	X	17	4%
Refused	99	X	1	0%

61: **Q10B**

CLARIFY

What factor influences your company's profitability next most?

=> Q11

si Q10A=98,99

N =			424	100%
RECORD COMMENTS	97	O	364	86%
No other factors	00	X	43	10%
Don't know	98	X	17	4%
Refused	99	X	0	0%

62: **Q10C**

CLARIFY

And, what other factor influences your company's profitability?

=> +1

si Q10B=00-99

N =			321	100%
RECORD COMMENTS	97	O	216	67%
No other factors	00	X	101	31%
Don't know	98	X	4	1%
Refused	99	X	0	0%

63: **Q11**

READ 1-97. PROBE TO FIT.

What is your major source of income, would you say... READ

N =			492	100%
Referrals from dealers	01		28	6%
The customer pays direct	02		111	23%
Insurance companies	03		304	62%
Or something else (SPECIFY:)	97	O	45	9%
Don't know	98		4	1%
Refused	99		0	0%

64: **Q12**

Do you belong to a retrospective rating program for workers' compensation insurance, also called a "retro" program?

N =			482	100%
Yes	1		83	17%
No	2		340	71%
Don't know	3		59	12%
Refused	4		0	0%

65: **Q12A**

Which program do you belong to?

=> +1
si NOT Q12=1

N =			81	100%
RECORD COMMENTS	97	O	73	90%
Don't know	98	X	7	9%
Refused	99	X	1	1%

66: **Q13**

Do you belong to any local or national automotive industry associations?

N =			489	100%
Yes	1		186	38%
No	2		295	60%
Don't know	3		8	2%
Refused	4		0	0%

67: **Q13A**

Which associations do you belong to?

=> +1
si NOT Q13=1

N =			181	100%
RECORD COMMENTS	97	O	178	98%
Don't know	98	X	3	2%
Refused	99	X	0	0%

68: **Q14**

IF NEEDED: Just give me your best estimate

How many employees in total do you have in the shop at your busiest time? Please include office workers, repair technicians, painters and all other employees. IF OWNER-OPERATOR AND NO EMPLOYEES USE CODE 9999996.

$R 0 9999999

N =		491	100%
Other (SPECIFY:)	9999997 O	0	0%
Owner-operator--no employees	9999996	42	9%
Don't know	9999998	0	0%
Refused	9999999	0	0%
0		4	1%
1		37	8%
2		49	10%
3		45	9%
4		37	8%
5		32	7%
6		39	8%
7		26	5%
8		20	4%
9		25	5%
10		22	4%
11		9	2%
12		19	4%
13		15	3%
14		11	2%
15		10	2%
16		9	2%
17		7	1%
18		5	1%
19		2	0%
20		5	1%
22		2	0%
23		2	0%
24		1	0%
25		5	1%
28		1	0%
30		3	1%
32		1	0%
34		2	0%
35		1	0%
36		1	0%
47		1	0%
63		1	0%

69: **Q15**

Is your shop unionized?

N =		489	100%
Yes	1	11	2%
No	2	478	98%
Don't know	3	0	0%
Refused	4	0	0%

70: **Q16A1**

IF NEEDED: Just give me your best estimate

These next questions are about body men or collision technicians and painters working at your shop at your busiest time. First, how many body men or collision technicians are there? TYPE NUMBER, USE OTHER ONLY IF ANSWER IS NOT A NUMBER. IF

OWNER-OPERATOR--NO EMPLOYEES AND OWNER IS A BODY MAN/COLLISION TECH., ENTER "1", IF NOT ENTER "0".

$R 0 999999

N =			478	100%
Other (SPECIFY:)	999997	O	1	0%
Don't know	999998		0	0%
Refused	999999		0	0%
	0		3	1%
	1		131	27%
	2		120	25%
	3		108	23%
	4		53	11%
	5		20	4%
	6		19	4%
	7		7	1%
	8		1	0%
	9		3	1%
	10		5	1%
	11		1	0%
	12		5	1%
	14		1	0%

71: Q16A2

IF NEEDED: Just give me your best estimate

(Now thinking the number of employees working in your shop at your busiest time..)

How many painters are there? TYPE NUMBER, USE OTHER ONLY IF ANSWER IS NOT A NUMBER. IF OWNER-OPERATOR AND NO EMPLOYEES, ASK IF HE DOES PAINTING. ENTER "1" IF YES, ENTER "0" IF NO.

$R 0 999999

N =			472	100%
Other (SPECIFY:)	999997	O	0	0%
Don't know	999998		0	0%
Refused	999999		0	0%
	0		3	1%
	1		243	51%
	2		145	31%
	3		52	11%
	4		19	4%
	5		3	1%
	6		3	1%
	7		2	0%
	8		2	0%

72: Q16B1

IF NEEDED: Just give me your best estimate

(Now thinking the number of employees working in your shop at your busiest time..)

How many female collision technicians are there? TYPE NUMBER, USE OTHER ONLY IF ANSWER IS NOT A NUMBER. IF OWNER-OPERATOR--NO EMPLOYEES IS FEMALE AND IS A COLLISION TECH, ENTER "1", IF NOT ENTER "0".

$R 0 999999

N =			444	100%
Other (SPECIFY:)	999997	O	0	0%
Don't know	999998		1	0%
Refused	999999		0	0%
	0		427	96%
	1		15	3%
	2		1	0%

73: **Q16B2**

IF NEEDED: Just give me your best estimate

(Now thinking the number of employees working in your shop at your busiest time..)

How many female painters are there? TYPE NUMBER, USE OTHER ONLY IF ANSWER IS NOT A NUMBER. IF OWNER-OPERATOR--NO EMPLOYEES IS FEMALE AND PAINTS, ENTER "1", IF NOT ENTER "0".

$R 0 999999

N = ...			437	100%
Other (SPECIFY:)	999997	O	0	0%
Don't know	999998		0	0%
Refused.....	999999		0	0%
.....	0		422	97%
.....	1		15	3%

74: **Q16C1**

IF NEEDED: Just give me your best estimate

(Now thinking the number of employees working in your shop at your busiest time..)

What is the average number of years on the job for body men or collision technicians? TYPE NUMBER, USE OTHER ONLY IF ANSWER IS NOT A NUMBER. IF OWNER-OPERATOR--NO EMPLOYEES, ENTER # OF YEARS OF OWNER'S EXPERIENCE

$E 1 99

N =			462	100%
Other (SPECIFY:)	97	O	1	0%
Less than 1 year	96		2	0%
No body men or collision technicians	88		0	0%
Don't know	98		14	3%
Refused	99		0	0%
	1		5	1%
	2		7	2%
	3		16	3%
	4		11	2%
	5		29	6%
	6		4	1%
	7		11	2%
	8		19	4%
	9		5	1%
	10		51	11%
	11		7	2%
	12		17	4%
	13		8	2%
	14		3	1%
	15		67	15%
	16		1	0%
	17		4	1%
	18		14	3%
	19		2	0%
	20		53	11%
	21		1	0%
	22		3	1%
	23		1	0%
	24		2	0%
	25		24	5%
	26		2	0%
	27		5	1%
	28		3	1%
	29		1	0%
	30		31	7%
	31		2	0%
	32		1	0%
	35		8	2%
	36		1	0%
	38		1	0%
	40		11	2%
	41		1	0%
	43		1	0%
	44		1	0%
	45		6	1%
	48		2	0%
	50		1	0%
	70		1	0%
	80		1	0%

75: **Q16C2**

IF NEEDED: Just give me your best estimate

(Now thinking the number of employees working in your shop at your busiest time..)

What is the average number of years on the job for painters? TYPE NUMBER, USE OTHER ONLY IF ANSWER IS NOT A NUMBER. IF OWNER-OPERATOR--NO EMPLOYEES, ENTER # OF YEARS OF OWNER'S EXPERIENCE

$E 1 99

N =			449	100%
Other (SPECIFY:)	97	O	0	0%
Less than 1 year	96		4	1%
No body men or collision technicians	88		0	0%
Don't know	98		14	3%
Refused	99		0	0%
	1		6	1%
	2		8	2%
	3		12	3%
	4		12	3%
	5		23	5%
	6		17	4%
	7		13	3%
	8		22	5%
	9		7	2%
	10		72	16%
	11		5	1%
	12		14	3%
	13		5	1%
	15		49	11%
	16		1	0%
	17		6	1%
	18		11	2%
	19		1	0%
	20		42	9%
	21		2	0%
	22		2	0%
	23		3	1%
	24		1	0%
	25		29	6%
	26		3	1%
	27		4	1%
	28		3	1%
	29		1	0%
	30		25	6%
	31		2	0%
	35		11	2%
	36		1	0%
	40		9	2%
	41		1	0%
	43		1	0%
	44		1	0%
	45		3	1%
	48		2	0%
	50		1	0%

76: **Q16D1**

IF NEEDED: Just give me your best estimate

(Now thinking the number of employees working in your shop at your busiest time..)

How many body men or collision technicians are less than 35 years old? TYPE NUMBER, USE OTHER ONLY IF ANSWER IS NOT A NUMBER.

$R 0 999999

N =			466	100%
Other (SPECIFY:)	999997	O	0	0%
Don't know	999998		3	1%
Refused	999999		0	0%
0			201	43%
1			143	31%
2			72	15%
3			28	6%
4			12	3%
5			5	1%
6			1	0%
10			1	0%

77: **Q16D2**

IF NEEDED: Just give me your best estimate

(Now thinking the number of employees working in your shop at your busiest time..)

How many painters are less than 35 years old? TYPE NUMBER, USE OTHER ONLY IF ANSWER IS NOT A NUMBER.

$R 0 999999

N =			447	100%
Other (SPECIFY:)	999997	O	0	0%
Don't know	999998		2	0%
Refused	999999		0	0%
0			212	47%
1			151	34%
2			56	13%
3			18	4%
4			7	2%
5			1	0%

78: **Q16E1**

IF NEEDED: Just give me your best estimate

(Now thinking the number of employees working in your shop at your busiest time..)
How many body men or collision technicians are 35 to 55 years old? TYPE NUMBER, USE OTHER ONLY IF ANSWER IS NOT A NUMBER.

$R 0 999999

N =			460	100%
Other (SPECIFY:)	999997	O	1	0%
Don't know	999998		3	1%
Refused	999999		0	0%
0			71	15%
1			176	38%
2			108	23%
3			59	13%
4			20	4%
5			8	2%
6			3	1%
7			3	1%
8			3	1%
9			2	0%
10			3	1%

79: **Q16E2**

IF NEEDED: Just give me your best estimate

(Now thinking the number of employees working in your shop at your busiest time..)
How many painters are 35 to 55 years old? TYPE NUMBER, USE OTHER ONLY IF ANSWER IS NOT A NUMBER.

$R 0 999999

N =			449	100%
Other (SPECIFY:)	999997	O	0	0%
Don't know	999998		2	0%
Refused	999999		0	0%
0			139	31%
1			225	50%
2			68	15%
3			12	3%
4			2	0%
6			1	0%

80: **Q16F1**

IF NEEDED: Just give me your best estimate

(Now thinking the number of employees working in your shop at your busiest time..)
How many body men or collision technicians are greater than 55? TYPE NUMBER, USE OTHER ONLY IF ANSWER IS NOT A NUMBER.

$R 0 999999

N =			449	100%
Other (SPECIFY:)	999997	O	0	0%
Don't know	999998		5	1%
Refused	999999		0	0%
0			338	75%
1			91	20%
2			15	3%

81: **Q16F2**

IF NEEDED: Just give me your best estimate

(Now thinking the number of employees working in your shop at your busiest time..)

How many painters are greater than 55? TYPE NUMBER, USE OTHER ONLY IF ANSWER IS NOT A NUMBER.

$R 0 999999

N =			435	100%
Other (SPECIFY:)	999997	O	0	0%
Don't know	999998		4	1%
Refused	999999		0	0%
	0		382	88%
	1		48	11%
	2		1	0%

82: **Q16G1**

READ 1-97. ONE RESPONSE ONLY.

(Now thinking the number of employees working in your shop at your busiest time..)

How are the body men or collision technicians most frequently paid...

N =			472	100%
Commission	01		95	20%
Flat rate	02		104	22%
Hourly	03		194	41%
Salaried	04		32	7%
Or some other way (SPECIFY:)	97	O	47	10%
Don't know	98	X	0	0%
Refused	99	X	0	0%

83: **Q16G2**

READ 1-97. ONE RESPONSE ONLY

(Now thinking the number of employees working in your shop at your busiest time..)

How are the painters most frequently paid...

N =			463	100%
Commission	01		79	17%
Flat rate	02		90	19%
Hourly	03		205	44%
Salaried	04		41	9%
Or some other way (SPECIFY:)	97	O	47	10%
Don't know	98	X	1	0%
Refused	99	X	0	0%

84: **Q17A**

UP TO 3 RESPONSES

These next questions are about employee benefits. Does your company provide any of your workers with the following benefits... First, Medical? IF OWNER-OPERATOR--NO EMPLOYEES ENTER CODE 6, NOT APPLICABLE.

IF YES, ASK: Is that available to...READ 1-3

N =			417	100%
Office staff	1		250	60%
Collision techicians	2		263	63%
Or Painters	3		261	63%
Not applicable-- Owner-operator --no employees DO NOT READ	6	X	37	9%
No/do not provide--DO NOT READ	0	X	102	24%
Don't know--DO NOT READ	4	X	0	0%
Refused--DO NOT READ	5	X	2	0%

85: **Q17B**

UP TO 3 RESPONSES

(Does your company provide your workers with the following benefits...) Dental? IF OWNER-OPERATOR--NO EMPLOYEES ENTER CODE 6, NOT APPLICABLE.
IF YES, ASK: Is that available to...READ 1-3

N =			378	100%
Office staff	1		166	44%
Collision technicians	2		171	45%
Or painters	3		172	46%
Not applicable-- Owner-operator --no employees DO NOT READ	6	X	38	10%
No/Do not provide - DO NOT READ	0	X	160	42%
Don't know - DO NOT READ	4	X	0	0%
Refused - DO NOT READ	5	X	2	1%

86: **Q17C**

UP TO 3 RESPONSES

(Does your company provide your workers with the following benefits...) Vision? IF OWNER-OPERATOR--NO EMPLOYEES ENTER CODE 6, NOT APPLICABLE.
IF YES, ASK: Is that available to...READ 1-3

N =			359	100%
Office staff	1		129	36%
Collision technicians	2		132	37%
Or painters	3		131	36%
Not applicable-- Owner-operator --no employees DO NOT READ	6	X	38	11%
No/Do not provide - DO NOT READ	0	X	177	49%
Don't know - DO NOT READ	4	X	4	1%
Refused - DO NOT READ	5	X	2	1%

87: **Q17D**

UP TO 3 RESPONSES

(Does your company provide your workers with the following benefits...) Retirement plan? IF OWNER-OPERATOR--NO EMPLOYEES ENTER CODE 6, NOT APPLICABLE.
IF YES, ASK: Is that available to...READ 1-3

N =			361	100%
Office staff	1		144	40%
Collision technicians	2		149	41%
Or painters	3		150	42%
Not applicable-- Owner-operator --no employees DO NOT READ	6	X	38	11%
No/Do not provide - DO NOT READ	0	X	168	47%
Don't know - DO NOT READ	4	X	2	1%
Refused - DO NOT READ	5	X	2	1%

88: **Q17E**

UP TO 3 RESPONSES

(Does your company provide your workers with the following benefits...) Childcare Assistance? IF OWNER-OPERATOR NO EMPLOYEES ENTER CODE 6 "NOT APPLICABLE."
IF YES, ASK: Is that available to...READ 1-3

N =			308	100%
Office staff	1		5	2%
Collision technicians	2		5	2%
Or painters	3		5	2%
No/Do not provide - DO NOT READ	0	X	252	82%
Not applicable --Owner-operator --no employees DO NOT READ	6	X	46	15%
Don't know - DO NOT READ	4	X	3	1%
Refused - DO NOT READ	5	X	2	1%

89: **Q17F**

UP TO 3 RESPONSES

(Does your company provide your workers with the following benefits...) On the job training? IF OWNER-OPERATOR NO EMPLOYEES ENTER CODE 6, NOT APPLICABLE.

IF YES, ASK: Is that available to...READ 1-3

N =			389	100%
Office staff	1		194	50%
Collision technicians	2		245	63%
Or painters	3		240	62%
No/Do not provide - DO NOT READ	0	X	84	22%
Not applicable --Owner-operator --no employees DO NOT READ	6	X	41	11%
Don't know - DO NOT READ	4	X	3	1%
Refused - DO NOT READ	5	X	2	1%

90: **Q17G**

UP TO 3 RESPONSES

(Does your company provide your workers with the following benefits...) Tuition Reimbursement? IF OWNER-OPERATOR--NO EMPLOYEES ENTER CODE 6.

IF YES, ASK: Is that available to...READ 1-3

N =			339	100%
Office staff	1		71	21%
Collision technicians	2		91	27%
Or painters	3		92	27%
No/Do not provide - DO NOT READ	0	X	196	58%
Not applicable --Owner-operator --no employees DO NOT READ	6	X	41	12%
Don't know - DO NOT READ	4	X	5	1%
Refused - DO NOT READ	5	X	2	1%

91: **Q17H**

UP TO 3 RESPONSES

(Does your company provide your workers with the following benefits...) Outside training? IF OWNER-OPERATOR --NO EMPLOYEES ENTER CODE 6.

IF YES, ASK: Is that available to...READ 1-3

N =			391	100%
Office staff	1		194	50%
Collision technicians	2		252	64%
Or painters	3		253	65%
No/Do not provide - DO NOT READ	0	X	85	22%
Not applicable --Owner-operator --no employees DO NOT READ	6	X	40	10%
Don't know - DO NOT READ	4	X	3	1%
Refused - DO NOT READ	5	X	2	1%

92: **Q17I**

UP TO 3 RESPONSES

(Does your company provide your workers with the following benefits...) Paid vacation leave? IF OWNER-OPERATOR--NO EMPLOYEES, ENTER CODE 6.

IF YES, ASK: Is that available to...READ 1-3

N =			437	100%
Office staff	1		285	65%
Collision technicians	2		320	73%
Or painters	3		317	73%
No/Do not provide - DO NOT READ	0	X	57	13%
Not applicable --Owner-operator --no employees DO NOT READ	6	X	40	9%
Don't know - DO NOT READ	4	X	1	0%
Refused - DO NOT READ	5	X	2	0%

93: **Q17J**

UP TO 3 RESPONSES

(Does your company provide your workers with the following benefits...) Paid sick leave? IF OWNER-OPERATOR--NO EMPLOYEES, ENTER CODE 6.
IF YES, ASK: Is that available to...READ 1-3

N =			344	100%
Office staff	1		90	26%
Collision technicians	2		97	28%
Or painters	3		96	28%
No/Do not provide - DO NOT READ	0	X	191	56%
Not applicable --Owner-operator --no employees DO NOT READ	6	X	40	12%
Don't know - DO NOT READ	4	X	2	1%
Refused - DO NOT READ	5	X	2	1%

94: **Q17K**

UP TO 3 RESPONSES

(Does your company provide your workers with the following benefits...) Paid family leave? IF OWNER-OPERATOR--NO EMPLOYEES, ENTER CODE 6.
IF YES, ASK: Is that available to...READ 1-3

N =			327	100%
Office staff	1		57	17%
Collision technicians	2		63	19%
Or painters	3		63	19%
No/Do not provide - DO NOT READ	0	X	204	62%
Not applicable --Owner-operator --no employees DO NOT READ	6	X	40	12%
Don't know - DO NOT READ	4	X	12	4%
Refused - DO NOT READ	5	X	2	1%

95: **Q17L**

UP TO 3 RESPONSES

(Does your company provide your workers with the following benefits...) Family emergency assistance? IF OWNER-OPERATOR--NO EMPLOYEES, ENTER CODE 6.
IF YES, ASK: Is that available to...READ 1-3

N =			317	100%
Office staff	1		53	17%
Collision technicians	2		60	19%
Or painters	3		60	19%
No/Do not provide - DO NOT READ	0	X	193	61%
Not applicable --Owner-operator --no employees DO NOT READ	6	X	40	13%
Don't know - DO NOT READ	4	X	18	6%
Refused - DO NOT READ	5	X	2	1%

96: **Q17M**

Does your company offer any other benefits? IF OWNER-OPERATOR--NO EMPLOYEES, ENTER CODE 96--NOT APPLICABLE. IF YES, PROBE: What would those be?

N =			315	100%
RECORD COMMENTS	97	O	39	12%
No/No other benefits offered	00	X	240	76%
Not applicable-- Owner-operator --no employees DO NOT READ	96	X	33	10%
Don't know	98	X	1	0%
Refused	99	X	2	1%

97: **Q17N**

Is that available to...READ 1-3 IF OWNER-OPERATOR--NO EMPLOYEES, ENTER CODE 6.

=> +1
si NOT Q17M=97

N =			39	100%
Office staff	1		33	85%
Collision technicians	2		38	97%
Or painters	3		38	97%
Not applicable --Owner-operator--no employees --DO NOT READ	6	X	0	0%
No/Do not provide - DO NOT READ	0	X	0	0%
Don't know - DO NOT READ	4	X	0	0%
Refused - DO NOT READ	5	X	0	0%

98: **Q18**

READ 1-97. UP TO 5 RESPONSES.

The next series of questions are about health and safety. First, which trade journals do you read? I am going to read you a list. Please say yes or no after I read each one. Do you read... PAUSE AFTER EACH:

N =			480	100%
Body/Shop Business	01		425	89%
Parts and People	02		108	23%
ACA Newsletter	03		172	36%
Auto Inc (ASA)	04		115	24%
Or something else (SPECIFY:)	97	O	132	28%
None -DO NOT READ	00	X	24	5%
Don't know - -DO NOT READ	98	X	5	1%
Refused --DO NOT READ	99	X	0	0%

99: **Q19**

Does your shop have a safety committee that meets regularly? IF OWNER-OPERATOR--NO EMPLOYEES, ENTER CODE 6, NOT APPLICABLE.

N =		489	100%
Yes	1	273	56%
No	2	175	36%
Not applicable--Owner-operator--no employees	6	39	8%
Don't know	3	2	0%
Refused	4	0	0%

100: **Q20**

Is there a person designated with allotted time to address safety and health issues? IF OWNER-OPERATOR--NO EMPLOYEES, ENTER CODE 6, NOT APPLICABLE.

N =		487	100%
Yes	1	286	59%
No	2	160	33%
Not applicable--Owner-operator--no employees	6	39	8%
Don't know	3	2	0%
Refused	4	0	0%

101: **Q21**

Does the shop have funds dedicated to address unsafe conditions or equipment?

N =			488	100%
Yes	1		205	42%
No	2		268	55%
Don't know	3		15	3%
Refused	4		0	0%

102: **Q22**

Does your shop have a safety incentive program for employees? IF OWNER-OPERATOR--NO EMPLOYEES, ENTER CODE 6, NOT APPLICABLE.

N =			488	100%
Yes	1		62	13%
No	2		380	78%
Not applicable--Owner-operator--no employees	6		39	8%
Don't know	3		7	1%
Refused	4		0	0%

103: **Q23**

Do you generally keep injured employees on salary? IF OWNER-OPERATOR--NO EMPLOYEES, ENTER CODE 6, NOT APPLICABLE.

N =			479	100%
Yes	1		141	29%
No	2		247	52%
Not applicable--Owner-operator--no employees	6		40	8%
Don't know	3		51	11%
Refused	4		0	0%

104: **Q24**

Does your shop design and provide modified or light-duty jobs for injured employees? IF OWNER-OPERATOR--NO EMPLOYEES, ENTER CODE 6, NOT APPLICABLE.

N =			478	100%
Yes	1		268	56%
No	2		153	32%
Not applicable--Owner-operator--no employees	6		39	8%
Don't know	3		18	4%
Refused	4		0	0%

105: **Q25**

READ 1-97. UP TO 5 RESPONSES

Where do you get your health & safety information for two-part paint systems? I am going to read you a list. Please say yes or no after I read each one. PAUSE AFTER EACH.

N =			491	100%
Material Safety Data Sheets (MSDS)	01		470	96%
Other manufacturer or supplier information	02		377	77%
Health and safety information on the Internet	03		130	26%
Trade journals	04		225	46%
Or somewhere else (SPECIFY:)	97	O	39	8%
Don't have access to any health information -DO NOT READ	00	X	1	0%
Don't know- -DO NOT READ	98	X	4	1%
Refused --DO NOT READ	99	X	0	0%

106: **Q26**

PROBE TO FIT

How do your painters most often clean their paint guns with solvent? DO NOT READ. PROBE TO FIT. IF MORE THAN ONE ANSWER, ASK: What method is used the most often?

N =			493	100%
Don't use Solvent	01		1	0%
Manual cleaning	02		91	18%
Automatic gun washer	03		276	56%
Combination of manual and automatic washing	04		119	24%
Other (SPECIFY:)	97	O	4	1%
Don't know	98	X	2	0%
Refused	99	X	0	0%

107: **Q27**

PROBE TO FIT. UP TO 8 RESPONSES

What types of gloves do your workers use when handling lacquer thinner? READ 3-97 IF NEEDED.

N =			487	100%
Latex	03		215	44%
Natural rubber	04		49	10%
Nitrile	05		186	38%
Neoprene	06		54	11%
PVC	07		7	1%
Laminated polyethylene	08		11	2%
Cloth/Leather	09		4	1%
Other (SPECIFY:)	97	O	0	0%
Don't use lacquer thinner	01	X	17	3%
None	02	X	4	1%
Don't know	98	X	46	9%
Refused	99	X	0	0%

108: **Q28**

Do you have a central vacuum system to collect dust from power tools?

N =			494	100%
Yes	1		99	20%
No	2		392	79%
Don't know	3		3	1%
Refused	4		0	0%

109: **Q28A**

DO NOT READ. PROBE TO FIT. UP TO 8 RESPONSES

Please tell me why you don't have a system?

=> +1

si NOT Q28=2

N =			387	100%
Too expensive	01		150	39%
Too difficult to maintain	02		21	5%
Too difficult to install	03		27	7%
Not proven to work	04		23	6%
Inconvenient to use	05		43	11%
Not enough dust generated to justify cost	06		149	39%
Incompatible with technicians' tools	07		60	16%
Other (SPECIFY:)	97	O	60	16%
Don't know	98	X	30	8%
Refused	99	X	0	0%

110: **Q29**

READ 1-97. UP TO 13 RESPONSES

Which of the following personal protective equipment , also called PPE, do your workers wear while spraying two-part clear coats? Please say yes or no after I read each one. PAUSE AFTER EACH.

N =			494	100%
Respirator	01		482	98%
Safety glasses	02		292	59%
Goggles	03		184	37%
Head socks	04		267	54%
Earplugs or muffs	05		197	40%
Gloves	06		422	85%
Shoot suit	07		411	83%
Fabric coveralls	08		141	29%
Disposable coveralls	09		151	31%
Cloth or leather work boots	10		228	46%
Rubber boots	11		43	9%
Disposable boot covers	12		67	14%
Or something else (SPECIFY:)	97	O	2	0%
Don't know	98	X	0	0%
Refused	99	X	0	0%

111: **Q30**

PROBE TO FIT. UP TO 8 RESPONSES

What types of gloves do your workers use when mixing or applying two-part clear coats?

N =			493	100%
Latex	01		253	51%
Natural rubber	02		24	5%
Nitrile	03		195	40%
Neoprene	04		39	8%
PVC	05		5	1%
Laminated polyethylene	06		4	1%
Cloth/Leather	07		3	1%
Other (SPECIFY:)	97	O	5	1%
None	00	X	11	2%
Don't know	98	X	42	9%
Refused	99	X	0	0%

112: **Q31**

DO NOT READ. PROBE TO FIT. UP TO 9 RESPONSES

What types of respirators do your workers use while spraying two-part clear coats? PROBE WELL!

N =			494	100%
Dust masks (filtering face pieces)	01		16	3%
Disposable half-face type with cartridges (entire unit disposable - both the face-piece and cartridges)	02		114	23%
Half-face type with replaceable cartridges	03		227	46%
Full-face type with cartridges	04		79	16%
Half-face type with an air supply hose	05		70	14%
Full-face type with an air supply hose	06		128	26%
Hood or head covering with air supply hose	07		87	18%
Hood-type powered air-purifying respirator (PAPR)	08		40	8%
Other (SPECIFY:)	97	O	1	0%
None	00	X	0	0%
Don't know	98	X	2	0%
Refused	99	X	0	0%

113: **Q32**

DO NOT READ. PROBE TO FIT. UP TO 6 RESPONSES

Please tell me why your workers do not use supplied air respirators.

=> Q33

si Q31=05-07

N =			243	100%
We don't have supplied air respirators because they are too expensive	01		60	25%
We don't have supplied air respirators because they are too difficult to install	02		6	2%
We don't have supplied air respirators because they are too difficult to maintain	03		7	3%
We don't have supplied air respirators because the painters don't like them	04		70	29%
We have supplied air respirators but the painters don't use them	05		55	23%
Other (SPECIFY:)	97	O	52	21%
Don't know	98	X	22	9%
Refused	99	X	0	0%

114: **Q33**

READ 1-97. UP TO 7 RESPONSES

Where do painters spray two-part clear coats? I am going to read a list. Please say yes or no after I read each one. Do they use a... PAUSE AFTER EACH. IF THEY SAY SOMEWHERE ELSE, PLEASE PROBE TO FIT.

N =			492	100%
Downdraft booth IF NEEDED: Air supplied from the top of the booth and exhausted below)	01		226	46%
Semi-downdraft booth IF NEEDED: Air supplied from the top of the booth and exhausted from the side	02		50	10%
Prefabricated crossdraft booth IF NEEDED: Air supplied from one side of the booth and exhausted on the opposite side	03		127	26%
Custom crossdraft booth IF NEEDED: Air supplied from one side of the booth and exhausted on the opposite side	04		99	20%
Ventilated prep station	05		44	9%
On the shop floor IF NEEDED: No mechanical ventilation	06		13	3%
Or somewhere else (SPECIFY:)	97		8	2%
Don't know - DO NOT READ	98		1	0%
Refused - DO NOT READ	99		0	0%

115: **Q34**

CLARIFY

What health effects do you know of that can be caused by exposure to two-part paint systems?

N =			460	100%
RECORD COMMENTS	97	O	391	85%
Don't know	98	X	69	15%
Refused	99	X	0	0%

116: **Q35**

CLARIFY

What harmful chemicals do you know of that are present in two-part paint systems?

N =			443	100%
RECORD COMMENTS	97	O	345	78%
Don't know	98	X	98	22%
Refused	99	X	0	0%

117: **Q36**

CLARIFY

How do employees report health & safety concerns? IF OWNER-OPERATOR--NO EMPLOYEES ENTER CODE 96, NOT APPLICABLE

N =			461	100%
RECORD COMMENTS	97	O	398	86%
Not applicable--owner-operator--no employees	96	X	48	10%
Don't know	98	X	15	3%
Refused	99	X	0	0%

118: **Q37**

CLARIFY

How do you know when those health and safety concerns have been resolved? IF OWNER-OPERATOR--NO EMPLOYEES ENTER CODE 96, NOT APPLICABLE

N =			441	100%
RECORD COMMENTS	97	O	375	85%
Not applicable--owner-operator--no employees	96	X	40	9%
Don't know	98	X	26	6%
Refused	99	X	0	0%

119: **Q38**

CLARIFY

If you were given $500 to improve some aspect of health and safety in your shop, what would you do with it?

N =			440	100%
RECORD COMMENTS	97	O	356	81%
Don't know	98	X	84	19%
Refused	99	X	0	0%

120: **Q39**

Do you contract with a private health & safety consultant or "compliance company"?

N =			491	100%
Yes	1		123	25%
No	2		355	72%
Don't know	3		13	3%
Refused	4		0	0%

121: **Q39A**

IF NEEDED: Just give me your best estimate

How many times per year do they visit your shop? TYPE NUMBER, USE OTHER ONLY IF NUMBER NOT GIVEN

$E 1 9999

=> Q40A

si NOT Q39=1

N =			117	100%
Other (SPECIFY:)	9997	O	8	7%
Don't know	9998		3	3%
Refused	9999		0	0%
	1		18	15%
	2		16	14%
	3		5	4%
	4		28	24%
	5		4	3%
	6		14	12%
	8		1	1%
	10		2	2%
	12		15	13%
	20		1	1%
	24		1	1%
	36		1	1%

122: **Q39B**

Are you satisfied with the services provided by the consultant or company?

N =			118	100%
Yes	1		113	96%
No	2		4	3%
Don't know	3		1	1%
Refused	4		0	0%

123: **Q39C**

Would you recommend your consultant or company to another shop?

N =			116	100%
Yes	1		107	92%
No	2		7	6%
Don't know	3		2	2%
Refused	4		0	0%

124: **Q39D**

Which consultant or company do you use?

N =			112	100%
RECORD COMMENTS	97	O	100	89%
Don't know	98	X	11	10%
Refused	99	X	1	1%

125: **Q40A**

CLARIFY.

In your opinion, what is the ONE most serious injury, illness, or exposure in the collision repair industry?

N =			472	100%
RECORD COMMENTS	97	O	437	93%
Don't know	98	X	35	7%
Refused	99	X	0	0%

126: **Q40B**

CLARIFY.

In your opinion, what is the second most serious injury, illness, or exposure in the collision repair industry?

=> Q41A

si Q40A=98,99

N =			419	100%
RECORD COMMENTS	97	O	353	84%
None/No others	00	X	51	12%
Don't know	98	X	15	4%
Refused	99	X	0	0%

127: **Q40C**

CLARIFY.

What else is a serious injury, illness, or exposure in the collision repair industry?

=> +1

si Q40B=00-99

N =			318	100%
RECORD COMMENTS	97	O	196	62%
None/No others	00	X	109	34%
Don't know	98	X	13	4%
Refused	99	X	0	0%

128: **Q41A**

CLARIFY.

What is the one most effective way, that is, the best practice, to protect the health & safety of collision repair workers?

N =			471	100%
RECORD COMMENTS	97	O	453	96%
Don't know	98	X	16	3%
Refused	99	X	2	0%

129: **Q41B**

CLARIFY.

What is the second most effective way to protect the health & safety of collision repair workers?

=> Q42A

si Q41A=98,99

N =			439	100%
RECORD COMMENTS	97	O	338	77%
None/No others	00	X	91	21%
Don't know	98	X	10	2%
Refused	99	X	0	0%

130: **Q41C**

CLARIFY.

What else is an effective way to protect the health & safety of collision repair workers?

=> +1

si Q41B=00-99

N =			312	100%
RECORD COMMENTS	97	O	185	59%
None/No others	00	X	118	38%
Don't know	98	X	9	3%
Refused	99	X	0	0%

131: **Q42A**

CLARIFY.

What is the one most significant challenge to implementing those "best practices" in health and safety?

=> Q43A

si Q42A=98-99

N =			446	100%
RECORD COMMENTS	97	O	359	80%
None/No challenges	00	X	49	11%
Don't know	98	X	36	8%
Refused	99	X	2	0%

132: **Q42B**

CLARIFY.

What is the second most significant challenge to implementing those "best practices" in health and safety?

=> Q43A

si Q42A=00-99

N =			315	100%
RECORD COMMENTS	97	O	165	52%
None/No others	00	X	133	42%
Don't know	98	X	17	5%
Refused	99	X	0	0%

133: **Q42C**

CLARIFY.

What else is a significant challenge to implementing those "best practices" in health and safety?

=> +1

si Q42B=00-99

N =			134	100%
RECORD COMMENTS	97	O	69	51%
None/No others	00	X	55	41%
Don't know	98	X	10	7%
Refused	99	X	0	0%

134: **Q43A**

CLARIFY.

What is the one best strategy that could be used to overcome these challenges? IF NEEDED: Or any challenges you have for health and safety at your work.

=> Q44

si Q42A=00

N =			357	100%
RECORD COMMENTS	97	O	285	80%
Don't know	98	X	70	20%
Refused	99	X	2	1%

135: **Q43B**

CLARIFY.

What is the second best strategy that could be used to overcome these challenges? IF NEEDED: Or any challenges you have for health and safety at your work.

=> Q44

si Q43A=98,99

N =			255	100%
RECORD COMMENTS	97	O	138	54%
None/No others	00	X	108	42%
Don't know	98	X	9	4%
Refused	99	X	0	0%

136: **Q43C**

CLARIFY.

What else is a good strategy that could be used to overcome these challenges? IF NEEDED: Or any challenges you have for health and safety at your work.

=> +1

si Q43B=00-99

N =			121	100%
RECORD COMMENTS	97	O	60	50%
None/No others	00	X	57	47%
Don't know	98	X	4	3%
Refused	99	X	0	0%

137: **Q44**

If SHARP gets additional funding, they will be doing further work in the collision repair industry. Would you be willing to work with SHARP on this confidential project? SHARP would visit your shop and provide hands-on training and education. In order for SHARP to work with you we will need to send them your contact information.

N =		464	100%
Yes	1	300	65%
No	2	132	28%
Don't know	3	32	7%
Refused	4	0	0%

138: **Q45**

Do you have access to the Internet?

N =		487	100%
Yes	1	427	88%
No	2	60	12%
Don't know	3	0	0%
Refused	4	0	0%

139: **Q45A**

Would you consider completing a future confidential survey on-line, rather than on paper?

=> +1

si NOT Q45=1

N =		423	100%
Yes	1	300	71%
No	2	113	27%
Don't know	3	10	2%
Refused	4	0	0%

140: **Q46**

CLARIFY

Do you have additional concerns or comments about health & safety in the collision repair industry?

N =			381	100%
RECORD COMMENTS	97	O	63	17%
No/No additional comments	00	X	317	83%
Don't know	98	X	1	0%
Refused	99	X	0	0%

141: **Q47**

Would you be interested in receiving more information about this project and educational materials? If so, we would send your contact information to SHARP.

N =		430	100%
Yes	1	348	81%
No	2	78	18%
Don't know	3	4	1%
Refused	4	0	0%

151: **CNAME**

Name of person

N =	344	100%

152: **SNAME**

Name of shop

N =	341	100%

153: **CTIT**

Person title

N =	344	100%

154: CADDR

Shop address

N =		343	100%

155: CCITY

N =		344	100%

156: CSTAT

N =		347	100%

157: CZIP

N =		345	100%

177: QEMAI

Is there an email address SHARP can reach you at?

N =		225	100%
Yes	1	171	76%
No	2	53	24%
Refused	3	1	0%

178: EMAIL

RECORD EMAIL ADDRESS

=> QPHON
si QEMAI=2-3

N =		256	100%

179: QPHON

What is the best phone number to reach you?

N =		344	100%

180: QFAX

Is there a fax number SHARP can reach you at?

N =		225	100%
Yes	1	209	93%
No	2	16	7%
Refused	3	0	0%

181: FAXP

RECORD FAX #

=> SETIN
si QFAX=2-3

N =		313	100%